RADIO SHACK COMPUTER OWNERS

TRS-80™ MONTHLY NEWSLETTER

ISSUE NUMBER 10
APRIL, 1979

- **PRACTICAL APPLICATIONS**
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. . . . AND MORE

- TEXT EDITOR
- WORD PROCESSOR
- PRINT TO LPRINT
- LPRINT VIDEO CONTENTS
- DATA FILES FOR BEGINNERS
- BARGAIN DISKETTES

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H & E COMPUTRONICS INC.
MATHEMATICAL APPLICATIONS SERVICE™

Box 149
New City, New York 10956
(914) 425-1535

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THE PURPOSE OF THE **TRS-80 MONTHLY NEWSLETTER** IS TO PROVIDE AND EXCHANGE INFORMATION RELATED TO THE CARE, USE AND APPLICATION OF THE TRS-80 COMPUTER SYSTEM.

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SUBSCRIPTIONS ARE $24 PER YEAR ($28 PER YEAR -CANADA AND MEXICO, $36 PER YEAR OUTSIDE OF THE UNITED STATES, CANADA AND MEXICO-AIR MAIL). BACK ISSUES ARE AVAILABLE ($2 PER ISSUE).

HAVE ANY URGENT QUESTIONS? WE HAVE TELEPHONE HOURS - 9 A.M. - 5 P.M. OTHER TIMES, LEAVE A MESSAGE ON OUR ANSWERING MACHINE. WE WILL PROMPTLY RETURN ALL CALLS (COLLECT).

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H & E COMPUTRONICS INC.
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BITS AND PIECES

by

HOWARD Y. GOSMAN

YOUR SUBSCRIPTION HAS EXPIRED IF...

IT IS EXTREMELY IMPORTANT THAT YOU CHECK THE NUMBER ABOVE YOUR NAME ON YOUR MAILING LABEL. You should see a four or five digit number followed by a dash (-) followed by one or two numbers (and possibly followed by some additional letters). The first four or five digits before the dash indicate your subscription number. For example, 14567-12CW is subscriber number 14,567. It is possible that some new subscribers may receive a low subscription number. If that is the case, you would be taking the place of a subscriber who has an expired subscription. The one or two numbers following the dash tells you when your subscription has run out. For example, subscriber 14567-12CW will receive the issues up to and including #12 (June, 1979), but will not receive the July issue unless he renews his subscription. The letters and the end of your subscription number give us some vital information about your subscription. For example, C tells us that you paid with your credit card and that your credit card number is on file. W tells us that you were to receive a FREE WORD PROCESSOR PROGRAM. YOU WILL PROBABLY NOT BE NOTIFIED WHEN YOUR SUBSCRIPTION HAS EXPIRED...SO WATCH YOUR MAILING LABEL.

BOTH APRIL AND MAY IN ONE ENVELOPE

Ever since last July (1978) we have been trying to catch up. We are almost there. We decided to make an all out effort...so we complete two issues. Several months ago, we told you that issues would be mailed out on the 16th of the previous month (so the June issue should be mailed on May 16). We hope, but can't promise that we can now keep to this schedule. The newsletter should take a maximum of 15 days (according to the Post Office) to reach you. In reality, we are finding that subscribers are receiving their issues as long as 30-days after they are mailed. This issue (and the May issue) was mailed on April 30. The Post Office will only deliver bulk mail if the zip code is correct...so please check the zip code. If your newsletter is not delivered, it is not returned to us. Unfortunately, we forgot to include RETURN POSTAGE GUARANTEED on our mailing envelopes. Our new envelopes will have that statement included.

FIRST CLASS OPTION

A number of subscribers have requested that their Newsletter be sent by first class mail (and pay the additional postal charges). At the present time, our NET INCOME is less than 10 cents an issue (after salaries,

postage, office expenses, printing and advertising...our biggest expense). BULK MAILING costs about 9 cents per issues...FIRST CLASS postage is 54 cents an issue. Anyone wishing to be on our FIRST CLASS POSTAGE LIST can be by sending an addition 45 cents per issue ($5.40 per year).

RIGHT JUSTIFICATION

This entire issue has been typed by the TRS-80 computer and the SELECTRAPRINT TYPEWRITER using the ELECTRIC PENCIL (disk version). If you compare this month's edition to last month's edition...you will see that we have added right justification (alignment of the right hand margin). This was all done by the ELECTRIC PENCIL.

OUR NEW SOFTWARE MANAGER

Last month, we announced that Karen was our new software manager. Unfortunately, Karen was afraid of our computer and is no longer with us. Our new software manager is MARYANN. If you have any problems with an order, MARYANN is the person to speak to. All orders are now processed immediately (that now includes subscriptions). Some of you have had to wait 15-45 days to get your subscription to begin. MARYANN and our staff now gets them out as soon as they are received. You can place a phone order between 9 A.M. and 5 P.M. (New York time), Monday through Saturday. You can give your order to Maryann, Marty, Renee or Elaine. If you call at any other time, you will probably reach our telephone answering machine. If you place your order on the machine, you should receive it within three to six days. Please don't ask for me unless it's important. When we had less than 1000 subscribers, I answered every phone call, took every order and personally mailed it. At some point in November, that became impossible. One of the reasons for the delayed issues was the fact I was always on the phone. With over 14,000 subscribers, it is impossible to speak to everyone that calls. MARYANN is in complete charge of our subscriptions and software and will answer any question regarding the shipment of an order.

YOUR FREE WORD PROCESSOR

Everyone who is eligible to receive a FREE WORD PROCESSOR, should have received it. They were sent out (by FIRST CLASS MAIL). If you haven't received yours, send us a postcard and we will get it right out. The WORD PROCESS comes FREE with each renewal or new subscription in response to one of our FREE WORD PROCESSOR ADS.

Your WORD PROCESSOR (the complete program listing is in this issue) comes on cassette. If you have a DISK SYSTEM, just CLOAD the program (after entering CMD"T" to turn off the clock), and then SAVE the program. The WORD PROCESSOR saves text on either cassette or disk. The WORD PROCESSOR is recorded twice (once on each side of the cassette). Both sides contain the same program. This program will allow the user to SAVE any text on either DISKETTE or CASSETTE.

The WORD PROCESSOR is very similar to WORD PROCESSORS found on expensive

computer systems. It took four months to complete the WORD PROCESSOR (named TEXT by Dr. Howe). We had four earlier versions which were not sent out because they lacked certain functions (such as right justification). TEXT can be compared to the ELECTRIC PENCIL (selling for $150...disk version, $99.95...cassette version). It does have advantages and disadvantages (when compared to the ELECTRIC PENCIL).

ADVANTAGES-(1) It can print both upper and lower case characters on any printer with this capacity (although only upper case characters on displayed on the VIDEO of any unmodified TRS-80 system). (2) Unlike the ELECTRIC PENCIL, you can instantly GOTO any part of the text. (3) Unlike the ELECTRIC PENCIL, TEXT shows right justification on the screen. (4) TEXT is written in BASIC so the user (without machine language knowledge) can alter the program. (5) By adding a couple of program lines, TEXT can be used to write letters to a large list of people...and address them personally. It will repeatedly print out a form letter, typed directly, that includes each individual name. The ELECTRIC PENCIL will print a form letter, but you will have to stop the computer after each letter, change the name of the person used on the letter, and then print the next letter.

DISADVANTAGES-Of course, we don't claim to have a FREE WORD PROCESSOR tha is better than the $150 ELECTRIC PENCIL. (1) TEXT is slow when compared to the ELECTRIC PENCIL. Because TEXT is in BASIC, it takes time to process each character. With the ELECTRIC PENCIL, you can type just about as fast as your fingers can move. With TEXT, you will find that typing is just a little bit slow. (2) The ELECTRIC PENCIL loads, saves and justifies rapidly (many times faster than TEXT). (3) The ELECTRIC PENCIL has many additional commands not found on text.

Dr. Howe is working on a machine language version of TEXT that will process text much more quickly and also offer addition commands. You can't argue with the price. TEXT is an excellent WORD PROCESSOR and out performs most TRS-80 WORD PROCESSORS on the market (some selling for $50 and up). In its present form, it does not take the place of the ELECTRIC PENCIL, but it does come close (and does give more value per dollar!).

ACCOUNTS PAYABLE CORRECTIONS

There were two errors in the ACCOUNTS PAYABLE program appearing in Issue Number 8. On page 171, LINE 16005 should be changed to:

```
16005 OPEN"O",1,"SCRATCH":CLOSE:KILL"SCRATCH"
```

ON page 171, LINE 21215 should be change to:

```
21215 IF PR(I)=0 LR(I)=0:GOTO 21270
```

Also, page 174 is a duplicate of page 175...so there is no need to enter the additional page. There are no other mistakes in the program (to our

knowledge). We have run and tested the program several times. Many mistakes are caused by using the SHIFT KEY to type in a character. REMEMBER...your computer does not treat P just as SHIFT-P (even though they appear to be the same on the VIDEO SCREEN). Another mistake made by many people entering a program...is leaving out #, ! or %. These symbols are used in conjunction with PRINT USING statements and can not be left out of a program. Look at page 175 (for example). LINE 25110 has an exclamation point (!). I have had at least five phone calls and found that people just leave it out because they either don't see it or don't believe that it is important. Well, it is essential. An error will occur without it. Dr. Shenkin has used the PRINT USING STATEMENTS in many of his programs. Those subscribers not familiar with PRINT USING should read that section in the LEVEL II BASIC MANUAL. We will also try to include a BEGINNERS CORNER in the Newsletter which will further describe the PRINT USNING function.

OUR NEW CATALOG

Our new catalog will be shipped with the June issue of the Newsletter. It is complete and bound. It consists of most of the ads that you have already received....plus additional information. The catalog will be distributed at the SAN FRANCISCO COMPUTER EXHIBITION (yes...we will be there).

FROM OUR CRYSTAL BALL DEPARTMENT

Nothing much in the way of predictions this month. PERCOM is shipping dual density disk drives (with 600K on line power) for the TRS-80. I'm sure that RS must be close behind.

New from RS is an other $300 printer similar to their $500 quick printer. Also new is their printer interface cable ($79) which will allow you to connect any of RS printers directly to the CPU (for those who do not have the EXPANSION INTERFACE). $80 is a little much for something that will become obsolete...after you purchase the EXPANSION INTERFACE.

RS has advertised a Level II BASIC COURSE on tape. Part I is $14.95...part II is $19.95. Although they have been advertised widely (in RS circulars), they are not being delivered yet.

TWO NEW COMPUTER BOOKS FROM RADIO SHACK

RS has two new computer books available for sale at local RS dealers. Both books are not really new. They are both reprints of books published by TAB BOOKS. They are identical to the TAB BOOKS version, but contain pictures of the TRS-80 on the cover. Buyers should be aware of the fact that not everything in these books will work on the TRS-80 (even though the TRS-80 appears on the cover). The pictures on the cover are quite deceptive (for some). Both books contain certain commands that do not work on the TRS-80 and some programs that will have to be modified for the TRS-80. This does not take away from the fact that both books are well done and should be a part of your library.

THE BASIC COOKBOOK by Ken Tractor ($2.95) is a dictionary of BASIC

statements, commands and functions. It contains a comprehensive list of commands appearing on many personal computers (such as the TRS-80). It explains each command (in beginners language) and gives examples of their use. Most of the commands contained in the book are used on the TRS-80. Some additional commands are also explained. This is helpful for users trying to translate a BASIC program written for another computer for use on the TRS-80. The book is well done and would make an excellent addition to your library (for any level...BEGINNER to ADVANCED).

57 PRACTICAL PROGRAMS % GAMES IN BASIC also by Ken Tracton. This books contains 57 programs...many of which you may find useful (only 3 or 4 of the 57 programs are games). Programs included are games (such as Blackjack), Statistical (such as Chi-Square evaluation), Mathematical (such as derivative and primer number test) and Business (such as compounded interest).

MY IMPRESSIONS OF OUR LOCAL TANDY COMPUTER CENTER

Last week I visited my new local TANDY COMPUTER CENTER (in New Rochelle). I have never been so disappointed. Hopefully, computer centers in other areas have more to offer...or RS plans on expanding them. The COMPUTER CENTER did not have very much in the way of equipment (and certainly far less than most of the local RS (non-computer stores) in my area. The store had a TRS-80 on display...a printer and interface. It has very little equipment in stock (such as an expansion interface or memory). It had some RS software, but not as much as the software at my local RS dealers. Many standard programs that are available at local RS stores were not availabe at the COMPUTER STORE. Much worse, the salesmen within the store were not aware that the software (such as Double Precision Subroutines) were even available. WAS I DISAPPOINTED!! I was under the impression that the new COMPUTER STORES would be well stock, have knowledgeable help and have certain non-competitive products designed for the TRS-80. The computer store did have a selection of computer books. Once again, I was disappointed. Their selection of books was not very suitable. It appeared that they were ordered without any though about what people like to read. They had a selection of some pretty highly specialize books that the majority of TRS-80 owners would not be interested in. On the other hand, they didn't have any of the beginner or intermediate books (that are available at other non RS computer stores) that should be apart of the library of most beginner and intermediate TRS-80 owners.

RS computer stores do not have any competitive products. But what is a competitive product? They don't have software unless it RS software. For example, you won't be able to buy a product such as GSF (Generalized Subroutine Facility) at an RS store because it's not RS software. I believe that this is a dreadful mistake. RS has done an excellent job in selling

computers. Their COMPUTER STORES should support the TRS-80 in everyway possible. That means selling non RS software and the products of thoses (such as H & E COMPUTRONICS INC.) designed to support the TRS-80. Also missing from my local computer center were the usually computer magazines (available at all non-RS computer stores). Many subscribers are not aware not magazines such as BYTE, KILOBAUD, CREATIVE COMPUTING and PERSONAL COMPUTING are available or exist.

I should state that my impressions of the COMPUTER STORE may be a little premature. The store is new and I'm sure plans are underway to improve the stores (something has to be done...I was the only customer in the store...and I was there for an hour). The idea of having COMPUTER CENTERS is great and a great selling point for the TRS-80. Hopefully, the stores will improve in quality and support TRS-80 owners and much as possible.

THE TANDY 10

I did see the TANDY 10 at the RS COMPUTER CENTER. What an overpriced piece of junk (well, that is a mass subjective exaggeration). The TANDY 10 (that's the advanced RS computer that RS sells but hasn't publisized very much...a picture appeared in Issue #1 of this Newsletter) sells for $9,995. That includes 48K storage, 1000K of floppy disk storage and a desk. It does not include a printer. If you read the TANDY 10 ad, it tells you that it has such features as BASIC, a DOS, multiple statement lines, integer, single and double precision floating point values, PRINT-USING and (many of the features found on the TRS-80). It even has an EDIT command that allows modifications and additions to existing program lines without having to retype the line!! It doesn't have too many features that already included on the TRS-80 system. It does have upper and lower case, underlining and some other features not available on the TRS-80. It is certainly not work $10,000 (or by TRS-80 is worth $8,000). Unlike the TRS-80, the TANDY 10 was not developed by RS (it is someone else's computer with the TANDY 10 label on it). My advice, if you want to go a step above the TRS-80, don't look at the TANDY 10. There are other computers on the market in that price range which are a much better value per dollar. Better still, wait for the new computers to come out. They will make the TANDY 10 obsolete very shortly.

LOWER CASE MODIFICATIONS

As stated in the last issue, our TRS-80 now has a lower case modification installed. The modification works without any problems. As a matter of fact, the person who modified my TRS-80 also our other system plus two systems of close friends. Also four systems work and their doesn't seem to be any bad affects. We warn you again, RS will not repair a modified CPU. If something does going wrong with the CPU, the modification can be removed (then RS will repair your CPU). RS will probably have the modification available directly soon. LAZAAR ENTERPRISES (in New York) will put in your lower case modification for $75 (with a 90-day guarantee of the CPU). It can be done through the mail. Contact LAZAAR enterprises by calling (212) 893-3008.

CHEAP MEMORY

We have discussed cheap memory in many past issues of the Newsletter. In most cases, the memory is equal to the memory that is sold by RS. We have had several reports of some RS repair centers that are installing the inexpensive memory (although equal in quality) into the computers of customers that are unaware that it is being used. We can't confirm the practice, but several subscribers (and one memory distributor) have reported this practice. DON'T GO RUNNING TO YOUR NEIGHBORHOOD RS WITH A COMPLAINT. I'm sure that 99.99% of the installed memories are legitimate.

HELP FROM RS COMPUTER SERVICES

The program below was contributed by RS COMPUTER SERVICES. This program will change all PRINT statements within a program to LPRINT statements (the program it self is not changed...the computer just internally interprets PRINTS as LPRINTS. The program works just like the one printed last month (but accomplishes it in two steps).

```
POKE 16414,141
POKE 16415,5
```

To return (change back to PRINT) use:

```
POKE 16414,88
POKE 16415,4
```

These statements should appear within your program.

You can also change LPRINT statements into PRINT statements using the following:

```
POKE 16422,88
POKE 16423,4
```

To reverse the process use:

```
POKE 16422,141
POKE 16423,5
```

A PROGRAM THAT PRINTS THE CONTENTS OF THE VIDEO DISPLAY ONTO THE LINE PRINTER

The following program was also contributed by RS COMPUTER SERVICES:

```
1000 C=15360:D=C+63:FOR A=1 TO 15:FOR B=C TO D
1010 E=PEEK(B):LPRINT CHR$(E);
1020 NEXT B
1030 C=C+64:D=D+64
1040 LPRINT
1050 NEXT A
```

The above program will do strange things when printing graphics. It should be used mainly for printing character contents displayed on the video.

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BEGINNERS CORNER

by

ELAINE TRAUM

The BEGINNERS CORNER is written specially for TRS-80 Level II owners who know little or nothing about writing programs in BASIC. This is PART I in a series of articles that will teach you how to write a FILE program (a program that will allow you to enter a list, such as a list of names, onto your computer). We are going to write it together...so make sure that you understand every line in the program.

We can begin by writing a REMark that will help us remember the purpose of the program. REM used in a program has no purpose but to help you REMember something (such as what the program will do). If you eliminate a REM statement, nothing will happen to the program. REM statements do take up memory space. If memory space is a problem in a program, you can always eliminate it. TYPE LINE 10 ONTO YOUR COMPUTER:

```
10 REM-DATA FILING SYSTEM
```

Now, we must CLEAR some space for our DATA FILE. Let's say you have a 16K computer. That means that you have enough room for a computer program that is 16,000 characters long. Our DATA FILING PROGRAM will certainly not be that long. We do have to leave some room for our DATA FILE (our list of names). We can CLEAR 1000. That's enough to leave room for a list of names that total 1000 characters. For example, the name ROBERT would use 6 characters of the 1000 characters that are reserved. The name ROBERT BEST JR. would use 15 characters of space (that includes the two blank spaces and the period). If you need more that 1000 characters of space...reserve more space. You can always change your mind later by changing the amount of space you wish to reserve. TYPE IN LINE 20:

```
20 CLEAR 1000
```

How many names are you going to have? We must tell the computer how many names we are going to have in our list (at least the maximum number of names). Let's say our list is going to include 50 names (or less). We can give this information to the computer with the following statement:

```
30 DIM N$(50)
```

DIM stands for dimension. We use the letter N to stand for name (we could have used any letter...or any two letters of the alphabet). The $ sign tells the computer that the list will contain letters or both letters and

numbers. If we left out the $ sign, our list could only contain numbers. The 50 tells the computer that our list will have 50 (or less names). Your computer has now reserved enough space for a list of up to 50 names (that can total up to 1000 characters). If your list will contain more than 50 names, reserve for space in the DIM state. Our list could contain the following information (names for our example): 1...N$(1) ADRIENNE MESSENGER 2...N$(2) could be ROBERT BEST...name 3...N$(3) could be ALEX HAMILTON...name 4...N$(4) could be FRED MASSEY...name 5...N$(5) could be HENRY BERGER (and so on). Oh yes, I should point out that the above DIM statement really allows for 51 names...but let's not get involved with extras now.

CLS will CLEAR the video screen so we can start fresh. TYPE IN LINE 40:

```
40 CLS
```

We want to be able to enter up to 50 names onto the computer. We want to tell the computer...FOR name 1 to 50, give us a chance to enter a name. The computer statement could look like this:

```
50 FOR C=1 to 50
```

C stands for COUNTER. We could have used any letter (or two letter combination) to stand for counter. As a matter of fact, most programs use the letter I for the counter. That's the letter that mathematicians favor...so let's change line 50 to read:

```
50 FOR I=1 TO 50
```

LINE 60 will display or PRINT the I (or counter number) on the screen. For example, for name #1, you will see 1. After we enter the first name, 2 will be displayed...then 3...4...etc. PRINT I instructs the computer to PRINT the I (or count) of names. TYPE IN LINE 60:

```
PRINT I
```

Now we are ready to tell our computer to let us enter names. LINE 60 PRINTS the number of the name we ae enter. Now we need the chance to enter the name. An INPUT statement tells the computer to stop and wait for the user to enter some information. INPUT N$(I) tells the computer to stop and give us a change to enter a name. The I in the INPUT state will keep varying (that's why I is called a variable. When I is 1 we will enter the first name. When I is 2 we will enter the second name...etc. $ tells the computer that we are entering a list that contains letters and numbers (rathers than only numbers). N tells the computer that we are letter N stand for the list (which in this case is names). TYPE IN LINE 70:

```
70 INPUT A$(I)
```

Do we have to enter all 50 names? Yes!! Unless we can tell our computer to stop before we reach all 50 names. Well, here is one way.

```
80 IF N$(I)="BINGO" GOTO 1000
```

The above statement tells the computer to GOTO LINE 1000 if the name we enter is called BINGO. We could have used any other name in place of BINGO. Many programs use the word END to stop a list...others use the number 9999 to stop the list. You do have to make sure that the name you use to end the list is not a name that would appear in the list. So, in the above statement, we must make sure that the name BINGO does not appear on our list of names. Notice that BINGO is written within quotes. It is essential that the word you use to end or stop the list appears within quotes. We have now told our computer to GOTO LINE 1000 when we have finished listing our names. We will get back to LINE 1000 soon.

Our computer allows us to enter a name when it reaches LINE 70. It will then check the name in LINE 80 to see if it is the word that will end or stop the list. If it is, the computer will GOTO LINE 1000...if not, it will GOTO the next line in your program.

```
90 NEXT I
```

This line tells the computer that we are ready to enter another name into the computer. First we enter name 1. Next I tells the computer to add 1 to the counter. We are now ready to enter name 2. NEXT I also tells the computer to go back to LINE 60 and let us enter name 2. NEXT I tells the computer to return to the statement that follows the FOR statement (such as line 50).

Our computer will keep going from line 60-70-80-90 until we either type in BINGO as part of our list (and GOTO LINE 1000) or until we exceed our self-imposed limit of a list of 50 names).

LINE 1000 is another REM statement used to REMind us that this part of the program will display all of the names in our computer memory.

```
1000 REM-DISPLAYS OUR COMPLETE LIST OF NAMES
```

LINE 1010 will CLEAR our video screen.

```
1010 CLS
```

LINE 1020 will once again start our counter going.

```
1020 FOR I=1 TO 50
```

LINE 1030 tells our computer to GOTO line 2000 if the name in our computer memory is BINGO. After all, BINGO is not really part of our list and we do not want to display it on our list.

```
1030 IF N$(I)="BINGO" GOTO 2000
```

LINE 1040 will PRINT I (the counter number...1, 2, 3...). The semicolon (;) leaves a space after the number. N$(I) prints the name that the counter has reached. So, if I is 3, N$(I) is the third name on our list. REMEMBER...if our list has 5 names, it will really have 6 included on the list (5 plus BINGO). We have already told our computer to GOTO line 2000 if it is up to the name BINGO...so BINGO will not be printed.

```
1040 PRINT I;N$(I)
```

LINE 1050 tells the computer to raise the counter by 1 and return to the part of the program right after the FOR statement which initializes the counting.

```
1050 NEXT I
```

Well, we are all finished. LINE 2000 tells the computer to END. Whenever the computer reaches an END statement is ENDS.

```
2000 END
```

Next time, we'll add some lines that will let us ADD or DELETE names on our list.

```
10 REM-DATA FILING SYSTEM
20 CLEAR 1000
30 DIM N$(50)
40 CLS
50 FOR I=1 TO 50
60 PRINT I
70 INPUT N$(I)
80 IF N$(I)="BINGO" GOTO 1000
90 NEXT I
1000 REM-DISPLAYS OUR COMPLETE LIST OF NAMES
1010 CLS
1020 FOR I=1 TO 50
1030 IF N$(I)="BINGO" GOTO 2000
1040 PRINT I;N$(I)
1050 NEXT I
2000 END
```

RUN PROGRAM...ENTER SEVERAL NAMES...THEN ENTER BINGO.

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TEXT: A BASIC TEXT EDITOR

by

HUBERT S. HOWE, JR. Ph.D.

INTRODUCTION

TEXT is a Level II BASIC text editor that enables you to create files that represent documents to be printed on your TRS-80. Its main features are:

(1) It is line-oriented. This means that every line of text has a line number associated with it, whether or not the line number is printed. Line numbers are convenient references to the text. Lines can be moved, replaced, rearranged, etc.

(2) It allows entry of upper or lower case letters from your keyboard without modification to the TRS-80.

(3) Lower case letters can be printed properly if you have a line printer with the lower-case character set. Otherwise, everthing is printed as upper case.

(4) Text files can be saved and loaded either on cassette tape or disk.

(5) Lines can be edited in a manner very similar to Level II BASIC.

(6) Text lines can automatically be right justified.

(7) There are provisions for adjustable page lengths, page numbering, line spacing, line lengths, and a special title to be printed at the top of each page.

(8) The program itself is in Level II Basic so that you can study it to learn how it works and possibly modify it if desired.

LOADING AND MODIFYING THE PROGRAM

TEXT is provided on a standard Level II cassette tape. It is loaded by CLOAD"T" (or simply CLOAD)

The standard version provided is written to fit into a 16k Level II TRS-80 computer. It has provisions for 120 lines of text, which is sufficient for much business correspondence or short documents. If you have 32K or 48K, you will probably want to expand it into your larger memory. This is accomplished by changing line 110, near the beginning of the program. It currently reads:

```
110 CLEAR 7200: NL=120
```

With 32k, you can expand to at least 200 lines, and with 48k to at least 400 lines. The amount of string space that you must clear is 60 (or the number of characters per line) times the number of lines. Thus, for 32k you could change line 110 to:

```
110 CLEAR 12000: NL=200
```

and for 48K it could be:

```
110 CLEAR 24000: NL=400
```

RUNNING THE PROGRAM

There are basically two modes of operation in TEXT: the FILL mode and the COMMAND mode. FILL is used when you are entering text into the computer, and COMMAND at other times. When in FILL, you can return to COMMAND only by typing "shift-@" twice in succession.

When in the COMMAND mode, the computer prints the word "COMMAND" and awaits your reply. The replies, all discussed in detail below, are either a single letter or an entire word. The computer executes the command, which may require additional input from you, and return for another one.

HELP

"HELP" or "H" is a command provided in case you forget any of the commands. It prints the complete list of commands and their assoicated words in order to remind you. These are summarized here:

F	FILL	Add text to the buffer.
P	PRINT	Print text on video display or line printer.
C	CLEAR	Clear buffer (erase all text)
R	REPLACE	Replace text starting at existing line.
I	INSERT	Insert text starting at empty line.
D	DELETE	Delete lines.
M	MOVE	Move lines.
N	NUMBER	Number lines, eliminating blanks
E	EDIT	Edit line.
L	LOAD	Load text file from cassette or disk.
S	SAVE	Save text file on cassette or disk.
J	JUSTIFY	Right-justify text lines.
H	HELP	HELP! Print commands.
	SET	Set variables governing program options.

FILL

"FILL" or "F" enters the FILL mode, which you use to enter text into the computer. The line number is displayed at the left, and then the cursor flashes on and off over the current position in the line where you are entering text. If you are starting at the beginning, FILL begins at the first space in line 0 (zero). If there is already text in the buffer, it starts after the last filled space, and any preceding lines are printed on the video display. The "cursor" used throughout the program is not the same cursor used in BASIC, but a graphics block that cover the entire spaced filled in by the letter.

If you are typing in a word that goes off the end of a line (by exceeding the line length, which is set by default to 60 or by the SET command). TEXT automatically removes the word from the preceding line and places it at the beginning of the next line so that the word will not be split. Later, the line can be right justified by the JUSTIFY command.

During the FILL mode, the following keys have special functions:

LEFT ARROW	backspace
RIGHT ARROW	TAB five spaces to the right
DOWN ARROW	form feed (page eject) on line printer
ENTER	move to the next line (inserts no character
SHIFT LEFT ARROW	backspace entire line
SHIFT RIGHT ARROW	fill to end of line with spaces
SHIFT-@ (TWICE)	return to COMMAND mode

The following points should be noted about the use of these special keys:

The RIGHT ARROW (TAB) key actually insertw five spaces into the line.

The DOWN ARROW key will cause a page eject on the line printer (if your line printer responds this way to a form feed), but does not affect the printing of the page number and title.

When ENTER is typed, it does not insert any character into the line. If ENTER is typed at the beginning of a line, the line remains empty, but FILL proceeds to the next line.

If you type SHIFT LEFT ARROW when the cursor is at the bottom of the screen, it appears to scroll to the next line but actually continues to fill the same line.

The FILL mode is entered by both REPLACE and INSERT as well as FILL. The difference is that REPLACE and INSERT can insert lines of text anywhere a line number can exist, and they will stop as soon as existing text is reached. FILL always adds text to the end of the file.

PRINT

PRINT or P is used to print the text in the buffer, optionally on the line printer or video display. When the PRINT command is issued, the computer asks two questions*:

```
PRINT LINE NUMBERS (Y/N)?
LINE PRINTER OR VIDEO DISPLAY (P/V)?
```

You must reply "Y" in order for line numbers to be printed. Similarly, you must reply "P" for the line printer to be selected. When you select the line printer, the program automatically checks to see if the line printer is ready. If it is not, it prints the message:

```
LINE PRINTER NOT READY. ABORT (Y/N)?
```

If you reply "Y" a new command is requested. Otherwise, it asks you to press ENTER when ready, and repeats the printer test. You can never use the printer without first readying it; the program will never inadvertently "freeze up" as it will if you do a LLIST or LPRINT in BASIC (without a ready printer).

The printing on the video display is identical to that on the line printer, with the exception that only upper case letters are printed. In particular, the number of lines on the page is the same; the default number is 50 lines per page. Not all these lines can be displayed on the screen at the same time, although they fit comfortably onto a page. Therefore, it is useful to PAUSE during the printing process by typing "shift-@". (This is a normal feature of Level II BASIC.)

The program pauses and asks you to press ENTER before continuing at the end of each line of a multi-page printing.

The TITLE and PAGE NUMBER are optionally printed at the top of each page. These options are controlled by the SET command.

If your TRS-80 is unmodified, holding down the SHIFT key while typing a letter produces a lower case letter: otherwise the letter is upper case. This is the reverse of a typewriter. Some printers (such as the SELECTRAPRINT) have been modified so that they convert upper case into lower case and vice versa. Whichever way your TRS-80 works, TEXT considers upper and lower case letters to be distinct. This means that "A" is different than "shift-A" even though both are displayed as "A" on the screen.

CLEAR

CLEAR or "C" erases everything in the buffer. In addition, it restores all SET variables to their default values.

It is not necessary to perform a CLEAR at the beginning of a run. It is only necessary if you want to clear everything out and start over.

LOADing a text file from cassette tape or disk also clears out anything in the buffer and fills it with material read in.

INSERT

INSERT or "I" is used to FILL in new lines starting from any legal line number, provided that no text currently occupies the starting line. INSERT will operate just like FILL until you come to a line that is occupied with text, at which point it will automatically return to the COMMAND mode.

REPLACE

REPLACE or "R" is used to FILL in new lines starting from any legal line number, provided that text DOES exist at the starting line. The text at the starting line is replaced entirely. Following that line, REPLACE operates exactly like INSERT and continues to FILL new lines until you come to a line occupied with text, at which point it will automatically return to the COMMAND mode.

DELETE

DELETE or "D" is used to delete a range of lines from the text. Deleted lines are empty, but the line marker used to FILL continues to point to where it did before the DELETE. Therefore, to insert new text into the deleted lines, INSERT should be used rather than FILL.

MOVE

MOVE or "M" is used to move a block of lines from one position in the buffer to another. The only limitation is that the position where the text is moved must consist of empty lines. If a new line is ever found that contains text, the MOVE is terminated, and only the lines that were moved prior to the error are moved. The lines from which the text is moved are replaced with empty spaces.

When a MOVE begins, the computer asks:

```
FIRST LINE TO BE MOVED?
LAST LINE TO MOVE
FIRST NEW LINE?
```

If you were to reply to these questions, in succession, 1, 4, and 6, line 1 would be moved to line 6, line 2 to line 7, line 3 to line 8, and line 4 to line 9. Lines 1, 2, 3, and 4 would become empty lines. If, in performing the move, the computer found that line 7 already had text in it, it would print:

```
LINE 7 ALREADY OCCUPIED
```

and stop the move. However, line 1 would have been moved to line 6.

If you want to insert one or more blank lines into existing text, first MOVE the lines following the line where you want the blank line inserted down to a free area in the buffer, and then MOVE them back to one or more lines following their original position.

MOVE can also be used to rearrange the text lines, in order to change the order of paragraphs or for other reasons.

NUMBER

NUMBER or "N" is used to delete all blank lines in a text and close up the text. In addition, the lines are renumbered from zero and the line marker indicating the first empty line is moved to the first line after any text lines.

BLANK (lines (lines containing only spaces) are different from EMPTY lines (lines containing nothing at all). Only EMPTY lines are eliminated by NUMBER. Therefore, blank lines can still be kept in a text.

SAVE

SAVE or "S" saves the text file, including the TITLE, all SET variables, and the complete text, on cassette tape or disk. When you type SAVE, the computer first asks:

TAPE OR DISK (T/D)?

If you are using cassette tape, the computer prints PRESS ENTER WHEN READY TO CONTINUE? and waits for you to ready the tape before continuing. (If you want to abort the SAVE command, type BREAK and GOTO 200.)

If you are using a disk, the computer asks FILESPEC? Here you must give the complete file specification. If you specify a drive number (such as ":0") the file specification must be enclosed in double quotation marks.

Because of the way that Level II BASIC handles string variables, commas, colons, and blank spaces must be translated into special graphics characters so that the text can be restored to its precise previous structure. Unfortunately, this translationbn process takes a significant amount of computer time to execute -- possibly several minutes. When you save or load a text file, the computer may appear to be doing nothing, but if you interrupt execution and turn on the trace function you will see it going through a long loop. This process can be considerably speeded up by an assembler version of TEXT.

After the file has been saved on tape or disk, TEXT then retranslates the file back to its original condition so that execution may continue and you may add new text to the file. The retranslation, of course, also takes a significant amount of computer time.

Text files are stored in the same way whether on tape or disk. A file can be loaded from cassette and saved on disk or vice versa.

LOAD

LOAD or "L" loads a previously-saved text file from cassette tape or disk. LOADing the file restored everything to the condition it was in when the file was saved: all SET variables, the TITLE, and all text lines are retrieved. Any text presently in the buffer is lost.

In other respects the operation of LOAD is the same as SAVE.

SET

SET (there is no single letter abbreviation) is used to set internal variables that control the line length, page length, spacing of text, page numbering, starting page number, and TITLE. When you type SET, the computerer asks you a series of questions about setting each of these variables. If you do not want to change the present value, simply hit ENTER without typing a new value. Only the new values are inserted.

The variables are as follows:

LINE LENGTH? This indicates the number of characters in a line. The default is 60. LINE LENGTH can be any value up to 255. LINE LENGTH controls the manner in which words are separated on lines during FILL, and is used to set the right margin by JUSTIFY.

PAGE LENGTH? This indicates the number of lines on a page. The default value is 50. During printing, the computer waits for you to press ENTER following the completion of each page.

SPACING (1-SINGLE, 2-DOUBLE)? This controls the spacing between lines during the printing. 1 is for single spacing, 2 for double, and any number that you input here would be used as the number of spaces between lines.

PAGE NUMBERING (1=YES, 0=NO)? This variable controls the printing of both the TITLE and the page numbering. If you respond with zero, nothing is printed at the top of the page. But, if you reply with one, then both the TITLE (if present) and the page number are printed at the head of each page. This line is not counted as a line of text.

STARTING PAGE NUMBER? This indicates the number of the first page of text. If you have long documents prepared as several text files, then they can still be combined into one final document by setting the starting page number to the right value. Page numbers are printed so that they are right justified over the right margin of the text.

TITLE? The TITLE is a character string that is printed left-justified on the top line of each page of text, followed by the page number. It is printed only if the PAGE NUMBERING is on. The TITLE can appear to be centered if it begins with blank spaces. The same TITLE is printed on each page. If the TITLE contains any punctuation, it must be enclosed within double quotation marks when it is SET.

EDIT

EDIT or "E" is one of the most powerful commands in the text editor. It is used to edit a single line at a time in a manner very similar to Level II BASIC. When you type "E", the computer asks you the line number of the line you want to edit. If the line contains text, it is printed on the second line of the video screen with the cursor flashing over the first character. (If there is no text, an error message is produced.) What you then type at the keyboard determines how the line is edited. The following EDIT commands are recognized:

SPACE - Advances the cursor to the next character in the line, unless you are at the last character in the line.

ENTER - Terminates editing. ENTER MUST be typed at the conclusion of the editing process.

LEFT ARROW - Backspace, unless you are at the first character.

I - Insert characters. Following the I, any characters that you type are inserted BEFORE the current cursor position. You can exit from I by typing either ENTER, which terminates editing, or SHIFT UP ARROW, which allows you to continue editing the line. If the line length equals or exceeds the maximum, you cannot start an Insert, but you can continue it past the end of a line.

D - Delete character. Only ONE character is deleted, and all characters following that character are moved left one space.

H - Hack and Insert. All text following the current cursor position is deleted, and whatever you type is added to the line. Note that the cursor does not flash in this mode, indicating that there is no text in the line at the position where you are adding text.

X - End of line and insert. The cursor is moved to the first position following the last character in the line, and then the operation of X is identical to H.

C - Change character. Only ONE character is changed, to whatever character is typed following the "C".

S - Search character. The character following the "S" is searched for in the line and, if it is found, the cursor is moved to that position; otherwise, it is not moved.

During the EDIT process, upper and lower case letters are kept distinct, although everything is printed as uppercase on the screen.

When text is being entered in the FILL mode, it is impossible to enter characters into a line past the line length, but in EDIT, only during the operation of "H" or "X", it is possible to go past the end of a line. This is legal, although the program prints a reminder after exiting from EDIT. If you want to delete the characters, you can re-edit the line.

Once you enter "H" or "X" in EDIT, it is impossible to return to EDIT by SHIFT UP ARROW as during "I". If you want to Insert, you must use "I". It is impossible to Insert characters past the end of the line.

JUSTIFY

JUSTIFY or "J" is used to right justify all lines of text. Nothing is printed during the operation of JUSTIFY, although it can take a long time to execute if the program contains a long text. For this reason, it is suggested that you JUSTIFY each section as you enter it into the text, and check it as you go along.

JUSTIFY inserts additional spaces into the middle of a line, only where there are already empty spaces, to make the right margin vertically aligned. If a line contains no spaces at all, it will not be justified. It will also not be justified if it ends in a period, question mark, exclamation point or right parenthesis.

When a line contains only a few words, requiring many spaces to be inserted, it may be necessary to execute JUSTIFY more than once to complete the process.

If a line ends with a blank space, it may appear not to be justified even though the program would consider it to be. To avoid this problem, end the line with ENTER as you type it in, unless the word is split from one line and moved to the next.

When you end a line with a SHIFT RIGHT ARROW, spaces are automatically inserted out to the end of the line. This is used when you want text such as titles, etc. to be centered on the page, or not to be justified for any reason.

JUSTIFY physically changes the text in the buffer, so that it is then stored with the internal spaces.

PROBLEMS

There are several problems that must be taken into account when using TEXT. Most of there are a direct consequence of the fact that the program is in BASIC, and thus could be eliminated by translating the program into assembly language.

First, you will probably notice immediately that the speed at which you can type characters into the file is not always fast enough, and some letters that you do type are not inserted into the text. This is because of the time that it takes BASIC to process each letter, which is very short, but sometimes not short enough.

More annoying than this, however, is that sometimes the entire computer will appear to "freeze up" for a moment. As the buffer gets fuller and fuller, the likeliness that this will happen and the length of time it will take both get longer and longer. The reason for this is that BASIC must sometimes reallocate the string space while a job is running, even though many of the locations set aside for string space are still free. Nothing is really wrong when this happens, but it can disturb your use of the program.

Another BASIC problem, which we mentioned above, was the necessity of translating special characters before executing a SAVE or after a LOAD. One reason why this was necessary was that, in designing TEXT, we wanted to use only Level II BASIC so that anyone with a Level II computer could use the program, whether or not they have a disk. Some features of the program could be implemented more efficeintly in DISK BASIC.

Finally, another problem for which there is presently no solution is that TEXT does not allow you to underline or overprint characters. Such a feature would require a line printer that could execute a carriage return without a line feed (such as the DIABLO or SPINTER). Such a feature could easily be implemented in TEXT in the future if line printers with these capabilities become available to the average user.

NOTES ON USING TEXT

When using TEXT, it is convenient, and recommended, that you type ENTER when nearly at the end of a line. This will prevent ending the line with a space, which may appear to be misaligned after a JUSTIFY.

In order to center titles or other materials, use the SHIFT RIGHT ARROW following the last character in the lne. This will prevent the line from being justified, by filling it with spaces.

To enter information at the beginning of a new page, use the INSERT command at a multiple of the page length (default is 50). That is, INSERT at 50, 100, 150, etc. If you use the form feed character to eject pages, turn off the page numbering (by using SET).

Finally, if the program ever aborts with any BASIC error, you can retrieve anything presently in the buffer and return to the COMMAND mode by a GOTO 200 statement. If you get an error in data transmission from a cassette tape or disk, you will find that the text may contain graphics in place of certain characters after a GOTO 200. To untranslate the text and retrieve the proper characters, BREAK the program, type GOSUB 2400, and then CONT.

```
10 CLS:PRINT@340,"BASIC TEXT EDITOR"
20 REM COPYRIGHT <C> 1979 BY HUBERT S. HOWE, JR.
100 DEFINTA-Z
110 CLEAR7200:NL=120
120 DIMA$(NL)
130 C=0:S=1:L=0:LA=0:SP=1:PN=1:PG=1:PL=50:LL=60:T$=""
140 B$=" ":BB$="  ":CC$=CHR$(143):BR$=CHR$(96):LF$=CHR$(11)
190 CLS
200 INPUT"COMMAND";C$
210 IFC$="F"ORC$="FILL"THENL=LA:GOTO450
220 IFC$="C"ORC$="CLEAR"THEN110
230 IFC$="D"ORC$="DELETE"THEN1200
240 IFC$="R"ORC$="REPLACE"THEN1300
250 IFC$="I"ORC$="INSERT"THEN1400
260 IFC$="P"ORC$="PRINT"THEN1000
270 IFC$="N"ORC$="NUM"THEN1500
280 IFC$="M"ORC$="MOVE"THEN1600
290 IFC$="H"ORC$="HELP"THEN1700
300 IFC$="SET"THEN1800
310 IFC$="E"ORC$="EDIT"THEN1900
330 IFC$="L"ORC$="LOAD"THEN2100
340 IFC$="S"ORC$="SAVE"THEN2200
350 IFC$="J"ORC$="JUSTIFY"THEN3000
390 GOTO200
450 CLS:IFL<1THEN500:REM FILL
460 FORJ=0TOL-1:C=J*64:IFC>958THENPRINT@960,B$:C=896
470 PRINT@C,J;:IFLEN(A$(J))<1THEN490
480 PRINTTAB(4);A$(J);
490 PRINT:NEXTJ
500 GOSUB700:PRINT@C,L;TAB(4);:C=C+4
505 IFLEN(A$(L))>0THENS=LEN(A$(L)):PRINT@C,A$(L):C=C+S
510 PRINT@C,CC$;:A$=INKEY$:IFA$=""THENPRINT@C,B$;:GOTO510
520 A=ASC(A$)
530 IFA=13THENA$=B$:GOTO750
540 IFA=8THEN800
550 IFA=9THEN900
560 IFA=24THEN850
570 IFA=10THEN740
580 IFA$=BR$THENPRINT:GOTO200
590 IFA=25THEN950
600 PRINT@C,A$;:A$(L)=A$(L)+A$:S=S+1:C=C+1:IFS<=LLTHEN510
610 S=1:L=L+1
620 IFL>NLTHENL=NL:PRINT"BUFFER FULL":GOTO200
625 IFLEN(A$(L))<>0THENPRINT:GOTO200
630 IFL>LATHENLA=L
```

```
635 IFA$=B$THEN500
640 FORI=LLTO0STEP-1:IFMID$(A$(L-1),I,1)=B$THEN660
650 C=C-1:NEXTI:GOTO500
660 IFI=LLTHEN500ELSEFORJ=I+1TOLL:PRINT@C,B$;
665 A$(L)=A$(L)+MID$(A$(L-1),J,1)
670 S=S+1:C=C+1:NEXTJ:A$(L-1)=LEFT$(A$(L-1),I-1):GOTO500
700 C=L*64:IFC<959THENRETURNELSEPRINT@960,B$:C=896:RETURN
740 A$(L)=A$(L)+LF$:A$=B$:REM DOWN ARROW
750 PRINT@C,A$;:GOTO610:REM ENTER
800 IFS<2THEN510:REM BACKSPACE
810 C=C-1:PRINT@C,BB$;:S=S-1:A$(L)=LEFT$(A$(L),S-1):GOTO510
850 IFS<2THEN510:REM SHIFT LEFT ARROW
860 A$(L)="":S=1:GOSUB700:C=C+4
870 PRINT@C,CHR$(30):GOTO510
900 IFS>LL-6THEN510:REM RIGHT ARROW
910 FORI=STOS+4:A$(L)=A$(L)+B$:PRINT@C,B$;:C=C+1:NEXTI
920 S=S+5:GOTO510
950 IFS>=LLTHEN610:REM SHIFT-RIGHT ARROW
960 PRINT@C,B$:FORI=STOLL:A$(L)=A$(L)+B$:NEXTI:GOTO610
990 INPUT"PRESS ENTER WHEN READY TO CONTINUE";EN$:RETURN
1000 CLS:INPUT"PRINT LINE NUMBERS (Y/N)";N$:REM PRINT
1010 INPUT"LINE PRINTER OR VIDEO DISPLAY (P/V)";P$
1020 IFP$="P"THEN1100
1030 CLS:PP=PG-1:FORK=0TOLASTEPPL:PP=PP+1
1040 IFPN<1THEN1050ELSEPRINTT$;
1045 PRINTTAB(LL-7);"PAGE";:PRINTUSING"###";PP
1050 FORJ=KTOK+PL-1:IFJ>LATHEN1090
1055 IFSP>0THENFORM=1TOSP:PRINT:NEXTM
1060 IFN$="Y"THENPRINTJ;
1070 PRINTA$(J);
1080 NEXTJ:GOSUB990
1090 PRINTCHR$(30):NEXTK:GOTO200
1100 IFPEEK(14312)<128THEN1130
1110 INPUT"LINE PRINTER NOT READY.  ABORT? (Y/N)";A$
1120 IFA$="Y"THEN200ELSEGOSUB990:GOTO1100
1130 PP=PG-1:FORK=0TOLASTEPPL:PP=PP+1
1140 IFPN<1THEN1150ELSEPRINTT$
1145 LPRINTTAB(LL-7);"PAGE";:LPRINTUSING"###";PP
1150 FORJ=KTOK+PL-1:IFJ>LATHEN1190
1155 IFSP>0THENFORM=1TOSP:LPRINT:NEXTM
1160 IFN$="Y"THENLPRINTJ;
1170 LPRINTA$(J);
1180 NEXTJ:GOSUB990
1190 LPRINTLF$:NEXTK:GOTO200
1200 INPUT"FIRST LINE TO DELETE";N1:REM DELETE
```

```
1210 INPUT"LAST LINE TO DELETE";N2:IFN1>NLTHENN1=NL
1220 IFN1<0THENN1=0
1230 IFN2>NLTHENN2=NL
1240 FORI=N1TON2:A$(I)="":NEXTI:GOTO200
1300 INPUT"LINE NUMBER";L:REM REPLACE
1310 IFA$(L)=""THENPRINT"CAN'T REPLACE LINE";L:GOTO200
1320 A$(L)="":GOTO450
1400 INPUT"STARTING LINE";L:REM INSERT
1410 IFLEN(A$(L))=0THEN450
1420 PRINT"CAN'T INSERT AT LINE";L:GOTO200
1500 K=0:REM NUMBER
1510 IFK>=LATHEN200
1520 IFLEN(A$(K))<>0THENK=K+1:GOTO1510
1530 FORJ=KTOLA-1:A$(J)=A$(J+1):NEXTJ
1540 A$(LA)="":LA=LA-1:GOTO1510
1600 INPUT"FIRST LINE TO MOVE";N1:REM MOVE
1610 INPUT"LAST LINE TO MOVE";N2
1620 INPUT"FIRST NEW LINE";N3
1630 FORJ=N1TON2
1640 IFLEN(A$(N3))=0THEN1650
1645 PRINT"LINE";N3;"ALREADY OCCUPIED.":GOTO200
1650 A$(N3)=A$(J):A$(J)=""
1660 N3=N3+1:IFN3>LATHENLA=N3
1670 NEXTJ:GOTO200
1700 CLS:PRINT"LEGAL COMMANDS ARE AS FOLLOWS:"
1710 PRINT"F  FILL","P  PRINT","C  CLEAR"
1720 PRINT"R  REPLACE","I  INSERT","D  DELETE"
1730 PRINT"N  NUMBER","M  MOVE","E  EDIT"
1740 PRINT"L  LOAD","S  SAVE","H  HELP"
1750 PRINT"J  JUSTIFY","  SET"
1760 PRINT"TYPE 'SHIFT-@' TWICE TO RETURN TO COMMAND MODE."
1770 GOTO200
1800 CLS:INPUT"LINE LENGTH";LL
1810 INPUT"PAGE LENGTH";PL
1820 INPUT"SPACING (1=SINGLE, 2=DOUBLE)";SP
1830 INPUT"PAGE NUMBERING (1=YES, 0=NO)";PN
1840 IFPN>0THENINPUT"STARTING PAGE NUMBER";PG
1850 INPUT"TITLE";T$
1890 GOTO200
1900 CLS:INPUT"LINE NUMBER";L:REM EDIT
1910 IFLEN(A$(L))<1THENPRINT"CAN'T EDIT LINE";L:GOTO200
1920 PRINTL;TAB(4);A$(L);
1930 C=68:S=1:IFL>99THENC=69
1940 GOSUB2520
1950 IFA$=" "THEN2500
```

```
1960 IFASC(A$)=8THENGOSUB2510:GOTO1940
1970 IFASC(A$)=13THEN2900
1980 IFA$="I"THEN2600
1990 IFA$="D"THEN2650
2000 IFA$="H"THEN2750
2010 IFA$="X"THEN2800
2020 IFA$="C"THEN2850
2040 IFA$="S"THEN2950
2050 GOTO1940
2100 GOSUB2300:IFA$="D"THEN2150:REM LOAD
2110 INPUT#-1,LA,SP,PN,PG,PL,LL,T
2115 IFT>0THENINPUT#-1,T$
2120 FORL=0TOLA:INPUT#-1,A$(L)
2130 NEXTL:GOSUB2400:GOTO200
2150 OPEN"I",1,F$
2160 INPUT#1,LA,SP,PN,PG,PL,LL,T
2165 IFT>0THENINPUT#1,T$
2170 FORL=0TOLA:INPUT#1,A$(L)
2180 NEXTL:CLOSE:GOSUB2400:GOTO200
2200 GOSUB2300:GOSUB2450:IFA$="D"THEN2250:REM SAVE
2210 PRINT#-1,LA,SP,PN,PG,PL,LL,LEN(T$)
2215 IFLEN(T$)>0THENPRINT#-1,T$
2220 FORL=0TOLA:PRINT#-1,A$(L)
2230 NEXTL:GOSUB2400:GOTO200
2250 OPEN"O",1,F$
2260 PRINT#1,LA,SP,PN,PG,PL,LL,LEN(T$)
2265 IFLEN(T$)>0THENPRINT#1,T$
2270 FORL=0TOLA:PRINT#1,A$(L)
2280 NEXTL:CLOSE:GOSUB2400:GOTO200
2300 CLS:INPUT"TAPE OR DISK (T/D)";A$
2310 IFA$<>"D"THEN2330
2320 INPUT"FILESPEC";F$:RETURN
2330 PRINT"READY CASSETTE":GOSUB990:RETURN
2400 FORL=0TOLA:IFLEN(A$(L))<1THEN2440:UNTRANSLATE
2410 FORI=1TOLEN(A$(L)):M=ASC(MID$(A$(L),I,1))
2420 IFM>128THENGOSUB3200
2430 NEXTI
2440 NEXTL:RETURN
2450 FORL=0TOLA:IFLEN(A$(L))<1THEN2490:TRANSLATE
2460 FORI=1TOLEN(A$(L)):M$=MID$(A$(L),I,1)
2470 IFM$=","ORM$=":"ORM$=" "ORM$=CHR$(34)THENGOSUB3220
2480 NEXTI
2490 NEXTL:RETURN
2500 IFS>=LEN(A$(L))THEN1940
2505 PRINT@C,MID$(A$(L),S,1);:S=S+1:C=C+1:GOTO1940
```

```
2510 IFS<2THENRETURN
2515 PRINT@C,MID$(A$(L),S,1);:S=S-1:C=C-1:RETURN
2520 PRINT@C,CC$;:A$=INKEY$:IFA$<>""THEN2540
2530 PRINT@C,MID$(A$(L),S,1);:GOTO2520
2540 IFASC(A$)=13THEN2900ELSEIFASC(A$)=8THENGOSUB2510:GOTO2520
2545 RETURN
2550 IFLEN(A$(L))>=LLTHEN1940ELSERETURN
2560 IFLEN(A$(L))<1THEN1940ELSERETURN
2570 PRINTCHR$(8);
2575 IFS>=LEN(A$(L))THEN1940ELSERETURN
2580 L$="":IFS>1THENL$=LEFT$(A$(L),S-1):RETURN
2590 R$="":IFS<LEN(A$(L))THENR$=RIGHT$(A$(L),LEN(A$(L))-S+1)
2595 RETURN
2600 GOSUB2550:REM INSERT
2610 GOSUB2520:PRINT@C,A$;:IFASC(A$)=13THEN2900
2615 IFASC(A$)=27THEN1940ELSEIFASC(A$)=8THENGOSUB2510:GOTO2610
2620 GOSUB2580:GOSUB2590
2630 A$(L)=L$+A$+R$:S=S+1:C=C+1:PRINTR$;:GOTO2610
2650 GOSUB2560:GOSUB2570:PRINTCHR$(30);:REM DELETE
2660 GOSUB2580:S=S+1:GOSUB2590:S=S-1
2670 A$(L)=L$+R$:PRINTR$:GOTO1940
2750 PRINTCHR$(30):REM HACK
2760 IFS>1THENA$(L)=LEFT$(A$(L),S-1)
2770 GOSUB2520:PRINT@C,A$;:A$(L)=A$(L)+A$
2780 C=C+1:S=S+1:GOTO2770
2800 GOSUB2550:GOSUB2570:REM X
2810 GOSUB2590:PRINTR$;:C=C+LEN(A$(L))-S+1
2820 S=LEN(A$(L))+1:GOTO2750
2850 GOSUB2520:REM CHANGE
2860 PRINT@C,A$
2870 GOSUB2580:S=S+1:GOSUB2590:S=S-1
2880 A$(L)=L$+A$+R$:S=S+1:C=C+1:GOTO1940
2900 IFLEN(A$(L))>=LLTHEN2920:REM ENTER
2910 FORI=STOLEN(A$(L)):PRINT@C,MID$(A$(L),I,1);:C=C+1:NEXTI
2920 PRINT:S=1:IFLEN(A$(L))<=LLTHEN200
2930 PRINT"LINE";L;"CONTAINS";LEN(A$(L));"CHARACTERS.":GOTO200
2950 GOSUB2575:GOSUB2520:PRINT@C,MID$(A$(L),S,1);:REM SEARCH
2960 CS=C+1:FORI=S+1TOLEN(A$(L)):IFMID$(A$(L),I,1)<>A$THEN2980
2970 S=I:C=CS:GOTO1940
2980 CS=CS+1:NEXTI:GOTO1940
3000 L=-1:REM JUSTIFY
3010 L=L+1:IFLEN(A$(L))<1ORLEN(A$(L))>=LLTHEN3090
3015 E$=RIGHT$(A$(L),1)
3016 IFE$="."ORE$="!"ORE$="?"ORE$=")"ORE$=":"ORE$=LF$THEN3090
```

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```
3020 FORI=1TOLEN(A$(L)):IFMID$(A$(L),I,1)<>B$THENNEXTI:GOTO3090
3040 I=FIX(LEN(A$(L))/2):J=I+1
3050 IFMID$(A$(L),I,1)=B$THENGOSUB3100
3060 I=I-1:IFI<2THEN3010
3065 IFLEN(A$(L))>=LLTHEN3090
3070 IFMID$(A$(L),J,1)=B$THENGOSUB3120
3080 J=J+1:IFJ>=LLTHEN3010
3085 IFLEN(A$(L))<LLTHEN3050
3090 IFL>=LATHEN200ELSE3010
3100 L$=LEFT$(A$(L),I):R$=RIGHT$(A$(L),LEN(A$(L))-I)
3110 I=I-1:GOTO3130
3120 L$=LEFT$(A$(L),J):R$=RIGHT$(A$(L),LEN(A$(L))-J):J=J+1
3130 A$(L)=L$+B$+R$:RETURN
3200 GOSUB3250
3210 M$=CHR$(M-128):GOTO3230
3220 GOSUB3250:M$=CHR$(ASC(M$)+128)
3230 A$(L)=L$+M$+R$:RETURN
3250 L$="":IFI>1THENL$=LEFT$(A$(L),I-1)
3260 R$="":IFI<LEN(A$(L))THENR$=RIGHT$(A$(L),LEN(A$(L))-I)
3270 RETURN
```


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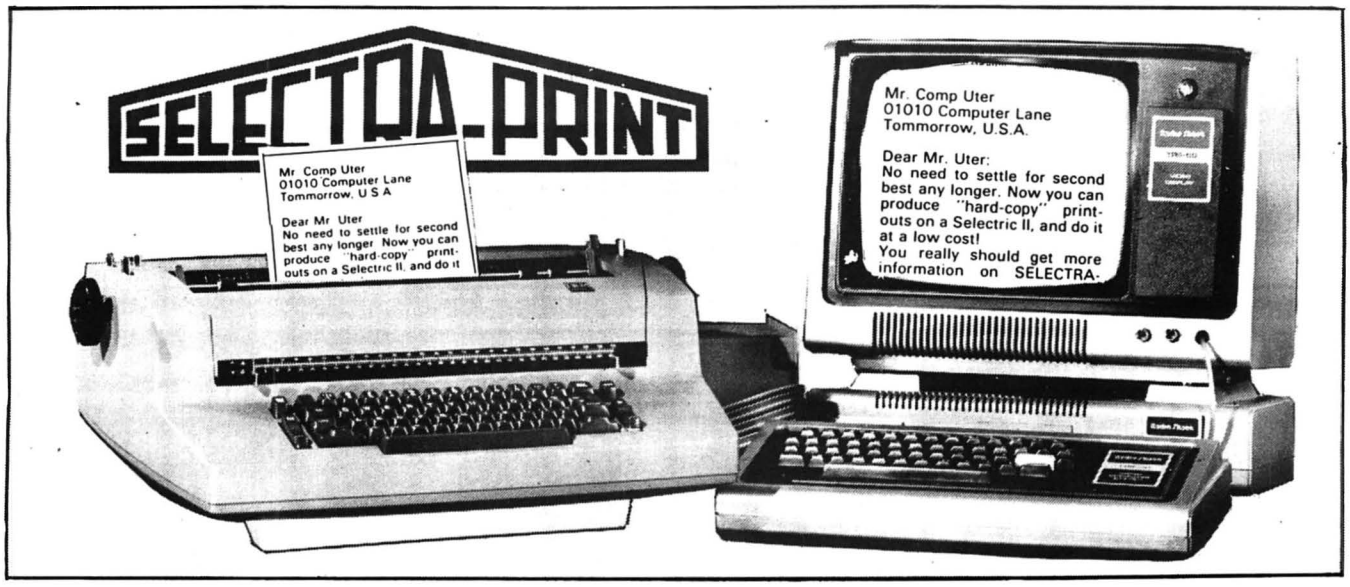

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