L.E.D.

Line-Oriented Text Editor

Arnie Lee

Feb, 1981.

The LED is line-oriented as opposed to word-oriented. As such, it cannot be considered a true word processor although it does provide many of the same capabilities as many of the other commercially available word processors. In fact, a slightly modified version of the LED was used to create this article. Although we wrote the LED to maintain program source statements, its usefulness is by no means limited to that application.

The LED is a line oriented text editor. The entire source program must be in memory while the user is modifying it. Modifications allowed include appending source to the end of the text, inserting lines of text into the middle of existing text, changing occurance of a character string to another string, and printing the text to a hardcopy device. After creating or modifying the text, the user may then save it onto tape or diskette. Some of the key points to note when using the LED are:

- Each line is numbered;
- Each line can contain up to 80 characters;
- When entering 3 line, the line must be terminated by `RETURN` key;
- A maximum of 500 lines of text may be entered (this is subject to the memory capacity of your particular computer);
- As lines arc inserted or deleted from the source program, the remaining lines arc automatically renumbered;
- A line of source may extend more than one screen line on your CRT.

Commands.

The following arc the descriptions of each of the commands:

‘F’

Enter FILER portion of LED.

This command allows you to use the LOAD or SAVE commands which arc described below:

‘L’

Load file from tape or diskette.

This command allows you to load a previously edited source program. The source program may have been saved on tape or diskette. After keying ‘L’ the LED will prompt you for the name of the source program. Key in the filename and depress `RETURN`. Do not key in the suffix `.SOURCE`. If you decide that you really don’t want to load a file, then enter a null line instead of a filename. At this point you will be asked if the file was saved on tape or diskette (for the PET version of LED). Type ‘T’ or ‘D’ as appropriate. If the source program is on tape, then you must put the source file tape into cassette #1. For either tape or diskette, the filename that is keyed in must match the filename that is on the storage medium.

‘S’

Save file onto tape or diskette.

This command allows you to save the current source program onto tape or diskette. After keying ‘S’, the LED will prompt you for the name of the file to be saved. Key in the file-name and then depress `RETURN`. The file-name is limited to twelve characters. The suffix `.SOURCE` will be added to the filename by the LED. If you decide that you really don’t want to save a file, then enter a null line instead of a filename.

At this point you will be asked if you want to save the file onto tape or diskette (for PET version of the LED). Type ‘T’ or ‘D’ as appropriate. If the source is to be saved onto tape, then you must put the tape into cassette #1.

*** Note that tape is supported only in the PET version.

‘A’

Append the end of source.

This command allows you to add lines to the end of the current source program. If you have not loaded any source program, then this command will allow you to create a new source program. You may append one or as many lines as you desire. To signal the end of append mode press `RETURN` when the cursor is sitting at the first character after the line number prompt (null line).

‘C’

Change string.

This command allows you to change an existing string to a new string. It will make changes to either a single line or to a range of lines. Indicate a single line by keying in its line number followed by `RETURN`. Indicate a range of lines by keying the line number of the first line to be searched followed by ‘-’ and finally followed by the line number of the last line to be searched followed by `RETURN`. You will then be prompted for the change siring. The format for the changed string is:

```
+ from-string + to-string +
```

where:

`+` is a delimiter — any character may be used but it must not be contained in cither the `from-string` or the `to-string`.

`from-string` is the string of characters which are to be replaced

`to-string` is the string of characters which are to replace the from-string in the original source line

```
e.g.  /abc/xyz/
```

in the above example all occurances of `abc` will be replaced by `xyz`.

```
e.g.  /abc//
```

in the above example all occurances of ‘abc’ will be eliminated (replaced by nulls).

‘D’

Delete line or range.

This command allows you to delete a line or a range of lines from the source program in memory.

`DELETE  RANGE(LOW,HIGH)->  80` will delete line 80

```
DELETE  RANGE(LOW,HIGH)->  80-90
```

will delete lines 80 thru 90

```
DELETE  RANGE(LOW-HIGH)->  -20
```

will delete all lines thru 20

‘I’ insert lines into source program

This command will allow you to insert lines into the c-xisiing source program. LED will prompt you for the line number before which you want to insert the new source statements. You may enter one or as many new lines as you desire. Follow each line with `RETURN`. To signal the end of INSERT mode press `RETURN` when the cursor is setting at the first character in the line (null).

‘L’ list source program

This command allows you to list a line or range of lines.

```
LIST  RANGE(LOW-HIGH)->  80
```

will list line 80

```
LIST  RANGE(LOW-HIGH)->  80-100
```

will list lines 80 thru 100

```
LIST  RANGE(LOW-HIGH)->  -20
```

will list all lines thru 20

```
LIST  RANGE(LOW-HIGH)->  NULL
```

will list all lines

With the LIST command only the following features are available:

PET.

`RUN/STOP` key - suspends the listing awaiting the depression of the `RETURN` key.

`SPACE BAR` - scrolls the listing one line at a time

`OFF/RVS` key - slows the speeds of the listing

APPLE II.

`ESC` key - suspends the listing awaiting the depres- sion of the `RETURN` key.

`RETURN` key - reverts to normal speed listing after ESC

`SPACE BAR` - slows the speed of the listing

‘M’

Menu display.

This command allows you to sec a more complete explanation of the commands than the abbreviated version which prompts you,

‘P’

Print source program.

This command allows you to print a line or range of lines to a hardcopy printer. The PET is supported thru the IEEE interface as device 4. The APPLE II is supported thru slot 2. The range specifications are identical as LIST.

‘Q’

Quit LED.

This command allows you to gracefully exit from the LED. The LED gives you a chance to change your mind so that if you accidentally keyed `Q`, then you will have another opporttmity to save your source file.

‘R’

Replace a line.

This command allows you to replace a single line only. After keying in the line number to be replaced, the LED will prompt you with that line number. Key in the replacement text and press return.

e.g.

```
REPLACE -LINE#->  108
```

allows you to replace line 108.

Listing.

The listing which follows is the version of the LED lor the PET/CBM machines. The version for the APPLE II is very similar to the PET/CBM version and runs under APPLESOFT. The major differences between the two versions are in the routines that handle the disk and printer I/O.

```
0 REM LINE EDITOR (c)1980 ABACUS SOFTWARE
10 DIM T$(500):REM BUFFER SPACE
20 L$="":REM CURRENT LINE
30 LL=1:REM LAST LINE #
40 SP$=" ":DL$=CHR$(20)
50 EE=0:REM DISK ERROR CHANNEL CLOSED
60 PR=0: REM PRINT CHANNEL
90 POKE 144,49:REM DISABLE STOP KEY
100 PRINT "       ABACUS SOFTWARE LINE EDITOR"
110 PRINT "      FUNCTIONS:"
130 PRINT
140 PRINT TAB(8);"A)PPEND-TO END OF TEXT"
150 PRINT TAB(8);"C)HANGE-STRING"
160 PRINT TAB(8);"D)ELETE LINE(S)"
170 PRINT TAB(8);"F)ILER COMMANDS"
180 PRINT TAB(8);"I)NSERT BEFORE LINE"
190 PRINT TAB(8);"L)IST LINE(S)"
200 PRINT TAB(8);"M)ENU DISPLAY"
210 PRINT TAB(8);"P)RINT LINE(S)"
220 PRINT TAB(8);"Q)UIT LEAVE EDITOR"
230 PRINT TAB(8);"R)EPLACE LINE"
240 PRINT:PRINT "    ENTER SELECTION-> ";
250 GOTO 510
500 PRINT:PRINT "ENTER A,C,D,F,I,L,P,Q,R,M)ENU->";
510 GET A$:IF A$="" THEN 510
520 J=0:FOR I=1 TO 10
530 IF A$=MID$("ACDFILRMQP",I,1) THEN J=I:I=10
540 NEXT I
550 PRINT A$
560 IF J=0 THEN 500
570 ON J GOTO 1000,2000,3000,4000,5000,6000,7000,100,8000,9000
1000 PRINT
1005 PRINT "APPEND TO END OF TEXT"
1010 PRINT:PRINT LL ">";
1020 GOSUB 10000:REM GO READ LINE
1030 IF LEN(L$)=0 THEN 500
1040 T$(LL)=L$
1050 LL=LL+1
1060 GOTO 1010
```

```
2000 REM CHANGE STRING
2010 PRINT:PRINT "CHANGE";:GOSUB 16000:REM GET RANGE
2020 IF HI=0 THEN 500
2025 PRINT "CHANGE STRING->";:GOSUB 10000:REM GET STRING
2030 L=LEN(L$)
2040 IF L=0 THEN 500
2050 IF L<4 THEN 2000
2060 DM$=LEFT$(L$,1):REM DELIMITER
2070 IF RIGHT$(L$,1)<>DM$ THEN 2000
2080 J=0: FOR I=2 TO L-1
2090     IF MID$(L$,I,1)=DM$ THEN J=I
2100 NEXT I
2110 IF J=0 THEN 2000
2120 IF J=2 THEN 2000
2130 FR$=MID$(L$,2,J-2)
2140 IF J+1=L THEN TS$="":GOTO 2160
2150 TS$=MID$(L$,J+1,L-J-1)
2160 F=LEN(FR$)
2170 FOR I=LO TO HI
2180     T=LEN(T$(I)):S=1:NL$=""
2190     FOR J=1 TO T-F+1
2200         IF MID$(T$(I),J,F)<>FR$ THEN 2230
2210         NL$=NL$+MID$(T$(I),S,J-S)+TS$
2220         S=J+F:J=S-1
2230     NEXT J
2240     IF S<>1 THEN NL$=NL$+RIGHT$(T$(I),T=S+1):T$(I)=NL$
2250 NEXT I
2260 GOTO 500
3000 REM DELETE LINES(S)
3005 PRINT:PRINT "DELETE ";:GOSUB 16000:REM GET RANGE
3010 IF NOT DF THEN 3015:REM NOT DEFAULT ON ENTIRE FILE
3011 PRINT "DELETE ENTIRE FILE? ";
3012 GET A$:IF A$="" THEN 3012
3013 PRINT A$:IF A$="N" THEN 500
3014 IF A$<>"Y" THEN 3011
3015 IF HI>LL-1 THEN 500
3020 IF HI=LL-1 THEN LL=LO:GOTO 500
3030 J=HI-LO+1
3040 FOR I=LO TO LL-J-1
3050     T$(I)=T$(I+J)
3060 NEXT I
3070 LL=LL-(HI-LO)-1
3080 GOTO 500
4000 REM FILER
4010 PRINT "FILER ENTER L)OAD OR S)AVE-> ";
4020 GET A$:IF A$="" THEN 4020
```

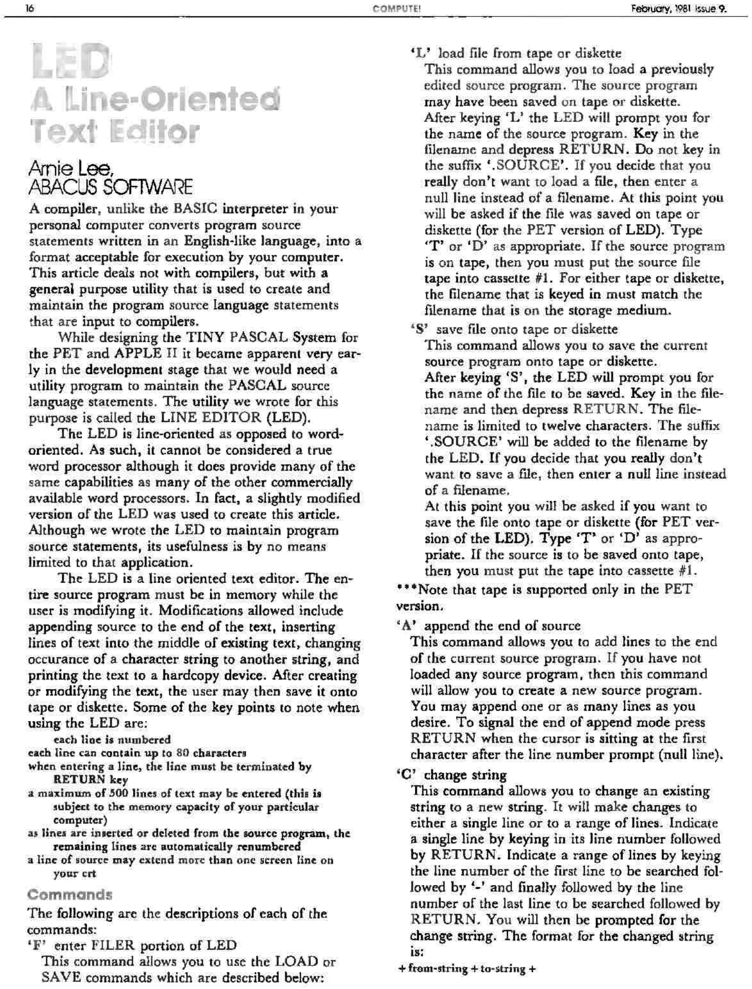
```
4030 IF A$<>"L" AND A$<>"S" THEN PRINT:GOTO 4000
4040 PRINT A$:M$=A$
4050 PRINT "ENTER FILENAME-> ";
4070 GOSUB 10000
4075 IF LEN(L$)=0 THEN 500
4076 IF LEN(L$)>12 THEN 4050
4080 FI$=L$
4090 PRINT "ENTER D)ISK OR T)APE-> ";
4100 GET A$:IF A$="" THEN 4100
4110 PRINT A$
4120 IF A$<>"D" AND A$<>"T" THEN 4090
4130 IF A$="D" THEN 4160:REM DISK ROUTINES
4140 IF M$="L" THEN 4400
4150 GOTO 4200
4160 DR$="":IF LEFT$(FI$,2)<>"0:" AND LEFT$(FI$,2)<>"1:" THEN DR$="0:"
4170 GOTO 4600
4200 REM TAPE SAVE
4210 IF LL=1 THEN PRINT "NO FILE TO SAVE":GOTO 500
4220 OPEN 2,1,2,FI$+".SOURCE"
4230 FOR I=1 TO LL-1
4230     FOR J=1 TO LEN(T$(I))
4250         PRINT# 2,MID$(T$(I),J,1);
4260     NEXT J
4270     PRINT# 2,CHR$(255);
4280 NEXT I
4290 CLOSE 2
4300 PRINT SPC(6);FI$;" SAVED"
4310 GOTO 500
4400 REM TAPE LOAD
4410 OPEN 2,1,0,FI$+".SOURCE"
4430 IF=L0:REM LINE COUNT
4440 LL=LL+1:T$(LL)=""
4450 GET# 2,A$
4460 IF ST=64 THEN 4500:REM END OF FILE
4465 IF ST<>0 THEN PRINT "*** LOAD ERROR ***":GOTO 500
4470 IF A$=CHR$(255) THEN 4440:REM END OF LINE
4480 T$(LL)=T$(LL)+A$
4490 GOTO 4450
4500 CLOSE 2
4510 PRINT SPC(6);FI$;" LOADED"
4520 LL+LL+1
4530 GOTO 500
4600 REM DISK SAVE
4610 IF M$="L" THEN 4800
4620 IF LL=1 THEN PRINT "NO FILE TO SAVE":GOTO 500
4630 FL$="@0"+DR$+FI$+".SOURCE,S,W"
```

```
4640 OPEN 2,8,2,FL$
4650 GOSUB 20000:REM ERROR CHECK
4655 IF E1<>0 THEN 500
4660 FOR I=1 TO LL-1
4670     FOR J=1 TO LEN(T$(I))
4680         PRINT# 2,MID$(T$(I),J,1);
4690     NEXT J
4700     PRINT# 2,CHR$(255);
4710 NEXT I
4720 CLOSE 2
4730 PRINT SPC(6);FI$;" SAVED"
4740 GOTO 500
4800 REM DISK LOAD
4810 FL$=DR$+FI$+".SOURCE,S,R"
4820 OPEN 2,8,2,FL$
4830 GOSUB 20000:REM ERROR CHECK
4835 IF E1<>0 THEN 500
4840 LL=0:REM LINE COUNT
4850 LL=LL+1:T$(LL)=""
4860 GET# 2,A$
4870 IF ST=64 THEN 4500: REM END OF FILE
4880 IF ST<>0 THEN GOSUB 20000:GOTO 500
4890 IF A$=CHR$(255) THEN 4850:REM END OF LINE
4900 T$(LL)=T$(LL)+A$
4910 GOTO 4860
4920 CLOSE 2
4930 PRINT SPC(6);FI$;" LOADED"
4940 LL=LL+1
4950 GOTO 500
5000 REM INSERT LINE
5010 PRINT:PRINT "INSERT BEFORE ";:GOSUB 17000:REM GET LINE #
5015 IF LO>LL OR LO<1 THEN 5000
5020 PRINT:PRINT LO;">";
5030 GOSUB 10000:REM READ LINE
5040 IF LEN(L$)=0 THEN 500
5050 LL=LL+1
5060 FOR I=LL TO LO STEP -1
5070     T$(LO)=L$
5080 NEXT I
5090 T$(LO)=L$
5100 LO=LO+1
5110 GOTO 5020
6000 REM LIST LINES
6010 PRINT:PRINT "LIST ";:GOSUB 16000:REM GET RANGE
6020 IF HI=0 THEN 500
6030 SS$="N":PRINT:FOR I=LO TO HI:REM PERFORM LIST
```

```
6040 PRINT I;">";T$(I)
6050 GET A$:OF A$=CHR$(18) THEN FOR J=1 TO 1024:NEXT J
6060 IF A$<>CHR$(3) THEN 6110
6070 SS$="Y"
6080 GET A$:IF A$=CHR$(13) THEN SS$="N":GOTO 6110
6090 IF A$<>CHR$(32) THEN 6070
6100 GOTO 6120
6110 IF SS$="Y" THEN 6070
6120 NEXT I
6130 GOTO 500
7000 REM REPLACE LINE
7010 PRINT:PRINT "REPLACE ";:GOSUB 17000:REM GET LINE #
7020 IF LO>=LL OR LO<1 THEN 7000
7030 PRINT:PRINT LO;">";
7040 GOSUB 10000:REM READ LINE
7050 IF LEN(L$)=0 THEN 500
7060 T$(LO)=L$
7070 GOTO 500
8000 REM QUIT
8010 PRINT:PRINT "     LEAVE EDITOR-ARE YOU SURE? ";
8020 GET A$:IF A$="" THEN 8020
8030 PRINT A$
8040 IF A$<>"Y" AND A$<>"N" THEN 8000
8050 IF A$="N" THEN 500
8060 PRINT:PRINT "           ** END LINE EDITOR **"
8070 POKE 144,46:REM ENABLE STOP KEY
8080 END
9000 REM PRINT LINE
9010 IF PR=0 THEN PR=4 OPEN PR,PR
9020 PRINT "PRINT ";:GOSUB 16000:REM GET RANGE
9030 IF HI=0 THEN 500
9040 FOR I=LO TO HI:REM PERFORM PRINT
9050     PRINT# PR,I;": ";T$(I)
9060 NEXT I
9070 PRINT# PR
9080 PRINT# PR,"***";LL-1;"LINES IN BUFFER ***"
9090 PRINT #PR
9100 GOTO 500
10000 REM INPUT A LINE OF TEXT
10010 L$=""
10020 PRINT "$<-";
10030 GET A$:IF A$="" THEN 10030
10040 IF A$=CHR$(13) THEN PRINT " ":RETURN
10050 IF LEN(L$)>80 THEN GOTO 15000
10060 IF A$>=SP$ AND A$<=CHR$(95) THEN 10100
10065 IF A$>=CHR$(161) AND A$<=CHR$(223) THEN 10100
```

```
10070 IF A$<>DL$ THEN GOTO 10030
10080 IF LEN(L$)>0 THEN PRINT A$;:L$=LEFT$(L$,LEN(L$)-1)
10090 GOTO 10020
10100 L$=L$+A$:PRINT A$;:GOTO 10020
15000 REM LINE INPUT ERROR
15010 PRINT:PRINT "ERROR LINE TRUNCATED"
15020 RETURN
16000 PRINT "RANGE(LOW,HIGH)-> ";
16010 GOSUB 10000:REM INPUT RANGE
16020 LO=1:HI=LL-1:REM DEFAULT LIST ALL
16025 L=LEN(L$)
16030 DF=0:IF L=0 THEN DF=-1:GOTO 16150
16040 J=0:FOR I=1 TO L
16050 A$=MID$(L$,I,1)
16060 IF A$>="0" AND A$<="9" THEN 16090
16070 IF A$="-" THEN J=I:GOTO 16090
16080 J=99:I=99
16090 NEXT I
16100 IF J=99 THEN 16000
16110 IF J=0 THEN LO=VAL(L$):HI=LO:RETURN
16120 IF J>1 THEN LO=VAL(LEFT$(L$,J-1))
16130 IF J<L THEN HI=VAL(RIGHT$(L$,L-J))
16140 IF LO>HI THEN 16000
16150 RETURN
17000 PRINT "-LINE#->";
17010 GOSUB 10000:REM INPUT LINE#
17020 L=LEN(L$)
17030 IF L=0 THEN 17000
17040 J=0
17050 FOR I=1 TO L
17060     A$=MID$(L$,I,1)
17070     IF A$>="0" AND A$<="9" THEN 17090
17080     J=99:I=L
17090 NEXT I
17100 IF J=99 THEN 17000
17110 LO=VAL(L$)
17120 RETURN
20000 IF EE=0 THEN EE=15:OPEN EE,8,EE
20010 INPUT# EE,E1,E2$,E3,E4
20020 IF E1=0 THEN RETURN
20030 PRINT E1;",";E2$;",";E3:",";E4
20040 PRINT "*** DISK ERROR ***"
20050 CLOSE 2
20060 RETURN
```

MAGAZINE SCANS



LED A Line-Oriented Text Editor

Arnie Lee,
ABACUS SOFTWARE

A compiler, unlike the BASIC interpreter in your personal computer converts program source statements written in an English-like language, into a format acceptable for execution by your computer. This article deals not with compilers, but with a general purpose utility that is used to create and maintain the program source language statements that are input to compilers.

While designing the TINY PASCAL System for the PET and APPLE II it became apparent very early in the development stage that we would need a utility program to maintain the PASCAL source language statements. The utility we wrote for this purpose is called the LINE EDITOR (LED).

The LED is line-oriented as opposed to word-oriented. As such, it cannot be considered a true word processor although it does provide many of the same capabilities as many of the other commercially available word processors. In fact, a slightly modified version of the LED was used to create this article. Although we wrote the LED to maintain program source statements, its usefulness is by no means limited to that application.

The LED is a line oriented text editor. The entire source program must be in memory while the user is modifying it. Modifications allowed include appending source to the end of the text, inserting lines of text into the middle of existing text, changing occurance of a character string to another string, and printing the text to a hardcopy device. After creating or modifying the text, the user may then save it onto tape or diskette. Some of the key points to note when using the LED are:

each line is numbered
each line can contain up to 80 characters
when entering a line, the line must be terminated by RETURN key
a maximum of 500 lines of text may be entered (this is subject to the memory capacity of your particular computer)
as lines are inserted or deleted from the source program, the remaining lines are automatically renumbered
a line of source may extend more than one screen line on your crt

Commands

The following are the descriptions of each of the commands:

'F' enter FILER portion of LED
This command allows you to use the LOAD or SAVE commands which are described below:

'L' load file from tape or diskette
This command allows you to load a previously edited source program. The source program may have been saved on tape or diskette.
After keying 'L' the LED will prompt you for the name of the source program. Key in the filename and depress RETURN. Do not key in the suffix '.SOURCE'. If you decide that you really don't want to load a file, then enter a null line instead of a filename. At this point you will be asked if the file was saved on tape or diskette (for the PET version of LED). Type 'T' or 'D' as appropriate. If the source program is on tape, then you must put the source file tape into cassette #1. For either tape or diskette, the filename that is keyed in must match the filename that is on the storage medium.

'S' save file onto tape or diskette
This command allows you to save the current source program onto tape or diskette.
After keying 'S', the LED will prompt you for the name of the file to be saved. Key in the filename and then depress RETURN. The filename is limited to twelve characters. The suffix '.SOURCE' will be added to the filename by the LED. If you decide that you really don't want to save a file, then enter a null line instead of a filename.
At this point you will be asked if you want to save the file onto tape or diskette (for PET version of the LED). Type 'T' or 'D' as appropriate. If the source is to be saved onto tape, then you must put the tape into cassette #1.

***Note that tape is supported only in the PET version.

'A' append the end of source
This command allows you to add lines to the end of the current source program. If you have not loaded any source program, then this command will allow you to create a new source program. You may append one or as many lines as you desire. To signal the end of append mode press RETURN when the cursor is sitting at the first character after the line number prompt (null line).

'C' change string
This command allows you to change an existing string to a new string. It will make changes to either a single line or to a range of lines. Indicate a single line by keying in its line number followed by RETURN. Indicate a range of lines by keying the line number of the first line to be searched followed by '-' and finally followed by the line number of the last line to be searched followed by RETURN. You will then be prompted for the change string. The format for the changed string is:

+ from-string + to-string +

where:
+ is a delimiter—any character may be used but it must not be contained in either the from-string or the to-string.
from-string is the string of characters which are to be replaced
to-string is the string of characters which are to replace the from-string in the original source line
e.g. /abc/xyz/
in the above example all occurances of 'abc' will be replaced by 'xyz'.
e.g. /abc//
in the above example all occurances of 'abc' will be eliminated (replaced by nulls).

'D' delete line or range
This command allows you to delete a line or a range of lines from the source program in memory.
DELETE range(low,high)-> 80
will delete line 80
DELETE range(low,high)-> 80-90
will delete lines 80 thru 90
DELETE range(low-high)-> -20
will delete all lines thru 20

'I' insert lines into source program
This command will allow you to insert lines into the existing source program. LED will prompt you for the line number before which you want to insert the new source statements. You may enter one or as many new lines as you desire. Follow each line with RETURN. To signal the end of INSERT mode press RETURN when the cursor is setting at the first character in the line (null).

'L' list source program
This command allows you to list a line or range of lines.
LIST range(low-high)-> 80
will list line 80
LIST range(low-high)-> 80-100
will list lines 80 thru 100
LIST range(low-high)-> -20
will list all lines thru 20
LIST range(low-high)-> null
will list all lines

With the LIST command only the following features are available:

PET

RUN/STOP key - suspends the listing awaiting the depression of the RETURN key.
SPACE BAR - scrolls the listing one line at a time
OFF/RVS key - slows the speeds of the listing

APPLE II

ESC key - suspends the listing awaiting the depression of the RETURN key.
RETURN KEY - reverts to normal speed listing after ESC
SPACE BAR - slows the speed of the listing

'M' menu display
This command allows you to see a more complete explanation of the commands than the abbreviated version which prompts you.

'P' print source program
This command allows you to print a line or range of lines to a hardcopy printer. The PET is supported thru the IEEE interface as device 4. The APPLE II is supported thru slot 2. The range specifications are identical as LIST.

'Q' quit LED
This command allows you to gracefully exit from the LED. The LED gives you a chance to change your mind so that if you accidentally keyed 'Q', then you will have another opportunity to save your source file.

'R' replace a line
This command allows you to replace a single line only. After keying in the line number to be replaced, the LED will prompt you with that line number. Key in the replacement text and press return.
e.g.
REPLACE -line#-> 108

allows you to replace line 108

Listing

The listing which follows is the version of the LED for the PET/CBM machines. The version for the APPLE II is very similar to the PET/CBM version and runs under APPLESOFT. The major differences between the two versions are in the routines that handle the disk and printer I/O.

```
0 REM LINE EDITOR (C)1980 ABACUS ¬
      ¬SOFTWARE
10 DIMT$(500):REM BUFFER SPACE
20 L$="":REM CURRENT LINE
30 LL=1:REM LAST LINE #
40 SP$=" ":DL$=CHR$(20)
50 EE=0:REM DISK ERROR CHANNEL CLOSED
60 PR=0:REM PRINT CHANNEL
90 POKE144,49:REM DISABLE STOP KEY
100 PRINT"R̂     ɪABACUS SOFTWARE LINE ¬
      ¬EDITOR"
110 PRINT"↓↓    FUNCTIONS:"
130 PRINT
140 PRINTTAB(8);"A)PPEND-TO END OF TEXT"
150 PRINTTAB(8);"C)HANGE-STRING
160 PRINTTAB(8);"D)ELETE LINE(S)
170 PRINTTAB(8);"F)ILER COMMANDS
180 PRINTTAB(8);"I)NSERT BEFORE LINE
190 PRINTTAB(8);"L)IST LINE(S)
200 PRINTTAB(8);"M)ENU DISPLAY
210 PRINTTAB(8);"P)RINT LINE(S)
220 PRINTTAB(8);"Q)UIT LEAVE EDITOR
230 PRINTTAB(8);"R)EPLACE LINE
240 PRINT:PRINT"    ENTER SELECTION-> ";
250 GOTO510
500 PRINT:PRINT"ɪENTERȓ A,C,D,F,I,L,P,Q,
      ¬R,M)ENU->";
510 GET A$:IFA$=""THEN510
520 J=0:FORI=1TO10
530 IFA$=MID$("ACDFILRMQP",I,1)THENJ=I:
      ¬I=10
```

```
540 NEXTI
550 PRINTA$
560 IFJ=ØTHEN5ØØ
57Ø ONJGOTO1ØØØ,2ØØØ,3ØØØ,4ØØØ,5ØØØ,
     ¬6ØØØ,7ØØØ,1ØØ,8ØØØ,9ØØØ
1ØØØ PRINT
1ØØ5 PRINT"ɾAPPENDʔ TO END OF TEXT"
1Ø1Ø PRINT:PRINTLL">";
1Ø2Ø GOSUB1ØØØØ:REM GO READ LINE
1Ø3Ø IFLEN(L$)=ØTHEN5ØØ
1Ø4Ø T$(LL)=L$
1Ø5Ø LL=LL+1
1Ø6Ø GOTO1Ø1Ø
2ØØØ REM CHANGE STRING
2Ø1Ø PRINT:PRINT"ɾCHANGEʔ";:GOSUB16ØØØ:
      ¬REM GET RANGE
2Ø2Ø IFHI=ØTHEN5ØØ
2Ø25 PRINT"ɾCHANGEʔ STRING->";:GOSUB1ØØØ
      ¬Ø:REM GET STRING
2Ø3Ø L=LEN(L$)
2Ø4Ø IFL=ØTHEN5ØØ
2Ø5Ø IFL<4THEN2ØØØ
2Ø6Ø DM$=LEFT$(L$,1):REM DELIMITER
2Ø7Ø IFRIGHT$(L$,1)<>DM$THEN2ØØØ
2Ø8Ø J=Ø:FORI=2TOL-1
2Ø9Ø IFMID$(L$,I,1)=DM$THENJ=I
21ØØ NEXTI
211Ø IFJ=ØTHEN2ØØØ
212Ø IFJ=2THEN2ØØØ
213Ø FR$=MID$(L$,2,J-2)
214Ø IFJ+1=LTHENTS$="":GOTO216Ø
215Ø TS$=MID$(L$,J+1,L-J-1)
216Ø F=LEN(FR$)
217Ø FORI=LOTOHI
218Ø T=LEN(T$(I)):S=1:NL$=""
219Ø FORJ=1TOT-F+1
22ØØ IFMID$(T$(I),J,F)<>FR$THEN223Ø
221Ø NL$=NL$+MID$(T$(I),S,J-S)+TS$
222Ø S=J+F:J=S-1
223Ø NEXTJ
224Ø IFS<>1THENNL$=NL$+RIGHT$(T$(I),
      ¬T-S+1):T$(I)=NL$
225Ø NEXTI
226Ø GOTO5ØØ
3ØØØ REM DELETE LINE(S)
3ØØ5 PRINT:PRINT"ɾDELETEʔ ";:GOSUB16ØØØ:
      ¬REM GET RANGE
3Ø1Ø IFNOTDFTHEN3Ø15:REM NOT DEFAULT ON ¬
      ¬ENTIRE FILE
3Ø11 PRINT"ɾDELETEʔ ENTIRE FILE? ";
3Ø12 GETA$:IFA$=""THEN3Ø12
3Ø13 PRINTA$:IFA$="N"THEN5ØØ
3Ø14 IFA$<>"Y"THEN3Ø11
3Ø15 IFHI>LL-1THEN5ØØ
3Ø2Ø IFHI=LL-1THENLL=LO:GOTO5ØØ
3Ø3Ø J=HI-LO+1
3Ø4Ø FORI=LOTOLL-J-1
3Ø5Ø T$(I)=T$(I+J)
3Ø6Ø NEXTI
3Ø7Ø LL=LL-(HI-LO)-1
3Ø8Ø GOTO5ØØ
4ØØØ REM FILER
4Ø1Ø PRINT"↓ɾFILERʔ ENTER L)OAD OR ¬
      ¬S)AVE-> ";
4Ø2Ø GETA$:IFA$=""THEN4Ø2Ø
4Ø3Ø IFA$<>"L"ANDA$<>"S"THENPRINT:
      ¬GOTO4ØØØ
4Ø4Ø PRINTA$:M$=A$
4Ø5Ø PRINT"ɾENTERʔ FILENAME-> ";
4Ø7Ø GOSUB1ØØØØ
4Ø75 IFLEN(L$)=ØTHEN5ØØ
4Ø76 IFLEN(L$)>12THEN4Ø5Ø
4Ø8Ø FI$=L$
4Ø9Ø PRINT"ɾENTERʔ D)ISK OR T)APE-> ";
41ØØ GETA$:IFA$=""THEN41ØØ
411Ø PRINTA$
412Ø IFA$<>"D"ANDA$<>"T"THEN4Ø9Ø
413Ø IFA$="D"THEN416Ø:REM DISK ROUTINES
414Ø IFM$="L"THEN44ØØ
415Ø GOTO42ØØ
416Ø DR$="":IFLEFT$(FI$,2)<>"Ø:"ANDLEFT$
      ¬(FI$,2)<>"1:"THENDR$="Ø:"
417Ø GOTO46ØØ
42ØØ REM TAPE SAVE
421Ø IFLL=1THENPRINT"NO FILE TO SAVE":
      ¬GOTO5ØØ
422Ø OPEN2,1,2,FI$+".SOURCE"
423Ø FORI=1TOLL-1
424Ø FORJ=1TOLEN(T$(I))
425Ø PRINT#2,MID$(T$(I),J,1);
426Ø NEXTJ
427Ø PRINT#2,CHR$(255);
428Ø NEXTI
429Ø CLOSE2
43ØØ PRINTSPC(6);FI$;" SAVED"
431Ø GOTO5ØØ
44ØØ REM TAPE LOAD
441Ø OPEN2,1,Ø,FI$+".SOURCE"
443Ø LL=Ø:REM LINE COUNT
444Ø LL=LL+1:T$(LL)=""
445Ø GET#2,A$
446Ø IFST=64THEN45ØØ:REM END OF FILE
4465 IFST<>ØTHENPRINT"*** LOAD ERROR ¬
      ¬***":GOTO5ØØ
447Ø IFA$=CHR$(255)THEN444Ø:REM END OF ¬
      ¬LINE
448Ø T$(LL)=T$(LL)+A$
449Ø GOTO445Ø
45ØØ CLOSE2
451Ø PRINTSPC(6);FI$;" LOADED"
452Ø LL=LL+1
453Ø GOTO5ØØ
46ØØ REM DISK SAVE
461Ø IFM$="L"THEN48ØØ
462Ø IFLL=1THENPRINT"NO FILE TO SAVE":
      ¬GOTO5ØØ
463Ø FL$="@Ø"+DR$+FI$+".SOURCE,S,W"
464Ø OPEN2,8,2,FL$
465Ø GOSUB2ØØØØ:REM ERROR CHECK
4655 IFE1<>ØTHEN5ØØ
466Ø FORI=1TOLL-1
467Ø FORJ=1TOLEN(T$(I))
468Ø PRINT#2,MID$(T$(I),J,1);
469Ø NEXTJ
47ØØ PRINT#2,CHR$(255);
471Ø NEXTI
472Ø CLOSE2
473Ø PRINTSPC(6);FI$;" SAVED"
474Ø GOTO5ØØ
48ØØ REM DISK LOAD
481Ø FL$=DR$+FI$+".SOURCE,S,R"
482Ø OPEN2,8,2,FL$
483Ø GOSUB2ØØØØ:REM ERROR CHECK
4835 IFE1<>ØTHEN5ØØ
484Ø LL=Ø:REM LINE COUNT
485Ø LL=LL+1:T$(LL)=""
486Ø GET#2,A$
487Ø IFST=64THEN45ØØ:REM END OF FILE
488Ø IFST<>ØTHENGOSUB2ØØØØ:GOTO5ØØ
489Ø IFA$=CHR$(255)THEN485Ø:REM END OF ¬
      ¬LINE
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4900 T$(LL)=T$(LL)+A$
4910 GOTO4860
4920 CLOSE2
4930 PRINTSPC(6);FI$;" LOADED"
4940 LL=LL+1
4950 GOTO500
5000 REM INSERT LINE
5010 PRINT:PRINT"ṟINSERTf̂ BEFORE ";:
      ¬GOSUB17000:REM GET LINE#
5015 IFLO>LLORLO<1THEN5000
5020 PRINT:PRINTLO;">";
5030 GOSUB10000:REM READ LINE
5040 IFLEN(L$)=0THEN500
5050 LL=LL+1
5060 FORI=LLTOLOSTEP-1
5070 T$(I)=T$(I-1)
5080 NEXTI
5090 T$(LO)=L$
5100 LO=LO+1
5110 GOTO5020
6000 REM LIST LINES
6010 PRINT:PRINT"ṟLISTf̂ ";:GOSUB16000:
      ¬REM GET RANGE
6020 IFHI=0THEN500
6030 SS$="N":PRINT:FORI=LOTOHI:REM ¬
      ¬PERFORM LIST
6040 PRINTI;">";T$(I)
6050 GETA$:IFA$=CHR$(18)THENFORJ=1TO1024
      ¬:NEXTJ
6060 IFA$<>CHR$(3)THEN6110
6070 SS$="Y"
6080 GETA$:IFA$=CHR$(13)THENSS$="N":
      ¬GOTO6110
6090 IFA$<>CHR$(32)THEN6070
6100 GOTO6120
6110 IFSS$="Y"THEN6070
6120 NEXTI
6130 GOTO500
7000 REM REPLACE LINE
7010 PRINT:PRINT"ṟREPLACEf̂ ";:GOSUB17000
      ¬:REM GET LINE#
7020 IFLO>=LLORLO<1THEN7000
7030 PRINT:PRINTLO;">";
7040 GOSUB10000:REM READ LINE
7050 IFLEN(L$)=0THEN500
7060 T$(LO)=L$
7070 GOTO500
8000 REM QUIT
8010 PRINT:PRINT"       ṟLEAVE EDITOR-ARE ¬
      ¬YOU SURE?f̂ ";
8020 GETA$:IFA$=""THEN8020
8030 PRINTA$
8040 IFA$<>"Y"ANDA$<>"N"THEN8000
8050 IFA$="N"THEN500
8060 PRINT:PRINT"          ṟ** END LINE ¬
      ¬EDITOR **f̂"
8070 POKE144,46:REM ENABLE STOP KEY
8080 END
9000 REM PRINT LINE
9010 IFPR=0THENPR=4:OPENPR,PR
9020 PRINT"ṟPRINTf̂ ";:GOSUB16000:
      ¬REM GET RANGE
9030 IFHI=0THEN500
9040 FORI=LOTOHI:REM PERFORM PRINT
9050 PRINT#PR,I;": ";T$(I)
9060 NEXTI
9070 PRINT#PR
9080 PRINT#PR,"***";LL-1;"LINES IN ¬
      ¬BUFFER ***"
9090 PRINT#PR
9100 GOTO500
10000 REM INPUT A LINE OF TEXT
10010 L$=""
10020 PRINT"S̲<";
10030 GETA$:IFA$=""THEN10030
10040 IFA$=CHR$(13)THENPRINT" ":RETURN
10050 IFLEN(L$)>80THENGOTO15000
10060 IFA$>=SP$ANDA$<=CHR$(95)THEN10100
10065 IFA$>=CHR$(161)ANDA$<=CHR$(223)THE
      ¬N10100
10070 IFA$<>DL$THENGOTO10030
10080 IFLEN(L$)>0THENPRINTA$;:L$=LEFT$(L
      ¬$,LEN(L$)-1)
10090 GOTO10020
10100 L$=L$+A$:PRINTA$;:GOTO10020
15000 REM LINE INPUT ERROR
15010 PRINT:PRINT"ṟERRORf̂ LINE TRUNCATED
      ¬"
15020 RETURN
16000 PRINT"RANGE(LOW,HIGH)-> ";
16010 GOSUB10000:REM INPUT RANGE
16020 LO=1:HI=LL-1:REM DEFAULT LIST ALL
16025 L=LEN(L$)
16030 DF=0:IFL=0THENDF=-1:GOTO16150
16040 J=0:FORI=1TOL
16050 A$=MID$(L$,I,1)
16060 IFA$>="0"ANDA$<="9"THEN16090
16070 IFA$="-"THENJ=I:GOTO16090
16080 J=99:I=99
16090 NEXTI
16100 IFJ=99THEN16000
16110 IFJ=0THENLO=VAL(L$):HI=LO:RETURN
16120 IFJ>1THENLO=VAL(LEFT$(L$,J-1))
16130 IFJ<LTHENHI=VAL(RIGHT$(L$,L-J))
16140 IFLO>HITHEN16000
16150 RETURN
17000 PRINT"-LINE#->";
17010 GOSUB10000:REM INPUT LINE#
17020 L=LEN(L$)
17030 IFL=0THEN17000
17040 J=0
17050 FORI=1TOL
17060 A$=MID$(L$,I,1)
17070 IFA$>="0"ANDA$<="9"THEN17090
17080 J=99:I=L
17090 NEXTI
17100 IFJ=99THEN17000
17110 LO=VAL(L$)
17120 RETURN
20000 IFEE=0THENEE=15:OPENEE,8,EE
20010 INPUT#EE,E1,E2$,E3,E4
20020 IFE1=0THENRETURN
20030 PRINTE1;",";E2$;",";E3;",";E4
20040 PRINT"*** DISK ERROR ***"
20050 CLOSE2
20060 RETURN
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