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Red's Natural Editor,

a program designed to edit FORTRAN programs

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Abstract: An EDITOR code is documented which supplements the 1994 ENDF Pre-processing Code Package which is available from the IAEA Nuclear Data Section for the processing of ENDF formatted nuclear data libraries.

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Red's NATURAL Editor
A Program designed to edit FORTRAN Programs

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Introduction

=====

This program allows the user to edit files using a completely natural method. You don't need a lot of time to learn how to use this program; it's as simple as using a typewriter. Even while you are reading this report you can start editing files.

Although it is as simple as using a typewriter, this is a full screen editor, so that you can overwrite (replace) anything, delete or insert characters or lines, copy or move lines, find or change anything. All of this can be done without using any complicated combinations of key strokes (as you are forced to memorize with other editors).

This program is written in standard FORTRAN. Although it was designed and implemented on an IBM-PC, it can be easily adapted for use on virtually any graphics terminal (see, appendix A for details).

Full Screen Editor

=====

If you want to edit a file simply position the cursor to where you want to start editing and start typing - there are no special control characters or anything else to remember - what could be more natural. If you want to replace any text in the file simply type over it. If you want to insert text in the middle of a file press the INSERT key and then start typing. If you want to delete a character simply press the DELETE key. It's that simple and natural.

Requirements

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The program is written in standard FORTRAN that can easily to adapted to run on virtually any computer.

For use on an IBM-PC (or compatible) you need,

- 1) At least 2 megabytes of memory
- 2) A Lahey FORTRAN compiler
- 3) A 101 keyboard
- 4) A color screen is highly desirable, but not required.

For use on other computers, see the section on "Adapting for use on other computers", below.

Limitations

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This program is primarily designed to edit FORTRAN programs. As such its major limitation is that each line may not be longer than 72 characters; if any lines exceeds this length, only the first 72 characters will be read and output when you close the file.

Although this program is primarily designed for use with FORTRAN programs, it is a general editor that can be used to type letters or reports (such as this one) or create tables of data (see, the below section on tabs, which can be used to simplify creating tables).

WARNING - the only real limitation is 72 characters per line; this is sufficient for many applications. However, you should be WARNED that if you open an existing file that has more than 72 character on any line, all characters past the 72-th will NOT be read and if you then SAVE the file these characters will be lost. Before editing a file it is always a good idea to first make a backup copy. If you do this you can always recover your original file should you truncate longer lines, or inadvertently make incorrect changes to a file.

As distributed the program is limited to handle files of up to 15,000 lines in length. If you need to edit longer files and you have more memory available the program can be easily modified to edit larger files. Conversely, if you do not have 2 megabytes of memory available and only edit smaller files you can easily modify the program to use less memory to only edit smaller files.

Minimum File Size

=====

This program will minimize the disk storage requirements for your files. When files are written to disk each line will be output only up to the last non-blank character on the line. If a line is completely blank only one blank character will be output. Using this convention you may be surprised at how much your disk storage requirements can be reduced.

Screen Layout

=====

The screen layout is 30 lines by 80 columns. The definition of the lines are,

- 1 = Program identification to LEFT and messages to RIGHT
- 2 = HOME to LEFT and number of lines in the file being edited to RIGHT
- 3-30 = Up to 28 lines of text from the file being edited

You should watch the messages to the RIGHT on line 1. If you aren't doing anything special this message will continuously remind you how to get on-line HELP - H in Home for HELP. If you are INSERTING, COPYING, MOVING or DELETING this message will remind you what you are doing, e.g., COPY Mode on ON. It is particularly important to watch this message if you make a mistake - Syntax ERROR - Command IGNORED. In this case you can either try the command again or use the on-line HELP to review the available commands and then retry.

The definition of columns are,

- 1- 6 = Sequence number of lines from the file being edited
- 7-78 = Up to 72 columns of text from the file being edited
- 78-80 = Not used

Identifying Modified Text

=====

On a color screen for an original line from a file the sequence number will be RED and the text will be WHITE on a black background. If you modify any line the sequence number will be YELLOW in all cases. Any text that you modify will be shown in a different color than WHITE as long as it stays on the screen. If you move to a different page of text all lines that have been modified will still be indicated by a YELLOW sequence number, but the text will be WHITE.

Case Sensitivity

=====

Text to actually be included in a file is case sensitive, i.e., the program distinguishes between upper and lower case letters. The same is true of the character strings used in find or change commands.

Commands to the program are NOT case sensitive. For a find command you can type either f or F, for a change command either c or C; similarly for all of the control commands.

Summary of What you have to know

=====

The following sections describe in detail what you have to know in order to use this editor. What you have to know is,

- 1) How to open, save and close files that you want to edit
- 2) How to position yourself anywhere in a file
- 3) How to edit a file by replacing, inserting or deleting characters
- 4) How to edit a file by copying, moving or deleting lines
- 5) How to edit a file by finding or changing character strings

That's basically everything that you need to know. It is so easy to use this editor that it is recommended you now start the editor running and as you read the following sections try each option as it is described. If you follow this recommendation you will find that by the time you have finished reading this report you will be familiar enough with the editor to feel comfortable editing files. If you need a quick reminder of any program option simply use the on-line HELP facility while you are running the program.

REMINDER - If you follow this recommendation to now start the editor you can open and edit any text file. To learn the options in this editor feel free to make any changes to the file that you want. When you are finished if you do not want to SAVE these changes (i.e., you do not want to really modify the file on disk) use the ESCAPE option described in the next section.

Opening, Saving and Closing Files

=====

When you start the program it will display a list of options,

Existing File..... = open an existing file to be edited
Create File..... = create a file to be edited
Set Tabs..... = set tabs and then return to this menu (see, details below)
Display HELP File. = display the on-line HELP file and then return to this menu
Terminate (STOP).. = execution is terminated

Use UP and DOWN ARROWS to position to the option you wish to select and then press ENTER (or RETURN).

If you select either Existing File or Create File the program will then prompt you for the filename,

Enter Filename....

Type the filename exactly. If you make any mistakes while typing you can use the DELETE key to delete characters. When you are finished press ENTER (or RETURN).

The file will be opened or created and you can now start editing. While you are editing the file, all editing is done within the memory of the computer and changes to the actual file on disk are only made when you tell the code to update the disk file. If you are making many changes to a file it is recommended that you periodically SAVE these changes in the actual file on disk. This is done by pressing the HOME key to move the cursor to HOME and then pressing the S key (S = SAVE).

When you are finished editing you can return to the initial list of options by pressing either,

END = SAVE the current file with all editing changes and then restart the program.
ESCAPE = Immediately restart the program WITHOUT SAVING the file. This option can be used to advantage if you have somehow made erroneous changes to the file that you want to cancel. Since using this option will cause you to lose all changes that you have made, you are asked to

CONFIRM ESCAPE by Pressing C

If you press C or c the program will then immediately restart. If you press any other key the program will assume you pressed ESCAPE by mistake, ignore this command and allow you to continue editing.

WARNING - Using the ESCAPE option will NOT undo any changes that you have made to the file on disk if you have used the SAVE option, described above. When you use the SAVE option the current file is copied from memory to disk and replaces the original file; similarly if you use the END option. When you use the ESCAPE option the file is NOT copied from memory to disk. Therefore the file on the disk will either be the original file (if you have not used the SAVE option) or the last version of the file that you SAVED.

Positioning within a File

=====

Your current position in a file is defined by a cursor, which on a color screen is shown in GREEN. The following section describes how to position the cursor anywhere within a file.

A file being edited can be thought of as a number of pages of text, with each page being up to 28 lines in length (the number that will fit on the screen). To position within a file or on a screen,

- 1) Use ARROW keys to position LEFT, RIGHT, UP or DOWN within a page.
- 2) Use PAGE UP or PAGE DOWN to position to the preceding (toward the start of the file) or following (toward the end of the file) page of the file.
- 3) Position the cursor to HOME by pressing the HOME key and then use PAGE UP or PAGE DOWN to position to the beginning or end of the file.
- 4) Anywhere in columns 1-6 pressing T will cause the line where the cursor is currently located to be moved to the TOP of the screen.
- 5) On any line position the cursor to the first column and type any number followed by ENTER (or RETURN) to position that line number to the top of the screen, e.g., typing 1234 ENTER, will cause the 1234-th line of the file to be positioned to the top of the screen.
- 6) Positioning the cursor to HOME and typing any number followed by ENTER (or RETURN) has the exactly the same effect as 5), above.

These are the only controls that you need to position yourself anywhere within the file that you are editing.

Replacing, Inserting and Deleting Characters

=====

This is a full screen editor, so that once you have positioned the cursor over a character in the file you can,

REPLACE - the character simply by typing over it. If you type over a character it is replaced and the cursor advances one position to the right, so you can continue replacing characters.

INSERT - characters by first pressing the **INSERT** key and then continuing to type. As you type each character will be inserting into the line and the cursor and all following characters will be shifted to the right.

You can continue inserting characters as long as you want, including continuing to the next and following lines; if you press **RETURN** (or **ENTER**) the line will be divided at that point and a new line started.

You terminate inserting by using any cursor re-positioning command, e.g., **ARROW UP**, **DOWN**, **LEFT** or **RIGHT**, **PAGE UP** or **DOWN**, etc.

You cannot use **INSERT** to extend the length of any line beyond 72 characters; your input will be ignored once a line is full.

DELETE - the character by pressing the **DELETE** key. The character will be deleted and all following characters on the line will be shifted to the left. You can delete as many characters as you wish by repeatedly pressing the **DELETE** key. If you delete all of the characters on a line the line itself will be deleted.

REMINDER - For a full screen editor **ENTER** (or **RETURN**) is an acceptable character, which will cause a new line to be started. Do not use **ENTER** (or **RETURN**) to try and re-position the cursor - experience has shown that for people who are used to using editors, but not full screen editors, this is probably the most difficult thing to remember when using this editor.

Copying, Moving and Deleting Lines

=====

This program can be used to copy, move or delete one or a series of lines.

The syntax for all three of these options is very similar. Position the cursor to column 1 of the line where you want to start and press **C** (for Copy), **M** (for Move) or **D** (for Delete). Next position the cursor to column 1 of the line where you want to end and again press **C**, **M** or **D** (it must be the same character you used on the starting line - if it isn't you will get the error message **Syntax ERROR - Command IGNORED**).

Once you start one of these commands the sequence number of the starting line will be replaced by the word **COPY**, **MOVE** or **DELETE** and the message to the **RIGHT** on line 1 will indicate what you are doing, e.g., **COPY Mode is ON**.

If you are **DELETING** lines, as soon as you press **D** on the end line the entire range of lines between start and end will be deleted.

If you are **COPYING** or **MOVING** lines you must next position the cursor to column 1 of the line **BEFORE** the line where you want to **INSERT** the **COPY** or **MOVE**; remember at the beginning of a line the cursor is in front of the line and the **INSERT** of the **COPY** or **MOVE** will be to **BEFORE** the line the cursor is currently positioned to. To complete the **COPY** or **MOVE** press **INSERT**.

If you only want to COPY, MOVE or DELETE one line the starting and ending lines can be the same line. In all cases you can press the same key (C, M or D) twice on the same line to define a range. However, if you wish you can use a simpler method for one line. To COPY or MOVE one line, once you identify the starting line by pressing C or M, you can position to the insertion point and press INSERT (you need not identify an ending line). To DELETE one line can can either press D twice on the same line, or DELETE once on the line (as described below under Inserting or Deleting a line).

To position the cursor from the first to last line of the range and to indicate the INSERT point for COPY and MOVE you can only use,

- 1) UP and DOWN ARROWS to position within a page
- 2) PAGE UP or PAGE DOWN to position to different pages
- 3) type a line number starting in column 1 of any line to position to that line

If you try to position the cursor using any other commands a message will appear to the RIGHT on line 1,

Syntax ERROR - Command IGNORED

and your command, including the starting line, will be ignored.

If you only want to COPY, MOVE or DELETE a relatively small number of lines which will be COPIED or MOVED to a relatively nearby place in the file you can easily use the above cursor positioning commands without any planning.

However if a large number of lines are involved and they must be moved a relatively long distance in the file you should plan what you intent to do by first positioning through the file and noting the sequence number of the start, end and insert lines. Once you know these sequence numbers you can easily position to the points involved and quickly complete any of these operations.

Inserting or Deleting a Line

=====

In addition to the commands described above you can INSERT or DELETE individual lines by positioning the cursor in column 1 of any line and pressing,

INSERT - to create a blank line with the cursor positioned in the first text column BEFORE the line where the cursor is located.

DELETE - to delete the line where the cursor is positioned. If you want to delete just a few lines this may be more convenient for you to use then the more general DELETE command described above.

Finding and/or Changing Text

=====

This program will allow you to find or change text within a file.

To define a find command use the HOME key to position the cursor to HOME and then type f followed by the character string that you wish to find followed by ENTER (or RETURN). A find command is terminated by a ENTER or a blank. If you wish to find anything that includes blanks enclose the command in quotes. For example, you can type either,

```
f this
```

or

```
f 'this is a test find'
```

To define a change command use the HOME key to position the cursor to HOME and then type c followed by the character string that you wish to find followed by the character string that you wish to change it to. A change command is treated as a find followed by a change. The find and change parts of the command are each terminated by a blank or ENTER. If either character string includes blanks it should be enclosed in quotes. For example you can change XOLD to XNEW using the following change command,

```
c XOLD XNEW
```

If you define a change command as described above the program will only change the next occurrence of the character string found by searching forward in the file from the current cursor position. If you wish to change every occurrence of a character string you can include the word ALL at the end of the change command, e.g.,

```
c XOLD XNEW all
```

Since the program is primarily designed to edit FORTRAN programs it will distinguish between FORTRAN variables and general text strings. When a find or change command is defined if it is NOT enclosed in quotes it assumed you want to find or change a FORTRAN variable. If it is enclosed in quotes it is assumed you are defining a general text string. For example, the find command,

```
f editor
```

will only find the word editor, whereas,

```
f 'editor'
```

will find editor, editors, editorial, etc. - anything in which the character string editor occurs.

You cannot use CHANGE to extend the length of any line beyond 72 characters; if a change commands would cause the new line length to exceed 72 characters the cursor will be positioned to the point where the change is required, but the change will not be performed. In this case the message on line 1 will say, Line TOO Long for CHANGE. If all changes are performed successfully the message on line 1 will tell you the number of changes made, e.g., 17 Changes.

Repeating Find or Change Commands

=====

This program remembers the last find and change commands that you define (as described above). To repeat the last find command press FUNCTION KEY 1. To repeat the last change command press FUNCTION KEY 2. For Example, if you wish to step through a file finding all occurrences of XOLD you can first define this find command (see, preceding section) and then merely repeatedly press FUNCTION KEY 1 to find the next occurrence; the program will notify you when it reaches the end of the file without finding another occurrence.

What this program remembers is the last find command that you defined OR the last two parts of a change command = find followed by change. For example, if the last find or change command was a find, this will define what the program will find next if you press FUNCTION KEY 1. However, it will also define the first half of the change command (the find part) if you press FUNCTION KEY 2. Conversely if the last find or change command was a change, this will define what the program will change next if you press FUNCTION KEY 2. However, it will also define what the program will find next if you press FUNCTION KEY 1.

This convention can be used to good advantage. If you are not sure if you want to change every occurrence of a character string in a file, you can define a change command to change only the next occurrence of the string in a file. You can then use FUNCTION KEY 1 to position to the next occurrence of the string in the file. If you want to then change it, simply press FUNCTION KEY 2. If you do not want to change it, press FUNCTION KEY 1 again to proceed to the next occurrence of the string. Following this procedure you can quickly step through an entire file only using FUNCTION KEYS 1 and 2, to selectively decide whether or not you want to change each individual occurrence of a character string.

Display Column Numbers

=====

This program can display column numbers for columns 1 through 72 of the text. This option can be helpful if you want to determine exactly what columns any text is located in, or how long a given string of text is.

Press HOME to position the cursor to HOME and then press # to display column numbers 1 through 72 on line 2 of the screen.

Using Tabs

=====

It is convenient to use tabs to minimize the number of key strokes that you must use for input and to position text in specific columns. Therefore this program can read files containing tabs and you can input tabs from your keyboard.

However, the output file from this program will not contain tabs. Any tabs read from an input file or the keyboard will be replaced by blank characters to position the next input character at the next tab position on a line.

This program has built-in tabs every 7 columns, e.g., inputting a tab in any column between 1 and 6 will position the next character to be in column 7. Similarly, inputting a tab in any column between 7 and 13 will position the next character to be in column 14. This continues out to the last tab in column 70.

When you start the program you have the option to change the position of the built-in tabs. If you wish to do this, on the first screen position the cursor (using UP and DOWN ARROWS) to "Set Tabs" and press ENTER (or RETURN). The program will display column numbers 1 through 72 on the second line of the screen and the current tab positions, indicated by T on the third line. The cursor is initially positioned at the beginning of the second line. Use the SPACE BAR to position the cursor to your next tab position and press the T key; this will set the next tab position in this column. Continue to insert as many tabs as you wish. Press ENTER (or RETURN) when you have defined ALL of your tab positions. This procedure is very similar to what you would do to set tabs on a typewriter. Your defined tab positions will remain until you restart the program; at which time the tabs will be reset to their built-in default positions of every 7 columns.

Once you have started editing a file you cannot change tab positions while still editing. However, it is easy enough to simply END your editing, which will save your edited file and restart the program with the first screen. You can then "Set Tabs" and resume editing your file.

Adding Lines to the End of a File

=====

To add lines to the end of a file position the cursor anywhere after the last line of the file and press INSERT. The program will create a line at the end of the file and position the cursor to the first column of this file, so that you can immediately start typing and continue as long as you like.

Characters Echoed by this Program

=====

Any time you press a keyboard key and the program understands what you are trying to do it will always echo your action either by showing the character you typed or taking some action. If you press a key that the program doesn't understand it will ignore your action.

For example, at HOME and in columns 1 through 6, there are only a few keys that the program understands (see, summary of commands by position, below). Similarly, in columns 7 through 78 (1 through 72 of the data), you can only use keys that correspond to normal key codes (1 through 255); if you press any other key it will be ignored.

Simply by watching the screen you will immediately know whether or not the program understands what you are trying to do. If the program doesn't respond to your input and you do not understand why, use the on-line HELP facility to review the available commands.

On Line Help

=====

This program comes with a file named README. This is a simple text file that you can read, type to the screen or print. In addition at any time this file may be viewed using the editor by positioning the cursor to HOME and keying H (for HELP).

The first page of this file is a summary of all the commands that you can use with this editor - that's how simple this editor is - all of its commands can be displayed on only one page!

When using the on-line HELP the message displayed to the RIGHT of the first line says: Q to Quit, otherwise MORE. This means that if you have seen enough of this file, press Q to return to editing. If you want to see more of the file press any other key to see the next page.

See, the appendix for a copy of README.

Summary of Commands by Position

=====

The following table summarizes ALL of the commands that you can use depending on the current location of the cursor. This table is identical to the first screen that you will see if you use the on-line HELP facility.

- * - Anywhere
 - * - HOME = Position cursor to HOME
 - * - END = SAVE the file and terminate
 - * - ESCAPE = Terminate WITHOUT saving the file
 - * - Page Up = Move a Page toward the BEGINNING of the file
 - * - Page Down = Move a Page toward the END of the file
 - * - ARROWS = Move cursor in the indicated direction
 - * - F1 = Repeat last FIND
 - * - F2 = Repeat last CHANGE
- * - At HOME
 - * - Page Up = Move to the BEGINNING of the file
 - * - Page Down = Move to the END of the file
 - * - F = FIND
 - * - C = CHANGE
 - * - S = SAVE the current file and continue
 - * - # = Display Column Numbers
 - * - Numbers = Position to this line NUMBER
- * - In Columns 1 through 6
 - * - Delete = DELETE a Line
 - * - Insert = INSERT a Line
 - * - D = DELETE RANGE
 - * - C = CHANGE RANGE
 - * - M = MOVE RANGE
 - * - T = Move current line to the TOP of the screen
 - * - Numbers = Position to this line NUMBER
- * - In Columns 7 through 78 (1 through 72 of the data)
 - * - Delete = DELETE a Character
 - * - Insert = Start to INSERT Characters

That's It

=====

Unlike other editors where you need a 300 or 400 page manual describing how to use it, this editor is so simple that this documentation is all you need to use it. Everything has been kept as simple and natural as possible, so that you can start editing even while you are reading this document.

That's it! There is nothing more that you need to use this editor. Have fun and please contact the author if you have any comments or suggestions, either pro or con - based on experience, it is feedback from users that leads to the most significant improvement in programs such as this one - so that any comments you have would be most appreciated.

Appendix A: Adapting for use on other computers

Defining Control Keys

This program was originally designed to be used on a IBM-PC (or compatible) with a 101 keyboard; this keyboard has all of the control keys that you need to operate this code. This program has been adapted for use on other computers (e.g., SUN workstations) by relabeling a few infrequently used keyboard keys.

For example, on some older SUN workstations the following infrequently used keys can be relabeled,

SUN key	Relabel to
Line Feed	HOME
Break	END
Option	INSERT
PF1	PAGE UP
PF2	PAGE DOWN

Reading the keyboard

For use on any computer the user must supply a function,

KEYCODE()

to read all keys on your keyboard. This includes not only all characters and numbers, but also all keys that are used to control this program. Normal characters, numbers, etc. will have key codes in the range 1 to 255 and these correspond to the character code that you are using, e.g., EBCDIC, ASCII, etc. The KEYCODE that you must return for special keys includes,

TAB	9
ENTER (or RETURN)	13
ESCAPE	27
FUNCTION KEY 1	1059
FUNCTION KEY 2	1060
UP ARROW	1072
DOWN ARROW	1080
LEFT ARROW	1075
RIGHT ARROW	1077
PAGE UP	1073
PAGE DOWN	1081
HOME	1071
END	1079
INSERT	1082
DELETE	1083

These correspond to the key codes returned by IXKEY() included with the Lahey FORTRAN compiler for use on IBM-PC (or compatible).

When you write a version of KEYCODE() for your computer you need merely map whatever code your system gives you to the above numbers for each of these keys.

WARNING - on most computers this cannot be done by merely using a FORTRAN READ statement. But on virtually every computer you will be able to find a means of reading a code every time a key on the keyboard is pressed.

Graphic Interface

For use on any computer the user must supply the graphics interface routines. The graphic interface used by this routine is relatively simple; it is made up of the following subroutines,

- 1) STARPLOT - initialize plotting
- 2) ENDPLOTS - terminate plotting
- 3) PEN - select color for all following vectors and characters
- 4) PLOT - draw, or move, from last position to new position
- 5) BOXCOLOR - fill a rectangular box with color
- 6) SHOWTEXT - display a string of text (only horizontal)
- 7) CURSEON - display cursor at a new position
- 8) CURSEOFF - remove cursor from its previous position

This interface has been designed to be as simple as possible so that this program can be interfaced to almost any graphics terminal. It includes the minimum necessary to: turn the graphics on and off (STARPLOT, ENDPLOTS), select color (PEN), draw vectors (PLOT), fill areas (BOXCOLOR) and display characters (SHOWTEXT, CURSEON, CURSEOFF). The equivalent capabilities exist on every graphics terminal.

To interface this program to your graphics terminal all you need do is, first find out the names of the routines on your system that serve the equivalent purposes. Next, write a series of subroutines with the above described names and below described arguments, to call the routines on your system that serve the equivalent purpose. Lastly within your interface routines scale dimensions and character positions to fill your screen (see, details below).

The arguments for these routines are described below,

- 1) STARPLOT - none
- 2) ENDPLOTS - none
- 3) PEN(IP)
IP = integer color index (0 to any number)
- 4) PLOT(X, Y, I)
X = new X coordinate
Y = new Y coordinate
I = 2 - draw
= 3 - move
- 5) BOXCOLOR(X, Y, I1, I2)
X = 2 X limits of rectangle
Y = 2 Y limits of rectangle
I1 = interior color index
I2 = border color index
- 6) SHOWTEXT(IC, IL, T, NT)
IC = column index (1 to 80)
IL = line index (1 to 30)
T = text to display
NT = number of text characters to display
- 7) CURSEON(IC, IL, T)
IC = column index (1 to 80)
IL = line index (1 to 30)
T = character to display
- 8) CURSEOFF(IC, IL, T)
IC = column index (1 to 80)
IL = line index (1 to 30)
T = character to display

Definition of Colors

For use with SUBROUTINE PEN, once this routine is called with a given color index all following text and graphics lines should be in this color. Note, for use with SUBROUTINE BOXCOLOR, you can have BOXCOLOR call PEN to follow the same conventions.

0	= Black	= Background
1	= White	= Basic Text
2	= Yellow	= Border
3	= Red	= Sequence Numbers
4	= Blue	= Messages from Program
5	= Green	= Cursor
6	= Magenta	= Modified Text

Dimensions of the Screen

The screen layout is assumed to be X = 0.0 to 11.0 by Y = 0.0 to 8.5. For any other size screen your graphics interface need merely map these ranges into the actual limits of your screen. This applies to PLOT and BOXCOLOR.

Character Size

You should define character size and position to allow your screen to display 80 characters per line and 30 lines on a screen. This applies to SHOWTEXT, CURSEON and CURSEOFF.

Appendix B: A copy of the on-line HELP file README

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The following is a copy of the on-line HELP file README as of the date of this report; for the most up-to-date version see the copy of this file that you received with the program.

This is a simple text file that you can read, type on your screen or print. When you are running this program you can also access this file by pressing the HOME key to position the cursor to HOME and then pressing H (H = HELP).

You can use this standard on-line HELP file or if you wish you can modify it to meet your own needs - you are free to include anything that you wish in this file that will be of assistance to you while you are running this editor.

If you do decide to modify this file you should understand the structure of the file. It is divided into pages of text, with up to 28 lines on each page. The end of each page is defined by a line of the form,

----- (PAGE) -----

This is a signal to the program that only the lines above this line should be included on the current screen. The next screen will start at the line immediately following this line; this line is not displayed on the screen.

The first page of the standard file distributed with this program is a summary of all commands that you can use - this usually serves as a quick reference in case you forget one or more of the commands. It is recommended that you leave this page in place for your use.

The following pages give more details on the use of this program. You may want to edit these pages to meet your needs, e.g., different people think different ways, so that you may prefer to explain the use of the commands in the form that you can more easily understand and follow when you use this file for on-line HELP.

You do not have to follow this "page" convention if you decide to modify this file. This program will display up to the next 28 lines from the file. If it encounters an end of page line (as described above) before displaying 28 lines, it is merely a signal to stop displaying lines on the current screen, and then continue with the next line on the next screen. If it doesn't find an end of page line it will merely keep displaying lines, up to 28 at a time. This end of page line is merely a convenience that can be used to group together and display similar information on the same screen, but it is not necessary for you to use it.

- * - Anywhere (Summary of Commands by Position)
 - * - HOME = Position cursor to HOME
 - * - END = SAVE the file and terminate
 - * - ESCAPE = Terminate WITHOUT saving the file
 - * - Page Up = Move a Page toward the BEGINNING of the file
 - * - Page Down = Move a Page toward the END of the file
 - * - ARROWS = Move cursor in the indicated direction
 - * - F1 = Repeat last FIND
 - * - F2 = Repeat last CHANGE
 - * - At HOME
 - * - Page Up = Move to the BEGINNING of the file
 - * - Page Down = Move to the END of the file
 - * - F = FIND
 - * - C = CHANGE
 - * - S = SAVE the current file and continue
 - * - # = Display Column Numbers
 - * - Numbers = Position to this line NUMBER
 - * - In Columns 1 through 6
 - * - Delete = DELETE a Line
 - * - Insert = INSERT a Line
 - * - D = DELETE RANGE
 - * - C = CHANGE RANGE
 - * - M = MOVE RANGE
 - * - T = Move current line to the TOP of the screen
 - * - Numbers = Position to this line NUMBER
 - * - In Columns 7 through 78 (1 through 72 of the data)
 - * - Delete = DELETE a Character
 - * - Insert = Start to INSERT Characters
- (PAGE) -----
- * - Closing and Saving Files
 - * - END = SAVE the file and terminate
 - * - ESCAPE = Terminate WITHOUT saving the file
 - * - At HOME S = SAVE the file and then return to editing
 - * - Positioning with a file
 - * - UP, DOWN, LEFT or RIGHT ARROWS within page
 - * - PAGE UP or PAGE DOWN for next or preceding page
 - * - At HOME, PAGE UP or PAGE DOWN for beginning or end of file
 - * - In Column 1 T to position cursor line to TOP of screen
 - * - In Column 1 any number to position to this line number
 - * - At HOME any number to position to this line number
 - * - Full Screen Editor
 - * - In Columns 7 through 78 (1 through 72 of the data)
 - * - Replace - type over character
 - * - Insert - Press INSERT and continue typing
 - * - End Insert using cursor motion, e.g., any ARROW
 - * - Delete - Press DELETE
 - * - Copying, Moving and Deleting Lines
 - * - Starting Line Column 1 C (Copy), M (Move) or D (Delete)
 - * - Ending Line Column 1 C (Copy), M (Move) or D (Delete)
 - * - for Delete starting to end immediately deleted
 - * - for Copy or Move
 - * - At INSERTION Line Column 1 press INSERT
 - * - Inserting or Deleting a Line
 - * - In Column 1 press INSERT or DELETE
- (PAGE) -----
- * - Finding Text
 - * - At HOME press F immediately followed by the string to find
 - * - Enclose in quotes if string includes any blanks
 - * - e.g., f 'this is a test'
 - * - Changing Text
 - * - At HOME press C immediately followed by the string to find and what to replace it with

- * - Enclose in quotes if string includes any blanks
 - * - e.g., c 'this is a test' 'this is not a test'
- * - Follow with ALL to change ALL occurrences
 - * - e.g., c 'start with this' 'change to this' all
- * - Repeating Last Find or Change
 - * - Find - Press FUNCTION KEY 1
 - * - Change - Press FUNCTION KEY 2
- * - Display Column Numbers
 - * - At HOME press #
- * - Defining TABS
 - * - ONLY possible at program start or restart (end editing)
 - * - Select 'Set Tabs'
 - * - Use space bar to space to column
 - * - Use T to define TAB positions
 - * - Repeat for each TAB
 - * - ENTER (or RETURN) at end

----- (PAGE) -----

- * - Requirements (on IBM-PC)
 - * - 2 megabyte of memory
 - * - Lahey FORTRAN Compiler
 - * - 101 keyboard
 - * - Color screen desirable
- * - Limitations
 - * - 15,000 lines per file
 - * - 72 characters per line
- * - Screen layout
 - * - line 1 - Program identification and messages
 - * - for messages watch the upper right hand corner of the screen
 - * - line 2 - Home and number of lines in the current file
 - * - lines 3-30 - Lines from the file you opened (28 lines)
 - * - cols. 1- 6 - Line number from the file
 - * - cols. 7-78 - Line from the file (up to 72 characters)