



University of Queensland  
PRENTICE COMPUTER CENTRE

TECHNICAL MANUAL No. 14  
RUNOFF

MNT-14

1 Nov 1978

This manual has been authorized by the  
Director of the Prentice Computer Centre.

**TECHNICAL MANUAL NO 14**

**RUNOFF**

**Edited: Andrew Broughton**

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### USE OF THIS MANUAL.

This manual has been produced to describe the commands as of Version 10 of RUNOFF. As well as the standard RUNOFF commands, there are some which have been implemented only on the University of Queensland system. These commands have been indicated in this manual by enclosing them in square brackets; "[", "]" . Users of other Digital installations are warned that these features are probably not available, and that use of them will cause errors to occur.

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## CHAPTER 1

### INTRODUCTION

RUNOFF is a computer program for the preparation of typed or printed manuscripts, such as memoranda, circulars, lecture notes, manuals, and so on. It is simple to use and contains many powerful features which make it invaluable in the production of essays, assignments, theses, and research papers. It is not necessary to have any depth of knowledge of computers or computing techniques to use RUNOFF; it can be understood and used by anybody. In fact, this manual was produced by RUNOFF.

You enter the text of your document, interspersed with RUNOFF commands, into the computer from a terminal. When all the text and commands have been entered, the RUNOFF program is called to process that information and produce a well formatted document. The principal benefit of such a system is that files prepared for use with it may be edited and corrected easily. Small or large amounts of material may be added or deleted and unchanged material need not be retyped. After a set of changes, the RUNOFF program will produce a new copy that is properly paged and formatted. Documents can be easily updated, reformatted, and reprinted without extensive retyping.

Among the many features of RUNOFF are page titling and subtitling, automatic paragraphing, ragged or justified right hand of text, automatic chapter titling and numbering, semi-automatic index production, adding appendices, table production, variable output (such as form letters), and various other options affecting the format.

RUNOFF may also be used to prepare Program Logic Manuals from program source code, allowing full up to date documentation to be produced in a well formatted and presentable manner.

It is basically necessary to know two things about the PDP-10 computer at the University of Queensland to use RUNOFF.

1. How to "log in" to the system; and
2. How to create and modify files using the Editor.

This information can be obtained from the manuals MNT-2 "Using the U.Q. PDP-10 System" and MNT-6 "Edit - A Line Editor for the PDP-10", available at the Centre, or by attending one of the courses given by the Centre. The technique of logging in is discussed in chapter 2.

This manual discusses the instructions for Version 10 of RUNOFF. Chapter 2 is an introduction to using the computer for those unfamiliar with this. If you already are familiar with logging in you may skip this chapter. Chapter 3 details some basic commands. It is possible to use RUNOFF with only these commands, and they will form a basis for the remaining material. Chapter 4 discusses the "better" features which will generally be the most useful. Chapter 5 discusses some features which you would only use in more specialised applications.

### 1.1 FILES ON THE PDP-10 COMPUTER

All information in the PDP-10 computer is stored as logical units called "files". A file is a collection of characters (it may be text, numeric data, or a mixture of both) recorded in a magnetic form (as on a cassette tape) in the computer. Each file belonging to a user has a unique name. This allows each file to be referenced by that name. A file name consists of two parts - a file name and a file extension. The format is NAME.EXT. The file name can be up to six characters in length, and the extension up to three. The extension specifies the type of the file. A RUNOFF file is specified by an RNO extension (for RUNOFF). A file which is input to a program (i.e. used as data for the program) is called an input file or source file, and a file which is created by a program is called an output file. A file may be entered into the system either by terminal or on punched cards.

RUNOFF requires a source file as input and from this source file produces an output file. The source file is the text of your document plus instructions to RUNOFF. RUNOFF instruction lines are interspersed with the lines of text wherever required throughout the file. The output file is the final document formatted as requested. This can either be printed on a terminal or line-printer, or stored in the computer for later printing. The Computer Centre has a "Diablo" terminal, which is a special computer terminal for high quality typing with a carbon ribbon. This can be used by you to produce the final version of a document from RUNOFF.



1.2 CREATING DOCUMENTS.

The text of your document may be entered freely leaving at least one space between words. All material in the source file is taken to be source text except those lines beginning with a period ".". A line beginning with a period is assumed to be a command to RUNOFF. A command line must have a period in column 1, with the command starting in column 2. The commands provide the formatting information and control for the RUNOFF program.

Usually the text is filled and justified as it is processed. That is, the program FILLS a line by adding successive words from the source text until one or more words would cause the right margin to be exceeded. The line is then JUSTIFIED by making the word spacings larger until the last word in the line exactly meets the right margin. This means that the text may be typed on the terminal in lines of any length since RUNOFF handles the aligning of text and treats the end of a line as a word separator. Should you wish to reproduce source text exactly this can be done by disabling filling and justification.

The text is usually entered in upper and lower case exactly as it is to appear in the output. Special provision is made for those terminals which do not have upper and lower case facilities (section 5.1.1).

There are certain special characters which cannot be used in the text in general, since they have special meaning to the RUNOFF program. These are discussed in section 3.1.

The following is an example showing some of the basic commands available in the RUNOFF program. The commands to the RUNOFF program, in this example, are in upper case, and the document text is in upper and lower case. The text before processing by the RUNOFF program, as well as after processing is given to show you some of the principles of using RUNOFF.

Text before processing by RUNOFF:

.SPACING 1

.FILL

.LEFT MARGIN 10

.RIGHT MARGIN 65

"Who did you pass on the road?" the King went on, holding his hand to the Messenger for some more hay.

.SKIP 1

.INDENT 2

"Nobody," said the Messenger.

.SKIP 1

.INDENT 2

"Quite right," said the King, "this young lady saw him, too. So of course Nobody walks slower than you."

.SKIP 1

.INDENT 2

"I do my best," said the Messenger in a sulky tone; "I'm sure nobody walks much faster than I do."

.SKIP 1

.INDENT 2

"He can't do that," said the King, "or else he'd have been there first."

.SKIP 2

.CENTRE

-----  
.SPACING 2

.SKIP 1

.INDENT 2

"You're a poor speaker," said the King.

.SKIP 1

.INDENT 2

Here one of the guinea-pigs cheered, and was immediately suppressed by the officers of the court. (As that is rather a hard word, I will just explain to you how it was done. They had a large canvas bag, which tied up at the mouth with strings: into this bag they slipped the guinea-pig, head first, and then sat upon it.) "I'm glad I've seen that done," thought Alice, "I've often read in the newspapers at the end of the trials, 'There was some attempt at applause which was immediately suppressed by the officers of the Court,' and I never understood what it meant till now."

.CENTRE

\*\*\*\*\*

Text after processing by RUNOFF:

"Who did you pass on the road?" the King went on, holding his hand to the Messenger for some more hay.

"Nobody," said the Messenger.

"Quite right," said the King, "this young lady saw him, too. So of course Nobody walks slower than you."

"I do my best," said the Messenger in a sulky tone; "I'm sure nobody walks much faster than I do."

"He can't do that," said the King, "or else he'd have been there first."

-----

"You're a poor speaker," said the King.

Here one of the guinea-pigs cheered, and was immediately suppressed by the officers of the court. (As that is rather a hard word, I will just explain to you how it was done. They had a large canvas bag, which tied up at the mouth with strings: into this bag they slipped the guinea-pig, head first, and then sat upon it.) "I'm glad I've seen that done," thought Alice, "I've often read in the newspapers at the end of the trials, 'There was some attempt at applause which was immediately suppressed by the officers of the Court,' and I never understood what it meant till now."

\*\*\*\*\*



## CHAPTER 2

### HOW TO USE THE COMPUTER.

This chapter is a very brief introduction to the use of the computer. It is for those using the computer for the first time. To obtain the best results from reading this chapter it is recommended that you actually work through the examples given here, on a computer terminal, and see for yourself what really happens. It is also important to obtain and study the other manuals referenced here (especially MNT-6) so that you may have a good understanding of the methods involved.

#### 2.1 LOGGING IN.

Before you can use the RUNOFF program you must identify yourself to the computer. The process whereby you do this is called "logging in". Logging in is necessary before you can do any work on the computer.

To be able to log in you must have opened an account with the Computer Centre. When you do this you are allotted a unique means of identification - a pair of numbers called a project-programmer number. The project-programmer number consists of two integers - the first is your project number, and the second is your programmer number. For example your project-programmer number could be 175,171. The computer uses this unique identification method to ensure the privacy of all information which you store in the computer.

The work done in the period between entering and leaving the system is called a "job". When you log in, you are allocated a job number. The computer then requests your project-programmer number, a password, and a cost limit.

The password is used to retain the security and privacy of your information. This is a word known only to you, which is established when you open an account. You may also change your password any time you want. This ensures that no unauthorised person may use your account and spend your money, or read the information you have stored in the computer.

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The password you give is checked against the one stored by the computer, and if the two are the same you may continue. If they are not, you are not allowed to log in.

The cost limit which you specify is the initial amount of money you wish to spend on this job. You can increase your cost limit at any stage during a job. The amount you specify as your cost limit cannot exceed the funds in your account.

If all checks have been satisfactory you will be allowed to log in. When you have completed logging in you are in communication with a program called the Monitor. This program monitors everything that happens on the computer. You must tell the Monitor program what you wish the computer to do for you, and it will do it. Every command to the computer must be completed by typing the carriage return key. This is generally labelled "return" or "cr".

A sample of the logging in procedure is given below. The typeout printed by the computer is underlined to distinguish it from what you type on the terminal.

.LOGIN 175,171

This signals to the computer that the person with project-programmer number 175,171 wants to log in.

JOB 25 PRENTICE C. C. 603 #9 TTY31

PASSWORD:

You have been assigned job number 25, and you are using terminal number 31. The computer asks you for your password - when you type this it does not appear on the terminal (for security reasons). If your password is correct then your account balance and the date it was last updated are printed. The computer then asks for the job cost limit.

A/C BALANCE IS \$166.21

[UPDATED 21:20:45 12-SEP-78]

COST LIMIT: \$2.00

Following this some more general information, including the time and date, are typed on the terminal, and you are logged in.

CHARGE NO. 20

COST LIMIT: \$2.00

SEQ. NO. 158608921

14:39:37 13-SEP-78 WED

.

The Monitor types a period on the terminal to tell you it is ready to accept commands from you.

2.2 USING THE RUNOFF PROGRAM.

RUNOFF is simply a program which you ask the Monitor to run for you. However before you can run RUNOFF you must store your text in the computer.

You do this by using another program called the Editor (i.e. text editor) designed specifically for entering and changing text. Full details on the use of this program are given in MNT-6 which is available from the Computer Centre.

Setting up your file initially is called "creating" it. To create a file called NOTICE.RNO you would proceed as follows.

.CREATE NOTICE.RNO

Tell the Monitor that you wish to use the Editor program to create a file. Now you type in your input exactly as you would type it in a typewriter. You include the commands to the RUNOFF program with the rest of your text.

INPUT:

.NOTE NOTICE

All departmental managers are required to attend the general meeting to be held in the board room this Thursday morning at 9:30. This meeting is to discuss the sales policy for the forthcoming autumn sale.

.END NOTE

When you have finished typing in your file you type the carriage return key TWICE.

\*FILE

When the Editor responds with an asterisk you type FILE. This returns you back to the Monitor program.

.

You have now set up a file containing the text of your document, as well as commands to the RUNOFF program. You can now process this file with the RUNOFF program to produce your formatted document. To do this you tell the Monitor you want to run the RUNOFF program by typing R RUNOFF.

When the RUNOFF program responds with an asterisk you tell it the name of your text file, and it produces your formatted document for you. The document produced by RUNOFF is also a file (as discussed in chapter 1). This file has the same name as you gave your original text file, and has a MEM extension (for memorandum). You can then request that this file be printed on the line printer.

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To return from the RUNOFF program to the Monitor you must type a control-C character. You do this by holding down the control key while you strike the C key. A control-C is printed as ^C.

Your dialogue with RUNOFF could look like this:

```
.R RUNOFF  
*TTY:=NOTICE  
_
```

#### NOTICE

All departmental managers are required to attend the general meeting to be held in the board room this Thursday morning at 9:30. This meeting is to discuss the sales policy for the forthcoming autumn sale.

\*^C

Notice that RUNOFF expects that your file name will have an RNO extension (e.g. THESIS.RNO). You only have to tell it the file name and not the extension as well. RUNOFF tells you how many pages of output were produced. You instruct the Monitor to print your output using the Monitor PRINT command (e.g. PRINT THESIS.RNO).

Now that you have finished your work you will want to leave the computer. This is called logging out. The simplest way of doing this is by typing K/F. Should you happen to desire more information about logging out you should consult MNT-2 "Using The U.Q. PDP-10 System".

Chapter 6 discusses how to use the RUNOFF program in slightly more detail. However what you have learnt here will be sufficient in most cases.



## CHAPTER 3

### BASIC RUNOFF COMMANDS

As previously discussed a RUNOFF command is signified by a period in column 1. Commands may be abbreviated according to the standard abbreviations listed in this manual. Long commands may also be abbreviated by typing only enough letters to make the command unique. Typing 6 letters should ensure this, however you should not make extensive use of your own abbreviations, since they are not guaranteed to remain unique with future versions of RUNOFF.

Some commands require arguments of one or more decimal numbers. Other commands require text arguments. Numeric arguments are specified by n and m in this manual; text arguments are specified by "text". In both cases you type the command followed by the argument(s).

RUNOFF allows you to type more than one command on a single line. Multiple commands may be separated by a period, a space, or a semicolon. However if commands are separated by a space or semicolon then each command must still be preceded by a period. If the first command takes text as its argument, you cannot use the period as a separator.

For example,

```
.TAB STOPS 10,20,30;.SKIP 2  
.LEFT MARGIN 5.RIGHT MARGIN 70
```

In commands which take text strings as their argument, the period, semicolon, and exclamation mark characters are considered as part of the text. You can only terminate these commands by typing a carriage return. There are some RUNOFF commands which require the text argument to be on the line following the command. However it is possible to type both command and text on the one line if they are separated by a semicolon.

For example,

```
.CENTRE  
Text
```

produces the same results as

```
.CENTRE;Text
```

There are some commands which cannot have another command on the same line. These commands are TITLE, SUBTITLE, and INDEX. All characters after these commands are taken as part of the argument to the command.

For example,

```
.INDEX Files;.TITLE Creating Documents
```

causes "Files;.title creating documents" to be placed in the index.

Every character that you type is not taken literally by RUNOFF. There are some "special" characters, which are so called because they are used to signify that you want some "special" effect to take place. If you want any of these characters to appear in your document you must let RUNOFF know that you want them to be taken literally, and not to cause any special effects. You can do this by what is called "quoting" the characters. This is done by preceding the character by an underscore character ("\_"). For example if the text is to be "Tape drive #3" it must be entered as "Tape drive \_#3".

The special characters and the effects they have are listed below:

- |                |   |                                |
|----------------|---|--------------------------------|
| 1. Underscore  | _ | takes next character literally |
| 2. Up-arrow    | ^ | upper case next character      |
| 3. Back-slash  | \ | lower case next character      |
| 4. Number sign | # | non-expandable space           |
| 5. Ampersand   | & | underline next character       |

- |                     |   |                               |
|---------------------|---|-------------------------------|
| 6. Less-than        | < | capitalize the next word      |
| 7. Greater-than     | > | index the following word      |
| 8. Exclamation mark | ! | end footnote or begin comment |

Since all commands start with a period in column 1, if a period is desired as the first character of a line of text it must be quoted by preceding it with an underscore character. The number sign character can be used to signal to RUNOFF that a sequence of spaces (represented by a string of #'s) should not be expanded when the line is being justified. The other special characters are discussed in more detail in chapters 4 and 5.

If you desire to underline a text string you can do this by "locking" underlining on before the text string, and "unlocking" it at the end of the text string. Underlining is turned on by an up-arrow ampersand "^&" combination and turned off by a backslash ampersand "\&" combination. To underline the string ABCDE you enter ^&ABCDE\& .

Following are a collection of simple RUNOFF commands with their allowable abbreviations. The full command is given first followed by its shortest abbreviation.

### 3.1 TEXT FORMATTING.

#### 3.1.1 Filling And Justifying.

Usually in RUNOFF, text is input from the source file until one or more words would exceed the right margin. Then the space between words is increased until the last word exactly reaches the right margin. This effect is obtained by using the FILL and JUSTIFY commands. Text may be output in the same format as it is entered by use of the NOFILL command. The FILL command automatically turns on justification and the NOFILL command automatically turns off justification. A "break" is said to occur when the current line is output exactly as it is - i.e. the carriage return is taken as a line terminator rather than just a word separator. A break occurs in the last line of a paragraph, such as this line.

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(a) FILL , F

Causes a break and specifies that subsequent output lines be filled. Sets the justification mode to be that specified by the last appearance of JUSTIFY or NOJUSTIFY. (FILL is the initial setting).

(b) NOFILL , NF

Causes a break and prevents filling of subsequent output lines. Also turns off justification. This command can also be entered as NO FILL

NOTE

- (i) Normally FILL and NOFILL are used to turn both filling and justification on and off. It is usually desirable to do both. However, a subsequent appearance of a justification command will override the FILL command.
- (ii) The NOFILL-NOJUSTIFY mode need be used only where there are several lines of material to be copied exactly. A single line example will not require using these commands if there are breaks before and after the line. (c.f. LITERAL - section 4.1.5)
- (iii) Because of the action of FILL, a single occurrence of NOJUSTIFY will cause the remainder of the file to be unjustified, with filling as specified. In order to justify but not fill (not recommended), a JUSTIFY command must follow every NOFILL command.

(c) JUSTIFY , J

Causes a break and sets subsequent output lines to be justified (initial setting). That is, word spacings are increased and adjusted until the last word in the line ends at the right margin.

(d) NOJUSTIFY , NJ

Causes a break and prevents justification of subsequent output lines. This command can also be entered as NO JUSTIFY.

If text is filled but not justified this gives a ragged right, but text is not reproduced exactly as it is entered (because filling

treats a carriage return as a line separator). If text is justified but not filled two situations can arise. When the current line is longer than the page width an error (CAN'T JUSTIFY LINE) occurs, and when the current line is shorter than the page width the spacing between words can be very large.

The following section of a poem shows an example of where you would wish to use the nofill mode. The first paragraph shows the text as it would be output under the normal fill mode. The second shows the output with no filling.

Then flashed the living lightning from her eyes, And screams  
of horror rend the affrighted skies, Not louder shrieks to  
judging Heaven are cast, When husbands, or when lapdogs  
breathe their last, Or when rich China vessels, fallen from  
high, In glittering dust and painted fragments lie!

Then flashed the living lightning from her eyes,  
And screams of horror rend the affrighted skies,  
Not louder shrieks to judging Heaven are cast,  
When husbands, or when lapdogs breathe their last,  
Or when rich China vessels, fallen from high,  
In glittering dust and painted fragments lie!

### 3.1.2 Spacing Commands.

With RUNOFF the vertical spacing between lines can be set to different values just as with a typewriter, the only difference being that with RUNOFF the spacing range is from 1 to 5 lines rather than the usual values available on a typewriter. The initial value of the spacing is 1. The line spacing value is specified by LS in this manual.

(a) BREAK , BR

Causes a break, i.e. the current line will be output with no justification, and the next word of the source text will be placed at the beginning of the next line.

(b) SPACING n , SP n

Causes a break after which the vertical line spacing is set to n. The n must be within the range 1 to 5. Single spacing is 1, double spacing is 2, etc. The default spacing is 1.

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(c) SKIP n , S n

Causes a break after which  $n*LS$  lines are left blank. If the skip would leave room for less than two printed lines on the page (i.e. if there are less than  $(n+2)*LS$  lines left), the output is advanced to the top of the next page. If  $n$  is negative the skip is to  $n*LS$  lines above the bottom of the page. If this is not possible the skip is to this position on the following page.

(d) BLANK n , B n

Exactly like SKIP, except that  $n$  (rather than  $n*LS$ ) lines are specified. BLANK is used where space is to be left independent of the line spacing; SKIP is used where the space should be relative to the size of line spacing. Those interested in more control over where the blank lines are to appear should see the TEST PAGE (section 3.2.1) and FIGURE commands. If  $n$  is negative a skip to  $n$  lines above the bottom of the page occurs. If this is not possible, the skip is to this position on the following page.

(e) FIGURE n , FG n

Like BLANK except that if less than  $n$  lines remain on the current page, the page will be advanced, and  $n$  blank lines will be left at the top of the new page. Principally used where it is desired to leave room for a figure to be drawn in manually.

(f) FIGURE DEFERRED n (No abbr.)

The FIGURE DEFERRED command has the same effect as the FIGURE command except that if  $n$  lines do not remain on the page instead of leaving the remainder of the page blank and skipping to a new page, text is output on the current page and the space for the figure is deferred to the next page.

The following is an example of the spacing commands. The text before and after processing by RUNOFF is shown below.

Before processing:

.SPACING 2

"Take some more tea," said the March Hare to Alice, very earnestly.

.SKIP 1

"I've had nothing yet," Alice replied in an offended tone "so I can't take more."

.SKIP 1

"You mean you can't take less," said the Hatter; "It's easy to take more than nothing."

.CENTRE

\*\*\*\*\*

.BLANK 1

Alice could see, as well as if she were looking over their shoulders, that all the jurors were writing down "stupid things" on their slates, and she could even make out that one of them didn't know how to spell "stupid", and that he had to ask his neighbour to tell him.

.BLANK 1

"A nice muddle their slates will be in before the trial's over," thought Alice.

.CENTRE

\*\*\*\*\*

.SPACING 1

Alice did not wish to offend the Doormouse again, so she began very cautiously: "But I don't understand. Where did they draw the treacle from?"

.FIGURE 4

"You can draw water out of a water-well," said the Hatter; "so I should think you could draw treacle out of a treacle well - eh, stupid?"

After processing:

"Take some more tea," said the March Hare to Alice, very earnestly.

"I've had nothing yet," Alice replied in an offended tone "so I can't take more."

"You mean you can't take less," said the Hatter; "It's easy to take more than nothing."

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Alice could see, as well as if she were looking over their shoulders, that all the jurors were writing down "stupid things" on their slates, and she could even make out that one of them didn't know how to spell "stupid", and that he had to ask his neighbour to tell him.

"A nice muddle their slates will be in before the trial's over," thought Alice.

\*\*\*\*\*

Alice did not wish to offend the Doormouse again, so she began very cautiously: "But I don't understand. Where did they draw the treacle from?"

"You can draw water out of a water-well," said the Hatter; "so I should think you could draw treacle out of a treacle well - eh, stupid?"



3.2 PAGE FORMATTING.

3.2.1 Page Setout.

With documents produced by RUNOFF it is possible to have pages numbered on the top of the page, on the bottom of the page, or to have no page numbering at all. The page layouts for the various cases are given below. Document identification is discussed in section 4.2.2.

(I) If page numbering is at top of page;

- (i) top margin (defaults to 1 line)
- (ii) title, page number (both on same line)
- (iii) subtitle
- (iv) two blank lines before the start of text
- (v) text (continues to the last line of page).

(II) If page numbering is at bottom of page;

- (i) top margin (defaults to 1 line)
- (ii) title, document identification (both on same line)
- (iii) subtitle, document date (both on same line)
- (iv) two blank lines before the start of text
- (v) text (continues to fourth last line of page)
- (vi) two blank lines before the page number line
- (vii) page number (1 line).

(III) If pages are not numbered;

Exactly as above except the page number is left blank.

(a) PAGE , PG

Causes a break and an advance to a new page. If the current page is empty, this does not advance the page. Titling and numbering are as for automatic page advance.

(b) TEST PAGE n , TP n

Causes a break followed by a conditional page advance. If there are n or more lines remaining on the current page, no advance is made and no lines are skipped. Otherwise, the page is advanced as for PAGE. This command should be used to ensure that the following n lines are all output on the same page.

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(c) CENTRE n , C n

This command causes a break after which it centres the next line following in the source file. The centring is over the column  $n/2$ , independent of the setting of the left and right margins. To centre data over a page where the left margin is  $n$  and the right margin is  $m$ , the command is `CENTRE (n+m)`. This does not mean you include the characters "(" and ")" in the command. To do this would cause a RUNOFF error message to be printed on your terminal. You must work out the figure for yourself. For example, to centre over a page with a left margin of 5 and a right margin of 70, use `CENTRE 75`. If  $n$  is not specified in the command, it is assumed to be the last value specified. It is initially set to centre over the initial paper size (i.e. 60 for left margin=0, right margin=60). If you wish to type the command as well as the text to be centred on the same line they must be separated by a semicolon.

(d) CENTER n , C n

Equivalent to `CENTRE`.

(e) LEFT MARGIN n , LM n

Causes a break after which the left margin is set to  $n$ . The  $n$  must be less than the right margin, but not less than 0. The initial setting is 0. The amount of any indent plus the left margin must not be less than 0.

(f) RIGHT MARGIN n , RM n

Causes a break after which the right margin is set to  $n$ . The  $n$  must be greater than the left margin. The initial setting is 60, unless otherwise specified using a `PAGE SIZE` command.

The number of characters on a line will be equal to or less than the right margin minus the left margin minus any indenting which may be specified. Even if filling has been disabled, lines will not be extended past the right margin.

When the right margin is reset by RUNOFF, by such commands as `STANDARD` (section 4.4) and `CHAPTER` (section 4.2.1), it is reset to the value given by the last `PAGE SIZE` command, otherwise to the default setting.

(g) INDENT n , I n

Causes a break and sets the next line to begin n spaces to the right of the left margin. The n may be negative to cause the line to begin to the left of the left margin (useful for numbered paragraphs). However n cannot specify a position to the left of 0.

(h) PAGE SIZE n,m , PS n,m

Sets the number of lines per page to n (initially 58) and sets the paper width in columns to m (initially 60). The second argument m, is optional. The number n must be greater than 10, and the number m must be greater than the left margin. The number m is set into the right margin as if a RIGHT MARGIN m command had been given. The PAGE SIZE command is usually used only at the beginning of a source file, but may be used elsewhere if required.

(i) PAPER SIZE n,m , PS n,m

This command is exactly the same as the PAGE SIZE command. This similarity of commands is only necessary for compatibility with previous versions of RUNOFF. A PAPER SIZE 60,70 command was used in the production of this manual.

Example:

```
.LEFT MARGIN 10;.RIGHT MARGIN 60
.NOFILL;.CENTRE;BERT, THE LOST ELEPHANT.
.SKIP 1;.INDENT 2
Made of orange stuff,
With long white tusks,
I am Bert the elephant.
Lost am I,
.SKIP 1;.INDENT 2
Alone I struggle
Under a pile of dirty clothes,
All alone
without even my Snoopy
.SKIP 1;.INDENT 2
To talk to me
To guide me from my imprisonment
Oh Sharon, here I am forced to stay;
Time is my captor
Oh Sharon, hear my cry
.INDENT 5
HELP!!
.SKIP 2;.INDENT 35
Lee MacDonald.
```

This is output by RUNOFF as:

BERT, THE LOST ELEPHANT.

Made of orange stuff,  
With long white tusks,  
I am Bert the elephant.  
Lost am I,

Alone I struggle  
Under a pile of dirty clothes,  
All alone  
without even my Snoopy

To talk to me  
To guide me from my imprisonment  
Oh Sharon, here I am forced to stay;  
Time is my captor  
Oh Sharon, hear my cry  
HELP!!

Lee MacDonald.

### 3.2.2 Numbering.

In memoranda and simple documents, a numbering system of 1, 2, 3, etc. is quite adequate. However, for the production of manuals and other chapter orientated documents it is possible to have a page number of the form 1-3, where 1 is the chapter number and 3 is the number of the page within that chapter. In addition, the pages at the front of a manual comprising the foreword, chapter contents and so on, are usually numbered in small roman numerals. This case is allowed for also, with roman numerals up to 20 (xx) being possible. Should you desire to add additional pages to a document you can use subnumbering to do this. Subnumbering appends an alphabetic character to the page number - e.g. 2a, 2b, 2c.

#### (a) NUMBER n , NM n

Turns on page numbering (initial setting) and, if n is supplied, sets the current page number to n. If n is not given the page number defaults to the current value of the page counter. This is initially 1. If n is relative (i.e. +n or -n) then this value is either added to or subtracted from the current page counter.

(b) NO NUMBER , NNM

Turns off page numbering. Pages will continue to be counted, so the normal page number will appear if numbering is re-enabled.

[ (c) TOP NUMBER , TN ]

Causes pages to be numbered at the top. (This is the default or initial setting). No roman numbering is possible when page numbers appear at the top of pages, although both chapter numbering and subnumbering are available.

[ (d) BOTTOM NUMBER . BN ]

Causes page numbers to be placed at the bottom of pages rather than at the top. Bottom numbering is used in this manual.

[ (e) ARABIC NUMERALS , AN ]

This command changes numbers from roman numerals to arabic numerals, and is the default setting.

[ (f) ROMAN NUMERALS , RN ]

This command will ensure that normal page numbers are produced in roman numerals. The maximum number allowable in roman numerals is 20. The contents pages of this manual were numbered using this command.

### 3.2.3 Titling.

(a) TITLE text , T text

This command takes the remaining text on the line as the title. This text will appear on the first line after the top margin on all subsequent pages, beginning at the left margin unless leading blanks are used for indenting. The title is initially blank.

(b) SUBTITLE text , ST text

This command takes the remaining text on the line as the subtitle. This text will appear on the line immediately following the title. The subtitle is initially blank. The subtitle is not indented, but may contain leading spaces to achieve the same effect, if desired.

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(c) SUBTTL text , ST text

Equivalent to SUBTITLE

(d) NO SUBTITLE , NST

Specifies that subtitles are to be suppressed.

(e) FIRST TITLE , FT

Specifies that the title and subtitle are to be included on the first page of the document. The default is not to do this.

Now that you have learnt the basic RUNOFF commands you are ready to run RUNOFF. A discussion of how to do this is given in section 6.1 . Some switches which you may find useful in your application are discussed in section 6.3

## CHAPTER 4

### GENERAL RUNOFF COMMANDS

This chapter discusses those commands in RUNOFF which are more powerful, but which require some extra knowledge to use. It is assumed that the reader of this chapter has read and understood the basics covered in chapter 3 of this manual.

#### 4.1 TEXT FORMATTING.

##### 4.1.1 Paragraph Handling.

In many documents the chapters are broken up into numbered sections. These sections themselves may be broken into further subsections. The standard numbering system for such sections and subsections is c.s.t, where c is the chapter number, s is the section number within the chapter, and t is the subsection number. For example, subsection 5 of section 1 of chapter 4 would be numbered as 4.1.5. RUNOFF has commands which enable you to set up and number sections quite simply. A great advantage of using these commands is that, should you desire to add or remove an entire section, no laborious renumbering is necessary. Renumbering is handled automatically by RUNOFF.

##### (a) PARAGRAPH n,v,t , Pn,v,t

Causes a break and formats the output paragraphs. The value of n specifies the indentation of the first line of the paragraph. It is optional and if omitted the value 5 is assumed. The second argument v specifies the vertical spacing between paragraphs and can have values from 1 to 5. The default spacing is 1. The third argument t is the argument of an automatic TEST PAGE instruction (section 3.2.1). A LEFT MARGIN command will reset the paragraph indentation to n, if the current indentation is to the left of n.

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(b) AUTOPARAGRAPH , AP

This command causes any blank line or any line starting with a space to be considered as the start of a new paragraph. It allows for normally typed text to be formatted without special commands. It does not cause a paragraph if blank lines are followed by a command.

(c) NO AUTOPARAGRAPH , NAP

Disengages the AUTOPARAGRAPH mode.

(d) HEADER LEVEL n text , HL n text

This command is used to start a numbered section at the level specified. The text is taken as the section header. The value of n can be in the range of 1 to 5. The sections are incremented by 1 automatically, and the level number is output in the form i.j.k.l.m . If the command is used in a chapter orientated document, i is the chapter number; otherwise it is the number of the most recent occurrence of a HEADER LEVEL 1 command. The text for header level 1 items is output in upper case, whereas the text for all other header levels is output with the first character of each word in upper case and the remainder in lower case. Header levels 1 and 2 have the section text to which they correspond starting on a new line, but the other header levels (3 to 5) have the header title followed by a space dash space (#-#) combination and then the section text on the same line. A full example using header levels is given in appendix B.

For example, this is chapter 4: so 4.1 is header level 1, and 4.1.1 is header level 2.

(e) NUMBER LEVEL a,b,c ... (No abbr.)

This is used to set the next header level number to a.b.c ...

Each paragraph in this manual which discusses a RUNOFF command was formatted using the PARAGRAPH -5,2,6 command. An example of the use of AUTOPARAGRAPH is given in Appendix B, the "Simple RUNOFF Commands" document.



For example, the text:

```
.header level 2^&Example of Header Levels.\&
.left margin 10
.paragraph -10,2,6
TEACHER:##"Well Jones, what did the Head say about
your funny picture?"
.paragraph
BOY:#####"He said, sir, that only the lowest of the
low would call it funny."
```

is output as:

#### 4.1.2 Example Of Header Levels.

TEACHER: "Well Jones, what did the Head say about your funny picture?"

BOY: "He said, sir, that only the lowest of the low would call it funny."

#### 4.1.3 Tables.

Most people who have had any experience with typing know the advantage of using tab stops. RUNOFF has the capability of allowing you to set tab stops, making aligning of text and formatting of tables extremely simple. RUNOFF has the extra advantage that you may use up to 32 tab stops, in any positions. There is no necessity for your tab stops to be equally spaced, even though this is possible.

##### (a) TAB STOPS n,...,k , TS n,...,k

Clears all previous tab-stops and sets new tab-stops as specified by the numbers n,...,k. The several numbers (maximum 32) must be greater than 0 and in increasing order. They are the positions of tab-stops independent of the setting of the left margin, although any which are less than the left margin will be ignored.

Tabs should be used only in lines which will be unjustified and unfilled, i.e. where filling is disabled or a break immediately follows. Clearly, the spaces specified by a tab character should not be expanded by RUNOFF to justify the line; this would defeat the purpose of tab formatting. The presence of a tab in the source text will be translated to one or more spaces, i.e. the amount necessary to advance to the next tab-stop. If a tab

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appears at a point where no further tab-stops have been set on a line, the tab will be treated as though it had been a space.

(b) AUTOTABLE , AT

This command causes any line without a leading space to be treated as the beginning of a new paragraph. It is very useful, used in addition with the TAB STOPS command, for setting up tables.

(c) NO AUTOTABLE , NAT

Turns off the AUTOTABLE mode.

This example shows how simple it is to format tables or to obtain column formatted output.

Before processing by RUNOFF:

```
.tab stops 30  
.no fill  
.autotable
```

```
The busy sylphs          surround their darling care,  
These set the head,     and those divide the hair,  
Some fold the sleeve,   whilst others plaid the gown;  
And Betty's praised     for labours not her own.
```

After processing by RUNOFF:

```
The busy sylphs          surround their darling care,  
These set the head,     and those divide the hair,  
Some fold the sleeve,   whilst others plaid the gown;  
And Betty's praised     for labours not her own.
```

#### 4.1.4 List Production.

(a) LIST n , LS n

This command starts an indented list with spacing n. The left margin is moved 9 spaces to the right for the first LIST command and 4 more spaces to the right for each subsequent nested LIST. The normal fill and justify modes remain in effect; therefore you must disengage them just before the LIST command if you want a ragged right margin.

(b) LIST ELEMENT , LE

Specifies an element of the current list. The elements are numbered sequentially and the number is given a negative indent so that the list lines up. The number is followed by a period and 2 spaces. The list elements are separated by the standard paragraph spacing. Should you wish to type the text on the same line as the command you must separate them by a semicolon.

(c) END LIST , ELS

Terminates the LIST command and returns parameters to their former settings.

(d) NUMBER LIST d,c (No abbr.)

Since nested lists are possible, when you desire to set a list element number to a specified value you not only have to specify the value, but also the list to which you wish the change to apply. The first argument d specifies the list level, and the second argument c specifies the value you want the next list element at this level to have.

An example of list production is given below:

Before processing

Ask yourself what work the word "after" does in these five sentences:

```
.list
.le;After me cometh a man that is preferred before me.
.le;You go first; I will come after.
.le;After him then, and bring him back.
.le;I hear him mock
.break
The luck of Caesar, which the gods give men
.break
To excuse their after wrath.
.le;After he came all went wrong.
.end list
```

After processing

Ask yourself what work the word "after" does in these five sentences:

1. After me cometh a man that is preferred before me.
2. You go first; I will come after.
3. After him then, and bring him back.
4. I hear him mock  
The luck of Caesar, which the gods give men  
To excuse their after wrath.
5. After he came all went wrong.

#### 4.1.5 Notes And Footnotes.

(a) NOTE text , NT text

Starts an indented note. First 2 blank lines are left and both margins are reduced by 5. The given text is centred, or the word "NOTE" is centred if no text is given. This is followed by 1 blank line. The main text of the note must be terminated by an END NOTE command.

(b) END NOTE , EN

This terminates the NOTE command, leaves 2 blank lines and returns both margins to their former values.

(c) FOOTNOTE n , FN n

Allocates n\*LS lines at the bottom of the current page for a footnote[1]. If insufficient room remains on the current page, space will be allocated at the bottom of the following page. The text for the footnote begins on the line following the command, and it may contain any appropriate commands (e.g. CENTRE, SKIP) necessary to format the footnote. The footnote is terminated by the END FOOTNOTE command or by an exclamation mark. The lines bracketed by this line and the FOOTNOTE command are put aside to be processed when the output moves to within the stated distance of the bottom of the page.

If a page has multiple footnotes, the allocated space is the sum of the allocations for all footnotes assigned to the page. The user must include his choice of footnote-designating symbols within the text.

The current values of left and right margin and line spacing are saved and restored after processing of footnotes. Therefore, a footnote may contain commands which change these parameters, and the effect will be limited to the footnote text.

The actual space taken by the footnote may be more or less than that specified by n. The n merely allocates space and should be the user's best estimate. If it is an inaccurate estimate, the footnote text may overflow the page, or extra space may be left unnecessarily at the bottom of the page. The user may have to adjust n after examining a first draft print-out of the file.

(d) END FOOTNOTE (No abbr.)

Terminates the footnote and signals the return to previous formatting instructions. An exclamation mark in column 1 can be used to signal end of footnote also.

4.1.6 Literals.

(a) LITERAL n , LT n

This command specifies that the following n lines of text are to be output exactly and not interpreted by RUNOFF. This allows for the inclusion of RUNOFF commands in text as well as a ragged right effect as produced by the NOFILL command. Text enclosed in literals is not justified so care must be taken if you do not wish to exceed the right hand margin. A LITERAL command must be terminated by an END LITERAL command.

(b) END LITERAL , EL

Terminates the LITERAL command.

The LITERAL command is used as follows:

[1] This is a footnote. This text and the dividing line above were specified by text and commands following a FOOTNOTE 4 command.

The text

```
.literal  
.left margin 50.right margin 55  
.spacing 5.skip 15  
.indent 5
```

This example shows that any RUNOFF commands enclosed in literals have no effect on the output text.

```
.end literal
```

is output as follows

```
.left margin 50.right margin 55  
.spacing 5.skip 15  
.indent 5
```

This example shows that any RUNOFF commands enclosed in literals have no effect on the output text.

## 4.2 PAGE FORMATTING.

### 4.2.1 Chapters And Appendices.

#### (a) CHAPTER text , CH text

CHAPTER is used to indicate the start of a new chapter. You will remember, as discussed in section 3.2.2, that the format of a page number in a chapter orientated document is c-p.

The effect of the CHAPTER command is to finish the current page and advance to a new page. The text given is used as the chapter title. 12 blank lines are left at the top of the page, followed by the chapter number and title separated by a blank line. 3 blank lines are left before the commencement of printing the actual chapter text. The chapter number and title are centred on the page and the chapter title is printed on the top of each page of the chapter. This command resets the margin, spacing, and justify/fill mode. The chapter number is set to be one greater than that of the last chapter unless a NUMBER CHAPTER command is used. The maximum number of chapters is 64, and pages per chapter is 99.

The chapters in this manual were formatted using the chapter command. A chapter heading, such as on the first page of this chapter, will show you the layout given using this command.

(b) NUMBER CHAPTER n (No abbr.)

Sets the chapter number to n. If n is omitted the current chapter number is assumed. If this command is used in page numbered (i.e. non chapter numbered) documents there is no affect on the output. This only affects the chapter number (i.e. c in c-p) and has no affect on the page number.

(c) NUMBER PAGE n (No abbr.)

Sets the current page number to n. If n is omitted the current value of the page counter is assumed. This command is used with chapter numbered documents to set the page number within the chapter to n. Relative values can also be used. Normal chapter numbering continues from the new value.

(d) APPENDIX text , AX text

Similar to the CHAPTER command. The text is taken as the appendix title, if given. Appendix numbering starts automatically at A and proceeds through to Z for consecutive appendices. All numbering is changed to conform to the appendix "number" rather than the chapter number.

(e) NUMBER APPENDIX ch (No abbr.)

Sets appendix number to ch (A-Z).

4.2.2 Document Identification.

For purposes of reference, many documents carry an identification code and date. The code and date are printed at the top of each page of the document.

Normally, the identification appears at the top right-hand corner of a page. However, for manuals and documents printed on both sides of the paper, it is usual for the identification to 'swing' from side to side so that it appears on the outermost edge of the book. That is, on 'front' pages or odd-numbered pages, it appears at the right-hand corner; on 'reverse' or even-numbered pages, it appears on the left-hand corner. The identification is thus based on the page numbering if it is to be 'swung' from side to side. In this case it appears in the right-hand corner for odd-numbered pages 1, 3, etc; 1-1, 1-3, etc; or 1a, 1c, 2a, 2c, etc.

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Document identification and date are not supplied if the page numbering mode is set for the top of page, since the actual page number appears in the position used by the document identification. However, it is possible to use both title and subtitle as well as document identification and date, provided the title and subtitle lines finish before the starting position of the identification and date.

If the option is to swing the identification and date from the right to left pages, users should be warned that a left-hand identification and date will displace the title and subtitle lines to the right.

Documentation identification can be switched off by specifying a null identification. If no date is specified, the current date from the Monitor will be used.

### [ (a) DOCUMENT ID text , DI text ]

In effect, this command takes the place of the TITLE command. The identification is placed at the top of each page, and unless otherwise specified, it will appear in the right-hand corner, indented 10 positions from the specified right margin. (Specified in the PAGE SIZE command). The text should be a maximum of 20 characters in length.

### [ (b) DOCUMENT DATE text , DD text ]

This command stores the text as part of the subtitle line. If no DOCUMENT DATE command is given after a DOCUMENT ID command, RUNOFF uses as default the current date, and prints it in the form ddMmmyy (e.g. 24Oct78). The DOCUMENT DATE command allows alteration of pages of a document which has already been produced on a specific day.

### [ (c) BOTH SIDES n,m , BS n,m ]

This command specifies that the identification is to be swung from side to side on pages, according to the page number (i.e. odd or even). Odd-numbered pages have the identification on the right-hand side, and even-numbered pages on the left-hand side as in this manual.

The arguments n and m specify the left and right hand starting positions of the identification. If they are omitted, RUNOFF assumes the left margin and 10 positions less than the right margin.



[ (d) ONE SIDE m , OS m ]

This command counteracts any previous BOTH SIDES commands and reverts the identification positioning to one side only. (Normal or default setting). The argument m specifies the starting position for the identification. If it is omitted, the identification is assumed to start at 10 positions less than the right-hand margin.

The DOCUMENT ID and DOCUMENT DATE commands were used in the production of this manual. Here the document id is MNT-14# and the document date is 1Nov78. A BOTH SIDES 0,64 command was used to swing the manual identification from side to side.

4.2.3 Subpaging.

(a) SUBPAGE , SPG

This command allows pages to be inserted into a document without changing the document's overall paging structure. This is done by by-passing page number incrementation and appending an alphabetic (starting with 'a') to the present page number.

(b) END SUBPAGE , ES

This command is the same as the PAGE command and may be used instead of the PAGE command to terminate any subpaging that is in progress. This command has been implemented for use in those documents where the SUBPAGE command is to be edited out at some later date, with paging reverting to an automatic mode.

(c) NUMBER SUBPAGE ch (No abbr.)

Set the current subpage number to ch. This is a character in the range of a-z.

4.2.4 Page Setout.

(a) PAGING , PA

Commences breaking the output into pages. This is the default setting.

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(b) NO PAGING , NPA

This command specifies that the output is not to be broken into pages. It is reset by any command such as STANDARD and CHAPTER which reset all parameters.

[ (c) TOP MARGIN , TM ]

This command allows the user to vary the number of lines that appear at the top of each page before the title and sub-title lines (see section 3.2.3 on titling). The top margin is set by default to 1 line and is included in the number of lines allowed per page. This command is useful for positioning text on special stationery.

(d) NO HEADER , NHD

Specifies that page headings are to be suppressed.

(e) HEADER x , HD x

This command is used to specify the case type for page headers. The argument x must be one of UPPER, LOWER, or MIXED. UPPER is the default setting.

(f) LEFT n , L n

Specifies that the next line is to be commenced n columns to the right of the left margin. This can be negative as long as it does not specify a position to the left of 0. This command is effectively the same as the INDENT command

(g) RIGHT n , R n

Similar to the LEFT command except here n specifies positions to the left of the right margin. The next line in your input file is adjusted so that it finishes n columns to the left of the right margin. This line is taken exactly as you typed it and is not filled or justified

#### 4.2.5 Change Bars.

RUNOFF allows you to add change bars to your output text. The default change bar character is "|", but can be changed by using the /BAR:ch switch when running RUNOFF. Change bars are set up so that they are printed to the left of all text. To allow for this, every line which is not marked with a change bar has 3 extra spaces preceding it. This means that if you specify a left margin of 0, your text will start in column 4. You can arrange for the change bars to align with your normal left margin (as is done here) if you so desire. Change bars are used to denote those sections of a document which have been changed since previous printings or publications, or to denote text which has been added.

(a) ENABLE BAR , EBB

This command must be used to enable change bars to be produced otherwise the BEGIN BAR command has no effect. This is so that extensive editing is not necessary to remove change bars from your document. You should issue this command before any of the text of your input file. This is so that you will not have problems aligning the left margin of your output document. Should you only desire your change bars to align with the normal left margin (as is done in this manual), with the remaining text being unaffected, you can do this by preceding every BEGIN BAR command with an ENABLE BAR command, and following every END BAR command by a BREAK, DISABLE BAR combination.

(b) DISABLE BAR , DBB

Disables the production of change bars. If you do not want your change bars to appear to the left of your left margin, this command should follow the END BAR command.

(c) BEGIN BAR , BB

Starts adding a change bar to the left of your output text. An END BAR command must follow this to stop the change bar being output.

(d) END BAR , EB

Must follow a BEGIN BAR command to turn off change bars.

The following example shows how you can have change bars added to your output.

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The input to RUNOFF:

```
.enable bar
.begin bar
Suddenly Alice came upon a little three-legged table all made of
solid glass, there was nothing on it but a gold key, and Alice's
first idea was that this might belong to one of the doors of the
hall; but alas ! either the locks were too large or the key was too
small, but at any rate it would not open any of them.
.end bar
.break
.disable bar
```

The output from RUNOFF:

```
| Suddenly Alice came upon a little three-legged table all made of
| solid glass, there was nothing on it but a gold key, and Alice's
| first idea was that this might belong to one of the doors of the
| hall; but alas ! either the locks were too large or the key was
| too small, but at any rate it would not open any of them.
```

### 4.3 INDICES.

It is very simple in RUNOFF to set up an index containing various words throughout your source file. By using the appropriate commands the index is set up and printed wherever desired in your document. The items you index are placed in an "index buffer", from where they are printed when you request it. The index items are printed with the first character of the first word in upper case, and all other characters in lower case.

#### (a) INDEX text (No abbr.)

This command takes the remaining text on the line as a key word or words and adds it, along with the current page number, to the internal index buffer. The command does not cause a break, and it should appear on either the line preceding or the line following the line containing the item to be indexed. A key word or words may be indexed more than once.

(b) FLAG INDEX (No abbr.)

Enables the > character to be used to place the word following it into the index buffer. Only a single word text item can be indexed in this way. Should you desire to index items containing more than one word use the INDEX command.

(c) DO INDEX text , DX text

Forces a new page, and centres the text, if given. Otherwise the word "INDEX" is centred. A period terminates this command unless the period is quoted. After the title has been printed the entire contents of the index buffer is printed in alphabetical order. Entries are set against the left margin and regular line spacing is used between entries, except that a blank line is left between entries of different first letters. The page number for each entry is placed on the same line as the entry and multiple entries are separated by commas. If chapter numbering is used the pages of the index are numbered Index-1, Index-2, etc. If page numbering is being used page numbers are incremented normally.

(d) PRINT INDEX , PX

Similar to DO INDEX except that there is no skip to a new page and no heading is output. In chapter numbered documents this command uses the current chapter number to number the index pages.

(e) NUMBER INDEX (No abbr.)

Sets the current chapter number to "Index". This enables numbering pages which are to be additions to a document.

(f) SUBINDEX major >minor , X major >minor

This command is used to create subheadings in the index. The major field refers to the major section heading within the index, and the minor item refers to a subheading which you wish to have placed under the major heading. The minor item must be preceded with the subindex flag character (this can be different to the index flag character) otherwise the whole line is placed in the index just as if you had used an INDEX command. The minor items are indented 2 spaces when they are printed in the index.

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If you had the following commands in you input:

```
.index Mad Hatter
.index treacle
.index the king
.subindex alice > in wonderland
.subindex alice > adventures of
.subindex well > treacle
.subindex well > water
.do index
```

they could be output as follows:

INDEX

```
Alice
  adventures of . . . . . 1-4
  in wonderland . . . . . 3-7

Mad hatter . . . . . 3-7

The king . . . . . 1-5
Treacle . . . . . 3-7

Well
  treacle . . . . . 3-8
  water . . . . . 3-8
```

4.4 MISCELLANEOUS.

(a) COMMENT (No abbr.)

A comment is a section of explanatory text which you include with your input file to help others who may possibly use the file. Comments are ignored by RUNOFF. Should you desire to type multiple commands and comments on the same line, a semicolon is used to indicate the end of comment. Comments in a line of multiple commands must be preceded by an exclamation mark. Comments can be included in the source file on separate lines by preceding the comment with a period-semicolon combination ".;".

This command specifies that the remainder of the line is to be taken as a comment, and is to be ignored by RUNOFF.

(b) STANDARD n , SD n

Returns all settings to the standard defaults, however it does not alter tabs or paragraph numbering (section 4.1.1). The argument n refers to the page width. A command STANDARD 60 will set the left margin to 0, the right margin to 60, and allow for 58 lines per page. The value of n, if given, overrides any previous right margin setting.

(c) PERIOD , PR

This is the default setting. It causes double spacing after the characters ".", "!", "?", ":", and ";" .

(d) NO PERIOD , NPR

Stops double spacing after the above characters.

(e) NO SPACE , NSP

You can use this command if you have to split a word over a line for some reason. Normally RUNOFF treats a carriage return as a word separator. However if you use the NO SPACE command this does not happen; the carriage return is ignored. Use this command after line on the end of which you would have typed a hyphen.

[ (f) SPACE UNDERLINE , SU ]

Ensures that real, quoted, and justified spaces are underlined when the underline mode is enabled.

[ (g) NOSPACE UNDERLINE , NSU ]

Turns off underlining for all types of spaces, and is the default setting.





## CHAPTER 5

### ADVANCED FEATURES OF RUNOFF.

#### 5.1 USE OF SPECIAL TERMINALS.

##### 5.1.1 Upper Case Only Terminals.

Many terminals have an upper and lower case facility and on these it is easy to type text in both cases. There are, however, some terminals which only provide for you to type in upper case.

When inputting text using an upper case terminal, such as the Model 33 Teletype, it is still possible to have upper and lower case output produced on the line printer. RUNOFF uses a "case offset parameter" to process upper case alphabetic characters. If this parameter is set to upper case, then the upper-case characters (A-Z) are not affected; if it is set to lower case then all upper case characters are converted to their lower case equivalents. The case parameter is set to either of its values by the UPPER CASE and LOWER CASE commands, the format of which is given below.

RUNOFF uses flag characters (section 5.3) to alter the case of the letters in your input file. To obtain an upper and lower case document when only an upper case terminal is available you should do the following:

1. Set the lower case parameter by using a LOWER CASE command.
2. Specify your case requirements by use of the appropriate flags.

3. Have your output document printed on an upper and lower case line printer.

The case formatting characters are up-arrow "^", and backslash "\". These can be entered on an upper case terminal as shift-N and shift-L respectively. The presence of an up-arrow causes the letter immediately following it to be converted to upper case, and any letter preceded by a backslash is converted to lower case. This means that the first letter in every sentence and any other letter you may wish to capitalize should be preceded by an up-arrow. If you want to make a section of text into upper case, you can "lock" on upper case mode by preceding your text with ^^. When you wish to return to the normal lower case you enter \\ to "lock" on lower case. You may also use the capitalize flag to capitalize entire words.

The following demonstrates the use of the case control characters:

```
.LOWER CASE
^^DEAR MARY JONES,\\
.INDENT 2
^AT ^LONDON WE SEEN THE PARK, AND THE PALEASS OF ^SAINT ^GIMSE'S,
AND THE KING'S AND QUEEN'S MAGESTERIAL PURSING, AND THE SWEET
YOUNG PRINCES, AND THE HILLYFENTS, PYEBALD ASS, AND ALL THE REST
OF THE ^ROYAL FAMILY.
.INDENT 2
^I PRAY YOU WILL MIND YOUR WRITING AND YOUR SPILLING FOR,
CRAVING YOUR PARDON ^MOLLY, IT MADE ME SUET TO DISSEYFFER YOUR
LAST SCRABBLE, WICH WAS DELIVERED BY THE HIND AT ^BATH.
.INDENT 37
^DEAR ^MARY ^JONES,
.INDENT 35
^YOURS WITH TRUE INFECTION,
.INDENT 40
^^WIN JENKINS.\\
```

On processing by RUNOFF this becomes

```
DEAR MARY JONES,
  At London we seen the park, and the paleass of Saint Gimse's, and
the king's and queen's magesterial pursing, and the sweet young
princes, and the hillyfents, pyebald ass, and all the rest of the
Royal family.
  I pray you will mind your writing and your spilling for, craving
your pardon Molly, it made me suet to disseyffer your last scrabble,
wich was delivered by the hind at Bath.
                                Dear Mary Jones,
                                Yours with true infection,
                                WIN JENKINS.
```

(a) UPPER CASE , UC

Causes all upper case letters A-Z appearing in the source text following this command to be left unchanged. That is, all alphabets appearing after this command in the source text are left in their original case.

(b) LOWER CASE , LC

Causes all upper case letters A-Z in the source text to be translated to the corresponding lower case letters a-z. That is, regardless of the case of letters in the original source text, all letters in the output text will be lower case.

(c) FLAG CAPITALIZE (No abbr.)

Enables the < character to capitalize the word it precedes.

5.1.2 High Quality Terminals.

Some terminals, such as the Diablo 1620 and Diablo 1610, provide special features which can be used by RUNOFF to provide high quality output.

The Diablo 1620 terminal is micro-processor controlled, and allows you to produce output on variable size stationery, including 2-part and 4-part, at quite a reasonable rate. The production of cut stencils is also simple using this terminal. There are different print ribbons available depending on the quality of the output you wish to produce. Different print wheels can be used to give a range of character styles, such as Pica, Courier, and Elite.

If your output document contains numeric formulae with superscripts or subscripts, the Diablo terminal can be used, using its half-line spacing capabilities, to give you the style of output you desire. To obtain this effect you include certain "control" characters to the terminal in your RUNOFF file. However there are some limitations using RUNOFF for such purposes. With the general terminals available, such as the Diablo, it is not possible to get a full range of print characters (mathematical symbols etc.). You can get over this by leaving space where such symbols would go, and type them in later. RUNOFF has formatting limitations also. Some of the page layouts are unchangeable, and it is difficult to change the format of the headings given using the header level commands.

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Included in the standard character set used on terminals are a group of non-printing characters called control characters. Among the uses of these characters are the controlling of the print carriage mechanism. To include these in your RUNOFF file you must enable control characters by means of the CONTROL CHARACTERS command.

One control character is used with the Diablo terminal to signal that the following character is not to be printed, but is a command to the terminal. This flag control character is ESC. This is echoed on your terminal when you are inputting your file as a \$ character. The \$ character will not be printed in your output document. ESC is alternately labelled ALT or PREFIX on some terminals. If you cannot find any of these keys you can type a control-[ (hold down the control key while you type the [ character).

The two control sequences you use are ESC D and ESC U. ESC D moves the print carriage down a half-line spacing and is used for printing superscripts. ESC U moves the carriage up a half-line spacing and is used for printing subscripts. However when using control characters in your file you should ensure that the line containing them is output in nofill mode, because of a slight deficiency in the current version of RUNOFF. This ensures that RUNOFF does not miscalculate the number of characters in the line.

(a) CONTROL CHARACTERS , CC

Allows control characters to be included in your input file. If this command is not used all control characters are ignored, with a warning being printed on your terminal to tell you of their presence.

(b) NO CONTROL CHARACTERS , NCC

Specifies that control characters are to be ignored (default setting).

5.2 VARIABLES AND CONDITIONALS.

RUNOFF provides commands to allow you to include variable sections of text in your output, with the output produced being dependent on a switch value given at run time. This means that different documents can be produced from the one source file without any editing being necessary. The main use of such a feature is in producing documents of similar framework but with different keywords or phrases included. Such a feature would be very useful, for example, in producing newsletters of similar content which are to be sent to different departments. The way this feature is obtained is by declaring certain

variables and enclosing the variant sections of text by conditional statements to RUNOFF. The state of any variables, and these conditional statements, determine the output produced.

(a) VARIABLE name,ch1,ch2 , VR name,ch1,ch2

This command declares the variable "name", where "name" can be up to 6 characters, and associates with it two characters, ch1 and ch2, to identify whether the variable is "on" or "off". The /VARIANT switch is used to specify the condition of any variables (see section 6.3). If the variable name is included in the switch, the variable is "on", otherwise it is "off".

The two characters ch1, and ch2, are for use with the /DRAFT switch (section 6.3). This switch is used to include all variable text in the output. The text which would be printed if the variable were "on" is output with ch1 in column 1 of every line; and the text which would be printed if the variable were "off" is output with ch2 in column 1 of every line.

(b) IF name (No abbr.)

Specifies that the following text in the input file is to be included if the variable specified by name is "on". This text should either be followed by an ELSE name command or an ENDIF name command.

(c) IFNOT name , IN name

Specifies that the following text is to be included if the variable is "off". Again the text should be followed by an ELSE name or an ENDIF name command.

(d) ELSE name (No abbr.)

The following text is to be included if the logical complement of the preceding IF or IFNOT is true. This means that if the ELSE is preceded by an IF name, and the variable is "off" the ELSE text is output. An ELSE command must be followed by an ENDIF command.

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(e) ENDIF name , EI name

Must terminate any conditional sections of text.

Appendix A (section A.6) shows an example of the use of variables, as well as the output produced when using the /DRAFT switch.

5.3 FLAG COMMANDS.

RUNOFF allows you to set various flags to notify it of various different situations. You can set a flag to enable you to capitalize certain words, or to index certain words, or to underline characters, and various other cases. Each flag has associated with it a certain flag character, and you must enable each flag that you wish to use. This causes RUNOFF to take the appropriate action when it meets the flag characters. It is possible also to change the character which is associated with each of the various flags.

(a) FLAGS ALL (No abbr.)

This command enables all of the possible flags, and sets the default characters (given in section 3.1) to be associated with each flag. The flag types are CAPITALIZE, CONTROL, ENDFOOTNOTE, INDEX, LOWERCASE, QUOTE, SPACE, SUBINDEX, UNDERLINE, and UPPERCASE. Their associated flag characters are "<", ".", "!", ">", "\", " ", "#", ">", "&", "^". Separate flags can be enabled by using a FLAG flagtype command, where flagtype is any one of the possible flags.

(b) NO FLAGS ALL (No abbr.)

Turns off all flags, except CONTROL and ENDFOOTNOTE. Single flags may be disabled by using a NO FLAG flagtype command.

(c) FLAGS type ch , FL type ch

Changes the flag character for the flag of the specified type to be ch, the given character. This allows for the use of different characters than the default values mentioned above, which may be necessary in some documents to save having to quote every occurrence of a frequently used character. If no character is given the default flag character is enabled.

(d) NO FLAGS type , NFL type

Cancel the use of a user specified character with the given flag type. The flag character reverts to the default.

5.4 PROGRAM LOGIC MANUALS.

RUNOFF allows you to produce, from program documentation, a formatted documentation manuscript. This can include selected sections of program documentation, and also selected sections of program code and declarations. This allows you to produce a detailed piece of documentation without any retyping. You can include RUNOFF commands in your program source code, and simply run the program through RUNOFF to give your output.

This can be done for programs written in many languages. These are Algol, Basic, Bliss-10, Bliss-11, Cobol, Fail, Fortran-10, Fortran-4, Macro-10, Macy-11, and Pal-10. Each of these languages has a specific comment character. The commands to RUNOFF are included in with your comments.

In order that you can select portions of your program to be processed by RUNOFF, a "selection string" is defined. This consists of 4 characters in the order: comment char., single command line char., block start char., and block stop char. The single, start, and stop characters are "&", "+", and "-". You follow the comment character of the language by the appropriate selection character, depending on the length of comments text that you want processed by RUNOFF. If you want a single line processed you use the "single" character. If you want a block of text processed you precede the block by the "start" character, and follow it with the "stop" character. RUNOFF processing is initially turned off. This means that when you want processing to commence you must use a "single" or "start" character.

If you have a section of program code such as constant definitions, or record descriptors which you wish to include with your documentation you proceed as follows:

1. Use the SELECT command to change the language comment character to the last non-blank character of each line before the portion of the line which you wish to include. This character must be the same for every line.

2. Follow the section of code with a SELECT command to change the comment character back to its standard value. Should this character be one of the special RUNOFF characters such as ; it must be quoted (preceded with an underscore).

The following example uses a section of a Macro-10 program to demonstrate these capabilities. The comment character in Macro-10 is a semicolon ";".

```
;+
;.hllDefault Parameters.
;
;.ts20.lm20.p-20,0.select D
;D+
ND      AD.CAS,CASEUPPER      ;INITIAL CASE DEFAULT
ND      BARWID,3              ;WIDTH OF BAR AREA
ND      ILMRG,0               ;INITIAL LEFT MARGIN
ND      ILPGNO,1              ;INITIAL PAGE NUMBER

;D.select _;
; ..... (Comments not processed by RUNOFF)
```

This is output as follows (supposing we are up to section 2 of chapter 4):

#### 4.2 DEFAULT PARAMETERS.

```
AD.CAS,CASEUPPER      ;initial case default
BARWID,3              ;width of bar area
ILMRG,0               ;initial left margin
ILPGNO,1              ;initial page number
```

(a) SELECTION string , SL string

Sets the selection string to be that given.

(b) NO SELECTION , NSL

Turns off selection. All following text is considered to be input to RUNOFF.



(c) END SELECTION , ESL

All selection is disabled until the next occurrence of the "single" line command flag character. From that point on selection is re-enabled.



## CHAPTER 6

### HOW TO USE RUNOFF.

#### 6.1 RUNNING THE RUNOFF PROGRAM.

This section discusses how to instruct RUNOFF to take your input file and produce your formatted document as output. Output can be directed to disk or to terminal.

When you give RUNOFF an input file name it expects a standard extension. This extension is RNO. Other extensions may be used by typing the full file name and extension to RUNOFF. If the RNO extension is used you need only type the file name to RUNOFF and not the extension. If you do not specify the name of your output file RUNOFF uses the name of your input file and gives the file a MEM extension.

As is the usual convention output from the computer, which is echoed on the terminal, is underlined in this manual. This is to distinguish it from what you type.

To run RUNOFF you must first log in to the system. When the logging in procedure is complete the monitor responds with a period ".". You then proceed as follows:

```
.R RUNOFF
```

RUNOFF responds with an asterisk "\*" to tell you that it is ready for your instructions. The instructions you type to the RUNOFF program are called a command string. These should not be confused with the actual RUNOFF commands which you include with your input file.

The command string format is as follows:

```
*outputfile=inputfile/switches
```

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This can be abbreviated to just \*inputfile ; with any switches being added should you desire them.

Your file is processed through RUNOFF, and the system responds with the filename, the number of pages contained in the resulting output file, any errors which may have occurred in processing, and the input and output pages where your errors occurred, if any.

For example, with a file called TEST.RNO your dialogue could look as follows:

```
.R RUNOFF  
*TEST  
TEST 22 PAGES  
*^C  
.PRINT TEST.MEM
```

The response from RUNOFF tells you that you have no errors and your output is 22 pages long. If you have made any errors, your dialogue with RUNOFF may look like this:

```
.R RUNOFF  
*TEST  
TEST  
%RNFJEC JUNK AT END OF COMMAND:".LM 5"  
ON OUTPUT PAGE !; ON INPUT LINE 8 OF PAGE 1  
TOTAL 22 PAGES  
*  
-
```

You correct your errors with the Editor and rerun your file through RUNOFF. A complete list of error messages is given in Appendix E.

Should you desire your output to be printed on your terminal, replace the output file name in the command string by TTY:. Using our TEST example again, your dialogue could look as follows:

```
.R RUNOFF  
*TTY:=TEST  
  
(output is printed on the terminal)  
  
*^C
```

If you are producing your final copy, and having it printed on the terminal, you can use the /PAUSE switch. The effect of this switch is that every time a new page is ready to be output, RUNOFF pauses and rings a bell on the terminal to allow you to position your paper. Once you have done this you type any character, such as a space, and RUNOFF proceeds and outputs the next page.

RUNOFF allows for full wildcarding in its command string. This means that you may use an asterisk instead of a filename or an extension to specify all files with a certain extension or all files of a given name with any extension. A question mark may be used to designate a variable character within a filename. For example, if you had a collection of files on your area called TEST01.RNO, TEST02.RNO, and TEST03.RNO, all of which you wished to run through RUNOFF, and you wished to create output files called TEST01.MAN, TEST02.MAN, and TEST03.MAN you would type:

```
.R RUNOFF  
**.MAN=TEST0?
```

6.2 DEFAULT EXTENSIONS.

The default device is DSK:. The default output name is the same as the input name. The default output extension is a function of the input extension as follows:

INPUT ext	OUTPUT ext
.RNO	.MEM
.RND	.DOC
.RNP	.OPR
.RNC	.CCO
.RNH	.HLP
.RNL	.PLM
none	.MEM
other	.MEM

If no input extension is supplied, all of these are tried, the first one found being processed. If the input extension turns out to be that of the source file to a compiler (.ALG, .BAS, .BLI, .Bl0, .Bl1, .CBL, .FOR, .F40, .MAC, .N, .Pl1), then the default output extension is .PLM and a default /SELECTION is set automatically to match the commenting conventions of that language.

### 6.3 USEFUL SWITCHES.

Listed below are a number of RUNOFF switches which you may find useful. A brief explanation of the function of each switch is given. A complete list of RUNOFF switches is given in Appendix D. The switch values are set up initially, and override any initial settings given in your input file.

/AUTOPARAGRAPH	Turns on the autoparagraph mode. This means that lines starting with a space force a new paragraph.
/BAR:ch	Change the default bar character to ch.
/DRAFT	Include all excluded contents. For use with the VARIABLE command.
/IRANGE:"l1/c1-p1:l2/c2-p2"	Only text from line l1 of page c1-p to line l2 of page c2-p is used as input to RUNOFF. Page numbers can be of the form p rather than c-p. Line numbers may be omitted, but you still must type the "/" character. If the "from" section is omitted the default is from the beginning of the file. If the "to" section is omitted, it defaults to the end of the file.
/NOAUTOPARAGRAPH	Turn off autoparagraph mode (default).
/ORANGE:r	The range r is of the same form as for the /IRANGE switch. Here all input text is processed but only text in the given range is output.
/PAUSE	Pause between output pages when output is to terminal.
/SELECT:"string"	start with "string" as initial selection string.
/SIMULATE	Simulate form feeds. Also only pause on first output page.
/SPACING:n	Start with spacing n
/UNDERLINE:BACKSPACE	Underline by backspace and overprint.
/UNDERLINE:LINE	Underline by overprinting (default).
/UNDERLINE:SEPARATE	Output underlines as a separate line.

`/UNDERLINE:Ø` suppress underlining.  
`/UNDERLINE:ch` Use ch (octal or quoted character) as underline character.  
`/VARIANT:"name"` declare variable "name" to be on.  
`/VARIANT:(n1,n2,....,nk)` declare variables n1 ... nk to be on.

6.4 UNDERLINING ON VARIOUS PRINTERS.

The Computer Centre has at least five general high-quality output printers. There are two line printers for use on the KA system, two line printers for use on the KL system, and a Diablo terminal which may be used on either system. These printers differ in their method of underlining, but you may obtain comparable results by using the various `/UNDERLINE` switches available with RUNOFF.

1. Main KL line printer and Diablo terminal (either system).

There is no need to include any special switch in this situation, as all underlining will be printed in the correct position.

2. Main KA line printer.

Underlining on this printer is done by overprinting the line using the back-arrow as the underline character. This will be printed over the text which you wish to underline. To get over this you can have the underlining produced on a separate line by use of the `/UNDERLINE:SEPARATE` ( or `/UND:SEP`) switch. To do this you would proceed as follows:

```
.R RUNOFF  
*THESIS/UND:SEP
```

3. Upper/lower case printers at remote batch stations (both systems).

These printers use the same underlining method as the main KA line printer. The same comments apply here, as above, for you to obtain correctly underlined output.





APPENDIX A  
RUNOFF EXAMPLES

This appendix contains various examples showing the use of different RUNOFF features and commands.

A.1 FORMATTING CAPABILITIES.

The following example is an illustration of RUNOFF's formatting capabilities.

The coding

```
^^ONOMATOPOEIA\\  
.SKIP 1  
^FORMATION OF NAMES OR WORDS FROM SOUNDS THAT  
RESEMBLE THOSE ASSOCIATED WITH THE  
OBJECT OR ACTION TO BE NAMED, OR THAT SEEM SUGGESTIVE OF ITS  
QUALITIES; BABBLE, CUCKOO, CROAK, PING-PONG, QUACK,  
SIZZLE, ARE PROBABLE EXAMPLES. ^THE WORD IS ALSO USED OF  
A SENTENCE WHOSE SOUND SUGGESTS WHAT IT DESCRIBES, AS IN  
^TENNYSON'S  
.LEFT MARGIN 15  
.SKIP 1  
.NOFILL  
^MYRIADS OF RIVULETS HURRYING THRO' THE LAWN,  
^THE MOAN OF DOVES IN IMMEMORIAL ELMS,  
^AND MURMURING OF INNUMERABLE BEES.  
.FILL
```

will produce:

#### ONOMATOPOEIA

Formation of names or words from sounds that resemble those associated with the object or action to be named, or that seem suggestive of its qualities; babble, cuckoo, croak, ping-pong, quack, sizzle, are probable examples. The word is also used of a sentence whose sound suggests what it describes, as in Tennyson's

Myriads of rivulets hurrying thro' the lawn,  
The moan of doves in immemorial elms,  
And murmuring of innumerable bees.

#### A.2 UPPER AND LOWER CASE FACILITIES.

Here is an example of a source file which is to be processed and typed out on an upper and lower case terminal.

```
.left margin 10
.centre
^&EXAMPLE of UPPER-LOWER CASE and UNDERLINING\&
.skip 1
This example illustrates the simplest method
of processing upper and lower case text from a
terminal with upper and lower case facilities.
.skip 1
Before creating the source file from the
terminal, it is necessary to set the terminal
case mode to lower case by a SET TTY LC
command. Then, at the very beginning of the
source file, an UPPER CASE command is
required, so that the text may be entered in
the appropriate case by using the shift key
for capitals.
.skip 1
Here are a few more lines of mixed upper and
lower case text which have been placed in the
source file as shown above;
.skip 2;.indent 3
Beauty is but a blossom.
.skip 1;.indent 3
D.E.C. stands for Digital Equipment Corporation.
.skip 1;.indent 3
UPPER and lower case text presents NO PROBLEMS.
.skip 1
.centre
^&
```

\&

After processing by RUNOFF is complete, the output file can be typed on the terminal as shown below.

EXAMPLE of UPPER-LOWER CASE and UNDERLINING

This example illustrates the simplest method of processing upper and lower case text from a terminal with upper and lower case facilities.

Before creating the source file from the terminal, it is necessary to set the terminal case mode to lower case by a SET TTY LC command. Then, at the very beginning of the source file, an UPPER CASE command is required, so that the text may be entered in the appropriate case by using the shift key for capitals.

Here are a few more lines of mixed upper and lower case text which have been placed in the source file as shown above;

Beauty is but a blossom.

D.E.C. stands for Digital Equipment Corporation.

UPPER and lower case text presents NO PROBLEMS.

---

A.3 PARAGRAPH NUMBERING.

This example shows how to set up numbered paragraphs.

The width of the lines in the source file is unimportant, as is the spacing between words. Simply type the text as written by the author. The input falls into three categories:

.left margin 5

.paragraph -5,2,6

(a) ##Lines that start with a period are RUNOFF commands and must be typed as a distinct line. The period goes in column 1 and the command starts in column 2. Words are separated by exactly one space.

.paragraph

(b) ##Tables and formatted text should be entered using tabs to align the columns. Use exactly one tab between columns, regardless of the width; RUNOFF will control the tabs properly. The author must include a TAB STOPS command before the table. The author should indicate the columns by drawing a light vertical line showing the columns of the table. The author should precede the table with a NOFILL command, and follow the table with a FILL command, if necessary.

.paragraph

(c)##General text may be entered freely. In general, one space should be typed between each pair of words, but no harm will result if more than one space is used. Tabs should not be used at all in general text. When entering the source file from a terminal which only has upper case letters, each required capital letter should be preceded by an up-arrow (^). Whenever the exact number of spaces is important, they should be entered as multiple number-signs (#) rather than as spaces. This will ensure that the quoted number of spaces is never expanded or compressed by the justifying facility.

The output produced is:

The width of the lines in the source file is unimportant, as is the spacing between words. Simply type the text as written by the author. The input falls into three categories:

- (a) Lines that start with a period are RUNOFF commands and must be typed as a distinct line. The period goes in column 1 and the command starts in column 2. Words are separated by exactly one space.
- (b) Tables and formatted text should be entered using tabs to align the columns. Use exactly one tab between columns, regardless of the width; RUNOFF will control the tabs properly. The author must include a TAB STOPS command before the table. The author should indicate the columns by drawing a light vertical line showing the columns of the table. The author should precede the table with a NOFILL command, and follow the table with a FILL command, if necessary.
- (c) General text may be entered freely. In general, one space should be typed between each pair of words, but no harm will result if more than one space is used. Tabs should not be used at all in general text. When entering the source file from a terminal which only has upper case letters, each required capital letter should be preceded by an up-arrow (^). Whenever the exact number of spaces is important, they should be entered as multiple number-signs (#) rather than as spaces. This will ensure that the quoted number of spaces is never expanded or compressed by the justifying facility.

A.4 SETTING UP TABLES.

This example shows how to set up tables in your file.

In order to enter a table with the rightmost column filled and justified, you must use the following technique.

Precede the table by a TAB STOPS line to set the columns. Then give a LEFT MARGIN command to set the left margin to the rightmost tab stop. Then enter the table with an INDENT -n command to start each line at the first column. Finally, space and restore the left margin.

For example, the following sequence,

```
.SKIP 1
.TAB STOPS 20,30
.LEFT MARGIN 30
.INDENT -20
^FIRST<tab>^SECOND<tab>^THE THIRD COLUMN
IS COMPOSED OF AN ARBITRARY AMOUNT OF TEXT.
.INDENT -20
^NEXT<tab>^LINE<tab>^THIS LINE IS SHORT.
.INDENT -20
^FINAL<tab>^EXAMPLE<tab>^YET ANOTHER
EXAMPLE.
```

would produce (if lower case facilities are available)

First	Second	The third column is composed of an arbitrary amount of text.
Next	Line	This line is short.
Final	Example	Yet another example.

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A.5 USING UPPER CASE ONLY TERMINALS.

The following file SAMPLE.RNO is created as an ordinary text file by the Editor.

```
.CENTRE
^^SAMPLE PROGRAM TO ILLUSTRATE USE OF RUNOFF
.SKIP 2
T\\THIS FILE JUST ILLUSTRATES A FEW OF THE FEATURES OF
^^RUNOFF\\.
.SKIP 2
.LEFT MARGIN 5
.INDENT -5
(A)##^SPACING
.BREAK
^EXACT SPACING CAN BE PROVIDED BY THE NUMBER SIGN `_#`.
.SKIP 1
.INDENT -5
(B)##^SPECIAL ^CHARACTERS
.BREAK
^SPECIAL CHARACTERS, ^, \, &, AND #, MUST BE
PRECEDED BY AN UNDERLINE CHARACTER SINCE
THEY HAVE SPECIAL SIGNIFICANCE AS FORMATTING CHARACTERS
OTHERWISE. ^THAT IS, THEY MUST BE TYPED IN
AS _^, _\, _&, OR _# RESPECTIVELY.
.SKIP 1
.INDENT -5
(C)##^TABLING
.BREAK
^TABLING CAN BE DONE VERY SIMPLY.
.NOFILL
.TAB STOPS 10,20
      ^ONE   FIRST ENTRY
      ^TWO  SECOND ENTRY
      ^THREE THIRD ENTRY
.FILL
.SKIP 1
.INDENT -5
(D)##^OTHER ^FEATURES
.BREAK
^THERE ARE MANY OTHER FEATURES AVAILABLE,
BUT SINCE THIS IS ONLY A SAMPLE
PROGRAM THEY WILL NOT BE ILLUSTRATED HERE.
```

The file SAMPLE.MEM appears as below:

SAMPLE PROGRAM TO ILLUSTRATE USE OF RUNOFF

This file just illustrates a few of the features of RUNOFF.

- (a) Spacing  
Exact spacing can be provided by the number sign '#'.  
  #
- (b) Special Characters  
Special characters, ^, \, &, and #, must be preceded by an underline character since they have special significance as formatting characters otherwise. That is, they must be typed in as \_^, \_\, \_&, or \_# respectively.  
  \_#
- (c) Tabling  
Tabling can be done very simply.  
    One           first entry  
    Two           second entry  
    Three         third entry
- (d) Other Features  
There are many other features available, but since this is only a sample program they will not be illustrated here.

A.6 VARIABLE OUTPUT.

This example shows the capability of RUNOFF to produce variable output. Two variables are used, giving two possible output documents. Both of these are shown below, as is the output produced using the /DRAFT switch

Input to RUNOFF:

```
.VARIABLE S,+,*
.VARIABLE P,$,@
.NONUMBER.LOWER CASE.FLAG CAPITALIZE
.AUTOPARAGRAPH.SPACE UNDERLINE
.CENTRE;^&<PRENTICE <COMPUTER <CENTRE.\&
.SKIP 2
^DURING THE WEEK COMMENCING 12 ^JULY 1976, THE ^CENTRE WILL
CONDUCT A NUMBER OF SEMINARS ON PARTICULAR SERVICES.
^FROM OUR RECORD OF
.IF S
STATISTICAL
.ENDIF S
.IF P
GRAPHICS
.ENDIF P
USERS IT WOULD APPEAR AS IF YOU MIGHT BE INTERESTED IN THE SEMINAR
LISTED BELOW.
^THE SEMINAR WILL BE HELD IN ^LECTURE ^ROOM ^B18 IN THE ^BASEMENT
OF THE ^HAWKEN ^BUILDING AT THE ^UNIVERSITY OF ^QUEENSLAND AND WILL
COMMENCE AT 2 P.M.
.BREAK
.IF S
^&<STATISTICS/SPSS - ^MONDAY, 12TH ^JULY\&
^THIS IS AN INTRODUCTORY SEMINAR ON THE USE OF PACKAGE PROGRAMS,
PARTICULARLY THE <SPSS PACKAGE (^STATISTICAL ^PACKAGE FOR THE
^SOCIAL ^SCIENCES).
.BREAK
.ENDIF S
.IF P
^&<PLOTING/GRAPHICS - ^WEDNESDAY, 14TH ^JULY\&
^THE SEMINAR DESCRIBES THE PLOTING FACILITIES AVAILABLE AT THE
^CENTRE AND GIVES DETAILS OF THE PACKAGES AVAILABLE FOR SIMPLE
PRODUCTION OF A WIDE RANGE OF GRAPHICAL OUTPUTS.
.BREAK
.ENDIF P
^WE TRUST THAT THIS INFORMATION WILL BE OF INTEREST TO YOU AND
YOUR COLLEAGUES AND WOULD ASK THAT YOU MAKE THESE DETAILS KNOWN
TO WORKERS IN YOUR AREA.
```



Output from RUNOFF using a /VARIANT:S switch

PRENTICE COMPUTER CENTRE.

During the week commencing 12 July 1976, the Centre will conduct a number of seminars on particular services.

From our record of statistical users it would appear as if you might be interested in the seminar listed below.

The seminar will be held in Lecture Room B18 in the Basement of the Hawken Building at the University of Queensland and will commence at 2 p.m.

STATISTICS/SPSS - Monday, 12th July

This is an introductory seminar on the use of package programs, particularly the SPSS package (Statistical Package for the Social Sciences).

We trust that this information will be of interest to you and your colleagues and would ask that you make these details known to workers in your area.

Output from RUNOFF using a /VARIANT:P switch

PRENTICE COMPUTER CENTRE.

During the week commencing 12 July 1976, the Centre will conduct a number of seminars on particular services.

From our record of graphics users it would appear as if you might be interested in the seminar listed below.

The seminar will be held in Lecture Room B18 in the Basement of the Hawken Building at the University of Queensland and will commence at 2 p.m.

PLOTTING/GRAPHICS - Wednesday, 14th July

The seminar describes the plotting facilities available at the Centre and gives details of the packages available for simple production of a wide range of graphical outputs.

We trust that this information will be of interest to you and your colleagues and would ask that you make these details known to workers in your area.

Output using the /DRAFT switch:

5/1 PRENTICE COMPUTER CENTRE.

7/1 During the week commencing 12 July 1976, the Centre  
7/1 will conduct a number of seminars on particular services.

9/1 From our record of statistical graphics users it would  
16/1 appear as if you might be interested in the seminar listed  
17/1 below.

18/1 The seminar will be held in Lecture Room B18 in the  
18/1 Basement of the Hawken Building at the University of  
19/1 Queensland and will commence at 2 p.m.

23/1 + STATISTICS/SPSS - Monday, 12th July

24/1 + This is an introductory seminar on the use of package  
24/1 + programs, particularly the SPSS package (Statistical Package  
25/1 + for the Social Sciences).

30/1 \$ PLOTTING/GRAPHICS - Wednesday, 14th July

31/1 \$ The seminar describes the plotting facilities available  
31/1 \$ at the Centre and gives details of the packages available  
32/1 \$ for simple production of a wide range of graphical outputs.

36/1 We trust that this information will be of interest to  
36/1 you and your colleagues and would ask that you make these  
37/1 details known to workers in your area.

APPENDIX B

"SIMPLE RUNOFF COMMANDS" DOCUMENT.

This appendix contains a complete example of a RUNOFF output document. Facing pages show the output produced, and the input to RUNOFF respectively.

Blank lines have been inserted into the original input file so that the output and input pages align. These blank lines would not usually be entered.

### Simple RUNOFF Commands

This document is intended as a quick reference for those who use RUNOFF infrequently. The output at the right is the file as typed in.

The output from RUNOFF is at the left. The text of this document describes, in turn, each RUNOFF feature used herein. Blank lines have been inserted in the original file only to ensure alignment of the original and processed text. They are not required.

Looking at a Runoff input file, one immediately notices that input text is typed freely, with no regard for formatting or line boundaries. Spaces are not significant (Use a # for each significant space). Unless disabled, Runoff provides automatic FILLING and JUSTIFICATION to line text up on the right margin.

Special commands to Runoff, starting with a dot in the first position of a line, are used to invoke special operations on your text. Avoid accidentally commencing lines with a dot since this will cause an "illegal command" error. When a command is not on a line by itself, terminate each command with a semicolon.

#### 1.0 RUNOFF FEATURES USED IN THIS DOCUMENT.

##### 1.1 Automatic Paragraphing.

In order to simplify the division of a document into paragraphs, autoparagraph mode can be turned on with the .ap command. This means that the start of a new paragraph may be indicated to Runoff by simply starting the paragraph on a new line, commencing with a space. Runoff supplies the necessary line spacing and indentation.

##### 1.2 Titling Documents

The .t (title) command can be used to specify a title to be printed at the top of the page along with the page number. A sub-title may also be specified to appear under the title with .st. In a document with numbered sections like this one, the sub-title is changed automatically with changes in section title.

.ap  
.T RUNOFF Text Formatting Program  
.st Quick Reference Guide  
.ft  
.c; ^&Simple RUNOFF Commands\&  
.s

This document is intended as a quick reference for those who use RUNOFF infrequently. The output at the right is the file as typed in.  
.br;The output from RUNOFF is at the left. The text of this document describes, in turn, each RUNOFF feature used herein. Blank lines have been inserted in the original file only to ensure alignment of the original and processed text. They are not required.

Looking at a Runoff input file, one immediately notices that input text is typed freely, with no regard for formatting or line boundaries. Spaces are not significant (Use a \_# for each significant space). Unless disabled, Runoff provides automatic FILLING and JUSTIFICATION to line text up on the right margin.

Special commands to Runoff, starting with a dot in the first position of a line, are used to invoke special operations on your text. Avoid accidentally commencing lines with a dot since this will cause an "illegal command" error. When a command is not on a line by itself, terminate each command with a semicolon.

.h11Runoff Features used in this Document.

.hl2Automatic Paragraphing.

In order to simplify the division of a document into paragraphs, autoparagraph mode can be turned on with the .ap command. This means that the start of a new paragraph may be indicated to Runoff by simply starting the paragraph on a new line, commencing with a space. Runoff supplies the necessary line spacing and indentation.

.hl2Titling Documents

The .t (title) command can be used to specify a title to be printed at the top of the page along with the page number. A sub-title may also be specified to appear under the title with .st. In a document with numbered sections like this one, the sub-title is changed automatically with changes in section title.

### 1.3 Centering And Underlining

Text may be centred on a line by typing it after a `.c` command. Underline characters by preceding them with `&`. Underlining may be locked on with `^&` and turned off with `\&`.

### 1.4 Spacing Between Lines

The `.s` command is used to skip (insert) blank lines in the text. It causes one blank line to be left before commencing the following text. Following the command with a number causes that many lines to be skipped. It is possible to globally double space (for example) the document, in which case skips are also doubled. To cause the next text to start on a new line, the `.br` command can be used.

### 1.5 Automatic Section Numbering

Runoff provides the ability to automatically generate section numbers at desired places. This greatly facilitates the maintenance of a section-oriented document, since sections may be inserted or deleted at will without having to manually renumber surrounding sections accordingly. Five levels of nesting are provided with the numbers being incremented automatically wherever a `.hl` command is encountered. Within chapters (if specified) the outer section number is incremented at each chapter change.

### 1.6 Reserved Characters

As we have already seen, certain characters (eg `&`) have special meanings to Runoff. To use one of these characters in the text it is necessary to indicate it is to have its normal (as opposed to Runoff Special) meaning by preceding it with an underline character `"`. Other special characters to watch out for are: `^`, `\`, `#`, `<`, `>`, and `!`

### 1.7 Lists

Runoff can automatically indent and number lists of points for you. The entire list is bracketed by `.ls` and `.els` whilst each element is commenced with a `.le;` command.

## .hl2Centering and Underlining

Text may be centred on a line by typing it after a .c command. Underline characters by preceding them with &. Underlining may be locked on with ^& and turned off with \&.

## .hl2Spacing between lines

The .s command is used to skip (insert) blank lines in the text. It causes one blank line to be left before commencing the following text. Following the command with a number causes that many lines to be skipped. It is possible to globally double space (for example) the document, in which case skips are also doubled. To cause the next text to start on a new line, the .br command can be used.

## .hl2Automatic Section Numbering

Runoff provides the ability to automatically generate section numbers at desired places. This greatly facilitates the maintenance of a section-oriented document, since sections may be inserted or deleted at will without having to manually renumber surrounding sections accordingly. Five levels of nesting are provided with the numbers being incremented automatically wherever a .hl command is encountered. Within chapters (if specified) the outer section number is incremented at each chapter change.

## .hl2Reserved Characters

As we have already seen, certain characters (eg &) have special meanings to Runoff. To use one of these characters in the text it is necessary to indicate it is to have its normal (as opposed to Runoff Special) meaning by preceding it with an underline character " ". Other special characters to watch out for are: ^, \, #, <, >, and !

## .hl2Lists

Runoff can automatically indent and number lists of points for you. The entire list is bracketed by .ls and .els whilst each element is commenced with a .le; command.

## 2.0 INVOKING RUNOFF

### 2.1 Output To Your Terminal

```
.R RUNOFF  
*TTY:=file/underline:separate
```

### 2.2 Output To A File For Printing

```
.R RUNOFF  
*file
```

## 3.0 CONCLUSION

This document illustrates but a few of the many features Runoff has to offer for formatting text and producing standardised presentable documentation. Whilst it is not always possible to make Runoff produce exactly the sort of output format desired, by adapting your formatting to its capabilities, a good compromise can be reached. Some of the many other features of Runoff not mentioned in this guide are:

1. Variable tab stops
2. Setting of margins
3. Setting page size
4. Creating upper and lower case documents from a terminal capable only of upper case input
5. Production of a cross-referenced index
6. Indenting of text relative to Margins
7. Footnotes
8. Indented Notes
9. Chapters
10. Specifying Page Breaks
11. Ensuring a block of text stays on the one page
12. Change bars and sub-pages for Updating Documents
13. Conditional Output of Named Portions of the file



```
.h11 Invoking Runoff
.h12 Output to your Terminal
&.R RUNOFF
&*TTY:=file/underline:separate
.h12 Output to a File for Printing
&.R RUNOFF
&*file
```

### .h11 Conclusion

This document illustrates but a few of the many features Runoff has to offer for formatting text and producing standardised presentable documentation. Whilst it is not always possible to make Runoff produce exactly the sort of output format desired, by adapting your formatting to its capabilities, a good compromise can be reached. Some of the many other features of Runoff not mentioned in this guide are:

```
.ls
.le; Variable tab stops
.le; Setting of margins
.le; Setting page size
.le; Creating upper and lower case documents from a
terminal capable only of upper case input
.le; Production of a cross-referenced index
.le; Indenting of text relative to Margins
.le; Footnotes
.le; Indented Notes
.le; Chapters
.le; Specifying Page Breaks
.le; Ensuring a block of text stays on the one page
.le; Change bars and sub-pages for Updating Documents
.le; Conditional Output of Named Portions of the
file
```

14. Various Underlinings for different terminals/  
printers
15. Extraction of Program Logic Manuals from Language  
Source Files (eg CBL's)
16. Centring around Specified Column
17. Literal mode for entry of Diagrams, etc
18. Changing Reserved Characters
19. Appendices
20. Many Settings Alterable at RUNOFF command time by  
switches

[End of Document]

"SIMPLE RUNOFF COMMANDS" DOCUMENT.

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.le;Various Underlinings for different terminals/printers  
.le;Extraction of Program Logic Manuals from  
Language Source Files (eg CBL's)  
.le;Centring around Specified Column  
.le;Literal mode for entry of Diagrams, etc  
.le;Changing Reserved Characters  
.le;Appendices  
.le;Many Settings Alterable at RUNOFF command  
time by switches  
.els

.s 2;[End of Document]



APPENDIX C  
FULL COMMAND LIST.

Commands and abbreviations in alphabetical order.

APPENDIX text; AX text	start next appendix with rest of line as name.
ARABIC NUMERALS ; AN	use arabic numerals in page numbering.
AUTOPARAGRAPH ; AP	treat leading spaces as new paragraph.
AUTOTABLE ; AT	treat lines without leading space as new paragraph.
BEGIN BAR ; BB	start a change bar.
BLANK n ; B n	skip n lines.
BOTH SIDES n,m ; BS n,m	titles swing from side to side (column n to m).
BOTTOM NUMBER ; BN	pages will be numbered at the bottom.
BREAK ; BR	start new output line.
CENTER n ; C n	centre next line around column n/2.
CENTRE n ; C n	" " " " " " " "
CHAPTER text ; CH text	start new chapter with rest of line as name.
COMMENT text	treat rest of line as comment.
CONTROL CHARACTERS ; CC	allow control characters.
DISABLE BAR ; DBB	set to ignore change bars.
DO INDEX text ; DX text	output index with rest of line as title.
DOCUMENT DATE ddMmmyy ; DD ddMmmyy	use date as subtitle.
DOCUMENT ID text ; DI text	use text as title.
ELSE name	change sense of IF/IFNOT.
ENABLE BAR ; EBB	set to allow change bars.
ENDIF name ; EI name	ends conditional input.
END BAR ; EB	end change bar.
END FOOTNOTE	terminate a footnote definition.
END LIST ; ELS	end a list.
END LITERAL ; EL	terminate a literal block of text.
END NOTE ; EN	terminate a NOTE command.
END SELECTION ; ESL	stop selection until single line prefix.

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END SUBPAGE ; ES	stop subpage numbering (resumes page).
FIGURE n ; FG n	make space for n line figure.
FIGURE DEFERRED n	same except maybe on next page.
FILL ; F	resume filling and justifying each line.
FIRST TITLE ; FT	include title on first page.
FLAGS ALL	enable existing flag characters.
FLAGS type ch ; FL type ch	change flag character to ch.
FOOTNOTE n ; FN n	start n line footnote (input until ! in col.1).
HEADER x ; HD x	issue page heading in x (UPPER, LOWER, MIXED) case.
HEADER LEVEL n ; HL n	start section at level n(1-5); rest is name.
IF name	start conditional input if VARIANT name is on.
IFNOT name ; IN name	start conditional input if VARIANT name is off.
INDENT n ; I n	indent next line.
INDEX text	insert rest of this line in index.
JUSTIFY ; J	resume justifying text.
LEFT n ; L n	start next line n cols from left margin.
LEFT MARGIN n ; LM n	set left margin.
LIST n ; LS n	start list of items with spacing n.
LIST ELEMENT ; LE	start of item in a list.
LITERAL n ; LT n	start a literal block of text n lines long.
LOWER CASE ; LC	start footnotes and text in lower case.
NO AUTOPARAGRAPH ; NAP	stop autoparagraph mode.
NO AUTOTABLE ; NAT	stop autotable mode.
NO CONTROL CHARACTERS ; NCC	don't allow control characters.
NO FILL ; NF	stop fill and justify.
NO FLAGS ALL	disable existing flag characters except ".", "!", ".".
NO FLAGS type ; NFL type	don't use flag character type.
NO HEADER ; NHD	suppress page headers.
NO JUSTIFY ; NJ	stop justifying.
NO NUMBER ; NNM	stop page numbering.
NO PAGING ; NPA	stop splitting into pages.
NO PERIOD ; NPR	stop double spacing after period, excl., ques., etc.
NO SELECTION ; NSL	accept all text as input.
NO SPACE ; NSP	suppress space on this end of line.
NOSPACE UNDERLINE ; NSU	turns off underlining for all types of spaces.
NO SUBTITLE ; NST	suppress subtitles.
NOTE text ; NT text	start indented note with heading "text" centered.
NUMBER n ; NM n	resume page numbering at page n.
NUMBER APPENDIX n	set chapter to appendix n.







APPENDIX D

LIST OF SWITCHES.

The available RUNOFF switches are listed below.

/AUTOPARAGRAPH	leading spaces force a new paragraph
/BAR:ch	use ch as bar character
/CASE:LOWER	start in lower case mode
/CASE:UPPER	(default) start in upper case mode
/CONTROL	allow control characters in input
/CRETURN	necessary for correct results on some terminals which have problems with fill characters
/DOWN:n	move text of each page down n lines
/DRAFT	include all excluded contents
/HEADER:LOWER	page header in lower case
/HEADER:MIXED	(default) page header in upper and lower case
/HEADER:UPPER	page header in upper case
/HELP	type this text
/IRANGE:r	only output pages in input range
/LINES:n	start with n lines per page
/NOAUTOPARAGRAPH	(default) don't automatically paragraph
/NOCONTROL	(default) don't allow control characters in input
/NODRAFT	(default) obey all IF commands
/NOPAUSE	(default) don't pause at end of page
/NOSELECT	(default) don't start with SELECT set
/NOSEQUENCE	(default unless /DRAFT) don't list input line numbers
/NOSIMULATE	(default) don't simulate form feeds
/ORANGE:r	only output pages in output range
/PAUSE	pause between pages
/RIGHT:n	move text of each page to the right n spaces
/SELECT:"string"	start with SELECT string
/SEQUENCE	list input sequence numbers at left side of output
/SIMULATE	simulate form feeds
/SPACING:n	start with SPACING n
/UNDERLINE:BACKSPACE	underline by backspace and overprint
/UNDERLINE:CHARACTER	underline character does not space
/UNDERLINE:LINE	(default) underline by overprinting line

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/UNDERLINE:SEPARATE	output underlines as separate line
/UNDERLINE:Ø	suppress underlining
/UNDERLINE:ch	use ch (octal or quoted character) as underline character
/VARIANT:word	do variant "word"
/VARIANT:(w1,w2,...wn)	do variants w1, w2, ...wn together
/WIDTH:n	start with page width n

APPENDIX E  
ERROR MESSAGES.

RUNOFF conforms to the DECsystem-10 standard for system diagnostic messages and error codes. The following conventions are used in describing these messages:

CONVENTION	MEANING
dev	a legal device name
file structure name	a legal file structure name
file.ext	a legal filename and extension
adr	a user address
n	a number
abc	a disk unit or drive
x	an alphabetic character
switch	a switch

The formats of the messages are

? RNFXXX text  
% RNFXXX text  
[ RNFXXX text

where

? = a fatal error message  
% = warning or advisory message  
[ = comment line  
RNF = RUNOFF mnemonic  
XXX = 3 letter mnemonic for the message  
text = explanation of the message

If you input RUNOFF commands incorrectly into your source file, you can receive one or several of the messages in the following list:

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?RNFCJL CAN'T JUSTIFY LINE

The string of input between spaces (and end of line) is greater than the separation between left and right margins and therefore does not fit in the output even before any attempt to expand spaces.

?RNFDVN DUPLICATE VARIABLE NAME:"command"

This variable command is attempting to declare a variable which has already been declared. This declaration will be ignored.

?RNFEFD END FOOTNOTE DOESN'T FOLLOW FOOTNOTE:"command"

This end footnote command appears at a place in the file which is not immediately following a footnote command and the corresponding footnote data.

?RNFEFD END LITERAL DOESN'T FOLLOW LITERAL: "command"

This end literal command appears at a place in the file which is not immediately following a literal command and the corresponding literal text. It probably reflects that the count on the literal command is incorrect.

?RNFEVL EXCEEDING VARIABLE LIST:"command"

Only a maximum of 20 variables can be declared. This command is attempting to declare the 21st variable. This and all further variable declarations will be ignored, although the message will not be repeated.

?RNFFIF FOOTNOTE INSIDE FOOTNOTE: ".command"

This command is attempting to start a footnote definition, only it occurs within a footnote definition, which is illegal. It probably indicates that the previous footnote definition was never terminated.

?RNFIBO INPUT BUFFER OVERFLOW

A string of characters has been input which is so long between spaces (or the right margin is so large) that it has overflowed the internal line buffer storage area.

?RNFIFT ILLEGAL IN FOOTNOTE: ".command"

This command is illegal within a footnote.

%RNFIIF x IGNORED IN INPUT FILE

Control characters are not normally allowed in the input file. This character was input and is being ignored. If it should be input, then declare ".CONTROL CHARACTERS" in order to make it legal.

?RNFILC ILLEGAL COMMAND: ".command"

This command is illegal for some reason. Most reasons are that a key word was not recognized or that an argument was out of range.

ERROR MESSAGES.

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- %RNFJEC JUNK AT END OF COMMAND: ".command"  
The command after all its arguments, still has some other characters which are not blanks or comments.
- [RNFKCF nK CORE - FOOTNOTE]  
Core was expanded because of growth in the footnote storage area. If this repeats indefinitely it probably indicates that the footnote was improperly terminated.
- [RNFKCI nK CORE - INDEX]  
Core was expanded because of growth in the index storage area. In a well indexed document this message should be output occasionally as processing progresses.
- ?RNFLDE LITERAL DOESN'T END WITH END LITERAL: ".command"  
After a counted literal, the next line is not an end literal command. This probably indicates that the count is wrong.
- ?RNFNEC NOT ENOUGH CORE nK  
Core has been expanded to the limit of what the monitor is allowed to assign to this job. The processing is aborted at this point.
- ?RNFNFS NO FILE SPECIFIED  
The user has specified some switches or an output file, but has not specified an input file.
- %RNFNIA NEGATIVE INDENT ATTEMPTED  
The sum of the indent and the left margin is less than zero, meaning that the line should start to the left of the left edge of the paper. Either the left margin has been missed or the indent is wrong. The indent might be implicit in a paragraph or table request. This message is output only once until the next left margin or SD command.
- %RNFNIC ANOTHER n NEGATIVE INDENTS COUNTED  
This message indicates how many additional negative indents were discovered since the last NIA message.
- ?RNFNID NO INPUT DEVICE  
The user has failed to specify either an input device or file.
- ?RNFODE OUTPUT ERROR xxxxxx  
The output file has an I/O error whose octal code is included in the message.
- %RNFSP0 SUBPAGE OVERFLOW  
While incrementing the subpage counter, it got larger than 26. This probably indicates that the end subpage command is missing.

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%RNFTFE TOO FEW END COMMANDS

When the end of the input was reached there were not the same number of end (or end list or end note) commands as there had been list and note commands. This probably indicates that an end command is missing.

?RNFTMI INSUFFICIENT CORE FOR COMMAND

The user has specified so many input file specifications that RUNOFF could not fit them into core. The command should be split into several commands.

?RNFTMR TOO MANY RANGES

The user has specified too many IRANGE or ORANGE pairs to fit in the storage space assigned (20 pairs each). Fewer ranges should be specified.

?RNFTMV TOO MANY /VARIANTS

The user has specified too many VARIANTS in the command. Only 20 variants can be specified in one command.

%RNFTNN TOO MANY NESTED NOTES

More than 6 nested notes and lists has occurred. This probably indicates that one or more end commands is missing.

?RNFUKV UNKNOWN VARIABLE: ".command"

On an if, ifnot, else, or endif command a variable was referenced which was not declared in a variable command. This usually indicates a spelling error or a missing variable command.

%RNFUME UNMATCHED END COMMAND

More end commands have occurred than list or note commands.

?RNFYVZ /VARIANT VALUE ZERO

In a VARIANT switch, the value was null or zero. Variants always have names.

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