

SMA STANDARD

RUNOFF Language Specification

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RUNOFF LANGUAGE SPECIFICATION - DRAFT 2.0

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Foreword: This document establishes a standard for the use of the RUNOFF language and processor to prepare textual material on-line. The RUNOFF language, provided by Spectrum Manufacturers Association member systems, is used primarily for generating form letters and text documentation. This document is meant to serve as a guide to the preparation of RUNOFF items that can be moved from one SMA system to another. For details on any specific system, the user should refer to the manufacturer's reference manual.

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1.0 Scope

1.1 Inclusions: This document includes all commands and features common to all SMA systems with syntactic representations to clearly define the usage permitted with each. It also includes sufficient "run time" considerations to meet the objective of inter-system portability.

1.2 Exclusions: Excluded from this standard are issues of support of statements during the run time process by other SMA system processors, such as the output spooler and CRT handlers. Also excluded is any discussion of how RUNOFF source items are created.

2.0 Definitions

2.1 Nomenclature: Within this document, capitalized words represent tokens within the RUNOFF language and must be included as shown. RUNOFF commands will be recognized without regard to case. For example, both ".NCS" and ".ncs" will turn off the Capitalize Sentence mode.

Terms in lower case refer to parameters which must be supplied as part of the RUNOFF command.

The use of quotes (") and single quotes (') is required in the forms shown below.

The use of braces ({ }) means the included string is optional.

The use of ellipsis (...) means the preceding information can be repeated.

The term "printed" refers to output to the specified device which may be a terminal, an auxiliary device connected to the terminal, the system spooler or to the tape device.

3.0 Overview

3.1 Concepts: RUNOFF provides users the means to output text documents that have been prepared on a SMA computer system. The text can be entered via any other process, for example the SMA/EDITOR. As noted before, the entry of text is not discussed in this document, as RUNOFF is a text output formatter. It takes text items with RUNOFF commands embedded within the text and generates output. Features of RUNOFF allow the generation of form letters with data inserted by RUNOFF from an application database as well as the creation of books and pamphlets, with indexes and tables of contents maintained and printed automatically.

3.2 RUNOFF Item Structure: Input to the RUNOFF processor is contained in standard SMA items. All attributes within the item are considered to be text, except attributes that begin with a period (.) which are RUNOFF command lines. RUNOFF command lines contain one or more RUNOFF commands, each command prefaced with a period. Some RUNOFF commands also use the following text line for special situations, such as headings and footings.

3.3 Process Initiation: The RUNOFF Processor is invoked from TCL with the following statement:

RUNOFF {DICT} filename {itemlist} {(options)}

where the valid options are:

- n Any positive integer number which specifies the number of times to repetitively print character(s) which are printed in boldface mode.
- C Suppresses linking to other items via the CHAIN and READ commands.
- I Outputs each source item name before generating text output.
- J Suppress functioning of the highlighting mode.
- N Suppresses the pause at end of page when output is directed to the terminal.
- P Directs output to the system spooler.
- S Suppress functioning of the Boldface and Underline modes.
- U Specifies that all lower case characters will be converted to upper case during printing.

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The "itemlist" specification designates an explicit itemlist, which is made up of source RUNOFF item ID(s) separated with blanks. The item id(s) do not have to be enclosed in quotes or single quotes.

If there is no explicit itemlist, there must be an implicit itemlist, generated by a previous SELECT, SSELECT, FORM-LIST, or GET-LIST verb. See the SMA/Retrieval Language Specification for information on these verbs.

With one exception, the explicit itemlist over-rides the implicit itemlist. The exception is when the READNEXT RUNOFF command is used. When used, READNEXT requires both the implicit and explicit itemlists. Only the first item in the explicit itemlist is used.

3.4 Execution: Execution begins with the first item specified and continues until all items in the itemlist are output. Within each item execution begins with the first attribute and continues with each succeeding attribute until the end of item is reached.

RUNOFF begins processing each line by testing the first character of the line for a period, ".", which identifies a RUNOFF command line. Each RUNOFF command on that line is processed as specified by the command definitions in chapter 5.

If RUNOFF is in Fill Mode, the text line is parsed into words (separated by spaces) and these words are placed into a temporary buffer whose length is defined by the LINE LENGTH command (and, in the case of a Paragraph Break, by Paragraph Indent.) When RUNOFF is unable to place a complete word in the buffer, the buffer is printed and then emptied. Processing continues with the word which caused the overflow.

If RUNOFF is not in Fill Mode, the source text line is printed as it appears in the source item.

Before a line is printed, RUNOFF will adjust the line based on the Box, Highlight and Justify Modes. The line is prefaced with the number of spaces indicated by a combination of Left Margin, Temporary Indent, Indent, Offset Indent, and Paragraph Indent. It is then sent to be printed.

In the special case that nothing has been printed yet, a Page Break is generated before the line is printed.

After each line is printed, the Line Spacing Counter is checked. If the Line Spacing Counter is greater than one, additional blank lines are printed so that the blank lines plus the text line equals the Line Spacing Counter. The Current Line Counter is incremented by the amount of the Line Spacing Counter. If the

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Current Line Counter plus the number of lines to be generated by the Footing Tag is greater exceeds the Paper Length, a Page Break is generated.

4.0 Processing Mechanisms

RUNOFF can manipulate text in a variety of ways. To accomplish some of these effects, RUNOFF requires the use of mechanisms to remember such things as the number of lines already printed on the current page and whether text should be printed with a justified right margin.

These mechanisms are described below. They can be broken down into three categories: A) Tags and Counters, which store user specified information or accumulated results. B) Output Breaks, which affect the format of output. C) Modes, which flag whether RUNOFF is to take specified action automatically and repeatedly.

4.1 Footing and Heading Tags: The Footing and Heading Commands use the subsequent line of text, known as the tag line, as what to print at the top or bottom of each page. The tag line is text with options embedded within it. Options are specified within single quotes (') and may be any combination of the following:

- C Centers the tag output line between left and right margins. If the "L" option is being used, then the "C" option must be repeated for each of the output lines that is to be centered.
- D Prints the current date.
- F Prints the source file name.
- I Prints the source item id.
- L Prints a carriage return and linefeed.
- P Prints the current page number right justified in a field of four spaces.
- T Prints the current time and date.

There may be any number of occurrences of options within the tag line.

In generating the tag lines, RUNOFF uses the margins that are in effect when the Footing or Heading Command was issued. The tag line is not affected by subsequent changes to the margins.

4.2 Index Table: The Index Table is built via use of the INDEX command. It stores, in sorted order, phrases and the pages that they occur on. The Index Table can be printed with the PRINT INDEX command and permanently stored using the SAVE INDEX command.

4.3 TOC Table: The TOC (for Table of Contents) Table is built via the use of CHAPTER and SECTION commands. It stores the Sections Counter, Title and Page Number. This can then be printed with the CONTENTS command and permanently stored using the SAVE CONTENTS command.

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4.4 Current Line Counter: The Current Line Counter keeps track of the number of lines printed on the page and is incremented every time a line is printed.

4.5 Current Page Counter: The Current Page Counter keeps track of the number of pages printed and is incremented every time a Page Break occurs.

4.6 Line Spacing Counter: The Line Spacing Counter keeps track of the number of blank lines between printed lines of text.

4.7 Sections Counter: The Sections Counter keeps track of the current section number for use by the CHAPTER and SECTION commands. The Sections Counter is multi-level; level 1 is commonly known as the chapter number. Subsequent levels enumerate subsections within the chapter. Used in the SECTION command, the chapter number, level 1, is displayed left of the period. Subsequent levels are displayed with periods separating them as diagrammed:

level1.level2.level3.level4.level5

When the counter for a specified level is incremented, all subsequent levels are set to zero.

4.8 Indent: Indent is set by the Indent Margin command and generates a number of spaces to precede the line when printed. If Indent is negative, it will subtract spaces from the calculation of the left margin as defined by Left Margin, Indent, Temporary Indent, Offset Indent and Paragraph Indent.

4.9 Left Margin: The Left Margin is a counter like the other indents which generates a number of spaces to precede the line when it is printed. Left Margin cannot be negative.

4.10 Paragraph Indent: The Paragraph Indent is set by the Paragraph Command and generates a number of spaces to precede the line when printed. It is only used in the calculation of left margin on the first line of a paragraph, which is the first line after a Paragraph Break. If Paragraph Indent is negative, it will subtract spaces from the calculation.

4.11 Temporary Indent: Temporary Indent is set by the Indent command and generates a number of spaces to precede the line when printed. If Indent is negative, it will subtract spaces from the calculation of the left margin as defined by Left Margin, Indent, Temporary Indent, Offset Indent and Paragraph Indent.

Temporary Indent is effective for one line only, and is reset to zero after it is used.

4.12 Text Breaks: Text breaks are caused by RUNOFF commands which change the mode of formatting. This requires that those words which are waiting to be output as part of an unfinished line to be output. Then the mode is changed as specified by the RUNOFF command, then formatting and output continues.

4.13 Paragraph Breaks: The beginning of a paragraph can be indicated in the source text by either an empty line or a line starting with a blank. In addition, RUNOFF commands can cause, or specify, the end of a paragraph. A Paragraph Break consists of a Text Break, followed by the number of blank lines indicated by the Line Spacing Counter. The left margin is offset by the number of spaces indicated by the Paragraph Indent. If the Paragraph Indent is negative, then the calculation of the left margin is decremented by the absolute value of Paragraph Indent. In addition, Line Length is temporarily decremented by the value of Paragraph Indent.

4.14 Page Breaks: A Page Break can be caused by RUNOFF commands or when the Current Line Counter plus the number of lines to be printed in the Footing Tag exceeds the Page Depth. A Text Break is generated, if needed, and then the Footing Tag is printed. The page is ejected and the Heading Tag is printed. The Current Page Counter is incremented. The Current Line Counter is incremented to the number of lines printed in the Heading Tag.

4.15 Boldface Mode: When in Boldface mode, every character is overprinted again to emphasis it. The number of overstrikes can be varied from the default, one, by specifying the number of overstrikes as an option in the RUNOFF TCL statement.

4.16 Box Mode: When in Box Mode, output text is bracketed on the left and right with vertical bars (|). The left and right columns of the box are defined by the ".BOX" command that turned the Box Mode command on.

4.17 Capitalize Sentence Mode: When in Capitalize Sentence Mode, the first character of each word following a period or a question mark is capitalized.

4.18 Fill Mode: When in Fill mode, words are taken from the source item and placed in a buffer which represents one line of output. When RUNOFF attempts to put a word in this buffer that would cause the buffer to be longer than the line width, the buffer will be output and that word will be placed at the beginning of the next line buffer.

4.19 Highlight Mode: When in Highlight mode, a character is printed two columns to the right of the right margin. The character printed is specified as an argument in the ".HILITE"

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command.

4.20 Justify Mode: When in Justify mode, each line before it is output, will be adjusted so that the end of the last word on the line will end directly at the right margin, or width of the line. Blanks are inserted randomly between words to accomplish this. The line immediately preceeding a text break is not justified.

Justify mode "on" implies that Fill mode is also "on".

4.21 Lower Case Mode: When in Lower Case Mode, RUNOFF will output all characters in lower case, except as directed by Capitalize Sentence Mode.

4.22 Underline Mode: When in Underline mode, an underline character, "_" is printed below every character. If Fill Mode is on, blanks are NOT underlined.

4.23 Upper Case Mode: When in Upper Case Mode, RUNOFF will output all characters in upper case, except as directed by Capitalize Sentence Mode.

4.24 Initial Conditions: When RUNOFF is started, the tags, counters and modes are set as followed:

Boldface Mode	off
Box Mode	off
Capitalize Sentence Mode	on
Current Line Counter	.0
Current Page Counter	.1
Fill Mode	on
Footing	null
Heading	null
Highlight Mode	off
Indent	0
Justify Mode	on
Left Margin	0
Line Length	70
Line Spacing Counter	.1
Lower Case Mode	off
Paper Length	*1
Paragraph Indent	5
Sections Counter	1.0
Tab Stops	not set
Temporary Indent	0
Underline Mode	off
Upper Case Mode	off

*1: Initialized to the Page Depth set by the TERM TCL command.

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5.0 RUNOFF Command Definitions

- 5.1 **Comment:** The Comment command causes the RUNOFF processor to ignore any text following the "*". This can be used by the user to insert comments about special conditions. The format of this command is:

.*{text}

- 5.2 **Begin Page:** The Begin Page command causes a Page Break. Permissible formats of the command are:

.BP
.BEGIN PAGE

- 5.3 **Box:** The Box command causes a Text Break and turns the Box Mode on or off. To turn box mode on, you must specify:

.BOX leftedge,rightedge

The command to turn Box Mode off is:

.BOX OFF

Turning the Box mode on or off also prints a line of hyphens (-) between the "leftedge" and "rightedge".

- 5.4 **Break:** This command causes a text break. Permissible formats of the command are:

.B
.BREAK

- 5.5 **Capitalize Sentence:** The Capitalize Sentence command turns on Capitalize Sentence Mode. Permissible formats of the command are:

.CS
.CAPITALIZE SENTENCES

- 5.6 **Center:** The Center command causes a text break and then prints text centered between the left and right margins. Permissible formats of the command are:

.C
.CENTER

Only the next line is centered.

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5.7 Chain: The Chain command causes the RUNOFF processor to use another, specified, source item for text. The format of the Chain command is:

.CHAIN {{DICT }filename} itemname

If "filename" is not specified, then the filename is assumed to be the same file as the current source item. Control is never returned to the current source item.

5.8 Chapter: The Chapter command causes a page break; prints the literal "CHAPTER" followed by the current chapter number (Sections Counter, level 1); increments the chapter number; skips a line; prints the optional chapter title; skips a line. The format of the command is:

.CHAPTER {chapter#}{title}

If "chapter#" is specified, then the current chapter number is reset to "chapter#". An entry is made in the TOC Table.

5.9 Contents: The Contents Command causes a Page Break; prints the literal:

Table of Contents

centered between left and right margins; skips two lines; prints the TOC Table based on previous CHAPTER and SECTION commands. The format of the command is:

.CONTENTS

5.10 Crt: The CRT command redirects subsequent output to the terminal. The format is:

.CRT

5.11 EndCase: The End Case command turns the Upper Case and Lower Case Modes both to "off". Permissible formats of the command are:

.EC

.END CASE

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- 5.12 Fill: The Fill command sets the Fill Mode on. Permissible formats of the command are:

.F
.FILL

If the Fill Mode is currently off, a Text Break is generated.

- 5.13 Footing: The Footing command specifies text and information to be displayed at the bottom of each page. The format is:

.FOOTING

The next line of text following the Footing command is used as the Footing Tag. Heading and Footing Tags can have data automatically inserted (such as page number) if the appropriate options are set. See the section on Heading and Footing Tags.

The Footing Tag takes effect at the next Page Break to occur, except for the special case of when nothing has been printed yet. In that case, the Footing Tag takes effect after the first Page Break.

The Footing Tag is reset to null if the line following the Footing command is a RUNOFF command line.

- 5.14 Heading: The Heading command specifies text and information to be displayed at the top of each page. The format is:

.HEADING

The next line of text following the Heading command is used as the Heading Tag. Heading and Footing Tags can have data automatically inserted (such as page number) if the appropriate options are set. See the section on Heading and Footing Tags.

The Heading Tag takes effect at the next Page Break to occur.

The Heading Tag is reset to null if the line following the Heading command is another RUNOFF command line.

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5.15 Hilite: The Hilite command turns the Highlight Mode on and off. The format of the command to turn the mode on is:

.HILITE character

The "character" specified will be printed in the right margin. To turn the mode off the command is:

.HILITE OFF

5.16 Indent: The Indent Command causes a Text Break and adjusts the indent from the left margin for the next line only. The format is:

.I spaces
.INDENT spaces

The "spaces" can be either a positive or negative number and may cause the indent to go negative, which would cause the output of text to start before the left margin by the absolute value of indent.

5.17 Indent Margin: The Indent Margin Command causes a Text Break and adjusts the indent from the left margin. Permissible formats of the command are:

.IM spaces
.INDENT MARGIN spaces

The "spaces" can be either a positive or negative number and may cause the indent to go negative, which would cause the output of text to start before the left margin by the absolute value of indent. The specification "spaces" is cumulative in that it is added to the current value of indent.

5.18 Index: The Index command places the following term with the current page number into an index table which can be printed out later with the "Print Index" command. The format is:

.INDEX term { term... }

If the term contains blanks, it must be enclosed in double quote marks.

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- 5.19 **Input:** The Input command prompts for input from the terminal and uses the response as text to be processed. The format is:

.INPUT

- 5.20 **Justify:** The Justify command turns the Justify and Fill Modes on. Permissible formats of the command are:

.JUSTIFY

If the Fill Mode is currently off, a Text Break is generated.

- 5.21 **Left Margin:** The Left Margin command causes a Text Break and sets the left margin column. Permissible formats of the command are:

.LM column
.LEFT MARGIN column

The "column" specification must be a positive whole number.

- 5.22 **Line Length:** The Line Length command causes a Text Break and sets the width of the output line. The format is:

.LINE LENGTH columns

The "columns" specification must be a positive whole number.

- 5.23 **Lower Case:** The Lower Case command turns the Upper Case Mode off and the Lower Case Mode on. Permissible formats of the command are:

.LC
.LOWER CASE

- 5.24 **Line Printer:** The Line Printer command directs subsequent processing to output to the system spooler. The format is:

.LPTR

5.25 No Capitalize Sentence: The No Capitalize Sentence Command turns the Capitalize Sentence Mode off. Permissible formats of the command are:

.NCS

.NOCAPITALIZE SENTENCES

5.26 Nofill: The Nofill command turns the Fill and Justify Modes off. Permissible formats of the command are:

.NF

.NOFILL

If the Fill Mode is currently on, a Text Break will be generated.

5.27 Nojustify: The Nojustify command turns the Justify Mode off. Permissible formats of the command are:

.NJ

.NOJUSTIFY

If the Justify Mode is currently on, a Text Break will be generated.

5.28 Noparagraph: The No Paragraph command disables the processing of Paragraph breaks. The format is:

.NOPARAGRAPH

5.29 Page Number: The Page Number command sets the current page number to the specified number. The format is:

.PAGE NUMBER page

The "page" specification must be a positive whole number.

5.30 Paper Length: The Paper Length Command sets the number of lines on a page to the specified number. The format is:

.PAPER LENGTH lines

The "lines" specification must be a positive whole number.

- 5.31 Paragraph: The Paragraph Command specifies the number of spaces that the first line of a paragraph is indented. Permissible formats are:

.P spaces
.PARAGRAPH spaces

The "spaces" specification can be either a positive or negative whole number. A negative number indicates the first line of a paragraph begins the absolute value of "spaces" columns before the left margin.

- 5.32 Pfile: The PFILE command directs further processing to be output to the specified spooler print file. The format is:

.PFILE file#

The "file#" specification must be a whole number between 0 and 125.

- 5.33 Print: The Print command prints the following source line on terminal. The format is:

.PRINT

- 5.34 Print Index: The Print Index command causes the index table built via previous Index commands to be printed. The format is:

.PRINT INDEX

- 5.35 Read: The Read command causes the RUNOFF processor to use another, specified, source item for text. The format of the command is:

.READ {{DICT }filename} itemname

If "filename" is not specified, then the filename is assumed to be the same file as the current source item. When the RUNOFF is finished processing the "read" source item, it continues processing the current source item.

- 5.36 Readnext: The Readnext command extracts the next element from the implicit itemlist and uses it as source text. The format is:

.READNEXT

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5.37 Save Index: The Save Index command stores the index table built via previous Index commands as an item in a specified file. The format is:

SAVE INDEX filename

The item id will be the same as the source item id.

5.38 Section: The Section command causes a Text break then the Sections Counter is displayed and incremented, followed by the optional text. The Sections Counter, Text and Page Number are stored in the TOC Table. A Paragraph Break is then generated. The format is:

.SECTION level {title}

5.39 Set Tabs: The Set Tabs command defines tabulation columns which are used with the "<" and ">" embedded subcommands. The format is:

.SET TABS column{,column...}

5.40 Skip: The Skip command causes a text break and prints a specified number of blank lines. Permissible formats of the command are:

.SK lines
.SKIP lines

The number of blank lines printed is the specification "lines" multiplied by the Line Spacing Counter.

5.41 Space: The Space command causes a text break and prints a specified number of blank lines. Permissible formats of the command are:

.SP lines
.SPACE lines

The specification "lines" defines the number of blank lines generated, independent of the Line Spacing Counter.

5.42 Spacing: The Spacing command defines the vertical line spacing and is stored as the Line Spacing Counter. The format is:

.SPACING lines

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5.43 Standard: The Standard command initializes various modes to the default values. The format is:

.STANDARD

The command performs the same actions as the following list of commands:

.CAPITALIZE SENTENCES

.FILL

.JUSTIFY

.FOOTING

.HEADING

.LEFT MARGIN 0

.LINE LENGTH 70

.PARAGRAPH 5

.END CASE

5.44 Test Page: The Test Page command verifies that the specified number of lines can be printed on the page. If not, a Page Break is generated. Permissible formats of the command are:

.TP lines

.TEST PAGE lines

5.45 Upper Case: The Upper Case command turns the Upper Case Mode on and the Lower Case Mode off. Permissible formats of the command are:

.UC

.UPPER CASE

6.0. Embedded Subcommands

RUNOFF provides for a set of special characters, or subcommands, which can be embedded within the source text to control modes.

6.1 Boldface: The Boldface subcommand turns the Boldface Mode as specified:

@ Next character only is printed in Boldface Mode.

@ Boldface Mode is turned on.

@\ Boldface Mode is turned off.

6.2 Underline: The Underline subcommand controls the Underline Mode as specified:

& Next character only is printed in Underline Mode.

& Underline Mode is turned on.

&\ Underline Mode is turned off.

6.3 Upper Case: The Upper Case subcommand controls the Upper Case Mode as specified:

^ Next character only is printed in Upper Case Mode.

^^ Upper Case Mode is turned on.

6.4 Lower Case: The Lower Case subcommand controls the Lower Case Mode as specified:

\ Next character only is printed in Lower Case Mode.

\\ Lower Case Mode is turned on.

6.5 Literal Lead-in: The Literal lead-in subcommand specifies the next character to be treated as a literal and not to be considered as an embedded subcommand. The Literal lead-in subcommand is a "_", underline character.

If the literal character is a space and Justify Mode is on then RUNOFF will not insert extra blanks at this point to create a justified line.

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6.6 Left Tab: The Left Tab Subcommand causes spaces to be inserted into the line so that the next word will begin in the next specified tabulation column. If there is no corresponding tabulation column specified, a single space will be inserted.

6.7 Right Tab: The Right Tab Subcommand causes the next word to be right justified so that it ends in the next specified tabulation column. If there is no corresponding tabulation column specified, a single space will be inserted.

6.8 Underline: The Underline Subcommand causes the next word to be underlined. If there is no corresponding tabulation column specified, a single space will be inserted.

6.9 Upper Case: The Upper Case Subcommand causes the next word to be upper case. If there is no corresponding tabulation column specified, a single space will be inserted.

6.10 Lower Case: The Lower Case Subcommand causes the next word to be lower case. If there is no corresponding tabulation column specified, a single space will be inserted.

6.11 Left Justify: The Left Justify Subcommand causes the next word to be left justified. If there is no corresponding tabulation column specified, a single space will be inserted.

6.12 Right Justify: The Right Justify Subcommand causes the next word to be right justified. If there is no corresponding tabulation column specified, a single space will be inserted.

6.13 Center: The Center Subcommand causes the next word to be centered. If there is no corresponding tabulation column specified, a single space will be inserted.

6.14 Internal Lead-in: The Internal Lead-in Subcommand causes the next word to be preceded by a space. If there is no corresponding tabulation column specified, a single space will be inserted.

6.15 External Lead-in: The External Lead-in Subcommand causes the next word to be preceded by a space. If there is no corresponding tabulation column specified, a single space will be inserted.

6.16 No Runoff: The No Runoff Subcommand causes the next word to be preceded by a space. If there is no corresponding tabulation column specified, a single space will be inserted.

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