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Microsoft Technical Support

Subject: **Rich Text Format (RTF) Specification**

Specification

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INTRODUCTION

The Rich Text Format (RTF) Specification is a method of encoding formatted text and graphics for easy transfer between applications. Currently, users depend on special translation software to move word-processing documents between different MS-DOS®, Microsoft® Windows®, OS/2, Macintosh, and Power Macintosh applications.

The RTF Specification provides a format for text and graphics interchange that can be used with different output devices, operating environments, and operating systems. RTF uses the ANSI, PC-8, Macintosh, or IBM PC character set to control the representation and formatting of a document, both on the screen and in print. With the RTF Specification, documents created under different operating systems and with different software applications can be transferred between those operating systems and applications. RTF files created in Microsoft Word 6.0 (and later) for the Macintosh and Power Macintosh have a file type of “RTF.”

Software that takes a formatted file and turns it into an RTF file is called an RTF writer. An RTF writer separates the application's control information from the actual text and writes a new file containing the text and the RTF groups associated with that text. Software that translates an RTF file into a formatted file is called an RTF reader.

A sample RTF reader application is available (see Appendix A: Sample RTF Reader Application). It is designed for use with the specification to assist those interested in developing their own RTF readers. This application and its use are described in Appendix A. The sample RTF reader is not a for-sale product, and Microsoft does not provide technical or any other type of support for the sample RTF reader code or the RTF specification.

RTF version 1.7 includes all new control words introduced by Microsoft Word for Windows 95 version 7.0, Word 97 for Windows, Word 98 for the Macintosh, Word 2000 for Windows, and Word 2002 for Windows, as well as other Microsoft products.

RTF SYNTAX

An RTF file consists of unformatted text, control words, control symbols, and groups. For ease of transport, a standard RTF file can consist of only 7-bit ASCII characters. (Converters that communicate with Microsoft Word for Windows or Microsoft Word for the Macintosh should expect 8-bit characters.) There is no set maximum line length for an RTF file.

A *control word* is a specially formatted command that RTF uses to mark printer control codes and information that applications use to manage documents. A control word cannot be longer than 32 characters. A control word takes the following form:

\LetterSequence<Delimiter>

Note that a backslash begins each control word.

The LetterSequence is made up of lowercase alphabetic characters (a through z). RTF is case sensitive. Control words (also known as Keywords) may not contain any uppercase alphabetic characters.

The following keywords found in Word 97 through Word 2002 do not currently follow the requirement that keywords may not contain any uppercase alphabetic characters. All writers should still follow this rule, and Word will also emit completely lowercase versions of all these keywords in the next version. In the meantime, those implementing readers are advised to treat them as exceptions.

- **\clFitText**
- **\clftsWidth*N***
- **\clNoWrap**
- **\clwWidth*N***
- **\tdfrmtxtBottom*N***

- **\tdfrmtxtLeft*N***
- **\tdfrmtxtRight*N***
- **\tdfrmtxtTop*N***
- **\trftsWidthA*N***
- **\trftsWidthB*N***
- **\trftsWidth*N***
- **\trwWidthA*N***
- **\trwWidthB*N***
- **\trwWidth*N***
- **\sectspecifygenN**
- **\ApplyBrkRules**

The delimiter marks the end of an RTF control word, and can be one of the following:

- A space. In this case, the space is part of the control word.
- A digit or a hyphen (-), which indicates that a numeric parameter follows. The subsequent digital sequence is then delimited by a space or any character other than a letter or a digit. The parameter can be a positive or negative number. The range of the values for the number is generally –32767 through 32767. However, Word tends to restrict the range to –31680 through 31680. Word allows values in the range –2,147,483,648 to 2,147,483,648 for a small number of keywords (specifically **\bin**, **\revdttm**, and some picture properties). An RTF parser must handle an arbitrary string of digits as a legal value for a keyword. If a numeric parameter immediately follows the control word, this parameter becomes part of the control word. The control word is then delimited by a space or a nonalphabetic or nonnumeric character in the same manner as any other control word.
- Any character other than a letter or a digit. In this case, the delimiting character terminates the control word but is not actually part of the control word.

If a space delimits the control word, the space does not appear in the document. Any characters following the delimiter, including spaces, will appear in the document. For this reason, you should use spaces only where necessary; do not use spaces merely to break up RTF code.

A *control symbol* consists of a backslash followed by a single, nonalphabetic character. For example, **\~** represents a nonbreaking space. Control symbols take no delimiters.

A *group* consists of text and control words or control symbols enclosed in braces ({ }). The opening brace ({) indicates the start of the group and the closing brace (}) indicates the end of the group. Each group specifies the text affected by the group and the different attributes of that text. The RTF file can also include groups for fonts, styles, screen color, pictures, footnotes, comments (annotations), headers and footers, summary information, fields, and bookmarks, as well as document-, section-, paragraph-, and character-formatting properties. If the font, file, style, screen color, revision mark, and summary-information groups and document-formatting properties are included, they must precede the first plain-text character in the document. These groups form the RTF file header. If the group for fonts is included, it should precede the group for styles. If any group is not used, it can be omitted. The groups are discussed in the following sections.

The control properties of certain control words (such as bold, italic, keep together, and so on) have only two states. When such a control word has no parameter or has a nonzero parameter, it is assumed that the control word turns on the property. When such a control word has a parameter of 0, it is assumed that the control word turns off the property. For example, **\b** turns on bold, whereas **\b0** turns off bold.

Certain control words, referred to as *destinations*, mark the beginning of a collection of related text that could appear at another position, or destination, within the document. Destinations may also be text that is used but should not appear within the document at all. An example of a destination is the \footnote group, where the footnote text follows the control word. Page breaks cannot occur in destination text. Destination control words and their following text must be enclosed in braces. No other control words or text may appear within the destination

group. Destinations added after the RTF Specification published in the March 1987 *Microsoft Systems Journal* may be preceded by the control symbol *****. This control symbol identifies destinations whose related text should be ignored if the RTF reader does not recognize the destination. (RTF writers should follow the convention of using this control symbol when adding new destinations or groups.) Destinations whose related text should be inserted into the document even if the RTF reader does not recognize the destination should not use *****. All destinations that were not included in the March 1987 revision of the RTF Specification are shown with ***** as part of the control word.

Formatting specified within a group affects only the text within that group. Generally, text within a group inherits the formatting of the text in the preceding group. However, Microsoft implementations of RTF assume that the footnote, annotation, header, and footer groups (described later in this specification) do not inherit the formatting of the preceding text. Therefore, to ensure that these groups are always formatted correctly, you should set the formatting within these groups to the default with the **\sectd, \pard,** and **\plain** control words, and then add any desired formatting.

The control words, control symbols, and braces constitute control information. All other characters in the file are plain text. Here is an example of plain text that does not exist within a group:

```
{\rtf\ansi\deff0{\fonttbl{\f0\froman Tms Rmn;}{\f1\fdecor
Symbol;}{\f2\fswiss Helv;}}{\colortbl;\red0\green0\blue0;
\red0\green0\blue255;\red0\green255\blue255;\red0\green255\
blue0;\red255\green0\blue255;\red255\green0\blue0;\red255\
green255\blue0;\red255\green255\blue255;}{\stylesheet{\fs20 \snext0Normal;}}{\info{\author John Doe}
{\creatim\yr1990\mo7\dy30\hr10\min48}{\version1}{\edmins0}
{\nofpages1}{\nofwords0}{\nofchars0}{\vern8351}}\widoctrl\ftnbj \sectd\linex0\endnhere \pard\plain
\fs20 This is plain text.\par}
```

The phrase “This is plain text.” is not part of a group and is treated as document text.

As previously mentioned, the backslash (\) and braces ({ }) have special meaning in RTF. To use these characters as text, precede them with a backslash, as in \\, \{, and \}.

CONVENTIONS OF AN RTF READER

The reader of an RTF stream is concerned with the following:

- Separating control information from plain text.
- Acting on control information.
- Collecting and properly inserting text into the document, as directed by the current group state.

Acting on control information is designed to be a relatively simple process. Some control information simply contributes special characters to the plain text stream. Other information serves to change the *program state*, which includes properties of the document as a whole, or to change any of a collection of *group states*, which apply to parts of the document.

As previously mentioned, a group state can specify the following:

- The *destination*, or part of the document that the plain text is constructing.
- Character-formatting properties, such as bold or italic.
- Paragraph-formatting properties, such as justified or centered.
- Section-formatting properties, such as the number of columns.
- Table-formatting properties, which define the number of cells and dimensions of a table row.

In practice, an RTF reader will evaluate each character it reads in sequence as follows:

- If the character is an opening brace ({), the reader stores its current state on the stack. If the character is a closing brace (}), the reader retrieves the current state from the stack.
- If the character is a backslash (\), the reader collects the control word or control symbol and its parameter, if any, and looks up the control word or control symbol in a table that maps control words to actions. It then carries out the action prescribed in the lookup table. (The possible actions are discussed in the following table.) The read pointer is left before or after a control-word delimiter, as appropriate.
- If the character is anything other than an opening brace ({), closing brace (}), or backslash (\), the reader assumes that the character is plain text and writes the character to the current destination using the current formatting properties.

If the RTF reader cannot find a particular control word or control symbol in the lookup table described in the preceding list, the control word or control symbol should be ignored. If a control word or control symbol is preceded by an opening brace ({), it is part of a group. The current state should be saved on the stack, but no state change should occur. When a closing brace (}) is encountered, the current state should be retrieved from the stack, thereby resetting the current state. If the ***** control symbol precedes a control word, then it defines a destination group and was itself preceded by an opening brace ({). The RTF reader should discard all text up to and including the closing brace (}) that closes this group. All RTF readers must recognize all destinations defined in the March 1987 RTF Specification. The reader may skip past the group, but it is not allowed to simply discard the control word. Destinations defined since March 1987 are marked with the ***** control symbol.

> ***Note*** *All RTF readers must implement the* ***** *control symbol so that they can read RTF files written by newer RTF writers.*

For control words or control symbols that the RTF reader can find in the lookup table, the possible actions are as follows.

Action	Description
Change Destination	The RTF reader changes the destination to the destination described in the table entry. Destination changes are legal only immediately after an opening brace ({). (Other restrictions may also apply; for example, footnotes cannot be nested.) Many destination changes imply that the current property settings will be reset to their default settings. Examples of control words that change destination are **\footnote**, **\header**, **\footer**, **\pict**, **\info**, **\fonttbl**, **\stylesheet**, and **\colortbl**. This specification identifies all destination control words where they appear in control-word tables.
Change Formatting Property	The RTF reader changes the property as described in the table entry. The entry will specify whether a parameter is required. Appendix B: Index of RTF Control Words at the end of this Specification also specifies which control words require parameters. If a parameter is needed and not specified, then a default value will be used. The default value used depends on the control word. If the control word does not specify a default, then all RTF readers should assume a default of 0.
Insert Special Character	The reader inserts into the document the character code or codes described in the table entry.
Insert Special Character and Perform Action	The reader inserts into the document the character code or codes described in the table entry and performs whatever other action the entry specifies. For example, when Microsoft Word interprets **\par**, a paragraph mark is inserted in the document and special code is run to record the paragraph properties belonging to that paragraph mark.

FORMAL SYNTAX

RTF uses the following syntax, based on Backus-Naur Form.

Syntax	Meaning
#PCDATA	Text (without control words).
#SDATA	Hexadecimal data.
#BDATA	Binary data.
'c'	A literal.
<text>	A nonterminal.
A	The (terminal) control word a, without a parameter.
a or **a*N***	The (terminal) control word a, with a parameter.
A?	Item a is optional.
A+	One or more repetitions of item a.
A*	Zero or more repetitions of item a.
A b	Item a followed by item b.
A | b	Item a or item b.
a & b	Item a and/or item b, in any order.

CONTENTS OF AN RTF FILE

An RTF file has the following syntax:

<File> '{' <header> <document> '}'

This syntax is the standard RTF syntax; any RTF reader must be able to correctly interpret RTF written to this syntax. It is worth mentioning again that RTF readers do not have to use all control words, but they must be able to harmlessly ignore unknown (or unused) control words, and they must correctly skip over destinations marked with the ***** control symbol. There may, however, be RTF writers that generate RTF that does not conform to this syntax, and as such, RTF readers should be robust enough to handle some minor variations. Nonetheless, if an RTF writer generates RTF conforming to this specification, then any correct RTF reader should be able to interpret it.

Header

The header has the following syntax:

<header> ***rtf*** <charset> <deffont> ***deff***? <fonttbl> <filetbl>? <colortbl>? <stylesheet>? <listtables>? <revtbl>? <rsidtable>? <generator>?

Each of the various header tables should appear, if they exist, in this order. Document properties can occur before and between the header tables. A property must be defined before being referenced. Specifically,

- The style sheet must occur before any style usage.
- The font table must precede any reference to a font.
- The **\deff** keyword must precede any text without an explicit reference to a font, because it specifies the font to use in such cases.

RTF Version

An entire RTF file is considered a group and must be enclosed in braces. The **\rtf*N*** control word must follow the opening brace. The numeric parameter ***N*** identifies the major version of the RTF Specification used. The RTF standard described in this specification, although titled as version 1.7, continues to correspond syntactically to RTF Specification version 1. Therefore, the numeric parameter ***N*** for the **\rtf** control word should still be emitted as 1.

Character Set

After specifying the RTF version, you must declare the character set used in this document. The control word for the character set must precede any plain text or any table control words. The RTF Specification currently supports the following character sets.

Control word	Character set
\ansi	ANSI (the default)
\mac	Apple Macintosh
\pc	IBM PC code page 437
\pca	IBM PC code page 850, used by IBM Personal System/2 (not implemented in version 1 of Microsoft Word for OS/2)

Unicode RTF

Word 2002 is a Unicode-enabled application. Text is handled using the 16-bit Unicode character encoding scheme. Expressing this text in RTF requires a new mechanism, because until this release (version 1.6), RTF has only handled 7-bit characters directly and 8-bit characters encoded as hexadecimal. The Unicode mechanism described here can be applied to any RTF destination or body text.

Control word	Meaning
\ansicpg*N*	This keyword represents the ANSI code page used to perform the Unicode to ANSI conversion when writing RTF text. ***N*** represents the code page in decimal. This is typically set to the default ANSI code page of the run-time environment (for example, **\ansicpg1252** for U.S. Windows). The reader can use the same ANSI code page to convert ANSI text back to Unicode. Possible values include the following: 437 United States IBM 708 Arabic (ASMO 708) 709 Arabic (ASMO 449+, BCON V4) 710 Arabic (transparent Arabic) 711 Arabic (Nafitha Enhanced) 720 Arabic (transparent ASMO) 819 Windows 3.1 (United States and Western Europe) 850 IBM multilingual 852 Eastern European 860 Portuguese 862 Hebrew 863 French Canadian 864 Arabic 865 Norwegian 866 Soviet Union 874 Thai 932 Japanese 936 Simplified Chinese 949 Korean 950 Traditional Chinese 1250 Windows 3.1 (Eastern European) 1251 Windows 3.1 (Cyrillic) 1252 Western European 1253 Greek 1254 Turkish 1255 Hebrew 1256 Arabic 1257 Baltic 1258 Vietnamese 1361 Johab This keyword should be emitted in the RTF header section right after the **\ansi**, **\mac**, **\pc** or **\pca** keyword.

Control word	Meaning
\upr	This keyword represents a destination with two embedded destinations, one represented using Unicode and the other using ANSI. This keyword operates in conjunction with the **\ud** keyword to provide backward compatibility. The general syntax is as follows: `{\upr{keyword ansi_text}{\*\ud{keyword Unicode_text}}}` Notice that this keyword destination does not use the ***** keyword; this forces the old RTF readers to pick up the ANSI representation and discard the Unicode one.
\ud	This is a destination that is represented in Unicode. The text is represented using a mixture of ANSI translation and use of **\u*N*** keywords to represent characters that do not have the exact ANSI equivalent.
\u*N*	This keyword represents a single Unicode character that has no equivalent ANSI representation based on the current ANSI code page. ***N*** represents the Unicode character value expressed as a decimal number. This keyword is followed immediately by equivalent character(s) in ANSI representation. In this way, old readers will ignore the **\u*N*** keyword and pick up the ANSI representation properly. When this keyword is encountered, the reader should ignore the next ***N*** characters, where ***N*** corresponds to the last **\uc*N*** value encountered. As with all RTF keywords, a keyword-terminating space may be present (before the ANSI characters) that is not counted in the characters to skip. While this is not likely to occur (or recommended), a **\bin** keyword, its argument, and the binary data that follows are considered one character for skipping purposes. If an RTF scope delimiter character (that is, an opening or closing brace) is encountered while scanning skippable data, the skippable data is considered to be ended before the delimiter. This makes it possible for a reader to perform some rudimentary error recovery. To include an RTF delimiter in skippable data, it must be represented using the appropriate control symbol (that is, escaped with a backslash,) as in plain text. Any RTF control word or symbol is considered a single character for the purposes of counting skippable characters. An RTF writer, when it encounters a Unicode character with no corresponding ANSI character, should output **\u*N*** followed by the best ANSI representation it can manage. Also, if the Unicode character translates into an ANSI character stream with count of bytes differing from the current Unicode Character Byte Count, it should emit the **\uc*N*** keyword prior to the **\u*N*** keyword to notify the reader of the change. RTF control words generally accept signed 16-bit numbers as arguments. For this reason, Unicode values greater than 32767 must be expressed as negative numbers.
\uc*N*	This keyword represents the number of bytes corresponding to a given **\u*N*** Unicode character. This keyword may be used at any time, and values are scoped like character properties. That is, a **\uc*N*** keyword applies only to text following the keyword, and within the same (or deeper) nested braces. On exiting the group, the previous **\uc** value is restored. The reader must keep a stack of counts seen and use the most recent one to skip the appropriate number of characters when it encounters a **\u*N*** keyword. When leaving an RTF group that specified a **\uc** value, the reader must revert to the previous value. A default of 1 should be assumed if no **\uc** keyword has been seen in the current or outer scopes. A common practice is to emit no ANSI representation for Unicode characters within a Unicode destination context (that is, inside a **\ud** destination). Typically, the destination will contain a **\uc0** control sequence. There is no need to reset the count on leaving the **\ud** destination, because the scoping rules will ensure the previous value is restored.

Document Text

Document text should be emitted as ANSI characters. If there are Unicode characters that do not have corresponding ANSI characters, they should be output using the **\uc*N*** and **\u*N*** keywords.

For example, the text **LabΓValue** (Unicode characters 0x004c, 0x0061, 0x0062, 0x0393, 0x0056, 0x0061, 0x006c, 0x0075, 0x0065) should be represented as follows (assuming a previous **\ucl)**:

```
Lab\u915GValue
```

Destination Text

Destination text is defined as any text represented in an RTF destination. A good example is the bookmark name in the **\bkmkstart** destination.

Any destination containing Unicode characters should be emitted as two destinations within a **\upr** destination to ensure that old readers can read it properly and that no Unicode character encoding is lost when read with a new reader.

For example, a bookmark name **LabΓValue** (Unicode characters 0x004c, 0x0061, 0x0062, 0x0393, 0x0056, 0x0061, 0x006c, 0x0075, 0x0065) should be represented as follows:

```
{\upr{\*\bkmkstart LabGValue}{\*\ud{\*\bkmkstart Lab\u915Value}}}
```

The first subdestination contains only ANSI characters and is the representation that old readers will see. The second subdestination is a ***\ud** destination that contains a second copy of the **\bkmkstart** destination. This copy can contain Unicode characters and is the representation that Unicode-aware readers must pay attention to, ignoring the ANSI-only version.

Default Fonts

Default font settings can be used to tell the program what regional settings are appropriate as defaults. For example, having a Japanese font set in **\stshfdbch*N*** would tell Word to enable Japanese formatting options. ***N*** refers to an entry in the font table.

<deffont>	**\stshfdbch*N* \stshfloch*N* \stshfhich*N* \stshfbi**
\stshfdbch*N*	Defines what font should be used by default in the style sheet for Far East characters.
\stshfloch*N*	Defines what font should be used by default in the style sheet for ACSII characters.
\stshfhich*N*	Defines what font should be used by default in the style sheet for High-ANSI characters.
\stshfbi	Defines what font should be used by default in the style sheet for Complex Scripts (BiDi) characters.

Default font settings can be used to tell the program what regional settings are appropriate as defaults. For example, having a Japanese font set in **\stshfdbch*N*** would tell Word to enable Japanese formatting options. ***N*** refers to an entry in the font table.

Font Table

The **\fonttbl** control word introduces the font table group. Unique **\f*N*** control words define each font available in the document, and are used to reference that font throughout the document. The font table group has the following syntax.

<fonttbl> '{' **\fonttbl** (<fontinfo> | ('{' <fontinfo> '}'))+ '}'

<fontinfo>	<fontnum> <fontfamily> <fcharset>? <fprq>? <panose>? <nontaggedname>? <fontemb>? <codepage>? <fontname> <fontaltname>? ';'
<fontnum>	***f***
<fontfamily>	**\fnil** | **\froman** | **\fswiss** | **\fmodern** | **\fscript** | **\fdecor** | **\ftech** | **\fbidi**
<fcharset>	***fcharset***
<fprq>	***fprq***
<panose>	<data>
<nontaggedname>	***fname*
<fontname>	#PCDATA
<fontaltname>	'{***'** **\falt** #PCDATA '}'
<fontemb>	'{*' **\fontemb** <fonttype> <fontfname>? <data>? '}'
<fonttype>	**\ftnil** | **\fttruetype**
<fontfname>	'{*' **\fontfile** <codepage>? #PCDATA '}'
<codepage>	***cpg***

Note for <fontemb> that either <fontfname> or <data> must be present, although both may be present.

All fonts available to the RTF writer can be included in the font table, even if the document doesn't use all the fonts.

RTF also supports font families so that applications can attempt to intelligently choose fonts if the exact font is not present on the reading system. RTF uses the following control words to describe the various font families.

Control word	Font family	Examples
\fnil	Unknown or default fonts (the default)	Not applicable
\froman	Roman, proportionally spaced serif fonts	Times New Roman, Palatino
\fswiss	Swiss, proportionally spaced sans serif fonts	Arial
\fmodern	Fixed-pitch serif and sans serif fonts	Courier New, Pica
\fscript	Script fonts	Cursive
\fdecor	Decorative fonts	Old English, ITC Zapf Chancery
\ftech	Technical, symbol, and mathematical fonts	Symbol
\fbidi	Arabic, Hebrew, or other bidirectional font	Miriam

If an RTF file uses a default font, the default font number is specified with the **\deff*N*** control word, which must precede the font-table group. The RTF writer supplies the default font number used in the creation of the document as the numeric argument ***N***. The RTF reader then translates this number through the font table into the most similar font available on the reader's system.

The following control words specify the character set, alternative font name, pitch of a font in the font table, and nontagged font name.

Control word	Meaning

Control word	Meaning
\fcharset*N*	Specifies the character set of a font in the font table. Values for ***N*** are defined by Windows header files: 0 ANSI 1 Default 2 Symbol 3 Invalid 77 Mac 128 Shift Jis 129 Hangul 130 Johab 134 GB2312 136 Big5 161 Greek 162 Turkish 163 Vietnamese 177 Hebrew 178 Arabic 179 Arabic Traditional 180 Arabic user 181 Hebrew user 186 Baltic 204 Russian 222 Thai 238 Eastern European 254 PC 437 255 OEM
\falt	Indicates alternate font name to use if the specified font in the font table is not available. '**{*' \falt** <Alternate Font Name>'**}**'
\fprq*N*	Specifies the pitch of a font in the font table.
***\panose**	Destination keyword. This destination contains a 10-byte Panose 1 number. Each byte represents a single font property as described by the Panose 1 standard specification.
***\fname**	This is an optional control word in the font table to define the nontagged font name. This is the actual name of the font without the tag, used to show which character set is being used. For example, Arial is a nontagged font name, and Arial (Cyrillic) is a tagged font name. This control word is used by WordPad. Word ignores this control word (and never creates it).

Control word	Meaning
\fbias*N*	Used to arbitrate between two fonts when a particular character can exist in either non-Far East or Far East font. Word 97 through Word 2002 emit the **\fbiasN** keyword only in the context of bullets or list information (that is, a **\listlevel** destination). The default value of 0 for **N** indicates a non-Far East font. A value of 1 indicates a Far East font. Additional values may be defined in future releases.

If **\fprq** is specified, the ***N*** argument can be one of the following values.

Pitch	Value
Default pitch	0
Fixed pitch	1
Variable pitch	2

Font Embedding

RTF supports embedded fonts with the **\fontemb** group located inside a font definition. An embedded font can be specified by a file name, or the actual font data may be located inside the group. If a file name is specified, it is contained in the **\fontfile** group. The **\cpg** control word can be used to specify the character set for the file name.

RTF supports TrueType® and other embedded fonts. The type of the embedded font is described by the following control words.

Control word	Embedded font type
\ftnil	Unknown or default font type (the default)
\fttruetype	TrueType font

Code Page Support

A font may have a different character set from the character set of the document. For example, the Symbol font has the same characters in the same positions both on the Macintosh and in Windows. RTF describes this with the **\cpg** control word, which names the character set used by the font. In addition, file names (used in field instructions and in embedded fonts) may not necessarily be the same as the character set of the document; the **\cpg** control word can change the character set for these file names as well. However, all RTF documents must still declare a character set (that is, **\ansi**, **\mac**, **\pc**, or **\pca**) to maintain backward compatibility with earlier RTF readers.

The following table describes valid values for **\cpg**.

Value	Description
437	United States IBM
708	Arabic (ASMO 708)
709	Arabic (ASMO 449+, BCON V4)
710	Arabic (transparent Arabic)
711	Arabic (Nafitha Enhanced)
720	Arabic (transparent ASMO)
819	Windows 3.1 (United States and Western Europe)
850	IBM multilingual

Value	Description
852	Eastern European
860	Portuguese
862	Hebrew
863	French Canadian
864	Arabic
865	Norwegian
866	Soviet Union
874	Thai
932	Japanese
936	Simplified Chinese
949	Korean
950	Traditional Chinese
1250	Windows 3.1 (Eastern European)
1251	Windows 3.1 (Cyrillic)
1252	Western European
1253	Greek
1254	Turkish
1255	Hebrew
1256	Arabic
1257	Baltic
1258	Vietnamese
1361	Johab

File Table

The **\filetbl** control word introduces the file table destination. The only time a file table is created in RTF is when the document contains subdocuments. The file table group defines the files referenced in the document and has the following syntax:

<filetbl>	'{*' **\filetbl** ('{' <fileinfo> '}')+ '}'
<fileinfo>	**file** <filenum><relpath>?<osnum>? <filesource>+ <file name>
<filenum>	***fid***
<relpath>	***frelative***
<osnum>	***fosnum***
<filesource>	**\fvalidmac** | **\fvaliddos** | **\fvalidntfs** | **\fvalidhpfs** | **\fnetwork | \fnonfilesys**
<file name>	#PCDATA

Note that the file name can be any valid alphanumeric string for the named file system, indicating the complete path and file name.

Control word	Meaning
\filetbl	A list of documents referenced by the current document. The file table has a structure analogous to the style or font table. This is a destination control word output as part of the document header.
\file	Marks the beginning of a file group, which lists relevant information about the referenced file. This is a destination control word.
\fid*N*	File ID number. Files are referenced later in the document using this number.
\frelative*N*	The character position within the path (starting at 0) where the referenced file's path starts to be relative to the path of the owning document. For example, if a document is saved to the path C:\Private\Resume\File1.doc and its file table contains the path C:\Private\Resume\Edu\File2.doc, then that entry in the file table will be **\frelative**18, to point at the character "e" in "edu". This allows preservation of relative paths.
\fosnum*N*	Currently only filled in for paths from the Macintosh file system. It is an operating system–specific number for identifying the file, which may be used to speed up access to the file or find the file if it has been moved to another folder or disk. The Macintosh operating system name for this number is the "file id." Additional meanings of the **\fosnum*N*** control word may be defined for other file systems in the future.
\fvalidmac	Macintosh file system.
\fvaliddos	MS-DOS file system.
\fvalidntfs	NTFS file system.
\fvalidhpfs	HPFS file system.
\fnetwork	Network file system. This control word may be used in conjunction with any of the previous file source control words.
\fnonfilesys	Indicates http/odma.

Color Table

The **\colortbl** control word introduces the color table group, which defines screen colors, character colors, and other color information. The color table group has the following syntax:

<colortbl>	'{' **\colortbl** <colordef>+ '}'
<colordef>	***red*** ? & ***green*** ? & ***blue*** ? ';'

The following are valid control words for this group.

Control word	Meaning
\red*N*	Red index
\green*N*	Green index
\blue*N*	Blue index

Each definition must be delimited by a semicolon, even if the definition is omitted. If a color definition is omitted, the RTF reader uses its default color. The following example defines the default color table used by Word. The first color is omitted, as shown by the semicolon following the **\colortbl** control word. The missing definition indicates that color 0 is the ''auto'' color.

```
{\colortbl;\red0\green0\blue0;\red0\green0\blue255;\red0\green255\blue255;\red0\green255\blue0;\red2
55\green0\blue255;\red255\green0\blue0;\red255\green255\blue0;\red255\green255\blue255;\red0\green0\
```

```
blue128;\red0\green128\blue128;\red0\green128\blue0;\red128\green0\blue128;\red128\green0\blue0;\red
128\green128\blue0;\red128\green128\blue128;\red192\green192\blue192;}
```

The foreground and background colors use indexes into the color table to define a color. For more information on color setup, see your Windows documentation.

The following example defines a block of text in color (where supported). Note that the **cf**/**cb** index is the index of an entry in the color table, which represents a red/green/blue color combination.

```
{\f1\cb1\cf2 This is colored text. The background is color
1 and the foreground is color 2.}
```

If the file is translated for software that does not display color, the reader ignores the color table group.

Style Sheet

The **\stylesheet** control word introduces the style sheet group, which contains definitions and descriptions of the various styles used in the document. All styles in the document's style sheet can be included, even if not all the styles are used. In RTF, a style is a form of shorthand used to specify a set of character, paragraph, or section formatting.

The style sheet group has the following syntax:

<stylesheet>	'{' **\stylesheet** <style>+ '}'
<style>	'{' <styledef>?<keycode>? <formatting> <additive>? <based>? <next>? <autoupd>? <hidden>? <personal>? <compose>? <reply>? <styleid>? <semihidden>? <stylename>? ';' '}'
<styledef>	**\s** |***\cs** | **\ds | \ts\tsrowd**
<keycode>	'{' **\keycode** <keys> '}'
<keys>	(**\shift**? & **\ctrl**? & **\alt**?) <key>
<key>	**\fn** | #PCDATA
<additive>	**\additive**
<based>	**\sbasedon**
<next>	**\snext**
<autoupd>	**\sautoupd**
<hidden>	**\shidden**
<personal>	**\spersonal**
<compose>	**\scompose**
<reply>	**\sreply**
<formatting>	(<brdrdef> | <parfmt> | <apoctl> | <tabdef> | <shading> | <chrfmt>)+
<styleid>	**\styrsidN**
<semihidden>	**\ssemihidden**
<stylename>	#PCDATA

For <style>, both <styledef> and <stylename> are optional; the default is paragraph style 0. Note for <stylename> that Microsoft Word for the Macintosh interprets commas in #PCDATA as separating style synonyms. Also, for <key>, the data must be exactly one character.

Control word	Meaning

Control word	Meaning
\cs*N	Designates character style. Like **\s**, **\cs** is not a destination control word. However, it is important to treat it like one inside the style sheet; that is, **\cs** must be prefixed with ***** and must appear as the first item inside a group. Doing so ensures that readers that do not understand character styles will skip the character style information correctly. When used in body text to indicate that a character style has been applied, do not include the ***** prefix.
\s*N*	Designates paragraph style.
\ds*N*	Designates section style.
\ts*N*	Designates table style, in the same style as **\cs** for placement and prefixes.
\tsrowd	Like **\trowd** but for table style definitions.
\additive	Used in a character style definition ('**{*'\cs**…'}'). Indicates that character style attributes are to be added to the current paragraph style attributes, rather than setting the paragraph attributes to only those defined in the character style definition.
\sbasedon*N*	Defines the number of the style on which the current style is based (the default is 222—no style).
\snext*N*	Defines the next style associated with the current style; if omitted, the next style is the current style.
\sautoupd	Automatically update styles.
\shidden	Style does not appear in the **Styles** drop-down list in the **Style** dialog box[1] (on the **Format** menu, click **Styles**).
\spersonal	Style is a personal e-mail style.
\scompose	Style is the e-mail compose style.
\sreply	Style is the e-mail reply style.
\styrsid*N*	Tied to the rsid table, ***N*** is the rsid of the author who implemented the style.
\ssemihidden	Style does not appear in drop-down menus.
\keycode	This group is specified within the description of a style in the style sheet in the RTF header. The syntax for this group is '**{***'**keycode** <keys>**}**' where <*keys*> are the characters used in the key code. For example, a style, Normal, may be defined {\s0 {*\keycode \shift\ctrl n}Normal;} within the RTF style sheet. See the Special Character control words for the characters outside the alphanumeric range that may be used.
\alt	The ALT modifier key. Used to describe shortcut key codes for styles.
\shift	The SHIFT modifier key. Used to describe shortcut key codes for styles.
\ctrl	The CTRL modifier key. Used to describe shortcut key codes for styles.
\fn*N*	Specifies a function key where ***N*** is the function key number. Used to describe shortcut-key codes for styles.

Table Styles

Word 2002 introduced table styles. Table styles are like other styles in that they contain properties to be shared by many tables. Unlike other styles, table styles allow for conditional formatting, such as specifically

[1] The hidden style property can only be accessed using Microsoft Visual Basic® for Applications.

coloring the first row.

To address the issue of older readers opening newer RTF files, raw properties were implemented. Older readers can still see the regular properties and edit them, but newer readers should be able to read the RTF back in and not lose any style functionality. This leaves two types of properties, those applied by older emitters that are readable by older readers, and those the user applied directly to override aspects of the style. The user-applied changes are referred to as “raw” and have a higher priority than their non-raw counterparts.

The following table describes keywords available for style definitions. Any older table formatting properties may be used as well.

Control word	Meaning
\tscellwidth*N*	Currently emitted but has no effect.
\tscellwidthfts*N*	Currently emitted but has no effect.
\tscellpaddt*N*	Top padding value.
\tscellpaddl*N*	Left padding value.
\tscellpaddr*N*	Right padding value
\tscellpaddb*N*	Bottom padding value
\tscellpaddft*N*	Units for ***tscellpaddtN***
	0 Auto
	3 Twips
\tscellpaddfl*N*	Units for **\tscellpaddl*N***
	0 Auto
	3 Twips
\tscellpaddfr*N*	Units for **\tscellpaddr*N***
	0 Auto
	3 Twips
\tscellpaddfb*N*	Units for **\tscellpaddb*N***
	0 Auto
	3 Twips
\tsvertalt	Top vertical alignment of cell
\tsvertalc	Center vertical alignment of cell
\tsvertalb	Bottom vertical alignment of cell
\tsnowrap	No cell wrapping
\tscellcfpat	Foreground cell shading color
\tscellcbpat*N*	Background cell shading color

Control word	Meaning
\tscellpct*N*	Cell shading percentage – ***N*** is the shading of a table cell in hundredths of a percent
\tsbgbdiag	Cell shading pattern – backward diagonal (////)
\tsbgfdiag	Cell shading pattern – forward diagonal (\\\\)
\tsbgdkbdiag	Cell shading pattern – dark backward diagonal (////)
\tsbgdkfdiag	Cell shading pattern – dark forward diagonal (\\\\)
\tsbgcross	Cell shading pattern – cross
\tsbgdcross	Cell shading pattern – diagonal cross
\tsbgdkcross	Cell shading pattern – dark cross
\tsbgdkdcross	Cell shading pattern – dark diagonal cross
\tsbghoriz	Cell shading pattern – horizontal
\tsbgvert	Cell shading pattern – vertical
\tsbgdkhor	Cell shading pattern – dark horizontal
\tsbgdkvert	Cell shading pattern – dark vertical
\tsbrdrt	Top border for cell
\tsbrdrb	Bottom border for cell
\tsbrdrl	Left border for cell
\tsbrdrr	Right border for cell
\tsbrdrh	Horizontal (inside) border for cell
\tsbrdrv	Vertical (inside) border for cell
\tsbrdrdgl	Diagonal (top left to bottom right) border for cell
\tsbrdrdgr	Diagonal (bottom left to top right) border for cell
\tscbandsh*N*	Count of rows in a row band
\tscbandsv*N*	Count of cells in a cell band

The following is an example of an RTF style sheet:

```
{\stylesheet{\ql \li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 \snext0 Normal;}{\*\cs10 \additive Default
Paragraph Font;}{\*\cs15 \additive \b\ul\cf6 \sbasedon10 UNDERLINE;}
{\*\ts11\tsrowd\trftsWidthB3\trpaddl108\trpaddr108\trpaddfl3
\trpaddft3\trpaddfb3\trpaddfr3\tscellwidthfts0\tsvertalt\tsbrdrt\tsbrdrl\tsbrdrb\tsbrdrr\tsbrdrdgl\t
sbrdrdgr\tsbrdrh\tsbrdrv \ql \li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0 \lin0\itap0
\fs20\lang1024\langfe1024\cgrid\langnp1024 \langfenp1024 \snext11 \ssemihidden Normal
Table;  }{\s16\qc \li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\b\fs24\cf2\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 \sbasedon0 \snext16 \sautoupd
CENTER;}}
```

and RTF paragraphs to which the styles are applied:

```
\pard\plain \ql \li0\ri0\widctlpar\aspalpha\aspnum\faauto\outlinelevel0\adjustright\rin0\lin0\itap0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {This is the Normal Style
\par }\pard \ql \li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
{\par }\pard\plain \s16\qc \li0\ri0\widctlpar\aspalpha\aspnum\faauto\outlinelevel0\adjustright
\rin0\lin0\itap0 \b\fs24\cf2\lang1033\langfe1033\cgrid\langnp1033\langfenp1033
{This is a centered paragraph with blue, bold font. I call the style CENTER.\par }
\pard\plain \ql \li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033
{\par The word \'93}{\cs15\b\ul\cf6 style}{\'94 is red and underlined. I used a style I called
```

```
UNDERLINE.\par }
```

Some of the control words in this example are discussed in later sections. In the example, note that the properties of the style were emitted following the application of the style. This was done for two reasons: (1) to allow RTF readers that don't support styles to still retain all formatting; and (2) to allow the additive model for styles, where additional property changes are "added" on top of the defined style. Some RTF readers may not "apply" a style upon only encountering the style number without the accompanying formatting information because of this.

List Tables

Word 97, Word 2000, and Word 2002 store bullets and numbering information very differently from earlier versions of Word. In Word 6.0, for example, number formatting data is stored individually with each paragraph. In Word 97 and later versions, however, all of the formatting information is stored in a pair of document-wide list tables that act as a style sheet, and each individual paragraph stores only an index to one of the tables, like a style index.

There are two list tables in Word: the List table (destination **\listtable**), and the List Override table (destination **\listoverridetable).**

List Table

The first table Word stores is the List table. A List table is a list of lists (destination **\list**). Each list contains a number of list properties that pertain to the entire list, and a list of levels (destination **\listlevel)**, each of which contains properties that pertain only to that level. The **\listpicture** destination contains all of the picture bullets used in the document, with a **\shppict** headed list of **\pict** entries. These are referenced within the list by the **\levelpicture*N*** keyword, with ***N*** referring to an element in the list, starting at 0.

The syntax for the List table is as follows:

<listtable>	'{' ***\listtable*** <listpicture>? <list>+ '}'
<listpicture>	'{' ***\listpicture*** <shppictlist> '}'
<list>	**\list *listemplateid*** & (**\listsimple** | **listhybrid**)? & <listlevel>+ & **\listrestarthdn** & ***listid*** & (**\listname** #PCDATA ';') **\liststyleid**? **\liststylename**?
<listlevel>	<number> <justification> **& \leveljcn*N***? & **\levelstartat*N*** & (**\levelold*N*** & **\levelprev*N***? & **\levelprevspace*N***? & **\levelspace*N***? & **\levelindent*N***?)? & <leveltext> & <levelnumbers> & **\levelfollow*N*** & **\levellegal*N***? & **\levelnorestart*N***? & <chrfmt>? & **\levelpicture*N*** *&* ***li***? & ***fi***? & (\jclisttab ***tx***)?
<number>	**\levelnfc*N* | \levelnfcn*N* |** (**\levelnfc*N*** *&* **\levelnfcn*N***)
<justification>	**\leveljc*N*** | **\leveljcn*N*** | (**\leveljc*N*** & **\leveljcn*N***)
<leveltext>	'{' **\leveltext *leveltemplateid***? #SDATA ';' '}'
<levelnumbers>	'{' **\levelnumbers** #SDATA ';' '}'

Top-Level List Properties

Control word	Meaning
\listid*N*	Each list must have a unique list ID that should be randomly generated. The value ***N*** is a long integer. The list ID cannot be between –1 and –5.
\listtemplateid*N*	Each list should have a unique template ID as well, which also should be randomly generated. The template ID cannot be –1. The value ***N*** is a long integer.
\listsimple*N*	1 if the list has one level; 0 (default) if the list has nine levels.

Control word	Meaning
\listhybrid	Present if the list has 9 levels, each of which is the equivalent of a simple list. Only one of **\listsimple** and **\listhybrid** should be present. Word 2000 will write lists with the **\listhybrid** property.
\listrestarthdn*N*	1 if the list restarts at each section; 0 if not. Used for Word 7.0 compatibility only.
\listname	The argument for **\listname** is a string that is the name of this list. Names allow ListNum fields to specify the list they belong to. This is a destination control word.
\liststyleid*N*	This identifies the style of this list from the list style definition that has this ID as its **\listid**. There can be more than one list style reference to a list style definition. This keyword follows the same numbering convention as **\listid**. **\liststyleid*N*** and **\liststylename** are exclusive; either zero or one of each can exist per **\list** definition, but never both.
\liststylename	Identifies this list as a list style definition. This creates a new list style with the given name and the properties of the current list. **\liststyleid*N*** and **\liststylename** are exclusive; either zero or one of each can exist per **\list** definition, but never both.

While Word 97 emitted simple or multilevel (not simple) lists, Word 2000 and Word 2002 emit hybrid lists, which are essentially collections of simple lists. The main difference between Word 2000 and Word 2002 hybrid lists and Word 97 multilevel lists is that each level of a hybrid list has a unique identifier.

List Levels

Each list consists of either one or nine list levels depending upon whether the **\listsimple** flag is set. Each list level contains a number of properties that specify the formatting for that level, such as the start-at value, the text string surrounding the number, its justification and indents, and so on.

Control word	Meaning
\levelstartat*N*	***N*** specifies the start-at value for the level.

Control word	Meaning	
\levelnfc*N*	Specifies the number type for the level:	
	0	Arabic (1, 2, 3)
	1	Uppercase Roman numeral (I, II, III)
	2	Lowercase Roman numeral (i, ii, iii)
	3	Uppercase letter (A, B, C)
	4	Lowercase letter (a, b, c)
	5	Ordinal number (1st, 2nd, 3rd)
	6	Cardinal text number (One, Two Three)
	7	Ordinal text number (First, Second, Third)
	10	Kanji numbering without the digit character (*dbnum1)
	11	Kanji numbering with the digit character (*dbnum2)
	12	46 phonetic katakana characters in "aiueo" order (*aiueo)
	13	46 phonetic katakana characters in "iroha" order (*iroha)
	14	Double-byte character
	15	Single-byte character
	16	Kanji numbering 3 (*dbnum3)
	17	Kanji numbering 4 (*dbnum4)
	18	Circle numbering (*circlenum)
	19	Double-byte Arabic numbering
	20	46 phonetic double-byte katakana characters (*aiueo*dbchar)
	21	46 phonetic double-byte katakana characters (*iroha*dbchar)
	22	Arabic with leading zero (01, 02, 03, ..., 10, 11)
	23	Bullet (no number at all)
	24	Korean numbering 2 (*ganada)
	25	Korean numbering 1 (*chosung)
	26	Chinese numbering 1 (*gb1)
	27	Chinese numbering 2 (*gb2)
	28	Chinese numbering 3 (*gb3)
	29	Chinese numbering 4 (*gb4)
	30	Chinese Zodiac numbering 1 (* zodiac1)
	31	Chinese Zodiac numbering 2 (* zodiac2)
	32	Chinese Zodiac numbering 3 (* zodiac3)
	33	Taiwanese double-byte numbering 1
	34	Taiwanese double-byte numbering 2
	35	Taiwanese double-byte numbering 3
	36	Taiwanese double-byte numbering 4
	37	Chinese double-byte numbering 1
	38	Chinese double-byte numbering 2
	39	Chinese double-byte numbering 3
	40	Chinese double-byte numbering 4

Control word	Meaning
\leveljc*N*	0 Left justified 1 Center justified 2 Right justified
\levelnfcn*N*	Same arguments as **\levelnfc**. Takes priority over **\levelnfc** if both are present. In Word 97 **\levelnfc** was interpreted differently by the Hebrew/Arabic versions. **\levelnfcn*N*** in Word 2000 and Word 2002 eliminates dual interpretation, while **\levelnfc** is still needed for backward compatibility.
\leveljcn*N*	0 Left justified for left-to-right paragraphs and right justified for right-to-left paragraphs 1 Center justified 2 Right justified for left-to-right paragraphs and left justified for right-to-left paragraphs Word 2000 and Word 2002 prefer **\leveljcn*N*** over **\leveljc** if both are present, but it will be written for backward compatibility with older readers.
\leveloldN	1 if this level was converted from Word 6.0 or Word 7.0; 0 if it is a native Word 97 through Word 2002 level.
\levelprev*N*	1 if this level includes the text from the previous level (used for Word 7.0 compatibility only); otherwise, the value is 0. This keyword will only be valid if the **\leveloldN** keyword is emitted.
\levelprevspace*N*	1 if this level includes the indentation from the previous level (used for Word 7.0 compatibility only); otherwise, the value is 0. This keyword will only be valid if the **\leveloldN** keyword is emitted.
\levelindent*N*	Minimum distance from the left indent to the start of the paragraph text (used for Word 7.0 compatibility only). This keyword will only be valid if the **\levelold*N*** keyword is emitted.
\levelspace*N*	Minimum distance from the right edge of the number to the start of the paragraph text (used for Word 7.0 compatibility only). This keyword will only be valid if the **\levelold*N*** keyword is emitted.
\leveltext	If the list is hybrid, as indicated by **\listhybrid**, the **\leveltemplateid*N*** keyword will be included, whose argument is a unique level ID that should be randomly generated. The value ***N*** is a long integer. The level ID cannot be between –1 and –5. The second argument for this destination should be the number format string for this level. The first character is the length of the string, and any numbers within the level should be replaced by the index of the level they represent. For example, a level three number such as “1.1.1.” would generate the following RTF: “**{\leveltext \leveltemplateid*N* \'06\'00.\'01.\'02.}**” where the ’06 is the string length, the \’00, \’01, and \’02 are the level placeholders, and the periods are the surrounding text. This is a destination control word.
\levelnumbers	The argument for this destination should be a string that gives the offsets into the **\leveltext** of the level placeholders. In the preceding example, “1.1.1.”, the **\levelnumbers** RTF should be `{\levelnumbers \’01\’03\’05}` because the level placeholders have indices 1, 3, and 5. This is a destination control word.

Control word	Meaning
\levelfollow*N*	Specifies which character follows the level text: 0 Tab 1 Space 2 Nothing
\levellegal*N*	1 if any list numbers from previous levels should be converted to Arabic numbers; 0 if they should be left with the format specified by their own level's definition.
\levelnorestart*N*	1 if this level does not restart its count each time a number of a higher level is reached; 0 if this level does restart its count each time a number of a higher level is reached.
\levelpicture*N*	Determines which picture bullet from the **\listpicture** destination should be applied.

In addition to all of these properties, each list level can contain any character properties (all of which affect all text for that level) and any combination of three paragraph properties: left indents, first line left indents, and tabs—each of which must be of a special type: **jclisttab**. These paragraph properties will be automatically applied to any paragraph in the list.

List Override Table

The List Override table is a list of list overrides (destination **\listoverride**). Each list override contains the **listid** of one of the lists in the List table, as well as a list of any properties it chooses to override. Each paragraph will contain a list override index (keyword **ls**), which is a 1-based index into this table. Most list overrides don't override any properties—instead, they provide a level of indirection to a list. There are generally two types of list overrides: (1) formatting overrides, which allow a paragraph to be part of a list and are numbered along with the other members of the list, but have different formatting properties; and (2) start-at overrides, which allow a paragraph to share the formatting properties of a list, but have different start-at values. The first element in the document with each list override index takes the start-at value that the list override specifies as its value, while each subsequent element is assigned the number succeeding the previous element of the list.

List overrides have a few top-level keywords, including a **\listoverridecount**, which contains a count of the number of levels whose format is overridden. This **\listoverridecount** should always be either 1 or 9, depending upon whether the list to be overridden is simple or hybrid/multilevel. All of the actual override information is stored within a list of list override levels (destination **\lfolevel**).

Control word	Meaning
\listid*N*	Should exactly match the **\listid** of one of the lists in the List table. The value ***N*** is a long integer.
\listoverridecount*N*	Number of list override levels within this list override (1 or 9).
\ls	The (1-based) index of this **\listoverride** in the **\listoverride** table. This value should never be zero inside a **\listoverride** and must be unique for all **\listoverride**s within a document. The valid values are from 1 to 2000.

List Override Level

Each list override level contains flags to specify whether the formatting or start-at values are being overridden for each level. If the format flag (**listoverrideformat**) is given, the **lfolevel** should also contain a list level (**listlevel**). If the start-at flag (**listoverridestartat**) is given, a start-at value must be provided. If the start-at is overridden but the

format is not, then a **levelstartat** should be provided in the **lfolevel** itself. If both start-at and format are overridden, put the **levelstartat** inside the **listlevel** contained in the **lfolevel**.

Control word	Meaning
\listoverridestartat	Indicates an override of the start-at value.
\listoverrideformat*N*	Number of list override levels within this list override (should be either 1 or 9).

Paragraph Group Properties

Word 2002 introduced paragraph group properties, similar to style sheets. A document making use of these places a **\pgptbl** entry in the header. Elements in the Paragraph Group Properties (PGP) table are entered as they are created in the document. In the program, the **\ipgp*N*** values are assigned random numbers, but for storage the numbers are converted to numbers in the integer range. Internally, this numbering system is left up to the developer. The formatting options are taken from the regular paragraph formatting options. PGP table entries may exist with different **\ipgp*N*** values but with the same properties. Any paragraph that references an entry in the PGP table does so by emitting **\ipgp*N***, which sets paragraph formatting options according to the entry in the PGP table. Additional formatting options may also be employed.

The PGP syntax is as follows:

<pgptbl> ‘{‘ ***\pgptbl** <entry>+ ‘}’

<entry> ‘{‘ **\pgp**<value> ‘}’

<value> **\ipgp*N***<*parfmt*>+

The following is a sample PGP table with two entries:

```
{\*\pgptbl {\pgp\ipgp13\itap0\li0\ri0\sb0\sa0}{\pgp\ipgp80\itap0\li720\ri0\sb100\sa100}}
```

Track Changes (Revision Marks)

This table allows tracking of multiple authors and reviewers of a document, and is used in conjunction with the character properties for tracking changes (using revision marks).

Control word	Meaning
***\revtbl**	This group consists of subgroups that each identify the author of a revision in the document, as in `{Author1;}`. This is a destination control word. Revision conflicts, such as those that result when one author deletes another's additions, are stored as one group, in the following form: `CurrentAuthor\'00\'<length of previous author's name>PreviousAuthor\'00 PreviousRevisionTime` The 4 bytes of the Date/Time (DTTM) structure are emitted as ASCII characters, so values greater than 127 should be emitted as hexadecimal values enclosed in quotation marks.

All time references for revision marks use the following bit field structure, DTTM.

Bit numbers	Information	Range

Bit numbers	Information	Range
0–5	Minute	0–59
6–10	Hour	0–23
11–15	Day of month	1–31
16–19	Month	1–12
20–28	Year	= Year - 1900
29–31	Day of week	0 (Sun)–6 (Sat)

RSID

In Word 2002, a new style of revision tracking was established. RSIDs (Revision Save IDs) indicate when text or a property was changed. Whenever text is added or deleted or properties are changed, that text or property is tagged with the current "Save ID," which is a random number that changes each time the document is saved. They are primarily used when merging or comparing two documents with a common history but no revision marks. By looking at the RSID we can tell which of the two authors made the change. Without the RSID we can only tell that there is a difference, but we don't know if (for example) it was an addition by author A or a deletion by author B. An RSID table is placed after all other style definitions and before the <generator> and <info> groups.

The syntax for an RSID table is as follows:

<rsidtable> ‘{‘ ***\rsidtbl** <rsidlist>**+** ‘;’ ‘}’

<rsidlist> **\rsidN**

Control word	Meaning
\rsid*N*	Each time a document is saved a new entry is added to this table, with ***N*** being the random number assigned to represent the unique session.
\insrsid*N*	An RSID is inserted to denote the session in which particular text was inserted. Example: {\insrsid8282541 This is text.} For use in lists: {\insrsid8282541 Item in List \par{\listtext\pard\plain\f3\insrsid8282541 \loch\af3\dbch\af0 \hich\f3 \’b7\tab}}
\rsidroot*N*	Designates the start of the document’s history (first save).
\delrsid*N*	RSID value identifying when text was marked as deleted.
\charrsid*N*	RSID value identifying when character formatting was changed.
\sectrsid*N*	RSID identifying when section formatting was changed.
\pararsid*N*	RSID identifying when paragraph formatting was changed.
\tblrsid*N*	RSID identifying when table formatting was changed.

Old Properties

With tracking enabled, changes to formatting can be documented. To keep track of the property before the

changes were made, Old Properties were created. This tracking uses the following syntax:

<oldprop>	'{' *\<oldproptype> <oldproperties>+ <trackinginfo> ';' '}'
<oldproptype>	**\oldcprops | \oldpprops | \oldtprops | \oldsprops**
<oldproperties>	This section includes any of the relevant format tags that would have to be put in place to revert the document to its pre-edit form. For example, this would be "**\b0**" if the user had chosen to make the selection bold.
<trackinginfo>	This can be any tag used to track the author, revision ID, and date.

Control word	Meaning
\oldcprops	Old character formatting properties.
\oldpprops	Old paragraph formatting properties.
\oldtprops	Old table formatting properties.
\oldsprops	Old section formatting properties.

The following is an example of the correct use of the Old Properties when bold and italics are applied to a section of existing text. If the original text "This is a test." is changed to "This ***is a*** test." the following code snippet will be formed, which would tell an RTF reader that to undo the change to the character property bold and italic would have to be disabled:

```
{\rtlch\fcs1 \af0 \ltrch\fcs0 \insrsid2778197 \hich\af0\dbch\af13\loch\f0 This }{\rtlch\fcs1 \ab\af0
\ltrch\fcs0 \b\i\crauth1\crdate1717000906\insrsid2778197\charrsid2778197 {\*\oldcprops
\b0\i0\crauth1\crdate1717000906\insrsid2778197\charrsid2778197 }\hich\af0\dbch\af13\loch\f0 is
a}{\rtlch\fcs1 \af0 \ltrch\fcs0 \insrsid2778197 \hich\af0\dbch\af13\loch\f0  test.}{\rtlch\fcs1 \af0
\ltrch\fcs0 \insrsid15803535
```

Generator

Word 2002 allows the RTF emitter application to stamp the document with its name, version, and build number. The generator area has the following syntax:

<generator>	'{' ***\generator** <name> ';' '}'
<name>	#PCDATA, the name of the program, the version, the build, and any other information about the emitting program can be listed here. Word 2002 lists {*\generator Microsoft Word 10.0.XXXX} in which XXXX is replaced by the build number. Only ASCII text is allowed in this field.

Document Area

Once the RTF header is defined, the RTF reader has enough information to correctly read the actual document text. The document area has the following syntax:

<document> <info>? <docfmt>* <section>+

Information Group

The **\info** control word introduces the information group, which contains information about the document. This can include the title, author, keywords, comments, and other information specific to the file. This information is for use by a document-management utility, if available.

The information group has the following syntax:

<info>	'{' <title>? & <subject>? & <author>? & <manager>? & <company>? <operator>? & <category>? & <keywords>? & <comment>? & ***version*** ? & <doccomm>? & ***vern*** ? & <creatim>? & <revtim>? & <printim>? & <buptim>? & ***edmins*** ? & ***nofpages*** ? & ***nofwords*** ? ***nofchars*** ? & ***id*** ? '}'
<title>	'{' **\title** #PCDATA '}'
<subject>	'{' **\subject** #PCDATA '}'
<author>	'{' **\author** #PCDATA '}'
<manager>	{' **\manager** #PCDATA '}'
<company>	{' **\company** #PCDATA '}'
<operator>	'{' **\operator** #PCDATA '}'
<category>	{' **\category** #PCDATA '}'
<keywords>	'{' **\keywords** #PCDATA '}'
<comment>	'{' **\comment** #PCDATA '}'
<doccomm>	'{' **\doccomm** #PCDATA '}'
<hlinkbase>	'{' **\hlinkbase** #PCDATA '}'
<creatim>	'{' **\creatim** <time> '}'
<revtim>	'{' **\revtim** <time> '}'
<printim>	'{' **\printim** <time> '}'
<buptim>	'{' **\buptim** <time> '}'
<time>	***yr*** ? ***mo*** ? ***dy*** ? ***hr*** ? ***min*** ? **\sec** ?

Some applications, such as Word, ask the user to type this information when saving the document in its native format. If the document is then saved as an RTF file or translated into RTF, the RTF writer specifies this information using control words in the following table. These control words are destinations, and both the control words and the text should be enclosed in braces ({ }).

Control word	Meaning
\title	Title of the document. This is a destination control word.
\subject	Subject of the document. This is a destination control word.
\author	Author of the document. This is a destination control word.
\manager	Manager of the author. This is a destination control word.
\company	Company of the author. This is a destination control word.
\operator	Person who last made changes to the document. This is a destination control word.
\category	Category of the document. This is a destination control word.
\keywords	Selected keywords for the document. This is a destination control word.
\comment	Comments; text is ignored. This is a destination control word.
\version*N*	Version number of the document.
\doccomm	Comments displayed in the **Summary Info** or **Properties** dialog box in Word. This is a destination control word.

Control word	Meaning
\hlinkbase	The base address that is used for the path of all relative hyperlinks inserted in the document. This can be a path or an Internet address (URL).

The **\userprops** control word introduces the user-defined document properties. Unique **\propname** control words define each user-defined property in the document. This group has the following syntax:

<userprops>	'{*' **\userprops** ('{' <propinfo> '}'*) '}'
<propinfo>	<propname> <proptype> <staticval> <linkval>?
<propname>	'{' **\propname** #PCDATA '}'
<proptype>	***proptype***
<staticval>	**\staticval**
<linkval>	**\linkval**

Control word	Meaning
\propname	The name of the user-defined property.
\staticval	The value of the property.
\linkval	The name of a bookmark that contains the text to display as the value of the property.
\proptype*N*	Specifies the type of the property: 3 Integer 5 Real number 7 Date 11 Boolean 30 Text

The RTF writer may automatically enter other control words, including those in the following table.

Control word	Meaning
\vern*N*	Internal version number
\creatim	Creation time
\revtim	Revision time
\printim	Last print time
\buptim	Backup time
\edmins*N*	Total editing time (in minutes)
\yr*N*	Year
\mo*N*	Month
\dy*N*	Day
\hr*N*	Hour
\min*N*	Minute

Control word	Meaning
\sec*N*	Seconds
\nofpages*N*	Number of pages
\nofwords*N*	Number of words
\nofchars*N*	Number of characters including spaces
\nofcharsws*N*	Number of characters not including spaces
\id*N*	Internal ID number

Any control word described in the previous table that does not have a numeric parameter specifies a date; all dates are specified with the **\yr \mo \dy \hr \min \sec** controls. An example of an information group follows:

```
{\info{\title Template}{\author John Doe}{\operator JOHN
DOE}{\creatim\yr1999\mo4\dy27\min1}{\revtim\yr1999\mo4\dy27\min1}{\printim\yr1999\mo3\dy17\hr23\min5
}{\version2}{\edmins2}{\nofpages183}{\nofwords53170}{\nofchars303071}{\*\company
Microsoft}{\nofcharsws372192}{\vern8247}}
```

Document Formatting Properties

After the information group (if there is one), there may be some document formatting control words (described as <docfmt> in the document area syntax description). These control words specify the attributes of the document, such as margins and footnote placement. These attributes must precede the first plain-text character in the document.

The control words that specify document formatting are listed in the following table (measurements are in twips; a twip is one-twentieth of a point). For omitted control words, RTF uses the default values.

Note that the three document-protection control words (**\formprot**, **\revprot**, and **\annotprot**) are mutually exclusive; only one of the three can apply to any given document. Also, there is currently no method for storing passwords in RTF, so any document that associates a password with a protection level will lose the password protection in RTF.

For more information about bidirectional controls, see Bidirectional Language Support in this specification.

Control word	Meaning
\deftab*N*	Default tab width in twips (the default is 720).
\hyphhotz*N*	Hyphenation hot zone in twips (the amount of space at the right margin in which words are hyphenated).
\hyphconsec*N*	***N*** is the maximum number of consecutive lines that will be allowed to end in a hyphen. 0 means no limit.
\hyphcaps	Toggles hyphenation of capitalized words (the default is on). Append 1 or leave control word by itself to toggle property on; append 0 to turn it off.
\hyphauto	Toggles automatic hyphenation (the default is off). Append 1 or leave control word by itself to toggle property on; append 0 to turn it off.
\linestart*N*	Beginning line number (the default is 1).
\fracwidth	Uses fractional character widths when printing (QuickDraw only).
***\nextfile**	The argument is the name of the file to print or index next; it must be enclosed in braces. This is a destination control word.

Control word	Meaning
***\template**	The argument is the name of a related template file; it must be enclosed in braces. This is a destination control word.
\makebackup	Backup copy is made automatically when the document is saved.
\defformat	Tells the RTF reader that the document should be saved in RTF format.
\psover	Prints PostScript over the text.
\doctemp	Document is a boilerplate document. For Word for Windows, this is a template; for Word for the Macintosh, this is a stationery file.
\deflang*N*	Defines the default language used in the document used with a **\plain** control word. See the section on Font/Character Formatting Properties in this Specification for a list of possible values for ***N***.
\deflangfe*N*	Default language ID for Asian/Middle Eastern text in Word.
\windowcaption	Sets the caption text for the document window. This is a string value.
\doctype*N*	An integer (0–2) that describes the document type for AutoFormat. 0 General document (for formatting most documents, the default) 1 Letter (for formatting letters, and used by Letter Wizard) 2 E-mail (for formatting e-mail, and used by WordMail)
\fromtext	Indicates document was originally plain text.
\fromhtml	Indicates the document was originally HTML and may contain encapsulated HTML tags. This keyword may be followed by a version number (currently 1).
\horzdoc	Horizontal rendering.
\vertdoc	Vertical rendering.
\jcompress	Compressing justification (default).
\jexpand	Expanding justification.
\lnongrid	Define line based on the grid.
Document Views and Zoom Level	
\viewkind*N*	An integer (0 through 5) that represents the view mode of the document. 0 None 1 Page Layout view 2 Outline view 3 Master Document view 4 Normal view 5 Online Layout view
\viewscale*N*	Zoom level of the document; the ***N*** argument is a value representing a percentage (the default is 100).
\viewzk*N*	An integer (0 through 2) that represents the zoom kind of the document. 0 None 1 Full page 2 Best fit

Control word	Meaning
\private	Obsolete destination. It has no leading *. It should be skipped.
Footnotes and Endnotes	
\fet*N*	Footnote/endnote type. This indicates what type of notes are present in the document. 0 Footnotes only or nothing at all (the default) 1 Endnotes only 2 Both footnotes and endnotes For backward compatibility, if **\fet1** is emitted, **\endnotes** or **\enddoc** will be emitted along with **\aendnotes** or **\aenddoc**. **RTF** readers that understand **\fet** will need to ignore the footnote-positioning control words and use the endnote control words instead.
\ftnsep	Text argument separates footnotes from the document. This is a destination control word.
\ftnsepc	Text argument separates continued footnotes from the document. This is a destination control word.
\ftncn	Text argument is a notice for continued footnotes. This is a destination control word.
\aftnsep	Text argument separates endnotes from the document. This is a destination control word.
\aftnsepc	Text argument separates continued endnotes from the document. This is a destination control word.
\aftncn	Text argument is a notice for continued endnotes. This is a destination control word.
\endnotes	Footnotes at the end of the section (the default).
\enddoc	Footnotes at the end of the document.
\ftntj	Footnotes beneath text (top justified).
\ftnbj	Footnotes at the bottom of the page (bottom justified).
\aendnotes	Endnotes at end of section (the default).
\aenddoc	Endnotes at end of document.
\aftnbj	Endnotes at bottom of page (bottom justified).
\aftntj	Endnotes beneath text (top justified).
\ftnstart*N*	Beginning footnote number (the default is 1).
\aftnstart*N*	Beginning endnote number (the default is 1).
\ftnrstpg	Restart footnote numbering each page.
\ftnrestart	Footnote numbers restart at each section. Microsoft Word for the Macintosh uses this control to restart footnote numbering at each page.
\ftnrstcont	Continuous footnote numbering (the default).
\aftnrestart	Restart endnote numbering each section.
\aftnrstcont	Continuous endnote numbering (the default).
\ftnnar	Footnote numbering—Arabic numbering (1, 2, 3, …).
\ftnnalc	Footnote numbering—Alphabetic lowercase (a, b, c, …).

Control word	Meaning
\ftnnauc	Footnote numbering—Alphabetic uppercase (A, B, C, …).
\ftnnrlc	Footnote numbering—Roman lowercase (i, ii, iii, …).
\ftnnruc	Footnote numbering—Roman uppercase (I, II, III, …).
\ftnnchi	Footnote numbering—Chicago Manual of Style (*, †, ‡, §).
\ftnnchosung	Footnote Korean numbering 1 (*chosung).
\ftnncnum	Footnote Circle numbering (*circlenum).
\ftnndbnum	Footnote kanji numbering without the digit character (*dbnum1).
\ftnndbnumd	Footnote kanji numbering with the digit character (*dbnum2).
\ftnndbnumt	Footnote kanji numbering 3 (*dbnum3).
\ftnndbnumk	Footnote kanji numbering 4 (*dbnum4).
\ftnndbar	Footnote double-byte numbering (*dbchar).
\ftnnganada	Footnote Korean numbering 2 (*ganada).
\ftnngbnum	Footnote Chinese numbering 1 (*gb1).
\ftnngbnumd	Footnote Chinese numbering 2 (*gb2).
\ftnngbnuml	Footnote Chinese numbering 3 (*gb3).
\ftnngbnumk	Footnote Chinese numbering 4 (*gb4).
\ftnnzodiac	Footnote numbering—Chinese Zodiac numbering 1 (***** zodiac1). 甲、乙、丙…甲、乙、丙…甲、乙、丙…
\ftnnzodiacd	Footnote numbering—Chinese Zodiac numbering 2 (***** zodiac2). 子、丑、寅…
\ftnnzodiacl	Footnote numbering—Chinese Zodiac numbering 3 (***** zodiac3).
\aftnnar	Endnote numbering—Arabic numbering (1, 2, 3, …).
\aftnnalc	Endnote numbering—Alphabetic lowercase (a, b, c, …).
\aftnnauc	Endnote numbering—Alphabetic uppercase (A, B, C, …).
\aftnnrlc	Endnote numbering—Roman lowercase (i, ii, iii, …).
\aftnnruc	Endnote numbering—Roman uppercase (I, II, III, …).
\aftnnchi	Endnote numbering—Chicago Manual of Style (*, †, ‡, §).
\aftnnchosung	Endnote Korean numbering 1 (*chosung).
\aftnncnum	Endnote Circle numbering (*circlenum).
\aftnndbnum	Endnote kanji numbering without the digit character (*dbnum1).
\aftnndbnumd	Endnote kanji numbering with the digit character (*dbnum2).
\aftnndbnumt	Endnote kanji numbering 3 (*dbnum3).
\aftnndbnumk	Endnote kanji numbering 4 (*dbnum4).
\aftnndbar	Endnote double-byte numbering (*dbchar).
\aftnnganada	Endnote Korean numbering 2 (*ganada).
\aftnngbnum	Endnote Chinese numbering 1 (*gb1).
\aftnngbnumd	Endnote Chinese numbering 2 (*gb2).

Control word	Meaning
\aftnngbnuml	Endnote Chinese numbering 3 (*gb3).
\aftnngbnumk	Endnote Chinese numbering 4 (*gb4).
\aftnnzodiac	Endnote numbering—Chinese Zodiac numbering 1 (***** zodiac1). 甲、乙、丙…
\aftnnzodiacd	Endnote numbering—Chinese Zodiac numbering 2 (***** zodiac2). 子、丑、寅…
\aftnnzodiacl	Endnote numbering—Chinese Zodiac numbering 3 (***** zodiac3).
Page Information	
\paperw*N*	Paper width in twips (the default is 12,240).
\paperh*N*	Paper height in twips (the default is 15,840).
\psz*N*	Used to differentiate between paper sizes with identical dimensions in Microsoft Windows NT®. Values 1 through 41 correspond to paper sizes defined in DRIVINI.H in the Windows 3.1 SDK (DMPAPER_ values). Values greater than or equal to 42 correspond to user-defined forms in Windows NT.
\margl*N*	Left margin in twips (the default is 1800).
\margr*N*	Right margin in twips (the default is 1800).
\margt*N*	Top margin in twips (the default is 1440).
\margb*N*	Bottom margin in twips (the default is 1440).
\facingp	Facing pages (activates odd/even headers and gutters).
\gutter*N*	Gutter width in twips (the default is 0).
\rtlgutter	Gutter is positioned on the right.
\gutterprl	Parallel gutter.
\margmirror	Switches margin definitions on left and right pages. Used in conjunction with **\facingp**.
\landscape	Landscape format.
\pgnstart*N*	Beginning page number (the default is 1).
\widowctrl	Enable widow and orphan control.
\twoonone	Print two logical pages on one physical page.
\bookfold	Book fold printing. Allows for printing documents that can easily be made into pamphlets. This will print two pages side by side in landscape mode, and will print to the back of the sheet if the printer supports duplex printing.
\bookfoldrev	Reverse book fold printing for bidirectional languages.
\bookfoldsheets*N*	Sheets per booklet; this should be a multiple of four.
Linked Styles	
\linkstyles	Update document styles automatically based on template.
Compatibility Options	
\notabind	Don't add automatic tab stop for hanging indent.
\wraptrsp	Wrap trailing spaces onto the next line.
\prcolbl	Print all colors as black.
\noextrasprl	Don't add extra space to line height for showing raised/lowered characters.

Control word	Meaning
\nocolbal	Don't balance columns.
\cvmme	Treat old-style escaped quotation marks (\") as current style ("") in mail merge data documents.
\sprstsp	Suppress extra line spacing at top of page. Basically, this means to ignore any line spacing larger than Auto at the top of a page.
\sprsspbf	Suppress space before paragraph property after hard page or column break.
\otblrul	Combine table borders as done in Word 5.*x* for the Macintosh. Contradictory table border information is resolved in favor of the first cell.
\transmf	Metafiles are considered transparent; don't blank the area behind metafiles.
\swpbdr	If a paragraph has a left border (not a box) and the **Different Odd And Even** or **Mirror Margins** check box is selected, Word will print the border on the right for odd-numbered pages.
\brkfrm	Show hard (manual) page breaks and column breaks in frames.
\sprslnsp	Suppress extra line spacing like WordPerfect version 5.*x*.
\subfontbysize	Substitute fonts based on size first.
\truncatefont height	Round down to the nearest font size instead of rounding up.
\truncex	Don't add leading (extra space) between rows of text.
\bdbfhdr	Print body before header/footer. Option for compatibility with Word 5.*x* for the Macintosh.
\dntblnsbdb	Don't balance SBCS/DBCS characters. Option for compatibility with Word 6.0 (Japanese).
\expshrtn	Expand character spaces on line-ending with SHIFT+RETURN. Option for compatibility with Word 6.0 (Japanese).
\lytexcttp	Don’t center exact line height lines.
\lytprtmet	Use printer metrics to lay out document.
\msmcap	Small caps like Word 5.*x* for the Macintosh.
\nolead	No external leading. Option for compatibility with Word 5.*x* for the Macintosh.
\nospaceforul	Don't add space for underline. Option for compatibility with Word 6.0 (Japanese).
\noultrlspc	Don't underline trailing spaces. Option for compatibility with Word 6.0 (Japanese).
\noxlattoyen	Don't translate backslash to Yen sign. Option for compatibility with Word 6.0 (Japanese).
\oldlinewrap	Lines wrap like Word 6.0.
\sprsbsp	Suppress extra line spacing at bottom of page.
\sprstsm	Does nothing. This keyword should be ignored.
\wpjst	Do full justification like WordPerfect 6.*x* for Windows.
\wpsp	Set the width of a space like WordPerfect 5.*x*.
\wptab	Advance to next tab stop like WordPerfect 6.*x*.
\splytwnine	Don’t lay out AutoShapes like Word 97.
\ftnlytwnine	Don’t lay out footnotes like Word 6.0, Word 95, and Word 97.

Control word	Meaning
\htmautsp	Use HTML paragraph auto spacing.
\useltbaln	Don't forget last tab alignment.
\alntblind	Don't align table rows independently.
\lytcalctblwd	Don't lay out tables with raw width.
\lyttblrtgr	Don't allow table rows to lay out apart.
\oldas	Use Word 95 Auto spacing.
\lnbrkrule	Don't use Word 97 line breaking rules for Asian text.
\bdrrlswsix	Use Word 6.0/Word 95 borders rules.
\nolnhtadjtbl	Don't adjust line height in table.
\ApplyBrkRules	Use line breaking rules compatible with Thai text.
\rempersonalinfo	This will indicate to the emitting program to remove personal information such as the author's name as a document property or in a comment.
\snapgridtocell	Snap text to grid inside table with inline objects.
\wrppunct	Allow hanging punctuation in character grid.
\asianbrkrule	Use Asian rules for line breaks with character grid.
\nobrkwrptbl	Don't break wrapped tables across pages.
\toplinepunct	Turns on a check box in the **Paragraph Formatting** dialogue box with a setting to allow punctuation at the start of the line to compress.
\viewnobound	Hide white space between pages.
\donotshowmarkup	Don't show markup while reviewing.
\donotshowcomments	Don't show comments while reviewing.
\donotshowinsdel	Don't show insertions and deletions while reviewing.
\donotshowprops	Don't show formatting while reviewing.
\allowfieldendsel	Enables selecting the entire field with the first or last character.
\nocompatoptions	Specifies that all compatibility options should be set to default.
Forms	
\formprot	This document is protected for forms.
\allprot	This document has no unprotected areas.
\formshade	This document has form field shading on.
\formdisp	This document currently has a forms drop-down box or check box selected.
\printdata	This document has print form data only on.
Revision Marks	
\revprot	This document is protected for revisions. The user can edit the document, but revision marking cannot be disabled.
\revisions	Turns on revision marking.

Control word	Meaning
\revprop*N*	Argument indicates how revised text will be displayed: 0 No properties shown 1 Bold 2 Italic 3 Underline (default) 4 Double underline
\revbar*N*	Vertical lines mark altered text, based on the argument: 0 No marking 1 Left margin 2 Right margin 3 Outside (the default: left on left pages, right on right pages)
Tables	
\tsd*N*	Sets the default table style for this document. ***N*** references an entry in the table styles list.
Comments (Annotations)	
\annotprot	This document is protected for comments (annotations). The user cannot edit the document but can insert comments (annotations).
Bidirectional Controls	
\rtldoc	This document will be formatted to have Arabic-style pagination.
\ltrdoc	This document will have English-style pagination (the default).
Click-and-Type	
\cts*N*	Index to the style to be used for Click-and-Type (0 is the default).
Kinsoku Characters (Far East)	
\jsksu	Indicates that the strict Kinsoku set must be used for Japanese; **\jsku** should not be present if **\ksulang*N*** is present *and* the language ***N*** is Japanese.
\ksulang*N*	***N*** **i**ndicates which language the customized Kinsoku characters defined in the **\fchars** and **\lchars** destinations belong to.
***\fchars**	List of following Kinsoku characters.
***\lchars**	List of leading Kinsoku characters.
Drawing Grid	
\dghspace*N*	Drawing grid horizontal spacing in twips (the default is 120).
\dgvspace*N*	Drawing grid vertical spacing in twips (the default is 120).
\dghorigin*N*	Drawing grid horizontal origin in twips (the default is 1701).
\dgvorigin*N*	Drawing grid vertical origin in twips (the default is 1984).
\dghshow*N*	Show ***N***th horizontal gridline (the default is 3).
\dgvshow*N*	Show ***N***th vertical gridline (the default is 0).
\dgsnap	Snap to drawing grid.

Control word	Meaning
\dgmargin	Drawing grid to follow margins.

Page Borders

\pgbrdrhead		Page border surrounds header.
\pgbrdrfoot		Page border surrounds footer.
\pgbrdrt		Page border top.
\pgbrdrb		Page border bottom.
\pgbrdrl		Page border left.
\pgbrdrr		Page border right.
\brdrart*N*		Page border art; the ***N*** argument is a value from 1 to165 representing the number of the border.
\pgbrdropt*N*	8	Page border measure from text. **Always display in fron**t option is set to **off**.
	32	Page border measure from edge of page. **Always display in front** option is set to **on**.
	40	Page border measure from edge of page. **Always display in front** option is set to **off**.
\pgbrdrsnap		Align paragraph borders and table edges with page border.

The color, width, border style, and border spacing keywords for page borders are the same as the keywords defined for paragraph borders.

Section Text

Each section in the RTF file has the following syntax:

<section> <secfmt>* <hdrftr>? <para>+ (**\sect** <section>)?

Section Formatting Properties

At the beginning of each section, there may be some section-formatting control words (described as <secfmt> in the section text syntax description). These control words specify section-formatting properties, which apply to the text *following* the control word, with the exception of the section-break control words (those beginning with **\sbk**). Section-break control words describe the break *preceding* the text. These control words can appear anywhere in the section, not just at the start.

Note that if the **\sectd** control word is not present, the current section inherits all section properties defined in the previous section.

The section-formatting control words are listed in the following table.

Control word	Meaning
\sect	New section.
\sectd	Reset to default section properties.
\endnhere	Endnotes included in the section.

Control word	Meaning
\binfsxn*N*	***N*** is the printer bin used for the first page of the section. If this control is not defined, then the first page uses the same printer bin as defined by the **\binsxn*N*** control.
\binsxn*N*	***N*** is the printer bin used for the pages of the section.
\ds*N*	Designates section style. If a section style is specified, style properties must be specified with the section.
\pnseclvl*N*	Used for multilevel lists. This property sets the default numbering style for each corresponding **\pnlvl*N*** control word (bullets and numbering property for paragraphs) within that section. This is a destination control word.
\sectunlocked	This section is unlocked for forms.
Section Break	
\sbknone	No section break.
\sbkcol	Section break starts a new column.
\sbkpage	Section break starts a new page (the default).
\sbkeven	Section break starts at an even page.
\sbkodd	Section break starts at an odd page.
Columns	
\cols*N*	Number of columns for "snaking" (the default is 1).
\colsx*N*	Space between columns in twips (the default is 720).
\colno*N*	Column number to be formatted; used to specify formatting for variable-width columns.
\colsr*N*	Space to right of column in twips; used to specify formatting for variable-width columns.
\colw*N*	Width of column in twips; used to override the default constant width setting for variable-width columns.
\linebetcol	Line between columns.
Footnotes and Endnotes	
\sftntj	Footnotes beneath text (top justified).
\sftnbj	Footnotes at the bottom of the page (bottom justified).
\sftnstart*N*	Beginning footnote number (the default is 1).
\saftnstart*N*	Beginning endnote number (the default is 1).
\sftnrstpg	Restart footnote numbering each page.
\sftnrestart	Footnote numbers restart at each section. Microsoft Word for the Macintosh uses this control to restart footnote numbering at each page.
\sftnrstcont	Continuous footnote numbering (the default).
\saftnrestart	Restart endnote numbering each section.
\saftnrstcont	Continuous endnote numbering (the default).
\sftnnar	Footnote numbering—Arabic numbering (1, 2, 3, …).
\sftnnalc	Footnote numbering—Alphabetic lowercase (a, b, c, …).
\sftnnauc	Footnote numbering—Alphabetic uppercase (A, B, C, …).
\sftnnrlc	Footnote numbering—Roman lowercase (i, ii, iii, …).

Control word	Meaning
\sftnnruc	Footnote numbering—Roman uppercase (I, II, III, …).
\sftnnchi	Footnote numbering—Chicago Manual of Style (*, †, ‡, §).
\sftnnchosung	Footnote Korean numbering 1 (*chosung).
\sftnncnum	Footnote Circle numbering (*circlenum).
\sftnndbnum	Footnote kanji numbering without the digit character (*dbnum1).
\sftnndbnumd	Footnote kanji numbering with the digit character (*dbnum2).
\sftnndbnumt	Footnote kanji numbering 3 (*dbnum3).
\sftnndbnumk	Footnote kanji numbering 4 (*dbnum4).
\sftnndbar	Footnote double-byte numbering (*dbchar).
\sftnnganada	Footnote Korean numbering 2 (*ganada).
\sftnngbnum	Footnote Chinese numbering 1 (*gb1).
\sftnngbnumd	Footnote Chinese numbering 2 (*gb2).
\sftnngbnuml	Footnote Chinese numbering 3 (*gb3).
\sftnngbnumk	Footnote Chinese numbering 4 (*gb4).
\sftnnzodiac	Footnote numbering—Chinese Zodiac numbering 1 (***** zodiac1). 甲、乙、丙…甲、乙、丙…甲、乙、丙…
\sftnnzodiacd	Footnote numbering—Chinese Zodiac numbering 2 (***** zodiac2). 子、丑、寅…
\sftnnzodiacl	Footnote numbering—Chinese Zodiac numbering 3 (***** zodiac3).
\saftnnar	Endnote numbering—Arabic numbering (1, 2, 3, …).
\saftnnalc	Endnote numbering—Alphabetic lowercase (a, b, c, …).
\saftnnauc	Endnote numbering—Alphabetic uppercase (A, B, C, …).
\saftnnrlc	Endnote numbering—Roman lowercase (i, ii, iii, …).
\saftnnruc	Endnote numbering—Roman uppercase (I, II, III, …).
\saftnnchi	Endnote numbering—Chicago Manual of Style (*, †, ‡, §).
\saftnnchosung	Endnote Korean numbering 1 (*chosung).
\saftnncnum	Endnote Circle numbering (*circlenum).
\saftnndbnum	Endnote kanji numbering without the digit character (*dbnum1).
\saftnndbnumd	Endnote kanji numbering with the digit character (*dbnum2).
\saftnndbnumt	Endnote kanji numbering 3 (*dbnum3).
\saftnndbnumk	Endnote kanji numbering 4 (*dbnum4).
\saftnndbar	Endnote double-byte numbering (*dbchar).
\saftnnganada	Endnote Korean numbering 2 (*ganada).
\saftnngbnum	Endnote Chinese numbering 1 (*gb1).
\saftnngbnumd	Endnote Chinese numbering 2 (*gb2).
\saftnngbnuml	Endnote Chinese numbering 3 (*gb3).
\saftnngbnumk	Endnote Chinese numbering 4 (*gb4).
\saftnnzodiac	Endnote numbering—Chinese Zodiac numbering 1 (***** zodiac1). 甲、乙、丙…

Control word	Meaning
\saftnnzodiacd	Endnote numbering—Chinese Zodiac numbering 2 (***** zodiac2). 子、丑、寅…
\saftnnzodiacl	Endnote numbering—Chinese Zodiac numbering 3 (***** zodiac3).
Line Numbering	
\linemod*N*	Line-number modulus amount to increase each line number (the default is 1).
\linex*N*	Distance from the line number to the left text margin in twips (the default is 360). The automatic distance is 0.
\linestarts*N*	Beginning line number (the default is 1).
\linerestart	Line numbers restart at **\linestarts** value.
\lineppage	Line numbers restart on each page.
\linecont	Line numbers continue from the preceding section.
Page Information	
\pgwsxn*N*	***N*** is the page width in twips. A **\sectd** resets the value to that specified by **\paperw*N*** in the document properties.
\pghsxn*N*	***N*** is the page height in twips. A **\sectd** resets the value to that specified by **\paperh*N*** in the document properties.
\marglsxn*N*	***N*** is the left margin of the page in twips. A **\sectd** resets the value to that specified by **\margl*N*** in the document properties.
\margrsxn*N*	***N*** is the right margin of the page in twips. A **\sectd** resets the value to that specified by **\margr*N*** in the document properties.
\margtsxn*N*	***N*** is the top margin of the page in twips. A **\sectd** resets the value to that specified by **\margt*N*** in the document properties.
\margbsxn*N*	***N*** is the bottom margin of the page in twips. A **\sectd** resets the value to that specified by **\margb*N*** in the document properties.
\guttersxn*N*	***N*** is the width of the gutter margin for the section in twips. A **\sectd** resets the value to that specified by **\gutter*N*** from the document properties. If **Facing Pages** is turned **off,** the gutter will be added to the left margin of all pages. If **Facing Pages** is turned **on,** the gutter will be added to the left side of odd-numbered pages and the right side of even-numbered pages.
\margmirsxn	Switches margin definitions on left and right pages. Used in conjunction with **\facingp**.
\lndscpsxn	Page orientation is in landscape format. To mix portrait and landscape sections within a document, the **\landscape** control should not be used so that the default for a section is portrait, which may be overridden by the **\lndscpsxn** control.
\titlepg	First page has a special format.
\headery*N*	Header is ***N*** twips from the top of the page (the default is 720).
\footery*N*	Footer is ***N*** twips from the bottom of the page (the default is 720).
Page Numbers	
\pgnstarts*N*	Beginning page number (the default is 1).
\pgncont	Continuous page numbering (the default).
\pgnrestart	Page numbers restart at **\pgnstarts** value.
\pgnx*N*	Page number is ***N*** twips from the right margin (the default is 720). This control word is understood but not used by current versions (6.0 or later) of Word.

Control word	Meaning
\pgny*N*	Page number is ***N*** twips from the top margin (the default is 720). This control word is understood but not used by current versions (6.0 or later) of Word.
\pgndec	Page-number format is decimal.
\pgnucrm	Page-number format is uppercase Roman numeral.
\pgnlcrm	Page-number format is lowercase Roman numeral.
\pgnucltr	Page-number format is uppercase letter.
\pgnlcltr	Page-number format is lowercase letter.
\pgnbidia	Page-number format is Abjad Jawaz if language is Arabic and Biblical Standard if language is Hebrew.
\pgnbidib	Page-number format is Alif Ba Tah if language is Arabic and Non-standard Decimal if language is Hebrew.
\pgnchosung	Korean numbering 1 (* chosung).
\pgncnum	Circle numbering (*circlenum).
\pgndbnum	Kanji numbering without the digit character.
\pgndbnumd	Kanji numbering with the digit character.
\pgndbnumt	Kanji numbering 3 (*dbnum3).
\pgndbnumk	Kanji numbering 4 (*dbnum4).
\pgndecd	Double-byte decimal numbering.
\pgnganada	Korean numbering 2 (*ganada).
\pgngbnum	Chinese numbering 1 (*gb1).
\pgngbnumd	Chinese numbering 2 (*gb2).
\pgngbnuml	Chinese numbering 3 (*gb3).
\pgngbnumk	Chinese numbering 4 (*gb4).
\pgnzodiac	Chinese Zodiac numbering 1 (*zodiac1).
\pgnzodiacd	Chinese Zodiac numbering 2 (*zodiac2).
\pgnzodiacl	Chinese Zodiac numbering 3 (*zodiac3).
\pgnhindia	Hindi vowel numeric format.
\pgnhindib	Hindi consonants.
\pgnhindic	Hindi digits.
\pgnhindid	Hindi descriptive (cardinal) text.
\phnthaia	Thai letters.
\pgnthaib	Thai digits.
\pgnthaic	Thai descriptive.
\pgnvieta	Vietnamese descriptive.
\pgnid	Page number in dashes (Korean).
\pgnhn*N*	Indicates which heading level is used to prefix a heading number to the page number. This control word can only be used in conjunction with numbered heading styles. 0 specifies to not show heading level (the default). Values 1 through 9 correspond to heading levels 1 through 9.

Control word	Meaning
\pgnhnsh	Hyphen separator character. This separator and the successive ones appear between the heading level number and the page number.
\pgnhnsp	Period separator character.
\pgnhnsc	Colon separator character.
\pgnhnsm	Em dash (—) separator character.
\pgnhnsn	En dash (–) separator character.
Vertical Alignment	
\vertalt	Text is top-aligned (the default).
\vertalb	Text is bottom-aligned.
\vertalc	Text is centered vertically.
\vertalj	Text is justified vertically.
Bidirectional Controls	
\rtlsect	This section will snake (newspaper style) columns from right to left.
\ltrsect	This section will snake (newspaper style) columns from left to right (the default).
Asian Controls	
\horzsect	Horizontal rendering.
\vertsect	Vertical rendering.
Text Flow	
\stextflow	Section property for specifying text flow: 0 Text flows left to right and top to bottom 1 Text flows top to bottom and right to left, vertical 2 Text flows left to right and bottom to top 3 Text flows right to left and top to bottom 4 Text flows left to right and top to bottom, vertical 5 Text flows vertically, non-vertical font
Page Borders	
\pgbrdrhead	Page border surrounds header.
\pgbrdrfoot	Page border surrounds footer.
\pgbrdrt	Page border top.
\pgbrdrb	Page border bottom.
\pgbrdrl	Page border left.
\pgbrdrr	Page border right.
\brdrart*N*	Page border art; the ***N*** argument is a value from 1 through 165 representing the number of the border.

Control word	Meaning	
\pgbrdropt*N*	8	Page border measure from text. **Always display in fron**t option is set to **off**.
	32	Page border measure from edge of page. **Always display in front** option is set to **on**.
	40	Page border measure from edge of page. **Always display in front** option is set to **off**.
\pgbrdrsnap	Align paragraph borders and table edges with page border.	
Line and Character Grid		
\sectexpand*N*	Character space basement (character pitch minus font size) ***N*** in device-independent units (a device-independent unit is 1/294912th of an inch).	
\sectlinegrid*N*	Line grid, where ***N*** is the line pitch in 20ths of a point.	
\sectdefaultcl	Default state of section. Indicates **\sectspecifycl** and **\sectspecifyl** are not emitted.	
\sectspecifycl	Specify number of characters per line only.	
\sectspecifyl	Specify both number of characters per line and number of lines per page.	
\sectspecifygenN	Indicates that text should snap to the character grid. Note that the N is part of the keyword.	

The color, width, border style, and border spacing keywords for page borders are the same as the keywords defined for paragraph borders.

Headers and Footers

Headers and footers are RTF destinations. Each section in the document can have its own set of headers and footers. If no headers or footers are defined for a given section, the headers and footers from the previous section (if any) are used. Headers and footers have the following syntax:

<hdrftr>	'{' <hdrctl> <para>+ '}' <hdrftr>?
<hdrctl>	**\header** | **\footer** | **\headerl** | **\headerr** | **\headerf** | **\footerl** | **\footerr** | **\footerf**

Note that each separate <hdrftr> group must have a distinct <hdrctl> introducing it.

Control word	Meaning
\header	Header on all pages. This is a destination control word.
\footer	Footer on all pages. This is a destination control word.
\headerl	Header on left pages only. This is a destination control word.
\headerr	Header on right pages only. This is a destination control word.
\headerf	Header on first page only. This is a destination control word.
\footerl	Footer on left pages only. This is a destination control word.
\footerr	Footer on right pages only. This is a destination control word.
\footerf	Footer on first page only. This is a destination control word.

The **\headerl**, **\headerr**, **\footerl**, and **\footerr** control words are used in conjunction with the **\facingp** control word, and the **\headerf** and **\footerf** control words are used in conjunction with the **\titlepg** control word. Many RTF readers will not function correctly if the appropriate document properties are not set. In particular, if **\facingp**

is not set, then only **\header** and **\footer** should be used; if **\facingp** is set, then only **\headerl**, **\headerr**, **\footerl**, and **\footerr** should be used. Combining both **\facingp** and **\titlepg** is allowed. You should not use **\header** to set the headers for both pages when **\facingp** is set. You can use **\headerf** if **\titlepg** is not set, but no header will appear. For more information, see Document Formatting Properties and Section Formatting Properties in this Specification.

If the previous section had a first page header or footer and had **\titlepg** set, and the current section does not, then the previous section's first page header or footer is disabled. However, it is not destroyed; if subsequent sections have **\titlepg** set, then the first page header or footer is restored.

Paragraph Text

There are two kinds of paragraphs: plain and table. A table is a collection of paragraphs, and a table row is a continuous sequence of paragraphs partitioned into cells. The **\intbl** paragraph-formatting control word identifies the paragraph as part of a table. Additional keywords related to table styles are documented next, and refer to properties of the cell within which the paragraph resides. For more information, see the Table Definitions section of this Specification. This control is inherited between paragraphs that do not have paragraph properties reset with **\pard**.

<para>	<textpar> | <row>
<textpar>	<pn>? <brdrdef>? <parfmt>* <apoctl>* <tabdef>? <shading>? (/v /spv)? (***subdocument** | <char>+) (**\par** <para>)?
<row>	(<tbldef> <cell>+ <tbldef> **\row**) | (<tbldef> <cell>+ **\row**) | (<cell>+ <tbldef> **\row**)
<cell>	(<nestrow>? <tbldef>?) & <textpar>+ **\cell**
<nestrow>	<nestcell>+ '{*'**\nesttableprops** <tbldef> **\nestrow** '}'
<nestcell>	<textpar>+ **\nestcell**

Paragraph Formatting Properties

These control words (described as <parfmt> in the paragraph-text syntax description) specify generic paragraph formatting properties. These control words can appear anywhere in the body of the paragraph, not just at the beginning.

Note that if the **\pard** control word is not present, the current paragraph inherits all paragraph properties defined in the previous paragraph.

The paragraph-formatting control words are listed in the following table.

Control word	Meaning
\par	New paragraph.
\pard	Resets to default paragraph properties.
\spv	Style separator feature that causes the paragraph mark to not appear even in ShowAll. Used to nest paragraphs within the document view or outline without generating a new heading.
\hyphpar	Toggles automatic hyphenation for the paragraph. Append 1 or nothing to toggle property on; append 0 to turn it off.
\intbl	Paragraph is part of a table.
\itap*N*	Paragraph nesting level, where 0 is the main document, 1 is a table cell, 2 is a nested table cell, 3 is a doubly nested table cell, and so forth. The default is 1.
\keep	Keep paragraph intact.

Control word	Meaning
\keepn	Keep paragraph with the next paragraph.
\level*N*	***N*** is the outline level of the paragraph.
\noline	No line numbering.
\nowidctlpar	No widow/orphan control. This is a paragraph-level property and is used to override the document-level **\widowctrl**.
\widctlpar	Widow/orphan control is used for the current paragraph. This is a paragraph property used to override the absence of the document-level **\widowctrl**.
\outlinelevel*N*	Outline level of paragraph. The ***N*** argument is a value from 0 to 8 representing the outline level of the paragraph. In the default case, no outline level is specified (same as body text).
\pagebb	Break page before the paragraph.
\sbys	Side-by-side paragraphs.
\s*N*	Designates paragraph style. If a paragraph style is specified, style properties must be specified with the paragraph. ***N*** references an entry in the style sheet.
Table Style Specific	
\yts	Designates the table style that was applied to the row/cell.
\tscfirstrow	This cell is in the first row.
\tsclastrow	This cell is in the last row.
\tscfirstcol	This cell is in the first column.
\tsclastcol	This cell is in the last column.
\tscbandhorzodd	This cell is in the odd row band.
\tscbandhorzeven	This cell is in the even row band.
\tscbandvertodd	This cell is in the odd column band.
\tscbandverteven	This cell is in the even column band.
\tscnwcell	This is the NW cell in the table (top left).
\tscnecell	NE cell.
\tscswcell	SW cell.
\tscsecell	SE cell.
Alignment	
\qc	Centered.
\qj	Justified.
\ql	Left-aligned (the default).
\qr	Right-aligned.
\qd	Distributed.
\qkN	Percentage of line occupied by Kashida justification (0 – low, 10 – medium, 20 – high).
\qt	For Thai distributed justification.
Font Alignment	
\faauto	Font alignment. The default setting for this is "Auto."

Control word	Meaning
\fahang	Font alignment: Hanging.
\facenter	Font alignment: Center.
\faroman	Font alignment : Roman (default).
\favar	Font alignment: Upholding variable.
\fafixed	Font alignment: Upholding fixed.
Indentation	
\fi*N*	First-line indent (the default is 0).
\cufi*N*	First-line indent in hundredths of a character unit; overrides **\fi*N***, although they should both be emitted with equivalent values.
\li*N*	Left indent (the default is 0).
\lin*N*	Left indent for left-to-right paragraphs; right indent for right-to-left paragraphs (the default is 0). **\lin*N*** defines space before the paragraph.
\culi*N*	Left indent (space before) in hundredths of a character unit. Behaves like **\lin*N*** and overrides **\li*N*** and **\lin*N***, although they should all be emitted with equivalent values.
\ri*N*	Right indent (the default is 0).
\rin*N*	Right indent for left-to-right paragraphs; left indent for right-to-left paragraphs (the default is 0). **\rin*N*** defines space after the paragraph.
\curi*N*	Right indent (space after) in hundredths of a character unit. Behaves like **\rin*N*** and overrides **\ri*N*** and **\rin*N***, although they should all be emitted with equivalent values.
\adjustright	Automatically adjust right indent when document grid is defined.
Spacing	
\sb*N*	Space before (the default is 0).
\sa*N*	Space after (the default is 0).
\sbauto*N*	Auto spacing before: 0 Space before determined by **\sb** 1 Space before is Auto (ignores **\sb**) The default is 0.
\saauto*N*	Auto spacing after: 0 Space after determined by **\sa** 1 Space after is Auto (ignores **\sa**) The default is 0.
\lisb*N*	Space before in hundredths of a character unit. Overrides **\sb*N***, although they should both be emitted with equivalent values.
\lisa*N*	Space after in hundredths of a character unit. Overrides **\sa*N***, although they should both be emitted with equivalent values.
\sl*N*	Space between lines. If this control word is missing or if **\sl0** is used, the line spacing is automatically determined by the tallest character in the line. If ***N*** is a positive value, this size is used only if it is taller than the tallest character (otherwise, the tallest character is used); if ***N*** is a negative value, the absolute value of ***N*** is used, even if it is shorter than the tallest character.

Control word	Meaning
\slmult*N*	Line spacing multiple. Indicates that the current line spacing is a multiple of "Single" line spacing. This control word can follow only the **\sl** control word and works in conjunction with it. 0 "At Least" or "Exactly" line spacing 1 Multiple line spacing, relative to "Single"
\nosnaplinegrid	Disable snap line to grid.
Subdocuments	
\subdocument*N*	Indicates that a subdocument in a master document/subdocument relationship should occur here. ***N*** represents an index into the file table. This control word must be the only item in a paragraph.
Bidirectional Controls	
\rtlpar	Text in this paragraph will be displayed with right-to-left precedence.
\ltrpar	Text in this paragraph will be displayed with left-to-right precedence (the default).
Asian Typography	
\nocwrap	No character wrapping.
\nowwrap	No word wrapping.
\nooverflow	No overflow period and comma.
\aspalpha	Auto spacing between DBC and English.
\aspnum	Auto spacing between DBC and numbers.
Pocket Word	
\collapsed	Paragraph property active in outline view that specifies that the paragraph is collapsed (not viewed).

Tabs

Any paragraph may have its own set of tabs. Tabs must follow this syntax:

<tabdef>	(<tab> | <bartab>)+
<tab>	<tabkind>? <tablead>? **\t*x***
<bartab>	<tablead>? **\t*b***
<tabkind>	**\tqr** | **\tqc** | **\tqdec**
<tablead>	**\tldot** | **\tlmdot | \tlhyph** | **\tlul** | **\tlth** | **\tleq**

Control word	Meaning
\tx*N*	Tab position in twips from the left margin.
\tqr	Flush-right tab.
\tqc	Centered tab.
\tqdec	Decimal tab.
\tb*N*	Bar tab position in twips from the left margin.

Control word	Meaning
\tldot	Leader dots.
\tlmdot	Leader middle dots.
\tlhyph	Leader hyphens.
\tlul	Leader underline.
\tlth	Leader thick line.
\tleq	Leader equal sign.

Bullets and Numbering

Word 6.0 and Word 95 RTF

To provide compatibility with existing RTF readers, all applications that can automatically format paragraphs with bullets or numbers will also emit the generated text as plain text in the **\pntext** group. This will allow existing RTF readers to capture the plain text and safely ignore the auto number instructions. This group precedes all bulleted or numbered paragraphs, and will contain all the text and formatting that would be automatically generated. It should precede the **'{'*\pn … '}'** destination, and it is the responsibility of RTF readers that understand the **'{'*\pn … '}'** destination to ignore the **\pntext** group. The following table defines the grammar of this group.

<pn>	<pnseclvl> | <pnpara>
<pnseclvl>	'{*' ***pnseclvl** <pndesc>'}'
<pnpara>	<pntext> <pnprops>
<pntext>	'{' **\pntext** <char> '}'
<pnprops>	'{*' **\pn** <pnlevel> <pndesc>'}'
<pnlevel>	***pnlvl** | **\pnlvlblt** | **\pnlvlbody** | **\pnlvlcont**
<pndesc>	<pnnstyle> & <pnchrfmt> & <pntxtb> & <pntxta> & <pnfmt>
<pnnstyle>	**\pncard | \pndec | \pnucltr | \pnucrm | \pnlcltr | \pnlcrm | \pnord | \pnordt** | **\pnbidia** | **\pnbidib** | **\pnaiu | \pnaiud | \pnaiueo | \pnaiueod | \pnchosung | \pncnum | \pndbnum | \pndbnumd | \pndbnumk | \pndbnuml | \pndbnumt | \pndecd | \pnganada | \pnganada | \pngbnum | \pngbnumd | \pngbnumk | \pngbnuml | \pniroha | \pnirohad | \pnuldash | \pnuldashd | \pnuldashdd | \pnulhair | \pnulth | \pnulwave | \pnzodiac | \pnzodiacd | \pnzodiacl**
<pnchrfmt>	***pnf**? & ***pnfs**? & **pnb**? & **pni**? & **pncaps**? & **pnscaps**? & <pnul>? & **pnstrike**? & ***pncf**?
<pnul>	**\pnul** | **\pnuld** | **\pnuldb** | **\pnulnone** | **\pnulw**
<pnfmt>	**pnnumonce**? & **pnacross**? & ***pnindent**? & ***pnsp**? & **pnprev**? & <pnjust>? & ***pnstart**? & **pnhang**? & **pnrestart**?
<pnjust>	**\pnqc** | **\pnql** | **\pnqr**
<pntxtb>	'{' **pntxtb** #PCDATA'}'
<pntxta>	'{' **pntxta** #PCDATA'}'

Settings in the following table marked with an asterisk can be turned off by appending 0 to the control word.

Control word	Meaning
\pntext	This group precedes all numbered/bulleted paragraphs and contains all automatically generated text and formatting. It should precede the **'{*'\pn … '}'** destination, and it is the responsibility of RTF readers that understand the **'{*'\pn … '}'** destination to ignore this preceding group. This is a destination control word.
\pn	Turns on paragraph numbering. This is a destination control word.
\pnlvl*N*	Paragraph level, where ***N*** is a level from 1 to 9. Default set by **\pnseclvl*N*** section formatting property.
\pnlvlblt	Bulleted paragraph (corresponds to level 11). The actual character used for the bullet is stored in the **\pntxtb** group.
\pnlvlbody	Simple paragraph numbering (corresponds to level 10).
\pnlvlcont	Continue numbering but do not display number (“skip numbering”).
\pnnumonce	Number each cell only once in a table (the default is to number each paragraph in a table).
\pnacross	Number across rows (the default is to number down columns).
\pnhang	Paragraph uses a hanging indent.
\pnrestart	Restart numbering after each section break. Note that this control word is used only in conjunction with the Heading Numbering feature (applying multilevel numbering to Heading style definitions).
\pncard	Cardinal numbering (One, Two, Three).
\pndec	Decimal numbering (1, 2, 3).
\pnucltr	Uppercase alphabetic numbering (A, B, C).
\pnucrm	Uppercase Roman numbering (I, II, III).
\pnlcltr	Lowercase alphabetic numbering (a, b, c).
\pnlcrm	Lowercase Roman numbering (i, ii, iii).
\pnord	Ordinal numbering (1st, 2nd, 3rd).
\pnordt	Ordinal text numbering (First, Second, Third).
\pnbidia	Abjad Jawaz if language is Arabic and Biblical Standard if language is Hebrew.
\pnbidib	Alif Ba Tah if language is Arabic and Non-standard Decimal if language is Hebrew.
\pnaiu	46 phonetic katakana characters in "aiueo" order (***aiueo**).
\pnaiud	46 phonetic double-byte katakana characters (***aiueo*dbchar**).
\pnaiueo	46 phonetic katakana characters in "aiueo" order (*aiueo).
\pnaiueod	46 phonetic double-byte katakana characters (*aiueo*dbchar).
\pnchosung	Korean numbering 2 (*chosung).
\pncnum	20 numbered list in circle (***circlenum**).
\pndbnum	Kanji numbering without the digit character (***dbnum1**).
\pndbnumd	Kanji numbering with the digit character (*dbnum2).
\pndbnumk	Kanji numbering 4 (*dbnum4).
\pndbnuml	Kanji numbering 3 (*dbnum3).

Control word	Meaning
\pndbnumt	Kanji numbering 3 (*dbnum3).
\pndecd	Double-byte decimal numbering (***arabic*dbchar**).
\pnganada	Korean numbering 2 (*ganada).
\pnganada	Korean numbering 1 (*ganada).
\pngbnum	Chinese numbering 1 (*gb1).
\pngbnumd	Chinese numbering 2 (*gb2).
\pngbnumk	Chinese numbering 4 (*gb4).
\pngbnuml	Chinese numbering 3 (*gb3).
\pniroha	46 phonetic katakana characters in "iroha" order (***iroha**).
\pnirohad	46 phonetic double-byte katakana characters (***iroha*dbchar**).
\pnuldash	Dashed underline.
\pnuldashd	Dash-dotted underline.
\pnuldashdd	Dash-dot-dotted underline.
\pnulhair	Hairline underline.
\pnulth	Thick underline.
\pnulwave	Wave underline.
\pnzodiac	Chinese Zodiac numbering 1 (*zodiac1).
\pnzodiacd	Chinese Zodiac numbering 2 (*zodiac2).
\pnzodiacl	Chinese Zodiac numbering 3 (*zodiac3).
\pnb	Bold numbering.*
\pni	Italic numbering.*
\pncaps	All caps numbering.*
\pnscaps	Small caps numbering.*
\pnul	Continuous underline.*
\pnuld	Dotted underline.
\pnuldb	Double underline.
\pnulnone	Turns off underlining.
\pnulw	Word underline.
\pnstrike	Strikethrough numbering.*
\pncf*N*	Foreground color—index into color table (the default is 0).
\pnf*N*	Font number.
\pnfs*N*	Font size (in half-points).
\pnindent*N*	Minimum distance from margin to body text.
\pnsp*N*	Distance from number text to body text.
\pnprev	Used for multilevel lists. Include information from previous level in this level; for example, 1, 1.1, 1.1.1, 1.1.1.1

Control word	Meaning
\pnqc	Centered numbering.
\pnql	Left-justified numbering.
\pnqr	Right-justified numbering.
\pnstart*N*	Start at number.
\pntxta	Text after. This group contains the text that succeeds the number. This is a destination control word.
\pntxtb	Text before. This group contains the text that precedes the number. This is a destination control word.

Note that there is a limit of 32 characters total for the sum of text before and text after for simple numbering. Multilevel numbering has a limit of 64 characters total for the sum of all levels.

Word 97 through Word 2002 RTF

Each paragraph that is part of a list must contain some keyword to indicate which list it's in, and which level of the list it belongs to. Word 97 through Word 2002 also provide the flat text representation of each number (in the **\listtext** destination); so, RTF readers that don't understand Word 97 numbering will get the paragraph number, along with appropriate character properties, inserted into their document at the beginning of the paragraph. Any RTF reader that does understand Word 97 through Word 2002 numbering should ignore the entire **\listtext** destination.

Control word	Meaning
\ls	Should exactly match the **ls** for one of the list overrides in the List Override table.
\ilvl	The 0-based level of the list to which the paragraph belongs. For all simple lists, this should always be 0. For multilevel lists, it can be 0 through 8.
\listtext	Contains the flat text representation of the number, including character properties. Should be ignored by any reader that understands Word 97 through Word 2002 numbering. This is a destination control word.

Revision Marks for Paragraph Numbers and ListNum Fields

Paragraph numbers and ListNum fields track revision information with special properties applied to the paragraph mark and ListNum field, respectively. The special properties hold the "old" value of the number—the value it held when revision-mark tracking began. At display time, Word checks the number's current value and compares it with this "old" value to determine whether it has changed. If the numbers are different, the old value shows up as deleted and the new value as inserted; if the numbers are the same, Word displays the new value normally, with no revision information. If there was no old value, the new value shows up as inserted. The following table lists the RTF specifications for these special properties.

Control word	Meaning
\pnrauth*N*	Index into the revision table. The content of the ***N***th group in the revision table is considered to be the author of that revision. **Note** This keyword is used to indicate paragraph number revisions.
\pnrdate*N*	Time of the revision. The 32-bit DTTM structure is emitted as a long integer.
\pnrnot	Indicates whether the paragraph number for the current paragraph is marked as "inserted."

\pnrxst*N* The keywords **\pnrxst**, **\pnrrgb**, **\pnrpnbr**, and **\pnrnfc** describe the "deleted number" text for the paragraph number. Their values are binary. Each of these keywords is represented as an array. The deleted number is written out with a **\pnrstart** keyword, followed by the array's keyword, followed by the first byte of the array, followed by the array's keyword, followed by the second byte of the array's keyword, followed by the array's keyword, followed by the third byte of the array's keyword, and so on. This sequence is followed by the **\pnrstop** keyword.

\pnrxst is a 32-item Unicode character array (double bytes for each character) with a length byte as the first number—it has the actual text of the number, with "level" place holders written out as digits from 0 through 8.

\pnrrgb*N* Nine-item array of indices of the level place holders in the **\pnrxst** array.

\pnrnfc*N* Nine-item array containing the number format codes of each level (using the same values as the **\levelnfc** keyword). The number format code is represented as a short integer.

\pnrpnbr*N* Nine-item array of the actual values of the number in each level. The number is represented as a long integer.

\pnrstart*N* The **\pnrxst**, **\pnrrgb**, **\pnrpnbr**, and **\pnrnfc** arrays are each preceded by the **\pnrstart** keyword, whose argument is 0 through 3, depending on the array.

\pnrstop*N* The **\pnrxst**, **\pnrrgb**, **\pnrpnbr**, and **\pnrnfc** arrays are each terminated by the **\pnrstop** keyword, whose argument is the number of bytes written out in the array.

Example

Let's take an example of the number "3-4b." which represents the third level of the list. The following table lists the values of each array.

Array	Binary	Comment
pnrxst	\'05\'00-\'01\'02	The length of the string is 5. Then, first level (level 0), followed by a dash, followed by the second and third levels (levels 1 and 2), followed by a period.
pnrrgb	\'01\'03\'04	The level place holders are at indices 1, 3, and 4 in the string.
pnrnfc	\'00\'00\'04	The nfc values are Arabic (0), Arabic (0), and lowercase letter (4).
pnrpnbr	\'03\'04\'02	The numbers or 3, 4, and 2 (b)

Here is the RTF for this number:

```
\pnrstart0
\pnrxst0\pnrxst5\pnrxst0\pnrxst1\pnrxst0\pnrxst45\pnrxst0\pnrxst2\pnrxst0\pnrxst3\pnrxst0\pnrxst46
\pnrstop12

\pnrstart1
\pnrrgb1\pnrrgb3\pnrrgb4
\pnrrgb0\pnrrgb0\pnrrgb0
\pnrrgb0\pnrrgb0\pnrrgb0
\pnrstop9

\pnrstart2
\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc4
\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc0
\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc0\pnrnfc0
```

```
\pnrstop18

\pnrstart3
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr3
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr4
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr2
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr0
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr0
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr0
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr0
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr0
\pnrpnbr0\pnrpnbr0\pnrpnbr0\pnrpnbr0
\pnrstop36
```

Control word	Meaning
Track Changes (Revision Mark) Properties for ListNum Fields	
\dfrauth*N*	Index into the revision table. The content of the ***N***th group in the revision table is considered the author of that revision. **Note** This keyword is used to indicate the deleted value of a ListNum field.
\dfrdate*N*	Time of the revision. The 32-bit DTTM structure is emitted as a long integer.
\dfrxst	Unicode character array with a length byte.
\dfrstart	The **\dfrxst** array is preceded by the **\dfrstart** keyword.
\dfrstop	The **\dfrxst** array is terminated by the **\dfrstop** keyword.

Example

Let's look again at the preceding example, in which the deleted value is "3-4b." The RTF would then be

```
\dfrstart0\dfrxst0\dfrxst5\dfrxst0\dfrxst51\dfrxst0\dfrxst45\dfrxst0\dfrxst52
\dfrxst0\dfrxst66\dfrxst0\dfrxst46\dfrstop10
```

where 5 is the length byte, 51 is Unicode for "3", 45 is Unicode for "-", 52 is Unicode for "4", and so on.

Paragraph Borders

Paragraph borders have the following syntax:

<brdrdef>	(<brdrseg> <brdr>)+
<brdrseg>	**\brdrt** | **\brdrb** | **\brdrl** | **\brdrr** | **\brdrbtw** | **\brdrbar** | **\box**
<brdr>	<brdrk> ***brdrw*** ? ***brsp*** ? ***brdrcf*** ?
<brdrk>	**\brdrs | \brdrth | \brdrsh | \brdrdb | \brdrdot | \brdrdash | \brdrhair | brdrinset | \brdrdashsm** | **\brdrdashd | \brdrdashdd | \brdrtriple | \brdrtnthsg | \brdrthtnsg | \brdrtnthtnsg | \brdrtnthmg | \brdrthtnmg | \brdrtnthtnmg | \brdrtnthlg | \brdrthtnlg | \brdrtnthtnlg | \brdrwavy | \brdrwavydb | \brdrdashdotstr | \brdremboss | \brdrengrave \brdroutset | \ brdrnone | \brdrtbl | \brdrnil**

Control word	Meaning
\brdrt	Border top.
\brdrb	Border bottom.
\brdrl	Border left.
\brdrr	Border right.
\brdrbtw	Consecutive paragraphs with identical border formatting are considered part of a single group with the border information applying to the entire group. To have borders around individual paragraphs within the group, the **\brdrbtw** control must be specified for that paragraph.
\brdrbar	Border outside (right side of odd-numbered pages, left side of even-numbered pages).
\box	Border around the paragraph (box paragraph).
\brdrs	Single-thickness border.
\brdrth	Double-thickness border.
\brdrsh	Shadowed border.
\brdrdb	Double border.
\brdrdot	Dotted border.
\brdrdash	Dashed border.
\brdrhair	Hairline border.
\brdrinset	Inset border.
\brdrdashsm	Dashed border (small).
\brdrdashd	Dot-dashed border.
\brdrdashdd	Dot-dot-dashed border.
\brdroutset	Outset border.
\brdrtriple	Triple border.
\brdrtnthsg	Thick-thin border (small).
\brdrthtnsg	Thin-thick border (small).
\brdrtnthtnsg	Thin-thick thin border (small).
\brdrtnthmg	Thick-thin border (medium).
\brdrthtnmg	Thin-thick border (medium).
\brdrtnthtnmg	Thin-thick thin border (medium).
\brdrtnthlg	Thick-thin border (large).
\brdrthtnlg	Thin-thick border (large).
\brdrtnthtnlg	Thin-thick-thin border (large).
\brdrwavy	Wavy border.
\brdrwavydb	Double wavy border.
\brdrdashdotstr	Striped border.
\brdremboss	Embossed border.
\brdrengrave	Engraved border.

Control word	Meaning
\brdrframe	Border resembles a “Frame.”
\brdrw*N*	***N*** is the width in twips of the pen used to draw the paragraph border line. ***N*** cannot be greater than 75. To obtain a larger border width, the ***brdth*** control word can be used to obtain a width double that of ***N.***
\brdrcf*N*	***N*** is the color of the paragraph border, specified as an index into the color table in the RTF header.
\brsp*N*	Space in twips between borders and the paragraph.
\brdrnil	No border specified.
\brdrtbl	Table cell has no borders.

Paragraph Shading

Paragraph shading has the following syntax:

<shading> (***shading*** | <pat>) ***cfpat***? ***cbpat***?

<pat> **\bghoriz** | **\bgvert** | **\bgfdiag** | **\bgbdiag** | **\bgcross** | **\bgdcross** | **\bgdkhoriz** | **\bgdkvert** | **\bgdkfdiag** | **\bgdkbdiag** | **\bgdkcross** | **\bgdkdcross**

Control word	Meaning
\shading*N*	***N*** is the shading of the paragraph in hundredths of a percent.
\bghoriz	Specifies a horizontal background pattern for the paragraph.
\bgvert	Specifies a vertical background pattern for the paragraph.
\bgfdiag	Specifies a forward diagonal background pattern for the paragraph (\\\\).
\bgbdiag	Specifies a backward diagonal background pattern for the paragraph (////).
\bgcross	Specifies a cross background pattern for the paragraph.
\bgdcross	Specifies a diagonal cross background pattern for the paragraph.
\bgdkhoriz	Specifies a dark horizontal background pattern for the paragraph.
\bgdkvert	Specifies a dark vertical background pattern for the paragraph.
\bgdkfdiag	Specifies a dark forward diagonal background pattern for the paragraph (****).
\bgdkbdiag	Specifies a dark backward diagonal background pattern for the paragraph (***////***).
\bgdkcross	Specifies a dark cross background pattern for the paragraph.
\bgdkdcross	Specifies a dark diagonal cross background pattern for the paragraph.
\cfpat*N*	***N*** is the fill color, specified as an index into the document's color table.
\cbpat*N*	***N*** is the background color of the background pattern, specified as an index into the document's color table.

Positioned Objects and Frames

The following paragraph-formatting control words specify the location of a paragraph on the page. Consecutive paragraphs with the same frame formatting are considered part of the same frame. For two framed paragraphs to appear at the same position on a page, they must be separated by a paragraph with different or no frame information.

Note that if any paragraph in a table row has any of these control words specified, then all paragraphs in the table row must have the same control words specified, either by inheriting the properties from the previous paragraph or by re-specifying the controls.

Paragraph positioning has the following syntax:

<apoctl>	<framesize> & <horzpos> & <vertpos> & <txtwrap> & <dropcap> & <txtflow> & **\absnoovrlp**?
<framesize>	**\absw**? & **\absh**?
<horzpos>	<hframe> & <hdist>
<vertpos>	<vframe> & <vdist>
<txtwrap>	**\nowrap**? & **\dxfrtext**? & **\dfrmtxtx**? &**\dfrmtxty**?
<dropcap>	**\dropcapli**? & **\dropcapt**?
<hframe>	**\phmrg**? | **\phpg**? | **\phcol**?
<hdist>	**\posx**? | **\posnegx**? | **\posxc**? | **\posxi**? | **\posxo**? | **\posxl**? | **\posxr**?
<vframe>	**\pvmrg**? | **\pvpg**? | **\pvpara**?
<vdist>	**\posy**? | **\posnegy**? | **\posyt**? | **\posyil**? | **\posyb**? | **\posyc**? | **\posyin**? | **\posyout**? & **\abslock**?
<txtflow>	**\frmtxlrtb** | **\frmtxtbrl** | **\frmtxbtlr** | **\frmtxlrtbv** | **\frmtxtbrlv**

Control word	Meaning
Frame Size	
\absw*N*	***N*** is the width of the frame in twips.
\absh*N*	***N*** is the height of the frame in twips. A positive number indicates the minimum height of the frame, and a negative number indicates the exact height of the frame. A value of zero indicates that the height of the frame adjusts to the contents of the frame. This is the default for frames where no height is given.
Horizontal Position	
\phmrg	Use the margin as the horizontal reference frame.
\phpg	Use the page as the horizontal reference frame.
\phcol	Use the column as the horizontal reference frame. This is the default if no horizontal reference frame is given.
\posx*N*	Positions the frame ***N*** twips from the left edge of the reference frame.
\posnegx*N*	Same as **\posx** but allows arbitrary negative values.
\posxc	Centers the frame horizontally within the reference frame.
\posxi	Positions the paragraph horizontally inside the reference frame.
\posxo	Positions the paragraph horizontally outside the reference frame.
\posxr	Positions the paragraph to the right within the reference frame.
\posxl	Positions the paragraph to the left within the reference frame. This is the default if no horizontal positioning information is given.

Control word	Meaning
Vertical Position	
\pvmrg	Positions the reference frame vertically relative to the margin. This is the default if no vertical frame positioning information is given.
\pvpg	Positions the reference frame vertically relative to the page.
\pvpara	Positions the reference frame vertically relative to the top left corner of the next unframed paragraph in the RTF stream.
\posy*N*	Positions the paragraph ***N*** twips from the top edge of the reference frame.
\posnegy*N*	Same as **\posy** but allows arbitrary negative values.
\posyil	Positions the paragraph vertically to be inline.
\posyt	Positions the paragraph at the top of the reference frame.
\posyc	Centers the paragraph vertically within the reference frame.
\posyb	Positions the paragraph at the bottom of the reference frame.
\posyin	Positions the paragraph vertically inside the reference frame.
\posyout	Positions the paragraph vertically outside the reference frame.
\abslock*N*	Lock anchor: 0 Do not lock anchor (default). 1 Locks a frame anchor to the current paragraph that it is associated with.
Text Wrapping	
\nowrap	Prevents text from flowing around the positioned object.
\dxfrtext*N*	Distance in twips of a positioned paragraph from text in the main text flow in all directions.
\dfrmtxtx*N*	***N*** is the horizontal distance in twips from text on both sides of the frame.
\dfrmtxty*N*	***N*** is the vertical distance in twips from text on both sides of the frame.
\overlay	Text flows underneath frame.
Drop Caps	
\dropcapli*N*	Number of lines drop cap is to occupy. The range is 1 through 10.
\dropcapt*N*	Type of drop cap: 1 In-text drop cap 2 Margin drop cap
Overlap	
\absnoovrlp*N*	Allow overlap with other frames or objects with similar wrapping: 0 Allow overlap (default) 1 Do not allow overlap
Text Flow	
\frmtxlrtb	Frame box flows from left to right and top to bottom (default).

Control word	Meaning
\frmtxtbrl	Frame box flows right to left and top to bottom.
\frmtxbtlr	Frame box flows left to right and bottom to top.
\frmtxlrtbv	Frame box flows left to right and top to bottom, vertical.
\frmtxtbrlv	Frame box flows top to bottom and right to left, vertical.

The following is an example of absolute-positioned text in a document:

```
\par \pard \pvpg\phpg\posxc\posyt\absw5040\dxfrtest173 First APO para
\par \pard \phmrg\posxo\posyc\dxfrtext1152 Second APO para
```

Table Definitions

There is no RTF table group; instead, tables are specified as paragraph properties. A table is represented as a sequence of table rows. A table row is a continuous sequence of paragraphs partitioned into cells. The table row begins with the **\trowd** control word and ends with the **\row** control word. Every paragraph that is contained in a table row must have the **\intbl** control word specified or inherited from the previous paragraph. A cell may have more than one paragraph in it; the cell is terminated by a cell mark (the **\cell** control word), and the row is terminated by a row mark (the **\row** control word). Table rows can also be positioned. In this case, every paragraph in a table row must have the same positioning controls (see the <apoctl> controls on the Positioned Objects and Frames subsection of this Specification. Table properties may be inherited from the previous row; therefore, a series of table rows may be introduced by a single <tbldef>.

An RTF table row has the following syntax, as shown in the general paragraph-text syntax shown in the Paragraph Text section of this Specification:

<row>	(<tbldef> <cell>+ <tbldef> **\row**) | (<tbldef> <cell>+ **\row**) | (<cell>+ <tbldef> **\row**)
<cell>	(<nestrow>? <tbldef>?) & <textpar>+ **\cell**
<nestrow>	<nestcell>+ '{*'**\nesttableprops** <tbldef> **\nestrow** '}'
<nestcell>	<textpar>+ **\nestcell**

Note that while Word 97 emitted the row properties (<tbldef>) at the beginning of the row, a reader should not assume that this is the case. Properties can be emitted at the end, and, in fact, Word 2002 does this. To avoid breaking readers that might make the aforementioned assumption, Word 2002 will write a copy at the beginning as well, so the properties of a typical row in a Word 2002 document are repeated at the beginning and at the end of the row. Note that for nested cells, Word 2002 writes the properties at the end only.

A table definition has the following syntax:

<tbldef>	**\trowd \irow*N* \irowband*N* \ts*N* *trgaph*** & <rowjust>? & <rowwrite>? & <rowtop>? & <rowbot>? & <rowleft>? & <rowright>? & <rowhor>? & <rowvert>? & <rowpos> ? & ***trleft***? & ***trrh***? **\trhdr**? & **\trkeep**? & <rowwidth>? & <rowinv>? & ***trautofit***? & <rowspc>? & <rowpad>? & **\taprtl**? <trrevision>? <tflags>? <celldef>+
<rowjust>	**\trql** | **\trqr** | **\trqc**
<rowwrite>	**\ltrrow** | **\rtlrow**
<rowtop>	**\trbrdrt** <brdr>
<rowbot>	**\trbrdrl** <brdr>

<rowleft>	**\trbrdrb** <brdr>
<rowright>	**\trbrdrr** <brdr>
<rowhor>	**\trbrdrh** <brdr>
<rowvert>	**\trbrdrv** <brdr>
<rowpos>	<rowhorzpos> & <rowvertpos> & <rowwrap> & **\tabsnoovrlp**?
<rowhorzpos>	<rowhframe>& <rowhdist>
<rowvertpos>	<rowvframe>& <rowvdist>
<rowwrap>	***tdfrmtxtLeft***? & ***tdfrmtxtRight***? & ***tdfrmtxtTop***? & **\tdfrmtxtBottom**?
<rowhframe>	**\phmrg**? | **\phpg**? | **\phcol**?
<rowhdist>	***tposx***? | ***tposnegx***? | **\tposxc**? | **\tposxi**? | **\tposxo**? | **\tposxl**? | **\tposxr**?
<rowvframe>	**\tpvmrg**? | **\tpvpg**? | **\tpvpara**?
<rowvdist>	***tposy***? | ***tposnegy***? | **\tposyt**? | **\tposyil**? | **\tposyb**? | **\tposyc**? | **tposyin** | **tposyout**
<rowwidth>	***trftsWidth*** & ***trwWidth***?
<rowinv>	(***trftsWidthB*** & ***trwWidthB***?)? & (***trftsWidthA*** & ***trwWidthA***?)?
<rowspc>	(***trspdl*** & ***trspdfl***?)? & (***trspdt*** & ***trspdft***?)? & (***trspdb*** & ***trspdfb***?)? & (***trspdr*** & ***trspdfr***?)?
<rowpad>	(***trpaddl*** & ***trpaddfl***?)? & (***trpaddt*** & ***trpaddft***?)? & (***trpaddb*** & ***trpaddfb***?)? & (***trpaddr*** & ***trpaddfr***?)?
<trrevision>	**\trauth*N*** **\trdate*N***
<tflags>	**\tbllkborder** & **\tbllkshading** & **\tbllkfont** & **\tbllkcolor** & **\tbllkbestfit** & **\tbllkhdrrows** & **\tbllklastrow** & **\tbllkhdrcols** & **\tbllklastcol**
<celldef>	(**\clmgf**? & **\clmrg**? & **\clvmgf**? & **\clvmrg**? <celldgu>? & <celldgl>? & <cellalign>? & <celltop>? & <cellleft>? & <cellbot>? & <cellright>? & <cellshad>? & <cellflow>? & **clFitText**? & **clNoWrap**? & <cellwidth>? & <cellpad>?) ***cellx***
<celldgu>	**\cldglu** <brdr>
<celldgl>	**\cldgll** <brdr>
<cellalign>	**\clvertalt** | **\clvertalc** | **\clvertalb**
<celltop>	**\clbrdrt** <brdr>
<cellleft>	**\clbrdrl** <brdr>
<cellbot>	**\clbrdrb** <brdr>
<cellright>	**\clbrdrr** <brdr>
<cellshad>	<cellpat>? ***clcfpat***? & ***clcbpat***? & ***clshdng***
<cellpat>	**\clbghoriz** | **\clbgvert** | **\clbgfdiag** | **\clbgbdiag** | **\clbgcross** | **\clbgdcross** | **\clbgdkhor** | **\clbgdkvert** | **\clbgdkfdiag** | **\clbgdkbdiag** | **\clbgdkcross** | **\clbgdkdcross**
<cellflow>	**\cltxlrtb** | **\cltxtbrl** | **\cltxbtlr** | **\cltxlrtbv** | **\cltxtbrlv**
<cellwidth>	***clftsWidth*** & ***clwWidth***?
<cellpad>	(***clpadl*** & ***clpadfl***?)? & (***clpadt*** & ***clpadft***?)? & (***clpadb*** & ***clpadfb***?)? & (***clpadr*** & ***clpadfr***?)?

Note for <tbldef> that the number of **\cellx**s must match the number of **\cell**s in the **\row**.

The following control words further define options for each row of the table.

Control word	Meaning
\trowd	Sets table row defaults.
\irow*N*	***N*** is the row index of this row.
\irowband*N*	***N*** is the row index of the row, adjusted to account for header rows. A header row has a value of –1.
\row	Denotes the end of a row.
\lastrow	Output if this is the last row in the table.
\tcelld	Sets table cell defaults.
\nestcell	Denotes the end of a nested cell.
\nestrow	Denotes the end of a nested row.
\nesttableprops	Defines the properties of a nested table. This is a destination control word.
\nonesttables	Contains text for readers that do not understand nested tables. This destination should be ignored by readers that support nested tables.
\trgaph*N*	Half the space between the cells of a table row in twips.
\cellx*N*	Defines the right boundary of a table cell, including its half of the space between cells.
\cell	Denotes the end of a table cell.
\clmgf	The first cell in a range of table cells to be merged.
\clmrg	Contents of the table cell are merged with those of the preceding cell.
\clvmgf	The first cell in a range of table cells to be vertically merged.
\clvmrg	Contents of the table cell are vertically merged with those of the preceding cell.
Table Row Revision Tracking	
\trauth*N*	With revision tracking enabled, this control word identifies the author of changes to a table row's properties. ***N*** refers to a value in the revision table.
\trdate*N*	With revision tracking enabled, this control word identifies the date on which a revision was made.
Autoformatting Flags	
\tbllkborder	Flag sets table autoformat to format borders.
\tbllkshading	Flag sets table autoformat to affect shading.
\tbllkfont	Flag sets table autoformat to affect font.
\tbllkcolor	Flag sets table autoformat to affect color.
\tbllkbestfit	Flag sets table autoformat to apply best fit.
\tbllkhdrrows	Flag sets table autoformat to format the first (header) row.
\tbllklastrow	Flag sets table autoformat to format the last row.
\tbllkhdrcols	Flag sets table autoformat to format the first (header) column.
\tbllklastcol	Flag sets table autoformat to format the last column.

Control word	Meaning
Row Formatting	
\taprtl	Table direction is right to left.
\trautofit*N*	AutoFit: 0 No AutoFit (default). 1 AutoFit is on for the row. Overridden by **\clwWidth*N*** and **\trwWidth*N*** in any table row.
\trhdr	Table row header. This row should appear at the top of every page on which the current table appears.
\trkeep	Keep table row together. This row cannot be split by a page break. This property is assumed to be off unless the control word is present.
\trkeepfollow	Keep row in the same page as the following row.
\trleft*N*	Position in twips of the leftmost edge of the table with respect to the left edge of its column.
\trqc	Centers a table row with respect to its containing column.
\trql	Left-justifies a table row with respect to its containing column.
\trqr	Right-justifies a table row with respect to its containing column.
\trrh*N*	Height of a table row in twips. When 0, the height is sufficient for all the text in the line; when positive, the height is guaranteed to be at least the specified height; when negative, the absolute value of the height is used, regardless of the height of the text in the line.
\trpaddb*N*	Default bottom cell margin or padding for the row.
\trpaddl*N*	Default left cell margin or padding for the row.
\trpaddr*N*	Default right cell margin or padding for the row.
\trpaddt*N*	Default top cell margin or padding for the row.
\trpaddfb*N*	Units for **\trpaddb*N***: 0 Null. Ignore **\trpaddb*N*** in favor of ***trgaph*** (Word 97 style padding). 3 Twips.
\trpaddfl*N*	Units for **\trpaddl*N***: 0 Null. Ignore **\trpaddl*N*** in favor of ***trgaph*** (Word 97 style padding). 3 Twips.
\trpaddfr*N*	Units for **\trpaddr*N***: 0 Null. Ignore **\trpaddr*N*** in favor of ***trgaph*** (Word 97 style padding). 3 Twips.

Control word	Meaning
\trpaddft*N*	Units for **\trpaddt*N***: 0 Null. Ignore **\trpaddt*N*** in favor of ***trgaph*** (Word 97 style padding). 3 Twips.
\trspdl*N*	Default left cell spacing for the row. The total horizontal spacing between adjacent cells is equal to the sum of **\trspdl*N*** from the rightmost cell and **\trspdr*N*** from the leftmost cell, both of which will have the same value when written by Word.
\trspdt*N*	Default top cell spacing for the row. The total horizontal spacing between adjacent cells is equal to the sum of **\trspdt*N*** from the bottom cell and **\trspdb*N*** from the top cell, both of which will have the same value when written by Word.
\trspdb*N*	Default bottom cell spacing for the row. The total horizontal spacing between adjacent cells is equal to the sum of **\trspdt*N*** from the bottom cell and **\trspdb*N*** from the top cell, both of which will have the same value when written by Word.
\trspdr*N*	Default right cell spacing for the row. The total horizontal spacing between adjacent cells is equal to the sum of **\trspdl*N*** from the rightmost cell and **\trspdr*N*** from the leftmost cell, both of which will have the same value when written by Word.
\trspdfl*N*	Units for **\trspdl*N***: 0 Null. Ignore **\trspdl*N***. 3 Twips.
\trspdft*N*	Units for **\trspdt*N***: 0 Null. Ignore **\trspdt*N***. 3 Twips.
\trspdfb*N*	Units for **\trspdb*N***: 0 Null. Ignore **\trspdb*N***. 3 Twips.
\trspdfr*N*	Units for **\trspdr*N***: 0 Null. Ignore **\trspdr*N***. 3 Twips.
\trwWidth*N*	Preferred row width. Overrides **\trautofit*N***.

Control word	Meaning
\trftsWidth*N*	Units for **\clwWidth*N***: 0 Null. Ignore ***\trwWidth*** in favor of ***\cellx*** (Word 97 style of determining cell and row width) 1 Auto, no preferred row width, ignores **\clwWidth*N*** if present; **\clwWidth*N*** will generally not be written, giving precedence to row defaults and autofit. 2 Percentage (in 50ths of a percent). 3 Twips.
\trwWidthB*N*	Width of invisible cell at the beginning of the row. Used only in cases where rows have different widths.
\trftsWidthB*N*	Units for **\clwWidthB*N***: 0 Null. No invisible cell before. 1 Auto. ignores **\clwWidthB*N*** if present; **\clwWidthB*N*** will generally not be written. 2 Percentage (in 50ths of a percent). 3 Twips.
\trwWidthA*N*	Width of invisible cell at the end of the row. Used only in cases where rows have different widths.
\trftsWidthA*N*	Units for **\clwWidthB*N***: 0 Null. No invisible cell after. 1 Auto, ignores **\clwWidthB*N*** if present; **\clwWidthB*N*** will generally not be written. 2 Percentage (in 50ths of a percent). 3 Twips.
Row Shading and Background Color	
\trcbpat*N*	Background pattern color for the table row shading.
\trcfpat*N*	Foreground pattern color for the table row shading.
\trpat*N*	Pattern for table row shading.
\trshdng*N*	Percentage shading for table row shading.
\trbgbdiag	Backward diagonal pattern.
\trbgcross	Cross pattern.
\trbgdcross	Diagonal cross pattern.
\trbgdkbdiag	Dark backward diagonal pattern.
\trbgdkcross	Dark cross pattern.
\trbgdkdcross	Dark diagonal cross pattern.
\trbgdkfdiag	Dark forward diagonal pattern.
\trbgdkhor	Dark horizontal pattern.
\trbgdkvert	Dark vertical pattern.
\trbgfdiag	Forward diagonal pattern.
\trbghoriz	Horizontal pattern.
\trbgvert	Vertical pattern.

Control word	Meaning
Cell Formatting	
\clFitText	Fit text in cell, compressing each paragraph to the width of the cell.
\clNoWrap	Do not wrap text for the cell. Only has an effect if the table cell does not have a preferred **\clwWidth*N***, which overrides **\trautofit*N***.
\clpadl*N*	Left cell margin or padding. Overrides **\trpaddl*N***.
\clpadt*N*	Top cell margin or padding. Overrides **\trpaddt*N***.
\clpadb*N*	Bottom cell margin or padding. Overrides **\trpaddb*N***.
\clpadr*N*	Right cell margin or padding. Overrides **\trpaddr*N***.
\clpadfl*N*	Units for **\clpadl*N***: 0 Null. Ignore ***\clpadl*** in favor of ***\trgaph*** (Word 97 style cell padding). 3 Twips.
\clpadft*N*	Units for **\clpadt*N***: 0 Null. Ignore ***\clpadt*** in favor of ***\trgaph*** (Word 97 style cell padding). 3 Twips.
\clpadfb*N*	Units for **\clpadb*N***: 0 Null. Ignore ***\clpadb*** in favor of ***\trgaph*** (Word 97 style cell padding). 3 Twips.
\clpadfr*N*	Units for **\clpadr*N***: 0 Null. Ignore ***\clpadr*** in favor of ***\trgaph*** (Word 97 style cell padding). 3 Twips.
\clwWidth*N*	Preferred cell width. Overrides **\trautofit*N***.
\clftsWidth*N*	Units for **\clwWidth*N***: 0 Null. Ignore ***\clwWidth*** in favor of ***\cellx*** (Word 97 style of determining cell and row width). 1 Auto, no preferred cell width, ignores **\clwWidth*N*** if present; **\clwWidth*N*** will generally not be written, giving precedence to row defaults. 2 Percentage (in 50ths of a percent). 3 Twips.
Positioned Wrapped Tables (The following properties must be the same for all rows in the table.)	
\tdfrmtxtLeft*N*	Distance in twips, between the left of the table and surrounding text (the default is 0).
\tdfrmtxtRight*N*	Distance in twips, between the right of the table and surrounding text (the default is 0).

Control word	Meaning
\tdfrmtxtTop*N*	Distance in twips, between the top of the table and surrounding text (the default is 0).
\tdfrmtxtBottom*N*	Distance in twips, between the bottom of the table and surrounding text (the default is 0).
\tabsnoovrlp	Do not allow the table to overlap with other tables or shapes with similar wrapping not contained within it.
\tphcol	Use the column as the horizontal reference frame. This is the default if no horizontal table positioning information is given.
\tphmrg	Use the margin as the horizontal reference frame.
\tphpg	Use the page as the horizontal reference frame.
\tposnegx*N*	Same as ***tposx*** but allows arbitrary negative values.
\tposnegy*N*	Same as ***tposy*** but allows arbitrary negative values.
\tposx*N*	Positions the table ***N*** twips from the left edge of the horizontal reference frame.
\tposxc	Centers the table within the horizontal reference frame.
\tposxi	Positions the table inside the horizontal reference frame.
\tposxl	Positions the table at the left of the horizontal reference frame.
\tposxo	Positions the table outside the horizontal reference frame.
\tposxr	Positions the table at the right of the horizontal reference frame.
\tposy	Positions the table ***N*** twips from the top edge of the vertical reference frame.
\tposyb	Positions the table at the bottom of the vertical reference frame.
\tposyc	Centers the table within the vertical reference frame
\tposyil	Positions the table to be inline.
\tposyin	Positions the table inside within the vertical reference frame.
\tposyout	Positions the table outside within the vertical reference frame.
\tposyt	Positions the table at the top of the vertical reference frame.
\tpvmrg	Positions the table vertically relative to the top margin. This is the default if no vertical table positioning information is given.
\tpvpara	Positions the table vertically relative to the top left corner of the next unframed paragraph in the stream.
\tpvpg	Positions the table vertically relative to the top of the page.
Bidirectional Controls	
\rtlrow	Cells in this table row will have right-to-left precedence.
\ltrrow	Cells in this table row will have left-to-right precedence (the default).
Row Borders	
\trbrdrt	Table row border top.
\trbrdrl	Table row border left.
\trbrdrb	Table row border bottom.
\trbrdrr	Table row border right.
\trbrdrh	Table row border horizontal (inside).

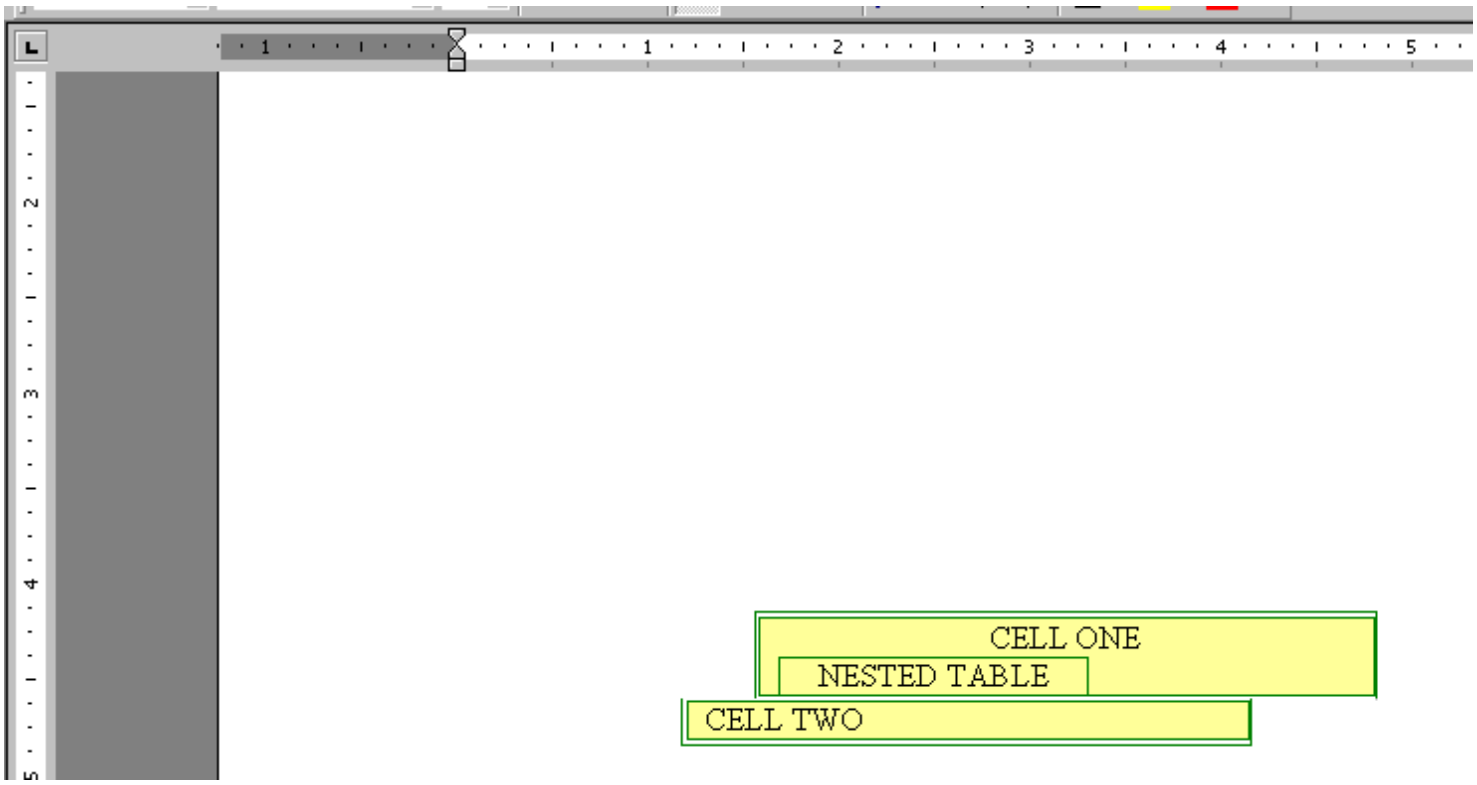
Control word	Meaning
\trbrdrv	Table row border vertical (inside).
Cell Borders	
\brdrnil	No border specified.
\clbrdrb	Bottom table cell border.
\clbrdrt	Top table cell border.
\clbrdrl	Left table cell border.
\clbrdrr	Right table cell border.
\cldglu	Diagonal line (top left to bottom right).
\cldgll	Diagonal line (top right to bottom left).
Cell Shading and Background Pattern	
\clshdrawnil	No shading specified.
\clshdng*N*	***N*** is the shading of a table cell in hundredths of a percent. This control should be included in RTF along with cell border information.
\clshdngraw*N*	Same as **\clshdng*N*** for use with table styles.
\clbghoriz	Specifies a horizontal background pattern for the cell.
\rawclbghoriz	Same as **\clbghoriz** for use with table styles.
\clbgvert	Specifies a vertical background pattern for the cell.
\rawclbgvert	Same as **\clbgvert** for use with table styles.
\clbgfdiag	Specifies a forward diagonal background pattern for the cell (\\\\).
\rawclbgfdiag	Same as **\clbgfdiag** for use with table styles.
\clbgbdiag	Specifies a backward diagonal background pattern for the cell (////).
\rawclbgbdiag	Same as **\clbgbdiag** for use with table styles.
\clbgcross	Specifies a cross background pattern for the cell.
\rawclbgcross	Same as **\clbgcross** for use with table styles.
\clbgdcross	Specifies a diagonal cross background pattern for the cell.
\rawclbgdcross	Same as **clbgdcross** for use with table styles.
\clbgdkhor	Specifies a dark horizontal background pattern for the cell.
\rawclbgdkhor	Same as **\clbgdkhor** for use with table styles.
\clbgdkvert	Specifies a dark vertical background pattern for the cell.
\rawclbgdkvert	Same as **\clbgdkvert** for use with table styles.
\clbgdkfdiag	Specifies a dark forward diagonal background pattern for the cell (****).
\rawclbgdkfdiag	Same as **\clbgdkfdiag** for use with table styles.
\clbgdkbdiag	Specifies a dark backward diagonal background pattern for the cell (***////***).
\rawclbgdkbdiag	Same as **\clbgdkbdiag** for use with table styles.
\clbgdkcross	Specifies a dark cross background pattern for the cell.
\rawclbgdkcross	Same as **\clbgdkcross** for use with table styles.

Control word	Meaning
\clbgdkdcross	Specifies a dark diagonal cross background pattern for the cell.
\rawclbgdkdcross	Same as **\clbgdkdcross** for use with table styles.
\clcfpat*N*	***N*** is the line color of the background pattern.
\clcfpatraw*N*	Same as **\clcfpat*N*** for use with table styles.
\clcbpat*N*	***N*** is the background color of the background pattern.
\clcbpatraw*N*	Same as **\clcbpat*N*** for use with table styles.
Cell Vertical Text Alignment	
\clvertalt	Text is top-aligned in cell (the default).
\clvertalc	Text is centered vertically in cell.
\clvertalb	Text is bottom-aligned in cell.
Cell Text Flow	
\cltxlrtb	Text in a cell flows from left to right and top to bottom (default).
\cltxtbrl	Text in a cell flows right to left and top to bottom.
\cltxbtlr	Text in a cell flows left to right and bottom to top.
\cltxlrtbv	Text in a cell flows left to right and top to bottom, vertical.
\cltxtbrlv	Text in a cell flows top to bottom and right to left, vertical.

Example

The following is an example of a complex Word 2000 table RTF. It does not take account of the table styles implemented in Word 2002. The BMP showing the table's look and position is followed by the corresponding RTF, which is followed by a piece-by-piece analysis of the RTF.

The image shows a freely positioned Word table, with two cells at an offset. Inside the topmost cell is a nested table. The table has green borders, yellow shading, a small amount of spacing between cells, and inner cell margins or padding.



The following is the RTF for this table as emitted by Word 2000. Word 2000 also emits RTF that older readers (such as previous versions of Word) can understand, so new features degrade nicely.

```
¥trowd ¥trgaph115¥trleft388¥trbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl¥brdrs¥brdrw15¥brdrcf11
¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr¥brdrs¥brdrw15¥brdrcf11
¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
¥tphmrg¥tposxc¥tposyc¥tdfrmtxtLeft187¥tdfrmtxtRight187¥trftsWidth1¥trftsWidthB3¥trwWidthB504¥trftsWidthA3
¥trautofit1¥trspdl14¥trspdt14¥trspdb14¥trspdr14¥trspdfl3¥trspdft3¥trspdfb3¥trspdfr3¥trpaddl115¥trpaddr115
¥trpaddfl3¥trpaddfr3 ¥clvertalc¥clbrdrt
¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb¥brdrs¥brdrw15¥brdrcf11
¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥clcbpat17¥cltxlrtb¥clftsWidth3¥clwWidth4644 ¥cellx5074¥pard¥plain
¥qc
¥li0¥ri0¥widctlpar¥intbl¥phmrg¥posxc¥posyc¥dxfrtext187¥dfrmtxtx187¥dfrmtxty0¥aspalpha¥aspnum¥faauto¥adjus
tright¥rin0¥lin0 ¥fs24¥lang1033¥langfe2052¥loch¥af0¥hich¥af0¥dbch¥af17¥cgrid¥langnp1033¥langfenp2052
{¥hich¥af0¥dbch¥af17¥loch¥f0 CELL ONE
¥par }¥pard ¥qc
¥li0¥ri0¥widctlpar¥intbl¥phmrg¥posxc¥posyc¥dxfrtext187¥dfrmtxtx187¥dfrmtxty0¥aspalpha¥aspnum¥faauto¥adjus
tright¥rin0¥lin0¥itap2 {¥hich¥af0¥dbch¥af17¥loch¥f0 NESTED TABLE¥nestcell{¥nonesttables
¥par }}¥pard ¥ql ¥li0¥ri0¥widctlpar¥intbl¥aspalpha¥aspnum¥faauto¥adjustright¥rin0¥lin0¥itap2
{{¥*¥nesttableprops¥trowd ¥trgaph108¥trleft8¥trbrdrt¥brdrs¥brdrw15¥brdrcf11
¥trbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr
¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
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¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥cltxlrtb¥clftsWidth3¥clwWidth2340
¥cellx2348¥nestrow}{¥nonesttables
¥par }}¥trowd ¥trgaph115¥trleft388¥trbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl¥brdrs¥brdrw15¥brdrcf11
¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrh¥brdrs¥brdrw15¥brdrcf11
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¥trpaddfl3¥trpaddfr3 ¥clvertalc¥clbrdrt
¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb¥brdrs¥brdrw15¥brdrcf11
¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥clcbpat17¥cltxlrtb¥clftsWidth3¥clwWidth4644 ¥cellx5074¥pard
¥qc
¥li0¥ri0¥widctlpar¥intbl¥phmrg¥posxc¥posyc¥dxfrtext187¥dfrmtxtx187¥dfrmtxty0¥aspalpha¥aspnum¥faauto¥adjus
tright¥rin0¥lin0 {¥cell }¥pard ¥ql ¥li0¥ri0¥widctlpar¥intbl¥aspalpha¥aspnum¥faauto¥adjustright¥rin0¥lin0
{¥trowd ¥trgaph115¥trleft388¥trbrdrt
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¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrb¥brdrs¥brdrw15¥brdrcf11
¥trbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
¥tphmrg¥tposxc¥tposyc¥tdfrmtxtLeft187¥tdfrmtxtRight187¥trftsWidth1¥trftsWidthB3¥trwWidthB504¥trftsWidthA3
¥trautofit1¥trspdl14¥trspdt14¥trspdb14¥trspdr14¥trspdfl3¥trspdft3¥trspdfb3¥trspdfr3¥trpaddl115¥trpaddr115
¥trpaddfl3¥trpaddfr3 ¥clvertalc¥clbrdrt
¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb¥brdrs¥brdrw15¥brdrcf11
¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥clcbpat17¥cltxlrtb¥clftsWidth3¥clwWidth4644 ¥cellx5074¥row }¥trowd
¥trgaph115¥trleft-158¥trbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl
¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr¥brdrs¥brdrw15¥brdrcf11
¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
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¥trpaddfl3¥trpaddfr3 ¥clvertalt¥clbrdrt
¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb¥brdrs¥brdrw15¥brdrcf11
¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥clcbpat17¥cltxlrtb¥clftsWidth3¥clwWidth4248 ¥cellx4132¥pard
¥ql
¥li0¥ri0¥widctlpar¥intbl¥phmrg¥posxc¥posyc¥dxfrtext187¥dfrmtxtx187¥dfrmtxty0¥aspalpha¥aspnum¥faauto¥adjus
tright¥rin0¥lin0 {¥hich¥af0¥dbch¥af17¥loch¥f0 CELL TWO¥cell }¥pard ¥ql
¥li0¥ri0¥widctlpar¥intbl¥aspalpha¥aspnum¥faauto¥adjustright¥rin0¥lin0 {
¥trowd ¥trgaph115¥trleft-158¥trbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl¥brdrs¥brdrw15¥brdrcf11
¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrh¥brdrs¥brdrw15¥brdrcf11
¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
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¥trautofit1¥trspdl14¥trspdt14¥trspdb14¥trspdr14¥trspdfl3¥trspdft3¥trspdfb3¥trspdfr3¥trpaddl115¥trpaddr115
¥trpaddfl3¥trpaddfr3 ¥clvertalt¥clbrdrt
\brdrs\brdrw15\brdrcf11 \clbrdrl\brdrs\brdrw15\brdrcf11 \clbrdrb\brdrs\brdrw15\brdrcf11
\clbrdrr\brdrs\brdrw15\brdrcf11 \clcbpat17\cltxlrtb\clftsWidth3\clwWidth4248 \cellx4132\row }
```

The following is an analysis of the preceding RTF. It has been restructured for ease of explanation. All text in red are comments. The topmost cell is cell 1 (inside row 1). The bottom cell is cell 2 (inside row 2).

```
Begin table row defaults for row 1.
¥trowd

¥trgaph115
¥trleft388

Row borders
¥trbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrb¥brdrs¥brdrw15¥brdrcf11
¥trbrdrr¥brdrs¥brdrw15¥brdrcf11
¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11

Absolute positioning of the table. All rows should have the same positioning.
¥tphmrg¥tposxc¥tposyc¥tdfrmtxtLeft187¥tdfrmtxtRight187

Width of invisible cell before cell one (to simulate offset)
¥trftsWidth1¥trftsWidthB3¥trwWidthB504¥trftsWidthA3

Autofit is on.
¥trautofit1

Default cell spacing for the row
¥trspdl14¥trspdt14¥trspdb14¥trspdr14¥trspdfl3¥trspdft3¥trspdfb3¥trspdfr3¥trpaddl115¥trpaddr115¥trpaddfl3¥
trpaddfr3

Cell 1 definition begins.

Vertical alignment of contents
¥clvertalc

Cell borders
¥clbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb¥brdrs¥brdrw15¥brdrcf11
¥clbrdrr¥brdrs¥brdrw15¥brdrcf11

Cell shading
¥clcbpat17

Cell text flow
¥cltxlrtb

Cell width, using new properties and old ones
```

```
¥clftsWidth3¥clwWidth4644 ¥cellx5074

Text for cell 1 begins here. Includes paragraph absolute positioning equivalent to the table absolute
positioning above so that old readers get it right.
¥pard¥plain ¥qc
¥li0¥ri0¥widctlpar¥intbl¥phmrg¥posxc¥posyc¥dxfrtext187¥dfrmtxtx187¥dfrmtxty0¥aspalpha¥aspnum¥faauto¥adjus
tright¥rin0¥lin0 ¥fs24¥lang1033¥langfe2052¥loch¥af0¥hich¥af0¥dbch¥af17¥cgrid¥langnp1033¥langfenp2052
{¥hich¥af0¥dbch¥af17¥loch¥f0 CELL ONE
¥par }

Begin definition of nested table inside cell 1.
¥pard ¥qc
¥li0¥ri0¥widctlpar¥intbl¥phmrg¥posxc¥posyc¥dxfrtext187¥dfrmtxtx187¥dfrmtxty0¥aspalpha¥aspnum¥faauto¥adjus
tright¥rin0¥lin0

Notice itap is set to 2, indicating second nesting level.
¥itap2

Nested cell ends with a ¥nestcell and is followed by a paragraph mark inside a ¥nonesttables destination,
which is only read by readers that do not understand nested tables. This way the text in the nested table
is in its own paragraph.
{¥hich¥af0¥dbch¥af17¥loch¥f0 NESTED TABLE¥nestcell{¥nonesttables
¥par }}¥pard ¥ql ¥li0¥ri0¥widctlpar¥intbl¥aspalpha¥aspnum¥faauto¥adjustright¥rin0¥lin0¥itap2

Nested table properties occur after the text for the nested cell.
{{¥*¥nesttableprops¥trowd ¥trgaph108¥trleft8¥trbrdrt¥brdrs¥brdrw15¥brdrcf11
¥trbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr
¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
¥trftsWidth1¥trautofit1¥trpaddl108¥trpaddr108¥trpaddfl3¥trpaddfr3
¥clvertalt¥clbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb
¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥cltxlrtb¥clftsWidth3¥clwWidth2340
¥cellx2348¥nestrow}{¥nonesttables
¥par }}
End of nested table properties

Set the default for the row again after nested table! We're still in the first row, and this repeats what
was written in the beginning of the row. Defaults of the table are reset and the cell is closed with a
¥cell.
¥trowd ¥trgaph115¥trleft388¥trbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl¥brdrs¥brdrw15¥brdrcf11
¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr¥brdrs¥brdrw15
cf11 ¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
¥tphmrg¥tposxc¥tposyc¥tdfrmtxtLeft187¥tdfrmtxtRight187¥trftsWidth1¥trftsWidthB3¥trwWidthB504¥trftsWidthA3
¥trautofit1¥trspdl14¥trspdt14¥trspdb14¥trspdr14¥trspdfl3¥trspdft3¥trspdfb3¥trspdfr3¥trpaddl115¥trpaddr115
¥trpaddfl3¥trpaddfr3 ¥clvertalc¥clbrdrt
¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb¥brdrs¥brdrw15¥brdrcf11
¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥clcbpat17¥cltxlrtb¥clftsWidth3¥clwWidth4644 ¥cellx5074¥pard
¥qc
¥li0¥ri0¥widctlpar¥intbl¥phmrg¥posxc¥posyc¥dxfrtext187¥dfrmtxtx187¥dfrmtxty0¥aspalpha¥aspnum¥faauto¥adjus
tright¥rin0¥lin0 {¥cell }¥pard ¥ql ¥li0¥ri0¥widctlpar¥intbl¥aspalpha¥aspnum¥faauto¥adjustright¥rin0¥lin0
This is the end of the table cell.

Now the row ends, repeating the defaults of the row at the end of it!
{¥trowd ¥trgaph115¥trleft388¥trbrdrt
¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrb¥brdrs¥brdrw15¥brdrcf11
¥trbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
¥tphmrg¥tposxc¥tposyc¥tdfrmtxtLeft187¥tdfrmtxtRight187¥trftsWidth1¥trftsWidthB3¥trwWidthB504¥trftsWidthA3
¥trautofit1¥trspdl14¥trspdt14¥trspdb14¥trspdr14¥trspdfl3¥trspdft3¥trspdfb3¥trspdfr3¥trpaddl115¥trpaddr115
¥trpaddfl3¥trpaddfr3 ¥clvertalc¥clbrdrt
¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb¥brdrs¥brdrw15¥brdrcf11
¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥clcbpat17¥cltxlrtb¥clftsWidth3¥clwWidth4644 ¥cellx5074¥row }
END OF ROW 1

Row 2 begins here and is structured similarly.

Row defaults
¥trowd ¥trgaph115¥trleft-158¥trbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl
¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr¥brdrs¥brdrw15¥brdrcf11
¥trbrdrh¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrv¥brdrs¥brdrw15¥brdrcf11

Absolute positioning for the table row, matching the previous one
¥tphmrg¥tposxc¥tposyc¥tdfrmtxtLeft187¥tdfrmtxtRight187¥trftsWidth1¥trftsWidthB3¥trftsWidthA3¥trwWidthA900
¥trautofit1¥trspdl14¥trspdt14¥trspdb14¥trspdr14¥trspdfl3¥trspdft3¥trspdfb3¥trspdfr3¥trpaddl115¥trpaddr115
¥trpaddfl3¥trpaddfr3
```

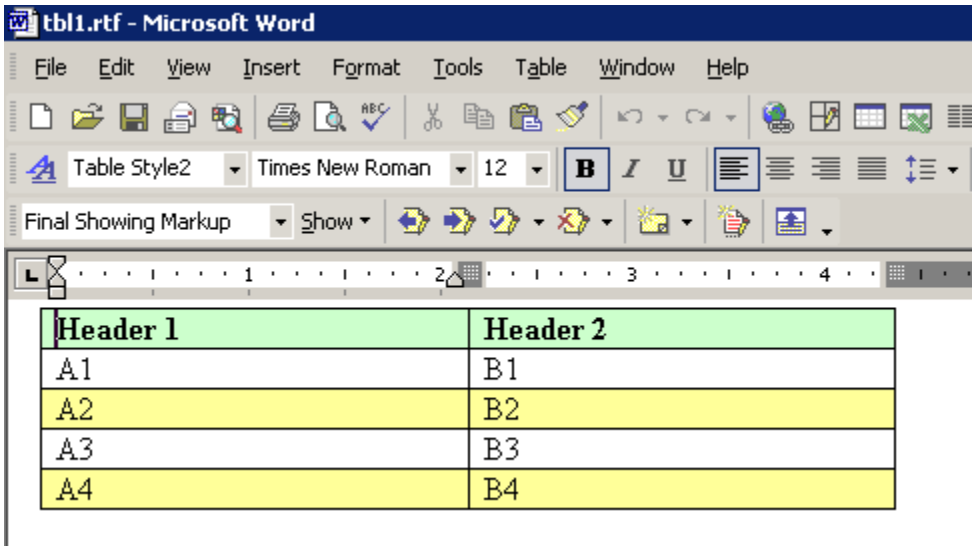
```
Cell 2 properties
¥clvertalt¥clbrdrt
¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrl¥brdrs¥brdrw15¥brdrcf11 ¥clbrdrb¥brdrs¥brdrw15¥brdrcf11
¥clbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥clcbpat17¥cltxlrtb¥clftsWidth3¥clwWidth4248 ¥cellx4132

Cell 2 text
¥pard
¥ql
¥li0¥ri0¥widctlpar¥intbl¥phmrg¥posxc¥posyc¥dxfrtext187¥dfrmtxtx187¥dfrmtxty0¥aspalpha¥aspnum¥faauto¥adjus
tright¥rin0¥lin0 {¥hich¥af0¥dbch¥af17¥loch¥f0 CELL TWO¥cell }¥pard ¥ql
¥li0¥ri0¥widctlpar¥intbl¥aspalpha¥aspnum¥faauto¥adjustright¥rin0¥lin0
End cell 2 text

Now the row ends, repeating the defaults of the row at the end of it!
{¥trowd ¥trgaph115¥trleft-158¥trbrdrt¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrl¥brdrs¥brdrw15¥brdrcf11
¥trbrdrb¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrr¥brdrs¥brdrw15¥brdrcf11 ¥trbrdrh¥brdrs¥brdrw15¥brdrcf11
¥trbrdrv¥brdrs¥brdrw15¥brdrcf11
¥tphmrg¥tposxc¥tposyc¥tdfrmtxtLeft187¥tdfrmtxtRight187¥trftsWidth1¥trftsWidthB3¥trftsWidthA3¥trwWidthA900
¥trautofit1¥trspdl14¥trspdt14¥trspdb14¥trspdr14¥trspdfl3¥trspdft3¥trspdfb3¥trspdfr3¥trpaddl115¥trpaddr115
¥trpaddfl3¥trpaddfr3 ¥clvertalt¥clbrdrt
\brdrs\brdrw15\brdrcf11 \clbrdrl\brdrs\brdrw15\brdrcf11 \clbrdrb\brdrs\brdrw15\brdrcf11
\clbrdrr\brdrs\brdrw15\brdrcf11 \clcbpat17\cltxlrtb\clftsWidth3\clwWidth4248 \cellx4132\row }

END OF ROW TWO
```

Table Styles Example



Header 1	Header 2
A1	B1
A2	B2
A3	B3
A4	B4

Here is the stylesheet with one table style highlighted. Note that a single table style can have multiple entries. **\ts**11 is the default table style. This style gives the first row a fill color and font attributes. Every subsequent odd row is filled with pale yellow.

```
{\stylesheet{\ql \li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 \snext0 Normal;}{\*\cs10 \additive
\ssemihidden Default Paragraph
Font;}{\*\ts11\tsrowd\trftsWidthB3\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb3\trpaddfr3\tsc
ellwidthfts0\tsvertalt\tsbrdrt\tsbrdrl\tsbrdrb\tsbrdrr\tsbrdrdgl\tsbrdrdgr\tsbrdrh\tsbrdrv \ql
\li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs20\lang1024\langfe1024\cgrid\langnp1024\langfenp1024 \snext11 \ssemihidden Normal
Table;}{\*\ts15\tsrowd\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10 \trbrdrb\brdrs\brdrw10
\trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidthB3\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb3\trpaddfr3\tscellwidthfts0\tsvertal
t\tsbrdrt\tsbrdrl\tsbrdrb\tsbrdrr\tsbrdrdgl\tsbrdrdgr\tsbrdrh\tsbrdrv \ql
\li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs20\lang1024\langfe1024\cgrid\langnp1024\langfenp1024 \sbasedon11 \snext15 \styrsid353782 Table
Grid;}{\*\ts16\tsrowd\trbrdrt\brdrs\brdrw15\brdrcf1 \trbrdrl\brdrs\brdrw15\brdrcf1
\trbrdrb\brdrs\brdrw15\brdrcf1 \trbrdrr\brdrs\brdrw15\brdrcf1 \trbrdrv\brdrs\brdrw15\brdrcf1
\trftsWidthB3\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb3\trpaddfr3\tscbandsh1\tscellwidthft
s0\tsvertalt\tsbrdrt\tsbrdrl\tsbrdrb\tsbrdrr\tsbrdrdgl\tsbrdrdgr\tsbrdrh\tsbrdrv \ql
```

```
\li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs20\lang1024\langfe1024\cgrid\langnp1024\langfenp1024 \sbasedon11 \snext16 \styrsid353782 Table
List 8;}{\*\ts16\tsrowd\tscellcfpat7\tscellcbpat8\tscellpct10000\tsbrdrb\brdrs\brdrw15\brdrcf1
\tsbrdrdgl\brdrnil\tsbrdrdgr\brdrnil \b\i \tscfirstrow Table List
8;}{\*\ts16\tsrowd\tsbrdrt\brdrs\brdrw15\brdrcf1 \tsbrdrdgl\brdrnil\tsbrdrdgr\brdrnil \b \tsclastrow
Table List 8;}{\*\ts16\tsrowd\tsbrdrdgl\brdrnil\tsbrdrdgr\brdrnil \b \tscfirstcol Table List
8;}{\*\ts16\tsrowd\tsbrdrdgl\brdrnil\tsbrdrdgr\brdrnil \b \tsclastcol Table List
8;}{\*\ts16\tsrowd\tscellcfpat7\tscellcbpat8\tscellpct2500\tsbrdrdgl\brdrnil\tsbrdrdgr\brdrnil \cf0
\tscbandhorzodd Table List
8;}{\*\ts16\tsrowd\tscellcfpat6\tscellcbpat8\tscellpct5000\tsbrdrdgl\brdrnil\tsbrdrdgr\brdrnil
\tscbandhorzeven Table List 8;}{\*\ts17\tsrowd\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10
\trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidthB3\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb3\trpaddfr3\tscbandsh1\tscellwidthft
s0\tsvertalc\tsbrdrt\tsbrdrl\tsbrdrb\tsbrdrr\tsbrdrdgl\tsbrdrdgr\tsbrdrh\tsbrdrv \qr
\li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs20\lang1024\langfe1024\cgrid\langnp1024\langfenp1024 \sbasedon15 \snext17 \styrsid353782 Table
Style1;}{\*\ts17\tsrowd\tsvertalc\tscellcfpat0\tscellcbpat17\tscellpct0 \qc \f36\fs22 \tscfirstrow
Table Style1;}{\*\ts17\tsrowd\tsvertalt \qr \tsclastrow Table Style1;}{\*\ts17\tsrowd \ql \f36\fs18
\tscfirstcol Table Style1;}{\*\ts17\tsrowd\tscellcfpat0\tscellcbpat18\tscellpct0 \tscbandhorzodd
Table Style1;}{\*\ts17\tsrowd \b\f36\fs20 \tscsecell Table
Style1;}{\*\ts18\tsrowd\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10 \trbrdrb\brdrs\brdrw10
\trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidthB3\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb3\trpaddfr3\tscbandsh1\tscellwidthft
s0\tsvertalt\tsbrdrt\tsbrdrl\tsbrdrb\tsbrdrr\tsbrdrdgl\tsbrdrdgr\tsbrdrh\tsbrdrv \ql
\li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs20\lang1024\langfe1024\cgrid\langnp1024\langfenp1024 \sbasedon15 \snext18 \styrsid353782 Table
Style2;}{\*\ts18\tsrowd\tscellcfpat0\tscellcbpat17\tscellpct0 \b \tscfirstrow Table
Style2;}{\*\ts18\tsrowd\tscellcfpat0\tscellcbpat18\tscellpct0 \tscbandhorzeven Table Style2;}}
```

Table RTF Most of this has been explained in the preceding example, so only some of the changes in Word 2002 have been highlighted.

```
\trowd \irow0\irowband-1\ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10
\trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat17\cltxlrtb\clftsWidth3\clwWidth3208\clcbpatraw17
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat17\cltxlrtb\clftsWidth3\clwWidth3207\clcbpatraw17
\cellx6307\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0\tscfirstrow\yts18
\b\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 Header 1\cell }\pard\plain
\ql \li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0\tscfirstrow\yts18
\b\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 Header 2\cell }\pard\plain
\ql \li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 \trowd \irow0\irowband-1
\ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10 \trbrdrb\brdrs\brdrw10
\trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat17\cltxlrtb\clftsWidth3\clwWidth3208\clcbpatraw17
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat17\cltxlrtb\clftsWidth3\clwWidth3207\clcbpatraw17
\cellx6307\row }\trowd \irow1\irowband0\ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10
\trbrdrl\brdrs\brdrw10 \trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10
\trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \cltxlrtb\clftsWidth3\clwWidth3208\clshdrawnil
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \cltxlrtb\clftsWidth3\clwWidth3207\clshdrawnil \cellx6307\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0\yts18
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 A1\cell B1\cell }\pard\plain
\ql \li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 \trowd
\irow1\irowband0\ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10
\trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
```

```
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \cltxlrtb\clftsWidth3\clwWidth3208\clshdrawnil
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \cltxlrtb\clftsWidth3\clwWidth3207\clshdrawnil \cellx6307\row }\trowd
\irow2\irowband1\ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10
\trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat18\cltxlrtb\clftsWidth3\clwWidth3208\clcbpatraw18
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat18\cltxlrtb\clftsWidth3\clwWidth3207\clcbpatraw18
\cellx6307\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0\tscbandhorzeven\yts18
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 A2\cell }\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0\tscbandhorzeven\yts18
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 B2\cell }\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 \trowd
\irow2\irowband1\ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10
\trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat18\cltxlrtb\clftsWidth3\clwWidth3208\clcbpatraw18
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat18\cltxlrtb\clftsWidth3\clwWidth3207\clcbpatraw18
\cellx6307\row }\trowd \irow3\irowband2\ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10
\trbrdrl\brdrs\brdrw10 \trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10
\trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \cltxlrtb\clftsWidth3\clwWidth3208\clshdrawnil
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \cltxlrtb\clftsWidth3\clwWidth3207\clshdrawnil \cellx6307\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0\yts18
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 A3\cell B3\cell }\pard\plain
\ql \li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 \trowd
\irow3\irowband2\ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10
\trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \cltxlrtb\clftsWidth3\clwWidth3208\clshdrawnil
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \cltxlrtb\clftsWidth3\clwWidth3207\clshdrawnil \cellx6307\row }\trowd
\irow4\irowband3\lastrow \ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10
\trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat18\cltxlrtb\clftsWidth3\clwWidth3208\clcbpatraw18
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat18\cltxlrtb\clftsWidth3\clwWidth3207\clcbpatraw18
\cellx6307\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0\tscbandhorzeven\yts18
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 A4\cell }\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0\tscbandhorzeven\yts18
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 B4\cell }\pard\plain \ql
\li0\ri0\widctlpar\intbl\aspalpha\aspnum\faauto\adjustright\rin0\lin0
\fs24\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\insrsid353782 \trowd
\irow4\irowband3\lastrow \ts18\trgaph108\trleft-108\trbrdrt\brdrs\brdrw10 \trbrdrl\brdrs\brdrw10
\trbrdrb\brdrs\brdrw10 \trbrdrr\brdrs\brdrw10 \trbrdrh\brdrs\brdrw10 \trbrdrv\brdrs\brdrw10
\trftsWidth1\trftsWidthB3\trftsWidthA3\trautofit1\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb
3\trpaddfr3\tscbandsh1\tbllkhdrrows\tbllklastrow\tbllkhdrcols\tbllklastcol
\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat18\cltxlrtb\clftsWidth3\clwWidth3208\clcbpatraw18
\cellx3100\clvertalt\clbrdrt\brdrs\brdrw10 \clbrdrl\brdrs\brdrw10 \clbrdrb\brdrs\brdrw10
\clbrdrr\brdrs\brdrw10 \clcbpat18\cltxlrtb\clftsWidth3\clwWidth3207\clcbpatraw18
\cellx6307\row }\pard \ql \li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
```

```
{\insrsid14034704 \par }
```

Character Text

Character text has the following syntax:

<char>	<ptext> | <atext> | '{' <char> '}'
<ptext>	(<chrfmt>* <data>+)+
<data>	#PCDATA | <spec> | <pict> | <obj> | <do> | <foot> | <annot> | <field> | <idx> | <toc> | <book>

Font (Character) Formatting Properties

These control words (described as <chrfmt> in the syntax description) change font (character) formatting properties. A control word preceding plain text turns on the specified attribute. Some control words (indicated in the following table by an asterisk following the description) can be turned off by appending 0 to the control word. For example, **\b** turns on bold, while **\b0** turns off bold.

The font (character) formatting control words are listed in the following table.

Control word	Meaning
\plain	Reset font (character) formatting properties to a default value defined by the application (for example, bold, underline and italic are disabled; font size is reset to 12 point). The associated font (character) formatting properties (described in the section Associated Character Properties of this Specification) are also reset.
\animtext*N*	Animated text properties: 1 Las Vegas Lights 2 Blinking Background 3 Sparkle Text 4 Marching Black Ants 5 Marching Red Ants 6 Shimmer
\accnone	No accent characters (over dot/over comma).
\accdot	Over-dot accent.
\acccomma	Over-comma accent.
\b	Bold.*
\caps	All capitals.*
\cb*N*	Background color (the default is 0).
\cchs*N*	Indicates any characters not belonging to the default document character set and tells which character set they do belong to. Macintosh character sets are represented by values greater than 255. The values for ***N*** correspond to the values for the **\fcharset** control word.
\cf*N*	Foreground color (the default is 0).

Control word	Meaning
\charscalex*N*	Character scaling value. The ***N*** argument is a value representing a percentage (the default is 100).
\cs*N*	Designates character style. If a character style is specified, style properties must be specified with the character run. ***N*** refers to an entry in the style table.
\cgrid*N*	Character grid.
\g	Destination related to character grids.
\gcw	Grid column width.
\gridtbl	Destination keyword related to character grids.
\deleted	Marks the text as deletion.*
\dn*N*	Subscript position in half-points (the default is 6).
\embo	Emboss.
\expnd*N*	Expansion or compression of the space between characters in quarter-points; a negative value compresses (the default is 0).
\expndtw*N*	Expansion or compression of the space between characters in twips; a negative value compresses. For backward compatibility, both **\expndtw** and **\expnd** should be emitted.
\fittext*N*	Fit the text in the current group in ***N*** twips. When ***N*** is set to -1 (**\fittext-1**), it indicates a continuation of the previous **\fittext*N*** run. In other words, `{\fittext1000 Fit this}{\fittext-1 text}` fits the string “Fit this text” in 1000 twips.
\f*N*	Font number. ***N*** refers to an entry in the font table.
\fs*N*	Font size in half-points (the default is 24).
\i	Italic.*
\impr	Engrave.
\kerning*N*	Point size (in half-points) above which to kern character pairs. **\kerning0** turns off kerning.
\langfe*N*	Applies a language to a character. ***N*** is a number corresponding to a language. The **\plain** control word resets the language property to the language defined by **\deflangfe*N*** in the document properties.
\langfenp*N*	Applies a language to a character. ***N*** is a number corresponding to a language. The **\plain** control word resets the language property to the language defined by **\deflangfe*N*** in the document properties. Usually follows **\langfe*N***.
\lang*N*	Applies a language to a character. ***N*** is a number corresponding to a language. The **\plain** control word resets the language property to the language defined by **\deflang*N*** in the document properties.
\langnp*N*	Applies a language to a character. ***N*** is a number corresponding to a language. The **\plain** control word resets the language property to the language defined by **\deflang*N*** in the document properties. It is identical to **\langN**, but needed when **\noproof** is written together with **\lang*1024*** in order to preserve the language of the text that is not being checked for spelling or grammar. Usually follows **\lang*N***.
\ltrch	The character data following this control word will be treated as a left-to-right run (the default).
\rtlch	The character data following this control word will be treated as a right-to-left run.

Control word	Meaning
\noproof	Do not check spelling or grammar for text in the group. Serves the function of **\lang**1024**.** Usually **\lang**1024 is emitted with it for backwards compatibility with old readers.
\nosupersub	Turns off superscripting or subscripting.
\nosectexpand	Disables character space basement.
\outl	Outline.*
\rtlch	The character data following this control word will be treated as a right-to-left run.
\scaps	Small capitals.*
\shad	Shadow.*
\strike	Strikethrough.*
\striked1	Double strikethrough. **\striked0** turns it off.
\sub	Subscripts text and shrinks point size according to font information.
\super	Superscripts text and shrinks point size according to font information.
\ul	Continuous underline. **\ul0** turns off all underlining.
\ulc*N*	Underline color.
\uld	Dotted underline.
\uldash	Dashed underline.
\uldashd	Dash-dotted underline.
\uldashdd	Dash-dot-dotted underline.
\uldb	Double underline.
\ulhwave	Heavy wave underline.
\ulldash	Long dashed underline.
\ulnone	Stops all underlining.
\ulth	Thick underline.
\ulthd	Thick dotted underline.
\ulthdash	Thick dashed underline.
\ulthdashd	Thick dash-dotted underline.
\ulthdashdd	Thick dash-dot-dotted underline.
\ulthldash	Thick long dashed underline.
\ululdbwave	Double wave underline.
\ulw	Word underline.
\ulwave	Wave underline.
\up*N*	Superscript position in half-points (the default is 6).
\v	Hidden text.*
\webhidden	Indicates that the text in the group is hidden in the Word 2002 Web View and will not be emitted upon saving as Web page.

The following table defines the standard languages used by Microsoft. This table was generated by the Unicode group for use with TrueType and Unicode.

Language	ID (hexadecimal)	ID (decimal)
Afrikaans	0x0436	1078
Albanian	0x041c	1052
Arabic	0x0401	1025
Arabic Algeria	0x1401	5121
Arabic Bahrain	0x3c01	15361
Arabic Egypt	0x0c01	3073
Arabic General	0x0001	1
Arabic Iraq	0x0801	2049
Arabic Jordan	0x2c01	11265
Arabic Kuwait	0x3401	13313
Arabic Lebanon	0x3001	12289
Arabic Libya	0x1001	4097
Arabic Morocco	0x1801	6145
Arabic Oman	0x2001	8193
Arabic Qatar	0x4001	16385
Arabic Syria	0x2801	10241
Arabic Tunisia	0x1c01	7169
Arabic U.A.E.	0x3801	14337
Arabic Yemen	0x2401	9217
Armenian	0x042b	1067
Assamese	0x044d	1101
Azeri Cyrillic	0x082c	2092
Azeri Latin	0x042c	1068
Basque	0x042d	1069
Bengali	0x0445	1093
Bosnia Herzegovina	0x101a	4122
Bulgarian	0x0402	1026
Burmese	0x0455	1109
Byelorussian	0x0423	1059
Catalan	0x0403	1027
Chinese China	0x0804	2052

Chinese General	0x0004	4
Chinese Hong Kong	0x0c04	3076
Chinese Macao	0x0c04	3076
Chinese Singapore	0x1004	4100
Chinese Taiwan	0x0404	1028
Croatian	0x041a	1050
Czech	0x0405	1029
Danish	0x0406	1030
Dutch Belgium	0x0813	2067
Dutch Standard	0x0413	1043
English Australia	0x0c09	3081
English Belize	0x2809	10249
English British	0x0809	2057
English Canada	0x1009	4105
English Caribbean	0x2409	9225
English General	0x0009	9
English Ireland	0x1809	6153
English Jamaica	0x2009	8201
English New Zealand	0x1409	5129
English Philippines	0x3409	13321
English South Africa	0x1c09	7177
English Trinidad	0x2c09	11273
English United States	0x0409	1033
English Zimbabwe	0x0409	1033
Estonian	0x0425	1061
Faeroese	0x0438	1080
Farsi	0x0429	1065
Finnish	0x040b	1035
French	0x040c	1036
French Belgium	0x080c	2060
French Cameroon	0x2c0c	11276
French Canada	0x0c0c	3084
French Cote d'Ivoire	0x300c	12300
French Luxemburg	0x140c	5132
French Mali	0x340c	13324
French Monaco	0x180c	6156

French Reunion	0x200c	8204
French Senegal	0x280c	10252
French Swiss	0x100c	4108
French West Indies	0x1c0c	7180
French Zaire	0x240c	9228
Frisian	0x0462	1122
Gaelic	0x043c	1084
Gaelic Ireland	0x083c	2108
Galician	0x0456	1110
Georgian	0x0437	1079
German	0x0407	1031
German Austrian	0x0c07	3079
German Liechtenstein	0x1407	5127
German Luxemburg	0x1007	4103
German Switzerland	0x0807	2055
Greek	0x0408	1032
Gujarati	0x0447	1095
Hebrew	0x040d	1037
Hindi	0x0439	1081
Hungarian	0x040e	1038
Icelandic	0x040f	1039
Indonesian	0x0421	1057
Italian	0x0410	1040
Italian Switzerland	0x0810	2064
Japanese	0x0411	1041
Kannada	0x044b	1099
Kashmiri	0x0460	1120
Kashmiri India	0x0860	2144
Kazakh	0x043f	1087
Khmer	0x0453	1107
Kirghiz	0x0440	1088
Konkani	0x0457	1111
Korean	0x0412	1042
Korean Johab	0x0812	2066
Lao	0x0454	1108
Latvian	0x0426	1062

Lithuanian	0x0427	1063
Lithuanian Classic	0x0827	2087
Macedonian	0x043e	1086
Malay	0x043e	1086
Malay Brunei Darussalam	0x083e	2110
Malayalam	0x044c	1100
Maltese	0x043a	1082
Manipuri	0x0458	1112
Marathi	0x044e	1102
Mongolian	0x0450	1104
Nepali	0x0461	1121
Nepali India	0x0861	2145
Norwegian Bokmal	0x0414	1044
Norwegian Nynorsk	0x0814	2068
Oriya	0x0448	1096
Polish	0x0415	1045
Portuguese Brazil	0x0416	1046
Portuguese Iberian	0x0816	2070
Punjabi	0x0446	1094
Rhaeto-Romanic	0x0417	1047
Romanian	0x0418	1048
Romanian Moldova	0x0818	2072
Russian	0x0419	1049
Russian Moldova	0x0819	2073
Sami Lappish	0x043b	1083
Sanskrit	0x044f	1103
Serbian Cyrillic	0x0c1a	3098
Serbian Latin	0x081a	2074
Sindhi	0x0459	1113
Slovak	0x041b	1051
Slovenian	0x0424	1060
Sorbian	0x042e	1070
Spanish Argentina	0x2c0a	11274
Spanish Bolivia	0x400a	16394
Spanish Chile	0x340a	13322
Spanish Colombia	0x240a	9226

Spanish Costa Rica	0x140a	5130
Spanish Dominican Republic	0x1c0a	7178
Spanish Ecuador	0x300a	12298
Spanish El Salvador	0x440a	17418
Spanish Guatemala	0x100a	4106
Spanish Honduras	0x480a	18442
Spanish Mexico	0x080a	2058
Spanish Modern	0x0c0a	3082
Spanish Nicaragua	0x4c0a	19466
Spanish Panama	0x180a	6154
Spanish Paraguay	0x3c0a	15370
Spanish Peru	0x280a	10250
Spanish Puerto Rico	0x500a	20490
Spanish Traditional	0x040a	1034
Spanish Uruguay	0x380a	14346
Spanish Venezuela	0x200a	8202
Sutu	0x0430	1072
Swahili	0x0441	1089
Swedish	0x041d	1053
Swedish Finland	0x081d	2077
Tajik	0x0428	1064
Tamil	0x0449	1097
Tatar	0x0444	1092
Telugu	0x044a	1098
Thai	0x041e	1054
Tibetan	0x0451	1105
Tsonga	0x0431	1073
Tswana	0x0432	1074
Turkish	0x041f	1055
Turkmen	0x0442	1090
Ukrainian	0x0422	1058
Urdu	0x0420	1056
Urdu India	0x0820	2080
Uzbek Cyrillic	0x0843	2115
Uzbek Latin	0x0443	1091
Venda	0x0433	1075

Vietnamese	0x042a	1066
Welsh	0x0452	1106
Xhosa	0x0434	1076
Yiddish	0x043d	1085
Zulu	0x0435	1077

To read negative **\expnd** values from Word for the Macintosh, an RTF reader should use only the low-order 6 bits of the value read. Word for the Macintosh does not emit negative values for **\expnd**. Instead, it treats values from 57 through 63 as –7 through –1, respectively (the low-order 6 bits of 57 through 63 are the same as –7 through –1).

Character Borders and Shading

Character shading has the following syntax:

<shading> (***chshdng*** | <pat>) ***chcfpat*?** ***chcbpat*?**

<pat> **\chbghoriz** | **\chbgvert** | **\chbgfdiag** | **\chbgbdiag** | **\chbgcross** | **\chbgdcross** | **\chbgdkhoriz** | **\chbgdkvert** | **\chbgdkfdiag** | **\chbgdkbdiag** | **\chbgdkcross** | **\chbgdkdcross**

Control word	Meaning
\chbrdr	Character border (border always appears on all sides).
\chshdng*N*	Character shading. The ***N*** argument is a value representing the shading of the text in hundredths of a percent.
\chcfpat*N*	***N*** is the color of the background pattern, specified as an index into the document's color table.
\chcbpat*N*	***N*** is the fill color, specified as an index into the document's color table.
\chbghoriz	Specifies a horizontal background pattern for the text.
\chbgvert	Specifies a vertical background pattern for the text.
\chbgfdiag	Specifies a forward diagonal background pattern for the text (\\\\).
\chbgbdiag	Specifies a backward diagonal background pattern for the text (////).
\chbgcross	Specifies a cross background pattern for the text.
\chbgdcross	Specifies a diagonal cross background pattern for the text.
\chbgdkhoriz	Specifies a dark horizontal background pattern for the text.
\chbgdkvert	Specifies a dark vertical background pattern for the text.
\chbgdkfdiag	Specifies a dark forward diagonal background pattern for the text (****).
\chbgdkbdiag	Specifies a dark backward diagonal background pattern for the text (***////***).
\chbgdkcross	Specifies a dark cross background pattern for the text.
\chbgdkdcross	Specifies a dark diagonal cross background pattern for the text.

The color, width, and border style keywords for character borders are the same as the keywords for paragraph borders.

Control word	Meaning
Track Changes (Revision Mark) Properties	
\revised	Text has been added since revision marking was turned on.
\revauth*N*	Index into the revision table. The content of the ***N***th group in the revision table is considered to be the author of that revision.
\revdttm*N*	Time of the revision. The 32-bit DTTM structure is emitted as a long integer.
\crauth*N*	Index into the revision table. The content of the ***N***th group in the revision table is considered to be the author of that revision. **Note** This keyword is used to indicate formatting revisions, such as bold, italic, and so on.
\crdate*N*	Time of the revision. The 32-bit DTTM structure is emitted as a long integer.
\revauthdel*N*	Index into the revision table. The content of the ***N***th group in the revision table is considered to be the author of that deletion.
\revdttmdel*N*	Time of the deletion. The 32-bit DTTM structure is emitted as a long integer.

Associated Character Properties

Bidirectional-aware text processors often need to associate a Latin (or other left-to-right) font with an Arabic or Hebrew (or other right-to-left) font. The association is needed to match commonly used pairs of fonts in name, size, and other attributes. Although RTF defines a broad variety of associated character properties, any implementation may choose not to implement a particular associated character property and share the property between the Latin and Arabic fonts.

Property association uses the following syntax:

<atext>	<ltrrun> | <rtlrun>
<ltrrun>	**\rtlch \a*f*** & <aprops>* **\ltrch** <ptext>
<rtlrun>	**\ltrch \a*f*** & <aprops>* **\rtlch** <ptext>
<atext>	<losbrun> | <hisbrun> | <dbrun>
<losbrun>	**\hich \a*f*** & <aprops> **\dbch \a*f*** & <aprops> **\loch** <ptext>
<hisbrun>	**\loch \a*f*** & <aprops> **\dbch \a*f*** & <aprops> **\hich** <ptext>
<dbrun>	**\loch \a*f*** & <aprops> **\hich \a*f*** & <aprops> **\dbch** <ptext>

The following are some examples of property association. The first example is a right-to-left run. Text will use the default bidirectional font, and will be underlined. The left-to-right font associated with this run is font 2 (in the font table) with bold and underlining.

```
\ltrch\af2\ab\au\rtlch\u Sample Text
```

The next example is a left-to-right run. The right-to-left font and the left-to-right font use the default font (specified by **\deff**).

```
\plain\rtlch\ltrch Sample Text
```

The following example is a left-to-right run. The right-to-left font is font 5, bold and italicized. The left-to-right font is the default font, underlined. If the reader does not support underlining in the associated font, both fonts will be underlined.

```
\rtlch\af5\ab\ai\ltrch\u Sample Text
```

The property association control words (described as <aprops> in the syntax description) are listed in the following table. Some control words (indicated in the table by an asterisk following the description) can be turned off by appending 0 to the control word.

Control word	Meaning
\ab	Associated font is bold.*
\acaps	Associated font is all capitals.*
\acf*N*	Associated foreground color (the default is 0).
\adn*N*	Associated font is subscript position in half-points (the default is 6).
\aexpnd*N*	Expansion or compression of the space between characters in quarter-points; a negative value compresses (the default is 0).
\af*N*	Associated font number (the default is 0).
\afs*N*	Associated font size in half-points (the default is 24).
\ai	Associated font is italic.*
\alang*N*	Language ID for the associated font. (This uses the same language ID codes described in the standard language table in the Character Text section of this Specification.)
\aoutl	Associated font is outline.*
\ascaps	Associated font is small capitals.*
\ashad	Associated font is shadow.*
\astrike	Associated font is strikethrough.*
\aul	Associated font is continuous underline. **\aul0** turns off all underlining for the alternate font.
\auld	Associated font is dotted underline.
\auldb	Associated font is double underline.
\aulnone	Associated font is no longer underlined.
\aulw	Associated font is word underline.
\aup*N*	Superscript position in half-points (the default is 6).
\loch	The text consists of single-byte low-ANSI (0x00–0x7F) characters.
\hich	The text consists of single-byte high-ANSI (0x80–0xFF) characters.
\dbch	The text consists of double-byte characters.

Highlighting

This property applies highlighting to text. The formatting is not a character format, so it cannot be part of a style definition.

Control word	Meaning
\highlight*N*	Highlights the specified text. ***N*** specifies the color as an index of the color table.

Special Characters

The RTF Specification includes control words for special characters (described as <spec> in the character-text syntax description). If a special-character control word is not recognized by the RTF reader, it is ignored and the text following it is considered plain text. The RTF Specification is flexible enough to allow new special characters to be added for interchange with other software.

The special RTF characters are listed in the following table.

Control word	Meaning
\chdate	Current date (as in headers).
\chdpl	Current date in long format (for example, Thursday, October 28, 1997).
\chdpa	Current date in abbreviated format (for example, Thu, Oct 28, 1997).
\chtime	Current time (as in headers).
\chpgn	Current page number (as in headers).
\sectnum	Current section number (as in headers).
\chftn	Automatic footnote reference (footnotes follow in a group).
\chatn	Annotation reference (annotation text follows in a group).
\chftnsep	Anchoring character for footnote separator.
\chftnsepc	Anchoring character for footnote continuation.
\cell	End of table cell.
\nestcell	End of nested table cell.
\row	End of table row.
\nestrow	End of nested table row.
\par	End of paragraph.
\sect	End of section and paragraph.
\page	Required page break.
\column	Required column break.
\line	Required line break (no paragraph break).
\lbr*N*	Text wrapping break of type: 0 Default line break (just like **\line**) 1 Clear left 2 Clear right 3 Clear all Whenever an **\lbr** is emitted, a **\line** will be emitted for the benefit of old readers.
\softpage	Nonrequired page break. Emitted as it appears in galley view.
\softcol	Nonrequired column break. Emitted as it appears in galley view.
\softline	Nonrequired line break. Emitted as it appears in galley view.
\softlheight*N*	Nonrequired line height. This is emitted as a prefix to each line.
\tab	Tab character.
\emdash	Em dash (—).
\endash	En dash (–).
\emspace	Nonbreaking space equal to width of character "m" in current font. Some old RTF writers use the construct '{**\emspace** }' (with two spaces before the closing brace) to trick readers unaware of **\emspace** into parsing a regular space. A reader should interpret this as an **\emspace** and a regular space.

Control word	Meaning
\enspace	Nonbreaking space equal to width of character "n" in current font. Some old RTF writers use the construct '{**\enspace** }' (with two spaces before the closing brace) to trick readers unaware of **\enspace** into parsing a regular space. A reader should interpret this as an **\enspace** and a regular space.
\qmspace	One-quarter em space.
\bullet	Bullet character.
\lquote	Left single quotation mark.
\rquote	Right single quotation mark.
\ldblquote	Left double quotation mark.
\rdblquote	Right double quotation mark.
|	Formula character. (Used by Word 5.1 for the Macintosh as the beginning delimiter for a string of formula typesetting commands.)
\~	Nonbreaking space.
\-	Optional hyphen.
_	Nonbreaking hyphen.
\:	Specifies a subentry in an index entry.
*****	Marks a destination whose text should be ignored if not understood by the RTF reader.
\'*hh*	A hexadecimal value, based on the specified character set (may be used to identify 8-bit values).
\ltrmark	The following characters should be displayed from left to right; usually found at the start of **\ltrch** runs.
\rtlmark	The following characters should be displayed from right to left; usually found at the start of **\rtlch** runs.
\zwbo	Zero-width break opportunity. Used to insert break opportunity between two characters.
\zwnbo	Zero-width nonbreak opportunity. Used to remove break opportunity between two characters.
\zwj	Zero-width joiner. This is used for ligating (joining) characters.
\zwnj	Zero-width nonjoiner. This is used for unligating a character.

A carriage return (character value 13) or linefeed (character value 10) will be treated as a **\par** control if the character is preceded by a backslash. You must include the backslash; otherwise, RTF ignores the control word. (You may also want to insert a carriage-return/linefeed pair without backslashes at least every 255 characters for better text transmission over communication lines.)

A tab (character value 9) should be treated as a **\tab** control word. Not all RTF readers understand this; therefore, an RTF writer should always emit the control word for tabs.

The following are the code values for the special characters listed.

Control word	Word for Windows and OS/2	Apple Macintosh
\bullet	149	0xA5
\endash	150	0xD1
\emdash	151	0xD0

Control word	Word for Windows and OS/2	Apple Macintosh
\lquote	145	0xD4
\rquote	146	0xD5
\ldblquote	147	0xD2
\rdblquote	148	0xD3

Document Variables

Document variables are definable and accessed through macros. Document variables have the following syntax:

<variables>	'{*' <docvar>'{' <varname> '}' '{' <vartext> '}' '}'*
<docvar>	**\docvar**
<varname>	#PCDATA
<vartype>	#PCDATA

The control word is described in the following table.

Control word	Meaning
\ docvar	A group that defines a document variable name and its value.

Bookmarks

This destination may specify one of two control words: ***\bkmkstart**, which indicates the start of the specified bookmark, and ***\bkmkend**, which indicates the end of the specified bookmark.

Bookmarks have the following syntax:

<book>	<bookstart> | <bookend>
<bookstart>	'{*' **\bkmkstart** (***\bkmkcolf***? & ***\bkmkcoll***?) #PCDATA '}'
<bookend>	'{*' **\bkmkend** #PCDATA '}'

A bookmark is shown in the following example:

```
\pard\plain \fs20 Kuhn believes that science, rather than
discovering in experience certain structured
relationships, actually creates (or already participates in)
a presupposed structure to which it fits the data.
{\bkmkstart paradigm} Kuhn calls such a presupposed
structure a paradigm.{\bkmkend paradigm}
```

The bookmark start and end are matched with the bookmark tag. In this example, the bookmark tag is "paradigm." Each bookmark start should have a matching bookmark end; however, the bookmark start and the bookmark end may be in any order.

\bkmkcolf*N* is used to denote the first column of a table covered by a bookmark. If it is not included, the first column is assumed. **\bkmkcoll*N*** is used to denote the last column. If it is not used, the last column is assumed.

These controls are used within the ***\bkmkstart** destination following the **\bkmkstart** control. For example, `{\*\bkmkstart\bkmkcolf2\bkmkcoll5 Table1}` places the bookmark "Table1" in columns 2 through 5 of a table.

Pictures

An RTF file can include pictures created with other applications. These pictures can be in hexadecimal (the default) or binary format. Pictures are destinations and begin with the **pict** control word. The **\pict** keyword is preceded by the ***\shppict** destination control keyword as described in the following example. A picture destination has the following syntax:

<pict>	'{' **\pict** (<brdr>? & <shading>? & <picttype> & <pictsize> & <metafileinfo>?) <data> '}'
<picttype>	| **\emfblip** | **\pngblip** | **\jpegblip | \macpict** | ***pmmetafile** | ***wmetafile** | ***dibitmap** <bitmapinfo> | ***wbitmap** <bitmapinfo>
<bitmapinfo>	***wbmbitspixel** & ***wbmplanes** & ***wbmwidthbytes**
<pictsize>	(***picw** & ***pich**) *picwgoal? & *pichgoal? ***picscalex**? & ***picscaley**? & **\picscaled**? & ***piccropt**? & ***piccropb**? & ***piccropr**? & ***piccropl**?
<metafileinfo>	**\picbmp** & ***picbpp**
<data>	(***bin** #BDATA) | #SDATA

These control words are described in the following table. Some measurements in this table are in twips. A twip is one-twentieth of a point.

Control word	Meaning
\emfblip	Source of the picture is an EMF (enhanced metafile).
\pngblip	Source of the picture is a PNG.
\jpegblip	Source of the picture is a JPEG.
\shppict	Specifies a Word 97 through Word 2002 picture. This is a destination control word.
\nonshppict	Specifies that Word 97 through Word 2002 has written a `{\pict` destination that it will not read on input. This keyword is for compatibility with other readers.
\macpict	Source of the picture is QuickDraw.
\pmmetafile*N*	Source of the picture is an OS/2 metafile. The ***N*** argument identifies the metafile type. The ***N*** values are described in the ***pmmetafile** table further on in this section.
\wmetafile*N*	Source of the picture is a Windows metafile. The ***N*** argument identifies the metafile type (the default type is 1).
\dibitmap*N*	Source of the picture is a Windows device-independent bitmap. The ***N*** argument identifies the bitmap type, which must equal 0.
	The information to be included in RTF from a Windows device-independent bitmap is the concatenation of the BITMAPINFO structure followed by the actual pixel data.
\wbitmap*N*	Source of the picture is a Windows device-dependent bitmap. The ***N*** argument identifies the bitmap type (must equal 0).
	The information to be included in RTF from a Windows device-dependent bitmap is the result of the **GetBitmapBits** function.

The following is an example of the **\shppict** group:

```
{\*\shppict {\pict \emfblip …. }}{\nonshppict {\pict ….}}
```

For best device-independence and interoperability with Microsoft products, use of the **\wbitmap** and **\dibitmap** control words is discouraged. Rather, bitmaps should be embedded within Windows metafiles and the **\wmetafile** control word should be used. For more information on the **GetDIBits** and **GetBitmapBits** functions and the structure of Windows device-independent and device-dependent bitmaps, as well as information on embedding bitmaps within metafiles, see *Volume 1* and *Volume 2* of the *Programmer's Reference* in the Microsoft Windows 3.1 Software Development Kit. The following table outlines picture control keywords:

Control word	Meaning
Bitmap Information	
\wbmbitspixel*N*	Number of adjacent color bits on each plane needed to define a pixel. Possible values are 1 (monochrome), 4 (16 colors), 8 (256 colors) and 24 (**RGB**). The default value is 1.
\wbmplanes*N*	Number of bitmap color planes (must equal 1).
\wbmwidthbytes*N*	Specifies the number of bytes in each raster line. This value must be an even number because the Windows Graphics Device Interface (GDI) assumes that the bit values of a bitmap form an array of integer (two-byte) values. In other words, **\wbmwidthbytes** multiplied by 8 must be the next multiple of 16 greater than or equal to the **\picw** (bitmap width in pixels) value.
Picture Size, Scaling, and Cropping	
\picw*N*	*xExt* field if the picture is a Windows metafile; picture width in pixels if the picture is a bitmap or from QuickDraw. The ***N*** argument is a long integer.
\pich*N*	*yExt* field if the picture is a Windows metafile; picture height in pixels if the picture is a bitmap or from QuickDraw. The ***N*** argument is a long integer.
\picwgoal*N*	Desired width of the picture in twips. The ***N*** argument is a long integer.
\pichgoal*N*	Desired height of the picture in twips. The ***N*** argument is a long integer.
\picscalex*N*	Horizontal scaling value. The ***N*** argument is a value representing a percentage (the default is 100 percent).
\picscaley*N*	Vertical scaling value. The ***N*** argument is a value representing a percentage (the default is 100 percent).
\picscaled	Scales the picture to fit within the specified frame. Used only with **\macpict** pictures.
\picprop	Indicates there are shape properties applied to an inline picture. This is a destination control word.
\defshp	Indicates that the inline picture is a WordArt shape.
\piccropt*N*	Top cropping value in twips. A positive value crops toward the center of the picture; a negative value crops away from the center, adding a space border around the picture (the default value is 0).
\piccropb*N*	Bottom cropping value in twips. A positive value crops toward the center of the picture; a negative value crops away from the center, adding a space border around the picture (the default value is 0).
\piccropl*N*	Left cropping value in twips. A positive value crops toward the center of the picture; a negative value crops away from the center, adding a space border around the picture (the default value is 0).
\piccropr*N*	Right cropping value in twips. A positive value crops toward the center of the picture; a negative value crops away from the center, adding a space border around the picture (the default value is 0).

Control word	Meaning
Metafile Information	
\picbmp	Specifies whether a metafile contains a bitmap.
\picbpp*N*	Specifies the bits per pixel in a metafile bitmap. The valid range is 1 through 32, with 1, 4, 8, and 24 being recognized.
Picture Data	
\bin*N*	The picture is in binary format. The numeric parameter ***N*** is the number of bytes that follow. Unlike all other controls, this control word takes a 32-bit parameter.
\blipupi*N*	***N*** represents units per inch on a picture (only certain image types need or output this)
\blipuid XXXXX	Used as `{\*\blipuid XXXXX}` where *XXXX* is a 16-byte identification number for the image.
\bliptag*N*	A unique identifier for a picture, where ***N*** is a long integer value.

The **\wbitmap** control word is optional. If no other picture type is specified, the picture is assumed to be a Windows bitmap. If **\wmetafile** is specified, the ***N*** argument can be one of the following types.

Type	*N* argument
MM_TEXT	1
MM_LOMETRIC	2
MM_HIMETRIC	3
MM_LOENGLISH	4
MM_HIENGLISH	5
MM_TWIPS	6
MM_ISOTROPIC	7
MM_ANISOTROPIC	8

For more information about these types, see volume 1 of the *Programmer's Reference* in the Microsoft Windows 3.1 Software Development Kit.

If **\pmmetafile** is specified, the ***N*** argument can be one of the following types.

Type	*N* argument
PU_ARBITRARY	0x0004
PU_PELS	0x0008
PU_LOMETRIC	0x000C
PU_HIMETRIC	0x0010
PU_LOENGLISH	0x0014
PU_HIENGLISH	0x0018
PU_TWIPS	0x001C

For more information about these types, see volume 2 of the *OS/2 Programmer's Reference*.

Be careful with spaces following control words when dealing with pictures in binary format. When reading files, RTF considers the first space after a control word the delimiter and subsequent spaces part of the document text. Therefore, any extra spaces are attached to the picture, with unpredictable results.

RTF writers should not use the carriage return/line feed (CR/LF) combination to break up pictures in binary format. If they do, the CR/LF combination is treated as literal text and considered part of the picture data.

The picture in hexadecimal or binary format follows the picture-destination control words. The following example illustrates the destination format:

```
{\pict\wbitmap0\picw170\pich77\wbmbitspixel1\wbmplanes1\wbmwidthbytes22
\picwgoal505
\pichgoal221
\picscalex172
\picscaley172
49f2000000000273023d1101a030
3901000a000000000273023d98
0048000200000275
0204000020001027 5023e000000000
273023d000002b90002b90002
b90002b90002b9
0002b90002b90002b90002b90002b90002
b92222b90002b90002b90
002b90002b9
0002b90002b90002b90002b9000
```

Objects

Microsoft OLE links, Microsoft OLE embedded objects, and Macintosh Edition Manager subscriber objects are represented in RTF as objects. Objects are destinations that contain data and a result. The data is generally hidden to the application that produced the document. A separate application uses the data and supplies the appearance of the data. This appearance is the result of the object.

The representation of objects in RTF is designed to allow RTF readers that don't understand objects, or don't use a particular type of object, to use the current result in place of the object. This allows the appearance of the object to be maintained through the conversion even though the object functionality is lost. Each object comes with optional information about itself, a required destination that contains the object data, and an optional result that contains the current appearance of the object. This result contains standard RTF. The RTF writer is responsible for providing the result so that existing RTF readers that either do not support objects, or that do not support a particular type of object, will be able to display the object.

When the object is an OLE embedded or linked object, the data part of the object is the structure produced by the **OLESaveToStream** function. Some OLE clients rely on the OLE system to render the object when a copy of the result is not available to the RTF writer for that application. In these cases, the object result can be extracted from the structure produced by the **OLESaveToStream** function. For information about the **OLESaveToStream** function, see the Microsoft Object Linking and Embedding Software Development Kit.

This destination has the following syntax:

<obj>	('{' **\object** (<objtype> & <objmod>? & <objclass>? & <objname>? & <objtime>? & <objsize>? & <rsltmod>?) <objdata> <result> '}') | <pubobject>
<objtype>	**\objemb** | **\objlink** | **\objautlink** | **\objsub** | **\objpub** | **\objicemb | objhtml | objocx**
<objmod>	**\linkself**? & **\objlock**? | **\objupdate**?

<objclass>	'{*' **\objclass** #PCDATA '}'
<objname>	'{*' **\objname** #PCDATA '}'
<objtime>	'{*' **\objtime** <time> '}'
<rsltmod>	**\rsltmerge**? & <rslttype>?
<rslttype>	**\rsltrtf** | **\rslttxt** | **\rsltpict** | **\rsltbmp** | **\rslthtml**
<objsize>	**\objsetsize**? & ***objalign***? & ***objtransy***? & <objhw>? & ***objcropt***? & ***objcropb***? & ***objcropl***? & ***objcropr***? & ***objscalex***? & ***objscaley***?
<objhw>	***objh*** & ***objw***
<objdata>	'{*' **\objdata** (<objalias>? & <objsect>?) <data> '}'
<objalias>	'{*' **\objalias** <data> '}'
<objsect>	'{*' **\objsect** <data> '}'
<result>	'{' **\result** <para>+ '}'

These control words are described in the following table.

Control word	Meaning
Object Type	
\objemb	An object type of OLE embedded object. If no type is given for the object, the object is assumed to be of type **\objemb**.
\objlink	An object type of OLE link.
\objautlink	An object type of OLE autolink.
\objsub	An object type of Macintosh Edition Manager subscriber.
\objpub	An object type of Macintosh Edition Manager publisher.
\objicemb	An object type of MS Word for the Macintosh Installable Command (IC) Embedder.
\objhtml	An object type of Hypertext Markup Language (HTML) control.
\objocx	An object type of OLE control.
Object Information	
\linkself	The object is a link to another part of the same document.
\objlock	Locks the object from any updates.
\objupdate	Forces an update to the object before displaying it. Note that this will override any values in the <objsize> control words, but values should always be provided for these to maintain backwards compatibility.
\objclass	The text argument is the object class to use for this object; ignore the class specified in the object data. This is a destination control word.
\objname	The text argument is the name of this object. This is a destination control word.
\objtime	Lists the time that the object was last updated.
Object Size, Position, Cropping, and Scaling	
\objh*N*	***N*** is the original object height in twips, assuming the object has a graphical representation.

Control word	Meaning
\objw*N*	***N*** is the original object width in twips, assuming the object has a graphical representation.
\objsetsize	Forces the object server to set the object's dimensions to the size specified by the client.
\objalign*N*	***N*** is the distance in twips from the left edge of the objects that should be aligned on a tab stop. This is needed to place Equation Editor equations correctly.
\objtransy*N*	***N*** is the distance in twips the objects should be moved vertically with respect to the baseline. This is needed to place Math Type equations correctly.
\objcropt*N*	***N*** is the top cropping value in twips.
\objcropb*N*	***N*** is the bottom cropping value in twips.
\objcropl*N*	***N*** is the left cropping value in twips.
\objcropr*N*	***N*** is the right cropping value in twips.
\objscalex*N*	***N*** is the horizontal scaling percentage.
\objscaley*N*	***N*** is the vertical scaling percentage.
Object Data	
\objdata	This subdestination contains the data for the object in the appropriate format; OLE objects are in **OLESaveToStream** format. This is a destination control word.
\objalias	This subdestination contains the alias record of the publisher object for the Macintosh Edition Manager. This is a destination control word.
\objsect	This subdestination contains the section record of the publisher object for the Macintosh Edition Manager. This is a destination control word.
Object Result	
\rsltrtf	Forces the result to be RTF, if possible.
\rsltpict	Forces the result to be a Windows metafile or MacPict image format, if possible.
\rsltbmp	Forces the result to be a bitmap, if possible.
\rslttxt	Forces the result to be plain text, if possible.
\rslthtml	Forces the result to be HTML, if possible.
\rsltmerge	Uses the formatting of the current result whenever a new result is obtained.
\result	The result destination is optional in the **\object** destination. The result destination contains the last update of the result of the object. The data of the result destination should be standard RTF. This allows RTF readers that don't understand objects or the type of object represented to use the current result, in place of the object, to maintain appearance. This is a destination control word.

When Word is used as an editor for Mail, the following control word can be emitted. Otherwise, it is not seen.

Control word	Meaning
\objattph	Object attachment placeholder. Used in the RTF stream when Word is started as an e-mail editor and the message contains attachments. The control word lists where in the text stream the attachment should be placed. It does not define the actual attachment.

Macintosh Edition Manager Publisher Objects

Word for the Macintosh writes publisher objects for the Macintosh Edition Manager in terms of bookmarks (see the Bookmark section of this specification). The range of publisher objects are marked as bookmarks, so these controls are all used within the **\bkmkstart** destination. The RTF syntax for a publisher object is:

<pubobject> '{*' **\bkmkstart \bkmkpub \pubauto**? (<objalias>? & <objsect>) #PCDATA '}'

These control words are descibed in the following table.

Control word	Meaning
\bkmkpub	The bookmark identifies a Macintosh Edition Manager publisher object.
\pubauto	The publisher object updates all Macintosh Edition Manager subscribers of this object automatically, whenever it is edited.

Drawing Objects

Drawing Objects in Word 6.0/95 RTF

Drawing objects and the drawing primitives enumerated within drawing object groups use the following syntax:

<do> '{*' **\do** <dohead> <dpinfo>'}'

<dohead> <dobx> <doby> <dodhgt> <dolock>?

<dobx> **\dobxpage** | **\dobxcolumn** | **\dobxmargin**

<doby> **\dobypage** | **\dobypara** | **\dobymargin**

<dodhgt> ***\dodhgt***

<dolock> **\dolock**

<dpinfo> <dpgroup> | <dpcallout> | <dpsimple>

<dpgroup> **\dpgroup *dpcount** <dphead> <dpinfo>+ **\dpendgroup** <dphead>

<dpcallout> **\dpcallout** <cotype> <coangle>? <coaccent>? <cosmartattach>? <cobestfit>? <cominusx>? <cominusy>? <coborder>? <codescent>? ***\dpcooffset \dpcolength*** <dphead> <dppolyline> <dphead> <dpprops> <dptextbox> <dphead> <dpprops>

<dpsimple> <dpsimpledpk> <dphead> <dpprops>

<dpsimpledpk> <dpline> | <dprect> | <dptextbox> | <dpellipse> | <dppolyline> | <dparc>

<dpline> **\dpline** <dppt> <dppt>

<dprect> **\dprect** (**\dproundr**)?

<dptextbox> **\dptxbx** (**\dptxlrtb** | **\dptxtbrl** | **\dptxbtlr** | **\dptxlrtbv** | **\dptxtbrlv**)? ***\dptxbxmar*** '{' **\dptxbxtext** <para>+'}'

<dpellipse> **\dpellipse**

<dparc> **\dparc \dparcflipx**? **\dparcflipy**?

<dppolyline> **\dppolyline** (**\dppolygon**)? ***\dppolycount*** <dppt>+

<dppt> ***\dpptx \dppty***

<dphead> ***\dpx \dpy \dpxsize \dpysize***

Note that in <dpgroup> the number of <dpinfo> occurrences is equal to the argument of **\dpcount**. This means that in <dppolyline> the number of <dppt> occurrence is equal to the argument of **\dppolycount**.

The following elements of the drawing-object syntax pertain specifically to callout objects:

<cotype>	**\dpcotright** | **\dpcotsingle** | **\dpcotdouble** | **\dpcottriple**
<coangle>	***dpcoa***
<coaccent>	**\dpcoaccent**
<cosmartattach>	**\dpcosmarta**
<cobestfit>	**\dpcobestfit**
<cominusx>	**\dpcominusx**
<cominusy>	**\dpcominusy**
<coborder>	**\dpcoborder**
<codescent>	**\dpcodtop** | **\dpcodcenter** | **\dpcodbottom** | ***dpcodabs***

The remaining elements of the drawing object syntax are properties applied to individual drawn primitives. These remaining objects use the following syntax:

<dpprops>	<lineprops>? <fillprops>? <endstylestart>? <endstyleend>? <shadow>?
<lineprops>	<linestyle> <linecolor> ***dplinew***
<linestyle>	**\dplinesolid** | **\dplinehollow** | **\dplinedash** | **\dplinedot** | **\dplinedado** | **\dplinedadodo**
<linecolor>	<linegray> | <linergb>
<linegray>	***dplinegray***
<linergb>	***dplinecor*** ***dplinecog*** ***dplinecob***<linepal>?
<linepal>	**\dplinepal**
<fillprops>	<fillcolorfg> <fillcolorbg> ***dpfillpat***
<fillcolorfg>	<fillfggray> | <fillfgrgb>
<fillfggray>	***dpfillfggray***
<fillfgrgb>	***dpfillfgcr*** ***dpfillfgcg*** ***dpfillfgcb***<fillfgpal>?
<fillfgpal>	**\dpfillfgpal**
<fillcolorbg>	<fillbggray> | <fillbgrgb>
<fillbggray>	***dpfillbggray***
<fillbgrgb>	***dpfillbgcr*** ***dpfillbgcg*** ***dpfillbgcb***<fillbgpal>?
<fillbgpal>	**\dpfillbgpal**
<endstylestart>	<arrowstartfill> ***dpastartl*** ***dpastartw***
<arrowstartfill>	**\dpastartsol** | **\dpastarthol**
<endstyleend>	<arrowendfill> ***dpaendl*** ***dpaendw***
<arrowendfill>	**\dpaendsol** | **\dpaendhol**
<shadow>	**\dpshadow** ***dpshadx*** ***dpshady***

The following table describes the control words for the drawing object group. All color values are **RGB** values from 0 through 255. All distances are in twips. All other values are as indicated.

Control word	Meaning
\do	Indicates a drawing object is to be inserted at this point in the character stream. This is a destination control word.
\dolock	The drawing object's anchor is locked and cannot be moved.
\dobxpage	The drawing object is page relative in the x-direction.
\dobxcolumn	The drawing object is column relative in the x-direction.
\dobxmargin	The drawing object is margin relative in the x-direction.
\dobypage	The drawing object is page relative in the y-direction.
\dobypara	The drawing object is paragraph relative in the y-direction.
\dobymargin	The drawing object is margin relative in the y-direction.
\dodhgt*N*	The drawing object is positioned at the following numeric address in the z-ordering.
Drawing Primitives	
\dpgroup	Begin group of drawing primitives.
\dpcount*N*	Number of drawing primitives in the current group.
\dpendgroup	End group of drawing primitives.
\dparc	Arc drawing primitive.
\dpcallout	Callout drawing primitive, which consists of both a polyline and a text box.
\dpellipse	Ellipse drawing primitive.
\dpline	Line drawing primitive.
\dppolygon	Polygon drawing primitive (closed polyline).
\dppolyline	Polyline drawing primitive.
\dprect	Rectangle drawing primitive.
\dptxbx	Text box drawing primitive.
Position and Size	
\dpx*N*	X-offset of the drawing primitive from its anchor.
\dpxsize*N*	X-size of the drawing primitive.
\dpy*N*	Y-offset of the drawing primitive from its anchor.
\dpysize*N*	Y-size of the drawing primitive.
Callouts	
\dpcoa*N*	Angle of callout's diagonal line is restricted to one of the following: 0, 30, 45, 60, or 90. If this control word is absent, the callout has an arbitrary angle, indicated by the coordinates of its primitives.
\dpcoaccent	Accent bar on callout (vertical bar between polyline and text box).
\dpcobestfit	Best fit callout (x-length of each line in callout is similar).
\dpcoborder	Visible border on callout text box.

Control word	Meaning
\dpcodabs	Absolute distance-attached polyline.
\dpcodbottom	Bottom-attached polyline.
\dpcodcenter	Center-attached polyline.
\dpcodtop	Top-attached callout.
\dpcodescent*N*	Descent of the callout
\dpcolength*N*	Length of callout.
\dpcominusx	Text box falls in quadrants II or III relative to polyline origin.
\dpcominusy	Text box falls in quadrants III or IV relative to polyline origin.
\dpcooffset*N*	Offset of callout. This is the distance between the end of the polyline and the edge of the text box.
\dpcosmarta	Auto-attached callout. Polyline will attach to either the top or bottom of the text box depending on the relative quadrant.
\dpcotdouble	Double line callout.
\dpcotright	Right angle callout.
\dpcotsingle	Single line callout.
\dpcottriple	Triple line callout.
Text Boxes and Rectangles	
\dptxbxmar*N*	Internal margin of the text box.
\dptxbxtext	Group that contains the text of the text box.
\dptxlrtb	Text box flows from left to right and top to bottom (default).
\dptxtbrl	Text box flows from right to left and top to bottom.
\dptxbtlr	Text box flows from left to right and bottom to top.
\dptxlrtbv	Text box flows from left to right and top to bottom, vertically.
\dptxtbrlv	Text box flows from right to left and top to bottom, vertically.
\dproundr	Rectangle is a round rectangle.
Lines and Polylines	
\dpptx*N*	X-coordinate of the current vertex (only for lines and polylines). The coordinate order for a point must be x, y.
\dppty*N*	Y-coordinate of the current vertex (only for lines and polylines). The coordinate order for a point must be x, y.
\dppolycount*N*	Number of vertices in a polyline drawing primitive.
Arcs	
\dparcflipx	This indicates that the end point of the arc is to the right of the start point. Arcs are drawn counter-clockwise.
\dparcflipy	This indicates that the end point of the arc is below the start point. Arcs are drawn counter-clockwise.

Control word	Meaning
Line Style	
\dplinecob*N*	Blue value for line color.
\dplinecog*N*	Green value for line color.
\dplinecor*N*	Red value for line color.
\dplinepal	Render line color using the **PALETTERGB** macro instead of the **RGB** macro in Windows.
\dplinedado	Dash-dotted line style.
\dplinedadodo	Dash-dot-dotted line style.
\dplinedash	Dashed line style.
\dplinedot	Dotted line style.
\dplinegray*N*	Grayscale value for line color (in half-percentages).
\dplinehollow	Hollow line style (no line color).
\dplinesolid	Solid line style.
\dplinew*N*	Thickness of line (in twips).
Arrow Style	
\dpaendhol	Hollow end arrow (lines only).
\dpaendl*N*	Length of end arrow, relative to pen width: 1 Small 2 Medium 3 Large
\dpaendsol	Solid end arrow (lines only).
\dpaendw*N*	Width of end arrow, relative to pen width: 1 Small 2 Medium 3 Large
\dpastarthol	Hollow start arrow (lines only).
\dpastartl*N*	Length of start arrow, relative to pen width: 1 Small 2 Medium 3 Large
\dpastartsol	Solid start arrow (lines only).
\dpastartw*N*	Width of start arrow, relative to pen width: 1 Small 2 Medium 3 Large

Control word	Meaning
Fill Pattern	
\dpfillbgcb*N*	Blue value for background fill color.
\dpfillbgcg*N*	Green value for background fill color.
\dpfillbgcr*N*	Red value for background fill color.
\dpfillbgpal	Render fill background color using the **PALETTERGB** macro instead of the **RGB** macro in Windows.
\dpfillbggray*N*	Grayscale value for background fill (in half-percentages).
\dpfillfgcb*N*	Blue value for foreground fill color.
\dpfillfgcg*N*	Green value for foreground fill color.
\dpfillfgcr*N*	Red value for foreground fill color.
\dpfillfgpal	Render fill foreground color using the **PALETTERGB** macro instead of the **RGB** macro in Windows.
\dpfillfggray*N*	Grayscale value for foreground fill (in half-percentages).
\dpfillpat*N*	Index into a list of fill patterns. See the fill pattern table that follows for list.
Shadow	
\dpshadow	Current drawing primitive has a shadow.
\dpshadx*N*	X-offset of the shadow.
\dpshady*N*	Y-offset of the shadow.

The following values are available for specifying fill patterns in drawing objects with the **\dpfillpat** control word.

Value	Fill pattern
0	Clear (no pattern)
1	Solid (100%)
2	5%
3	10%
4	20%
5	25%
6	30%
7	40%
8	50%
9	60%
10	70%
11	75%
12	80%
13	90%
14	Dark horizontal lines

Value	Fill pattern
15	Dark vertical lines
16	Dark left-diagonal lines (\\\)
17	Dark right-diagonal lines (///)
18	Dark grid lines
19	Dark trellis lines
20	Light horizontal lines
21	Light vertical lines
22	Light left-diagonal lines (\\\)
23	Light right-diagonal lines (///)
24	Light grid lines
25	Light trellis lines

Word 97 through Word 2002 RTF for Drawing Objects (Shapes)

Basic Format

The basic format for drawing objects in RTF is as follows:

```
{ \shp  ........ { \*\shpinst { \spp { \sn .......... } { \sp .............. } } }
          { \shprslt  ............... }  }
```

The first destination (**\shp**) is always present. This control word groups everything related to a shape together. Following the destination change is basic information regarding the shape. The following keywords with values can appear in any order after the "{ \shp" control word.

Control word	Meaning
Shape Keywords	
\shplefт*N*	Specifies position of shape from the left of the anchor. The value ***N*** is a measurement in twips.
\shptop*N*	Specifies position of shape from the top of the anchor. The value ***N*** is a measurement in twips.
\shpbottom*N*	Specifies position of shape from the bottom of the anchor. The value ***N*** is a measurement in twips.
\shpright*N*	Specifies position of shape from the right of the anchor. The value ***N*** is a measurement in twips.
\shplid*N*	A number that is unique to each shape. This keyword is primarily used for linked text boxes. The value ***N*** is a long integer.
\shpz*N*	Describes the z-order of the shape. It starts at 0 for the shape that is furthest from the top, and proceeds to the top most shape (***N***). The shapes that appear inside the header document will have a separate z-order, compared to the z-order of the shapes in the main document. For instance, both the back-most shape in the header and the back-most main-document shape will have a z-order of 0.

Control word	Meaning
**shpfhdr*N*	Set to 0 if the shape is in the main document. Set to 1 if the shape is in the header document.
\shpbxpage	The shape is positioned relative to the page in the x (horizontal) direction.
\shpbxmargin	The shape is positioned relative to the margin in the x (horizontal) direction.
\shpbxcolumn	The shape is positioned relative to the column in the x (horizontal) direction.
\shpbxignore	Ignore **\shpbxpage**, **\shpbxmargin**, and **\shpbxcolumn**, in favor of **\posrelh**. The ignored properties will be written for backwards compatibility with older readers that do not understand **\posrelh**.
\shpbypage	The shape is positioned relative to the page in the y (vertical) direction.
\shpbymargin	The shape is positioned relative to the margin in the y (vertical) direction.
\shpbypara	The shape is positioned relative to the paragraph in the y (vertical) direction.
\shpbyignore	Ignore **\shpbypage**, **\shpbymargin**, and **\shpbxpara**, in favor of **\posrelh**. The ignored properties will be written for backwards compatibility with older readers that do not understand **\posrelh**.
**shpwr*N*	Describes the type of wrap for the shape: 1 Wrap around top and bottom of shape (no text allowed beside shape) 2 Wrap around shape 3 None (wrap as if shape isn't present) 4 Wrap tightly around shape 5 Wrap text through shape
**shpwrk*N*	Wrap on side (for types 2 and 4 for **\shpwr*N***): 0 Wrap both sides of shape 1 Wrap left side only 2 Wrap right side only 3 Wrap only on largest side
**shpfblwtxt*N*	Describes relative z-ordering: 0 Text is below shape 1 Shape is below text
\shplockanchor	Lock anchor for a shape.
\shptxt	Text for a shape. The text must follow all of the other properties for the shape (inside the \shpinst destination) and must appear in the following format: `{ \shptxt Any valid RTF for the current text box }` **Note** For linked text boxes, the first text box of the linked set has the entire story, so all following text boxes will not have a **\shptxt** field.
\shprslt	This is where the Word 6.0 and Word 95 drawn object RTF can be placed.

Control word	Meaning

\shpgrp	Specifies a group shape. The parameters following this keyword are the same as those following **\shp**. The order of the shapes inside a group is from bottom to top in z-order.
	
	Inside of a \shpgrp, no `{ \shprslt .... }` fields would be generated (that is, only the root-level shape can have a **\shprslt** field (this field describes the entire group). For example:
	
	`{ \shpgrp ..... { \shp ..... (and all sub-items as usual) }`
	`{ \shp .....(and all sub-items as usual) }`
	
	Note `{ \shpgrp ..... }` can be substituted for `{ \shp ..... }` in order to create groups inside of groups.

With the exception of **\shplid,** the control words listed in the preceding table do not apply for shapes that are within a group. For more information about groups, see the Introduction section of this specification.

Control word	Meaning
\background	Specifies the document background. This is a destination control word. It contains the `{ \shp` keyword and all the shape properties.

Drawing Object Properties

The bulk of a drawing object is defined as a series of properties. The `{ \shp .....` control word is followed by `{ \*\shpinst` Following the `{ \*\shpinst` is a list of all the properties of a shape. Each of the properties is in the following format:

```
{ \sp { \sn PropertyName } { \sv PropertyValueInformation } }
```

The control word for the drawing object property is **\sp.** Each property has a pair of name (**\sn**) and value (**\sv**) control words placed in the shape property group. For example, the vertical flip property is represented as:

```
{\sp{\sn fFlipV}{\sv 1}}
```

Here, the name of the property is **fFlipV** and the value is 1, which indicates **True**. All shape properties follow this basic format. Only properties that have been explicitly set for a shape are written out in RTF. Other properties assume the default values (a property may be set to the default value explicitly).

The following table describes all the names of properties for drawing objects along with their corresponding value type.

Property	Meaning	Type of value	Default
Position			
posh	Horizontal alignment: 1 Left 2 Center 3 Right 4 Inside 5 Outside This overrides the absolute position specified in **\shplefN** and **\shprightN**.	Not applicable	Absolute position as specified in **\shplefN** and **\shprightN**.
posrelh	Position horizontally relative to: 0 Margin 1 Page 2 Column 3 Character	Not applicable	2, if **posh** is present
posv	Vertical alignment: 1 Center 2 Column 3 Bottom 4 Inside 5 Outside This overrides the absolute position specified in **\shptopN** and **\shpbottomN.**.	Not applicable	Absolute position as specified in **\shptopN** and **\shpbottomN**.
posrelv	Position horizontally relative to: 0 Margin 1 Page 2 Paragraph 3 Line 2 is the assumed value if the property is not explicitly written.	Not applicable	2, if **posv** is present
fLayoutInCell	Allows shape to anchor and position inside table cells.	Boolean	FALSE
fAllowOverlap	Allows shape to overlap other shapes unless it is a shape with None wrapping (**\shpwr3**), in which case it can always overlap an object with other types of wrapping and vice-versa.	Boolean	TRUE
fChangePage	Anchor may change page.	Boolean	FALSE

Object Type			
fIsBullet	Boolean	Indicates whether a picture was inserted as a picture bullet.	FALSE
Rotation	Angle	Rotation of the shape.	0
fFlipV	Boolean	Vertical flip, applied after the rotation.	FALSE
fFlipH	Boolean	Horizontal flip, applied after the rotation.	FALSE
ShapeType	Not applicable	See below for values. 0 indicates user-drawn freeforms and polygons.	Not applicable
wzName	String	Shape name (only set through Visual Basic for Applications).	NULL
pWrapPolygonVertices	Array	Points of the text wrap polygon.	NULL
dxWrapDistLeft	EMU	Left wrapping distance from text.	114,305
dyWrapDistTop	EMU	Top wrapping distance from text.	0
dxWrapDistRight	EMU	Right wrapping distance from text.	114,305
dyWrapDistBottom	EMU	Bottom wrapping distance from text.	0
fBehindDocument	Boolean	Place the shape behind text.	FALSE
fIsButton	Boolean	A button shape (That is, clicking performs an action). Set for shapes with attached hyperlinks or macros.	FALSE
fHidden	Boolean	Do not display or print (only set through Visual Basic for Applications).	FALSE
pihlShape	Hyperlink	The hyperlink in the shape.	NULL
fArrowheadsOK	Boolean	Allow arrowheads.	FALSE
fBackground	Boolean	This is the background shape.	FALSE
fDeleteAttachedObject	Boolean	Delete object attached to shape.	FALSE
fEditedWrap	Boolean	The shape's wrap polygon has been edited.	FALSE
fHidden	Boolean	Do not display.	FALSE
fHitTestFill	Boolean	Hit test fill.	TRUE
fHitTestLine	Boolean	Hit test lines.	TRUE
fInitiator	Boolean	Set by the solver.	NULL
fNoFillHitTest	Boolean	Hit test a shape as though filled.	FALSE
fNoHitTestPicture	Boolean	Do not hit test the picture.	FALSE
fNoLineDrawDash	Boolean	Draw a dashed line if no line exists.	FALSE
fOleIcon	Boolean	For OLE objects, indicates whether the object is in icon form or not.	FALSE
fOnDblClickNotify	Boolean	Notify client on a double click.	FALSE
fOneD	Boolean	1D adjustment.	FALSE
fPreferRelativeResize	Boolean	For UI only. Prefer relative resizing.	FALSE
fPrint	Boolean	Print this shape.	TRUE
hspMaster	Shape ID	Master shape.	NULL

hspNext	Shape ID	ID of the next shape (used by Word for linked text boxes).	NULL
xLimo	Long integer	Defines the limo stretch point.	Not applicable
yLimo	Long integer	Defines the limo stretch point.	Not applicable

Lock			
fLockRotation	Boolean	Lock rotation.	FALSE
fLockAspectRatio	Boolean	Lock aspect ratio.	FALSE
fLockAgainstSelect	Boolean	Lock against selection.	FALSE
fLockCropping	Boolean	Lock against cropping.	FALSE
fLockVerticies	Boolean	Lock against edit mode.	FALSE
fLockText	Boolean	Lock text against editing.	FALSE
fLockAdjustHandles	Boolean	Lock adjust handles.	FALSE
fLockAgainstGrouping	Boolean	Lock against grouping.	FALSE
fLockShapeType	Boolean	Lock the shape type (don't allow Change Shape).	FALSE

Text Box			
dxTextLeft	EMU	Left internal margin of the text box.	91,440
dyTextTop	EMU	Top internal margin of the text box.	45,720
dxTextRight	EMU	Right internal margin of the text box.	91,440
dyTextBottom	EMU	Bottom internal margin of the text box.	45,720
WrapText	Not applicable	Wrap text at shape margins: 0 Square 1 Tight 2 None 3 Top bottom 4 Through	0
anchorText	Not applicable	Text anchor point: 0 Top 1 Middle 2 Bottom 3 Top centered 4 Middle centered 5 Bottom centered 6 Bottom centered baseline	0

txflTextFlow	Not applicable	Text flow: 0 Horizontal non-ASCII font 1 Top to bottom ASCII font 2 Bottom to top non-ASCII font 3 Top to bottom non-ASCII font 4 Horizontal ASCII font	0
cdirFont	Direction	Font rotation: 0 Right 1 Down 2 Left 3 Up	0
fAutoTextMargin	Boolean	Use host's margin calculations.	FALSE
scaleText	Long integer	Text zoom and scale.	0
lTxid	Long integer	ID for the text. The value is determined by the host.	0
fRotateText	Boolean	Rotate text with shape.	FALSE
fSelectText	Boolean	TRUE if single click selects text, FALSE if two clicks select text.	TRUE
fFitShapeToText	Boolean	Adjust shape to fit text size.	FALSE
fFitTextToShape	Boolean	Adjust text to fit shape size.	FALSE

WordArt Effect

gtextUNICODE	String	Unicode text string.	NULL
gtextAlign	Not applicable	Alignment on curve: 0 Stretch each line of text to fit width 1 Center text on width 2 Left justify 3 Right justify 4 Spread letters out to fit width 5 Spread words out to fit width	1
gtextSize	Fixed	Default point size.	2,359,296
gtextSpacing	Fixed	Adjust the spacing between characters (1.0 is normal).	65,536
gtextFont	String	Font name.	NULL
fGtext	Boolean	**True** if the text effect properties (**gtext***) are used. **False** if these properties are ignored.	FALSE
gtextFVertical	Boolean	If available, an @ font should be used. Otherwise, rotate individual characters 90 degrees counter-clockwise.	FALSE

gtextFKern	Boolean	Use character pair kerning if it is supported by the font.	FALSE
gtextFTight	Boolean	Adjust the spacing between characters rather than the character advance by the **gtextSpacingratio**.	FALSE
gtextFStretch	Boolean	Stretch the text to fit the shape.	FALSE
gtextFShrinkFit	Boolean	When laying out the characters, consider the glyph bounding box rather than the nominal font character bounds.	FALSE
gtextFBestFit	Boolean	Scale text laid out on a path to fit the path.	FALSE
gtextFNormalize	Boolean	Stretch individual character heights independently to fit.	FALSE
gtextFDxMeasure	Boolean	When laying out characters, measure the distances along the x-axis rather than along the path.	FALSE
gtextFBold	Boolean	Bold font (if available).	FALSE
gtextFItalic	Boolean	Italic font (if available).	FALSE
gtextFUnderline	Boolean	Underline font (if available).	FALSE
gtextFShadow	Boolean	Shadow font (if available).	FALSE
gtextFSmallcaps	Boolean	Small caps font (if available).	FALSE
gtextFStrikethrough	Boolean	Strikethrough font (if available).	FALSE
fGtextOK	Boolean	Text effect (WordArt) supported.	FALSE
gtextFReverseRows	Boolean	Reverse row order.	FALSE
gtextRTF	String	RTF text string.	NULL

Picture

cropFromTop	Fixed	Top cropping percentage.	0
cropFromBottom	Fixed	Bottom cropping percentage.	0
cropFromLeft	Fixed	Left cropping percentage.	0
cropFromRight	Fixed	Right cropping percentage.	0
pib	Picture	Binary picture data.	NULL
pibName	String	Picture file name that is used to link to file pictures.	NULL
pibFlags	Not applicable	Flags for linked pictures: 0 No links (default) 10 Link to file; save with document 14 Link to file; do not save picture with document	0
pictureTransparent	Color	Transparent color.	0
pictureContrast	Fixed	Contrast setting.	65,536
PictureBrightness	Fixed	Brightness setting.	0
pictureGamma	Fixed	Gamma correction setting.	0
pictureGray	Boolean	Display grayscale.	0

pictureBiLevel	Boolean	Display bi-level.	0
pibPrint	Picture	Blip to display when printing.	NULL
pibPrintFlags	Not applicable	Flags: 0 No links (default) 10 Link to file; save with document 14 Link to file; do not save picture with document	0
pibPrintName	String	Blip file name.	NULL
pictureActive	Boolean	Server is active (OLE objects only).	FALSE
pictureDblCrMod	Color	Modification used if shape has double shadow.	No change
pictureFillCrMod	Color	Modification for BW views.	Undefined
pictureId	Long integer	Host-defined ID for OLE objects (usually a pointer).	0
pictureLineCrMod	Color	Modification for BW views.	Undefined

Geometry

geoLeft	Long integer	Left edge of the bounds of a user-drawn shape.	0
geoTop	Long integer	Top edge of the bounds of a user-drawn shape.	0
geoRight	Long integer	Right edge of the bounds of a user-drawn shape.	21,600
geoBottom	Long integer	Bottom edge of the bounds of a user-drawn shape.	21,600
pVerticies	Array	The points of the shape.	NULL
pSegmentInfo	Array	The segment information.	NULL
pFragments	Array	Fragments are optional, additional parts to the shape. They allow the shape to contain multiple paths and parts. This property lists the fragments of the shape.	NULL
pGuides	Array	Guide formulas—an array of elements that correspond to the VML <formulas> element, where each array entry is a single <f> entry.	NULL
pInscribe	Array	The inscribed rectangle definition.	NULL
pAdjustHandles	Array	The adjust handle definitions - an array of values corresponding to the VML <handles> element.	NULL
adjustValue	Integer	First adjust value from an adjust handle. The interpretation varies with the shape type. Adjust values alter the geometry of the shape in smart ways.	0
adjust2Value	Long integer	Second adjust value.	0

adjust3Value	Long integer	Third adjust value.	0
adjust4Value	Long integer	Fourth adjust value.	0
adjust5Value	Long integer	Fifth adjust value.	0
adjust6Value	Long integer	Sixth adjust value.	0
adjust7Value	Long integer	Seventh adjust value.	0
adjust8Value	Long integer	Eighth adjust value.	0
adjust9Value	Long integer	Ninth adjust value.	0
adjust10Value	Long integer	Tenth adjust value.	0

Grouped Shapes

fRelChangePage	Boolean	Anchor may change page.	FALSE
fRelFlipH	Boolean	Vertical flip of an object inside a group, relative to its container and applied after the rotation.	FALSE
fRelFlipV	Boolean	Horizontal flip of an object inside a group, relative to its container and applied after the rotation.	FALSE
groupBottom	Twips	Defines the height of the group rectangle, but does not necessarily indicate position on the page. The difference between groupBottom and groupTop should match the dimensions specified by ***shptop*** and ***shpbottom***.	20,000
groupLeft	Twips	Defines the width of the group rectangle, but does not necessarily indicate position on the page. The difference between groupLeft and groupRight should match the dimensions specified by ***shpleft*** and ***shpright***.	0
groupRight	Twips	See meaning for **groupLeft**.	20,000
groupTop	Twips	See meaning for **groupBottom**.	0
relBottom	Twips	Defines the bottom of a shape within its parent shape (used for shapes in a group). The measurement is relative to the position of the parent group or drawing.	1
relLeft	Twips	Defines the left of a shape within its parent shape (used for shapes in a group). The measurement is relative to the position of the parent group or drawing.	0
relRight	Twips	Defines the right of a shape within its parent shape (used for shapes in a group). The measurement is relative to the position of the parent group or drawing.	1

relRotation	Fixed	Represents the information stored in the site of a shape, which defines the size and location of the shape in the parent group or drawing. The coordinates are relative to the position of the parent group or drawing. The units are relative to the m_rcg of the parent.	0
relTop	Twips	Defines the top of a shape within its parent shape (used for shapes in a group). The measurement is relative to the position of the parent group or drawing.	0
lidRegroup	Long integer	Regroup ID.	0

Fill

fillType	Fill type	Type of fill: 0 Solid color 1 Pattern (bitmap) 2 Texture (pattern with its own color map) 3 Picture centered in the shape 4 Shade from start to end points 5 Shade from bounding rectangle to end point 6 Shade from shape outline to end point 7 Shade using the fillAngle	0
fillColor	Color	Foreground color.	White
fillOpacity	Fixed	Opacity.	65,536
fillBackColor	Color	Background color.	White
fillBackOpacity	Fixed	Opacity for shades only.	65,536
fillBlip	Picture	Pattern or texture picture for the fill.	NULL
fillBlipName	String	Picture file name for custom fills.	NULL
fillblipflags	Not applicable	Flags for fills: 0 No links (default) 10 Link to file; save picture with document 14 Link to file; do not save picture with document	0
fillWidth	EMU	Exand the pattern or tile to approximately this size.	0
fillHeight	EMU	Expand the pattern or tile to approximately this size.	0
fillAngle	Fixed	Fade angle specified number of degrees.	0
fillFocus	Not applicable	Linear shaded fill focus percent.	0

fillToLeft	Fixed	The **fillToLeft**, **fillToTop**, **fillToRight**, and **fillToBottom** values define the "focus" rectangle for concentric shapes; they are specified as a fraction of the outer rectangle of the shade.	0
fillToTop	Fixed	See meaning for **fillToLeft**.	0
fillToRight	Fixed	See meaning for **fillToLeft**.	0
fillToBottom	Fixed	See meaning for **fillToLeft**.	0
fillShadeColors	Array	Custom or preset color ramps for graduated fills on shapes.	NULL
fillOriginX	Fixed	When a textured fill is used, the texture may be aligned with the shape (**fFillShape**)—if this is done, the default alignment is to the top left. The values **FillOriginY**, **FillShapeOriginX**, and **fillShapeOriginY** allow an arbitrary position in the texture (relative to the top left proportion of the texture's height and width) to be aligned with an arbitrary position on the shape (relative to the top-left proportion of the width and height of the bounding box). Note that all these values are fixed point fractions of the relevant width or height.	0
fillOriginY	Fixed	See meaning for **fillOriginX**.	0
fillShapeOriginX	Fixed	See meaning for **fillOriginX**.	0
fillShapeOriginY	Fixed	See meaning for **fillOriginX**.	0
fFilled	Boolean	The shape is filled.	TRUE
fillCrMod	Color	Modification for BW views	Undefined
fillDztype	Measurement type	Measurement type: 0 Default size, ignore the values 1 Values are in EMUs 2 Values are in pixels 3 Values are fixed fractions of the shape size 4 Aspect ratio is fixed 5 EMUs, fixed aspect ratio 6 Pixels, fixed aspect ratio 7 Proportion of shape, fixed aspect ratio 8 Aspect ratio is fixed, favor larger size 9 EMUs, fixed aspect ratio 10 Pixels, fixed aspect ratio 11 Proportion of shape, fixed aspect ratio	0
fillRectBottom	EMU	For shaded fills, use the specified rectangle instead of the shape’s bounding rectangle to define how large the fade will be.	0

fillRectLeft	EMU	For shaded fills, use the specified rectangle instead of the shape's bounding rectangle to define how large the fade will be.	0
fillRectRight	EMU	For shaded fills, use the specified rectangle instead of the shape's bounding rectangle to define how large the fade will be.	0
fillRectTop	EMU	For shaded fills, use the specified rectangle instead of the shape's bounding rectangle to define how large the fade will be.	0
fillShadeColors	Array	Preset array of colors.	NULL
fillShadePreset	Long integer	Special shades.	0
fillShadeType	Shade type	Type of shading, if using a shaded (gradient) fill.	Default
fillShape	Boolean	Register pattern on shape.	TRUE
fillUseRect	Boolean	Use the large rectangle.	FALSE
fillWidth	EMU	Size of a metafile texture.	0
fFillOK	Boolean	Define whether the shape can be filled through the user interface (UI) or Microsoft Visual Basic for Applications."	TRUE
fFillShadeShapeOK	Boolean	If TRUE, a concentric shade (repeatedly drawing the shape at a decreasing size) is permitted for this path. If FALSE, a concentric shade is not permitted (generally because the repeated drawing will overwrite the shape boundary).	FALSE

Line

lineColor	Color	Color of the line.	Black
lineBackColor	Color	Background color of the pattern.	White
lineType	Line type	Type of line: 0 Solid fill with the line color 1 Patterned fill with the **lineFillBlip** 2 Textured fill with the **lineFillBlip** 3 Picture fill with the **lineFillBlip**	0
lineFillBlip	Picture	Pattern for the line.	NULL
lineFillBlipFlags	Not applicable	Flags for patterned lines: 0 No links (default) 10 Link to file; save picture with document 14 Link to file; do not save picture with document	0
lineFillWidth	EMU	Width of the pattern.	0
lineFillHeight	EMU	Height of the pattern.	0
lineWidth	EMU	Width of the line.	9,525 (0.75pt)

lineStyle	Line style	Line style:	0
		0 Single line (of width **lineWidth**)	
		1 Double lines of equal width	
		2 Double lines, one thick, one thin	
		3 Double lines, reverse order	
		4 Three lines, thin, thick, thin	
lineDashing	Dash style	Dashing:	0
		0 Solid line	
		1 Dashed line (Windows)	
		2 Dotted line (Windows)	
		3 Dash-dotted line (Windows)	
		4 Dash-dot-dotted line (Windows)	
		6 Dotted line	
		7 Dashed line	
		8 Long dashed line	
		9 Dash-dotted line	
		10 Long dash-dotted line	
		11 Long dash-dot-dotted line	
lineStartArrowhead	Arrow type	Start arrow type:	0
		0 Nothing	
		1 Arrow	
		2 Stealth arrow	
		3 Diamond	
		4 Oval	
		6 Open arrow	
		7 Chevron arrow	
		8 Double chevron arrow	
lineEndArrowhead	Arrow type	End arrow type (for acceptable values see meaning for **lineStartArrowhead**).	0
lineStartArrowWidth	Arrow width	Start arrow width:	1
		0 Narrow	
		1 Medium	
		2 Wide	
lineStartArrowLength	Arrow length	Start arrow length:	1
		0 Short	
		1 Medium	
		2 Long	

lineEndArrowWidth	Arrow width	End arrow width (for acceptable values see meaning for **lineStartArrowWidth**).	1
lineEndArrowLength	Arrow length	End arrow length (for acceptable values see meaning for **lineStartArrowLength**).	1
fLine	Boolean	Has a line.	TRUE
lineBackColor	Color	Background color.	white
lineCrMod	Color	Modification for Black and White views.	undefined
lineDashStyle	Array	Line dash style.	NULL
lineEndCapStyle	Line cap style	Line cap style for shape: 0 Round 1 Square 2 Flat	2
lineFillBlipName	String	Blip file name.	NULL
lineFillDztype	Measurement type	fillWidth/Height numbers: 0 Default size, ignore the values 1 Values are in EMUs 2 Values are in pixels 3 Values are fixed fractions of shape size 4 Aspect ratio is fixed 5 EMUs, fixed aspect ratio 6 Pixels, fixed aspect ratio 7 Proportion of shape, fixed aspect ratio 8 Aspect ratio is fixed, favor larger size 9 EMUs, fixed aspect ratio 10 Pixels, fixed aspect ratio 11 Proportion of shape, fixed aspect ratio	0
lineFillHeight	EMU	Size of a metafile texture.	0
lineJoinStyle	Line join style	Line join style for shape: 0 Join edges by a straight line 1 Extend edges until they join 2 Draw an arc between the two edges	2
lineMiterLimit	Fixed	Ratio of width.	524,288
fLineOK	Boolean	Line style may be set.	TRUE

Shadow			
shadowType	Not applicable	Type of shadow: 0 Offset shadow 1 Double offset shadow 2 Rich perspective shadow (cast relative to shape) 3 Rich perspective shadow (cast in shape space) 4 Perspective shadow (cast in drawing space) 6 Emboss or engrave	0
shadowColor	Color	Foreground color.	RGB (128,128,128)
shadowHighlight	Color	Embossed color.	RGB (203,203,203)
shadowOpacity	Fixed	Opacity of the shadow.	65,536
shadowOffsetX	EMU	Shadow offset toward the right.	0
shadowOffsetY	EMU	Shadow offset toward the bottom.	0
shadowSecondOffsetX	EMU	Double shadow offset toward the right.	25,400
shadowSecondOffsetY	EMU	Double shadow offset toward the bottom.	25,400
shadowScaleXToX	Fixed	The **shadowScaleXToX** to **shadowWeight** define a 3x2 transform matrix that is applied to the shape to generate the shadow.	65,536
shadowScaleYToX	Fixed	See meaning for **shadowScaleXToX**.	0
shadowScaleXToY	Fixed	See meaning for **shadowScaleXToX**.	0
shadowScaleYToY	Fixed	See meaning for **shadowScaleXToX**.	65,536
shadowPerspectiveX	Fixed	See meaning for **shadowScaleXToX**.	0
shadowPerspectiveY	Fixed	See meaning for **shadowScaleXToX**.	0
shadowWeight	Fixed	See meaning for **shadowScaleXToX**.	32,768
shadowOriginX	Fixed	Defines the position of the origin relative to the center of the shape— this position is determined based on a proportion of the *rotated* shape width and height. The shape will be rotated and then positioned such that the point is at (0,0) before the transformation is applied.	0
ShadowOriginY	Fixed	See meaning for **shadowOriginX.**	0
fShadow	Boolean	Turns the shadow on or off.	FALSE
shadowCrMod	Color	Modification for BW views.	Undefined
fshadowObscured	Boolean	Microsoft Excel 5 style shadow.	FALSE
fShadowOK	Boolean	Shadow may be set.	TRUE

3-D Effects			
c3DSpecularAmt	Fixed	Specular amount for the material.	0
c3DDiffuseAmt	Fixed	Diffusion amount for the material.	65,536
c3DShininess	Long integer	Shininess of the material.	5
c3DEdgeThickness	EMU	Specular edge thickness.	12,700
c3DExtrudeForward	EMU	Extrusion amount forward.	0
c3DExtrudeBackward	EMU	Extrusion amount backward.	457,200
c3DExtrusionColor	Color	Color of the extrusion.	
f3D	Boolean	**True** if shape has a three-dimensional (3D) effect, **False** if it does not.	FALSE
fc3DMetallic	Boolean	**True** if shape uses metallic specularity, **False** if it does not.	FALSE
fc3DUseExtrusionColor	Boolean	Extrusion color is set explicitly.	FALSE
fc3DLightFace	Boolean	Light the face of the shape.	TRUE
c3DYRotationAngle	Angle	Degrees about y-axis. If **fc3DconstrainRotation** (a Boolean property which defaults to **True**) is **True**, then the rotation is restricted to x-y rotation. In addition, the final rotation results from first rotating by **c3DYRotationAngle** degrees about the y-axis and then by **c3DXRotationAngle** degrees about the z-axis. If **fc3DconstrainRotation** is **False**, then the final rotation results from a single rotation of **c3DrotationAngle** about the axis specified by **c3DrotationAxisX**, **c3DrotationAxisY**, and **c3DrotationAxisZ**.	0
c3DXRotationAngle	Angle	Degrees about x-axis.	0
c3DRotationAxisX	Long integer	These keywords specify the rotation axis. Only their relative magnitudes matter.	100
c3DRotationAxisY	Long integer	See meaning for **c3DYRotationAxisX**.	0
c3DRotationAxisZ	Long integer	See meaning for **c3DYRotationAxisX**.	0
c3DRotationAngle	Angle	The rotation about the axis (defined previously in the **c3DRotationAxisX**, **Y**, and **Z** parameter sections)	0
fC3DRotationCenterAuto	Boolean	If **fC3DRotationCenterAuto** is **True**, then the rotation will be about the center of the 3-D bounding cube of the 3-D group; otherwise, the rotation center will be about **c3DRotationCenterX**, **c3DRotationCenterY**, and **c3DRotationCenterZ**.	FALSE

c3DRotationCenterX	Fixed	Rotation center (X). The **X** and **Y** values are a 16.16 fraction of the geometry width and height, with (0,0) being at the center of the geometry. The **Z** value must be in absolute units (EMUs).	0
c3DRotationCenterY	Fixed	Rotation center (Y). If **fC3DRotationCenterAuto** is **True**, then the rotation will be about the center of the 3-D bounding cube of the 3-D group; otherwise, the rotation center will be about **c3DRotationCenterX**, **c3DRotationCenterY**, and **c3DRotationCenterZ**. The **X** values and **Y** values are a fraction of the geometry width and height, with (0,0) being at the center of the geometry. The **Z** value is in absolute units.	0
c3DRotationCenterZ	EMU	See meaning for **c3DRotationCenterY**.	0
c3DRenderMode	Long integer	0 Render with full detail 1 Render as a wire frame 2 Render a bounding cube	Not applicable
c3DXViewpoint	EMU	X view point.	1,250,000
c3DYViewpoint	EMU	Y view point.	-1,250,000
c3DZViewpoint	EMU	Z view distance.	9,000,000
c3DOriginX	Fixed	The following **c3DOriginY** and **c3DSkewAngle** values define the origin relative to the viewpoint origin measured. These values are 16.16 numbers that specify the position of the origin within the shape bounding box, as multiples of the width and height of that bounding box and relative to the center (that is, they are displaced from the center). When these values are applied the actual transformed shape path is used, rather than the shape geometry (compare with the shadow and perspective values that work on the geometry bounding box, not the actual points). This means that a shape that extends outside the geometry bounding box (such as a text effect) is handled "correctly" for the calculation of the 3-D origin.	32,768
c3DOriginY	Fixed	See meaning for **c3DOriginX**.	-32,768
c3DSkewAngle	Fixed	Skew angle.	-8,847,360
c3DSkewAmount	Long integer	Percentage skew amount.	50
c3DAmbientIntensity	Fixed	Ambient intensity should be low (0 to .1) to avoid washed out appearance.	20,000
c3DKeyX	Long integer	Key light source direction. Values may be any number; only their relative magnitudes matter.	50,000

c3DKeyY	Long integer	See meaning for **c3DKeyX**.	0
c3DKeyZ	Long integer	See meaning for **c3DKeyX**.	10,000
c3DKeyIntensity	Fixed	Fixed point intensity. Theoretical maximum is 1, but may be higher.	38,000
c3DFillX	Long integer	Fill light source direction; only their relative magnitudes matter. This direction defines a second light source arbitrarily called the "fill light." Generally this will be positioned 90-180 degrees away from the key light and very roughly in front of the scene to fill in any harsh shadows. This fill will be dim compared to the first light source. Theoretically it should be non-harsh, but harsh fill lighting looks better sometimes.	-50,000
c3DFillY	Long integer	See meaning for **c3DfillX**.	0
c3DFillZ	Long integer	See meaning for **c3DfillX**.	10,000
c3DFillIntensity	Fixed	Theoretical maximum is 1, but may be higher.	38,000
fc3DParallel	Boolean	**True** if the fill has parallel projection, **False** if it does not. If **fc3DParallel** is **True**, the **fc3DKeyHarsh** and **fc3DFillHarsh** properties determine the parallel projection used. A skew amount of 0 means the projection is orthographic.	TRUE
fc3DKeyHarsh	Boolean	**True** if key lighting is harsh, **False** if it is not.	TRUE
fc3DFillHarsh	Boolean	**True** if fill lighting harsh, **False** if it is not.	FALSE
c3DCrMod	Color	Modification for BW views.	Undefined
c3DTolerance	Fixed	3D tolerance.	30,000
f3DOK	Boolean	3D can be set.	TRUE
fc3DConstrainRotation	Boolean	If TRUE, then, the rotation is restricted to x-y rotation and the final rotation results from first rotating by c3DYRotation degrees about the y-axis and then by rotating c3DXRotation degrees about the z-axis. If FALSE, then the final rotation results from a single rotation of c3DRotationAngle about the axis specified by c3DRotationAxisX,Y,and Z.	TRUE

Perspective

perspectiveOffsetX	Fixed	The values define a transformation matrix. Each value is scaled by the perspectiveWeight parameter.	0
perspectiveOffsetY	Fixed	See meaning for **perspectiveOffsetX**.	0
perspectiveOriginX	Fixed	Perspective x origin.	32,768
perspectiveOriginY	Fixed	Perspective y origin.	32,768
perspectivePerspectiveX	Fixed	See meaning for **perspectiveOffsetX**.	0

perspectivePerspectiveY	Fixed	See meaning for **perspectiveOffsetX**.	0
perspectiveScaleXToX	Fixed	See meaning for **perspectiveOffsetX**.	65,536
perspectiveScaleXToY	Fixed	See meaning for **perspectiveOffsetX**.	0
perspectiveScaleYToX	Fixed	See meaning for **perspectiveOffsetX**.	0
perspectiveScaleYToY	Fixed	See meaning for **perspectiveOffsetX**.	65,536
perspectiveType	Transform type	Where transform applies: 0 Absolute 1 Shape 2 Drawing	1
perspectiveWeight	Fixed	Scaling factor.	256
fPerspective	Boolean	On/off.	Not applicable

Callout

spcot	Not applicable	Callout type: 1 Right angle 2 One segment 3 Two segments 4 Three segments	3
dxyCalloutGap	EMU	Distance from box to first point.	76,200
spcoa	Not applicable	Callout angle: 1 Any angle 2 30 degrees 3 43 degrees 4 60 degrees 5 90 degrees	1
spcod		Callout drop type: 0 Top 1 Center 2 Bottom 3 Specified by **dxyCalloutDropSpecified**	3
dxyCalloutDropSpecified	EMU	If **spcod** is 3, then this holds the actual drop distance.	114,300
dxyCalloutLengthSpecified	EMU	In the case where **fCalloutLengthSpecified** is **True**, this holds the actual distance.	0
fCallout	Boolean	This is a callout.	FALSE
fCalloutAccentBar	Boolean	Callout has an accent bar.	FALSE
fCalloutTextBorder	Boolean	Callout has a text border.	TRUE

fCalloutDropAuto	Boolean	**True** if Auto attach is on. **False** if it is off. If this is **True**, then the converter should occasionally invert the drop distance.	FALSE
fCalloutLengthSpecified	Boolean	**True** if the callout length is specified; **False** if it is not. If **True**, use **dxyCalloutLengthSpecified.** If **False**, the **Best Fit** option is on.	FALSE
fCalloutMinusX	Boolean	The polyline of the callout is to the right	FALSE
fCalloutMinusY	Boolean	The polyline of the callout is down.	FALSE
fCalloutTextBorder	Boolean	Callout has a text border	TRUE

Connectors

cxk	Connection site type	Connection site type:		1
		0	None	
		1	Segments	
		2	Custom	
		3	Rect	
cxstyle	Connector style	Connector style:		3
		0	Straight	
		1	Bent	
		2	Curved	
		3	None	

Black and White Modes

bWMode	Black and white mode	Settings for modifications to be made when in different forms of black and white mode:		1
		0	Color	
		1	Automatic	
		2	Grayscale	
		3	Light grayscale	
		4	Inverse gray	
		5	Gray outline	
		6	Black TextLine	
		7	High contrast	
		8	Black	
		9	White	
		10	Don’t show	
		11	Number of black and white modes	
bWModeBW	Black and white mode	See meaning for **bWMode**.		1

bWModePureBW	Black and White Mode	See meaning for **bWmode**.	1

The format of the value depends on the property name it is paired with. Many values are simple single numbers. Distances are expressed in EMU units. There are 12,700 EMU units in a point hence 914,400 in an inch and 360,000 cm^{-1}. Fractional or fixed values are expressed using units that are $1/65536^{th}$ of a whole. Angles are expressed as fractions of a degree. Colors are 24-bit color values. Booleans have two possible values: 1 for **True** and 0 for **False**.

Arrays are formatted as a sequence of numbers separated by semicolons. The first number tells the size of each element in the array in bytes. The number of bytes per element may be 2, 4, or 8. When the size of the element is 8, each element is represented as a group of two numbers. The second number tells the number of elements in the array. For example, the points of a square polygon are written as:

```
{sv 8;4;{0,0};{100,0};{100,100};{0,100}}
```

The **ShapeType** property can have the following possible values.

Value	Meaning
0	Freeform or non-autoshape
1	Rectangle
2	Round rectangle
3	Ellipse
4	Diamond
5	Isosceles triangle
6	Right triangle
7	Parallelogram
8	Trapezoid
9	Hexagon
10	Octagon
11	Plus Sign
12	Star
13	Arrow
14	Thick arrow
15	Home plate
16	Cube
17	Balloon
18	Seal
19	Arc
20	Line
21	Plaque
22	Can
23	Donut

Value	Meaning
24	Text simple
25	Text octagon
26	Text hexagon
27	Text curve
28	Text wave
29	Text ring
30	Text on curve
31	Text on ring
41	Callout 1
42	Callout 2
43	Callout 3
44	Accent callout 1
45	Accent callout 2
46	Accent callout 3
47	Border callout 1
48	Border callout 2
49	Border callout 3
50	Accent border callout 1
51	Accent border callout 2
52	Accent border callout 3
53	Ribbon
54	Ribbon2
55	Chevron
56	Pentagon
57	No smoking
58	Seal8
59	Seal16
60	Seal32
61	Wedge rectangle callout
62	Wedge RRect callout
63	Wedge ellipse callout
64	Wave
65	Folded corner
66	Left arrow
67	Down arrow
68	Up arrow

Value	Meaning
69	Left right arrow
70	Up down arrow
71	IrregularSeal1
72	IrregularSeal2
73	Lightning bolt
74	Heart
75	Picture frame
76	Quad arrow
77	Left arrow callout
78	Right arrow callout
79	Up arrow callout
80	Down arrow callout
81	Left right arrow callout
82	Up down arrow callout
83	Quad arrow callout
84	Bevel
85	Left bracket
86	Right bracket
87	Left brace
88	Right brace
89	Left up arrow
90	Bent up arrow
91	Bent arrow
92	Seal24
93	Striped right arrow
94	Notched right arrow
95	Block arc
96	Smiley face
97	Vertical scroll
98	Horizontal scroll
99	Circular arrow
100	Notched circular arrow
101	U-turn arrow
102	Curved right arrow
103	Curved left arrow
104	Curved up arrow

Value	Meaning
105	Curved down arrow
106	Cloud callout
107	Ellipse ribbon
108	Ellipse ribbon 2
109	Flow chart process
110	Flow chart decision
111	Flow chart input output
112	Flow chart predefined process
113	Flow chart internal storage
114	Flow chart document
115	Flow chart multidocument
116	Flow chart terminator
117	Flow chart preparation
118	Flow chart manual input
119	Flow chart manual operation
120	Flow chart connector
121	Flow chart punched card
122	Flow chart punched tape
123	Flow chart summing junction
124	Flow chart or
125	Flow chart collate
126	Flow chart sort
127	Flow chart extract
128	Flow chart merge
129	Flow chart offline storage
130	Flow chart online storage
131	Flow chart magnetic tape
132	Flow chart magnetic disk
133	Flow chart magnetic drum
134	Flow chart display
135	Flow chart delay
136	Text plain text
137	Text stop
138	Text triangle
139	Text triangle inverted
140	Text chevron

Value	Meaning
141	Text chevron inverted
142	Text ring inside
143	Text ring outside
144	Text arch up curve
145	Text arch down curve
146	Text circle curve
147	Text button curve
148	Text arch up pour
149	Text arch down pour
150	Text circle pour
151	Text button pour
152	Text curve up
153	Text curve down
154	Text cascade up
155	Text cascade down
156	Text wave1
157	Text wave2
158	Text wave3
159	Text wave4
160	Text inflate
161	Text deflate
162	Text inflate bottom
163	Text deflate bottom
164	Text inflate top
165	Text deflate top
166	Text deflate inflate
167	Text deflate inflate deflate
168	Text fade right
169	Text fade left
170	Text fade up
171	Text fade down
172	Text slant up
173	Text slant down
174	Text can up
175	Text can down
176	Flow chart alternate process

Value	Meaning
177	Flow chart off-page connector
178	Callout 90
179	Accent callout 90
180	Border callout 90
181	Accent border callout 90
182	Left right up arrow
183	Sun
184	Moon
185	Bracket pair
186	Brace pair
187	Seal4
188	Double wave
201	Host control
202	Text box

The following keywords are related to defining a hyperlink hanging off of a shape (that is, all of them are inside of a `{\sp {\sn … } {\sp …}}`). These specifically can occur in the \sp to define a property that is a hyperlink. They are used in the following way:

```
{ \hl  { \hlloc  RTF-string } { \hlsrc RTF-string } { \hlfr RTF-string } }
```

The three groups can be in any order and provide the three strings needed to fully describe a hyperlink. The control words are described in the following table.

Control word	Meaning
\hlloc	Location string for hyperlink.
\hlsrc	Source string for hyperlink.
\hlfr	Friendly name for hyperlink.

For more information on drawing, please refer to the Microsoft Draw Binary Format Specification.

Footnotes

The **\footnote** control word introduces a footnote. Footnotes are destinations in RTF. A footnote is anchored to the character that immediately precedes the footnote destination (that is, the footnote moves with the character to which it is anchored). If automatic footnote numbering is defined, the destination can be preceded by a footnote reference character, identified by the control word **\chftn**. Microsoft products do not support footnotes within headers, footers, or comments (annotations). Placing a footnote within headers, footers, or comments will often result in a corrupted document.

Footnotes have the following syntax:

<foot> '{' **\footnote** <para>+ '}'

Here is an example of a destination containing footnotes:

```
\ftnbj\ftnrestart \sectd \linemod0\linex0\endnhere \pard\plain
\ri1170 \fs20 {\pu6 Mead's landmark study has been amply annotated.\chftn
```

```
{\footnote \pard\plain \s246 \fs20 {\up6\chftn }See Sahlins, Bateson, and
Geertz for a complete bibliography.}
It was her work in America during the Second World War, however, that forms
the basis for the paper. As others have noted, \chftn
{\footnote \pard\plain \s246 \fs20 {\up6\chftn}
A complete bibliography will be found at the end of this chapter.}
this period was a turning point for Margaret Mead.}
\par
```

To indicate endnotes, the following combination is emitted: **\footnote\ftnalt.** Existing readers will ignore the **\ftnalt** control word and treat everything as a footnote.

For other control words relating to footnotes, see the sections titled Document Formatting Properties, Section Formatting Properties, and Special Characters in this specification

Comments (Annotations)

RTF comments (annotations) have two parts; the author ID (introduced by the control word **\atnid**) and the annotation text (introduced by the control word **\annotation**); there is no group enclosing both parts. Microsoft products do not support comments within headers, footers, or footnotes. Placing an annotation within headers, footers, or footnotes will often result in a corrupted document. Each part of the annotation is an RTF destination. Comments are anchored to the character that immediately precedes the annotation.

If an annotation is associated with an annotation bookmark, the following two destination control words precede and follow the bookmark. The alphanumeric string ***N***, such as a long integer, represents the bookmark name.

<atrfstart>	'{***' \atrfstart *N*** '}'
<atrfend>	'{***' \atrfend *N*** '}'

Comments have the following syntax:

<annot>	<annotid> <atnauthor> <atntime>? **\chatn** <atnicn>? <annotdef>
<annotid>	'{*' **\atnid** #PCDATA '}'
<atnauthor>	'{*' **\atnauthor** #PCDATA '}'
<annotdef>	'{*' **\annotation** <atndate>? <atnref> <atnparent> <para>+ '}'
<atnref>	'{***' \atnref *N*** '}'
<atntime>	'{*' **\atntime** <time> '}'
<atndate>	'{*' **\atndate** <date> '}'
<atnparent>	"{*' **\atnparent** <annotid of parent> '}'
<atnicn>	'{*' **\atnicn** <pict> '}'

The following is an example of annotation text:

```
{\insrsid8729657 An example of a paradigm might be Darwinian biology.}{\cs15\v\fs16\insrsid8729657
{\*\atnid JD}{\*\atnauthor John Doe}\chatn {\*\annotation{\*\atndate 1180187342}\pard\plain \s16\ql
\li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs20\lang1033\langfe1033\cgrid\langnp1033\langfenp1033 {\cs15\fs16\insrsid8729657
\chatn }{\insrsid9244585 How about some examples that deal with social science? That is what this paper
is about.}}}
```

Comments may have optional time stamps (contained in the **\atntime** destination), date stamps (contained in the **\atndate** destination), or icons (contained in the **\atnicn** destination).

Fields

The **\field** control word introduces a field destination, which contains the text of fields. Fields have the following syntax:

<field>	'{' **\field** <fieldmod>? <fieldinst> <fieldrslt> '}'
<fieldmod>	**\flddirty**? & **\fldedit**? & **\fldlock**? & **\fldpriv**?
<fieldinst>	'{*' **\fldinst** <para>+ <fldalt>? '}'
<fldalt>	**\fldalt**
<fieldrslt>	'{' **\fldrslt** <para>+ '}'

There are several control words that alter the interpretation of the field. These control words are listed in the following table.

Control word	Meaning
\flddirty	A formatting change has been made to the field result since the field was last updated.
\fldedit	Text has been added to, or removed from, the field result since the field was last updated.
\fldlock	Field is locked and cannot be updated.
\fldpriv	Result is not in a form suitable for display (for example, binary data used by fields whose result is a picture).

Two subdestinations are required within the **\field** destination. They must be enclosed in braces ({ }) and begin with the following control words.

Control word	Meaning
\fldinst	Field instructions. This is a destination control word.
\fldrslt	Most recent calculated result of the field. This is a destination control word.

If the instruction for a field contains a file name, then the **\cpg** control can be used to define the character set of the file name. See Code Page Support in this specification for details.

The **\fldrslt** control word should be included even if no result has been calculated because most readers (even those readers that do not recognize fields) can generally include the value of the **\fldrslt** destination in the document. A field result should not start with a table, because this will break some RTF readers.

The following is an example of some field text:

```
{\field {\*\fldinst AUTHOR \\*MERGEFORMAT       }{\fldrslt Joe Smith}}\par\pard
{\field{\*\fldinst time \\@ "h:mm AM/PM"}{\fldrslt 8:12 AM}}
```

You can use the **\fldalt** control word to specify that the given field reference is to an endnote. For example, the following field in RTF is a reference to a footnote

```
{\field{\*\fldinst NOTEREF _RefNumber } {\fldrslt 1}}
```

The following is an example of a reference to an endnote

```
{\field{\*\fldinst NOTEREF _RefNumber \fldalt } {\fldrslt I}}
```

If the specified field is a form field, the ***\datafield** destination appears as a part of <char> and contains the binary data of a form field instruction. For example:

```
{\field{\*\fldinst {\*\bkmkstart Text1} FORMTEXT {{\*\datafield
00000000000000000055465787431000847656520776 8697a000000000000000000000000}}}{\fldrslt Default
Result}}{\*\bkmkend Text1}
```

Note that the **\datafield** destination requires the ***** prefix. The **\fldtype**, **\date**, **\time,** and **\wpeqn** field keywords should be ignored.

Form Fields

Control word	Meaning
\formfield	Group destination keyword indicating start of form field data.
\fftype*N*	Form field type: 0 Text 1 Check box 2 List
\ffownhelp*N*	1 if there is associated Help text (defined under **\ffhelptext**), 0 otherwise.
\ffownstat*N*	1 if there is associated status line text (defined under **\ffstattext**), 0 otherwise.
\ffprot*N*	1 if this field is protected, 0 otherwise.
\ffsize*N*	Type of size selected for check box field: 0 Auto 1 Exact
\fftypetxt*N*	Type of text field: 0 Regular text 1 Number 2 Date 3 Current date 4 Current time 5 Calculation
\ffrecalc*N*	1 if the field should be calculated on exit, 0 otherwise.
\ffhaslistbox*N*	1 if this field has list box attached to it, 0 otherwise.
\ffmaxlen	Number of characters for text field.
\ffhps*N*	Check box size (half-point sizes).
\ffname	Form field name (string). This is a destination control word.
\ffdeftext	Default text for text field (string). This is a destination control word.
\ffdefres	Default entry for list field (for example 0 = first list item, 1 = second list item).
\ffformat	Format for text field (string). This is a destination control word.

Control word	Meaning
\ffhelptext	Help text (string). This is a destination control word.
\ffstattext	Status line text (string). This is a destination control word.
\ffentrymcr	Macro to be executed upon entry into this form field (string). This is a destination control word.
\ffexitmcr	Macro to be executed upon exit from this form field (string). This is a destination control word.
\ffl	List of text for list field. This is a destination control word.
\ffres*N*	Result field for a form field. Values from 0 to ***N***-1, where ***N*** is the number of **\ffl** entries.

Index Entries

The **\xe** control word introduces an index entry. Index entries in RTF are destinations. An index entry has the following syntax:

<idx>	'{' **\xe** (**xef**? & **bxe**? & **\ixe**?) <entry> (<txe> | <rxe>)? '}'
<entry>	(<char>+ <yxe>?) | ('{' <char>+ <yxe>? '}')
<yxe>	**yxe** <char>+ #PCDATA
<txe>	'{' **\txe** <char>+ #PCDATA'}'
<rxe>	'{' **\rxe** #PCDATA '}'

If the text of the index entry is not formatted as hidden text with the **v** control word, then the text is put into the document as well as into the index. Similarly, the text of the **\txe** subdestination, described later in this section, becomes part of the document if it is not formatted as hidden text. For more information on the **\v** control word, see Font/Character Formatting Properties in this specification.

The following control words may also be used.

Control word	Meaning
\xef*N*	Allows multiple indexes within the same document. ***N*** is an integer that corresponds to the ASCII value of a letter between A and Z.
\bxe	Formats the page number or cross-reference in bold.
\ixe	Formats the page number or cross-reference in italic.
\txe *Text*	Text argument to be used instead of a page number. This is a destination control word.
\rxe *BookmarkName*	Text argument is a bookmark for the range of page numbers. This is a destination control word.
\yxe	Pronunciation (or heading) for index entry, used in phonetic sorting.
***\pxe**	"Yomi" (pronunciation) for index entry.

Table of Contents Entries

The **tc** control word introduces a table of contents entry, which can be used to build the actual table of contents. The **\tcn** control word marks a table of contents entry that will not have a page number associated with it; this is used in place of **\tc** for such entries. Table of contents entries are destinations, and they have the following syntax:

<toc> '{' **\tc | \tcn** (***tcf***? & ***tcl***?) <char>+ '}'

As with index entries, text that is not formatted as hidden with the **v** character-formatting control word is put into the document. The following control words can also be used in this destination.

Control word	Meaning
\tcf*N*	Type of table being compiled. ***N*** is mapped by existing Microsoft software to a letter between A and Z (the default is 67, which maps to C, used for tables of contents).
\tcl*N*	Level number (the default is 1).

Bidirectional Language Support

RTF supports bidirectional writing orders for languages such as Arabic. The controls are described in the following table (as well as in the appropriate sections throughout this specification). Also refer to the associated character properties defined in Associated Character Properties in this specification.

All the control words relating to bidirectional language support are repeated here for convenience.

Control word	Meaning
\rtlch	The character data following this control word will be treated as a right-to-left run.
\ltrch	The character data following this control word will be treated as a left-to-right run (the default).
\lin*N*	Left indent for left-to-right paragraphs; right indent for right-to-left paragraphs (the default is 0).
\rin*N*	Right indent for left-to-right paragraphs; left indent for right-to-left paragraphs (the default is 0).
\pgnbidia	Page-number format is Abjad Jawaz if language is Arabic and Biblical Standard if language is Hebrew.
\pgnbidib	Page number format is Alif Ba Tah if language is Arabic and Non-standard Decimal if language is Hebrew.
\pnbidia	Abjad Jawaz if language is Arabic and Biblical Standard if language is Hebrew.
\pnbidib	Alif Ba Tah if language is Arabic and Non-standard Decimal if language is Hebrew.
\rtlmark	The following characters should be displayed from right to left.
\ltrmark	The following characters should be displayed from left to right.
\rtlpar	Text in this paragraph will be displayed with right-to-left precedence.
\ltrpar	Text in this paragraph will be displayed with left-to-right precedence (the default).
\rtlrow	Cells in this table row will have right-to-left precedence.
\ltrrow	Cells in this table row will have left-to-right precedence (the default).
\rtlsect	This section will thread columns from right to left.
\ltrsect	This section will thread columns from left to right (the default).
\rtldoc	Text in this document will be displayed from right to left unless overridden by a more specific control.
\ltrdoc	Text in this document will be displayed from left to right unless overridden by a more specific control (the default).
\levelnfcn*N*	Same as **\levelnfc.** Takes priority over it if both are present.

Control word	Meaning
\leveljcn*N*	0 Left justified for left-to-right paragraphs and right justified for right-to-left paragraphs 1 Center justified 2 Right justified for left-to-right paragraphs and left justified for right-to-left paragraphs Takes priority over **\leveljc** if both are present.
\rtlgutter	Gutter is positioned on the right.
\taprtl	Indicates that the table direction is right-to-left.
\zwj	Zero-width joiner. This is used for ligating characters.
\zwnj	Zero-width nonjoiner. This is used for unligating characters.

FAR EAST SUPPORT

Word 2000 contains full support for all Far East features introduced in all previous Asian versions of Word and it has the ability to read and write RTF keywords related to such features. This section provides details on the handling of Far East characters. For more information on handling Far East features, see the appropriate subsection in the Contents of an RTF File section in this document.

Escaped Expressions

An escaped expression (for example, \'hh, \\, or \{) is usable in all RTF control words.

Writer

In general RTF should be written out with all characters above 0x80 in the escaped form, \'hh. The following table shows values for character codes.

Character code	Write out as
0x00 <= ch < 0x20	Escaped (\'hh)
0x20 <= ch < 0x80	Raw (non-escaped) character
0x80 <= ch <= 0xFF	Escaped (\'hh)
0x5C, 0x7B, 0x7D (special RTF characters \,{, or })	Escaped (\'hh)

Reader

When the RTF reader encounters raw characters in the leading-byte range of the double-byte character, it regards the next character as the trailing byte of the double-byte character and combines the two characters into one double-byte character. The following table shows possible byte combinations.

Leading byte	Trailing byte	Validity
Escaped	Raw (0x20 <= ch <= 0x7f)	Valid (standard format for double-byte character)
Escaped	Escaped (other)	Valid (standard format for double-byte character)
Raw	Raw	Valid (RTF-J format for double-byte character)
Raw	Escaped	Invalid

Note that characters that are special RTF symbols (\,{, or }) should always be escaped, preferably using the \'hh syntax.

Character Set

Word J specifies the character set in the font table using **\fcharset**. Word J interprets **\cpg437** as **\fcharset0** and **\cpg932** as **\fcharset128** if it encounters these control words when reading RTF. If both **\fcharset** and **\cpg** appear in the font table, **\cpg** is ignored.

Character Mapping

Word maps single-byte characters according to character set information (for example, Macintosh to ANSI) and leaves double-byte characters unmapped.

Font Family

RTF-J control words	Definition and the interpretation in Word
\jis	RTF-J uses **\jis** as a control word for character set. Word J interprets this as **\ansi**, which is the default character set used if the character set is not defined.
\fjminchou and **\fjgothic**	RTF-J uses **\fjminchou** and **\fjgothic** to specify font family. Word J interprets these as **\fnil**, which is the default font family.

ShiftJIS Font Without \cpg or \fcharset

If **\cpg** or **\fcharset** control words are not present, Word J uses the text metrics of the font before determining the character set of these fonts. If the font is unknown, Word J assumes it is SHIFTJIS_CHARSET.

Composite Fonts (Associated Fonts for International Runs)

Word J defines control words to specify composite fonts as associated character properties. These control words follow the rule of associated character properties and understand font designation (***af***). All other <aprops> are ignored in Word J. Composite fonts have the following syntax:

<atext>	<losbrun> | <hisbrun> | <dbrun>
<losbrun>	**\hich \af** & <aprops> **\dbch \af** & <aprops> **\loch** <ptext>
<hisbrun>	**\loch \af** & <aprops> **\dbch \af** & <aprops> **\hich** <ptext>
<dbrun>	**\loch \af** & <aprops> **\hich \af** & <aprops> **\dbch** <ptext>

These control words are described in the following table.

Control word	Meaning
\loch	Specifies a run of the characters in the low-ANSI (0x00–0x7F) area.
\hich	For the characters in the high-ANSI (0x80–-0xFF) area.
\dbch	Specifies a run of the double-byte characters.

Word J writes out associated character properties in the styles. In the style sheet, the <dbrun> definition should be used for compatibility with applications that have transparent readers.

```
{\stylesheet{\loch\af5\hich\af5\dbch\f27\fs20\snext0 Normal;}}
```

If the composite font definition matches the style, only the control word (**\loch**, **\hich**, or **\dbch**) will be used to distinguish the type of run, along with the font information for transparent readers.

```
{\fonttbl{\f5\fswiss\fcharset0\fprq2 Arial;}{\f27\froman\fcharset128\fprq1 Mincho;}}
{\stylesheet{\loch\af5\hich\af5\dbch\f27\fs20\snext0 Normal;}}
\pard\plain
{\dbch\f27\fs20 \'82\'b1\'82\'ea\'82\'cd}
{\loch\f5 Test }
{\dbch\f27\'82\'c5\'82\'b7\'81B}
\par}
```

If one or all of **\loch**, **\hich**, and **\dbch** are missing from the style sheet definition (or the character set does not match), Word J will apply the following fonts to each character run in the style using the bulleted rules in the next paragraph.

Control word	Font Word J applies
\loch	Same font as \f.
\hich	Any font whose character set is ANSI_CHARSET.
\dbch	Any font whose character set is SHIFTJIS_CHARSET.

If the composite font control words are missing from the character run, Word J will interpret all characters below 0x80 as a **\loch** run. Characters above or equal to 0x80 will be determined using the following rules:

- If the character is in the leading-byte range and the next character is in the trailing-byte range of a double-byte character, it will be treated as a **\dbch** run (one double-byte character). For example,

  \'99\'47→ 僖

- If the character is in the leading-byte range of a double-byte character but the next character is not in the trailing-byte range, it will be treated as a **\hich** run (two high-ANSI or low-ANSI characters). For example,

  \'99\'FF→ÿ

- If the character is in the leading-byte range of a double-byte character and is the last character in the run, it will be treated as a **\hich** run (one high-ANSI character). For example,

  \'99\par→

- If the character is not in the leading-byte range of a double-byte character, it will be treated as a **\hich** run (one high-ANSI character). For example,

  \'FF→ÿ

New Far East Control Words Created by Word 6J

Control word	Meaning
Associated Character Properties	
\loch	The text consists of single-byte low-ANSI (0x00–0x7F) characters.
\hich	The text consists of single-byte high-ANSI (0x80–0xFF) characters.
\dbch	The text consists of double-byte characters.

Control word	Meaning
Borders	
\brdrdash	Dashed border.
\brdrdashd	Dash-dotted border.
\brdrdashdd	Dash-dot-dotted border.
Character Properties	
\uldash	Dashed underline.
\uldashd	Dash-dotted underline.
\uldashdd	Dash-dot-dotted underline.
\ulhair	Hairline underline.
\ulth	Thick underline.
\ulwave	Wave underline.
\accnone	No accent characters (over dot / over comma).
\accdot	Over dot accent.
\acccomma	Over comma accent.
\charscalex	Character width scaling.
\striked1	Double strikethrough. **\striked0** turns it off.
Document Formatting Properties	
\horzdoc	Horizontal rendering.
\vertdoc	Vertical rendering.
***\fchars**	List of following Kinsoku characters.
***\lchars**	List of leading Kinsoku characters.
\jcompress	Compressing justification (default).
\jexpand	Expanding justification.
\gutterprl	Parallel gutter.
\dgsnap	Snap to drawing grid.
\dghspace*N*	Drawing grid horizontal spacing in twips (the default is 120).
\dgvspace*N*	Drawing grid vertical spacing in twips (the default is 120).
\dghorigin*N*	Drawing grid horizontal origin in twips (the default is 1,701).
\dgvorigin*N*	Drawing grid vertical origin in twips (the default is 1,984).
\dghshow*N*	Show ***N***th horizontal drawing gridline (the default is 3).
\dgvshow*N*	Show ***N***th vertical drawing gridline (the default is 0).
\twoonone	Print two logical pages on one physical page.
\lnongrid	Define line based on the grid.
Bullets and Numbering	
\pndecd	Double-byte decimal numbering (***arabic*dbchar**).
\pndbnum	Kanji numbering without the digit character (***dbnum1**).

Control word	Meaning
\pnaiu	46 phonetic katakana characters in "aiueo" order (***aiueo**).
\pnaiud	46 phonetic double-byte katakana characters (***aiueo*dbchar**).
\pniroha	46 phonetic katakana characters in "iroha" order (***iroha**).
\pnirohad	46 phonetic double-byte katakana characters (***iroha*dbchar**).
\pncnum	20 numbered list in circle (***circlenum**).
\pnuldash	Dashed underline.
\pnuldashd	Dash-dotted underline.
\pnuldashdd	Dash-dot-dotted underline.
\pnulhair	Hairline underline.
\pnulth	Thick underline.
\pnulwave	Wave underline.
Drawing Objects	
\dptxlrtb	Text box flows from left to right and top to bottom (default).
\dptxtbrl	Text box flows from right to left and top to bottom.
\dptxbtlr	Text box flows from left to right and bottom to top.
\dptxlrtbv	Text box flows from left to right and top to bottom, vertically.
\dptxtbrlv	Text box flows from top to bottom and right to left, vertically.
Frame Properties	
\frmtxlrtb	Frame box flows from left to right and top to bottom (default).
\frmtxtbrl	Frame box flows right to left and top to bottom.
\frmtxbtlr	Frame box flows left to right and bottom to top.
\frmtxlrtbv	Frame box flows left to right and top to bottom, vertical.
\frmtxtbrlv	Frame box flows top to bottom and right to left, vertical.
Index Entries	
***\pxe**	"Yomi" (pronunciation) for index entry.
Paragraph Properties	
\nocwrap	No character wrapping.
\nowwrap	No word wrapping.
\qd	Distributed.
\nooverflow	No overflow period and comma.
\aspalpha	Auto spacing between DBC and English.
\aspnum	Auto spacing between DBC and numbers.
\fahang	Font alignment – Hanging.
\facenter	Font alignment – Center.

Control word	Meaning
\faroman	Font alignment – Roman (default).
\favar	Font alignment – Upholding variable.
\fafixed	Font alignment – Upholding fixed.
Section Formatting Properties	
\horzsect	Horizontal rendering.
\vertsect	Vertical rendering.
\pgndecd	Double-byte decimal numbering.
\pgndbnum	Kanji numbering without the digit character.
\pgndbnumd	Kanji numbering with the digit character.
Special Characters	
\zwbo	Zero-width break opportunity. Used to insert break opportunity between two characters.
\zwnbo	Zero-width nonbreak opportunity. Used to remove break opportunity between two characters.
\qmspace	One-quarter em space.
Table Formatting	
\cldglu	Diagonal line (top left to bottom right). Followed by <brdr>, which defines the properties of the diagonal border (**cldglu** <brdr>).
\cldgll	Diagonal line (top right to bottom left). Followed by <brdr>, which defines the properties of the diagonal border (**cldgll** <brdr>).
\cltxlrtb	Text in a cell flows from left to right and top to bottom (default).
\cltxtbrl	Text in a cell flows right to left and top to bottom.
\cltxbtlr	Text in a cell flows left to right and bottom to top.
\cltxlrtbv	Text in a cell flows left to right and top to bottom, vertical.
\cltxtbrlv	Text in a cell flows top to bottom and right to left, vertical.
\clvmgf	The first cell in a range of table cells to be vertically merged.
\clvmrg	Contents of the table cell are vertically merged with those of the preceding cell.
\clvertalt	Cell top align.
\clvertalc	Cell vertically center align.
\clvertalb	Cell bottom align.
Tabs	
\tlmdot	Leader middle dots.

New Far East Control Words Created by Asian Versions of Word 97

Control word	Meaning
Character Formatting Properties	
\cgrid*N*	Character grid.

Control word	Meaning
\g	Destination related to character grids.
\gcw	Grid column width.
\gridtbl	Destination keyword related to character grids.
\nosectexpand	Disable character space basement.
Paragraph Formatting Properties	
\adjustright	Automatically adjust right indent when document grid is defined.
\nosnaplinegrid	Disable snap line to grid.
\faauto	Font alignment the default setting for this is "Auto."
Borders	
\brdrframe	Border resembles a frame.
Bullets and Numbers	
\pnaiueo	46 phonetic katakana characters in "aiueo" order (*aiueo).
\pnaiueod	46 phonetic double-byte katakana characters (*aiueo*dbchar).
\pndbnumd	Kanji numbering with the digit character (*dbnum2).
\pndbnumt	Kanji numbering 3 (*dbnum3).
\pndbnuml	Kanji numbering 3 (*dbnum3).
\pndbnumk	Kanji numbering 4 (*dbnum4).
\pnganada	Korean numbering 2 (*ganada).
\pngbnum	Chinese numbering 1 (*gb1).
\pngbnumd	Chinese numbering 2 (*gb2).
\pngbnuml	Chinese numbering 3 (*gb3).
\pngbnumk	Chinese numbering 4 (*gb4).
\pnzodiac	Chinese Zodiac numbering 1 (*zodiac1).
\pnzodiacd	Chinese Zodiac numbering 2 (*zodiac2).
\pnzodiacl	Chinese Zodiac numbering 3 (*zodiac3).
\pnganada	Korean numbering 1 (*ganada).
\pnchosung	Korean numbering 2 (*chosung).
Endnotes and Footnotes	
\ftnnchosung	Footnote Korean numbering 1 (*chosung).
\ftnncnum	Footnote Circle numbering (*circlenum).
\ftnndbnum	Footnote kanji numbering without the digit character (*dbnum1).
\ftnndbnumd	Footnote kanji numbering with the digit character (*dbnum2).
\ftnndbnumt	Footnote kanji numbering 3 (*dbnum3).
\ftnndbnumk	Footnote kanji numbering 4 (*dbnum4).
\ftnndbar	Footnote double-byte numbering (*dbchar).
\ftnnganada	Footnote Korean numbering 2 (*ganada).

Control word	Meaning
\ftnngbnum	Footnote Chinese numbering 1 (*gb1).
\ftnngbnumd	Footnote Chinese numbering 2 (*gb2).
\ftnngbnuml	Footnote Chinese numbering 3 (*gb3).
\ftnngbnumk	Footnote Chinese numbering 4 (*gb4).
\ftnnzodiac	Footnote numbering—Chinese Zodiac numbering 1 (***** zodiac1) 甲、乙、丙…甲、乙、丙…甲、乙、丙…
\ftnnzodiacd	Footnote numbering—Chinese Zodiac numbering 2 (***** zodiac2) 子、丑、寅…
\ftnnzodiacl	Footnote numbering—Chinese Zodiac numbering 3 (***** zodiac3).
\aftnnchosung	Endnote Korean numbering 1 (*chosung).
\aftnncnum	Endnote Circle numbering (*circlenum).
\aftnndbnum	Endnote kanji numbering without the digit character (*dbnum1).
\aftnndbnumd	Endnote kanji numbering with the digit character (*dbnum2).
\aftnndbnumt	Endnote kanji numbering 3 (*dbnum3).
\aftnndbnumk	Endnote kanji numbering 4 (*dbnum4).
\aftnndbar	Endnote double-byte numbering (*dbchar).
\aftnnganada	Endnote Korean numbering 2 (*ganada).
\aftnngbnum	Endnote Chinese numbering 1 (*gb1).
\aftnngbnumd	Endnote Chinese numbering 2 (*gb2).
\aftnngbnuml	Endnote Chinese numbering 3 (*gb3).
\aftnngbnumk	Endnote Chinese numbering 4 (*gb4).
\aftnnzodiac	Endnote numbering—Chinese Zodiac numbering 1 (***** zodiac1) 甲、乙、丙…
\aftnnzodiacd	Endnote numbering—Chinese Zodiac numbering 2 (***** zodiac2) 子、丑、寅…
\aftnnzodiacl	Endnote numbering—Chinese Zodiac numbering 3 (***** zodiac3).
Section Formatting Properties	
\pgnchosung	Korean numbering 1 (* chosung).
\pgncnum	Circle numbering (*circlenum).
\pgndbnumt	Kanji numbering 3 (*dbnum3).
\pgndbnumk	Kanji numbering 4 (*dbnum4).
\pgnganada	Korean numbering 2 (*ganada).
\pgngbnum	Chinese numbering 1 (*gb1).
\pgngbnumd	Chinese numbering 2 (*gb2).
\pgngbnuml	Chinese numbering 3 (*gb3).
\pgngbnumk	Chinese numbering 4 (*gb4).
\pgnzodiac	Chinese Zodiac numbering 1 (*zodiac1).
\pgnzodiacd	Chinese Zodiac numbering 2 (*zodiac2).
\pgnzodiacl	Chinese Zodiac numbering 3 (*zodiac3).

Control word	Meaning
\sectexpand*N*	Character space basement (character pitch minus font size) ***N*** in device independent units (a device independent unit is 1/294912th of an inch).
\sectlinegrid*N*	Line grid, where ***N*** is the line pitch in 20ths of a point.
\sectdefaultcl	Default state of section. Indicates **\sectspecifycl** and **\sectspecifyl** are not emitted.
\sectspecifycl	Specify number of characters per line only.
\sectspecifyl	Specify both number of characters per line and number of lines per page.
Document Formatting Properties	
\dgmargin	Grid to follow margins.
Index Entries	
\yxe	Pronunciation (or heading) for index entry, used in phonetic sorting.

New Far East Control Words Created by Word 2000

Document Formatting Properties	
\jsksu	Indicates that the strict Kinsoku set must be used for Japanese; **\jsku** should not be present if **\ksulang*N*** is present *and* the language *N* is Japanese.
\ksulang*N*	Indicates what language ***N*** the customized Kinsoku characters defined in the **\fchars** and **\lchars** destinations belong to.
Section Formatting Properties	
\sectspecifygenN	Indicates that text should snap to the character grid. Note that the N is part of the keyword.
Paragraph Formatting Properties	
\cufi*N*	First-line indent in hundredths of a character unit; overrides **\fi*N***, although they should both be emitted with equivalent values.
\culi*N*	Left indent (space before) in character units. Behaves like **\lin*N*** and overrides **\li*N*** and **\lin*N***, although they should all be emitted with equivalent values.
\curi*N*	Right indent (space after) in character units. Behaves like **\rin*N*** and overrides **\ri*N*** and **\rin*N***, although they should all be emitted with equivalent values.
\lisb*N*	Space before in hundredths of a character unit. Overrides **\sb*N*** although they should both be emitted with equivalent values.
\lisa*N*	Space after in hundredths of a character unit. Overrides **\sa*N*** although they should both be emitted with equivalent values.
Character Formatting Properties	
\horzvert*N*	Text in the group flows in a direction opposite to that of the main document (Horizontal in vertical and vertical in horizontal): 0 Switched text is uncompressed. 1 Switched text is compressed to current line height.

\twoinone*N* Text in the group is displayed as two half-height lines within a line:

0 Text is not enclosed.

1 Text is enclosed in parentheses.

2 Text is enclosed in square brackets ([]).

3 Text is enclosed in angled brackets (<>).

4 Text is enclosed in braces ({}).

\fittext*N* Fit the text in the current group in ***N*** twips. When ***N*** is set to -1 (**\fittext-1**) it indicates a continuation of the previous **\fittext*N*** run. In other words `{\fittext1000 Fit this}{\fittext-1 text}` fits the string “Fit this text” in 1,000 twips.

APPENDIX A: SAMPLE RTF READER APPLICATION

A sample RTF reader program RTFREADR.EXE is available as part of the Software Development Kit (SDK) for 16-Bit and 32-Bit External Text File Converters, Application Note GC1039. The sample RTF reader will help you create an RTF reader for your own application when used in conjunction with the Microsoft Rich Text Format Specification and the information that follows.

> ***Note*** *The sample RTF reader is not a for-sale product, and Microsoft does not provide technical or any other type of support for the sample RTF reader code or the RTF specification.*

For more information about how to download files from the Microsoft Download Center, please visit the Download Center at the following Web address:

http://www.microsoft.com/downloads/search.asp

and then click "How to use the Microsoft Download Center."

How to Write an RTF Reader

There are three basic things that an RTF reader must do:

1. Separate text from RTF controls.
2. Parse an RTF control.
3. Dispatch an RTF control.

Separating text from RTF controls is relatively simple, because all RTF controls begin with a backslash. Therefore, any incoming character that is not a backslash is text and will be handled as text.

Parsing an RTF control is also relatively simple. An RTF control is either (a) a sequence of alphabetic characters followed by an optional numeric parameter, or (b) a single non-alphanumeric character.

Dispatching an RTF control, on the other hand, is relatively complicated. A recursive-descent parser tends to be overly strict because RTF is intentionally vague about the order of various properties relative to one another. However, whatever method you use to dispatch an RTF control, your RTF reader should do the following:

- **Ignore control words you don't understand**

  Many RTF readers crash when they come across an unknown RTF control. Because Microsoft is continually adding new RTF controls, this limits an RTF reader to working with the RTF from one particular product (usually some version of Word for Windows).

- **Always understand ***

  One of the most important things an RTF reader can do is to understand the * control. This control introduces a destination that is not part of the document. It tells the RTF reader that if the reader does not understand the next control word, then it should skip the entire enclosing group.

- **Remember that binary data can occur when you're skipping RTF**

  A simple way to skip a group in RTF is to keep a running count of the opening braces that the RTF reader has encountered in the RTF stream. When the RTF reader sees an opening brace, it increments the count. When the reader sees a closing brace, it decrements the count. When the count becomes negative, the end of the group has been found. Unfortunately, this doesn't work when the RTF file contains a **\bin** control; the reader must explicitly check each control word found to see if it is a **\bin** control, and, if a **\bin** control is found, skip that many bytes before resuming its scanning for braces.

A Sample RTF Reader Implementation

The Microsoft Word Processing Conversions group uses a table-driven approach to reading RTF. This approach allows the most flexibility in reading RTF but makes it difficult to detect incorrect RTF. An RTF reader that is based on this approach is presented in this section. This reader works exactly as described in the RTF specification and uses the principles of operation described in the RTF specification as well. This reader is designed to be simple to understand but is not intended to be very efficient. This RTF reader also implements the three design principles listed in the previous section.

The RTF reader consists of the following four files:

- Rtfdecl.h, which contains the prototypes for all the functions in the RTF reader
- Rtftype.h, which contains the types used in the RTF reader
- Rtfreadr.c, which contains the main program, the main loop of the RTF reader, and the RTF control parser
- Rtfactn.c, which contains the dispatch routines for the RTF reader

Rtfdecl.h

Rtfdecl.h is straightforward and requires little explanation.

Rtfreadr.c

Like rtfdecl.h, rtfreadr.c is also reasonably straightforward. The function **ecRtfParse** separates text from RTF controls and handles text, and the function **ecParseRtfKeyword** parses an RTF control and also collects any parameter that follows the RTF control.

Rtftype.h

Rtftype.h begins by declaring a sample set of character, paragraph, section, and document properties. These structures are present to demonstrate how the dispatch routines can modify any particular property and are not actually used to format text.

For example, the following enumeration describes which destination text should be routed to:

```
typedef enum { rdsNorm, rdsSkip } RDS;
```

Because this is just a sample RTF reader, there are only two destinations. A more complicated reader would add an entry to this enumeration for each destination supported [for example, headers, footnotes, endnotes, comments (annotations), bookmarks, and pictures].

The following enumeration describes the internal state of the RTF parser:

```
typedef enum { risNorm, risBin, risHex } RIS;
```

This is entirely separate from the state of the dispatch routines and the destination state; other RTF readers may not necessarily have anything similar to this.

The following structure encapsulates the state that must be saved at a group start and restored at a group end:

```
typedef struct save
{
struct save *pNext;
CHP chp;
PAP pap;
SEP sep;
DOP dop;
```

```
RDS rds;
RIS ris;
} SAVE;
```

The following enumeration describes a set of classes for RTF controls:

```
typedef enum {kwdChar, kwdDest, kwdProp, kwdSpec} KWD;
```

Use **kwdChar** for controls that represent special characters (such as **\-**, **\{**, or **\}**).

Use **kwdDest** for controls that introduce RTF destinations.

Use **kwdProp** for controls that modify some sort of property.

Use **kwdSpec** for controls that need to run some specialized code.

The following enumeration defines the number of PROP structures (described later) that will be used. There will typically be an **iprop** for every field in the character, paragraph, section, and document properties.

```
typedef enum {ipropBold, ipropItalic, ipropUnderline, ipropLeftInd,
ipropRightInd, ipropFirstInd, ipropCols, ipropPgnX, ipropPgnY,
ipropXaPage, ipropYaPage, ipropXaLeft, ipropXaRight,
ipropYaTop, ipropYaBottom, ipropPgnStart, ipropSbk,
ipropPgnFormat, ipropFacingp, ipropLandscape, ipropJust,
ipropPard, ipropPlain,
ipropMax} IPROP;
```

The following structure is a very compact way to describe how to locate the address of a particular value in one of the property structures:

```
typedef enum {actnSpec, actnByte, actnWord} ACTN;
typedef enum {propChp, propPap, propSep, propDop} PROPTYPE;

typedef struct propmod
{
ACTN actn;
PROPTYPE prop;
int offset;
} PROP;
```

The **actn** field describes the width of the value being described: if the value is a byte, then **actn** is **actnByte**; if the value is a word, then **actn** is **actnWord**; if the value is neither a byte nor a word, then you can use **actnSpec** to indicate that some C code needs to be run to set the value. The **prop** field indicates which property structure is being described; **propChp** indicates that the value is located within the CHP structure; **propPap** indicates that the value is located within the PAP structure, and so on. Finally, the offset field contains the offset of the value from the start of the structure. The **offsetof()** macro is usually used to initialize this field.

The following structure describes how to parse a particular RTF control:

```
typedef enum {ipfnBin, ipfnHex, ipfnSkipDest } IPFN;
typedef enum {idestPict, idestSkip } IDEST;

typedef struct symbol
{
char *szKeyword;
int dflt;
```

```
bool fPassDflt;
KWD kwd;
int idx;
} SYM;
```

szKeyword points to the RTF control being described; **kwd** describes the class of the particular RTF control (described earlier); **dflt** is the default value for this control, and **fPassDflt** should be nonzero if the value in **dflt** should be passed to the dispatch routine.

Note **fPassDflt** is only nonzero for control words that normally set a particular value. For example, the various section break controls typically have nonzero **fPassDflt** controls, but controls that take parameters should not.

Idx is a generalized index; its use depends on the **kwd** being used for this control.

- If **kwd** is **kwdChar,** then **idx** is the character that should be output.
- If **kwd** is **kwdDest,** then **idx** is the **idest** for the new destination.
- If **kwd** is **kwdProp,** then **idx** is the **iprop** for the appropriate property.
- If **kwd** is **kwdSpec,** then **idx** is an **ipfn** for the appropriate function.

With this structure it is very simple to dispatch an RTF control word. Once the reader isolates the RTF control word and its (possibly associated) value, the reader then searches an array of SYM structures to find the RTF control word. If the control word is not found, the RTF reader ignores it, unless the previous control was *****, in which case the reader must scan past an entire group.

If the control word is found, the reader then uses the **kwd** value from the SYM structure to determine what to do. This is, in fact, exactly what the function **ecTranslateKeyword** in the file RTFACTN.C does.

Rtfactn.c

Rtfactn.c contains the tables describing the properties and control words, and the routines to evaluate properties (**ecApplyPropChange**) and to dispatch control words (**ecTranslateKeyword**).

The tables are the keys to understanding the RTF dispatch routines. The following are some sample entries from both tables, along with a brief explanation of each entry.

Property Table

This table must have an entry for every **iprop.**

```
actnByte,   propChp,    offsetof(CHP, fBold),      // ipropBold
```

This property says that the ***ipropBold*** property is a byte parameter bound to **chp.fBold**.

```
actnWord,   propPap,    offsetof(PAP, xaRight),    // ipropRightInd
```

This property says that ***ipropRightInd*** is a word parameter bound to **pap.xaRight**.

```
actnWord,   propSep,    offsetof(SEP, cCols),      // ipropCols
```

This property says that ***ipropCols*** is a word parameter bound to **sep.cCols**.

```
actnSpec,   propChp,    0,                      // ipropPlain
```

This property says that ***ipropPlain*** is a special parameter. Instead of directly evaluating it, **ecApplyPropChange** will run some custom C code to apply a property change.

Control Word Table

```
"b",        1,      fFalse,     kwdProp,    ipropBold,
```

This structure says that the control **\b** sets the ipropBold property. Because **fPassDflt** is **False**, the RTF reader only uses the default value if the control does not have a parameter. If no parameter is provided, the RTF reader uses a value of 1.

```
"sbknone",  sbkNon, fTrue,     kwdProp,    ipropSbk,
```

This entry says that the control **\sbknone** sets the **ipropSbk** property. Because **fPassDflt** is **True**, the RTF reader always uses the default value of **sbkNon**, even if the control has a parameter.

```
"par",      0,      fFalse,    kwdChar,    0x0a,
```

This entry says that the control **\par** is equivalent to a 0x0a (linefeed) character.

```
"tab",      0,      fFalse,    kwdChar,    0x09,
```

This entry says that the control **\tab** is equivalent to a 0x09 (tab) character.

```
"bin",      0,      fFalse,    kwdSpec,    ipfnBin,
```

This entry says that the control **\bin** should run some C code. The particular piece of C code can be located by the **ipfnBin** parameter.

```
"fonttbl",  0,      fFalse,    kwdDest,    idestSkip,
```

This entry says that the control **\fonttbl** should change to the destination **idestSkip**.

Notes on Implementing Other RTF Features

The table-driven approach to dispatching RTF controls used by the sample converter does not implement any syntax checking. For most controls this is not a problem; a control simply modifies the appropriate property. However, some controls, such as those for tabs and borders, are dependent on other control words either before or after the current control word.

There are some standard techniques for handling these features.

Tabs and Other Control Sequences Terminating in a Fixed Control

The best way to implement these types of control sequences is to have a global structure that represents the current state of the tab descriptor (or other entity). As the modifiers come in, they modify the various fields of the global structure. When the fixed control at the end of the sequence is dispatched, it adds the entire descriptor and reinitializes the global variable.

Borders and Other Control Sequences Beginning with a Fixed Control

The best way to implement these types of control sequences is to have a global pointer that is initialized when the fixed control is dispatched. The controls that modify the fixed control then modify fields pointed to by the control.

Other Problem Areas in RTF

Style Sheets

Style sheets can be handled as destinations. However, styles have default values, just as every other control does. RTF readers should be sure to handle a missing style control as the default style value (that is, 0).

Property Changes

Some RTF readers use various bits of RTF syntax to mark property changes. In particular, they assume that property changes will occur only after a group start, which is not correct. Because there is a variety of ways to represent identical property changes in RTF, RTF readers should look at the changes in the properties and not at any particular way of representing a property change. In particular, properties can be changed explicitly with a

control word or implicitly at the end of a group. For example, these three sequences of RTF have exactly the same semantics, and should be translated identically:

- `{\b bold \i Bold Italic \i0 Bold again}`
- `{\b bold {\i Bold Italic }Bold again}`
- `{\b bold \i Bold Italic \plain\b Bold again}`

Fields

All versions of Microsoft Word for Windows and version 6.0 and later of Microsoft Word for the Macintosh have fields. If you are writing an RTF reader and expect to do anything with fields, keep the following notes in mind:

- Field instructions may have arbitrary amounts of character formatting and arbitrarily nested groups. While the groups will be properly nested within the field instructions, you may already be inside an arbitrary number of groups by the time you know which field you are working with. If you then expect to be able to skip to the end of the field instructions, you'll have to know how many groups have started so that you can skip to the end properly.
- Some fields, the INCLUDE field in particular, can have section breaks in the field results. If this occurs, then the text after the end of the field does not have the same section properties as the text at the start of the field. Therefore, the section properties must not be restored when the field results contain section breaks.

Tables

Tables are probably the hardest part of RTF to read and write correctly. Because of the way Microsoft word processors implement tables, and the table-driven approach of many Microsoft RTF readers, it is very easy to write tables in RTF that are not compatible with Microsoft word processors when you try to read the RTF. Here are some guidelines to reduce problems with tables in RTF:

- Place the entire table definition before any paragraph properties, including **\pard**.
- Verify that the number of cells in the RTF matches the number of cell definitions.
- Some controls must be the same in all paragraphs in a row. In particular, all paragraphs in a row must have the same positioning controls, and all paragraphs in a row must have **\intbl** specified.
- Do not use the **\sbys** control inside a table. **\sbys** is a holdover from Word for MS-DOS and early versions of Word for the Macintosh. Word for Windows and current versions of Word for the Macintosh translate **\sbys** as a table.
- Cell definitions starting before the left margin of the paper begins (that is, the parameter plus the left margin is negative) are always in error.

Appendix A-1: Listings

Rtfdecl.h

```
// RTF parser declarations

int ecRtfParse(FILE *fp);
int ecPushRtfState(void);
int ecPopRtfState(void);
int ecParseRtfKeyword(FILE *fp);
int ecParseChar(int c);
int ecTranslateKeyword(char *szKeyword, int param, bool fParam);
int ecPrintChar(int ch);
int ecEndGroupAction(RDS rds);
int ecApplyPropChange(IPROP iprop, int val);
int ecChangeDest(IDEST idest);
int ecParseSpecialKeyword(IPFN ipfn);
int ecParseSpecialProperty(IPROP iprop, int val);
int ecParseHexByte(void);

// RTF variable declarations

extern int cGroup;
extern RDS rds;
extern RIS ris;

extern CHP chp;
extern PAP pap;
extern SEP sep;
extern DOP dop;

extern SAVE *psave;
extern long cbBin;
extern long lParam;
extern bool fSkipDestIfUnk;
extern FILE *fpIn;

// RTF parser error codes

#define ecOK 0                  // Everything's fine!
#define ecStackUnderflow    1      // Unmatched '}'
#define ecStackOverflow     2      // Too many '{' -- memory exhausted
#define ecUnmatchedBrace    3      // RTF ended during an open group.
#define ecInvalidHex        4      // invalid hex character found in data
```

```
#define ecBadTable         5      // RTF table (sym or prop) invalid
#define ecAssertion        6      // Assertion failure
#define ecEndOfFile        7      // End of file reached while reading RTF
```

Rtftype.h

```
typedef char bool;
#define fTrue 1
#define fFalse 0

typedef struct char_prop
{
   char fBold;
   char fUnderline;
   char fItalic;
} CHP;               // CHaracter Properties

typedef enum {justL, justR, justC, justF } JUST;
typedef struct para_prop
{
   int xaLeft;              // left indent in twips
   int xaRight;             // right indent in twips
   int xaFirst;             // first line indent in twips
   JUST just;               // justification
} PAP;               // PAragraph Properties

typedef enum {sbkNon, sbkCol, sbkEvn, sbkOdd, sbkPg} SBK;
typedef enum {pgDec, pgURom, pgLRom, pgULtr, pgLLtr} PGN;
typedef struct sect_prop
{
   int cCols;               // number of columns
   SBK sbk;                 // section break type
   int xaPgn;               // x position of page number in twips
   int yaPgn;               // y position of page number in twips
   PGN pgnFormat;            // how the page number is formatted
} SEP;               // SEction Properties

typedef struct doc_prop
{
   int xaPage;              // page width in twips
   int yaPage;              // page height in twips
   int xaLeft;              // left margin in twips
   int yaTop;               // top margin in twips
   int xaRight;             // right margin in twips
```

```
    int yaBottom;            // bottom margin in twips
    int pgnStart;            // starting page number in twips
    char fFacingp;           // facing pages enabled?
    char fLandscape;         // landscape or portrait?
} DOP;              // DOcument Properties

typedef enum { rdsNorm, rdsSkip } RDS;           // Rtf Destination State
typedef enum { risNorm, risBin, risHex } RIS;     // Rtf Internal State

typedef struct save          // property save structure
{
    struct save *pNext;      // next save
    CHP chp;
    PAP pap;
    SEP sep;
    DOP dop;
    RDS rds;
    RIS ris;
} SAVE;

// What types of properties are there?
typedef enum {ipropBold, ipropItalic, ipropUnderline, ipropLeftInd,
            ipropRightInd, ipropFirstInd, ipropCols, ipropPgnX,
            ipropPgnY, ipropXaPage, ipropYaPage, ipropXaLeft,
            ipropXaRight, ipropYaTop, ipropYaBottom, ipropPgnStart,
            ipropSbk, ipropPgnFormat, ipropFacingp, ipropLandscape,
            ipropJust, ipropPard, ipropPlain, ipropSectd,
            ipropMax } IPROP;

typedef enum {actnSpec, actnByte, actnWord} ACTN;
typedef enum {propChp, propPap, propSep, propDop} PROPTYPE;

typedef struct propmod
{
    ACTN actn;           // size of value
    PROPTYPE prop;       // structure containing value
    int  offset;         // offset of value from base of structure
} PROP;

typedef enum {ipfnBin, ipfnHex, ipfnSkipDest } IPFN;
typedef enum {idestPict, idestSkip } IDEST;
typedef enum {kwdChar, kwdDest, kwdProp, kwdSpec} KWD;

typedef struct symbol
```

```
{
    char *szKeyword;       // RTF keyword
    int  dflt;             // default value to use
    bool fPassDflt;        // true to use default value from this table
    KWD  kwd;              // base action to take
    int  idx;              // index into property table if kwd == kwdProp
                          // index into destination table if kwd == kwdDest
                          // character to print if kwd == kwdChar
} SYM;
```

Rtfreadr.c

```
#include <stdio.h>
#include <stdlib.h>
#include <ctype.h>
#include "rtftype.h"
#include "rtfdecl.h"

int cGroup;
bool fSkipDestIfUnk;
long cbBin;
long lParam;

RDS rds;
RIS ris;

CHP chp;
PAP pap;
SEP sep;
DOP dop;

SAVE *psave;
FILE *fpIn;

//
// %%Function: main
//
// Main loop. Initialize and parse RTF.
//
main(int argc, char *argv[])
{
   FILE *fp;
   int ec;

   fp = fpIn = fopen("test.rtf", "r");
   if (!fp)
   {
      printf ("Can't open test file!\n");
      return 1;
   }
   if ((ec = ecRtfParse(fp)) != ecOK)
      printf("error %d parsing rtf\n", ec);
   else
```

```
        printf("Parsed RTF file OK\n");
    fclose(fp);
    return 0;
}

//
// %%Function: ecRtfParse
//
// Step 1:
// Isolate RTF keywords and send them to ecParseRtfKeyword;
// Push and pop state at the start and end of RTF groups;
// Send text to ecParseChar for further processing.
//

int
ecRtfParse(FILE *fp)
{
    int ch;
    int ec;
    int cNibble = 2;
    int b = 0;
    while ((ch = getc(fp)) != EOF)
    {
        if (cGroup < 0)
            return ecStackUnderflow;
        if (ris == risBin)                  // if we're parsing binary data, handle it directly
        {
            if ((ec = ecParseChar(ch)) != ecOK)
                return ec;
        }
        else
        {
            switch (ch)
            {
            case '{':
                if ((ec = ecPushRtfState()) != ecOK)
                    return ec;
                break;
            case '}':
                if ((ec = ecPopRtfState()) != ecOK)
                    return ec;
                break;
            case '\\':
                if ((ec = ecParseRtfKeyword(fp)) != ecOK)
```

```
                return ec;
            break;
        case 0x0d:
        case 0x0a:        // cr and lf are noise characters...
            break;
        default:
            if (ris == risNorm)
            {
                if ((ec = ecParseChar(ch)) != ecOK)
                    return ec;
            }
            else
            {             // parsing hex data
                if (ris != risHex)
                    return ecAssertion;
                b = b << 4;
                if (isdigit(ch))
                    b += (char) ch - '0';
                else
                {
                    if (islower(ch))
                    {
                        if (ch < 'a' || ch > 'f')
                            return ecInvalidHex;
                        b += (char) ch - 'a';
                    }
                    else
                    {
                        if (ch < 'A' || ch > 'F')
                            return ecInvalidHex;
                        b += (char) ch - 'A';
                    }
                }
                cNibble--;
                if (!cNibble)
                {
                    if ((ec = ecParseChar(b)) != ecOK)
                        return ec;
                    cNibble = 2;
                    b = 0;
ris = risNorm;
                }
            }                // end else (ris != risNorm)
            break;
```

```
            }       // switch
        }           // else (ris != risBin)
    }               // while
    if (cGroup < 0)
        return ecStackUnderflow;
    if (cGroup > 0)
        return ecUnmatchedBrace;
    return ecOK;
}

//
// %%Function: ecPushRtfState
//
// Save relevant info on a linked list of SAVE structures.
//

int
ecPushRtfState(void)
{
    SAVE *psaveNew = malloc(sizeof(SAVE));
    if (!psaveNew)
        return ecStackOverflow;

    psaveNew -> pNext = psave;
    psaveNew -> chp = chp;
    psaveNew -> pap = pap;
    psaveNew -> sep = sep;
    psaveNew -> dop = dop;
    psaveNew -> rds = rds;
    psaveNew -> ris = ris;
    ris = risNorm;
    psave = psaveNew;
    cGroup++;
    return ecOK;
}

//
// %%Function: ecPopRtfState
//
// If we're ending a destination (that is, the destination is changing),
// call ecEndGroupAction.
// Always restore relevant info from the top of the SAVE list.
//
```

```
int
ecPopRtfState(void)
{
    SAVE *psaveOld;
    int ec;

    if (!psave)
        return ecStackUnderflow;

    if (rds != psave->rds)
    {
        if ((ec = ecEndGroupAction(rds)) != ecOK)
            return ec;
    }
    chp = psave->chp;
    pap = psave->pap;
    sep = psave->sep;
    dop = psave->dop;
    rds = psave->rds;
    ris = psave->ris;

    psaveOld = psave;
    psave = psave->pNext;
    cGroup--;
    free(psaveOld);
    return ecOK;
}

//
// %%Function: ecParseRtfKeyword
//
// Step 2:
// get a control word (and its associated value) and
// call ecTranslateKeyword to dispatch the control.
//

int
ecParseRtfKeyword(FILE *fp)
{
    int ch;
    char fParam = fFalse;
    char fNeg = fFalse;
    int param = 0;
    char *pch;
```

```
    char szKeyword[30];
    char szParameter[20];

    szKeyword[0] = '\0';
    szParameter[0] = '\0';
    if ((ch = getc(fp)) == EOF)
        return ecEndOfFile;
    if (!isalpha(ch))         // a control symbol; no delimiter.
    {
        szKeyword[0] = (char) ch;
        szKeyword[1] = '\0';
        return ecTranslateKeyword(szKeyword, 0, fParam);
    }
    for (pch = szKeyword; isalpha(ch); ch = getc(fp))
        *pch++ = (char) ch;
    *pch = '\0';
    if (ch == '-')
    {
        fNeg  = fTrue;
        if ((ch = getc(fp)) == EOF)
            return ecEndOfFile;
    }
    if (isdigit(ch))
    {
        fParam = fTrue;        // a digit after the control means we have a parameter
        for (pch = szParameter; isdigit(ch); ch = getc(fp))
            *pch++ = (char) ch;
        *pch = '\0';
        param = atoi(szParameter);
        if (fNeg)
            param = -param;
        lParam = atol(szParameter);
        if (fNeg)
            param = -param;
    }
    if (ch != ' ')
        ungetc(ch, fp);
    return ecTranslateKeyword(szKeyword, param, fParam);
}

//
// %%Function: ecParseChar
//
// Route the character to the appropriate destination stream.
```

```
//

int
ecParseChar(int ch)
{
    if (ris == risBin && --cbBin <= 0)
        ris = risNorm;
    switch (rds)
    {
    case rdsSkip:
        // Toss this character.
        return ecOK;
    case rdsNorm:
        // Output a character. Properties are valid at this point.
        return ecPrintChar(ch);
    default:
    // handle other destinations....
        return ecOK;
    }
}
//
// %%Function: ecPrintChar
//
// Send a character to the output file.
//

int
ecPrintChar(int ch)
{
    // unfortunately, we don't do a whole lot here as far as layout goes...
    putchar(ch);
    return ecOK;
}
```

```
RTFACTN.C
#include <stdio.h>
#include <string.h>
#include <stddef.h>
#include <ctype.h>
#include "rtftype.h"
#include "rtfdecl.h"

// RTF parser tables

// Property descriptions
PROP rgprop [ipropMax] = {
    actnByte,   propChp,    offsetof(CHP, fBold),      // ipropBold
    actnByte,   propChp,    offsetof(CHP, fItalic),    // ipropItalic
    actnByte,   propChp,    offsetof(CHP, fUnderline), // ipropUnderline
    actnWord,   propPap,    offsetof(PAP, xaLeft),     // ipropLeftInd
    actnWord,   propPap,    offsetof(PAP, xaRight),    // ipropRightInd
    actnWord,   propPap,    offsetof(PAP, xaFirst),    // ipropFirstInd
    actnWord,   propSep,    offsetof(SEP, cCols),      // ipropCols
    actnWord,   propSep,    offsetof(SEP, xaPgn),      // ipropPgnX
    actnWord,   propSep,    offsetof(SEP, yaPgn),      // ipropPgnY
    actnWord,   propDop,    offsetof(DOP, xaPage),     // ipropXaPage
    actnWord,   propDop,    offsetof(DOP, yaPage),     // ipropYaPage
    actnWord,   propDop,    offsetof(DOP, xaLeft),     // ipropXaLeft
    actnWord,   propDop,    offsetof(DOP, xaRight),    // ipropXaRight
    actnWord,   propDop,    offsetof(DOP, yaTop),      // ipropYaTop
    actnWord,   propDop,    offsetof(DOP, yaBottom),   // ipropYaBottom
    actnWord,   propDop,    offsetof(DOP, pgnStart),   // ipropPgnStart
    actnByte,   propSep,    offsetof(SEP, sbk),       // ipropSbk
    actnByte,   propSep,    offsetof(SEP, pgnFormat),  // ipropPgnFormat
    actnByte,   propDop,    offsetof(DOP, fFacingp),   // ipropFacingp
    actnByte,   propDop,    offsetof(DOP, fLandscape), // ipropLandscape
    actnByte,   propPap,    offsetof(PAP, just),       // ipropJust
    actnSpec,   propPap,    0,                      // ipropPard
    actnSpec,   propChp,    0,                      // ipropPlain
    actnSpec,   propSep,    0,                      // ipropSectd
};

// Keyword descriptions
SYM rgsymRtf[] = {
//  keyword    dflt    fPassDflt   kwd        idx
    "b",       1,     fFalse,    kwdProp,    ipropBold,
    "u",       1,     fFalse,    kwdProp,    ipropUnderline,
    "i",       1,     fFalse,    kwdProp,    ipropItalic,
```

```
"li",      0,     fFalse,    kwdProp,   ipropLeftInd,
"ri",      0,     fFalse,    kwdProp,   ipropRightInd,
"fi",      0,     fFalse,    kwdProp,   ipropFirstInd,
"cols",    1,     fFalse,    kwdProp,   ipropCols,
"sbknone", sbkNon, fTrue,     kwdProp,   ipropSbk,
"sbkcol",  sbkCol, fTrue,     kwdProp,   ipropSbk,
"sbkeven", sbkEvn, fTrue,     kwdProp,   ipropSbk,
"sbkodd",  sbkOdd, fTrue,     kwdProp,   ipropSbk,
"sbkpage", sbkPg,  fTrue,     kwdProp,   ipropSbk,
"pgnx",    0,     fFalse,    kwdProp,   ipropPgnX,
"pgny",    0,     fFalse,    kwdProp,   ipropPgnY,
"pgndec",  pgDec,  fTrue,     kwdProp,   ipropPgnFormat,
"pgnucrm", pgURom, fTrue,     kwdProp,   ipropPgnFormat,
"pgnlcrm", pgLRom, fTrue,     kwdProp,   ipropPgnFormat,
"pgnucltr", pgULtr, fTrue,     kwdProp,   ipropPgnFormat,
"pgnlcltr", pgLLtr, fTrue,     kwdProp,   ipropPgnFormat,
"qc",      justC,  fTrue,     kwdProp,   ipropJust,
"ql",      justL,  fTrue,     kwdProp,   ipropJust,
"qr",      justR,  fTrue,     kwdProp,   ipropJust,
"qj",      justF,  fTrue,     kwdProp,   ipropJust,
"paperw",  12240,  fFalse,    kwdProp,   ipropXaPage,
"paperh",  15480,  fFalse,    kwdProp,   ipropYaPage,
"margl",   1800,   fFalse,    kwdProp,   ipropXaLeft,
"margr",   1800,   fFalse,    kwdProp,   ipropXaRight,
"margt",   1440,   fFalse,    kwdProp,   ipropYaTop,
"margb",   1440,   fFalse,    kwdProp,   ipropYaBottom,
"pgnstart", 1,     fTrue,     kwdProp,   ipropPgnStart,
"facingp",  1,     fTrue,     kwdProp,   ipropFacingp,
"landscape",1,     fTrue,     kwdProp,   ipropLandscape,
"par",     0,     fFalse,    kwdChar,   0x0a,
"\0x0a",   0,     fFalse,    kwdChar,   0x0a,
"\0x0d",   0,     fFalse,    kwdChar,   0x0a,
"tab",     0,     fFalse,    kwdChar,   0x09,
"ldblquote",0,     fFalse,    kwdChar,   '"',
"rdblquote",0,     fFalse,    kwdChar,   '"',
"bin",     0,     fFalse,    kwdSpec,   ipfnBin,
"*",       0,     fFalse,    kwdSpec,   ipfnSkipDest,
"'",       0,     fFalse,    kwdSpec,   ipfnHex,
"author",  0,     fFalse,    kwdDest,   idestSkip,
"buptim",  0,     fFalse,    kwdDest,   idestSkip,
"colortbl", 0,     fFalse,    kwdDest,   idestSkip,
"comment", 0,     fFalse,    kwdDest,   idestSkip,
"creatim", 0,     fFalse,    kwdDest,   idestSkip,
"doccomm", 0,     fFalse,    kwdDest,   idestSkip,
```

```
    "fonttbl",  0,     fFalse,    kwdDest,   idestSkip,
    "footer",   0,     fFalse,    kwdDest,   idestSkip,
    "footerf",  0,     fFalse,    kwdDest,   idestSkip,
    "footerl",  0,     fFalse,    kwdDest,   idestSkip,
    "footerr",  0,     fFalse,    kwdDest,   idestSkip,
    "footnote", 0,     fFalse,    kwdDest,   idestSkip,
    "ftncn",    0,     fFalse,    kwdDest,   idestSkip,
    "ftnsep",   0,     fFalse,    kwdDest,   idestSkip,
    "ftnsepc",  0,     fFalse,    kwdDest,   idestSkip,
    "header",   0,     fFalse,    kwdDest,   idestSkip,
    "headerf",  0,     fFalse,    kwdDest,   idestSkip,
    "headerl",  0,     fFalse,    kwdDest,   idestSkip,
    "headerr",  0,     fFalse,    kwdDest,   idestSkip,
    "info",     0,     fFalse,    kwdDest,   idestSkip,
    "keywords", 0,     fFalse,    kwdDest,   idestSkip,
    "operator", 0,     fFalse,    kwdDest,   idestSkip,
    "pict",     0,     fFalse,    kwdDest,   idestSkip,
    "printim",  0,     fFalse,    kwdDest,   idestSkip,
    "private1", 0,     fFalse,    kwdDest,   idestSkip,
    "revtim",   0,     fFalse,    kwdDest,   idestSkip,
    "rxe",      0,     fFalse,    kwdDest,   idestSkip,
    "stylesheet",   0,     fFalse,    kwdDest,   idestSkip,
    "subject",  0,     fFalse,    kwdDest,   idestSkip,
    "tc",       0,     fFalse,    kwdDest,   idestSkip,
    "title",    0,     fFalse,    kwdDest,   idestSkip,
    "txe",      0,     fFalse,    kwdDest,   idestSkip,
    "xe",       0,     fFalse,    kwdDest,   idestSkip,
    "{",        0,     fFalse,    kwdChar,   '{',
    "}",        0,     fFalse,    kwdChar,   '}',
    "\\",       0,     fFalse,    kwdChar,   '\\'
    };
int isymMax = sizeof(rgsymRtf) / sizeof(SYM);

//
// %%Function: ecApplyPropChange
//
// Set the property identified by _iprop_ to the value _val_.
//
//

int
ecApplyPropChange(IPROP iprop, int val)
{
    char *pb;
```

```
    if (rds == rdsSkip)              // If we're skipping text,
        return ecOK;                 // don't do anything.

    switch (rgprop[iprop].prop)
    {
    case propDop:
        pb = (char *)&dop;
        break;
    case propSep:
        pb = (char *)&sep;
        break;
    case propPap:
        pb = (char *)&pap;
        break;
    case propChp:
        pb = (char *)&chp;
        break;
    default:
        if (rgprop[iprop].actn != actnSpec)
            return ecBadTable;
        break;
    }
    switch (rgprop[iprop].actn)
    {
    case actnByte:
        pb[rgprop[iprop].offset] = (unsigned char) val;
        break;
    case actnWord:
        (*(int *) (pb+rgprop[iprop].offset)) = val;
        break;
    case actnSpec:
        return ecParseSpecialProperty(iprop, val);
        break;
    default:
        return ecBadTable;
    }
    return ecOK;
}

//
// %%Function: ecParseSpecialProperty
//
// Set a property that requires code to evaluate.
```

```
//

int
ecParseSpecialProperty(IPROP iprop, int val)
{
    switch (iprop)
    {
    case ipropPard:
        memset(&pap, 0, sizeof(pap));
        return ecOK;
    case ipropPlain:
        memset(&chp, 0, sizeof(chp));
        return ecOK;
    case ipropSectd:
        memset(&sep, 0, sizeof(sep));
        return ecOK;
    default:
        return ecBadTable;
    }
    return ecBadTable;
}

//
// %%Function: ecTranslateKeyword.
//
// Step 3.
// Search rgsymRtf for szKeyword and evaluate it appropriately.
//
// Inputs:
// szKeyword:   The RTF control to evaluate.
// param:      The parameter of the RTF control.
// fParam:     fTrue if the control had a parameter; (that is, if param is valid)
//            fFalse if it did not.
//

int
ecTranslateKeyword(char *szKeyword, int param, bool fParam)
{
    int isym;

    // search for szKeyword in rgsymRtf

    for (isym = 0; isym < isymMax; isym++)
        if (strcmp(szKeyword, rgsymRtf[isym].szKeyword) == 0)
```

```
            break;
        if (isym == isymMax)           // control word not found
        {
            if (fSkipDestIfUnk)        // if this is a new destination
                rds = rdsSkip;         // skip the destination
                                       // else just discard it
            fSkipDestIfUnk = fFalse;
            return ecOK;
        }

        // found it!  use kwd and idx to determine what to do with it.

        fSkipDestIfUnk = fFalse;
        switch (rgsymRtf[isym].kwd)
        {
        case kwdProp:
            if (rgsymRtf[isym].fPassDflt || !fParam)
                param = rgsymRtf[isym].dflt;
            return ecApplyPropChange(rgsymRtf[isym].idx, param);
        case kwdChar:
            return ecParseChar(rgsymRtf[isym].idx);
        case kwdDest:
            return ecChangeDest(rgsymRtf[isym].idx);
        case kwdSpec:
            return ecParseSpecialKeyword(rgsymRtf[isym].idx);
        default:
            return ecBadTable;
        }
        return ecBadTable;
    }

    //
    // %%Function: ecChangeDest
    //
    // Change to the destination specified by idest.
    // There's usually more to do here than this...
    //

    int
    ecChangeDest(IDEST idest)
    {
        if (rds == rdsSkip)            // if we're skipping text,
            return ecOK;               // don't do anything
```

```
    switch (idest)
    {
    default:
        rds = rdsSkip;            // when in doubt, skip it...
        break;
    }
    return ecOK;
}

//
// %%Function: ecEndGroupAction
//
// The destination specified by rds is coming to a close.
// If there's any cleanup that needs to be done, do it now.
//

int
ecEndGroupAction(RDS rds)
{
    return ecOK;
}

//
// %%Function: ecParseSpecialKeyword
//
// Evaluate an RTF control that needs special processing.
//

int
ecParseSpecialKeyword(IPFN ipfn)
{
    if (rds == rdsSkip && ipfn != ipfnBin)  // if we're skipping, and it's not
        return ecOK;                    // the \bin keyword, ignore it.
    switch (ipfn)
    {
    case ipfnBin:
        ris = risBin;
        cbBin = lParam;
        break;
    case ipfnSkipDest:
        fSkipDestIfUnk = fTrue;
        break;
    case ipfnHex:
 ris = risHex;
```

```
 break;
    default:
        return ecBadTable;
    }
    return ecOK;
}
```

Makefile

```
rtfreadr.exe: rtfactn.obj rtfreadr.obj
    link rtfreadr.obj rtfactn.obj <nul

rtfactn.obj: rtfactn.c rtfdecl.h rtftype.h

rtfreadr.obj: rtfreadr.c rtfdecl.h rtftype.h
```

APPENDIX B: INDEX OF RTF CONTROL WORDS

The control word table contains a list of each RTF control word, the name of the section where it may be found, and its type. The types are described in the following table.

Type	Meaning
Flag	This control word ignores any parameter.
Destination	This control word starts a group or destination. It ignores any parameter.
Symbol	This control word represents a special character.
Toggle	This control word distinguishes between the ON and OFF states for the given property. The control word with no parameter or a nonzero parameter is used to turn on the property, while the control word with a zero parameter is used to turn it off.
Value	This control word requires a parameter.

Note *In the following comprehensive table, the names of all control words added in version 7.0 or later are flagged with the version number in which they were added (7.0, 97, 2000, and 2002).*

Special Characters and A–B

Control word	Described in section	Type
\'	Special Characters	Symbol
\-	Special Characters	Symbol
*****	Special Characters	Symbol
\:	Special Characters	Symbol
****	Special Characters	Symbol
_	Special Characters	Symbol
\{	Special Characters	Symbol
|	Special Characters	Symbol
\}	Special Characters	Symbol
\~	Special Characters	Symbol
\ab	Associated Character Properties	Toggle
\absh	Positioned Objects and Frames	Value
\abslock [7.0]	Positioned Objects and Frames	Flag
\absnoovrlp*N* [2000]	Positioned Objects and Frames	Toggle
\absw	Positioned Objects and Frames	Value

\acaps	Associated Character Properties	Toggle
\acccomma 7.0	Font (Character) Formatting Properties	Toggle
\accdot 7.0	Font (Character) Formatting Properties	Toggle
\accnone 7.0	Font (Character) Formatting Properties	Toggle
\acf	Associated Character Properties	Value
\additive	Style Sheet	Flag
\adjustright 97	Section Formatting Properties	Flag
\adn	Associated Character Properties	Value
\aenddoc	Document Formatting Properties	Flag
\aendnotes	Document formatting Properties	Flag
\aexpnd	Associated Character Properties	Value
\af	Associated Character Properties	Value
\affixed 7.0	Paragraph Formatting Properties	Flag
\afs	Associated Character Properties	Value
\aftnbj	Document Formatting Properties	Flag
\aftncn	Document Formatting Properties	Destination
\aftnnalc	Document Formatting Properties	Flag
\aftnnar	Document Formatting Properties	Flag
\aftnnauc	Document Formatting Properties	Flag
\aftnnchi	Document Formatting Properties	Flag
\aftnnchosung 97	Document Formatting Properties	Flag
\aftnncnum 97	Document Formatting Properties	Flag
\aftnndbar 97	Document Formatting	Flag

	Properties	
\aftnndbnum 97	Document Formatting Properties	Flag
\aftnndbnumd 97	Document Formatting Properties	Flag
\aftnndbnumk 97	Document Formatting Properties	Flag
\aftnndbnumt 97	Document Formatting Properties	Flag
\aftnnganada 97	Document Formatting Properties	Flag
\aftnngbnum 97	Document Formatting Properties	Flag
\aftnngbnumd 97	Document Formatting Properties	Flag
\aftnngbnumk 97	Document Formatting Properties	Flag
\aftnngbnuml 97	Document Formatting Properties	Flag
\aftnnrlc	Document Formatting Properties	Flag
\aftnnruc	Document Formatting Properties	Flag
\aftnnzodiac 97	Document Formatting Properties	Flag
\aftnnzodiacd 97	Document Formatting Properties	Flag
\aftnnzodiacl 97	Document Formatting Properties	Flag
\aftnrestart	Document Formatting Properties	Flag
\aftnrstcont	Document Formatting Properties	Flag
\aftnsep	Document Formatting Properties	Destination
\aftnsepc	Document Formatting Properties	Destination
\aftnstart	Document Formatting Properties	Value
\aftntj	Document Formatting Properties	Flag
\ai	Associated Character Properties	Toggle
\alang	Associated Character	Value

	Properties	
\allowfieldendsel 2002	Document Formatting Properties	Flag
\allprot	Document Formatting Properties	Flag
\alntblind 2000	Document Formatting Properties	Flag
\alt	Style Sheet	Flag
\animtext*N* 97	Font (Character) Formatting Properties	Value
\annotation	Comments (Annotations)	Destination
\annotprot	Document Formatting Properties	Flag
\ansi	Character Set	Flag
\ansicpgN 97	Unicode RTF	Value
\aoutl	Associated Character Properties	Toggle
\ApplyBrkRules 2002	Document Formatting Properties	Flag
\ascaps	Associated Character Properties	Toggle
\ashad	Associated Character Properties	Toggle
\asianbrkrule 2002	Document Formatting Properties	Flag
\aspalpha 7.0	Paragraph Formatting Properties	Toggle
\aspnum 7.0	Paragraph Formatting Properties	Toggle
\astrike	Associated Character Properties	Toggle
\atnauthor 2002	Comments (Annotations)	Destination
\atndate	Comments (Annotations)	Destination
\atnicn	Comments (Annotations)	Destination
\atnid	Comments (Annotations)	Destination
\atnparent 2002	Comments (Annotations)	Destination
\atnref	Comments (Annotations)	Destination
\atntime	Comments (Annotations)	Destination
\atrfend	Comments (Annotations)	Destination
\atrfstart	Comments (Annotations)	Destination
\aul	Associated Character	Toggle

	Properties	
\auld	Associated Character Properties	Toggle
\auldb	Associated Character Properties	Toggle
\aulnone	Associated Character Properties	Toggle
\aulw	Associated Character Properties	Toggle
\aup	Associated Character Properties	Value
\author	Information Group	Destination
\b	Font (Character) Formatting Properties	Toggle
\background 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Destination
\bdbfhdr 97	Document Formatting Properties	Flag
\bdrrlswsix 2000	Document Formatting Properties	Flag
\bgbdiag	Paragraph Shading	Flag
\bgcross	Paragraph Shading	Flag
\bgdcross	Paragraph Shading	Flag
\bgdkbdiag	Paragraph Shading	Flag
\bgdkcross	Paragraph Shading	Flag
\bgdkdcross	Paragraph Shading	Flag
\bgdkfdiag	Paragraph Shading	Flag
\bgdkhoriz	Paragraph Shading	Flag
\bgdkvert	Paragraph Shading	Flag
\bgfdiag	Paragraph Shading	Flag
\bghoriz	Paragraph Shading	Flag
\bgvert	Paragraph Shading	Flag
\bin	Pictures	Value
\binfsxn	Section Formatting Properties	Value
\binsxn	Section Formatting Properties	Value
\bkmkcolf	Bookmarks	Value
\bkmkcoll	Bookmarks	Value

\bkmkend	Bookmarks	Destination
\bkmkpub	Macintosh Edition Manager Publisher Objects	Flag
\bkmkstart	Bookmarks	Destination
\bliptagN 97	Pictures	Value
\blipuid 97	Pictures	Value
\blipupiN 97	Pictures	Value
\blue	Color Table	Value
\bookfold 2002	Document Formatting Properties	Flag
\bookfoldrev 2002	Document Formatting Properties	Flag
\bookfoldsheetsN 2002	Document Formatting Properties	Value
\box	Paragraph Borders	Flag
\brdrartN 97	Document Formatting Properties	Value
\brdrb	Paragraph Borders	Flag
\brdrbar	Paragraph Borders	Flag
\brdrbtw	Paragraph Borders	Flag
\brdrcf	Paragraph Borders	Value
\brdrdash	Paragraph Borders	Flag
\brdrdashd 97	Paragraph Text	Flag
\brdrdashdd 97	Paragraph Text	Flag
\brdrdashdotstr 97	Paragraph Text	Flag
\brdrdashsm 97	Paragraph Text	Flag
\brdrdb	Paragraph Borders	Flag
\brdrdot	Paragraph Borders	Flag
\brdremboss 97	Paragraph Text	Flag
\brdrengrave 97	Paragraph Text	Flag
\brdrframe 97	Paragraph Borders	Flag
\brdrhair	Paragraph Borders	Flag
\brdrinset 2000	Paragraph Text	Flag
\brdrl	Paragraph Borders	Flag
\brdrnil 2002	Paragraph Borders	Flag
\brdroutset 2000	Paragraph Text	Flag
\brdrr	Paragraph Borders	Flag

\brdrs	Paragraph Borders	Flag
\brdrsh	Paragraph Borders	Flag
\brdrt	Paragraph Borders	Flag
\brdrtbl 2002	Paragraph Borders	Flag
\brdrth	Paragraph Borders	Flag
\brdrthtnlg 97	Paragraph Text	Flag
\brdrthtnmg 97	Paragraph Text	Flag
\brdrthtnsg 97	Paragraph Text	Flag
\brdrtnthlg 97	Paragraph Text	Flag
\brdrtnthmg 97	Paragraph Text	Flag
\brdrtnthsg 97	Paragraph Text	Flag
\brdrtnthtnlg 97	Paragraph Text	Flag
\brdrtnthtnmg 97	Paragraph Text	Flag
\brdrtnthtnsg 97	Paragraph Text	Flag
\brdrtriple 97	Paragraph Text	Flag
\brdrw	Paragraph Borders	Value
\brdrwavy 97	Paragraph Text	Flag
\brdrwavydb 97	Paragraph Text	Flag
\brkfrm	Document Formatting Properties	Flag
\brsp	Paragraph Borders	Value
\bullet	Special Characters	Symbol
\buptim	Information Group	Destination
\bxe	Index Entries	Flag

C-E

\caps	Font (Character) Formatting Properties	Toggle
\category 7.0	Information Group	Destination
\cb	Font (Character) Formatting Properties	Value
\cbpat	Paragraph Shading	Value
\cchs	Font (Character) Formatting Properties	Value
\cell	Special Characters	Symbol
\cellx	Table Definitions	Value
\cf	Font (Character)	Value

	Formatting Properties	
\cfpat	Paragraph Shading	Value
\cgridN 97	Font (Character) Formatting Properties	Value
\charrsidN 2002	Track Changes (Revision Marks)	Value
\charscalex 7.0	Font (Character) Formatting Properties	Value
\charscalexN 97	Character Text	Value
\chatn	Special Characters	Symbol
\chbgbdiag 97	Character Text	Flag
\chbgcross 97	Character Text	Flag
\chbgdcross 97	Character Text	Flag
\chbgdkbdiag 97	Character Text	Flag
\chbgdkcross 97	Character Text	Flag
\chbgdkdcross 97	Character Text	Flag
\chbgdkfdiag 97	Character Text	Flag
\chbgdkhoriz 97	Character Text	Flag
\chbgdkvert 97	Character Text	Flag
\chbgfdiag 97	Character Text	Flag
\chbghoriz 97	Character Text	Flag
\chbgvert 97	Character Text	Flag
\chbrdr 97	Character Text	Flag
\chcbpatN 97	Character Text	Value
\chcfpatN 97	Character Text	Value
\chdate	Special Characters	Symbol
\chdpa	Special Characters	Symbol
\chdpl	Special Characters	Symbol
\chftn	Special Characters	Symbol
\chftnsep	Special Characters	Symbol
\chftnsepc	Special Characters	Symbol
\chpgn	Special Characters	Symbol
\chshdngN 97	Character Text	Value
\chtime	Special Characters	Symbol
\clbgbdiag	Table Definitions	Flag
\clbgcross	Table Definitions	Flag
\clbgdcross	Table Definitions	Flag

\clbgdkbdiag	Table Definitions	Flag
\clbgdkcross	Table Definitions	Flag
\clbgdkdcross	Table Definitions	Flag
\clbgdkfdiag	Table Definitions	Flag
\clbgdkhor	Table Definitions	Flag
\clbgdkvert	Table Definitions	Flag
\clbgfdiag	Table Definitions	Flag
\clbghoriz	Table Definitions	Flag
\clbgvert	Table Definitions	Flag
\clbrdrb	Table Definitions	Flag
\clbrdrl	Table Definitions	Flag
\clbrdrr	Table Definitions	Flag
\clbrdrt	Table Definitions	Flag
\clcbpat	Table Definitions	Value
\clcbpatrawN 2002	Table Definitions	Value
\clcfpat	Table Definitions	Value
\clcfpatrawN 2002	Table Definitions	Value
\cldgll 7.0	Table Definitions	Flag
\cldglu 7.0	Table Definitions	Flag
\clFitText 2000	Table Definitions	Flag
\clftsWidth*N* 2000	Table Definitions	Value
\clmgf	Table Definitions	Flag
\clmrg	Table Definitions	Flag
\clNoWrap 2000	Table Definitions	Flag
\clpadb*N* 2000	Table Definitions	Value
\clpadfb*N* 2000	Table Definitions	Value
\clpadfl*N* 2000	Table Definitions	Value
\clpadfr*N* 2000	Table Definitions	Value
\clpadft*N* 2000	Table Definitions	Value
\clpadl*N* 2000	Table Definitions	Value
\clpadr*N* 2000	Table Definitions	Value
\clpadt*N* 2000	Table Definitions	Value
\clshdng	Table Definitions	Value
\clshdngraw 2002	Table Definitions	Value
\clshdrawnil 2002	Table Definitions	Flag
\cltxbtlr 7.0	Table Definitions	Flag

\cltxlrtb 7.0	Table Definitions	Flag
\cltxlrtb 97	Table Definitions	Flag
\cltxlrtbv 7.0	Table Definitions	Flag
\cltxtbrl 97	Table Definitions	Flag
\cltxtbrl 7.0	Table Definitions	Flag
\cltxtbrlv 7.0	Table Definitions	Flag
\clvertalb 7.0	Table Definitions	Flag
\clvertalc 7.0	Table Definitions	Flag
\clvertalt 7.0	Table Definitions	Flag
\clvmgf 7.0	Table Definitions	Flag
\clvmrg 7.0	Table Definitions	Flag
\clwWidth*N* 2000	Table Definitions	Value
\collapsed	Paragraph Formatting Properties	Flag
\colno	Section Formatting Properties	Value
\colortbl	Color Table	Destination
\cols	Section Formatting Properties	Value
\colsr	Section Formatting Properties	Value
\colsx	Section Formatting Properties	Value
\column	Special Characters	Symbol
\colw	Section Formatting Properties	Value
\comment	Information Group	Destination
\company 7.0	Information Group	Destination
\cpg	Code Page Support	Value
\crauthN 97	Character Text	Value
\crdateN 97	Character Text	Value
\creatim	Information Group	Destination
\cs	Font (Character) Formatting Properties	Value
\ctrl	Style Sheet	Flag
\cts*N* 2000	Document Formatting Properties	Value
\cufi*N* 2000	Paragraph Formatting Properties	Value

\culi*N* 2000	Paragraph Formatting Properties	Value
\curi*N* 2000	Paragraph Formatting Properties	Value
\cvmme	Document Formatting Properties	Flag
\datafield	Fields	Destination
\date 97	Fields	Flag
\dbch 7.0	Associated Character Properties	Flag
\deff	Font Table	Value
\defformat	Document Formatting Properties	Flag
\deflang	Document Formatting Properties	Value
\deflangfe 97	Document Formatting Properties	Value
\defshp 2000	Pictures	Flag
\deftab	Document Formatting Properties	Value
\deleted	Font (Character) Formatting Properties	Toggle
\delrsidN 2002	Track Changes (Revision Marks)	Value
\dfrauthN 97	Paragraph Text	Value
\dfrdateN 97	Paragraph Text	Value
\dfrmtxtx	Positioned Objects and Frames	Value
\dfrmtxty	Positioned Objects and Frames	Value
\dfrstart 97	Paragraph Text	Value
\dfrstop 97	Paragraph Text	Value
\dfrxst 97	Paragraph Text	Value
\dghorigin*N* 7.0	Document Formatting Properties	Value
\dghshow*N* 7.0	Document Formatting Properties	Value
\dghspace*N* 7.0	Document Formatting Properties	Value
\dgmargin 97	Document Formatting Properties	Flag
\dgsnap 7.0	Document Formatting	Flag

	Properties	
\dgvorigin*N* 7.0	Document Formatting Properties	Value
\dgvshow*N* 7.0	Document Formatting Properties	Value
\dgvspace*N* 7.0	Document Formatting Properties	Value
\dibitmap	Pictures	Value
\dn	Font (Character) Formatting Properties	Value
\dntblnsbdb 97	Document Formatting Properties	Flag
\do	Drawing Objects	Destination
\dobxcolumn	Drawing Objects	Flag
\dobxmargin	Drawing Objects	Flag
\dobxpage	Drawing Objects	Flag
\dobymargin	Drawing Objects	Flag
\dobypage	Drawing Objects	Flag
\dobypara	Drawing Objects	Flag
\doccomm	Information Group	Destination
\doctemp	Document Formatting Properties	Flag
\doctypeN 97	Document Formatting Properties	Value
\docvar 7.0	Document Variables	Destination
\dodhgt	Drawing Objects	Value
\dolock	Drawing Objects	Flag
\donotshowcomments 2002	Document Formatting Properties	Flag
\donotshowinsdel 2002	Document Formatting Properties	Flag
\donotshowmarkup 2002	Document Formatting Properties	Flag
\donotshowprops 2002	Document Formatting Properties	Flag
\dpaendhol	Drawing Objects	Flag
\dpaendl	Drawing Objects	Value
\dpaendsol	Drawing Objects	Flag
\dpaendw	Drawing Objects	Value
\dparc	Drawing Objects	Flag

\dparcflipx	Drawing Objects	Flag
\dparcflipy	Drawing Objects	Flag
\dpastarthol	Drawing Objects	Flag
\dpastartl	Drawing Objects	Value
\dpastartsol	Drawing Objects	Flag
\dpastartw	Drawing Objects	Value
\dpcallout	Drawing Objects	Flag
\dpcoa	Drawing Objects	Value
\dpcoaccent	Drawing Objects	Flag
\dpcobestfit	Drawing Objects	Flag
\dpcoborder	Drawing Objects	Flag
\dpcodabs	Drawing Objects	Value
\dpcodbottom	Drawing Objects	Flag
\dpcodcenter	Drawing Objects	Flag
\dpcodescent	Drawing Objects	Value
\dpcodtop	Drawing Objects	Flag
\dpcolength	Drawing Objects	Value
\dpcominusx	Drawing Objects	Flag
\dpcominusy	Drawing Objects	Flag
\dpcooffset	Drawing Objects	Value
\dpcosmarta	Drawing Objects	Flag
\dpcotdouble	Drawing Objects	Flag
\dpcotright	Drawing Objects	Flag
\dpcotsingle	Drawing Objects	Flag
\dpcottriple	Drawing Objects	Flag
\dpcount	Drawing Objects	Value
\dpellipse	Drawing Objects	Flag
\dpendgroup	Drawing Objects	Flag
\dpfillbgcb	Drawing Objects	Value
\dpfillbgcg	Drawing Objects	Value
\dpfillbgcr	Drawing Objects	Value
\dpfillbggray	Drawing Objects	Value
\dpfillbgpal	Drawing Objects	Flag
\dpfillfgcb	Drawing Objects	Value
\dpfillfgcg	Drawing Objects	Value
\dpfillfgcr	Drawing Objects	Value

\dpfillfggray	Drawing Objects	Value
\dpfillfgpal	Drawing Objects	Flag
\dpfillpat	Drawing Objects	Value
\dpgroup	Drawing Objects	Flag
\dpline	Drawing Objects	Flag
\dplinecob	Drawing Objects	Value
\dplinecog	Drawing Objects	Value
\dplinecor	Drawing Objects	Value
\dplinedado	Drawing Objects	Flag
\dplinedadodo	Drawing Objects	Flag
\dplinedash	Drawing Objects	Flag
\dplinedot	Drawing Objects	Flag
\dplinegray	Drawing Objects	Value
\dplinehollow	Drawing Objects	Flag
\dplinepal	Drawing Objects	Flag
\dplinesolid	Drawing Objects	Flag
\dplinew	Drawing Objects	Value
\dppolycount	Drawing Objects	Value
\dppolygon	Drawing Objects	Flag
\dppolyline	Drawing Objects	Flag
\dpptx	Drawing Objects	Value
\dppty	Drawing Objects	Value
\dprect	Drawing Objects	Flag
\dproundr	Drawing Objects	Flag
\dpshadow	Drawing Objects	Flag
\dpshadx	Drawing Objects	Value
\dpshady	Drawing Objects	Value
\dptxbtlr [7.0]	Drawing Objects	Flag
\dptxbx	Drawing Objects	Flag
\dptxbxmar	Drawing Objects	Value
\dptxbxtext	Drawing Objects	Destination
\dptxlrtb [7.0]	Drawing Objects	Flag
\dptxlrtbv [7.0]	Drawing Objects	Flag
\dptxtbrl [7.0]	Drawing Objects	Flag
\dptxtbrlv [7.0]	Drawing Objects	Flag
\dpx	Drawing Objects	Value

\dpxsize	Drawing Objects	Value
\dpy	Drawing Objects	Value
\dpysize	Drawing Objects	Value
\dropcapli	Positioned Objects and Frames	Value
\dropcapt	Positioned Objects and Frames	Value
\ds	Section Formatting Properties	Value
\dxfrtext	Positioned Objects and Frames	Value
\dy	Information Group	Value
\edmins	Information Group	Value
\embo 97	Character Text	Toggle
\emdash	Special Characters	Symbol
\emfblip 97	Pictures	Flag
\emspace	Special Characters	Symbol
\endash	Special Characters	Symbol
\enddoc	Document Formatting Properties	Flag
\endnhere	Section Formatting Properties	Flag
\endnotes	Document Formatting Properties	Flag
\enspace	Special Characters	Symbol
\expnd	Font (Character) Formatting Properties	Value
\expndtw	Font (Character) Formatting Properties	Value
\expshrtn 97	Document Formatting Properties	Flag

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\f	Font (Character) Formatting Properties	Value
\faauto 97	Paragraph Formatting Properties	Value
\facenter7.0	Paragraph Formatting Properties	Flag
\facingp	Document Formatting Properties	Flag

\fahang 7.0	Paragraph Formatting Properties	Flag
\falt	Font Table	Destination
\faroman 7.0	Paragraph Formatting Properties	Flag
\favar 7.0	Paragraph Formatting Properties	Flag
\fbiasN 97	Font Table	Value
\fbidi	Font Table	Flag
\fchars 7.0	Document Formatting Properties	Destination
\fcharset	Font Table	Value
\fdecor	Font Table	Flag
\fet	Document Formatting Properties	Value
\fetch	Font Table	Flag
\ffdefres 97	Form Fields	Value
\ffdeftext 97	Form Fields	Destination
\ffentrymcr 97	Form Fields	Destination
\ffexitmcr 97	Form Fields	Destination
\ffformat 97	Form Fields	Destination
\ffhaslistboxN 97	Form Fields	Value
\ffhelptext 97	Form Fields	Destination
\ffhpsN 97	Form Fields	Value
\ffl 97	Form Fields	Destination
\ffmaxlen 97	Form Fields	Value
\ffname 97	Form Fields	Destination
\ffownhelpN 97	Form Fields	Value
\ffownstatN 97	Form Fields	Value
\ffprotN 97	Form Fields	Value
\ffrecalcN 97	Form Fields	Value
\ffresN 97	Form Fields	Value
\ffsizeN 97	Form Fields	Value
\ffstattext 97	Form Fields	Destination
\fftypeN 97	Form Fields	Value
\fftypetxtN 97	Form Fields	Value
\fi	Paragraph Formatting Properties	Value

\fid	File Table	Value
\field	Fields	Destination
\file	File Table	Destination
\filetbl	File Table	Destination
\fittext*N* 2000	Font (Character) Formatting Properties	Value
\fldalt	Document Formatting Properties	Flag
\flddirty	Fields	Flag
\fldedit	Fields	Flag
\fldinst	Fields	Destination
\fldlock	Fields	Flag
\fldpriv	Fields	Flag
\fldrslt	Fields	Destination
\fldtype 97	Fields	Destination
\fmodern	Font Table	Flag
\fn	Style Sheet	Value
\fname 7.0	Font Table	Destination
\fnetwork	File Table	Flag
\fnil	Font Table	Flag
\fnonfilesys 2002	File Table	Flag
\fontemb	Font Table	Destination
\fontfile	Font Table	Destination
\fonttbl	Font Table	Destination
\footer	Headers and Footers	Destination
\footer	Headers and Footers	Destination
\footerf	Headers and Footers	Destination
\footerl	Headers and Footers	Destination
\footery	Section Formatting Properties	Value
\footnote	Footnotes	Destination
\formdisp	Document Formatting Properties	Flag
\formfield 97	Form Fields	Destination
\formprot	Document Formatting Properties	Flag
\formshade	Document Formatting Properties	Flag

\fosnum	File Table	Value
\fprq	Font Table	Value
\fracwidth	Document Formatting Properties	Flag
\frelative	File Table	Value
\frmtxbtlr 7.0	Positioned Objects and Frames	Flag
\frmtxlrtb 7.0	Positioned Objects and Frames	Flag
\frmtxlrtbv 7.0	Positioned Objects and Frames	Flag
\frmtxtbrl 7.0	Positioned Objects and Frames	Flag
\frmtxtbrlv 7.0	Positioned Objects and Frames	Flag
\froman	Font Table	Flag
\fromhtml 97	Document Formatting Properties	Flag
\fromtext 97	Document Formatting Properties	Flag
\fs	Font (Character) Formatting Properties	Value
\fscript	Font Table	Flag
\fswiss	Font Table	Flag
\ftnalt	Document Formatting Properties	Flag
\ftnbj	Document Formatting Properties	Flag
\ftncn	Document Formatting Properties	Destination
\ftnil	Font Table	Flag
\ftnlytwnine 2000	Document Formatting Properties	Flag
\ftnnalc	Document Formatting Properties	Flag
\ftnnar	Document Formatting Properties	Flag
\ftnnauc	Document Formatting Properties	Flag
\ftnnchi	Document Formatting Properties	Flag
\ftnnchosung 97	Document Formatting	Flag

	Properties	
\ftnncnum 97	Document Formatting Properties	Flag
\ftnndbar 97	Document Formatting Properties	Flag
\ftnndbnum 97	Document Formatting Properties	Flag
\ftnndbnumd 97	Document Formatting Properties	Flag
\ftnndbnumk 97	Document Formatting Properties	Flag
\ftnndbnumt 97	Document Formatting Properties	Flag
\ftnnganada 97	Document Formatting Properties	Flag
\ftnngbnum 97	Document Formatting Properties	Flag
\ftnngbnumd 97	Document Formatting Properties	Flag
\ftnngbnumk 97	Document Formatting Properties	Flag
\ftnngbnuml 97	Document Formatting Properties	Flag
\ftnnrlc	Document Formatting Properties	Flag
\ftnnruc	Document Formatting Properties	Flag
\ftnnzodiac 97	Document Formatting Properties	Flag
\ftnnzodiacd 97	Document Formatting Properties	Flag
\ftnnzodiacl 97	Document Formatting Properties	Flag
\ftnrestart	Document Formatting Properties	Flag
\ftnrstcont	Document Formatting Properties	Flag
\ftnrstpg	Document Formatting Properties	Flag
\ftnsep	Document Formatting Properties	Destination
\ftnsepc	Document Formatting Properties	Destination
\ftnstart	Document Formatting	Value

	Properties	
\ftntj	Document Formatting Properties	Flag
\fttruetype	Font Table	Flag
\fvaliddos	File Table	Flag
\fvalidhpfs	File Table	Flag
\fvalidmac	File Table	Flag
\fvalidntfs	File Table	Flag
\g 97	Font (Character) Formatting Properties	Destination
\gcw 97	Font (Character) Formatting Properties	Value
\generator 2002	Generator	Destination
\green	Color Table	Value
\gridtbl 97	Font (Character) Formatting Properties	Destination
\gutter	Document Formatting Properties	Value
\gutterprl 7.0	Document Formatting Properties	Flag
\guttersxn	Section Formatting Properties	Value
\header	Headers and Footers	Destination
\header	Headers and Footers	Destination
\headerf	Headers and Footers	Destination
\headerl	Headers and Footers	Destination
\headery	Section Formatting Properties	Value
\hich 7.0	Associated Character Properties	Flag
\highlight 7.0	Highlighting	Value
\hlfr 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\hlinkbase 97	Information Group	Value
\hlloc 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\hlsrc 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value

\horzdoc 7.0	Document Formatting Properties	Flag
\horzsect 7.0	Section Formatting Properties	Flag
\hr	Information Group	Value
\htmautsp 2000	Document Formatting Properties	Flag
\htmlbase	Control Words Introduced by Other Microsoft Products	Flag
\htmlrtf	Control Words Introduced by Other Microsoft Products	Toggle
\htmltag	Control Words Introduced by Other Microsoft Products	Destination
\hyphauto	Document Formatting Properties	Toggle
\hyphcaps	Document Formatting Properties	Toggle
\hyphconsec	Document Formatting Properties	Value
\hyphhotz	Document Formatting Properties	Value
\hyphpar	Paragraph Formatting Properties	Toggle
\i	Font (Character) Formatting Properties	Toggle
\id	Information Group	Value
\ilvl 97	Paragraph Text	Value
\impr 97	Character Text	Toggle
\info	Information Group	Destination
\insrsidN 2002	Track Changes (Revision Marks)	Value
\intbl	Paragraph Formatting Properties	Flag
\ipgpN 2002	Paragraph Group Propreties	Value
\irowN 2002	Table Definitions	Value
\irowbandN 2002	Table Definitions	Value
\itap*N* 2000	Paragraph Formatting Properties	Value
\ixe	Index Entries	Flag

\jcompress 7.0	Document Formatting Properties	Flag
\jexpand 7.0	Document Formatting Properties	Flag
\jpegblip 97	Pictures	Flag
\jsksu 2000	Document Formatting Properties	Flag
\keep	Paragraph Formatting Properties	Flag
\keepn	Paragraph Formatting Properties	Flag
\kerning	Font (Character) Formatting Properties	Value
\keycode	Style Sheet	Destination
\keywords	Information Group	Destination
\ksulang*N* 2000	Document Formatting Properties	Value
\landscape	Document Formatting Properties	Flag
\lang	Font (Character) Formatting Properties	Value
\langfe*N* 2000	Font (Character) Formatting Properties	Value
\langfenp*N* 2000	Font (Character) Formatting Properties	Value
\langnp*N* 2000	Font (Character) Formatting Properties	Value
\lastrow 2002	Table Definitions	Flag
\lbr*N* 2000	Special Characters	Symbol
\lchars 7.0	Document Formatting Properties	Destination
\ldblquote	Special Characters	Symbol
\level	Paragraph Formatting Properties	Value
\levelfollowN 97	List Table	Value
\levelindentN 97	List Table	Value
\leveljcN 97	List Table	Value
\leveljcn*N* 2000	List Table	Value
\levellegalN 97	List Table	Value
\levelnfcN 97	List Table	Value
\levelnfcn*N* 2000	List Table	Value

\levelnorestartN 97	List Table	Value
\levelnumbers 97	List Table	Destination
\leveloldN 97	List Table	Value
\levelpictureN 2002	List Table	Value
\levelprevN 97	List Table	Value
\levelprevspaceN 97	List Table	Value
\levelspaceN 97	List Table	Value
\levelstartatN 97	List Table	Value
\leveltemplateid*N* 2000	List Table	Value
\leveltext 97	List Table	Value
\li	Paragraph Formatting Properties	Value
\line	Special Characters	Symbol
\linebetcol	Section Formatting Properties	Flag
\linecont	Section Formatting Properties	Flag
\linemod	Section Formatting Properties	Value
\lineppage	Section Formatting Properties	Flag
\linerestart	Section Formatting Properties	Flag
\linestart	Document Formatting Properties	Value
\linestarts	Section Formatting Properties	Value
\linex	Section Formatting Properties	Value
\linkself	Objects	Flag
\linkstyles	Document Formatting Properties	Flag
\linkval 7.0	Information Group	Value
\lin*N* 2000	Paragraph Formatting Properties	Value
\lisa*N* 2000	Paragraph Formatting Properties	Value
\lisb*N* 2000	Paragraph Formatting Properties	Value
\listhybrid 2000	List Table	Flag
\listidN 97	List Table	Value

\listname 97	List Table	Destination
\listoverridecountN 97	List Table	Value
\listoverrideformatN 97	List Table	Value
\listoverridestartN 97	List Table	Value
\listpictureN 2002	List Table	Value
\listrestarthdnN 97	List Table	Value
\listsimpleN 97	List Table	Value
\liststyleidN 2002	List Table	Value
\liststylename 2002	List Table	Value
\listtemplateidN 97	List Table	Value
\listtext 97	Paragraph Text	Destination
\lnbrkrule 2000	Document Formatting Properties	Flag
\lndscpsxn	Section Formatting Properties	Flag
\lnongrid 7.0	Document Formatting Properties	Flag
\loch 7.0	Associated Character Properties	Flag
\lquote	Special Characters	Symbol
\ls 97	List Table	Value
\ltrch	Font (Character) Formatting Properties	Flag
\ltrdoc	Document Formatting Properties	Flag
\ltrmark 2002	Special Characters	Symbol
\ltrpar	Paragraph Formatting Properties	Flag
\ltrrow	Table Definitions	Flag
\ltrsect	Section Formatting Properties	Flag
\lytcalctblwd 2000	Document Formatting Properties	Flag
\lytexcttp 97	Document Formatting Properties	Flag
\lytprtmet 97	Document Formatting Properties	Flag
\lyttblrtgr 2000	Document Formatting Properties	Flag

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\mac	Character Set	Flag
\macpict	Pictures	Flag
\makebackup	Document Formatting Properties	Flag
\manager 7.0	Information Group	Destination
\margb	Document Formatting Properties	Value
\margbsxn	Section Formatting Properties	Value
\margl	Document Formatting Properties	Value
\marglsxn	Section Formatting Properties	Value
\margmirror	Document Formatting Properties	Flag
\margr	Document Formatting Properties	Value
\margrsxn	Section Formatting Properties	Value
\margt	Document Formatting Properties	Value
\margtsxn	Section Formatting Properties	Value
\mhtmltag	Control Words Introduced by Other Microsoft Products	Destination
\min	Information Group	Value
\mo	Information Group	Value
\msmcap 97	Document Formatting Properties	Flag
\nestcell 2000	Table Definitions	Symbol
\nestrow 2000	Table Definitions	Symbol
\nesttableprops 2000	Table Definitions	Destination
\nextfile	Document Formatting Properties	Destination
\nobrkwrptbl 2002	Document Formatting Properties	Flag
\nocolbal	Document Formatting Properties	Flag

\nocompatoptions 2002	Document Formatting Properties	Flag
\nocwrap 7.0	Paragraph Formatting Properties	Flag
\noextrasprl	Document Formatting Properties	Flag
\nofchars	Information Group	Value
\nofcharsws 97	Information Group	Value
\nofpages	Information Group	Value
\nofwords	Information Group	Value
\nolead 97	Document Formatting Properties	Flag
\noline	Paragraph Formatting Properties	Flag
\nolnhtadjtbl 2000	Document Formatting Properties	Flag
\nonesttables 2000	Table Definitions	Destination
\nonshppict 97	Pictures	Flag
\nooverflow 7.0	Paragraph Formatting Properties	Flag
\noproof 2000	Font (Character) Formatting Properties	Flag
\nosectexpand 97	Font (Character) Formatting Properties	Flag
\nosnaplinegrid 97	Paragraph Formatting Properties	Flag
\nospaceforul 97	Document Formatting Properties	Flag
\nosupersub	Font (Character) Formatting Properties	Flag
\notabind	Document Formatting Properties	Flag
\noultrlspc 97	Document Formatting Properties	Flag
\nowidctlpar	Paragraph Formatting Properties	Flag
\nowrap	Positioned Objects and Frames	Flag
\nowwrap 7.0	Paragraph Formatting Properties	Flag
\noxlattoyen 97	Document Formatting Properties	Flag

\objalias	Objects	Destination
\objalign	Objects	Value
\objattph 7.0	Objects	Flag
\objautlink	Objects	Flag
\objclass	Objects	Destination
\objcropb	Objects	Value
\objcropl	Objects	Value
\objcropr	Objects	Value
\objcropt	Objects	Value
\objdata	Objects	Destination
\object	Objects	Destination
\objemb	Objects	Flag
\objh	Objects	Value
\objhtml 97	Objects	Flag
\objicemb	Objects	Flag
\objlink	Objects	Flag
\objlock	Objects	Flag
\objname	Objects	Destination
\objocx 97	Objects	Flag
\objpub	Objects	Flag
\objscalex	Objects	Value
\objscaley	Objects	Value
\objsect	Objects	Destination
\objsetsize	Objects	Flag
\objsub	Objects	Flag
\objtime	Objects	Destination
\objtransy	Objects	Value
\objupdate	Objects	Flag
\objw	Objects	Value
\oldas 2000	Document Formatting Properties	Flag
\oldcprops 2002	Track Changes (Revision Marks)	Destination
\oldpprops 2002	Track Changes (Revision Marks)	Destination
\oldsprops 2002	Track Changes (Revision Marks)	Destination

\oldtprops 2002	Track Changes (Revision Marks)	Destination
\oldlinewrap 97	Document Formatting Properties	Flag
\operator	Information Group	Destination
\otblrul	Document Formatting Properties	Flag
\outl	Font (Character) Formatting Properties	Toggle
\outlinelevelN 97	Paragraph Text	Value
\overlay 97	Paragraph Text	Flag

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\page	Special Characters	Symbol
\pagebb	Paragraph Formatting Properties	Flag
\panose 97	Font Table	Destination
\paperh	Document Formatting Properties	Value
\paperw	Document Formatting Properties	Value
\par	Special Characters	Symbol
\pararsidN 2002	Track Changes (Revision Marks)	Value
\pard	Paragraph Formatting Properties	Flag
\pc	Character Set	Flag
\pca	Character Set	Flag
\pgbrdrb 97	Document Formatting Properties	Flag
\pgbrdrfoot 97	Document Formatting Properties	Flag
\pgbrdrhead 97	Document Formatting Properties	Flag
\pgbrdrl 97	Document Formatting Properties	Flag
\pgbrdroptN 97	Document Formatting Properties	Value
\pgbrdrr 97	Document Formatting Properties	Flag
\pgbrdrsnap 97	Document Formatting	Flag

	Properties	
\pgbrdrt 97	Document Formatting Properties	Flag
\pghsxn	Section Formatting Properties	Value
\pgnbidia 2000	Section Formatting Properties	Flag
\pgnbidib 2000	Section Formatting Properties	Flag
\pgnchosung 97	Bullets and Numbering	Flag
\pgncnum 97	Bullets and Numbering	Flag
\pgncont	Section Formatting Properties	Flag
\pgndbnum 7.0	Section Formatting Properties	Flag
\pgndbnumd 7.0	Section Formatting Properties	Flag
\pgndbnumk 97	Bullets and Numbering	Flag
\pgndbnumt 97	Bullets and Numbering	Flag
\pgndec	Section Formatting Properties	Flag
\pgndecd 7.0	Section Formatting Properties	Flag
\pgnganada 97	Bullets and Numbering	Flag
\pgngbnum 97	Bullets and Numbering	Flag
\pgngbnumd 97	Bullets and Numbering	Flag
\pgngbnumk 97	Bullets and Numbering	Flag
\pgngbnuml 97	Bullets and Numbering	Flag
\pgnhindia 2002	Section Formatting Properties	Flag
\pgnhindib 2002	Section Formatting Properties	Flag
\pgnhindic 2002	Section Formatting Properties	Flag
\pgnhindid 2002	Section Formatting Properties	Flag
\pgnhn	Section Formatting Properties	Value
\pgnhnsc	Section Formatting Properties	Flag
\pgnhnsh	Section Formatting Properties	Flag

\pgnhnsm	Section Formatting Properties	Flag
\pgnhnsn	Section Formatting Properties	Flag
\pgnhnsp	Section Formatting Properties	Flag
\pgnidN 2002	Section Formatting Properties	Value
\pgnlcltr	Section Formatting Properties	Flag
\pgnlcrm	Section Formatting Properties	Flag
\pgnrestart	Section Formatting Properties	Flag
\pgnstart	Document Formatting Properties	Value
\pgnstarts	Section Formatting Properties	Value
\pgnthaia 2002	Section Formatting Properties	Flag
\pgnthaib 2002	Section Formatting Properties	Flag
\pgnthaic 2002	Section Formatting Properties	Flag
\pgnucltr	Section Formatting Properties	Flag
\pgnucrm	Section Formatting Properties	Flag
\pgnvieta 2002	Section Formatting Properties	Flag
\pgnx	Section Formatting Properties	Value
\pgny	Section Formatting Properties	Value
\pgnzodiac 97	Bullets and Numbering	Flag
\pgnzodiacd 97	Bullets and Numbering	Flag
\pgnzodiacl 97	Bullets and Numbering	Flag
\pgp 2002	Paragraph Group Properties	Destination
\pgptbl 2002	Paragraph Group Properties	Destination
\pgwsxn	Section Formatting Properties	Value

\phcol	Positioned Objects and Frames	Flag
\phmrg	Positioned Objects and Frames	Flag
\phpg	Positioned Objects and Frames	Flag
\picbmp	Pictures	Flag
\picbpp	Pictures	Value
\piccropb	Pictures	Value
\piccropl	Pictures	Value
\piccropr	Pictures	Value
\piccropt	Pictures	Value
\pich	Pictures	Value
\pichgoal	Pictures	Value
\picprop 97	Pictures	Destination
\picscaled	Pictures	Flag
\picscalex	Pictures	Value
\picscaley	Pictures	Value
\pict	Pictures	Destination
\picw	Pictures	Value
\picwgoal	Pictures	Value
\plain	Font (Character) Formatting Properties	Flag
\pmmetafile	Pictures	Value
\pn	Bullets and Numbering	Destination
\pnacross	Bullets and Numbering	Flag
\pnaiu 7.0	Bullets and Numbering	Flag
\pnaiud 7.0	Bullets and Numbering	Flag
\pnaiueo 97	Bullets and Numbering	Flag
\pnaiueod 97	Bullets and Numbering	Flag
\pnb	Bullets and Numbering	Toggle
\pnbidia 2000	Bullets and Numbering	Flag
\pnbidib 2000	Bullets and Numbering	Flag
\pncaps	Bullets and Numbering	Toggle
\pncard	Bullets and Numbering	Flag
\pncf	Bullets and Numbering	Value
\pnchosung 97	Bullets and Numbering	Flag

\pncnum 7.0	Bullets and Numbering	Flag
\pndbnum 7.0	Bullets and Numbering	Flag
\pndbnumd 97	Bullets and Numbering	Flag
\pndbnumk 97	Bullets and Numbering	Flag
\pndbnuml 97	Bullets and Numbering	Flag
\pndbnumt 97	Bullets and Numbering	Flag
\pndec	Bullets and Numbering	Flag
\pndecd 7.0	Bullets and Numbering	Flag
\pnf	Bullets and Numbering	Value
\pnfs	Bullets and Numbering	Value
\pnganada 97	Bullets and Numbering	Flag
\pnganada 97	Bullets and Numbering	Flag
\pngblip 97	Pictures	Flag
\pngbnum 97	Bullets and Numbering	Flag
\pngbnumd 97	Bullets and Numbering	Flag
\pngbnumk 97	Bullets and Numbering	Flag
\pngbnuml 97	Bullets and Numbering	Flag
\pnhang	Bullets and Numbering	Flag
\pni	Bullets and Numbering	Toggle
\pnindent	Bullets and Numbering	Value
\pniroha 7.0	Bullets and Numbering	Flag
\pnirohad 7.0	Bullets and Numbering	Flag
\pnlcltr	Bullets and Numbering	Flag
\pnlcrm	Bullets and Numbering	Flag
\pnlvl	Bullets and Numbering	Value
\pnlvlblt	Bullets and Numbering	Flag
\pnlvlbody	Bullets and Numbering	Flag
\pnlvlcont	Bullets and Numbering	Flag
\pnnumonce	Bullets and Numbering	Flag
\pnord	Bullets and Numbering	Flag
\pnordt	Bullets and Numbering	Flag
\pnprev	Bullets and Numbering	Flag
\pnqc	Bullets and Numbering	Flag
\pnql	Bullets and Numbering	Flag
\pnqr	Bullets and Numbering	Flag
\pnrauthN 97	Paragraph Text	Value

\pnrdateN 97	Paragraph Text	Value
\pnrestart	Bullets and Numbering	Flag
\pnrnfcN 97	Paragraph Text	Value
\pnrnot 97	Paragraph Text	Flag
\pnrpnbrN 97	Paragraph Text	Value
\pnrrgbN 97	Paragraph Text	Value
\pnrstartN 97	Paragraph Text	Value
\pnrstopN 97	Paragraph Text	Value
\pnrxstN 97	Paragraph Text	Value
\pnscaps	Bullets and Numbering	Toggle
\pnseclvl	Bullets and Numbering	Destination
\pnsp	Bullets and Numbering	Value
\pnstart	Bullets and Numbering	Value
\pnstrike	Bullets and Numbering	Toggle
\pntext	Bullets and Numbering	Destination
\pntxta	Bullets and Numbering	Destination
\pntxtb	Bullets and Numbering	Destination
\pnucltr	Bullets and Numbering	Flag
\pnucrm	Bullets and Numbering	Flag
\pnul	Bullets and Numbering	Toggle
\pnuld	Bullets and Numbering	Flag
\pnuldash 7.0	Bullets and Numbering	Flag
\pnuldashd 7.0	Bullets and Numbering	Flag
\pnuldashdd 7.0	Bullets and Numbering	Flag
\pnuldb	Bullets and Numbering	Flag
\pnulhair 7.0	Bullets and Numbering	Flag
\pnulnone	Bullets and Numbering	Flag
\pnulth 7.0	Bullets and Numbering	Flag
\pnulw	Bullets and Numbering	Flag
\pnulwave 7.0	Bullets and Numbering	Flag
\pnzodiac 97	Bullets and Numbering	Flag
\pnzodiacd 97	Bullets and Numbering	Flag
\pnzodiacl 97	Bullets and Numbering	Flag
\posnegx	Positioned Objects and Frames	Value
\posnegy	Positioned Objects and Frames	Value

\posx	Positioned Objects and Frames	Value
\posxc	Positioned Objects and Frames	Flag
\posxi	Positioned Objects and Frames	Flag
\posxl	Positioned Objects and Frames	Flag
\posxo	Positioned Objects and Frames	Flag
\posxr	Positioned Objects and Frames	Flag
\posy	Positioned Objects and Frames	Value
\posyb	Positioned Objects and Frames	Flag
\posyc	Positioned Objects and Frames	Flag
\posyil	Positioned Objects and Frames	Flag
\posyin 97	Paragraph Text	Flag
\posyout 97	Paragraph Text	Flag
\posyt	Positioned Objects and Frames	Flag
\prcolbl	Document Formatting Properties	Flag
\printdata	Document Formatting Properties	Flag
\printim	Information Group	Destination
\private 97	Document Formatting Properties	Destination
\propname 7.0	Information Group	Value
\proptype 7.0	Information Group	Value
\psover	Document Formatting Properties	Flag
\psz	Document Formatting Properties	Value
\pubauto	Macintosh Edition Manager Publisher Objects	Flag
\pvmrg	Positioned Objects and Frames	Flag
\pvpara	Positioned Objects and	Flag

	Frames	
\pvpg	Positioned Objects and Frames	Flag
\pwd*N*	Control Words Introduced by Other Microsoft Products	Destination
\pxe 7.0	Index Entries	Destination
\qc	Paragraph Formatting Properties	Flag
\qd 7.0	Paragraph Formatting Properties	Flag
\qj	Paragraph Formatting Properties	Flag
\qk 2002	Paragraph Formatting Properties	Flag
\ql	Paragraph Formatting Properties	Flag
\qmspace 7.0	Special Characters	Symbol
\qr	Paragraph Formatting Properties	Flag
\qt 2002	Paragraph Formatting Properties	Flag
\rawclbgbdiag 2002	Table Definitions	Flag
\rawclbgcross 2002	Table Definitions	Flag
\rawclbgdcross 2002	Table Definitions	Flag
\rawbgdkbdiag 2002	Table Definitions	Flag
\rawclbgdkcross 2002	Table Definitions	Flag
\rawclbgdkdcross 2002	Table Definitions	Flag
\rawclbgdkfdiag 2002	Table Definitions	Flag
\rawclbgdkhor 2002	Table Definitions	Flag
\rawclbgdkvert 2002	Table Definitions	Flag
\rawclbgfdiag 2002	Table Definitions	Flag
\rawclbghoriz 2002	Table Definitions	Flag
\rawclbgvert 2002	Table Definitions	Flag
\rdblquote	Special Characters	Symbol
\red	Color Table	Value
\rempersonalinfo 2002	Document Formatting Properties	Flag
\result	Objects	Destination
\revauth	Font (Character)	Value

	Formatting Properties	
\revauthdelN 97	Character Text	Value
\revbar	Document Formatting Properties	Value
\revdttm	Font (Character) Formatting Properties	Value
\revdttmdelN 97	Character Text	Value
\revised	Font (Character) Formatting Properties	Toggle
\revisions	Document Formatting Properties	Flag
\revprop	Document Formatting Properties	Value
\revprot	Document Formatting Properties	Flag
\revtbl	Track Changes	Destination
\revtim	Information Group	Destination
\ri	Paragraph Formatting Properties	Value
\rin*N* 2000	Paragraph Formatting Properties	Value
\row	Special Characters	Symbol
\rquote	Special Characters	Symbol
\rsidN 2002	Track Changes (Revision Marks)	Value
\rsidrootN 2002	Track Changes (Revision Marks)	Value
\rsidtbl 2002	Track Changes (Revision Marks)	Destination
\rsltbmp	Objects	Flag
\rslthtml 2000	Objects	Flag
\rsltmerge	Objects	Flag
\rsltpict	Objects	Flag
\rsltrtf	Objects	Flag
\rslttxt	Objects	Flag
\rtf	RTF Version	Destination
\rtlch	Font (Character) Formatting Properties	Flag
\rtldoc	Document Formatting Properties	Flag
\rtlgutter 2000	Document Formatting	Flag

	Properties	
\rtlmark 2002	Special Characters	Symbol
\rtlpar	Paragraph Formatting Properties	Flag
\rtlrow	Table Definitions	Flag
\rtlsect	Section Formatting Properties	Flag
\rxe	Index Entries	Destination

S-T

\s	Paragraph Formatting Properties	Value
\sa	Paragraph Formatting Properties	Value
\saauto*N* 2000	Paragraph Formatting Properties	Toggle
\saftnnalc 2002	Section Formatting Properties	Flag
\saftnnar 2002	Section Formatting Properties	Flag
\saftnnauc 2002	Section Formatting Properties	Flag
\saftnnchi 2002	Section Formatting Properties	Flag
\saftnnchosung 2002	Section Formatting Properties	Flag
\saftnncnum 2002	Section Formatting Properties	Flag
\saftnndbar 2002	Section Formatting Properties	Flag
\saftnndbnum 2002	Section Formatting Properties	Flag
\saftnndbnumd 2002	Section Formatting Properties	Flag
\saftnndbnumk 2002	Section Formatting Properties	Flag
\saftnndbnumt 2002	Section Formatting Properties	Flag
\saftnnganada 2002	Section Formatting Properties	Flag
\saftnngbnum 2002	Section Formatting Properties	Flag

\saftnngbnumd 2002	Section Formatting Properties	Flag
\saftnngbnumk 2002	Section Formatting Properties	Flag
\saftnngbnuml 2002	Section Formatting Properties	Flag
\saftnnrlc 2002	Section Formatting Properties	Flag
\saftnnruc 2002	Section Formatting Properties	Flag
\saftnnzodiac 2002	Section Formatting Properties	Flag
\saftnnzodiacd 2002	Section Formatting Properties	Flag
\saftnnzodiacl 2002	Section Formatting Properties	Flag
\saftnrestart 2002	Section Formatting Properties	Flag
\saftnrstcont 2002	Section Formatting Properties	Flag
\saftnstart 2002	Section Formatting Properties	Flag
\sautoupd 97	Style Sheet	Flag
\sb	Paragraph Formatting Properties	Value
\sbasedon	Style Sheet	Value
\sbauto*N* 2000	Paragraph Formatting Properties	Toggle
\sbkcol	Section Formatting Properties	Flag
\sbkeven	Section Formatting Properties	Flag
\sbknone	Section Formatting Properties	Flag
\sbkodd	Section Formatting Properties	Flag
\sbkpage	Section Formatting Properties	Flag
\sbys	Paragraph Formatting Properties	Flag
\scaps	Font (Character) Formatting Properties	Toggle
\scompose 2000	Style Sheet	Flag

\sec	Information Group	Value
\sect	Special Characters	Symbol
\sectd	Section Formatting Properties	Flag
\sectdefaultcl 97	Section Formatting Properties	Value
\sectexpand*N* 97	Section Formatting Properties	Value
\sectlinegrid*N* 97	Section Formatting Properties	Value
\sectnum	Special Characters	Symbol
\sectrsidN 2002	Track Changes (Revision Marks)	Value
\sectspecifycl 97	Section Formatting Properties	Value
\sectspecifygenN	Section Formatting Properties	Flag
\sectspecifyl 97	Section Formatting Properties	Value
\sectunlocked	Section Formatting Properties	Flag
\sftnbj 2002	Section Formatting Properties	Flag
\sftnnalc 2002	Section Formatting Properties	Flag
\sftnnar 2002	Section Formatting Properties	Flag
\sftnnauc 2002	Section Formatting Properties	Flag
\sftnnchi 2002	Section Formatting Properties	Flag
\sftnnchosung 2002	Section Formatting Properties	Flag
\sftnncnum 2002	Section Formatting Properties	Flag
\sftnndbar 2002	Section Formatting Properties	Flag
\sftnndbnum 2002	Section Formatting Properties	Flag
\sftnndbnumd 2002	Section Formatting Properties	Flag
\sftnndbnumk 2002	Section Formatting Properties	Flag

\sftnndbnumt 2002	Section Formatting Properties	Flag
\sftnnganada 2002	Section Formatting Properties	Flag
\sftnngbnum 2002	Section Formatting Properties	Flag
\sftnngbnumd 2002	Section Formatting Properties	Flag
\sftnngbnumk 2002	Section Formatting Properties	Flag
\sftnngbnuml 2002	Section Formatting Properties	Flag
\sftnnrlc 2002	Section Formatting Properties	Flag
\sftnnruc 2002	Section Formatting Properties	Flag
\sftnnzodiac 2002	Section Formatting Properties	Flag
\sftnnzodiacd 2002	Section Formatting Properties	Flag
\sftnnzodiacl 2002	Section Formatting Properties	Flag
\sftnrestart 2002	Section Formatting Properties	Flag
\sftnrstcont 2002	Section Formatting Properties	Flag
\sftnrstpg 2002	Section Formatting Properties	Flag
\sftnstart 2002	Section Formatting Properties	Flag
\sftntj 2002	Section Formatting Properties	Flag
\shad	Font (Character) Formatting Properties	Toggle
\shading	Paragraph Shading	Value
\shidden 97	Style Sheet	Flag
\shift	Style Sheet	Flag
\shpbottomN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shpbxcolumn 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Flag
\shpbxignore 2000	Word 97 through Word	Flag

	2002 RTF for Drawing Objects (Shapes)	
\shpbxmargin 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Flag
\shpbxpage 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Flag
\shpbyignore 2000	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Flag
\shpbymargin 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Flag
\shpbypage 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Flag
\shpbypara 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Flag
\shpfblwtxtN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shpfhdrN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shpgrp 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shpleftN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shplidN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shplockanchor 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Flag
\shppict 97	Pictures	Destination
\shprightN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shprslt 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shptopN 97	Word 97 through Word 2002 RTF for Drawing	Value

	Objects (Shapes)	
\shptxt 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shpwrkN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shpwrN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\shpzN 97	Word 97 through Word 2002 RTF for Drawing Objects (Shapes)	Value
\sl	Paragraph Formatting Properties	Value
\slmult	Paragraph Formatting Properties	Value
\snaptogridincell 2002	Document Formatting Properties	Flag
\snext	Style Sheet	Value
\softcol	Special Characters	Flag
\softlheight	Special Characters	Value
\softline	Special Characters	Flag
\softpage	Special Characters	Flag
\spersonal 2000	Style Sheet	Flag
\splytwnine 2000	Document Formatting Properties	Flag
\sprsbsp 97	Document Formatting Properties	Flag
\sprslnsp 7.0	Document Formatting Properties	Flag
\sprsspbf	Document Formatting Properties	Flag
\sprstsm 97	Document Formatting Properties	Flag
\sprstsp	Document Formatting Properties	Flag
\spv 2002	Paragraph Formatting Properties	Flag
\sreply 2000	Style Sheet	Flag
\ssemihidden 2002	Style Sheet	Flag
\staticval 7.0	Information Group	Value
\stextflow 97	Section Text	Value

\strike	Font (Character) Formatting Properties	Toggle
\striked1 97	Character Text	Toggle
\stshfbiN 2002	Default Fonts	Value
\stshfdbchN 2002	Default Fonts	Value
\stshfhichN 2002	Default Fonts	Value
\stshflochN 2002	Default Fonts	Value
\stylesheet	Style Sheet	Destination
\styrsidN 2002	Track Changes (Revision Marks)	Value
\sub	Font (Character) Formatting Properties	Flag
\subdocument	Paragraph Formatting Properties	Value
\subfontbysize 7.0	Document Formatting Properties	Flag
\subject	Information Group	Destination
\super	Font (Character) Formatting Properties	Flag
\swpbdr	Document Formatting Properties	Flag
\tab	Special Characters	Symbol
\tabsnoovrlp 2000	Table Definitions	Flag
\taprtl 2000	Table Definitions	Flag
\tb	Tabs	Value
\tbllkbestfit 2002	Table Definitions	Flag
\tbllkborder 2002	Table Definitions	Flag
\tbllkcolor 2002	Table Definitions	Flag
\tbllkfont 2002	Table Definitions	Flag
\tbllkhdrcols 2002	Table Definitions	Flag
\tbllkhdrrows 2002	Table Definitions	Flag
\tbllklastcol 2002	Table Definitions	Flag
\tbllklastrow 2002	Table Definitions	Flag
\tbllkshading 2002	Table Definitions	Flag
\tblrsidN 2002	Table Definitions	Flag
\tc	Table of Contents Entries	Destination
\tcelld 97	Table Definitions	Flag
\tcf	Table of Contents	Value

	Entries	
\tcl	Table of Contents Entries	Value
\tcn	Table of Contents Entries	Flag
\tdfrmtxtBottom*N* 2000	Table Definitions	Value
\tdfrmtxtLeft*N* 2000	Table Definitions	Value
\tdfrmtxtRight*N* 2000	Table Definitions	Value
\tdfrmtxtTop*N* 2000	Table Definitions	Value
\template	Document Formatting Properties	Destination
\time 97	Fields	Flag
\title	Information Group	Destination
\titlepg	Section Formatting Properties	Flag
\tldot	Tabs	Flag
\tleq	Tabs	Flag
\tlhyph	Tabs	Flag
\tlmdot 7.0	Tabs	Flag
\tlth	Tabs	Flag
\tlul	Tabs	Flag
\toplinepunct 2002	Document Formatting Properties	Flag
\tphcol 2000	Table Definitions	Flag
\tphmrg 2000	Table Definitions	Flag
\tphpg 2000	Table Definitions	Flag
\tposnegx*N* 2000	Table Definitions	Value
\tposnegy*N* 2000	Table Definitions	Value
\tposxc 2000	Table Definitions	Flag
\tposxi 2000	Table Definitions	Flag
\tposxl 2000	Table Definitions	Flag
\tposx*N* 2000	Table Definitions	Value
\tposxo 2000	Table Definitions	Flag
\tposxr 2000	Table Definitions	Flag
\tposy 2000	Table Definitions	Flag
\tposyb 2000	Table Definitions	Flag
\tposyc 2000	Table Definitions	Flag
\tposyil 2000	Table Definitions	Flag

\tposyin 2000	Table Definitions	Flag
\tposyoutv 2000	Table Definitions	Flag
\tposyt 2000	Table Definitions	Flag
\tpvmrg 2000	Table Definitions	Flag
\tpvpara 2000	Table Definitions	Flag
\tpvpg 2000	Table Definitions	Flag
\tqc	Tabs	Flag
\tqdec	Tabs	Flag
\tqr	Tabs	Flag
\transmf	Document Formatting Properties	Flag
\trauthN 2002	Table Definitions	Value
\trautofit*N* 2000	Table Definitions	Toggle
\trbgbdiag 2002	Table Definitions	Flag
\trbgcross 2002	Table Definitions	Flag
\trbgdcross 2002	Table Definitions	Flag
\trbgdkbdiag 2002	Table Definitions	Flag
\trbgdkcross 2002	Table Definitions	Flag
\trbgdkdcross 2002	Table Definitions	Flag
\trbgdkfdiag 2002	Table Definitions	Flag
\trbgdkhor 2002	Table Definitions	Flag
\trbgdkvert 2002	Table Definitions	Flag
\trbgfdiag 2002	Table Definitions	Flag
\trbghoriz 2002	Table Definitions	Flag
\trbgvert 2002	Table Definitions	Flag
\trbrdrb	Table Definitions	Flag
\trbrdrh	Table Definitions	Flag
\trbrdrl	Table Definitions	Flag
\trbrdrr	Table Definitions	Flag
\trbrdrt	Table Definitions	Flag
\trbrdrv	Table Definitions	Flag
\trcbpatN 2002	Table Definitions	Value
\trcfpatN 2002	Table Definitions	Value
\trdateN	Table Definitions	Value
\trftsWidthA*N* 2000	Table Definitions	Value
\trftsWidthB*N* 2000	Table Definitions	Value

\trftsWidth*N* 2000	Table Definitions	Value
\trgaph	Table Definitions	Value
\trhdr	Table Definitions	Flag
\trkeep	Table Definitions	Flag
\trleft	Table Definitions	Value
\trowd	Table Definitions	Flag
\trpaddb*N* 2000	Table Definitions	Value
\trpaddfb*N* 2000	Table Definitions	Value
\trpaddfl*N* 2000	Table Definitions	Value
\trpaddfr*N* 2000	Table Definitions	Value
\trpaddft*N* 2000	Table Definitions	Value
\trpaddl*N* 2000	Table Definitions	Value
\trpaddr*N* 2000	Table Definitions	Value
\trpaddt*N* 2000	Table Definitions	Value
\trpatN **2002**	Table Definitions	Value
\trqc	Table Definitions	Flag
\trql	Table Definitions	Flag
\trqr	Table Definitions	Flag
\trrh	Table Definitions	Value
\trshdngN 2002	Table Definitions	Value
\trspdb*N* 2000	Table Definitions	Value
\trspdfb*N* 2000	Table Definitions	Value
\trspdfl*N* 2000	Table Definitions	Value
\trspdfr*N* 2000	Table Definitions	Value
\trspdft*N* 2000	Table Definitions	Value
\trspdl*N* 2000	Table Definitions	Value
\trspdr*N* 2000	Table Definitions	Value
\trspdt*N* 2000	Table Definitions	Value
\truncatefontheight	Document Formatting Properties	Flag
\trwWidthA*N* 2000	Table Definitions	Value
\trwWidthB*N* 2000	Table Definitions	Value
\trwWidth*N* 2000	Table Definitions	Value
\ts **2002**	Style Sheet	Value
\tsbgbdiag **2002**	Table Styles	Flag
\tsbgcross **2002**	Table Styles	Flag
\tsbgdcross **2002**	Table Styles	Flag

\tsbgdkbdiag 2002	Table Styles	Flag
\tsbgdkcross 2002	Table Styles	Flag
\tsbgdkdcross 2002	Table Styles	Flag
\tsbgdkfdiag 2002	Table Styles	Flag
\tsbgdkhor 2002	Table Styles	Flag
\tsbgdkvert 2002	Table Styles	Flag
\tsbgfdiag 2002	Table Styles	Flag
\tsbghoriz 2002	Table Styles	Flag
\tsbgvert 2002	Table Styles	Flag
\tsbrdrb 2002	Table Styles	Flag
\tsbrdrdgl 2002	Table Styles	Flag
\tsbrdrdgr 2002	Table Styles	Flag
\tsbrdrh 2002	Table Styles	Flag
\tsbrdrl 2002	Table Styles	Flag
\tsbrdrr 2002	Table Styles	Flag
\tsbrdrr 2002	Table Styles	Flag
\tsbrdrt 2002	Table Styles	Flag
\tsbrdrv 2002	Table Styles	Flag
\tscbandhorzeven 2002	Table Styles	Flag
\tscbandhorzodd 2002	Table Styles	Flag
\tscbandsh 2002	Table Styles	Flag
\tscbandsv 2002	Table Styles	Flag
\tscbandverteven 2002	Table Styles	Flag
\tscbandvertodd 2002	Table Styles	Flag
\tscellcbpatN 2002	Table Styles	Value
\tscellcfpatN 2002	Table Styles	Value
\tscellpaddbN 2002	Table Styles	Value
\tscellpaddfbN 2002	Table Styles	Value
\tscellpaddflN 2002	Table Styles	Value
\tscellpaddfrN 2002	Table Styles	Value
\tscellpaddftN 2002	Table Styles	Value
\tscellpaddlN 2002	Table Styles	Value
\tscellpaddrN 2002	Table Styles	Value
\tscellpaddtN 2002	Table Styles	Value
\tscellpctN 2002	Table Styles	Value
\tscellwidth 2002	Table Styles	Flag

\tscellwidthfts 2002	Table Styles	Flag
\tscfirstcol 2002	Table Styles	Flag
\tscfirstrow 2002	Table Styles	Flag
\tsclastcol 2002	Table Styles	Flag
\tsclastrow 2002	Table Styles	Flag
\tscnecell 2002	Table Styles	Flag
\tscnwcell 2002	Table Styles	Flag
\tscsecell 2002	Table Styles	Flag
\tscswcell 2002	Table Styles	Flag
\tsd 2002	Table Styles	Flag
\tsnowrap 2002	Table Styles	Flag
\tsrowd 2002	Style Sheet	Flag
\tsvertalb 2002	Table Styles	Flag
\tsvertalc 2002	Table Styles	Flag
\tsvertalt 2002	Table Styles	Flag
\twoonone 7.0	Document Formatting Properties	Flag
\tx	Tabs	Value
\txe	Index Entries	Destination

U-Z

\ucN 97	Unicode RTF	Value
\ud 97	Unicode RTF	Destination
\ul	Font (Character) Formatting Properties	Toggle
\ulc*N* 2000	Font (Character) Formatting Properties	Value
\uld	Font (Character) Formatting Properties	Flag
\uldash 7.0	Font (Character) Formatting Properties	Toggle
\uldashd 7.0	Font (Character) Formatting Properties	Toggle
\uldashdd 7.0	Font (Character) Formatting Properties	Toggle
\uldb	Font (Character) Formatting Properties	Toggle
\ulhair 7.0	Font (Character) Formatting Properties	Toggle

\ulhwave 2000	Font (Character) Formatting Properties	Toggle
\ulldash 2000	Font (Character) Formatting Properties	Toggle
\ulnone	Font (Character) Formatting Properties	Flag
\ulth 7.0	Font (Character) Formatting Properties	Toggle
\ulth 97	Character Text	Toggle
\ulthd 2000	Font (Character) Formatting Properties	Toggle
\ulthdash 2000	Font (Character) Formatting Properties	Toggle
\ulthdashd 2000	Font (Character) Formatting Properties	Toggle
\ulthdashdd 2000	Font (Character) Formatting Properties	Toggle
\ulthldash 2000	Font (Character) Formatting Properties	Toggle
\ululdbwave 2000	Font (Character) Formatting Properties	Toggle
\ulw	Font (Character) Formatting Properties	Flag
\ulwave 7.0	Font (Character) Formatting Properties	Toggle
\uN 97	Unicode RTF	Value
\up	Font (Character) Formatting Properties	Value
\upr 97	Unicode RTF	Destination
\urtf*N*	Control Words Introduced by Other Microsoft Products	Destination
\useltbaln 2000	Document Formatting Properties	Flag
\userprops **7.0**	Information Group	Destination
\v	Font (Character) Formatting Properties	Toggle
\vern	Information Group	Value
\version	Information Group	Value
\vertalb	Section Formatting Properties	Flag
\vertalc	Section Formatting Properties	Flag

\vertalj	Section Formatting Properties	Flag
\vertalt	Section Formatting Properties	Flag
\vertdoc 7.0	Document Formatting Properties	Flag
\vertsect 7.0	Section Formatting Properties	Flag
\viewkindN 97	Document Formatting Properties	Value
\viewnobound 2002	Document Formatting Properties	Flag
\viewscaleN 97	Document Formatting Properties	Value
\viewzkN 97	Document Formatting Properties	Value
\wbitmap	Pictures	Value
\wbmbitspixel	Pictures	Value
\wbmplanes	Pictures	Value
\wbmwidthbytes	Pictures	Value
\webhidden 2000	Font (Character) Formatting Properties	Flag
\widctlpar	Paragraph Formatting Properties	Flag
\widowctrl	Document Formatting Properties	Flag
\windowcaption 97	Document Formatting Properties	Value
\wmetafile	Pictures	Value
\wpeqn 97	Fields	Flag
\wpjst 97	Document Formatting Properties	Flag
\wpsp 97	Document Formatting Properties	Flag
\wraptrsp	Document Formatting Properties	Flag
\wrppunct 2002	Document Formatting Properties	Flag
\xe	Index Entries	Destination
\xef	Index Entries	Value
\yr	Information Group	Value
\ytsN 2002	Paragraph Formatting	Value

	Properties	
\lyxe 97	Index Entries	Flag
\zwbo 7.0	Special Characters	Symbol
\zwj 2002	Special Characters	Symbol
\zwnbo 7.0	Special Characters	Symbol
\zwnj 2002	Special Characters	Symbol

APPENDIX C: CONTROL WORDS INTRODUCED BY OTHER MICROSOFT PRODUCTS

Pocket Word

Control word	Meaning
\pwd*N*	Substitute for **\rtf*N***. Introduced by Pocket Word to distinguish its files from general RTF files. Currently only 1 is emitted and the number is ignored by the RTF reader.
\collapsed	Paragraph property active in outline view that specifies that the paragraph is collapsed (not viewed).
\urtf*N*	Identifies an RTF file in which all text characters are encoded in UTF-8. Only binary data escapes this transformation. Word does not read this encoding of RTF.

Exchange (Used in RTF<->HTML Conversions)

Control word	Meaning
\fromtext	Indicates that the document was originally a plain text document.
\fromhtml	Indicates that the document was originally HTML and may contain encapsulated HTML tags. This keyword may be followed by a version number (currently 1).
***\htmltag**	Indicates that the destination is encapsulated HTML text (to be ignored by RTF readers, but used during reverse RTF->HTML conversion). This keyword is followed by a numeric parameter containing encapsulation flags.
\htmlrtf	Toggling keyword to mark pieces of RTF to be ignored during reverse RTF->HTML conversion. Lack of a parameter turns it on, parameter 0 turns it off.
***\mhtmltag**	Indicates that the destination is an encapsulated tag with rewritten URL links that should be used in a conversion to plain HTML. Typically, URL links are rewritten as automatically generated MHTML reference names or as absolute external links. The keyword is followed by the flag parameter (the same one as for the **\htmltag** keyword).

Control word	Meaning
\htmlbase	Placeholder in front of encapsulated MHTML reference name that marks the place where the base URL should be appended. This keyword is only used inside the **\mhtmltag** destination.

#######

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