Macintosh WordPerfect 4.0

File Format Manual

A Guide to
Understanding and Interfacing to
Macintosh WordPerfect 4.0

January 4, 2011
Function Revision History

22 Apr 93  New format for manual. Prefix updated to include Macintosh Resource Block.
30 Apr 93  1st distribution of 3.0 document.
01 July 93  Alpha revisions
30 July 93  Beta revisions

1.  \(<\text{Mode}> = 5 = \text{Decimal align added to } $D0$/06 = \text{Set Justification Mode}\)

2.  \(<\text{Cell horizontal justification}> \text{eliminated from } $E2$/0D = \text{Set Table Cell Vertical Alignment}\)

3.  $E2$/0D = \text{Set Table Cell Attributes} changed to a reserved function.

4.  \(<\text{Column justification}>, \ <\text{Alignment digits}>, \ \{\text{Column attributes}\} \text{eliminated from } $E2$/01 = \text{Table Function}\)

5.  $18 = \text{Table ON Subfunction} added.

01 Sep 93  Final format adjustments and corrections. Borders further clarified. Some subfunctions modified.

01 Nov 93  1.  $D2$/02 = \text{Define Paragraph Numbering} clarified.

2.  $D7$/03 = \text{Define Index Entry} renamed \text{Mark Index Entry}.

3.  $D7$/04 = \text{Define Table of Authority Entry} renamed \text{Mark Table of Authority Entry}.

4.  Appendix D added.

5.  $D8$/04 = \text{Insert Box Number},
    $D8$/05 = \text{Insert Chapter Number},
    $D8$/06 = \text{Insert Page Number},
    $D8$/07 = \text{Insert Footnote Number} and
    $D8$/08 = \text{Insert Endnote Number} documentation corrected.

02 Apr 97  Updated manual for 4.0 changes. Some graphics changed. Some previously undocumented functions added.

1.  Documented previously existant functions for $90$-$93, $9C$-$9D, $A1$-$A2, $A4, $B0$-$B1, $B4, $D9$/02-$03, $D9$/06, and $D9$/08-$0A$

22 Apr 97  Updates the marker function (SCC) to include indices 44-47.

14 May 97  Added $C4$ and $DA$/05 - $DA$/06. Modified end-of-line subfunctions. Added

16 May 97  Added hairline attribute to $DF$ group.
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<table>
<thead>
<tr>
<th>Function</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AE = Start Table Header</td>
<td>9</td>
</tr>
<tr>
<td>$AF = End Table Header</td>
<td>9</td>
</tr>
<tr>
<td>$B0 = Turn Widow/Orphan On</td>
<td>9</td>
</tr>
<tr>
<td>$B1 = Turn Widow/Orphan Off</td>
<td>9</td>
</tr>
<tr>
<td>$B2 = Block ON</td>
<td>9</td>
</tr>
<tr>
<td>$B3 = Block OFF</td>
<td>9</td>
</tr>
<tr>
<td>$B4 = Turn Hyphenation On</td>
<td>9</td>
</tr>
<tr>
<td>$B5 = Turn Hyphenation Off</td>
<td>9</td>
</tr>
<tr>
<td>$B6 = Reverse Video ON</td>
<td>9</td>
</tr>
<tr>
<td>$B7 = Reverse Video OFF</td>
<td>9</td>
</tr>
<tr>
<td>$B8 = Generate Marker #1</td>
<td>9</td>
</tr>
<tr>
<td>$B9 = Generate Marker #2</td>
<td>9</td>
</tr>
<tr>
<td>$BA = Search Marker #1</td>
<td>9</td>
</tr>
<tr>
<td>$BB = Search Marker #2</td>
<td>9</td>
</tr>
<tr>
<td>$BC = Format to EOL/EOP/EOC</td>
<td>9</td>
</tr>
<tr>
<td>$BD = Misc Formatter Marker</td>
<td>9</td>
</tr>
<tr>
<td>$BE = Reformat Line Marker</td>
<td>9</td>
</tr>
<tr>
<td>$BF = No Operation</td>
<td>9</td>
</tr>
</tbody>
</table>

**Fixed Length Multi-byte Functions**

<table>
<thead>
<tr>
<th>Function</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C0 = Extended Character</td>
<td>10</td>
</tr>
<tr>
<td>$C1/$00 = Tab</td>
<td>11</td>
</tr>
<tr>
<td>$C1/$01 = Center</td>
<td>11</td>
</tr>
<tr>
<td>$C1/$02 = Flush Right</td>
<td>11</td>
</tr>
<tr>
<td>$C1/$03 = Back Tab</td>
<td>11</td>
</tr>
<tr>
<td>$C1/$04 = Character Kerning</td>
<td>11</td>
</tr>
<tr>
<td>$C1/$05 = Tab w/Vertical Line</td>
<td>11</td>
</tr>
<tr>
<td>$C1/$06 = Fixed Tab</td>
<td>11</td>
</tr>
<tr>
<td>$C2/$00 = Left Indent</td>
<td>13</td>
</tr>
<tr>
<td>$C2/$01 = Left/Right Indent</td>
<td>13</td>
</tr>
<tr>
<td>$C3 = Attribute ON/OFF</td>
<td>14</td>
</tr>
<tr>
<td>$C4 = Emphasis Character</td>
<td>15</td>
</tr>
<tr>
<td>$C5/$00 = Block Protect ON</td>
<td>15</td>
</tr>
<tr>
<td>$C5/$01 = Block Protect OFF</td>
<td>15</td>
</tr>
<tr>
<td>$C6 = End of Indent</td>
<td>15</td>
</tr>
<tr>
<td>$C8 = Double Byte Script Character</td>
<td>16</td>
</tr>
<tr>
<td>$CC = Temp Formatter Marker</td>
<td>17</td>
</tr>
<tr>
<td>$CD/$00 = Start of Invalid Text</td>
<td>18</td>
</tr>
<tr>
<td>$CD/$01 = End of Invalid Text</td>
<td>18</td>
</tr>
<tr>
<td>$CD/$02 = Start of Valid Text</td>
<td>18</td>
</tr>
<tr>
<td>$CD/$03 = End of Valid Text</td>
<td>18</td>
</tr>
<tr>
<td>$CE/$00 = Temp Character Space Function</td>
<td>18</td>
</tr>
<tr>
<td>$CE/$01 = Temp Space-Extra Function</td>
<td>18</td>
</tr>
<tr>
<td>$CE/$FF = Temp Char-Extra Function</td>
<td>18</td>
</tr>
<tr>
<td>$CF = Formatter Marker</td>
<td>19</td>
</tr>
</tbody>
</table>

**Variable Length Multi-byte Functions**

<table>
<thead>
<tr>
<th>Function</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>$DO = Page Format Group</td>
<td>20</td>
</tr>
<tr>
<td>$DO/$00 = Set Line Size</td>
<td>20</td>
</tr>
<tr>
<td>$DO/$01 = Set Horizontal Margins</td>
<td>21</td>
</tr>
<tr>
<td>$DO/$02 = Set Line Spacing</td>
<td>21</td>
</tr>
<tr>
<td>$DO/$03 = Set Hyphenation Zone (Hotzone)</td>
<td>22</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>$D0/$04</td>
<td>Set Tabs</td>
</tr>
<tr>
<td>$D0/$05</td>
<td>Set Vertical Margins</td>
</tr>
<tr>
<td>$D0/$06</td>
<td>Set Justification Mode</td>
</tr>
<tr>
<td>$D0/$07</td>
<td>Suppress Page</td>
</tr>
<tr>
<td>$D0/$08</td>
<td>Set Page Number Position</td>
</tr>
<tr>
<td>$D0/$09</td>
<td>Set Spacing Between Paragraphs</td>
</tr>
<tr>
<td>$D0/$0A</td>
<td>Set Vertical Spacing Between Columns</td>
</tr>
<tr>
<td>$D0/$0C</td>
<td>Set Indent At Beginning of Paragraph</td>
</tr>
<tr>
<td>$D0/$0D</td>
<td>Set Widow/Orphan Mode</td>
</tr>
<tr>
<td>$D0/$0E</td>
<td>Set Hyphenation Mode</td>
</tr>
<tr>
<td>$D1</td>
<td>Font Group</td>
</tr>
<tr>
<td>$D1/$00</td>
<td>Set Text Color</td>
</tr>
<tr>
<td>$D1/$01</td>
<td>Set Text Font</td>
</tr>
<tr>
<td>$D1/$02</td>
<td>Set Font Size</td>
</tr>
<tr>
<td>$D1/$03</td>
<td>Set Line Leading</td>
</tr>
<tr>
<td>$D1/$04</td>
<td>Define Relative Font Sizes</td>
</tr>
<tr>
<td>$D2</td>
<td>Definition Group</td>
</tr>
<tr>
<td>$D2/$01</td>
<td>Set Columns ON/OFF</td>
</tr>
<tr>
<td>$D2/$02</td>
<td>Define Paragraph Numbering</td>
</tr>
<tr>
<td>$D2/$03</td>
<td>Define Footnote Options</td>
</tr>
<tr>
<td>$D2/$04</td>
<td>Define Endnote Options</td>
</tr>
<tr>
<td>$D2/$05</td>
<td>Define Figure Box Options</td>
</tr>
<tr>
<td>$D2/$06</td>
<td>Define Table Box Options</td>
</tr>
<tr>
<td>$D2/$07</td>
<td>Define Text Box Options</td>
</tr>
<tr>
<td>$D2/$08</td>
<td>Define User Box Options</td>
</tr>
<tr>
<td>$D2/$09</td>
<td>Define Equation Box Options</td>
</tr>
<tr>
<td>$D2/$0A</td>
<td>Define Super/Subscript Options</td>
</tr>
<tr>
<td>$D2/$0B</td>
<td>Define Chapter Number Style</td>
</tr>
<tr>
<td>$D2/$0C</td>
<td>Set Line Numbering Font/Size/Attributes</td>
</tr>
<tr>
<td>$D2/$0D</td>
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</tr>
<tr>
<td>$D3</td>
<td>Set Group</td>
</tr>
<tr>
<td>$D3/$00</td>
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</tr>
<tr>
<td>$D3/$01</td>
<td>Set Underline Mode</td>
</tr>
<tr>
<td>$D3/$02</td>
<td>Set Footnote Number</td>
</tr>
<tr>
<td>$D3/$03</td>
<td>Set Endnote Number</td>
</tr>
<tr>
<td>$D3/$04</td>
<td>Set Page Number</td>
</tr>
<tr>
<td>$D3/$05</td>
<td>Define Line Numbering Options</td>
</tr>
<tr>
<td>$D3/$06</td>
<td>Advance to Page Position</td>
</tr>
<tr>
<td>$D3/$07</td>
<td>Force Page Front/Back</td>
</tr>
<tr>
<td>$D3/$0C</td>
<td>Set Figure Box Number</td>
</tr>
<tr>
<td>$D3/$0D</td>
<td>Set Table Box Number</td>
</tr>
<tr>
<td>$D3/$0E</td>
<td>Set Text Box Number</td>
</tr>
<tr>
<td>$D3/$0F</td>
<td>Set User Box Number</td>
</tr>
<tr>
<td>$D3/$10</td>
<td>Set Equation Box Number</td>
</tr>
<tr>
<td>$D3/$11</td>
<td>Set Language</td>
</tr>
<tr>
<td>$D3/$12</td>
<td>Set Chapter Number</td>
</tr>
<tr>
<td>$D4</td>
<td>Format Group</td>
</tr>
<tr>
<td>$D4/$00</td>
<td>Dummy Table Insert Function</td>
</tr>
<tr>
<td>$D4/$01</td>
<td>Temporary Smart Quote Function</td>
</tr>
<tr>
<td>$D5</td>
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</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>$23</td>
<td>Paragraph Indent Subfunction</td>
<td>108</td>
</tr>
<tr>
<td>$24</td>
<td>Temp Margin Adjustment Subfunction</td>
<td>109</td>
</tr>
<tr>
<td>$25</td>
<td>Line Indent Subfunction</td>
<td>109</td>
</tr>
<tr>
<td>$26</td>
<td>Border Ascent Subfunction</td>
<td>109</td>
</tr>
<tr>
<td>$27</td>
<td>Beginning of Line Subfunction</td>
<td>109</td>
</tr>
<tr>
<td>$28</td>
<td>Begin of Line Characters Subfunction</td>
<td>110</td>
</tr>
<tr>
<td>$DE</td>
<td>Merge Group</td>
<td>113</td>
</tr>
<tr>
<td>$DE/$00</td>
<td>Merge Code Function</td>
<td>113</td>
</tr>
<tr>
<td>$DE/$01</td>
<td>Output Merge Message</td>
<td>114</td>
</tr>
<tr>
<td>$DF</td>
<td>Border Group</td>
<td>115</td>
</tr>
<tr>
<td>$DF/$00</td>
<td>Set Character Border On/Off</td>
<td>115</td>
</tr>
<tr>
<td>$DF/$01</td>
<td>Set Paragraph Border On/Off</td>
<td>117</td>
</tr>
<tr>
<td>$DF/$02</td>
<td>Set Column Border On/Off</td>
<td>117</td>
</tr>
<tr>
<td>$DF/$03</td>
<td>Set Page Border On/Off</td>
<td>117</td>
</tr>
<tr>
<td>$DF/$04</td>
<td>Set Figure Box Border On/Off</td>
<td>117</td>
</tr>
<tr>
<td>$DF/$05</td>
<td>Set Table Box Border On/Off</td>
<td>117</td>
</tr>
<tr>
<td>$DF/$06</td>
<td>Set Text Box Border On/Off</td>
<td>118</td>
</tr>
<tr>
<td>$DF/$07</td>
<td>Set User Box Border On/Off</td>
<td>118</td>
</tr>
<tr>
<td>$DF/$08</td>
<td>Set Equation Box Border On/Off</td>
<td>118</td>
</tr>
<tr>
<td>$E0</td>
<td>Subtitle Group</td>
<td>119</td>
</tr>
<tr>
<td>$E0/$00</td>
<td>Subtitle Function</td>
<td>119</td>
</tr>
<tr>
<td>$E0/$01</td>
<td>Set Subtitle Font</td>
<td>119</td>
</tr>
<tr>
<td>$E0/$02</td>
<td>Set Subtitle Size</td>
<td>119</td>
</tr>
<tr>
<td>$E0/$03</td>
<td>Set Subtitle Face Style</td>
<td>120</td>
</tr>
<tr>
<td>$E0/$04</td>
<td>Set Subtitle Position</td>
<td>120</td>
</tr>
<tr>
<td>$E1</td>
<td>Edition Group</td>
<td>121</td>
</tr>
<tr>
<td>$E1/$00</td>
<td>Publish On - Start of Published Text</td>
<td>121</td>
</tr>
<tr>
<td>$E1/$01</td>
<td>Publish Off - End of Published Text</td>
<td>121</td>
</tr>
<tr>
<td>$E1/$02</td>
<td>Subscribe On - Start of Subscribed Text</td>
<td>122</td>
</tr>
<tr>
<td>$E1/$03</td>
<td>Subscribe Off - End of Subscribed Text</td>
<td>124</td>
</tr>
<tr>
<td>$E2</td>
<td>Tables Group</td>
<td>125</td>
</tr>
<tr>
<td>$E2/$01</td>
<td>Table Function</td>
<td>126</td>
</tr>
<tr>
<td>$E2/$02</td>
<td>Set Table Cell Span</td>
<td>128</td>
</tr>
<tr>
<td>$E2/$03</td>
<td>Set Table Cell Top Line</td>
<td>129</td>
</tr>
<tr>
<td>$E2/$04</td>
<td>Set Table Cell Left Line</td>
<td>129</td>
</tr>
<tr>
<td>$E2/$05</td>
<td>Set Table Cell Bottom Line</td>
<td>129</td>
</tr>
<tr>
<td>$E2/$06</td>
<td>Set Table Cell Right Line</td>
<td>129</td>
</tr>
<tr>
<td>$E2/$07</td>
<td>Set Table Cell Top Line Color</td>
<td>130</td>
</tr>
<tr>
<td>$E2/$08</td>
<td>Set Table Cell Left Line Color</td>
<td>130</td>
</tr>
<tr>
<td>$E2/$09</td>
<td>Set Table Cell Bottom Line Color</td>
<td>130</td>
</tr>
<tr>
<td>$E2/$0A</td>
<td>Set Table Cell Right Line Color</td>
<td>130</td>
</tr>
<tr>
<td>$E2/$0B</td>
<td>Set Table Cell Fill Color/Pattern</td>
<td>131</td>
</tr>
<tr>
<td>$E2/$0D</td>
<td>Set Table Cell Vertical Alignment</td>
<td>132</td>
</tr>
<tr>
<td>$E2/$0E</td>
<td>Set Table Cell Mode</td>
<td>132</td>
</tr>
<tr>
<td>$E2/$0F</td>
<td>Set Table Row Mode</td>
<td>133</td>
</tr>
<tr>
<td>$E3</td>
<td>Math Group</td>
<td>134</td>
</tr>
<tr>
<td>$E3/$00</td>
<td>Insert Math Formula Result</td>
<td>135</td>
</tr>
<tr>
<td>$E3/$01</td>
<td>Insert Math Sub-Total Result</td>
<td>136</td>
</tr>
<tr>
<td>$E3/$02</td>
<td>Insert Math Total Result</td>
<td>136</td>
</tr>
<tr>
<td>$E3/$03</td>
<td>Insert Math Grand Total Result</td>
<td>137</td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>$E3/$04 = Define Math Number Format</td>
<td>137</td>
<td></td>
</tr>
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<td>INDEX</td>
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<td></td>
</tr>
</tbody>
</table>
INTRODUCTION

A WordPerfect 4.0 file consists of a WordPerfect header immediately followed by the WordPerfect document. All data associated with a WordPerfect file are stored in the data fork of a Macintosh file.

The WordPerfect header consists of the WordPerfect prefix and the embedded Macintosh resource fork. The WordPerfect document consists of ASCII text with embedded function codes.

The creator type of 3.0/4.0 files is ‘WPC2’ and the file type is ‘WPD2.’ Other associated WordPerfect files that share the same creator type (WPC2) include libraries (WPLB), stationary files (sPD2), temporaries (WPTV), backups (WPBK), help (WP??), and defaults (WPDF). 4.0/3.0 dictionary (DICT) and thesaurus (THES) files have type ‘WPCU’ as their creator.

WordPerfect Prefix

The WordPerfect prefix is defined as follows:

| 4 bytes | File ID |
| 4 bytes | Double word pointer to WP document |
| 1 byte  | Product code |
| 1 byte  | File type |
| 1 byte  | Major version |
| 1 byte  | Minor version |
| 2 bytes | Encryption key |
| 2 bytes | Reserved |

The WordPerfect products code is:

```
pfwp  equ  1  ;WordPerfect
```

WordPerfect file types are assigned as follows:

```
pfmac  equ  1  ;macro file
```

---

1 The 32-bit pointer to the WP document is stored in Intel order (i.e. both bytes and words are swapped from regular Macintosh storage order.)
WordPerfect 4.0 for Macintosh
File Format Manual

pfhelp equ 2 ;help file
pfkbd equ 3 ;keyboard definition file
pfwpdoc equ 10 ;wordperfect document
pfwpdct equ 11 ;dictionary - wordlist
pfwpth equ 12 ;thesaurus
pfwpmd2 equ 44 ;MAC WP 2.0 document
pfwp42d equ 45 ;WP 4.2 document
pfwpspx equ 46 ;spell code module - created external to WP Corp
pfwpdsx equ 47 ;spell dictionary - created external to WP Corp
pfwpsft equ 48 ;MAC Soft (graphics format)

Embedded Macintosh Resource Fork

The Embedded Macintosh Resource Fork is defined as follows:

Resource Header

<table>
<thead>
<tr>
<th>Offset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 bytes</td>
<td>Offset from beginning of resource block to data</td>
</tr>
<tr>
<td>4 bytes</td>
<td>Offset from beginning of resource block to map</td>
</tr>
<tr>
<td>4 bytes</td>
<td>Length of resource data</td>
</tr>
<tr>
<td>4 bytes</td>
<td>Length of resource map</td>
</tr>
</tbody>
</table>

Note: All offsets and lengths in the resource block are given in bytes.

This is what immediately follows the resource header:

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>Reserved for system use</td>
</tr>
<tr>
<td>128</td>
<td>Available for application data</td>
</tr>
</tbody>
</table>

The resource data follows the space reserved for the application data. It consists of the following for each resource in the resource block:

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 bytes</td>
<td>Length of following resource data</td>
</tr>
<tr>
<td>n bytes</td>
<td>Resource data for this resource</td>
</tr>
</tbody>
</table>

After the resource data, the resource map begins as follows:

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 bytes</td>
<td>0 (reserved for copy of resource header)</td>
</tr>
<tr>
<td>4 bytes</td>
<td>0 (reserved for handle to next resource map to be searched)</td>
</tr>
<tr>
<td>2 bytes</td>
<td>0 (reserved for file reference number)</td>
</tr>
<tr>
<td>2 bytes</td>
<td>Resource file attributes</td>
</tr>
<tr>
<td>2 bytes</td>
<td>Offset from beginning of resource map to type list (see below)</td>
</tr>
<tr>
<td>2 bytes</td>
<td>Offset from beginning of resource map to resource name list</td>
</tr>
</tbody>
</table>

After reading the resource map into memory, the Resource Manager stores the indicated information in the reserved areas at the beginning of the map.
The resource map continues with a type list, reference lists, and a resource name list. The type list contains the following:

- 2 bytes Number of resource types in the map minus 1
- For each type:
  - 4 bytes Resource type
  - 2 bytes Number of resources of this type in the map minus 1
  - 2 bytes Offset from beginning of type list to reference list for resources of this type

This is followed by the reference list for each type of resource, which contains a resource reference for each resource of that type. The reference lists are contiguous and in the same order as the types in the type list. The format of a reference list is as follows:

- For each reference of this type:
  - 2 bytes Resource ID
  - 2 bytes Offset from beginning of resource name list to length of resource name, or -1 if none
  - 1 byte Resource attributes
  - 3 bytes Offset from beginning of resource data to length of data for this resource
  - 4 bytes 0 (reserved for handle to resource)

The resource name list follows the reference list and has this format:

- For each name:
  - 1 byte Length of following resource name
  - n bytes Character of resource name

The embedded resource fork consists of such resources as printer job (PJob), printer definition (PtPt), and page setup (PSet). It may also contain macros (Wmac), temporary styles (TStl), styles (Styl), pictures (WBOX, Pict), overlays (WBFN), window definition (WDat), font maps (FNTD) and keyboards (WPkg, WPkr, WPkt, WPkx).
The following figure shows where the various offsets lead to in a resource file, in general and also specifically for a resource reference:
WordPerfect Document

Document formatting is accomplished by embedding function codes in the ASCII text of a document. A WordPerfect function begins and ends with a negative byte (greater than $7F$). All function codes listed below are represented as base-16 (hexadecimal) numbers. Angle brackets (‘<’ and ‘>’) enclose internal byte values. Likewise, brackets (‘[’ and ‘]’) enclose 16 bit words and braces (‘{’ and ‘}’) enclose 32 bit long words. These delimiters are not actually a part of the function codes. Unless otherwise indicated, all 16 bit words are signed integer values. Likewise, unless otherwise specified, all 32 bit long words are signed fixed point numbers where the upper 16 bits is the integer part and the lower 16 bits is the fractional part.

Individual bits are specified by a bit number beginning with the left or most significant bit. The range is from 0 to 7 with bit 7 being the most significant. Formatter supplied values are indicated with the ‘†’ symbol.

### Single Byte Functions

Single byte functions range from $80$ through $B{F}$. They may or may not be paired and may change depending upon their function in the file.

### Fixed Length Multi-byte Functions

The codes for fixed length multi-byte functions ($C{0}$ through $C{F}$) always appear twice - the first occurrence is the "open gate," and a second occurrence is the "closing gate." The length of each function is fixed and listed after the function code. The length listed for this class of functions is the length of the entire function.

### Variable Length Multi-byte Functions

The codes for variable length multi-byte functions ($D{0}$ through $E{F}$) also appear twice - the first occurrence is the function group and is referred to as the "open gate," and a second occurrence is the "closing gate." In addition, each open gate is followed by a sub-group byte and a length word (16 bits). Each closing gate is preceded by the same sub-group byte and a length word. The length of each function when fixed is listed after the function code. The length for this class of functions is the number of bytes following the length word in the function to the end of the function i.e. the length of the entire function minus four.

### Function Orientation

Functions are placed in a document according to the orientation. A “character” orientation means that the function can be inserted anywhere within the document. A
“paragraph” oriented function must be inserted at the beginning of a paragraph. Likewise, “Cell”, “Table”, “Column”, “Page”, and “Document” orientations specify where particular functions need to be inserted. With the exception of “character” orientation, all other functions need to be inserted within paragraph gates ($AA$ and $AB$) as well.
Single Byte Functions

Single Byte Functions are single bytes encountered in a WordPerfect document that range from $80 to $BF. They may represent special characters, mode changes, markers or shortened forms of larger multi-byte functions. Single byte functions are self contained and represent both the start and end gates. There is no associated ‘old’ value and hence are not used in functions with revert operations such as paired styles.

Functions $80-$8F are reserved for condensed output and are converted by WP to their corresponding multi-byte function when the file is formatted.

<table>
<thead>
<tr>
<th>Single Byte Function</th>
<th>Converted Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>$80 = Condensed Hard Return</td>
<td>TempHardReturn_ Converted to Hard Return ($DC/$02)</td>
</tr>
<tr>
<td>$81 = Condensed Hard Page</td>
<td>TempHardPage_ Converted to Hard Page ($DC/$07)</td>
</tr>
<tr>
<td>$82 = Condensed Tab</td>
<td>TempTab_ Converted to Tab ($C1/$00)</td>
</tr>
<tr>
<td>$83 = Condensed Back Tab</td>
<td>TempBackTab_ Converted to Back Tab ($C1/$03)</td>
</tr>
<tr>
<td>$84 = Condensed Indent</td>
<td>TempIndent_ Converted to Indent ($C2/$00)</td>
</tr>
<tr>
<td>$85 = Condensed L/R Indent</td>
<td>TempLeftRightIndent_ Converted to L/R Indent ($C2/$01)</td>
</tr>
<tr>
<td>$86 = Reserved</td>
<td></td>
</tr>
<tr>
<td>$87 = Reserved</td>
<td></td>
</tr>
<tr>
<td>$88 = Reserved</td>
<td></td>
</tr>
<tr>
<td>$89 = Reserved</td>
<td></td>
</tr>
</tbody>
</table>

Functions $8A-$8F are reserved for the Text Services Manager (TSM).

<table>
<thead>
<tr>
<th>Single Byte Function</th>
<th>Converted Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>$8A = Highlite Off</td>
<td>Highlite0_</td>
</tr>
<tr>
<td>$8B = Cursor Position</td>
<td>Highlite1_</td>
</tr>
<tr>
<td>$8C = Raw Text Range</td>
<td>Highlite2_</td>
</tr>
<tr>
<td>$8D = Selected Raw Text Range</td>
<td>Highlite3_</td>
</tr>
<tr>
<td>$8E = Converted Text Range</td>
<td>Highlite4_</td>
</tr>
<tr>
<td>$8F = Select Converted Text Range</td>
<td>Highlite5_</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Single Byte Function</th>
<th>Converted Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>$90 = End of Bookmark</td>
<td>EndBookMark_</td>
</tr>
<tr>
<td>$91 = End of Hyperlink Text</td>
<td>EndHyperText_</td>
</tr>
<tr>
<td>$92 = Turn Display Off</td>
<td>DisplayOff_</td>
</tr>
<tr>
<td>$93 = Turn Display On</td>
<td>DisplayOn_</td>
</tr>
<tr>
<td>$94 = End Center/Align</td>
<td>EndCenAlign_</td>
</tr>
<tr>
<td>$95 = Begin Character Substitution</td>
<td>CharSub_  CharSub_ function terminates the display of a line. Any end-of-line characters would then be displayed.</td>
</tr>
</tbody>
</table>

Functions $96-$99 are soft end-of-line functions not at end-of-line. Corresponding multi-byte functions are found in the End-Of-Line group.

<table>
<thead>
<tr>
<th>Single Byte Function</th>
<th>Converted Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>$96 = Hard Hyphen In Line</td>
<td>HardHyph_                              User inserted wrapable</td>
</tr>
<tr>
<td>$97 = Soft Hyphen In Line</td>
<td>SoftHyph_                              User inserted warp point</td>
</tr>
<tr>
<td>$98 = Auto Hyphen In Line</td>
<td>AutoHyph_                              Auto hyphenator inserted</td>
</tr>
</tbody>
</table>
$99 = \text{Reserved}

$9A = \text{Cancel Hyphenation of Word} \quad \text{WordHyphOff}_\text{\_}

WordHyphOff\_\_ is placed at the beginning of a word by the hyphenator when the CANCEL option is selected. The word will subsequently not be hyphenated.

$9B = \text{Reserved}

$9C = \text{Box Number} \quad \text{TempBoxNumber}_\text{\_}

Converted to ($D8$/04)

$9D = \text{Chapter Number} \quad \text{TempChapterNumber}_\text{\_}

Converted to ($D8$/05)

Functions $9E$ and $9F$ temporarily hide functions in formatted portions of a document. When encountered in unformatted areas, they are deleted and essential ‘unhide’ the encased functions. They are used to hide functions at the end of a table cell that don’t fit in the cell due to fixed cell height or cell spanning a full page.

$9E = \text{Hide Functions ON} \quad \text{HideOn}_\text{\_}

$9F = \text{Hide Functions OFF} \quad \text{HideOff}_\text{\_}

$A0 = \text{Hard space} \quad \text{HardSpace}_\text{\_}

Non-wrap space

$A1 = \text{Page Number} \quad \text{TempPageNumber}_\text{\_}

Converted to ($D8$/06)

$A2 = \text{Footnote Number} \quad \text{TempFootnoteNumber}_\text{\_}

Converted to ($D8$/07)

$A3 = \text{Table of Contents Placeholder} \quad \text{TocPageNum}_\text{\_}

For internal use only.

$A4 = \text{Endnote Number} \quad \text{TempEndnoteNumber}_\text{\_}

Converted to ($D8$/08)

$A5 = \text{Start of Subtitle Text} \quad \text{SubtitleMark}_\text{\_}

For internal use only.

$A6 = \text{End of Centered/Aligned Text} \quad \text{EndAlign}_\text{\_}

$A7 = \text{End of Generated Text} \quad \text{EndGenText}_\text{\_}

For internal use only.

$A8 = \text{Center Page Top to Bottom} \quad \text{CenterPage}_\text{\_}

(Page Oriented)

Functions $A9$ encase functions that remain valid only in formatted portions of a document. If an unformatted Start Table Header is encountered by the formatter, the encasing functions and all functions in between them are deleted.

$AA = \text{Beginning of Paragraph ON} \quad \text{ParFuncON}_\text{\_}

$AB = \text{Beginning of Paragraph OFF} \quad \text{ParFuncOFF}_\text{\_}

Functions $AC$ and $AD$ encase functions that can appear anywhere on a line but must remain together (i.e. a footnote style must remain with the footnote.)

$AC = \text{Begin Encased Grouping} \quad \text{EncaseOn}_\text{\_}

$AD = \text{End Encased Grouping} \quad \text{EncaseOff}_\text{\_}
WordPerfect 4.0 for Macintosh
File Format Manual

$AE = Start Table Header
$AF = End Table Header
$B0 = Turn Widow/Orphan On
$B1 = Turn Widow/Orphan Off

Functions $B2 and $B3 are temporary functions placed in the text to signal the display processor to highlight text.

$B2 = Block ON
$B3 = Block OFF

Functions $B4 and $B5 allow the display processor to keep text selected even when scrolled off the screen.

$B4 = Turn Hyphenation On
$B5 = Turn Hyphenation Off

Functions $B6 and $B7 allow the display processor to keep text selected even when scrolled off the screen.

$B6 = Reverse Video ON
$B7 = Reverse Video OFF

Functions $B8-$BE are reserved for internal markers and reference points.

$B8 = Generate Marker #1
$B9 = Generate Marker #2
$BA = Search Marker #1
$BB = Search Marker #2
$BC = Format to EOL/EOP/EOC
$BD = Misc Formatter Marker
$BE = Reformat Line Marker

$BF = No Operation

$BF = No Operation

NOOP_ is always deleted by WordPerfect if encountered in unformatted text.

Corel Corp. Confidential
January 4, 2011
Fixed Length Multi-byte Functions

Function: **$C0**

Name: ExtendedChar_

Length: 5

**$C0 = Extended Character**

<\$C0> <Mac character>†

<WP character set #>

<Character>

<\$C0>

<Mac character> = Displayed Mac character.

<WP character set #> <Character> = WordPerfect character.

The WordPerfect character (<WP character set #> <Character>) is used to generate the displayed Mac character (<Mac character>) whenever possible. When this not possible due to an unknown Mac character or because of conversions, then an attempt is made to generate a new <WP character set #> <Character> from the <Mac character>.

To convert a WordPerfect character to a Macintosh character, use the following format:

<\$C0> <\$00>

<WP character set # from WP 5.1>

<Character from WP 5.1>

<\$C0>

To convert a Macintosh character to a WordPerfect character, if the character is an ASCII character no conversion is necessary, otherwise <5.1 character set #> and <Character Code> are set to <WP character set #> and <Character> from WP 2.1 for Mac i.e.

<\$C0> <\$00>

<Character from WP 2.1 Mac>

<WP character set # from WP 2.1 Mac>

<\$C0>

When converting to WordPerfect 5.1 and <WP character set #> is negative then <5.1 character set #> should be set to <\$C0> indicating the character can’t be mapped i.e.

<\$C0> <\$00>

<Character from WP 2.1 Mac>

<\$C0>

<\$C0>
Note: When in a symbol font, all characters are converted to extended characters with the exception of a space. In non-symbol fonts, characters in the normal character range ($20-$7F) are taken out of extended character gates and stored as regular single byte characters.

Function: $C1
    Name: HorzMove_
    Length: 8

$C1/$00 = Tab
$C1/$01 = Center
$C1/$02 = Flush Right
$C1/$03 = Back Tab
$C1/$04 = Character Kerning
$C1/$05 = Tab w/Vertical Line
$C1/$06 = Fixed Tab

<Def>
    <Mode/Type†>
        (Horizontal Adjustment†)
    </Def>

<Def> =
    0 = Tab
    1 = Center
    2 = Flush Right
    3 = Back Tab
    4 = Character Kerning
    5 = Tab w/Vertical Line
    6 = Fixed Tab

<Mode/Type> =
    (msb) 7 = Always 0
    6
    5
    4
    3
    2
    1
    (lsb) 0

Mode = 0 = No leader
    1 = Leader #1 (dots & spaces)
    2 = Leader #2 (dots)
    3 = Leader #3 (dashes & spaces)
    4 = Leader #4 (underline)
    5 = Leader #5
    6 = Leader #6
    7 = Leader #7
Type = 0 = Normal tab
1 = Centered tab
2 = Right justified tab
3 = Character aligned tab
4 = Bar (Vertical line)

\{Horizontal Adjustment\} = Fixed point adjustment to current cursor position.

**Tab**

For \(<\text{Def}> = 0\), formatter supplies \(<\text{Mode/Type}>\) and \{Horizontal Adjustment\}.

\[
\begin{align*}
\text{Type} &= \text{Formatted supplied.} \\
\text{Mode} &= \text{Formatted supplied.} \\
\{\text{Horizontal Adjustment}\} &= \text{Formatted supplied.}
\end{align*}
\]

**Center**

**Flush Right**

**Back Tab**

For \(<\text{Def}> = 1, 2, \text{or} 3\), Type is undefined, user supplies Mode, and formatter supplies the \{Horizontal Adjustment\}.

\[
\begin{align*}
\text{Type} &= \text{Undefined.} \\
\text{Mode} &= \text{User supplied.} \\
\{\text{Horizontal Adjustment}\} &= \text{Formatter supplied.}
\end{align*}
\]

**Character Kerning**

For \(<\text{Def}> = 4\), Type is undefined and the user supplies Mode and \{Horizontal Adjustment\}.

\[
\begin{align*}
\text{Type} &= \text{Undefined.} \\
\text{Mode} &= \text{User supplied.} \\
\{\text{Horizontal Adjustment}\} &= \text{User supplied.}
\end{align*}
\]

**Tab w/Vertical Line**

For \(<\text{Def}> = 5\), user supplies \(<\text{Mode/Type}>\) and \{Horizontal Adjustment\}. The following Types are defined:

\[
\begin{align*}
\text{Type} &= \text{Top of line} \\
0 &= \text{Middle of line} \\
1 &= \text{Bottom of line} \\
2 &= \text{Bottom of line}
\end{align*}
\]
Mode = User supplied.
(Horizontal Adjustment) = User supplied.

**Fixed Tab**

For \(<\text{Def}\> = 6\), user supplies \(<\text{Mode/Type}\>\) and formatter supplies the \(\text{Horizontal Adjustment}\).

Type = User supplied.
Mode = User supplied.
(Horizontal Adjustment) = Formatter supplied.

---

**Function:** \(\$C2\)

**Name:** Indent_

**Length:** 7

\(\$C2/\$00 = \text{Left Indent}\)

\(\$C2/\$01 = \text{Left/Right Indent}\)

\(<\$C2>\)  
\(<\text{Def}\>\)  
\(\text{(Margin Adjustment}^{†}\)  
\(<\$C2>\)

\(<\text{Def}\> = \)  
0 = Indent  
1 = Left/right indent

\(\text{(Margin Adjustment)} = \)  
Formatter supplied fixed point adjustment to current margin(s).
Function: $C3
Name: AttributeOnOff_
Length: 4

$C3 = Attribute ON/OFF

<$C3> < Attribute >
< $C3 >

<Attribute> =
0 = Bold 16 = Small print
1 = Italics 17 = Fine print
2 = Underline 18 = Small caps
3 = Outline 19 = Reserved
4 = Shadow 20 = Reserved
5 = Reserved 21 = Reserved
6 = Reserved 22 = Reserved
7 = Reserved 23 = Reserved
8 = Red line 24 = Reserved
9 = Strike out 25 = Reserved
10 = Subscript 26 = Reserved
11 = Superscript 27 = Reserved
12 = Double underline 28 = Reserved
13 = Extra large print 29 = Misspelled
14 = Very large print 30 =
15 = Large print 31 =

<State> =
(msb) 7 = Old value (0=Off, 1=On)
6 =
5 =
4 =
3 =
2 =
1 =
(lsb) 0 = New value (0=Off, 1=On)

Note: The <Attribute> is used as an index to the corresponding bit in the formatter status variable.

If the Attribute ON/OFF function is immediately followed by another Attribute ON/OFF function for the same attribute or the old value equals the new value, then the function is deleted by the formatter.
Function: $C4
Name: EmphasisChar_
Length: 4

$C4 = Emphasis Character

$ascii\ code$
$reserved$
$ascii\ code = Ascii\ character\ to\ display\ with\ emphasis

Function: $C5
Name: BlockProtect_
Length: 7

$C5/$00 = Block Protect ON
$C5/$01 = Block Protect OFF

$Def$
{Page position†}

$Def = (msb) 7 = Old\ block\ protect\ state
6 =
5 =
4 =
3 =
2 =
1 =
(lsb) 0 = 0=Block Protect On, 1=Block Protect Off

{Page position} = Fixed point vertical page position of start of protected block.

Function: $C6
Name: EndIndent_
Length: 10

$C6 = End of Indent

$Def = (Old\ temp\ left\ margin†)$
(Old\ temp\ right\ margin†)

The End-of-Indent function is written by the forward formatter and used to recover temporary margins during back formatting.

For internal use only. This function should not be inserted when creating WordPerfect documents.
<table>
<thead>
<tr>
<th>Function: $C7</th>
<th>Reserved.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Length: 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $C8</th>
<th>$C8 = Double Byte Script Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: SMDblByteChar_</td>
<td></td>
</tr>
<tr>
<td>Length: 4</td>
<td><code>&lt;$C8&gt;[Character]</code></td>
</tr>
<tr>
<td></td>
<td><code>&lt;$C8&gt;</code></td>
</tr>
<tr>
<td></td>
<td>[Character] = Double byte Macintosh script character.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $C9</th>
<th>Reserved.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Length: 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $CA</th>
<th>Reserved.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Length: 6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $CB</th>
<th>Reserved.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Length: 6</td>
<td></td>
</tr>
</tbody>
</table>
Function: $CC
Name: TempMarker_
Length: 7

$CC = Temp Formatter Marker

<$CC> <Mark index>
(Temp mark counter†)
<$CC>

<Mark index> =

0 = SelectMark_ 26 = InlineMark2_
1 = VirtualMark_ 27 = InlineMark3_
2 = SearchMark_ 28 = RummageMark1_
3 = NoteMark_ 29 = RummageMark2_
4 = NoteMark_ 30 = RummageMark3_
5 = BegWordMark_ 31 = HyphEntryMark1_
6 = EndWordMark_ 32 = HyphEntryMark2_
7 = PrintMark_ 33 = HyphEntryMark3_
8 = PrintPreviewMark_ 34 = HyphEntryMark4_
9 = SaveStyleMark1_ 35 = HyphEntryMark5_
10 = SaveStyleMark2_ 36 = GrammarBegin_
11 = AutoFormatMark_ 37 = GrammarEnd_
12 = DisplayMark_ 38 = GrammarSubDoc_
13 = EndnoteMark_ 39 = GrammarSentence_
14 = HyphMark_ 40 = DragDropMark1_
15 = EditionMark_ 41 = DragDropMark2_
16 = SubSelMark_ 42 = DragDropMark3_
17 = WordDelimMark_ 43 = DragDropMark4_
18 = FunctionInsertionMark_ 44 = FirstHyperLinkMark_
19 = AEBeginMark_ 45 = LastHyperLinkMark_
20 = AEEndMark_ 46 = BookMark1_
21 = AEBeginMark_ 47 = SpellMark_
22 =
23 = AEEndMark_
24 =
25 = InlineMark1_

For internal use only. This function should not be inserted when creating WordPerfect documents.
Function: $CD
  Name: Undo_
  Length: 9

$CD/$00 = Start of Invalid Text
$CD/$01 = End of Invalid Text
$CD/$02 = Start of Valid Text
$CD/$03 = End of Valid Text

<$CD> <Def>
  [Count]
  {Document stamp †}
</$CD>

<Def> =
  0 = Start of invalid text
  1 = End of invalid text
  2 = Start of valid text
  3 = End valid text

[Count] =
  Current level of Undo

{Document stamp} =
  Time stamp of when document was opened.
  If this value does not match current time
  stamp, the function (and bracketed data for
  invalid gates) are deleted.

Text and function codes between a start of invalid text function
and an end of invalid function of a given level and document stamp
should be ignored i.e.

<$CD>$<00>[Count]{Document stamp}$<CD>$
  …text and function codes to be ignored…
<$CD>$<01>[Count]{Document stamp}$<CD>$

Where [Count] & {Document stamp} are equal in both Undo_ functionso

Function: $CE
  Name: LineSpace_
  Length: 7

$CE/$00 = Temp Character Space Function
$CE/$01 = Temp Space-Extra Function
$CE/$FF = Temp Char-Extra Function

<$CE> <Def>
  {Space/Space-extra/Char-extra}
</$CE>

<Def> =
  0 {Space/Space-extra/Char-extra} is line space.
  1 {Space/Space-extra/Char-extra} is Space-extra.
  -1 {Space/Space-extra/Char-extra} is Char-extra.
Function: $CF
Name: Marker_
Length: 4

$CF = Formatter Marker

<$CF>[Mark counter†]
<$CF>

For internal use only. This function should not be inserted when creating WordPerfect documents.
Variable Length Multi-byte Functions

$D0 = Page Format Group

Function: $D0/$00
   Name: FixedLnHeight_
   Length: 12
   Orientation: Paragraph

$D0/$00 = Set Line Size
   <$D0><$00>[Length] (Old line size†)
   (New line size)
   <PC stuff…>

[Length]<$00><$D0>

{Line size} = 0 = Auto line size
Otherwise, set line size to fixed point value.

Note: If the Set Line Size function is immediately followed by another Set Line Size function or the old values equal the new values, then the function is deleted by the formatter.
Function: $D0/$01
Name: HorzMarginSet_
Length: 20
Orientation: Paragraph

$D0/$01 = Set Horizontal Margins

<$D0><$01>[Length]
(Old left margin†)
(Old right margin†)
(New left margin)
(New right margin)
<PC stuff…>

[Length]<$01><$D0>

(left margin) =
Distance from left edge of paper to text. If
(left margin) = $80000000, then the current
left margin is substituted in the function.

(right margin) =
Distance from right edge of paper to text. If
(right margin) = $80000000, then the current
right margin is substituted in the function.

Note: Parameters are pixel values expressed as fixed point long
words.

Absolute right margin = Page width - (right margin).

If the Horizontal Margin Set function is immediately
followed by another Horizontal Margin Set function or the
old values equal the new values, then the function is deleted
by the formatter.

Function: $D0/$02
Name: SpacingSet_
Length: 12
Orientation: Paragraph

$D0/$02 = Set Line Spacing

<$D0><$02>[Length]
(Old spacing†)
(New spacing)
<PC stuff…>

[Length]<$02><$D0>

(Spacing) =
Value used to calculate vertical line spacing.
Distance from line to line = (spacing) *
(linesize).

Note: (Linesize) is set with the $D0/$00 function. For auto line
spacing linesize is the greatest font size on the line plus
leading, and for fixed line spacing it is the fixed line spacing
value.

If the Spacing Set function is immediately followed by
another Spacing Set function or the old value equals the new
value, then the function is deleted by the formatter.

---

Function: $D0/$03
Name: HotZoneSet_
Length: 20
Orientation: Paragraph

$D0/$03 = Set Hyphenation Zone (Hotzone)

<$D0><$03>[Length]
{Old left hzone†}
{Old right hzone†}
{New left hzone}
{New right hzone}
<PC stuff...>

[Length]<$03><$D0>

{Left hzone} = Distance left from right margin where formatter begins looking for a place to break a word down to next line.

{Right hzone} = Distance right of right margin where formatter limits the length of a line. Only has affect in full justified modes.

Note: Parameters are pixel values expressed as fixed point long words.

If the Set Hyphenation Zone function is immediately followed by another Set Hyphenation Zone function or the old values equal the new values, then the function is deleted by the formatter.

---

Function: $D0/$04
Name: TabSet_
Length: Variable
Orientation: Paragraph

$D0/$04 = Set Tabs

<$D0><$04>[Length]
{Old def}
{Old condensed tab table...†}
<$FF>
{New def}
{New condensed tab table...}
<$FF>

[Length]<$04><$D0>

<def> = (msb)

7 =
6 =
5 =
4 =
3 =
2 =
1 =
(lsb)  0 = 0=absolute, 1=relative

The condensed tab table consists of a series of entities, each 5 bytes in length, and terminated by a single <$FF> byte. Each entry is either an individual tab entry (Type 1) or a difference tab entry (Type 2). The old and new tab tables follow the same format.

A type 1 or individual tab entry specifies a single tab point. The tab mode/type is always positive and the tab point is a fixed point number.

\[
\begin{array}{c|c}
<\text{Mode/Type}> & \text{Type 1} \\
\hline
\text{(Tab point)} & \text{Fixed point #}
\end{array}
\]

A type 2 or difference tab entry specifies multiple tabs that are equally spaced from the last tab. They all have the same tab mode/type as the last tab. This number of tabs is negative thus differentiating a type 2 from a type 1 entry.

\[
\begin{array}{c|c}
<-\# \text{of defined tab points}> & \text{Type 2} \\
\hline
\text{(Tab difference)} & \text{Fixed point #}
\end{array}
\]

A tab mode/type is defined as follows:

\[
\begin{array}{c|c}
<\text{Mode/Type}> = (\text{msb}) & 7 = \text{Always 0} \\
& 6 \% = \text{Mode} \\
& 5 \% = \text{Type} \\
& 4 \% = \text{Type} \\
& 3 \% = \text{Type} \\
& 2 \% = \text{Type} \\
& 1 \% = \text{Type} \\
(\text{lsb}) & 0 \% = \text{Type}
\end{array}
\]

\text{Mode} = 0 = \text{No leader}
1 = Leader #1 (dots & spaces)
2 = Leader #2 (dots)
3 = Leader #3 (dashes & spaces)
4 = Leader #4 (underline)
5 = Leader #5
6 = Leader #6
7 = Leader #7

\text{Type} = 0 = \text{Normal tab}
1 = Centered tab
2 = Right justified tab
3 = Character aligned tab
4 = Bar (Vertical line)

Notes:
1. A def byte of <$FF> is both a def and terminator.
2. The number of tabs is currently limited to 40 tabs.

Example:

\(<\$D0><\$04>[\$0026]\>
\(<\$01>\>
\(<\$00>\>\{\$FFB8000000\}\>
\(<\$E6>\>\{\$0024000000\}\>
\(<\$FF>\>
\(<\$01>\>
\(<\$00>\>\{\$0024000000\}\>
\(<\$23>\>\{\$0048000000\}\>
\(<\$00>\>\{\$006D000000\}\>
\(<\$DB>\>\{\$0012000000\}\>
\(<\$FF>\>
\>[\$0026]\><\$04><\$D0]\>

Closing gates

Note: If the Tab Set function is immediately followed by another Tab Set function, then the function is deleted by the formatter.

---

Function: $D0/$05
Name: VertMarginSet_
Length: 20
Orientation: Page

$D0/$05 = Set Vertical Margins

\(<\$D0><\$05>[\text{Length}]\>
\{\text{Old top margin} \dagger\}
\{\text{Old bottom margin} \dagger\}
\{\text{New top margin}\}
\{\text{New bottom margin}\}
\{\text{PC stuff...}\}

\[\text{Length}\]<\$05><\$D0\>

\{\text{top margin}\} = Distance from top edge of page to text. If \{\text{top margin}\} = $80000000, then the current top margin is substituted in the function.

\{\text{bottom margin}\} = Distance from bottom edge of paper to text. If \{\text{bottom margin}\} = $80000000, then the current bottom margin is substituted in the function.

Note: Parameters are pixel values expressed as fixed point long words.

Absolute bottom margin = Page height - \{\text{bottom margin}\}.

If the Vertical Margin Set function is immediately followed by another Vertical Margin Set function or the old values equal the new values, then the function is deleted by the formatter.
Function: $D0/$06
   Name: JustifyMode_
   Length: 6
Orientation: Paragraph

$D0/$06 = Set Justification Mode

<$D0><$06>[Length]  <Old mode†>
<New mode>
<PC stuff…>

[Length]<$06><$D0>

<Mode> =
  0 = Left
  1 = Center
  2 = Right
  3 = Full
  4 = All
  5 = Decimal align

Note: If the Set Justification Mode function is immediately followed by another Set Justification Mode function or the old value equals the new value, then the function is deleted by the formatter.
Function: $D0/$07
Name: SuppressPage_
Length: 8
Orientation: Page

$D0/$07 = Suppress Page

<$D0><$07>[Length]  [Old suppress code†]
[New suppress code]
<PC stuff...>

[Length]<$07><$D0>

[Suppress code] =

(msb) 
15 =
14 =
13 =
12 =
11 =
10 =
9 =
8 =
7 = Watermark B suppressed
6 = Watermark A suppressed
5 = Footer B suppressed
4 = Footer A suppressed
3 = Header B suppressed
2 = Header A suppressed
1 = Page #'s to bottom

(ls) 0 = Page #'s suppressed

Note: If the Suppress Page function is immediately followed by another Suppress Page function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D0/$08
Name: PageNumPos_
Length: 6
Orientation: Page

$D0/$08 = Set Page Number Position

<$D0><$08>[Length]  <Old position†>
<New position>
<PC stuff...>

[Length]<$08><$D0>

<Position> =
0 = None
1 = Top Left
2 = Top Center
3 = Top Right
4 = Top Left & Right
5 = Bottom Left
6 = Bottom Center
7 = Bottom Right
8 = Bottom Left & Right
Note: If the Page Number Position function is immediately followed by another Page Number Position or the old value equals the new value, then the function is deleted by the formatter.

### $\text{D0}/\text{09} = \text{Set Spacing Between Paragraphs}

**Name:** ParagraphSpacing  
**Length:** 22  
**Orientation:** Paragraph

- `<\text{D0}\text{09}>[\text{Length}]`  
- `<\text{Old def}>`  
- `{\text{Old spacing before paragraph}†}`  
- `{\text{Old spacing after paragraph}†}`  
- `<\text{New def}>`  
- `{\text{New spacing before paragraph}}`  
- `{\text{New spacing after paragraph}}`  
- `<\text{PC stuff…}>`

Note: Parameters are pixel values expressed as fixed point long words.

If the Set Spacing Between Paragraphs function is immediately followed by another Set Spacing Between Paragraphs function or the old values equal the new values, then the function is deleted by the formatter.

### $\text{D0}/\text{0A} = \text{Set Vertical Spacing Between Columns}

**Name:** ColumnSpacing  
**Length:** 12  
**Orientation:** Column

- `<\text{D0}\text{0A}>[\text{Length}]`  
- `{\text{Old spacing}†}`  
- `{\text{New spacing}}`
Function: $D0/$0B  
Reserved.

Function: $D0/$0C  
$D0/$0C = Set Indent At Beginning of Paragraph  
Name: ParagraphIndent_  
Length: 12  
Orientation: Paragraph  

<$D0><$0C>[Length]  
(Old indent†)  
(New indent)  
<PC stuff...>

[Length]<$0C><$D0>

(indent) =  
Fixed point pixel value added to current cursor position when beginning a new line preceded by a hard end of line.

Note: If the Set Indent At Beginning of Paragraph function is immediately followed by another Set Indent At Beginning of Paragraph function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D0/$0D  
$D0/$0D = Set Widow/Orphan Mode  
Name: WidowOrphanControl_  
Length: 6  
Orientation: Paragraph  

<$D0><$0D>[Length]  
<Old mode†>  
<New mode>  
<PC stuff...>

[Length]<$0D><$D0>

<New mode> =  
(msb) 7 = 6 = 5 = 4 =
3 =
2 =
1 = Enable orphan processing
(lsb) 0 = Enable widow processing

Note: If the Set Widow/Orphan Mode function is immediately followed by another Set Widow/Orphan Mode function or the old value equals the new value, then the function is deleted by the formatter.

---

Function: \$D0/$0E
Name: HyphenationControl_
Length: 6
Orientation: Paragraph

\$D0/$0E = Set Hyphenation Mode

\(<D0><0E>[Length]<Old mode†><New mode><PC stuff…>\)[Length]<0E><D0>\n
\(<New mode> = (msb) 7 = 6 = 5 = 4 = 3 = 2 = 1 = (lsb) 0 = Enable hyphenation processing\n
Note: If the Set Hyphenation Mode function is immediately followed by another Set Hyphenation Mode function or the old value equals the new value, then the function is deleted by the formatter.
$D1 = Font Group

Function: $D1/$00
Name: Color_
Length: 16
Orientation: Character

$D1/$00 = Set Text Color

<$D1><$00>[Length] [Old red color↑]
[Old green color↑]
[Old blue color↑]
[New red color]
[New green color]
[New blue color]
<PC stuff…>

[Length]<$00><$D1>

[Red color] =
[Green color] =
[Blue color] =

RGB color components are expressed as unsigned integer values. Each R, G and B can have a value from $0000 to $FFFF (or 0 to 65,535.) RGB color is additive; that is, as the value of a component is increased, the amount of that component in the total color increases. An RGB color is black if all three components are set to 0, or white if each component is set to 65,535.

Note: If the Color function is immediately followed by another Color function or the old value equals the new value, then the function is deleted by the formatter.
Function: $D1/$01
Name: FontChange_
Length: Variable
Orientation: Character

$D1/$01 = Set Text Font

<$D1><$01>[Length]

{Document stamp†}
[Old font #†]
[Old font type†]
[New font #†]
[New font type†]
<Font name…> Pascal string
<PC stuff…>

[Length]<$01><$D1>

[Font #] = Macintosh font number. Used to select new font.

[Font type] = Negative => Symbol font
Positive => Regular font

<Font name…> = Font name.

The following algorithm is used to select a new font:

IF (Document stamp) ≠ current document time THEN
BEGIN
IF <Font name…> = 0 THEN
Use [New font #] to create <Font name…>.
ENDIF

END

<Font name…> is used to create a [New font #].

ENDIF

[New font #] is used to select new font.

Note: If the Font Change function is immediately followed by another Font Change function or the old value equals the new value, then the function is deleted by the formatter.
Function: $D1/$02
Name: FontSize_
Length: 8
Orientation: Character

$D1/$02 = Set Font Size

<$D1><$02>[Length]  [Old font size†]
                [New font size]
<PC stuff…>

[Length]<$02><$D1>

[font size] = Integer value for current font size.

Note: If the Font Size Change function is immediately followed by another Font Size Change function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D1/$03
Name: Leading_
Length: 12
Orientation: Character

$D1/$03 = Set Line Leading

<$D1><$03>[Length]  {Old leading†}
                {New leading}
<PC stuff…>

[Length]<$03><$D1>

{Leading} = Fixed point leading value added to the bottom of each line. Auto leading is used if {Leading} = $8000 0000.

Note: If the Leading function is immediately followed by another Leading function or the old value equals the new value, then the function is deleted by the formatter.
Function: $D1/$04

Name: RelFontSize_

Length: 26

Orientation: Character

$D1/$04 = Define Relative Font Sizes

<$D1><$04>[Length]

<Old mode flag†>
[Old Very Small†]
[Old Small†]
[Old Large†]
[Old Very Large†]
[Old Extra Large†]

<New mode flag>
[New Very Small]
[New Small]
[New Large]
[New Very Large]
[New Extra Large]

[Length]<$04><$D1>

<Mode flag> = (msb) 7 =
6 =
5 =
4 = Extra Large (0=%, 1=point size)
3 = Very Large (0=%, 1=point size)
2 = Large (0=%, 1=point size)
1 = Small (0=%, 1=point size)
(lsbb) 0 = Very small (0=%, 1=point size)

[New Very Small] = Percent or integer point size for very small font attribute.

[New Small] = Percent or integer point size for small font attribute.

[New Large] = Percent or integer point size for large font attribute.

[New Very Large] = Percent or integer point size for very large font attribute.

[New Extra Large] = Percent or integer point size for extra large font attribute.

Note: If any of the new relative font sizes $= 8000$, then the current relative font value is substituted in the function.

If the Define Relative Font Sizes function is immediately followed by another Define Relative Font Sizes function or the old value equals the new value, then the function is deleted by the formatter.
$D2 = Definition Group

Function: $D2/$00
   Name: Reserved
   Length: Reserved
   Orientation: Reserved

Function: $D2/$01
   Name: ColumnDef_
   Length: Variable
   Orientation: Column

$D2/$01 = Set Columns ON/OFF

<$D2><$01>[Length] <Def>
   <Old def†> <Old number of columns†>
   <Old column table....†>
   <New def> <New number of columns>
   <New column table....>
   <PC stuff...>

[Length]<$01><$D2>

<Def> = 0 = Columns off (1 column)
      1 = Newspaper columns
      2 = Parallel columns
      3 = Extended columns

Note: If <Def> = 0, then there are no <Number of columns> or <Column table....> parameters.

<Number of columns> = Number of defined columns.

<Column table...> = [% size of column 1]
                   {Space between columns 1 & 2}
                   ....
                   [% size of column (n-1)]
                   {Space between columns (n-1) & n}
                   [% size of column n]

The [% size of column] numbers are binary fractions of the total text area available. Hence, the size of a column is determined by:

[% size of column] x (Space between margins - sum of space between columns)

Note: {Space between x x x x x x} are a fixed point numbers.

Temp end of columns will be inserted by the formatter to guarantee this function at the beginning of the first column.
Function: \$D2/$02  
Name: ParNumDef_  
Length: 52  
Orientation: Paragraph

$D2/$02 = Define Paragraph Numbering

<\$D2><\$02>[Length]  
<Old def #1-8†>.8  
[Old levels #1-8†].8  
<New def #1-8>  
[New level #1-8]  
<PC stuff…>

[Length]<\$02><\$D2>

This function defines paragraph numbering formats, and is typically used to define outlining styles. For instance, for traditional outlines, it would specify that the first level should be an upper case roman numeral followed by a period. A second level paragraph number is composed of an upper case letter followed by a period, etc. Paragraph numbering is limited to eight levels.

Typically there would be a paragraph numbering function at the beginning of an outline section of the document which defines the "starting state." The state is modified automatically by the formatter as paragraph numbers at various levels are inserted into the document.

<def #?> = These 8 bytes define the format of a paragraph number at the specified level. Each byte is composed of two nibbles $ps where $p is the punctuation and $s is the style. Possible values for punctuation are:

0 - None  
1 - A period following the "number"  
2 - A close paren following the "number"  
3 - The "number" is enclosed in parenthesis

Possible values for style are:

0 - Uppercase Roman numeral (I, II, III, IV, ...)  
1 - Lowercase Roman numeral (i, ii, iii, iv, ...)  
2 - Uppercase letter (A, B, C, ...)  
3 - Lowercase letter (a, b, c, ...)  
4 - Numeral (1, 2, 3, ...)  
5 - Level with period (1.1, 1.2, ...) this is
for the "legal" format

As an example, for traditional outlines the values are as follows:

<New def 1> = $10  Uppercase Roman numeral with a period following the "number"
<New def 2> = $12  Uppercase letter with a period following the "number"
<New def 3> = $14  Numeral with a period following the "number"
<New def 4> = $13  Lowercase letter with a period following the "number"
<New def 5> = $34  Numeral enclosed in parenthesis
<New def 6> = $33  Lowercase letter enclosed in parenthesis
<New def 7> = $21  Lowercase Roman numeral followed by a parenthesis
<New def 8> = $23  Lowercase Letter followed by a parenthesis

Following are the definitions for the three standard options in the Outlining Dialog of WordPerfect 3.0.

$"14 13 11 34 33 31 24 23"  Paragraph
$"10 12 14 13 34 33 21 23"  Outline (illustrated above)
$"05 05 05 05 05 05 05 05"  Legal

[level #?] = These 8 words define the paragraph number for each of the levels. To set a starting paragraph number for the first level put the value in the first word, and set all other words to zero. Typically only the first level is set, but you can set values for each level.

Note: If the Paragraph Number Definition function is immediately followed by another Paragraph Number Definition function or the old values equal the new values, then the function is deleted by the formatter.
Function: $D2/$03
Name: FtnoteOptions_
Length: Variable
Orientation: Character

$D2/$03 = Define Footnote Options

<$D2><$03>[Length]
{Old text/footnote separation†}
{Old space between footnotes†}
<Old minimum # of footnote lines†>
<Old footnote options†>
<Old footnote characters...(6 bytes)†>
{New text/footnote separation}
{New space between footnotes}
<New minimum # of footnote lines>
<New footnote options>
<New footnote characters...(6 bytes)>
<PC Stuff...>

[Length]-$03<$D2>

{text/footnote separation} = Space between bottom line of text and beginning of footnote

{space between footnotes} = Space between footnotes on the same page

<min # of footnote lines> = Minimum number of lines allowed in separating a footnote between more than one page

<footnote options> = (msb) 7 = Footnotes at bottom of page
6 = Line across page
5 = 2" footnote line
4 =
3 =
2 = Use letters
1 = Use characters

(lsb) 0 = Numbering starts on each page

<footnote characters...> = Pascal character string used to generate the footnote reference when character option is selected.
Function: $D2$/04
    Name: EndnoteOptions_
    Length: Variable
    Orientation: Character

$D2$/04 = Define Endnote Options

    <$D2>$><$03>[Length]
            (Old text/endnote separation†)
            (Old spacing between endnotes†)
            <Old minimum # of endnote lines†>
            <Old endnote options†>
            <Old endnote characters…(6 bytes)†>
            (New text/endnote separation)
            (New spacing between endnotes)
            <New minimum # of endnote lines>
            <New endnote options>
            <New endnote characters…(6 bytes)>
            <PC Stuff…>

    [Length]<$03><$D2>
    {text/endnote separation} = Space between bottom line of text and
    beginning of endnote

    {space between endnotes} = Space between endnotes on the same page

    <min # of endnote lines> = Minimum number of lines allowed in
    separating a endnote between more than one
    page

    <endnote options> =
            (msb) 7 = Endnotes at bottom of page
                  6 = Line across page
                  5 = 2" endnote line
                  4 =
                  3 =
                  2 = Use letters
                  1 = Use characters
            (lsb) 0 = Numbering starts on each page

    <endnote characters…> = Pascal character string used to generate the
    endnote reference when character option is
    selected.
Function: $D2/$05
Name: FigureBoxOptions_
Length: Variable
Orientation: Character

$D2/$05 = Define Figure Box Options

$D2/$05 = <Old number type†>
<Old caption position†>
{Old offset from paragraph†}
<New number type>
<New caption position>
{New offset from paragraph}
<PC Stuff…>

[Length]<$05><$D2>

<Number type> = 0 = Arabic
1 = Roman (Lower case)
2 = Roman (Upper case)
3 = Character

<Caption position> = (msb) 7 =
6 =
5 =
4 =
3 =
2 =
1 =
(lsb) 0 = 0 = Under, 1 = Above

{offset from paragraph} =

Note: If the Define Figure Box Options function is immediately followed by another Define Figure Box Options or the old values equal the new values, then the function is deleted by the formatter.

Function: $D2/$06
Name: TableBoxOptions_
Length: Variable
Orientation: Character

$D2/$06 = Define Table Box Options

$D2/$06 = <Same as figure box options…>
### Define User Box Options

<table>
<thead>
<tr>
<th>Function: $D2/$08</th>
<th>$D2/$08 = Define User Box Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: UserBoxOptions_</td>
<td>&lt;$D2&gt;&lt;$08&gt;[Length] &lt;Same as figure box options…&gt;</td>
</tr>
<tr>
<td>Length: Variable</td>
<td>&lt;$D2&gt;&lt;$08&gt;[Length]</td>
</tr>
<tr>
<td>Orientation: Character</td>
<td>[Length]&lt;$08&gt;&lt;$D2&gt;</td>
</tr>
</tbody>
</table>

### Define Equation Box Options

<table>
<thead>
<tr>
<th>Function: $D2/$09</th>
<th>$D2/$09 = Define Equation Box Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: EquationBoxOptions_</td>
<td>&lt;$D2&gt;&lt;$09&gt;[Length] &lt;Same as figure box options…&gt;</td>
</tr>
<tr>
<td>Length: Variable</td>
<td>&lt;$D2&gt;&lt;$09&gt;[Length]</td>
</tr>
<tr>
<td>Orientation: Character</td>
<td>[Length]&lt;$09&gt;&lt;$D2&gt;</td>
</tr>
</tbody>
</table>
Function: \texttt{$D2$/0A}  
Name: SuperSubMode_  
Length: 26  
Orientation: Character

\texttt{$D2$/0A = Define Super/Subscript Options}

\begin{verbatim}
<$D2>$0A>[Length]  
  <$D2>$0A>\texttt{[Length]} \texttt{<Old line size flag\dag>}  
  \texttt{<Old superscript mode\dag>}  
  \texttt{<Old subscript mode\dag>}  
  \texttt{[Old supUp\dag]}  
  \texttt{[Old supSize\dag]}  
  \texttt{[Old subDown\dag]}  
  \texttt{[Old subSize\dag]}  
  \texttt{<New line size flag>}  
  \texttt{<New superscript mode>}  
  \texttt{<New subscript mode>}  
  \texttt{[New supUp]}  
  \texttt{[New supSize]}  
  \texttt{[New subDown]}  
  \texttt{[New subSize]}  

<Length>$0A>$D2>  

<line size flag> = \begin{array}{l}
  (msb) 7 = \\
  6 = \\
  5 = \\
  4 = \\
  3 = \\
  2 = \\
  1 = \\
  (lsb) 0 = \text{Effect line size: } 0 = \text{No, } 1 = \text{Yes}
\end{array}

<Superscript mode> = \begin{array}{l}
  (msb) 7 = \text{Position of superscript (0=\%, 1=points)} \\
  6 = \\
  5 = \\
  4 = \\
  3 = \\
  2 = \\
  1 = \\
  (lsb) 0 = \text{Size of superscript (0=\%, 1=points)}
\end{array}

<Subscript mode> = \begin{array}{l}
  (msb) 7 = \text{Position of subscript} \\
  (0=\%, 1=points)} \\
  6 = \\
  5 = \\
  4 = \\
  3 = \\
  2 = \\
  1 = \\
  (lsb) 0 = \text{Size of subscript (0=\%, 1=points)}
\end{array}
\end{verbatim}
### Variable Length Multi-byte Functions

**$D2 = Definition Group**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$D2/$0B</strong></td>
<td><em>Define Chapter Number Style</em></td>
</tr>
<tr>
<td><strong>Name:</strong></td>
<td>ChapterNumType_</td>
</tr>
<tr>
<td><strong>Length:</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Orientation:</strong></td>
<td>Character</td>
</tr>
</tbody>
</table>

**$D2/$0B** = Define Chapter Number Style

- **<$D2><$0B>[Length]**
- **<Old style>**
- **<New style>**

**<New style>** =
- 0 = Arabic
- 1 = Roman (Lower case)
- 2 = Roman (Upper case)
- 3 = Character

**Note:** If the Chapter Number Style function is immediately followed by another Chapter Number Style or the old value equals the new value, then the function is deleted by the formatter.

---

**$D2 = Definition Group**

- **[New supUp]** = Position of superscript (% of current font or absolute position)
- **[New supSize]** = Size of superscript (% of current font or absolute position)
- **[New subDown]** = Position of subscript (% of current font or absolute position)
- **[New subSize]** = Size of subscript (% of current font or absolute position)

**Note:** If the Super/Subscript Mode function is immediately followed by another Super/Subscript Mode or the old values equal the new values, then the function is deleted by the formatter.
Function:  $D2/$0C

$D2/$0C = Set Line Numbering Font/Size/Attributes

Name: LineNumberOptions_

Length: Variable

Orientation: Character

Document stamp†

[Old attributes†]
[Old font size†]
[Old font #†]
[New attributes]
[New font size]
[New font #†]

<Font name...>  Pascal string

[Length]<$0C><$D2>

[New attributes] = (msb) 15 =
14 =
13 =
12 =
11 =
10 =
9 =
8 =
7 =
6 =
5 =
4 = Shadow
3 = Outline
2 = Underline
1 = Italics

(lsb) 0 = Bold

[New font size] = Font size for line numbers.

[New font #†] = Font number for line numbers. Derived from <Font name...> when (Document stamp) differs from current document time.

<Font name...> = Pascal string of font name.

Note: If the Line Number Options function is immediately followed by another Line Number Options or the old values equal the new values, then the function is deleted by the formatter.
Function: $D2/$0D  
$D2/$0D = Define Page Number Options

Name: PageNumberOptions

Length: Variable

Orientation: Character

<$D2><$0D>[Length] (Document stamp†)
[Old attributes†]
[Old font size†]
[Old font #†]
[New attributes]
[New font size]
[New font #†]

<Font name...> Pascal string

[Length]<$0D><$D2>

[New attributes] = (msb) 15 =
14 =
13 =
12 =
11 =
10 =
9 =
8 =
7 =
6 =
5 =
4 = Shadow
3 = Outline
2 = Underline
1 = Italics

(lsb) 0 = Bold

[New font size] = Font size for page numbers.

[New font #†] = Font number for page numbers. Derived from <Font name...> when (Document stamp)
differs from current document time.

<Font name...> = Pascal string of font name.

Note: If the Page Number Options function is immediately
followed by another Page Number Options function or the
old values equal the new values, then the function is deleted
by the formatter.
$D3 = \text{Set Group}

\text{Function: $D3/$00}
\text{Name: SetAlignChar_}
\text{Length: 20}
\text{Orientation: Character}

$D3/$00 = \text{Set Alignment Character}

$<D3><$00><[\text{Length}]>
\begin{align*}
\text{(Old alignment character} & \quad \text{Or} \\
\text{(Old separator character} & \quad \text{New alignment character} \\
\text{(New separator character)} & \\
\text{[Length]}<\$00><\$D3> \\
\{\text{character}\} = \\
\begin{align*}
\text{<Def><Mac character><WP char set #><Character}> \\
\text{or} \\
\text{<Def><Script ID>[Script character]}
\end{align*}
\end{align*}

\text{If <Def> = 0 \quad Non script character}

\text{<Mac character} = \text{Formatter supplied displayable character.}
\text{<WP char set #} = \text{WordPerfect character set number.}
\text{<Character} = \text{User supplied character}

\text{Note: <WP character set #><Character> is used to generate a <Mac}
\text{character> whenever possible. When not possible, an attempt}
\text{is made to generate a new <WP character set #><Character> from}
\text{the <Mac character>.

\text{If <Def> = 1 \quad Script character}

\text{<Script ID} = \text{Script ID}
\text{[Script character} = \text{Script character}

\text{Note: (Separator character) is currently not supported. If the old}
\text{values equal the new values, then the function is deleted by}
\text{the formatter.

\text{Function: $D3/$01}
\text{Name: SetUlineMode_}
\text{Length: 6}
\text{Orientation: Character}

$D3/$01 = \text{Set Underline Mode}

$<D3><$01><[\text{Length}]>
\begin{align*}
\text{<Old mode} & \quad \text{<New mode} \\
\text{[Length]}<\$01><\$D3> \\
\text{<Mode} = \\
\begin{align*}
0 = \text{Underline characters only} \\
1 = \text{Underline characters and spaces (Default)} \\
2 = \text{Underline characters and tabs}
\end{align*}
\end{align*}
3 = Underline characters, spaces and tabs

Note: If the Set Underline Mode function is immediately followed by another Set Underline Mode function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D3/$02 $D3/$02 = Set Footnote Number
Name: SetFtnoteNum_
Length: 8
Orientation: Character

$D3$/<$02> [Length] [Old number†]
[Length]<$02><$D3>

[New number] = Next footnote number

Note: If the Set Footnote Number function is immediately followed by another Set Footnote Number function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D3/$03 $D3/$03 = Set Endnote Number
Name: SetEndnoteNum_
Length: 8
Orientation: Character

$D3$/<$03> [Length] [Old number†]
[Length]<$03><$D3>

[New number] = Next endnote number

Note: If the Set Endnote Number function is immediately followed by another Set Endnote Number function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D3/$04 $D3/$04 = Set Page Number
Name: SetPageNum_
Length: 10
Orientation: Page

$D3$/<$04> [Length] <Old def†>
[Length]<$04><$D3>

<Old def†>
[Old page number†]
<New def>
[New page number]
$D3 = Set Group

<def> =
0 = Arabic
1 = Roman (Lower case)
2 = Roman (Upper case)
3 = Character

[New page number] =
0, the current page number is not altered
≠0, set current page number

Note: If the Set Page Number function is immediately followed by another Set Page Number function or the old values equal the new values, then the function is deleted by the formatter.

Function: $D3/$05
Name: LineNumbering_
Length: 24
Orientation: Paragraph

$D3/$05 = Define Line Numbering Options

<Old def> =
<Old interval> =
(Old position)
[Old starting number]

<New def> =
<New interval> =
{New position}
[New starting number]

<Length><$05><$D3>

<def> =
(msb) 7 = Line numbering ON (0=OFF)
6 = Number text lines only
5 = Restart numbering on each page
4 = Suppress blank line numbers
3 = Ignore blank lines
2 =
1 =
(lsб) 0 =

<interval> =
Line numbering interval

{position} =
Fixed point displacement from left edge of paper.

[Starting number] =
0, the current line number is not altered
≠0, set current line number

Note: If the Set Line Numbering Options function is immediately followed by another Set Line Numbering Options function or the old values equal the new values, then the function is deleted by the formatter.
<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Syntax</th>
<th>Orientation</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$D3/$06</td>
<td>$D3/$06 = Advance to Page Position (Not implemented)</td>
<td>$D3$06[Length]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>$D3/$08</td>
<td>Reserved.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D3/$09</td>
<td>Reserved.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D3/$0A</td>
<td>Reserved.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D3/$0B</td>
<td>Reserved.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Function: $D3/$0C
  Name: FigureBoxNum_
  Length: 8
  Orientation: Character

$D3/$0C = Set Figure Box Number

<$D3><$0C>[Length] [Old number†]
[Length]<$0C><$D3>
[New number] = Next figure box number

Note: If the Set Figure Box Number function is immediately followed by another Set Figure Box Number function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D3/$0D
  Name: TableBoxNum_
  Length: 8
  Orientation: Character

$D3/$0D = Set Table Box Number

<$D3><$0D>[Length] [Old number†]
[Length]<$0D><$D3>
[New number] = Next table box number

Note: If the Set Table Box Number function is immediately followed by another Set Table Box Number function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D3/$0E
  Name: TextBoxNum_
  Length: 8
  Orientation: Character

$D3/$0E = Set Text Box Number

<$D3><$0E>[Length] [Old number†]
[Length]<$0E><$D3>
[New number] = Next text box number

Note: If the Set Text Box Number function is immediately followed by another Set Text Box Number function or the old value equals the new value, then the function is deleted by the formatter.
Function: $D3/$0F
Name: UserBoxNum_
Length: 8
Orientation: Character

$D3/$0F = Set User Box Number

<$D3><$0F>[Length] [Old number†]
[Length]<$0F><$D3>

[New number] = Next user box number

Note: If the Set User Box Number function is immediately followed by another Set User Box Number function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D3/$10
Name: EquationBoxNum_
Length: 8
Orientation: Character

$D3/$10 = Set Equation Box Number

<$D3><$10>[Length] [Old number†]
[Length]<$10><$D3>

[New number] = Next equation box number

Note: If the Set Equation Box Number function is immediately followed by another Set Equation Box Number function or the old value equals the new value, then the function is deleted by the formatter.

Function: $D3/$11
Name: SetLanguage_
Length: 16
Orientation: Character

$D3/$11 = Set Language

<$D3><$11>[Length] <Old script†>
<Old language†>
[Old region†]
<br> <New script>
<New language>
[New region]

<New script> = Used for interpreting two-byte script characters (function $C8.) Also for determining characteristics such as writing direction, keyboard layout, font compatibility and so forth.
$D3 = \text{Set Group}$

$\text{<New language>} = \text{Primary determinant used for selecting auxiliary tools such as speller, thesaurus, hyphenation, sorting and so forth.}$

$[\text{New region}] = \text{Used for determining formats for Date/Time, currency, decimal, thousand, list separators and so forth.}$

Note: See Appendix B for language code definitions.

If the Set Language function is immediately followed by another Set Language function or the old value equals the new value, then the function is deleted by the formatter.

---

**Function:** $\text{<$D3/12> = Set Chapter Number}$

Name: SetChapterNum_

Length: 8

Orientation: Character

$\text{<$D3><$0C>[Length]} \quad \text{[Old number†]}$

$\text{[New number]}$

$\text{[Length]<$0C><$D3>}$

$\text{[New number]} = \text{Next chapter number}$

Note: If the Set Chapter Number function is immediately followed by another Set Chapter Number function or the old value equals the new value, then the function is deleted by the formatter.
$D4 = Format Group

*For internal use only.* These functions should not be inserted when creating WordPerfect documents.

---

Function: $D4/$00  
**$D4/$00 = Dummy Table Insert Function**

Name: TableDummyInsert_  
Length: Variable  
Orientation: Paragraph

`<$D4><$00>[Length]`

*For internal use only.* This functions should not be inserted when creating WordPerfect documents.

---

Function: $D4/$01  
**$D4/$01 = Temporary Smart Quote Function**

Name: TempSmartQuote_  
Length: Variable  
Orientation: Character

`<$D4><$01>[Length]  [Script quote]`

`[Length]<$01><$D4>`

*For internal use only.* This functions should not be inserted when creating WordPerfect documents.
$D5 = Header/Footer Group

Function: $D5/$00
    Name: HeaderA_
    Length: Variable
    Orientation: Page

$D5/$00 = Header A Function

<$D5><$00>[Length] <Format flags>
{Document stamp†}
{Ptr to header window†}
<Old def†>
{Old height†}
[Old header length†]
<Old header...†>
<New def>
{New height†}
[New header length]
<New header...>

[Length]<$00><$D5>

<Format flags> = (msb) Bit 7 = Always format flag bit
Bit 6 =
Bit 5 =
Bit 4 =
Bit 3 =
Bit 2 =
Bit 1 =
(lsb) Bit 0 =

<def> = (msb) Bit 7 =
Bit 6 =
Bit 5 =
Bit 4 =
Bit 3 =
Bit 2 =
Bit 1 = Odd pages
(lsb) Bit 0 = Even pages

(Height) = Height of Header A in pixels (Formatter supplied).

[Header length] = # of bytes in <Header...>.

<Header...> = A WP document containing Header A.
Function: $D5/$01
Name: HeaderB_
Length: Variable
Orientation: Page

$D5/$01 = Header B Function

<$D5><$01>[Length] <Format flags>
{Document stamp†}
{Ptr to header window†}
<Old def†>
{Old height†}
[Old header length†]
<Old header...†>
<New def>
{New height}
[New header length]
<New header...>

[Length]<$01><$D5>

All function values have definitions corresponding to Header A.

Function: $D5/$02
Name: FooterA_
Length: Variable
Orientation: Page

$D5/$02 = Footer A Function

<$D5><$02>[Length] <Format flags>
{Document stamp†}
{Ptr to footer window†}
<Old def†>
{Old height†}
[Old footer length†]
<Old footer...†>
<New def>
{New height}
[New footer length]
<New footer...>

[Length]<$02><$D5>

All function values have definitions corresponding to Header A.
Function: $D5/$03
Name: FooterB
Length: Variable
Orientation: Page

$D5/$03 = Footer B Function

$D5<$03>[Length]<Format flags>
{Document stamp†}
{Ptr to footer window†}
<Old def†>
{Old height†}
[Old footer length†]
<Old footer...†>
<New def>
{New height}
[New footer length]
<New footer...>

[Length]$03<$D5>

All function values have definitions corresponding to Header A.

Function: $D5/$04
Name: WaterMarkA
Length: 10
Orientation: Page

$D5/$04 = Watermark A Function

$D5<$04>[Length]<Old def†>
[Old Resource ID†]
{Old Resource Length†}
<New def>
[New Resource ID]
{New Resource Length}

[Length]$04<$D5>
<def> = (msb) Bit 7 =
Bit 6 =
Bit 5 =
Bit 4 =
Bit 3 =
Bit 2 =
Bit 1 = Odd pages
(lsb) Bit 0 = Even pages

[Resource ID] = Resource ID number of resource containing watermark.

{Resource Length} = Length in bytes of resource watermark.
(0 = No watermark)
Function: $D5/$05
Name: WaterMarkB_
Length: 10
Orientation: Page

$D5/$05 = Watermark B Function

<def> = (msb) Bit 7 =
       Bit 6 =
       Bit 5 =
       Bit 4 =
       Bit 3 =
       Bit 2 =
       Bit 1 = Odd pages
      (lsb) Bit 0 = Even pages

[Resource ID] = Resource ID number of resource containing watermark.

{Resource Length} = Length in bytes of resource watermark.
(0 = No watermark)
**$D6 = Footnote/Endnote Group**

**Function:** $D6/$00  
**Name:** Footnote_  
**Length:** Variable  
**Orientation:** Character

### Footnote Function

$D6/$00 = Footnote Function

<table>
<thead>
<tr>
<th>Format flags</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$D6&gt; &lt;$00&gt; [Length]</td>
<td>&lt;Format flags&gt;</td>
</tr>
<tr>
<td></td>
<td>{Document stamp†}</td>
</tr>
<tr>
<td></td>
<td>{Ptr to footnote window†}</td>
</tr>
<tr>
<td></td>
<td>[Window footnote #†]</td>
</tr>
<tr>
<td></td>
<td>{Footnote size on this page†}</td>
</tr>
<tr>
<td></td>
<td>[Additional footnote pages†]</td>
</tr>
<tr>
<td></td>
<td>{Footnote size on last page†}</td>
</tr>
<tr>
<td></td>
<td>(Footnote length†)</td>
</tr>
<tr>
<td></td>
<td>[# of footnote pages†] (# of 4 byte entries below)</td>
</tr>
<tr>
<td></td>
<td>{# pixels†}</td>
</tr>
<tr>
<td></td>
<td>....</td>
</tr>
<tr>
<td></td>
<td>[# of break table entries†] (# of 6 byte entries below)</td>
</tr>
<tr>
<td></td>
<td>[# of lines†]</td>
</tr>
<tr>
<td></td>
<td>{line size†}</td>
</tr>
<tr>
<td></td>
<td>....</td>
</tr>
<tr>
<td></td>
<td>&lt;Footnote...&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length</th>
<th>&lt;$00&gt; &lt;$D6&gt;</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Format flags</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>= (msb) Bit 7 = Always format flag bit</td>
<td></td>
</tr>
<tr>
<td>Bit 6 = Footnote in column†</td>
<td></td>
</tr>
<tr>
<td>Bit 5 =</td>
<td></td>
</tr>
<tr>
<td>Bit 4 =</td>
<td></td>
</tr>
<tr>
<td>Bit 3 =</td>
<td></td>
</tr>
<tr>
<td>Bit 2 =</td>
<td></td>
</tr>
<tr>
<td>Bit 1 =</td>
<td></td>
</tr>
<tr>
<td>(lsb) Bit 0 =</td>
<td></td>
</tr>
</tbody>
</table>

| Document stamp† | = |
| Ptr to footnote window† | = |
| Window footnote #† | = |

| Footnote size on this page† | = Current accumulation of footnote sizes on page (formatter supplied.) |
| Additional footnote pages† | = |
| Footnote size on last page† | = |

| Footnote length† | = Fixed point pixel length of the formatted footnote (formatter supplied.) |
| # of footnote pages† | = |
| {# pixels†} | = |
| [# of break table entries†] | = |
| [# of lines†] | = |
Variable Length Multi-byte Functions

$D6 = Footnote/Endnote Group

{line size†} =

<Footnote...> = WP document containing the footnote.

Note: All formatter supplied values (designated by †) should be set to zero when creating a new footnote. [# of lines†] and {line size†} are not in function if [# of break table entries†] is ZERO.

Function: $D6/$01
Name: Endnote_
Length: Variable
Orientation: Character

$D6/$01 = Endnote Function

<Format flags> = (msb) Bit 7 = Always format flag bit
Bit 6 =
Bit 5 =
Bit 4 =
Bit 3 =
Bit 2 =
Bit 1 =
(lsb) Bit 0 =

{Document stamp†} =
{Ptr to endnote window†} =
[Window endnote #†] =
($00000000)
($00000000)
{Endnote length†} =
($0000)
[# of break table entries†] = (# of 6 byte entries below)
[# of lines†] =
{line size†} =

...,<...Endnote text...>

[Length]$01<$D6>

<Format flags> =
<Endnote...> = WP document containing the endnote.

Note: All formatter supplied values (designated by †) should be set to zero when creating a new footnote. [# of lines†] and {line size†} are not in function if [# of break table entries†] is zero.
$D7 = Generate Group

Function: $D7/$00  
Name: StartMarkedTOC_  
Length: 5  
Orientation: Character

$D7/$00 = Begin Marked Table of Contents Entry

$D7/$00 = <$D7><$00>[Length] <Level>

$D7/$00 = [Length]<$00><$D7>

<Level> = TOC level number of marked item

Function: $D7/$01  
Name: EndMarkedTOC_  
Length: 5  
Orientation: Character

$D7/$01 = End Marked Table of Contents Entry

$D7/$01 = <$D7><$01>[Length] <Level>

$D7/$01 = [Length]<$01><$D7>

<Level> = TOC level number of marked item
Function: \$D7/$02
Name: Define Marked
Length: Variable
Orientation: Character

\$D7/$02 = Define Marked Text

\[ \text{Length} \]

\[ \text{def} \int \text{info} \]

2 Nibbles

Table of Contents

\[ \text{def} \int \text{info} = 0 \]

Max level (0-4)

Index

\[ \text{def} \int \text{info} = 1 \]

0 = No concordance file
1 = Concordance file

(Only level 1 def is defined)

List

\[ \text{def} \int \text{info} = 2 \]

List number (0-8)

(Only level 1 def is defined)

Table of Authorities

\[ \text{def} \int \text{info} = 3 \]

Table of authority section number (0-15)

(Only level 1 def is defined)
For all defs:

\[
\text{<Level def> } = \begin{cases} 
(\text{msb}) & 7 = \text{Wrap after last entry} \\
6 = \text{Blank line between entries} \\
5 = \text{Disallow underline} \\
4 = & \\
3 = & \\
2 = \text{Page Mode} \\
1 = \\
(\text{lsb}) & 0 
\end{cases}
\]

\text{Page Mode} = 
\begin{align*}
0 & = \text{no page numbers} \\
1 & = \text{page # after text, preceded by 2 spaces} \\
2 & = \text{page # after text, in parentheses, preceded by one space} \\
3 & = \text{page # flush right} \\
4 & = \text{page # flush right with dot leader}
\end{align*}

\[
<\ldots\text{concordance filename}\ldots> =
\]

<table>
<thead>
<tr>
<th>Function: $D7/03$</th>
<th>$D7/03 = \text{Mark Index Entry}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: IndexEntry_</td>
<td>&lt;Major heading…&gt; = Pascal String</td>
</tr>
<tr>
<td>Length: Variable</td>
<td>&lt;Minor heading…&gt; = Pascal String</td>
</tr>
<tr>
<td>Orientation: Character</td>
<td>&lt;$D7&gt;$&lt;$03&gt;[Length]</td>
</tr>
</tbody>
</table>

\[
<\text{Major heading…}> = \\
<\text{Minor heading…}> =
\]
$D7/$04 = Mark Table of Authority Entry

Name: TOAEntry_
Length: Variable
Orientation: Character

$D7/$04 = Generate Group

$D7/$05 = Endnotes Print Here

Name: EndNotesHere_ (Not implemented)
Length: Variable
Orientation: Character

$D7/$06 = Save Page Information

Name: SavePageInfo_ (Not implemented)
Length: Variable
Orientation: Character
$D7/$07 = Auto Reference Definition

**Function:** $D7/$07

**Name:** AutoRefDef_

**Length:** Variable

**Orientation:** Character

$$<D7><07>[Length]$$

**<Reference type>**

Pascal String

**<Tag ID text…>**

Pascal String

[Length]<07><D7>

**<Reference type> =**

0 = Page #
1 = Paragraph #
2 = Footnote #
3 = Endnote #
4 = Figure #
5 = Table #
6 = Text box #
7 = User defined box #
8 = Equation box #

**<Tag ID text…> =**

**<Text of # being referenced> =**

$D7/$08 = Auto Reference Tag

**Function:** $D7/$08

**Name:** AutoRefTag_

**Length:** Variable

**Orientation:** Character

$$<D7><08>[Length]$$

**<Tag ID text…>**

Pascal String

[Length]<08><D7>

**<Tag ID text…> =**

$D7/$09 = Include Sub-document

**Function:** $D7/$09

**Name:** IncSubDoc_

(Not implemented)

**Length:** Variable

**Orientation:** Character

$D7/$0A = Start Sub-document

**Function:** $D7/$0A

**Name:** StartSubDoc_

(Not implemented)

**Length:** Variable

**Orientation:** Character

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January 4, 2011
Function: $D7/$0B
   Name: EndSubDoc_
   Length: Variable
   Orientation: Character

   $D7/$0B = End Sub-document
            (Not implemented)

Function: $D7/$0C
   Name: StartMarkedList_
   Length: 5
   Orientation: Character

   $D7/$0C = Begin Marked List Entry

   $D7/$0D = End Marked List Entry

Function: $D7/$0D
   Name: EndMarkedList_
   Length: 5
   Orientation: Character

   $D7/$0B = Generate Group
Function: **$D8/$00**  
Name: **Date_**  
Length: **Variable**  
Orientation: **Character**

**$D8/$00 = Insert Date/Time**

```
<$D8><$00>[Length]  
{Document time stamp↑}  
{Date/Time string width↑}  
<$# of characters in date/time string↑>}  
<$# of spaces in date/time string↑>}  
<Date/time string...↑>  
<Formatted string...>  
```

```
<Old format length↑> =  
{Document time stamp↑} =  
{Date/Time string width↑} =  
<$# of characters in date/time string↑>} =  
<$# of spaces in date/time string↑>} =  
<Date/time string...↑> =  Pascal string containing the displayable date or time  
<Formatted string...> =  Pascal string containing the format codes for the date or time as follows:

**Date format string codes:**

- $01 = Day number
- $02 = Day name
- $03 = Day name (abbreviated)
- $04 = Month number
- $05 = Month name
- $06 = Month name (abbreviated)
- $07 = 2 digit year
- $08 =
- $09 = 4 digit year
- $0A = 12 hour
- $0B = 24 hour
- $0C = Minute
- $0E = AM/PM
- $0F = Leading 0 before single digit numbers
- $10 = Date separator
- $11 = Time separator
- $12 = Number suffix
- $20-$7E = normal ASCII
- all others = disallowed
Function: $D8/$01
Name: ParNum_
Length: 21
Orientation: Paragraph

$D8/$01 = Insert Paragraph Number

<$D8><$01>[Length] <New level number> <New level def†>
[Old level #1†] ....
[Old level #8†]

[Length]<$01><$D8>

<New level number> = Low 7 bits are level #, Sign set if level fixed.
<New level def†> =
[Old level #†] =

Function: $D8/$02
Name: OverStrike_
Length: Variable
Orientation: Character

$D8/$02 = Overstrike Text

<$D8><$02>[Length] <Def> {Widest character width†} <characters...>
[Length]<$02><$D8>

<Def> =
0 = Center characters
1 = Left justify
2 = Right justify

{Widest character width†} =

<characters...> = Characters to be overstruck

Function: $D8/$03
Name: SearchChar_
Length: Variable
Orientation: Character

$D8/$03 = Search Character

<$D8><$03>[Length] <Search string...> Pascal string
[Length]<$03><$D8>

<Search string...> =
Function: $D8/$04  
**Name**: BoxNumber_  
**Length**: Variable  
**Orientation**: Character  

**$D8/$04 = Insert Box Number**

\[
\text{<}D8\text{<}04\text{[Length]} \quad \text{(String width} \dagger \text{)} \quad \text{<}\text{String...} \dagger \text{>}
\]

```
[Length]<04><D8>
{String width \dagger}
```

```
<\text{String...} \dagger> = \text{Displayable Pascal string of current box number}
```

Function: $D8/$05  
**Name**: ChapterNumber_  
**Length**: Variable  
**Orientation**: Character  

**$D8/$05 = Insert Chapter Number**

\[
\text{<}D8\text{<}05\text{[Length]} \quad \text{(String width} \dagger \text{)} \quad \text{<}\text{String...} \dagger \text{>}
\]

```
[Length]<05><D8>
{String width \dagger}
```

```
<\text{String...} \dagger> = \text{Displayable Pascal string of current chapter number}
```

Function: $D8/$06  
**Name**: PageNumber_  
**Length**: Variable  
**Orientation**: Character  

**$D8/$06 = Insert Page Number**

\[
\text{<}D8\text{<}06\text{[Length]} \quad \text{(String width} \dagger \text{)} \quad \text{<}\text{String...} \dagger \text{>}
\]

```
[Length]<06><D8>
{String width \dagger}
```

```
<\text{String...} \dagger> = \text{Displayable Pascal string of current page number}
```
Function: $D8/$07  
Name: FootnoteNumber_  
Length: Variable  
Orientation: Character

$D8/$07 = Insert Footnote Number

\[
<\$D8><\$07>[\text{Length}] \quad \{\text{String width} \uparrow\}\quad \text{Pascal string}
\]

\[
[\text{Length}]<\$07><\$D8>
\]

\[
\text{(String width} \uparrow\}
\]

\[
<\text{String}...\uparrow> = \text{Displayable Pascal string of current footnote number}
\]

Function: $D8/$08  
Name: EndnoteNumber_  
Length: Variable  
Orientation: Character

$D8/$08 = Insert Endnote Number

\[
<\$D8><\$08>[\text{Length}] \quad \{\text{String width} \uparrow\}\quad \text{Pascal string}
\]

\[
[\text{Length}]<\$08><\$D8>
\]

\[
\text{(String width} \uparrow\}
\]

\[
<\text{String}...\uparrow> = \text{Displayable Pascal string of current endnote number}
\]
$D9 = Miscellaneous Group

Function: $D9/$00
   Name: PCprinterRecord_ (Not implemented)
   Length: Variable
   Orientation: Page

$D9/$00 = PC Printer Record

Function: $D9/$01
   Name: ConditionalEOP_
   Length: 7
   Orientation: Character

$D9/$01 = Conditional End of Page

Function: $D9/$02
   Name: BeginBookMark_
   Length: Variable
   Orientation: Character

$D9/$02 = Begin Bookmark

Function: $D9/$03
   Name: BeginHyperText_
   Length: Variable
   Orientation: Character

$D9/$03 = Begin Hypertext
[Length]$02$D9

(Document stamp†) =

<def> = Type of link:
0 = within current document
1 = within another MacWP document
2 = internet address link (will launch browser)
3 = link to an internal MacWP macro to execute

<Bookmark name...> = Name of bookmark

<Bookmark address...> = If def = 1 then this is a Macintosh specific alias record to the specified file. If def = 2 or 3 then this is URL or macro name (C string).
**$D9$/04 = Page Size Override**

**Function:** $D9$/04

**Name:** PageSizeOverride_

**Length:** Variable

**Orientation:** Character

---

<table>
<thead>
<tr>
<th><strong>[Length]</strong>&lt;$D9$&gt;&lt;$04$&gt;</th>
<th><strong>Page orientation</strong> = Pxxx xxFO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P = 0 = Reset orientation at end of page</td>
</tr>
<tr>
<td></td>
<td>1 = Orientation persists until next</td>
</tr>
<tr>
<td></td>
<td>F = 0 = Normal page orientation</td>
</tr>
<tr>
<td></td>
<td>1 = Flip page</td>
</tr>
<tr>
<td></td>
<td>O = 0 = Portrait</td>
</tr>
<tr>
<td></td>
<td>1 = Landscape</td>
</tr>
</tbody>
</table>

| {Page width} = | Page width |
| {Page height} = | Page height |
| [Page scale] = | Page scale (Integer value) |

| {GX reference number} = | GX print job reference number |
| <GX print job...> = | GX print job structure (defined by Apple) |

**Note:** If no <GX print job...> is found, then a new job is created using [New page orientation], (New page width), (New page height), and [New page scale].
Function: $D9/$05  
Name: ClipStat_  
Length: Variable  
Orientation: Character  

$D9/$05 = Clipboard Resource Data Function

<Def> = <Def>  
<Length>[Length] <Def>  
[Length]<$05><$D9>  

<Def> =  
(msb) 7 =  
6 =  
5 =  
4 = Top of selection is in table  
3 = Table selection (non-contiguous) - always cleared for graphic copy  
2 = Border for box only paste  
1 = Word boundary at bottom  
(lsb) 0 = Word boundary at top  

This function is only used on the clipboard and is not used within a document.

Function: $D9/$06  
Name: Imbedded_  
Length: Variable  
Orientation: Character  

$D9/$06 = Embedded Resource Function

<Def> = <data...>  
<Length><$06><$D9>  
[data...]  
Resourse data  

Note: This function can never appear in a normal MacWP document. It is intended to be used in a Mac published edition document. Therefore this function should never be inserted into a MacWP document.

Function: $D9/$07  
Name: WPHide_  
Length: Variable  
Orientation: Character  

$D9/$07 = Hide Function

<Def> = <Product type>  
<File type>  
<Major version>  
<Minor Version>  
[Resource ID]  
<Data...>  
[Length]<$07><$D9>  
[Length]<$07><$D9>  

For WordPerfect files, <Product type>, <File type>, <Major version>, and <Minor Version> are the same as found in the header of the converted
The hide function is used by WordPerfect to hide well behaved functions from the body of the document. References outside of the body of the document are not allowed because these parts are not transferred between platforms.

Function: $D9/$08
Name: HTMLHeading_
Length: Variable
Orientation: Character

$D9/$08 = HTML Heading

<def> = HTML Heading # (0 - 5)

<old/new†> =

Function: $D9/$09
Name: HTMLAttr_
Length: Variable
Orientation: Character

$D9/$09 = HTML Attributes

<attribute> = HTML Attribute #
0 = Strong emphasis
1 = Name or title of cited work
2 = Emphasis
3 = Variable phrase or substitutable
4 = Source code phrase
5 = Keyboard phrase; user input
6 = Sample text or characters
7 = Typewriter text
8 = Blinking text
9 = Address
10 = Preformatted text
11 = Script text
Function: $D9/$0A  
Name: HTMLHide_  
Length: Variable  
Orientation: Character

$D9/$0A = HTML Hide

<old/new↑> =

<Data...> = Hidden data
$DA = $DA/$00 \text{ Figure Box Function}

<table>
<thead>
<tr>
<th>Function</th>
<th>Name</th>
<th>Length</th>
<th>Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$DA/$00</td>
<td>FigureBox_</td>
<td>Variable</td>
<td>Character</td>
</tr>
</tbody>
</table>

$DA/$00 = Figure Box Function

$$<DA><00>[Length]$$

- \{Document stamp\}
- \{Ptr to Box window\}
- \{Figure number\}
- \{Page position\}
- \{Figure flags\}
- \{Box ID\}
- \{Left align column\}
- \{Right align column\}
- \{Original pic width\}
- \{Original pic height\}
- \{Sized width of picture\}
- \{Sized height of picture\}
- \{Rotation\}
- \{Horizontal move for crop\}
- \{Vertical move for crop\}
- \{Size of box caption\}
- \{Box type\}
- \{Sizing options\}
- \{Resource ID\}
- \{Vertical offset\}
- \{Horizontal offset\}
- \{Box Width\}
- \{Box Height\}
- \{Absolute top page position\}
- \{Absolute left page position\}
- \{Absolute bottom page position\}
- \{Absolute right page position\}
- \{Wrap mode\}
- \{# of sub rectangles\}
  - \{Relative Top\}
  - \{Relative Left\}
  - \{Relative Bottom\}
  - \{Relative Right\}
- \{Box caption length\}
- \{Text box text length\}
- \{PC Stuff\}

$$[Length]<00><DA>$$

- Document stamp = Formatter supplied value to indicate if the box needed to be reformatted.
- Ptr to Box window =
- Figure number = Formatter supplied value of current box number.
(Page position) = Formatter supplied value of current page position (UPLin)

[Figure flags] = cf-p pprr w-hv mmaa

  c: 0 = B/W Pic conversion
      1 = Color Pic conversion

  f: 1 = Checked for dumping soft
      (internal use only)

  ppp: 0 = Full page
       1 = Top
       2 = Middle
       3 = Bottom
       4 = Absolute

  rr: 0 = Paragraph
      1 = Page
      2 = Character

  w: 0 = Wrap text around box
      1 = No text wrap around box

  h: 0 = scale to figure heightwise
      1 = fixed height

  v: 0 = scale to figure widthwise
      1 = fixed width

  mm: 0 = Relative to margins
      1 = Relative to column margins
      2 = Absolute

  aa: 0 = Left
      1 = Right
      2 = Centered
      3 = Left/right justified

More specifically:

Paragraph:  c--- --00 w--- --aa

  aa: 0 = Left
      1 = Right
      2 = Centered
      3 = Left/right justified
Rel Page: c--p pp01 w--- 0maa

ppp: 0 = Full page
1 = Top
2 = Middle
3 = Bottom
4 = Absolute

m: 0 = Relative to margins
1 = Relative to column margins

aa: 0 = Left
1 = Right
2 = Centered
3 = Left/right justified

Full Page: c--0 0001 w--- 0---

Abs Page: c--1 0001 w--- 1---

Character: c--p pp10 w--- ----

ppp: 0 = Baseline
1 = Top
2 = Middle
3 = Bottom
4 = Absolute

[Box ID] =

<Left align column> = Column # to use in getting left margin if aligning to column margins.

<Right align column> = Column # to use in getting right margin if aligning to column margins.

{Original pic width} = Original pic width used to restore %100 of sized picture.

{Original pic height} = Original pic height used to restore %100 of sized picture.

{(Sized width of picture)} = New width of picture after sizing.

{(Sized height of picture)} = New height of picture after sizing.

[Rotation] = (Currently not implemented)

{(Horizontal move for crop)} =
(Vertical move for crop) =

[Size of box caption] =
<Box type> =
0 = text
1 = internal graphic (soft w/known rect)
2 = picture
3 = soft w/unknown rect
4 = 5.1 table w/unknown rect - used by conversion routines
5 = 5.1 table - used by conversion routines
6 = Quicktime movie box

<Sizing options> =
(msb) 7 =
6 =
5 =
4 =
3 =
2 =
1 = 0 =, 1 = Size once
(lsb) 0 = 0 =, 1 = Always size

Note: This is for vertical sizing only in a text box.

[Resource ID] = Resource of type 'WBOX' (0=no picture)

(Vertical offset) = Fixed point number added to final vertical position.

(Horizontal offset) = Fixed point number added to final horizontal position.

(Box Width) = Final box width - includes border and caption

(Box Height) = Final box height - includes border and caption

[Abs top page position] = Absolute position of box on page (Formatter supplied)

[Abs left page position] =
[Abs bottom page position] =
[Abs right page position] =

<Wrap mode> =

<# of sub rectangles> = # of region (rectangle) describing box
[Relative Top][Relative Left]
[Relative Bottom][Relative Right]
...

[Box caption length] = # of caption bytes that follow in function

<Caption...> (If caption length ≠ 0)

[Text box text length] = # of text bytes that follow in function

<Text...> (If text length ≠ 0) The <Text...> field contains the markup string of the equation box figure.

---

Function: $DA/$01
Name: TableBox_
Length: Variable
Orientation: Character

$DA/$01 = Table Box Function
(See Figure Box Function)

---

Function: $DA/$02
Name: TextBox_
Length: Variable
Orientation: Character

$DA/$02 = Text Box Function
(See Figure Box Function)

---

Function: $DA/$03
Name: UserBox_
Length: Variable
Orientation: Character

$DA/$03 = User Box Function
(See Figure Box Function)

---

Function: $DA/$04
Name: EquationBox_
Length: Variable
Orientation: Character

$DA/$04 = Equation Box Function
(See Figure Box Function)

Note: The <Text...> field contains the markup string of the equation box figure.
Function: $DA/$05
   Name: HTMLImageBox_
   Length: Variable
   Orientation: Character
$DA/$05 = HTML Image Box Function
   (See Figure Box Function)

Function: $DA/$06
   Name: HorizontalLine_
   Length: Variable
   Orientation: Paragraph
$DA/$06 = Horizontal Line

<$DA><$06>[Length]
   {FunctionWidth†}
   {Function Height†}
   <Horizontal Position>
   <Horizontal Flags>
   {Horizontal Length}
   <Vertical Position>
   <Vertical Flags>
   {Vertical Thickness}
   {Vertical Space}
   <Shade Pattern #>

[Length]<$06><$DA>

(Function Width†) = Line function width
(Function Height†) = Line function height

<Horizontal Position> = rrrr rrPP
   PP: 0 = align left
       1 = align center
       2 = align right

<Horizontal Flags> = rrrr rrrP
   P: 0 = fixed
      1 = percentage

<Horizontal Length> = Horizontal line length (Fixed or Percentage of current margin)

<Vertical Position> = rrrr rrPP
   PP: 0 = align top
       1 = align middle
       2 = align bottom

<Vertical Flags> = rrrr rrrP
   P: 0 = fixed
      1 = percentage

{Vertical Thickness} = Vertical line thickness (Fixed or Percentage of current line height)
(Vertical Space) = Vertical space (Fixed or Percent of current line height)

<Shade Pattern #> = Line shading pattern #
$DB = \text{Style Group}

Function: $DB/$00
Name: StyleDefEnd_
Length: Variable
Orientation: Paragraph

$DB/$00 = \text{End of Style Definition}

\begin{align*}
&\langle DB\rangle\langle 00\rangle\langle 0002\rangle\langle DB\rangle \\
&\text{(Preferred)} \\
or \\
&\langle DB\rangle\langle 00\rangle\langle 0004\rangle\langle 0004\rangle\langle DB\rangle
\end{align*}

Function: $DB/$01
Name: BeginPairedStyle_
Length: Variable
Orientation: Paragraph

$DB/$01 = \text{Begin Start Paragraph Style Definition}

\begin{align*}
&\langle DB\rangle\langle 01\rangle\langle \text{Length}\rangle \\
&\{\text{Document stamp}\} = \\
&\{\text{Resource ID}\} = \\
&\langle \text{Stylename...}\rangle = \text{Name of style} \\
&\langle \text{Reload flag}\rangle =
\end{align*}

Function: $DB/$02
Name: EndPairedStyle_
Length: 15
Orientation: Character

$DB/$02 = \text{Begin End Paragraph Style Definition}

\begin{align*}
&\langle DB\rangle\langle 02\rangle\langle \text{Length}\rangle \\
&\{\text{Document stamp}\} = \\
&\{\text{Old Resource ID}\} = \\
&\{\text{File index}\} = \\
&\langle \text{Reload flag}\rangle =
\end{align*}
Function: $DB/$03

Name: BeginDocumentStyle_

Length: Variable

Orientation: Paragraph

$DB/$03 = Begin Document Style Definition

$<$DB>$<$03>$[Length]

{Document stamp†}

[Resource ID†]

$<$Stylename...$>$ Pascal String

<Reload flag†>

[Length]$<$03>$<$DB>

{Document stamp†} =

[Resource ID†] =

<Stylename...> = Style name

<Reload flag†> =

Function: $DB/$04

Name: BeginFormatterStyle_

Length: Variable

Orientation: Character

$DB/$04 = Begin Formatter Style Definition

$<$DB>$<$04>$[Length]

{Document stamp†}

[Resource ID†]

$<$Stylename...$>$ Pascal String

<Reload flag†>

[Length]$<$04>$<$DB>

{Document stamp†} =

[Resource ID†] =

<Stylename...> = Style Name

<Reload flag†> =

Function: $DB/$05

Name: BeginCharStyle_

Length: Variable

Orientation: Character

$DB/$05 = Begin Start Character Style Definition

(Not implemented)

$<$DB>$<$05>$[Length]

{Document stamp†}

[Old Resource ID†]

[New Resource ID]

$<$Stylename...$>$ Pascal String
Function: $\text{DB}/\text{SO}_6$
Name: EndCharStyle_
Length: Variable
Orientation: Character

$\text{DB}/\text{SO}_6 = \text{Begin End Character Style Definition}$
(Not implemented)

Pre-defined Styles:

- \{WP\}01 = WP Defaults
- \{WP\}10 = Top of Document
- \{WP\}11 = Footnote # in Document
- \{WP\}12 = Footnote
- \{WP\}13 = Endnote # in Document
- \{WP\}14 = Endnote
- \{WP\}15 = Figure Box Caption
- \{WP\}16 = Text Box Caption
- \{WP\}17 = Table Box Caption
- \{WP\}18 = User Box Caption
- \{WP\}19 = Equation Box Caption
- \{WP\}20 = Header
- \{WP\}21 = Footer
- \{WP\}22 = Text Box
- \{WP\}23 = Normal

Style formats:

Open style: $\langle \text{DB}/\text{SO}_1\rangle...\text{Style codes}...\langle \text{DB}/\text{SO}_0\rangle$
Paragraph Paired style: $\langle \text{DB}/\text{SO}_1\rangle...\text{Style codes}...\langle \text{DB}/\text{SO}_0\rangle...\text{text}...\langle \text{DB}/\text{SO}_2\rangle...\text{Inverse style codes}...\langle \text{DB}/\text{SO}_0\rangle$
Formatter style: $\langle \text{DB}/\text{SO}_4\rangle...\text{Style codes}.../...\text{Inverse style codes}...\langle \text{DB}/\text{SO}_0\rangle$
### $DC = \text{End of Line/Page Group}$

**Function:** $DC/\$xx$  
**Name:** See $\langle\text{Sub-group}\rangle$  
**Length:** Variable  
**Orientation:** Character

$\langle DC\rangle\langle\text{sub-group}\rangle[\text{Length}] <\text{Sub-functions}>...$  
$[\text{Length}]\langle\text{sub-group}\rangle<DC>$

$\langle\text{Sub-group}\rangle =$

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$00$</td>
<td>SoftEOL_ Soft end of line</td>
</tr>
<tr>
<td>$01$</td>
<td>SoftEOP_ Soft end of page/column</td>
</tr>
<tr>
<td>$02$</td>
<td>HardEOL_ Hard end of line</td>
</tr>
<tr>
<td>$03$</td>
<td>HardEOLSoftEOP_ Hard end of line/soft end of page/column</td>
</tr>
<tr>
<td>$04$</td>
<td>TempEOL_ Temporary end of line</td>
</tr>
<tr>
<td>$05$</td>
<td>TempEOP_ Temporary end of page/column</td>
</tr>
<tr>
<td>$06$</td>
<td>DormantHardEOL_ Dormant hard return</td>
</tr>
<tr>
<td>$07$</td>
<td>HardEOP_ Hard end of page</td>
</tr>
<tr>
<td>$08$</td>
<td>HardEOC_ Hard end of column</td>
</tr>
<tr>
<td>$09$</td>
<td>HardEOCSSoftEOP_ Hard end of column/Soft end of page</td>
</tr>
<tr>
<td>$0A$</td>
<td>HardCEOL_ Hard end of line (HardEOC_ not in columns)</td>
</tr>
<tr>
<td>$0B$</td>
<td>HardCEOLSoftEOP_ Hard EOL/Soft EOP (HardEOCSSoftEOP_ not cols)</td>
</tr>
<tr>
<td>$0C$</td>
<td>HardHyphEOL_ Hard hyphen at end of line</td>
</tr>
<tr>
<td>$0D$</td>
<td>HardHyphEOP_ Hard hyphen at end of page/col</td>
</tr>
<tr>
<td>$0E$</td>
<td>SoftHyphEOL_ Soft hyphen at end of line</td>
</tr>
<tr>
<td>$0F$</td>
<td>SoftHyphEOP_ Soft hyphen at end of page/col</td>
</tr>
<tr>
<td>$10$</td>
<td>AutoHyphEOL_ Auto hyphen at end of line</td>
</tr>
<tr>
<td>$11$</td>
<td>AutoHyphEOP_ Auto hyphen at end of page/column</td>
</tr>
<tr>
<td>$12$</td>
<td>(reserved)</td>
</tr>
<tr>
<td>$13$</td>
<td>HardBOF_ Hard beginning of file</td>
</tr>
<tr>
<td>$14$</td>
<td>TempHardEOC_ Temporary Hard end of column</td>
</tr>
<tr>
<td>$15$</td>
<td>TempHardEOCSSoftEOP_ Temporary Hard EOC/Soft EOP</td>
</tr>
<tr>
<td>$16$</td>
<td>TableCell_ Hard end of table cell</td>
</tr>
<tr>
<td>$17$</td>
<td>(reserved)</td>
</tr>
<tr>
<td>$18$</td>
<td>TableRow_ Hard end of table row/child</td>
</tr>
<tr>
<td>$19$</td>
<td>TableRowSoftEOP_ Hard end of table row/child/soft end of page</td>
</tr>
<tr>
<td>$1A$</td>
<td>TableOff_ Hard end of table row/end of table</td>
</tr>
<tr>
<td>$1B$</td>
<td>TableOffSoftEOP_ Hard end of table row/end of table/soft EOP</td>
</tr>
<tr>
<td>$1C$</td>
<td>TableRowEOH_ Hard end of table row/child/end of header</td>
</tr>
<tr>
<td>$1D$</td>
<td>TableRowBOHSOFTEOP_ Hard end of table row/child/soft EOP/start of header</td>
</tr>
</tbody>
</table>
$1E = \text{(reserved)}$

$1F = \text{(reserved)}$
Conversions and search routines should use the following mappings:

$00 = \text{SoftEOL}_\rightarrow \text{Space}$
$01 = \text{SoftEOP}_\rightarrow \text{Space}$
$02 = \text{HardEOL}_\rightarrow \text{HardEOL}_$
$03 = \text{HardEOLSoftEOP}_\rightarrow \text{HardEOL}_$
$04 = \text{TempEOL}_\rightarrow \text{Deleted}$
$05 = \text{TempEOP}_\rightarrow \text{Deleted}$
$06 = \text{DormantHardEOL}_\rightarrow \text{HardEOL}_$
$07 = \text{HardEOP}_\rightarrow \text{HardEOP}_$
$09 = \text{HardEOC}_\rightarrow \text{HardEOC}_$
$09 = \text{HardEOCSoftEOP}_\rightarrow \text{HardEOC}_$
$0A = \text{HardCEOL}_\rightarrow \text{HardEOL}_$
$0B = \text{HardCEOLSoftEOP}_\rightarrow \text{HardEOL}_$
$0C = \text{HardHyphEOL}_\rightarrow \text{HardHyphen}$
$0D = \text{HardHyphEOP}_\rightarrow \text{HardHyphen}$
$0E = \text{SoftHyphEOL}_\rightarrow \text{Deleted}$
$0F = \text{SoftHyphEOP}_\rightarrow \text{Deleted}$
$10 = \text{AutoHyphEOL}_\rightarrow \text{Deleted}$
$11 = \text{AutoHyphEOP}_\rightarrow \text{Deleted}$
$12 =$
$13 = \text{HardBOF}_\rightarrow \text{Deleted}$
$14 = \text{TempHardEOC}_\rightarrow \text{HardEOC}_$
$15 = \text{TempHardEOCSoftEOP}_\rightarrow \text{HardEOC}_$
$16 = \text{TableCell}_\rightarrow \text{TableCell}_$
$17 =$
$18 = \text{TableRow}_\rightarrow \text{TableRow}_$
$19 = \text{TableRowHardEOP}_\rightarrow \text{TableRow}_$
$1A = \text{TableOff}_\rightarrow \text{TableOff}_$
$1B = \text{TableOffSoftEOP}_\rightarrow \text{TableOff}_$
$1C = \text{TableRowEOH}_\rightarrow \text{TableRow}_$
$1D = \text{TableRowBOHSoftEOP}_\rightarrow \text{TableRow}_$
$1E =$
$1F =$

When inserting an end-of-line/page function, a short form may be used to increase speed and reduce memory requirements. These functions contain only one \{Length\} parameter (Length=2). i.e.

<$DC><EOL\ Type>[\$0002]<EOL\ Type><$DC>$

The above functions are to be used at the beginning/end of each line. All sub-functions within the $DC function are for internal use only and should not be inserted when creating WordPerfect documents.

2Conversions should replace \text{TableRowBOHSoftEOP}_, \text{TableRowEOH}_ and everything in between with one \text{TableRow}_ function.
End of Line Subfunctions

The following section documents functions referred to as sub-functions. They exist inside the end-of-line function and are either of fixed length or have a word of variable length. Unlike regular functions, the length is the total size in bytes of the sub-function. Sub-functions are for *internal use only* and should not be inserted when creating a function.

See Appendix D for summary of sub-functions.

<table>
<thead>
<tr>
<th>Subfunction</th>
<th>$00</th>
<th>$00 = End of Line Characters Subfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>EOLCharsSubFunc_</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>Variable</td>
<td></td>
</tr>
<tr>
<td>$&lt;00&gt;$ [Length]</td>
<td></td>
<td>0=Pascal, 1=Script</td>
</tr>
<tr>
<td>$&lt;Characters...&gt;$</td>
<td></td>
<td>Pascal or Script String</td>
</tr>
<tr>
<td>$&lt;00&gt;$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The end-of-line-characters sub-function is written by the hyphenation routines and used by display to show alternate hyphenation characters associated with an end-of-line function.

<table>
<thead>
<tr>
<th>Subfunction</th>
<th>$01</th>
<th>$01 = End of Paragraph Subfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>EndParSubFunc_</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>$&lt;01&gt;$ [Paragraph #]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[SoftNewLines]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[LineNum]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>{UDLinAtBegPar}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>{UDLinAtHardRtn}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>{SpaceAfterParagraph}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$&lt;01&gt;$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The beginning-of-paragraph sub-function is written by the forward formatter and used by the reverse formatter to determine the position of the beginning of a paragraph for graphic positioning as well as line numbering functions.

<table>
<thead>
<tr>
<th>Subfunction</th>
<th>$02</th>
<th>$02 = End of Indent Subfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>EndIndentSubFunc_</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>$&lt;02&gt;$ &lt;Old def&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Old TLMar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Old TRMar)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The end-of-lindent sub-function is written by the forward formatter when reverting back to original margins after an indent and is used by the reverse formatter to recover indent margins when moving back onto a line.

**Subfunction:** $03

**Name:** EOPHTMLSubFunc_

**Length:** 6

<$03> {Old HTML flags}

<$03>

???

### $03 = End of Paragraph HTML Subfunction

**Subfunction:** $04

**Name:** EOLSubFunc_

**Length:** 12

<$04> {Old integer part of document position} UDLin

[Old fractional part of document position] UPLin

(Old vertical page position)

<$04>

The end-of-line sub-function is written by the forward formatter when a line size change is encountered anywhere in the current line and used by the reverse formatter to set the top of line position when moving back onto a line.
### $05 = Subtitle Region Subfunction

**Subfunction:**  $05  
**Name:** SubtitleSubFunc_  
**Length:** 12

$05 > [Begin upcur]  
[End upcur]  
{Udlin}  
{Delta udlin}  
$05>

The subtitle region sub-function is written by the forward formatter when a subtitle appears on a line and is used by display.

### $06 = End of Table Cell Subfunction

**Subfunction:**  $06  
**Name:** EOCTableSubFunc_  
**Length:** 9

$06 > [LineCnt]  
<Cell mode>  
<Cell vertical alignment>  
<Cell number format>  
<Cell flags>  
$06>

The End of Table Cell sub-function is written by the formatter at the end of each table cell.

### $07 = Table Cell Line Number Subfunction

**Subfunction:**  $07  
**Name:** EOCellLineDefSubFunc_  
**Length:** 6

$07 > <Cell top border #>  
<Cell Left border #>  
<Cell Bottom border #>  
<Cell Right border #>  
$07>

The Table Cell Line Number sub-function is written by the formatter at the end of each table cell when data values have been changed and used by the reverse formatter recover cell line information.
Subfunction: $08
Name: EOCellLineColorSubFunc_
Length: 26

$08 = Table Cell Line Color Definition Subfunction

<$08> [Cell top border color].3
[Cell Left border color].3
[Cell Bottom border color].3
[Cell Right border color].3

<$08>

The Table Cell Line/Color sub-function is written by the formatter at the end of each table cell when data values have been changed and used by the reverse formatter recover cell line color information.

Subfunction: $09
Name: EOCellFillSubFunc_
Length: 9

$09 = Table Cell Fill Subfunction

<$09> [Cell fill background color].3
<Cell fill pattern #>

<$09>

The Table Cell Fill sub-function is written by the formatter at the end of each table cell when data values have been changed and used by the reverse formatter recover cell fill information.
Subfunction: $0A  
Name: EORTTableSubFunc_  
Length: Variable

$0A = End of Table Row Subfunction

The End of Table Row sub-function is written by the formatter at the end of each table row and used by the reverse formatter to recover row information.

Subfunction: $0B  
Name: EOPSubFunc_  
Length: 39

$0B = End of Page/Column Subfunction

The end of page/column sub-function is written by the forward formatter at the end of every page and/or column and used by the reverse formatter to recover various display and formatter values when moving back across a page break.

Corel Corp. Confidential  
January 4, 2011
Subfunction: $0C  
Name: LastColumnSubFunc_  
Length: Variable  

$0C = Last Column at EOP Subfunction

Subfunction:
Name: LastColumnSubFunc_
Length: Variable

$0C = Last Column at EOP Subfunction

The last-column sub-function is written by the forward formatter at the end of the last column and used by the reverse formatter to recover column values when moving back into the last column.

Subfunction: $0D  
Name: OldHoleTableSubFunc_  
Length: Variable  

$0D = Old Hole Table Subfunction

Subfunction:
Name: OldHoleTableSubFunc_
Length: Variable

$0D = Old Hole Table Subfunction

[Box ID] < 0 indicates the box is to the right of the current position.

The old-hole-table sub-function is written by the formatter at the end of a page and used by the reverse formatter to recover hole positions when moving back on a page.
### $0E = Line Break Subfunction

<table>
<thead>
<tr>
<th>Subfunction: $0E</th>
<th>Name: LineBreakSubFunc_</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length: 1</td>
<td>&lt;$0E&gt;</td>
</tr>
</tbody>
</table>

The line break sub-function is written by the formatter when it is an end of line and Temp-margin-adjustment and Beginning-of-line sub-functions are present or in end-of-column/page functions.

### $0F = Cell Break Subfunction

<table>
<thead>
<tr>
<th>Subfunction: $0F</th>
<th>Name: CellBreakSubFunc_</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length: 8</td>
<td>&lt;$0F&gt; [Old TableColumnNumber]</td>
</tr>
<tr>
<td></td>
<td>[Old TableRowNumber]</td>
</tr>
<tr>
<td></td>
<td>[Old TableRealRowNumber]</td>
</tr>
<tr>
<td></td>
<td>&lt;$0F&gt;</td>
</tr>
</tbody>
</table>

The Cell break sub-function is written by the formatter when it is an end of cell.
### Subfunction: $10$

**Name:** TableBreakSubFunc_

**Length:** Variable

<table>
<thead>
<tr>
<th>Start Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$10&gt;</td>
</tr>
</tbody>
</table>

- [TableID1]
- [TableID2]
- Outside Top border #>
- Outside Left border #>
- Outside Bottom border #>
- Outside Right border #>

- [Outside Top border RGB color].3
- [Outside Left border RGB color].3
- [Outside Bottom border RGB color].3
- [Outside Right border RGB color].3

- Inside Top border #>
- Inside Left border #>
- Inside Bottom border #>
- Inside Right border #>

- [Inside Top border RGB color].3
- [Inside Left border RGB color].3
- [Inside Bottom border RGB color].3
- [Inside Right border RGB color].3

- [Cell background fill RGB color].3
- <Cell fill pattern>

- <Table mode>
  - (Offset from left edge of paper)
  - (Top gutter)
  - (Left gutter)
  - (Bottom gutter)
  - (Right gutter)

- {Left margin at start of table}
- {Right margin at start of table}
- {TableHeaderIndex}
- {Table Header Size}
- {Table row #}
- {# of table rows defined}
- {# of header rows}
- {Current table column number}
- {# of table columns defined}

- {leftMargin}
- <mode>
- {width}
- {decimalOffset}
  
  .....
- {rightMargin}
- [End Length]
The Table Off sub-function is written by the forward formatter at the end of the table and used by the reverse formatter to recover table values when moving back into the last cell of a table.

Subfunction: $11$  
Name: ColumnBreakSubFunc_  
Length: 7  

$11 = \text{Column Break Subfunction}$  

$<$11$>$  
$<$Current column number$>$  
$<$11$>$  
$<$Max UD Lin at End of columns $-$ UD Lin at EOC$>$  

The column break sub-function indicates when to apply end-of-column calculations.

Subfunction: $12$  
Name: BottomBorderSubFunc_  
Length: 14  

$12 = \text{Bottom border adjustment Subfunction}$  

$<$12$>$  
$<$Inside bottom space$>$  
$<$Border width$>$  
$<$Inside bottom space$>$  

The bottom-border-adjustment sub-function is written by the forward formatter if borders are present.

Subfunction: $13$  
Name: BetweenBorderSubFunc_  
Length: 14  

$13 = \text{Between Border Adjustment Subfunction}$  

$<$13$>$  
$<$Inside between space$>$  
$<$Border width$>$  
$<$Inside top space$>$  

The between-border-adjustment sub-function is written by the forward formatter if borders are present.
$14 = Bottom Page Adjustment Subfunction

Subfunction: $14
Name: BottomSpaceSubFunc_
Length: 26

The bottom-page-adjustment sub-function is written by the forward formatter if in galley mode and is used by display to determine the white space at the bottom of the page. The white space is equal to the sum of (Bottom margin), (Footnote/endnote size), and maximum((Page # size), (Footer A size), (Footer B size)).

$15 = Page Break Subfunction

Subfunction: $15
Name: PageBreakSubFunc_
Length: 10

The page break sub-function indicates when to apply end-of-page calculations.

$16 = Page Orientation Subfunction

Subfunction: $16
Name: Page OrientationFunc_
Length: Variable

The page orientation sub-function is written by the forward formatter if a new page orientation is present.
Subfunction: $17  
Name: TopSpaceSubFunc_  
Length: 22

$17 = Top Page Adjustment Subfunction

$17>

(Top margin)
(Page # size)
(Header A size)
(Header B size)
(Table Header size)

$17>

The top-page-adjustment sub-function is written by the forward formatter if in galley mode and updated as a page is formatted. It is used by display to determine the white space at the top of the page. The white space is equal to the sum of (Top margin) and maximum((Page # size), (Header A size), (Header B size)).

Subfunction: $18  
Name: TopBorderSubFunc_  
Length: 14

$18 = Top Border Adjustment Subfunction

$18>

(Outside top space)
(Border width)
(Inside top space)

$18>

The top-border-adjustment sub-function is written by the forward formatter if borders are present.
Subfunction: $19
Name: NewHoleTableSubFunc_
Length: Variable

$19 = New Hole Table Subfunction

$19> [Length]
Number of table entries
[Box ID]
[Page #]
[Top UPLin]
[Left UPCur]
[Bottom UPLin]
[Right UPCur]
[Text wrap flag]

[Length]

[Box ID] < 0 indicates the box is to the right of the current position.

The new-hole-table sub-function is written and/or updated as a page is formatted and used by the forward formatter to open holes for boxes.

Subfunction: $1A
Name: MarginChangeSubFunc_
Length: 18

$1A = Margin Change Subfunction

$1A> {Old Left margin}
{Old Right margin}
{New Left margin}
{New Right margin}

The Temp-margin-adjustment sub-function temporarily adjusts line margins for figures.
Subfunction: **$1B**

Name: ColumnMarginSubFunc_

Length: Variable

$1B = Column Margin Change Subfunction

<$1B> [Length]

<Old def>

<Old number of columns>
[Old % size of column 1]
{Old space between column 1 & 2}

....

[Old % size of column (n-1)]
{Old space between column (n-1) & n}
[Old % size of column n]

<New def>

<New number of columns>
[New % size of column 1]
{New space between column 1 & 2}

....

[New % size of column (n-1)]
{New space between column (n-1) & n}
[New % size of column n]

[Length]

<$1B>

<def> = 0 = Columns off (1 column)
1 = Newspaper columns
2 = Parallel columns
3 = Extended columns
Subfunction:  $1C$
Name: TableOnSubFunc_
Length: Variable

$1C = Table ON Subfunction$

<$1C$> [Start Length]
[Table ID1]
[Table ID2]
<Outside Top border #>  Outside border #
<Outside Left border #>  
<Outside Bottom border #>  
<Outside Right border #>  

[Outside Top border RGB color].3  Outside border color
[Outside Left border RGB color].3
[Outside Bottom border RGB color].3
[Outside Right border RGB color].3

<Inside Top border #>  Inside border #
<Inside Left border #>  
<Inside Bottom border #>  
<Inside Right border #>  

[Inside Top border RGB color].3  Inside border color
[Inside Left border RGB color].3
[Inside Bottom border RGB color].3
[Inside Right border RGB color].3

[Cell background fill RGB color].3  Cell Color
<Cell fill pattern>  Cell Fill Pattern

<Table mode>
(Offset from left edge of paper)
(Top gutter)
(Left gutter)
(Bottom gutter)
(Right gutter)
[# of rows]
<$ header rows$>
<$ of columns$>

<Column mode>
:Number format>
(Column width)
(Decimal right offset)
[End length]

<$1C$>
Subfunction: $\text{1D}$
   Name: TableHeaderSubFunc_
   Length: 38

$\text{1D} = \text{Beg/End Table Header Subfunction}$

   $<\text{1D}>$
   <tableHeaderFlag>
   [Old table header font]
   [Old table header font size]
   [Old table header attributes]
   [Old table header justification]
   [Old text RGB]×3
   [New table header font]
   [New table header font size]
   [New table header attributes]
   [New table header justification]
   [New text RGB]×3
   [Start row number]
   [Header row count]

   $<\text{1D}>$

Subfunction: $\text{1E}$
   Name: BORowSubFunc__
   Length: Variable

$\text{1E} = \text{Beginning of Table Row Subfunction}$

   $<\text{1E}>$
   [Start Length]
   <...CellInfo...>
   [End Length]

   $<\text{1E}>$
Subfunction: $1F
Name: BOCellFillSubFunc__
Length: 9

$1F = Beginning of Cell Fill Subfunction

<$1F> [Cell fill background color].3
<$1F>

Subfunction: $20
Name: BOCellLineColorSubFunc__
Length: 26

$20 = Beginning of Cell Line Color Subfunction

<$20> [Cell top border color].3
[Cell Left border color].3
[Cell Bottom border color].3
[Cell Right border color].3
<$20>

Subfunction: $21
Name: BOCellLineSubFunc__
Length: 6

$21 = Begin of Cell Line Number Subfunction

<$21> <Cell top border #>
<$21> <Cell Left border #>
<$21> <Cell Bottom border #>
<$21> <Cell Right border #>
<$21>

Subfunction: $22
Name: BOCellSubFunc__
Length: 3

$22 = Beginning of Table Cell Subfunction

<$22> <Cell mode>
<$22>

Subfunction: $23
Name: ParIndentSubFunc_
Length: 10

$23 = Paragraph Indent Subfunction

<$23> (Old ParagraphIndent)
<$23> (New ParagraphIndent)
<$23>

The paragraph indent sub-function is inserted at the beginning of each paragraph if paragraph indent is not
equal to left margin.

Subfunction: $24 $24 = Temp Margin Adjustment Subfunction
   Name: TempMarginSubFunc_
   Length: 6
   <$24> [Left margin adjustment]
   <$24> [Right margin adjustment]
   <$24>

The Temp-margin-adjustment sub-function temporarily adjusts line margins for figures.

Subfunction: $25 $25 = Line Indent Subfunction
   Name: IndentSubFunc_
   Length: 6
   <$25> (Line indent)
   <$25>

The line indent sub-function is inserted at the beginning of each paragraph if paragraph indent is not equal to left margin.

Subfunction: $26 $26 = Border Ascent Subfunction
   Name: AscentSubFunc_
   Length: 4
   <$26> [Border ascent]
   <$26>

Subfunction: $27 $27 = Beginning of Line Subfunction
   Name: BOLSubFunc_
   Length: 12
   <$27> [Top border of line]
   <$27> [Maximum ascent of line]
   <$27> [Maximum descent of line]
   <$27> [Line height]

The beginning-of-line sub-function is inserted when the entire line has been formatted and used by display to set line baseline.
Subfunction: $28
Name: BOLCharsSubFunc_
Length: Variable

$28 = Begin of Line Characters Subfunction

<$28> [Length]
<Def> 0=Pascal, 1=Script
<Character...> Pascal or Script String [Length]
<$28>

The beginning-of-line-characters sub-function is written by the hyphenation routines and used by display to show alternate hyphenation characters associated with an beginning-of-line function.
$DD = \text{Reserved}$
Variable Length Multi-byte Functions

SDD = Reserved
### $DE = \text{Merge Group}

Function: $DE/$00

- **Name:** SingleCodes_
- **Length:** 5
- **Orientation:** Character

$DE/$00 = Merge Code Function

<table>
<thead>
<tr>
<th>$&lt;DE&gt;&lt;00&gt;&lt;\text{Length}&gt;&lt;\text{Merge code}&gt; &lt;\text{Length}&gt;&lt;00&gt;&lt;DE&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2 = Define names</td>
</tr>
<tr>
<td></td>
<td>3 = From keyboard</td>
</tr>
<tr>
<td></td>
<td>4 = Date</td>
</tr>
<tr>
<td></td>
<td>5 = End of record</td>
</tr>
<tr>
<td></td>
<td>6 =</td>
</tr>
<tr>
<td></td>
<td>7 =</td>
</tr>
<tr>
<td></td>
<td>8 =</td>
</tr>
<tr>
<td></td>
<td>9 =</td>
</tr>
<tr>
<td></td>
<td>10 =</td>
</tr>
<tr>
<td></td>
<td>11 =</td>
</tr>
<tr>
<td></td>
<td>12 =</td>
</tr>
<tr>
<td></td>
<td>13 =</td>
</tr>
<tr>
<td></td>
<td>14 = Next record</td>
</tr>
<tr>
<td></td>
<td>15 =</td>
</tr>
<tr>
<td></td>
<td>16 =</td>
</tr>
<tr>
<td></td>
<td>17 = Quit</td>
</tr>
<tr>
<td></td>
<td>18 = End of field</td>
</tr>
<tr>
<td></td>
<td>19 =</td>
</tr>
<tr>
<td></td>
<td>20 = To printer</td>
</tr>
<tr>
<td></td>
<td>21 =</td>
</tr>
<tr>
<td></td>
<td>22 = Transfer</td>
</tr>
</tbody>
</table>
Function: $DE/$01
Name: MergeMessage_
Length: Variable
Orientaton: Character

$DE/$01 = Output Merge Message

<$DE><$01>[Length] <Def>
  <Action def>
    <Prompt...>

[Length]$01<$DE>

<Def> = 1 = Macro File
  2 = Primary File
  3 = Secondary File
  4 = Field Number
  5 = Field Prompt
  6 = Field Name
  7 = unused
  8 = Message (Macro file)
  9 = Message (Primary file)
 10 = Message (Secondary File)
 11 = Message (Field number)
 12 = Message (Notification)
 13 = Message (Keyboard response)

For <Def> = 2 or 3:

  <Action def> =
    0 = No prompt
    1 = Prompt if file not found during merge

For <Def> = 4, 5, or 6:

  <Action def> =
    0 = No action
    1 = Eliminate blank line if field not found.
$DF = \text{Border Group}$

Function: $\text{$DF$/00}$
Name: CharBorder_
Length: Variable
Orientation: Character

$\text{$DF$/00} = \text{Set Character Border On/Off}$

$<\text{$DF$}><\text{$00$}>[\text{Length}] <\text{Old values}> \uparrow > \text{Same number as new values}$

[New border flags]

(NeW top outside space) Spacing
(NeW left outside space)
(NeW bottom outside space)
(NeW right outside space)
(NeW top inside space)
(NeW left inside space)
(NeW bottom inside space)
(NeW right inside space)

[New Red color] Border Color
[New Green color]
[New Blue color]

[New fill foreground Red color] Fill Color
[New fill foreground Green color]
[New fill foreground Blue color]
[New fill background Red color]
[New fill background Green color]
[New fill background Blue color]

(NeW fill pattern #1)
(NeW fill pattern #2)

<New Space between borders> Border defs
<New # of borders defined:\n  <New border def>
  <New border thickness>
  {New line pattern #1}
  {New line pattern #2}
...

[Length]$<\text{$00$}>$<\text{$DF$}>

(Border flags) = (msb) 15 = Border On
14 = Fill On
13 = Adjust line height
12 = Line between paragraphs
11 = Line between columns
10 =
  9 =
  8 =
  7 =
  6 =
5 = 4 = Border definitions in function
3 = Fill Pattern values in function
2 = Fill Color values in function
1 = Border Color values in function

(lsb) 0 = Spacing values in function

{Top outside space}
{Left outside space}
{Bottom outside space}
(Right outside space) = Spacing reserved outside border

{Top inside space}
{Left inside space}
{Bottom inside space}
(Right inside space) = Spacing between border and text

[Red color]
[Green color]
[Blue color] = Border color

[Fill foreground Red color]
[Fill foreground Green color]
[Fill foreground Blue color] = Foreground fill color

[Fill background Red color]
[Fill background Green color]
[Fill background Blue color] = Background fill color

{Fill pattern #1}
{Fill pattern #2} = Border fill pattern

<Space between borders> = Space between each border def

<# of borders defined> = Number of borderdefs

Each border def includes the following record:

<Border def> =

(msb) 7 =
6 = Hairline
5 = Drop shadow
4 = Rounded corners
3 = Right
2 = Bottom
1 = Left
(lsb) 0 = Top

<Border thickness> = Border line thickness
(Line pattern #1)
(Line pattern #2) = Border line pattern

Note: If [Border flags] = 0, then there are no other old/new function
values.

A border off function needs only \[\text{New border flags} = 0\]. All other new values are not to be included in function.

<table>
<thead>
<tr>
<th>Function: $DF/$01</th>
<th>$DF/$01 = Set Paragraph Border On/Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: ParBorder_</td>
<td></td>
</tr>
<tr>
<td>Length: Variable</td>
<td>(&lt;\text{$DF}&gt;&lt;\text{$01}&gt;&lt;\text{Length}&gt;&lt;\text{$01}&gt;&lt;\text{$DF}&gt;)</td>
</tr>
<tr>
<td>Orientation: Paragraph</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $DF/$02</th>
<th>$DF/$02 = Set Column Border On/Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: ColBorder_</td>
<td></td>
</tr>
<tr>
<td>Length: Variable</td>
<td>(&lt;\text{$DF}&gt;&lt;\text{$02}&gt;&lt;\text{Length}&gt;&lt;\text{$02}&gt;&lt;\text{$DF}&gt;)</td>
</tr>
<tr>
<td>Orientation: Column</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $DF/$03</th>
<th>$DF/$03 = Set Page Border On/Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: PageBorder_</td>
<td></td>
</tr>
<tr>
<td>Length: Variable</td>
<td>(&lt;\text{$DF}&gt;&lt;\text{$03}&gt;&lt;\text{Length}&gt;&lt;\text{$03}&gt;&lt;\text{$DF}&gt;)</td>
</tr>
<tr>
<td>Orientation: Page</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $DF/$04</th>
<th>$DF/$04 = Set Figure Box Border On/Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: FigureBoxBorder_</td>
<td></td>
</tr>
<tr>
<td>Length: Variable</td>
<td>(&lt;\text{$DF}&gt;&lt;\text{$04}&gt;&lt;\text{Length}&gt;&lt;\text{$04}&gt;&lt;\text{$DF}&gt;)</td>
</tr>
<tr>
<td>Orientation: Character</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $DF/$05</th>
<th>$DF/$05 = Set Table Box Border On/Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: TableBoxBorder_</td>
<td></td>
</tr>
<tr>
<td>Length: Variable</td>
<td>(&lt;\text{$DF}&gt;&lt;\text{$05}&gt;&lt;\text{Length}&gt;&lt;\text{$05}&gt;&lt;\text{$DF}&gt;)</td>
</tr>
<tr>
<td>Orientation: Character</td>
<td></td>
</tr>
</tbody>
</table>
Function: $DF/$06
  Name: TextBoxBorder_
  Length: Variable
  Orientation: Character

$DF/$06 = Set Text Box Border On/Off

...Same as character border....>

Function: $DF/$07
  Name: UserBoxBorder_
  Length: Variable
  Orientation: Character

$DF/$07 = Set User Box Border On/Off

...Same as character border....>

Function: $DF/$08
  Name: EquationBoxBorder_
  Length: Variable
  Orientation: Character

$DF/$08 = Set Equation Box Border On/Off

...Same as character border....>
### $E0 = \text{Subtitle Group}$

<table>
<thead>
<tr>
<th>Function: $E0$/00</th>
<th>$E0$/00 = \text{Subtitle Function}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: Subtitle_</td>
<td>[Length] # of regions</td>
</tr>
<tr>
<td>Length: Variable</td>
<td>[Delta UPCur]</td>
</tr>
<tr>
<td>Orientation: Character</td>
<td>[Delta UDLin]</td>
</tr>
<tr>
<td></td>
<td>[Ascent]</td>
</tr>
<tr>
<td></td>
<td>[Width]</td>
</tr>
<tr>
<td></td>
<td>[1/2 space between units]</td>
</tr>
<tr>
<td></td>
<td>[# of Units]</td>
</tr>
<tr>
<td></td>
<td>[Unit width]</td>
</tr>
<tr>
<td></td>
<td>[Unit separator]</td>
</tr>
<tr>
<td></td>
<td>&lt;Unit text...&gt;</td>
</tr>
<tr>
<td></td>
<td>Pascal String</td>
</tr>
<tr>
<td></td>
<td>[Length]&lt;00&gt;&lt;E0&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function: $E0$/01</th>
<th>$E0$/01 = \text{Set Subtitle Font}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: SubtitleFont_</td>
<td>(Document stamp)</td>
</tr>
<tr>
<td>Length: Variable</td>
<td>[Old font #]</td>
</tr>
<tr>
<td>Orientation: Character</td>
<td>[Old font type]</td>
</tr>
<tr>
<td></td>
<td>[New font #]</td>
</tr>
<tr>
<td></td>
<td>[New font type]</td>
</tr>
<tr>
<td></td>
<td>&lt;Font name...&gt;</td>
</tr>
<tr>
<td></td>
<td>Pascal String</td>
</tr>
<tr>
<td></td>
<td>[Length]&lt;01&gt;&lt;E0&gt;</td>
</tr>
</tbody>
</table>

See Font Change ($D1$/01.)

<table>
<thead>
<tr>
<th>Function: $E0$/02</th>
<th>$E0$/02 = \text{Set Subtitle Size}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: SubtitleSize_</td>
<td>[Length] Old size</td>
</tr>
<tr>
<td>Length: 8</td>
<td>[New size]</td>
</tr>
<tr>
<td>Orientation: Character</td>
<td>[Length]&lt;02&gt;&lt;E0&gt;</td>
</tr>
</tbody>
</table>

[size] =
0 = fine
1 = small
2 = normal
3 = large
4 = very large
5 = extra large
**Function:** $E0$/03
**Name:** SubtitleFace_
**Length:** Variable
**Orientation:** Paragraph

$E0$/03 = Set Subtitle Face Style

```
<$E0><$03>[Length] [Old face] [New face]
[Length]<$03><$E0>

[face] = (msb) 7 =
6 = Extended
5 = Condensed
4 = Shadow
3 = Outline
2 = Underline
1 = Italic
0 = Bold
```

---

**Function:** $E0$/04
**Name:** SubtitlePosition_
**Length:** 8
**Orientation:** Paragraph

$E0$/04 = Set Subtitle Position

```
<$E0><$04>[Length] [Old position] [New position]
[Length]<$04><$E0>

[position] =
0 = below line
1 = above line
```
$E1 = \text{Edition Group}

\textbf{Function: }$E1/$00

\textbf{Name: } PublishOn_

\textbf{Length: } 9

\textbf{Orientation: } Character

\textbf{$E1/$00 = Publish On - Start of Published Text}

\textbf{Name: } PublishOn_

\textbf{Length: } 9

\textbf{Orientation: } Character

\textbf{<Def>}

\textbf{<Def> =}

\textbf{(msb) 7 = Edition being updated}

\textbf{(Don’t remove sect/alias resources)}

\textbf{6 = Dissallow global adornment}

\textbf{5 =}

\textbf{4 =}

\textbf{3 =}

\textbf{2 =}

\textbf{1 =}

\textbf{(lsb) 0 = PICT only}

\textbf{(Edition ID) =}

\textbf{A unique number for edition. The low order word is the resource ID of the resource containing sect (section) and alis (alias) data.}

\textbf{Function: }$E1/$01

\textbf{Name: } PublishOff_

\textbf{Length: } 9

\textbf{Orientation: } Character

\textbf{$E1/$01 = Publish Off - End of Published Text}

\textbf{Name: } PublishOff_

\textbf{Length: } 9

\textbf{Orientation: } Character

\textbf{<Def>}

\textbf{<Def> =}

\textbf{(msb) 7 = Edition being updated}

\textbf{(Don’t remove sect/alias resources)}

\textbf{6 = Dissallow global adornment}

\textbf{5 =}

\textbf{4 =}

\textbf{3 =}

\textbf{2 =}

\textbf{1 =}

\textbf{(lsb) 0 = PICT only}

\textbf{(Edition ID) =}

\textbf{A unique number for edition. The low order word is the resource ID of the resource containing sect (section) and alis (alias) data.}
Function: $\text{E1}/\text{F2}$

Name: SubscribeOn_

Length: Variable

Orientation: Character

$\text{E1}/\text{F2} = \text{Subscribe On} - \text{Start of Subscribed Text}$

<$\text{E1}>\text{F2}>[\text{Length}]

<Def>

{Edition ID}

{Edition type}

{Global adornment attributes}

[Other global adornment functions] Optional

....

[Other global adornment functions] Optional

<PC Stuff...>

[Length]<$\text{F2}>\text{E1}>

<Def> =

(msb) 7 = Edition being updated

(Don’t remove sect/alias resources)

6 = Dissallow global adornment

5 =

4 =

3 =

2 =

1 =

(lsb) 0 = PICT only

{Edition ID} =

A unique number for edition. The low order word is the resource ID of the resource containing sect (section) and alis (alias) data.

{Edition type} =

PICT, TEXT, styl, WPD2...

{Global adornment attributes} =

bits of attributes that will be stripped from the subscription.

(msb) 31 =

30 =

29 =

28 =

27 =

26 =

25 =

24 =

23 =

22 =

21 =

20 =
19 =
18 = Small caps
17 = Fine print
16 = Small print
15 = Larg print
14 = Very large print
13 = Extra large print
12 = Double underline
11 = Superscript
10 = Subscript
  9 = Strike out
  8 = Red line
  7 =
  6 =
  5 =
  4 = Shadow
  3 = Outline
  2 = Underline
  1 = Italics
(lsb) 0 = Bold

[Other global adornment functions] =

<Group><Sub Class> of variable length functions to be stripped from the subscription.

or

<Function><0> of Fixed length or single byte functions to be stripped from the subscription.

NOTE: AttributeOnOff_ ($C3) should not be part of this list, but globally adorned attributes are set in the {Global adornment attributes} portion of this function.
Function: $E1/$03

Name: SubscribeOff_

Length: 9

Orientation: Paragraph

$E1/$03 = Subscribe Off - End of Subscribed Text

$$E1$$<$$03$$>[Length]  
<Def>  
(Edition ID)

<PC Stuff...>

[Length]<$$03$$><$$E1$$>

<Def> = (msb) 7 = Edition being updated  
(Don’t remove sect/alias resources)  
6 = Dissallow global adornment  
5 =  
4 =  
3 =  
2 =  
1 =  

(lsib) 0 = PICT only

(Edition ID) = A unique number for edition. The low order word is the resource ID of the resource containing sect (section) and alis (alias) data.
$E2 = Tables Group

Function:  $E2/$00  
Name:  Reserved  
Length:  <$E2><$00>[Length] ...  
Orientation:  [Length]<$00><$E2>

NOTE: Not to be used to insure compatibility with versions 2.1.
Function: $E2/01$
Name: TableDef_
Length: Variable
Orientation: Paragraph

$E2/01 = \text{Table Function}$

*Document stamp†*

[Table ID1†]

[Table ID2]

<Outside top border #> Outside border #
<Outside left border #>
<Outside bottom border #>
<Outside right border #>

[Outside top RGB color].3 Outside border color
[Outside left RGB color].3
[Outside bottom RGB color].3
[Outside right RGB color].3

<Cell top border #> Default cell border #
<Cell left border #>
<Cell bottom border #>
<Cell right border #>

<Cell top RGB color>.3 Default cell RGB
<Cell left RGB color>.3
<Cell bottom RGB color>.3
<Cell right RGB color>.3

[Table background fill RGB color].3

<Cell fill pattern #>

(Table mode)
{Offset from left edge of paper}
{Top gutter spacing}
{Left gutter spacing}
{Bottom gutter spacing}
{Right gutter spacing}
[# of rows]
[# of header rows]
[# of columns]

<Column mode> Repeat block
<Number format #> for each
(Column width) column
(Right offset for decimal align)

[Length]<01><E2>

(Document stamp†) = Supplied by formatter

[Table ID1] = Supplied by formatter - incremented with each table

[Table ID2] = Must be unique to document
<table>
<thead>
<tr>
<th>Type</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td>0</td>
</tr>
<tr>
<td>1 = Hairline</td>
<td>1</td>
</tr>
<tr>
<td>2 = Single</td>
<td>1</td>
</tr>
<tr>
<td>3 = Thick</td>
<td>2</td>
</tr>
<tr>
<td>4 = Extra Thick</td>
<td>3</td>
</tr>
<tr>
<td>5 = Dashed</td>
<td>1</td>
</tr>
<tr>
<td>6 = Dotted</td>
<td>1</td>
</tr>
<tr>
<td>7 = Double</td>
<td>3</td>
</tr>
<tr>
<td>8 = Double Thick</td>
<td>4</td>
</tr>
</tbody>
</table>

[Outside top RGB color].3
[Outside left RGB color].3
[Outside bottom RGB color].3
[Outside right RGB color].3 = Outside border color

<Cell top border #>
<Cell left border #>
<Cell bottom border #>
<Cell right border #> = Default cell border #

[Cell top RGB color].3
[Cell left RGB color].3
[Cell bottom RGB color].3
[Cell right RGB color].3 = Default cell RGB

[Table background fill RGB color].3

<Cell fill pattern #> = 0-63 from WP Pattern pallette

<Table mode> =

(msb)  7 = Tables ON
       6 = Ignore Table locks
       5 = Formula in Table
       4 = Before def
       3 = Hidden functions in table
       2       1 = Table position options

(lsb)  0       1 = Align with left margin
       2 = Center between margins
       3 = Align with right margin
       4 = Adjust to fit margins
       5 = Absolute offset from left edge

Table position options =
{(Offset from left edge of paper) =
  Always added to table position.}

<# of columns> = Number of columns. (32 Maximum.)

<Column mode> = (msb) 7 = Column cells locked
  6 = Ignore col cells in calculations
  5 = Formula in column
  4 =
  3 =
  2 =
  1 =

(lsb) 0 =

<Number format #> = Default number format for column.

(Column width) = Fixed point width of table column.

{Right decimal align offset} =
  Offset from right margin for decimal alignment.

---

Function: $E2/02$
Name: CellSpan_
Length: 6
Orientation: Table Cell

$E2/02 = Set Table Cell Span$

<$E2><02>[Length]  <# of horizontally spanned cells>
<$02><E2>  <# of vertically spanned cells>

[Length]<02><E2>

NOTE: Zero means no joined cells. One joins two cells.
### Function: $\text{E2}/03$

**Name:** CellTopLineDef_

**Length:** 5

**Orientation:** Table Cell

**Definition:**

$$\langle \text{E2} \rangle \langle 03 \rangle [\text{Length}] \langle \text{Top Line Def} \rangle$$

**Description:**

Set Table Cell Top Line

**Top Line Def** =

<table>
<thead>
<tr>
<th>Type</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td>0</td>
</tr>
<tr>
<td>1 = Hairline</td>
<td>1</td>
</tr>
<tr>
<td>2 = Single</td>
<td>1</td>
</tr>
<tr>
<td>3 = Thick</td>
<td>2</td>
</tr>
<tr>
<td>4 = Extra Thick</td>
<td>3</td>
</tr>
<tr>
<td>5 = Dashed</td>
<td>1</td>
</tr>
<tr>
<td>6 = Dotted</td>
<td>1</td>
</tr>
<tr>
<td>7 = Double</td>
<td>3</td>
</tr>
<tr>
<td>8 = Double Thick</td>
<td>4</td>
</tr>
</tbody>
</table>

### Function: $\text{E2}/04$

**Name:** CellLeftLineDef_

**Length:** 5

**Orientation:** Table Cell

**Definition:**

$$\langle \text{E2} \rangle \langle 04 \rangle [\text{Length}] \langle \text{Left Line Def} \rangle$$

**Description:**

Set Table Cell Left Line

**Left Line Def** = Same as Table Cell Top Line Def

### Function: $\text{E2}/05$

**Name:** CellBottomLineDef_

**Length:** 5

**Orientation:** Table Cell

**Definition:**

$$\langle \text{E2} \rangle \langle 05 \rangle [\text{Length}] \langle \text{Bottom Line Def} \rangle$$

**Description:**

Set Table Cell Bottom Line

**Bottom Line Def** = Same as Table Cell Top Line Def

### Function: $\text{E2}/06$

**Name:** CellRightLineDef_

**Length:** 5

**Orientation:** Table Cell

**Definition:**

$$\langle \text{E2} \rangle \langle 06 \rangle [\text{Length}] \langle \text{Right Line Def} \rangle$$

**Description:**

Set Table Cell Right Line

**Right Line Def** = Same as Table Cell Top Line Def
$E2/$07 = Set Table Cell Top Line Color

Function: $E2/$07
Name: CellTopLineColor_
Length: 10
Orientation: Table Cell

[Cell Top line Red color]
[Cell Top line Green color]
[Cell Top line Blue color]

[Length]<$07><$E2>

[Cell Top line color] = RGB color components are expressed as unsigned integer values. Each R, G and B can have a value from $0000 to $FFFF (or 0 to 65,535.)
RGB color is additive; that is, as the value of a component is increased, the amount of that component in the total color increases. An RGB color is black if all three components are set to 0, or white if each component is set to 65,535.

$E2/$08 = Set Table Cell Left Line Color

Function: $E2/$08
Name: CellLeftLineColor_
Length: 10
Orientation: Table Cell

[Cell Left line Red color]
[Cell Left line Green color]
[Cell Left line Blue color]

[Length]<$08><$E2>

[Cell Left line color] = (See $E2/$07 = Table Cell Top Line Color.)

$E2/$09 = Set Table Cell Bottom Line Color

Function: $E2/$09
Name: CellBottomLineColor_
Length: 10
Orientation: Table Cell

[Cell Bottom line Red color]
[Cell Bottom line Green color]
[Cell Bottom line Blue color]

[Length]<$09><$E2>

[Cell Bottom line color] = (See $E2/$07 = Table Cell Top Line Color.)
Function: `$E2/$0A`  
Name: CellRightLineColor_  
Length: 10  
Orientation: Table Cell

**$E2/$0A = Set Table Cell Right Line Color**

- `<$E2><$0A>[Length]`  
- [Cell Right line Red color]  
- [Cell Right line Green color]  
- [Cell Right line Blue color]  
- [Length]<$0A><$E2>

[Cell Right line color] = (See $E2/$07 = Table Cell Top Line Color.)

---

Function: `$E2/$0B`  
Name: CellFill_  
Length: 11  
Orientation: Table Cell

**$E2/$0B = Set Table Cell Fill Color/Pattern**

- `<$E2><$0B>[Length]`  
- [Cell fill background red color]  
- [Cell fill background blue color]  
- [Cell fill background green color]  
- <Cell fill pattern #>  
- [Length]<$0B><$E2>

[Cell fill background color] =  
RGB color components are expressed as unsigned integer values. Each R, G and B can have a value from $0000 to $FFFF (or 0 to 65,535.) RBG color is additive; that is, as the value of a component is increased, the amount of that component in the total color increases. An RGB color is black if all three components are set to 0, or white if each component is set to 65,535.

- `<Cell fill pattern #> =`

---

Function: `$E2/$0C`  
Name: CellAttributes_  
Length: 8  
Orientation: Table Cell

**Reserved**

- `<$E2><$0C>[Length]`  
- [Length]<$0C><$E2>`
Function: \$E2/$0D  \$E2/$0D = Set Table Cell Vertical Alignment
Name: CellJustification_
Length: 5  \(<E2><0D>[Length]  \<Cell vertical alignment>\)
Orientation: Table Cell
[Length]<0D><E2>

\(<Cell vertical alignment> = \)
0 = Top
1 = Middle
2 = Bottom
3 = Full

Function: \$E2/$0E  \$E2/$0E = Set Table Cell Mode
Name: CellMode_
Length: 5  \(<E2><0E>[Length]  \<Cell mode>\)
Orientation: Table Cell
[Length]<0E><E2>

\(<Def> = \)  (msb) 7 = Cell locked
6 = Ignore in calculations
5 = Formula in cell†
4 =
3 =
2 =
1 =
(lsbo) 0 =

Note:  Bit 5 (Formula in Cell) is set only by formatter.
Function: $E2/0F$  
Name: RowMode_  
Length: 9  
Orientation: Table Row

$E2/0F = Set Table Row Mode$

$<E2><0F>[Length]$  
$<Row Mode>$  
$(Row height)$

$[Length]<0F><E2>$

$<Row Mode> =$

(msb) 7 =
6 =
5 =
4 =
3 =
2 =
1 = Wrap mode:
0 = multi-line (Default)
1 = Single line of text (no wrap)

(lsb) 0 = Line height:
0 = Auto (Default)
1 = Fixed line height

$(Row height) =$
Fixed point row height used if fixed line height is selected.
$E3 = \text{Math Group}

The Math Group functions are only valid in tables. With the exception of the Define Math Number Format function ($E3$/04), all other math functions have an associated result string. The association between the math function and its result is maintained by encasing them together as follows:

\[
\begin{align*}
\text{<EncaseOn_>} \\
\text{$E3$<xx>...[Result \#\dagger]...<xx>$E3$} \\
\text{<Result string...>} \\
\text{<EncaseOff_>}
\end{align*}
\]

When a new \([\text{Result \#\dagger}]...\) is generated, the \(<\text{Result string...}>\) is automatically replaced with a new result string.

The result of formula calculation is stored as a 79-bit two's complement integer multiplied by a scale factor of $10^7$ (10,000,000). This provides 7 fractional digits of precision with no rounding errors and a range of more than 16 integer digits.

The most significant bit is an error flag. If it is set, an error occurred while the value was being calculated; the third word contains the error number and all other bits are reserved and should be zero. The error number is actually the string number in the STR# resource, ID=TableMathErrorStrs, for an error message.

\[
\begin{align*}
\text{max. value} &= [\$3fff][\$fff][\$fff][\$fff][\$fff] = 30,223,145,490,365,729,367,6543 \\
\text{min. value} &= [\$4000][\$0000][\$0000][\$0000][\$0000] = -30,223,145,490,365,729,367,6544 \\
\text{error value} &= [\$8000][\$0000][\text{Error #}][\$0000][\$0000]
\end{align*}
\]
**$E3/$00 = Insert Math Formula Result**

- **Function:** \$E3/$00
- **Name:** MathFormula_
- **Length:** Variable
- **Orientation:** Character

\[$E3\langle00\rangle[\text{Length}]\left[\text{Result }\#\right]$.5
\[$\langle\text{Formula length}\rangle\langle00\rangle\langle E3\rangle\]

\[\text{Result BCD }\#$.5 = \text{Result of formula calculation}\]

\[\langle\text{Formula length}\rangle = \text{Length for following formula}\]

\[\langle\text{Formula...}\rangle = \text{Encoded formula bytes consisting of one or more of the following in post-fix order:}\]

- \$00 = *Disallowed* (should never occur)
- \$01 = Add
- \$02 = Subtract
- \$03 = Multiply
- \$04 = Divide
- \$05 = Negative (unary minus)
- \$06 = Positive (unary plus)
- \$07 = Cell range; followed by:
  - \langleStarting column offset\rangle
  - \langleStaring row offset\rangle
  - \langleEnding column offset\rangle
  - \langleEnding row offset\rangle
- \$08 = Cell reference; followed by:
  - \langleColumn offset\rangle
  - \langleRow offset\rangle
- \$09 = Numeric constant; followed by:
  - \langleConstant #\rangle$.5
  - \langleConstant string...\rangle
- \$0A = Subtotal
- \$0B = Total
- \$0C = Grand total
- \$0D = Average; followed by:
  - \langle# of parameters\rangle
- \$0E = Sum; followed by:
  - \langle# of parameters\rangle
- \$0F-$FE = Reserved
- \$FF = *Disallowed* (should never occur)

**Note:** Offsets are relative to current column/row.
Function: $E3/$01
Name: MathSubTotal_
Length: Variable
Orientation: Character

$E3/$01 = Insert Math Sub-Total Result

<$E3><$01>[Length]  [Subtotal #\d].5
[Formula length]  <Formula...>

[Length]<$01><$E3>

{Subtotal width\d} = Fixed point width of subtotal string

{Subtotal string...\d} = Converted displayable string of subtotal #

[Subtotal BCD #\d].5 = Result of formula calculation

[Formula length] = Length for following formula

<Formula...> = Formula used to derive subtotal.
(See $E3/$00 = Insert Math Formula Result.)

----------

Function: $E3/$02
Name: MathTotal_
Length: Variable
Orientation: Character

$E3/$02 = Insert Math Total Result

<$E3><$02>[Length]  [Total #\d].5
[Formula length]  <Formula...>

[Length]<$02><$E3>

{Total width\d} = Fixed point width of total string

{Total string...\d} = Converted displayable string of total #

[Total BCD #\d].5 = Result of formula calculation

[Formula length] = Length for following formula

<Formula...> = Formula used to derive subtotal.
(See $E3/$00 = Insert Math Formula Result.)
**$E3/$03 = Insert Math Grand Total Result**

Function: $E3/$03

Name: MathGrandTotal_

Length: Variable

Orientation: Character

$E3/$03 = \[\text{Insert Math Grand Total Result}\]

- [Grandtotal #\] = Result of formula calculation
- [Formula length] = Length for following formula
- <Formula...> = Formula used to derive subtotal.

(See $E3/$00 = Insert Math Formula Result.)

**$E3/$04 = Define Math Number Format**

Function: $E3/$04

Name: NumberFormat_

Length: 5

Orientation: Paragraph

$E3/$04 = \[\text{Define Math Number Format}\]

- (msb) 7 = Negatives in parentheses flag:
  - 0 = negative numbers with leading minus
  - 1 = negative numbers in parentheses
- 6 = Show currency symbol
- 5 = Show thousands separators
- 4 = Show trailing zeros
- 3 = Numeric flag:
  - 0 = non-numeric
  - 1 = numeric
- \{2 \atop 1\} = Number of decimal places (0-7)
- (lsb) 0

Note: If Numeric flag=0, then all other bits are reserved and must be 0; this indicates “Text” format.

The number format applies to the formula result or, if there is no formula, to the first number in the cell's text. The
"Text" format, <Format #> = $00, is a special case that will leave the cell's text untouched (if the cell happens to have a formula, the result will be displayed in the "General" format, <Format #> = $2F).
Appendix A - Condensed Output

The standard file output starting with WordPerfect 4.0 is a large reduction in WordPerfect document size realized by altering or deleting the following functions:

1. All "For internal use only" functions are deleted such as:

   - $AE Start Table Header
   - $AF End Table Header
   - $B2 Block ON
   - $B3 Block Off
   - $B6 Reverse video ON
   - $B7 Reverse video OFF
   - $B8 Generate Marker #1
   - $B9 Generate Marker #2
   - $BA Search marker #1
   - $BB Search marker #2
   - $BC Format to EOL/EOP/EOC marker
   - $BD Auto format marker
   - $BE Reformat line marker
   - $BF Noop
   - $C6 End of indent
   - $CC Temp formatter marker
   - $CD Undo
   - $CE Line space function
   - $CF Formatter marker
   - $D4/All Formatter group

2. The functions surrounded by invalid undo gates ($CD/$00 to $CD/$01), as well as all Undo functions ($CD) are deleted.

3. The body of all styles should be deleted ($DB/$01 to $DB/$00, $DB/$02 to $DB/$00, $DB/$03 to $DB/$00, and $DB/$04 to $DB/$00).

4. All temp encasement and encasement bodies should be deleted ($AE - ... - $AF).

5. The old values of some variable length functions may be condensed if the open length is adjusted. These include:

   - $D0/$04 Tab set Replace old values with <$FF>
   - $D2/$01 Define columns Replace old values with <$00>
   - $D5/$00-$03 Header/Footers Replace old header length with [$0000] and remove old header text
   - #D6/$00-$01 Footnote/Endnote Replace [# of footnote pages] and [# of break table entries] with 0 and remove their respective table entries
   - $D8/$00 Date/time function Replace [old format length] with <$00>
   - $D8/$04 Insert Box Num Replace all with $9C

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$D8/$05  Insert Chapter Num  Replace all with $9D
$D8/$06  Insert Page Num  Replace all with $A1
$D8/$07  Insert Footnote Num  Replace all with $A2
$D8/$08  Insert Endnote Num  Replace all with $A4
$DF/$00-$08  Border functions  Replace old values with [$0000]

6. Delete the following end-of-line functions:

$DC/$04  Temp end-of-line
$DC/$05  Temp end-of-page
$DC/$0E  Soft hyphen at end-of-line
$DC/$0F  Soft hyphen at end-of-page
$DC/$10  Auto hyphen at end-of-line
$DC/$11  Auto hyphen at end-of-page
$DC/$13  Hard beginning-of-file

7. Translate the following end-of-line functions to single byte functions:

$DC/$00 - $80 -> Sp  Soft end-of-line
$DC/$01 - $80 -> Sp  Soft end-of-page
$DC/$02 - $80 -> $80  Hard end-of-line
$DC/$03 - $80 -> $80  Hard end-of-line at Soft end-of-page
$DC/$06 - $80 -> $80  Dormant hard end-of-line
$DC/$0A - $80 -> $80  Hard end-of-column not in column
$DC/$0B - $80 -> $80  Hard end-of-column/Soft end-of-page not in column
$DC/$07 - $81 -> $81  Hard end-of-page
$DC/$0C - $96 -> $96  Hard hyphen at end-of-line
$DC/$0D - $96 -> $96  Hard hyphen at end-of-page/column

8. Translate the following end-of-line functions to shorter functions:
$DC/$08 -> $DC/$08/$0002/$08/$DC  Hard end-of-column
$DC/$09 -> $DC/$08/$0002/$08/$DC  Hard end-of-column/Soft end-of-page
$DC/$14 -> $DC/$08/$0002/$08/$DC  Temp hard end-of-column
$DC/$15 -> $DC/$08/$0002/$08/$DC  Temp hard end-of-column/Soft end-of-page
$DC/$18 -> $DC/$18/$0002/$18/$DC  Hard end-of-table row/cell
$DC/$19 -> $DC/$18/$0002/$18/$DC  Hard end-of-table row/cell/Soft end-of-page
$DC/$1D...$DC/$1C -> $DC/$18/$0002/$18/$DC  Hard end-of-table row/cell/Soft end-of-page - Header info
$DC/$1A -> $DC/$1A/$0002/$1A/$DC  Hard end-of-table row/end-of-table
$DC/$1B -> $DC/$1A/$0002/$1A/$DC  Hard end-of-table row/end-of-table/Soft end-of-page
$DC/$xx -> $DC/$xx/$0002/$xx/$DC  All other EOF sub-functions

9. Translate the following fixed length functions to single byte functions:

$C1/$00 -> $82  Tab
$C1/$03 -> $83  Back Tab
$C2/$00 -> $84  Left indent
$C2/$01 -> $85  Left/Right indent

10. Translate the following variable length functions to single byte functions:

$D0/$0C -> $B1 or $B0  Widow and orphan on in <New mode> is $B0. Widow and orphan off in <New mode> is $B1. Others cases remain as is.
$D0/$0D -> $B5 or $B4  Hyphenation mode on in <New mode> is $B4. Hyphenation mode off in <New mode> is $B5.
Appendix B - Importing to WordPerfect

When importing other file formats to WordPerfect, follow these guidelines:

1. Use the Hide Function to preserve unmapable functions:

   <$D9><$07>[Length] <Product type>
   <File type>
   <Major version>
   <Minor Version>
   [Resource ID]
   <Data…>

   [Length]$07<$D9>

2. If more than one function is hidden, then only the first function may have a resource.

3. Use [Resource ID] where possible to avoid making function too large.

4. Either use <PC Stuff…> or <EncaseOn_…<EncaseOff_> to mimic converted functions.

   <PC Stuff…> is appended to the end of a WordPerfect function and is used to preserve data for exporting the function back to the same product. <PC Stuff…> is defined as follows:

   <Subgroup><Group>[Length]
   <Old data…>
   <New data…>
   <PC Stuff…> = <Product type>
   <File type>
   <Major version>
   <Minor Version>
   <Hidden data…>
   [Length]<Subgroup><Group>

   By encasing both the hidden imported function as well as the WordPerfect equivalent functions, exporting can ignore the WordPerfect functions and output only the hidden function. The format is as follows:

   <EncaseOn_>
   <$D9><$07>[Length]<P><F><M><m><R><Hiden function…>[Length]$07<$D9>
   ...WordPerfect functions...
   <EncaseOff_>

5. Hidden functions are not to be written to the clipboard (ie. deleted from copys and pastes.)
Appendix C - WordPerfect Macintosh Language Codes

The language code is used to determine which “language module” should be used to perform operations on the text that follows. Any operation that could possible be different based on country, language, or script (writing system) is handled by the language module. For convenience, the language code is divided into three parts.

These parts can be referred to individually, but must be set as one unit. An example of one unit is language compatibility. For instance: while spell-checking French-Canadian text, the CAN-Dictionaire is not found. The French-France dictionary (FRA-Dictionaire) can be used instead. This is done by comparing script and language, but ignoring the region information in the language code.

A brief description of each of the parts of the language code follows:

- **<Script>** Used for interpreting two-byte characters (function $C8$.) Also for determining characteristics such as writing direction, keyboard layout, font compatibility and so forth.

- **<Language>** Primary determinant used for selecting auxiliary tools such as speller, thesaurus, hyphenation, sorting and so forth.

- **[Region]** Used for determining formats for Date/Time, currency, decimal, thousand, list separators and so forth.

Current list of behaviors that are Language-Code dependent:

- **Interface** Items such as Menus, Dialogs, Auxiliary file names, etc. User can select these with the Finder at startup time only.

- **Speller**
- **Thesaurus**
- **Hyphenation**
- **Sort**
- **Word Delimiters**
- **Case conversion**
- **Search**

Within document only. Dialogs with lists are sorted by the system.
<table>
<thead>
<tr>
<th>Script ID</th>
<th>Language ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amharic</td>
<td>Afrikaans</td>
</tr>
<tr>
<td>Arabic</td>
<td>Arabic</td>
</tr>
<tr>
<td>Armenian</td>
<td>Catalan</td>
</tr>
<tr>
<td>Bengali</td>
<td>Chinese</td>
</tr>
<tr>
<td>Burmese</td>
<td>Cyprian</td>
</tr>
<tr>
<td>Chinese</td>
<td>Danish</td>
</tr>
<tr>
<td>Devanagari</td>
<td>Dutch</td>
</tr>
<tr>
<td>Georgian</td>
<td>English</td>
</tr>
<tr>
<td>Greek</td>
<td>Faeroese</td>
</tr>
<tr>
<td>Gujarati</td>
<td>Finnish</td>
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<tr>
<td>Gurmukhi</td>
<td>Flemish</td>
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<tr>
<td>Hebrew</td>
<td>French</td>
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<tr>
<td>Kannada</td>
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<td>Icelandic</td>
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<td>Portuguese</td>
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<td>Portuguese</td>
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<td>Symbol</td>
<td>Russian</td>
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<td></td>
<td>Yugoslavian</td>
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<td>Region ID</td>
<td>Language Codes</td>
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<td>Sweden</td>
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<td>Switzerland</td>
<td>$0103</td>
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<tr>
<td>United Kingdom</td>
<td>$0100</td>
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<tr>
<td>Yugoslavia</td>
<td>$011B</td>
</tr>
<tr>
<td>ASIA ($02xx)</td>
<td></td>
</tr>
<tr>
<td>Afganistan</td>
<td>$0208</td>
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<tr>
<td>Bangladesh</td>
<td>$020B</td>
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<td>$020C</td>
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AFRICA .................................. ($07xx)

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<Characters...>  
[End Length] | Variable |
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[SoftNewLines]  
[LineNum]  
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{UDLinAtHardRtn}  
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{old TempRightMargin} | 11 |
| $03$ End of Paragraph HTML | {Old HTML flags} | 6 |
| $04$ EOL | {{Old UDLin}}  
{Old UPLin} | 12 |
| $05$ EOL subtitle | [Begin upcur]  
[End upcur]  
{Udlin}  
{Delta udlin} | 12 |
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<Cell Bottom border #>  
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[Cell Left border color].3  
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2 + (columns x 12)

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<tr>
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<tr>
<td>&lt;Outside Right border #&gt;</td>
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100 + (columns x 10)
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