6

VP Parameters and Synonyms

VP parameters are global numeric values that control processing and may be used as command input or in calculations. There are a fixed number of INTEGER parameters and a variable number of REAL parameters. Use Pname value fields on any command line to change parameter values. Current values of the parameters may be displayed with the PRINT INTEGER or PRINT REAL commands, individual values may be displayed with the PRINT Pname command.

VP synonyms are global character strings that the user may define to customize .eg file processing and simplify VP operation with easy-to-remember mnemonics for complicated commands.

6.1 INTEGER Parameters

There is a fixed number of INTEGER parameters (2-bytes or SHORT under DOS, otherwise 4-bytes or LONG). Their names, index, default values (in parentheses), and purpose are given in the following list. The index specifies their relative position in internal storage and BIN-READ/SAVE.

**ISYM 1. (1)** symbol number, <10 solid, >10 open, -1 = omit, 0 = invisible. Symbols are usually referred to by their standard synonyms:

1 = dot, 2 = diamond, 3 = triangle, 4 = square
5 = del, 6 = arrow, 7 = plus, 8 = X
11 = circle, 12 = odiamond, 13 = otriangle, 14 = osquare
15 = odel, 16 = oarrow

**ILINE 2. (0)** line type, -1 = omit, 0 = invisible:

1 = lines connecting symbols, 11 = lines, no symbols
2 = pattern 1 line with symbols, 12 = pattern 1 line only,
3 = pattern 2 line with symbols, 13 = pattern 2 line only,
4 = pattern 3 line with symbols, 14 = pattern 3 line only,
Default pattern 1 gives a “dotted” line.
Default pattern 2 gives a “dashed” line.
Default pattern 3 gives a “dot-dashed” line.
Use the PATTERN command to define a new line pattern.

PRUNE 3. (1)
0 to allow plotting outside axis box limits, a value >0 truncates lines at the box edges and omits outside symbols.

COLOR 4. (1)
current plotting color for lines and symbols. COLOR is usually set with the standard synonyms for colors 0 to 7 indicated in uppercase in the following list:

0 BLACK
1 bright BLUE
2 bright GREEN
3 bright CYAN
4 bright RED
5 bright MAGENTA
6 bright YELLOW
7 bright WHITE
8 brown
9 dark blue
10 dark green
11 light green
12 orange
13 dark purple
14 dark yellow
15 gray
16 - 255 bright white

XFONT 5. (12180)
font specification for the x-axis label, 12180 corresponds to font number 12, size 180/1000 inch.

YFONT 6. (-12180)
font specification for the y-axis label. A negative font signifies 90 degree rotation.

NFONT 7. (12180)
font specification for numeric axis labels.

CFONT 8. (12180)
font specification for caption and COMMENT text.

LXROUND 9. (1)
specifies limit rounding for the log x-axis (* = X or Y):
• If LROUND = 2 or (LROUND = 1 and limit range < $10^9$), then limits rounded to nearest integer in decade.
• If LROUND = 10 or (LROUND = 1 and limit range $\geq$ $10^9$), then limits rounded to nearest decade.

XTICS 10. (0)
number of minor axis tics between major intervals on LINEAR axis and on LOG axis when ‘INTS >0 (* = X or Y). For LOG axis with ‘INTS = 0, specifies minor tics on the integers within each decade:

0 all integer tics and single digit labels when range < $10^9$, otherwise nothing.
1 all integer tics, label on 3 only.
2 all integer tics, label on 2 and 5 only.
3-8 all integer tics, all single digit labels.
> 8 all integer tics, no labels.
-1 integer tic and label on 3 only.
-2 integer tic and label on 2 and 5 only.
-<2 omit all minor tics and labels.

LYROUND 11. (1)
rounding limit for the log y-axis. See LXROUND.

YTICS 12. (0)
number of minor axis tics between major intervals on LINEAR axis and on LOG axis when YINTS >0. See XTICS for explanation with LOG axis and YINTS = 0.

NMBR 13. (0)
the current number of data point pairs. Set by XDATA, YDATA, and XYDATA.

NCOL 14. (0)
the number of TABDATA columns. Set by TABDATA.

NROW 15. (0)
the number of TABDATA rows. Set by TABDATA.

XDECP 16. (-1)
the number of decimal places in x-axis numeric labels if $\geq$ 0.

YDECP 17. (-1)
the number of decimal places in y-axis numeric labels if $\geq$ 0.

NINTX 18. (5)
the target number of x-axis tic intervals. The AXIS command will try to adjust limits and tic marks to give NINT* major intervals. This may be overridden with XINT and/or YINT.

NINTY 19. (4)
target number of y-axis tic intervals. See NINTX.

PIXPIN 20. (800)
assumed final UGH resolution in pixels per inch. The UGH hardcopy utilities also assume a default of 800.

AMAJOR 21. (7)
axis major tics color. Negative to omit.

ANCOLOR 22. (7)
axis numeric labels color.
text color for Labels and Comments.

line width for Curves and Lines (in UCH units inch/800).

axis box line width (in UCH units inch/800).

major tic line width (in UCH units inch/800).

minor tic line width (in UCH units inch/800).

number of decimal places for printing real numbers with PRINT command and synonym evaluation. Negative NDECPL values, give exponential notation.

if > 0, includes page boundary on a VIEW in specified color.

axis box color. If negative, box will not be drawn.

axis minor tics color, negative to omit.

secondary font specification.

secondary font color.

color for underlining text delimited by _ or text boxes delimited by |. If ULCOLOR < 0 boxes will be filled with color ABS(ULCOLOR) but underlines will be eliminated.

if ≥ 0 fills in open symbols with this color before drawing the outline in COLOR. OFCOLOR = 0 will fill blank centers on most output devices, giving the impression of overlapping symbols.

the number of lines to be skipped at the start of the next READ or *DATA command.

REPEAT-END loop index count value. Nonzero only inside a loop.

minimum exponent for numeric axis label switch from F to E notation.

explicit loop count for calculations. LOOP must be set on the same line as the calculations.

counts the number of VIEWS since the last SAVE or RESTART.

6.2 REAL Parameters

REAL parameters are stored as 8-byte (double) floating point numbers. Many are set initially by VP and may be changed, but not removed. Their names, index, default values (in parentheses), and purpose are given in the following list. The index specifies their relative position in internal storage and BINREAD/SAVEs. Additional REALs may be defined and removed within VP by certain commands or by the user as follows (case is not significant):

```plaintext
define NewReal { 1 } ; force numeric with calculations
define NewReal +1 ; force numeric with initial +
define NewReal "" ; remove parameter
```

TOP 1. (0.5) inches to top of page from top of axis box.

BOTTOM 2. (1.5) inches to bottom of page from bottom of axis box.

YSIZE 3. (4.0) axis box Y size in inches.

RIGHT 4. (1.0) inches to right of page from right side of axis box. The page width is assumed to be 8.0 inches if LEFT < 0.

XSIZE 5. (6.0) axis box X size in inches.

LEFT 6. (-1.0) if LEFT ≥ 0, indicates axis position from left edge of page, and PageWidth = LEFT + XSIZE + RIGHT.

XMIN 7. (0.0) desired x-axis minimum coordinate.

XMAX 8. (0.0) desired x-axis maximum coordinate. If XMAX ≤ XMIN, the data limits XDMIN XDMAX will be used for x-axis scaling.

XDMIN 9. (0.0) X data minimum value. Set by XDATA or XSTDATA.

XDMAX 10. (0.0) X data maximum value. Set by XDATA or XSTDATA.

XINT 11. (0.0) if > 0, overrides NINTX to specify the exact number of major x-axis intervals.

XIND 12. (0.0) x-axis limits indentation fraction, (0.05 is a good try).

YMIN 13. (0.0) desired y-axis minimum coordinate.

YMAX 14. (0.0) desired y-axis maximum coordinate. If YMAX ≤ YMIN, the data limits YDMIN YDMAX will be used for y-axis scaling.
YDMIN 15. (0.0)  Y data minimum value. Set by YDATA or XYDATA.
YMAX 16. (0.0)  Y data maximum value. Set by YDATA or XYDATA.
YINT 17. (0.0)   if > 0, overrides NINTY to specify the exact
                 number of major y-axis intervals.
YIND 18. (0.0)   y-axis limits indentation fraction.

The following 7 REAL parameters determine how data points are
scaled before plotting (see CURVE command):

\[
X_{\text{plot}} = (X \times X + XSHIFT) \times Y_{\text{plot}} = (Y \times Y + YSHIFT) \times X_{\text{plot}}^\text{POWER} \times Y_{\text{plot}}^\text{POWER}
\]

XMULT 19. (1.0) x-scale factor for plotting.
YMULT 20. (1.0) y-scale factor for plotting.
XSHIFT 21. (0.0) x-scale shift add value.
YSHIFT 22. (0.0) y-scale shift add value.
XPOWER 23. (1.0) x-scale power exponent.
YPOWER 24. (1.0) y-scale power exponent.
XYPOWER 25. (0.0) xy-scale power exponent to scale Y values by X.

TCSIZE 26. (0.03) major tic size as a fraction of XSIZE or YSIZE. A
                   positive TCSIZE places the tics inside the axis
                   box. Negative TCSIZE places them outside. Use the
                   CENTER option with AXIS or TICMARKS to center
                   the tics on the axis box.

FONTWID 27. (0.40) text character width as a fraction of height.

CCSIZE 28. (2.5)  The allowed overflow to the LABEL CAPTION line in space units.

LSPACE 29. (1.3)  effective spacing between caption lines and
                   multiple-line comments and drop for numeric
                   axis scale factors.

XERRMIN 30. (0.0) size of error bar for ALL points in XMIN direction.

XERRMAX 31. (0.0) size of error bar for ALL points in XMAX direction.

YERRMIN 32. (0.0) size of error bar for ALL points in YMIN direction.

YERRMAX 33. (0.0) size of error bar for ALL points in YMAX direction.

HTTHICK 34. (0.16) font stroke thickness as a fraction of character
                   width.

SMULT 35. (2.0)  symbol size multiplier.

ULSPACE 36. (0.33) drop (as fraction of CFONT height) for underlined
                   and boxed text.

The FIT command of order n defines the following REALS:

Y0  y-intercept (corresponds to C0 coefficient).
SLOPE slope (C1 coefficient).
Cn  for n > 1, the remaining coefficients.
CHI  reduced Chi of the fit.
FITX0 fit X origin.
FITY0 fit Y origin.

For linear fits the following parameters are also defined:

EY0  Y0 error.
ESLOPE SLOPE error.
RAB  "correlation coefficient."
ECORCO error in correlation coefficient.

Graphics cursor calls may add the following parameters:

CX1 x-axis coordinates of 1st point.
CY1 y-axis coordinates of 1st point.
CX2 x-axis coordinates of 2nd point.
CY2 y-axis coordinates of 2nd point.
User defined Synonyms customize .exg file processing and simplify VP operation with easy-to-remember mnemonics. When VP is started, the profile .exg file sets a number of default synonyms. The user may define (or redefine) synonyms by including the fields:

```
DEFINE Sname 'substitution text'
```

In any command line, the synonym will be defined before the command is executed. If the substitution text is to contain blanks, it should be delimited by single (') or double ("") quotes.

Existing synonym definitions may be eliminated with a null definition:

```
DEFINE Sname ''
```

Before the execution of any VP command line, all SYNONYM substitution text is replaced by their substitution text. In text lines (such as those following the LABEL and COMMENT commands) and in calculations, SYNONYM substitution will occur only if the synonym names are delimited between an ampersand (&) and a period (.) (such as &Sname.). Synonyms may also be nested, as in

```
echo sjoin &sjoin &sjoin...
```

The following table lists the default SYNONYM entries and their substitution text.

<table>
<thead>
<tr>
<th>Sname</th>
<th>Substitution text</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0T</td>
<td>isym -1 iline -1</td>
<td>CURVE with prior reset standard symbols</td>
</tr>
<tr>
<td>D0T</td>
<td>isym 11</td>
<td></td>
</tr>
<tr>
<td>CIRCLE</td>
<td>isym 11</td>
<td></td>
</tr>
<tr>
<td>DIAMOND</td>
<td>isym 2</td>
<td></td>
</tr>
<tr>
<td>ODIAMOND</td>
<td>isym 12</td>
<td></td>
</tr>
<tr>
<td>TRINACLE</td>
<td>isym 3</td>
<td></td>
</tr>
<tr>
<td>OTRINACLE</td>
<td>isym 13</td>
<td></td>
</tr>
<tr>
<td>SQUARE</td>
<td>isym 4</td>
<td></td>
</tr>
<tr>
<td>OSQUARE</td>
<td>isym 14</td>
<td></td>
</tr>
<tr>
<td>DEL</td>
<td>isym 5</td>
<td></td>
</tr>
<tr>
<td>ODEL</td>
<td>isym 15</td>
<td></td>
</tr>
<tr>
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<td>isym 6</td>
<td></td>
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<tr>
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<td>isym 16</td>
<td></td>
</tr>
<tr>
<td>PLUS</td>
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<td></td>
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<tr>
<td>XMARK</td>
<td>isym 8</td>
<td></td>
</tr>
<tr>
<td>NOSYM</td>
<td>isym -1</td>
<td></td>
</tr>
</tbody>
</table>

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