

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 .exg 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/SAVEs.

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	8 brown
1 bright BLUE	9 dark blue
2 bright GREEN	10 dark green
3 bright CYAN	11 light green
4 bright RED	12 orange
5 bright MAGENTA	13 dark purple
6 bright YELLOW	14 dark yellow
7 bright WHITE	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 $L*ROUND = 2$ or ($L*ROUND = 1$ and limit range $< 10^3$), then limits rounded to nearest integer in decade.
- If $L*ROUND = 10$ or ($L*ROUND = 1$ and limit range $\geq 10^3$), 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 $< 10^3$, 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 ≥ 0 .

YDECP 17. (-1) the number of decimal places in y-axis numeric labels if ≥ 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.

AMAJCOL 21. (7) axis major tics color, negative to omit.

ANCOLOR 22. (7) axis numeric labels color.

TCOLOR 23. (7)	text color for Labels and Comments.
WIDTH 24. (10)	line width for Curves and Lines (in UGH units inch/800).
WAXIS 25. (12)	axis box line width (in UGH units inch/800).
WMAJOR 26. (8)	major tic line width (in UGH units inch/800).
WMINOR 27. (5)	minor tic line width (in UGH units inch/800).
NDECPL 28. (4)	number of decimal places for printing real numbers with PRINT command and synonym evaluation. Negative NDECPL values, give exponential notation.
PBCOLOR 29. (1)	if > 0, includes page boundary on a VIEW in specified color.
ABCOLOR 30. (7)	axis box color, if negative, box will not be drawn.
AMINCOL 31. (7)	axis minor tics color, negative to omit.
C2FONT 32. (20200)	secondary font specification.
C2COLOR 33. (6)	secondary font color.
ULCOLOR 34. (4)	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.
OFCOLOR 35. (-1)	if ≥ 0 fills in open symbols with this color before drawing the outline in COLOR. OFCOLOR = 0 will blank centers on most output devices, giving the impression of overlapping symbols.
SKIP 36. (0)	the number of lines to be skipped at the start of the next READ or *DATA command.
COUNT 37. (0)	REPEAT-END loop index count value. Nonzero only inside a loop.
EXPMIN 38. (3)	minimum exponent for numeric axis label switch from F to E notation.
LOOP 39. (-1)	explicit loop count for calculations. LOOP must be set on the same line as the calculations.
NVIEWS 40. (0)	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):

```
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 \leq 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 XY-DATA.
XDMAX 10. (0.0)	X data maximum value. Set by XDATA or XY-DATA.
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 \leq 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 XY-DATA.
YDMAX 16. (0.0)	Y data maximum value. Set by YDATA or XY-DATA.
YINT 17. (0.0)	if > 0, overrides NINTY to specify the <i>exact</i> 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):

$$X_{\text{plot}} = (XMULT \times X + XSHIFT)^{XPOWER}$$

$$Y_{\text{plot}} = (YMULT \times Y + YSHIFT)^{YPOWER} X_{\text{plot}}^{XYPOWER}$$

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.
TICSIZE 26. (0.03)	major tic size as a fraction of XSIZE or YSIZE. A positive TICSIZE places the tics inside the axis box. Negative TICSIZE 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.
HTHICK 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.

6.3 Synonyms

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 SYNONYMS are 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 slope &num is &slope&num..
```

The following table lists the default SYNONYMS and their substitution text.

Sname	Substitution text	Comments
DRAW	curve isym -1 iline -1	CURVE with prior reset
DOT	isym 1	standard symbols
ODOT	isym 11	
CIRCLE	isym 11	
DIAMOND	isym 2	
ODIAMOND	isym 12	
TRINAGLE	isym 3	
OTRIANGLE	isym 13	
SQUARE	isym 4	
OSQUARE	isym 14	
DEL	isym 5	
ODEL	isym 15	
ARROW	isym 6	
OARROW	isym 16	
PLUS	isym 7	
XMARK	isym 8	
NOSYM	isym -1	

Continued on next page.

Sname	Substitution text	Comments
NOLINE	iline -1	Define standard line types
LINE	iline 11	lines without symbols
CONNECT	iline 1	lines, possible symbols
DOTTED	iline 2	dotted line, possible symbols
DASHED	iline 3	dashed line, possible symbols
DOTDASH	iline 4	dot-dash line, possible symbols
BLACK	color 0	standard colors
BLUE	color 1	
GREEN	color 2	
CYAN	color 3	
RED	color 4	
MAGENTA	color 5	
YELLOW	color 6	
WHITE	color 7	
DATE	mm/dd/yy	set to current date
TIME	hh:mm	set to current time
TIMESEC	hh:mm:ss	current time including secs
NOLABELS	noxlabel noylabel	NOLABEL axis option
SET	''	easier reading of Pname value
PROMPT	'vp: '	initial prompt
MSGFILE	stderr	where the messages go
UGHDNAME	vossplot	default .ugh(bin) save name
SYMBOL	''	character plotted, not symbols
UGHPATH	''	path prefix for .ugh(bin) saves
PATHEXG	''	path prefix for current .exg file
OS	DOS/AIX/OS2	set to operating system
%0	console	current .exg command file
%1 ... %8	''	current READ filespec args
C1	''	set to 1st CURSOR character
C2	''	set to 2nd CURSOR character
AX	''	returned UGH registers
BX	''	
CX	''	
DX	''	
DI	''	
SI	''	