... LOG

PURPOSE
Specifies whether or not a log scale is to appear on plot axes of subsequent plots.

DESCRIPTION
There are 2 scales available--linear and log. The default is linear. The analyst can independently control the log scale of the horizontal and vertical axes by specifying the prefix in the command (see the SYNTAX section). The tic labels for log scales can be drawn in 3 different formats. See the documentation for TIC MARK LABEL FORMAT command in this chapter for details.

SYNTAX
<prefix>LOG <ON or OFF>
where <prefix> is one of the following:

X	refers to the horizontal axis;
Y	refers to the vertical axis;
no prefix	refers to both the vertical and horizontal axes;

and   ON specifies a LOG scale while OFF reverts back to a linear scale.

EXAMPLES
LOG ON
XLOG ON
LOG OFF

NOTE 1
If you use the LIMITS command, log scales are rounded to the nearest power of 10 that includes the values. For example, LIMITS 15 975 goes from 10 to 1000. Sometimes when you specify an exact power of 10 DATAPLOT goes to the next power of 10 (e.g., LIMITS 0.001 100 might go from 0.0001 to 100). This is caused by rounding and can be avoided by adding a small fudge factor. In the example above, use LIMITS 0.0015 99.5.

NOTE 2
Sometimes log scales can have a large amount of empty space since DATAPLOT rounds to powers of 10. For example, if your data go from 1 to 1100, DATAPLOT sets the upper limit to 10,000. The solution to this problem is to use the TIC OFFSET command:

TIC OFFSET UNITS DATA
YLOG ON
YLIMITS 1.1 999
YTIC OFFSET 0 120

NOTE 3
The ...LOG command with no argument is equivalent to ...LOG ON. A ...LOG command with no prefix refers to both axes. Thus LOG ON sets both axes to log scale.

DEFAULT
The default is linear scales on both axes.

SYNONYMS
LOGLOG ON/OFF is equivalent to LOG ON/OFF.

RELATED COMMANDS
PLOT	=	Generates a data or function plot.
LOG (LET)	=	Compute the log of a number or variable.
FRAME	=	Sets the on/off switch for the plot frame.
GRID	=	Sets the on/off switch for the plot grid.

APPLICATIONS
Log plots, semi-log plots

IMPLEMENTATION DATE
Pre-1987

PROGRAM
```
SERIAL READ Y
 760. 2042. 2111. 1684. 3888. 1858. 11379. 17560. 39287. 64382. 113159. 175108.
 273291. 400186. 581243. 811568. 1121004. 1506550. 2002767. 2611612. 3369180.
END OF DATA
SERIAL READ X
 0. 1. 32. 243. 1024. 3125. 7776. 16807. 32768. 59049. 100000. 161051. 248832.
371293. 537824. 759375. 1048576. 1419857. 1889568. 2476099. 3200000.
END OF DATA
MULTIPLOT 2 2; MULTIPLOT CORNER COORDINATES 0 0 100 100
TITLE SIZE 3
TIC MARK LABEL SIZE 2.5
TITLE LINEAR SCALE
PLOT Y X
TITLE LOG SCALES (POWER FORMAT)
LOG ON
LET X = 0.0001 SUBSET X <= 0
PLOT Y X
TITLE LOG SCALE (REAL FORMAT)
TIC LABEL FORMAT REAL
PLOT Y X
TITLE LOG SCALE (EXPONENTIAL FORMAT)
TIC LABEL FORMAT EXPONENTIAL
TIC LABEL FONT SIMPLEX
PLOT Y X
END OF MULTIPLOT
```