FIT STANDARD DEVIATION

PURPOSE
Specifies the target value for the residual standard deviation which (upon attainment) will cause the iterations in the FIT command to terminate.

DESCRIPTION
Under usual default circumstances, The FIT command automatically terminates itself when it has converged to the least squares solution. The number of iterations for such convergence varies with the model and the data. There are two convergence criterion:

1. If the residual standard deviation at a single step is less than 0.0000001, convergence is assumed.

2. Residual standard deviations for 3 successive iterations are compared. The 2 successive differences are computed, a ratio is formed, and this ratio is compared to a cutoff value (the value is 0.00001).

This criterion is excellent and has served well for a wide variety of models and data sets. If the starting values were at all decent (within an order of magnitude), convergence (via the underlying Marquardt/Levenberg/ Osborne algorithm) is usually rapid (within 15 iterations). If convergence is too slow, however, and if the analyst has a pre-specified value in mind that he or she wants the fitted model to be accurate to, then the usual mode of convergence may be circumvented via the FIT STANDARD DEVIATION command. The FIT STANDARD DEVIATION applies to the first criteria only (i.e., the absolute value of the residual standard deviation).

SYNTAX
FIT STANDARD DEVIATION <value>
where <value> is a positive number or parameter that specifies the target value for the residual standard deviation.

EXAMPLES
FIT STANDARD DEVIATION 0.01
FIT STANDARD DEVIATION 0.0001
FIT STANDARD DEVIATION A

DEFAULT
The default value is 0.0000001.

SYNONYMS
None

RELATED COMMANDS
FIT	=	Carries out a least squares fit.
FIT ITERATIONS	=	Set the maximum iterations for a fit command.
WEIGHTS	=	Set the weights for a fit command.
PRED	=	A variable where predicted values are stored.
RES	=	A variable where residuals are stored.

APPLICATIONS
Fitting

IMPLEMENTATION DATE
This command was activated 94/2.

PROGRAM
. DAN CHWIRUT ULTRASONIC REFERENCE BLOCK ANALYSIS
. PERFORM A NON-LINEAR REGRESSION
SKIP 25
READ CHWIRUT1.DAT Y X
LET ALPHA = 0.15
LET A = 0.004
LET B = 0.01
FIT STANDARD DEVIATION 0.00001
FIT Y = EXP(-ALPHA*X)/(A+B*X)