DIAGONAL MATRIX

PURPOSE

Generate a diagonal matrix from the elements of a variable.

DESCRIPTION

A diagonal matrix is one in which all the elements off the main diagonal are zero. Diagonal matrices are typically created in the intermediate stages of a computation rather than as a final step of an analysis.

SYNTAX

LET <mat> = DIAGONAL MATRIX <v> <SUBSET/EXCEPT/FOR qualification>
where <v> is a variable with N elements;
<mat> is a matrix of dimension NxN where the resulting diagonal matrix is saved;
and where the <SUBSET/EXCEPT/FOR qualification> is optional and rarely used in this context.

EXAMPLES

LET C = DIAGONAL MATRIX X
LET IDENT = DIAGONAL MATRIX ONES

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

MATRIX DIAGONAL	=	Extract the diagonal elements of a variable.
MATRIX DEFINITION	=	Set a matrix definition.
MATRIX NUMBER OF COLUMNS	=	Compute the number of columns in a matrix.
MATRIX NUMBER OF ROWS	=	Compute the number of rows in a matrix.
MATRIX SUBMATRIX	=	Define a matrix submatrix.

REFERENCE

Any standard text on linear algebra.

APPLICATIONS

Linear Algebra

IMPLEMENTATION DATE

93/10

PROGRAM

```
. GENERATE A 6X6 IDENTITY MATRIX
LET N = 6
LET ONES = 1 FOR I = 1 1 N
LET IDENT = DIAGONAL MATRIX ONES
PRINT IDENT
```

The following output is generated.

```
VARIABLES--IDENT1      IDENT2      IDENT3      IDENT4      IDENT5      IDENT6

  0.1000E+01  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
  0.0000E+00  0.1000E+01  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
  0.0000E+00  0.0000E+00  0.1000E+01  0.0000E+00  0.0000E+00  0.0000E+00
  0.0000E+00  0.0000E+00  0.0000E+00  0.1000E+01  0.0000E+00  0.0000E+00
  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.1000E+01  0.0000E+00
  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.1000E+01
```