**MATRIX ELEMENT**

**PURPOSE**
Copy an element of a matrix (i.e., the value for a specific row and column of the matrix) into a parameter.

**DESCRIPTION**
This command is typically useful in loops. The following syntax can also be used (it does NOT work for versions prior to 93/10):

\[
\text{LET } A = M^K(J)
\]
where \( M \) is a matrix and \( K \) is a loop index parameter.

**SYNTAX**

\[
\text{LET } \langle \text{par} \rangle = \text{MATRIX ELEMENT } \langle \text{mat} \rangle \langle \text{rowid} \rangle \langle \text{colid} \rangle
\]

where \( \langle \text{mat} \rangle \) is a matrix for which the element is to be extracted;

\( \langle \text{rowid} \rangle \) is a number or parameter that specifies the row to be extracted;

\( \langle \text{colid} \rangle \) is a number or parameter that specifies the column to be extracted;

and \( \langle \text{par} \rangle \) is a parameter where the resulting element is saved.

**EXAMPLES**

- LET \( C = \text{MATRIX ELEMENT } A 3 2 \)
- LET \( C = \text{MATRIX ELEMENT } A K J \)

**DEFAULT**
None

**SYNONYMS**
None

**RELATED COMMANDS**
- MATRIX REPLACE ELEMENT = Replace an element of the matrix.
- MATRIX REPLACE ROW = Replace a row of the matrix.
- MATRIX ROW = Extract a row of the matrix.
- MATRIX NUMBER OF COLUMNS = Compute the number of columns in a matrix.
- MATRIX NUMBER OF ROWS = Compute the number of rows in a matrix.

**APPLICATIONS**
Linear Algebra

**IMPLEMENTATION DATE**
93/10

**PROGRAM**

```
. EXTRACT THE DIAGONAL OF THE MATRIX
READ MATRIX M
14 37 32
19 42 17
12 17 10
END OF DATA
.
LET NROW = MATRIX NUMBER OF COLUMNS M
.
LOOP FOR K = 1 1 NROW
    LET A = MATRIX ELEMENT M K K
    LET DIAG(K) = A
END OF LOOP
PRINT DIAG
```

The variable DIAG will contain the values 14, 42, and 10.