

Appendix A Input structures used in MODOPTIM files

Data are read from MODOPTIM input files as 2,048-character alphanumeric cards to facilitate the addition of comments within the model input files and the use of keys to identify input variables. All integer, real, and character variables are read from the alphanumeric cards. The cards are initially read by the subroutine NCREAD. Cards with a '#' sign in the first column are treated as comment cards, are not passed to any other routines, and are discarded. Once NCREAD has acquired a valid data card, the card is checked for a '!' sign. If a '!' sign is detected, the '!' sign and all text right of the '!' sign are removed from the card before passing it to any other routines.

The subroutine QREAD extracts numeric values as real numbers from the input cards acquired by NCREAD and will read all numeric values that are followed by a trailing blank or comma. Numeric values will be read from the card regardless of the presence or absence of text on the card which allows for text only descriptors to be embedded next to the input variables. All integer variables are read as real numbers and converted to integers to avoid reading errors if the user specifies the variable as a real number.

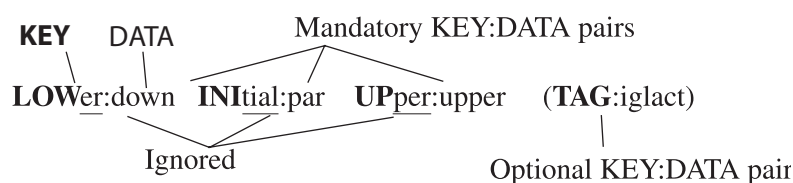
The typical functioning of the subroutines NCREAD and QREAD are best illustrated by example. If the following is read from an input file by NCREAD:

```
# Closure Criteria for:
#           Iterations, Net Parameter Change, & SS Error Reduction
#
# maxit=4 smin 0.001   dermin=0.05! Try dermin= -1.0E6 to ignore oversteps
#
```

NCREAD returns the stripped input card (maxit = 4 smin 0.001 dermin=0.05) to the routine and the subroutine QREAD extracts three values (4, 0.001, and 0.05).

Array data are read with the subroutine GETMAT, which utilizes the subroutines NCREAD and QREAD. As such, arrays can contain comment cards and text identifiers within the field of the array but all numeric entries must be separated by blank, comma, or tab delimiters. Row numbers can be denoted in the input by placing the values beyond the rightmost edge of the matrix and preceding the value with a '!' sign. Array data entry is terminated with an '<end>' flag.

Alphanumeric strings are used in MODOPTIM to identify variables (keys) and logical conditions (flags). Specification of these keys and flags is case insensitive because all letters are capitalized before performing any logical tests. Keys precede the variable to be read. Logical decisions are based on the presence (true) or absence (false) of a flag. Data entry with key:data pairs will be presented as follows:



where:

- Bold,** upper-case letters denote the part of the key that is tested by MODOPTIM,
- Key:data** pairs that are not delimited by parentheses are mandatory and must be included, and
- Key:data** pairs that are delimited by parentheses are optional; default values exist if they are not specified.

I/O Redirection

The three primary MODOPTIM files (Appendices B, C, and D) can be subdivided into smaller files with I/O redirection. I/O can be redirected from the primary file to an auxiliary input file by inserting an I/O redirect statement at any location in the file. Multiple I/O redirect statements can be used in a file. I/O redirection can only occur from a primary MODOPTIM file and not from an auxiliary input file.

1. DATA:	REDIRECT	:Filename
TYPE:	Alphanumeric header card	

REDIRECT:Filename=The filename of the auxiliary input must follow the colon. The **REDIRECT** key switches the I/O from the primary file to the auxiliary file. All eight characters must be present.

Sample input of an element of GROUP 1 data:

```
#
Tag:PERM                Layer:1
      10      1.000      (6e13.5)      -7
Redirect to file:sem_bos.array      I/O redirect occurs here
Tag:VCON                Layer:1
      0      1.000      (6e13.5)      -7
```