1. How to use MDS (X) programs

1. HOW TO USE THE MDS(X) PROGRAMS

The MDS(X) programs are run using a set of control cards similar to, though not identical with, those used in SPSS. Program-specific parameters are set by means of the control card 'PARAMETERS'.

1.1 FORMAT OF CONTROL CARDS

A control card has two distinct parts:

i) a control field which occupies columns 1 to 15, and

ii) an operand (or parameters) field which extends from column 16 to column 80.

The operand field may be blank for some control cards.

The control field

The control field is always punched in columns 1 to 15 and must be left justified (i.e. it must begin in column 1). The spelling (and any spaces in the field) must conform to that specified in section 1.2.

The operand field

The operand (or parameters) field is punched anywhere in columns 16 to 80. All spaces are ignored except in the spelling of keywords. Only the first four letters (including spaces) of keywords are significant.

Control cards must occupy one and only one card except for the PARAMETERS card, the COMMENT card and the three output option cards PRINT, PLOT and PUNCH which may continue for as many cards as necessary so long as columns 1 to 15 at each continuation card are left blank.

Generally, there is no fixed precedence of control cards. However, all data definition cards (N OF SUBJECTS, N OF STIMULI, PARAMETERS, etc.) must precede the READ MATRIX card and each READ MATRIX or READ CONFIG card is preceded by an INPUT FORMAT specification. It should also be noted that the PRINT, PLOT and PUNCH commands should precede the COMPUTE command.

All control cards are echoed at the line printer and all errors (up to the specified ERROR LIMIT) are flagged. If an error has occurred then the remaining cards will be scanned for errors.

1.2 CONTROL CARDS (obligatory cards are marked with an asterisk for ease of reference)

1. The RUN NAME card

1	16
RUN NAME	any descriptive title for the run

Function : Provides a name for the run

Status : Optional

2. The TASK NAME card

1	16
TASK NAME	any descriptive title for the run

Function : Provides a name for the task (Useful in runs where more than one task is performed)

Status : Optional

Notes : On encountering a second (and subsequent) TASK NAME card, PARAMETERS will resume their default values.

3. The COMMENT card

1	16
COMMENT	any comments

Function : Allows the user to insert comments and notes at any point in the run. Comments may be continued onto subsequent cards by leaving blank cols 1-15.

Status : Optional

4. The PRINT DATA card

1	16
PRINT DATA	(YES) (or) (NO)

Function : Allows the user to have any input data echoed on the line printer output. Can be useful if the system appears to be misreading your data.

Status : Optional

Notes : PRINT DATA is initially set to NO and will remain in force until the end of the run or another PRINT DATA card is encountered.

*5. The # OF SUBJECTS CARD

1	16
# OF SUBJECTS or NO OF SUBJECTS or N OF SUBJECTS	number of subjects in the analysis: must be an integer value

Function : Provides the system with the number of subjects in the analysis.

Status : Obligatory

Notes : Not applicable to some of the programs: see relevant program documentation in Section 2.

*6. The # OF STIMULI card

1	16
# OF STIMULI or NO OF STIMULI or N OF STIMULI	number of stimuli in the analysis: must be an integer value

Function : Provides the system with the number of stimuli in the analysis

Status : Obligatory for most programs

Notes : Not applicable to some of the programs: see relevant program documentation in Section 2.

*7. The DIMENSIONS card

1	16	
DIMENSIONS	<number> <number list> <number> TO <number>	} Not all programs consult documentation

Function : Sets the dimensionalities for the analysis

Status : Obligatory

Notes : Solutions are usually computed from the highest dimensionality down to the lowest, whatever the order specified on the card.

8. The PARAMETERS card

1	16
PARAMETERS	keyword (value), keyword (value) etc.

Function : Allows the user to set program parameters to control the analysis

Status : Optional

Notes : See Section 1.3 for fuller description of PARAMETERS
See Section 2 for description of keywords and values.

9. The ITERATIONS card

1	16
ITERATIONS	maximum number of iterations to be performed

Function : Sets the maximum number of iterations to be performed in the analysis

Status : Optional

Notes : Only applicable to those programs which employ an iterative procedure. A maximum of 100 iterations will be assumed if this control card is not used.

10. The INPUT MEDIUM card

1	16
INPUT MEDIUM	CARD DISK DISC TAPE

Function : Allows the user to read data from different streams, e.g. the user may want to read the data matrix from disc and an initial configuration from tape.

Status : Optional

Notes : The default INPUT MEDIUM is CARD and will remain in force until the end of the run or another INPUT MEDIUM card is encountered.
See also Section 3 for any installation dependent requirements.

*11. The INPUT FORMAT card

1	16
INPUT FORMAT	a legal FORTRAN format enclosed in brackets (excluding the word FORMAT)

Function : Describes the data to be read in

Status : Obligatory

Notes : In most programs, the format must be suitable for reading real (floating point) numbers. See relevant program documentation in Section 2. If in doubt, consult a FORTRAN programmer.

12. The READ MATRIX card

1	16
READ MATRIX	blank

Function : Instructs the system to begin reading the data matrix (or matrices) from the selected INPUT MEDIUM according to INPUT FORMAT.

Status : Obligatory

Notes : READ MATRIX must be preceded by an INPUT FORMAT card and where applicable a # OF SUBJECTS and a # OF STIMULI cards. See relevant program documentation in Section 2 for the type matrix expected. If INPUT MEDIUM is CARD then the data matrix must immediately follow the READ MATRIX card.

13. The READ CONFIGURATION card

1	16
READ CONFIG	blank

Function : Instructs the system to read in an initial configuration rather than generating its own. Use of this option can often cut the time taken to reach the solution.

Status : Optional

Notes : READ CONFIG, if used, must be preceded by its own INPUT FORMAT card and, where applicable, a # OF SUBJECTS, a # OF STIMULI, and a DIMENSIONS card.
See relevant program documentation in Section 2 for the type of matrix expected.
If INPUT MEDIUM is CARD then the configuration must immediately follow the READ CONFIG card.

*14. The COMPUTE card

1	16
COMPUTE	blank

Function : Instructs the system to start the computation

Status : Obligatory

Notes : COMPUTE must be preceded by READ MATRIX.

15. The PRINT, PLOT and PUNCH cards

1	16
PRINT	ALL
or	
PLOT	ALLBUT
or	
PUNCH	EXCEPT
	<matrix name (dimensions)>
	<matrix list>
	<null>

Function : Allows user control over amount of output generated

Status : Optional

Notes : See Section 1.4

16. The REWIND card

1	16
REWIND	DISC
	DISK
	TAPE

Function : Allows re-use of some data or configuration

Status : Optional

Notes : If the user wishes to REWIND both TAPE and DISC then two REWIND cards must be inserted. The action is performed immediately.

17. The ERROR LIMIT card

1	16
ERROR LIMIT	<number>

Function : Sets the number of errors to be encountered in a pass before processing ceases

Status : Optional

Notes : The default value allows for 20 errors.

18. The NUMBERED card

1	16
NUMBERED	YES or NO

Function : Allows users to specify whether columns 73-80 of the control cards are numbered

Status : Optional

Notes : NUMBERED defaults to NO and should be reset only on those operating systems which insist on such a scheme.
This card refers only to the control cards in a task. Data cards are described only by the INPUT FORMAT card.

19. The FINISH card

1	16
FINISH	blank

Function : Terminates the run

Status : Obligatory (must be the last card in the run)

1.3 THE 'PARAMETERS' CARD

The PARAMETERS card controls options for certain program-specific operations. Each operation is allocated a keyword and a default value. These are listed in the individual program documentation and a full list of parameters and default values is in Appendix 2.

The program parameters are set according to a simple syntax. The keyword corresponding to a parameter is punched anywhere in columns 16 to 80 of the PARAMETERS card (or continuation cards) followed by a numerical value enclosed in a pair of brackets. Only the first four characters of the keywords (including spaces where present) are significant.

The PARAMETERS card can be continued by leaving columns 1 to 15 of continuation cards blank. 'Keyword (value)' items may be separated by as many spaces and commas as desired.

If continuation is necessary, a 'keyword (value)' item may not be split over two cards. Subject to this restriction, all parameters are freefield, i.e. spaces are not significant (except, of course, in the spelling of the keyword).

N.B. Keywords which are not specified by the user assume default values. An implicit call is made by the system to set the parameters to their default values if no PARAMETERS card has been encountered before a READ MATRIX or READ CONFIG card. This is particularly relevant if there is more than one task per run. The parameters are set either implicitly or explicitly for each new task.

1.4 THE OUTPUT DEFINITION CARDS

The PRINT, PLOT and PUNCH commands allow the user control over the type and extent of output generated by the program.

The PRINT command generates line-printer output, usually in tabular or matrix form; the PLOT command controls the output of line-printer plots, and the PUNCH command generates a card-image file of relevant information for subsequent analysis.

The options available for each program are described in the individual program documentation as are the default options. These default options are designed to provide the essential information from an analysis. By specifying the keyword ALL the user will normally be presented with a detailed history of the analysis, which may be voluminous, intricate and of dubious value to the uninitiated.

Particular items to be PRINTed PLOTted or PUNCHed are described by keywords. These may be followed by an argument enclosed in brackets which gives the dimensionalities for which the particular output is required. The keyword TO may appear within the bracket as may the keyword ALL.