

READ FUNCTION

PURPOSE

Reads a function into DATAPLOT:

1. from a mass storage file;
2. from within a CALLED DATAPLOT sub-program;
3. from the terminal.

DESCRIPTION

The rules regarding READ FUNCTION are as follows:

1. Only one line is read. Unlike a READ of variables, no END OF DATA is searched for.
2. Typically, only one function is read at a time. Reading more than one function is allowed (but not recommended). If more than one function is read from the same line, separate the functions with at least one space and leave no spaces within a given function. For example,


```
READ FUNCTION F G
X**2+8X-4    X**3-X+1
```
3. In scanning for the function, the full line image is scanned (for reading from a mass storage file, the full line image is 132 columns; for reading from within a sub-program and for reading from the terminal, the full line image is 80 columns). For variations on this, see the COLUMN LIMITS command.
4. If one function is read, blanks are ignored in the function. However, if more than one function is read, blanks are used to separate the functions (and are therefore significant).
5. Function definitions can be free format. They need not be aligned in specific columns.
6. By default, all reads start from the beginning of the file (to override this, see the SKIP and ROW LIMITS commands).

SYNTAX 1

```
READ FUNCTION <f1> <f2> ... <fk>
```

where <f1>, <f2>, ..., <fk> are the desired functions (typically only one is given).

This syntax is used to read a function from the terminal or from within a DATAPLOT sub-program. For example:

```
READ FUNCTION Y X
```

SYNTAX 2

```
READ FUNCTION <file> <f1> <f2> ... <fk>
```

where <file> is the name of the mass storage file where the function resides;

and <f1>, <f2>, ..., <fk> are the desired functions (typically only one is given).

This syntax is used to read a function from a file. For example, READ FUNCTION ABC.TEX F1 F2.

EXAMPLES

```
READ FUNCTION CALIB.DAT F
```

```
READ FUNCTION F
```

```
X**2+4*X-1
```

NOTE 1

In order to determine whether the first argument is a file name or a variable name, it looks for a period in the name. If it finds one, it assumes a file name. If it does not, it assumes a variable name. If your file name does not contain a period, attach a trailing period (no spaces) to the file name on the READ command.

NOTE 2

DATAPLOT has no restrictions on the file name other than it be a valid file name on the local operating system and that it contain a period "." in the file name itself or as a trailing character. DATAPLOT strips off trailing periods on those systems where it is appropriate to do so. On systems where trailing periods can be a valid file name (e.g., Unix), DATAPLOT tries to open the file with the trailing period. If this fails, it then tries to open the file with the trailing period stripped off.

Some users prefer to give all data files a ".DAT" or ".dat" extension. Although this is a useful method for keeping track of data files, it is strictly a user convention and is not enforced by DATAPLOT in any way.

NOTE 3

File names are case sensitive on Unix file systems. For Unix, DATAPLOT attempts to open the file as given. If this fails, it attempts to open the file as all upper case characters. If this fails, it attempts to open the file as all lower case characters. All other currently supported systems are not case sensitive regarding file names.

As a further caution for Unix hosts, certain expansion characters (specifically ~ to refer to your home directory) are interpreted by the shell and are not recognized by the Fortran compiler. These expansion characters are interpreted as literal characters and do not yield the intended file name.

DEFAULT

1. If no file name is specified, and if a CALL is being executed, then the function should be listed directly in the DATAPLOT sub-program immediately after the READ FUNCTION command.
2. If no file name is specified, and if commands are being manually entered/executed 1-at-a-time from the terminal, then the function should be entered directly from the terminal immediately after the READ FUNCTION command.

SYNONYMS

READ STRING is equivalent to READ FUNCTION (strings and functions are treated equivalently internally in DATAPLOT, although they differ in the context in which they are used).

RELATED COMMANDS

SERIAL READ	=	Perform a serial read.
READ	=	Read variables.
READ PARAMETER	=	Read a parameter.
READ MATRIX	=	Read a matrix.
READ STRING	=	Read a string.

APPLICATIONS

Function definition

IMPLEMENTATION DATE

87/4

PROGRAM 1

```
READ FUNCTION F
X**2+2*X-6
PLOT F FOR X = -3 .1 3
```

PROGRAM 2

```
READ FUNCTION F G
SIN(X) COS(X)
LET FUNCTION H = (F**2)/G
PLOT H FOR X = -3 .1 3
```