# nag_opt_read (e04xyc)

## 1. Purpose

**nag_opt_read (e04xyc)** reads a set of optional parameter values from a file and assigns those values to a given options structure of type Nag_E04_Opt. Values supplied are checked as being of correct type and within range for the specified optional parameter.

## 2. Specification

```
#include <nag.h>
#include <nage04.h>

void nag_opt_read(char *name, char *opt_file, Nag_E04_Opt *options,
                  Boolean print, char *outfile, NagError *fail)
```

## 3. Description

The optimization functions of Chapter e04 have a number of optional parameters, which are set by means of a structure of type Nag_E04_Opt. Optional parameter values may be assigned to members of the options structure directly in the program text and/or by supplying the optional values in a file which can be read by the function nag_opt_read.

When optional parameter values are read from a file using nag_opt_read then the options structure will be initialized automatically if this has not already been done. It is only necessary to call nag_opt_init (e04xxc) if direct assignments to the options structure are made in the user's program before calling nag_opt_read.

As well as reading from a file, nag_opt_read will also read from `stdin`. This allows redirection to be used to supply the file; it also permits nag_opt_read to be used interactively with the user supplying values from the keyboard.

Checks are made that the values read in are of valid type for the optional parameter specified and that the value is within the valid range for that parameter. If a value is accepted, a printed confirmation of the setting of the relevant parameter will be output if **print** = **TRUE**. An unacceptable parameter name or value will give an error message if **fail.print** = **TRUE**.

## 4. Parameters

**name**

Input: a character string specifying either the NAG six-character name or the NAG long name of the proposed optimization routine. The case of the character string is disregarded.

**opt_file**

Input: the name of the file which specifies the optional parameter values. If `stdin` is to be used, the string `"stdin"` should be supplied. The set of option values must be preceded by the keyword `begin` followed by the function name for which the set of options is being supplied. The function name may be the six character NAG name of an optimization routine or its associated long name.

Each option value specified in the file must be preceded by the name of the optional parameter. The parameter name and value must be separated by at least one blank space or an equals symbol. nag_opt_read will read to the end of file or until the keyword `end` is found or until another `begin` is found. C style comments may be placed within a set of option values to aid the user's documentation. Outside the option value sets, text need not be within C style comment delimiters.

N.B. Assignment to function pointers in the options structure, memory allocation to array pointers and assignment of trailing array dimensions cannot be performed from an options file. These must be assigned directly to the options structure in the user's calling program.

**options**

Input: the options structure may or may not have previously been initialized, and had values assigned to its members.

Output: the options structure, initialized and with values assigned according to the values found in the options file.

**print**
Input: if **TRUE** a message confirming the setting of each option will be output.

**outfile**
Input: a character string specifying the name of the file to which confirmation messages should be output. If `stdout` is required then the string `"stdout"` should be given. When **print** = **FALSE** the empty string `""` can be supplied as **outfile** will be ignored.

**fail**
The NAG error parameter, see the Essential Introduction to the NAG C Library.
Users are recommended to declare and initialize **fail** and set **fail.print** = **TRUE** for this function.

## 5. Error Indications and Warnings

**NE_INVALID_BEGIN**
The Begin statement occurring in data file from which options are being read is not valid.

**NE_NOT_FUN_NAME**
The string, ⟨*string*⟩, supplied in the parameter name is not the name of any C Library function with option setting facilities.

**NE_INVALID_OPTION_NAME**
(line ⟨*value*⟩) '⟨*string*⟩' is not a valid name for a structure member or option.

This error message is output if, for example, the specified string contains characters which are not permitted in a variable name in the C programming language.

**NE_INVALID_OPTION**
(line ⟨*value*⟩) ⟨*string*⟩ cannot be assigned to using an options file.

**NE_FIELD_UNKNOWN**
(line ⟨*value*⟩) '⟨*string*⟩' is not a permitted structure member or option for ⟨*string*⟩.

**NE_INVALID_VALUE**
(line ⟨*value*⟩) value '⟨*string*⟩' given to ⟨*string*⟩ option is not of the correct type for this option.

**NE_NO_VALUE**
(line ⟨*value*⟩) no value found for option ⟨*string*⟩.

**NE_UNBALANCED_COMMENT**
Unbalanced comment starting on line ⟨*value*⟩ found in options file.

**NE_INVALID_INT_RANGE_1**
**NE_INVALID_REAL_RANGE_E**
**NE_INVALID_REAL_RANGE_F**
Value ⟨*value*⟩ given to ⟨*option*⟩ is not valid. Correct range is ⟨*option*⟩ ⟨*value*⟩.

**NE_INVALID_INT_RANGE_2**
**NE_INVALID_REAL_RANGE_EF**
**NE_INVALID_REAL_RANGE_FF**
Value ⟨*value*⟩ given to ⟨*option*⟩ is not valid. Correct range is ⟨*value*⟩ ⟨*option*⟩ ⟨*value*⟩.

**NE_INVALID_REAL_RANGE_CONS**
Value ⟨*value*⟩ given to ⟨*option*⟩ not valid. The parameter ⟨*option*⟩ must satisfy ⟨*constraint*⟩.

**NE_INVALID_TEXT_RANGE**
Value ⟨*string*⟩ given to ⟨*option*⟩ not valid.

**NE_INVALID_ENUM_RANGE**
Enum value ⟨*string*⟩ given to ⟨*option*⟩ is not valid for this function.

**NE_NOT_READ_FILE**
Cannot open file ⟨*string*⟩ for reading.

**NE_NOT_APPEND_FILE**
Cannot open file ⟨*string*⟩ for appending.

**NE_NOT_CLOSE_FILE**
Cannot close file ⟨*string*⟩.

**NE_WRITE_ERROR**
Error occurred when writing to file ⟨*string*⟩.

The following error messages are specific to option setting for nag_opt_conj_grad (e04dgc), nag_opt_nlp (e04ucc) and nag_opt_nlin_lsq (e04unc).

**NE_STOP_LT_START**
Value given to obj_check_stop, ⟨*value*⟩, is less than value given to obj_check_start, ⟨*value*⟩.

**NE_CHECK_LT_ONE**
Value ⟨*value*⟩ given to ⟨*string*⟩ is less than 1.

## 6. Further Comments

nag_opt_read may be used to read the optional 'MPSX names' (e.g., **prob_name**, **obj_name**) for nag_opt_sparse_mps_read (e04mzc) and nag_opt_sparse_convex_qp (e04nkc). However, although these functions allow the names to contain non-leading blank characters, nag_opt_read will not read such names correctly from an options file since blank spaces are assumed to denote the end of an option name or value within the file. All other valid MPSX names (see the documentation for nag_opt_sparse_mps_read (e04mzc) for details) will be read correctly by nag_opt_read.

## 7. See Also

nag_opt_sparse_mps_read (e04mzc)
nag_opt_init (e04xxc)
nag_opt_free (e04xzc)
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## 8. Example

See the use of nag_opt_read in any of the example programs for nag_opt_simplex (e04ccc), nag_opt_conj_grad (e04dgc), nag_opt_lsq_no_deriv (e04fcc), nag_opt_lsq_deriv (e04gbc), nag_opt_bounds_no_deriv (e04jbc), nag_opt_bounds_deriv (e04kbc), nag_opt_bounds_2nd_deriv (e04lbc), nag_opt_lp (e04mfc), nag_opt_qp (e04nfc) and nag_opt_nlp (e04ucc).