

# NAG Library Routine Document

## E05ZLF

**Note:** before using this routine, please read the Users' Note for your implementation to check the interpretation of *bold italicised* terms and other implementation-dependent details.

### 1 Purpose

E05ZLF is used to query the value of optional parameters available to supported problem solving routines in Chapter E05. Currently the following routines are supported:

E05SAF,  
E05SBF,  
E05UCF,  
E05USF.

### 2 Specification

```
SUBROUTINE E05ZLF (OPTSTR, IVALUE, RVALUE, CVALUE, OPTYPE, IOPTS, OPTS,      &
                  IFAIL)
INTEGER          IVALUE, OPTYPE, IOPTS(*), IFAIL
REAL (KIND=nag_wp) RVALUE, OPTS(*)
CHARACTER(*)     OPTSTR, CVALUE
```

### 3 Description

E05ZLF is used to query the current values of options. It is necessary to initialize optional parameter arrays using E05ZKF before any options are queried.

E05ZLF will normally return either an integer, real or character value dependent upon the type associated with the optional parameter being queried. Some real and integer options also return additional information in CVALUE. Whether the option queried is of integer, real or character type, and whether additional information is returned in CVALUE, is indicated by the returned value of OPTYPE.

Information on optional parameter names and whether these options are real, integer or character can be found in Section 12 in E05SAF, E05SBF, E05UCF and E05USF.

### 4 References

None.

### 5 Arguments

- 1: OPTSTR – CHARACTER(\*) *Input*  
*On entry:* a string identifying the option whose current value is required. See Section 12 in E05SAF and E05SBF for information on valid options. In addition, the following is a valid option:  
**Identify**  
E05ZLF returns in CVALUE the routine name supplied to E05ZKF when the optional parameter arrays IOPTS and OPTS were initialized.
- 2: IVALUE – INTEGER *Output*  
*On exit:* if the optional parameter supplied in OPTSTR is an integer valued argument, IVALUE will hold its current value.

- 3: RVALUE – REAL (KIND=nag\_wp) *Output*  
*On exit:* if the optional parameter supplied in OPTSTR is a real valued argument, RVALUE will hold its current value.
- 4: CVALUE – CHARACTER(\*) *Output*  
**Note:** the string returned in CVALUE will never exceed 40 characters in length.  
*On exit:* if the optional parameter supplied in OPTSTR is a character valued argument, CVALUE will hold its current value. CVALUE will also contain additional information for some integer and real valued arguments, as indicated by OPTYPE.
- 5: OPTYPE – INTEGER *Output*  
*On exit:* indicates whether the optional parameter supplied in OPTSTR is an integer, real or character valued argument and hence which of IVALUE, RVALUE or CVALUE holds the current value.  
 OPTYPE = 1  
 OPTSTR is an integer valued optional parameter, its current value has been returned in IVALUE.  
 OPTYPE = 2  
 OPTSTR is a real valued optional parameter, its current value has been returned in RVALUE.  
 OPTYPE = 3  
 OPTSTR is a character valued optional parameter, its current value has been returned in CVALUE.  
 OPTYPE = 4  
 OPTSTR is an integer valued optional parameter, its current value has been returned in IVALUE. Additional information has been returned in CVALUE.  
 OPTYPE = 5  
 OPTSTR is a real valued optional parameter, its current value has been returned in RVALUE. Additional information has been returned in CVALUE.
- 6: IOPTS(\*) – INTEGER array *Communication Array*  
**Note:** the dimension of this array is dictated by the requirements of associated functions that must have been previously called. This array **must** be the same array passed as argument IOPTS in the previous call to E05ZKF.
- 7: OPTS(\*) – REAL (KIND=nag\_wp) array *Communication Array*  
**Note:** the dimension of this array is dictated by the requirements of associated functions that must have been previously called. This array **must** be the same array passed as argument OPTS in the previous call to E05ZKF.
- 8: IFAIL – INTEGER *Input/Output*  
*On entry:* IFAIL must be set to 0, -1 or 1. If you are unfamiliar with this argument you should refer to Section 3.4 in How to Use the NAG Library and its Documentation for details.  
 For environments where it might be inappropriate to halt program execution when an error is detected, the value -1 or 1 is recommended. If the output of error messages is undesirable, then the value 1 is recommended. Otherwise, if you are not familiar with this argument, the recommended value is 0. **When the value -1 or 1 is used it is essential to test the value of IFAIL on exit.**  
*On exit:* IFAIL = 0 unless the routine detects an error or a warning has been flagged (see Section 6).

## 6 Error Indicators and Warnings

If on entry  $IFAIL = 0$  or  $-1$ , explanatory error messages are output on the current error message unit (as defined by X04AAF).

Errors or warnings detected by the routine:

$IFAIL = 11$

On entry, the *option* in OPTSTR has not been recognized.

$IFAIL = 41$

On entry, OPTSTR indicates a character optional parameter, but CVALUE is too short to hold the stored value. The returned value will be truncated.

$IFAIL = 61$

The arrays IOPTS and OPTS have either not been initialized, have become corrupted, or are not compatible with this option setting routine.

$IFAIL = -99$

An unexpected error has been triggered by this routine. Please contact NAG.

See Section 3.9 in How to Use the NAG Library and its Documentation for further information.

$IFAIL = -399$

Your licence key may have expired or may not have been installed correctly.

See Section 3.8 in How to Use the NAG Library and its Documentation for further information.

$IFAIL = -999$

Dynamic memory allocation failed.

See Section 3.7 in How to Use the NAG Library and its Documentation for further information.

## 7 Accuracy

Not applicable.

## 8 Parallelism and Performance

E05ZLF is not threaded in any implementation.

## 9 Further Comments

Some options have default values which are problem dependent. For example the option **Maximum Iterations Completed** for E05SAF has the default value  $1000 \times \text{NDIM}$ . If options such as this are queried before being set, or before the problem solving routine has been called, they will return misleading information in IVALUE or RVALUE. In some cases, the value of CVALUE will be set to DEFAULT to indicate that the real or integer valued optional parameter supplied in OPTSTR is at its default value.

## 10 Example

See the example programs associated with the problem solving routine you wish to use for a demonstration of how to use E05ZLF to query options.

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