

NAG Fortran Library Routine Document

F06RLF

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

F06RLF returns, via the function name, the value of the 1-norm, the ∞ -norm, the Frobenius norm, or the maximum absolute value of the elements of a real n by n triangular band matrix.

2 Specification

```
double precision FUNCTION F06RLF (NORM, UPLO, DIAG, N, K, AB, LDAB, WORK)
INTEGER                                N, K, LDAB
double precision AB(LDAB,*), WORK(*)
CHARACTER*1                           NORM, UPLO, DIAG
```

3 Description

None.

4 References

None.

5 Parameters

- 1: NORM – CHARACTER*1 *Input*
On entry: specifies the value to be returned:
 if NORM = '1' or 'O', the 1-norm;
 if NORM = 'I', the ∞ -norm;
 if NORM = 'F' or 'E', the Frobenius (or Euclidean) norm;
 if NORM = 'M', the value $\max_{i,j} |a_{ij}|$ (not a norm).
Constraint: NORM = '1', 'O', 'I', 'F', 'E' or 'M'.
- 2: UPLO – CHARACTER*1 *Input*
On entry: specifies whether A is upper or lower triangular as follows:
 if UPLO = 'U', A is upper triangular;
 if UPLO = 'L', A is lower triangular.
Constraint: UPLO = 'U' or 'L'.
- 3: DIAG – CHARACTER*1 *Input*
On entry: specifies whether A has non-unit or unit diagonal elements, as follows:
 if DIAG = 'N', the diagonal elements are stored explicitly;
 if DIAG = 'U', the diagonal elements are assumed to be 1, and are not referenced.
Constraint: DIAG = 'N' or 'U'.

- 4: N – INTEGER *Input*
On entry: n , the order of the matrix A .
Constraint: $N \geq 0$.
- 5: K – INTEGER *Input*
On entry: k , the number of sub-diagonals or super-diagonals of the matrix A .
Constraint: $K \geq 0$.
- 6: AB(LDAB,*) – **double precision** array *Input*
Note: the second dimension of the array AB must be at least $\max(1, N)$.
On entry: the n by n triangular band matrix A , stored in rows 1 to $k + 1$. More precisely, if UPLO = 'U', the elements of the upper triangle of A within the band must be stored with element a_{ij} in $AB(k + 1 + i - j, j)$ for $\max(1, j - k) \leq i \leq j$; if UPLO = 'L', the elements of the lower triangle of A within the band must be stored with element a_{ij} in $AB(1 + i - j, j)$ for $j \leq i \leq \min(n, j + k)$. If DIAG = 'U', the diagonal elements of A are assumed to be 1, and are not referenced.
- 7: LDAB – INTEGER *Input*
On entry: the first dimension of the array AB as declared in the (sub)program from which F06RLF is called.
Constraint: $LDAB \geq K + 1$.
- 8: WORK(*) – **double precision** array *Workspace*
Note: the dimension of the array WORK must be at least $\max(1, N)$ if NORM = 'I' and at least 1 otherwise.

6 Error Indicators and Warnings

None.
