

D02NZF – NAG Fortran Library Routine Document

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

D02NZF is a setup routine which must be called, if optional inputs need resetting, prior to a continuation call to any of the integrators in the subchapter D02M–D02N.

2 Specification

```

SUBROUTINE D02NZF(NEQMAX, TCRIT, H, HMIN, HMAX, MAXSTP, MXHNIL,
1              RWORK, IFAIL)
  INTEGER      NEQMAX, MAXSTP, MXHNIL, IFAIL
  real       TCRIT, H, HMIN, HMAX, RWORK(50+4*NEQMAX)

```

3 Description

This routine is provided to permit the user to reset many of the parameters which control the integration 'on the fly', that is in conjunction with the interrupt facility permitted through the parameter ITASK of the integrator. In addition to a number of parameters which the user can set initially through one of the integrator setup routines, the step size to be attempted on the next step may be changed.

4 References

None.

5 Parameters

- 1: NEQMAX — INTEGER *Input*
On entry: the value used for the parameter NEQMAX when calling the integrator.
Constraint: $NEQMAX \geq 1$.
- 2: TCRIT — *real* *Input*
On entry: a point beyond which integration must not be attempted. The use of TCRIT is described under the parameter ITASK in the specification for the integrator. A value, 0.0 say, must be specified even if ITASK subsequently specifies that TCRIT will not be used.
- 3: H — *real* *Input*
On entry: the next step size to be attempted. Set $H = 0.0$ if the current value of H is not to be changed.
- 4: HMIN — *real* *Input*
On entry: the minimum absolute step size to be allowed. Set $HMIN = 0.0$ if this option is not required. Set $HMIN < 0.0$ if the current value of HMIN is not to be changed.
- 5: HMAX — *real* *Input*
On entry: the maximum absolute step size to be allowed. Set $HMAX = 0.0$ if this option is not required. Set $HMAX < 0.0$ if the current value of HMAX is not to be changed.
- 6: MAXSTP — INTEGER *Input*
On entry: the maximum number of steps to be attempted during one call to the integrator after which it will return with $IFAIL = 2$. Set $MAXSTP = 0$ if this option is not required. Set $MAXSTP < 0$ if the current value of MAXSTP is not to be changed.

- 7:** MXHNIL — INTEGER *Input*
On entry: the maximum number of warnings printed (if ITRACE ≥ 0) per problem when $t + h = t$ on a step ($h =$ current step size). If MXHNIL ≤ 0 , a default value of 10 is assumed.
- 8:** RWORK(50+4*NEQMAX) — *real* array *Workspace*
This must be the same workspace array as the array RWORK supplied to the integrator. It is used to pass information from the integrator to D02NZF and therefore its contents must not be changed before calling D02NZF.
- 9:** IFAIL — INTEGER *Input/Output*
On entry: IFAIL must be set to 0, -1 or 1. For users not familiar with this parameter (described in Chapter P01) the recommended value is 0.
On exit: IFAIL = 0 unless the routine detects an error (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 detected by the routine:

IFAIL = 1
NEQMAX < 1.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

See the example for Section 9 of the document for D02NCF.
