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VECTORIZED TRIDIAGONAL SOLVERS

NAVAL RESEARCH LABORATORY
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Vectorized Tridiagonal Solvers

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Plasma Dynamics Branch
Plasma Physics Division

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NAVAL RESEARCH LABORATORY
Washington, D.C.

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This report briefly documents four related tridiagonal solvers optimized for parallel computation on the ASC computer at NRL. Both single and double precision versions are available. The report also contains listings of the routines and a test program with results for a standard test problem.

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CONTENTS

VECTORIZED TRIDIAGONAL SOLVERS

I. Introduction

In many areas of computational physics and numerical analysis the tridiagonal system of linear equations appears:

$$a_i X_{i-1} + b_i X_i + c_i X_{i+1} = d_i \tag{1}$$

for i = 1, 2, 3, $\cdots$, N_c. Here N_c is the number of columns (and rows) in the corresponding matrix representation. These applications include implicit diffusion equations, splines, Poisson Equation solvers, and many others. References include Roache[1] and Richtmyer and Morton[2].

Boundary conditions for the system depend on the coefficients a_1 and c_{N_c}. When a_1 and c_{N_c} are zero, the first and last equation couple only two of the unknown values $\{X_i\}$ and the usual double sweep algorithms work. The periodic system in which $X_o \equiv X_{N_c}$ and $X_{N_c+1} \equiv X_1$ also occurs often in real applications. Both periodic and aperiodic boundary conditions are handled as if periodic in the routines described below. Distinction between these two conditions occurs only through the values assigned to the input coefficients a_1 anc c_{N_c}.

Eight different user-called routines are provided and documented in the SPL library, four for single precision and four for double precision. Four extra routines are required for internal use by the vectorized tridiagonal solvers; these four are not to be referenced by the user. Two of these auxiliary

Note: Manuscript submitted October 29, 1976.

routines are for the double precision solvers, and the other two are their single precision equivalents. Appendix A lists the four double precision tridiagonal solvers and the two auxiliary coefficient-folding routines used by the two vectorized solvers TRIDDV and TRIDDM. The single precision equivalent routines are not listed, being derived from those in Appendix A simply by

1. Changing the D to an S in the fifth letter of each routine name, and

2. Removing the IMPLICIT REAL*8 statement from each double precision routine.

Appendix B contains the SPL double precision test program and its output for verifying the results. The single precision output is also included but <u>not</u> the corresponding single precision test program.

All of the tridiagonal solvers in this series are named according to the following conventions:

1. The first four letters are TRID.

2. The fifth letter is S or D for single or double precision.

3. The sixth letter denotes the purpose and usage of the routine as detailed in Table 1.

II. Solution Method

All discussion of the algorithms used will be based on the single precision solvers although it holds equally well for the double precision solvers with the fifth character of the six-character name changed from S to D. The basic scalar solver was originally written by C. Wagner under the name TRIDAG and employs a modified double sweep technique to allow the non-zero corner elements of a periodic boundary condition. The current routine TRIDSS (scalar) is based on TRIDAG.

The vectorized algorithm is based on NRL Memorandum Report 3144 in detail although the basic ideas have been around for years.[3,4] The number of equations is reduced roughly by a factor of two by substituting successive even-numbered equations into all of the odd-numbered equations. This folding is repeated, in TRIDSV (vector), over and over again until the residual tridiagonal system is so short that the TRIDSS scalar algorithm is the most efficient solution method. The vector operations which result over the entire system of equations more than make up for the extra overhead of the folding and unfolding operations.

TRIDSV also manages memory so that the operands are contiguous in memory, thus maximizing memory access speed. The price of this is the necessity for every vector entered to TRIDSV (or TRIDSM) to be at least twice as large as needed to hold the data. Thus a vector of length $2N_c$ would have to be passed to the vector routines but only the first N_c locations are filled with data. The upper half of every array is used as scratch and the original contents are destroyed.

TRIDSR (repeated) is a simple rewrite of TRIDSS in which several different tridiagonal systems are solved in parallel by bringing the appropriate DO loops inside TRIDSS. The operations are then all vectorized and contiguous across the N_s tridiagonal systems although the scalar, recursion loops of TRIDSS are still in evidence as outer loops.

TRIDSM (multiple) is a vectorized rewrite of TRIDSV corresponding to the vectorized TRIDSR rewrite of TRIDSS. In TRIDSM, however, both inner and outer loops vectorize so it is the most efficient of all the routines. The next section, which describes the actual usage, should clarify this apparent jungle of routines.

In all of the routines the usual divide by the b_i coefficients is retained as minimizing the number of operations even though one of the operations is an expensive divide. Therefore the diagonal terms cannot be zero (generally). The simple (but maybe not always necessary or sufficient) requirement of diagonal dominance should prevent an undesired zero divide. This choice was dictated by simplicity and flexibility.

III. Usage

Let A, B, C, D be the Fortran arrays in which the coefficients $\{a_i\}$, $\{b_i\}$, $\{c_i\}$, $\{d_i\}$ are stored by the user, and X the Fortran array where the user wants his results $\{x_i\}$ stored. Let SCA and SCB be scratch arrays of the same dimensionality as X. Let N_c be the number of equations. The user should ensure that A, B, C, D, X, SCA, and SCB all have dimensions of at least $2*N_c$. The vector routines use (and despoil) the upper N_c locations in each array.

A single tridiagonal system can be solved by the statement

```
CALL TRIDSV(NC,A,B,C,D,X,SCA,SCB)
```

or, for double precision arguments throughout,

```
CALL TRIDDV(NC,A,B,C,D,X,SCA,SCB).
```

TRIDSV automatically calls TRIDDS for greater efficiency if NC is small and hence vectorization is inefficient. Thus the user generally need not touch TRIDSS, TRIDSF, TRIDDS, TRIDDF at all. In the event that the user cannot afford the scratch area in the upper half of each array, he can call instead TRIDSS(NC,A,B,C,D,X,SCA,SCB) where now the arrays need only be dimensioned N_c. Figures 1a and 1b show what speed the user loses in going to the scalar altorithm to save space.

In multidimensional cases let A, B, C, D, X, SCA, and SCB be dimensioned A(ND, 2*NC) where the first subscript loops over the different tridiagonal systems, the lower half of the second subscript contains the data, and the upper half of the second index is left free as scratch space. This system of multiple tridiagonal systems can be solved by the statement

```
CALL TRIDSM(NC,A,B,C,D,X,SCA,SCB,NS,ND)
```

where NS is the number of systems (out of ND) which are actually solved. For double precision real arguments throughout the statement is

```
CALL TRIDDM(NC,A,B,C,D,X,SCA,SCB,NS,ND)
```

TRIDSM automatically calls TRIDSR when the residual systems become sufficiently short (NC $\sim$ 12). Since vectors in TRIDSM are two-dimensional, however, the breakeven point for efficiency between TRIDSM and TRIDSR is at lower NC than it is for TRIDSV and TRIDSS. When NS, the number of systems, is very large (> 200), the fact that the scalar algorithm in TRIDSR has 20% fewer operations than the vector algorithm will begin to show as better performance for TRIDSR. TRIDSR should also be used when the factor of two scratch space required by TRIDSM is prohibitive.

In the great majority of cases, however, the most efficient method is to use TRIDSM. In general the user need only remember TRIDSV and TRIDSM and their nearly identical argument lists which differ only in the obvious necessity to specify the second index dimension and span in the case of multiple tridiagonal systems.

IV. Timing

Table 2 contains approximate formulae for the execution time of the six most-likely-to-be-used routines. Figures 1a and 1b graph the same data for the single and the double precision routines separately. The fastest solvers are the vector multiple tridiagonal solvers TRIDSM and TRIDDM. The single precision version is the fastest for obvious reasons. There are 23 operations needing about 30 "clocks" of computation per point. This is about 2.4μsec per point. Since there are two arithmetic pipelines, however, and many of the vector operations can be executed back to back with others, the speed is substantially faster than could be obtained with one pipe.

Table 2, in addition to presenting formulae which quantify Fig. 1, contains the size of the routines in words (decimal).

Table 1. Tridiagonal Solvers

Routine Name	Arguments/Results	Purpose and Algorithm
TRIDSS	single precision	scalar two-sweep solution for short system
TRIDSV	single precision	vector folding solution for long system
TRIDSR	single precision	repeated scalar solution - parallel short systems
TRIDSM	single precision	multiple vector solution - parallel long systems
TRIDSF*	single precision	vector folding - called only by TRIDSV)
TRIDSG*	single precision	vector folding - called only by TRIDSM)
TRIDDS	double precision	scalar two-sweep solution for short system
TRIDDV	double precision	vector folding solution for long system
TRIDDR	double precision	repeated scalar solution - parallel short systems
TRIDDM	double precision	multiple vector solution - parallel long systems
TRIDDF*	double precision	vector folding - called only by TRIDDV)
TRIDDG*	double precision	vector folding - called only by TRIDDM)

*not to be called by user.

Table 2. Timing Formulae and Size of Tridiagonal Solvers

Solver	Single Precision	Double Precision
Scalar - Short System	TRIDSS $T_{SS} \approx 100 + 19N_c$ μsec $\sim$ 310 words	TRIDDS $T_{DS} \approx 100 + 20.5N_c$ μsec $\sim$ 310 words
Vector - Long System	TRIDSV $T_{SV} < 460 + 4.5N_c$ μsec $\sim$ 1000 words	TRIDDV $T_{DV} < 540 + 5.3N_c$ μsec $\sim$ 1100 words
Multiple Tridiagonal Systems	TRIDSM $T_{SM} \approx 125 + 1.6N_c$ μsec $\sim$ 2000 words	$T_{DM} \approx 120 + 3.8\ N_c$ μsec $\sim$ 2400 words

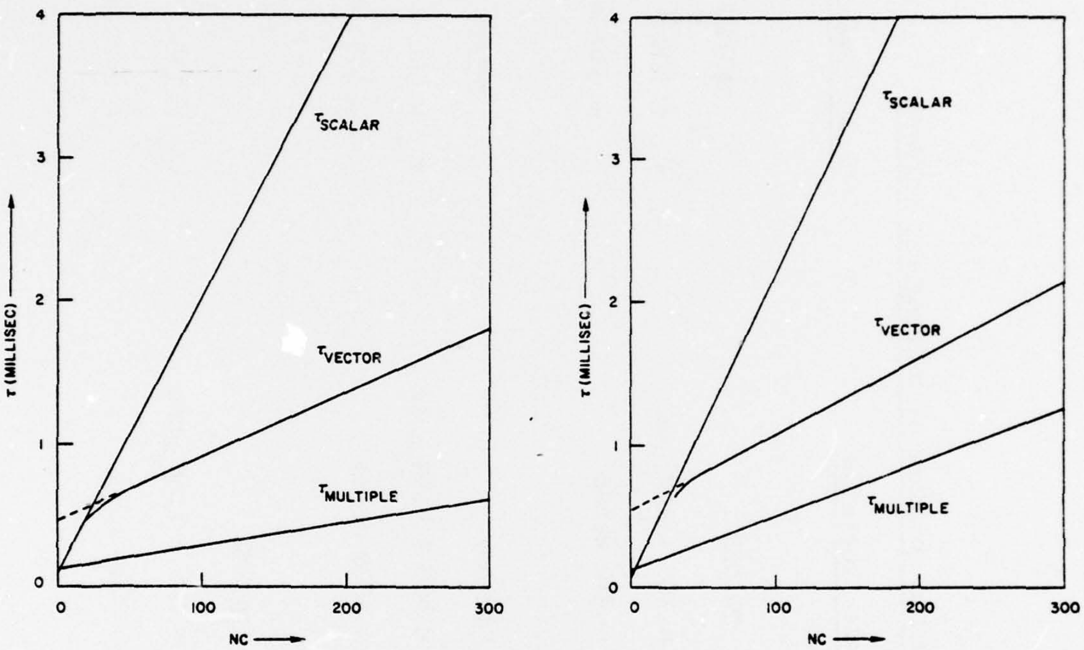

Fig. 1 — Timing data for optimized tridiagonal solvers. (a) the three principal single precision solvers (TRIDSS, TRIDSV, TRIDSM). (b) the three principal double precision solvers (TRIDDS, TRIDDV, TRIDDM).

References

1. P. J. Roache, Computational Fluid Dynamics, Appendix A, (Hermosa Press, Albuquerque, New Nexico, 1972).

2. Richtmyer and Morton, Finite Difference Methods for Initial Value Problems,

3. B. Buzbee, G. Golub, and C. Nielson, "On Direct Methods for Solving Poisson's Equations, SIAM Journal of Numerical Analysis, Vol. 7, pp. 627-656, 1970.

4. H. S. Stone, "An Efficient Parallel Algorithm for the Solutions of a Tridiagonal Linear System of Equations," J.A.C.M 20, p. 27, 1973.

Appendix A
Four Double Precision Tridiagonal Solvers for the ASC

The routines listed directly in this appendix have been optimized for and run on the ASC system at NRL. Self-contained documentation appears in comment statements to these routines. To change to single precision, alter the subroutine names as described in the text of this report and remove the "IMPLICIT REAL*8" card found at the beginning of each routine. Note that all intrinsic double precision function names must be changed as well.

```
      SUBROUTINE TRIDDS (NC, A, B, C, D, X, RB, AINVQ)
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
CD
CD    TRIDDS (NC, A, B, C, D, X, RB, AINVQ)                     CLASS.
CD    ORIGINATOR - C. WAGNER             CODE 7750, NRL          1974
CD    LATEST MODS - J. BORIS             CODE 7706, NRL     NOV. 1976
CD
CD    DESCRIPTION: THIS ROUTINE SOLVES IN DOUBLE PRECISION THE TRI-
CD    DIAGONAL MATRIX EQUATION M*X = D WHERE A(I), B(I), AND C(I) ARE
CD    THE ONLY THREE NON ZERO ELEMENTS OF ROW I. SPECIFICALLY WE SEEK
CD    X(I) IN A(I)*X(I-1) + B(I)*X(I) + C(I)*X(I+1) = D(I). FOR PERIODIC
CD    BOUNDARY CONDITIONS X(1) = X(NC+1) AND X(0) = X(NC). THE APERIODIC
CD    CASE IS HANDLED BY SETTING A(1) AND C(NC) TO ZERO. THE SCALAR AL-
CD    GORITHM EMPLOYED HERE FOLLOWS FROM SEPARATING M INTO A PURELY
CD    TRIDIAGONAL PART AND A VECTOR IN COLUMN NC AND  ONE AT ROW NC.
CD
CD    ARGUMENTS: (R ARR(...) IS USED TO DENOTE REAL ARRAY & DIMENSIONS)
CD    NC       INTEGER          # EQNS IN THE TRIDIAGONAL SYSTEM       I
CD    A          R ARR(NC)      COEFFS OF X(I-1) IN I-TH EQN.          I
CD    B          R ARR(NC)      COEFFS OF X(I)   IN I-TH EQN.          I
CD    C          R ARR(NC)      COEFFS OF X(I+1) IN I-TH EQN.          I
CD    D          R ARR(NC)      D(I) = INHOMOGENEOUS PART OF I-TH EQN  I
CD    X          R ARR(NC)      SOLUTION VECTOR SOUGHT                 O
CD    RB         R ARR(NC)      SCRATCH ARRAY FROM CALLING PROGRAM     S
CD    AINVQ      R ARR(NC)      SCRATCH ARRAY FROM CALLING PROGRAM     S
CD
CD    LANGUAGE AND LIMITATIONS: THIS ROUTINE IS WRITTEN IN DOUBLE PRE-
CD    CISION FORTRAN FOR THE ASC (64 BITS). DIAGONAL DOMINANCE IS
CD    STRONGLY RECOMMENDED FOR GOOD ERROR CONTROL. THIS ROUTINE IS REC-
CD    OMMENDED WHEN SHORT (NC < 15) TRIDIAGONAL SYSTEMS ARE BEING SOL-
CD    VED. THE VECTOR TRIDIAGONAL SOLVER TRIDDV CALLS TRIDDS TO SOLVE
CD    THE SHORT RESIDUAL SYSTEMS GENERATED BY THE VECTOR FOLDING OPER-
CD    ATIONS. THE REPEATED TRIDIAGONAL SOLVER TRIDDR IS BASED ON AN EX-
CD    PANSION OF TRIDDS.
CD
CD    TRIDDS HAS NO ADDITIONAL USER ENTRIES AND CALLS NO AUXILIARY SUB-
CD    ROUTINES.
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

```
C
      IMPLICIT REAL*8 (A-H,O-Z)
      DIMENSION A(NC), B(NC), C(NC), D(NC), X(NC), RB(NC), AINVQ(NC)
      NM = NC - 1
C
      DO 10 I = 1, NC
      IF (B(I) .EQ. 0.D+0) B(I) = 1.0D-70
   10 CONTINUE
C
      RB(1) = 1.D+0/B(1)
      DO 15 I = 2, NM
   15 RB(I)=1.D+0/ (B(I) - A(I) * C(I-1) * RB(I-1))
C
C   INVERT TRIDIAGONAL PART ON Q
      AINVQ(1) = A(1) * RB(1)
      DO 20 I = 2, NM
   20 AINVQ(I) = - A(I) * AINVQ(I-1) * RB(I)
      AINVQ(NM) = AINVQ(NM) + C(NM) * RB(NM)
C
      DO 30 J = 2, NM
      I = NC - J
   30 AINVQ(I) = AINVQ(I) - C(I) * RB(I) * AINVQ(I+1)
      RCAQ=1.D+0/ (B(NC) - C(NC) * AINVQ(1) - A(NC) * AINVQ(NM))
C
C   END PRECOMPUTATION.  THE FOLLOWING ARE ALL THE CALCS INVOLVING D
      X(1) = D(1) * RB(1)
      DO 40 I = 2, NM
   40 X(I) = (D(I) - A(I) * X(I-1)) * RB(I)
C
      DO 50 J = 2, NM
      I = NC - J
   50 X(I) = X(I) - C(I) * RB(I) * X(I+1)
C
      X(NC) = (D(NC) - C(NC) * X(1) - A(NC) * X(NM)) * RCAQ
      DO 60 I = 1, NM
   60 X(I) = X(I) - X(NC) * AINVQ(I)
      RETURN
C
C
   ENTRY BOTCHD (N, M, I1, J1, A, B, C, D, X)
C  HANDLES COMPILER BUG IN TRIDDF, TRIDDG.
      RETURN
   END
```

```
      SUBROUTINE TRIDDV (NC, A, B, C, D, X, SCA, SCB)
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
CD
CD    TRIDDV (NC, A, B, C, D, X, SCA, SCB)                    CLASS.
CD    ORIGINATOR  - J. BORIS          CODE 7706, NRL          JULY 1976
CD
CD    DESCRIPTION: THIS ROUTINE SOLVES IN DOUBLE PRECISION THE TRI-
CD    DIAGONAL MATRIX EQUATION M*X = D WHERE A(I), B(I), AND C(I) ARE
CD    THE ONLY THREE NON ZERO ELEMENTS OF ROW I. SPECIFICALLY WE SEEK
CD    X(I) IN A(I)*X(I-1) + B(I)*X(I) + C(I)*X(I+1) = D(I). FOR PERIODIC
CD    BOUNDARY CONDITIONS X(1) = X(NC+1) AND X(0) = X(NC). THE APERIODIC
CD    CASE IS HANDLED BY SETTING A(1) AND C(NC) TO ZERO. THE ALGORITHM
CD    USED HERE FOLLOWS FROM REPEATED CYCLIC REDUCTION (NRL MEMO-
CD    RANDUM REPORT 3144, OCT. 76). THE AUXILIARY ROUTINE TRIDDF IS USED
CD    TO AID WITH STORAGE FOR THE NX COMPLIER. ALL ARRAYS MUST HAVE AT
CD    LEAST 2*NC LOCATIONS TO ALLOW FOR EXPANSION OF INTERMEDIATE
CD    COEFFICIENTS. THE SCALAR VERSION REQUIRES 19 OPERATIONS PER POINT
CD    WHILE THIS VECTOR VERSION REQUIRES 23. THESE CAN BE SPLIT ACROSS
CD    BOTH PIPES, HOWEVER, AND ARE PERFORMED IN VECTOR MODE.
CD
CD    ARGUMENTS: (R ARR(...) IS USED TO DENOTE REAL ARRAY & DIMENSIONS)
CD    NC        INTEGER             # EQNS IN THE TRIDIAGONAL SYSTEM       I
CD    A         R ARR(NC)           COEFFS OF X(I-1)  IN I-TH EQN.         I
CD    B         R ARR(NC)           COEFFS OF X(I)    IN I-TH EQN.         I
CD    C         R ARR(NC)           COEFFS OF X(I+1)  IN I-TH EQN.         I
CD    D         R ARR(NC)           D(I) = INHOMOGENEOUS PART OF I-TH EQN  I
CD    X         R ARR(NC)           SOLUTION VECTOR SOUGHT                 O
CD    SCA       R ARR(NC)           SCRATCH ARRAY FROM CALLING PROGRAM     S
CD    SCB       R ARR(NC)           SCRATCH ARRAY FROM CALLING PROGRAM     S
CD
CD    LANGUAGE AND LIMITATIONS: THIS ROUTINE IS WRITTEN IN DOUBLE PRE-
CD    CISION FORTRAN FOR THE ASC (64 BITS). DIAGONAL DOMINANCE IS
CD    STRONGLY RECOMMENDED FOR GOOD ERROR CONTROL. THIS ROUTINE IS REC-
CD    OMMENDED WHEN LONG (NC > 15) TRIDIAGONAL SYSTEMS ARE BEING SOLVED.
CD    WHEN CALLED WITH SHORTER SYSTEMS TRIDDV CALLS TRIDDS. THE SHORT
CD    RESIDUAL SYSTEMS GENERATED BY THE VECTOR FOLDING OPERATIONS ARE
CD    SOLVED BY CALLING TRIDDS. THE MULTIPLE TRIDIAGONAL SOLVER TRIDDM
CD    IS BASED ON AN EXPANSION OF TRIDDV.
CD    NOTE:  IN TRIDDF THERE ARE TWO PARAMETERS  WHICH CONTROL THE VEC-
CD    TOR SOLUTION. LMAX IS THE MAXIMUM NUMBER OF FOLDING OPERATIONS.
CD    LMAX = 11 CURRENTLY. IF SYSTEMS LONGER THAN ABOUT 2**14 ARE TO BE
CD    SOLVED, LMAX MUST BE INCREASED. WHEN LMAX IS INCREASED, LMIN MUST
CD    BE INCREASED AT LEAST AS MUCH.
CD
CD    TRIDDV HAS NO ADDITIONAL USER ENTRIES AND CALLS THE SUBROUTINE
CD    TRIDDF TO PERFORM THE VECTORIZED FOLDING.
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
C


      IMPLICIT REAL*8 (A-H,O-Z)
      DIMENSION A(NC), B(NC), C(NC), D(NC), X(NC), SCA(NC), SCB(NC)
C
C     TRIDDF MANAGES BOTH A AND ANEW, ETC, IN THE SAME ARRAY WITHOUT
C     VECTOR HAZARDS.
      II = NC/2
      CALL TRIDDF (NC, A, B, C, D, X, SCA, SCB(1), SCB(II+1),
     1     SCB(2*II+1), SCB(3*II+1), A, B, C, D, X, 2*NC)
      RETURN
      END
```

```
      SUBROUTINE TRIDDM (NC, A, B, C, D, X, SCA, SCB, NS, ND)
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
CD
CD    TRIDDM (NC, A, B, C, D, X, SCA, SCB, NS, ND)              CLASS.
CD    ORIGINATOR  - J. BORIS               CODE 7706, NRL        JULY 1976
CD
CD    DESCRIPTION: THIS ROUTINE SOLVES IN DOUBLE PRECISION THE SET OF
CD    NS PARALLEL TRIDIAGONAL MATRIX EQUATIONS M*X = D WHICH ARE ALL OF
CD    THE SAME LENGTH.  HERE A(IS,I), B(IS,I) AND C(IS,I) ARE THE ONLY
CD    THREE NON ZERO ELEMENTS OF ROW I IN SET IS. SPECIFICALLY WE SEEK
CD    X(IS,I) IN THE EQUATION
CD
CD    A(IS,I)*X(IS,I-1) + B(IS,I)*X(IS,I) + C(IS,I)*X(IS,I+1) = D(IS,I)
CD
CD    FOR IS = 1, ..., NS AND I = 1, ..., NC. FOR PERIODIC BOUNDARY CON-
CD    DITIONS X(IS,1) = X(IS,NC+1) AND X(IS,0) = X(IS,NC). THE APERIODIC
CD    CASE FOLLOWS FROM SETTING A(IS,1) AND C(IS,NC) TO ZERO. THE ALGO-
CD    RITHM USED HERE FOLLOWS FROM REPEATED CYCLIC REDUCTION (NRL MEMO-
CD    RANDUM REPORT 3144, OCT. 76). THE AUXILIARY ROUTINE TRIDDG IS USED
CD    TO AID WITH STORAGE FOR THE NX COMPLIER. ALL ARRAYS MUST HAVE AT
CD    LEAST 2*NC LOCATIONS TO ALLOW FOR EXPANSION OF INTERMEDIATE
CD    COEFFICIENTS. THE SCALAR VERSION REQUIRES 19 OPERATIONS PER POINT
CD    WHILE THIS VECTOR VERSION REQUIRES 23. THESE CAN BE SPLIT ACROSS
CD    BOTH PIPES, HOWEVER, AND ARE PERFORMED IN VECTOR MODE.
CD
CD    ARGUMENTS: (R ARR(...) IS USED TO DENOTE REAL ARRAY & DIMENSIONS)
CD    NC       INTEGER             # EQNS IN THE TRIDIAGONAL SYSTEM        I
CD    A        R ARR(ND,2*NC)      COEFFS OF X(IS,I-1) IN I-TH EQN.        I
CD    B        R ARR(ND,2*NC)      COEFFS OF X(IS,I)   IN I-TH EQN.        I
CD    C        R ARR(ND,2*NC)      COEFFS OF X(IS,I+1) IN I-TH EQN.        I
CD    D        R ARR(ND,2*NC)      D(IS,I) = INHOMOGENEOUS PART OF EQN I   I
CD    X        R ARR(ND,2*NC)      SOLUTION VECTOR SOUGHT  X(IS,I)         O
CD    SCA      R ARR(ND,2*NC)      SCRATCH ARRAY FROM CALLING PROGRAM      S
CD    SCB      R ARR(ND,2*NC)      SCRATCH ARRAY FROM CALLING PROGRAM      S
CD    NS       INTEGER             # SETS OF TRIDIAGONAL SYSTEMS           I
CD    ND       INTEGER             DIMENSION OF FIRST INDEX (.GE. NS)      I
CD
CD    LANGUAGE AND LIMITATIONS: THIS ROUTINE IS WRITTEN IN DOUBLE PRE-
CD    CISION FORTRAN FOR THE ASC (64 BITS). DIAGONAL DOMINANCE IS
CD    STRONGLY RECOMMENDED FOR GOOD ERROR CONTROL. THIS ROUTINE IS
CD    PARTICULARLY EFFICIENT WHEN MANY LONG TRIDIAGONAL SYSTEMS (NS>12)
CD    HAVE TO BE SOLVED IN PARALLEL. TRIDDR WOULD BE BETTER FOR MANY
CD    SHORT TRIDIAGONAL SYSTEMS. TRIDDM CALLS TRIDDR TO SOLVE THE SERIES
CD    OF SHORT RESIDUAL SYSTEMS BEING GENERATED BY THE VECTOR FOLDING
CD    OPERATIONS. THE FX COMPILER SHOULD BE USED TO AVOID A COMPILER BUG
CD    NOTE:  IN TRIDDG THERE ARE TWO PARAMETERS  WHICH CONTROL THE VEC-
CD    TOR SOLUTION. LMAX IS THE MAXIMUM NUMBER OF FOLDING OPERATIONS.
CD    LMAX = 10 CURRENTLY. IF SYSTEMS LONGER THAN ABOUT 2**13 ARE TO BE
CD    SOLVED, LMAX MUST BE INCREASED. WHEN LMAX IS INCREASED, LMIN MUST
```

```
CD     BE INCREASED AT LEAST AS MUCH.
CD
CD     TRIDOM HAS NO ADDITIONAL USER ENTRIES AND CALLS THE SUBROUTINE
CD     TRIDDG TO PERFORM THE VECTORIZED FOLDING.
CD
CD     * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
C
          IMPLICIT REAL*8 (A-H,O-Z)
          DIMENSION  A(ND,NC), B(ND,NC), C(ND,NC), D(ND,NC), X(ND,NC)
          DIMENSION  SCA(ND,NC), SCB(ND,NC)
C
C      TRIDDG MANAGES BOTH A AND ANEW, ETC, IN THE SAME ARRAY WITHOUT
C      VECTOR HAZARDS.
          II = NC/2
          CALL TRIDDG (NC, A, B, C, D, X, SCA, SCB(1,1), SCB(1,II+1),
      1       SCB(1,2*II+1), SCB(1,3*II+1), A, B, C, D, X, 2*NC, NS, ND)
          RETURN
       END
```

```
      SUBROUTINE TRIDOR (NC, A, B, C, D, X, RB, AINVQ, NS, ND)
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
CD
CD    TRIDOR (NC, A, B, C, D, X, RB, AINVQ, NS, ND)            CLASS.
CD    ORIGINATOR -  J. BORIS                CODE 7706, NRL     JULY 1976
CD
CD    DESCRIPTION: THIS ROUTINE SOLVES IN DOUBLE PRECISION THE SET OF
CD    NS PARALLEL TRIDIAGONAL MATRIX EQUATIONS M*X = D WHICH ARE ALL OF
CD    THE SAME LENGTH.  HERE A(IS,I), B(IS,I) AND C(IS,I) ARE THE ONLY
CD    THREE NON ZERO ELEMENTS OF ROW I IN SET IS. SPECIFICALLY WE SEEK
CD    X(IS,I) IN THE EQUATION
CD
CD    A(IS,I)*X(IS,I-1) + B(IS,I)*X(IS,I) + C(IS,I)*X(IS,I+1) = D(IS,I)
CD
CD    FOR IS = 1, ..., NS AND I = 1, ..., NC. FOR PERIODIC BOUNDARY CON-
CD    DITIONS X(IS,1) = X(IS,NC+1) AND X(IS,0) = X(IS,NC). THE APERIODIC
CD    CASE FOLLOWS FROM SETTING A(IS,1) AND C(IS,NC) TO ZERO. THE SCALAR
CD    ALGORITHM EMPLOYED HERE FOLLOWS FROM SEPARATING M INTO A PURELY
CD    TRIDIAGONAL PART AND A VECTOR Q IN COLUMN NC WITH ONE AT ROW NC.
CD    SINCE NS CASES ARE BEING SOLVED IN PARALLEL, VECTORIZATION ON THE
CD    CASES IS PROVIDED. NOTE THAT ALL ARRAYS OF INPUT COEFFICIENTS AND
CD    DATA MAY HAVE TO BE TRANSPOSED TO ENSURE THAT THE CORRESPONDING
CD    ELEMENTS OF DATA IN THE NS SYSTEMS ARE CONTIGUOUS. ND IS THE INC-
CD    REMENT IN MEMORY TO THE NEXT ELEMENT OF THE SAME SYSTEM.
CD         THIS ROUTINE IS PARTICULARLY EFFICIENT WHEN MANY TRIDIAGONAL
CD    SYSTEMS (NS > 20) HAVE TO BE SOLVED IN PARALLEL. TRIDDS WOULD BE
CD    BETTER FOR ONLY A FEW SHORT SYSTEMS. THE PRIMARY PURPOSE OF TRIDDR
CD    IS TO COMPLETE THE FOLDING CALCULATION IN TRIDOM.
CD
CD    ARGUMENTS: (R ARR(...) IS USED TO DENOTE REAL ARRAY & DIMENSIONS)
CD    NC        INTEGER             # EQNS IN THE TRIDIAGONAL SYSTEM       I
CD    A         R ARR(ND,NC)        COEFFS OF X(IS,I-1) IN I-TH EQN.       I
CD    B         R ARR(ND,NC)        COEFFS OF X(IS,I)   IN I-TH EQN.       I
CD    C         R ARR(ND,NC)        COEFFS OF X(IS,I+1) IN I-TH EQN.       I
CD    D         R ARR(ND,NC)        D(IS,I) = INHOMOGENEOUS PART OF EQ I   I
CD    X         R ARR(ND,NC)        SOLUTION VECTOR SOUGHT                 O
CD    RB        R ARR(ND,NC)        SCRATCH ARRAY FROM CALLING PROGRAM     S
CD    AINVQ     R ARR(ND,NC)        SCRATCH ARRAY FROM CALLING PROGRAM     S
CD    NS        INTEGER             # SETS OF TRIDIAGONAL SYSTEMS          I
CD    ND        INTEGER             DIMENSION OF FIRST INDEX (.GE. NS)     I
CD
CD    LANGUAGE AND LIMITATIONS: THIS ROUTINE IS WRITTEN IN DOUBLE PRE-
CD    CISION FORTRAN FOR THE ASC (64 BITS). DIAGONAL DOMINANCE IS
CD    STRONGLY RECOMMENDED FOR GOOD ERROR CONTROL. AS WRITTEN, NS < 202
CD    IS REQUIRED BECAUSE OF THE PARAMETER NPT BELOW.
CD
CD    TRIDOR HAS NO ADDITIONAL USER ENTRIES AND CALLS NO AUXILIARY SUB-
CD    ROUTINES.
CD
```

```
CD     * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
C
          IMPLICIT REAL*8 (A-H,O-Z)
          PARAMETER  NPT = 202
          DIMENSION  A(ND,NC), B(ND,NC), C(ND,NC), D(ND,NC), X(ND,NC)
          DIMENSION  RB(ND,NC), AINVQ(ND,NC), RCAQ(NPT)
          NM = NC - 1
C
          DO 10 I = 1, NC
          DO 10 IS = 1, NS
          IF (B(IS,I) .NE. 0.0) GO TO 10
          B(IS,I) = 1.0E-70
   10     CONTINUE
C
          DO 12 IS = 1, NS
   12     RB(IS,1) = 1.0D0/B(IS,1)
          DO 15 I = 2, NM
          DO 15 IS = 1, NS
   15     RB(IS,I)=1.D+0/ (B(IS,I) - A(IS,I) * C(IS,I-1) * RB(IS,I-1))
C
C      INVERT TRIDIAGONAL PART ON Q
          DO 17 IS = 1, NS
   17     AINVQ(IS,1) = A(IS,1) * RB(IS,1)
          DO 20 I = 2, NM
          DO 20 IS = 1, NS
   20     AINVQ(IS,I) = - A(IS,I) * AINVQ(IS,I-1) * RB(IS,I)
          DO 25 IS = 1, NS
   25     AINVQ(IS,NM) = AINVQ(IS,NM) + C(IS,NM) * RB(IS,NM)
C
          DO 30 J = 2, NM
          I = NC - J
          DO 30 IS = 1, NS
   30     AINVQ(IS,I) = AINVQ(IS,I) - C(IS,I) * RB(IS,I) * AINVQ(IS,I+1)
          DO 35 IS = 1, NS
   35     RCAQ(IS) = 1.0D0/(B(IS,NC) - C(IS,NC) * AINVQ(IS,1)
     1        - A(IS,NC) * AINVQ(IS,NM))
C
C      END PRECOMPUTATION.  THE FOLLOWING ARE ALL THE CALCS INVOLVING D
          DO 37 IS = 1, NS
   37     X(IS,1) = D(IS,1) * RB(IS,1)
          DO 40 I = 2, NM
          DO 40 IS = 1, NS
   40     X(IS,I) = (D(IS,I) - A(IS,I) * X(IS,I-1)) * RB(IS,I)
C
          DO 50 J = 2, NM
          I = NC - J
          DO 50 IS = 1, NS
   50     X(IS,I) = X(IS,I) - C(IS,I) * RB(IS,I) * X(IS,I+1)
C
          DO 55 IS = 1, NS

   55     X(IS,NC) = (D(IS,NC) - C(IS,NC) * X(IS,1) - A(IS,NC)*X(IS,NM))
     1        * RCAQ(IS)
          DO 60 I = 1, NM
          DO 60 IS = 1, NS
   60     X(IS,I) = X(IS,I) - X(IS,NC) * AINVQ(IS,I)
          RETURN
       END
```

```
      SUBROUTINE TRIDDF (NC, A, B, C, D, X, RB, SCA, SCB, SCC, SCD,
     1         ANEW, BNEW, CNEW, DNEW, XNEW, LENGTH)
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
CD
CD    TRIDDF ( ---------)                                      CLASS.
CD    ORIGINATOR   - J. BORIS              CODE 7706, NRL        JULY 1976
CD    TRIDDF IS AN INTERNALLY USED AUXILIARY ROUTINE TO TRIDDV AND NEED
CD    NOT BE REFERENCED DIRECTLY BY THE USER. TRIDDF IS SEPARATE FROM
CD    TRIDDV SO THAT A & ANEW, B & BNEW, ETC. CAN BE EQUIVALENCED VIA
CD    THE ARGUMENT LISTS.
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
C
C     NOTE THAT LMIN SHOULD EXCEED LMAX.
      IMPLICIT REAL*8 (A-H,O-Z)
      PARAMETER  LMAX = 11, LMIN = 14, LMAXP = LMAX + 1
      DIMENSION  NL(LMAXP), ML(LMAXP), IO(LMAXP), JO(LMAXP)
      DIMENSION  A(LENGTH),B(LENGTH),C(LENGTH), D(LENGTH), X(LENGTH)
      DIMENSION  RB(LENGTH), ANEW(LENGTH), BNEW(LENGTH),CNEW(LENGTH)
      DIMENSION  DNEW(LENGTH), XNEW(LENGTH)
      DIMENSION  SCA(NC), SCB(NC), SCC(NC), SCD(NC)
C
C     FOLD THE BEJESUS OUT OF THE COEFFICIENTS.
      N = NC
      LEVEL = 0
      IO(LEVEL+1) = N
      JO(LEVEL+1) = 0
      DO 500 L = 1, LMAX
      I1 = IO(L)
      J1 = JO(L)
      NL(L) = N
      IF (N .LE. LMIN) GO TO 600
      M = (N+1)/2
      MM = M - 1
      ML(L) = M
      DO 200 II = 1, M
      I = II + I1
      J = 2*II + J1 - 1
      BNEW(I) = B(J)
      DNEW(I) = D(J)
  200 RB(I) = 1.0/B(J+1)
      DO 210 II = 1, MM
      I = II + I1
      J = 2*II + J1
      SCA(II) = A(J+1)*RB(I)
      SCC(II) = C(J-1)*RB(I)
      ANEW(I+1) = A(J)*SCA(II)
      CNEW(I) = C(J)*SCC(II)
      ANEW(I+1) = -ANEW(I+1)
```

```
      CNEW(I) = -CNEW(I)
      SCB(II) = C(J)*SCA(II)
      SCD(II) = D(J)*SCA(II)
      BNEW(I+1) = BNEW(I+1) - SCB(II)
      DNEW(I+1) = DNEW(I+1) - SCD(II)
      SCB(II) = A(J)*SCC(II)
      SCD(II) = D(J)*SCC(II)
      BNEW(I) = BNEW(I) - SCB(II)
  210 DNEW(I) = DNEW(I) - SCD(II)
      CALL BOTCHD (N,M,I1,J1, ANEW, BNEW, CNEW, DNEW, XNEW)
      IF (2*M .NE. N) GO TO 220
      TA = A(J1+1)/B(J1+N)
      TC = C(J1+N-1)/B(J1+N)
      ANEW(I1+1) = - TA*A(J1+N)
      BNEW(I1+1) = BNEW(I1+1) - TA*C(J1+N)
      DNEW(I1+1) = DNEW(I1+1) - TA*D(J1+N)
      BNEW(I1+M) = BNEW(I1+M) - TC*A(J1+N)
      CNEW(I1+M) = -TC*C(J1+N)
      DNEW(I1+M) = DNEW(I1+M) - TC*D(J1+N)
      GO TO 230
  220 ANEW(I1+1) = A(J1+1)
      CNEW(I1+M) = C(J1+N)
  230 CONTINUE
      JO(L+1) = JO(L) + N
      IO(L+1) = IO(L) + M
      N = M
  500 LEVEL = LEVEL + 1
C
C     USE THE SCALAR VERSION FOR SHORTIES.
  600 CALL TRIDDS (N, A(J1+1), B(J1+1), C(J1+1), D(J1+1),
     1     X(J1+1), SCA, SCB)
      IF (LEVEL .EQ. 0) RETURN
C
C     UNFOLD AND THE ANSWER APPEARS MIRACULOUSLY.
      DO 900 LL = 1, LEVEL
      L = LEVEL + 1 - LL
      M = ML(L)
      N = NL(L)
      I1 = IO(L)
      J1 = JO(L)
      DO 800 II = 1, M
      I = II + I1
      J = 2*II + J1 - 1
  800 X(J) = XNEW(I)
      MM = M - 1
      DO 810 II = 1, MM
      I = II + I1
      J = 2*II + J1
      SCA(II) = A(J)*XNEW(J-1)
      SCC(II) = C(J)*XNEW(J+1)
      SCB(II) = D(J) - SCA(II)
      SCD(II) = SCB(II) - SCC(II)
  810 X(J) = SCD(II)*RB(I)
      IF (2*M .EQ. N)
     1     X(J1+N) = (D(J1+N) - A(J1+N)*X(J1+N-1) - C(J1+N)*X(J1+1))
     2               /B(J1+N)
  900 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE TRIDDG (NC, A, B, C, D, X, RB, SCA, SCB, SCC, SCD,
     1         ANEW, BNEW, CNEW, DNEW, XNEW, LENGTH, NS, ND)
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
CD
CD    TRIDDG ( ---------)                                        CLASS.
CD    ORIGINATOR  - J. BORIS                 CODE 7706, NRL     JULY 1976
CD    TRIDDG IS AN INTERNALLY USED AUXILIARY ROUTINE TO TRIDDM AND NEED
CD    NOT BE REFERENCED DIRECTLY BY THE USER. TRIDDG IS SEPARATE FROM
CD    TRIDDM SO THAT A & ANEW, B & BNEW, ETC. CAN BE EQUIVALENCED VIA
CD    THE ARGUMENT LISTS.
CD
CD    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
C
C     NOTE THAT LMIN SHOULD EXCEED LMAX.
      IMPLICIT REAL*8 (A-H,O-Z)
      PARAMETER  LMAX = 10, LMIN = 11, LMAXP = LMAX + 1, NPT = 202
      DIMENSION  NL(LMAXP), ML(LMAXP), IO(LMAXP), JO(LMAXP)
      DIMENSION  A(ND,LENGTH), B(ND,LENGTH), C(ND,LENGTH)
      DIMENSION  D(ND,LENGTH), X(ND,LENGTH), RB(ND,LENGTH)
      DIMENSION  SCA(ND,NC), SCB(ND,NC), SCC(ND,NC), SCD(ND,NC)
      DIMENSION  ANEW(ND,LENGTH), BNEW(ND,LENGTH), CNEW(ND,LENGTH)
      DIMENSION  DNEW(ND,LENGTH), XNEW(ND,LENGTH), TA(NPT), TC(NPT)
C
C     FOLD THE BEJESUS OUT OF THE COEFFICIENTS.
      N = NC
      LEVEL = 0
      IO(LEVEL+1) = N
      JO(LEVEL+1) = 0
      DO 500 L = 1, LMAX
      I1 = IO(L)
      J1 = JO(L)
      NL(L) = N
      IF (N .LE. LMIN) GO TO 600
      M = (N+1)/2
      MM = M - 1
      ML(L) = M
      DO 200 II = 1, M
      I = II + I1
      J = 2*II + J1 - 1
      DO 200 IS = 1, NS
      BNEW(IS,I) = B(IS,J)
      DNEW(IS,I) = D(IS,J)
  200 RB(IS,I) = 1.0/B(IS,J+1)
      DO 210 II = 1, MM
      I = II + I1
      J = 2*II + J1
      DO 210 IS = 1, NS
      SCA(IS,II) = A(IS,J+1)*RB(IS,I)
      SCC(IS,II) = C(IS,J-1)*RB(IS,I)
```

```
          ANEW(IS,I+1) = A(IS,J)*SCA(IS,II)
          CNEW(IS,I) = C(IS,J)*SCC(IS,II)
          ANEW(IS,I+1) = -ANEW(IS,I+1)
          CNEW(IS,I) = -CNEW(IS,I)
          SCB(IS,II) = C(IS,J)*SCA(IS,II)
          SCD(IS,II) = D(IS,J)*SCA(IS,II)
          BNEW(IS,I+1) = BNEW(IS,I+1) - SCB(IS,II)
          DNEW(IS,I+1) = DNEW(IS,I+1) - SCD(IS,II)
          SCB(IS,II) = A(IS,J)*SCC(IS,II)
          SCD(IS,II) = D(IS,J)*SCC(IS,II)
          BNEW(IS,I) = BNEW(IS,I) - SCB(IS,II)
  210     DNEW(IS,I) = DNEW(IS,I) - SCD(IS,II)
          CALL BOTCHD (N,M,I1,J1, ANEW, BNEW, CNEW, DNEW, XNEW)
          IF (2*M .NE. N) GO TO 220
          DO 215 IS  = 1, NS
          TA(IS) = A(IS,J1+1)/B(IS,J1+N)
          TC(IS) = C(IS,J1+N-1)/B(IS,J1+N)
          ANEW(IS,I1+1) = - TA(IS)*A(IS,J1+N)
          BNEW(IS,I1+1) = BNEW(IS,I1+1) - TA(IS)*C(IS,J1+N)
          DNEW(IS,I1+1) = DNEW(IS,I1+1) - TA(IS)*D(IS,J1+N)
          BNEW(IS,I1+M) = BNEW(IS,I1+M) - TC(IS)*A(IS,J1+N)
          CNEW(IS,I1+M) = -TC(IS)*C(IS,J1+N)
  215     DNEW(IS,I1+M) = DNEW(IS,I1+M) - TC(IS)*D(IS,J1+N)
          GO TO 230
  220     CONTINUE
          DO 225 IS = 1, NS
          ANEW(IS,I1+1) = A(IS,J1+1)
  225     CNEW(IS,I1+M) = C(IS,J1+N)
  230     CONTINUE
          JO(L+1) = JO(L) + N
          IO(L+1) = IO(L) + M
          N = M
  500     LEVEL = LEVEL + 1
C
C      USE THE SCALAR REPEAT VERSION FOR SHORTIES.
  600     CALL TRIDDR (N, A(1,J1+1), B(1,J1+1), C(1,J1+1), D(1,J1+1),
     1        X(1,J1+1), SCA, SCB, NS, ND)
          IF (LEVEL .EQ. 0) RETURN
C
C      UNFOLD AND THE ANSWER APPEARS MIRACULOUSLY.
          DO 900 LL = 1, LEVEL
          L = LEVEL + 1 - LL
          M = ML(L)
          N = NL(L)
          I1 = IO(L)
          J1 = JO(L)
          DO 800 II = 1, M
          I = II + I1
          J = 2*II + J1 - 1
          DO 800 IS = 1, NS
```

```
800     X(IS,J) = XNEW(IS,I)
        MM = M - 1
        DO 810 II = 1, MM
        I = II + I1
        J = 2*II + J1
        DO 810 IS = 1, NS
        SCA(IS,II) = A(IS,J)*XNEW(IS,J-1)
        SCC(IS,II) = C(IS,J)*XNEW(IS,J+1)
        SCB(IS,II) = D(IS,J) - SCA(IS,II)
        SCD(IS,II) = SCB(IS,II) - SCC(IS,II)
810     X(IS,J) = SCD(IS,II)*RB(IS,I)
        IF (2*M .NE. N)  GO TO 900
        DO 820 IS = 1, NS
        TA(IS) = A(IS,J1+N)*X(IS,J1+N-1)
        TC(IS) = C(IS,J1+N)*X(IS,J1+1)
        X(IS,J1+N) = D(IS,J1+N) - TA(IS)
        X(IS,J1+N) = X(IS,J1+N) - TC(IS)
820     X(IS,J1+N) = X(IS,J1+N)/B(IS,J1+N)
900     CONTINUE
        RETURN
    END
```

Appendix B
Test Program for Double Precision Solvers
Including Both Single and Double Precision Results

Because the single and double precision test programs submitted to SPL are essentially identical, only the double precision driver is included. The results from both single and double precision tests are included for comparison, however. The timing routine SECOND (from / ASG UTIL, •••) is used to time the various test executions.

```
/ ASG PPDLIB, USERCAT/D77/850/CODYJ1/PPDLIB,USE=SHR
/ ASG UTIL,USERCAT/CC010948/TMS/UTILITY/OBJECT,USE=SHR
/ FTN FTNOPT=(K,M,Y,V,D,U),IN=SYS.FIN,FTNTIME=30000
C     PROGRAM TO TEST THE THREE TRIDIAGONAL SOLVERS        SPL 1976
           IMPLICIT REAL*8 (A-H, O-Z)
           PARAMETER  NPT = 100, NX = 50, NS = 50, ND = 50
           DIMENSION  X(NPT), XHOLD(NPT), A(NPT), B(NPT), C(NPT), D(NPT)
           DIMENSION  SCA(NPT), SCB(NPT)
           DIMENSION  AM(ND,NPT), BM(ND,NPT), CM(ND,NPT), DM(ND,NPT)
           DIMENSION  XM(ND,NPT), SCAM(ND,NPT), SCBM(ND,NPT)
 1000      FORMAT ('1      NEW TEST CASE  ', I2, ' OF PERIODIC TRIDDS', /)
 1001      FORMAT (5X, I3, 1P6D12.4)
 1002      FORMAT ('1      NEW TEST CASE  ', I2, ' OF APERIODIC TRIDDS',/)
 1003      FORMAT ('1      NEW TEST CASE  ', I2, ' OF PERIODIC TRIDDV', /)
 1004      FORMAT ('1      NEW TEST CASE  ', I2, ' OF APERIODIC TRIDDV',/)
 1005      FORMAT (5X, ' I      A(I)        B(I)         C(I)        D(I)',
     1       '       XHOLD(I)      DELTA(I)    ', /)
 1006      FORMAT ('1      NEW TEST CASE  ', I2, ' OF PERIODIC TRIDDM', /)
 1007      FORMAT ('1      NEW TEST CASE  ', I2, ' OF APERIODIC TRIDDM',/)
C
           CALL INDUMP
           NCASE = 1
           NXM = NX - 1
           TWOPI = 4.0D0*DATAN(1.0D0)
C
C     START THE LOOP OVER TEST CASES.
           DO 500 ICASE = 1, NCASE
           AS = DFLOAT(ICASE)*TWOPI/DFLOAT(NX)
           AE = DFLOAT(ICASE)/DFLOAT(NX)
C
C     SET UP THE INITIAL CONDITIONS FOR SINGLE AND MULTIPLE CASES.
           DO 50 I = 1, NX
           XHOLD(I) = DSIN(DFLOAT(I)*AS)*DEXP(DFLOAT(I)*AE)
           A(I) = 0.5D0*(1.0D0 - DSIN(DFLOAT(I)*AS))
           C(I) = DEXP(-DFLOAT(I)*AE)
   50      B(I) = 4.0 - A(I) - C(I)
           DO 55 I = 2, NXM
   55      D(I) = A(I)*XHOLD(I-1) + B(I)*XHOLD(I) + C(I)*XHOLD(I+1)
           D(1) = A(1)*XHOLD(NX) + B(1)*XHOLD(1) + C(1)*XHOLD(2)
           D(NX) = A(NX)*XHOLD(NXM) + B(NX)*XHOLD(NX) + C(NX)*XHOLD(1)
```

```
      DO 60 I = 1, NX
      DO 60 IS = 1, NS
      AM(IS,I) = A(I)
      BM(IS,I) = B(I)
      CM(IS,I) = C(I)
   60 DM(IS,I) = D(I)
C
C     CALL THE TRIDIAGONAL SOLVERS AND PRINT THE RESULTS.
      WRITE (6, 1000) ICASE
      CALL SECOND (1, DTIME)
      CALL TRIDDS (NX, A, B, C, D, X, SCA, SCB)
      CALL SECOND (0, DTIME)
      PRINT 1984, DTIME
      WRITE (6, 1005)
      DO 65 I = 1, NX
   65 X(I) = X(I) - XHOLD(I)
      WRITE (6, 1001) (I, A(I), B(I), C(I), D(I), XHOLD(I), X(I),
     1      I = 1, NX)
      WRITE (6, 1003) ICASE
      CALL SECOND (1, DTIME)
      CALL TRIDDV (NX, A, B, C, D, X, SCA, SCB)
      CALL SECOND (0, DTIME)
      PRINT 1984, DTIME
      WRITE (6, 1005)
 1984 FORMAT (10X,'TOTAL DTIME = ',D20.5,' SECONDS'/)
      DO 70 I = 1, NX
   70 X(I) = X(I) - XHOLD(I)
      WRITE (6, 1001) (I, A(I), B(I), C(I), D(I), XHOLD(I), X(I),
     1      I = 1, NX)
      WRITE (6, 1006) ICASE
      CALL SECOND (1, DTIME)
      CALL TRIDDM (NX, AM, BM, CM, DM, XM, SCAM, SCBM, NS, ND)
      CALL SECOND (0, DTIME)
      PRINT 1984, DTIME
      WRITE (6, 1005)
      DO 75 I = 1, NX
   75 XM(1,I) = XM(1,I) - XHOLD(I)
      WRITE (6, 1001) (I, AM(1,I), BM(1,I), CM(1,I), DM(1,I),
     1      XHOLD(I), XM(1,I), I = 1, NX)
C
C     FOR THE APERIODIC CASE.
      A(1) = 0.0
      C(NX) = 0.0
      DO 80 I = 2, NXM
   80 D(I) = A(I)*XHOLD(I-1) + B(I)*XHOLD(I) + C(I)*XHOLD(I+1)
      D(1) = A(1)*XHOLD(NX) + B(1)*XHOLD(1) + C(1)*XHOLD(2)
      D(NX) = A(NX)*XHOLD(NXM) + B(NX)*XHOLD(NX) + C(NX)*XHOLD(1)
      DO 85 I = 1, NX
      DO 85 IS = 1, NS
      AM(IS,I) = A(I)
```

```
      CM(IS,I) = C(I)
85    DM(IS,I) = D(I)
C
C     CALL THE TRIDIAGONAL SOLVERS AND PRINT THE RESULTS.
      WRITE (6, 1002) ICASE
      WRITE (6, 1005)
      CALL TRIDOS (NX, A, B, C, D, X, SCA, SCB)
      DO 90 I = 1, NX
90    X(I) = X(I) - XHOLD(I)
      WRITE (6, 1001) (I, A(I), B(I), C(I), D(I), XHOLD(I), X(I),
     1     I = 1, NX)
      WRITE (6, 1004) ICASE
      WRITE (6, 1005)
      CALL TRIDDV (NX, A, B, C, D, X, SCA, SCB)
      DO 95 I = 1, NX
95    X(I) = X(I) - XHOLD(I)
      WRITE (6, 1001) (I, A(I), B(I), C(I), D(I), XHOLD(I), X(I),
     1     I = 1, NX)
      WRITE (6, 1007) ICASE
      CALL SECOND (1, DTIME)
      CALL TRIDDM (NX, AM, BM, CM, DM, XM, SCAM, SCBM, NS, ND)
      CALL SECOND (0, DTIME)
      PRINT 1984, DTIME
      WRITE (6, 1005)
      DO 100 I = 1, NX
100   XM(1,I) = XM(1,I) - XHOLD(I)
      WRITE (6, 1001) (I, AM(1,I), BM(1,I), CM(1,I), DM(1,I),
     1     XHOLD(I), XM(1,I), I = 1, NX)
500   CONTINUE
C
      STOP
      END
```

NEW TEST CASE 1 OF PERIODIC TRIDDS

TOTAL DTIME = 0.10963D-02 SECONDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	4.6860D-01	2.5512D 00	9.8020D-01	2.9129D-01	6.4059D-02	-2.7756D-17
2	4.3733D-01	2.6019D 00	9.6079D-01	5.5859D-01	1.3045D-01	-2.7756D-17
3	4.0631D-01	2.6519D 00	9.4176D-01	8.3437D-01	1.9897D-01	4.1633D-17
4	3.7566D-01	2.7012D 00	9.2312D-01	1.1177D 00	2.6940D-01	-4.1633D-17
5	3.4549D-01	2.7497D 00	9.0484D-01	1.4077D 00	3.4152D-01	-1.2490D-16
6	3.1594D-01	2.7971D 00	8.8692D-01	1.7033D 00	4.1506D-01	-2.7756D-17
7	2.8711D-01	2.8435D 00	8.6936D-01	2.0033D 00	4.8976D-01	-8.3267D-17
8	2.5912D-01	2.8887D 00	8.5214D-01	2.3067D 00	5.6534D-01	-9.7145D-17
9	2.3209D-01	2.9326D 00	8.3527D-01	2.6122D 00	6.4150D-01	-1.2490D-16
10	2.0611D-01	2.9752D 00	8.1873D-01	2.9185D 00	7.1792D-01	-6.9389D-17
11	1.8129D-01	3.0162D 00	8.0252D-01	3.2242D 00	7.9428D-01	-2.0817D-16
12	1.5773D-01	3.0556D 00	7.8663D-01	3.5281D 00	8.7023D-01	-1.3878D-16
13	1.3552D-01	3.0934D 00	7.7105D-01	3.8286D 00	9.4542D-01	-1.6653D-16
14	1.1474D-01	3.1295D 00	7.5578D-01	4.1243D 00	1.0195D 00	-4.4409D-16
15	9.5492D-02	3.1637D 00	7.4082D-01	4.4137D 00	1.0921D 00	-2.2204D-16
16	7.7836D-02	3.1960D 00	7.2615D-01	4.6952D 00	1.1627D 00	-2.2204D-16
17	6.1847D-02	3.2264D 00	7.1177D-01	4.9672D 00	1.2312D 00	-2.2204D-16
18	4.7586D-02	3.2547D 00	6.9768D-01	5.2283D 00	1.2969D 00	-2.2204D-16
19	3.5112D-02	3.2810D 00	6.8386D-01	5.4767D 00	1.3596D 00	-2.2204D-16
20	2.4472D-02	3.3052D 00	6.7032D-01	5.7109D 00	1.4188D 00	-2.2204D-16
21	1.5708D-02	3.3272D 00	6.5705D-01	5.9293D 00	1.4741D 00	0.0000D 00
22	8.8564D-03	3.3471D 00	6.4404D-01	6.1302D 00	1.5252D 00	-2.2204D-16
23	3.9426D-03	3.3648D 00	6.3128D-01	6.3122D 00	1.5716D 00	-2.2204D-16
24	9.8664D-04	3.3802D 00	6.1878D-01	6.4737D 00	1.6129D 00	-2.2204D-16
25	0.0000D 00	3.3935D 00	6.0653D-01	6.6131D 00	1.6487D 00	-2.2204D-16
26	9.8664D-04	3.4045D 00	5.9452D-01	6.7289D 00	1.6787D 00	-2.2204D-16
27	3.9426D-03	3.4133D 00	5.8275D-01	6.8198D 00	1.7025D 00	0.0000D 00
28	8.8564D-03	3.4199D 00	5.7121D-01	6.8844D 00	1.7197D 00	-2.2204D-16
29	1.5708D-02	3.4244D 00	5.5990D-01	6.9212D 00	1.7299D 00	-2.2204D-16
30	2.4472D-02	3.4267D 00	5.4881D-01	6.9292D 00	1.7329D 00	-2.2204D-16
31	3.5112D-02	3.4269D 00	5.3794D-01	6.9070D 00	1.7284D 00	0.0000D 00
32	4.7586D-02	3.4251D 00	5.2729D-01	6.8537D 00	1.7160D 00	-4.4409D-16
33	6.1847D-02	3.4213D 00	5.1685D-01	6.7682D 00	1.6955D 00	-2.2204D-16
34	7.7836D-02	3.4155D 00	5.0662D-01	6.6497D 00	1.6666D 00	-2.2204D-16
35	9.5492D-02	3.4079D 00	4.9659D-01	6.4973D 00	1.6292D 00	-2.2204D-16
36	1.1474D-01	3.3985D 00	4.8675D-01	6.3104D 00	1.5830D 00	-2.2204D-16
37	1.3552D-01	3.3874D 00	4.7711D-01	6.0884D 00	1.5279D 00	-2.2204D-16
38	1.5773D-01	3.3746D 00	4.6767D-01	5.8309D 00	1.4638D 00	-2.2204D-16
39	1.8129D-01	3.3603D 00	4.5841D-01	5.5376D 00	1.3905D 00	-2.2204D-16
40	2.0611D-01	3.3446D 00	4.4933D-01	5.2084D 00	1.3081D 00	-2.2204D-16
41	2.3209D-01	3.3275D 00	4.4043D-01	4.8433D 00	1.2166D 00	-2.2204D-16
42	2.5912D-01	3.3092D 00	4.3171D-01	4.4424D 00	1.1159D 00	-2.2204D-16
43	2.8711D-01	3.2897D 00	4.2316D-01	4.0060D 00	1.0062D 00	-2.2204D-16
44	3.1594D-01	3.2693D 00	4.1478D-01	3.5347D 00	8.8751D-01	-5.5511D-17
45	3.4549D-01	3.2479D 00	4.0657D-01	3.0290D 00	7.6006D-01	-9.7145D-17
46	3.7566D-01	3.2258D 00	3.9852D-01	2.4897D 00	6.2404D-01	-8.3267D-17
47	4.0631D-01	3.2031D 00	3.9063D-01	1.9179D 00	4.7969D-01	-4.1633D-17
48	4.3733D-01	3.1798D 00	3.8289D-01	1.3147D 00	3.2733D-01	-1.6653D-16
49	4.6860D-01	3.1561D 00	3.7531D-01	6.8141D-01	1.6730D-01	1.3878D-17
50	5.0000D-01	3.1321D 00	3.6788D-01	1.0722D-01	1.4222D-15	-1.5203D-18

NEW TEST CASE 1 OF PERIODIC TRIDOV

TOTAL DTIME = 0.79968D-03 SECONDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	4.6860D-01	2.5512D 00	9.8020D-01	2.9129D-01	6.4059D-02	0.0000D 00
2	4.3733D-01	2.6019D 00	9.6079D-01	5.5859D-01	1.3045D-01	-1.3878D-17
3	4.0631D-01	2.6519D 00	9.4176D-01	8.3437D-01	1.9897D-01	1.3878D-17
4	3.7566D-01	2.7012D 00	9.2312D-01	1.1177D 00	2.6940D-01	-8.3267D-17
5	3.4549D-01	2.7497D 00	9.0484D-01	1.4077D 00	3.4152D-01	-8.3267D-17
6	3.1594D-01	2.7971D 00	8.8692D-01	1.7033D 00	4.1506D-01	-9.7145D-17
7	2.8711D-01	2.8435D 00	8.6936D-01	2.0033D 00	4.8976D-01	-2.2204D-16
8	2.5912D-01	2.8887D 00	8.5214D-01	2.3067D 00	5.6534D-01	-1.5266D-16
9	2.3209D-01	2.9326D 00	8.3527D-01	2.6122D 00	6.4150D-01	-2.3592D-16
10	2.0611D-01	2.9752D 00	8.1873D-01	2.9185D 00	7.1792D-01	-6.9389D-17
11	1.8129D-01	3.0162D 00	8.0252D-01	3.2242D 00	7.9428D-01	-2.6368D-16
12	1.5773D-01	3.0556D 00	7.8663D-01	3.5281D 00	8.7023D-01	-1.2490D-16
13	1.3552D-01	3.0934D 00	7.7105D-01	3.8286D 00	9.4542D-01	8.3267D-17
14	1.1474D-01	3.1295D 00	7.5578D-01	4.1243D 00	1.0195D 00	-2.2204D-16
15	9.5492D-02	3.1637D 00	7.4082D-01	4.4137D 00	1.0921D 00	-2.2204D-16
16	7.7836D-02	3.1960D 00	7.2615D-01	4.6952D 00	1.1627D 00	-2.2204D-16
17	6.1847D-02	3.2264D 00	7.1177D-01	4.9672D 00	1.2312D 00	-4.4409D-16
18	4.7586D-02	3.2547D 00	6.9768D-01	5.2283D 00	1.2969D 00	-2.2204D-16
19	3.5112D-02	3.2810D 00	6.8386D-01	5.4767D 00	1.3596D 00	0.0000D 00
20	2.4472D-02	3.3052D 00	6.7032D-01	5.7109D 00	1.4188D 00	-2.2204D-16
21	1.5708D-02	3.3272D 00	6.5705D-01	5.9293D 00	1.4741D 00	-2.2204D-16
22	8.8564D-03	3.3471D 00	6.4404D-01	6.1302D 00	1.5252D 00	-2.2204D-16
23	3.9426D-03	3.3648D 00	6.3128D-01	6.3122D 00	1.5716D 00	-2.2204D-16
24	9.8664D-04	3.3802D 00	6.1878D-01	6.4737D 00	1.6129D 00	-2.2204D-16
25	0.0000D 00	3.3935D 00	6.0653D-01	6.6131D 00	1.6487D 00	-2.2204D-16
26	9.8664D-04	3.4045D 00	5.9452D-01	6.7289D 00	1.6787D 00	-2.2204D-16
27	3.9426D-03	3.4133D 00	5.8275D-01	6.8198D 00	1.7025D 00	-2.2204D-16
28	8.8564D-03	3.4199D 00	5.7121D-01	6.8844D 00	1.7197D 00	-2.2204D-16
29	1.5708D-02	3.4244D 00	5.5990D-01	6.9212D 00	1.7299D 00	-2.2204D-16
30	2.4472D-02	3.4267D 00	5.4881D-01	6.9292D 00	1.7329D 00	-2.2204D-16
31	3.5112D-02	3.4269D 00	5.3794D-01	6.9070D 00	1.7284D 00	-2.2204D-16
32	4.7586D-02	3.4251D 00	5.2729D-01	6.8537D 00	1.7160D 00	-2.2204D-16
33	6.1847D-02	3.4213D 00	5.1685D-01	6.7682D 00	1.6955D 00	-4.4409D-16
34	7.7836D-02	3.4155D 00	5.0662D-01	6.6497D 00	1.6666D 00	-2.2204D-16
35	9.5492D-02	3.4079D 00	4.9659D-01	6.4973D 00	1.6292D 00	-2.2204D-16
36	1.1474D-01	3.3985D 00	4.8675D-01	6.3104D 00	1.5830D 00	-2.2204D-16
37	1.3552D-01	3.3874D 00	4.7711D-01	6.0884D 00	1.5279D 00	-4.4409D-16
38	1.5773D-01	3.3746D 00	4.6767D-01	5.8309D 00	1.4638D 00	-2.2204D-16
39	1.8129D-01	3.3603D 00	4.5841D-01	5.5376D 00	1.3905D 00	-2.2204D-16
40	2.0611D-01	3.3446D 00	4.4933D-01	5.2084D 00	1.3081D 00	-2.2204D-16
41	2.3209D-01	3.3275D 00	4.4043D-01	4.8433D 00	1.2166D 00	-2.2204D-16
42	2.5912D-01	3.3092D 00	4.3171D-01	4.4424D 00	1.1159D 00	-2.2204D-16
43	2.8711D-01	3.2897D 00	4.2316D-01	4.0060D 00	1.0062D 00	-2.2204D-16
44	3.1594D-01	3.2693D 00	4.1478D-01	3.5347D 00	8.8751D-01	-1.5266D-16
45	3.4549D-01	3.2479D 00	4.0657D-01	3.0290D 00	7.6006D-01	-2.0817D-16
46	3.7566D-01	3.2258D 00	3.9852D-01	2.4897D 00	6.2404D-01	-9.7145D-17
47	4.0631D-01	3.2031D 00	3.9063D-01	1.9179D 00	4.7969D-01	-1.8041D-16
48	4.3733D-01	3.1798D 00	3.8289D-01	1.3147D 00	3.2733D-01	-1.9429D-16
49	4.6860D-01	3.1561D 00	3.7531D-01	6.8141D-01	1.6730D-01	1.3878D-17
50	5.0000D-01	3.1321D 00	3.6788D-01	1.0722D-01	1.4222D-15	1.3414D-19

NEW TEST CASE 1 OF PERIODIC TRIDDM

TOTAL DTIME = 0.15463D-01 SECONDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	4.6860D-01	2.5512D 00	9.8020D-01	2.9129D-01	6.4059D-02	0.0000D 00
2	4.3733D-01	2.6019D 00	9.6079D-01	5.5859D-01	1.3045D-01	-1.3878D-17
3	4.0631D-01	2.6519D 00	9.4176D-01	8.3437D-01	1.9897D-01	1.3878D-17
4	3.7566D-01	2.7012D 00	9.2312D-01	1.1177D 00	2.6940D-01	-6.9389D-17
5	3.4549D-01	2.7497D 00	9.0484D-01	1.4077D 00	3.4152D-01	-9.7145D-17
6	3.1594D-01	2.7971D 00	8.8692D-01	1.7033D 00	4.1506D-01	-9.7145D-17
7	2.8711D-01	2.8435D 00	8.6936D-01	2.0033D 00	4.8976D-01	-2.2204D-16
8	2.5912D-01	2.8887D 00	8.5214D-01	2.3067D 00	5.6534D-01	-1.5266D-16
9	2.3209D-01	2.9326D 00	8.3527D-01	2.6122D 00	6.4150D-01	-2.7756D-16
10	2.0611D-01	2.9752D 00	8.1873D-01	2.9185D 00	7.1792D-01	-6.9389D-17
11	1.8129D-01	3.0162D 00	8.0252D-01	3.2242D 00	7.9428D-01	-2.6368D-16
12	1.5773D-01	3.0556D 00	7.8663D-01	3.5281D 00	8.7023D-01	-1.2490D-16
13	1.3552D-01	3.0934D 00	7.7105D-01	3.8286D 00	9.4542D-01	6.9389D-17
14	1.1474D-01	3.1295D 00	7.5578D-01	4.1243D 00	1.0195D 00	-2.2204D-16
15	9.5492D-02	3.1637D 00	7.4082D-01	4.4137D 00	1.0921D 00	-2.2204D-16
16	7.7836D-02	3.1960D 00	7.2615D-01	4.6952D 00	1.1627D 00	-2.2204D-16
17	6.1847D-02	3.2264D 00	7.1177D-01	4.9672D 00	1.2312D 00	-2.2204D-16
18	4.7586D-02	3.2547D 00	6.9768D-01	5.2283D 00	1.2969D 00	-2.2204D-16
19	3.5112D-02	3.2810D 00	6.8386D-01	5.4767D 00	1.3596D 00	0.0000D 00
20	2.4472D-02	3.3052D 00	6.7032D-01	5.7109D 00	1.4188D 00	-2.2204D-16
21	1.5708D-02	3.3272D 00	6.5705D-01	5.9293D 00	1.4741D 00	-2.2204D-16
22	8.8564D-03	3.3471D 00	6.4404D-01	6.1302D 00	1.5252D 00	-2.2204D-16
23	3.9426D-03	3.3648D 00	6.3128D-01	6.3122D 00	1.5716D 00	-2.2204D-16
24	9.8664D-04	3.3802D 00	6.1878D-01	6.4737D 00	1.6129D 00	-2.2204D-16
25	0.0000D 00	3.3935D 00	6.0653D-01	6.6131D 00	1.6487D 00	0.0000D 00
26	9.8664D-04	3.4045D 00	5.9452D-01	6.7289D 00	1.6787D 00	-2.2204D-16
27	3.9426D-03	3.4133D 00	5.8275D-01	6.8198D 00	1.7025D 00	-2.2204D-16
28	8.8564D-03	3.4199D 00	5.7121D-01	6.8844D 00	1.7197D 00	-2.2204D-16
29	1.5708D-02	3.4244D 00	5.5990D-01	6.9212D 00	1.7299D 00	0.0000D 00
30	2.4472D-02	3.4267D 00	5.4881D-01	6.9292D 00	1.7329D 00	-2.2204D-16
31	3.5112D-02	3.4269D 00	5.3794D-01	6.9070D 00	1.7284D 00	-2.2204D-16
32	4.7586D-02	3.4251D 00	5.2729D-01	6.8537D 00	1.7160D 00	-2.2204D-16
33	6.1847D-02	3.4213D 00	5.1685D-01	6.7682D 00	1.6955D 00	-4.4409D-16
34	7.7836D-02	3.4155D 00	5.0662D-01	6.6497D 00	1.6666D 00	-2.2204D-16
35	9.5492D-02	3.4079D 00	4.9659D-01	6.4973D 00	1.6292D 00	-2.2204D-16
36	1.1474D-01	3.3985D 00	4.8675D-01	6.3104D 00	1.5830D 00	-2.2204D-16
37	1.3552D-01	3.3874D 00	4.7711D-01	6.0884D 00	1.5279D 00	-2.2204D-16
38	1.5773D-01	3.3746D 00	4.6767D-01	5.8309D 00	1.4638D 00	-2.2204D-16
39	1.8129D-01	3.3603D 00	4.5841D-01	5.5376D 00	1.3905D 00	-2.2204D-16
40	2.0611D-01	3.3446D 00	4.4933D-01	5.2084D 00	1.3081D 00	-2.2204D-16
41	2.3209D-01	3.3275D 00	4.4043D-01	4.8433D 00	1.2166D 00	-2.2204D-16
42	2.5912D-01	3.3092D 00	4.3171D-01	4.4424D 00	1.1159D 00	-2.2204D-16
43	2.8711D-01	3.2897D 00	4.2316D-01	4.0060D 00	1.0062D 00	-2.2204D-16
44	3.1594D-01	3.2693D 00	4.1478D-01	3.5347D 00	8.8751D-01	-8.3267D-17
45	3.4549D-01	3.2479D 00	4.0657D-01	3.0290D 00	7.6006D-01	-2.2204D-16
46	3.7566D-01	3.2258D 00	3.9852D-01	2.4897D 00	6.2404D-01	-9.7145D-17
47	4.0631D-01	3.2031D 00	3.9063D-01	1.9179D 00	4.7969D-01	-1.8041D-16
48	4.3733D-01	3.1798D 00	3.8289D-01	1.3147D 00	3.2733D-01	-1.9429D-16
49	4.6860D-01	3.1561D 00	3.7531D-01	6.8141D-01	1.6730D-01	1.3878D-17
50	5.0000D-01	3.1321D 00	3.6788D-01	1.0722D-01	1.4222D-15	-6.9663D-19

NEW TEST CASE 1 OF APERIODIC TRIDDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	0.0000D 00	2,5512D 00	9,8020D-01	2.9129D-01	6.4059D-02	-1,3878D-17
2	4.3733D-01	2.6019D 00	9,6079D-01	5,5859D-01	1.3045D-01	-2,7756D-17
3	4.0631D-01	2.6519D 00	9,4176D-01	8,3437D-01	1,9897D-01	5,5511D-17
4	3,7566D-01	2,7012D 00	9,2312D-01	1,1177D 00	2,6940D-01	-4,1633D-17
5	3,4549D-01	2,7497D 00	9,0484D-01	1,4077D 00	3,4152D-01	-1,2490D-16
6	3,1594D-01	2,7971D 00	8,8692D-01	1,7033D 00	4,1506D-01	-2,7756D-17
7	2,8711D-01	2,8435D 00	8,6936D-01	2,0033D 00	4,8976D-01	-8,3267D-17
8	2,5912D-01	2,8887D 00	8,5214D-01	2,3067D 00	5,6534D-01	-9,7145D-17
9	2,3209D-01	2,9326D 00	8,3527D-01	2,6122D 00	6,4150D-01	-1,2490D-16
10	2,0611D-01	2,9752D 00	8,1873D-01	2,9185D 00	7,1792D-01	-6,9389D-17
11	1,8129D-01	3,0162D 00	8,0252D-01	3,2242D 00	7,9428D-01	-2,0817D-16
12	1,5773D-01	3,0556D 00	7,8663D-01	3,5281D 00	8,7023D-01	-1,3878D-16
13	1,3552D-01	3,0934D 00	7,7105D-01	3,8286D 00	9,4542D-01	-1,6653D-16
14	1,1474D-01	3,1295D 00	7,5578D-01	4,1243D 00	1,0195D 00	-4,4409D-16
15	9,5492D-02	3,1637D 00	7,4082D-01	4,4137D 00	1,0921D 00	-2,2204D-16
16	7,7836D-02	3,1960D 00	7,2615D-01	4,6952D 00	1,1627D 00	-2,2204D-16
17	6,1847D-02	3,2264D 00	7,1177D-01	4,9672D 00	1,2312D 00	-2,2204D-16
18	4,7586D-02	3,2547D 00	6,9768D-01	5,2283D 00	1,2969D 00	-2,2204D-16
19	3,5112D-02	3,2810D 00	6,8386D-01	5,4767D 00	1,3596D 00	-2,2204D-16
20	2,4472D-02	3,3052D 00	6,7032D-01	5,7109D 00	1,4188D 00	-2,2204D-16
21	1,5708D-02	3,3272D 00	6,5705D-01	5,9293D 00	1,4741D 00	0,0000D 00
22	8,8564D-03	3,3471D 00	6,4404D-01	6,1302D 00	1,5252D 00	-2,2204D-16
23	3,9426D-03	3,3648D 00	6,3128D-01	6,3122D 00	1,5716D 00	-2,2204D-16
24	9,8664D-04	3,3802D 00	6,1878D-01	6,4737D 00	1,6129D 00	-2,2204D-16
25	0,0000D 00	3,3935D 00	6,0653D-01	6,6131D 00	1,6487D 00	-2,2204D-16
26	9,8664D-04	3,4045D 00	5,9452D-01	6,7289D 00	1,6787D 00	-2,2204D-16
27	3,9426D-03	3,4133D 00	5,8275D-01	6,8198D 00	1,7025D 00	0,0000D 00
28	8,8564D-03	3,4199D 00	5,7121D-01	6,8844D 00	1,7197D 00	-2,2204D-16
29	1,5708D-02	3,4244D 00	5,5990D-01	6,9212D 00	1,7299D 00	-2,2204D-16
30	2,4472D-02	3,4267D 00	5,4881D-01	6,9292D 00	1,7329D 00	-2,2204D-16
31	3,5112D-02	3,4269D 00	5,3794D-01	6,9070D 00	1,7284D 00	0,0000D 00
32	4,7586D-02	3,4251D 00	5,2729D-01	6,8537D 00	1,7160D 00	-4,4409D-16
33	6,1847D-02	3,4213D 00	5,1685D-01	6,7682D 00	1,6955D 00	-2,2204D-16
34	7,7836D-02	3,4155D 00	5,0662D-01	6,6497D 00	1,6666D 00	-2,2204D-16
35	9,5492D-02	3,4079D 00	4,9659D-01	6,4973D 00	1,6292D 00	-2,2204D-16
36	1,1474D-01	3,3985D 00	4,8675D-01	6,3104D 00	1,5830D 00	-2,2204D-16
37	1,3552D-01	3,3874D 00	4,7711D-01	6,0884D 00	1,5279D 00	-2,2204D-16
38	1,5773D-01	3,3746D 00	4,6767D-01	5,8309D 00	1,4638D 00	-2,2204D-16
39	1,8129D-01	3,3603D 00	4,5841D-01	5,5376D 00	1,3905D 00	-2,2204D-16
40	2,0611D-01	3,3446D 00	4,4933D-01	5,2084D 00	1,3081D 00	-2,2204D-16
41	2,3209D-01	3,3275D 00	4,4043D-01	4,8433D 00	1,2166D 00	-2,2204D-16
42	2,5912D-01	3,3092D 00	4,3171D-01	4,4424D 00	1.1159D 00	-2,2204D-16
43	2,8711D-01	3,2897D 00	4,2316D-01	4,0060D 00	1,0062D 00	-2,2204D-16
44	3,1594D-01	3,2693D 00	4,1478D-01	3,5347D 00	8,8751D-01	-5,5511D-17
45	3,4549D-01	3,2479D 00	4,0657D-01	3,0290D 00	7,6006D-01	-9,7145D-17
46	3,7566D-01	3,2258D 00	3,9852D-01	2,4897D 00	6,2404D-01	-8,3267D-17
47	4,0631D-01	3,2031D 00	3,9063D-01	1,9179D 00	4,7969D-01	-4,1633D-17
48	4,3733D-01	3,1798D 00	3,8289D-01	1,3147D 00	3,2733D-01	-1,6653D-16
49	4,6860D-01	3,1561D 00	3,7531D-01	6,8141D-01	1,6730D-01	1,3878D-17
50	5,0000D-01	3,1321D 00	0,0000D 00	8,3651D-02	1,4222D-15	-7,9689D-18

NEW TEST CASE 1 OF APERIODIC TRIDDV

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	0,0000D 00	2,5512D 00	9,8020D-01	2,9129D-01	6,4059D-02	0,0000D 00
2	4,3733D-01	2,6019D 00	9,6079D-01	5,5859D-01	1,3045D-01	-1,3878D-17
3	4,0631D-01	2,6519D 00	9,4176D-01	8,3437D-01	1,9897D-01	1,3878D-17
4	3,7566D-01	2,7012D 00	9,2312D-01	1,1177D 00	2,6940D-01	-8,3267D-17
5	3,4549D-01	2,7497D 00	9,0484D-01	1,4077D 00	3,4152D-01	-6,9389D-17
6	3,1594D-01	2,7971D 00	8,8692D-01	1,7033D 00	4,1506D-01	-9,7145D-17
7	2,8711D-01	2,8435D 00	8,6936D-01	2,0033D 00	4,8976D-01	-2,2204D-16
8	2,5912D-01	2,8887D 00	8,5214D-01	2,3067D 00	5,6534D-01	-1,5266D-16
9	2,3209D-01	2,9326D 00	8,3527D-01	2,6122D 00	6,4150D-01	-2,3592D-16
10	2,0611D-01	2,9752D 00	8,1873D-01	2,9185D 00	7,1792D-01	-6,9389D-17
11	1,8129D-01	3,0162D 00	8,0252D-01	3,2242D 00	7,9428D-01	-2,6368D-16
12	1,5773D-01	3,0556D 00	7,8663D-01	3,5281D 00	8,7023D-01	-1,2490D-16
13	1,3552D-01	3,0934D 00	7,7105D-01	3,8286D 00	9,4542D-01	9,7145D-17
14	1,1474D-01	3,1295D 00	7,5578D-01	4,1243D 00	1,0195D 00	-2,2204D-16
15	9,5492D-02	3,1637D 00	7,4082D-01	4,4137D 00	1,0921D 00	-2,2204D-16
16	7,7836D-02	3,1960D 00	7,2615D-01	4,6952D 00	1,1627D 00	-2,2204D-16
17	6,1847D-02	3,2264D 00	7,1177D-01	4,9672D 00	1,2312D 00	-4,4409D-16
18	4,7586D-02	3,2547D 00	6,9768D-01	5,2283D 00	1,2969D 00	-2,2204D-16
19	3,5112D-02	3,2810D 00	6,8386D-01	5,4767D 00	1,3596D 00	0,0000D 00
20	2,4472D-02	3,3052D 00	6,7032D-01	5,7109D 00	1,4188D 00	-2,2204D-16
21	1,5708D-02	3,3272D 00	6,5705D-01	5,9293D 00	1,4741D 00	-2,2204D-16
22	8,8564D-03	3,3471D 00	6,4404D-01	6,1302D 00	1,5252D 00	-2,2204D-16
23	3,9426D-03	3,3648D 00	6,3128D-01	6,3122D 00	1,5716D 00	-2,2204D-16
24	9,8664D-04	3,3802D 00	6,1878D-01	6,4737D 00	1,6129D 00	-2,2204D-16
25	0,0000D 00	3,3935D 00	6,0653D-01	6,6131D 00	1,6487D 00	-2,2204D-16
26	9,8664D-04	3,4045D 00	5,9452D-01	6,7289D 00	1,6787D 00	-2,2204D-16
27	3,9426D-03	3,4133D 00	5,8275D-01	6,8198D 00	1,7025D 00	-2,2204D-16
28	8,8564D-03	3,4199D 00	5,7121D-01	6,8844D 00	1,7197D 00	-2,2204D-16
29	1,5708D-02	3,4244D 00	5,5990D-01	6,9212D 00	1,7299D 00	-2,2204D-16
30	2,4472D-02	3,4267D 00	5,4881D-01	6,9292D 00	1,7329D 00	-2,2204D-16
31	3,5112D-02	3,4269D 00	5,3794D-01	6,9070D 00	1,7284D 00	-2,2204D-16
32	4,7586D-02	3,4251D 00	5,2729D-01	6,8537D 00	1,7160D 00	-2,2204D-16
33	6,1847D-02	3,4213D 00	5,1685D-01	6,7682D 00	1,6955D 00	-4,4409D-16
34	7,7836D-02	3,4155D 00	5,0662D-01	6,6497D 00	1,6666D 00	-2,2204D-16
35	9,5492D-02	3,4079D 00	4,9659D-01	6,4973D 00	1,6292D 00	-2,2204D-16
36	1,1474D-01	3,3985D 00	4,8675D-01	6,3104D 00	1,5830D 00	-2,2204D-16
37	1,3552D-01	3,3874D 00	4,7711D-01	6,0884D 00	1,5279D 00	-4,4409D-16
38	1,5773D-01	3,3746D 00	4,6767D-01	5,8309D 00	1,4638D 00	-2,2204D-16
39	1,8129D-01	3,3603D 00	4,5841D-01	5,5376D 00	1,3905D 00	-2,2204D-16
40	2,0611D-01	3,3446D 00	4,4933D-01	5,2084D 00	1,3081D 00	-2,2204D-16
41	2,3209D-01	3,3275D 00	4,4043D-01	4,8433D 00	1,2166D 00	-2,2204D-16
42	2,5912D-01	3,3092D 00	4,3171D-01	4,4424D 00	1,1159D 00	-2,2204D-16
43	2,8711D-01	3,2897D 00	4,2316D-01	4,0060D 00	1,0062D 00	-2,2204D-16
44	3,1594D-01	3,2693D 00	4,1478D-01	3,5347D 00	8,8751D-01	-1,5266D-16
45	3,4549D-01	3,2479D 00	4,0657D-01	3,0290D 00	7,6006D-01	-2,0817D-16
46	3,7566D-01	3,2258D 00	3,9852D-01	2,4897D 00	6,2404D-01	-9,7145D-17
47	4,0631D-01	3,2031D 00	3,9063D-01	1,9179D 00	4,7969D-01	-1,8041D-16
48	4,3733D-01	3,1798D 00	3,8289D-01	1,3147D 00	3,2733D-01	-1,9429D-16
49	4,6860D-01	3,1561D 00	3,7531D-01	6,8141D-01	1,6730D-01	2,7756D-17
50	5,0000D-01	3,1321D 00	0,0000D 00	8,3651D-02	1,4222D-15	-8,7275D-18

NEW TEST CASE 1 OF APERIODIC TRIDDM

TOTAL DTIME = 0.15464D-01 SECONDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	0,0000D 00	2,5512D 00	9,8020D-01	2,9129D-01	6,4059D-02	-1,3878D-17
2	4,3733D-01	2,6019D 00	9,6079D-01	5,5859D-01	1,3045D-01	-1,3878D-17
3	4,0631D-01	2,6519D 00	9,4176D-01	8,3437D-01	1,9897D-01	1,3878D-17
4	3,7566D-01	2,7012D 00	9,2312D-01	1,1177D 00	2,6940D-01	-6,9389D-17
5	3,4549D-01	2,7497D 00	9,0484D-01	1,4077D 00	3,4152D-01	-9,7145D-17
6	3,1594D-01	2,7971D 00	8,8692D-01	1,7033D 00	4,1506D-01	-9,7145D-17
7	2,8711D-01	2,8435D 00	8,6936D-01	2,0033D 00	4,8976D-01	-2,2204D-16
8	2,5912D-01	2,8887D 00	8,5214D-01	2,3067D 00	5,6534D-01	-1,5266D-16
9	2,3209D-01	2,9326D 00	8,3527D-01	2,6122D 00	6,4150D-01	-2,4980D-16
10	2,0611D-01	2,9752D 00	8,1873D-01	2,9185D 00	7,1792D-01	-6,9389D-17
11	1,8129D-01	3,0162D 00	8,0252D-01	3,2242D 00	7,9428D-01	-2,6368D-16
12	1,5773D-01	3,0556D 00	7,8663D-01	3,5281D 00	8,7023D-01	-1,2490D-16
13	1,3552D-01	3,0934D 00	7,7105D-01	3,8286D 00	9,4542D-01	6,9389D-17
14	1,1474D-01	3,1295D 00	7,5578D-01	4,1243D 00	1,0195D 00	-2,2204D-16
15	9,5492D-02	3,1637D 00	7,4082D-01	4,4137D 00	1,0921D 00	-2,2204D-16
16	7,7836D-02	3,1960D 00	7,2615D-01	4,6952D 00	1,1627D 00	-2,2204D-16
17	6,1847D-02	3,2264D 00	7,1177D-01	4,9672D 00	1,2312D 00	-2,2204D-16
18	4,7586D-02	3,2547D 00	6,9768D-01	5,2283D 00	1,2969D 00	-2,2204D-16
19	3,5112D-02	3,2810D 00	6,8386D-01	5,4767D 00	1,3596D 00	0,0000D 00
20	2,4472D-02	3,3052D 00	6,7032D-01	5,7109D 00	1,4188D 00	-2,2204D-16
21	1,5708D-02	3,3272D 00	6,5705D-01	5,9293D 00	1,4741D 00	-2,2204D-16
22	8,8564D-03	3,3471D 00	6,4404D-01	6,1302D 00	1,5252D 00	-2,2204D-16
23	3,9426D-03	3,3648D 00	6,3128D-01	6,3122D 00	1,5716D 00	-2,2204D-16
24	9,8664D-04	3,3802D 00	6,1878D-01	6,4737D 00	1,6129D 00	-2,2204D-16
25	0,0000D 00	3,3935D 00	6,0653D-01	6,6131D 00	1,6487D 00	0,0000D 00
26	9,8664D-04	3,4045D 00	5,9452D-01	6,7289D 00	1,6787D 00	-2,2204D-16
27	3,9426D-03	3,4133D 00	5,8275D-01	6,8198D 00	1,7025D 00	-2,2204D-16
28	8,8564D-03	3,4199D 00	5,7121D-01	6,8844D 00	1,7197D 00	-2,2204D-16
29	1,5708D-02	3,4244D 00	5,5990D-01	6,9212D 00	1,7299D 00	0,0000D 00
30	2,4472D-02	3,4267D 00	5,4881D-01	6,9292D 00	1,7329D 00	-2,2204D-16
31	3,5112D-02	3,4269D 00	5,3794D-01	6,9070D 00	1,7284D 00	-2,2204D-16
32	4,7586D-02	3,4251D 00	5,2729D-01	6,8537D 00	1,7160D 00	-2,2204D-16
33	6,1847D-02	3,4213D 00	5,1685D-01	6,7682D 00	1,6955D 00	-4,4409D-16
34	7,7836D-02	3,4155D 00	5,0662D-01	6,6497D 00	1,6666D 00	-2,2204D-16
35	9,5492D-02	3,4079D 00	4,9659D-01	6,4973D 00	1,6292D 00	-2,2204D-16
36	1,1474D-01	3,3985D 00	4,8675D-01	6,3104D 00	1,5830D 00	-2,2204D-16
37	1,3552D-01	3,3874D 00	4,7711D-01	6,0884D 00	1,5279D 00	-2,2204D-16
38	1,5773D-01	3,3746D 00	4,6767D-01	5,8309D 00	1,4638D 00	-2,2204D-16
39	1,8129D-01	3,3603D 00	4,5841D-01	5,5376D 00	1,3905D 00	-2,2204D-16
40	2,0611D-01	3,3446D 00	4,4933D-01	5,2084D 00	1,3081D 00	-2,2204D-16
41	2,3209D-01	3,3275D 00	4,4043D-01	4,8433D 00	1,2166D 00	-2,2204D-16
42	2,5912D-01	3,3092D 00	4,3171D-01	4,4424D 00	1,1159D 00	-2,2204D-16
43	2,8711D-01	3,2897D 00	4,2316D-01	4,0060D 00	1,0062D 00	-2,2204D-16
44	3,1594D-01	3,2693D 00	4,1478D-01	3,5347D 00	8,8751D-01	-8,3267D-17
45	3,4549D-01	3,2479D 00	4,0657D-01	3,0290D 00	7,6006D-01	-2,2204D-16
46	3,7566D-01	3,2258D 00	3,9852D-01	2,4897D 00	6,2404D-01	-9,7145D-17
47	4,0631D-01	3,2031D 00	3,9063D-01	1,9179D 00	4,7969D-01	-1,8041D-16
48	4,3733D-01	3,1798D 00	3,8289D-01	1,3147D 00	3,2733D-01	-1,9429D-16
49	4,6860D-01	3,1561D 00	3,7531D-01	6,8141D-01	1,6730D-01	1,3878D-17
50	5,0000D-01	3,1321D 00	0,0000D 00	8,3651D-02	1,4222D-15	-4,2967D-18

NEW TEST CASE 1 OF PERIODIC TRIDSS

TOTAL DTIME = 0,10122D-02 SECONDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	4,6860E-01	2,5512E 00	9,8020E-01	2,9129E-01	6,4059E-02	-5,9605E-08
2	4,3733E-01	2,6019E 00	9,6079E-01	5,5859E-01	1,3045E-01	-5,9605E-08
3	4,0631E-01	2,6519E 00	9,4176E-01	8,3436E-01	1,9897E-01	1,7881E-07
4	3,7566E-01	2,7012E 00	9,2312E-01	1,1177E 00	2,6940E-01	-3,5763E-07
5	3,4549E-01	2,7497E 00	9,0484E-01	1,4077E 00	3,4152E-01	-5,9605E-08
6	3,1594E-01	2,7971E 00	8,8692E-01	1,7033E 00	4,1506E-01	-1,7881E-07
7	2,8711E-01	2,8435E 00	8,6936E-01	2,0033E 00	4,8976E-01	-5,9605E-07
8	2,5912E-01	2,8887E 00	8,5214E-01	2,3067E 00	5,6534E-01	-2,9802E-07
9	2,3209E-01	2,9326E 00	8,3527E-01	2,6122E 00	6,4150E-01	-6,5565E-07
10	2,0611E-01	2,9752E 00	8,1873E-01	2,9184E 00	7,1792E-01	-5,9605E-08
11	1,8129E-01	3,0162E 00	8,0252E-01	3,2242E 00	7,9428E-01	-1,0729E-06
12	1,5773E-01	3,0556E 00	7,8663E-01	3,5281E 00	8,7023E-01	-4,1723E-07
13	1,3552E-01	3,0934E 00	7,7105E-01	3,8286E 00	9,4542E-01	-1,7881E-07
14	1,1474E-01	3,1295E 00	7,5578E-01	4,1243E 00	1,0195E 00	-1,9073E-06
15	9,5492E-02	3,1637E 00	7,4082E-01	4,4137E 00	1,0921E 00	-9,5367E-07
16	7,7836E-02	3,1960E 00	7,2615E-01	4,6952E 00	1,1627E 00	-9,5367E-07
17	6,1847E-02	3,2264E 00	7,1177E-01	4,9672E 00	1,2312E 00	-9,5367E-07
18	4,7587E-02	3,2547E 00	6,9768E-01	5,2283E 00	1,2969E 00	-9,5367E-07
19	3,5112E-02	3,2810E 00	6,8386E-01	5,4767E 00	1,3596E 00	-9,5367E-07
20	2,4472E-02	3,3052E 00	6,7032E-01	5,7109E 00	1,4188E 00	-9,5367E-07
21	1,5709E-02	3,3272E 00	6,5705E-01	5,9293E 00	1,4741E 00	-9,5367E-07
22	8,8564E-03	3,3471E 00	6,4404E-01	6,1302E 00	1,5252E 00	-9,5367E-07
23	3,9428E-03	3,3648E 00	6,3128E-01	6,3122E 00	1,5716E 00	-9,5367E-07
24	9,8678E-04	3,3802E 00	6,1878E-01	6,4737E 00	1,6129E 00	-9,5367E-07
25	0,0000E 00	3,3935E 00	6,0653E-01	6,6131E 00	1,6487E 00	-1,9073E-06
26	9,8640E-04	3,4045E 00	5,9452E-01	6,7289E 00	1,6787E 00	-9,5367E-07
27	3,9424E-03	3,4133E 00	5,8275E-01	6,8198E 00	1,7025E 00	-9,5367E-07
28	8,8563E-03	3,4199E 00	5,7121E-01	6,8844E 00	1,7197E 00	-9,5367E-07
29	1,5708E-02	3,4244E 00	5,5990E-01	6,9212E 00	1,7299E 00	-9,5367E-07
30	2,4472E-02	3,4267E 00	5,4881E-01	6,9292E 00	1,7329E 00	-9,5367E-07
31	3,5112E-02	3,4269E 00	5,3794E-01	6,9070E 00	1,7284E 00	-9,5367E-07
32	4,7586E-02	3,4251E 00	5,2729E-01	6,8537E 00	1,7160E 00	-9,5367E-07
33	6,1846E-02	3,4213E 00	5,1685E-01	6,7682E 00	1,6955E 00	-9,5367E-07
34	7,7836E-02	3,4155E 00	5,0662E-01	6,6497E 00	1,6666E 00	-9,5367E-07
35	9,5491E-02	3,4079E 00	4,9659E-01	6,4973E 00	1,6292E 00	-9,5367E-07
36	1,1474E-01	3,3985E 00	4,8675E-01	6,3104E 00	1,5830E 00	-9,5367E-07
37	1,3552E-01	3,3874E 00	4,7711E-01	6,0884E 00	1,5279E 00	0,0000E 00
38	1,5773E-01	3,3746E 00	4,6767E-01	5,8309E 00	1,4638E 00	-9,5367E-07
39	1,8129E-01	3,3603E 00	4,5841E-01	5,5376E 00	1,3905E 00	-1,9073E-06
40	2,0611E-01	3,3446E 00	4,4933E-01	5,2084E 00	1,3081E 00	0,0000E 00
41	2,3209E-01	3,3275E 00	4,4043E-01	4,8433E 00	1,2166E 00	-9,5367E-07
42	2,5912E-01	3,3092E 00	4,3171E-01	4,4424E 00	1,1159E 00	0,0000E 00
43	2,8711E-01	3,2897E 00	4,2316E-01	4,0060E 00	1,0062E 00	-2,8610E-06
44	3,1594E-01	3,2693E 00	4,1478E-01	3,5347E 00	8,8752E-01	-1,7881E-07
45	3,4549E-01	3,2479E 00	4,0657E-01	3,0290E 00	7,6006E-01	-4,7684E-07
46	3,7565E-01	3,2258E 00	3,9852E-01	2,4897E 00	6,2404E-01	-2,9802E-07
47	4,0631E-01	3,2031E 00	3,9063E-01	1,9179E 00	4,7970E-01	-7,1526E-07
48	4,3733E-01	3,1798E 00	3,8289E-01	1,3147E 00	3,2734E-01	-4,1723E-07
49	4,6860E-01	3,1561E 00	3,7531E-01	6,8144E-01	1,6731E-01	-5,9605E-08
50	5,0000E-01	3,1321E 00	3,6788E-01	1,0724E-01	6,8913E-06	5,2232E-09

NEW TEST CASE 1 OF PERIODIC TRIDSV

TOTAL DTIME = 0.67840D-03 SECONDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	4.6860E-01	2.5512E 00	9.8020E-01	2.9129E-01	6.4059E-02	0.0000E 00
2	4.3733E-01	2.6019E 00	9.6079E-01	5.5859E-01	1.3045E-01	-5.9605E-08
3	4.0631E-01	2.6519E 00	9.4176E-01	8.3436E-01	1.9897E-01	5.9605E-08
4	3.7566E-01	2.7012E 00	9.2312E-01	1.1177E 00	2.6940E-01	-3.5763E-07
5	3.4549E-01	2.7497E 00	9.0484E-01	1.4077E 00	3.4152E-01	-3.5763E-07
6	3.1594E-01	2.7971E 00	8.8692E-01	1.7033E 00	4.1506E-01	-5.9605E-08
7	2.8711E-01	2.8435E 00	8.6936E-01	2.0033E 00	4.8976E-01	-1.0133E-06
8	2.5912E-01	2.8887E 00	8.5214E-01	2.3067E 00	5.6534E-01	-8.9407E-07
9	2.3209E-01	2.9326E 00	8.3527E-01	2.6122E 00	6.4150E-01	-5.3644E-07
10	2.0611E-01	2.9752E 00	8.1873E-01	2.9184E 00	7.1792E-01	-5.3644E-07
11	1.8129E-01	3.0162E 00	8.0252E-01	3.2242E 00	7.9428E-01	-7.1526E-07
12	1.5773E-01	3.0556E 00	7.8663E-01	3.5281E 00	8.7023E-01	-1.0133E-06
13	1.3552E-01	3.0934E 00	7.7105E-01	3.8286E 00	9.4542E-01	5.3644E-07
14	1.1474E-01	3.1295E 00	7.5578E-01	4.1243E 00	1.0195E 00	-9.5367E-07
15	9.5492E-02	3.1637E 00	7.4082E-01	4.4137E 00	1.0921E 00	-9.5367E-07
16	7.7836E-02	3.1960E 00	7.2615E-01	4.6952E 00	1.1627E 00	-9.5367E-07
17	6.1847E-02	3.2264E 00	7.1177E-01	4.9672E 00	1.2312E 00	0.0000E 00
18	4.7587E-02	3.2547E 00	6.9768E-01	5.2283E 00	1.2969E 00	-9.5367E-07
19	3.5112E-02	3.2810E 00	6.8386E-01	5.4767E 00	1.3596E 00	-9.5367E-07
20	2.4472E-02	3.3052E 00	6.7032E-01	5.7109E 00	1.4188E 00	-9.5367E-07
21	1.5709E-02	3.3272E 00	6.5705E-01	5.9293E 00	1.4741E 00	0.0000E 00
22	8.8564E-03	3.3471E 00	6.4404E-01	6.1302E 00	1.5252E 00	-9.5367E-07
23	3.9428E-03	3.3648E 00	6.3128E-01	6.3122E 00	1.5716E 00	0.0000E 00
24	9.8678E-04	3.3802E 00	6.1878E-01	6.4737E 00	1.6129E 00	-9.5367E-07
25	0.0000E 00	3.3935E 00	6.0653E-01	6.6131E 00	1.6487E 00	0.0000E 00
26	9.8640E-04	3.4045E 00	5.9452E-01	6.7289E 00	1.6787E 00	-9.5367E-07
27	3.9424E-03	3.4133E 00	5.8275E-01	6.8198E 00	1.7025E 00	-9.5367E-07
28	8.8563E-03	3.4199E 00	5.7121E-01	6.8844E 00	1.7197E 00	-9.5367E-07
29	1.5708E-02	3.4244E 00	5.5990E-01	6.9212E 00	1.7299E 00	0.0000E 00
30	2.4472E-02	3.4267E 00	5.4881E-01	6.9292E 00	1.7329E 00	-9.5367E-07
31	3.5112E-02	3.4269E 00	5.3794E-01	6.9070E 00	1.7284E 00	-9.5367E-07
32	4.7586E-02	3.4251E 00	5.2729E-01	6.8537E 00	1.7160E 00	-9.5367E-07
33	6.1846E-02	3.4213E 00	5.1685E-01	6.7682E 00	1.6955E 00	-9.5367E-07
34	7.7836E-02	3.4155E 00	5.0662E-01	6.6497E 00	1.6666E 00	-9.5367E-07
35	9.5491E-02	3.4079E 00	4.9659E-01	6.4973E 00	1.6292E 00	-9.5367E-07
36	1.1474E-01	3.3985E 00	4.8675E-01	6.3104E 00	1.5830E 00	-9.5367E-07
37	1.3552E-01	3.3874E 00	4.7711E-01	6.0884E 00	1.5279E 00	0.0000E 00
38	1.5773E-01	3.3746E 00	4.6767E-01	5.8309E 00	1.4638E 00	-9.5367E-07
39	1.8129E-01	3.3603E 00	4.5841E-01	5.5376E 00	1.3905E 00	-1.9073E-06
40	2.0611E-01	3.3446E 00	4.4933E-01	5.2084E 00	1.3081E 00	-9.5367E-07
41	2.3209E-01	3.3275E 00	4.4043E-01	4.8433E 00	1.2166E 00	-9.5367E-07
42	2.5912E-01	3.3092E 00	4.3171E-01	4.4424E 00	1.1159E 00	-9.5367E-07
43	2.8711E-01	3.2897E 00	4.2316E-01	4.0060E 00	1.0062E 00	-9.5367E-07
44	3.1594E-01	3.2693E 00	4.1478E-01	3.5347E 00	8.8752E-01	-4.7684E-07
45	3.4549E-01	3.2479E 00	4.0657E-01	3.0290E 00	7.6006E-01	-2.9802E-07
46	3.7565E-01	3.2258E 00	3.9852E-01	2.4897E 00	6.2404E-01	-5.3644E-07
47	4.0631E-01	3.2031E 00	3.9063E-01	1.9179E 00	4.7970E-01	-1.0729E-06
48	4.3733E-01	3.1798E 00	3.8289E-01	1.3147E 00	3.2734E-01	-3.5763E-07
49	4.6860E-01	3.1561E 00	3.7531E-01	6.8144E-01	1.6731E-01	5.9605E-08
50	5.0000E-01	3.1321E 00	3.6788E-01	1.0724E-01	6.8913E-06	-2.1457E-08

NEW TEST CASE 1 OF PERIODIC TRIDSM

TOTAL DTIME = 0.10278D-01 SECONDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	4.6860E-01	2.5512E 00	9.8020E-01	2.9129E-01	6.4059E-02	0.0000E 00
2	4.3733E-01	2.6019E 00	9.6079E-01	5.5859E-01	1.3045E-01	-5.9605E-08
3	4.0631E-01	2.6519E 00	9.4176E-01	8.3436E-01	1.9897E-01	5.9605E-08
4	3.7566E-01	2.7012E 00	9.2312E-01	1.1177E 00	2.6940E-01	-3.5763E-07
5	3.4549E-01	2.7497E 00	9.0484E-01	1.4077E 00	3.4152E-01	-2.9802E-07
6	3.1594E-01	2.7971E 00	8.8692E-01	1.7033E 00	4.1506E-01	-5.9605E-08
7	2.8711E-01	2.8435E 00	8.6936E-01	2.0033E 00	4.8976E-01	-1.0133E-06
8	2.5912E-01	2.8887E 00	8.5214E-01	2.3067E 00	5.6534E-01	-8.9407E-07
9	2.3209E-01	2.9326E 00	8.3527E-01	2.6122E 00	6.4150E-01	-3.5763E-07
10	2.0611E-01	2.9752E 00	8.1873E-01	2.9184E 00	7.1792E-01	-5.3644E-07
11	1.8129E-01	3.0162E 00	8.0252E-01	3.2242E 00	7.9428E-01	-1.0729E-06
12	1.5773E-01	3.0556E 00	7.8663E-01	3.5281E 00	8.7023E-01	-7.1526E-07
13	1.3552E-01	3.0934E 00	7.7105E-01	3.8286E 00	9.4542E-01	1.7881E-07
14	1.1474E-01	3.1295E 00	7.5578E-01	4.1243E 00	1.0195E 00	-9.5367E-07
15	9.5492E-02	3.1637E 00	7.4082E-01	4.4137E 00	1.0921E 00	-9.5367E-07
16	7.7836E-02	3.1960E 00	7.2615E-01	4.6952E 00	1.1627E 00	-9.5367E-07
17	6.1847E-02	3.2264E 00	7.1177E-01	4.9672E 00	1.2312E 00	0.0000E 00
18	4.7587E-02	3.2547E 00	6.9768E-01	5.2283E 00	1.2969E 00	-9.5367E-07
19	3.5112E-02	3.2810E 00	6.8386E-01	5.4767E 00	1.3596E 00	-9.5367E-07
20	2.4472E-02	3.3052E 00	6.7032E-01	5.7109E 00	1.4188E 00	-9.5367E-07
21	1.5709E-02	3.3272E 00	6.5705E-01	5.9293E 00	1.4741E 00	0.0000E 00
22	8.8564E-03	3.3471E 00	6.4404E-01	6.1302E 00	1.5252E 00	-9.5367E-07
23	3.9428E-03	3.3648E 00	6.3128E-01	6.3122E 00	1.5716E 00	0.0000E 00
24	9.8678E-04	3.3802E 00	6.1878E-01	6.4737E 00	1.6129E 00	-9.5367E-07
25	0.0000E 00	3.3935E 00	6.0653E-01	6.6131E 00	1.6487E 00	9.5367E-07
26	9.8640E-04	3.4045E 00	5.9452E-01	6.7289E 00	1.6787E 00	-9.5367E-07
27	3.9424E-03	3.4133E 00	5.8275E-01	6.8198E 00	1.7025E 00	-9.5367E-07
28	8.8563E-03	3.4199E 00	5.7121E-01	6.8844E 00	1.7197E 00	-9.5367E-07
29	1.5708E-02	3.4244E 00	5.5990E-01	6.9212E 00	1.7299E 00	0.0000E 00
30	2.4472E-02	3.4267E 00	5.4881E-01	6.9292E 00	1.7329E 00	-9.5367E-07
31	3.5112E-02	3.4269E 00	5.3794E-01	6.9070E 00	1.7284E 00	-9.5367E-07
32	4.7586E-02	3.4251E 00	5.2729E-01	6.8537E 00	1.7160E 00	-9.5367E-07
33	6.1846E-02	3.4213E 00	5.1685E-01	6.7682E 00	1.6955E 00	0.0000E 00
34	7.7836E-02	3.4155E 00	5.0662E-01	6.6497E 00	1.6666E 00	-9.5367E-07
35	9.5491E-02	3.4079E 00	4.9659E-01	6.4973E 00	1.6292E 00	-9.5367E-07
36	1.1474E-01	3.3985E 00	4.8675E-01	6.3104E 00	1.5830E 00	-9.5367E-07
37	1.3552E-01	3.3874E 00	4.7711E-01	6.0884E 00	1.5279E 00	0.0000E 00
38	1.5773E-01	3.3746E 00	4.6767E-01	5.8309E 00	1.4638E 00	-9.5367E-07
39	1.8129E-01	3.3603E 00	4.5841E-01	5.5376E 00	1.3905E 00	-1.9073E-06
40	2.0611E-01	3.3446E 00	4.4933E-01	5.2084E 00	1.3081E 00	-9.5367E-07
41	2.3209E-01	3.3275E 00	4.4043E-01	4.8433E 00	1.2166E 00	0.0000E 00
42	2.5912E-01	3.3092E 00	4.3171E-01	4.4424E 00	1.1159E 00	-9.5367E-07
43	2.8711E-01	3.2897E 00	4.2316E-01	4.0060E 00	1.0062E 00	-9.5367E-07
44	3.1594E-01	3.2693E 00	4.1478E-01	3.5347E 00	8.8752E-01	-4.7684E-07
45	3.4549E-01	3.2479E 00	4.0657E-01	3.0290E 00	7.6006E-01	-6.5565E-07
46	3.7565E-01	3.2258E 00	3.9852E-01	2.4897E 00	6.2404E-01	-5.3644E-07
47	4.0651E-01	3.2031E 00	3.9063E-01	1.9179E 00	4.7970E-01	-1.0729E-06
48	4.3733E-01	3.1798E 00	3.8289E-01	1.3147E 00	3.2734E-01	-3.5763E-07
49	4.6860E-01	3.1561E 00	3.7531E-01	6.8144E-01	1.6731E-01	5.9605E-08
50	5.0000E-01	3.1321E 00	3.6788E-01	1.0724E-01	6.8913E-06	-3.4540E-08

NEW TEST CASE 1 OF APERIODIC TRIDSS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	0.0000E 00	2.5512E 00	9.8020E-01	2.9129E-01	6.4059E-02	-5.9605E-08
2	4.3733E-01	2.6019E 00	9.6079E-01	5.5859E-01	1.3045E-01	-5.9605E-08
3	4.0631E-01	2.6519E 00	9.4176E-01	8.3436E-01	1.9897E-01	1.7881E-07
4	3.7566E-01	2.7012E 00	9.2312E-01	1.1177E 00	2.6940E-01	-3.5763E-07
5	3.4549E-01	2.7497E 00	9.0484E-01	1.4077E 00	3.4152E-01	0.0000E 00
6	3.1594E-01	2.7971E 00	8.8692E-01	1.7033E 00	4.1506E-01	-1.7881E-07
7	2.8711E-01	2.8435E 00	8.6936E-01	2.0033E 00	4.8976E-01	-5.3644E-07
8	2.5912E-01	2.8887E 00	8.5214E-01	2.3067E 00	5.6534E-01	-2.9802E-07
9	2.3209E-01	2.9326E 00	8.3527E-01	2.6122E 00	6.4150E-01	-5.9605E-07
10	2.0611E-01	2.9752E 00	8.1873E-01	2.9184E 00	7.1792E-01	-5.9605E-08
11	1.8129E-01	3.0162E 00	8.0252E-01	3.2242E 00	7.9428E-01	-1.0133E-06
12	1.5773E-01	3.0556E 00	7.8663E-01	3.5281E 00	8.7023E-01	-4.1723E-07
13	1.3552E-01	3.0934E 00	7.7105E-01	3.8286E 00	9.4542E-01	-1.7881E-07
14	1.1474E-01	3.1295E 00	7.5578E-01	4.1243E 00	1.0195E 00	-1.9073E-06
15	9.5492E-02	3.1637E 00	7.4082E-01	4.4137E 00	1.0921E 00	-9.5367E-07
16	7.7836E-02	3.1960E 00	7.2615E-01	4.6952E 00	1.1627E 00	-9.5367E-07
17	6.1847E-02	3.2264E 00	7.1177E-01	4.9672E 00	1.2312E 00	-9.5367E-07
18	4.7587E-02	3.2547E 00	6.9768E-01	5.2283E 00	1.2969E 00	-9.5367E-07
19	3.5112E-02	3.2810E 00	6.8386E-01	5.4767E 00	1.3596E 00	-9.5367E-07
20	2.4472E-02	3.3052E 00	6.7032E-01	5.7109E 00	1.4188E 00	-9.5367E-07
21	1.5709E-02	3.3272E 00	6.5705E-01	5.9293E 00	1.4741E 00	-9.5367E-07
22	8.8564E-03	3.3471E 00	6.4404E-01	6.1302E 00	1.5252E 00	-9.5367E-07
23	3.9428E-03	3.3648E 00	6.3128E-01	6.3122E 00	1.5716E 00	-9.5367E-07
24	9.8678E-04	3.3802E 00	6.1878E-01	6.4737E 00	1.6129E 00	-9.5367E-07
25	0.0000E 00	3.3935E 00	6.0653E-01	6.6131E 00	1.6487E 00	-1.9073E-06
26	9.8640E-04	3.4045E 00	5.9452E-01	6.7289E 00	1.6787E 00	-9.5367E-07
27	3.9424E-03	3.4133E 00	5.8275E-01	6.8198E 00	1.7025E 00	-9.5367E-07
28	8.8563E-03	3.4199E 00	5.7121E-01	6.8844E 00	1.7197E 00	-9.5367E-07
29	1.5708E-02	3.4244E 00	5.5990E-01	6.9212E 00	1.7299E 00	-9.5367E-07
30	2.4472E-02	3.4267E 00	5.4881E-01	6.9292E 00	1.7329E 00	-9.5367E-07
31	3.5112E-02	3.4269E 00	5.3794E-01	6.9070E 00	1.7284E 00	-9.5367E-07
32	4.7586E-02	3.4251E 00	5.2729E-01	6.8537E 00	1.7160E 00	-9.5367E-07
33	6.1846E-02	3.4213E 00	5.1685E-01	6.7682E 00	1.6955E 00	-9.5367E-07
34	7.7836E-02	3.4155E 00	5.0662E-01	6.6497E 00	1.6666E 00	-9.5367E-07
35	9.5491E-02	3.4079E 00	4.9659E-01	6.4973E 00	1.6292E 00	-9.5367E-07
36	1.1474E-01	3.3985E 00	4.8675E-01	6.3104E 00	1.5830E 00	-9.5367E-07
37	1.3552E-01	3.3874E 00	4.7711E-01	6.0884E 00	1.5279E 00	0.0000E 00
38	1.5773E-01	3.3746E 00	4.6767E-01	5.8309E 00	1.4638E 00	-9.5367E-07
39	1.8129E-01	3.3603E 00	4.5841E-01	5.5376E 00	1.3905E 00	-1.9073E-06
40	2.0611E-01	3.3446E 00	4.4933E-01	5.2084E 00	1.3081E 00	0.0000E 00
41	2.3209E-01	3.3275E 00	4.4043E-01	4.8433E 00	1.2166E 00	-9.5367E-07
42	2.5912E-01	3.3092E 00	4.3171E-01	4.4424E 00	1.1159E 00	0.0000E 00
43	2.8711E-01	3.2897E 00	4.2316E-01	4.0060E 00	1.0062E 00	-2.8610E-06
44	3.1594E-01	3.2693E 00	4.1478E-01	3.5347E 00	8.8752E-01	-1.7881E-07
45	3.4549E-01	3.2479E 00	4.0657E-01	3.0290E 00	7.6006E-01	-4.7684E-07
46	3.7565E-01	3.2258E 00	3.9852E-01	2.4897E 00	6.2404E-01	-2.9802E-07
47	4.0631E-01	3.2031E 00	3.9063E-01	1.9179E 00	4.7970E-01	-7.1526E-07
48	4.3733E-01	3.1798E 00	3.8289E-01	1.3147E 00	3.2734E-01	-4.1723E-07
49	4.6860E-01	3.1561E 00	3.7531E-01	6.8144E-01	1.6731E-01	0.0000E 00
50	5.0000E-01	3.1321E 00	0.0000E 00	8.3676E-02	6.8913E-06	-2.4384E-09

NEW TEST CASE 1 OF APERIODIC TRIDSV

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	0.0000E 00	2.5512E 00	9.8020E-01	2.9129E-01	6.4059E-02	0.0000E 00
2	4.3733E-01	2.6019E 00	9.6079E-01	5.5859E-01	1.3045E-01	-5.9605E-08
3	4.0631E-01	2.6519E 00	9.4176E-01	8.3436E-01	1.9897E-01	5.9605E-08
4	3.7566E-01	2.7012E 00	9.2312E-01	1.1177E 00	2.6940E-01	-4.1723E-07
5	3.4549E-01	2.7497E 00	9.0484E-01	1.4077E 00	3.4152E-01	-2.3842E-07
6	3.1594E-01	2.7971E 00	8.8692E-01	1.7033E 00	4.1506E-01	-5.9605E-08
7	2.8711E-01	2.8435E 00	8.6936E-01	2.0033E 00	4.8976E-01	-1.0133E-06
8	2.5912E-01	2.8887E 00	8.5214E-01	2.3067E 00	5.5534E-01	-8.9407E-07
9	2.3209E-01	2.9326E 00	8.3527E-01	2.6122E 00	6.4150E-01	-5.3644E-07
10	2.0611E-01	2.9752E 00	8.1873E-01	2.9184E 00	7.1792E-01	-5.3644E-07
11	1.8129E-01	3.0162E 00	8.0252E-01	3.2242E 00	7.9428E-01	-7.1526E-07
12	1.5773E-01	3.0556E 00	7.8663E-01	3.5281E 00	8.7023E-01	-1.0133E-06
13	1.3552E-01	3.0934E 00	7.7105E-01	3.8286E 00	9.4542E-01	5.3644E-07
14	1.1474E-01	3.1295E 00	7.5578E-01	4.1243E 00	1.0195E 00	-9.5367E-07
15	9.5492E-02	3.1637E 00	7.4082E-01	4.4137E 00	1.0921E 00	-9.5367E-07
16	7.7836E-02	3.1960E 00	7.2615E-01	4.6952E 00	1.1627E 00	-9.5367E-07
17	6.1847E-02	3.2264E 00	7.1177E-01	4.9672E 00	1.2312E 00	0.0000E 00
18	4.7587E-02	3.2547E 00	6.9768E-01	5.2283E 00	1.2969E 00	-9.5367E-07
19	3.5112E-02	3.2810E 00	6.8386E-01	5.4767E 00	1.3596E 00	-9.5367E-07
20	2.4472E-02	3.3052E 00	6.7032E-01	5.7109E 00	1.4188E 00	-9.5367E-07
21	1.5709E-02	3.3272E 00	6.5705E-01	5.9293E 00	1.4741E 00	0.0000E 00
22	8.8564E-03	3.3471E 00	6.4404E-01	6.1302E 00	1.5252E 00	-9.5367E-07
23	3.9428E-03	3.3648E 00	6.3128E-01	6.3122E 00	1.5716E 00	0.0000E 00
24	9.8678E-04	3.3802E 00	6.1878E-01	6.4737E 00	1.6129E 00	-9.5367E-07
25	0.0000E 00	3.3935E 00	6.0653E-01	6.6131E 00	1.6487E 00	0.0000E 00
26	9.8640E-04	3.4045E 00	5.9452E-01	6.7289E 00	1.6787E 00	-9.5367E-07
27	3.9424E-03	3.4133E 00	5.8275E-01	6.8198E 00	1.7025E 00	-9.5367E-07
28	8.8563E-03	3.4199E 00	5.7121E-01	6.8844E 00	1.7197E 00	-9.5367E-07
29	1.5708E-02	3.4244E 00	5.5990E-01	6.9212E 00	1.7299E 00	0.0000E 00
30	2.4472E-02	3.4267E 00	5.4881E-01	6.9292E 00	1.7329E 00	-9.5367E-07
31	3.5112E-02	3.4269E 00	5.3794E-01	6.9070E 00	1.7284E 00	-9.5367E-07
32	4.7586E-02	3.4251E 00	5.2729E-01	6.8537E 00	1.7160E 00	-9.5367E-07
33	6.1846E-02	3.4213E 00	5.1685E-01	6.7682E 00	1.6955E 00	-9.5367E-07
34	7.7836E-02	3.4155E 00	5.0662E-01	6.6497E 00	1.6666E 00	-9.5367E-07
35	9.5491E-02	3.4079E 00	4.9659E-01	6.4973E 00	1.6292E 00	-9.5367E-07
36	1.1474E-01	3.3985E 00	4.8675E-01	6.3104E 00	1.5830E 00	-9.5367E-07
37	1.3552E-01	3.3874E 00	4.7711E-01	6.0884E 00	1.5279E 00	0.0000E 00
38	1.5773E-01	3.3746E 00	4.6767E-01	5.8309E 00	1.4638E 00	-9.5367E-07
39	1.8129E-01	3.3603E 00	4.5841E-01	5.5376E 00	1.3905E 00	-1.9073E-06
40	2.0611E-01	3.3446E 00	4.4933E-01	5.2084E 00	1.3081E 00	-9.5367E-07
41	2.3209E-01	3.3275E 00	4.4043E-01	4.8433E 00	1.2166E 00	-9.5367E-07
42	2.5912E-01	3.3092E 00	4.3171E-01	4.4424E 00	1.1159E 00	-9.5367E-07
43	2.8711E-01	3.2897E 00	4.2316E-01	4.0060E 00	1.0062E 00	-9.5367E-07
44	3.1594E-01	3.2693E 00	4.1478E-01	3.5347E 00	8.8752E-01	-4.7684E-07
45	3.4549E-01	3.2479E 00	4.0657E-01	3.0290E 00	7.6006E-01	-2.9802E-07
46	3.7565E-01	3.2258E 00	3.9852E-01	2.4897E 00	6.2404E-01	-5.3644E-07
47	4.0631E-01	3.2031E 00	3.9063E-01	1.9179E 00	4.7970E-01	-1.0729E-06
48	4.3733E-01	3.1798E 00	3.8289E-01	1.3147E 00	3.2734E-01	-3.5763E-07
49	4.6860E-01	3.1561E 00	3.7531E-01	6.8144E-01	1.6731E-01	5.9605E-08
50	5.0000E-01	3.1321E 00	0.0000E 00	8.3676E-02	6.8913E-06	-2.1457E-08

NEW TEST CASE 1 OF APERIODIC TRIPSH

TOTAL DTIME = 0.10327D-01 SECONDS

I	A(I)	B(I)	C(I)	D(I)	XHOLD(I)	DELTA(I)
1	0,0000E 00	2,5512E 00	9,8020E-01	2,9129E-01	6,4059E-02	0,0000E 00
2	4,3733E-01	2,6019E 00	9,6079E-01	5,5859E-01	1,3045E-01	-5,9605E-08
3	4,0631E-01	2,6519E 00	9,4176E-01	8,3436E-01	1,9897E-01	5,9605E-08
4	3,7566E-01	2,7012E 00	9,2312E-01	1,1177E 00	2,6940E-01	-3,5763E-07
5	3,4549E-01	2,7497E 00	9,0484E-01	1,4077E 00	3,4152E-01	-2,9802E-07
6	3,1594E-01	2,7971E 00	8,8692E-01	1,7033E 00	4,1506E-01	-5,9605E-08
7	2,8711E-01	2,8435E 00	8,6936E-01	2,0033E 00	4,8976E-01	-1,0133E-06
8	2,5912E-01	2,8887E 00	8,5214E-01	2,3067E 00	5,6534E-01	-8,9407E-07
9	2,3209E-01	2,9326E 00	8,3527E-01	2,6122E 00	6,4150E-01	-3,5763E-07
10	2,0611E-01	2,9752E 00	8,1873E-01	2,9184E 00	7,1792E-01	-5,3644E-07
11	1,8129E-01	3,0162E 00	8,0252E-01	3,2242E 00	7,9428E-01	-1,0729E-06
12	1,5773E-01	3,0556E 00	7,8663E-01	3,5281E 00	8,7023E-01	-7,1526E-07
13	1,3552E-01	3,0934E 00	7,7105E-01	3,8286E 00	9,4542E-01	1,7881E-07
14	1,1474E-01	3,1295E 00	7,5578E-01	4,1243E 00	1,0195E 00	-9,5367E-07
15	9,5492E-02	3,1637E 00	7,4082E-01	4,4137E 00	1,0921E 00	-9,5367E-07
16	7,7836E-02	3,1960E 00	7,2615E-01	4,6952E 00	1,1627E 00	-9,5367E-07
17	6,1847E-02	3,2264E 00	7,1177E-01	4,9672E 00	1,2312E 00	0,0000E 00
18	4,7587E-02	3,2547E 00	6,9768E-01	5,2283E 00	1,2969E 00	-9,5367E-07
19	3,5112E-02	3,2810E 00	6,8386E-01	5,4767E 00	1,3596E 00	-9,5367E-07
20	2,4472E-02	3,3052E 00	6,7032E-01	5,7109E 00	1,4188E 00	-9,5367E-07
21	1,5709E-02	3,3272E 00	6,5705E-01	5,9293E 00	1,4741E 00	0,0000E 00
22	8,8564E-03	3,3471E 00	6,4404E-01	6,1302E 00	1,5252E 00	-9,5367E-07
23	3,9428E-03	3,3648E 00	6,3128E-01	6,3122E 00	1,5716E 00	0,0000E 00
24	9,8678E-04	3,3802E 00	6,1878E-01	6,4737E 00	1,6129E 00	-9,5367E-07
25	0,0000E 00	3,3935E 00	6,0653E-01	6,6131E 00	1,6487E 00	9,5367E-07
26	9,8640E-04	3,4045E 00	5,9452E-01	6,7289E 00	1,6787E 00	-9,5367E-07
27	3,9424E-03	3,4133E 00	5,8275E-01	6,8198E 00	1,7025E 00	-9,5367E-07
28	8,8563E-03	3,4199E 00	5,7121E-01	6,8844E 00	1,7197E 00	-9,5367E-07
29	1,5708E-02	3,4244E 00	5,5990E-01	6,9212E 00	1,7299E 00	0,0000E 00
30	2,4472E-02	3,4267E 00	5,4881E-01	6,9292E 00	1,7329E 00	-9,5367E-07
31	3,5112E-02	3,4269E 00	5,3794E-01	6,9070E 00	1,7284E 00	-9,5367E-07
32	4,7586E-02	3,4251E 00	5,2729E-01	6,8537E 00	1,7160E 00	-9,5367E-07
33	6,1846E-02	3,4213E 00	5,1685E-01	6,7682E 00	1,6955E 00	0,0000E 00
34	7,7836E-02	3,4155E 00	5,0662E-01	6,6497E 00	1,6666E 00	-9,5367E-07
35	9,5491E-02	3,4079E 00	4,9659E-01	6,4973E 00	1,6292E 00	-9,5367E-07
36	1,1474E-01	3,3985E 00	4,8675E-01	6,3104E 00	1,5830E 00	-9,5367E-07
37	1,3552E-01	3,3874E 00	4,7711E-01	6,0884E 00	1,5279E 00	0,0000E 00
38	1,5773E-01	3,3746E 00	4,6767E-01	5,8309E 00	1,4638E 00	-9,5367E-07
39	1,8129E-01	3,3603E 00	4,5841E-01	5,5376E 00	1,3905E 00	-1,9073E-06
40	2,0611E-01	3,3446E 00	4,4933E-01	5,2084E 00	1,3081E 00	-9,5367E-07
41	2,3209E-01	3,3275E 00	4,4043E-01	4,8433E 00	1,2166E 00	0,0000E 00
42	2,5912E-01	3,3092E 00	4,3171E-01	4,4424E 00	1,1159E 00	-9,5367E-07
43	2,8711E-01	3,2897E 00	4,2316E-01	4,0060E 00	1,0062E 00	-9,5367E-07
44	3,1594E-01	3,2693E 00	4,1478E-01	3,5347E 00	8,8752E-01	-4,7684E-07
45	3,4549E-01	3,2479E 00	4,0657E-01	3,0290E 00	7,6006E-01	-6,5565E-07
46	3,7565E-01	3,2258E 00	3,9852E-01	2,4897E 00	6,2404E-01	-5,3644E-07
47	4,0631E-01	3,2031E 00	3,9063E-01	1,9179E 00	4,7970E-01	-1,0729E-06
48	4,3733E-01	3,1798E 00	3,8289E-01	1,3147E 00	3,2734E-01	-3,5763E-07
49	4,6860E-01	3,1561E 00	3,7531E-01	6,8144E-01	1,6731E-01	1,1921E-07
50	5,0000E-01	3,1321E 00	0,0000E 00	8,3676E-02	6,8913E-06	-2,1457E-08