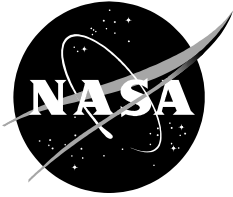NASA/TM—2016–219104

Use of the NLP10x10 Sequential Quadratic Programming Algorithm to Solve Rotorcraft Hub Loads Minimisation Problems

Appendix F:
Cases Run on the Mac Pro Desktop Computer

Jane Anne Leyland
Ames Research Center
Moffett Field, California

May 2016

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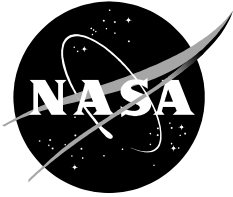
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Appendix F:
Cases Run on the Mac Pro Desktop Computer

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Ames Research Center
Moffett Field, California

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, CA 94035-1000

May 2016

Available from:

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F.1 (10 x 10) T-Matrix FX, FY, FZ Hub Shear Forces and MX, MY Hub Moments Problem

The Full (10 x 10) T-Matrix problem assumes a ten dimensional control vector comprised of the **five** harmonics [(FXS, FXC), (FYS, FYC), (FZS, FZC), (MXS, MXC), and (MYS, MYC)], and a ten dimensional end conditions vector comprised of the **five** harmonics [(D2S, D2C), (D3S, D3C), (D4S, D4C), (D5S, D5C), and (D6S, D6C)].

No Constraints

```
$CDATA
!
!  *****    Start of Case  1                         Input Data    *****
!          T is (10x10)  with  NO Constraints.
!          CV  is comprised of the  2, 3, 4, 5, and 6 per rev flap angles.
!          EC  is comprised of the  FX, FY, FZ, MX, and MY 5p Hub Loads.
!
 ACC       =     1.0D-8,
 ACC       =     1.0D-7,
 ACCQP     =     1.0D-12,
 AL0       =     0.00,    0.00,    0.00,    0.00,    0.00,
 AU0       =    10.00,   10.00,   10.00,   10.00,   10.00,
 CV00(1)   =     0.000,     0.000,     0.000,     0.000,     0.000,
 CV00(6)   =     0.000,     0.000,     0.000,     0.000,     0.000,
 CVOUT     =     1,
 CVOUT     =     0,
 CVPRV0(1) =     0.000,     0.000,     0.000,     0.000,     0.000,
 CVPRV0(6) =     0.000,     0.000,     0.000,     0.000,     0.000,
 ECPRV0(1) =   -95.5047,   75.6472,   84.8822,   80.7376,   -65.8481,
 ECPRV0(6) =    77.7241,  -37.3010,   31.3994,   43.5907,    12.1522,
 ICASE     =     1,
 IDATA     =     3,
 IOPT      =     1,
 IOPT      =     2,
 ITOUT     =     0,
 ITOUT     =     4,
 ITOUT     =     2,
 ITOUT     =     1,
 ITOUT     =     3,
 LQL       =    .FALSE.,
 LQL       =    .TRUE.,
 LSAVE     =     0,    0,    0,    0,    0,    0,
 MAXASUM   =     3.000,
 MAXIT     =   300,
 MAXNM     =     0,
 MAXNM     =    10,
 MI        =     0,
 MSAVE0    =     1,    1,    1,    1,    1,
 NSAVE0    =     1,    1,    1,    1,    1,
 NX0       =    10,
 NZ0       =    10,
 OPTEND    =     1,
 OPTEND    =     2,
 OPTEND    =     3,
 RHOB      =     0.0,
 RHOB      =   100.0,
!
!2345678901234567890123456789012345678901234567890123456789012345678901234567890
!
  T0(1,1)   =    -90.74040,   119.70700,   122.38400,    78.72380,   -69.68640,
  T0(6,1)   =     66.34010,   -40.05610,    20.25200,    29.75040,    24.36730,
  T0(1,2)   =   -135.69100,    79.44860,    87.60420,   115.95000,   -47.75700,
  T0(6,2)   =     79.13310,   -30.01580,    33.37590,    38.47500,    13.77080,
  T0(1,3)   =   -114.32000,    47.68370,    60.60960,    95.79040,   -56.22380,
  T0(6,3)   =     49.49840,   -24.87710,     3.77782,    24.54600,    -6.34307,
  T0(1,4)   =    -68.17730,    51.47110,    64.58900,    53.42570,   -30.91670,
  T0(6,4)   =     80.52170,    -8.45332,    54.59550,    66.75300,   -12.35370,
  T0(1,5)   =    -50.03930,    63.86900,    76.58370,    37.28330,    44.63530,
  T0(6,5)   =     79.28500,    -5.47938,    73.25790,   123.17900,   -16.06650,
  T0(1,6)   =    -76.47950,   107.92800,   113.11600,    66.38840,   -48.84220,
  T0(6,6)   =    155.67100,   -59.09700,    67.74370,    73.07250,    85.04140,
  T0(1,7)   =   -143.274,     110.904,     110.159,     131.805,     -89.7837,
  T0(6,7)   =    253.607,      17.6567,     49.4077,      19.5904,     70.4063,
  T0(1,8)   =   -137.09,       35.3513,     41.2782,     111.293,    -240.311,
  T0(6,8)   =     32.0795,    -49.5137,     88.9283,       0.494424,   -9.84387,
  T0(1,9)   =   -120.269,      35.5072,     40.179,       68.5191,    -148.798,
  T0(6,9)   =     67.0002,    -82.3286,    119.065,      -13.4636,     -73.7842,
  T0(1,10)  =    -35.6918,     52.9199,     96.5716,      18.697,      -48.3614,
  T0(6,10)  =    -20.1547,   -115.603,     -21.8472,     119.166,      -50.0921,
!
 MULT      =           1,
 MULT      =           0,
!
!  *****    End of Case  1  Input Data    *****
```

```
   !
   $END



   ********************************************************************************


             ***************   Start Case Number    1   ***************


           ***************   INPUT DATA for Case Number    1   ***************

   &CDATA
    A00= 6*1.0000000000000000         ,
    ACC= 9.9999999999999955E-008,
    ACCQP= 9.9999999999999980E-013,
    AL0= 5*0.0000000000000000          ,-9.9999999999999955E-008,
    ALPHA=  1.0000000000000000         ,
    APRV0= 6.95322072160373353E-310,  0.0000000000000000     , 2.12199579096527232E-314,
   2.14463893808993165E-314, 2.14464301166118161E-314,
     4.94065645841246544E-324,
    AU0= 5*10.000000000000000          ,  3.0000000000000000      ,
    CRAN1=  2.0000000000000000         ,
    CRAN2=  3.0000000000000000         ,
    CRAN3=  1.0000000000000000         ,
    CRAN4=  1.0000000000000000         ,
    CV00= 10*0.0000000000000000          , 1.48219693752373963E-323, 6.95322524263877661E-
   310, 5.27671991071368134E-319, 6.95322524236565712E-310,

    CVOUT=          0,
    CVPRV0= 10*0.0000000000000000          , 6.95322524235221854E-310, 6.95322072154484091E-
   310, 6.95325616664988679E-310,  0.0000000000000000      ,

    ECPRV0= -95.504700000000000        ,  75.647199999999998     ,  84.882199999999997     ,
   80.737600000000000     , -65.848100000000002     ,
      77.724100000000007      ,  -37.301000000000002     ,  31.399400000000000      ,
   43.590699999999998      ,  12.152200000000001      ,
    EPS= 9.9999999999999955E-008,
    ICASE=          1,
    ICYCL0=       2000,
    IDATA=          3,
    IN=          5,
    IOPT=          2,
    IOUT=          6,
    IPRINT=          2,
    ISEED1=       2395,       4013,       3813,       1837,
    ISEED2=       1843,       4011,       3364,       2835,
    ISEED3=       3962,       1111,       3215,       2637,
    ISEED4=       2397,       1504,       4031,       3173,
    ITOUT=          3,
    L=          1,
    LQL=T,
    LSAVE= 6*0             ,
    MAXASUM=  3.0000000000000000      ,
    MAXFUN=         30,
    MAXIT=         300,
    MAXNM=         10,
    MI=          0,
    MINASUM=  0.0000000000000000      ,
    MODE=          0,
    MSAVE0= 10*1           ,
    MULT=          0,
    NSAVE0= 10*1           ,
    NX0=         10,
    NZ0=         10,
    OPTEND=          3,
    PHASE0= 6*90.000000000000000         ,
    PHSPRV0= 6.95314360825605601E-310, 6.95314360825595720E-310,  0.0000000000000000
   , 6.95322524080085241E-310, 2*0.0000000000000000          ,

    RHOB=  100.00000000000000        ,
    STPMIN=  0.0000000000000000      ,


   F-4
```

```
  T0= -90.740399999999994      ,   119.70699999999999     ,   122.38400000000000      ,
78.723799999999997    , -69.686400000000006    ,
   66.340100000000007    , -40.056100000000001      ,    20.251999999999999     ,
29.750399999999999    ,  24.367300000000000    ,-135.69100000000000      ,
   79.448599999999999     ,   87.604200000000006     ,   115.95000000000000      , -
47.756999999999998    ,  79.133099999999999     , -30.015799999999999      ,
   33.375900000000001    ,   38.475000000000001     ,   13.770799999999999      , -
114.31999999999999     ,  47.683700000000002     ,  60.609600000000000      ,
   95.790400000000005     , -56.223799999999997      ,   49.498399999999997      , -
24.877099999999999     ,  3.7778200000000002     ,  24.545999999999999      ,
   -6.3430700000000000     , -68.177300000000002      ,   51.471100000000000      ,
64.588999999999999     ,  53.425699999999999      , -30.916699999999999      ,
   80.521699999999996     ,  -8.4533199999999997     ,   54.595500000000001      ,
66.753000000000000    , -12.353700000000000      , -50.039299999999997      ,
   63.869000000000000      ,   76.583699999999993      ,   37.283299999999997      ,
44.635300000000001     ,  79.284999999999997     ,  -5.4793799999999999      ,
   73.257900000000006     ,   123.17900000000000      ,  -16.066500000000001      , -
76.479500000000002     ,  107.92800000000000      ,   113.11600000000000      ,
   66.388400000000004     , -48.842199999999998      ,   155.67099999999999      , -
59.097000000000001     ,  67.743700000000004      ,  73.072500000000005      ,
   85.041399999999996     , -143.27400000000000      ,   110.90400000000000      ,
110.15900000000001     ,  131.80500000000001      , -89.783699999999996      ,
   253.60700000000000      ,   17.656700000000001      ,   49.407699999999998      ,
19.590399999999999     ,  70.406300000000002      ,-137.09000000000000      ,
   35.351300000000002     ,   41.278199999999998      ,   111.29300000000001      , -
240.31100000000001     ,  32.079500000000003      , -49.513700000000000      ,
   88.928299999999993     ,  0.49442399999999997     ,  -9.8438700000000008      , -
120.26900000000001     ,  35.507199999999997      ,  40.179000000000002      ,
68.519099999999995     , -148.79800000000000      ,   67.000200000000007      , -
82.328599999999994     ,  119.06500000000000      , -13.463600000000000      ,
   -73.784199999999998     , -35.691800000000001      ,   52.919899999999998      ,
96.571600000000004     ,  18.696999999999999     , -48.361400000000003      ,
   -20.154699999999998     , -115.60299999999999      ,  -21.847200000000001      ,
119.16600000000000     , -50.092100000000002      ,
 WDT0= 10*1.0000000000000000        ,
 WDX= 10*0.0000000000000000        ,
 WX= 10*0.0000000000000000        ,
 WZ= 10*1.0000000000000000        ,
 /


   ********************************************************************************

      ***************   OUTPUT DATA for Case Number    1   ***************

    *****   The Initial T-Matrix (T0) and Either the Initial
                  Previous Actual NLP Control Vector (CVPRV0) or
                    the Initial Previous Control Amplitude (APRV0)
                      and Phase Angle (PHSPRV0) Vectors Before
                         Compression are Directly Input   *****

    *****   Input the Initial Previous Actual NLP Control
                 Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                     and then Compute the Previous Control Amplitude (APRV0)
                        and Control Phase Angle (PHSPRV0) Vectors   *****


             **********   Case Number    1   **********


    *****   Initial Previous Control Amplitude (APRV0) and Phase
                         Angle (PHSPRV0) Vectors before Compression   *****

    Element    AL0               APRV0              AU0               PHSPRV0

       1    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       2    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       3    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       4    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       5    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00

    *****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

    Element        CVL0                CVPRV0                CVU0
```

```
        1        -0.10000000D+02        0.00000000D+00        0.10000000D+02
        2        -0.10000000D+02        0.00000000D+00        0.10000000D+02
        3        -0.10000000D+02        0.00000000D+00        0.10000000D+02
        4        -0.10000000D+02        0.00000000D+00        0.10000000D+02
        5        -0.10000000D+02        0.00000000D+00        0.10000000D+02
        6        -0.10000000D+02        0.00000000D+00        0.10000000D+02
        7        -0.10000000D+02        0.00000000D+00        0.10000000D+02
        8        -0.10000000D+02        0.00000000D+00        0.10000000D+02
        9        -0.10000000D+02        0.00000000D+00        0.10000000D+02
       10        -0.10000000D+02        0.00000000D+00        0.10000000D+02


*****    Either the BEFORE Compression Initial Actual NLP Control
           Vector Estimates (CV00), OR the BEFORE Compression
             Initial Control Vector Amplitudes (A00) and Phase
               Angles (PHASE0) Estimates are Directly Input
                     via NAMELIST Data CDATA                          *****

*****    Input the Initial Actual NLP Control Vector Estimate
           (CV00) Directly Via NAMELIST Input CDATA, and
                 then Compute the Control Vector Amplitudes
                     (A00) and Phase Angles (PHASE0) Estimates        *****


                 **********   Case Number    1    **********


*****    Adjust the Initial Control Amplitude Estimates Vector
          (A00) to define the Initial Control Amplitude Estimates
           Vector (A0) to Within Limits If Required Before Compression  *****


*****    Initial Control Amplitude Vector Estimates (A0), Its
                 Limits (AL0 & AU0), and Its Phase Angle Vector
                     Estimates (PHASE0) Before Compression           *****
```

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

```
*****    Initial Actual NLP Control Vector Estimates (CV0) and
                     Its Limits (CVL0 & CVU0) Before Compression     *****
```

Element	CVL0	CV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.10000000D+02	0.00000000D+00	0.10000000D+02
6	-0.10000000D+02	0.00000000D+00	0.10000000D+02
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

```
*****    End Conditions Vector EC0, Previous Cycle
                 End Conditions Vector ECPRV0, and Weighting
                     Coefficient Vector WDT0 Before Compression      *****
```

Element	EC0	ECPRV0	WDT0
1	-0.95504700D+02	-0.95504700D+02	0.10000000D+01

```
            2          0.75647200D+02         0.75647200D+02          0.10000000D+01
            3          0.84882200D+02         0.84882200D+02          0.10000000D+01
            4          0.80737600D+02         0.80737600D+02          0.10000000D+01
            5         -0.65848100D+02        -0.65848100D+02          0.10000000D+01
            6          0.77724100D+02         0.77724100D+02          0.10000000D+01
            7         -0.37301000D+02        -0.37301000D+02          0.10000000D+01
            8          0.31399400D+02         0.31399400D+02          0.10000000D+01
            9          0.43590700D+02         0.43590700D+02          0.10000000D+01
           10          0.12152200D+02         0.12152200D+02          0.10000000D+01
```

**********   Case Number   1   **********

Specification of CV, T-matrix, and EC Compression

MSAVE0/MSAVE

```
     1            1            1            1            1
  1     1     1     1     1     1     1     1     1     1
```

NSAVE0/NSAVE

```
     1            1            1            1            1
  1     1     1     1     1     1     1     1     1     1
```

******************   T-Matrix Compression is Initiated   ********************

  *****   Initial Control Vector (CV0), T-Matrix (T0),
                                and Measurement Vector (EC0)   *****

  *****   Initial Control Vector (CV0)   *****

```
   CV0     0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
           0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
           0.00000000D+00      0.00000000D+00
```

  *****   Initial Greatest Least Bounds (CVL0) for the
                                        Control Vector (CV0)   *****

```
   CVL0   -0.10000000D+02     -0.10000000D+02     -0.10000000D+02     -0.10000000D+02
          -0.10000000D+02     -0.10000000D+02     -0.10000000D+02     -0.10000000D+02
          -0.10000000D+02     -0.10000000D+02
```

  *****   Initial Least Upper Bounds (CVU0) for the
                                        Control Vector (CV0)   *****

```
   CVU0    0.10000000D+02      0.10000000D+02      0.10000000D+02      0.10000000D+02
           0.10000000D+02      0.10000000D+02      0.10000000D+02      0.10000000D+02
           0.10000000D+02      0.10000000D+02
```

     Row   *****   Initial T-Matrix (T0)   *****

```
T0   1   -0.90740400D+02     -0.13569100D+03     -0.11432000D+03     -0.68177300D+02
         -0.50039300D+02     -0.76479500D+02     -0.14327400D+03     -0.13709000D+03
         -0.12026900D+03     -0.35691800D+02

T0   2    0.11970700D+03      0.79448600D+02      0.47683700D+02      0.51471100D+02
          0.63869000D+02      0.10792800D+03      0.11090400D+03      0.35351300D+02
          0.35507200D+02      0.52919900D+02

T0   3    0.12238400D+03      0.87604200D+02      0.60609600D+02      0.64589000D+02
          0.76583700D+02      0.11311600D+03      0.11015900D+03      0.41278200D+02
          0.40179000D+02      0.96571600D+02

T0   4    0.78723800D+02      0.11595000D+03      0.95790400D+02      0.53425700D+02
          0.37283300D+02      0.66388400D+02      0.13180500D+03      0.11129300D+03
          0.68519100D+02      0.18697000D+02
```

```
T0  5   -0.69686400D+02   -0.47757000D+02   -0.56223800D+02   -0.30916700D+02
         0.44635300D+02   -0.48842200D+02   -0.89783700D+02   -0.24031100D+03
        -0.14879800D+03   -0.48361400D+02

T0  6    0.66340100D+02    0.79133100D+02    0.49498400D+02    0.80521700D+02
         0.79285000D+02    0.15567100D+03    0.25360700D+03    0.32079500D+02
         0.67000200D+02   -0.20154700D+02

T0  7   -0.40056100D+02   -0.30015800D+02   -0.24877100D+02   -0.84533200D+01
        -0.54793800D+01   -0.59097000D+02    0.17656700D+02   -0.49513700D+02
        -0.82328600D+02   -0.11560300D+03

T0  8    0.20252000D+02    0.33375900D+02    0.37778200D+01    0.54595500D+02
         0.73257900D+02    0.67743700D+02    0.49407700D+02    0.88928300D+02
         0.11906500D+03   -0.21847200D+02

T0  9    0.29750400D+02    0.38475000D+02    0.24546000D+02    0.66753000D+02
         0.12317900D+03    0.73072500D+02    0.19590400D+02    0.49442400D+00
        -0.13463600D+02    0.11916600D+03

T0 10    0.24367300D+02    0.13770800D+02   -0.63430700D+01   -0.12353700D+02
        -0.16066500D+02    0.85041400D+02    0.70406300D+02   -0.98438700D+01
        -0.73784200D+02   -0.50092100D+02


   *****   Initial End Conditions Vector (EC0)    *****

   EC0   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
        -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
         0.43590700D+02    0.12152200D+02

   *****   Initial End Conditions Weighting Coefficient Vector
                              (WDT0)  for the Performance Index (F)   *****

  WDT0    0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
          0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
          0.10000000D+01    0.10000000D+01


   *****   Initial Control Vector (CVPRV0) and Measurement
                      Vector (ECPRV0) from the Previous Duty Cycle   *****


   *****   Initial Previous Cycle Control Vector (CVPRV0)   *****

CVPRV0   0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
         0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
         0.00000000D+00    0.00000000D+00


   *****   Initial Previous Cycle End Conditions Vector (ECPRV0)   *****

ECPRV0  -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
        -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
         0.43590700D+02    0.12152200D+02


   *****   Intermediate Control Vector (CV), T-Matrix (TT),
              and Measurement Vector (ECT) after the First Compression   *****


   *****   Intermediate Control Vector (CV) after the First Compression   *****

    CV    0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
          0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
          0.00000000D+00    0.00000000D+00

   *****   Intermediate Greatest Least Bounds (CVL) for the
                                      Control Vector (CV)   *****

   CVL   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
         -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
         -0.10000000D+02   -0.10000000D+02
```

```
     *****    Intermediate Least Upper Bounds (CVU) for the
                                               Control Vector (CV)    *****

    CVU      0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
             0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
             0.10000000D+02    0.10000000D+02


     Row         *****    Intermediate T-Matrix (TT)    *****

  TT  1    -0.90740400D+02   -0.13569100D+03   -0.11432000D+03   -0.68177300D+02
           -0.50039300D+02   -0.76479500D+02   -0.14327400D+03   -0.13709000D+03
           -0.12026900D+03   -0.35691800D+02

  TT  2     0.11970700D+03    0.79448600D+02    0.47683700D+02    0.51471100D+02
            0.63869000D+02    0.10792800D+03    0.11090400D+03    0.35351300D+02
            0.35507200D+02    0.52919900D+02

  TT  3     0.12238400D+03    0.87604200D+02    0.60609600D+02    0.64589000D+02
            0.76583700D+02    0.11311600D+03    0.11015900D+03    0.41278200D+02
            0.40179000D+02    0.96571600D+02

  TT  4     0.78723800D+02    0.11595000D+03    0.95790400D+02    0.53425700D+02
            0.37283300D+02    0.66388400D+02    0.13180500D+03    0.11129300D+03
            0.68519100D+02    0.18697000D+02

  TT  5    -0.69686400D+02   -0.47757000D+02   -0.56223800D+02   -0.30916700D+02
            0.44635300D+02   -0.48842200D+02   -0.89783700D+02   -0.24031100D+03
           -0.14879800D+03   -0.48361400D+02

  TT  6     0.66340100D+02    0.79133100D+02    0.49498400D+02    0.80521700D+02
            0.79285000D+02    0.15567100D+03    0.25360700D+03    0.32079500D+02
            0.67000200D+02   -0.20154700D+02

  TT  7    -0.40056100D+02   -0.30015800D+02   -0.24877100D+02   -0.84533200D+01
           -0.54793800D+01   -0.59097000D+02    0.17656700D+02   -0.49513700D+02
           -0.82328600D+02   -0.11560300D+03

  TT  8     0.20252000D+02    0.33375900D+02    0.37778200D+01    0.54595500D+02
            0.73257900D+02    0.67743700D+02    0.49407700D+02    0.88928300D+02
            0.11906500D+03   -0.21847200D+02

  TT  9     0.29750400D+02    0.38475000D+02    0.24546000D+02    0.66753000D+02
            0.12317900D+03    0.73072500D+02    0.19590400D+02    0.49442400D+00
           -0.13463600D+02    0.11916600D+03

  TT 10     0.24367300D+02    0.13770800D+02   -0.63430700D+01   -0.12353700D+02
           -0.16066500D+02    0.85041400D+02    0.70406300D+02   -0.98438700D+01
           -0.73784200D+02   -0.50092100D+02


     *****    Intermediate End Conditions Vector (ECT)    *****

    ECT     -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
            -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
             0.43590700D+02    0.12152200D+02

     *****    Intermediate End Conditions Weighting Coefficient Vector
                             (WDTT) for the Performance Index (F)    *****

   WDTT      0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
             0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
             0.10000000D+01    0.10000000D+01


     *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                        (ECPRV0) from the Previous Duty Cycle after
                                          the First Compression    *****


     *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                          the First Compression    *****

  CVPRV     0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
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        0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
        0.00000000D+00    0.00000000D+00


    *****   Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                      after the First Compression    *****

  ECPRVT  -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02



    *****   Final Control Vector (CV), T-Matrix (T), and
                  Measurement Vector (EC) after the Second Compression    *****



    *****   Final Control Vector (CV) after the Second Compression    *****

     CV    0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
           0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
           0.00000000D+00    0.00000000D+00

    *****   Greatest Least Bounds (CVL) Vector for the
                                      Control Vector (CV)    *****

    CVL   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
          -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
          -0.10000000D+02   -0.10000000D+02

    *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

    CVU    0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
           0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
           0.10000000D+02    0.10000000D+02


     Row               *****   Final T-Matrix (T)    *****

   T  1  -0.90740400D+02   -0.13569100D+03   -0.11432000D+03   -0.68177300D+02
          -0.50039300D+02   -0.76479500D+02   -0.14327400D+03   -0.13709000D+03
          -0.12026900D+03   -0.35691800D+02

   T  2   0.11970700D+03    0.79448600D+02    0.47683700D+02    0.51471100D+02
           0.63869000D+02    0.10792800D+03    0.11090400D+03    0.35351300D+02
           0.35507200D+02    0.52919900D+02

   T  3   0.12238400D+03    0.87604200D+02    0.60609600D+02    0.64589000D+02
           0.76583700D+02    0.11311600D+03    0.11015900D+03    0.41278200D+02
           0.40179000D+02    0.96571600D+02

   T  4   0.78723800D+02    0.11595000D+03    0.95790400D+02    0.53425700D+02
           0.37283300D+02    0.66388400D+02    0.13180500D+03    0.11129300D+03
           0.68519100D+02    0.18697000D+02

   T  5  -0.69686400D+02   -0.47757000D+02   -0.56223800D+02   -0.30916700D+02
           0.44635300D+02   -0.48842200D+02   -0.89783700D+02   -0.24031100D+03
          -0.14879800D+03   -0.48361400D+02

   T  6   0.66340100D+02    0.79133100D+02    0.49498400D+02    0.80521700D+02
           0.79285000D+02    0.15567100D+03    0.25360700D+03    0.32079500D+02
           0.67000200D+02   -0.20154700D+02

   T  7  -0.40056100D+02   -0.30015800D+02   -0.24877100D+02   -0.84533200D+01
          -0.54793800D+01   -0.59097000D+02    0.17656700D+02   -0.49513700D+02
          -0.82328600D+02   -0.11560300D+03

   T  8   0.20252000D+02    0.33375900D+02    0.37778200D+01    0.54595500D+02
           0.73257900D+02    0.67743700D+02    0.49407700D+02    0.88928300D+02
           0.11906500D+03   -0.21847200D+02
   T  9   0.29750400D+02    0.38475000D+02    0.24546000D+02    0.66753000D+02
           0.12317900D+03    0.73072500D+02    0.19590400D+02    0.49442400D+00
          -0.13463600D+02    0.11916600D+03

   T 10   0.24367300D+02    0.13770800D+02   -0.63430700D+01   -0.12353700D+02
          -0.16066500D+02    0.85041400D+02    0.70406300D+02   -0.98438700D+01
```

F-10

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          -0.73784200D+02    -0.50092100D+02


  *****    Final End Conditions Vector (EC) after the Second Compression    *****

   EC    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02

  *****    Final End Conditions Weighting Coefficient Vector
                                  (WDT) for the Performance Index (F)    *****

   WDT    0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
          0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
          0.10000000D+01     0.10000000D+01


  *****    Final Control Vector (CVPRV) and Measurement Vector
                         (ECPRV) from the Previous Duty Cycle after
                                             the Second Compression    *****


  *****    Final Previous Cycle Control Vector (CVPRV) after
                                          the Second Compression    *****

 CVPRV    0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00


  *****    Final Previous Cycle End Conditions Vector (ECPRV)
                                          after the Second Compression    *****

 ECPRV   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02


******************    T-Matrix Compression is Completed    ********************


  *****    Initial End Conditions Vector EC    *****


   -0.95504700D+02        0.75647200D+02        0.84882200D+02        0.80737600D+02
   -0.65848100D+02        0.77724100D+02       -0.37301000D+02        0.31399400D+02
    0.43590700D+02        0.12152200D+02


  *****    Initial Performance Index  =   0.43369315D+05    *****

  *****    Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors    *****

 Element   AL                 A                  AU                 PHASE

     1    0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
     2    0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
     3    0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
     4    0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
     5    0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00


              **********   Case Number    1   **********


                             LSAVE

     0      0      0      0      0      0


  *****    Solve the NLPQLP Problem for Case Number    1    *****
```

```
          ----------------------------------------------------------------------
          START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
          ----------------------------------------------------------------------

          Parameters:
             N       =        10
             M       =         0
             ME      =         0
             MODE    =         0
             ACC     =   0.1000D-06
             ACCQP   =   0.1000D-11
             STPMIN  =   0.0000D+00
             RHOB    =   0.1000D+03
             MAXFUN  =        30
             MAXNM   =        10
             MAXIT   =       300
             IPRINT  =         2

          Output in the following order:
             IT    - iteration number
             F     - objective function value
             SCV   - sum of constraint violations
             NA    - number of active constraints
             I     - number of line search iterations
             ALPHA - steplength parameter
             DELTA - additional variable to prevent inconsistency
             KKT   - Karush-Kuhn-Tucker optimality criterion


           IT        F           SCV       NA  I    ALPHA      DELTA      KKT
          ----------------------------------------------------------------------
            1  0.43369315D+05  0.00D+00    0  0   0.00D+00   0.00D+00  0.18D+08
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
            2  0.24251394D+04  0.00D+00    0  3   0.12D-01   0.00D+00  0.35D+06
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
            3  0.22780139D+04  0.00D+00    0  3   0.10D-01   0.00D+00  0.98D+05
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
            4  0.22400433D+04  0.00D+00    0  4   0.11D-02   0.00D+00  0.40D+06
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
            5  0.12962350D+04  0.00D+00    0  4   0.43D-02   0.00D+00  0.77D+06
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
            6  0.12938823D+04  0.00D+00    0  3   0.10D-01   0.00D+00  0.86D+05
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
            7  0.12403793D+04  0.00D+00    0  4   0.17D-02   0.00D+00  0.36D+05
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
            8  0.11826950D+04  0.00D+00    0  4   0.37D-02   0.00D+00  0.23D+06
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
                             *****   Completed CALL to NLPQLP   *****
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                    *****   Completed CALL to NLPQLP   *****
  9  0.23118369D+03  0.00D+00    0  3  0.10D-01  0.00D+00  0.67D+05
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 10  0.17429043D+03  0.00D+00    0  3  0.10D-01  0.00D+00  0.10D+05
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 11  0.16349769D+03  0.00D+00    0  4  0.26D-02  0.00D+00  0.12D+05
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 12  0.45397846D+02  0.00D+00    0  3  0.18D-01  0.00D+00  0.15D+03
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 13  0.35423407D+02  0.00D+00    0  2  0.10D+00  0.00D+00  0.19D+03
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 14  0.11605055D+01  0.00D+00    0  2  0.34D+00  0.00D+00  0.54D+01
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 15  0.70946611D+00  0.00D+00    0  2  0.10D+00  0.00D+00  0.16D+01
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 16  0.22127657D-01  0.00D+00    0  1  0.10D+01  0.00D+00  0.46D-01
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 17  0.76393984D-04  0.00D+00    0  1  0.10D+01  0.00D+00  0.15D-03
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 18  0.32054870D-06  0.00D+00    0  1  0.10D+01  0.00D+00  0.24D-06
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
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                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
 19  0.32054870D-06  0.00D+00    0 25  0.38D-10  0.00D+00  0.46D-04
                    *****   Completed CALL to NLPQLP   *****
                    *****   Completed CALL to NLPQLP   *****
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                    *****    Completed CALL to NLPQLP    *****
    20   0.32054870D-06  0.00D+00     0 29  0.12D-12   0.00D+00   0.29D-07


    --- Final Convergence Analysis at Last Iterate ---

      Objective function value:      F(X)  =  0.32054870D-06
      Solution values:               X     =
        -0.16092618D+00 -0.33315547D+00  0.76025438D-01  0.23350939D+00
        -0.15603567D+00 -0.19430946D-02 -0.19345490D+00 -0.12050082D+00
        -0.16539292D-01 -0.17160590D+00
      Distances from lower bounds:   X-XL  =
         0.98390738D+01  0.96668445D+01  0.10076025D+02  0.10233509D+02
         0.98439643D+01  0.99980569D+01  0.98065451D+01  0.98794992D+01
         0.99834607D+01  0.98283941D+01
      Distances from upper bounds:   XU-X  =
         0.10160926D+02  0.10333155D+02  0.99239746D+01  0.97664906D+01
         0.10156036D+02  0.10001943D+02  0.10193455D+02  0.10120501D+02
         0.10016539D+02  0.10171606D+02
      Multipliers for lower bounds:  U     =
         0.00000000D+00  0.00000000D+00  0.00000000D+00  0.00000000D+00
         0.00000000D+00  0.00000000D+00  0.00000000D+00  0.00000000D+00
         0.00000000D+00  0.00000000D+00
      Multipliers for upper bounds:  U     =
         0.00000000D+00  0.00000000D+00  0.00000000D+00  0.00000000D+00
         0.00000000D+00  0.00000000D+00  0.00000000D+00  0.00000000D+00
         0.00000000D+00  0.00000000D+00
      Number of function calls:      NFUNC =      102
      Number of gradient calls:      NGRAD =       20
      Number of calls of QP solver:  NQL   =       20


              *****    Completed CALL to NLPQLP    *****


         *****    Number of Function Evaluations  =    302    *****


   *****    Solution Control Vector for Case Number    1    *****

   Element    CVL             CV              CVU             CV - CV0

      1    -0.10000000D+02  -0.16092618D+00   0.10000000D+02  -0.16092618D+00
      2    -0.10000000D+02  -0.33315547D+00   0.10000000D+02  -0.33315547D+00
      3    -0.10000000D+02   0.76025438D-01   0.10000000D+02   0.76025438D-01
      4    -0.10000000D+02   0.23350939D+00   0.10000000D+02   0.23350939D+00
      5    -0.10000000D+02  -0.15603567D+00   0.10000000D+02  -0.15603567D+00
      6    -0.10000000D+02  -0.19430946D-02   0.10000000D+02  -0.19430946D-02
      7    -0.10000000D+02  -0.19345490D+00   0.10000000D+02  -0.19345490D+00
      8    -0.10000000D+02  -0.12050082D+00   0.10000000D+02  -0.12050082D+00
      9    -0.10000000D+02  -0.16539292D-01   0.10000000D+02  -0.16539292D-01
     10    -0.10000000D+02  -0.17160590D+00   0.10000000D+02  -0.17160590D+00
```

```
*****   Predicted Measurement Vector EC   *****

  -0.14318695D-03      -0.33053418D-03      0.38425342D-03      -0.10159955D-03
   0.77940073D-04      -0.38766018D-04      0.59294166D-04       0.15375035D-04
  -0.14208547D-03      -0.55325835D-05


*****   NLP Solution Performance Index  =   0.32054870D-06   *****


*****   Predicted Measurement Vector EC   *****

  -0.13961777D-03      -0.33582617D-03      0.37459626D-03      -0.10346925D-03
   0.82776213D-04      -0.36750548D-04      0.70854466D-04       0.17559755D-04
  -0.15400207D-03      -0.52337349D-06

*****   NLP Solution Performance Index  =   0.32054870D-06   *****

*****   Predicted Control Amplitude Vector (A)
           Its Limits (AL & AU), and Its Phase Angle
                                 Vector (PHASE) Before Compression   *****

Element     AL                 A                  AU                 PHASE

   1     0.00000000D+00     0.36998621D+00     0.10000000D+02     -0.15421777D+03
   2     0.00000000D+00     0.24557382D+00     0.10000000D+02      0.18034091D+02
   3     0.00000000D+00     0.15604776D+00     0.10000000D+02     -0.90713461D+02
   4     0.00000000D+00     0.22791499D+00     0.10000000D+02     -0.12191830D+03
   5     0.00000000D+00     0.17240109D+00     0.10000000D+02     -0.17449486D+03


*****   No Constraints are Specified for Case Number    1   *****



*****   Solve the Regulator Problem for Case Number    1   *****


             *****    Alpha  =      0.10000000D+01    *****


  Dim                    *****   WZ-Vector   *****

  10     0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
         0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
         0.10000000D+01     0.10000000D+01

  Dim                    *****   WX-Vector   *****

  10     0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
         0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
         0.00000000D+00     0.00000000D+00

  Dim                    *****   WDX-Vector   *****

  10     0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
         0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
         0.00000000D+00     0.00000000D+00

  Row   *****   The T-Matrix [TT]   *064*

   1    -0.90740400D+02    -0.13569100D+03    -0.11432000D+03    -0.68177300D+02
        -0.50039300D+02    -0.76479500D+02    -0.14327400D+03    -0.13709000D+03
        -0.12026900D+03    -0.35691800D+02
   2     0.11970700D+03     0.79448600D+02     0.47683700D+02     0.51471100D+02
         0.63869000D+02     0.10792800D+03     0.11090400D+03     0.35351300D+02
         0.35507200D+02     0.52919900D+02
   3     0.12238400D+03     0.87604200D+02     0.60609600D+02     0.64589000D+02
         0.76583700D+02     0.11311600D+03     0.11015900D+03     0.41278200D+02
         0.40179000D+02     0.96571600D+02
   4     0.78723800D+02     0.11595000D+03     0.95790400D+02     0.53425700D+02
         0.37283300D+02     0.66388400D+02     0.13180500D+03     0.11129300D+03
         0.68519100D+02     0.18697000D+02
```

```
   5      -0.69686400D+02    -0.47757000D+02     -0.56223800D+02    -0.30916700D+02
          0.44635300D+02    -0.48842200D+02     -0.89783700D+02    -0.24031100D+03
         -0.14879800D+03    -0.48361400D+02
   6       0.66340100D+02     0.79133100D+02      0.49498400D+02     0.80521700D+02
          0.79285000D+02     0.15567100D+03      0.25360700D+03     0.32079500D+02
          0.67000200D+02    -0.20154700D+02
   7      -0.40056100D+02    -0.30015800D+02     -0.24877100D+02    -0.84533200D+01
         -0.54793800D+01    -0.59097000D+02      0.17656700D+02    -0.49513700D+02
         -0.82328600D+02    -0.11560300D+03
   8       0.20252000D+02     0.33375900D+02      0.37778200D+01     0.54595500D+02
          0.73257900D+02     0.67743700D+02      0.49407700D+02     0.88928300D+02
          0.11906500D+03    -0.21847200D+02
   9       0.29750400D+02     0.38475000D+02      0.24546000D+02     0.66753000D+02
          0.12317900D+03     0.73072500D+02      0.19590400D+02     0.49442400D+00
         -0.13463600D+02     0.11916600D+03
  10       0.24367300D+02     0.13770800D+02     -0.63430700D+01    -0.12353700D+02
         -0.16066500D+02     0.85041400D+02      0.70406300D+02    -0.98438700D+01
         -0.73784200D+02    -0.50092100D+02


   Row     *****    [DUMXX1] = Matrix to be Inverted    *****

   1       0.56489556D+05     0.53608746D+05      0.39890586D+05     0.35083889D+05
          0.31619385D+05     0.60645626D+05      0.75807411D+05     0.52918307D+05
          0.43799663D+05     0.31410138D+05
   2       0.53608746D+05     0.58070664D+05      0.44049045D+05     0.37515859D+05
          0.34166237D+05     0.59228169D+05      0.80384187D+05     0.56283861D+05
          0.47924117D+05     0.27026005D+05
   3       0.39890586D+05     0.44049045D+05      0.35079212D+05     0.27138119D+05
          0.21932536D+05     0.40536689D+05      0.58352545D+05     0.47261836D+05
          0.38758807D+05     0.22005418D+05
   4       0.35083889D+05     0.37515859D+05      0.27138119D+05     0.29423753D+05
          0.31108409D+05     0.43692468D+05      0.55816022D+05     0.35218992D+05
          0.33487461D+05     0.20623845D+05
   5       0.31619385D+05     0.34166237D+05      0.21932536D+05     0.31108409D+05
          0.42944651D+05     0.44941799D+05      0.48507576D+05     0.15250481D+05
          0.21288711D+05     0.24018745D+05
   6       0.60645626D+05     0.59228169D+05      0.40536689D+05     0.43692468D+05
          0.44941799D+05     0.81972531D+05      0.97725300D+05     0.51238360D+05
          0.45494451D+05     0.29630497D+05
   7       0.75807411D+05     0.80384187D+05      0.58352545D+05     0.55816022D+05
          0.48507576D+05     0.97725300D+05      0.14280603D+06     0.75325879D+05
          0.63948351D+05     0.19003140D+05
   8       0.52918307D+05     0.56283861D+05      0.47261836D+05     0.35218992D+05
          0.15250481D+05     0.51238360D+05      0.75325879D+05     0.10336887D+06
          0.80318552D+05     0.28139263D+05
   9       0.43799663D+05     0.47924117D+05      0.38758807D+05     0.33487461D+05
          0.21288711D+05     0.45494451D+05      0.63948351D+05     0.80318552D+05
          0.75244334D+05     0.26186416D+05
  10       0.31410138D+05     0.27026005D+05      0.22005418D+05     0.20623845D+05
          0.24018745D+05     0.29630497D+05      0.19003140D+05     0.28139263D+05
          0.26186416D+05     0.47046217D+05


   *****   Matrix [DUMXX1] was Successfully Inverted
                                              to Yield Matrix [DD].    *****

   Row     *****    [DD] = The Inverse of Matrix [DUMXX1]    *****

   1       0.77251338D-02    -0.43783067D-01      0.49388311D-01    -0.16005815D-01
          0.14670785D-01     0.99402309D-02     -0.49860106D-02    -0.13736242D-03
          0.24693471D-02    -0.91193547D-02
   2      -0.43783067D-01     0.25930169D+00     -0.29529558D+00     0.74317469D-01
         -0.75916308D-01    -0.62902446D-01      0.34561045D-01     0.36752394D-02
         -0.13809153D-01     0.55719774D-01
   3       0.49388311D-01    -0.29529558D+00      0.33794013D+00    -0.71158639D-01
          0.79336408D-01     0.74032407D-01     -0.42844297D-01    -0.61395877D-02
          0.15251641D-01    -0.64855526D-01
   4      -0.16005815D-01     0.74317469D-01     -0.71158639D-01     0.16881832D+00
         -0.98986344D-01     0.57305597D-02     -0.26268182D-01    -0.19524841D-01
         -0.93829020D-02     0.17102108D-02
   5       0.14670785D-01    -0.75916308D-01      0.79336408D-01    -0.98986344D-01
          0.62758135D-01     0.59064644D-02      0.88260719D-02     0.97547716D-02
          0.68455376D-02    -0.88701519D-02
   6       0.99402309D-02    -0.62902446D-01      0.74032407D-01     0.57305597D-02
```

```
        0.59064644D-02     0.19354118D-01    -0.14376059D-01    -0.42423219D-02
        0.24962517D-02    -0.15892080D-01
  7    -0.49860106D-02     0.34561045D-01    -0.42844297D-01    -0.26268182D-01
        0.88260719D-02    -0.14376059D-01     0.13650597D-01     0.55532988D-02
       -0.52468915D-03     0.11035324D-01
  8    -0.13736242D-03     0.36752394D-02    -0.61395877D-02    -0.19524841D-01
        0.97547716D-02    -0.42423219D-02     0.55532988D-02     0.30269317D-02
        0.47670393D-03     0.27841738D-02
  9     0.24693471D-01    -0.13809153D-01     0.15251641D-01    -0.93829020D-02
        0.68455376D-02     0.24962517D-02    -0.52468915D-03     0.47670393D-03
        0.10354692D-02    -0.24530879D-02
 10    -0.91193547D-02     0.55719774D-01    -0.64855526D-01     0.17102108D-02
       -0.88701519D-02    -0.15892080D-01     0.11035324D-01     0.27841738D-02
       -0.24530879D-02     0.13467321D-01


 Row   *****    [EE] = The Identity Matrix [DUMXX1][DD]    *****

  1     0.10000000D+01    -0.18189894D-11     0.11368684D-11     0.18687274D-11
        0.56843419D-12     0.73896445D-12    -0.79580786D-12     0.85265128D-12
        0.14210855D-13    -0.45474735D-12
  2     0.00000000D+00     0.10000000D+01     0.22737368D-12     0.13855583D-11
        0.13926638D-11     0.56843419D-12    -0.90949470D-12     0.96633812D-12
        0.42632564D-13    -0.56843419D-13
  3     0.85265128D-13    -0.18189894D-11     0.10000000D+01     0.23732127D-11
        0.85265128D-13     0.34106051D-12    -0.85265128D-12     0.73896445D-12
       -0.56843419D-13    -0.34106051D-12
  4     0.25579538D-12    -0.20463631D-11     0.13642421D-11     0.10000000D+01
        0.93791641D-12     0.68212103D-12    -0.13926638D-11     0.75317530D-12
        0.71054274D-13    -0.51159077D-12
  5     0.22737368D-12    -0.25011104D-11     0.13642421D-11     0.30766500D-11
        0.10000000D+01     0.17053026D-12    -0.11368684D-11     0.78159701D-12
       -0.10658141D-12    -0.39790393D-12
  6    -0.39790393D-12    -0.27284841D-11     0.15916157D-11     0.37587711D-11
       -0.17053026D-12     0.10000000D+01    -0.17621460D-11     0.11226575D-11
        0.71054274D-13    -0.28421709D-12
  7     0.73896445D-12    -0.65938366D-11     0.65938366D-11     0.42206239D-11
        0.14210855D-11     0.16484591D-11     0.10000000D+01     0.15276669D-11
        0.85265128D-13    -0.85265128D-12
  8     0.22737368D-12    -0.13642421D-11    -0.22737368D-12     0.15560886D-11
        0.10231815D-11     0.79580786D-12    -0.79580786D-12     0.10000000D+01
       -0.42632564D-13    -0.56843419D-12
  9     0.54001248D-12    -0.56843419D-11     0.50022209D-11     0.80291329D-12
        0.15631940D-11     0.12505552D-11    -0.11937118D-11     0.72475359D-12
        0.10000000D+01    -0.85265128D-12
 10    -0.11368684D-12    -0.22737368D-11     0.45474735D-12     0.95212727D-12
       -0.17053026D-12     0.11368684D-12    -0.45474735D-12     0.42632564D-12
        0.14210855D-13     0.10000000D+01


 Row   *****    [FF] = The Identity Matrix [DD][DUMXX1]    *****

  1     0.10000000D+01    -0.82422957D-12    -0.36948222D-12    -0.39790393D-12
       -0.17053026D-12    -0.90949470D-12    -0.12505552D-11    -0.56843419D-13
       -0.19895197D-12     0.28421709D-12
  2     0.18189894D-11     0.10000000D+01    -0.11368684D-11    -0.22737368D-12
        0.68212103D-12    -0.11368684D-11    -0.11368684D-11    -0.29558578D-11
       -0.22737368D-11    -0.18189894D-11
  3    -0.22737368D-12     0.34106051D-12     0.10000000D+01     0.11368684D-11
        0.45474735D-12     0.31832315D-11     0.43200998D-11     0.90949470D-12
        0.18189894D-11     0.13642421D-11
  4     0.76738615D-12    -0.67501560D-12     0.85975671D-12     0.10000000D+01
        0.86686214D-12     0.49027449D-12     0.46185278D-12     0.70343731D-12
       -0.15631940D-12    -0.15631940D-12
  5    -0.85265128D-12     0.13073986D-11     0.31263880D-12     0.39790393D-12
        0.10000000D+01     0.73896445D-12    -0.51159077D-12     0.11937118D-11
        0.36948222D-12     0.10800250D-11
  6    -0.22737368D-12    -0.17053026D-12    -0.11368684D-12     0.51159077D-12
        0.56843419D-13     0.10000000D+01     0.56843419D-12     0.96633812D-12
        0.22737368D-12     0.45474735D-12
  7     0.17053026D-12    -0.28421709D-12    -0.25579538D-12    -0.22737368D-12
       -0.56843419D-13    -0.56843419D-12     0.10000000D+01    -0.79580786D-12
       -0.39790393D-12    -0.11368684D-12
  8    -0.56843419D-13    -0.71054274D-13    -0.12079227D-12    -0.99475983D-13
        0.28421709D-13    -0.14210855D-12    -0.24868996D-12     0.10000000D+01
       -0.17053026D-12    -0.56843419D-13
```

```
    9     0.71054274D-13   0.18474111D-12    0.16342483D-12    0.19895197D-12
          0.56843419D-13   0.27000624D-12    0.12789769D-12    0.14210855D-12
          0.10000000D+01   0.18474111D-12
   10     0.56843419D-13  -0.17053026D-12   -0.17053026D-12   -0.17053026D-12
         -0.17053026D-12  -0.90949470D-12   -0.14210855D-12   -0.51159077D-12
         -0.73896445D-12   0.10000000D+01
```

```
*****   The Regulator Solution Control Vector [THETA]   *****

 Element      [CV]            Element      Amplitude            Phase

     1     -0.16092001D+00
     2     -0.33316503D+00      1       0.36999215D+00      -0.15421928D+03
     3      0.76015769D-01
     4      0.23329631D+00      2       0.24536822D+00       0.18047349D+02
     5     -0.15592237D+00
     6     -0.19744307D-02      3       0.15593487D+00      -0.90725492D+02
     7     -0.19340434D+00
     8     -0.12047055D+00      4       0.22785608D+00      -0.12191856D+03
     9     -0.16531820D-01
    10     -0.17158719D+00      5       0.17238174D+00      -0.17449674D+03
```

```
*****   The NLP Solution Control Vector [CV]   *****

 Element      [CV]            Element      Amplitude            Phase

     1     -0.16092618D+00
     2     -0.33315547D+00      1       0.36998621D+00      -0.15421777D+03
     3      0.76025438D-01
     4      0.23350939D+00      2       0.24557382D+00       0.18034091D+02
     5     -0.15603567D+00
     6     -0.19430946D-02      3       0.15604776D+00      -0.90713461D+02
     7     -0.19345490D+00
     8     -0.12050082D+00      4       0.22791499D+00      -0.12191830D+03
     9     -0.16539292D-01
    10     -0.17160590D+00      5       0.17240109D+00      -0.17449486D+03
```

```
*****   The Regulator Solution End Conditions Vector [EC] = [ZZ]   *****

 Element      [EC] = [ZZ]

     1      0.25821123D-09
     2     -0.71196382D-10
     3     -0.74990680D-10
     4     -0.20358470D-09
     5      0.39818815D-10
     6     -0.74649620D-10
     7     -0.98197006D-11
     8     -0.46501469D-10
     9     -0.41509907D-10
    10      0.49395155D-10
```

```
*****   Regulator Solution Performance Index  =   0.47335424D-19   *****


           **********   End Case Number   1   **********
```

F-18

F.2 (6 x 2) T-Matrix FX, FY, FZ Hub Shear Forces Problem

A (6 x 2) T-Matrix problem assumes a **six** dimensional control vector comprised of the **three** harmonics [(FXS, FXC), (FYS, FYC), and (FZS, FZC)], and a **two** dimensional end conditions vector comprised of **one** harmonic [(D4S, D4C)].

No Constraints

```
$CDATA
!
!  *****    Start of Case   10                           Input Data   *****
!          T is (6x2)  with   No Constraints.
!          CV  is comprised of the   4  per rev flap angles.
!          EC  is comprised of the   FX, FY, and FZ  5p Hub Loads.
!
 ACC      =     1.0D-8,
 ACC      =     1.0D-7,
 ACCQP    =     1.0D-12,
 AL0      =     0.00,    0.00,    0.00,    0.00,    0.00,
 AU0      =    10.00,   10.00,   10.00,   10.00,   10.00,
 CV00(1)  =     0.000,      0.000,      0.000,      0.000,      0.000,
 CV00(6)  =     0.000,      0.000,      0.000,      0.000,      0.000,
 CVOUT    =        1,
 CVOUT    =        0,
 CVPRV0(1) =    0.000,      0.000,      0.000,      0.000,      0.000,
 CVPRV0(6) =    0.000,      0.000,      0.000,      0.000,      0.000,
 ECPRV0(1) =  -95.5047,   75.6472,   84.8822,   80.7376,   -65.8481,
 ECPRV0(6) =   77.7241,  -37.3010,   31.3994,   43.5907,    12.1522,
 ICASE    =       10,
 IDATA    =        3,
 IOPT     =        1,
 ITOUT    =        0,
 ITOUT    =        4,
 ITOUT    =        2,
 ITOUT    =        1,
 ITOUT    =        3,
 LQL      =    .FALSE.,
 LQL      =    .TRUE.,
 LSAVE    =     0,   0,    0,    0,    0,    0,
 MAXASUM  =     3.000,
 MAXIT    =   300,
 MAXNM    =     0,
 MAXNM    =    10,
 MI       =     0,
 MSAVE0   =     1,    1,    1,    0,    0,
 NSAVE0   =     0,    0,    1,    0,    0,
 NX0      =    10,
 NZ0      =    10,
 OPTEND   =     1,
 OPTEND   =     2,
 OPTEND   =     3,
 RHOB     =     0.0,
 RHOB     =   100.0,
!
!234567890123456789012345678901234567890123456789012345678901234567890
!
  T0(1,1)   =    -90.74040,   119.70700,   122.38400,    78.72380,   -69.68640,
  T0(6,1)   =     66.34010,   -40.05610,    20.25200,    29.75040,    24.36730,
  T0(1,2)   =   -135.69100,    79.44860,    87.60420,   115.95000,   -47.75700,
  T0(6,2)   =     79.13310,   -30.01580,    33.37590,    38.47500,    13.77080,
  T0(1,3)   =   -114.32000,    47.68370,    60.60960,    95.79040,   -56.22380,
  T0(6,3)   =     49.49840,   -24.87710,     3.77782,    24.54600,    -6.34307,
  T0(1,4)   =    -68.17730,    51.47110,    64.58900,    53.42570,   -30.91670,
  T0(6,4)   =     80.52170,    -8.45332,    54.59550,    66.75300,   -12.35370,
  T0(1,5)   =    -50.03930,    63.86900,    76.58370,    37.28330,    44.63530,
  T0(6,5)   =     79.28500,    -5.47938,    73.25790,   123.17900,   -16.06650,
  T0(1,6)   =    -76.47950,   107.92800,   113.11600,    66.38840,   -48.84220,
  T0(6,6)   =    155.67100,   -59.09700,    67.74370,    73.07250,    85.04140,
  T0(1,7)   =   -143.274,     110.904,     110.159,     131.805,     -89.7837,
  T0(6,7)   =    253.607,      17.6567,     49.4077,     19.5904,      70.4063,
  T0(1,8)   =   -137.09,       35.3513,     41.2782,    111.293,     -240.311,
  T0(6,8)   =     32.0795,    -49.5137,     88.9283,      0.494424,    -9.84387,
  T0(1,9)   =   -120.269,      35.5072,     40.179,      68.5191,    -148.798,
  T0(6,9)   =     67.0002,    -82.3286,    119.065,     -13.4636,     -73.7842,
  T0(1,10)  =    -35.6918,     52.9199,     96.5716,     18.697,      -48.3614,
  T0(6,10)  =    -20.1547,   -115.603,     -21.8472,    119.166,      -50.0921,
!
 MULT     =          1,
 MULT     =          0,
!
!  *****    End of Case   10  Input Data    *****
!
```

```
    $END



  ********************************************************************************


             ***************   Start Case Number   10   **************


          ***************   INPUT DATA for Case Number   10   **************


 &CDATA
  A00= 6*1.0000000000000000        ,
  ACC= 9.9999999999999955E-008,
  ACCQP= 9.9999999999999980E-013,
  AL0= 5*0.0000000000000000         ,-9.9999999999999955E-008,
  ALPHA=  1.0000000000000000       ,
  APRV0= 6.95321798395199821E-310,  0.0000000000000000    , 2.12199579096527232E-314,
 2.17201545544315946E-314, 2.17201952901440942E-314,
   4.94065645841246544E-324,
  AU0= 5*10.000000000000000        ,  3.0000000000000000      ,
  CRAN1=  2.0000000000000000      ,
  CRAN2=  3.0000000000000000       ,
  CRAN3=  1.0000000000000000       ,
  CRAN4=  1.0000000000000000       ,
  CV00= 10*0.0000000000000000         , 1.48219693752373963E-323, 6.95322798029051193E-
 310, 6.38421746243141959E-319, 6.95322798001739244E-310,

  CVOUT=          0,
  CVPRV0= 10*0.0000000000000000          , 6.95322798000395386E-310, 6.95321798389310559E-
 310, 6.95325616664988679E-310,  0.0000000000000000      ,

  ECPRV0= -95.504700000000000       ,  75.647199999999998      ,  84.882199999999997     ,
 80.737600000000000      , -65.848100000000002       ,
    77.724100000000007       , -37.301000000000002      ,  31.399400000000000      ,
 43.590699999999998       ,  12.152200000000001       ,
  EPS= 9.9999999999999955E-008,
  ICASE=         10,
  ICYCL0=       2000,
  IDATA=          3,
  IN=         5,
  IOPT=          1,
  IOUT=          6,
  IPRINT=          2,
  ISEED1=       2395,          4013,          3813,          1837,
  ISEED2=       1843,          4011,          3364,          2835,
  ISEED3=       3962,          1111,          3215,          2637,
  ISEED4=       2397,          1504,          4031,          3173,
  ITOUT=          3,
  L=          1,
  LQL=T,
  LSAVE= 6*0            ,
  MAXASUM=  3.0000000000000000       ,
  MAXFUN=         30,
  MAXIT=        300,
  MAXNM=         10,
  MI=          0,
  MINASUM=  0.0000000000000000       ,
  MODE=          0,
  MSAVE0= 3*1           , 2*0            , 5*1           ,
  MULT=          0,
  NSAVE0= 2*0            ,          1, 2*0           , 5*1            ,
  NX0=         10,
  NZ0=         10,
  OPTEND=          3,
  PHASE0= 6*90.000000000000000        ,
  PHSPRV0= 6.95314360825605601E-310, 6.95314360825595720E-310,  0.0000000000000000
 , 6.95322797845258773E-310, 2*0.0000000000000000        ,

  RHOB=  100.00000000000000       ,

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```

```
 STPMIN=  0.0000000000000000       ,
 T0= -90.740399999999994      ,  119.70699999999999      ,  122.38400000000000      ,
78.723799999999997      , -69.686400000000006      ,
   66.340100000000007      , -40.056100000000001      ,  20.251999999999999      ,
29.750399999999999      ,  24.367300000000000      , -135.69100000000000      ,
   79.448599999999999      ,  87.604200000000006      ,  115.95000000000000      , -
47.756999999999998      ,  79.133099999999999      , -30.015799999999999      ,
   33.375900000000001      ,  38.475000000000001      ,  13.770799999999999      , -
114.31999999999999      ,  47.683700000000002      ,  60.609600000000000      ,
   95.790400000000005      , -56.223799999999997      ,  49.498399999999997      , -
24.877099999999999      ,  3.7778200000000002      ,  24.545999999999999      ,
   -6.3430700000000000      , -68.177300000000002      ,  51.471100000000000      ,
64.588999999999999      ,  53.425699999999999      , -30.916699999999999      ,
   80.521699999999996      , -8.4533199999999997      ,  54.595500000000001      ,
66.753000000000000      , -12.353700000000000      , -50.039299999999997      ,
   63.869000000000000      ,  76.583699999999993      ,  37.283299999999997      ,
44.635300000000001      ,  79.284999999999997      , -5.4793799999999999      ,
   73.257900000000006      ,  123.17900000000000      , -16.066500000000001      , -
76.479500000000002      ,  107.92800000000000      ,  113.11600000000000      ,
   66.388400000000004      , -48.842199999999998      ,  155.67099999999999      , -
59.097000000000001      ,  67.743700000000004      ,  73.072500000000005      ,
   85.041399999999996      , -143.27400000000000      ,  110.90400000000000      ,
110.15900000000001      ,  131.80500000000001      , -89.783699999999996      ,
   253.60700000000000      ,  17.656700000000001      ,  49.407699999999998      ,
19.590399999999999      ,  70.406300000000002      , -137.09000000000000      ,
   35.351300000000002      ,  41.278199999999998      ,  111.29300000000001      , -
240.31100000000001      ,  32.079500000000003      , -49.513700000000000      ,
   88.928299999999993      ,  0.49442399999999997      , -9.8438700000000008      , -
120.26900000000001      ,  35.507199999999997      ,  40.179000000000002      ,
   68.519099999999995      , -148.79800000000000      ,  67.000200000000007      , -
82.328599999999994      ,  119.06500000000000      , -13.463600000000000      ,
   -73.784199999999998      , -35.691800000000001      ,  52.919899999999998      ,
96.571600000000004      ,  18.696999999999999      , -48.361400000000003      ,
   -20.154699999999998      , -115.60299999999999      , -21.847200000000001      ,
119.16600000000000      , -50.092100000000002      ,
 WDT0= 10*1.0000000000000000      ,
 WDX= 10*0.0000000000000000      ,
 WX= 10*0.0000000000000000      ,
 WZ= 10*1.0000000000000000      ,
 /
```

```
 ****************************************************************************


      ***************   OUTPUT DATA for Case Number   10   ***************

   *****    The Initial T-Matrix (T0) and Either the Initial
                  Previous Actual NLP Control Vector (CVPRV0) or
                     the Initial Previous Control Amplitude (APRV0)
                        and Phase Angle (PHSPRV0) Vectors Before
                              Compression are Directly Input   *****

   *****    Input the Initial Previous Actual NLP Control
                  Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                     and then Compute the Previous Control Amplitude (APRV0)
                        and Control Phase Angle (PHSPRV0) Vectors   *****



            **********   Case Number   10   **********



   *****    Initial Previous Control Amplitude (APRV0) and Phase
                        Angle (PHSPRV0) Vectors before Compression   *****

     Element    AL0              APRV0             AU0              PHSPRV0

        1    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
        2    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
        3    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
        4    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
```

```
     5      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00

*****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

Element        CVL0                CVPRV0                CVU0

     1      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     2      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     3      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     4      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     5      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     6      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     7      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     8      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     9      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    10      -0.10000000D+02      0.00000000D+00      0.10000000D+02

*****   Either the BEFORE Compression Initial Actual NLP Control
          Vector Estimates (CV00), OR the BEFORE Compression
            Initial Control Vector Amplitudes (A00) and Phase
             Angles (PHASE0) Estimates are Directly Input
                  via NAMELIST Data CDATA                          *****

*****   Input the Initial Actual NLP Control Vector Estimate
          (CV00) Directly Via NAMELIST Input CDATA, and
                then Compute the Control Vector Amplitudes
                    (A00) and Phase Angles (PHASE0) Estimates   *****



            **********   Case Number   10   **********


*****   Adjust the Initial Control Amplitude Estimates Vector
         (A00) to define the Initial Control Amplitude Estimates
          Vector (A0) to Within Limits If Required Before Compression   *****


*****   Initial Control Amplitude Vector Estimates (A0), Its
                 Limits (AL0 & AU0), and Its Phase Angle Vector
                      Estimates (PHASE0) Before Compression   *****

Element    AL0                 A0                  AU0                 PHASE0

     1   0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
     1   0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
     2   0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
     2   0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
     3   0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
     3   0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
     4   0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
     4   0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
     5   0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
     5   0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00

*****   Initial Actual NLP Control Vector Estimates (CV0) and
                   Its Limits (CVL0 & CVU0) Before Compression   *****

Element        CVL0                CV0                 CVU0

     1      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     2      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     3      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     4      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     5      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     6      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     7      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     8      -0.10000000D+02      0.00000000D+00      0.10000000D+02
     9      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    10      -0.10000000D+02      0.00000000D+00      0.10000000D+02


*****   End Conditions Vector EC0, Previous Cycle
                End Conditions Vector ECPRV0, and Weighting
```

Element	EC0	ECPRV0	WDT0
1	-0.95504700D+02	-0.95504700D+02	0.10000000D+01
2	0.75647200D+02	0.75647200D+02	0.10000000D+01
3	0.84882200D+02	0.84882200D+02	0.10000000D+01
4	0.80737600D+02	0.80737600D+02	0.10000000D+01
5	-0.65848100D+02	-0.65848100D+02	0.10000000D+01
6	0.77724100D+02	0.77724100D+02	0.10000000D+01
7	-0.37301000D+02	-0.37301000D+02	0.10000000D+01
8	0.31399400D+02	0.31399400D+02	0.10000000D+01
9	0.43590700D+02	0.43590700D+02	0.10000000D+01
10	0.12152200D+02	0.12152200D+02	0.10000000D+01

**********   Case Number   10   **********

Specification of CV, T-matrix, and EC Compression

MSAVE0/MSAVE

	1		1		1		0		0
1	1	1	1	1	1	0	0	0	0

NSAVE0/NSAVE

	0		0		1		0		0
0	0	0	0	1	1	0	0	0	0

******************   T-Matrix Compression is Initiated   ********************

*****   Initial Control Vector (CV0), T-Matrix (T0),
                                 and Measurement Vector (EC0)   *****

*****   Initial Control Vector (CV0)   *****

```
CV0     0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
        0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
        0.00000000D+00    0.00000000D+00
```

*****   Initial Greatest Least Bounds (CVL0) for the
                                 Control Vector (CV0)   *****

```
CVL0   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
       -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
       -0.10000000D+02   -0.10000000D+02
```

*****   Initial Least Upper Bounds (CVU0) for the
                                 Control Vector (CV0)   *****

```
CVU0    0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
        0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
        0.10000000D+02    0.10000000D+02
```

Row   *****   Initial T-Matrix (T0)   *****

```
T0  1   -0.90740400D+02   -0.13569100D+03   -0.11432000D+03   -0.68177300D+02
        -0.50039300D+02   -0.76479500D+02   -0.14327400D+03   -0.13709000D+03
        -0.12026900D+03   -0.35691800D+02

T0  2    0.11970700D+03    0.79448600D+02    0.47683700D+02    0.51471100D+02
         0.63869000D+02    0.10792800D+03    0.11090400D+03    0.35351300D+02
         0.35507200D+02    0.52919900D+02
```

```
  T0   3     0.12238400D+03     0.87604200D+02     0.60609600D+02     0.64589000D+02
             0.76583700D+02     0.11311600D+03     0.11015900D+03     0.41278200D+02
             0.40179000D+02     0.96571600D+02

  T0   4     0.78723800D+02     0.11595000D+03     0.95790400D+02     0.53425700D+02
             0.37283300D+02     0.66388400D+02     0.13180500D+03     0.11129300D+03
             0.68519100D+02     0.18697000D+02

  T0   5    -0.69686400D+02    -0.47757000D+02    -0.56223800D+02    -0.30916700D+02
             0.44635300D+02    -0.48842200D+02    -0.89783700D+02    -0.24031100D+03
            -0.14879800D+03    -0.48361400D+02

  T0   6     0.66340100D+02     0.79133100D+02     0.49498400D+02     0.80521700D+02
             0.79285000D+02     0.15567100D+03     0.25360700D+03     0.32079500D+02
             0.67000200D+02    -0.20154700D+02

  T0   7    -0.40056100D+02    -0.30015800D+02    -0.24877100D+02    -0.84533200D+01
            -0.54793800D+01    -0.59097000D+02     0.17656700D+02    -0.49513700D+02
            -0.82328600D+02    -0.11560300D+03

  T0   8     0.20252000D+02     0.33375900D+02     0.37778200D+01     0.54595500D+02
             0.73257900D+02     0.67743700D+02     0.49407700D+02     0.88928300D+02
             0.11906500D+03    -0.21847200D+02

  T0   9     0.29750400D+02     0.38475000D+02     0.24546000D+02     0.66753000D+02
             0.12317900D+03     0.73072500D+02     0.19590400D+02     0.49442400D+00
            -0.13463600D+02     0.11916600D+03

  T0  10     0.24367300D+02     0.13770800D+02    -0.63430700D+01    -0.12353700D+02
            -0.16066500D+02     0.85041400D+02     0.70406300D+02    -0.98438700D+01
            -0.73784200D+02    -0.50092100D+02


   *****    Initial End Conditions Vector (EC0)    *****

    EC0    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02

   *****    Initial End Conditions Weighting Coefficient Vector
                          (WDT0) for the Performance Index (F)    *****

    WDT0    0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
            0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
            0.10000000D+01     0.10000000D+01


   *****    Initial Control Vector (CVPRV0) and Measurement
                          Vector (ECPRV0) from the Previous Duty Cycle    *****


   *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

 CVPRV0    0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00


   *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

 ECPRV0   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02


   *****    Intermediate Control Vector (CV), T-Matrix (TT),
            and Measurement Vector (ECT) after the First Compression    *****


   *****    Intermediate Control Vector (CV) after the First Compression    *****

     CV    0.00000000D+00     0.00000000D+00
```

```
    *****    Intermediate Greatest Least Bounds (CVL) for the
                                            Control Vector (CV)    *****

   CVL    -0.10000000D+02    -0.10000000D+02

    *****    Intermediate Least Upper Bounds (CVU) for the
                                            Control Vector (CV)    *****

   CVU     0.10000000D+02     0.10000000D+02


     Row         *****    Intermediate T-Matrix (TT)    *****

  TT  1    -0.50039300D+02    -0.76479500D+02

  TT  2     0.63869000D+02     0.10792800D+03

  TT  3     0.76583700D+02     0.11311600D+03

  TT  4     0.37283300D+02     0.66388400D+02

  TT  5     0.44635300D+02    -0.48842200D+02

  TT  6     0.79285000D+02     0.15567100D+03

  TT  7    -0.54793800D+01    -0.59097000D+02

  TT  8     0.73257900D+02     0.67743700D+02

  TT  9     0.12317900D+03     0.73072500D+02

  TT 10    -0.16066500D+02     0.85041400D+02


   *****    Intermediate End Conditions Vector (ECT)    *****

   ECT    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02

   *****    Intermediate End Conditions Weighting Coefficient Vector
                            (WDTT) for the Performance Index (F)    *****

   WDTT    0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01


   *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                         (ECPRV0) from the Previous Duty Cycle after
                                        the First Compression    *****


   *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                        the First Compression    *****

  CVPRV    0.00000000D+00     0.00000000D+00


   *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                    after the First Compression    *****

 ECPRVT   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02


   *****    Final Control Vector (CV), T-Matrix (T), and
                  Measurement Vector (EC) after the Second Compression    *****


   *****    Final Control Vector (CV) after the Second Compression    *****

    CV     0.00000000D+00     0.00000000D+00
```

```
  *****   Greatest Least Bounds (CVL) Vector for the
                                              Control Vector (CV)   *****

  CVL    -0.10000000D+02    -0.10000000D+02

  *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)   *****

  CVU     0.10000000D+02     0.10000000D+02


   Row              *****   Final T-Matrix (T)   *****

 T  1    -0.50039300D+02    -0.76479500D+02

 T  2     0.63869000D+02     0.10792800D+03

 T  3     0.76583700D+02     0.11311600D+03

 T  4     0.37283300D+02     0.66388400D+02

 T  5     0.44635300D+02    -0.48842200D+02

 T  6     0.79285000D+02     0.15567100D+03


  *****   Final End Conditions Vector (EC) after the Second Compression   *****

   EC    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02

  *****   Final End Conditions Weighting Coefficient Vector
                                (WDT) for the Performance Index (F)   *****

  WDT     0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
          0.10000000D+01     0.10000000D+01


  *****   Final Control Vector (CVPRV) and Measurement Vector
                    (ECPRV) from the Previous Duty Cycle after
                                              the Second Compression   *****


  *****   Final Previous Cycle Control Vector (CVPRV) after
                                         the Second Compression   *****

CVPRV     0.00000000D+00     0.00000000D+00


  *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                    after the Second Compression   *****

ECPRV    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02


******************   T-Matrix Compression is Completed   ********************


  *****   Initial End Conditions Vector EC   *****


   -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
   -0.65848100D+02      0.77724100D+02


  *****   Initial Performance Index  =   0.38944203D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

  Element    AL              A               AU              PHASE

     1     0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
```

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```
                    **********   Case Number   10   **********


                                      LSAVE

      0        0


  *****    Solve the NLPQLP Problem for Case Number   10    *****




    ----------------------------------------------------------------------
    START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
    ----------------------------------------------------------------------


    Parameters:
       N      =        2
       M      =        0
       ME     =        0
       MODE   =        0
       ACC    =    0.1000D-06
       ACCQP  =    0.1000D-11
       STPMIN =    0.0000D+00
       RHOB   =    0.1000D+03
       MAXFUN =       30
       MAXNM  =       10
       MAXIT  =      300
       IPRINT =        2

    Output in the following order:
       IT    - iteration number
       F     - objective function value
       SCV   - sum of constraint violations
       NA    - number of active constraints
       I     - number of line search iterations
       ALPHA - steplength parameter
       DELTA - additional variable to prevent inconsistency
       KKT   - Karush-Kuhn-Tucker optimality criterion


     IT        F           SCV      NA  I    ALPHA     DELTA      KKT
    ----------------------------------------------------------------------
     1  0.38944203D+05  0.00D+00    0  0   0.00D+00  0.00D+00  0.27D+07
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     2  0.50240848D+05  0.00D+00    0  2   0.10D+00  0.00D+00  0.26D+06
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     3  0.39904039D+05  0.00D+00    0  2   0.10D+00  0.00D+00  0.21D+07
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     4  0.19685856D+05  0.00D+00    0  2   0.10D+00  0.00D+00  0.31D+05
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     5  0.49996391D+04  0.00D+00    0  1   0.10D+01  0.00D+00  0.69D+04
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     6  0.43986783D+04  0.00D+00    0  2   0.17D+00  0.00D+00  0.48D+02
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     7  0.43750704D+04  0.00D+00    0  1   0.10D+01  0.00D+00  0.33D-02
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     8  0.43750687D+04  0.00D+00    0  1   0.10D+01  0.00D+00  0.77D-14
```

```
    --- Final Convergence Analysis at Last Iterate ---

    Objective function value:      F(X)  =  0.43750687D+04
    Solution values:               X     =
        0.28609253D+00 -0.89542167D+00
    Distances from lower bounds:   X-XL  =
        0.10286093D+02  0.91045783D+01
    Distances from upper bounds:   XU-X  =
        0.97139075D+01  0.10895422D+02
    Multipliers for lower bounds:  U     =
        0.00000000D+00  0.00000000D+00
    Multipliers for upper bounds:  U     =
        0.00000000D+00  0.00000000D+00
    Number of function calls:      NFUNC =      12
    Number of gradient calls:      NGRAD =       8
    Number of calls of QP solver:  NQL   =       8



              *****   Completed CALL to NLPQLP   *****


         *****   Number of Function Evaluations =     28   *****


*****   Solution Control Vector for Case Number   10   *****

Element    CVL                CV                 CVU                CV - CV0

   1   -0.10000000D+02    0.28609253D+00    0.10000000D+02    0.28609253D+00
   2   -0.10000000D+02   -0.89542167D+00    0.10000000D+02   -0.89542167D+00




*****   Predicted Measurement Vector EC   *****

  -0.41339176D+02     -0.27214153D+01     0.55057183D+01     0.31958468D+02
  -0.93439144D+01     -0.38984225D+02


*****   NLP Solution Performance Index  =   0.43750687D+04   *****




*****   Predicted Measurement Vector EC   *****

  -0.41339168D+02     -0.27214261D+01     0.55057070D+01     0.31958462D+02
  -0.93439096D+01     -0.38984241D+02


*****   NLP Solution Performance Index  =   0.43750687D+04   *****




*****   Predicted Control Amplitude Vector (A)
            Its Limits (AL & AU), and Its Phase Angle
                              Vector (PHASE) Before Compression   *****

Element    AL              A               AU              PHASE

   1   0.00000000D+00   0.94001538D+00   0.10000000D+02   0.16228101D+03


*****   No Constraints are Specified for Case Number   10   *****



              **********   End Case Number   10   **********
```

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F.3   (2 x 2) T-Matrix FX Hub Shear Forces Problems

A (2 x 2) T-Matrix problem assumes a **two** dimensional control vector comprised of **one** harmonic [(FXS, FXC)], and a **two** dimensional end conditions vector comprised of **one** harmonic [(D4S, D4C)].

```
$CDATA
!
!  *****   Start of Case  20                         Input Data   *****
!           T is (2x2)  with   No Constraints.
!           CV  is comprised of the  4  per rev flap angles.
!           EC  is comprised of the  FX  5p Hub Loads.
!
 ACC       =     1.0D-8,
 ACC       =     1.0D-7,
 ACCQP     =     1.0D-12,
 AL0       =     0.00,    0.00,    0.00,    0.00,    0.00,
 AU0       =    10.00,   10.00,   10.00,   10.00,   10.00,
 CV00(1)   =     0.000,     0.000,     0.000,     0.000,     0.000,
 CV00(6)   =     0.000,     0.000,     0.000,     0.000,     0.000,
 CVOUT     =       1,
 CVOUT     =       0,
 CVPRV0(1) =     0.000,     0.000,     0.000,     0.000,     0.000,
 CVPRV0(6) =     0.000,     0.000,     0.000,     0.000,     0.000,
 ECPRV0(1) =  -95.5047,   75.6472,   84.8822,   80.7376,  -65.8481,
 ECPRV0(6) =   77.7241,  -37.3010,   31.3994,   43.5907,   12.1522,
 ICASE     =      20,
 IDATA     =       3,
 IOPT      =       1,
 ITOUT     =       0,
 ITOUT     =       4,
 ITOUT     =       2,
 ITOUT     =       1,
 ITOUT     =       3,
 LQL       =    .FALSE.,
 LQL       =    .TRUE.,
 LSAVE     =     0,    0,    0,    0,    0,    0,
 MAXASUM   =     3.000,
 MAXIT     =   300,
 MAXNM     =      0,
 MAXNM     =     10,
 MI        =      0,
 MSAVE0    =     1,    0,    0,    0,    0,
 NSAVE0    =     0,    0,    1,    0,    0,
 NX0       =     10,
 NZ0       =     10,
 OPTEND    =      1,
 OPTEND    =      2,
 OPTEND    =      3,
 RHOB      =     0.0,
 RHOB      =   100.0,
!
!234567890123456789012345678901234567890123456789012345678901234567890
!
  T0(1,1)   =    -90.74040,   119.70700,   122.38400,    78.72380,   -69.68640,
  T0(6,1)   =     66.34010,   -40.05610,    20.25200,    29.75040,    24.36730,
  T0(1,2)   =   -135.69100,    79.44860,    87.60420,   115.95000,   -47.75700,
  T0(6,2)   =     79.13310,   -30.01580,    33.37590,    38.47500,    13.77080,
  T0(1,3)   =   -114.32000,    47.68370,    60.60960,    95.79040,   -56.22380,
  T0(6,3)   =     49.49840,   -24.87710,     3.77782,    24.54600,    -6.34307,
  T0(1,4)   =    -68.17730,    51.47110,    64.58900,    53.42570,   -30.91670,
  T0(6,4)   =     80.52170,    -8.45332,    54.59550,    66.75300,   -12.35370,
  T0(1,5)   =    -50.03930,    63.86900,    76.58370,    37.28330,    44.63530,
  T0(6,5)   =     79.28500,    -5.47938,    73.25790,   123.17900,   -16.06650,
  T0(1,6)   =    -76.47950,   107.92800,   113.11600,    66.38840,   -48.84220,
  T0(6,6)   =    155.67100,   -59.09700,    67.74370,    73.07250,    85.04140,
  T0(1,7)   =   -143.274,     110.904,     110.159,     131.805,     -89.7837,
  T0(6,7)   =    253.607,      17.6567,     49.4077,     19.5904,      70.4063,
  T0(1,8)   =   -137.09,       35.3513,     41.2782,    111.293,     -240.311,
  T0(6,8)   =     32.0795,    -49.5137,     88.9283,      0.494424,    -9.84387,
  T0(1,9)   =   -120.269,      35.5072,     40.179,      68.5191,    -148.798,
  T0(6,9)   =     67.0002,    -82.3286,    119.065,     -13.4636,     -73.7842,
  T0(1,10)  =    -35.6918,     52.9199,     96.5716,     18.697,      -48.3614,
  T0(6,10)  =    -20.1547,   -115.603,     -21.8472,    119.166,      -50.0921,
!
 MULT      =          0,
 MULT      =          1,
!
!  *****   End of Case  20  Input Data   *****
!
```

```
$END
$CDATA
!
!  *****   Start of Case  1020                        Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FX  5p Hub Loads.
!
 AU0     =   10.00,  10.00,  10.00,  10.00,  10.00,
 ICASE   = 1020,
 IOPT    =    1,
 LSAVE   =    1,   0,   0,   0,   0,   0,
 MI      =    1,
 MSAVE0  =    1,   0,   0,   0,   0,
 NSAVE0  =    0,   0,   1,   0,   0,
!
 MULT    =          0,
 MULT    =          1,
!
!  *****   End of Case 1020  Input Data   *****
!
$END
$CDATA
!
!  *****   Start of Case  820                         Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FX  5p Hub Loads.
!
 AU0     =   10.00,  10.00,   8.00,  10.00,  10.00,
 ICASE   =  820,
 IOPT    =    1,
 LSAVE   =    1,   0,   0,   0,   0,   0,
 MI      =    1,
 MSAVE0  =    1,   0,   0,   0,   0,
 NSAVE0  =    0,   0,   1,   0,   0,
!
 MULT    =          0,
 MULT    =          1,
!
!  *****   End of Case  820  Input Data   *****
!
$END
$CDATA
!
!  *****   Start of Case  620                         Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FX  5p Hub Loads.
!
 AU0     =   10.00,  10.00,   6.00,  10.00,  10.00,
 ICASE   =  620,
 IOPT    =    1,
 LSAVE   =    1,   0,   0,   0,   0,   0,
 MI      =    1,
 MSAVE0  =    1,   0,   0,   0,   0,
 NSAVE0  =    0,   0,   1,   0,   0,
!
 MULT    =          0,
 MULT    =          1,
!
!  *****   End of Case  620  Input Data   *****
!
$END
$CDATA
!
!  *****   Start of Case  420                         Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FX  5p Hub Loads.
!
 AU0     =   10.00,  10.00,   4.00,  10.00,  10.00,
 ICASE   =  420,
 IOPT    =    1,
```

```
 LSAVE  =    1,   0,   0,   0,   0,   0,
 MI     =    1,
 MSAVE0 =    1,   0,   0,   0,   0,
 NSAVE0 =    0,   0,   1,   0,   0,
!
 MULT   =         0,
 MULT   =         1,
!
! *****   End of Case  420  Input Data   *****
!
$END
$CDATA
!
! *****   Start of Case  220                    Input Data   *****
!         T is (2x2)  with   One Constraint.
!         CV  is comprised of the  4  per rev flap angles.
!         EC  is comprised of the  FX  5p Hub Loads.
!
 AU0    =  10.00, 10.00,  2.00, 10.00, 10.00,
 ICASE  =  220,
 IOPT   =    1,
 LSAVE  =    1,   0,   0,   0,   0,   0,
 MI     =    1,
 MSAVE0 =    1,   0,   0,   0,   0,
 NSAVE0 =    0,   0,   1,   0,   0,
!
 MULT   =         0,
 MULT   =         1,
!
! *****   End of Case  220  Input Data   *****
!
$END
$CDATA
!
! *****   Start of Case  120                    Input Data   *****
!         T is (2x2)  with   One Constraint.
!         CV  is comprised of the  4  per rev flap angles.
!         EC  is comprised of the  FX  5p Hub Loads.
!
 AU0    =  10.00, 10.00,  1.00, 10.00, 10.00,
 ICASE  =  120,
 IOPT   =    1,
 LSAVE  =    1,   0,   0,   0,   0,   0,
 MI     =    1,
 MSAVE0 =    1,   0,   0,   0,   0,
 NSAVE0 =    0,   0,   1,   0,   0,
!
 MULT   =         0,
 MULT   =         1,
!
! *****   End of Case  120  Input Data   *****
!
$END
$CDATA
!
! *****   Start of Case 0320                    Input Data   *****
!         T is (2x2)  with   One Constraint.
!         CV  is comprised of the  4  per rev flap angles.
!         EC  is comprised of the  FX  5p Hub Loads.
!
 AU0    =  10.00, 10.00,  0.30, 10.00, 10.00,
 ICASE  = 0320,
 IOPT   =    1,
 LSAVE  =    1,   0,   0,   0,   0,   0,
 MI     =    1,
 MSAVE0 =    1,   0,   0,   0,   0,
 NSAVE0 =    0,   0,   1,   0,   0,
!
 MULT   =         1,
 MULT   =         0,
!
! *****   End of Case  0320  Input Data   *****
!
$END
```

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```
    ****************************************************************************


            ***************   Start Case Number   20   ***************

          ***************   INPUT DATA for Case Number   20   ***************

 &CDATA
  A00= 6*1.0000000000000000          ,
  ACC= 9.9999999999999955E-008,
  ACCQP= 9.9999999999999980E-013,
  AL0= 5*0.0000000000000000        ,-9.9999999999999955E-008,
  ALPHA= 1.0000000000000000         ,
  APRV0= 6.95321237063267278E-310, 0.0000000000000000      , 2.12199579096527232E-314,
 2.22814864869743451E-314, 2.22815272226868448E-314,
   4.94065645841246544E-324,
  AU0= 5*10.000000000000000         ,  3.0000000000000000      ,
  CRAN1=  2.0000000000000000       ,
  CRAN2=  3.0000000000000000       ,
  CRAN3=  1.0000000000000000       ,
  CRAN4=  1.0000000000000000       ,
  CV00= 10*0.0000000000000000          , 1.48219693752373963E-323, 6.95323359360983736E-
 310, 7.61607133720739960E-319, 6.95323359333671787E-310,

  CVOUT=          0,
  CVPRV0= 10*0.0000000000000000           , 6.95323359332327929E-310, 6.95321237057378016E-
 310, 6.95325616664988679E-310,  0.0000000000000000       ,

  ECPRV0= -95.504700000000000        ,   75.647199999999998      ,  84.882199999999997      ,
 80.737600000000000      , -65.848100000000002       ,
    77.724100000000007        , -37.301000000000002      ,  31.399400000000000       ,
 43.590699999999998      ,  12.152200000000001      ,
  EPS= 9.9999999999999955E-008,
  ICASE=          20,
  ICYCL0=       2000,
  IDATA=          3,
  IN=          5,
  IOPT=          1,
  IOUT=          6,
  IPRINT=          2,
  ISEED1=       2395,       4013,       3813,       1837,
  ISEED2=       1843,       4011,       3364,       2835,
  ISEED3=       3962,       1111,       3215,       2637,
  ISEED4=       2397,       1504,       4031,       3173,
  ITOUT=          3,
  L=          1,
  LQL=T,
  LSAVE= 6*0            ,
  MAXASUM=  3.0000000000000000       ,
  MAXFUN=         30,
  MAXIT=         300,
  MAXNM=         10,
  MI=          0,
  MINASUM=  0.0000000000000000       ,
  MODE=          0,
  MSAVE0=          1, 4*0            , 5*1             ,
  MULT=          1,
  NSAVE0= 2*0           ,           1, 2*0          , 5*1          ,
  NX0=         10,
  NZ0=         10,
  OPTEND=          3,
  PHASE0= 6*90.000000000000000        ,
  PHSPRV0= 6.95314360825605601E-310, 6.95314360825595720E-310,  0.0000000000000000
 , 6.95323359177191316E-310, 2*0.0000000000000000        ,

  RHOB=  100.00000000000000        ,
  STPMIN=  0.0000000000000000        ,
  T0= -90.740399999999994       ,  119.70699999999999       ,  122.38400000000000      ,
 78.723799999999997      , -69.686400000000006        ,
    66.340100000000007        , -40.056100000000001      ,  20.251999999999999       ,
 29.750399999999999      ,  24.367300000000000      , -135.69100000000000       ,
```

```
    79.448599999999999     ,    87.604200000000006     ,   115.95000000000000       , -
47.756999999999998     ,    79.133099999999999     ,  -30.015799999999999        ,
    33.375900000000001     ,    38.475000000000001     ,    13.770799999999999       , -
114.31999999999999     ,    47.683700000000002     ,    60.609600000000000        ,
    95.790400000000005     ,   -56.223799999999997     ,    49.498399999999997       , -
24.877099999999999     ,     3.7778200000000002     ,    24.545999999999999        ,
    -6.3430700000000000     ,   -68.177300000000002     ,    51.471100000000000        ,
64.588999999999999     ,    53.425699999999999     ,  -30.916699999999999        ,
    80.521699999999996     ,    -8.4533199999999997     ,    54.595500000000001        ,
66.753000000000000     ,   -12.353700000000000     ,  -50.039299999999997        ,
    63.869000000000000     ,    76.583699999999993     ,    37.283299999999997        ,
44.635300000000001     ,    79.284999999999997     ,   -5.4793799999999999        ,
    73.257900000000006     ,   123.17900000000000     ,  -16.066500000000001       , -
76.479500000000002     ,   107.92800000000000     ,   113.11600000000000        ,
    66.388400000000004     ,   -48.842199999999998     ,   155.67099999999999       , -
59.097000000000001     ,    67.743700000000004     ,    73.072500000000005        ,
    85.041399999999996     ,  -143.27400000000000     ,   110.90400000000000        ,
110.15900000000001     ,   131.80500000000001     ,  -89.783699999999996        ,
    253.60700000000000     ,    17.656700000000001     ,    49.407699999999998        ,
19.590399999999999     ,    70.406300000000002     , -137.09000000000000        ,
    35.351300000000002     ,    41.278199999999998     ,   111.29300000000001       , -
240.31100000000001     ,    32.079500000000003     ,  -49.513700000000000        ,
    88.928299999999993     ,     0.49442399999999997    ,    -9.8438700000000008       , -
120.26900000000001     ,    35.507199999999997     ,    40.179000000000002        ,
    68.519099999999995     ,  -148.79800000000000     ,    67.000200000000007       , -
82.328599999999994     ,   119.06500000000000     ,  -13.463600000000000        ,
    -73.784199999999998     ,   -35.691800000000001     ,    52.919899999999998        ,
96.571600000000004     ,    18.696999999999999     ,  -48.361400000000003        ,
    -20.154699999999998     ,  -115.60299999999999     ,  -21.847200000000001        ,
119.16600000000000     ,   -50.092100000000002     ,
 WDT0= 10*1.0000000000000000           ,
 WDX= 10*0.0000000000000000         ,
 WX= 10*0.0000000000000000        ,
 WZ= 10*1.0000000000000000         ,
 /


 ******************************************************************************

      ***************   OUTPUT DATA for Case Number   20   ***************


   *****   The Initial T-Matrix (T0) and Either the Initial
                   Previous Actual NLP Control Vector (CVPRV0) or
                      the Initial Previous Control Amplitude (APRV0)
                         and Phase Angle (PHSPRV0) Vectors Before
                            Compression are Directly Input   *****

   *****   Input the Initial Previous Actual NLP Control
                   Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                      and then Compute the Previous Control Amplitude (APRV0)
                         and Control Phase Angle (PHSPRV0) Vectors   *****


               **********   Case Number   20   **********


   *****   Initial Previous Control Amplitude (APRV0) and Phase
                         Angle (PHSPRV0) Vectors before Compression   *****

   Element    AL0              APRV0             AU0               PHSPRV0

      1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      2     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      3     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      4     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      5     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00

   *****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

   Element      CVL0              CVPRV0            CVU0

      1      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      2      -0.10000000D+02    0.00000000D+00    0.10000000D+02
```

```
        3        -0.10000000D+02      0.00000000D+00      0.10000000D+02
        4        -0.10000000D+02      0.00000000D+00      0.10000000D+02
        5        -0.10000000D+02      0.00000000D+00      0.10000000D+02
        6        -0.10000000D+02      0.00000000D+00      0.10000000D+02
        7        -0.10000000D+02      0.00000000D+00      0.10000000D+02
        8        -0.10000000D+02      0.00000000D+00      0.10000000D+02
        9        -0.10000000D+02      0.00000000D+00      0.10000000D+02
       10        -0.10000000D+02      0.00000000D+00      0.10000000D+02
```

```
*****    Either the BEFORE Compression Initial Actual NLP Control
            Vector Estimates (CV00), OR the BEFORE Compression
              Initial Control Vector Amplitudes (A00) and Phase
               Angles (PHASE0) Estimates are Directly Input
                    via NAMELIST Data CDATA                        *****


*****    Input the Initial Actual NLP Control Vector Estimate
            (CV00) Directly Via NAMELIST Input CDATA, and
                  then Compute the Control Vector Amplitudes
                    (A00) and Phase Angles (PHASE0) Estimates     *****



              **********   Case Number   20   **********



*****    Adjust the Initial Control Amplitude Estimates Vector
          (A00) to define the Initial Control Amplitude Estimates
           Vector (A0) to Within Limits If Required Before Compression   *****


*****    Initial Control Amplitude Vector Estimates (A0), Its
                  Limits (AL0 & AU0), and Its Phase Angle Vector
                            Estimates (PHASE0) Before Compression   *****
```

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

```
*****    Initial Actual NLP Control Vector Estimates (CV0) and
                        Its Limits (CVL0 & CVU0) Before Compression   *****
```

Element	CVL0	CV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.10000000D+02	0.00000000D+00	0.10000000D+02
6	-0.10000000D+02	0.00000000D+00	0.10000000D+02
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

```
*****    End Conditions Vector EC0, Previous Cycle
                  End Conditions Vector ECPRV0, and Weighting
                        Coefficient Vector WDT0 Before Compression   *****
```

Element	EC0	ECPRV0	WDT0
1	-0.95504700D+02	-0.95504700D+02	0.10000000D+01
2	0.75647200D+02	0.75647200D+02	0.10000000D+01
3	0.84882200D+02	0.84882200D+02	0.10000000D+01
4	0.80737600D+02	0.80737600D+02	0.10000000D+01

```
      5        -0.65848100D+02    -0.65848100D+02     0.10000000D+01
      6         0.77724100D+02     0.77724100D+02     0.10000000D+01
      7        -0.37301000D+02    -0.37301000D+02     0.10000000D+01
      8         0.31399400D+02     0.31399400D+02     0.10000000D+01
      9         0.43590700D+02     0.43590700D+02     0.10000000D+01
     10         0.12152200D+02     0.12152200D+02     0.10000000D+01


              **********   Case Number   20   **********


              Specification of CV, T-matrix, and EC Compression
                               MSAVE0/MSAVE

        1            0            0            0            0
     1     1      0      0      0      0      0      0      0      0



                               NSAVE0/NSAVE

        0            0            1            0            0
     0     0      0      0      1      1      0      0      0      0


  *******************   T-Matrix Compression is Initiated   *********************


   *****   Initial Control Vector (CV0), T-Matrix (T0),
                                     and Measurement Vector (EC0)   *****


   *****   Initial Control Vector (CV0)   *****

   CV0     0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00

   *****   Initial Greatest Least Bounds (CVL0) for the
                                     Control Vector (CV0)   *****

   CVL0   -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+02    -0.10000000D+02

   *****   Initial Least Upper Bounds (CVU0) for the
                                     Control Vector (CV0)   *****

   CVU0    0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
           0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
           0.10000000D+02     0.10000000D+02


     Row            *****   Initial T-Matrix (T0)   *****

   T0  1   -0.90740400D+02    -0.13569100D+03    -0.11432000D+03    -0.68177300D+02
           -0.50039300D+02    -0.76479500D+02    -0.14327400D+03    -0.13709000D+03
           -0.12026900D+03    -0.35691800D+02

   T0  2    0.11970700D+03     0.79448600D+02     0.47683700D+02     0.51471100D+02
            0.63869000D+02     0.10792800D+03     0.11090400D+03     0.35351300D+02
            0.35507200D+02     0.52919900D+02

   T0  3    0.12238400D+03     0.87604200D+02     0.60609600D+02     0.64589000D+02
            0.76583700D+02     0.11311600D+03     0.11015900D+03     0.41278200D+02
            0.40179000D+02     0.96571600D+02

   T0  4    0.78723800D+02     0.11595000D+03     0.95790400D+02     0.53425700D+02
            0.37283300D+02     0.66388400D+02     0.13180500D+03     0.11129300D+03
            0.68519100D+02     0.18697000D+02

   T0  5   -0.69686400D+02    -0.47757000D+02    -0.56223800D+02    -0.30916700D+02
            0.44635300D+02    -0.48842200D+02    -0.89783700D+02    -0.24031100D+03
           -0.14879800D+03    -0.48361400D+02
```

F-40

```
   T0   6      0.66340100D+02      0.79133100D+02      0.49498400D+02      0.80521700D+02
                0.79285000D+02      0.15567100D+03      0.25360700D+03      0.32079500D+02
                0.67000200D+02     -0.20154700D+02

   T0   7     -0.40056100D+02     -0.30015800D+02     -0.24877100D+02     -0.84533200D+01
               -0.54793800D+01     -0.59097000D+02      0.17656700D+02     -0.49513700D+02
               -0.82328600D+02     -0.11560300D+03

   T0   8      0.20252000D+02      0.33375900D+02      0.37778200D+01      0.54595500D+02
                0.73257900D+02      0.67743700D+02      0.49407700D+02      0.88928300D+02
                0.11906500D+03     -0.21847200D+02

   T0   9      0.29750400D+02      0.38475000D+02      0.24546000D+02      0.66753000D+02
                0.12317900D+03      0.73072500D+02      0.19590400D+02      0.49442400D+00
               -0.13463600D+02      0.11916600D+03

   T0  10      0.24367300D+02      0.13770800D+02     -0.63430700D+01     -0.12353700D+02
               -0.16066500D+02      0.85041400D+02      0.70406300D+02     -0.98438700D+01
               -0.73784200D+02     -0.50092100D+02


     *****    Initial End Conditions Vector (EC0)    *****

     EC0     -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
             -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
              0.43590700D+02      0.12152200D+02

     *****    Initial End Conditions Weighting Coefficient Vector
                              (WDT0) for the Performance Index (F)   *****

     WDT0     0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
              0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
              0.10000000D+01      0.10000000D+01


     *****    Initial Control Vector (CVPRV0) and Measurement
                              Vector (ECPRV0) from the Previous Duty Cycle    *****


     *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

  CVPRV0      0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
              0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
              0.00000000D+00      0.00000000D+00


     *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

  ECPRV0     -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
             -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
              0.43590700D+02      0.12152200D+02


     *****    Intermediate Control Vector (CV), T-Matrix (TT),
                 and Measurement Vector (ECT) after the First Compression    *****


     *****    Intermediate Control Vector (CV) after the First Compression    *****

     CV       0.00000000D+00      0.00000000D+00

     *****    Intermediate Greatest Least Bounds (CVL) for the
                                         Control Vector (CV)    *****

     CVL     -0.10000000D+02     -0.10000000D+02

     *****    Intermediate Least Upper Bounds (CVU) for the
                                         Control Vector (CV)    *****
     CVU      0.10000000D+02      0.10000000D+02


      Row        *****    Intermediate T-Matrix (TT)    *****

   TT   1     -0.50039300D+02     -0.76479500D+02
```

```
    TT  2      0.63869000D+02      0.10792800D+03

    TT  3      0.76583700D+02      0.11311600D+03

    TT  4      0.37283300D+02      0.66388400D+02

    TT  5      0.44635300D+02     -0.48842200D+02

    TT  6      0.79285000D+02      0.15567100D+03

    TT  7     -0.54793800D+01     -0.59097000D+02

    TT  8      0.73257900D+02      0.67743700D+02

    TT  9      0.12317900D+03      0.73072500D+02

    TT 10     -0.16066500D+02      0.85041400D+02


    *****    Intermediate End Conditions Vector (ECT)    *****

    ECT    -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
           -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
            0.43590700D+02      0.12152200D+02

    *****    Intermediate End Conditions Weighting Coefficient Vector
                             (WDTT) for the Performance Index (F)   *****

    WDTT    0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
            0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
            0.10000000D+01      0.10000000D+01


    *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                         (ECPRV0) from the Previous Duty Cycle after
                                     the First Compression   *****


    *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                     the First Compression   *****

    CVPRV    0.00000000D+00      0.00000000D+00
    *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                     after the First Compression   *****

    ECPRVT  -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
            -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
             0.43590700D+02      0.12152200D+02


    *****    Final Control Vector (CV), T-Matrix (T), and
                    Measurement Vector (EC) after the Second Compression   *****


    *****    Final Control Vector (CV) after the Second Compression   *****

     CV     0.00000000D+00      0.00000000D+00

    *****    Greatest Least Bounds (CVL) Vector for the
                                     Control Vector (CV)    *****

    CVL    -0.10000000D+02     -0.10000000D+02

    *****    Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

    CVU     0.10000000D+02      0.10000000D+02


    Row               *****    Final T-Matrix (T)    *****

    T  1    -0.50039300D+02     -0.76479500D+02

    T  2     0.63869000D+02      0.10792800D+03
```

```
  *****   Final End Conditions Vector (EC) after the Second Compression   *****

    EC   -0.95504700D+02   0.75647200D+02

  *****   Final End Conditions Weighting Coefficient Vector
                              (WDT) for the Performance Index (F)   *****

   WDT    0.10000000D+01   0.10000000D+01


  *****   Final Control Vector (CVPRV) and Measurement Vector
                      (ECPRV) from the Previous Duty Cycle after
                                        the Second Compression   *****


  *****   Final Previous Cycle Control Vector (CVPRV) after
                                        the Second Compression   *****

CVPRV    0.00000000D+00   0.00000000D+00


  *****   Final Previous Cycle End Conditions Vector (ECPRV)
                              after the Second Compression   *****

ECPRV    -0.95504700D+02   0.75647200D+02


*******************   T-Matrix Compression is Completed   *******************


  *****   Initial End Conditions Vector EC   *****

    -0.95504700D+02       0.75647200D+02


  *****   Initial Performance Index =   0.14843647D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

 Element   AL                A                 AU                PHASE

    1    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00


                 **********   Case Number   20   **********


                                LSAVE
       0       0


  *****   Solve the NLPQLP Problem for Case Number   20   *****




  ------------------------------------------------------------------
   START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
  ------------------------------------------------------------------

   Parameters:
     N      =        2
     M      =        0
     ME     =        0
     MODE   =        0
     ACC    =   0.1000D-06
     ACCQP  =   0.1000D-11
     STPMIN =   0.0000D+00
     RHOB   =   0.1000D+03
     MAXFUN =       30
     MAXNM  =       10
     MAXIT  =      300
```

```
      IPRINT =        2

   Output in the following order:
      IT   - iteration number
      F    - objective function value
      SCV  - sum of constraint violations
      NA   - number of active constraints
      I    - number of line search iterations
      ALPHA - steplength parameter
      DELTA - additional variable to prevent inconsistency
      KKT  - Karush-Kuhn-Tucker optimality criterion


   IT        F           SCV      NA  I    ALPHA     DELTA      KKT
   ----------------------------------------------------------------
    1  0.14843647D+05  0.00D+00    0  0   0.00D+00  0.00D+00  0.10D+07
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
    2  0.10206658D+05  0.00D+00    0  2   0.10D+00  0.00D+00  0.23D+05
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
    3  0.23646710D+02  0.00D+00    0  1   0.10D+01  0.00D+00  0.77D+03
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
    4  0.30802936D+02  0.00D+00    0  3   0.12D+00  0.00D+00  0.62D+02
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
    5  0.78886936D-03  0.00D+00    0  1   0.10D+01  0.00D+00  0.16D-02
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
    6  0.13390013D-06  0.00D+00    0  1   0.10D+01  0.00D+00  0.17D-06
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
    7  0.16009561D-07  0.00D+00    0  1   0.10D+01  0.00D+00  0.68D-13

   --- Final Convergence Analysis at Last Iterate ---

     Objective function value:      F(X)  =  0.16009561D-07
     Solution values:              X     =
       -0.87643983D+01   0.44856405D+01
     Distances from lower bounds:  X-XL  =
        0.12356017D+01   0.14485640D+02
     Distances from upper bounds:  XU-X  =
        0.18764398D+02   0.55143595D+01
     Multipliers for lower bounds: U     =
        0.00000000D+00   0.00000000D+00
     Multipliers for upper bounds: U     =
        0.00000000D+00   0.00000000D+00
     Number of function calls:     NFUNC =       10
     Number of gradient calls:     NGRAD =        7
     Number of calls of QP solver: NQL   =        7


              *****   Completed CALL to NLPQLP   *****


        *****   Number of Function Evaluations =     24   *****


  *****   Solution Control Vector for Case Number   20   *****

  Element    CVL              CV              CVU             CV - CV0

     1   -0.10000000D+02  -0.87643983D+01   0.10000000D+02  -0.87643983D+01
     2   -0.10000000D+02   0.44856405D+01   0.10000000D+02   0.44856405D+01


  *****   Predicted Measurement Vector EC   *****

    0.83183435D-04      0.95378612D-04
```

```
     *****   NLP Solution Performance Index  =   0.16009561D-07   *****



     *****   Predicted Measurement Vector EC   *****

       0.11748939D-03      0.46965992D-04


     *****   NLP Solution Performance Index  =   0.16009561D-07   *****



     *****   Predicted Control Amplitude Vector (A)
               Its Limits (AL & AU), and Its Phase Angle
                               Vector (PHASE) Before Compression   *****

    Element    AL               A                AU               PHASE

       1     0.00000000D+00    0.98455903D+01   0.10000000D+02   -0.62896523D+02


     *****   No Constraints are Specified for Case Number   20   *****


                 **********   End Case Number   20   **********


********************************************************************************
            ***************   Start Case Number 1020   ***************


        ***************   INPUT DATA for Case Number 1020   ***************


&CDATA
 A00= 5*0.0000000000000000        ,  1.0000000000000000      ,
 ACC= 9.9999999999999955E-008,
 ACCQP= 9.9999999999999980E-013,
 AL0= 5*0.0000000000000000        ,-9.9999999999999955E-008,
 ALPHA=  1.0000000000000000      ,
 APRV0= 5*0.0000000000000000        ,  4.9406564584124654E-324,
 AU0= 5*10.000000000000000        ,  3.0000000000000000      ,
 CRAN1=  2.0000000000000000      ,
 CRAN2=  3.0000000000000000      ,
 CRAN3=  1.0000000000000000      ,
 CRAN4=  1.0000000000000000      ,
 CV00= 10*0.0000000000000000        ,  1.4821969375237396E-323, 6.9532335936098373E-
310, 7.6160713372073996E-319, 6.9532335933367178E-310,

 CVOUT=          0,
 CVPRV0= 10*0.0000000000000000        ,  6.9532335933232792E-310, 6.9532123705737801E-
310, 6.9532561666498867E-310,  0.0000000000000000        ,

 ECPRV0= -95.504700000000000        ,  75.647199999999998      ,  84.882199999999997      ,
80.737600000000000        , -65.848100000000002      ,
   77.724100000000007      , -37.301000000000002      ,  31.399400000000000      ,
43.590699999999998        ,  12.152200000000001      ,
 EPS= 9.9999999999999955E-008,
 ICASE=      1020,
 ICYCL0=     2000,
 IDATA=         3,
 IN=         5,
 IOPT=         1,
 IOUT=         6,
 IPRINT=        2,
 ISEED1=    2395,      4013,      3813,      1837,
 ISEED2=    1843,      4011,      3364,      2835,
 ISEED3=    3962,      1111,      3215,      2637,
 ISEED4=    2397,      1504,      4031,      3173,
 ITOUT=         3,
```

```
 L=            1,
 LQL=T,
 LSAVE=            1, 5*0            ,
 MAXASUM=  3.0000000000000000     ,
 MAXFUN=          30,
 MAXIT=          300,
 MAXNM=           10,
 MI=           1,
 MINASUM=  0.0000000000000000     ,
 MODE=           0,
 MSAVE0=           1, 4*0          , 5*1          ,
 MULT=           1,
 NSAVE0= 2*0            ,            1, 2*0           , 5*1          ,
 NX0=          10,
 NZ0=          10,
 OPTEND=           3,
 PHASE0= 5*0.0000000000000000      ,  90.000000000000000      ,
 PHSPRV0= 6*0.0000000000000000     ,
 RHOB=  100.00000000000000     ,
 STPMIN=  0.0000000000000000      ,
 T0= -90.740399999999994      ,  119.70699999999999      ,  122.38400000000000     ,
78.723799999999997      , -69.686400000000006      ,
  66.340100000000007      , -40.056100000000001      ,  20.251999999999999      ,
29.750399999999999      ,  24.367300000000000      , -135.69100000000000      ,
  79.448599999999999      ,  87.604200000000006      ,  115.95000000000000      , -
47.756999999999998      ,  79.133099999999999      , -30.015799999999999      ,
  33.375900000000001      ,  38.475000000000001      ,  13.770799999999999      , -
114.31999999999999      ,  47.683700000000002      ,  60.609600000000000      ,
  95.790400000000005      , -56.223799999999997      ,  49.498399999999997      , -
24.877099999999999      ,  3.7778200000000002      ,  24.545999999999999      ,
  -6.3430700000000000      , -68.177300000000002      ,  51.471100000000000      ,
64.588999999999999      ,  53.425699999999999      , -30.916699999999999      ,
  80.521699999999996      , -8.4533199999999997      ,  54.595500000000001      ,
66.753000000000000      , -12.353700000000000      , -50.039299999999997      ,
  63.869000000000000      ,  76.583699999999993      ,  37.283299999999997      ,
44.635300000000001      ,  79.284999999999997      , -5.4793799999999999      ,
  73.257900000000006      ,  123.17900000000000      , -16.066500000000001      , -
76.479500000000002      ,  107.92800000000000      ,  113.11600000000000      ,
  66.388400000000004      , -48.842199999999998      ,  155.67099999999999      , -
59.097000000000001      ,  67.743700000000004      ,  73.072500000000005      ,
  85.041399999999996      , -143.27400000000000      ,  110.90400000000000      ,
110.15900000000001      ,  131.80500000000001      , -89.783699999999996      ,
  253.60700000000000      ,  17.656700000000001      ,  49.407699999999998      ,
19.590399999999999      ,  70.406300000000002      , -137.09000000000000      ,
  35.351300000000002      ,  41.278199999999998      ,  111.29300000000001      , -
240.31100000000001      ,  32.079500000000003      , -49.513700000000000      ,
  88.928299999999993      ,  0.49442399999999997      , -9.8438700000000008      , -
120.26900000000001      ,  35.507199999999997      ,  40.179000000000002      ,
  68.519099999999995      , -148.79800000000000      ,  67.000200000000007      , -
82.328599999999994      ,  119.06500000000000      , -13.463600000000000      ,
  -73.784199999999998      , -35.691800000000001      ,  52.919899999999998      ,
96.571600000000004      ,  18.696999999999999      , -48.361400000000003      ,
  -20.154699999999998      , -115.60299999999999      , -21.847200000000001      ,
119.16600000000000      , -50.092100000000002      ,
 WDT0= 10*1.0000000000000000      ,
 WDX= 10*0.0000000000000000       ,
 WX= 10*0.0000000000000000        ,
 WZ= 10*1.0000000000000000        ,
 /


 ****************************************************************************

         ***************   OUTPUT DATA for Case Number 1020   ***************


    *****   The Initial T-Matrix (T0) and Either the Initial
                  Previous Actual NLP Control Vector (CVPRV0) or
                     the Initial Previous Control Amplitude (APRV0)
                        and Phase Angle (PHSPRV0) Vectors Before
                            Compression are Directly Input   *****

    *****   Input the Initial Previous Actual NLP Control
```

Vector (CVPRV0) Directly Via NAMELIST Input CDATA
and then Compute the Previous Control Amplitude (APRV0)
and Control Phase Angle (PHSPRV0) Vectors   *****

**********   Case Number 1020   **********

*****   Initial Previous Control Amplitude (APRV0) and Phase
Angle (PHSPRV0) Vectors before Compression   *****

Element	AL0	APRV0	AU0	PHSPRV0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00

*****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

Element	CVL0	CVPRV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.10000000D+02	0.00000000D+00	0.10000000D+02
6	-0.10000000D+02	0.00000000D+00	0.10000000D+02
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

*****   Either the BEFORE Compression Initial Actual NLP Control
Vector Estimates (CV00), OR the BEFORE Compression
Initial Control Vector Amplitudes (A00) and Phase
Angles (PHASE0) Estimates are Directly Input
via NAMELIST Data CDATA   *****

*****   Input the Initial Actual NLP Control Vector Estimate
(CV00) Directly Via NAMELIST Input CDATA, and
then Compute the Control Vector Amplitudes
(A00) and Phase Angles (PHASE0) Estimates   *****

**********   Case Number 1020   **********

*****   Adjust the Initial Control Amplitude Estimates Vector
(A00) to define the Initial Control Amplitude Estimates
Vector (A0) to Within Limits If Required Before Compression   *****

*****   Initial Control Amplitude Vector Estimates (A0), Its
Limits (AL0 & AU0), and Its Phase Angle Vector
Estimates (PHASE0) Before Compression   *****

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

*****   Initial Actual NLP Control Vector Estimates (CV0) and
Its Limits (CVL0 & CVU0) Before Compression   *****

```
Element          CVL0                 CV0                  CVU0

   1         -0.10000000D+02      0.00000000D+00       0.10000000D+02
   2         -0.10000000D+02      0.00000000D+00       0.10000000D+02
   3         -0.10000000D+02      0.00000000D+00       0.10000000D+02
   4         -0.10000000D+02      0.00000000D+00       0.10000000D+02
   5         -0.10000000D+02      0.00000000D+00       0.10000000D+02
   6         -0.10000000D+02      0.00000000D+00       0.10000000D+02
   7         -0.10000000D+02      0.00000000D+00       0.10000000D+02
   8         -0.10000000D+02      0.00000000D+00       0.10000000D+02
   9         -0.10000000D+02      0.00000000D+00       0.10000000D+02
  10         -0.10000000D+02      0.00000000D+00       0.10000000D+02


*****   End Conditions Vector EC0, Previous Cycle
              End Conditions Vector ECPRV0, and Weighting
                    Coefficient Vector WDT0 Before Compression   *****


Element          EC0                  ECPRV0               WDT0

   1         -0.95504700D+02     -0.95504700D+02       0.10000000D+01
   2          0.75647200D+02      0.75647200D+02       0.10000000D+01
   3          0.84882200D+02      0.84882200D+02       0.10000000D+01
   4          0.80737600D+02      0.80737600D+02       0.10000000D+01
   5         -0.65848100D+02     -0.65848100D+02       0.10000000D+01
   6          0.77724100D+02      0.77724100D+02       0.10000000D+01
   7         -0.37301000D+02     -0.37301000D+02       0.10000000D+01
   8          0.31399400D+02      0.31399400D+02       0.10000000D+01
   9          0.43590700D+02      0.43590700D+02       0.10000000D+01
  10          0.12152200D+02      0.12152200D+02       0.10000000D+01


         **********   Case Number 1020   **********


         Specification of CV, T-matrix, and EC Compression

                        MSAVE0/MSAVE

      1            0            0            0            0
   1     1      0      0      0      0      0      0      0      0


                        NSAVE0/NSAVE

      0            0            1            0            0
   0     0      0      0      1      1      0      0      0      0


******************   T-Matrix Compression is Initiated   ********************


 *****   Initial Control Vector (CV0), T-Matrix (T0),
                              and Measurement Vector (EC0)   *****


 *****   Initial Control Vector (CV0)   *****

 CV0    0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
        0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
        0.00000000D+00    0.00000000D+00

 *****   Initial Greatest Least Bounds (CVL0) for the
                              Control Vector (CV0)   *****

 CVL0   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
        -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
        -0.10000000D+02   -0.10000000D+02

 *****   Initial Least Upper Bounds (CVU0) for the
```

```
                                       Control Vector (CV0)    *****

    CVU0      0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
              0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
              0.10000000D+02    0.10000000D+02


       Row           *****    Initial T-Matrix (T0)    *****

    T0   1   -0.90740400D+02   -0.13569100D+03   -0.11432000D+03   -0.68177300D+02
             -0.50039300D+02   -0.76479500D+02   -0.14327400D+03   -0.13709000D+03
             -0.12026900D+03   -0.35691800D+02

    T0   2    0.11970700D+03    0.79448600D+02    0.47683700D+02    0.51471100D+02
              0.63869000D+02    0.10792800D+03    0.11090400D+03    0.35351300D+02
              0.35507200D+02    0.52919900D+02

    T0   3    0.12238400D+03    0.87604200D+02    0.60609600D+02    0.64589000D+02
              0.76583700D+02    0.11311600D+03    0.11015900D+03    0.41278200D+02
              0.40179000D+02    0.96571600D+02

    T0   4    0.78723800D+02    0.11595000D+03    0.95790400D+02    0.53425700D+02
              0.37283300D+02    0.66388400D+02    0.13180500D+03    0.11129300D+03
              0.68519100D+02    0.18697000D+02

    T0   5   -0.69686400D+02   -0.47757000D+02   -0.56223800D+02   -0.30916700D+02
              0.44635300D+02   -0.48842200D+02   -0.89783700D+02   -0.24031100D+03
             -0.14879800D+03   -0.48361400D+02

    T0   6    0.66340100D+02    0.79133100D+02    0.49498400D+02    0.80521700D+02
              0.79285000D+02    0.15567100D+03    0.25360700D+03    0.32079500D+02
              0.67000200D+02   -0.20154700D+02

    T0   7   -0.40056100D+02   -0.30015800D+02   -0.24877100D+02   -0.84533200D+01
             -0.54793800D+01   -0.59097000D+02    0.17656700D+02   -0.49513700D+02
             -0.82328600D+02   -0.11560300D+03

    T0   8    0.20252000D+02    0.33375900D+02    0.37778200D+01    0.54595500D+02
              0.73257900D+02    0.67743700D+02    0.49407700D+02    0.88928300D+02
              0.11906500D+03   -0.21847200D+02

    T0   9    0.29750400D+02    0.38475000D+02    0.24546000D+02    0.66753000D+02
              0.12317900D+03    0.73072500D+02    0.19590400D+02    0.49442400D+00
             -0.13463600D+02    0.11916600D+03

    T0  10    0.24367300D+02    0.13770800D+02   -0.63430700D+01   -0.12353700D+02
             -0.16066500D+02    0.85041400D+02    0.70406300D+02   -0.98438700D+01
             -0.73784200D+02   -0.50092100D+02


     *****    Initial End Conditions Vector (EC0)    *****

     EC0     -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
             -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
              0.43590700D+02    0.12152200D+02

     *****    Initial End Conditions Weighting Coefficient Vector
                                 (WDT0) for the Performance Index (F)    *****

    WDT0      0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
              0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
              0.10000000D+01    0.10000000D+01


     *****    Initial Control Vector (CVPRV0) and Measurement
                           Vector (ECPRV0) from the Previous Duty Cycle    *****


     *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

  CVPRV0      0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
              0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
              0.00000000D+00    0.00000000D+00
```

```
    *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

 ECPRV0   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02


    *****    Intermediate Control Vector (CV), T-Matrix (TT),
             and Measurement Vector (ECT) after the First Compression    *****


    *****    Intermediate Control Vector (CV) after the First Compression    *****

     CV    0.00000000D+00    0.00000000D+00

    *****    Intermediate Greatest Least Bounds (CVL) for the
                                        Control Vector (CV)    *****

    CVL   -0.10000000D+02   -0.10000000D+02

    *****    Intermediate Least Upper Bounds (CVU) for the
                                        Control Vector (CV)    *****

    CVU    0.10000000D+02    0.10000000D+02


    Row        *****    Intermediate T-Matrix (TT)    *****

  TT  1   -0.50039300D+02   -0.76479500D+02

  TT  2    0.63869000D+02    0.10792800D+03

  TT  3    0.76583700D+02    0.11311600D+03

  TT  4    0.37283300D+02    0.66388400D+02

  TT  5    0.44635300D+02   -0.48842200D+02

  TT  6    0.79285000D+02    0.15567100D+03

  TT  7   -0.54793800D+01   -0.59097000D+02

  TT  8    0.73257900D+02    0.67743700D+02

  TT  9    0.12317900D+03    0.73072500D+02

  TT 10   -0.16066500D+02    0.85041400D+02


   *****    Intermediate End Conditions Vector (ECT)    *****
    ECT   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02

   *****    Intermediate End Conditions Weighting Coefficient Vector
                              (WDTT) for the Performance Index (F)    *****

   WDTT    0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
           0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
           0.10000000D+01    0.10000000D+01


   *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                     (ECPRV0) from the Previous Duty Cycle after
                                        the First Compression    *****


   *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                        the First Compression    *****

  CVPRV    0.00000000D+00    0.00000000D+00
```

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```
    *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                          after the First Compression    *****

ECPRVT   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02


   *****    Final Control Vector (CV), T-Matrix (T), and
                    Measurement Vector (EC) after the Second Compression    *****


   *****    Final Control Vector (CV) after the Second Compression    *****

    CV      0.00000000D+00     0.00000000D+00

   *****    Greatest Least Bounds (CVL) Vector for the
                                          Control Vector (CV)    *****

   CVL     -0.10000000D+02    -0.10000000D+02

   *****    Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

   CVU      0.10000000D+02     0.10000000D+02


    Row              *****    Final T-Matrix (T)    *****

  T  1    -0.50039300D+02    -0.76479500D+02

  T  2     0.63869000D+02     0.10792800D+03


   *****    Final End Conditions Vector (EC) after the Second Compression    *****

    EC     -0.95504700D+02     0.75647200D+02

   *****    Final End Conditions Weighting Coefficient Vector
                                 (WDT) for the Performance Index (F)    *****

   WDT      0.10000000D+01     0.10000000D+01

   *****    Final Control Vector (CVPRV) and Measurement Vector
                        (ECPRV) from the Previous Duty Cycle after
                                           the Second Compression    *****


   *****    Final Previous Cycle Control Vector (CVPRV) after
                                           the Second Compression    *****

 CVPRV      0.00000000D+00     0.00000000D+00


   *****    Final Previous Cycle End Conditions Vector (ECPRV)
                                  after the Second Compression    *****

 ECPRV     -0.95504700D+02     0.75647200D+02


******************    T-Matrix Compression is Completed    ********************


   *****    Initial End Conditions Vector EC    *****

   -0.95504700D+02       0.75647200D+02


   *****    Initial Performance Index  =    0.14843647D+05    *****

   *****    Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors    *****

   Element    AL                A                 AU                PHASE
```

```
      1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00


 *****   Initial Constraint Function Values for Case Number 1020   *****
                                LSAVE

     1      0

  *****    Inequality Constraints   *****

 Element        Constraint        Amplitude         Max Amp

    1         0.10000000D+02    0.00000000D+00    0.10000000D+02


  *****   Solve the NLPQLP Problem for Case Number 1020   *****



   ---------------------------------------------------------------------
    START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
   ---------------------------------------------------------------------

    Parameters:
      N      =        2
      M      =        1
      ME     =        0
      MODE   =        0
      ACC    =   0.1000D-06
      ACCQP  =   0.1000D-11
      STPMIN =   0.0000D+00
      RHOB   =   0.1000D+03
      MAXFUN =       30
      MAXNM  =       10
      MAXIT  =      300
      IPRINT =        2

    Output in the following order:
      IT    - iteration number
      F     - objective function value
      SCV   - sum of constraint violations
      NA    - number of active constraints
      I     - number of line search iterations
      ALPHA - steplength parameter
      DELTA - additional variable to prevent inconsistency
      KKT   - Karush-Kuhn-Tucker optimality criterion


     IT       F           SCV      NA  I    ALPHA    DELTA     KKT
   ---------------------------------------------------------------------
      1  0.14843647D+05  0.00D+00   1  0  0.00D+00  0.00D+00  0.10D+07
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
      2  0.10206658D+05  0.00D+00   0  2  0.10D+00  0.00D+00  0.23D+05
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
      3  0.23646710D+02  0.13D+01   1  1  0.10D+01  0.00D+00  0.77D+03
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
      4  0.25742229D+02  0.00D+00   0  3  0.11D+00  0.00D+00  0.52D+02
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
      5  0.78886918D-03  0.00D+00   0  1  0.10D+01  0.00D+00  0.16D-02
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
      6  0.12610499D-06  0.00D+00   0  1  0.10D+01  0.00D+00  0.15D-06
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
      7  0.16000305D-07  0.00D+00   0  1  0.10D+01  0.00D+00  0.98D-13
```

```
      --- Final Convergence Analysis at Last Iterate ---

      Objective function value:     F(X)  =  0.16000305D-07
      Solution values:             X     =
       -0.87643983D+01  0.44856404D+01
      Distances from lower bounds:  X-XL  =
        0.12356017D+01  0.14485640D+02
      Distances from upper bounds:  XU-X  =
        0.18764398D+02  0.55143596D+01
      Multipliers for lower bounds: U     =
        0.00000000D+00  0.00000000D+00
      Multipliers for upper bounds: U     =
        0.00000000D+00  0.00000000D+00
      Constraint values:           G(X)  =
        0.15440972D+00
      Multipliers for constraints: U     =
        0.00000000D+00
      Number of function calls:     NFUNC =      10
      Number of gradient calls:     NGRAD =       7
      Number of calls of QP solver: NQL   =       7



                *****   Completed CALL to NLPQLP   *****


            *****    Number of Function Evaluations =     24   *****


   *****   Solution Control Vector for Case Number 1020   *****

 Element    CVL              CV               CVU              CV - CV0

    1    -0.10000000D+02  -0.87643983D+01   0.10000000D+02  -0.87643983D+01
    2    -0.10000000D+02   0.44856404D+01   0.10000000D+02   0.44856404D+01




   *****   Predicted Measurement Vector EC   *****

      0.83148243D-04      0.95368092D-04


   *****   NLP Solution Performance Index  =   0.16000305D-07   *****




   *****   Predicted Measurement Vector EC   *****

      0.11745420D-03      0.46955472D-04


   *****   NLP Solution Performance Index  =   0.16000305D-07   *****




   *****   Predicted Control Amplitude Vector (A)
                Its Limits (AL & AU), and Its Phase Angle
                              Vector (PHASE) Before Compression   *****

 Element     AL               A               AU               PHASE

    1     0.00000000D+00   0.98455903D+01   0.10000000D+02  -0.62896523D+02


   *****   Solution Constraint Function Values for Case Number 1020   *****

                              LSAVE

    1      0
```

```
     *****    Inequality Constraints    *****

    Element          Constraint          Amplitude          Max Amp

       1           0.15440972D+00      0.98455903D+01      0.10000000D+02


                  **********   End Case Number 1020   **********




 *******************************************************************************
            ***************   Start Case Number  820   ***************


         ***************    INPUT DATA for Case Number  820   ***************


&CDATA
 A00= 5*0.0000000000000000          ,  1.0000000000000000      ,
 ACC= 9.99999999999999955E-008,
 ACCQP= 9.99999999999999980E-013,
 AL0= 5*0.0000000000000000         ,-9.99999999999999955E-008,
 ALPHA=  1.0000000000000000     ,
 APRV0= 5*0.0000000000000000         , 4.94065645841246544E-324,
 AU0= 2*10.000000000000000         ,  8.0000000000000000      , 2*10.000000000000000
 ,  3.0000000000000000         ,
 CRAN1=  2.0000000000000000        ,
 CRAN2=  3.0000000000000000        ,
 CRAN3=  1.0000000000000000        ,
 CRAN4=  1.0000000000000000        ,
 CV00= 10*0.0000000000000000          , 1.48219693752373963E-323, 6.95323359360983736E-
 310, 7.61607133720739960E-319, 6.95323359333671787E-310,

 CVOUT=          0,
 CVPRV0= 10*0.0000000000000000          , 6.95323359332327929E-310, 6.95321237057378016E-
 310, 6.95325616664988679E-310,  0.0000000000000000      ,

 ECPRV0= -95.504700000000000          ,  75.647199999999998      ,  84.882199999999997      ,
 80.737600000000000      , -65.848100000000002      ,
    77.724100000000007      ,  -37.301000000000002      ,  31.399400000000000      ,
 43.590699999999998      ,  12.152200000000001      ,
 EPS= 9.99999999999999955E-008,
 ICASE=         820,
 ICYCL0=        2000,
 IDATA=           3,
 IN=          5,
 IOPT=           1,
 IOUT=           6,
 IPRINT=          2,
 ISEED1=      2395,       4013,       3813,       1837,
 ISEED2=      1843,       4011,       3364,       2835,
 ISEED3=      3962,       1111,       3215,       2637,
 ISEED4=      2397,       1504,       4031,       3173,
 ITOUT=           3,
 L=           1,
 LQL=T,
 LSAVE=           1, 5*0            ,
 MAXASUM=  3.0000000000000000      ,
 MAXFUN=         30,
 MAXIT=         300,
 MAXNM=          10,
 MI=           1,
 MINASUM=  0.0000000000000000      ,
 MODE=           0,
 MSAVE0=           1, 4*0          , 5*1          ,
 MULT=           1,
 NSAVE0= 2*0          ,           1, 2*0          , 5*1          ,
 NX0=          10,
 NZ0=          10,
 OPTEND=           3,
```

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```
     PHASE0= 5*0.0000000000000000         ,   90.000000000000000       ,
     PHSPRV0= 6*0.0000000000000000          ,
     RHOB=   100.00000000000000       ,
     STPMIN=   0.0000000000000000       ,
     T0= -90.740399999999994       ,   119.70699999999999       ,   122.38400000000000       ,
    78.723799999999997       ,  -69.686400000000006       ,
       66.340100000000007       ,  -40.056100000000001       ,    20.251999999999999       ,
    29.750399999999999       ,   24.367300000000000       ,  -135.69100000000000       ,
       79.448599999999999       ,    87.604200000000006       ,    115.95000000000000       , -
    47.756999999999998       ,   79.133099999999999       ,  -30.015799999999999       ,
       33.375900000000001       ,    38.475000000000001       ,    13.770799999999999       , -
    114.31999999999999       ,   47.683700000000002       ,    60.609600000000000       ,
       95.790400000000005       ,  -56.223799999999997       ,    49.498399999999997       , -
    24.877099999999999       ,    3.7778200000000002       ,    24.545999999999999       ,
       -6.3430700000000000       ,  -68.177300000000002       ,    51.471100000000000       ,
    64.588999999999999       ,   53.425699999999999       ,  -30.916699999999999       ,
       80.521699999999996       ,   -8.4533199999999997       ,    54.595500000000001       ,
    66.753000000000000       ,  -12.353700000000000       ,  -50.039299999999997       ,
       63.869000000000000       ,    76.583699999999993       ,    37.283299999999997       ,
    44.635300000000001       ,   79.284999999999997       ,   -5.4793799999999999       ,
       73.257900000000006       ,    123.17900000000000       ,  -16.066500000000001       , -
    76.479500000000002       ,   107.92800000000000       ,    113.11600000000000       ,
       66.388400000000004       ,  -48.842199999999998       ,    155.67099999999999       , -
    59.097000000000001       ,   67.743700000000004       ,    73.072500000000005       ,
       85.041399999999996       ,  -143.27400000000000       ,    110.90400000000000       ,
    110.15900000000001       ,   131.80500000000001       ,  -89.783699999999996       ,
       253.60700000000000       ,    17.656700000000001       ,    49.407699999999998       ,
    19.590399999999999       ,   70.406300000000002       ,  -137.09000000000000       ,
       35.351300000000002       ,    41.278199999999998       ,    111.29300000000001       , -
    240.31100000000001       ,   32.079500000000003       ,  -49.513700000000000       ,
       88.928299999999993       ,   0.49442399999999997       ,   -9.8438700000000008       , -
    120.26900000000001       ,   35.507199999999997       ,    40.179000000000002       ,
       68.519099999999995       ,  -148.79800000000000       ,    67.000200000000007       , -
    82.328599999999994       ,   119.06500000000000       ,  -13.463600000000000       ,
       -73.784199999999998       ,  -35.691800000000001       ,    52.919899999999998       ,
    96.571600000000004       ,   18.696999999999999       ,  -48.361400000000003       ,
       -20.154699999999998       ,  -115.60299999999999       ,  -21.847200000000001       ,
    119.16600000000000       ,  -50.092100000000002       ,
     WDT0= 10*1.0000000000000000        ,
     WDX= 10*0.0000000000000000        ,
     WX= 10*0.0000000000000000        ,
     WZ= 10*1.0000000000000000        ,
     /



    ****************************************************************************


        ***************   OUTPUT DATA for Case Number  820   ***************


      *****    The Initial T-Matrix (T0) and Either the Initial
                   Previous Actual NLP Control Vector (CVPRV0) or
                     the Initial Previous Control Amplitude (APRV0)
                       and Phase Angle (PHSPRV0) Vectors Before
                              Compression are Directly Input   *****

      *****    Input the Initial Previous Actual NLP Control
                  Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                     and then Compute the Previous Control Amplitude (APRV0)
                        and Control Phase Angle (PHSPRV0) Vectors   *****


              **********   Case Number  820   **********


      *****    Initial Previous Control Amplitude (APRV0) and Phase
                       Angle (PHSPRV0) Vectors before Compression   *****

       Element    AL0              APRV0             AU0               PHSPRV0

         1      0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
         2      0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
         3      0.00000000D+00   0.00000000D+00   0.80000000D+01   0.00000000D+00
```

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```
     4     0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
     5     0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
```

***** Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

Element	CVL0	CVPRV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.80000000D+01	0.00000000D+00	0.80000000D+01
6	-0.80000000D+01	0.00000000D+00	0.80000000D+01
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

***** Either the BEFORE Compression Initial Actual NLP Control
         Vector Estimates (CV00), OR the BEFORE Compression
            Initial Control Vector Amplitudes (A00) and Phase
               Angles (PHASE0) Estimates are Directly Input
                     via NAMELIST Data CDATA   *****

***** Input the Initial Actual NLP Control Vector Estimate
         (CV00) Directly Via NAMELIST Input CDATA, and
               then Compute the Control Vector Amplitudes
                  (A00) and Phase Angles (PHASE0) Estimates   *****

              **********   Case Number 820   **********

***** Adjust the Initial Control Amplitude Estimates Vector
         (A00) to define the Initial Control Amplitude Estimates
            Vector (A0) to Within Limits If Required Before Compression   *****

***** Initial Control Amplitude Vector Estimates (A0), Its
                  Limits (AL0 & AU0), and Its Phase Angle Vector
                        Estimates (PHASE0) Before Compression   *****

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.80000000D+01	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.80000000D+01	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

***** Initial Actual NLP Control Vector Estimates (CV0) and
                  Its Limits (CVL0 & CVU0) Before Compression   *****

Element	CVL0	CV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.80000000D+01	0.00000000D+00	0.80000000D+01
6	-0.80000000D+01	0.00000000D+00	0.80000000D+01
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

***** End Conditions Vector EC0, Previous Cycle
               End Conditions Vector ECPRV0, and Weighting

```
                        Coefficient Vector WDT0 Before Compression    *****


    Element          EC0                 ECPRV0                WDT0

       1         -0.95504700D+02      -0.95504700D+02       0.10000000D+01
       2          0.75647200D+02       0.75647200D+02       0.10000000D+01
       3          0.84882200D+02       0.84882200D+02       0.10000000D+01
       4          0.80737600D+02       0.80737600D+02       0.10000000D+01
       5         -0.65848100D+02      -0.65848100D+02       0.10000000D+01
       6          0.77724100D+02       0.77724100D+02       0.10000000D+01
       7         -0.37301000D+02      -0.37301000D+02       0.10000000D+01
       8          0.31399400D+02       0.31399400D+02       0.10000000D+01
       9          0.43590700D+02       0.43590700D+02       0.10000000D+01
      10          0.12152200D+02       0.12152200D+02       0.10000000D+01



                 **********   Case Number  820   **********



           Specification of CV, T-matrix, and EC Compression

                              MSAVE0/MSAVE

         1              0              0              0              0
     1   1       0       0       0       0       0       0       0       0


                              NSAVE0/NSAVE

         0              0              1              0              0
     0   0       0       0       1       1       0       0       0       0



 ******************   T-Matrix Compression is Initiated   ********************


   *****    Initial Control Vector (CV0), T-Matrix (T0),
                                    and Measurement Vector (EC0)    *****


   *****    Initial Control Vector (CV0)    *****

   CV0     0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
           0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
           0.00000000D+00      0.00000000D+00

   *****    Initial Greatest Least Bounds (CVL0) for the
                                    Control Vector (CV0)    *****

   CVL0   -0.10000000D+02     -0.10000000D+02     -0.10000000D+02     -0.10000000D+02
          -0.80000000D+01     -0.80000000D+01     -0.10000000D+02     -0.10000000D+02
          -0.10000000D+02     -0.10000000D+02

   *****    Initial Least Upper Bounds (CVU0) for the
                                    Control Vector (CV0)    *****

   CVU0    0.10000000D+02      0.10000000D+02      0.10000000D+02      0.10000000D+02
           0.80000000D+01      0.80000000D+01      0.10000000D+02      0.10000000D+02
           0.10000000D+02      0.10000000D+02


     Row          *****    Initial T-Matrix (T0)    *****

  T0  1   -0.90740400D+02     -0.13569100D+03     -0.11432000D+03     -0.68177300D+02
          -0.50039300D+02     -0.76479500D+02     -0.14327400D+03     -0.13709000D+03
          -0.12026900D+03     -0.35691800D+02

  T0  2    0.11970700D+03      0.79448600D+02      0.47683700D+02      0.51471100D+02
           0.63869000D+02      0.10792800D+03      0.11090400D+03      0.35351300D+02
           0.35507200D+02      0.52919900D+02
```

```
     T0   3      0.12238400D+03      0.87604200D+02      0.60609600D+02      0.64589000D+02
                  0.76583700D+02      0.11311600D+03      0.11015900D+03      0.41278200D+02
                  0.40179000D+02      0.96571600D+02

     T0   4      0.78723800D+02      0.11595000D+03      0.95790400D+02      0.53425700D+02
                  0.37283300D+02      0.66388400D+02      0.13180500D+03      0.11129300D+03
                  0.68519100D+02      0.18697000D+02

     T0   5     -0.69686400D+02     -0.47757000D+02     -0.56223800D+02     -0.30916700D+02
                  0.44635300D+02     -0.48842200D+02     -0.89783700D+02     -0.24031100D+03
                 -0.14879800D+03     -0.48361400D+02

     T0   6      0.66340100D+02      0.79133100D+02      0.49498400D+02      0.80521700D+02
                  0.79285000D+02      0.15567100D+03      0.25360700D+03      0.32079500D+02
                  0.67000200D+02     -0.20154700D+02

     T0   7     -0.40056100D+02     -0.30015800D+02     -0.24877100D+02     -0.84533200D+01
                 -0.54793800D+01     -0.59097000D+02      0.17656700D+02     -0.49513700D+02
                 -0.82328600D+02     -0.11560300D+03

     T0   8      0.20252000D+02      0.33375900D+02      0.37778200D+01      0.54595500D+02
                  0.73257900D+02      0.67743700D+02      0.49407700D+02      0.88928300D+02
                  0.11906500D+03     -0.21847200D+02

     T0   9      0.29750400D+02      0.38475000D+02      0.24546000D+02      0.66753000D+02
                  0.12317900D+03      0.73072500D+02      0.19590400D+02      0.49442400D+00
                 -0.13463600D+02      0.11916600D+03

     T0  10      0.24367300D+02      0.13770800D+02     -0.63430700D+01     -0.12353700D+02
                 -0.16066500D+02      0.85041400D+02      0.70406300D+02     -0.98438700D+01
                 -0.73784200D+02     -0.50092100D+02


       *****    Initial End Conditions Vector (EC0)    *****

       EC0    -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
              -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
               0.43590700D+02      0.12152200D+02

       *****    Initial End Conditions Weighting Coefficient Vector
                                  (WDT0) for the Performance Index (F)    *****

       WDT0    0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
               0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
               0.10000000D+01      0.10000000D+01


       *****    Initial Control Vector (CVPRV0) and Measurement
                             Vector (ECPRV0) from the Previous Duty Cycle    *****


       *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

     CVPRV0    0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
               0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
               0.00000000D+00      0.00000000D+00


       *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

     ECPRV0   -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
              -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
               0.43590700D+02      0.12152200D+02


       *****    Intermediate Control Vector (CV), T-Matrix (TT),
                     and Measurement Vector (ECT) after the First Compression    *****


       *****    Intermediate Control Vector (CV) after the First Compression    *****

       CV     0.00000000D+00      0.00000000D+00

       *****    Intermediate Greatest Least Bounds (CVL) for the
```

```
                                                    Control Vector (CV)   *****

   CVL     -0.80000000D+01   -0.80000000D+01

  *****   Intermediate Least Upper Bounds (CVU) for the
                                                    Control Vector (CV)   *****

   CVU      0.80000000D+01    0.80000000D+01


    Row         *****   Intermediate T-Matrix (TT)   *****

  TT  1   -0.50039300D+02   -0.76479500D+02

  TT  2    0.63869000D+02    0.10792800D+03

  TT  3    0.76583700D+02    0.11311600D+03

  TT  4    0.37283300D+02    0.66388400D+02

  TT  5    0.44635300D+02   -0.48842200D+02

  TT  6    0.79285000D+02    0.15567100D+03

  TT  7   -0.54793800D+01   -0.59097000D+02

  TT  8    0.73257900D+02    0.67743700D+02

  TT  9    0.12317900D+03    0.73072500D+02

  TT 10   -0.16066500D+02    0.85041400D+02


  *****   Intermediate End Conditions Vector (ECT)   *****

   ECT    -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02

  *****   Intermediate End Conditions Weighting Coefficient Vector
                              (WDTT) for the Performance Index (F)   *****

   WDTT     0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
            0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
            0.10000000D+01    0.10000000D+01


  *****   Intermediate Control Vector (CVPRV) and Measurement Vector
                         (ECPRV0) from the Previous Duty Cycle after
                                           the First Compression   *****


  *****   Intermediate Previous Cycle Control Vector (CVPRV) after
                                           the First Compression   *****

 CVPRV     0.00000000D+00    0.00000000D+00


  *****   Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                    after the First Compression   *****

ECPRVT    -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02


  *****   Final Control Vector (CV), T-Matrix (T), and
              Measurement Vector (EC) after the Second Compression   *****


  *****   Final Control Vector (CV) after the Second Compression   *****

   CV      0.00000000D+00    0.00000000D+00
```

```
   *****   Greatest Least Bounds (CVL) Vector for the
                                         Control Vector (CV)   *****

  CVL    -0.80000000D+01   -0.80000000D+01

   *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)   *****

  CVU     0.80000000D+01    0.80000000D+01


   Row              *****   Final T-Matrix (T)   *****

 T  1   -0.50039300D+02   -0.76479500D+02

 T  2    0.63869000D+02    0.10792800D+03


  *****   Final End Conditions Vector (EC) after the Second Compression   *****

   EC    -0.95504700D+02    0.75647200D+02

  *****   Final End Conditions Weighting Coefficient Vector
                              (WDT) for the Performance Index (F)   *****

  WDT     0.10000000D+01    0.10000000D+01

  *****   Final Control Vector (CVPRV) and Measurement Vector
                    (ECPRV) from the Previous Duty Cycle after
                                         the Second Compression   *****


  *****   Final Previous Cycle Control Vector (CVPRV) after
                                         the Second Compression   *****

 CVPRV    0.00000000D+00    0.00000000D+00


  *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                    after the Second Compression   *****

 ECPRV   -0.95504700D+02    0.75647200D+02


 *******************   T-Matrix Compression is Completed   *********************


  *****   Initial End Conditions Vector EC   *****

   -0.95504700D+02       0.75647200D+02


  *****   Initial Performance Index =   0.14843647D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

  Element    AL              A               AU              PHASE

    1    0.00000000D+00   0.00000000D+00   0.80000000D+01   0.00000000D+00


 *****   Initial Constraint Function Values for Case Number  820   *****

                            LSAVE

    1      0

  *****   Inequality Constraints   *****

  Element        Constraint        Amplitude        Max Amp

    1        0.80000000D+01     0.00000000D+00     0.80000000D+01
```

```
*****   Solve the NLPQLP Problem for Case Number  820   *****




     ----------------------------------------------------------------------
     START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
     ----------------------------------------------------------------------

     Parameters:
        N     =        2
        M     =        1
        ME    =        0
        MODE  =        0
        ACC   =   0.1000D-06
        ACCQP =   0.1000D-11
        STPMIN =  0.0000D+00
        RHOB  =   0.1000D+03
        MAXFUN =       30
        MAXNM  =       10
        MAXIT  =      300
        IPRINT =        2

     Output in the following order:
        IT    - iteration number
        F     - objective function value
        SCV   - sum of constraint violations
        NA    - number of active constraints
        I     - number of line search iterations
        ALPHA - steplength parameter
        DELTA - additional variable to prevent inconsistency
        KKT   - Karush-Kuhn-Tucker optimality criterion


     IT        F            SCV      NA  I    ALPHA     DELTA      KKT
     ----------------------------------------------------------------------
      1  0.14843647D+05  0.00D+00    1  0   0.00D+00  0.00D+00  0.80D+06
                     *****   Completed CALL to NLPQLP   *****
                     *****   Completed CALL to NLPQLP   *****
                     *****   Completed CALL to NLPQLP   *****
      2  0.38506615D+04  0.00D+00    0  2   0.10D+00  0.00D+00  0.93D+04
                     *****   Completed CALL to NLPQLP   *****
                     *****   Completed CALL to NLPQLP   *****
      3  0.91483740D+01  0.95D+00    1  1   0.10D+01  0.00D+00  0.42D+02
                     *****   Completed CALL to NLPQLP   *****
                     *****   Completed CALL to NLPQLP   *****
      4  0.39988965D+02  0.35D-03    1  1   0.10D+01  0.00D+00  0.70D+01
                     *****   Completed CALL to NLPQLP   *****
                     *****   Completed CALL to NLPQLP   *****
      5  0.38949701D+02  0.16D-04    1  1   0.10D+01  0.00D+00  0.20D+01
                     *****   Completed CALL to NLPQLP   *****
                     *****   Completed CALL to NLPQLP   *****
      6  0.37949031D+02  0.26D-05    1  1   0.10D+01  0.00D+00  0.22D-03
                     *****   Completed CALL to NLPQLP   *****
                     *****   Completed CALL to NLPQLP   *****
      7  0.37949139D+02  0.53D-14    1  1   0.10D+01  0.00D+00  0.44D-12


     --- Final Convergence Analysis at Last Iterate ---

        Objective function value:      F(X)  =   0.37949139D+02
        Solution values:               X     =
          -0.71851689D+01   0.35175769D+01
        Distances from lower bounds:   X-XL  =
           0.81483106D+00   0.11517577D+02
        Distances from upper bounds:   XU-X  =
           0.15185169D+02   0.44824231D+01
        Multipliers for lower bounds:  U     =
           0.00000000D+00   0.00000000D+00
        Multipliers for upper bounds:  U     =
           0.00000000D+00   0.00000000D+00
        Constraint values:             G(X)  =
          -0.53290705D-14
        Multipliers for constraints:   U     =
```

```
          0.41160479D+02
       Number of function calls:      NFUNC =        8
       Number of gradient calls:      NGRAD =        7
       Number of calls of QP solver:  NQL   =        7




              *****  Completed CALL to NLPQLP   *****
            *****   Number of Function Evaluations  =     22    *****


    *****   Solution Control Vector for Case Number  820   *****

   Element    CVL              CV               CVU              CV - CV0

      1   -0.80000000D+01  -0.71851689D+01   0.80000000D+01  -0.71851689D+01
      2   -0.80000000D+01   0.35175769D+01   0.80000000D+01   0.35175769D+01




    *****   Predicted Measurement Vector EC   *****

     -0.49864262D+01     -0.36172761D+01


    *****   NLP Solution Performance Index  =   0.37949139D+02   *****




    *****   Predicted Measurement Vector EC   *****

     -0.49863993D+01     -0.36173141D+01


    *****   NLP Solution Performance Index  =   0.37949139D+02   *****




    *****   Predicted Control Amplitude Vector (A)
               Its Limits (AL & AU), and Its Phase Angle
                             Vector (PHASE) Before Compression   *****

   Element    AL              A               AU              PHASE

      1    0.00000000D+00   0.80000000D+01   0.80000000D+01  -0.63915443D+02

  *****   Solution Constraint Function Values for Case Number  820   *****

                              LSAVE

      1      0

    *****   Inequality Constraints   *****

   Element       Constraint          Amplitude          Max Amp

      1     -0.53290705D-14     0.80000000D+01     0.80000000D+01


              **********   End Case Number  820   **********




  ****************************************************************************
```

&CDATA
 A00= 5*0.0000000000000000   , 1.0000000000000000   ,
 ACC= 9.9999999999999955E-008,
 ACCQP= 9.9999999999999980E-013,
 AL0= 5*0.0000000000000000   ,-9.9999999999999955E-008,
 ALPHA= 1.0000000000000000   ,
 APRV0= 5*0.0000000000000000   , 4.94065645841246544E-324,
 AU0= 2*10.000000000000000   , 6.0000000000000000   , 2*10.000000000000000
 , 3.0000000000000000   ,
 CRAN1= 2.0000000000000000   ,
 CRAN2= 3.0000000000000000   ,
 CRAN3= 1.0000000000000000   ,
 CRAN4= 1.0000000000000000   ,
 CV00= 10*0.0000000000000000   , 1.48219693752373963E-323, 6.95323359360983736E-
310, 7.61607133720739960E-319, 6.95323359333671787E-310,

 CVOUT=   0,
 CVPRV0= 10*0.0000000000000000   , 6.95323359332327929E-310, 6.95321237057378016E-
310, 6.95325616664988679E-310, 0.0000000000000000   ,

 ECPRV0= -95.504700000000000   , 75.647199999999998   , 84.882199999999997   ,
80.737600000000000   , -65.848100000000002   ,
    77.724100000000007   , -37.301000000000002   , 31.399400000000000   ,
43.590699999999998   , 12.152200000000001   ,
 EPS= 9.9999999999999955E-008,
 ICASE=   620,
 ICYCL0=   2000,
 IDATA=   3,
 IN=   5,
 IOPT=   1,
 IOUT=   6,
 IPRINT=   2,
 ISEED1=   2395,   4013,   3813,   1837,
 ISEED2=   1843,   4011,   3364,   2835,
 ISEED3=   3962,   1111,   3215,   2637,
 ISEED4=   2397,   1504,   4031,   3173,
 ITOUT=   3,
 L=   1,
 LQL=T,
 LSAVE=   1, 5*0   ,
 MAXASUM= 3.0000000000000000   ,
 MAXFUN=   30,
 MAXIT=   300,
 MAXNM=   10,
 MI=   1,
 MINASUM= 0.0000000000000000   ,
 MODE=   0,
 MSAVE0=   1, 4*0   , 5*1   ,
 MULT=   1,
 NSAVE0= 2*0   ,   1, 2*0   , 5*1   ,
 NX0=   10,
 NZ0=   10,
 OPTEND=   3,
 PHASE0= 5*0.0000000000000000   , 90.000000000000000   ,
 PHSPRV0= 6*0.0000000000000000   ,
 RHOB= 100.00000000000000   ,
 STPMIN= 0.0000000000000000   ,
 T0= -90.740399999999994   , 119.70699999999999   , 122.38400000000000   ,
78.723799999999997   , -69.686400000000006   ,
    66.340100000000007   , -40.056100000000001   , 20.251999999999999   ,
29.750399999999999   , 24.367300000000000   , -135.69100000000000   ,
    79.448599999999999   , 87.604200000000006   , 115.95000000000000   , -
47.756999999999998   , 79.133099999999999   , -30.015799999999999   ,
    33.375900000000001   , 38.475000000000001   , 13.770799999999999   , -
114.31999999999999   , 47.683700000000002   , 60.609600000000000   ,
    95.790400000000005   , -56.223799999999997   , 49.498399999999997   , -
24.877099999999999   , 3.7778200000000002   , 24.545999999999999   ,

```
    -6.3430700000000000       , -68.177300000000002       ,    51.471100000000000       ,
 64.588999999999999       ,   53.425699999999999       , -30.916699999999999         ,
    80.521699999999996       ,  -8.4533199999999997       ,    54.595500000000001       ,
 66.753000000000000       , -12.353700000000000       , -50.039299999999997         ,
    63.869000000000000       ,   76.583699999999993       ,    37.283299999999997       ,
 44.635300000000001       ,   79.284999999999997       ,  -5.4793799999999999         ,
    73.257900000000006       ,  123.17900000000000       ,  -16.066500000000001       , -
 76.479500000000002       ,  107.92800000000000       ,  113.11600000000000         ,
    66.388400000000004       , -48.842199999999998       ,   155.67099999999999       , -
 59.097000000000001       ,   67.743700000000004       ,   73.072500000000005         ,
    85.041399999999996       , -143.27400000000000       ,   110.90400000000000       ,
110.15900000000001       ,  131.80500000000001       , -89.783699999999996         ,
    253.60700000000000       ,   17.656700000000001       ,    49.407699999999998       ,
 19.590399999999999       ,   70.406300000000002       , -137.09000000000000         ,
    35.351300000000002       ,   41.278199999999998       ,   111.29300000000001       , -
240.31100000000001       ,   32.079500000000003       , -49.513700000000000         ,
    88.928299999999993       , 0.49442399999999997       ,  -9.8438700000000008       , -
120.26900000000001       ,   35.507199999999997       ,    40.179000000000002         ,
    68.519099999999995       , -148.79800000000000       ,    67.000200000000007       , -
 82.328599999999994       ,  119.06500000000000       , -13.463600000000000         ,
    -73.784199999999998       , -35.691800000000001       ,    52.919899999999998       ,
 96.571600000000004       ,   18.696999999999999       , -48.361400000000003         ,
    -20.154699999999998       , -115.60299999999999       ,  -21.847200000000001       ,
119.16600000000000       , -50.092100000000002       ,
 WDT0= 10*1.0000000000000000          ,
 WDX= 10*0.0000000000000000          ,
 WX= 10*0.0000000000000000          ,
 WZ= 10*1.0000000000000000          ,
 /


 *******************************************************************************


      ***************   OUTPUT DATA for Case Number  620   ***************


    *****    The Initial T-Matrix (T0) and Either the Initial
                 Previous Actual NLP Control Vector (CVPRV0) or
                    the Initial Previous Control Amplitude (APRV0)
                       and Phase Angle (PHSPRV0) Vectors Before
                             Compression are Directly Input   *****

    *****    Input the Initial Previous Actual NLP Control
                 Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                    and then Compute the Previous Control Amplitude (APRV0)
                       and Control Phase Angle (PHSPRV0) Vectors   *****


             **********   Case Number  620   **********


    *****   Initial Previous Control Amplitude (APRV0) and Phase
                       Angle (PHSPRV0) Vectors before Compression   *****

    Element    AL0              APRV0             AU0              PHSPRV0

       1    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
       2    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
       3    0.00000000D+00   0.00000000D+00   0.60000000D+01   0.00000000D+00
       4    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
       5    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00

    *****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

    Element      CVL0              CVPRV0            CVU0

       1    -0.10000000D+02   0.00000000D+00   0.10000000D+02
       2    -0.10000000D+02   0.00000000D+00   0.10000000D+02
       3    -0.10000000D+02   0.00000000D+00   0.10000000D+02
       4    -0.10000000D+02   0.00000000D+00   0.10000000D+02
       5    -0.60000000D+01   0.00000000D+00   0.60000000D+01
       6    -0.60000000D+01   0.00000000D+00   0.60000000D+01
       7    -0.10000000D+02   0.00000000D+00   0.10000000D+02
```

```
    8        -0.10000000D+02    0.00000000D+00    0.10000000D+02
    9        -0.10000000D+02    0.00000000D+00    0.10000000D+02
   10        -0.10000000D+02    0.00000000D+00    0.10000000D+02
```

```
*****    Either the BEFORE Compression Initial Actual NLP Control
         Vector Estimates (CV00), OR the BEFORE Compression
          Initial Control Vector Amplitudes (A00) and Phase
           Angles (PHASE0) Estimates are Directly Input
                  via NAMELIST Data CDATA                        *****
```

```
*****    Input the Initial Actual NLP Control Vector Estimate
          (CV00) Directly Via NAMELIST Input CDATA, and
             then Compute the Control Vector Amplitudes
                  (A00) and Phase Angles (PHASE0) Estimates     *****
```

```
              **********   Case Number  620   **********
```

```
*****    Adjust the Initial Control Amplitude Estimates Vector
          (A00) to define the Initial Control Amplitude Estimates
           Vector (A0) to Within Limits If Required Before Compression   *****
```

```
*****    Initial Control Amplitude Vector Estimates (A0), Its
                  Limits (AL0 & AU0), and Its Phase Angle Vector
                        Estimates (PHASE0) Before Compression    *****
```

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.60000000D+01	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.60000000D+01	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

```
*****    Initial Actual NLP Control Vector Estimates (CV0) and
                  Its Limits (CVL0 & CVU0) Before Compression    *****
```

Element	CVL0	CV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.60000000D+01	0.00000000D+00	0.60000000D+01
6	-0.60000000D+01	0.00000000D+00	0.60000000D+01
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

```
*****    End Conditions Vector EC0, Previous Cycle
                  End Conditions Vector ECPRV0, and Weighting
                        Coefficient Vector WDT0 Before Compression   *****
```

Element	EC0	ECPRV0	WDT0
1	-0.95504700D+02	-0.95504700D+02	0.10000000D+01
2	0.75647200D+02	0.75647200D+02	0.10000000D+01
3	0.84882200D+02	0.84882200D+02	0.10000000D+01
4	0.80737600D+02	0.80737600D+02	0.10000000D+01
5	-0.65848100D+02	-0.65848100D+02	0.10000000D+01
6	0.77724100D+02	0.77724100D+02	0.10000000D+01
7	-0.37301000D+02	-0.37301000D+02	0.10000000D+01
8	0.31399400D+02	0.31399400D+02	0.10000000D+01
9	0.43590700D+02	0.43590700D+02	0.10000000D+01

```
     10          0.12152200D+02         0.12152200D+02          0.10000000D+01


                **********   Case Number  620   **********


              Specification of CV, T-matrix, and EC Compression

                            MSAVE0/MSAVE

       1              0              0              0              0
    1     1      0      0      0      0      0      0      0      0


                            NSAVE0/NSAVE

       0              0              1              0              0
    0     0      0      0      1      1      0      0      0      0


 ********************   T-Matrix Compression is Initiated   ********************


  *****   Initial Control Vector (CV0), T-Matrix (T0),
                                 and Measurement Vector (EC0)   *****


  *****   Initial Control Vector (CV0)   *****

   CV0    0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
          0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
          0.00000000D+00      0.00000000D+00

  *****   Initial Greatest Least Bounds (CVL0) for the
                                 Control Vector (CV0)   *****

   CVL0   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
          -0.60000000D+01   -0.60000000D+01   -0.10000000D+02   -0.10000000D+02
          -0.10000000D+02   -0.10000000D+02
  *****   Initial Least Upper Bounds (CVU0) for the
                                 Control Vector (CV0)   *****

   CVU0    0.10000000D+02      0.10000000D+02      0.10000000D+02      0.10000000D+02
           0.60000000D+01      0.60000000D+01      0.10000000D+02      0.10000000D+02
           0.10000000D+02      0.10000000D+02


     Row          *****   Initial T-Matrix (T0)   *****

 T0  1   -0.90740400D+02   -0.13569100D+03   -0.11432000D+03   -0.68177300D+02
         -0.50039300D+02   -0.76479500D+02   -0.14327400D+03   -0.13709000D+03
         -0.12026900D+03   -0.35691800D+02

 T0  2    0.11970700D+03    0.79448600D+02    0.47683700D+02    0.51471100D+02
          0.63869000D+02    0.10792800D+03    0.11090400D+03    0.35351300D+02
          0.35507200D+02    0.52919900D+02

 T0  3    0.12238400D+03    0.87604200D+02    0.60609600D+02    0.64589000D+02
          0.76583700D+02    0.11311600D+03    0.11015900D+03    0.41278200D+02
          0.40179000D+02    0.96571600D+02

 T0  4    0.78723800D+02    0.11595000D+03    0.95790400D+02    0.53425700D+02
          0.37283300D+02    0.66388400D+02    0.13180500D+03    0.11129300D+03
          0.68519100D+02    0.18697000D+02

 T0  5   -0.69686400D+02   -0.47757000D+02   -0.56223800D+02   -0.30916700D+02
          0.44635300D+02   -0.48842200D+02   -0.89783700D+02   -0.24031100D+03
         -0.14879800D+03   -0.48361400D+02

 T0  6    0.66340100D+02    0.79133100D+02    0.49498400D+02    0.80521700D+02
          0.79285000D+02    0.15567100D+03    0.25360700D+03    0.32079500D+02
          0.67000200D+02   -0.20154700D+02

 T0  7   -0.40056100D+02   -0.30015800D+02   -0.24877100D+02   -0.84533200D+01
```

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```
          -0.54793800D+01   -0.59097000D+02    0.17656700D+02   -0.49513700D+02
          -0.82328600D+02   -0.11560300D+03

  T0   8   0.20252000D+02    0.33375900D+02    0.37778200D+01    0.54595500D+02
           0.73257900D+02    0.67743700D+02    0.49407700D+02    0.88928300D+02
           0.11906500D+03   -0.21847200D+02

  T0   9   0.29750400D+02    0.38475000D+02    0.24546000D+02    0.66753000D+02
           0.12317900D+03    0.73072500D+02    0.19590400D+02    0.49442400D+00
          -0.13463600D+02    0.11916600D+03

  T0 10    0.24367300D+02    0.13770800D+02   -0.63430700D+01   -0.12353700D+02
          -0.16066500D+02    0.85041400D+02    0.70406300D+02   -0.98438700D+01
          -0.73784200D+02   -0.50092100D+02


   *****   Initial End Conditions Vector (EC0)   *****

   EC0    -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02

   *****   Initial End Conditions Weighting Coefficient Vector
                         (WDT0) for the Performance Index (F)   *****

   WDT0    0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
           0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
           0.10000000D+01    0.10000000D+01


   *****   Initial Control Vector (CVPRV0) and Measurement
                         Vector (ECPRV0) from the Previous Duty Cycle   *****


   *****   Initial Previous Cycle Control Vector (CVPRV0)   *****

 CVPRV0   0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
          0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
          0.00000000D+00    0.00000000D+00


   *****   Initial Previous Cycle End Conditions Vector (ECPRV0)   *****

 ECPRV0  -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
         -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
          0.43590700D+02    0.12152200D+02


   *****   Intermediate Control Vector (CV), T-Matrix (TT),
           and Measurement Vector (ECT) after the First Compression   *****


   *****   Intermediate Control Vector (CV) after the First Compression   *****

   CV     0.00000000D+00    0.00000000D+00

   *****   Intermediate Greatest Least Bounds (CVL) for the
                                        Control Vector (CV)   *****

   CVL    -0.60000000D+01   -0.60000000D+01

   *****   Intermediate Least Upper Bounds (CVU) for the
                                        Control Vector (CV)   *****

   CVU     0.60000000D+01    0.60000000D+01


     Row        *****   Intermediate T-Matrix (TT)   *****

  TT   1   -0.50039300D+02   -0.76479500D+02

  TT   2    0.63869000D+02    0.10792800D+03

  TT   3    0.76583700D+02    0.11311600D+03
```

```
   TT   4      0.37283300D+02     0.66388400D+02

   TT   5      0.44635300D+02    -0.48842200D+02

   TT   6      0.79285000D+02     0.15567100D+03

   TT   7     -0.54793800D+01    -0.59097000D+02

   TT   8      0.73257900D+02     0.67743700D+02

   TT   9      0.12317900D+03     0.73072500D+02

   TT  10     -0.16066500D+02     0.85041400D+02


    *****    Intermediate End Conditions Vector (ECT)    *****

    ECT   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02
    *****    Intermediate End Conditions Weighting Coefficient Vector
                                 (WDTT) for the Performance Index (F)    *****

    WDTT   0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01


    *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                            (ECPRV0) from the Previous Duty Cycle after
                                                the First Compression    *****


    *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                                the First Compression    *****

   CVPRV    0.00000000D+00     0.00000000D+00


    *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                       after the First Compression    *****

   ECPRVT  -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02


    *****    Final Control Vector (CV), T-Matrix (T), and
                   Measurement Vector (EC) after the Second Compression    *****


    *****    Final Control Vector (CV) after the Second Compression    *****
     CV    0.00000000D+00     0.00000000D+00

    *****    Greatest Least Bounds (CVL) Vector for the
                                                Control Vector (CV)    *****

    CVL   -0.60000000D+01    -0.60000000D+01

    *****    Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

    CVU    0.60000000D+01     0.60000000D+01


     Row              *****    Final T-Matrix (T)    *****

   T  1    -0.50039300D+02    -0.76479500D+02

   T  2     0.63869000D+02     0.10792800D+03


    *****    Final End Conditions Vector (EC) after the Second Compression    *****
```

```
    EC    -0.95504700D+02    0.75647200D+02

  *****    Final End Conditions Weighting Coefficient Vector
                               (WDT) for the Performance Index (F)   *****

   WDT    0.10000000D+01    0.10000000D+01


  *****    Final Control Vector (CVPRV) and Measurement Vector
                        (ECPRV) from the Previous Duty Cycle after
                                          the Second Compression   *****
  *****    Final Previous Cycle Control Vector (CVPRV) after
                                          the Second Compression   *****

 CVPRV     0.00000000D+00    0.00000000D+00


  *****    Final Previous Cycle End Conditions Vector (ECPRV)
                                      after the Second Compression   *****

 ECPRV    -0.95504700D+02    0.75647200D+02


******************    T-Matrix Compression is Completed   *******************


  *****    Initial End Conditions Vector EC    *****


   -0.95504700D+02      0.75647200D+02


  *****    Initial Performance Index  =   0.14843647D+05   *****

  *****    Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

 Element    AL               A                AU               PHASE

    1    0.00000000D+00    0.00000000D+00    0.60000000D+01    0.00000000D+00


*****   Initial Constraint Function Values for Case Number  620   *****

                            LSAVE

    1     0

  *****    Inequality Constraints    *****

 Element       Constraint         Amplitude         Max Amp

    1        0.60000000D+01    0.00000000D+00    0.60000000D+01


  *****    Solve the NLPQLP Problem for Case Number  620   *****



  ----------------------------------------------------------------------
   START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
  ----------------------------------------------------------------------

   Parameters:
     N      =       2
     M      =       1
     ME     =       0
     MODE   =       0
     ACC    =    0.1000D-06
     ACCQP  =    0.1000D-11
     STPMIN =    0.0000D+00
     RHOB   =    0.1000D+03
     MAXFUN =      30
```

```
   MAXNM  =        10
   MAXIT  =       300
   IPRINT =         2
 Output in the following order:
    IT    - iteration number
    F     - objective function value
    SCV   - sum of constraint violations
    NA    - number of active constraints
    I     - number of line search iterations
    ALPHA - steplength parameter
    DELTA - additional variable to prevent inconsistency
    KKT   - Karush-Kuhn-Tucker optimality criterion


   IT       F           SCV      NA  I    ALPHA     DELTA      KKT
   ------------------------------------------------------------------
    1  0.14843647D+05  0.00D+00   1  0   0.00D+00  0.00D+00  0.60D+06
                *****   Completed CALL to NLPQLP    *****
                *****   Completed CALL to NLPQLP    *****
                *****   Completed CALL to NLPQLP    *****
    2  0.11363619D+04  0.00D+00   0  2   0.10D+00  0.00D+00  0.29D+04
                *****   Completed CALL to NLPQLP    *****
                *****   Completed CALL to NLPQLP    *****
    3  0.11640825D+03  0.62D+00   1  1   0.10D+01  0.00D+00  0.96D+02
                *****   Completed CALL to NLPQLP    *****
                *****   Completed CALL to NLPQLP    *****
    4  0.16635703D+03  0.37D-03   1  1   0.10D+01  0.00D+00  0.70D+01
                *****   Completed CALL to NLPQLP    *****
                *****   Completed CALL to NLPQLP    *****
                *****   Completed CALL to NLPQLP    *****
    5  0.16514768D+03  0.25D-03   1  2   0.35D+00  0.00D+00  0.42D-01
                *****   Completed CALL to NLPQLP    *****
                *****   Completed CALL to NLPQLP    *****
    6  0.16516893D+03  0.91D-10   1  1   0.10D+01  0.00D+00  0.16D-07


   --- Final Convergence Analysis at Last Iterate ---

    Objective function value:      F(X)  =  0.16516893D+03
    Solution values:               X     =
      -0.54697646D+01  0.24661053D+01
    Distances from lower bounds:   X-XL  =
       0.53023541D+00  0.84661053D+01
    Distances from upper bounds:   XU-X  =
       0.11469765D+02  0.35338947D+01
    Multipliers for lower bounds:  U     =
       0.00000000D+00  0.00000000D+00
    Multipliers for upper bounds:  U     =
       0.00000000D+00  0.00000000D+00
    Constraint values:             G(X)  =
      -0.90656371D-10
    Multipliers for constraints:   U     =
       0.86172029D+02
    Number of function calls:      NFUNC =        8
    Number of gradient calls:      NGRAD =        6
    Number of calls of QP solver:  NQL   =        6



                *****   Completed CALL to NLPQLP    *****


          *****    Number of Function Evaluations  =     20   *****


  *****   Solution Control Vector for Case Number  620   *****

 Element    CVL              CV               CVU              CV - CV0

    1   -0.60000000D+01  -0.54697646D+01   0.60000000D+01  -0.54697646D+01
    2   -0.60000000D+01   0.24661053D+01   0.60000000D+01   0.24661053D+01
```

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```
      *****   Predicted Measurement Vector EC   *****

        -0.10408027D+02      -0.75393564D+01


      *****   NLP Solution Performance Index  =   0.16516893D+03   *****



      *****   Predicted Measurement Vector EC   *****

        -0.10408008D+02      -0.75393830D+01


      *****   NLP Solution Performance Index  =   0.16516893D+03   *****



      *****   Predicted Control Amplitude Vector (A)
                  Its Limits (AL & AU), and Its Phase Angle
                              Vector (PHASE) Before Compression   *****

     Element    AL               A               AU            PHASE

        1     0.00000000D+00   0.60000000D+01   0.60000000D+01   -0.65731228D+02

 *****   Solution Constraint Function Values for Case Number  620   *****

                            LSAVE

        1     0

      *****   Inequality Constraints   *****

     Element        Constraint        Amplitude         Max Amp

        1        -0.90656371D-10     0.60000000D+01     0.60000000D+01


              **********   End Case Number  620   **********




**************************************************************************
```

```
              ***************   Start Case Number  420   ***************


         ***************   INPUT DATA for Case Number  420   ***************


    &CDATA
     A00= 5*0.0000000000000000        ,  1.0000000000000000      ,
     ACC= 9.9999999999999955E-008,
     ACCQP= 9.9999999999999980E-013,
     AL0= 5*0.0000000000000000        ,-9.9999999999999955E-008,
     ALPHA=  1.0000000000000000      ,
     APRV0= 5*0.0000000000000000       , 4.94065645841246544E-324,
     AU0= 2*10.000000000000000       ,  4.0000000000000000     , 2*10.000000000000000
    ,  3.0000000000000000       ,
     CRAN1=  2.0000000000000000      ,
     CRAN2=  3.0000000000000000      ,
     CRAN3=  1.0000000000000000      ,
     CRAN4=  1.0000000000000000      ,
     CV00= 10*0.0000000000000000        , 1.48219693752373963E-323, 6.95323359360983736E-
    310, 7.61607133720739960E-319, 6.95323359333671787E-310,

     CVOUT=          0,
     CVPRV0= 10*0.0000000000000000          , 6.95323359332327929E-310, 6.95321237057378016E-
    310, 6.95325616664988679E-310,  0.0000000000000000       ,

     ECPRV0= -95.504700000000000        ,  75.647199999999998      ,  84.882199999999997      ,
    80.737600000000000      , -65.848100000000002      ,
        77.724100000000007       , -37.301000000000002      ,  31.399400000000000      ,
    43.590699999999998      ,  12.152200000000001      ,
     EPS= 9.9999999999999955E-008,
     ICASE=          420,
     ICYCL0=        2000,
     IDATA=            3,
     IN=           5,
     IOPT=            1,
     IOUT=            6,
     IPRINT=           2,
     ISEED1=       2395,        4013,        3813,        1837,
     ISEED2=       1843,        4011,        3364,        2835,
     ISEED3=       3962,        1111,        3215,        2637,
     ISEED4=       2397,        1504,        4031,        3173,
     ITOUT=            3,
     L=            1,
     LQL=T,
     LSAVE=            1, 5*0           ,
     MAXASUM=  3.0000000000000000      ,
     MAXFUN=          30,
     MAXIT=          300,
     MAXNM=           10,
     MI=            1,
     MINASUM=  0.0000000000000000      ,
     MODE=            0,
     MSAVE0=           1, 4*0          , 5*1          ,
     MULT=            1,
     NSAVE0= 2*0          ,            1, 2*0          , 5*1          ,
     NX0=           10,
     NZ0=           10,
     OPTEND=            3,
     PHASE0= 5*0.0000000000000000        , 90.000000000000000      ,
     PHSPRV0= 6*0.0000000000000000        ,
     RHOB=  100.00000000000000      ,
     STPMIN=  0.0000000000000000      ,
     T0= -90.740399999999994       , 119.70699999999999      , 122.38400000000000       ,
    78.723799999999997      , -69.686400000000006      ,
        66.340100000000007      , -40.056100000000001      ,  20.251999999999999      ,
    29.750399999999999      ,  24.367300000000000      , -135.69100000000000       ,
        79.448599999999999      ,  87.604200000000006      ,  115.95000000000000      , -
    47.756999999999998      ,  79.133099999999999      , -30.015799999999999       ,
        33.375900000000001      ,  38.475000000000001      ,  13.770799999999999      , -
    114.31999999999999       ,  47.683700000000002      ,  60.609600000000000       ,
        95.790400000000005      , -56.223799999999997      ,  49.498399999999997      , -
    24.877099999999999       ,  3.7778200000000002      ,  24.545999999999999       ,
```

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```
   -6.3430700000000000      , -68.177300000000002      ,   51.471100000000000     ,
64.588999999999999    ,  53.425699999999999    , -30.916699999999999        ,
   80.521699999999996    ,  -8.4533199999999997    ,   54.595500000000001      ,
66.753000000000000    , -12.353700000000000    , -50.039299999999997        ,
   63.869000000000000    ,  76.583699999999993    ,   37.283299999999997      ,
44.635300000000001    ,  79.284999999999997    ,  -5.4793799999999999        ,
   73.257900000000006    ,  123.17900000000000    ,  -16.066500000000001      , -
76.479500000000002    ,  107.92800000000000    ,  113.11600000000000        ,
   66.388400000000004    , -48.842199999999998    ,  155.67099999999999      , -
59.097000000000001    ,  67.743700000000004    ,  73.072500000000005        ,
   85.041399999999996    , -143.27400000000000    ,  110.90400000000000      ,
110.15900000000001    ,  131.80500000000001    , -89.783699999999996        ,
   253.60700000000000    ,  17.656700000000001    ,   49.407699999999998      ,
19.590399999999999    ,  70.406300000000002    , -137.09000000000000        ,
   35.351300000000002    ,  41.278199999999998    ,  111.29300000000001      , -
240.31100000000001    ,  32.079500000000003    , -49.513700000000000        ,
   88.928299999999993    , 0.49442399999999997    ,  -9.8438700000000008      , -
120.26900000000001    ,  35.507199999999997    ,   40.179000000000002        ,
   68.519099999999995    , -148.79800000000000    ,   67.000200000000007      , -
82.328599999999994    ,  119.06500000000000    , -13.463600000000000        ,
   -73.784199999999998    , -35.691800000000001    ,   52.919899999999998      ,
96.571600000000004    ,  18.696999999999999    , -48.361400000000003        ,
   -20.154699999999998    , -115.60299999999999    ,  -21.847200000000001      ,
119.16600000000000    , -50.092100000000002    ,
 WDT0= 10*1.0000000000000000      ,
 WDX= 10*0.0000000000000000      ,
 WX= 10*0.0000000000000000      ,
 WZ= 10*1.0000000000000000      ,
 /


 ******************************************************************************


     ***************   OUTPUT DATA for Case Number  420   ***************


   *****    The Initial T-Matrix (T0) and Either the Initial
                    Previous Actual NLP Control Vector (CVPRV0) or
                        the Initial Previous Control Amplitude (APRV0)
                          and Phase Angle (PHSPRV0) Vectors Before
                                Compression are Directly Input   *****

   *****    Input the Initial Previous Actual NLP Control
                   Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                       and then Compute the Previous Control Amplitude (APRV0)
                           and Control Phase Angle (PHSPRV0) Vectors   *****


             **********   Case Number  420   **********


   *****    Initial Previous Control Amplitude (APRV0) and Phase
                        Angle (PHSPRV0) Vectors before Compression   *****

   Element     AL0              APRV0             AU0              PHSPRV0

       1    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
       2    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
       3    0.00000000D+00   0.00000000D+00   0.40000000D+01   0.00000000D+00
       4    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
       5    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00

   *****    Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

   Element      CVL0               CVPRV0             CVU0

       1     -0.10000000D+02    0.00000000D+00     0.10000000D+02
       2     -0.10000000D+02    0.00000000D+00     0.10000000D+02
       3     -0.10000000D+02    0.00000000D+00     0.10000000D+02
       4     -0.10000000D+02    0.00000000D+00     0.10000000D+02
       5     -0.40000000D+01    0.00000000D+00     0.40000000D+01
       6     -0.40000000D+01    0.00000000D+00     0.40000000D+01
       7     -0.10000000D+02    0.00000000D+00     0.10000000D+02
```

```
      8        -0.10000000D+02      0.00000000D+00      0.10000000D+02
      9        -0.10000000D+02      0.00000000D+00      0.10000000D+02
     10        -0.10000000D+02      0.00000000D+00      0.10000000D+02
```

```
*****    Either the BEFORE Compression Initial Actual NLP Control
             Vector Estimates (CV00), OR the BEFORE Compression
               Initial Control Vector Amplitudes (A00) and Phase
                 Angles (PHASE0) Estimates are Directly Input
                      via NAMELIST Data CDATA                      *****


*****    Input the Initial Actual NLP Control Vector Estimate
             (CV00) Directly Via NAMELIST Input CDATA, and
                  then Compute the Control Vector Amplitudes
                       (A00) and Phase Angles (PHASE0) Estimates    *****



                **********   Case Number  420   **********


*****    Adjust the Initial Control Amplitude Estimates Vector
             (A00) to define the Initial Control Amplitude Estimates
               Vector (A0) to Within Limits If Required Before Compression   *****


*****    Initial Control Amplitude Vector Estimates (A0), Its
                   Limits (AL0 & AU0), and Its Phase Angle Vector
                         Estimates (PHASE0) Before Compression    *****
```

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.40000000D+01	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.40000000D+01	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

```
*****    Initial Actual NLP Control Vector Estimates (CV0) and
                       Its Limits (CVL0 & CVU0) Before Compression    *****
```

Element	CVL0	CV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.40000000D+01	0.00000000D+00	0.40000000D+01
6	-0.40000000D+01	0.00000000D+00	0.40000000D+01
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

```
*****    End Conditions Vector EC0, Previous Cycle
                   End Conditions Vector ECPRV0, and Weighting
                         Coefficient Vector WDT0 Before Compression    *****
```

Element	EC0	ECPRV0	WDT0
1	-0.95504700D+02	-0.95504700D+02	0.10000000D+01
2	0.75647200D+02	0.75647200D+02	0.10000000D+01
3	0.84882200D+02	0.84882200D+02	0.10000000D+01
4	0.80737600D+02	0.80737600D+02	0.10000000D+01
5	-0.65848100D+02	-0.65848100D+02	0.10000000D+01
6	0.77724100D+02	0.77724100D+02	0.10000000D+01
7	-0.37301000D+02	-0.37301000D+02	0.10000000D+01
8	0.31399400D+02	0.31399400D+02	0.10000000D+01
9	0.43590700D+02	0.43590700D+02	0.10000000D+01

```
     10          0.12152200D+02       0.12152200D+02       0.10000000D+01


                  **********   Case Number  420   **********


           Specification of CV, T-matrix, and EC Compression

                          MSAVE0/MSAVE

       1            0            0            0            0
       1    1       0       0       0       0       0       0       0       0


                          NSAVE0/NSAVE

       0            0            1            0            0
       0    0       0       0       1       1       0       0       0       0


*******************   T-Matrix Compression is Initiated   ********************



  *****    Initial Control Vector (CV0), T-Matrix (T0),
                                    and Measurement Vector (EC0)   *****


  *****    Initial Control Vector (CV0)   *****

   CV0     0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
           0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
           0.00000000D+00      0.00000000D+00

  *****    Initial Greatest Least Bounds (CVL0) for the
                                    Control Vector (CV0)   *****

   CVL0    -0.10000000D+02     -0.10000000D+02     -0.10000000D+02     -0.10000000D+02
           -0.40000000D+01     -0.40000000D+01     -0.10000000D+02     -0.10000000D+02
           -0.10000000D+02     -0.10000000D+02

  *****    Initial Least Upper Bounds (CVU0) for the
                                    Control Vector (CV0)   *****

   CVU0    0.10000000D+02      0.10000000D+02      0.10000000D+02      0.10000000D+02
           0.40000000D+01      0.40000000D+01      0.10000000D+02      0.10000000D+02
           0.10000000D+02      0.10000000D+02


     Row           *****   Initial T-Matrix (T0)   *****

  T0  1    -0.90740400D+02     -0.13569100D+03     -0.11432000D+03     -0.68177300D+02
           -0.50039300D+02     -0.76479500D+02     -0.14327400D+03     -0.13709000D+03
           -0.12026900D+03     -0.35691800D+02

  T0  2     0.11970700D+03      0.79448600D+02      0.47683700D+02      0.51471100D+02
            0.63869000D+02      0.10792800D+03      0.11090400D+03      0.35351300D+02
            0.35507200D+02      0.52919900D+02

  T0  3     0.12238400D+03      0.87604200D+02      0.60609600D+02      0.64589000D+02
            0.76583700D+02      0.11311600D+03      0.11015900D+03      0.41278200D+02
            0.40179000D+02      0.96571600D+02

  T0  4     0.78723800D+02      0.11595000D+03      0.95790400D+02      0.53425700D+02
            0.37283300D+02      0.66388400D+02      0.13180500D+03      0.11129300D+03
            0.68519100D+02      0.18697000D+02

  T0  5    -0.69686400D+02     -0.47757000D+02     -0.56223800D+02     -0.30916700D+02
            0.44635300D+02     -0.48842200D+02     -0.89783700D+02     -0.24031100D+03
           -0.14879800D+03     -0.48361400D+02

  T0  6     0.66340100D+02      0.79133100D+02      0.49498400D+02      0.80521700D+02
            0.79285000D+02      0.15567100D+03      0.25360700D+03      0.32079500D+02
            0.67000200D+02     -0.20154700D+02
```

```
   T0  7     -0.40056100D+02    -0.30015800D+02    -0.24877100D+02    -0.84533200D+01
             -0.54793800D+01    -0.59097000D+02     0.17656700D+02    -0.49513700D+02
             -0.82328600D+02    -0.11560300D+03

   T0  8      0.20252000D+02     0.33375900D+02     0.37778200D+01     0.54595500D+02
              0.73257900D+02     0.67743700D+02     0.49407700D+02     0.88928300D+02
              0.11906500D+03    -0.21847200D+02

   T0  9      0.29750400D+02     0.38475000D+02     0.24546000D+02     0.66753000D+02
              0.12317900D+03     0.73072500D+02     0.19590400D+02     0.49442400D+00
             -0.13463600D+02     0.11916600D+03

   T0 10      0.24367300D+02     0.13770800D+02    -0.63430700D+01    -0.12353700D+02
             -0.16066500D+02     0.85041400D+02     0.70406300D+02    -0.98438700D+01
             -0.73784200D+02    -0.50092100D+02


   *****    Initial End Conditions Vector (EC0)    *****

   EC0      -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
            -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
             0.43590700D+02     0.12152200D+02

   *****    Initial End Conditions Weighting Coefficient Vector
                           (WDT0) for the Performance Index (F)    *****

   WDT0      0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
             0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
             0.10000000D+01     0.10000000D+01
   *****    Initial Control Vector (CVPRV0) and Measurement
                           Vector (ECPRV0) from the Previous Duty Cycle    *****


   *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

 CVPRV0     0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
            0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
            0.00000000D+00     0.00000000D+00


   *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

 ECPRV0    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02


   *****    Intermediate Control Vector (CV), T-Matrix (TT),
             and Measurement Vector (ECT) after the First Compression    *****


   *****    Intermediate Control Vector (CV) after the First Compression    *****
     CV      0.00000000D+00     0.00000000D+00

   *****    Intermediate Greatest Least Bounds (CVL) for the
                                        Control Vector (CV)    *****

    CVL     -0.40000000D+01    -0.40000000D+01

   *****    Intermediate Least Upper Bounds (CVU) for the
                                        Control Vector (CV)    *****

    CVU      0.40000000D+01     0.40000000D+01


    Row          *****    Intermediate T-Matrix (TT)    *****

  TT  1     -0.50039300D+02    -0.76479500D+02

  TT  2      0.63869000D+02     0.10792800D+03

  TT  3      0.76583700D+02     0.11311600D+03
```

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```
TT  4     0.37283300D+02     0.66388400D+02

TT  5     0.44635300D+02    -0.48842200D+02

TT  6     0.79285000D+02     0.15567100D+03

TT  7    -0.54793800D+01    -0.59097000D+02

TT  8     0.73257900D+02     0.67743700D+02

TT  9     0.12317900D+03     0.73072500D+02

TT 10    -0.16066500D+02     0.85041400D+02


  *****    Intermediate End Conditions Vector (ECT)    *****

   ECT   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02
  *****    Intermediate End Conditions Weighting Coefficient Vector
                                 (WDTT) for the Performance Index (F)    *****

  WDTT    0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
          0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
          0.10000000D+01     0.10000000D+01


  *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                            (ECPRV0) from the Previous Duty Cycle after
                                              the First Compression    *****


  *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                              the First Compression    *****

 CVPRV    0.00000000D+00     0.00000000D+00


  *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                     after the First Compression    *****

ECPRVT   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02


  *****    Final Control Vector (CV), T-Matrix (T), and
                   Measurement Vector (EC) after the Second Compression    *****


  *****    Final Control Vector (CV) after the Second Compression    *****

   CV     0.00000000D+00     0.00000000D+00

  *****    Greatest Least Bounds (CVL) Vector for the
                                         Control Vector (CV)    *****

  CVL    -0.40000000D+01    -0.40000000D+01

  *****    Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

  CVU     0.40000000D+01     0.40000000D+01


   Row              *****    Final T-Matrix (T)    *****

 T  1    -0.50039300D+02    -0.76479500D+02

 T  2     0.63869000D+02     0.10792800D+03


  *****    Final End Conditions Vector (EC) after the Second Compression    *****
```

```
     EC     -0.95504700D+02     0.75647200D+02


  *****   Final End Conditions Weighting Coefficient Vector
                              (WDT) for the Performance Index (F)  *****

   WDT     0.10000000D+01     0.10000000D+01


  *****   Final Control Vector (CVPRV) and Measurement Vector
                    (ECPRV) from the Previous Duty Cycle after
                                        the Second Compression  *****
  *****   Final Previous Cycle Control Vector (CVPRV) after
                                        the Second Compression  *****

  CVPRV    0.00000000D+00     0.00000000D+00


  *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                    after the Second Compression  *****

  ECPRV   -0.95504700D+02     0.75647200D+02


******************   T-Matrix Compression is Completed   ********************


  *****   Initial End Conditions Vector EC   *****


    -0.95504700D+02        0.75647200D+02


  *****   Initial Performance Index  =   0.14843647D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

  Element    AL               A                AU               PHASE

     1    0.00000000D+00    0.00000000D+00    0.40000000D+01    0.00000000D+00


 *****   Initial Constraint Function Values for Case Number  420   *****

                              LSAVE

     1     0

  *****   Inequality Constraints   *****

  Element        Constraint         Amplitude         Max Amp

     1        0.40000000D+01     0.00000000D+00     0.40000000D+01


  *****   Solve the NLPQLP Problem for Case Number  420   *****


   -------------------------------------------------------------------
    START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
   -------------------------------------------------------------------

    Parameters:
      N       =        2
      M       =        1
      ME      =        0
      MODE    =        0
      ACC     =    0.1000D-06
      ACCQP   =    0.1000D-11
      STPMIN  =    0.0000D+00
      RHOB    =    0.1000D+03
      MAXFUN  =       30
      MAXNM   =       10
```

```
      MAXIT  =       300
      IPRINT =         2

  Output in the following order:
      IT    - iteration number
      F     - objective function value
      SCV   - sum of constraint violations
      NA    - number of active constraints
      I     - number of line search iterations
      ALPHA - steplength parameter
      DELTA - additional variable to prevent inconsistency
      KKT   - Karush-Kuhn-Tucker optimality criterion


   IT       F          SCV       NA  I    ALPHA     DELTA     KKT
   ------------------------------------------------------------------
    1  0.14843647D+05  0.00D+00    1  0  0.00D+00  0.00D+00  0.40D+06
               *****   Completed CALL to NLPQLP   *****
               *****   Completed CALL to NLPQLP   *****
               *****   Completed CALL to NLPQLP   *****
    2  0.10267626D+04  0.00D+00    0  2  0.14D+00  0.00D+00  0.17D+04
               *****   Completed CALL to NLPQLP   *****
               *****   Completed CALL to NLPQLP   *****
    3  0.34542635D+03  0.30D+00    1  1  0.10D+01  0.00D+00  0.76D+02
               *****   Completed CALL to NLPQLP   *****
               *****   Completed CALL to NLPQLP   *****
    4  0.38348485D+03  0.39D-03    1  1  0.10D+01  0.00D+00  0.10D+00
               *****   Completed CALL to NLPQLP   *****
               *****   Completed CALL to NLPQLP   *****
    5  0.38353561D+03  0.53D-09    1  1  0.10D+01  0.00D+00  0.10D-05
               *****   Completed CALL to NLPQLP   *****
               *****   Completed CALL to NLPQLP   *****
    6  0.38353561D+03  0.28D-11    1  1  0.10D+01  0.00D+00  0.74D-09


  --- Final Convergence Analysis at Last Iterate ---

    Objective function value:     F(X)  =  0.38353561D+03
    Solution values:              X     =
      -0.37438598D+01  0.14083727D+01
    Distances from lower bounds:  X-XL  =
       0.25614019D+00  0.54083727D+01
    Distances from upper bounds:  XU-X  =
       0.77438598D+01  0.25916273D+01
    Multipliers for lower bounds: U     =
       0.00000000D+00  0.00000000D+00
    Multipliers for upper bounds: U     =
       0.00000000D+00  0.00000000D+00
    Constraint values:            G(X)  =
      -0.27968738D-11
    Multipliers for constraints:  U     =
       0.13265481D+03
    Number of function calls:     NFUNC =        7
    Number of gradient calls:     NGRAD =        6
    Number of calls of QP solver: NQL   =        6



              *****   Completed CALL to NLPQLP   *****


        *****   Number of Function Evaluations  =     19   *****


*****   Solution Control Vector for Case Number  420   *****

Element   CVL             CV              CVU             CV - CV0

   1   -0.40000000D+01  -0.37438598D+01   0.40000000D+01  -0.37438598D+01
   2   -0.40000000D+01   0.14083727D+01   0.40000000D+01   0.14083727D+01
```

```
     *****   Predicted Measurement Vector EC   *****

       -0.15876228D+02      -0.11466516D+02


     *****   NLP Solution Performance Index  =   0.38353561D+03   *****



     *****   Predicted Measurement Vector EC   *****

       -0.15876217D+02      -0.11466531D+02


     *****   NLP Solution Performance Index  =   0.38353561D+03   *****



     *****   Predicted Control Amplitude Vector (A)
               Its Limits (AL & AU), and Its Phase Angle
                                 Vector (PHASE) Before Compression   *****

   Element    AL              A               AU              PHASE

      1     0.00000000D+00   0.40000000D+01   0.40000000D+01  -0.69384603D+02

  *****   Solution Constraint Function Values for Case Number  420   *****

                              LSAVE

      1      0

  *****   Inequality Constraints   *****

   Element       Constraint        Amplitude        Max Amp

      1       -0.27968738D-11    0.40000000D+01    0.40000000D+01


              **********   End Case Number  420   **********



  ****************************************************************************
```

```
 &CDATA
 A00= 5*0.0000000000000000        ,  1.0000000000000000      ,
 ACC= 9.9999999999999955E-008,
 ACCQP= 9.9999999999999980E-013,
 AL0= 5*0.0000000000000000        ,-9.9999999999999955E-008,
 ALPHA=  1.0000000000000000       ,
 APRV0= 5*0.0000000000000000       ,  4.94065645841246544E-324,
 AU0= 2*10.000000000000000       ,  2.0000000000000000      , 2*10.000000000000000
 ,  3.0000000000000000      ,
 CRAN1=  2.0000000000000000       ,
 CRAN2=  3.0000000000000000       ,
 CRAN3=  1.0000000000000000       ,
 CRAN4=  1.0000000000000000       ,
 CV00= 10*0.0000000000000000        , 1.48219693752373963E-323, 6.95323359360983736E-
 310, 7.61607133720739960E-319, 6.95323359333671787E-310,

 CVOUT=           0,
 CVPRV0= 10*0.0000000000000000         , 6.95323359332327929E-310, 6.95321237057378016E-
 310, 6.95325616664988679E-310,  0.0000000000000000      ,

 ECPRV0= -95.504700000000000        ,  75.647199999999998      ,  84.882199999999997     ,
 80.737600000000000      , -65.848100000000002      ,
    77.724100000000007      , -37.301000000000002      ,  31.399400000000000     ,
 43.590699999999998      ,  12.152200000000001      ,
 EPS= 9.9999999999999955E-008,
 ICASE=         220,
 ICYCL0=       2000,
 IDATA=           3,
 IN=           5,
 IOPT=           1,
 IOUT=           6,
 IPRINT=          2,
 ISEED1=       2395,       4013,       3813,       1837,
 ISEED2=       1843,       4011,       3364,       2835,
 ISEED3=       3962,       1111,       3215,       2637,
 ISEED4=       2397,       1504,       4031,       3173,
 ITOUT=           3,
 L=           1,
 LQL=T,
 LSAVE=           1, 5*0          ,
 MAXASUM=  3.0000000000000000      ,
 MAXFUN=          30,
 MAXIT=         300,
 MAXNM=          10,
 MI=           1,
 MINASUM=  0.0000000000000000      ,
 MODE=           0,
 MSAVE0=           1, 4*0          , 5*1          ,
 MULT=           1,
 NSAVE0= 2*0           ,          1, 2*0          , 5*1          ,
 NX0=          10,
 NZ0=          10,
 OPTEND=          3,
 PHASE0= 5*0.0000000000000000        , 90.000000000000000      ,
 PHSPRV0= 6*0.0000000000000000        ,
 RHOB=  100.00000000000000      ,
 STPMIN=  0.0000000000000000      ,
 T0= -90.740399999999994      , 119.70699999999999      , 122.38400000000000      ,
 78.723799999999997      , -69.686400000000006      ,
    66.340100000000007      , -40.056100000000001      ,  20.251999999999999     ,
 29.750399999999999      ,  24.367300000000000      , -135.69100000000000      ,
    79.448599999999999      ,  87.604200000000006      ,  115.95000000000000      , -
 47.756999999999998      ,  79.133099999999999      , -30.015799999999999      ,
    33.375900000000001      ,  38.475000000000001      ,  13.770799999999999      , -
 114.31999999999999      ,  47.683700000000002      ,  60.609600000000000      ,
    95.790400000000005      , -56.223799999999997      ,  49.498399999999997      , -
 24.877099999999999      ,  3.7778200000000002      ,  24.545999999999999      ,
```

```
   -6.3430700000000000      , -68.177300000000002     ,   51.471100000000000     ,
64.588999999999999     ,  53.425699999999999     , -30.916699999999999     ,
   80.521699999999996     ,  -8.4533199999999997     ,   54.595500000000001     ,
66.753000000000000     , -12.353700000000000     , -50.039299999999997     ,
   63.869000000000000     ,  76.583699999999993     ,   37.283299999999997     ,
44.635300000000001     ,  79.284999999999997     ,  -5.4793799999999999     ,
   73.257900000000006     ,  123.17900000000000     ,  -16.066500000000001     , -
76.479500000000002     ,  107.92800000000000     ,  113.11600000000000     ,
   66.388400000000004     , -48.842199999999998     ,  155.67099999999999     , -
59.097000000000001     ,  67.743700000000004     ,  73.072500000000005     ,
   85.041399999999996     , -143.27400000000000     ,  110.90400000000000     ,
110.15900000000001     ,  131.80500000000001     , -89.783699999999996     ,
   253.60700000000000     ,  17.656700000000001     ,  49.407699999999998     ,
19.590399999999999     ,  70.406300000000002     , -137.09000000000000     ,
   35.351300000000002     ,  41.278199999999998     ,  111.29300000000001     , -
240.31100000000001     ,  32.079500000000003     , -49.513700000000000     ,
   88.928299999999993     , 0.49442399999999997     ,  -9.8438700000000008     , -
120.26900000000001     ,  35.507199999999997     ,  40.179000000000002     ,
   68.519099999999995     , -148.79800000000000     ,  67.000200000000007     , -
82.328599999999994     ,  119.06500000000000     , -13.463600000000000     ,
   -73.784199999999998     , -35.691800000000001     ,   52.919899999999998     ,
96.571600000000004     ,  18.696999999999999     , -48.361400000000003     ,
   -20.154699999999998     , -115.60299999999999     , -21.847200000000001     ,
119.16600000000000     , -50.092100000000002     ,
 WDT0= 10*1.0000000000000000        ,
 WDX= 10*0.0000000000000000        ,
 WX= 10*0.0000000000000000        ,
 WZ= 10*1.0000000000000000        ,
 /




 ****************************************************************************


        ***************   OUTPUT DATA for Case Number  220   ***************


    *****     The Initial T-Matrix (T0) and Either the Initial
                    Previous Actual NLP Control Vector (CVPRV0) or
                        the Initial Previous Control Amplitude (APRV0)
                            and Phase Angle (PHSPRV0) Vectors Before
                                  Compression are Directly Input   *****

    *****     Input the Initial Previous Actual NLP Control
                    Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                        and then Compute the Previous Control Amplitude (APRV0)
                            and Control Phase Angle (PHSPRV0) Vectors   *****



                **********   Case Number  220   **********



    *****     Initial Previous Control Amplitude (APRV0) and Phase
                            Angle (PHSPRV0) Vectors before Compression   *****
        Element     AL0              APRV0              AU0              PHSPRV0

           1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
           2     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
           3     0.00000000D+00    0.00000000D+00    0.20000000D+01    0.00000000D+00
           4     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
           5     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00

    *****     Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

        Element       CVL0              CVPRV0              CVU0

           1        -0.10000000D+02    0.00000000D+00    0.10000000D+02
           2        -0.10000000D+02    0.00000000D+00    0.10000000D+02
           3        -0.10000000D+02    0.00000000D+00    0.10000000D+02
           4        -0.10000000D+02    0.00000000D+00    0.10000000D+02
           5        -0.20000000D+01    0.00000000D+00    0.20000000D+01
```

```
   6        -0.20000000D+01      0.00000000D+00      0.20000000D+01
   7        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   8        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   9        -0.10000000D+02      0.00000000D+00      0.10000000D+02
  10        -0.10000000D+02      0.00000000D+00      0.10000000D+02
```

```
*****     Either the BEFORE Compression Initial Actual NLP Control
            Vector Estimates (CV00), OR the BEFORE Compression
              Initial Control Vector Amplitudes (A00) and Phase
                Angles (PHASE0) Estimates are Directly Input
                    via NAMELIST Data CDATA                      *****


*****     Input the Initial Actual NLP Control Vector Estimate
             (CV00) Directly Via NAMELIST Input CDATA, and
                  then Compute the Control Vector Amplitudes
                      (A00) and Phase Angles (PHASE0) Estimates  *****



              **********   Case Number  220   **********


*****     Adjust the Initial Control Amplitude Estimates Vector
            (A00) to define the Initial Control Amplitude Estimates
              Vector (A0) to Within Limits If Required Before Compression  *****


*****     Initial Control Amplitude Vector Estimates (A0), Its
                Limits (AL0 & AU0), and Its Phase Angle Vector
                    Estimates (PHASE0) Before Compression        *****
```

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.20000000D+01	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.20000000D+01	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

```
*****     Initial Actual NLP Control Vector Estimates (CV0) and
                    Its Limits (CVL0 & CVU0) Before Compression  *****
```

Element	CVL0	CV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.20000000D+01	0.00000000D+00	0.20000000D+01
6	-0.20000000D+01	0.00000000D+00	0.20000000D+01
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

```
*****     End Conditions Vector EC0, Previous Cycle
                End Conditions Vector ECPRV0, and Weighting
                    Coefficient Vector WDT0 Before Compression   *****
```

Element	EC0	ECPRV0	WDT0
1	-0.95504700D+02	-0.95504700D+02	0.10000000D+01
2	0.75647200D+02	0.75647200D+02	0.10000000D+01
3	0.84882200D+02	0.84882200D+02	0.10000000D+01
4	0.80737600D+02	0.80737600D+02	0.10000000D+01
5	-0.65848100D+02	-0.65848100D+02	0.10000000D+01
6	0.77724100D+02	0.77724100D+02	0.10000000D+01
7	-0.37301000D+02	-0.37301000D+02	0.10000000D+01

```
       8          0.31399400D+02        0.31399400D+02        0.10000000D+01
       9          0.43590700D+02        0.43590700D+02        0.10000000D+01
      10          0.12152200D+02        0.12152200D+02        0.10000000D+01


                **********   Case Number  220   **********



                Specification of CV, T-matrix, and EC Compression

                               MSAVE0/MSAVE

        1              0              0              0              0
    1     1       0      0       0      0      0      0       0      0



                               NSAVE0/NSAVE

        0              0              1              0              0
    0     0       0      0       1      1      0      0       0      0



  ********************   T-Matrix Compression is Initiated   ********************



   *****   Initial Control Vector (CV0), T-Matrix (T0),
                                    and Measurement Vector (EC0)   *****


   *****   Initial Control Vector (CV0)   *****

   CV0    0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00

   *****   Initial Greatest Least Bounds (CVL0) for the
                                    Control Vector (CV0)   *****

   CVL0   -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
          -0.20000000D+01    -0.20000000D+01    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+02    -0.10000000D+02

   *****   Initial Least Upper Bounds (CVU0) for the
                                    Control Vector (CV0)   *****

   CVU0    0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
           0.20000000D+01     0.20000000D+01     0.10000000D+02     0.10000000D+02
           0.10000000D+02     0.10000000D+02


      Row           *****   Initial T-Matrix (T0)   *****

   T0  1   -0.90740400D+02    -0.13569100D+03    -0.11432000D+03    -0.68177300D+02
           -0.50039300D+02    -0.76479500D+02    -0.14327400D+03    -0.13709000D+03
           -0.12026900D+03    -0.35691800D+02

   T0  2    0.11970700D+03     0.79448600D+02     0.47683700D+02     0.51471100D+02
            0.63869000D+02     0.10792800D+03     0.11090400D+03     0.35351300D+02
            0.35507200D+02     0.52919900D+02

   T0  3    0.12238400D+03     0.87604200D+02     0.60609600D+02     0.64589000D+02
            0.76583700D+02     0.11311600D+03     0.11015900D+03     0.41278200D+02
            0.40179000D+02     0.96571600D+02

   T0  4    0.78723800D+02     0.11595000D+03     0.95790400D+02     0.53425700D+02
            0.37283300D+02     0.66388400D+02     0.13180500D+03     0.11129300D+03
            0.68519100D+02     0.18697000D+02

   T0  5   -0.69686400D+02    -0.47757000D+02    -0.56223800D+02    -0.30916700D+02
            0.44635300D+02    -0.48842200D+02    -0.89783700D+02    -0.24031100D+03
           -0.14879800D+03    -0.48361400D+02
```

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```
T0  6     0.66340100D+02     0.79133100D+02     0.49498400D+02     0.80521700D+02
          0.79285000D+02     0.15567100D+03     0.25360700D+03     0.32079500D+02
          0.67000200D+02    -0.20154700D+02

T0  7    -0.40056100D+02    -0.30015800D+02    -0.24877100D+02    -0.84533200D+01
         -0.54793800D+01    -0.59097000D+02     0.17656700D+02    -0.49513700D+02
         -0.82328600D+02    -0.11560300D+03

T0  8     0.20252000D+02     0.33375900D+02     0.37778200D+01     0.54595500D+02
          0.73257900D+02     0.67743700D+02     0.49407700D+02     0.88928300D+02
          0.11906500D+03    -0.21847200D+02

T0  9     0.29750400D+02     0.38475000D+02     0.24546000D+02     0.66753000D+02
          0.12317900D+03     0.73072500D+02     0.19590400D+02     0.49442400D+00
         -0.13463600D+02     0.11916600D+03

T0 10     0.24367300D+02     0.13770800D+02    -0.63430700D+01    -0.12353700D+02
         -0.16066500D+02     0.85041400D+02     0.70406300D+02    -0.98438700D+01
         -0.73784200D+02    -0.50092100D+02


  *****   Initial End Conditions Vector (EC0)   *****

  EC0    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02

  *****   Initial End Conditions Weighting Coefficient Vector
                         (WDT0) for the Performance Index (F)   *****
  WDT0    0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
          0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
          0.10000000D+01     0.10000000D+01


  *****   Initial Control Vector (CVPRV0) and Measurement
                         Vector (ECPRV0) from the Previous Duty Cycle   *****


  *****   Initial Previous Cycle Control Vector (CVPRV0)   *****

CVPRV0    0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00


  *****   Initial Previous Cycle End Conditions Vector (ECPRV0)   *****

ECPRV0   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02


  *****   Intermediate Control Vector (CV), T-Matrix (TT),
          and Measurement Vector (ECT) after the First Compression   *****


  *****   Intermediate Control Vector (CV) after the First Compression   *****

  CV      0.00000000D+00     0.00000000D+00

  *****   Intermediate Greatest Least Bounds (CVL) for the
                                     Control Vector (CV)   *****

  CVL    -0.20000000D+01    -0.20000000D+01

  *****   Intermediate Least Upper Bounds (CVU) for the
                                     Control Vector (CV)   *****

  CVU     0.20000000D+01     0.20000000D+01


  Row        *****   Intermediate T-Matrix (TT)   *****
```

```
        TT  1    -0.50039300D+02    -0.76479500D+02

        TT  2     0.63869000D+02     0.10792800D+03

        TT  3     0.76583700D+02     0.11311600D+03

        TT  4     0.37283300D+02     0.66388400D+02

        TT  5     0.44635300D+02    -0.48842200D+02

        TT  6     0.79285000D+02     0.15567100D+03

        TT  7    -0.54793800D+01    -0.59097000D+02

        TT  8     0.73257900D+02     0.67743700D+02

        TT  9     0.12317900D+03     0.73072500D+02

        TT 10    -0.16066500D+02     0.85041400D+02


     *****    Intermediate End Conditions Vector (ECT)    *****

      ECT    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
             -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
              0.43590700D+02     0.12152200D+02

     *****    Intermediate End Conditions Weighting Coefficient Vector
                              (WDTT) for the Performance Index (F)    *****

     WDTT     0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
              0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
              0.10000000D+01     0.10000000D+01


     *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                       (ECPRV0) from the Previous Duty Cycle after
                                            the First Compression    *****


     *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                            the First Compression    *****

    CVPRV     0.00000000D+00     0.00000000D+00


     *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                     after the First Compression    *****

   ECPRVT    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
             -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
              0.43590700D+02     0.12152200D+02


     *****    Final Control Vector (CV), T-Matrix (T), and
                   Measurement Vector (EC) after the Second Compression    *****


     *****    Final Control Vector (CV) after the Second Compression    *****

      CV      0.00000000D+00     0.00000000D+00

     *****    Greatest Least Bounds (CVL) Vector for the
                                            Control Vector (CV)    *****

     CVL     -0.20000000D+01    -0.20000000D+01

     *****    Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

     CVU      0.20000000D+01     0.20000000D+01


      Row               *****    Final T-Matrix (T)    *****
```

```
  T  1    -0.50039300D+02   -0.76479500D+02

  T  2     0.63869000D+02    0.10792800D+03


  *****   Final End Conditions Vector (EC) after the Second Compression   *****

    EC    -0.95504700D+02    0.75647200D+02

  *****   Final End Conditions Weighting Coefficient Vector
                                  (WDT) for the Performance Index (F)   *****

   WDT    0.10000000D+01    0.10000000D+01


  *****   Final Control Vector (CVPRV) and Measurement Vector
                      (ECPRV) from the Previous Duty Cycle after
                                    the Second Compression   *****


  *****   Final Previous Cycle Control Vector (CVPRV) after
                                    the Second Compression   *****

 CVPRV    0.00000000D+00    0.00000000D+00


  *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                after the Second Compression   *****

 ECPRV   -0.95504700D+02    0.75647200D+02


******************   T-Matrix Compression is Completed   ******************


  *****   Initial End Conditions Vector EC   *****


   -0.95504700D+02       0.75647200D+02


  *****   Initial Performance Index  =   0.14843647D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

  Element     AL              A              AU             PHASE

    1     0.00000000D+00    0.00000000D+00    0.20000000D+01    0.00000000D+00


*****   Initial Constraint Function Values for Case Number  220   *****

                              LSAVE

    1      0

  *****   Inequality Constraints   *****

  Element        Constraint        Amplitude         Max Amp

    1         0.20000000D+01    0.00000000D+00    0.20000000D+01


  *****   Solve the NLPQLP Problem for Case Number  220   *****



   ----------------------------------------------------------------------
   START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
   ----------------------------------------------------------------------

   Parameters:
     N      =       2
```

```
     M      =        1
     ME     =        0
     MODE   =        0
     ACC    =    0.1000D-06
     ACCQP  =    0.1000D-11
     STPMIN =    0.0000D+00
     RHOB   =    0.1000D+03
     MAXFUN =       30
     MAXNM  =       10
     MAXIT  =      300
     IPRINT =        2

  Output in the following order:
     IT    - iteration number
     F     - objective function value
     SCV   - sum of constraint violations
     NA    - number of active constraints
     I     - number of line search iterations
     ALPHA - steplength parameter
     DELTA - additional variable to prevent inconsistency
     KKT   - Karush-Kuhn-Tucker optimality criterion


   IT       F          SCV      NA  I    ALPHA     DELTA      KKT
   --------------------------------------------------------------------
   1  0.14843647D+05  0.00D+00   1  0   0.00D+00  0.00D+00  0.20D+06
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
   2  0.10267626D+04  0.00D+00   0  2   0.28D+00  0.00D+00  0.72D+03
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
   3  0.69620265D+03  0.29D-01   1  1   0.10D+01  0.00D+00  0.11D+02
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
   4  0.70165622D+03  0.45D-04   1  1   0.10D+01  0.00D+00  0.11D-01
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
   5  0.70166214D+03  0.34D-07   1  1   0.10D+01  0.00D+00  0.27D-04
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
   6  0.70166214D+03  0.16D-09   1  1   0.10D+01  0.00D+00  0.62D-07


   --- Final Convergence Analysis at Last Iterate ---

     Objective function value:      F(X)  =   0.70166214D+03
     Solution values:               X     =
       -0.19735472D+01  0.32420869D+00
     Distances from lower bounds:   X-XL  =
        0.26452756D-01  0.23242087D+01
     Distances from upper bounds:   XU-X  =
        0.39735472D+01  0.16757913D+01
     Multipliers for lower bounds:  U     =
        0.00000000D+00  0.00000000D+00
     Multipliers for upper bounds:  U     =
        0.00000000D+00  0.00000000D+00
     Constraint values:             G(X)  =
       -0.16168400D-09
     Multipliers for constraints:   U     =
        0.19026638D+03
     Number of function calls:      NFUNC =        7
     Number of gradient calls:      NGRAD =        6
     Number of calls of QP solver:  NQL   =        6



                 *****   Completed CALL to NLPQLP   *****

          *****   Number of Function Evaluations  =     19   *****


   *****   Solution Control Vector for Case Number  220   *****
```

```
Element    CVL               CV              CVU             CV - CV0

   1   -0.20000000D+01   -0.19735472D+01   0.20000000D+01   -0.19735472D+01
   2   -0.20000000D+01    0.32420869D+00   0.20000000D+01    0.32420869D+00




   *****   Predicted Measurement Vector EC   *****

    -0.21545104D+02      -0.15410083D+02


   *****   NLP Solution Performance Index  =   0.70166214D+03   *****




   *****   Predicted Measurement Vector EC   *****

    -0.21545096D+02      -0.15410093D+02


   *****   NLP Solution Performance Index  =   0.70166214D+03   *****




   *****   Predicted Control Amplitude Vector (A)
               Its Limits (AL & AU), and Its Phase Angle
                           Vector (PHASE) Before Compression   *****

   Element    AL               A               AU              PHASE

    1    0.00000000D+00    0.20000000D+01   0.20000000D+01   -0.80670939D+02

*****   Solution Constraint Function Values for Case Number  220   *****

                              LSAVE

    1      0

   *****   Inequality Constraints   *****

   Element       Constraint        Amplitude        Max Amp

    1       -0.16168400D-09     0.20000000D+01     0.20000000D+01


              **********   End Case Number  220   **********



*****************************************************************************
```

```
               ***************   Start Case Number  120   ***************


          ***************   INPUT DATA for Case Number  120   ***************


     &CDATA
      A00= 5*0.0000000000000000         ,  1.0000000000000000      ,
      ACC= 9.9999999999999955E-008,
      ACCQP= 9.9999999999999980E-013,
      AL0= 5*0.0000000000000000        ,-9.9999999999999955E-008,
      ALPHA=  1.0000000000000000       ,
      APRV0= 5*0.0000000000000000       , 4.94065645841246544E-324,
      AU0= 2*10.000000000000000        ,  1.0000000000000000    , 2*10.000000000000000
     ,  3.0000000000000000       ,
      CRAN1=  2.0000000000000000        ,
      CRAN2=  3.0000000000000000        ,
      CRAN3=  1.0000000000000000        ,
      CRAN4=  1.0000000000000000        ,
      CV00= 10*0.0000000000000000         , 1.48219693752373963E-323, 6.95323359360983736E-
     310, 7.61607133720739960E-319, 6.95323359333671787E-310,

      CVOUT=          0,
      CVPRV0= 10*0.0000000000000000        , 6.95323359332327929E-310, 6.95321237057378016E-
     310, 6.95325616664988679E-310,  0.0000000000000000       ,

      ECPRV0= -95.504700000000000       ,  75.647199999999998    ,  84.882199999999997     ,
     80.737600000000000     , -65.848100000000002     ,
         77.724100000000007     , -37.301000000000002     ,  31.399400000000000     ,
     43.590699999999998     ,  12.152200000000001      ,
      EPS= 9.9999999999999955E-008,
      ICASE=          120,
      ICYCL0=        2000,
      IDATA=            3,
      IN=           5,
      IOPT=            1,
      IOUT=            6,
      IPRINT=           2,
      ISEED1=       2395,        4013,        3813,        1837,
      ISEED2=       1843,        4011,        3364,        2835,
      ISEED3=       3962,        1111,        3215,        2637,
      ISEED4=       2397,        1504,        4031,        3173,
      ITOUT=            3,
      L=           1,
      LQL=T,
      LSAVE=            1, 5*0           ,
      MAXASUM=  3.0000000000000000        ,
      MAXFUN=          30,
      MAXIT=          300,
      MAXNM=           10,
      MI=           1,
      MINASUM=  0.0000000000000000       ,
      MODE=            0,
      MSAVE0=           1, 4*0          , 5*1          ,
      MULT=            1,
      NSAVE0= 2*0          ,            1, 2*0          , 5*1          ,
      NX0=          10,
      NZ0=          10,
      OPTEND=            3,
      PHASE0= 5*0.0000000000000000        , 90.000000000000000       ,
      PHSPRV0= 6*0.0000000000000000        ,
      RHOB=  100.000000000000000       ,
      STPMIN=  0.0000000000000000       ,
      T0= -90.740399999999994      , 119.70699999999999     , 122.38400000000000      ,
     78.723799999999997     , -69.686400000000006      ,
         66.340100000000007     , -40.056100000000001     ,  20.251999999999999      ,
     29.750399999999999     ,  24.367300000000000     , -135.69100000000000      ,
         79.448599999999999     ,  87.604200000000006     ,  115.95000000000000     , -
     47.756999999999998     ,  79.133099999999999     , -30.015799999999999      ,
         33.375900000000001     ,  38.475000000000001     ,  13.770799999999999     , -
     114.31999999999999     ,  47.683700000000002     ,  60.609600000000000      ,
         95.790400000000005     , -56.223799999999997     ,  49.498399999999997     , -
     24.877099999999999     ,  3.7778200000000002     ,  24.545999999999999      ,
```

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```
    -6.3430700000000000    , -68.177300000000002   ,    51.471100000000000    ,
64.588999999999999    ,    53.425699999999999   , -30.916699999999999    ,
    80.521699999999996    ,  -8.4533199999999997   ,    54.595500000000001    ,
66.753000000000000    , -12.353700000000000   , -50.039299999999997    ,
    63.869000000000000    ,   76.583699999999993   ,    37.283299999999997    ,
44.635300000000001    ,   79.284999999999997   ,  -5.4793799999999999    ,
    73.257900000000006    ,  123.17900000000000    , -16.066500000000001    , -
76.479500000000002    ,  107.92800000000000    ,  113.11600000000000    ,
    66.388400000000004    , -48.842199999999998   ,   155.67099999999999    , -
59.097000000000001    ,   67.743700000000004   ,   73.072500000000005    ,
    85.041399999999996    , -143.27400000000000   ,   110.90400000000000    ,
110.15900000000001    ,  131.80500000000001   , -89.783699999999996    ,
    253.60700000000000    ,   17.656700000000001   ,   49.407699999999998    ,
19.590399999999999    ,   70.406300000000002   , -137.09000000000000    ,
    35.351300000000002    ,   41.278199999999998   ,   111.29300000000001    , -
240.31100000000001    ,   32.079500000000003   , -49.513700000000000    ,
    88.928299999999993    ,  0.49442399999999997   ,  -9.8438700000000008    , -
120.26900000000001    ,   35.507199999999997   ,   40.179000000000002    ,
    68.519099999999995    , -148.79800000000000   ,   67.000200000000007    , -
82.328599999999994    ,  119.06500000000000    , -13.463600000000000    ,
   -73.784199999999998    , -35.691800000000001   ,   52.919899999999998    ,
96.571600000000004    ,   18.696999999999999   , -48.361400000000003    ,
   -20.154699999999998    , -115.60299999999999   , -21.847200000000001    ,
119.16600000000000    , -50.092100000000002   ,
 WDT0= 10*1.0000000000000000       ,
 WDX= 10*0.0000000000000000       ,
 WX= 10*0.0000000000000000       ,
 WZ= 10*1.0000000000000000       ,
 /




 ****************************************************************************


      ***************   OUTPUT DATA for Case Number  120   ***************


   *****    The Initial T-Matrix (T0) and Either the Initial
                Previous Actual NLP Control Vector (CVPRV0) or
                    the Initial Previous Control Amplitude (APRV0)
                        and Phase Angle (PHSPRV0) Vectors Before
                            Compression are Directly Input    *****

   *****    Input the Initial Previous Actual NLP Control
                Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                    and then Compute the Previous Control Amplitude (APRV0)
                        and Control Phase Angle (PHSPRV0) Vectors    *****



            **********   Case Number  120   **********



   *****    Initial Previous Control Amplitude (APRV0) and Phase
                        Angle (PHSPRV0) Vectors before Compression    *****
      Element    AL0              APRV0              AU0              PHSPRV0

       1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       2     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       3     0.00000000D+00    0.00000000D+00    0.10000000D+01    0.00000000D+00
       4     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       5     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00

   *****    Previous Actual NLP Control Vector CVPRV0 Before Compression    *****

      Element       CVL0              CVPRV0              CVU0

       1       -0.10000000D+02    0.00000000D+00    0.10000000D+02
       2       -0.10000000D+02    0.00000000D+00    0.10000000D+02
       3       -0.10000000D+02    0.00000000D+00    0.10000000D+02
       4       -0.10000000D+02    0.00000000D+00    0.10000000D+02
       5       -0.10000000D+01    0.00000000D+00    0.10000000D+01
```

```
    6      -0.10000000D+01      0.00000000D+00      0.10000000D+01
    7      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    8      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    9      -0.10000000D+02      0.00000000D+00      0.10000000D+02
   10      -0.10000000D+02      0.00000000D+00      0.10000000D+02
```

*****   Either the BEFORE Compression Initial Actual NLP Control
            Vector Estimates (CV00), OR the BEFORE Compression
             Initial Control Vector Amplitudes (A00) and Phase
               Angles (PHASE0) Estimates are Directly Input
                    via NAMELIST Data CDATA   *****

*****   Input the Initial Actual NLP Control Vector Estimate
            (CV00) Directly Via NAMELIST Input CDATA, and
               then Compute the Control Vector Amplitudes
                  (A00) and Phase Angles (PHASE0) Estimates   *****

              **********   Case Number   120   **********

*****   Adjust the Initial Control Amplitude Estimates Vector
           (A00) to define the Initial Control Amplitude Estimates
            Vector (A0) to Within Limits If Required Before Compression *****

*****   Initial Control Amplitude Vector Estimates (A0), Its
               Limits (AL0 & AU0), and Its Phase Angle Vector
                    Estimates (PHASE0) Before Compression   *****

```
Element      AL0                 A0                  AU0                 PHASE0

    1    0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    1    0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
    2    0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    2    0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
    3    0.00000000D+00      0.00000000D+00      0.10000000D+01      0.00000000D+00
    3    0.00000000D+00      0.10000000D-06      0.10000000D+01      0.00000000D+00
    4    0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    4    0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
    5    0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    5    0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
```

*****   Initial Actual NLP Control Vector Estimates (CV0) and
                    Its Limits (CVL0 & CVU0) Before Compression   *****

```
Element        CVL0                CV0                 CVU0
    1      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    2      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    3      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    4      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    5      -0.10000000D+01      0.00000000D+00      0.10000000D+01
    6      -0.10000000D+01      0.00000000D+00      0.10000000D+01
    7      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    8      -0.10000000D+02      0.00000000D+00      0.10000000D+02
    9      -0.10000000D+02      0.00000000D+00      0.10000000D+02
   10      -0.10000000D+02      0.00000000D+00      0.10000000D+02
```

*****   End Conditions Vector EC0, Previous Cycle
               End Conditions Vector ECPRV0, and Weighting
                    Coefficient Vector WDT0 Before Compression   *****


```
Element        EC0                 ECPRV0              WDT0

    1      -0.95504700D+02     -0.95504700D+02      0.10000000D+01
    2       0.75647200D+02      0.75647200D+02      0.10000000D+01
    3       0.84882200D+02      0.84882200D+02      0.10000000D+01
    4       0.80737600D+02      0.80737600D+02      0.10000000D+01
    5      -0.65848100D+02     -0.65848100D+02      0.10000000D+01
    6       0.77724100D+02      0.77724100D+02      0.10000000D+01
    7      -0.37301000D+02     -0.37301000D+02      0.10000000D+01
```

```
         8          0.31399400D+02        0.31399400D+02         0.10000000D+01
         9          0.43590700D+02        0.43590700D+02         0.10000000D+01
        10          0.12152200D+02        0.12152200D+02         0.10000000D+01


              **********   Case Number  120   **********



              Specification of CV, T-matrix, and EC Compression

                             MSAVE0/MSAVE

       1             0             0             0             0
       1    1        0      0      0      0      0      0      0      0



                             NSAVE0/NSAVE

       0             0             1             0             0
       0    0        0      0      1      1      0      0      0      0



******************   T-Matrix Compression is Initiated   ********************


  *****   Initial Control Vector (CV0), T-Matrix (T0),
                                      and Measurement Vector (EC0)   *****


  *****   Initial Control Vector (CV0)   *****

   CV0     0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00

  *****   Initial Greatest Least Bounds (CVL0) for the
                                      Control Vector (CV0)   *****

   CVL0   -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+01    -0.10000000D+01    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+02    -0.10000000D+02

  *****   Initial Least Upper Bounds (CVU0) for the
                                      Control Vector (CV0)   *****

   CVU0    0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
           0.10000000D+01     0.10000000D+01     0.10000000D+02     0.10000000D+02
           0.10000000D+02     0.10000000D+02


     Row           *****   Initial T-Matrix (T0)   *****

T0  1   -0.90740400D+02    -0.13569100D+03    -0.11432000D+03    -0.68177300D+02
        -0.50039300D+02    -0.76479500D+02    -0.14327400D+03    -0.13709000D+03
        -0.12026900D+03    -0.35691800D+02

T0  2    0.11970700D+03     0.79448600D+02     0.47683700D+02     0.51471100D+02
         0.63869000D+02     0.10792800D+03     0.11090400D+03     0.35351300D+02
         0.35507200D+02     0.52919900D+02

T0  3    0.12238400D+03     0.87604200D+02     0.60609600D+02     0.64589000D+02
         0.76583700D+02     0.11311600D+03     0.11015900D+03     0.41278200D+02
         0.40179000D+02     0.96571600D+02

T0  4    0.78723800D+02     0.11595000D+03     0.95790400D+02     0.53425700D+02
         0.37283300D+02     0.66388400D+02     0.13180500D+03     0.11129300D+03
         0.68519100D+02     0.18697000D+02

T0  5   -0.69686400D+02    -0.47757000D+02    -0.56223800D+02    -0.30916700D+02
         0.44635300D+02    -0.48842200D+02    -0.89783700D+02    -0.24031100D+03
        -0.14879800D+03    -0.48361400D+02
```

```
T0   6     0.66340100D+02     0.79133100D+02     0.49498400D+02     0.80521700D+02
           0.79285000D+02     0.15567100D+03     0.25360700D+03     0.32079500D+02
           0.67000200D+02    -0.20154700D+02

T0   7    -0.40056100D+02    -0.30015800D+02    -0.24877100D+02    -0.84533200D+01
          -0.54793800D+01    -0.59097000D+02     0.17656700D+02    -0.49513700D+02
          -0.82328600D+02    -0.11560300D+03

T0   8     0.20252000D+02     0.33375900D+02     0.37778200D+01     0.54595500D+02
           0.73257900D+02     0.67743700D+02     0.49407700D+02     0.88928300D+02
           0.11906500D+03    -0.21847200D+02

T0   9     0.29750400D+02     0.38475000D+02     0.24546000D+02     0.66753000D+02
           0.12317900D+03     0.73072500D+02     0.19590400D+02     0.49442400D+00
          -0.13463600D+02     0.11916600D+03

T0  10     0.24367300D+02     0.13770800D+02    -0.63430700D+01    -0.12353700D+02
          -0.16066500D+02     0.85041400D+02     0.70406300D+02    -0.98438700D+01
          -0.73784200D+02    -0.50092100D+02


     *****    Initial End Conditions Vector (EC0)    *****

   EC0    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02

     *****    Initial End Conditions Weighting Coefficient Vector
                             (WDT0) for the Performance Index (F)   *****
  WDT0     0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01


     *****    Initial Control Vector (CVPRV0) and Measurement
                             Vector (ECPRV0) from the Previous Duty Cycle    *****


     *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

 CVPRV0    0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00


     *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

 ECPRV0   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02


     *****    Intermediate Control Vector (CV), T-Matrix (TT),
               and Measurement Vector (ECT) after the First Compression    *****


     *****    Intermediate Control Vector (CV) after the First Compression    *****
    CV      0.00000000D+00     0.00000000D+00

     *****    Intermediate Greatest Least Bounds (CVL) for the
                                           Control Vector (CV)    *****

   CVL    -0.10000000D+01    -0.10000000D+01

     *****    Intermediate Least Upper Bounds (CVU) for the
                                           Control Vector (CV)    *****

   CVU     0.10000000D+01     0.10000000D+01


     Row         *****    Intermediate T-Matrix (TT)    *****
```

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```
TT  1    -0.50039300D+02   -0.76479500D+02

TT  2     0.63869000D+02    0.10792800D+03

TT  3     0.76583700D+02    0.11311600D+03

TT  4     0.37283300D+02    0.66388400D+02

TT  5     0.44635300D+02   -0.48842200D+02

TT  6     0.79285000D+02    0.15567100D+03

TT  7    -0.54793800D+01   -0.59097000D+02

TT  8     0.73257900D+02    0.67743700D+02

TT  9     0.12317900D+03    0.73072500D+02

TT 10    -0.16066500D+02    0.85041400D+02


   *****    Intermediate End Conditions Vector (ECT)    *****

   ECT    -0.95504700D+02    0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02    0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02    0.12152200D+02

   *****    Intermediate End Conditions Weighting Coefficient Vector
                              (WDTT) for the Performance Index (F)   *****

   WDTT    0.10000000D+01    0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01    0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01    0.10000000D+01


   *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                        (ECPRV0) from the Previous Duty Cycle after
                                        the First Compression    *****


   *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                        the First Compression    *****

 CVPRV     0.00000000D+00    0.00000000D+00


   *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                     after the First Compression    *****

ECPRVT    -0.95504700D+02    0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02    0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02    0.12152200D+02


   *****    Final Control Vector (CV), T-Matrix (T), and
                  Measurement Vector (EC) after the Second Compression    *****


   *****    Final Control Vector (CV) after the Second Compression    *****

    CV     0.00000000D+00    0.00000000D+00

   *****    Greatest Least Bounds (CVL) Vector for the
                                        Control Vector (CV)    *****

   CVL    -0.10000000D+01   -0.10000000D+01

   *****    Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

   CVU     0.10000000D+01    0.10000000D+01


    Row              *****    Final T-Matrix (T)    *****
```

```
   T  1    -0.50039300D+02   -0.76479500D+02

   T  2     0.63869000D+02    0.10792800D+03


   *****   Final End Conditions Vector (EC) after the Second Compression   *****

     EC    -0.95504700D+02    0.75647200D+02

   *****   Final End Conditions Weighting Coefficient Vector
                                  (WDT) for the Performance Index (F)   *****

    WDT    0.10000000D+01    0.10000000D+01


   *****   Final Control Vector (CVPRV) and Measurement Vector
                        (ECPRV) from the Previous Duty Cycle after
                                            the Second Compression   *****


   *****   Final Previous Cycle Control Vector (CVPRV) after
                                        the Second Compression   *****

 CVPRV     0.00000000D+00    0.00000000D+00


   *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                  after the Second Compression   *****

 ECPRV    -0.95504700D+02    0.75647200D+02


 ******************   T-Matrix Compression is Completed   ********************


  *****   Initial End Conditions Vector EC   *****


    -0.95504700D+02       0.75647200D+02


  *****   Initial Performance Index  =   0.14843647D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

  Element    AL              A               AU              PHASE

     1    0.00000000D+00   0.00000000D+00   0.10000000D+01   0.00000000D+00


 *****   Initial Constraint Function Values for Case Number  120   *****

                              LSAVE

     1      0

  *****   Inequality Constraints   *****

  Element        Constraint        Amplitude        Max Amp

     1         0.10000000D+01    0.00000000D+00    0.10000000D+01


  *****   Solve the NLPQLP Problem for Case Number  120   *****



    ----------------------------------------------------------------------
    START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
    ----------------------------------------------------------------------

    Parameters:
      N      =       2
```

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```
     M     =         1
     ME    =         0
     MODE  =         0
     ACC   =    0.1000D-06
     ACCQP =    0.1000D-11
     STPMIN =   0.0000D+00
     RHOB  =    0.1000D+03
     MAXFUN =        30
     MAXNM =         10
     MAXIT  =       300
     IPRINT =         2


 Output in the following order:
     IT    - iteration number
     F     - objective function value
     SCV   - sum of constraint violations
     NA    - number of active constraints
     I     - number of line search iterations
     ALPHA - steplength parameter
     DELTA - additional variable to prevent inconsistency
     KKT   - Karush-Kuhn-Tucker optimality criterion



   IT       F         SCV      NA  I    ALPHA     DELTA     KKT
  ---------------------------------------------------------------------
    1  0.14843647D+05  0.00D+00   1  0   0.00D+00  0.00D+00  0.10D+06
                 *****  Completed CALL to NLPQLP   *****
                 *****  Completed CALL to NLPQLP   *****
    2  0.10206658D+05  0.41D+00   1  1   0.10D+01  0.00D+00  0.19D+05
                 *****  Completed CALL to NLPQLP   *****
                 *****  Completed CALL to NLPQLP   *****
    3  0.91725014D+03  0.36D-01   1  1   0.10D+01  0.00D+00  0.21D+02
                 *****  Completed CALL to NLPQLP   *****
                 *****  Completed CALL to NLPQLP   *****
    4  0.92781234D+03  0.64D-03   1  1   0.10D+01  0.00D+00  0.36D+00
                 *****  Completed CALL to NLPQLP   *****
                 *****  Completed CALL to NLPQLP   *****
                 *****  Completed CALL to NLPQLP   *****
    5  0.92782975D+03  0.58D-03   1  2   0.10D+00  0.00D+00  0.35D+00
                 *****  Completed CALL to NLPQLP   *****
                 *****  Completed CALL to NLPQLP   *****
    6  0.92800655D+03  0.93D-07   1  1   0.10D+01  0.00D+00  0.57D-04
                 *****  Completed CALL to NLPQLP   *****
                 *****  Completed CALL to NLPQLP   *****
    7  0.92800658D+03  0.25D-11   1  1   0.10D+01  0.00D+00  0.15D-08


  --- Final Convergence Analysis at Last Iterate ---

   Objective function value:      F(X)  =   0.92800658D+03
   Solution values:               X     =
     -0.95510100D+00  -0.29628040D+00
   Distances from lower bounds:   X-XL  =
      0.44898997D-01   0.70371960D+00
   Distances from upper bounds:   XU-X  =
      0.19551010D+01   0.12962804D+01
   Multipliers for lower bounds:  U     =
      0.00000000D+00   0.00000000D+00
   Multipliers for upper bounds:  U     =
      0.00000000D+00   0.00000000D+00
   Constraint values:             G(X)  =
     -0.24769076D-11
   Multipliers for constraints:   U     =
      0.30719220D+03
   Number of function calls:      NFUNC =        8
   Number of gradient calls:      NGRAD =        7
   Number of calls of QP solver:  NQL   =        7

               *****   Completed CALL to NLPQLP   *****


        *****   Number of Function Evaluations =     22   *****
```

```
***** Solution Control Vector for Case Number  120   *****

Element    CVL               CV                CVU              CV - CV0

   1    -0.10000000D+01   -0.95510100D+00    0.10000000D+01   -0.95510100D+00
   2    -0.10000000D+01   -0.29628040D+00    0.10000000D+01   -0.29628040D+00



***** Predicted Measurement Vector EC   *****

  -0.25052745D+02     -0.17331086D+02

***** NLP Solution Performance Index =  0.92800658D+03   *****



***** Predicted Measurement Vector EC   *****

  -0.25052738D+02     -0.17331097D+02

***** NLP Solution Performance Index =  0.92800658D+03   *****



***** Predicted Control Amplitude Vector (A)
          Its Limits (AL & AU), and Its Phase Angle
                            Vector (PHASE) Before Compression   *****

Element    AL              A                 AU               PHASE

   1    0.00000000D+00   0.10000000D+01    0.10000000D+01   -0.10723433D+03

*****  Solution Constraint Function Values for Case Number  120   *****

                            LSAVE

   1      0

***** Inequality Constraints   *****

Element      Constraint        Amplitude          Max Amp

   1       -0.24769076D-11     0.10000000D+01     0.10000000D+01


          **********  End Case Number  120   **********


****************************************************************************
```

```
              ***************  Start Case Number  320   ***************


           ***************   INPUT DATA for Case Number  320   ***************


     &CDATA
      A00= 5*0.0000000000000000          ,  1.0000000000000000      ,
      ACC= 9.9999999999999955E-008,
      ACCQP= 9.9999999999999980E-013,
      AL0= 5*0.0000000000000000       ,-9.9999999999999955E-008,
      ALPHA=  1.0000000000000000      ,
      APRV0= 5*0.0000000000000000       , 4.94065645841246544E-324,
      AU0= 2*10.000000000000000       , 0.29999999999999999    , 2*10.000000000000000
     ,  3.0000000000000000       ,
      CRAN1=  2.0000000000000000      ,
      CRAN2=  3.0000000000000000      ,
      CRAN3=  1.0000000000000000      ,
      CRAN4=  1.0000000000000000      ,
      CV00= 10*0.0000000000000000        , 1.48219693752373963E-323, 6.95323359360983736E-
     310, 7.61607133720739960E-319, 6.95323359333671787E-310,

      CVOUT=          0,
      CVPRV0= 10*0.0000000000000000         , 6.95323359332327929E-310, 6.95321237057378016E-
     310, 6.95325616664988679E-310,  0.0000000000000000      ,

      ECPRV0= -95.504700000000000       ,  75.647199999999998      ,  84.882199999999997     ,
     80.737600000000000      , -65.848100000000002      ,
         77.724100000000007       , -37.301000000000002      ,  31.399400000000000      ,
     43.590699999999998      ,  12.152200000000001      ,
      EPS= 9.9999999999999955E-008,
      ICASE=         320,
      ICYCL0=       2000,
      IDATA=          3,
      IN=           5,
      IOPT=          1,
      IOUT=          6,
      IPRINT=         2,
      ISEED1=     2395,        4013,        3813,        1837,
      ISEED2=     1843,        4011,        3364,        2835,
      ISEED3=     3962,        1111,        3215,        2637,
      ISEED4=     2397,        1504,        4031,        3173,
      ITOUT=          3,
      L=          1,
      LQL=T,
      LSAVE=           1, 5*0          ,
      MAXASUM=  3.0000000000000000      ,
      MAXFUN=         30,
      MAXIT=        300,
      MAXNM=         10,
      MI=          1,
      MINASUM=  0.0000000000000000      ,
      MODE=          0,
      MSAVE0=          1, 4*0         , 5*1          ,
      MULT=          0,
      NSAVE0= 2*0          ,          1, 2*0          , 5*1          ,
      NX0=         10,
      NZ0=         10,
      OPTEND=          3,
      PHASE0= 5*0.0000000000000000       , 90.000000000000000      ,
      PHSPRV0= 6*0.0000000000000000       ,
      RHOB=  100.00000000000000      ,
      STPMIN=  0.0000000000000000      ,
      T0= -90.740399999999994      ,  119.70699999999999      ,  122.38400000000000     ,
     78.723799999999997      , -69.686400000000006      ,
         66.340100000000007      , -40.056100000000001      ,  20.251999999999999      ,
     29.750399999999999      ,  24.367300000000000      , -135.69100000000000      ,
         79.448599999999999      ,  87.604200000000006      ,  115.95000000000000      , -
     47.756999999999998      ,  79.133099999999999      , -30.015799999999999      ,
         33.375900000000001      ,  38.475000000000001      ,  13.770799999999999      , -
     114.31999999999999      ,  47.683700000000002      ,  60.609600000000000      ,
         95.790400000000005      , -56.223799999999997      ,  49.498399999999997      , -
     24.877099999999999      ,  3.7778200000000002      ,  24.545999999999999      ,
```

```
    -6.3430700000000000      , -68.177300000000002      ,   51.471100000000000      ,
 64.588999999999999      ,  53.425699999999999      , -30.916699999999999      ,
    80.521699999999996      ,  -8.4533199999999997      ,   54.595500000000001      ,
 66.753000000000000      , -12.353700000000000      , -50.039299999999997      ,
    63.869000000000000      ,   76.583699999999993      ,   37.283299999999997      ,
 44.635300000000001      ,  79.284999999999997      ,  -5.4793799999999999      ,
    73.257900000000006      ,  123.17900000000000      ,  -16.066500000000001      , -
 76.479500000000002      ,  107.92800000000000      ,  113.11600000000000      ,
    66.388400000000004      , -48.842199999999998      ,  155.67099999999999      , -
 59.097000000000001      ,  67.743700000000004      ,  73.072500000000005      ,
    85.041399999999996      , -143.27400000000000      ,  110.90400000000000      ,
 110.15900000000001      ,  131.80500000000001      , -89.783699999999996      ,
    253.60700000000000      ,   17.656700000000001      ,   49.407699999999998      ,
 19.590399999999999      ,  70.406300000000002      , -137.09000000000000      ,
    35.351300000000002      ,   41.278199999999998      ,  111.29300000000001      , -
 240.31100000000001      ,  32.079500000000003      , -49.513700000000000      ,
    88.928299999999993      , 0.49442399999999997      ,  -9.8438700000000008      , -
 120.26900000000001      ,  35.507199999999997      ,  40.179000000000002      ,
    68.519099999999995      , -148.79800000000000      ,  67.000200000000007      , -
 82.328599999999994      ,  119.06500000000000      , -13.463600000000000      ,
    -73.784199999999998      , -35.691800000000001      ,   52.919899999999998      ,
 96.571600000000004      ,  18.696999999999999      , -48.361400000000003      ,
    -20.154699999999998      , -115.60299999999999      , -21.847200000000001      ,
 119.16600000000000      , -50.092100000000002      ,
 WDT0= 10*1.0000000000000000          ,
 WDX= 10*0.0000000000000000          ,
 WX= 10*0.0000000000000000          ,
 WZ= 10*1.0000000000000000          ,
 /


 ******************************************************************************


       ***************   OUTPUT DATA for Case Number  320   ***************


    *****    The Initial T-Matrix (T0) and Either the Initial
                   Previous Actual NLP Control Vector (CVPRV0) or
                     the Initial Previous Control Amplitude (APRV0)
                        and Phase Angle (PHSPRV0) Vectors Before
                           Compression are Directly Input   *****

    *****    Input the Initial Previous Actual NLP Control
                   Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                      and then Compute the Previous Control Amplitude (APRV0)
                          and Control Phase Angle (PHSPRV0) Vectors   *****


              **********   Case Number  320   **********


    *****    Initial Previous Control Amplitude (APRV0) and Phase
                          Angle (PHSPRV0) Vectors before Compression   *****
    Element    AL0              APRV0             AU0              PHSPRV0

        1    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
        2    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
        3    0.00000000D+00    0.00000000D+00    0.30000000D+00    0.00000000D+00
        4    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
        5    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00

    *****    Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

    Element        CVL0              CVPRV0             CVU0

        1       -0.10000000D+02    0.00000000D+00    0.10000000D+02
        2       -0.10000000D+02    0.00000000D+00    0.10000000D+02
        3       -0.10000000D+02    0.00000000D+00    0.10000000D+02
        4       -0.10000000D+02    0.00000000D+00    0.10000000D+02
        5       -0.30000000D+00    0.00000000D+00    0.30000000D+00
        6       -0.30000000D+00    0.00000000D+00    0.30000000D+00
        7       -0.10000000D+02    0.00000000D+00    0.10000000D+02
        8       -0.10000000D+02    0.00000000D+00    0.10000000D+02
```

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```
    9        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   10        -0.10000000D+02      0.00000000D+00      0.10000000D+02

*****   Either the BEFORE Compression Initial Actual NLP Control
          Vector Estimates (CV00), OR the BEFORE Compression
            Initial Control Vector Amplitudes (A00) and Phase
              Angles (PHASE0) Estimates are Directly Input
                    via NAMELIST Data CDATA                        *****

*****   Input the Initial Actual NLP Control Vector Estimate
          (CV00) Directly Via NAMELIST Input CDATA, and
                then Compute the Control Vector Amplitudes
                    (A00) and Phase Angles (PHASE0) Estimates      *****


              **********   Case Number  320   **********


*****   Adjust the Initial Control Amplitude Estimates Vector
         (A00) to define the Initial Control Amplitude Estimates
          Vector (A0) to Within Limits If Required Before Compression *****


*****   Initial Control Amplitude Vector Estimates (A0), Its
                  Limits (AL0 & AU0), and Its Phase Angle Vector
                        Estimates (PHASE0) Before Compression    *****

Element    AL0                A0                 AU0                PHASE0

   1     0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
   1     0.00000000D+00     0.10000000D-06     0.10000000D+02     0.00000000D+00
   2     0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
   2     0.00000000D+00     0.10000000D-06     0.10000000D+02     0.00000000D+00
   3     0.00000000D+00     0.00000000D+00     0.30000000D+00     0.00000000D+00
   3     0.00000000D+00     0.10000000D-06     0.30000000D+00     0.00000000D+00
   4     0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
   4     0.00000000D+00     0.10000000D-06     0.10000000D+02     0.00000000D+00
   5     0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
   5     0.00000000D+00     0.10000000D-06     0.10000000D+02     0.00000000D+00

*****   Initial Actual NLP Control Vector Estimates (CV0) and
                        Its Limits (CVL0 & CVU0) Before Compression   *****

Element      CVL0               CV0                CVU0
   1        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   2        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   3        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   4        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   5        -0.30000000D+00      0.00000000D+00      0.30000000D+00
   6        -0.30000000D+00      0.00000000D+00      0.30000000D+00
   7        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   8        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   9        -0.10000000D+02      0.00000000D+00      0.10000000D+02
  10        -0.10000000D+02      0.00000000D+00      0.10000000D+02

*****   End Conditions Vector EC0, Previous Cycle
                  End Conditions Vector ECPRV0, and Weighting
                        Coefficient Vector WDT0 Before Compression    *****


Element      EC0                ECPRV0             WDT0

   1        -0.95504700D+02     -0.95504700D+02      0.10000000D+01
   2         0.75647200D+02      0.75647200D+02      0.10000000D+01
   3         0.84882200D+02      0.84882200D+02      0.10000000D+01
   4         0.80737600D+02      0.80737600D+02      0.10000000D+01
   5        -0.65848100D+02     -0.65848100D+02      0.10000000D+01
   6         0.77724100D+02      0.77724100D+02      0.10000000D+01
   7        -0.37301000D+02     -0.37301000D+02      0.10000000D+01
   8         0.31399400D+02      0.31399400D+02      0.10000000D+01
   9         0.43590700D+02      0.43590700D+02      0.10000000D+01
  10         0.12152200D+02      0.12152200D+02      0.10000000D+01
```

```
                   **********   Case Number  320   **********

              Specification of CV, T-matrix, and EC Compression

                              MSAVE0/MSAVE

        1              0              0              0              0
     1      1      0      0      0      0      0      0      0      0


                              NSAVE0/NSAVE

        0              0              1              0              0
     0      0      0      0      1      1      0      0      0      0



  ********************   T-Matrix Compression is Initiated   ********************



   *****    Initial Control Vector (CV0), T-Matrix (T0),
                                    and Measurement Vector (EC0)   *****


   *****    Initial Control Vector (CV0)   *****

    CV0     0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
            0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
            0.00000000D+00    0.00000000D+00

   *****    Initial Greatest Least Bounds (CVL0) for the
                                         Control Vector (CV0)   *****

    CVL0    -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
            -0.30000000D+00   -0.30000000D+00   -0.10000000D+02   -0.10000000D+02
            -0.10000000D+02   -0.10000000D+02
   *****    Initial Least Upper Bounds (CVU0) for the
                                         Control Vector (CV0)   *****

    CVU0    0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
            0.30000000D+00    0.30000000D+00    0.10000000D+02    0.10000000D+02
            0.10000000D+02    0.10000000D+02


     Row           *****   Initial T-Matrix (T0)   *****

  T0  1    -0.90740400D+02   -0.13569100D+03   -0.11432000D+03   -0.68177300D+02
           -0.50039300D+02   -0.76479500D+02   -0.14327400D+03   -0.13709000D+03
           -0.12026900D+03   -0.35691800D+02

  T0  2     0.11970700D+03    0.79448600D+02    0.47683700D+02    0.51471100D+02
            0.63869000D+02    0.10792800D+03    0.11090400D+03    0.35351300D+02
            0.35507200D+02    0.52919900D+02

  T0  3     0.12238400D+03    0.87604200D+02    0.60609600D+02    0.64589000D+02
            0.76583700D+02    0.11311600D+03    0.11015900D+03    0.41278200D+02
            0.40179000D+02    0.96571600D+02

  T0  4     0.78723800D+02    0.11595000D+03    0.95790400D+02    0.53425700D+02
            0.37283300D+02    0.66388400D+02    0.13180500D+03    0.11129300D+03
            0.68519100D+02    0.18697000D+02

  T0  5    -0.69686400D+02   -0.47757000D+02   -0.56223800D+02   -0.30916700D+02
            0.44635300D+02   -0.48842200D+02   -0.89783700D+02   -0.24031100D+03
           -0.14879800D+03   -0.48361400D+02

  T0  6     0.66340100D+02    0.79133100D+02    0.49498400D+02    0.80521700D+02
            0.79285000D+02    0.15567100D+03    0.25360700D+03    0.32079500D+02
            0.67000200D+02   -0.20154700D+02

  T0  7    -0.40056100D+02   -0.30015800D+02   -0.24877100D+02   -0.84533200D+01
```

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           -0.54793800D+01    -0.59097000D+02     0.17656700D+02    -0.49513700D+02
           -0.82328600D+02    -0.11560300D+03

   T0   8   0.20252000D+02     0.33375900D+02     0.37778200D+01     0.54595500D+02
            0.73257900D+02     0.67743700D+02     0.49407700D+02     0.88928300D+02
            0.11906500D+03    -0.21847200D+02

   T0   9   0.29750400D+02     0.38475000D+02     0.24546000D+02     0.66753000D+02
            0.12317900D+03     0.73072500D+02     0.19590400D+02     0.49442400D+00
           -0.13463600D+02     0.11916600D+03

   T0  10   0.24367300D+02     0.13770800D+02    -0.63430700D+01    -0.12353700D+02
           -0.16066500D+02     0.85041400D+02     0.70406300D+02    -0.98438700D+01
           -0.73784200D+02    -0.50092100D+02


    *****    Initial End Conditions Vector (EC0)    *****

    EC0   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02

    *****    Initial End Conditions Weighting Coefficient Vector
                             (WDT0) for the Performance Index (F)    *****
    WDT0   0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01


    *****    Initial Control Vector (CVPRV0) and Measurement
                         Vector (ECPRV0) from the Previous Duty Cycle    *****


    *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

 CVPRV0   0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00


    *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

 ECPRV0  -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02


    *****    Intermediate Control Vector (CV), T-Matrix (TT),
             and Measurement Vector (ECT) after the First Compression    *****


    *****    Intermediate Control Vector (CV) after the First Compression    *****

     CV    0.00000000D+00     0.00000000D+00

    *****    Intermediate Greatest Least Bounds (CVL) for the
                                        Control Vector (CV)    *****

    CVL   -0.30000000D+00    -0.30000000D+00

    *****    Intermediate Least Upper Bounds (CVU) for the
                                        Control Vector (CV)    *****

    CVU    0.30000000D+00     0.30000000D+00


     Row        *****    Intermediate T-Matrix (TT)    *****

   TT   1   -0.50039300D+02    -0.76479500D+02

   TT   2    0.63869000D+02     0.10792800D+03

   TT   3    0.76583700D+02     0.11311600D+03
```

```
TT  4     0.37283300D+02     0.66388400D+02

TT  5     0.44635300D+02    -0.48842200D+02

TT  6     0.79285000D+02     0.15567100D+03

TT  7    -0.54793800D+01    -0.59097000D+02

TT  8     0.73257900D+02     0.67743700D+02

TT  9     0.12317900D+03     0.73072500D+02

TT 10    -0.16066500D+02     0.85041400D+02


   *****   Intermediate End Conditions Vector (ECT)   *****

   ECT    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02

   *****   Intermediate End Conditions Weighting Coefficient Vector
                            (WDTT) for the Performance Index (F)   *****

   WDTT    0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
           0.10000000D+01     0.10000000D+01


   *****   Intermediate Control Vector (CVPRV) and Measurement Vector
                       (ECPRV0) from the Previous Duty Cycle after
                                      the First Compression   *****


   *****   Intermediate Previous Cycle Control Vector (CVPRV) after
                                      the First Compression   *****

  CVPRV    0.00000000D+00     0.00000000D+00


   *****   Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                after the First Compression   *****

 ECPRVT   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
          -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
           0.43590700D+02     0.12152200D+02


   *****   Final Control Vector (CV), T-Matrix (T), and
                Measurement Vector (EC) after the Second Compression   *****


   *****   Final Control Vector (CV) after the Second Compression   *****

    CV     0.00000000D+00     0.00000000D+00

   *****   Greatest Least Bounds (CVL) Vector for the
                                      Control Vector (CV)   *****

   CVL    -0.30000000D+00    -0.30000000D+00

   *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)   *****

   CVU     0.30000000D+00     0.30000000D+00


   Row            *****   Final T-Matrix (T)   *****

  T  1    -0.50039300D+02    -0.76479500D+02

  T  2     0.63869000D+02     0.10792800D+03


   *****   Final End Conditions Vector (EC) after the Second Compression   *****
```

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```
     EC     -0.95504700D+02     0.75647200D+02

  *****    Final End Conditions Weighting Coefficient Vector
                               (WDT) for the Performance Index (F)  *****

   WDT     0.10000000D+01     0.10000000D+01


  *****    Final Control Vector (CVPRV) and Measurement Vector
                       (ECPRV) from the Previous Duty Cycle after
                                          the Second Compression  *****
  *****    Final Previous Cycle Control Vector (CVPRV) after
                                          the Second Compression  *****

 CVPRV     0.00000000D+00     0.00000000D+00


  *****    Final Previous Cycle End Conditions Vector (ECPRV)
                                     after the Second Compression  *****

 ECPRV    -0.95504700D+02     0.75647200D+02


******************   T-Matrix Compression is Completed   ********************


  *****   Initial End Conditions Vector EC   *****


   -0.95504700D+02       0.75647200D+02


  *****   Initial Performance Index  =   0.14843647D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

 Element   AL               A                AU               PHASE

    1    0.00000000D+00    0.00000000D+00    0.30000000D+00    0.00000000D+00


*****   Initial Constraint Function Values for Case Number  320   *****

                          LSAVE

    1     0

  *****   Inequality Constraints   *****

 Element        Constraint         Amplitude         Max Amp

    1        0.30000000D+00    0.00000000D+00    0.30000000D+00


  *****   Solve the NLPQLP Problem for Case Number  320   *****


  ---------------------------------------------------------------------
   START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
  ---------------------------------------------------------------------

   Parameters:
     N     =        2
     M     =        1
     ME    =        0
     MODE  =        0
     ACC   =   0.1000D-06
     ACCQP =   0.1000D-11
     STPMIN =  0.0000D+00
     RHOB  =   0.1000D+03
     MAXFUN =      30
     MAXNM =       10
```

```
      MAXIT  =       300
      IPRINT =         2

   Output in the following order:
      IT    - iteration number
      F     - objective function value
      SCV   - sum of constraint violations
      NA    - number of active constraints
      I     - number of line search iterations
      ALPHA - steplength parameter
      DELTA - additional variable to prevent inconsistency
      KKT   - Karush-Kuhn-Tucker optimality criterion


    IT       F           SCV      NA  I    ALPHA     DELTA      KKT
   ------------------------------------------------------------------
     1  0.14843647D+05  0.00D+00   1  0   0.00D+00  0.00D+00  0.30D+05
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
     2  0.38930948D+04  0.12D+00   1  1   0.10D+01  0.00D+00  0.35D+04
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
     3  0.56497252D+04  0.25D-01   1  1   0.10D+01  0.00D+00  0.59D+03
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
     4  0.57001441D+04  0.18D-01   1  2   0.43D+00  0.00D+00  0.75D+03
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
     5  0.60819734D+04  0.60D-04   1  1   0.10D+01  0.00D+00  0.14D+01
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
     6  0.60819919D+04  0.55D-04   1  2   0.14D+00  0.00D+00  0.24D+01
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
     7  0.60832096D+04  0.14D-07   1  1   0.10D+01  0.00D+00  0.61D-03
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
     8  0.60832098D+04  0.76D-08   1  2   0.46D+00  0.00D+00  0.33D-03
                  *****  Completed CALL to NLPQLP   *****
                  *****  Completed CALL to NLPQLP   *****
     9  0.60832099D+04  0.36D-12   1  1   0.10D+01  0.00D+00  0.16D-07


   --- Final Convergence Analysis at Last Iterate ---

     Objective function value:       F(X) =  0.60832099D+04
     Solution values:               X     =
       -0.15931559D+00 -0.25420177D+00
     Distances from lower bounds:   X-XL  =
        0.14068441D+00  0.45798227D-01
     Distances from upper bounds:   XU-X  =
        0.45931559D+00  0.55420177D+00
     Multipliers for lower bounds:  U     =
        0.00000000D+00  0.00000000D+00
     Multipliers for upper bounds:  U     =
        0.00000000D+00  0.00000000D+00
     Constraint values:             G(X)  =
       -0.35960124D-12
     Multipliers for constraints:   U     =
        0.21981257D+05
     Number of function calls:      NFUNC =       12
     Number of gradient calls:      NGRAD =        9
     Number of calls of QP solver:  NQL   =        9


                 *****   Completed CALL to NLPQLP    *****


          *****   Number of Function Evaluations  =     30   *****
```

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```
*****   Solution Control Vector for Case Number  320   *****

Element     CVL               CV               CVU             CV - CV0

    1    -0.30000000D+00   -0.15931559D+00    0.30000000D+00   -0.15931559D+00
    2    -0.30000000D+00   -0.25420177D+00    0.30000000D+00   -0.25420177D+00




*****   Predicted Measurement Vector EC   *****

  -0.68091442D+02      0.38036394D+02


*****   NLP Solution Performance Index  =   0.60832099D+04   *****




*****   Predicted Measurement Vector EC   *****

  -0.68091435D+02      0.38036383D+02


*****   NLP Solution Performance Index  =   0.60832099D+04   *****




*****   Predicted Control Amplitude Vector (A)
            Its Limits (AL & AU), and Its Phase Angle
                             Vector (PHASE) Before Compression   *****

Element     AL               A                AU              PHASE

    1    0.00000000D+00    0.30000000D+00    0.30000000D+00   -0.14792344D+03

*****   Solution Constraint Function Values for Case Number  320   *****

                              LSAVE

    1       0

*****   Inequality Constraints   *****

Element       Constraint         Amplitude          Max Amp

    1       -0.35960124D-12     0.30000000D+00    0.30000000D+00


         **********   End Case Number  320   **********
```

F.4 (2 x 2) T-Matrix FY Hub Shear Forces Problems

A (2 x 2) T-Matrix problem assumes a **two** dimensional control vector comprised of **one** harmonic [(FYS, FYC)], and a **two** dimensional end conditions vector comprised of **one** harmonic [(D4S, D4C)].

```
$CDATA
!
!  *****   Start of Case  25                      Input Data   *****
!          T is (2x2)  with   No Constraints.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FY  5p Hub Loads.
!
 ACC      =    1.0D-8,
 ACC      =    1.0D-7,
 ACCQP    =    1.0D-12,
 AL0      =    0.00,    0.00,    0.00,    0.00,    0.00,
 AU0      =   10.00,   10.00,   10.00,   10.00,   10.00,
 CV00(1)  =    0.000,      0.000,      0.000,      0.000,      0.000,
 CV00(6)  =    0.000,      0.000,      0.000,      0.000,      0.000,
 CVOUT    =    1,
 CVOUT    =    0,
 CVPRV0(1) =   0.000,      0.000,      0.000,      0.000,      0.000,
 CVPRV0(6) =   0.000,      0.000,      0.000,      0.000,      0.000,
 ECPRV0(1) =  -95.5047,   75.6472,   84.8822,   80.7376,   -65.8481,
 ECPRV0(6) =   77.7241,  -37.3010,   31.3994,   43.5907,   12.1522,
 ICASE    =   25,
 IDATA    =    3,
 IOPT     =    1,
 ITOUT    =    0,
 ITOUT    =    4,
 ITOUT    =    2,
 ITOUT    =    1,
 ITOUT    =    3,
 LQL      =   .FALSE.,
 LQL      =   .TRUE.,
 LSAVE    =    0,    0,    0,    0,    0,    0,
 MAXASUM =    3.000,
 MAXIT    =  300,
 MAXNM    =    0,
 MAXNM    =   10,
 MI       =    0,
 MSAVE0   =    0,    1,    0,    0,    0,
 NSAVE0   =    0,    0,    1,    0,    0,
 NX0      =   10,
 NZ0      =   10,
 OPTEND   =    1,
 OPTEND   =    2,
 OPTEND   =    3,
 RHOB     =    0.0,
 RHOB     =  100.0,
!
!234567890123456789012345678901234567890123456789012345678901234567890
!
  T0(1,1)   =   -90.74040,  119.70700,  122.38400,   78.72380,  -69.68640,
  T0(6,1)   =    66.34010,  -40.05610,   20.25200,   29.75040,   24.36730,
  T0(1,2)   =  -135.69100,   79.44860,   87.60420,  115.95000,  -47.75700,
  T0(6,2)   =    79.13310,  -30.01580,   33.37590,   38.47500,   13.77080,
  T0(1,3)   =  -114.32000,   47.68370,   60.60960,   95.79040,  -56.22380,
  T0(6,3)   =    49.49840,  -24.87710,    3.77782,   24.54600,   -6.34307,
  T0(1,4)   =   -68.17730,   51.47110,   64.58900,   53.42570,  -30.91670,
  T0(6,4)   =    80.52170,   -8.45332,   54.59550,   66.75300,  -12.35370,
  T0(1,5)   =   -50.03930,   63.86900,   76.58370,   37.28330,   44.63530,
  T0(6,5)   =    79.28500,   -5.47938,   73.25790,  123.17900,  -16.06650,
  T0(1,6)   =   -76.47950,  107.92800,  113.11600,   66.38840,  -48.84220,
  T0(6,6)   =   155.67100,  -59.09700,   67.74370,   73.07250,   85.04140,
  T0(1,7)   =  -143.274,    110.904,    110.159,    131.805,    -89.7837,
  T0(6,7)   =   253.607,     17.6567,    49.4077,    19.5904,    70.4063,
  T0(1,8)   =  -137.09,      35.3513,    41.2782,   111.293,   -240.311,
  T0(6,8)   =    32.0795,   -49.5137,    88.9283,     0.494424,   -9.84387,
  T0(1,9)   =  -120.269,     35.5072,    40.179,     68.5191,  -148.798,
  T0(6,9)   =    67.0002,   -82.3286,   119.065,    -13.4636,   -73.7842,
  T0(1,10)  =   -35.6918,    52.9199,    96.5716,    18.697,    -48.3614,
  T0(6,10)  =   -20.1547,  -115.603,    -21.8472,   119.166,    -50.0921,
!
 MULT     =         0,
 MULT     =         1,
!
!  *****   End of Case  25  Input Data   *****
!
```

```
$END
$CDATA
!
!  *****   Start of Case  1025                        Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FY  5p Hub Loads.
!
 AU0     =   10.00,  10.00,  10.00,  10.00,  10.00,
 ICASE   = 1025,
 IOPT    =    1,
 LSAVE   =    1,    0,    0,    0,    0,    0,
 MI      =    1,
 MSAVE0  =    0,    1,    0,    0,    0,
 NSAVE0  =    0,    0,    1,    0,    0,
!
 MULT    =         0,
 MULT    =         1,
!
!  *****   End of Case  1025  Input Data   *****
!
$END
$CDATA
!
!  *****   Start of Case   525                        Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FY  5p Hub Loads.
!
 AU0     =   10.00,  10.00,   5.00,  10.00,  10.00,
 ICASE   =  525,
 IOPT    =    1,
 LSAVE   =    1,    0,    0,    0,    0,    0,
 MI      =    1,
 MSAVE0  =    0,    1,    0,    0,    0,
 NSAVE0  =    0,    0,    1,    0,    0,
!
 MULT    =         0,
 MULT    =         1,
!
!  *****   End of Case   525  Input Data   *****
!
$END
$CDATA
!
!  *****   Start of Case   325                        Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FY  5p Hub Loads.
!
 AU0     =   10.00,  10.00,   3.00,  10.00,  10.00,
 ICASE   =  325,
 IOPT    =    1,
 LSAVE   =    1,    0,    0,    0,    0,    0,
 MI      =    1,
 MSAVE0  =    0,    1,    0,    0,    0,
 NSAVE0  =    0,    0,    1,    0,    0,
!
 MULT    =         0,
 MULT    =         1,
!
!  *****   End of Case   325  Input Data   *****
!
$END
$CDATA
!
!  *****   Start of Case   125                        Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FY  5p Hub Loads.
!
 AU0     =   10.00,  10.00,   1.00,  10.00,  10.00,
 ICASE   =  125,
 IOPT    =    1,
```

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```
 LSAVE   =    1,   0,   0,   0,   0,   0,
 MI      =    1,
 MSAVE0  =    0,   1,   0,   0,   0,
 NSAVE0  =    0,   0,   1,   0,   0,
!
 MULT    =         0,
 MULT    =         1,
!
!  *****   End of Case   125  Input Data   *****
!
$END
$CDATA
!
!  *****   Start of Case   0325                    Input Data   *****
!          T is (2x2)  with   One Constraint.
!          CV  is comprised of the  4  per rev flap angles.
!          EC  is comprised of the  FY  5p Hub Loads.
!
 AU0     =  10.00, 10.00,  0.30, 10.00, 10.00,
 ICASE   = 0325,
 IOPT    =    1,
 LSAVE   =    1,   0,   0,   0,   0,   0,
 MI      =    1,
 MSAVE0  =    0,   1,   0,   0,   0,
 NSAVE0  =    0,   0,   1,   0,   0,
!
 MULT    =         1,
 MULT    =         0,
!
!  *****   End of Case   0325  Input Data   *****
!
$END




 ********************************************************************************


            ***************   Start Case Number   25   ***************


         ***************   INPUT DATA for Case Number   25   ***************


 &CDATA
 A00= 6*1.0000000000000000          ,
 ACC= 9.9999999999999955E-008,
 ACCQP= 9.9999999999999980E-013,
 AL0= 5*0.0000000000000000          ,-9.9999999999999955E-008,
 ALPHA= 1.0000000000000000          ,
 APRV0= 6.9532128625924132E-310,  0.0000000000000000     , 2.12199579096527232E-314,
 2.22322905129311039E-314, 2.22323312486436035E-314,
   4.94065645841246544E-324,
 AU0= 5*10.000000000000000          ,  3.0000000000000000      ,
 CRAN1=  2.0000000000000000         ,
 CRAN2=  3.0000000000000000         ,
 CRAN3=  1.0000000000000000         ,
 CRAN4=  1.0000000000000000         ,
 CV00= 10*0.0000000000000000         , 1.48219693752373963E-323, 6.95323310165009693E-
 310, 5.16525870101189612E-319, 6.95323310137697744E-310,

 CVOUT=         0,
 CVPRV0= 10*0.0000000000000000          , 6.95323310136353885E-310, 6.95321286253352059E-
 310, 6.95325616664988679E-310,  0.0000000000000000      ,

 ECPRV0= -95.504700000000000         ,  75.647199999999998      ,  84.882199999999997      ,
 80.737600000000000      , -65.848100000000002      ,
    77.724100000000007     , -37.301000000000002      ,  31.399400000000000      ,
 43.590699999999998      ,  12.152200000000001      ,
 EPS= 9.9999999999999955E-008,
 ICASE=        25,
 ICYCL0=       2000,
```

```
 IDATA=           3,
 IN=           5,
 IOPT=            1,
 IOUT=           6,
 IPRINT=          2,
 ISEED1=     2395,        4013,        3813,        1837,
 ISEED2=     1843,        4011,        3364,        2835,
 ISEED3=     3962,        1111,        3215,        2637,
 ISEED4=     2397,        1504,        4031,        3173,
 ITOUT=           3,
 L=           1,
 LQL=T,
 LSAVE= 6*0           ,
 MAXASUM=  3.0000000000000000      ,
 MAXFUN=          30,
 MAXIT=         300,
 MAXNM=          10,
 MI=           0,
 MINASUM=  0.0000000000000000      ,
 MODE=           0,
 MSAVE0=             0,           1, 3*0            , 5*1            ,
 MULT=           1,
 NSAVE0= 2*0            ,            1, 2*0          , 5*1           ,
 NX0=          10,
 NZ0=          10,
 OPTEND=           3,
 PHASE0= 6*90.000000000000000          ,
 PHSPRV0= 6.95314360825605601E-310, 6.95314360825595720E-310,  0.0000000000000000
 , 6.95323309981217273E-310, 2*0.0000000000000000         ,

 RHOB=  100.00000000000000      ,
 STPMIN=  0.0000000000000000      ,
 T0= -90.740399999999994      ,  119.70699999999999      ,  122.38400000000000      ,
 78.723799999999997      , -69.686400000000006      ,
    66.340100000000007      , -40.056100000000001      ,  20.251999999999999      ,
 29.750399999999999      ,  24.367300000000000      , -135.69100000000000      ,
    79.448599999999999      ,  87.604200000000006      ,  115.95000000000000      , -
 47.756999999999998      ,  79.133099999999999      , -30.015799999999999      ,
    33.375900000000001      ,  38.475000000000001      ,  13.770799999999999      , -
 114.31999999999999      ,  47.683700000000002      ,  60.609600000000000      ,
    95.790400000000005      , -56.223799999999997      ,  49.498399999999997      , -
 24.877099999999999      ,  3.7778200000000002      ,  24.545999999999999      ,
    -6.3430700000000000      , -68.177300000000002      ,  51.471100000000000      ,
 64.588999999999999      ,  53.425699999999999      , -30.916699999999999      ,
    80.521699999999996      , -8.4533199999999997      ,  54.595500000000001      ,
 66.753000000000000      , -12.353700000000000      , -50.039299999999997      ,
    63.869000000000000      ,  76.583699999999993      ,  37.283299999999997      ,
 44.635300000000001      ,  79.284999999999997      , -5.4793799999999999      ,
    73.257900000000006      ,  123.17900000000000      , -16.066500000000001      , -
 76.479500000000002      ,  107.92800000000000      ,  113.11600000000000      ,
    66.388400000000004      , -48.842199999999998      ,  155.67099999999999      , -
 59.097000000000001      ,  67.743700000000004      ,  73.072500000000005      ,
    85.041399999999996      , -143.27400000000000      ,  110.90400000000000      ,
 110.15900000000001      ,  131.80500000000001      , -89.783699999999996      ,
    253.60700000000000      ,  17.656700000000001      ,  49.407699999999998      ,
 19.590399999999999      ,  70.406300000000002      , -137.09000000000000      ,
    35.351300000000002      ,  41.278199999999998      ,  111.29300000000001      , -
 240.31100000000001      ,  32.079500000000003      , -49.513700000000000      ,
    88.928299999999993      , 0.49442399999999997      , -9.8438700000000008      , -
 120.26900000000001      ,  35.507199999999997      ,  40.179000000000002      ,
    68.519099999999995      , -148.79800000000000      ,  67.000200000000007      , -
 82.328599999999994      ,  119.06500000000000      , -13.463600000000000      ,
    -73.784199999999998      , -35.691800000000001      ,  52.919899999999998      ,
 96.571600000000004      ,  18.696999999999999      , -48.361400000000003      ,
    -20.154699999999998      , -115.60299999999999      , -21.847200000000001      ,
 119.16600000000000      , -50.092100000000002      ,
 WDT0= 10*1.0000000000000000          ,
 WDX= 10*0.0000000000000000          ,
 WX= 10*0.0000000000000000          ,
 WZ= 10*1.0000000000000000          ,
 /
```

```
*****************************************************************************


        ***************   OUTPUT DATA for Case Number   25   ***************


   *****   The Initial T-Matrix (T0) and Either the Initial
                     Previous Actual NLP Control Vector (CVPRV0) or
                        the Initial Previous Control Amplitude (APRV0)
                           and Phase Angle (PHSPRV0) Vectors Before
                              Compression are Directly Input   *****

   *****   Input the Initial Previous Actual NLP Control
                     Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                        and then Compute the Previous Control Amplitude (APRV0)
                           and Control Phase Angle (PHSPRV0) Vectors   *****



               **********   Case Number   25   **********



   *****   Initial Previous Control Amplitude (APRV0) and Phase
                           Angle (PHSPRV0) Vectors before Compression   *****

   Element     AL0              APRV0             AU0              PHSPRV0

      1      0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      2      0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      3      0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      4      0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      5      0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00

   *****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

   Element      CVL0              CVPRV0             CVU0

      1      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      2      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      3      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      4      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      5      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      6      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      7      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      8      -0.10000000D+02    0.00000000D+00    0.10000000D+02
      9      -0.10000000D+02    0.00000000D+00    0.10000000D+02
     10      -0.10000000D+02    0.00000000D+00    0.10000000D+02

   *****   Either the BEFORE Compression Initial Actual NLP Control
                     Vector Estimates (CV00), OR the BEFORE Compression
                        Initial Control Vector Amplitudes (A00) and Phase
                           Angles (PHASE0) Estimates are Directly Input
                              via NAMELIST Data CDATA                    *****

   *****   Input the Initial Actual NLP Control Vector Estimate
                     (CV00) Directly Via NAMELIST Input CDATA, and
                        then Compute the Control Vector Amplitudes
                           (A00) and Phase Angles (PHASE0) Estimates   *****



               **********   Case Number   25   **********



   *****   Adjust the Initial Control Amplitude Estimates Vector
                  (A00) to define the Initial Control Amplitude Estimates
                     Vector (A0) to Within Limits If Required Before Compression   *****


   *****   Initial Control Amplitude Vector Estimates (A0), Its
                        Limits (AL0 & AU0), and Its Phase Angle Vector
                              Estimates (PHASE0) Before Compression   *****
```

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```
Element    AL0                    A0                     AU0                    PHASE0

   1       0.00000000D+00        0.00000000D+00        0.10000000D+02        0.00000000D+00
   1       0.00000000D+00        0.10000000D-06        0.10000000D+02        0.00000000D+00
   2       0.00000000D+00        0.00000000D+00        0.10000000D+02        0.00000000D+00
   2       0.00000000D+00        0.10000000D-06        0.10000000D+02        0.00000000D+00
   3       0.00000000D+00        0.00000000D+00        0.10000000D+02        0.00000000D+00
   3       0.00000000D+00        0.10000000D-06        0.10000000D+02        0.00000000D+00
   4       0.00000000D+00        0.00000000D+00        0.10000000D+02        0.00000000D+00
   4       0.00000000D+00        0.10000000D-06        0.10000000D+02        0.00000000D+00
   5       0.00000000D+00        0.00000000D+00        0.10000000D+02        0.00000000D+00
   5       0.00000000D+00        0.10000000D-06        0.10000000D+02        0.00000000D+00
```

***** Initial Actual NLP Control Vector Estimates (CV0) and
               Its Limits (CVL0 & CVU0) Before Compression   *****

```
Element    CVL0                   CV0                    CVU0

   1      -0.10000000D+02        0.00000000D+00        0.10000000D+02
   2      -0.10000000D+02        0.00000000D+00        0.10000000D+02
   3      -0.10000000D+02        0.00000000D+00        0.10000000D+02
   4      -0.10000000D+02        0.00000000D+00        0.10000000D+02
   5      -0.10000000D+02        0.00000000D+00        0.10000000D+02
   6      -0.10000000D+02        0.00000000D+00        0.10000000D+02
   7      -0.10000000D+02        0.00000000D+00        0.10000000D+02
   8      -0.10000000D+02        0.00000000D+00        0.10000000D+02
   9      -0.10000000D+02        0.00000000D+00        0.10000000D+02
  10      -0.10000000D+02        0.00000000D+00        0.10000000D+02
```

***** End Conditions Vector EC0, Previous Cycle
             End Conditions Vector ECPRV0, and Weighting
                  Coefficient Vector WDT0 Before Compression   *****

```
Element    EC0                    ECPRV0                 WDT0

   1      -0.95504700D+02       -0.95504700D+02        0.10000000D+01
   2       0.75647200D+02        0.75647200D+02        0.10000000D+01
   3       0.84882200D+02        0.84882200D+02        0.10000000D+01
   4       0.80737600D+02        0.80737600D+02        0.10000000D+01
   5      -0.65848100D+02       -0.65848100D+02        0.10000000D+01
   6       0.77724100D+02        0.77724100D+02        0.10000000D+01
   7      -0.37301000D+02       -0.37301000D+02        0.10000000D+01
   8       0.31399400D+02        0.31399400D+02        0.10000000D+01
   9       0.43590700D+02        0.43590700D+02        0.10000000D+01
  10       0.12152200D+02        0.12152200D+02        0.10000000D+01
```

              ********** Case Number 25 **********

          Specification of CV, T-matrix, and EC Compression

                         MSAVE0/MSAVE

     0   1   0   0   0
  0   0   1   1   0   0   0   0   0   0

                         NSAVE0/NSAVE

     0   0   1   0   0
  0   0   0   0   1   1   0   0   0   0

 ******************** T-Matrix Compression is Initiated ********************

  ***** Initial Control Vector (CV0), T-Matrix (T0),
                         and Measurement Vector (EC0)   *****

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```

```
 *****    Initial Control Vector (CV0)    *****

  CV0    0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
         0.00000000D+00    0.00000000D+00    0.00000000D+00    0.00000000D+00
         0.00000000D+00    0.00000000D+00

 *****    Initial Greatest Least Bounds (CVL0) for the
                                    Control Vector (CV0)    *****

 CVL0   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
        -0.10000000D+02   -0.10000000D+02   -0.10000000D+02   -0.10000000D+02
        -0.10000000D+02   -0.10000000D+02

 *****    Initial Least Upper Bounds (CVU0) for the
                                    Control Vector (CV0)    *****

 CVU0    0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
         0.10000000D+02    0.10000000D+02    0.10000000D+02    0.10000000D+02
         0.10000000D+02    0.10000000D+02


    Row          *****    Initial T-Matrix (T0)    *****

T0   1  -0.90740400D+02   -0.13569100D+03   -0.11432000D+03   -0.68177300D+02
        -0.50039300D+02   -0.76479500D+02   -0.14327400D+03   -0.13709000D+03
        -0.12026900D+03   -0.35691800D+02

T0   2   0.11970700D+03    0.79448600D+02    0.47683700D+02    0.51471100D+02
         0.63869000D+02    0.10792800D+03    0.11090400D+03    0.35351300D+02
         0.35507200D+02    0.52919900D+02

T0   3   0.12238400D+03    0.87604200D+02    0.60609600D+02    0.64589000D+02
         0.76583700D+02    0.11311600D+03    0.11015900D+03    0.41278200D+02
         0.40179000D+02    0.96571600D+02

T0   4   0.78723800D+02    0.11595000D+03    0.95790400D+02    0.53425700D+02
         0.37283300D+02    0.66388400D+02    0.13180500D+03    0.11129300D+03
         0.68519100D+02    0.18697000D+02

T0   5  -0.69686400D+02   -0.47757000D+02   -0.56223800D+02   -0.30916700D+02
         0.44635300D+02   -0.48842200D+02   -0.89783700D+02   -0.24031100D+03
        -0.14879800D+03   -0.48361400D+02

T0   6   0.66340100D+02    0.79133100D+02    0.49498400D+02    0.80521700D+02
         0.79285000D+02    0.15567100D+03    0.25360700D+03    0.32079500D+02
         0.67000200D+02   -0.20154700D+02

T0   7  -0.40056100D+02   -0.30015800D+02   -0.24877100D+02   -0.84533200D+01
        -0.54793800D+01   -0.59097000D+02    0.17656700D+02   -0.49513700D+02
        -0.82328600D+02   -0.11560300D+03

T0   8   0.20252000D+02    0.33375900D+02    0.37778200D+01    0.54595500D+02
         0.73257900D+02    0.67743700D+02    0.49407700D+02    0.88928300D+02
         0.11906500D+03   -0.21847200D+02

T0   9   0.29750400D+02    0.38475000D+02    0.24546000D+02    0.66753000D+02
         0.12317900D+03    0.73072500D+02    0.19590400D+02    0.49442400D+00
        -0.13463600D+02    0.11916600D+03

T0 10    0.24367300D+02    0.13770800D+02   -0.63430700D+01   -0.12353700D+02
        -0.16066500D+02    0.85041400D+02    0.70406300D+02   -0.98438700D+01
        -0.73784200D+02   -0.50092100D+02


 *****    Initial End Conditions Vector (EC0)    *****

  EC0   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
        -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
         0.43590700D+02    0.12152200D+02

 *****    Initial End Conditions Weighting Coefficient Vector
                         (WDT0) for the Performance Index (F)    *****
```

```
   WDT0      0.10000000D+01    0.10000000D+01     0.10000000D+01     0.10000000D+01
             0.10000000D+01    0.10000000D+01     0.10000000D+01     0.10000000D+01
             0.10000000D+01    0.10000000D+01


   *****    Initial Control Vector (CVPRV0) and Measurement
                        Vector (ECPRV0) from the Previous Duty Cycle   *****


   *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

  CVPRV0     0.00000000D+00    0.00000000D+00     0.00000000D+00     0.00000000D+00
             0.00000000D+00    0.00000000D+00     0.00000000D+00     0.00000000D+00
             0.00000000D+00    0.00000000D+00


   *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

  ECPRV0    -0.95504700D+02    0.75647200D+02     0.84882200D+02     0.80737600D+02
            -0.65848100D+02    0.77724100D+02    -0.37301000D+02     0.31399400D+02
             0.43590700D+02    0.12152200D+02


   *****    Intermediate Control Vector (CV), T-Matrix (TT),
             and Measurement Vector (ECT) after the First Compression   *****


   *****    Intermediate Control Vector (CV) after the First Compression   *****
    CV       0.00000000D+00    0.00000000D+00

   *****    Intermediate Greatest Least Bounds (CVL) for the
                                         Control Vector (CV)   *****

   CVL      -0.10000000D+02   -0.10000000D+02

   *****    Intermediate Least Upper Bounds (CVU) for the
                                         Control Vector (CV)   *****

   CVU       0.10000000D+02    0.10000000D+02


    Row         *****   Intermediate T-Matrix (TT)   *****

  TT  1     -0.50039300D+02   -0.76479500D+02

  TT  2      0.63869000D+02    0.10792800D+03

  TT  3      0.76583700D+02    0.11311600D+03

  TT  4      0.37283300D+02    0.66388400D+02

  TT  5      0.44635300D+02   -0.48842200D+02

  TT  6      0.79285000D+02    0.15567100D+03

  TT  7     -0.54793800D+01   -0.59097000D+02

  TT  8      0.73257900D+02    0.67743700D+02

  TT  9      0.12317900D+03    0.73072500D+02

  TT 10     -0.16066500D+02    0.85041400D+02


   *****    Intermediate End Conditions Vector (ECT)   *****
   ECT      -0.95504700D+02    0.75647200D+02     0.84882200D+02     0.80737600D+02
            -0.65848100D+02    0.77724100D+02    -0.37301000D+02     0.31399400D+02
             0.43590700D+02    0.12152200D+02

   *****    Intermediate End Conditions Weighting Coefficient Vector
                                (WDTT) for the Performance Index (F)   *****
```

```
   WDTT      0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
             0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
             0.10000000D+01    0.10000000D+01


   *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                        (ECPRV0) from the Previous Duty Cycle after
                                          the First Compression    *****


   *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                          the First Compression    *****

   CVPRV     0.00000000D+00    0.00000000D+00


   *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                       after the First Compression    *****

   ECPRVT   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
            -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
             0.43590700D+02    0.12152200D+02


   *****    Final Control Vector (CV), T-Matrix (T), and
                    Measurement Vector (EC) after the Second Compression    *****


   *****    Final Control Vector (CV) after the Second Compression    *****

     CV      0.00000000D+00    0.00000000D+00

   *****    Greatest Least Bounds (CVL) Vector for the
                                          Control Vector (CV)    *****

    CVL     -0.10000000D+02   -0.10000000D+02

   *****    Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

    CVU      0.10000000D+02    0.10000000D+02


    Row              *****    Final T-Matrix (T)    *****

  T  1     0.76583700D+02    0.11311600D+03

  T  2     0.37283300D+02    0.66388400D+02


   *****    Final End Conditions Vector (EC) after the Second Compression    *****

     EC     0.84882200D+02    0.80737600D+02

   *****    Final End Conditions Weighting Coefficient Vector
                                      (WDT) for the Performance Index (F)    *****

    WDT     0.10000000D+01    0.10000000D+01

   *****    Final Control Vector (CVPRV) and Measurement Vector
                    (ECPRV) from the Previous Duty Cycle after
                                      the Second Compression    *****


   *****    Final Previous Cycle Control Vector (CVPRV) after
                                      the Second Compression    *****

   CVPRV     0.00000000D+00    0.00000000D+00


   *****    Final Previous Cycle End Conditions Vector (ECPRV)
                                      after the Second Compression    *****

   ECPRV     0.84882200D+02    0.80737600D+02
```

```
   ******************   T-Matrix Compression is Completed   ********************


  *****   Initial End Conditions Vector EC   *****


    0.84882200D+02      0.80737600D+02


  *****   Initial Performance Index  =   0.13723548D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

 Element    AL             A              AU             PHASE

    1    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00


               **********   Case Number   25   **********



                              LSAVE

     0       0


  *****   Solve the NLPQLP Problem for Case Number   25   *****




    ----------------------------------------------------------------------
    START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
    ----------------------------------------------------------------------

    Parameters:
      N      =        2
      M      =        0
      ME     =        0
      MODE   =        0
      ACC    =   0.1000D-06
      ACCQP  =   0.1000D-11
      STPMIN =   0.0000D+00
      RHOB   =   0.1000D+03
      MAXFUN =       30
      MAXNM  =       10
      MAXIT  =      300
      IPRINT =        2

    Output in the following order:
      IT    - iteration number
      F     - objective function value
      SCV   - sum of constraint violations
      NA    - number of active constraints
      I     - number of line search iterations
      ALPHA - steplength parameter
      DELTA - additional variable to prevent inconsistency
      KKT   - Karush-Kuhn-Tucker optimality criterion


     IT       F           SCV      NA  I    ALPHA     DELTA      KKT
    ----------------------------------------------------------------
     1  0.13723548D+05  0.00D+00   0  0  0.00D+00  0.00D+00  0.98D+06
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
     2  0.11512681D+05  0.00D+00   0  2  0.10D+00  0.00D+00  0.29D+05
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
     3  0.15592366D+04  0.00D+00   0  1  0.10D+01  0.00D+00  0.20D+05
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
```

F-120

```
                 *****    Completed CALL to NLPQLP    *****
    4  0.57961253D+03  0.00D+00    0  2  0.27D+00  0.00D+00  0.12D+04
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
    5  0.10608523D-06  0.00D+00    0  1  0.10D+01  0.00D+00  0.23D-06
                 *****    Completed CALL to NLPQLP    *****
                 *****    Completed CALL to NLPQLP    *****
    6  0.56974689D-08  0.00D+00    0  1  0.10D+01  0.00D+00  0.50D-18


   --- Final Convergence Analysis at Last Iterate ---

     Objective function value:      F(X)  =   0.56974689D-08
     Solution values:               X     =
        0.40343789D+01 -0.34818226D+01
     Distances from lower bounds:   X-XL  =
        0.14034379D+02  0.65181774D+01
     Distances from upper bounds:   XU-X  =
        0.59656211D+01  0.13481823D+02
     Multipliers for lower bounds:  U     =
        0.00000000D+00  0.00000000D+00
     Multipliers for upper bounds:  U     =
        0.00000000D+00  0.00000000D+00
     Number of function calls:      NFUNC =        8
     Number of gradient calls:      NGRAD =        6
     Number of calls of QP solver:  NQL   =        6



                 *****    Completed CALL to NLPQLP    *****


          *****    Number of Function Evaluations  =     20    *****


*****    Solution Control Vector for Case Number   25    *****

Element    CVL                CV                 CVU                CV - CV0

    1   -0.10000000D+02     0.40343789D+01     0.10000000D+02     0.40343789D+01
    2   -0.10000000D+02    -0.34818226D+01     0.10000000D+02    -0.34818226D+01




*****    Predicted Measurement Vector EC    *****

   0.56108702D-04     -0.50490349D-04


*****    NLP Solution Performance Index  =   0.56974689D-08    *****




*****    Predicted Measurement Vector EC    *****

   0.16723717D-04     -0.73605613D-04


*****    NLP Solution Performance Index  =   0.56974689D-08    *****




*****    Predicted Control Amplitude Vector (A)
            Its Limits (AL & AU), and Its Phase Angle
                          Vector (PHASE) Before Compression    *****

Element    AL                 A                  AU                 PHASE

    1    0.00000000D+00     0.53290995D+01     0.10000000D+02     0.13079544D+03
```

```
*****   No Constraints are Specified for Case Number   25   *****


               **********   End Case Number   25   **********




     **************************************************************************
```

```
             ***************   Start Case Number 1025   ***************


           ***************   INPUT DATA for Case Number 1025   ***************


     &CDATA
      A00= 5*0.0000000000000000          ,  1.0000000000000000      ,
      ACC= 9.9999999999999955E-008,
      ACCQP= 9.9999999999999980E-013,
      AL0= 5*0.0000000000000000        ,-9.9999999999999955E-008,
      ALPHA=  1.0000000000000000       ,
      APRV0= 5*0.0000000000000000        ,  4.94065645841246544E-324,
      AU0= 5*10.000000000000000       ,  3.0000000000000000     ,
      CRAN1=  2.0000000000000000       ,
      CRAN2=  3.0000000000000000       ,
      CRAN3=  1.0000000000000000       ,
      CRAN4=  1.0000000000000000       ,
      CV00= 10*0.0000000000000000        , 1.48219693752373963E-323, 6.95323310165009693E-
     310, 5.16525870101189612E-319, 6.95323310137697744E-310,

      CVOUT=         0,
      CVPRV0= 10*0.0000000000000000        , 6.95323310136353885E-310, 6.95321286253352059E-
     310, 6.95325616664988679E-310,  0.0000000000000000      ,

      ECPRV0= -95.504700000000000      ,  75.647199999999998     ,  84.882199999999997      ,
     80.737600000000000     , -65.848100000000002      ,
        77.724100000000007      , -37.301000000000002      ,  31.399400000000000      ,
     43.590699999999998     ,  12.152200000000001      ,
      EPS= 9.9999999999999955E-008,
      ICASE=       1025,
      ICYCL0=      2000,
      IDATA=          3,
      IN=          5,
      IOPT=          1,
      IOUT=          6,
      IPRINT=        2,
      ISEED1=     2395,       4013,       3813,       1837,
      ISEED2=     1843,       4011,       3364,       2835,
      ISEED3=     3962,       1111,       3215,       2637,
      ISEED4=     2397,       1504,       4031,       3173,
      ITOUT=         3,
      L=         1,
      LQL=T,
      LSAVE=          1, 5*0          ,
      MAXASUM=  3.0000000000000000      ,
      MAXFUN=         30,
      MAXIT=        300,
      MAXNM=         10,
      MI=         1,
      MINASUM=  0.0000000000000000      ,
      MODE=          0,
      MSAVE0=          0,          1, 3*0          , 5*1          ,
      MULT=          1,
      NSAVE0= 2*0          ,          1, 2*0          , 5*1          ,
      NX0=         10,
      NZ0=         10,
      OPTEND=          3,
      PHASE0= 5*0.0000000000000000       ,  90.000000000000000      ,
      PHSPRV0= 6*0.0000000000000000       ,
      RHOB=  100.00000000000000       ,
      STPMIN=  0.0000000000000000       ,
      T0= -90.740399999999994      ,  119.70699999999999      ,  122.38400000000000      ,
     78.723799999999997     , -69.686400000000006      ,
        66.340100000000007      , -40.056100000000001      ,  20.251999999999999      ,
     29.750399999999999     ,  24.367300000000000      , -135.69100000000000      ,
        79.448599999999999     ,  87.604200000000006      ,  115.95000000000000      , -
     47.756999999999998     ,  79.133099999999999      , -30.015799999999999      ,
        33.375900000000001      ,  38.475000000000001      ,  13.770799999999999      , -
     114.31999999999999     ,  47.683700000000002      ,  60.609600000000000      ,
        95.790400000000005      , -56.223799999999997      ,  49.498399999999997      , -
     24.877099999999999     ,  3.7778200000000002      ,  24.545999999999999      ,
       -6.3430700000000000      , -68.177300000000002      ,  51.471100000000000      ,
     64.588999999999999     ,  53.425699999999999      , -30.916699999999999      ,
```

```
      80.521699999999996      ,  -8.4533199999999997      ,   54.595500000000001      ,
66.753000000000000      , -12.353700000000000      , -50.039299999999997      ,
      63.869000000000000      ,  76.583699999999993      ,   37.283299999999997      ,
44.635300000000001      ,  79.284999999999997      ,  -5.4793799999999999      ,
      73.257900000000006      ,  123.17900000000000      ,  -16.066500000000001      , -
76.479500000000002      ,  107.92800000000000      ,  113.11600000000000      ,
      66.388400000000004      , -48.842199999999998      ,  155.67099999999999      , -
59.097000000000001      ,  67.743700000000004      ,   73.072500000000005      ,
      85.041399999999996      , -143.27400000000000      ,  110.90400000000000      ,
110.15900000000001      ,  131.80500000000001      , -89.783699999999996      ,
      253.60700000000000      ,  17.656700000000001      ,   49.407699999999998      ,
19.590399999999999      ,  70.406300000000002      , -137.09000000000000      ,
      35.351300000000002      ,  41.278199999999998      ,  111.29300000000001      , -
240.31100000000001      ,  32.079500000000003      , -49.513700000000000      ,
      88.928299999999993      , 0.49442399999999997      ,  -9.8438700000000008      , -
120.26900000000001      ,  35.507199999999997      ,  40.179000000000002      ,
      68.519099999999995      , -148.79800000000000      ,   67.000200000000007      , -
82.328599999999994      ,  119.06500000000000      , -13.463600000000000      ,
      -73.784199999999998      , -35.691800000000001      ,   52.919899999999998      ,
96.571600000000004      ,  18.696999999999999      , -48.361400000000003      ,
      -20.154699999999998      , -115.60299999999999      , -21.847200000000001      ,
119.16600000000000      , -50.092100000000002      ,
 WDT0= 10*1.0000000000000000        ,
 WDX= 10*0.0000000000000000        ,
 WX= 10*0.0000000000000000        ,
 WZ= 10*1.0000000000000000        ,
 /




 ******************************************************************************


     ***************   OUTPUT DATA for Case Number 1025   ***************


   *****   The Initial T-Matrix (T0) and Either the Initial
                 Previous Actual NLP Control Vector (CVPRV0) or
                     the Initial Previous Control Amplitude (APRV0)
                        and Phase Angle (PHSPRV0) Vectors Before
                               Compression are Directly Input   *****

   *****   Input the Initial Previous Actual NLP Control
                Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                   and then Compute the Previous Control Amplitude (APRV0)
                        and Control Phase Angle (PHSPRV0) Vectors   *****



           **********   Case Number 1025   **********



   *****   Initial Previous Control Amplitude (APRV0) and Phase
                      Angle (PHSPRV0) Vectors before Compression   *****
     Element     AL0              APRV0              AU0              PHSPRV0

        1    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
        2    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
        3    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
        4    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
        5    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00

   *****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

     Element      CVL0              CVPRV0             CVU0

        1    -0.10000000D+02   0.00000000D+00   0.10000000D+02
        2    -0.10000000D+02   0.00000000D+00   0.10000000D+02
        3    -0.10000000D+02   0.00000000D+00   0.10000000D+02
        4    -0.10000000D+02   0.00000000D+00   0.10000000D+02
        5    -0.10000000D+02   0.00000000D+00   0.10000000D+02
        6    -0.10000000D+02   0.00000000D+00   0.10000000D+02
        7    -0.10000000D+02   0.00000000D+00   0.10000000D+02
```

```
         8        -0.10000000D+02     0.00000000D+00     0.10000000D+02
         9        -0.10000000D+02     0.00000000D+00     0.10000000D+02
        10        -0.10000000D+02     0.00000000D+00     0.10000000D+02


*****     Either the BEFORE Compression Initial Actual NLP Control
              Vector Estimates (CV00), OR the BEFORE Compression
                Initial Control Vector Amplitudes (A00) and Phase
                  Angles (PHASE0) Estimates are Directly Input
                       via NAMELIST Data CDATA                        *****


*****     Input the Initial Actual NLP Control Vector Estimate
              (CV00) Directly Via NAMELIST Input CDATA, and
                   then Compute the Control Vector Amplitudes
                      (A00) and Phase Angles (PHASE0) Estimates    *****



              **********   Case Number 1025   **********


*****     Adjust the Initial Control Amplitude Estimates Vector
          (A00) to define the Initial Control Amplitude Estimates
            Vector (A0) to Within Limits If Required Before Compression   *****


*****     Initial Control Amplitude Vector Estimates (A0), Its
                   Limits (AL0 & AU0), and Its Phase Angle Vector
                      Estimates (PHASE0) Before Compression    *****
```

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

```
*****     Initial Actual NLP Control Vector Estimates (CV0) and
                       Its Limits (CVL0 & CVU0) Before Compression    *****
```

Element	CVL0	CV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.10000000D+02	0.00000000D+00	0.10000000D+02
6	-0.10000000D+02	0.00000000D+00	0.10000000D+02
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

```
*****     End Conditions Vector EC0, Previous Cycle
                   End Conditions Vector ECPRV0, and Weighting
                      Coefficient Vector WDT0 Before Compression    *****
```

Element	EC0	ECPRV0	WDT0
1	-0.95504700D+02	-0.95504700D+02	0.10000000D+01
2	0.75647200D+02	0.75647200D+02	0.10000000D+01
3	0.84882200D+02	0.84882200D+02	0.10000000D+01
4	0.80737600D+02	0.80737600D+02	0.10000000D+01
5	-0.65848100D+02	-0.65848100D+02	0.10000000D+01
6	0.77724100D+02	0.77724100D+02	0.10000000D+01
7	-0.37301000D+02	-0.37301000D+02	0.10000000D+01
8	0.31399400D+02	0.31399400D+02	0.10000000D+01
9	0.43590700D+02	0.43590700D+02	0.10000000D+01

```
      10          0.12152200D+02          0.12152200D+02          0.10000000D+01


              **********   Case Number 1025   **********



              Specification of CV, T-matrix, and EC Compression

                            MSAVE0/MSAVE

         0                1                0             0                 0
      0        0       1       1       0        0       0        0        0        0


                            NSAVE0/NSAVE

         0                0                1             0                 0
      0        0       0        0       1       1       0        0        0        0



  *******************   T-Matrix Compression is Initiated   ********************



   *****    Initial Control Vector (CV0), T-Matrix (T0),
                                        and Measurement Vector (EC0)   *****


   *****    Initial Control Vector (CV0)   *****

    CV0       0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
              0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
              0.00000000D+00      0.00000000D+00

   *****    Initial Greatest Least Bounds (CVL0) for the
                                        Control Vector (CV0)   *****

    CVL0     -0.10000000D+02     -0.10000000D+02     -0.10000000D+02     -0.10000000D+02
             -0.10000000D+02     -0.10000000D+02     -0.10000000D+02     -0.10000000D+02
             -0.10000000D+02     -0.10000000D+02

   *****    Initial Least Upper Bounds (CVU0) for the
                                        Control Vector (CV0)   *****

    CVU0      0.10000000D+02      0.10000000D+02      0.10000000D+02      0.10000000D+02
              0.10000000D+02      0.10000000D+02      0.10000000D+02      0.10000000D+02
              0.10000000D+02      0.10000000D+02


     Row           *****   Initial T-Matrix (T0)   *****

    T0   1   -0.90740400D+02     -0.13569100D+03     -0.11432000D+03     -0.68177300D+02
             -0.50039300D+02     -0.76479500D+02     -0.14327400D+03     -0.13709000D+03
             -0.12026900D+03     -0.35691800D+02

    T0   2    0.11970700D+03      0.79448600D+02      0.47683700D+02      0.51471100D+02
              0.63869000D+02      0.10792800D+03      0.11090400D+03      0.35351300D+02
              0.35507200D+02      0.52919900D+02

    T0   3    0.12238400D+03      0.87604200D+02      0.60609600D+02      0.64589000D+02
              0.76583700D+02      0.11311600D+03      0.11015900D+03      0.41278200D+02
              0.40179000D+02      0.96571600D+02

    T0   4    0.78723800D+02      0.11595000D+03      0.95790400D+02      0.53425700D+02
              0.37283300D+02      0.66388400D+02      0.13180500D+03      0.11129300D+03
              0.68519100D+02      0.18697000D+02

    T0   5   -0.69686400D+02     -0.47757000D+02     -0.56223800D+02     -0.30916700D+02
              0.44635300D+02     -0.48842200D+02     -0.89783700D+02     -0.24031100D+03
             -0.14879800D+03     -0.48361400D+02

    T0   6    0.66340100D+02      0.79133100D+02      0.49498400D+02      0.80521700D+02
```

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```
              0.79285000D+02     0.15567100D+03     0.25360700D+03     0.32079500D+02
              0.67000200D+02    -0.20154700D+02

  T0   7    -0.40056100D+02    -0.30015800D+02    -0.24877100D+02    -0.84533200D+01
            -0.54793800D+01    -0.59097000D+02     0.17656700D+02    -0.49513700D+02
            -0.82328600D+02    -0.11560300D+03

  T0   8     0.20252000D+02     0.33375900D+02     0.37778200D+01     0.54595500D+02
             0.73257900D+02     0.67743700D+02     0.49407700D+02     0.88928300D+02
             0.11906500D+03    -0.21847200D+02

  T0   9     0.29750400D+02     0.38475000D+02     0.24546000D+02     0.66753000D+02
             0.12317900D+03     0.73072500D+02     0.19590400D+02     0.49442400D+00
            -0.13463600D+02     0.11916600D+03

  T0  10     0.24367300D+02     0.13770800D+02    -0.63430700D+01    -0.12353700D+02
            -0.16066500D+02     0.85041400D+02     0.70406300D+02    -0.98438700D+01
            -0.73784200D+02    -0.50092100D+02


   *****    Initial End Conditions Vector (EC0)    *****

   EC0     -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02

   *****    Initial End Conditions Weighting Coefficient Vector
                            (WDT0) for the Performance Index (F)   *****
   WDT0     0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
            0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
            0.10000000D+01     0.10000000D+01


   *****    Initial Control Vector (CVPRV0) and Measurement
                            Vector (ECPRV0) from the Previous Duty Cycle   *****


   *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

 CVPRV0     0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
            0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
            0.00000000D+00     0.00000000D+00


   *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

 ECPRV0    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02


   *****    Intermediate Control Vector (CV), T-Matrix (TT),
              and Measurement Vector (ECT) after the First Compression   *****


   *****    Intermediate Control Vector (CV) after the First Compression   *****
    CV      0.00000000D+00     0.00000000D+00

   *****    Intermediate Greatest Least Bounds (CVL) for the
                                          Control Vector (CV)   *****

   CVL     -0.10000000D+02    -0.10000000D+02

   *****    Intermediate Least Upper Bounds (CVU) for the
                                          Control Vector (CV)   *****

   CVU      0.10000000D+02     0.10000000D+02


    Row        *****    Intermediate T-Matrix (TT)    *****

  TT   1    -0.50039300D+02    -0.76479500D+02
```

```
   TT  2     0.63869000D+02      0.10792800D+03

   TT  3     0.76583700D+02      0.11311600D+03

   TT  4     0.37283300D+02      0.66388400D+02

   TT  5     0.44635300D+02     -0.48842200D+02

   TT  6     0.79285000D+02      0.15567100D+03

   TT  7    -0.54793800D+01     -0.59097000D+02

   TT  8     0.73257900D+02      0.67743700D+02

   TT  9     0.12317900D+03      0.73072500D+02

   TT 10    -0.16066500D+02      0.85041400D+02


   *****   Intermediate End Conditions Vector (ECT)   *****

   ECT   -0.95504700D+02     0.75647200D+02      0.84882200D+02      0.80737600D+02
         -0.65848100D+02     0.77724100D+02     -0.37301000D+02      0.31399400D+02
          0.43590700D+02     0.12152200D+02

   *****   Intermediate End Conditions Weighting Coefficient Vector
                             (WDTT) for the Performance Index (F)   *****

   WDTT   0.10000000D+01     0.10000000D+01      0.10000000D+01      0.10000000D+01
          0.10000000D+01     0.10000000D+01      0.10000000D+01      0.10000000D+01
          0.10000000D+01     0.10000000D+01


   *****   Intermediate Control Vector (CVPRV) and Measurement Vector
                         (ECPRV0) from the Previous Duty Cycle after
                                        the First Compression   *****


   *****   Intermediate Previous Cycle Control Vector (CVPRV) after
                                        the First Compression   *****

   CVPRV   0.00000000D+00     0.00000000D+00


   *****   Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                   after the First Compression   *****

   ECPRVT  -0.95504700D+02     0.75647200D+02      0.84882200D+02      0.80737600D+02
           -0.65848100D+02     0.77724100D+02     -0.37301000D+02      0.31399400D+02
            0.43590700D+02     0.12152200D+02


   *****   Final Control Vector (CV), T-Matrix (T), and
                Measurement Vector (EC) after the Second Compression   *****


   *****   Final Control Vector (CV) after the Second Compression   *****

    CV    0.00000000D+00     0.00000000D+00

   *****   Greatest Least Bounds (CVL) Vector for the
                                        Control Vector (CV)   *****

    CVL   -0.10000000D+02    -0.10000000D+02

   *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)   *****

    CVU    0.10000000D+02     0.10000000D+02


     Row             *****   Final T-Matrix (T)   *****

    T  1    0.76583700D+02      0.11311600D+03
```

```
    T  2    0.37283300D+02    0.66388400D+02


  *****   Final End Conditions Vector (EC) after the Second Compression   *****

    EC     0.84882200D+02    0.80737600D+02

  *****   Final End Conditions Weighting Coefficient Vector
                                (WDT) for the Performance Index (F)   *****

   WDT     0.10000000D+01    0.10000000D+01


  *****   Final Control Vector (CVPRV) and Measurement Vector
                         (ECPRV) from the Previous Duty Cycle after
                                           the Second Compression   *****


  *****   Final Previous Cycle Control Vector (CVPRV) after
                                           the Second Compression   *****

 CVPRV     0.00000000D+00    0.00000000D+00


  *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                  after the Second Compression   *****

 ECPRV     0.84882200D+02    0.80737600D+02


******************   T-Matrix Compression is Completed   ********************


  *****   Initial End Conditions Vector EC   *****

    0.84882200D+02       0.80737600D+02


  *****   Initial Performance Index  =   0.13723548D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

 Element    AL               A                AU               PHASE

    1    0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00


*****   Initial Constraint Function Values for Case Number 1025   *****

                              LSAVE

    1      0

  *****   Inequality Constraints   *****

 Element       Constraint          Amplitude          Max Amp

    1        0.10000000D+02      0.00000000D+00      0.10000000D+02


  *****   Solve the NLPQLP Problem for Case Number 1025   *****



   --------------------------------------------------------------------
    START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
   --------------------------------------------------------------------

    Parameters:
      N     =        2
      M     =        1
      ME    =        0
      MODE  =        0
```

```
      ACC    =   0.1000D-06
      ACCQP  =   0.1000D-11
      STPMIN =   0.0000D+00
      RHOB   =   0.1000D+03
      MAXFUN =        30
      MAXNM  =        10
      MAXIT  =       300
      IPRINT =         2

   Output in the following order:
      IT    - iteration number
      F     - objective function value
      SCV   - sum of constraint violations
      NA    - number of active constraints
      I     - number of line search iterations
      ALPHA - steplength parameter
      DELTA - additional variable to prevent inconsistency
      KKT   - Karush-Kuhn-Tucker optimality criterion


    IT       F            SCV      NA  I    ALPHA     DELTA      KKT
   --------------------------------------------------------------------
     1  0.13723548D+05  0.00D+00   1  0   0.00D+00  0.00D+00  0.98D+06
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     2  0.11512681D+05  0.00D+00   0  2   0.10D+00  0.00D+00  0.29D+05
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     3  0.15592366D+04  0.24D+01   1  1   0.10D+01  0.00D+00  0.20D+05
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     4  0.57962682D+03  0.00D+00   0  2   0.27D+00  0.00D+00  0.12D+04
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     5  0.10617388D-06  0.00D+00   0  1   0.10D+01  0.00D+00  0.23D-06
                 *****   Completed CALL to NLPQLP   *****
                 *****   Completed CALL to NLPQLP   *****
     6  0.56974688D-08  0.00D+00   0  1   0.10D+01  0.00D+00  0.50D-18


   --- Final Convergence Analysis at Last Iterate ---

   Objective function value:      F(X)  =  0.56974688D-08
   Solution values:               X     =
      0.40343789D+01 -0.34818226D+01
   Distances from lower bounds:   X-XL  =
      0.14034379D+02  0.65181774D+01
   Distances from upper bounds:   XU-X  =
      0.59656211D+01  0.13481823D+02
   Multipliers for lower bounds:  U     =
      0.00000000D+00  0.00000000D+00
   Multipliers for upper bounds:  U     =
      0.00000000D+00  0.00000000D+00
   Constraint values:             G(X)  =
      0.46709005D+01
   Multipliers for constraints:   U     =
      0.00000000D+00
   Number of function calls:      NFUNC =        8
   Number of gradient calls:      NGRAD =        6
   Number of calls of QP solver:  NQL   =        6


              *****   Completed CALL to NLPQLP   *****

        *****   Number of Function Evaluations =     20   *****


   *****   Solution Control Vector for Case Number 1025   *****

   Element   CVL              CV               CVU              CV - CV0

      1   -0.10000000D+02   0.40343789D+01   0.10000000D+02   0.40343789D+01
```

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```
    2     -0.10000000D+02    -0.34818226D+01     0.10000000D+02    -0.34818226D+01


   *****    Predicted Measurement Vector EC    *****

      0.56108697D-04      -0.50490350D-04


   *****    NLP Solution Performance Index  =   0.56974688D-08    *****



   *****    Predicted Measurement Vector EC    *****

      0.16723712D-04      -0.73605613D-04


   *****    NLP Solution Performance Index  =   0.56974688D-08    *****



   *****    Predicted Control Amplitude Vector (A)
                  Its Limits (AL & AU), and Its Phase Angle
                                 Vector (PHASE) Before Compression    *****

   Element    AL                A                 AU                PHASE

      1     0.00000000D+00    0.53290995D+01    0.10000000D+02    0.13079544D+03

*****   Solution Constraint Function Values for Case Number 1025    *****

                               LSAVE

      1      0

   *****    Inequality Constraints    *****

   Element        Constraint         Amplitude         Max Amp

      1        0.46709005D+01      0.53290995D+01     0.10000000D+02


              **********   End Case Number 1025   **********



****************************************************************************
```

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```
 &CDATA
 A00= 5*0.0000000000000000         ,  1.0000000000000000      ,
 ACC= 9.9999999999999955E-008,
 ACCQP= 9.9999999999999980E-013,
 AL0= 5*0.0000000000000000        ,-9.9999999999999955E-008,
 ALPHA=  1.0000000000000000       ,
 APRV0= 5*0.0000000000000000         , 4.94065645841246544E-324,
 AU0= 2*10.000000000000000         ,  5.0000000000000000     , 2*10.000000000000000
 ,  3.0000000000000000       ,
 CRAN1=  2.0000000000000000        ,
 CRAN2=  3.0000000000000000        ,
 CRAN3=  1.0000000000000000        ,
 CRAN4=  1.0000000000000000        ,
 CV00= 10*0.0000000000000000         , 1.48219693752373963E-323, 6.95323310165009693E-
310, 5.16525870101189612E-319, 6.95323310137697744E-310,

 CVOUT=          0,
 CVPRV0= 10*0.0000000000000000          , 6.95323310136353885E-310, 6.95321286253352059E-
310, 6.95325616664988679E-310,  0.0000000000000000      ,

 ECPRV0= -95.504700000000000        ,  75.647199999999998     ,  84.882199999999997     ,
80.737600000000000      , -65.848100000000002     ,
    77.724100000000007      , -37.301000000000002     ,  31.399400000000000      ,
43.590699999999998      ,  12.152200000000001     ,
 EPS= 9.9999999999999955E-008,
 ICASE=        525,
 ICYCL0=       2000,
 IDATA=          3,
 IN=           5,
 IOPT=           1,
 IOUT=           6,
 IPRINT=         2,
 ISEED1=      2395,       4013,       3813,       1837,
 ISEED2=      1843,       4011,       3364,       2835,
 ISEED3=      3962,       1111,       3215,       2637,
 ISEED4=      2397,       1504,       4031,       3173,
 ITOUT=          3,
 L=           1,
 LQL=T,
 LSAVE=          1, 5*0          ,
 MAXASUM=  3.0000000000000000      ,
 MAXFUN=         30,
 MAXIT=        300,
 MAXNM=         10,
 MI=           1,
 MINASUM=  0.0000000000000000      ,
 MODE=           0,
 MSAVE0=          0,          1, 3*0          , 5*1           ,
 MULT=           1,
 NSAVE0= 2*0          ,          1, 2*0          , 5*1          ,
 NX0=          10,
 NZ0=          10,
 OPTEND=          3,
 PHASE0= 5*0.0000000000000000        , 90.000000000000000      ,
 PHSPRV0= 6*0.0000000000000000        ,
 RHOB=  100.00000000000000      ,
 STPMIN=  0.0000000000000000       ,
 T0= -90.740399999999994     , 119.70699999999999      , 122.38400000000000      ,
78.723799999999997     , -69.686400000000006      ,
    66.340100000000007     , -40.056100000000001      ,  20.251999999999999      ,
29.750399999999999     ,  24.367300000000000     , -135.69100000000000      ,
    79.448599999999999     ,  87.604200000000006     ,  115.95000000000000     , -
47.756999999999998     ,  79.133099999999999     , -30.015799999999999      ,
    33.375900000000001     ,  38.475000000000001     ,  13.770799999999999     , -
114.31999999999999     ,  47.683700000000002     ,  60.609600000000000      ,
    95.790400000000005     , -56.223799999999997     ,  49.498399999999997     , -
24.877099999999999     ,  3.7778200000000002     ,  24.545999999999999      ,
```

```
   -6.3430700000000000      , -68.177300000000002     ,   51.4711000000000000     ,
64.588999999999999      ,  53.425699999999999     , -30.916699999999999          ,
   80.521699999999996     ,  -8.4533199999999997    ,   54.595500000000001         ,
66.753000000000000      , -12.353700000000000     , -50.039299999999997          ,
   63.869000000000000     ,   76.583699999999993    ,   37.283299999999997         ,
44.635300000000001      ,  79.284999999999997     ,  -5.4793799999999999          ,
   73.257900000000006     ,  123.17900000000000     ,  -16.066500000000001       , -
76.479500000000002      ,  107.92800000000000     ,  113.11600000000000          ,
   66.388400000000004     ,  -48.842199999999998    ,   155.67099999999999       , -
59.097000000000001      ,  67.743700000000004     ,   73.072500000000005         ,
   85.041399999999996     , -143.27400000000000     ,   110.90400000000000        ,
110.15900000000001      ,  131.80500000000001     , -89.783699999999996          ,
   253.60700000000000     ,   17.656700000000001    ,   49.407699999999998        ,
19.590399999999999      ,  70.406300000000002     , -137.09000000000000          ,
   35.351300000000002     ,   41.278199999999998    ,   111.29300000000001       , -
240.31100000000001      ,  32.079500000000003     , -49.513700000000000          ,
   88.928299999999993     , 0.49442399999999997     ,  -9.8438700000000008       , -
120.26900000000001      ,  35.507199999999997     ,   40.179000000000002         ,
   68.519099999999995     , -148.79800000000000     ,   67.000200000000007       , -
82.328599999999994      ,  119.06500000000000     , -13.463600000000000          ,
  -73.784199999999998     , -35.691800000000001     ,   52.919899999999998        ,
96.571600000000004      ,  18.696999999999999     , -48.361400000000003          ,
  -20.154699999999998     , -115.60299999999999     ,  -21.847200000000001        ,
119.16600000000000      , -50.092100000000002     ,
 WDT0= 10*1.0000000000000000       ,
 WDX= 10*0.0000000000000000        ,
 WX= 10*0.0000000000000000      ,
 WZ= 10*1.0000000000000000       ,
 /




 **********************************************************************************


      ***************   OUTPUT DATA for Case Number  525   ***************


   *****    The Initial T-Matrix (T0) and Either the Initial
                   Previous Actual NLP Control Vector (CVPRV0) or
                       the Initial Previous Control Amplitude (APRV0)
                           and Phase Angle (PHSPRV0) Vectors Before
                                   Compression are Directly Input   *****

   *****    Input the Initial Previous Actual NLP Control
                   Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                       and then Compute the Previous Control Amplitude (APRV0)
                           and Control Phase Angle (PHSPRV0) Vectors   *****



              **********   Case Number  525   **********



   *****    Initial Previous Control Amplitude (APRV0) and Phase
                       Angle (PHSPRV0) Vectors before Compression   *****
      Element    AL0             APRV0              AU0                 PHSPRV0

       1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       2     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       3     0.00000000D+00    0.00000000D+00    0.50000000D+01    0.00000000D+00
       4     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
       5     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00

   *****    Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

      Element      CVL0               CVPRV0              CVU0

       1        -0.10000000D+02     0.00000000D+00     0.10000000D+02
       2        -0.10000000D+02     0.00000000D+00     0.10000000D+02
       3        -0.10000000D+02     0.00000000D+00     0.10000000D+02
       4        -0.10000000D+02     0.00000000D+00     0.10000000D+02
       5        -0.50000000D+01     0.00000000D+00     0.50000000D+01
```

```
      6         -0.50000000D+01        0.00000000D+00        0.50000000D+01
      7         -0.10000000D+02        0.00000000D+00        0.10000000D+02
      8         -0.10000000D+02        0.00000000D+00        0.10000000D+02
      9         -0.10000000D+02        0.00000000D+00        0.10000000D+02
     10         -0.10000000D+02        0.00000000D+00        0.10000000D+02
```

```
*****    Either the BEFORE Compression Initial Actual NLP Control
            Vector Estimates (CV00), OR the BEFORE Compression
              Initial Control Vector Amplitudes (A00) and Phase
                Angles (PHASE0) Estimates are Directly Input
                      via NAMELIST Data CDATA                        *****


*****    Input the Initial Actual NLP Control Vector Estimate
            (CV00) Directly Via NAMELIST Input CDATA, and
                then Compute the Control Vector Amplitudes
                    (A00) and Phase Angles (PHASE0) Estimates        *****



              **********   Case Number  525   **********


*****    Adjust the Initial Control Amplitude Estimates Vector
           (A00) to define the Initial Control Amplitude Estimates
            Vector (A0) to Within Limits If Required Before Compression  *****


*****    Initial Control Amplitude Vector Estimates (A0), Its
                Limits (AL0 & AU0), and Its Phase Angle Vector
                      Estimates (PHASE0) Before Compression          *****
```

```
Element     AL0                A0                 AU0                PHASE0

   1      0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
   1      0.00000000D+00     0.10000000D-06     0.10000000D+02     0.00000000D+00
   2      0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
   2      0.00000000D+00     0.10000000D-06     0.10000000D+02     0.00000000D+00
   3      0.00000000D+00     0.00000000D+00     0.50000000D+01     0.00000000D+00
   3      0.00000000D+00     0.10000000D-06     0.50000000D+01     0.00000000D+00
   4      0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
   4      0.00000000D+00     0.10000000D-06     0.10000000D+02     0.00000000D+00
   5      0.00000000D+00     0.00000000D+00     0.10000000D+02     0.00000000D+00
   5      0.00000000D+00     0.10000000D-06     0.10000000D+02     0.00000000D+00
```

```
*****    Initial Actual NLP Control Vector Estimates (CV0) and
                    Its Limits (CVL0 & CVU0) Before Compression     *****
```

```
Element     CVL0               CV0                CVU0
   1       -0.10000000D+02     0.00000000D+00     0.10000000D+02
   2       -0.10000000D+02     0.00000000D+00     0.10000000D+02
   3       -0.10000000D+02     0.00000000D+00     0.10000000D+02
   4       -0.10000000D+02     0.00000000D+00     0.10000000D+02
   5       -0.50000000D+01     0.00000000D+00     0.50000000D+01
   6       -0.50000000D+01     0.00000000D+00     0.50000000D+01
   7       -0.10000000D+02     0.00000000D+00     0.10000000D+02
   8       -0.10000000D+02     0.00000000D+00     0.10000000D+02
   9       -0.10000000D+02     0.00000000D+00     0.10000000D+02
  10       -0.10000000D+02     0.00000000D+00     0.10000000D+02
```

```
*****    End Conditions Vector EC0, Previous Cycle
                End Conditions Vector ECPRV0, and Weighting
                      Coefficient Vector WDT0 Before Compression    *****


Element      EC0                ECPRV0             WDT0

   1      -0.95504700D+02     -0.95504700D+02     0.10000000D+01
   2       0.75647200D+02      0.75647200D+02     0.10000000D+01
   3       0.84882200D+02      0.84882200D+02     0.10000000D+01
   4       0.80737600D+02      0.80737600D+02     0.10000000D+01
   5      -0.65848100D+02     -0.65848100D+02     0.10000000D+01
   6       0.77724100D+02      0.77724100D+02     0.10000000D+01
   7      -0.37301000D+02     -0.37301000D+02     0.10000000D+01
```

```
     8          0.31399400D+02          0.31399400D+02          0.10000000D+01
     9          0.43590700D+02          0.43590700D+02          0.10000000D+01
    10          0.12152200D+02          0.12152200D+02          0.10000000D+01


            **********   Case Number  525   **********



         Specification of CV, T-matrix, and EC Compression

                          MSAVE0/MSAVE

        0            1            0            0            0
     0       0       1       1       0       0       0       0       0       0



                          NSAVE0/NSAVE

        0            0            1            0            0
     0       0       0       0       1       1       0       0       0       0



*******************   T-Matrix Compression is Initiated   ********************



  *****   Initial Control Vector (CV0), T-Matrix (T0),
                                    and Measurement Vector (EC0)   *****


  *****   Initial Control Vector (CV0)   *****

   CV0    0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
          0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
          0.00000000D+00      0.00000000D+00

  *****   Initial Greatest Least Bounds (CVL0) for the
                                    Control Vector (CV0)   *****

   CVL0  -0.10000000D+02     -0.10000000D+02     -0.10000000D+02     -0.10000000D+02
         -0.50000000D+01     -0.50000000D+01     -0.10000000D+02     -0.10000000D+02
         -0.10000000D+02     -0.10000000D+02

  *****   Initial Least Upper Bounds (CVU0) for the
                                    Control Vector (CV0)   *****

   CVU0   0.10000000D+02      0.10000000D+02      0.10000000D+02      0.10000000D+02
          0.50000000D+01      0.50000000D+01      0.10000000D+02      0.10000000D+02
          0.10000000D+02      0.10000000D+02


    Row          *****   Initial T-Matrix (T0)   *****

T0  1   -0.90740400D+02     -0.13569100D+03     -0.11432000D+03     -0.68177300D+02
        -0.50039300D+02     -0.76479500D+02     -0.14327400D+03     -0.13709000D+03
        -0.12026900D+03     -0.35691800D+02

T0  2    0.11970700D+03      0.79448600D+02      0.47683700D+02      0.51471100D+02
         0.63869000D+02      0.10792800D+03      0.11090400D+03      0.35351300D+02
         0.35507200D+02      0.52919900D+02

T0  3    0.12238400D+03      0.87604200D+02      0.60609600D+02      0.64589000D+02
         0.76583700D+02      0.11311600D+03      0.11015900D+03      0.41278200D+02
         0.40179000D+02      0.96571600D+02

T0  4    0.78723800D+02      0.11595000D+03      0.95790400D+02      0.53425700D+02
         0.37283300D+02      0.66388400D+02      0.13180500D+03      0.11129300D+03
         0.68519100D+02      0.18697000D+02

T0  5   -0.69686400D+02     -0.47757000D+02     -0.56223800D+02     -0.30916700D+02
         0.44635300D+02     -0.48842200D+02     -0.89783700D+02     -0.24031100D+03
        -0.14879800D+03     -0.48361400D+02
```

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```
       T0  6      0.66340100D+02      0.79133100D+02      0.49498400D+02      0.80521700D+02
                   0.79285000D+02      0.15567100D+03      0.25360700D+03      0.32079500D+02
                   0.67000200D+02     -0.20154700D+02

       T0  7     -0.40056100D+02     -0.30015800D+02     -0.24877100D+02     -0.84533200D+01
                  -0.54793800D+01     -0.59097000D+02      0.17656700D+02     -0.49513700D+02
                  -0.82328600D+02     -0.11560300D+03

       T0  8      0.20252000D+02      0.33375900D+02      0.37778200D+01      0.54595500D+02
                   0.73257900D+02      0.67743700D+02      0.49407700D+02      0.88928300D+02
                   0.11906500D+03     -0.21847200D+02

       T0  9      0.29750400D+02      0.38475000D+02      0.24546000D+02      0.66753000D+02
                   0.12317900D+03      0.73072500D+02      0.19590400D+02      0.49442400D+00
                  -0.13463600D+02      0.11916600D+03

       T0 10      0.24367300D+02      0.13770800D+02     -0.63430700D+01     -0.12353700D+02
                  -0.16066500D+02      0.85041400D+02      0.70406300D+02     -0.98438700D+01
                  -0.73784200D+02     -0.50092100D+02


    *****    Initial End Conditions Vector (EC0)    *****

      EC0     -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
              -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
               0.43590700D+02      0.12152200D+02

    *****    Initial End Conditions Weighting Coefficient Vector
                                   (WDT0) for the Performance Index (F)    *****
      WDT0     0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
               0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
               0.10000000D+01      0.10000000D+01


    *****    Initial Control Vector (CVPRV0) and Measurement
                             Vector (ECPRV0) from the Previous Duty Cycle    *****


    *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

    CVPRV0    0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
              0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
              0.00000000D+00      0.00000000D+00


    *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

    ECPRV0   -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
             -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
              0.43590700D+02      0.12152200D+02


    *****    Intermediate Control Vector (CV), T-Matrix (TT),
             and Measurement Vector (ECT) after the First Compression    *****


    *****    Intermediate Control Vector (CV) after the First Compression    *****

      CV       0.00000000D+00      0.00000000D+00

    *****    Intermediate Greatest Least Bounds (CVL) for the
                                           Control Vector (CV)    *****

      CVL     -0.50000000D+01     -0.50000000D+01

    *****    Intermediate Least Upper Bounds (CVU) for the
                                           Control Vector (CV)    *****

      CVU      0.50000000D+01      0.50000000D+01


      Row          *****    Intermediate T-Matrix (TT)    *****
```

```
   TT  1    -0.50039300D+02   -0.76479500D+02

   TT  2     0.63869000D+02    0.10792800D+03

   TT  3     0.76583700D+02    0.11311600D+03

   TT  4     0.37283300D+02    0.66388400D+02

   TT  5     0.44635300D+02   -0.48842200D+02

   TT  6     0.79285000D+02    0.15567100D+03

   TT  7    -0.54793800D+01   -0.59097000D+02

   TT  8     0.73257900D+02    0.67743700D+02

   TT  9     0.12317900D+03    0.73072500D+02

   TT 10    -0.16066500D+02    0.85041400D+02


    *****   Intermediate End Conditions Vector (ECT)    *****

    ECT   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02

    *****   Intermediate End Conditions Weighting Coefficient Vector
                              (WDTT) for the Performance Index (F)   *****

    WDTT   0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
           0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
           0.10000000D+01    0.10000000D+01


    *****   Intermediate Control Vector (CVPRV) and Measurement Vector
                        (ECPRV0) from the Previous Duty Cycle after
                                          the First Compression   *****


    *****   Intermediate Previous Cycle Control Vector (CVPRV) after
                                          the First Compression   *****

  CVPRV    0.00000000D+00    0.00000000D+00


    *****   Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                    after the First Compression   *****

 ECPRVT   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02


    *****   Final Control Vector (CV), T-Matrix (T), and
                Measurement Vector (EC) after the Second Compression   *****


    *****   Final Control Vector (CV) after the Second Compression   *****

     CV    0.00000000D+00    0.00000000D+00

    *****   Greatest Least Bounds (CVL) Vector for the
                                          Control Vector (CV)   *****

    CVL   -0.50000000D+01   -0.50000000D+01

    *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)   *****

    CVU    0.50000000D+01    0.50000000D+01


    Row              *****   Final T-Matrix (T)   *****
```

```
   T  1     0.76583700D+02     0.11311600D+03

   T  2     0.37283300D+02     0.66388400D+02


   *****   Final End Conditions Vector (EC) after the Second Compression   *****

     EC     0.84882200D+02     0.80737600D+02

   *****   Final End Conditions Weighting Coefficient Vector
                                 (WDT) for the Performance Index (F)   *****

    WDT     0.10000000D+01     0.10000000D+01


   *****   Final Control Vector (CVPRV) and Measurement Vector
                       (ECPRV) from the Previous Duty Cycle after
                                       the Second Compression   *****


   *****   Final Previous Cycle Control Vector (CVPRV) after
                                       the Second Compression   *****

  CVPRV    0.00000000D+00     0.00000000D+00


   *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                 after the Second Compression   *****

  ECPRV    0.84882200D+02     0.80737600D+02


  *******************   T-Matrix Compression is Completed   *******************


   *****   Initial End Conditions Vector EC   *****


      0.84882200D+02        0.80737600D+02


   *****   Initial Performance Index  =   0.13723548D+05   *****

   *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

   Element    AL               A                AU               PHASE

      1    0.00000000D+00   0.00000000D+00   0.50000000D+01   0.00000000D+00


  *****   Initial Constraint Function Values for Case Number  525   *****

                            LSAVE

      1      0

   *****   Inequality Constraints   *****

   Element         Constraint         Amplitude         Max Amp

      1         0.50000000D+01     0.00000000D+00     0.50000000D+01


   *****   Solve the NLPQLP Problem for Case Number  525   *****



   ----------------------------------------------------------------------
    START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
   ----------------------------------------------------------------------

    Parameters:
      N      =       2
```

```
      M      =        1
      ME     =        0
      MODE   =        0
      ACC    =   0.1000D-06
      ACCQP  =   0.1000D-11
      STPMIN =   0.0000D+00
      RHOB   =   0.1000D+03
      MAXFUN =       30
      MAXNM  =       10
      MAXIT  =      300
      IPRINT =        2

  Output in the following order:
      IT    - iteration number
      F     - objective function value
      SCV   - sum of constraint violations
      NA    - number of active constraints
      I     - number of line search iterations
      ALPHA - steplength parameter
      DELTA - additional variable to prevent inconsistency
      KKT   - Karush-Kuhn-Tucker optimality criterion


     IT        F           SCV      NA  I    ALPHA     DELTA      KKT
     --------------------------------------------------------------------
      1  0.13723548D+05  0.00D+00   1  0   0.00D+00  0.00D+00  0.49D+06
                    *****  Completed CALL to NLPQLP   *****
                    *****  Completed CALL to NLPQLP   *****
                    *****  Completed CALL to NLPQLP   *****
      2  0.90851747D+03  0.00D+00   0  2   0.10D+00  0.00D+00  0.44D+04
                    *****  Completed CALL to NLPQLP   *****
                    *****  Completed CALL to NLPQLP   *****
      3  0.41948482D+02  0.15D+01   1  1   0.10D+01  0.00D+00  0.14D+03
                    *****  Completed CALL to NLPQLP   *****
                    *****  Completed CALL to NLPQLP   *****
      4  0.33461389D+01  0.26D-02   1  1   0.10D+01  0.00D+00  0.11D+00
                    *****  Completed CALL to NLPQLP   *****
                    *****  Completed CALL to NLPQLP   *****
      5  0.33992208D+01  0.30D-07   1  1   0.10D+01  0.00D+00  0.20D-05
                    *****  Completed CALL to NLPQLP   *****
                    *****  Completed CALL to NLPQLP   *****
      6  0.33992204D+01  0.41D-11   1  1   0.10D+01  0.00D+00  0.16D-09


  --- Final Convergence Analysis at Last Iterate ---

    Objective function value:      F(X)  =   0.33992204D+01
    Solution values:              X     =
       0.37555443D+01 -0.33008918D+01
    Distances from lower bounds:  X-XL  =
       0.87555443D+01  0.16991082D+01
    Distances from upper bounds:  XU-X  =
       0.12444557D+01  0.83008918D+01
    Multipliers for lower bounds: U     =
       0.00000000D+00  0.00000000D+00
    Multipliers for upper bounds: U     =
       0.00000000D+00  0.00000000D+00
    Constraint values:           G(X)  =
      -0.40998316D-11
    Multipliers for constraints:  U     =
       0.20673012D+02
    Number of function calls:     NFUNC =        7
    Number of gradient calls:     NGRAD =        6
    Number of calls of QP solver: NQL   =        6



              *****   Completed CALL to NLPQLP   *****


        *****   Number of Function Evaluations  =     19   *****


 *****   Solution Control Vector for Case Number  525   *****
```

```
Element      CVL                 CV                    CVU                 CV - CV0

   1    -0.50000000D+01     0.37555443D+01      0.50000000D+01      0.37555443D+01
   2    -0.50000000D+01    -0.33008918D+01      0.50000000D+01     -0.33008918D+01



   *****   Predicted Measurement Vector EC   *****

    -0.88795821D+00      0.16157831D+01


   *****   NLP Solution Performance Index  =   0.33992204D+01   *****



   *****   Predicted Measurement Vector EC   *****

    -0.88799555D+00      0.16157612D+01


   *****   NLP Solution Performance Index  =   0.33992204D+01   *****



   *****   Predicted Control Amplitude Vector (A)
              Its Limits (AL & AU), and Its Phase Angle
                              Vector (PHASE) Before Compression   *****

   Element    AL                  A                     AU                  PHASE

    1     0.00000000D+00     0.50000000D+01      0.50000000D+01      0.13131348D+03

 *****   Solution Constraint Function Values for Case Number  525   *****

                              LSAVE

    1      0

   *****   Inequality Constraints   *****

   Element       Constraint          Amplitude          Max Amp

    1       -0.40998316D-11      0.50000000D+01      0.50000000D+01

             **********   End Case Number  525   **********


********************************************************************************
```

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```
                ***************  Start Case Number  325  ***************


          ***************  INPUT DATA for Case Number  325   ***************


     &CDATA
      A00= 5*0.0000000000000000         ,  1.0000000000000000      ,
      ACC= 9.9999999999999955E-008,
      ACCQP= 9.9999999999999980E-013,
      AL0= 5*0.0000000000000000         ,-9.9999999999999955E-008,
      ALPHA=  1.0000000000000000      ,
      APRV0= 5*0.0000000000000000        ,  4.94065645841246544E-324,
      AU0= 2*10.000000000000000        ,  3.0000000000000000     , 2*10.000000000000000
     ,  3.0000000000000000       ,
      CRAN1=  2.0000000000000000       ,
      CRAN2=  3.0000000000000000       ,
      CRAN3=  1.0000000000000000       ,
      CRAN4=  1.0000000000000000       ,
      CV00= 10*0.0000000000000000        , 1.48219693752373963E-323, 6.95323310165009693E-
     310, 5.16525870101189612E-319, 6.95323310137697744E-310,

      CVOUT=          0,
      CVPRV0= 10*0.0000000000000000          , 6.95323310136353885E-310, 6.95321286253352059E-
     310, 6.95325616664988679E-310,  0.0000000000000000       ,

      ECPRV0= -95.504700000000000        ,  75.647199999999998     , 84.882199999999997     ,
     80.737600000000000      , -65.848100000000002      ,
         77.724100000000007     , -37.301000000000002      ,  31.399400000000000      ,
     43.590699999999998      ,  12.152200000000001      ,
      EPS= 9.9999999999999955E-008,
      ICASE=        325,
      ICYCL0=      2000,
      IDATA=          3,
      IN=          5,
      IOPT=          1,
      IOUT=          6,
      IPRINT=         2,
      ISEED1=      2395,       4013,       3813,       1837,
      ISEED2=      1843,       4011,       3364,       2835,
      ISEED3=      3962,       1111,       3215,       2637,
      ISEED4=      2397,       1504,       4031,       3173,
      ITOUT=          3,
      L=          1,
      LQL=T,
      LSAVE=          1, 5*0           ,
      MAXASUM=  3.0000000000000000       ,
      MAXFUN=         30,
      MAXIT=        300,
      MAXNM=         10,
      MI=          1,
      MINASUM=  0.0000000000000000       ,
      MODE=          0,
      MSAVE0=          0,          1, 3*0           , 5*1           ,
      MULT=          1,
      NSAVE0= 2*0           ,          1, 2*0           , 5*1           ,
      NX0=         10,
      NZ0=         10,
      OPTEND=          3,
      PHASE0= 5*0.0000000000000000        , 90.000000000000000      ,
      PHSPRV0= 6*0.0000000000000000        ,
      RHOB=  100.00000000000000       ,
      STPMIN=  0.0000000000000000       ,
      T0= -90.740399999999994      ,  119.70699999999999     ,  122.38400000000000      ,
     78.723799999999997      , -69.686400000000006      ,
         66.340100000000007     , -40.056100000000001      ,  20.251999999999999      ,
     29.750399999999999      ,  24.367300000000000      , -135.69100000000000      ,
         79.448599999999999      ,  87.604200000000006      ,  115.95000000000000      , -
     47.756999999999998      ,  79.133099999999999      , -30.015799999999999      ,
         33.375900000000001      ,  38.475000000000001      ,  13.770799999999999      , -
     114.31999999999999      ,  47.683700000000002      ,  60.609600000000000      ,
         95.790400000000005      , -56.223799999999997      ,  49.498399999999997      , -
     24.877099999999999      ,  3.7778200000000002      ,  24.545999999999999      ,
```

```
      -6.3430700000000000       , -68.177300000000002      ,   51.471100000000000       ,
 64.588999999999999       ,  53.425699999999999      , -30.916699999999999       ,
     80.521699999999996      ,  -8.4533199999999997      ,   54.595500000000001       ,
 66.753000000000000       , -12.353700000000000      , -50.039299999999997       ,
     63.869000000000000      ,   76.583699999999993      ,   37.283299999999997       ,
 44.635300000000001       ,  79.284999999999997      , -5.4793799999999999       ,
     73.257900000000006      ,  123.17900000000000       , -16.066500000000001       , -
 76.479500000000002       , 107.92800000000000       ,  113.11600000000000       ,
     66.388400000000004      , -48.842199999999998      ,  155.67099999999999       , -
 59.097000000000001       ,  67.743700000000004      ,  73.072500000000005       ,
     85.041399999999996      , -143.27400000000000      ,  110.90400000000000       ,
 110.15900000000001       , 131.80500000000001       , -89.783699999999996       ,
     253.60700000000000      ,  17.656700000000001      ,  49.407699999999998       ,
 19.590399999999999       ,  70.406300000000002      , -137.09000000000000       ,
     35.351300000000002      ,   41.278199999999998      ,  111.29300000000001       , -
 240.31100000000001       ,  32.079500000000003      , -49.513700000000000       ,
     88.928299999999993      , 0.49442399999999997      ,  -9.8438700000000008       , -
 120.26900000000001       ,  35.507199999999997      ,  40.179000000000002       ,
     68.519099999999995      , -148.79800000000000      ,  67.000200000000007       , -
 82.328599999999994       ,  119.06500000000000       , -13.463600000000000       ,
     -73.784199999999998      , -35.691800000000001      ,   52.919899999999998       ,
 96.571600000000004       ,  18.696999999999999      , -48.361400000000003       ,
     -20.154699999999998      , -115.60299999999999      , -21.847200000000001       ,
 119.16600000000000       , -50.092100000000002       ,
 WDT0= 10*1.0000000000000000       ,
 WDX= 10*0.0000000000000000        ,
 WX= 10*0.0000000000000000       ,
 WZ= 10*1.0000000000000000        ,
 /




 ******************************************************************************


      ***************   OUTPUT DATA for Case Number  325   ***************


    *****    The Initial T-Matrix (T0) and Either the Initial
                  Previous Actual NLP Control Vector (CVPRV0) or
                    the Initial Previous Control Amplitude (APRV0)
                      and Phase Angle (PHSPRV0) Vectors Before
                            Compression are Directly Input   *****

    *****    Input the Initial Previous Actual NLP Control
                  Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                      and then Compute the Previous Control Amplitude (APRV0)
                          and Control Phase Angle (PHSPRV0) Vectors   *****



                 **********  Case Number  325   **********



    *****    Initial Previous Control Amplitude (APRV0) and Phase
                            Angle (PHSPRV0) Vectors before Compression   *****
      Element    AL0              APRV0              AU0              PHSPRV0

         1    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
         2    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
         3    0.00000000D+00   0.00000000D+00   0.30000000D+01   0.00000000D+00
         4    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
         5    0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00

    *****    Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

      Element       CVL0              CVPRV0              CVU0

         1      -0.10000000D+02    0.00000000D+00    0.10000000D+02
         2      -0.10000000D+02    0.00000000D+00    0.10000000D+02
         3      -0.10000000D+02    0.00000000D+00    0.10000000D+02
         4      -0.10000000D+02    0.00000000D+00    0.10000000D+02
         5      -0.30000000D+01    0.00000000D+00    0.30000000D+01
```

```
   6        -0.30000000D+01      0.00000000D+00      0.30000000D+01
   7        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   8        -0.10000000D+02      0.00000000D+00      0.10000000D+02
   9        -0.10000000D+02      0.00000000D+00      0.10000000D+02
  10        -0.10000000D+02      0.00000000D+00      0.10000000D+02
```

*****   Either the BEFORE Compression Initial Actual NLP Control
           Vector Estimates (CV00), OR the BEFORE Compression
             Initial Control Vector Amplitudes (A00) and Phase
               Angles (PHASE0) Estimates are Directly Input
                    via NAMELIST Data CDATA   *****

*****   Input the Initial Actual NLP Control Vector Estimate
           (CV00) Directly Via NAMELIST Input CDATA, and
                then Compute the Control Vector Amplitudes
                    (A00) and Phase Angles (PHASE0) Estimates   *****

            **********   Case Number 325   **********

*****   Adjust the Initial Control Amplitude Estimates Vector
          (A00) to define the Initial Control Amplitude Estimates
            Vector (A0) to Within Limits If Required Before Compression   *****

*****   Initial Control Amplitude Vector Estimates (A0), Its
               Limits (AL0 & AU0), and Its Phase Angle Vector
                    Estimates (PHASE0) Before Compression   *****

Element   AL0   A0   AU0   PHASE0

   1   0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
   1   0.00000000D+00   0.10000000D-06   0.10000000D+02   0.00000000D+00
   2   0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
   2   0.00000000D+00   0.10000000D-06   0.10000000D+02   0.00000000D+00
   3   0.00000000D+00   0.00000000D+00   0.30000000D+01   0.00000000D+00
   3   0.00000000D+00   0.10000000D-06   0.30000000D+01   0.00000000D+00
   4   0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
   4   0.00000000D+00   0.10000000D-06   0.10000000D+02   0.00000000D+00
   5   0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
   5   0.00000000D+00   0.10000000D-06   0.10000000D+02   0.00000000D+00

*****   Initial Actual NLP Control Vector Estimates (CV0) and
                    Its Limits (CVL0 & CVU0) Before Compression   *****

Element   CVL0   CV0   CVU0
   1   -0.10000000D+02   0.00000000D+00   0.10000000D+02
   2   -0.10000000D+02   0.00000000D+00   0.10000000D+02
   3   -0.10000000D+02   0.00000000D+00   0.10000000D+02
   4   -0.10000000D+02   0.00000000D+00   0.10000000D+02
   5   -0.30000000D+01   0.00000000D+00   0.30000000D+01
   6   -0.30000000D+01   0.00000000D+00   0.30000000D+01
   7   -0.10000000D+02   0.00000000D+00   0.10000000D+02
   8   -0.10000000D+02   0.00000000D+00   0.10000000D+02
   9   -0.10000000D+02   0.00000000D+00   0.10000000D+02
  10   -0.10000000D+02   0.00000000D+00   0.10000000D+02

*****   End Conditions Vector EC0, Previous Cycle
               End Conditions Vector ECPRV0, and Weighting
                    Coefficient Vector WDT0 Before Compression   *****

Element   EC0   ECPRV0   WDT0

   1   -0.95504700D+02   -0.95504700D+02   0.10000000D+01
   2   0.75647200D+02   0.75647200D+02   0.10000000D+01
   3   0.84882200D+02   0.84882200D+02   0.10000000D+01
   4   0.80737600D+02   0.80737600D+02   0.10000000D+01
   5   -0.65848100D+02   -0.65848100D+02   0.10000000D+01
   6   0.77724100D+02   0.77724100D+02   0.10000000D+01
   7   -0.37301000D+02   -0.37301000D+02   0.10000000D+01
```

```
       8          0.31399400D+02        0.31399400D+02        0.10000000D+01
       9          0.43590700D+02        0.43590700D+02        0.10000000D+01
      10          0.12152200D+02        0.12152200D+02        0.10000000D+01


                **********   Case Number  325   **********



                Specification of CV, T-matrix, and EC Compression

                                MSAVE0/MSAVE

         0              1              0              0              0
      0      0      1      1      0      0      0      0      0      0



                                NSAVE0/NSAVE

         0              0              1              0              0
      0      0      0      0      1      1      0      0      0      0



   *******************   T-Matrix Compression is Initiated   ********************



    *****    Initial Control Vector (CV0), T-Matrix (T0),
                                        and Measurement Vector (EC0)   *****


    *****    Initial Control Vector (CV0)   *****

    CV0     0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
            0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
            0.00000000D+00     0.00000000D+00

    *****    Initial Greatest Least Bounds (CVL0) for the
                                        Control Vector (CV0)   *****

    CVL0   -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
           -0.30000000D+01    -0.30000000D+01    -0.10000000D+02    -0.10000000D+02
           -0.10000000D+02    -0.10000000D+02

    *****    Initial Least Upper Bounds (CVU0) for the
                                        Control Vector (CV0)   *****

    CVU0    0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
            0.30000000D+01     0.30000000D+01     0.10000000D+02     0.10000000D+02
            0.10000000D+02     0.10000000D+02


     Row          *****    Initial T-Matrix (T0)    *****

   T0  1    -0.90740400D+02    -0.13569100D+03    -0.11432000D+03    -0.68177300D+02
            -0.50039300D+02    -0.76479500D+02    -0.14327400D+03    -0.13709000D+03
            -0.12026900D+03    -0.35691800D+02

   T0  2     0.11970700D+03     0.79448600D+02     0.47683700D+02     0.51471100D+02
             0.63869000D+02     0.10792800D+03     0.11090400D+03     0.35351300D+02
             0.35507200D+02     0.52919900D+02

   T0  3     0.12238400D+03     0.87604200D+02     0.60609600D+02     0.64589000D+02
             0.76583700D+02     0.11311600D+03     0.11015900D+03     0.41278200D+02
             0.40179000D+02     0.96571600D+02

   T0  4     0.78723800D+02     0.11595000D+03     0.95790400D+02     0.53425700D+02
             0.37283300D+02     0.66388400D+02     0.13180500D+03     0.11129300D+03
             0.68519100D+02     0.18697000D+02

   T0  5    -0.69686400D+02    -0.47757000D+02    -0.56223800D+02    -0.30916700D+02
             0.44635300D+02    -0.48842200D+02    -0.89783700D+02    -0.24031100D+03
            -0.14879800D+03    -0.48361400D+02
```

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```
T0   6     0.66340100D+02     0.79133100D+02     0.49498400D+02     0.80521700D+02
           0.79285000D+02     0.15567100D+03     0.25360700D+03     0.32079500D+02
           0.67000200D+02    -0.20154700D+02

T0   7    -0.40056100D+02    -0.30015800D+02    -0.24877100D+02    -0.84533200D+01
          -0.54793800D+01    -0.59097000D+02     0.17656700D+02    -0.49513700D+02
          -0.82328600D+02    -0.11560300D+03

T0   8     0.20252000D+02     0.33375900D+02     0.37778200D+01     0.54595500D+02
           0.73257900D+02     0.67743700D+02     0.49407700D+02     0.88928300D+02
           0.11906500D+03    -0.21847200D+02

T0   9     0.29750400D+02     0.38475000D+02     0.24546000D+02     0.66753000D+02
           0.12317900D+03     0.73072500D+02     0.19590400D+02     0.49442400D+00
          -0.13463600D+02     0.11916600D+03

T0 10      0.24367300D+02     0.13770800D+02    -0.63430700D+01    -0.12353700D+02
          -0.16066500D+02     0.85041400D+02     0.70406300D+02    -0.98438700D+01
          -0.73784200D+02    -0.50092100D+02


 *****   Initial End Conditions Vector (EC0)   *****

  EC0    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
         -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
          0.43590700D+02     0.12152200D+02

 *****   Initial End Conditions Weighting Coefficient Vector
                            (WDT0) for the Performance Index (F)   *****
 WDT0    0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
         0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
         0.10000000D+01     0.10000000D+01


 *****   Initial Control Vector (CVPRV0) and Measurement
                      Vector (ECPRV0) from the Previous Duty Cycle   *****


 *****   Initial Previous Cycle Control Vector (CVPRV0)   *****

CVPRV0   0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
         0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
         0.00000000D+00     0.00000000D+00


 *****   Initial Previous Cycle End Conditions Vector (ECPRV0)   *****

ECPRV0  -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
        -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
         0.43590700D+02     0.12152200D+02


 *****   Intermediate Control Vector (CV), T-Matrix (TT),
         and Measurement Vector (ECT) after the First Compression   *****


 *****   Intermediate Control Vector (CV) after the First Compression   *****

   CV    0.00000000D+00     0.00000000D+00

 *****   Intermediate Greatest Least Bounds (CVL) for the
                                        Control Vector (CV)   *****

  CVL   -0.30000000D+01    -0.30000000D+01

 *****   Intermediate Least Upper Bounds (CVU) for the
                                        Control Vector (CV)   *****

  CVU    0.30000000D+01     0.30000000D+01


   Row        *****   Intermediate T-Matrix (TT)   *****
```

```
   TT  1    -0.50039300D+02    -0.76479500D+02

   TT  2     0.63869000D+02     0.10792800D+03

   TT  3     0.76583700D+02     0.11311600D+03

   TT  4     0.37283300D+02     0.66388400D+02

   TT  5     0.44635300D+02    -0.48842200D+02

   TT  6     0.79285000D+02     0.15567100D+03

   TT  7    -0.54793800D+01    -0.59097000D+02

   TT  8     0.73257900D+02     0.67743700D+02

   TT  9     0.12317900D+03     0.73072500D+02

   TT 10    -0.16066500D+02     0.85041400D+02


   *****    Intermediate End Conditions Vector (ECT)    *****

    ECT    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02

   *****    Intermediate End Conditions Weighting Coefficient Vector
                                 (WDTT) for the Performance Index (F)  *****

   WDTT     0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
            0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
            0.10000000D+01     0.10000000D+01


   *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                           (ECPRV0) from the Previous Duty Cycle after
                                                 the First Compression   *****


   *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                                 the First Compression   *****

  CVPRV     0.00000000D+00     0.00000000D+00


   *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                          after the First Compression    *****

 ECPRVT    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02


   *****    Final Control Vector (CV), T-Matrix (T), and
                   Measurement Vector (EC) after the Second Compression   *****


   *****    Final Control Vector (CV) after the Second Compression    *****

    CV      0.00000000D+00     0.00000000D+00

   *****    Greatest Least Bounds (CVL) Vector for the
                                                 Control Vector (CV)    *****

    CVL    -0.30000000D+01    -0.30000000D+01

   *****    Least Upper Bounds (CVU) Vector for the Control Vector (CV)    *****

    CVU     0.30000000D+01     0.30000000D+01


    Row               *****    Final T-Matrix (T)    *****
```

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```
    T  1     0.76583700D+02     0.11311600D+03

    T  2     0.37283300D+02     0.66388400D+02


    *****   Final End Conditions Vector (EC) after the Second Compression   *****

      EC     0.84882200D+02     0.80737600D+02

    *****   Final End Conditions Weighting Coefficient Vector
                                    (WDT) for the Performance Index (F)   *****

     WDT     0.10000000D+01     0.10000000D+01


    *****   Final Control Vector (CVPRV) and Measurement Vector
                      (ECPRV) from the Previous Duty Cycle after
                                          the Second Compression   *****


    *****   Final Previous Cycle Control Vector (CVPRV) after
                                          the Second Compression   *****

   CVPRV     0.00000000D+00     0.00000000D+00


    *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                    after the Second Compression   *****

   ECPRV     0.84882200D+02     0.80737600D+02


   ******************   T-Matrix Compression is Completed   ********************


    *****   Initial End Conditions Vector EC   *****


       0.84882200D+02       0.80737600D+02


    *****   Initial Performance Index =   0.13723548D+05   *****

    *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

    Element    AL               A                AU               PHASE

       1    0.00000000D+00    0.00000000D+00    0.30000000D+01    0.00000000D+00


   *****   Initial Constraint Function Values for Case Number  325   *****

                                LSAVE

       1      0

    *****   Inequality Constraints   *****

    Element        Constraint        Amplitude        Max Amp

       1        0.30000000D+01    0.00000000D+00     0.30000000D+01


    *****   Solve the NLPQLP Problem for Case Number  325   *****



      ----------------------------------------------------------------------
      START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
      ----------------------------------------------------------------------

      Parameters:
        N     =        2
```

```
        M      =        1
        ME     =        0
        MODE   =        0
        ACC    =   0.1000D-06
        ACCQP  =   0.1000D-11
        STPMIN =   0.0000D+00
        RHOB   =   0.1000D+03
        MAXFUN =       30
        MAXNM  =       10
        MAXIT  =      300
        IPRINT =        2


   Output in the following order:
        IT    - iteration number
        F     - objective function value
        SCV   - sum of constraint violations
        NA    - number of active constraints
        I     - number of line search iterations
        ALPHA - steplength parameter
        DELTA - additional variable to prevent inconsistency
        KKT   - Karush-Kuhn-Tucker optimality criterion



      IT        F           SCV      NA  I    ALPHA     DELTA      KKT
      ----------------------------------------------------------------------
       1  0.13723548D+05  0.00D+00    1  0   0.00D+00  0.00D+00  0.29D+06
                     *****  Completed CALL to NLPQLP   *****
                     *****  Completed CALL to NLPQLP   *****
                     *****  Completed CALL to NLPQLP   *****
       2  0.90851747D+03  0.00D+00    0  2   0.17D+00  0.00D+00  0.28D+04
                     *****  Completed CALL to NLPQLP   *****
                     *****  Completed CALL to NLPQLP   *****
       3  0.47236962D+02  0.11D+01    1  1   0.10D+01  0.00D+00  0.25D+03
                     *****  Completed CALL to NLPQLP   *****
                     *****  Completed CALL to NLPQLP   *****
       4  0.17164803D+03  0.63D-02    1  1   0.10D+01  0.00D+00  0.19D+01
                     *****  Completed CALL to NLPQLP   *****
                     *****  Completed CALL to NLPQLP   *****
       5  0.17259530D+03  0.54D-06    1  1   0.10D+01  0.00D+00  0.14D-03
                     *****  Completed CALL to NLPQLP   *****
                     *****  Completed CALL to NLPQLP   *****
       6  0.17259537D+03  0.95D-10    1  1   0.10D+01  0.00D+00  0.15D-07


   --- Final Convergence Analysis at Last Iterate ---

     Objective function value:      F(X)  =   0.17259537D+03
     Solution values:              X     =
         0.20477839D+01 -0.21923917D+01
     Distances from lower bounds:   X-XL  =
         0.50477839D+01  0.80760833D+00
     Distances from upper bounds:   XU-X  =
         0.95221613D+00  0.51923917D+01
     Multipliers for lower bounds:  U     =
         0.00000000D+00  0.00000000D+00
     Multipliers for upper bounds:  U     =
         0.00000000D+00  0.00000000D+00
     Constraint values:            G(X)  =
        -0.94987573D-10
     Multipliers for constraints:   U     =
         0.15019223D+03
     Number of function calls:      NFUNC =        7
     Number of gradient calls:      NGRAD =        6
     Number of calls of QP solver:  NQL   =        6



                 *****   Completed CALL to NLPQLP    *****
            *****   Number of Function Evaluations =     19   *****


   *****   Solution Control Vector for Case Number  325   *****

     Element    CVL             CV              CVU              CV - CV0
```

```
  1   -0.30000000D+01    0.20477839D+01    0.30000000D+01    0.20477839D+01
  2   -0.30000000D+01   -0.21923917D+01    0.30000000D+01   -0.21923917D+01



  *****   Predicted Measurement Vector EC   *****

    -0.62854854D+01        0.11536380D+02


  *****   NLP Solution Performance Index  =   0.17259537D+03   *****



  *****   Predicted Measurement Vector EC   *****

    -0.62855102D+01        0.11536365D+02


  *****   NLP Solution Performance Index  =   0.17259537D+03   *****



  *****   Predicted Control Amplitude Vector (A)
              Its Limits (AL & AU), and Its Phase Angle
                               Vector (PHASE) Before Compression   *****

  Element    AL              A              AU            PHASE

    1    0.00000000D+00    0.30000000D+01    0.30000000D+01    0.13695327D+03

*****   Solution Constraint Function Values for Case Number  325   *****

                           LSAVE

    1      0

  *****   Inequality Constraints   *****

  Element        Constraint         Amplitude        Max Amp

    1      -0.94987573D-10       0.30000000D+01      0.30000000D+01


            **********   End Case Number  325   **********



********************************************************************************
```

```
            ***************   Start Case Number  125   ***************


           ***************   INPUT DATA for Case Number  125   ***************


     &CDATA
      A00= 5*0.0000000000000000       ,  1.0000000000000000      ,
      ACC= 9.9999999999999955E-008,
      ACCQP= 9.9999999999999980E-013,
      AL0= 5*0.0000000000000000         ,-9.9999999999999955E-008,
      ALPHA=  1.0000000000000000      ,
      APRV0= 5*0.0000000000000000       ,  4.94065645841246544E-324,
      AU0= 2*10.000000000000000      ,  1.0000000000000000     , 2*10.000000000000000
     ,  3.0000000000000000       ,
      CRAN1=  2.0000000000000000      ,
      CRAN2=  3.0000000000000000      ,
      CRAN3=  1.0000000000000000      ,
      CRAN4=  1.0000000000000000      ,
      CV00= 10*0.0000000000000000        ,  1.48219693752373963E-323, 6.95323310165009693E-
     310, 5.16525870101189612E-319, 6.95323310137697744E-310,

      CVOUT=          0,
      CVPRV0= 10*0.0000000000000000       ,  6.95323310136353885E-310, 6.95321286253352059E-
     310, 6.95325616664988679E-310,  0.0000000000000000       ,

      ECPRV0= -95.504700000000000       ,  75.647199999999998      ,  84.882199999999997      ,
     80.737600000000000      , -65.848100000000002      ,
        77.724100000000007       , -37.301000000000002      ,  31.399400000000000      ,
     43.590699999999998      ,  12.152200000000001      ,
      EPS= 9.9999999999999955E-008,
      ICASE=        125,
      ICYCL0=       2000,
            ACCQP  =   0.1000D-11
            STPMIN =   0.0000D+00
            RHOB   =   0.1000D+03
            MAXFUN =        30
            MAXNM  =        10
            MAXIT  =       300
            IPRINT =         2

        Output in the following order:
            IT    - iteration number
            F     - objective function value
            SCV   - sum of constraint violations
            NA    - number of active constraints
            I     - number of line search iterations
            ALPHA - steplength parameter
            DELTA - additional variable to prevent inconsistency
            KKT   - Karush-Kuhn-Tucker optimality criterion


        IT       F          SCV      NA  I    ALPHA     DELTA      KKT
        ----------------------------------------------------------------
         1  0.13723548D+05  0.00D+00   1  0   0.00D+00  0.00D+00  0.29D+06
                   *****   Completed CALL to NLPQLP   *****
                   *****   Completed CALL to NLPQLP   *****
                   *****   Completed CALL to NLPQLP   *****
         2  0.90851747D+03  0.00D+00   0  2   0.17D+00  0.00D+00  0.28D+04
                   *****   Completed CALL to NLPQLP   *****
                   *****   Completed CALL to NLPQLP   *****
         3  0.47236962D+02  0.11D+01   1  1   0.10D+01  0.00D+00  0.25D+03
                   *****   Completed CALL to NLPQLP   *****
                   *****   Completed CALL to NLPQLP   *****
         4  0.17164803D+03  0.63D-02   1  1   0.10D+01  0.00D+00  0.19D+01
                   *****   Completed CALL to NLPQLP   *****
                   *****   Completed CALL to NLPQLP   *****
         5  0.17259530D+03  0.54D-06   1  1   0.10D+01  0.00D+00  0.14D-03
                   *****   Completed CALL to NLPQLP   *****
                   *****   Completed CALL to NLPQLP   *****
         6  0.17259537D+03  0.95D-10   1  1   0.10D+01  0.00D+00  0.15D-07


        --- Final Convergence Analysis at Last Iterate ---
```

```
        Objective function value:      F(X)   =   0.17259537D+03
        Solution values:               X      =
           0.20477839D+01 -0.21923917D+01
        Distances from lower bounds:   X-XL   =
           0.50477839D+01  0.80760833D+00
        Distances from upper bounds:   XU-X   =
           0.95221613D+00  0.51923917D+01
        Multipliers for lower bounds:  U      =
           0.00000000D+00  0.00000000D+00
        Multipliers for upper bounds:  U      =
           0.00000000D+00  0.00000000D+00
        Constraint values:            G(X)    =
          -0.94987129D-10
        Multipliers for constraints:   U      =
           0.15019223D+03
        Number of function calls:      NFUNC  =        7
        Number of gradient calls:      NGRAD  =        6
        Number of calls of QP solver:  NQL    =        6



              *****   Completed CALL to NLPQLP   *****


           *****   Number of Function Evaluations  =      19   *****


   *****   Solution Control Vector for Case Number  325   *****

   Element    CVL             CV              CVU             CV - CV0

      1    -0.30000000D+01   0.20477839D+01   0.30000000D+01   0.20477839D+01
      2    -0.30000000D+01  -0.21923917D+01   0.30000000D+01  -0.21923917D+01




   *****   Predicted Measurement Vector EC   *****

     -0.62854854D+01      0.11536380D+02


   *****   NLP Solution Performance Index  =   0.17259537D+03   *****




   *****   Predicted Measurement Vector EC   *****

     -0.62855102D+01      0.11536365D+02


   *****   NLP Solution Performance Index  =   0.17259537D+03   *****




   *****   Predicted Control Amplitude Vector (A)
                 Its Limits (AL & AU), and Its Phase Angle
                              Vector (PHASE) Before Compression   *****

   Element    AL              A               AU              PHASE

      1    0.00000000D+00   0.30000000D+01   0.30000000D+01   0.13695327D+03

 *****   Solution Constraint Function Values for Case Number  325   *****

                              LSAVE

      1      0

   *****   Inequality Constraints   *****
```
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```
     Element          Constraint          Amplitude          Max Amp

        1          -0.94987129D-10      0.30000000D+01      0.30000000D+01


                   **********   End Case Number  325   **********




*******************************************************************************


              ***************   Start Case Number  125   ***************


            ***************   INPUT DATA for Case Number  125   ***************


&CDATA
A00     = 5*0.000000000000000E+000   ,   1.00000000000000      ,
ACC     =  1.000000000000000E-007,
ACCQP   =  1.000000000000000E-012,
AL0     = 5*0.000000000000000E+000   , -1.000000000000000E-007,
ALPHA   =   1.00000000000000      ,
APRV0   = 6*0.000000000000000E+000   ,
AU0     = 2*10.0000000000000       ,   1.00000000000000      , 2*10.0000000000000
,    3.00000000000000       ,
CRAN1   =   2.00000000000000       ,
CRAN2   =   3.00000000000000       ,
CRAN3   =   1.00000000000000       ,
CRAN4   =   1.00000000000000       ,
CV00    = 14*0.000000000000000E+000   ,
CVOUT   =           0,
CVPRV0  = 14*0.000000000000000E+000   ,
ECPRV0  =  -95.5047000000000       ,   75.6472000000000      ,   84.8822000000000      ,
80.7376000000000       ,
  -65.8481000000000       ,   77.7241000000000      ,  -37.3010000000000      ,
31.3994000000000       ,   43.5907000000000      ,
   12.1522000000000       ,
EPS     =  1.000000000000000E-007,
ICASE   =          125,
ICYCL0  =         2000,
IDATA   =            3,
IN      =            5,
IOPT    =            1,
IOUT    =            6,
IPRINT  =            2,
ISEED1  =         2395,         4013,         3813,         1837,
ISEED2  =         1843,         4011,         3364,         2835,
ISEED3  =         3962,         1111,         3215,         2637,
ISEED4  =         2397,         1504,         4031,         3173,
ITOUT   =            3,
L       =            1,
LQL     = T,
LSAVE   =            1, 5*0,
MAXASUM =   3.00000000000000       ,
MAXFUN  =           30,
MAXIT   =          300,
MAXNM   =           10,
MI      =            1,
MINASUM =  0.000000000000000E+000,
MODE    =            0,
MSAVE0  =            0,            1, 3*0, 5*1,
MULT    =            1,
NSAVE0  = 2*0,            1, 2*0, 5*1,
NX0     =           10,
NZ0     =           10,
OPTEND  =            3,
PHASE0  = 5*0.000000000000000E+000   ,   90.0000000000000      ,
PHSPRV0 = 6*0.000000000000000E+000   ,
RHOB    =   100.000000000000       ,
```

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```
STPMIN  =  0.000000000000000E+000,
T0      =  -90.7404000000000        ,    119.707000000000      ,    122.384000000000        ,
78.7238000000000       ,
  -69.6864000000000     ,    66.3401000000000      ,    -40.0561000000000      ,
20.2520000000000       ,    29.7504000000000      ,
   24.3673000000000     ,   -135.691000000000      ,     79.4486000000000      ,
87.6042000000000       ,    115.950000000000      ,
  -47.7570000000000     ,    79.1331000000000      ,    -30.0158000000000      ,
33.3759000000000       ,    38.4750000000000      ,
   13.7708000000000     ,   -114.320000000000      ,     47.6837000000000      ,
60.6096000000000       ,    95.7904000000000      ,
  -56.2238000000000     ,    49.4984000000000      ,    -24.8771000000000      ,
3.77782000000000       ,    24.5460000000000      ,
   -6.34307000000000    ,    -68.1773000000000     ,     51.4711000000000      ,
64.5890000000000       ,    53.4257000000000      ,
  -30.9167000000000     ,    80.5217000000000      ,    -8.45332000000000      ,
54.5955000000000       ,    66.7530000000000      ,
  -12.3537000000000     ,    -50.0393000000000     ,     63.8690000000000      ,
76.5837000000000       ,    37.2833000000000      ,
   44.6353000000000     ,    79.2850000000000      ,    -5.47938000000000      ,
73.2579000000000       ,    123.179000000000      ,
  -16.0665000000000     ,    -76.4795000000000     ,     107.928000000000      ,
113.116000000000       ,    66.3884000000000      ,
  -48.8422000000000     ,    155.671000000000      ,    -59.0970000000000      ,
67.7437000000000       ,    73.0725000000000      ,
   85.0414000000000     ,   -143.274000000000      ,     110.904000000000      ,
110.159000000000       ,    131.805000000000      ,
  -89.7837000000000     ,    253.607000000000      ,     17.6567000000000      ,
49.4077000000000       ,    19.5904000000000      ,
   70.4063000000000     ,   -137.090000000000      ,     35.3513000000000      ,
41.2782000000000       ,    111.293000000000      ,
  -240.311000000000     ,    32.0795000000000      ,    -49.5137000000000      ,
88.9283000000000       ,    0.494424000000000     ,
   -9.84387000000000    ,    -120.269000000000     ,     35.5072000000000      ,
40.1790000000000       ,    68.5191000000000      ,
  -148.798000000000     ,    67.0002000000000      ,    -82.3286000000000      ,
119.065000000000       ,    -13.4636000000000     ,
  -73.7842000000000     ,    -35.6918000000000     ,     52.9199000000000      ,
96.5716000000000       ,    18.6970000000000      ,
  -48.3614000000000     ,    -20.1547000000000     ,    -115.603000000000      ,    -
21.8472000000000       ,    119.166000000000      ,
  -50.0921000000000     ,
WDT0    = 10*1.00000000000000       ,
WDX     = 10*0.000000000000000E+000  ,
WX      = 10*0.000000000000000E+000  ,
WZ      = 10*1.00000000000000
/



*******************************************************************************


         ***************   OUTPUT DATA for Case Number  125   ***************


   *****    The Initial T-Matrix (T0) and Either the Initial
                  Previous Actual NLP Control Vector (CVPRV0) or
                      the Initial Previous Control Amplitude (APRV0)
                          and Phase Angle (PHSPRV0) Vectors Before
                              Compression are Directly Input   *****

   *****    Input the Initial Previous Actual NLP Control
                  Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                      and then Compute the Previous Control Amplitude (APRV0)
                          and Control Phase Angle (PHSPRV0) Vectors   *****



             **********   Case Number  125   **********



   *****    Initial Previous Control Amplitude (APRV0) and Phase
```

```
                    Angle (PHSPRV0) Vectors before Compression   *****

   Element     AL0               APRV0             AU0               PHSPRV0

      1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      2     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      3     0.00000000D+00    0.00000000D+00    0.10000000D+01    0.00000000D+00
      4     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      5     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00

   *****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

   Element     CVL0              CVPRV0            CVU0

      1    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      2    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      3    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      4    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      5    -0.10000000D+01    0.00000000D+00    0.10000000D+01
      6    -0.10000000D+01    0.00000000D+00    0.10000000D+01
      7    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      8    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      9    -0.10000000D+02    0.00000000D+00    0.10000000D+02
     10    -0.10000000D+02    0.00000000D+00    0.10000000D+02

   *****   Either the BEFORE Compression Initial Actual NLP Control
              Vector Estimates (CV00), OR the BEFORE Compression
                Initial Control Vector Amplitudes (A00) and Phase
                  Angles (PHASE0) Estimates are Directly Input
                     via NAMELIST Data CDATA                      *****

   *****   Input the Initial Actual NLP Control Vector Estimate
              (CV00) Directly Via NAMELIST Input CDATA, and
                   then Compute the Control Vector Amplitudes
                      (A00) and Phase Angles (PHASE0) Estimates   *****



            **********   Case Number  125   **********


   *****   Adjust the Initial Control Amplitude Estimates Vector
             (A00) to define the Initial Control Amplitude Estimates
              Vector (A0) to Within Limits If Required Before Compression   *****


   *****   Initial Control Amplitude Vector Estimates (A0), Its
               Limits (AL0 & AU0), and Its Phase Angle Vector
                      Estimates (PHASE0) Before Compression   *****

   Element     AL0               A0                AU0               PHASE0

      1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      1     0.00000000D+00    0.10000000D-06    0.10000000D+02    0.00000000D+00
      2     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      2     0.00000000D+00    0.10000000D-06    0.10000000D+02    0.00000000D+00
      3     0.00000000D+00    0.00000000D+00    0.10000000D+01    0.00000000D+00
      3     0.00000000D+00    0.10000000D-06    0.10000000D+01    0.00000000D+00
      4     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      4     0.00000000D+00    0.10000000D-06    0.10000000D+02    0.00000000D+00
      5     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
      5     0.00000000D+00    0.10000000D-06    0.10000000D+02    0.00000000D+00

   *****   Initial Actual NLP Control Vector Estimates (CV0) and
                      Its Limits (CVL0 & CVU0) Before Compression   *****

   Element     CVL0              CV0               CVU0

      1    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      2    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      3    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      4    -0.10000000D+02    0.00000000D+00    0.10000000D+02
      5    -0.10000000D+01    0.00000000D+00    0.10000000D+01
      6    -0.10000000D+01    0.00000000D+00    0.10000000D+01
```

```
         7          -0.10000000D+02        0.00000000D+00        0.10000000D+02
         8          -0.10000000D+02        0.00000000D+00        0.10000000D+02
         9          -0.10000000D+02        0.00000000D+00        0.10000000D+02
        10          -0.10000000D+02        0.00000000D+00        0.10000000D+02


   *****   End Conditions Vector EC0, Previous Cycle
                 End Conditions Vector ECPRV0, and Weighting
                       Coefficient Vector WDT0 Before Compression   *****


   Element        EC0                    ECPRV0                 WDT0

       1          -0.95504700D+02        -0.95504700D+02        0.10000000D+01
       2           0.75647200D+02         0.75647200D+02        0.10000000D+01
       3           0.84882200D+02         0.84882200D+02        0.10000000D+01
       4           0.80737600D+02         0.80737600D+02        0.10000000D+01
       5          -0.65848100D+02        -0.65848100D+02        0.10000000D+01
       6           0.77724100D+02         0.77724100D+02        0.10000000D+01
       7          -0.37301000D+02        -0.37301000D+02        0.10000000D+01
       8           0.31399400D+02         0.31399400D+02        0.10000000D+01
       9           0.43590700D+02         0.43590700D+02        0.10000000D+01
      10           0.12152200D+02         0.12152200D+02        0.10000000D+01


              **********   Case Number  125   **********



              Specification of CV, T-matrix, and EC Compression

                            MSAVE0/MSAVE

        0            1            0            0            0
    0        0        1        1        0        0        0        0        0        0


                            NSAVE0/NSAVE

        0            0            1            0            0
    0        0        0        0        1        1        0        0        0        0



 *******************   T-Matrix Compression is Initiated   *******************



   *****   Initial Control Vector (CV0), T-Matrix (T0),
                                    and Measurement Vector (EC0)   *****


   *****   Initial Control Vector (CV0)   *****

   CV0    0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00

   *****   Initial Greatest Least Bounds (CVL0) for the
                                    Control Vector (CV0)   *****

   CVL0   -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+01    -0.10000000D+01    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+02    -0.10000000D+02

   *****   Initial Least Upper Bounds (CVU0) for the
                                    Control Vector (CV0)   *****

   CVU0    0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
           0.10000000D+01     0.10000000D+01     0.10000000D+02     0.10000000D+02
           0.10000000D+02     0.10000000D+02


   Row           *****   Initial T-Matrix (T0)   *****
```

```
     T0   1      -0.90740400D+02     -0.13569100D+03     -0.11432000D+03     -0.68177300D+02
                  -0.50039300D+02     -0.76479500D+02     -0.14327400D+03     -0.13709000D+03
                  -0.12026900D+03     -0.35691800D+02

     T0   2       0.11970700D+03      0.79448600D+02      0.47683700D+02      0.51471100D+02
                   0.63869000D+02      0.10792800D+03      0.11090400D+03      0.35351300D+02
                   0.35507200D+02      0.52919900D+02

     T0   3       0.12238400D+03      0.87604200D+02      0.60609600D+02      0.64589000D+02
                   0.76583700D+02      0.11311600D+03      0.11015900D+03      0.41278200D+02
                   0.40179000D+02      0.96571600D+02

     T0   4       0.78723800D+02      0.11595000D+03      0.95790400D+02      0.53425700D+02
                   0.37283300D+02      0.66388400D+02      0.13180500D+03      0.11129300D+03
                   0.68519100D+02      0.18697000D+02

     T0   5      -0.69686400D+02     -0.47757000D+02     -0.56223800D+02     -0.30916700D+02
                   0.44635300D+02     -0.48842200D+02     -0.89783700D+02     -0.24031100D+03
                  -0.14879800D+03     -0.48361400D+02

     T0   6       0.66340100D+02      0.79133100D+02      0.49498400D+02      0.80521700D+02
                   0.79285000D+02      0.15567100D+03      0.25360700D+03      0.32079500D+02
                   0.67000200D+02     -0.20154700D+02

     T0   7      -0.40056100D+02     -0.30015800D+02     -0.24877100D+02     -0.84533200D+01
                  -0.54793800D+01     -0.59097000D+02      0.17656700D+02     -0.49513700D+02
                  -0.82328600D+02     -0.11560300D+03

     T0   8       0.20252000D+02      0.33375900D+02      0.37778200D+01      0.54595500D+02
                   0.73257900D+02      0.67743700D+02      0.49407700D+02      0.88928300D+02
                   0.11906500D+03     -0.21847200D+02

     T0   9       0.29750400D+02      0.38475000D+02      0.24546000D+02      0.66753000D+02
                   0.12317900D+03      0.73072500D+02      0.19590400D+02      0.49442400D+00
                  -0.13463600D+02      0.11916600D+03

     T0  10       0.24367300D+02      0.13770800D+02     -0.63430700D+01     -0.12353700D+02
                  -0.16066500D+02      0.85041400D+02      0.70406300D+02     -0.98438700D+01
                  -0.73784200D+02     -0.50092100D+02


     *****    Initial End Conditions Vector (EC0)    *****

      EC0    -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
             -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
              0.43590700D+02      0.12152200D+02

     *****    Initial End Conditions Weighting Coefficient Vector
                              (WDT0) for the Performance Index (F)    *****

     WDT0     0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
              0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
              0.10000000D+01      0.10000000D+01


     *****    Initial Control Vector (CVPRV0) and Measurement
                              Vector (ECPRV0) from the Previous Duty Cycle    *****


     *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

   CVPRV0     0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
              0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
              0.00000000D+00      0.00000000D+00


     *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

   ECPRV0    -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
             -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
              0.43590700D+02      0.12152200D+02
```

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```
    *****    Intermediate Control Vector (CV), T-Matrix (TT),
              and Measurement Vector (ECT) after the First Compression    *****


    *****    Intermediate Control Vector (CV) after the First Compression    *****

     CV      0.00000000D+00    0.00000000D+00

    *****    Intermediate Greatest Least Bounds (CVL) for the
                                             Control Vector (CV)    *****

     CVL    -0.10000000D+01   -0.10000000D+01

    *****    Intermediate Least Upper Bounds (CVU) for the
                                             Control Vector (CV)    *****

     CVU     0.10000000D+01    0.10000000D+01


     Row         *****    Intermediate T-Matrix (TT)    *****

  TT   1    -0.50039300D+02   -0.76479500D+02

  TT   2     0.63869000D+02    0.10792800D+03

  TT   3     0.76583700D+02    0.11311600D+03

  TT   4     0.37283300D+02    0.66388400D+02

  TT   5     0.44635300D+02   -0.48842200D+02

  TT   6     0.79285000D+02    0.15567100D+03

  TT   7    -0.54793800D+01   -0.59097000D+02

  TT   8     0.73257900D+02    0.67743700D+02

  TT   9     0.12317900D+03    0.73072500D+02

  TT 10    -0.16066500D+02    0.85041400D+02


   *****    Intermediate End Conditions Vector (ECT)    *****

   ECT    -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02

   *****    Intermediate End Conditions Weighting Coefficient Vector
                                (WDTT) for the Performance Index (F)    *****

   WDTT     0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
            0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
            0.10000000D+01    0.10000000D+01


   *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                     (ECPRV0) from the Previous Duty Cycle after
                                        the First Compression    *****


   *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                        the First Compression    *****

  CVPRV     0.00000000D+00    0.00000000D+00

   *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                  after the First Compression    *****

 ECPRVT   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
          -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
           0.43590700D+02    0.12152200D+02
```

```
     *****   Final Control Vector (CV), T-Matrix (T), and
                   Measurement Vector (EC) after the Second Compression   *****


     *****   Final Control Vector (CV) after the Second Compression   *****

       CV     0.00000000D+00    0.00000000D+00

     *****   Greatest Least Bounds (CVL) Vector for the
                                               Control Vector (CV)   *****

      CVL    -0.10000000D+01   -0.10000000D+01

     *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)   *****

      CVU     0.10000000D+01    0.10000000D+01


      Row              *****   Final T-Matrix (T)   *****

    T  1     0.76583700D+02    0.11311600D+03

    T  2     0.37283300D+02    0.66388400D+02


     *****   Final End Conditions Vector (EC) after the Second Compression   *****

       EC     0.84882200D+02    0.80737600D+02

     *****   Final End Conditions Weighting Coefficient Vector
                                   (WDT) for the Performance Index (F)   *****

      WDT     0.10000000D+01    0.10000000D+01


     *****   Final Control Vector (CVPRV) and Measurement Vector
                   (ECPRV) from the Previous Duty Cycle after
                                        the Second Compression   *****


     *****   Final Previous Cycle Control Vector (CVPRV) after
                                        the Second Compression   *****

    CVPRV     0.00000000D+00    0.00000000D+00


     *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                     after the Second Compression   *****

    ECPRV     0.84882200D+02    0.80737600D+02


    ******************   T-Matrix Compression is Completed   ********************


     *****   Initial End Conditions Vector EC   *****

        0.84882200D+02       0.80737600D+02


     *****   Initial Performance Index  =   0.13723548D+05   *****

     *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

    Element    AL               A                AU               PHASE

       1     0.00000000D+00    0.00000000D+00    0.10000000D+01    0.00000000D+00


  *****   Initial Constraint Function Values for Case Number  125   *****

                              LSAVE

       1      0
```

```
*****   Inequality Constraints   *****

Element        Constraint        Amplitude          Max Amp

   1         0.10000000D+01     0.00000000D+00      0.10000000D+01


*****   Solve the NLPQLP Problem for Case Number  125   *****




  ----------------------------------------------------------------------
  START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
  ----------------------------------------------------------------------

  Parameters:
    N      =        2
    M      =        1
    ME     =        0
    MODE   =        0
    ACC    =   0.1000D-06
    ACCQP  =   0.1000D-11
    STPMIN =   0.0000D+00
    RHOB   =   0.1000D+03
    MAXFUN =       30
    MAXNM  =       10
    MAXIT  =      300
    IPRINT =        2

  Output in the following order:
    IT    - iteration number
    F     - objective function value
    SCV   - sum of constraint violations
    NA    - number of active constraints
    I     - number of line search iterations
    ALPHA - steplength parameter
    DELTA - additional variable to prevent inconsistency
    KKT   - Karush-Kuhn-Tucker optimality criterion


   IT        F            SCV      NA  I    ALPHA     DELTA      KKT
  ----------------------------------------------------------------------
   1  0.13723548D+05  0.00D+00   1  0  0.00D+00  0.00D+00  0.98D+05
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
   2  0.11512681D+05  0.41D+00   1  1  0.10D+01  0.00D+00  0.22D+05
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
   3  0.63811669D+03  0.25D-01   1  1  0.10D+01  0.00D+00  0.19D+02
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
   4  0.64755327D+03  0.49D-03   1  1  0.10D+01  0.00D+00  0.39D+00
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
   5  0.64774911D+03  0.10D-07   1  1  0.10D+01  0.00D+00  0.60D-03
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
   6  0.64774882D+03  0.13D-07   1  1  0.10D+01  0.00D+00  0.10D-04
                *****   Completed CALL to NLPQLP   *****
                *****   Completed CALL to NLPQLP   *****
   7  0.64774882D+03  0.21D-11   1  1  0.10D+01  0.00D+00  0.17D-08


  --- Final Convergence Analysis at Last Iterate ---

    Objective function value:      F(X) =  0.64774882D+03
    Solution values:            X     =
      0.19075814D+00 -0.98163707D+00
    Distances from lower bounds:  X-XL  =
      0.11907581D+01  0.18362933D-01
    Distances from upper bounds:  XU-X  =
      0.80924186D+00  0.19816371D+01
```

```
      Multipliers for lower bounds:  U     =
         0.00000000D+00  0.00000000D+00
      Multipliers for upper bounds:  U     =
         0.00000000D+00  0.00000000D+00
      Constraint values:            G(X)  =
        -0.21169733D-11
      Multipliers for constraints:   U     =
         0.40643521D+03
      Number of function calls:      NFUNC =        7
      Number of gradient calls:      NGRAD =        7
      Number of calls of QP solver:  NQL   =        7



                *****   Completed CALL to NLPQLP   *****


          *****   Number of Function Evaluations  =     21   *****


    *****   Solution Control Vector for Case Number  125   *****

   Element    CVL              CV               CVU              CV - CV0

      1    -0.10000000D+01    0.19075814D+00    0.10000000D+01    0.19075814D+00
      2    -0.10000000D+01   -0.98163707D+00    0.10000000D+01   -0.98163707D+00




    *****   Predicted Measurement Vector EC   *****

     -0.11547683D+02       0.22680385D+02


    *****   NLP Solution Performance Index  =   0.64774882D+03   *****




    *****   Predicted Measurement Vector EC   *****

     -0.11547694D+02       0.22680379D+02


    *****   NLP Solution Performance Index  =   0.64774882D+03   *****




    *****   Predicted Control Amplitude Vector (A)
               Its Limits (AL & AU), and Its Phase Angle
                              Vector (PHASE) Before Compression   *****

   Element    AL              A               AU              PHASE

      1    0.00000000D+00    0.10000000D+01    0.10000000D+01    0.16900297D+03

*****   Solution Constraint Function Values for Case Number  125   *****

                              LSAVE

      1      0

    *****   Inequality Constraints   *****

   Element        Constraint         Amplitude         Max Amp

      1        -0.21169733D-11      0.10000000D+01      0.10000000D+01


              **********   End Case Number  125   **********
```

****

```
               ***************  Start Case Number  325  ***************


           ***************   INPUT DATA for Case Number  325   ***************


       &CDATA
       A00     = 5*0.000000000000000E+000  ,   1.00000000000000       ,
       ACC     =   1.000000000000000E-007,
       ACCQP   =   1.000000000000000E-012,
       AL0     = 5*0.000000000000000E+000  , -1.000000000000000E-007,
       ALPHA   =   1.00000000000000       ,
       APRV0   = 6*0.000000000000000E+000  ,
       AU0     = 2*10.0000000000000        ,  0.300000000000000     , 2*10.0000000000000
       ,   3.00000000000000       ,
       CRAN1   =   2.00000000000000        ,
       CRAN2   =   3.00000000000000        ,
       CRAN3   =   1.00000000000000        ,
       CRAN4   =   1.00000000000000        ,
       CV00    = 14*0.000000000000000E+000  ,
       CVOUT   =          0,
       CVPRV0  = 14*0.000000000000000E+000  ,
       ECPRV0  =  -95.5047000000000        ,   75.6472000000000      ,   84.8822000000000      ,
       80.7376000000000       ,
         -65.8481000000000       ,   77.7241000000000      ,  -37.3010000000000       ,
       31.3994000000000       ,   43.5907000000000       ,
          12.1522000000000       ,
       EPS     =   1.000000000000000E-007,
       ICASE   =          325,
       ICYCL0  =         2000,
       IDATA   =            3,
       IN      =            5,
       IOPT    =            1,
       IOUT    =            6,
       IPRINT  =            2,
       ISEED1  =         2395,         4013,         3813,         1837,
       ISEED2  =         1843,         4011,         3364,         2835,
       ISEED3  =         3962,         1111,         3215,         2637,
       ISEED4  =         2397,         1504,         4031,         3173,
       ITOUT   =            3,
       L       =            1,
       LQL     = T,
       LSAVE   =            1, 5*0,
       MAXASUM =   3.00000000000000       ,
       MAXFUN  =           30,
       MAXIT   =          300,
       MAXNM   =           10,
       MI      =            1,
       MINASUM =   0.000000000000000E+000,
       MODE    =            0,
       MSAVE0  =            0,            1, 3*0, 5*1,
       MULT    =            0,
       NSAVE0  = 2*0,            1, 2*0, 5*1,
       NX0     =           10,
       NZ0     =           10,
       OPTEND  =            3,
       PHASE0  = 5*0.000000000000000E+000  ,   90.0000000000000       ,
       PHSPRV0 = 6*0.000000000000000E+000  ,
       RHOB    =   100.000000000000       ,
       STPMIN  =   0.000000000000000E+000,
       T0      =  -90.7404000000000        ,  119.707000000000       ,  122.384000000000       ,
       78.7238000000000       ,
         -69.6864000000000       ,   66.3401000000000      ,  -40.0561000000000       ,
       20.2520000000000       ,   29.7504000000000       ,
          24.3673000000000       ,  -135.691000000000      ,   79.4486000000000       ,
       87.6042000000000       ,  115.950000000000       ,
         -47.7570000000000       ,   79.1331000000000      ,  -30.0158000000000       ,
       33.3759000000000       ,   38.4750000000000       ,
          13.7708000000000       ,  -114.320000000000      ,   47.6837000000000       ,
       60.6096000000000       ,   95.7904000000000       ,
         -56.2238000000000       ,   49.4984000000000      ,  -24.8771000000000       ,
       3.77782000000000       ,   24.5460000000000       ,
         -6.34307000000000       ,  -68.1773000000000      ,   51.4711000000000       ,
       64.5890000000000       ,   53.4257000000000       ,
```

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```
   -30.9167000000000       ,     80.5217000000000       ,   -8.45332000000000        ,
54.5955000000000      ,    66.7530000000000       ,
   -12.3537000000000       ,    -50.0393000000000       ,    63.8690000000000        ,
76.5837000000000      ,    37.2833000000000       ,
    44.6353000000000       ,     79.2850000000000       ,   -5.47938000000000        ,
73.2579000000000      ,   123.179000000000        ,
   -16.0665000000000       ,    -76.4795000000000       ,   107.928000000000         ,
113.116000000000      ,    66.3884000000000       ,
   -48.8422000000000       ,    155.671000000000        ,   -59.0970000000000        ,
67.7437000000000      ,    73.0725000000000       ,
    85.0414000000000       ,   -143.274000000000        ,   110.904000000000         ,
110.159000000000      ,   131.805000000000        ,
   -89.7837000000000       ,    253.607000000000        ,    17.6567000000000        ,
49.4077000000000      ,    19.5904000000000       ,
    70.4063000000000       ,   -137.090000000000        ,    35.3513000000000        ,
41.2782000000000      ,   111.293000000000        ,
   -240.311000000000       ,     32.0795000000000       ,   -49.5137000000000        ,
88.9283000000000      ,   0.494424000000000       ,
   -9.84387000000000       ,    -120.269000000000       ,    35.5072000000000        ,
40.1790000000000      ,    68.5191000000000       ,
   -148.798000000000       ,     67.0002000000000       ,   -82.3286000000000        ,
119.065000000000      ,   -13.4636000000000       ,
   -73.7842000000000       ,    -35.6918000000000       ,    52.9199000000000        ,
96.5716000000000      ,    18.6970000000000       ,
   -48.3614000000000       ,    -20.1547000000000       ,  -115.603000000000         ,  -
21.8472000000000      ,   119.166000000000        ,
   -50.0921000000000       ,
WDT0    = 10*1.00000000000000             ,
WDX     = 10*0.000000000000000E+000   ,
WX      = 10*0.000000000000000E+000   ,
WZ      = 10*1.00000000000000
/
```

```
*******************************************************************************


     ***************   OUTPUT DATA for Case Number  325   ***************


   *****   The Initial T-Matrix (T0) and Either the Initial
                    Previous Actual NLP Control Vector (CVPRV0) or
                      the Initial Previous Control Amplitude (APRV0)
                        and Phase Angle (PHSPRV0) Vectors Before
                              Compression are Directly Input   *****

   *****   Input the Initial Previous Actual NLP Control
                    Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                      and then Compute the Previous Control Amplitude (APRV0)
                        and Control Phase Angle (PHSPRV0) Vectors   *****




                  **********   Case Number  325   **********
   *****   Initial Previous Control Amplitude (APRV0) and Phase
                        Angle (PHSPRV0) Vectors before Compression   *****

   Element    AL0              APRV0             AU0              PHSPRV0

     1     0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
     2     0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
     3     0.00000000D+00   0.00000000D+00   0.30000000D+00   0.00000000D+00
     4     0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00
     5     0.00000000D+00   0.00000000D+00   0.10000000D+02   0.00000000D+00

   *****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

   Element    CVL0              CVPRV0            CVU0

     1     -0.10000000D+02   0.00000000D+00   0.10000000D+02
     2     -0.10000000D+02   0.00000000D+00   0.10000000D+02
     3     -0.10000000D+02   0.00000000D+00   0.10000000D+02
     4     -0.10000000D+02   0.00000000D+00   0.10000000D+02
```

```
        5        -0.30000000D+00      0.00000000D+00      0.30000000D+00
        6        -0.30000000D+00      0.00000000D+00      0.30000000D+00
        7        -0.10000000D+02      0.00000000D+00      0.10000000D+02
        8        -0.10000000D+02      0.00000000D+00      0.10000000D+02
        9        -0.10000000D+02      0.00000000D+00      0.10000000D+02
       10        -0.10000000D+02      0.00000000D+00      0.10000000D+02
```

```
*****    Either the BEFORE Compression Initial Actual NLP Control
            Vector Estimates (CV00), OR the BEFORE Compression
              Initial Control Vector Amplitudes (A00) and Phase
               Angles (PHASE0) Estimates are Directly Input
                    via NAMELIST Data CDATA                       *****


*****    Input the Initial Actual NLP Control Vector Estimate
           (CV00) Directly Via NAMELIST Input CDATA, and
              then Compute the Control Vector Amplitudes
                  (A00) and Phase Angles (PHASE0) Estimates    *****



              **********   Case Number  325   **********


*****    Adjust the Initial Control Amplitude Estimates Vector
          (A00) to define the Initial Control Amplitude Estimates
           Vector (A0) to Within Limits If Required Before Compression   *****


*****    Initial Control Amplitude Vector Estimates (A0), Its
               Limits (AL0 & AU0), and Its Phase Angle Vector
                      Estimates (PHASE0) Before Compression    *****
```

Element	AL0	A0	AU0	PHASE0
1	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
1	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
2	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
3	0.00000000D+00	0.00000000D+00	0.30000000D+00	0.00000000D+00
3	0.00000000D+00	0.10000000D-06	0.30000000D+00	0.00000000D+00
4	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
4	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.00000000D+00	0.10000000D+02	0.00000000D+00
5	0.00000000D+00	0.10000000D-06	0.10000000D+02	0.00000000D+00

```
*****    Initial Actual NLP Control Vector Estimates (CV0) and
                   Its Limits (CVL0 & CVU0) Before Compression    *****
```

Element	CVL0	CV0	CVU0
1	-0.10000000D+02	0.00000000D+00	0.10000000D+02
2	-0.10000000D+02	0.00000000D+00	0.10000000D+02
3	-0.10000000D+02	0.00000000D+00	0.10000000D+02
4	-0.10000000D+02	0.00000000D+00	0.10000000D+02
5	-0.30000000D+00	0.00000000D+00	0.30000000D+00
6	-0.30000000D+00	0.00000000D+00	0.30000000D+00
7	-0.10000000D+02	0.00000000D+00	0.10000000D+02
8	-0.10000000D+02	0.00000000D+00	0.10000000D+02
9	-0.10000000D+02	0.00000000D+00	0.10000000D+02
10	-0.10000000D+02	0.00000000D+00	0.10000000D+02

```
*****    End Conditions Vector EC0, Previous Cycle
                End Conditions Vector ECPRV0, and Weighting
                     Coefficient Vector WDT0 Before Compression    *****
```

Element	EC0	ECPRV0	WDT0
1	-0.95504700D+02	-0.95504700D+02	0.10000000D+01
2	0.75647200D+02	0.75647200D+02	0.10000000D+01
3	0.84882200D+02	0.84882200D+02	0.10000000D+01
4	0.80737600D+02	0.80737600D+02	0.10000000D+01
5	-0.65848100D+02	-0.65848100D+02	0.10000000D+01

```
    6         0.77724100D+02        0.77724100D+02        0.10000000D+01
    7        -0.37301000D+02       -0.37301000D+02        0.10000000D+01
    8         0.31399400D+02        0.31399400D+02        0.10000000D+01
    9         0.43590700D+02        0.43590700D+02        0.10000000D+01
   10         0.12152200D+02        0.12152200D+02        0.10000000D+01


             **********   Case Number  325   **********



         Specification of CV, T-matrix, and EC Compression

                         MSAVE0/MSAVE

      0           1           0           0           0
   0      0      1      1      0      0      0      0      0      0


                         NSAVE0/NSAVE

      0           0           1           0           0
   0      0      0      0      1      1      0      0      0      0



********************   T-Matrix Compression is Initiated   ********************


  *****   Initial Control Vector (CV0), T-Matrix (T0),
                                 and Measurement Vector (EC0)   *****


  *****   Initial Control Vector (CV0)   *****

   CV0    0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
          0.00000000D+00     0.00000000D+00

  *****   Initial Greatest Least Bounds (CVL0) for the
                                 Control Vector (CV0)   *****

   CVL0  -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
         -0.30000000D+00    -0.30000000D+00    -0.10000000D+02    -0.10000000D+02
         -0.10000000D+02    -0.10000000D+02

  *****   Initial Least Upper Bounds (CVU0) for the
                                 Control Vector (CV0)   *****

   CVU0   0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
          0.30000000D+00     0.30000000D+00     0.10000000D+02     0.10000000D+02
          0.10000000D+02     0.10000000D+02


    Row          *****   Initial T-Matrix (T0)   *****

T0  1   -0.90740400D+02    -0.13569100D+03    -0.11432000D+03    -0.68177300D+02
        -0.50039300D+02    -0.76479500D+02    -0.14327400D+03    -0.13709000D+03
        -0.12026900D+03    -0.35691800D+02

T0  2    0.11970700D+03     0.79448600D+02     0.47683700D+02     0.51471100D+02
         0.63869000D+02     0.10792800D+03     0.11090400D+03     0.35351300D+02
         0.35507200D+02     0.52919900D+02

T0  3    0.12238400D+03     0.87604200D+02     0.60609600D+02     0.64589000D+02
         0.76583700D+02     0.11311600D+03     0.11015900D+03     0.41278200D+02
         0.40179000D+02     0.96571600D+02

T0  4    0.78723800D+02     0.11595000D+03     0.95790400D+02     0.53425700D+02
         0.37283300D+02     0.66388400D+02     0.13180500D+03     0.11129300D+03
         0.68519100D+02     0.18697000D+02

T0  5   -0.69686400D+02    -0.47757000D+02    -0.56223800D+02    -0.30916700D+02
```

```
              0.44635300D+02    -0.48842200D+02    -0.89783700D+02    -0.24031100D+03
             -0.14879800D+03    -0.48361400D+02

   T0   6    0.66340100D+02     0.79133100D+02     0.49498400D+02     0.80521700D+02
              0.79285000D+02     0.15567100D+03     0.25360700D+03     0.32079500D+02
              0.67000200D+02    -0.20154700D+02

   T0   7   -0.40056100D+02    -0.30015800D+02    -0.24877100D+02    -0.84533200D+01
             -0.54793800D+01    -0.59097000D+02     0.17656700D+02    -0.49513700D+02
             -0.82328600D+02    -0.11560300D+03

   T0   8    0.20252000D+02     0.33375900D+02     0.37778200D+01     0.54595500D+02
              0.73257900D+02     0.67743700D+02     0.49407700D+02     0.88928300D+02
              0.11906500D+03    -0.21847200D+02

   T0   9    0.29750400D+02     0.38475000D+02     0.24546000D+02     0.66753000D+02
              0.12317900D+03     0.73072500D+02     0.19590400D+02     0.49442400D+00
             -0.13463600D+02     0.11916600D+03

   T0  10    0.24367300D+02     0.13770800D+02    -0.63430700D+01    -0.12353700D+02
             -0.16066500D+02     0.85041400D+02     0.70406300D+02    -0.98438700D+01
             -0.73784200D+02    -0.50092100D+02


   *****    Initial End Conditions Vector (EC0)    *****

    EC0    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02

   *****    Initial End Conditions Weighting Coefficient Vector
                                 (WDT0) for the Performance Index (F)   *****

    WDT0    0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
            0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
            0.10000000D+01     0.10000000D+01


   *****    Initial Control Vector (CVPRV0) and Measurement
                            Vector (ECPRV0) from the Previous Duty Cycle   *****


   *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

 CVPRV0    0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00


   *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

 ECPRV0   -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02


   *****    Intermediate Control Vector (CV), T-Matrix (TT),
             and Measurement Vector (ECT) after the First Compression   *****


   *****    Intermediate Control Vector (CV) after the First Compression   *****

    CV     0.00000000D+00     0.00000000D+00

   *****    Intermediate Greatest Least Bounds (CVL) for the
                                       Control Vector (CV)   *****

    CVL   -0.30000000D+00    -0.30000000D+00

   *****    Intermediate Least Upper Bounds (CVU) for the
                                       Control Vector (CV)   *****

    CVU    0.30000000D+00     0.30000000D+00
```

```
    Row        *****   Intermediate T-Matrix (TT)   *****

 TT  1    -0.50039300D+02   -0.76479500D+02

 TT  2     0.63869000D+02    0.10792800D+03

 TT  3     0.76583700D+02    0.11311600D+03

 TT  4     0.37283300D+02    0.66388400D+02

 TT  5     0.44635300D+02   -0.48842200D+02

 TT  6     0.79285000D+02    0.15567100D+03

 TT  7    -0.54793800D+01   -0.59097000D+02

 TT  8     0.73257900D+02    0.67743700D+02

 TT  9     0.12317900D+03    0.73072500D+02

 TT 10    -0.16066500D+02    0.85041400D+02


  *****   Intermediate End Conditions Vector (ECT)   *****

   ECT   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
         -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
          0.43590700D+02    0.12152200D+02

  *****   Intermediate End Conditions Weighting Coefficient Vector
                             (WDTT) for the Performance Index (F)   *****

  WDTT    0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
          0.10000000D+01    0.10000000D+01    0.10000000D+01    0.10000000D+01
          0.10000000D+01    0.10000000D+01


  *****   Intermediate Control Vector (CVPRV) and Measurement Vector
                       (ECPRV0) from the Previous Duty Cycle after
                                        the First Compression   *****


  *****   Intermediate Previous Cycle Control Vector (CVPRV) after
                                        the First Compression   *****

 CVPRV    0.00000000D+00    0.00000000D+00


  *****   Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                     after the First Compression   *****

ECPRVT   -0.95504700D+02    0.75647200D+02    0.84882200D+02    0.80737600D+02
         -0.65848100D+02    0.77724100D+02   -0.37301000D+02    0.31399400D+02
          0.43590700D+02    0.12152200D+02


  *****   Final Control Vector (CV), T-Matrix (T), and
                  Measurement Vector (EC) after the Second Compression   *****


  *****   Final Control Vector (CV) after the Second Compression   *****

    CV    0.00000000D+00    0.00000000D+00

  *****   Greatest Least Bounds (CVL) Vector for the
                                        Control Vector (CV)   *****

   CVL   -0.30000000D+00   -0.30000000D+00

  *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)   *****

   CVU    0.30000000D+00    0.30000000D+00
```

```
   Row          *****   Final T-Matrix (T)   *****

 T  1    0.76583700D+02    0.11311600D+03

 T  2    0.37283300D+02    0.66388400D+02


  *****   Final End Conditions Vector (EC) after the Second Compression   *****

   EC    0.84882200D+02    0.80737600D+02

  *****   Final End Conditions Weighting Coefficient Vector
                              (WDT) for the Performance Index (F)   *****

  WDT    0.10000000D+01    0.10000000D+01


  *****   Final Control Vector (CVPRV) and Measurement Vector
                    (ECPRV) from the Previous Duty Cycle after
                                    the Second Compression   *****


  *****   Final Previous Cycle Control Vector (CVPRV) after
                                    the Second Compression   *****

 CVPRV    0.00000000D+00    0.00000000D+00


  *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                 after the Second Compression   *****

 ECPRV    0.84882200D+02    0.80737600D+02


******************   T-Matrix Compression is Completed   ********************


  *****   Initial End Conditions Vector EC   *****


    0.84882200D+02      0.80737600D+02


  *****   Initial Performance Index  =   0.13723548D+05   *****

  *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

 Element    AL               A               AU              PHASE

    1    0.00000000D+00    0.00000000D+00    0.30000000D+00    0.00000000D+00


*****   Initial Constraint Function Values for Case Number  325   *****

                              LSAVE

    1      0

  *****   Inequality Constraints   *****

 Element       Constraint        Amplitude        Max Amp

    1       0.30000000D+00    0.00000000D+00    0.30000000D+00


  *****   Solve the NLPQLP Problem for Case Number  325   *****


    --------------------------------------------------------------------
    START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
    --------------------------------------------------------------------
```

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```
       Parameters:
          N     =         2
          M     =         1
          ME    =         0
          MODE  =         0
          ACC   =   0.1000D-06
          ACCQP =   0.1000D-11
          STPMIN =  0.0000D+00
          RHOB  =   0.1000D+03
          MAXFUN =       30
          MAXNM =        10
          MAXIT =       300
          IPRINT =        2

       Output in the following order:
          IT    - iteration number
          F     - objective function value
          SCV   - sum of constraint violations
          NA    - number of active constraints
          I     - number of line search iterations
          ALPHA - steplength parameter
          DELTA - additional variable to prevent inconsistency
          KKT   - Karush-Kuhn-Tucker optimality criterion


        IT        F          SCV      NA  I    ALPHA     DELTA      KKT
       ----------------------------------------------------------------------
         1  0.13723548D+05  0.00D+00   1  0   0.00D+00  0.00D+00  0.29D+05
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
         2  0.32461904D+04  0.12D+00   1  1   0.10D+01  0.00D+00  0.33D+04
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
         3  0.48736144D+04  0.25D-01   1  1   0.10D+01  0.00D+00  0.56D+03
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
         4  0.49226936D+04  0.18D-01   1  2   0.43D+00  0.00D+00  0.71D+03
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
         5  0.52833314D+04  0.60D-04   1  1   0.10D+01  0.00D+00  0.13D+01
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
         6  0.52833296D+04  0.56D-04   1  2   0.12D+00  0.00D+00  0.23D+01
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
         7  0.52845033D+04  0.12D-07   1  1   0.10D+01  0.00D+00  0.49D-03
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
         8  0.52845035D+04  0.34D-11   1  1   0.10D+01  0.00D+00  0.13D-06
                       *****  Completed CALL to NLPQLP   *****
                       *****  Completed CALL to NLPQLP   *****
         9  0.52845035D+04  0.16D-12   1  1   0.10D+01  0.00D+00  0.67D-08


       --- Final Convergence Analysis at Last Iterate ---

         Objective function value:      F(X)  =  0.52845035D+04
         Solution values:              X     =
           -0.15930538D+00 -0.25420818D+00
         Distances from lower bounds:  X-XL  =
            0.14069462D+00  0.45791824D-01
         Distances from upper bounds:  XU-X  =
            0.45930538D+00  0.55420818D+00
         Multipliers for lower bounds: U     =
            0.00000000D+00  0.00000000D+00
         Multipliers for upper bounds: U     =
            0.00000000D+00  0.00000000D+00
         Constraint values:            G(X)  =
           -0.16187052D-12
         Multipliers for constraints:  U     =
            0.20803837D+05
```

```
          Number of function calls:      NFUNC =       11
          Number of gradient calls:      NGRAD =        9
          Number of calls of QP solver:  NQL   =        9



                 *****   Completed CALL to NLPQLP   *****


            *****   Number of Function Evaluations  =     29   *****


   *****   Solution Control Vector for Case Number  325   *****

   Element    CVL                CV                 CVU                CV - CV0

       1   -0.30000000D+00   -0.15930538D+00    0.30000000D+00    -0.15930538D+00
       2   -0.30000000D+00   -0.25420818D+00    0.30000000D+00    -0.25420818D+00




   *****   Predicted Measurement Vector EC   *****

     0.43927004D+02      0.57921702D+02

   *****   NLP Solution Performance Index  =   0.52845035D+04   *****




   *****   Predicted Measurement Vector EC   *****

     0.43926993D+02      0.57921696D+02


   *****   NLP Solution Performance Index  =   0.52845035D+04   *****




   *****   Predicted Control Amplitude Vector (A)
                  Its Limits (AL & AU), and Its Phase Angle
                                 Vector (PHASE) Before Compression   *****

   Element    AL                A                 AU                PHASE

       1    0.00000000D+00    0.30000000D+00    0.30000000D+00   -0.14792574D+03

*****   Solution Constraint Function Values for Case Number  325   *****

                             LSAVE

       1      0

   *****   Inequality Constraints   *****

   Element        Constraint         Amplitude          Max Amp

       1       -0.16187052D-12     0.30000000D+00      0.30000000D+00


                **********   End Case Number  325   **********


END of RUN.

   **********  END  *********   END   *********
```

F.5 (2 x 2) T-Matrix FZ Hub Shear Forces Problem

A (2 x 2) T-Matrix problem assumes a **two** dimensional control vector comprised of **one** harmonic [(FZS, FZC)], and a **two** dimensional end conditions vector comprised of **one** harmonic [(D4S, D4C)].

No Constraints

```
$CDATA
!
!  *****   Start of Case  30                          Input Data   *****
!         T is (2x2)  with   No Constraints.
!         CV  is comprised of the  4  per rev flap angles.
!         EC  is comprised of the  FZ  5p Hub Loads.
!
 ACC      =    1.0D-8,
 ACC      =    1.0D-7,
 ACCQP    =    1.0D-12,
 AL0      =    0.00,    0.00,    0.00,    0.00,    0.00,
 AU0      =   10.00,   10.00,   10.00,   10.00,   10.00,
 CV00(1)  =    0.000,      0.000,      0.000,      0.000,      0.000,
 CV00(6)  =    0.000,      0.000,      0.000,      0.000,      0.000,
 CVOUT    =    1,
 CVOUT    =    0,
 CVPRV0(1) =   0.000,      0.000,      0.000,      0.000,      0.000,
 CVPRV0(6) =   0.000,      0.000,      0.000,      0.000,      0.000,
 ECPRV0(1) =  -95.5047,   75.6472,   84.8822,   80.7376,   -65.8481,
 ECPRV0(6) =   77.7241,  -37.3010,   31.3994,   43.5907,   12.1522,
 ICASE    =   30,
 IDATA    =    3,
 IOPT     =    1,
 ITOUT    =    0,
 ITOUT    =    4,
 ITOUT    =    2,
 ITOUT    =    1,
 ITOUT    =    3,
 LQL      =   .FALSE.,
 LQL      =   .TRUE.,
 LSAVE    =    0,   0,   0,   0,   0,   0,
 MAXASUM  =    3.000,
 MAXIT    =  300,
 MAXNM    =    0,
 MAXNM    =   10,
 MI       =    0,
 MSAVE0   =    0,   0,   1,   0,   0,
 NSAVE0   =    0,   0,   1,   0,   0,
 NX0      =   10,
 NZ0      =   10,
 OPTEND   =    1,
 OPTEND   =    2,
 OPTEND   =    3,
 RHOB     =    0.0,
 RHOB     =  100.0,
!
!2345678901234567890123456789012345678901234567890123456789012345678901234567890
!
  T0(1,1)  =   -90.74040,   119.70700,   122.38400,    78.72380,   -69.68640,
  T0(6,1)  =    66.34010,   -40.05610,    20.25200,    29.75040,    24.36730,
  T0(1,2)  =  -135.69100,    79.44860,    87.60420,   115.95000,   -47.75700,
  T0(6,2)  =    79.13310,   -30.01580,    33.37590,    38.47500,    13.77080,
  T0(1,3)  =  -114.32000,    47.68370,    60.60960,    95.79040,   -56.22380,
  T0(6,3)  =    49.49840,   -24.87710,     3.77782,    24.54600,    -6.34307,
  T0(1,4)  =   -68.17730,    51.47110,    64.58900,    53.42570,   -30.91670,
  T0(6,4)  =    80.52170,    -8.45332,    54.59550,    66.75300,   -12.35370,
  T0(1,5)  =   -50.03930,    63.86900,    76.58370,    37.28330,    44.63530,
  T0(6,5)  =    79.28500,    -5.47938,    73.25790,   123.17900,   -16.06650,
  T0(1,6)  =   -76.47950,   107.92800,   113.11600,    66.38840,   -48.84220,
  T0(6,6)  =   155.67100,   -59.09700,    67.74370,    73.07250,    85.04140,
  T0(1,7)  =  -143.274,     110.904,     110.159,     131.805,     -89.7837,
  T0(6,7)  =   253.607,      17.6567,     49.4077,     19.5904,     70.4063,
  T0(1,8)  =  -137.09,       35.3513,     41.2782,    111.293,    -240.311,
  T0(6,8)  =    32.0795,    -49.5137,     88.9283,      0.494424,   -9.84387,
  T0(1,9)  =  -120.269,      35.5072,     40.179,      68.5191,    -148.798,
  T0(6,9)  =    67.0002,    -82.3286,    119.065,     -13.4636,    -73.7842,
  T0(1,10) =   -35.6918,     52.9199,     96.5716,     18.697,     -48.3614,
  T0(6,10) =   -20.1547,   -115.603,     -21.8472,    119.166,     -50.0921,
!
 MULT     =         1,
 MULT     =         0,
!
!  *****   End of Case  30  Input Data   *****
!
```

$END


```
***************************************************************************


              ***************   Start Case Number   30   ***************


           ***************   INPUT DATA for Case Number   30   ***************


&CDATA
 A00= 6*1.0000000000000000         ,
 ACC= 9.99999999999999955E-008,
 ACCQP= 9.99999999999999980E-013,
 AL0= 5*0.0000000000000000        ,-9.99999999999999955E-008,
 ALPHA=  1.0000000000000000       ,
 APRV0= 6.95322154383015286E-310,  0.0000000000000000      , 2.12199579096527232E-314,
2.13641667389669062E-314, 2.13642074746794058E-314,
   4.94065645841246544E-324,
 AU0= 5*10.000000000000000        ,  3.0000000000000000      ,
 CRAN1=  2.0000000000000000       ,
 CRAN2=  3.0000000000000000       ,
 CRAN3=  1.0000000000000000       ,
 CRAN4=  1.0000000000000000       ,
 CV00= 10*0.0000000000000000          , 1.48219693752373963E-323, 6.95322442041235729E-
310, 5.17311434478077194E-319, 6.95322442013923780E-310,

 CVOUT=          0,
 CVPRV0= 10*0.0000000000000000           , 6.95322442012579921E-310, 6.95322154377126023E-
310, 6.95325616664988679E-310,  0.0000000000000000      ,

 ECPRV0= -95.504700000000000      ,  75.647199999999998     ,  84.882199999999997     ,
80.737600000000000      , -65.848100000000002      ,
   77.724100000000007     , -37.301000000000002      ,  31.399400000000000      ,
43.590699999999998      ,  12.152200000000001      ,
 EPS= 9.99999999999999955E-008,
 ICASE=         30,
 ICYCL0=      2000,
 IDATA=          3,
 IN=          5,
 IOPT=          1,
 IOUT=          6,
 IPRINT=          2,
 ISEED1=       2395,       4013,       3813,       1837,
 ISEED2=       1843,       4011,       3364,       2835,
 ISEED3=       3962,       1111,       3215,       2637,
 ISEED4=       2397,       1504,       4031,       3173,
 ITOUT=          3,
 L=          1,
 LQL=T,
 LSAVE= 6*0           ,
 MAXASUM=  3.0000000000000000       ,
 MAXFUN=         30,
 MAXIT=        300,
 MAXNM=         10,
 MI=          0,
 MINASUM=  0.0000000000000000       ,
 MODE=          0,
 MSAVE0= 2*0            ,           1, 2*0           , 5*1          ,
 MULT=          0,
 NSAVE0= 2*0            ,           1, 2*0          , 5*1          ,
 NX0=         10,
 NZ0=         10,
 OPTEND=          3,
 PHASE0= 6*90.000000000000000       ,
 PHSPRV0= 6.95314360825605601E-310, 6.95314360825595720E-310,  0.0000000000000000
, 6.95322441857443308E-310, 2*0.0000000000000000        ,
```

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```
 RHOB=  100.00000000000000        ,
 STPMIN=  0.0000000000000000       ,
 T0= -90.740399999999994       ,  119.70699999999999       ,  122.38400000000000       ,
78.723799999999997      , -69.686400000000006        ,
   66.340100000000007       ,  -40.056100000000001        ,   20.251999999999999        ,
29.750399999999999      ,  24.367300000000000       , -135.69100000000000         ,
   79.448599999999999        ,   87.604200000000006        ,  115.95000000000000        , -
47.756999999999998      ,  79.133099999999999       , -30.015799999999999        ,
   33.375900000000001        ,   38.475000000000001        ,   13.770799999999999        , -
114.31999999999999      ,  47.683700000000002       ,   60.609600000000000        ,
   95.790400000000005       ,  -56.223799999999997        ,   49.498399999999997        , -
24.877099999999999      ,  3.7778200000000002       ,   24.545999999999999        ,
   -6.3430700000000000       ,  -68.177300000000002        ,   51.471100000000000        ,
64.588999999999999      ,  53.425699999999999       , -30.916699999999999        ,
   80.521699999999996       ,  -8.4533199999999997        ,   54.595500000000001        ,
66.753000000000000      , -12.353700000000000       , -50.039299999999997        ,
   63.869000000000000        ,   76.583699999999993        ,   37.283299999999997        ,
44.635300000000001      ,  79.284999999999997       , -5.4793799999999999        ,
   73.257900000000006        ,  123.17900000000000        ,  -16.066500000000001        , -
76.479500000000002      ,  107.92800000000000       ,  113.11600000000000        ,
   66.388400000000004        ,  -48.842199999999998        ,  155.67099999999999        , -
59.097000000000001      ,  67.743700000000004       ,   73.072500000000005        ,
   85.041399999999996       , -143.27400000000000        ,  110.90400000000000        ,
110.15900000000001      ,  131.80500000000001       , -89.783699999999996        ,
   253.60700000000000       ,   17.656700000000001        ,   49.407699999999998        ,
19.590399999999999      ,  70.406300000000002       , -137.09000000000000        ,
   35.351300000000002       ,   41.278199999999998        ,  111.29300000000001        , -
240.31100000000001      ,  32.079500000000003       , -49.513700000000000        ,
   88.928299999999993       ,  0.49442399999999997        ,  -9.8438700000000008        , -
120.26900000000001      ,  35.507199999999997       ,   40.179000000000002        ,
   68.519099999999995       , -148.79800000000000        ,   67.000200000000007        , -
82.328599999999994      ,  119.06500000000000       , -13.463600000000000        ,
   -73.784199999999998       ,  -35.691800000000001        ,   52.919899999999998        ,
96.571600000000004      ,  18.696999999999999       , -48.361400000000003        ,
   -20.154699999999998       , -115.60299999999999        ,  -21.847200000000001        ,
119.16600000000000      , -50.092100000000002       ,
 WDT0= 10*1.0000000000000000        ,
 WDX= 10*0.0000000000000000        ,
 WX= 10*0.0000000000000000        ,
 WZ= 10*1.0000000000000000        ,
 /
```

```
 ****************************************************************************

      ***************   OUTPUT DATA for Case Number   30   ***************


    *****    The Initial T-Matrix (T0) and Either the Initial
                  Previous Actual NLP Control Vector (CVPRV0) or
                     the Initial Previous Control Amplitude (APRV0)
                        and Phase Angle (PHSPRV0) Vectors Before
                              Compression are Directly Input    *****

    *****    Input the Initial Previous Actual NLP Control
                  Vector (CVPRV0) Directly Via NAMELIST Input CDATA
                     and then Compute the Previous Control Amplitude (APRV0)
                        and Control Phase Angle (PHSPRV0) Vectors    *****



           **********   Case Number   30   **********



    *****    Initial Previous Control Amplitude (APRV0) and Phase
                         Angle (PHSPRV0) Vectors before Compression   *****

      Element     AL0              APRV0              AU0              PHSPRV0

        1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
        2     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00
```

```
    3      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    4      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    5      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00

*****   Previous Actual NLP Control Vector CVPRV0 Before Compression   *****

Element         CVL0                 CVPRV0               CVU0

    1         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    2         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    3         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    4         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    5         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    6         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    7         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    8         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    9         -0.10000000D+02      0.00000000D+00      0.10000000D+02
   10         -0.10000000D+02      0.00000000D+00      0.10000000D+02

*****   Either the BEFORE Compression Initial Actual NLP Control
           Vector Estimates (CV00), OR the BEFORE Compression
             Initial Control Vector Amplitudes (A00) and Phase
               Angles (PHASE0) Estimates are Directly Input
                    via NAMELIST Data CDATA                        *****

*****   Input the Initial Actual NLP Control Vector Estimate
           (CV00) Directly Via NAMELIST Input CDATA, and
                then Compute the Control Vector Amplitudes
                    (A00) and Phase Angles (PHASE0) Estimates   *****



              **********   Case Number   30   **********


*****   Adjust the Initial Control Amplitude Estimates Vector
          (A00) to define the Initial Control Amplitude Estimates
            Vector (A0) to Within Limits If Required Before Compression   *****

*****   Initial Control Amplitude Vector Estimates (A0), Its
                 Limits (AL0 & AU0), and Its Phase Angle Vector
                      Estimates (PHASE0) Before Compression   *****

Element    AL0                  A0                   AU0                  PHASE0

    1      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    1      0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
    2      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    2      0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
    3      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    3      0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
    4      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    4      0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00
    5      0.00000000D+00      0.00000000D+00      0.10000000D+02      0.00000000D+00
    5      0.00000000D+00      0.10000000D-06      0.10000000D+02      0.00000000D+00

*****   Initial Actual NLP Control Vector Estimates (CV0) and
                      Its Limits (CVL0 & CVU0) Before Compression   *****

Element         CVL0                 CV0                  CVU0

    1         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    2         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    3         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    4         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    5         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    6         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    7         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    8         -0.10000000D+02      0.00000000D+00      0.10000000D+02
    9         -0.10000000D+02      0.00000000D+00      0.10000000D+02
   10         -0.10000000D+02      0.00000000D+00      0.10000000D+02


*****   End Conditions Vector EC0, Previous Cycle
```

```
                    End Conditions Vector ECPRV0, and Weighting
                       Coefficient Vector WDT0 Before Compression   *****


    Element         EC0                    ECPRV0                  WDT0

       1         -0.95504700D+02        -0.95504700D+02        0.10000000D+01
       2          0.75647200D+02         0.75647200D+02        0.10000000D+01
       3          0.84882200D+02         0.84882200D+02        0.10000000D+01
       4          0.80737600D+02         0.80737600D+02        0.10000000D+01
       5         -0.65848100D+02        -0.65848100D+02        0.10000000D+01
       6          0.77724100D+02         0.77724100D+02        0.10000000D+01
       7         -0.37301000D+02        -0.37301000D+02        0.10000000D+01
       8          0.31399400D+02         0.31399400D+02        0.10000000D+01
       9          0.43590700D+02         0.43590700D+02        0.10000000D+01
      10          0.12152200D+02         0.12152200D+02        0.10000000D+01


               **********   Case Number   30   **********



             Specification of CV, T-matrix, and EC Compression

                            MSAVE0/MSAVE

         0              0              1              0              0
     0       0      0       0      1       1      0       0      0       0


                            NSAVE0/NSAVE

         0              0              1              0              0
     0       0      0       0      1       1      0       0      0       0



******************   T-Matrix Compression is Initiated   *******************



  *****   Initial Control Vector (CV0), T-Matrix (T0),
                                    and Measurement Vector (EC0)   *****


  *****   Initial Control Vector (CV0)   *****

   CV0     0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00     0.00000000D+00     0.00000000D+00
           0.00000000D+00     0.00000000D+00

  *****   Initial Greatest Least Bounds (CVL0) for the
                                    Control Vector (CV0)   *****

   CVL0   -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+02    -0.10000000D+02    -0.10000000D+02    -0.10000000D+02
          -0.10000000D+02    -0.10000000D+02

  *****   Initial Least Upper Bounds (CVU0) for the
                                    Control Vector (CV0)   *****

   CVU0    0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
           0.10000000D+02     0.10000000D+02     0.10000000D+02     0.10000000D+02
           0.10000000D+02     0.10000000D+02


     Row          *****   Initial T-Matrix (T0)   *****

  T0  1   -0.90740400D+02    -0.13569100D+03    -0.11432000D+03    -0.68177300D+02
          -0.50039300D+02    -0.76479500D+02    -0.14327400D+03    -0.13709000D+03
          -0.12026900D+03    -0.35691800D+02

  T0  2    0.11970700D+03     0.79448600D+02     0.47683700D+02     0.51471100D+02
           0.63869000D+02     0.10792800D+03     0.11090400D+03     0.35351300D+02
```

```
                  0.35507200D+02      0.52919900D+02

    T0   3    0.12238400D+03      0.87604200D+02      0.60609600D+02      0.64589000D+02
              0.76583700D+02      0.11311600D+03      0.11015900D+03      0.41278200D+02
              0.40179000D+02      0.96571600D+02

    T0   4    0.78723800D+02      0.11595000D+03      0.95790400D+02      0.53425700D+02
              0.37283300D+02      0.66388400D+02      0.13180500D+03      0.11129300D+03
              0.68519100D+02      0.18697000D+02

    T0   5   -0.69686400D+02     -0.47757000D+02     -0.56223800D+02     -0.30916700D+02
              0.44635300D+02     -0.48842200D+02     -0.89783700D+02     -0.24031100D+03
             -0.14879800D+03     -0.48361400D+02

    T0   6    0.66340100D+02      0.79133100D+02      0.49498400D+02      0.80521700D+02
              0.79285000D+02      0.15567100D+03      0.25360700D+03      0.32079500D+02
              0.67000200D+02     -0.20154700D+02

    T0   7   -0.40056100D+02     -0.30015800D+02     -0.24877100D+02     -0.84533200D+01
             -0.54793800D+01     -0.59097000D+02      0.17656700D+02     -0.49513700D+02
             -0.82328600D+02     -0.11560300D+03

    T0   8    0.20252000D+02      0.33375900D+02      0.37778200D+01      0.54595500D+02
              0.73257900D+02      0.67743700D+02      0.49407700D+02      0.88928300D+02
              0.11906500D+03     -0.21847200D+02

    T0   9    0.29750400D+02      0.38475000D+02      0.24546000D+02      0.66753000D+02
              0.12317900D+03      0.73072500D+02      0.19590400D+02      0.49442400D+00
             -0.13463600D+02      0.11916600D+03

    T0  10    0.24367300D+02      0.13770800D+02     -0.63430700D+01     -0.12353700D+02
             -0.16066500D+02      0.85041400D+02      0.70406300D+02     -0.98438700D+01
             -0.73784200D+02     -0.50092100D+02


      *****    Initial End Conditions Vector (EC0)    *****

      EC0   -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
            -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
             0.43590700D+02      0.12152200D+02

      *****    Initial End Conditions Weighting Coefficient Vector
                              (WDT0) for the Performance Index (F)    *****

      WDT0   0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
             0.10000000D+01      0.10000000D+01      0.10000000D+01      0.10000000D+01
             0.10000000D+01      0.10000000D+01


      *****    Initial Control Vector (CVPRV0) and Measurement
                              Vector (ECPRV0) from the Previous Duty Cycle    *****


      *****    Initial Previous Cycle Control Vector (CVPRV0)    *****

  CVPRV0   0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
           0.00000000D+00      0.00000000D+00      0.00000000D+00      0.00000000D+00
           0.00000000D+00      0.00000000D+00


      *****    Initial Previous Cycle End Conditions Vector (ECPRV0)    *****

  ECPRV0   -0.95504700D+02      0.75647200D+02      0.84882200D+02      0.80737600D+02
           -0.65848100D+02      0.77724100D+02     -0.37301000D+02      0.31399400D+02
            0.43590700D+02      0.12152200D+02


      *****    Intermediate Control Vector (CV), T-Matrix (TT),
                  and Measurement Vector (ECT) after the First Compression    *****


      *****    Intermediate Control Vector (CV) after the First Compression    *****

      CV    0.00000000D+00      0.00000000D+00
```

```
    *****    Intermediate Greatest Least Bounds (CVL) for the
                                              Control Vector (CV)   *****

    CVL     -0.10000000D+02    -0.10000000D+02

    *****    Intermediate Least Upper Bounds (CVU) for the
                                              Control Vector (CV)   *****

    CVU      0.10000000D+02     0.10000000D+02


    Row          *****    Intermediate T-Matrix (TT)   *****

  TT  1    -0.50039300D+02    -0.76479500D+02

  TT  2     0.63869000D+02     0.10792800D+03

  TT  3     0.76583700D+02     0.11311600D+03

  TT  4     0.37283300D+02     0.66388400D+02

  TT  5     0.44635300D+02    -0.48842200D+02

  TT  6     0.79285000D+02     0.15567100D+03

  TT  7    -0.54793800D+01    -0.59097000D+02

  TT  8     0.73257900D+02     0.67743700D+02

  TT  9     0.12317900D+03     0.73072500D+02

  TT 10    -0.16066500D+02     0.85041400D+02


   *****    Intermediate End Conditions Vector (ECT)   *****

    ECT     -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
            -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
             0.43590700D+02     0.12152200D+02

   *****    Intermediate End Conditions Weighting Coefficient Vector
                               (WDTT) for the Performance Index (F)  *****

   WDTT      0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
             0.10000000D+01     0.10000000D+01     0.10000000D+01     0.10000000D+01
             0.10000000D+01     0.10000000D+01


   *****    Intermediate Control Vector (CVPRV) and Measurement Vector
                          (ECPRV0) from the Previous Duty Cycle after
                                             the First Compression   *****


   *****    Intermediate Previous Cycle Control Vector (CVPRV) after
                                             the First Compression   *****

  CVPRV     0.00000000D+00     0.00000000D+00


   *****    Intermediate Previous Cycle End Conditions Vector (ECPRVTT)
                                       after the First Compression   *****

 ECPRVT    -0.95504700D+02     0.75647200D+02     0.84882200D+02     0.80737600D+02
           -0.65848100D+02     0.77724100D+02    -0.37301000D+02     0.31399400D+02
            0.43590700D+02     0.12152200D+02


   *****    Final Control Vector (CV), T-Matrix (T), and
                Measurement Vector (EC) after the Second Compression   *****


   *****    Final Control Vector (CV) after the Second Compression   *****
```

```
   CV      0.00000000D+00     0.00000000D+00

 *****   Greatest Least Bounds (CVL) Vector for the
                                             Control Vector (CV)   *****

  CVL     -0.10000000D+02    -0.10000000D+02

 *****   Least Upper Bounds (CVU) Vector for the Control Vector (CV)   *****

  CVU      0.10000000D+02     0.10000000D+02


   Row              *****   Final T-Matrix (T)   *****

 T  1      0.44635300D+02    -0.48842200D+02

 T  2      0.79285000D+02     0.15567100D+03


 *****   Final End Conditions Vector (EC) after the Second Compression   *****

   EC     -0.65848100D+02     0.77724100D+02

 *****   Final End Conditions Weighting Coefficient Vector
                                   (WDT) for the Performance Index (F)   *****

  WDT      0.10000000D+01     0.10000000D+01


  *****   Final Control Vector (CVPRV) and Measurement Vector
                         (ECPRV) from the Previous Duty Cycle after
                                             the Second Compression   *****


  *****   Final Previous Cycle Control Vector (CVPRV) after
                                             the Second Compression   *****

 CVPRV     0.00000000D+00     0.00000000D+00


  *****   Final Previous Cycle End Conditions Vector (ECPRV)
                                   after the Second Compression   *****

 ECPRV    -0.65848100D+02     0.77724100D+02


******************   T-Matrix Compression is Completed   ********************


 *****   Initial End Conditions Vector EC   *****


   -0.65848100D+02        0.77724100D+02


 *****   Initial Performance Index  =   0.10377008D+05   *****

 *****   Initial Control Amplitude (A) and Phase Angle (PHASE) Vectors   *****

 Element    AL               A                AU               PHASE

    1     0.00000000D+00    0.00000000D+00    0.10000000D+02    0.00000000D+00


             **********   Case Number   30   **********



                              LSAVE

     0       0


 *****   Solve the NLPQLP Problem for Case Number   30   *****
```

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```
     ------------------------------------------------------------------------
     START OF THE SEQUENTIAL QUADRATIC PROGRAMMING ALGORITHM
     ------------------------------------------------------------------------


     Parameters:
        N      =          2
        M      =          0
        ME     =          0
        MODE   =          0
        ACC    =    0.1000D-06
        ACCQP  =    0.1000D-11
        STPMIN =    0.0000D+00
        RHOB   =    0.1000D+03
        MAXFUN =         30
        MAXNM  =         10
        MAXIT  =        300
        IPRINT =          2

     Output in the following order:
        IT    - iteration number
        F     - objective function value
        SCV   - sum of constraint violations
        NA    - number of active constraints
        I     - number of line search iterations
        ALPHA - steplength parameter
        DELTA - additional variable to prevent inconsistency
        KKT   - Karush-Kuhn-Tucker optimality criterion


      IT       F            SCV      NA  I    ALPHA      DELTA      KKT
     ------------------------------------------------------------------------
       1  0.10377008D+05  0.00D+00   0  0   0.00D+00  0.00D+00  0.74D+06
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
       2  0.28521508D+05  0.00D+00   0  2   0.10D+00  0.00D+00  0.23D+06
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
       3  0.20331113D+05  0.00D+00   0  2   0.10D+00  0.00D+00  0.12D+07
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
       4  0.72966602D+04  0.00D+00   0  2   0.10D+00  0.00D+00  0.15D+05
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
       5  0.20699916D+03  0.00D+00   0  1   0.10D+01  0.00D+00  0.10D+04
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
       6  0.51898345D+01  0.00D+00   0  2   0.39D+00  0.00D+00  0.11D+02
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
       7  0.14933208D-02  0.00D+00   0  1   0.10D+01  0.00D+00  0.30D-02
                   *****   Completed CALL to NLPQLP    *****
                   *****   Completed CALL to NLPQLP    *****
       8  0.68563959D-10  0.00D+00   0  1   0.10D+01  0.00D+00  0.39D-20


     --- Final Convergence Analysis at Last Iterate ---

        Objective function value:      F(X)  =   0.68563959D-10
        Solution values:               X     =
           0.59647888D+00 -0.80307787D+00
        Distances from lower bounds:    X-XL  =
           0.10596479D+02  0.91969221D+01
        Distances from upper bounds:    XU-X  =
           0.94035211D+01  0.10803078D+02
        Multipliers for lower bounds:   U     =
           0.00000000D+00  0.00000000D+00
```

```
      Multipliers for upper bounds:  U      =
          0.00000000D+00  0.00000000D+00
      Number of function calls:      NFUNC =      12
      Number of gradient calls:      NGRAD =       8
      Number of calls of QP solver:  NQL   =       8


              *****   Completed CALL to NLPQLP   *****


          *****   Number of Function Evaluations =     28   *****


  *****   Solution Control Vector for Case Number   30   *****

  Element    CVL              CV               CVU              CV - CV0

      1    -0.10000000D+02    0.59647888D+00   0.10000000D+02    0.59647888D+00
      2    -0.10000000D+02   -0.80307787D+00   0.10000000D+02   -0.80307787D+00




  *****   Predicted Measurement Vector EC   *****

    -0.10870661D-05      0.82087319D-05


  *****   NLP Solution Performance Index  =   0.68563959D-10   *****




  *****   Predicted Measurement Vector EC   *****

     0.37971539D-05     -0.73583681D-05


  *****   NLP Solution Performance Index  =   0.68563959D-10   *****




  *****   Predicted Control Amplitude Vector (A)
              Its Limits (AL & AU), and Its Phase Angle
                            Vector (PHASE) Before Compression   *****

  Element    AL               A                AU               PHASE

      1     0.00000000D+00    0.10003605D+01   0.10000000D+02    0.14339721D+03


  *****   No Constraints are Specified for Case Number   30   *****



              **********   End Case Number   30   **********
```