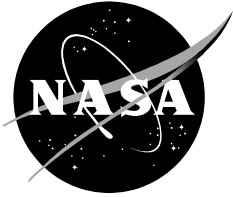


NASA/TM—2016–219104



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

## **Appendix E: Cases Run on the Hewlett-Packard Alpha Mainframe Computer**

*Jane Anne Leyland  
Ames Research Center  
Moffett Field, California*

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**May 2016**

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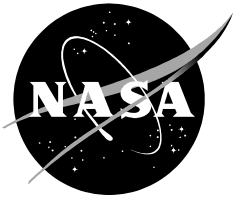
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# **Use of the NLP10x10 Sequential Quadratic Programming Algorithm to Solve Rotorcraft Hub Loads Minimisation Problems**

## **Appendix E: Cases Run on the Hewlett-Packard Alpha Mainframe Computer**

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**May 2016**

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## **E.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**





\*\*\*\*\* INPUT \*\*\*\*\* INPUT \*\*\*\*\*

\$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,  
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,

! 12345678901234567890123456789012345678901234567890123456789012345678901234567890

! TO (1,1) = -90.74040, 119.70700, 122.38400, 78.72380, -69.68640,  
TO (6,1) = 66.34010, -40.05610, 20.25200, 29.75040, 24.36730,  
TO (1,2) = -135.69100, 79.44860, 87.60420, 115.95000, -47.75700,  
TO (6,2) = 79.13310, -30.01580, 33.37590, 38.47500, 13.77080,  
TO (1,3) = -114.32000, 47.68370, 60.60960, 95.79040, -56.22380,  
TO (6,3) = 49.49840, -24.87710, 3.77782, 24.54600, -6.34307,  
TO (1,4) = -68.17730, 51.47110, 64.58900, 53.42570, -30.91670,  
TO (6,4) = 80.52170, -8.45332, 54.59550, 66.75300, -12.35370,  
TO (1,5) = -50.03930, 63.86900, 76.58370, 37.28330, 44.63530,  
TO (6,5) = 79.28500, -5.47938, 73.25790, 123.17900, -16.06650,  
TO (1,6) = -76.47950, 107.92800, 113.11600, 66.38840, -48.84220,  
TO (6,6) = 155.67100, -59.09700, 67.74370, 73.07250, 85.04140,  
TO (1,7) = -143.274, 110.904, 110.159, 131.805, -89.7837,  
TO (6,7) = 253.607, 17.6567, 49.4077, 19.5904, 70.4063,  
TO (1,8) = -137.09, 35.3513, 41.2782, 111.293, -240.311,  
TO (6,8) = 32.0795, -49.5137, 88.9283, 0.494424, -9.84387,  
TO (1,9) = -120.269, 35.5072, 40.179, 68.5191, -148.798,  
TO (6,9) = 67.0002, -82.3286, 119.065, -13.4636, -73.7842,  
TO (1,10) = -35.6918, 52.9199, 96.5716, 18.697, -48.3614,  
TO (6,10) = -20.1547, -115.603, -21.8472, 119.166, -50.0921,

! MULT = 1,

```
MULT      =      0,
!
! ***** End of Case 1 Input Data *****
!
$END
```

```
***** OUTPUT ***** OUTPUT *****
```

RUN the NLP10x10 Case.

START RUN.

```
*****
```

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

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

```
&CDATA
A00      = 6*1.0000000000000000 ,
ACC      = 1.0000000000000000E-007,
ACCQP    = 1.0000000000000000E-012,
AL0      = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA    = 1.0000000000000000 ,
APRV0    = 6*0.0000000000000000E+000 ,
AU0      = 5*10.0000000000000000 , 3.0000000000000000 ,
CRAN1    = 2.0000000000000000 ,
CRAN2    = 3.0000000000000000 ,
CRAN3    = 1.0000000000000000 ,
CRAN4    = 1.0000000000000000 ,
CV00     = 14*0.0000000000000000E+000 ,
CVOUT    = 0,
CVPRV0   = 14*0.0000000000000000E+000 ,
ECPRV0   = -95.504700000000000 , 75.647200000000000 , 84.882200000000000 ,
80.737600000000000 ,
-65.848100000000000 , 77.724100000000000 , -37.301000000000000 ,
31.399400000000000 , 43.590700000000000 ,
12.152200000000000 ,
EPS      = 1.0000000000000000E-007,
ICASE    = 1,
ICYCLO   = 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  = 0.0000000000000000E+000,
MODE     = 0,
MSAVE0   = 10*1,
MULT     = 0,
NSAVE0   = 10*1,
NX0      = 10,
NZ0      = 10,
```

```

OPTEND = 3,
PHASEO = 6*90.000000000000000 ,
PHSPRVO = 6*0.000000000000000E+000 ,
RHOB = 100.000000000000000 ,
STPMIN = 0.000000000000000E+000,
T0 = -90.740400000000000 , 119.707000000000000 , 122.384000000000000 ,
78.723800000000000 ,
-69.686400000000000 , 66.340100000000000 , -40.056100000000000 ,
20.252000000000000 , 29.750400000000000 ,
24.367300000000000 , -135.691000000000000 , 79.448600000000000 ,
87.604200000000000 , 115.950000000000000 ,
-47.757000000000000 , 79.133100000000000 , -30.015800000000000 ,
33.375900000000000 , 38.475000000000000 ,
13.770800000000000 , -114.320000000000000 , 47.683700000000000 ,
60.609600000000000 , 95.790400000000000 ,
-56.223800000000000 , 49.498400000000000 , -24.877100000000000 ,
3.777820000000000 , 24.546000000000000 ,
-6.343070000000000 , -68.177300000000000 , 51.471100000000000 ,
64.589000000000000 , 53.425700000000000 ,
-30.916700000000000 , 80.521700000000000 , -8.453320000000000 ,
54.595500000000000 , 66.753000000000000 ,
-12.353700000000000 , -50.039300000000000 , 63.869000000000000 ,
76.583700000000000 , 37.283300000000000 ,
44.635300000000000 , 79.285000000000000 , -5.479380000000000 ,
73.257900000000000 , 123.179000000000000 ,
-16.066500000000000 , -76.479500000000000 , 107.928000000000000 ,
113.116000000000000 , 66.388400000000000 ,
-48.842200000000000 , 155.671000000000000 , -59.097000000000000 ,
67.743700000000000 , 73.072500000000000 ,
85.041400000000000 , -143.274000000000000 , 110.904000000000000 ,
110.159000000000000 , 131.805000000000000 ,
-89.783700000000000 , 253.607000000000000 , 17.656700000000000 ,
49.407700000000000 , 19.590400000000000 ,
70.406300000000000 , -137.090000000000000 , 35.351300000000000 ,
41.278200000000000 , 111.293000000000000 ,
-240.311000000000000 , 32.079500000000000 , -49.513700000000000 ,
88.928300000000000 , 0.494424000000000 ,
-9.843870000000000 , -120.269000000000000 , 35.507200000000000 ,
40.179000000000000 , 68.519100000000000 ,
-148.798000000000000 , 67.000200000000000 , -82.328600000000000 ,
119.065000000000000 , -13.463600000000000 ,
-73.784200000000000 , -35.691800000000000 , 52.919900000000000 ,
96.571600000000000 , 18.697000000000000 ,
-48.361400000000000 , -20.154700000000000 , -115.603000000000000 , -
21.847200000000000 , 119.166000000000000 ,
-50.092100000000000 ,
WDT0 = 10*1.000000000000000 ,
WDX = 10*0.000000000000000E+000 ,
WX = 10*0.000000000000000E+000 ,
WZ = 10*1.000000000000000 ,
/

```

\*\*\*\*\*

\*\*\*\*\* 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
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

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 -0.50039300D+02 -0.12026900D+03	-0.13569100D+03 -0.76479500D+02 -0.35691800D+02	-0.11432000D+03 -0.14327400D+03	-0.68177300D+02 -0.13709000D+03
T0 2	0.11970700D+03 0.63869000D+02 0.35507200D+02	0.79448600D+02 0.10792800D+03 0.52919900D+02	0.47683700D+02 0.11090400D+03	0.51471100D+02 0.35351300D+02
T0 3	0.12238400D+03 0.76583700D+02 0.40179000D+02	0.87604200D+02 0.11311600D+03 0.96571600D+02	0.60609600D+02 0.11015900D+03	0.64589000D+02 0.41278200D+02
T0 4	0.78723800D+02 0.37283300D+02 0.68519100D+02	0.11595000D+03 0.66388400D+02 0.18697000D+02	0.95790400D+02 0.13180500D+03	0.53425700D+02 0.11129300D+03
T0 5	-0.69686400D+02 0.44635300D+02 -0.14879800D+03	-0.47757000D+02 -0.48842200D+02 -0.48361400D+02	-0.56223800D+02 -0.89783700D+02	-0.30916700D+02 -0.24031100D+03
T0 6	0.66340100D+02 0.79285000D+02 0.67000200D+02	0.79133100D+02 0.15567100D+03 -0.20154700D+02	0.49498400D+02 0.25360700D+03	0.80521700D+02 0.32079500D+02
T0 7	-0.40056100D+02 -0.54793800D+01 -0.82328600D+02	-0.30015800D+02 -0.59097000D+02 -0.11560300D+03	-0.24877100D+02 0.17656700D+02	-0.84533200D+01 -0.49513700D+02
T0 8	0.20252000D+02 0.73257900D+02 0.11906500D+03	0.33375900D+02 0.67743700D+02 -0.21847200D+02	0.37778200D+01 0.49407700D+02	0.54595500D+02 0.88928300D+02
T0 9	0.29750400D+02 0.12317900D+03 -0.13463600D+02	0.38475000D+02 0.73072500D+02 0.11916600D+03	0.24546000D+02 0.19590400D+02	0.66753000D+02 0.49442400D+00
T0 10	0.24367300D+02 -0.16066500D+02 -0.73784200D+02	0.13770800D+02 0.85041400D+02 -0.50092100D+02	-0.63430700D+01 0.70406300D+02	-0.12353700D+02 -0.98438700D+01

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

EC0	-0.95504700D+02 -0.65848100D+02 0.43590700D+02	0.75647200D+02 0.77724100D+02 0.12152200D+02	0.84882200D+02 -0.37301000D+02	0.80737600D+02 0.31399400D+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 -0.65848100D+02 0.43590700D+02	0.75647200D+02 0.77724100D+02 0.12152200D+02	0.84882200D+02 -0.37301000D+02	0.80737600D+02 0.31399400D+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
	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
	-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	*****	
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	*****	
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 *****
***** Completed CALL to NLPQLP *****
***** Completed CALL to NLPQLP *****
***** Completed CALL to NLPQLP *****
***** Completed CALL to NLPQLP *****
***** Completed CALL to NLPQLP *****
19  0.32054598D-06  0.00D+00  0 23  0.20D-09  0.00D+00  0.43D-07

```

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

```

Objective function value:      F(X)  =  0.32054598D-06
Solution values:              X      =
-0.16092618D+00 -0.33315546D+00  0.76025432D-01  0.23350939D+00
-0.15603567D+00 -0.19430960D-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 =    71
Number of gradient calls:      NGRAD =    19
Number of calls of QP solver:  NQL   =    19

```

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

\*\*\*\*\* Number of Function Evaluations = 261 \*\*\*\*\*

\*\*\*\*\* 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	-0.33315546D+00	0.10000000D+02	-0.33315546D+00
3	-0.10000000D+02	0.76025432D-01	0.10000000D+02	0.76025432D-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	-0.19430960D-02	0.10000000D+02	-0.19430960D-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 \*\*\*\*\*

-0.14318241D-03	-0.33053382D-03	0.38425255D-03	-0.10159093D-03
0.77942051D-04	-0.38764951D-04	0.59293608D-04	0.15374546D-04
-0.14208895D-03	-0.55369979D-05		

\*\*\*\*\* NLP Solution Performance Index = 0.32054598D-06 \*\*\*\*\*

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

```

-0.13961323D-03    -0.33582581D-03    0.37459539D-03    -0.10346063D-03
0.82778191D-04    -0.36749481D-04    0.70853908D-04    0.17559266D-04
-0.15400555D-03    -0.52778794D-06

```

\*\*\*\*\* NLP Solution Performance Index = 0.32054598D-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	0.18034090D+02
3	0.00000000D+00	0.15604777D+00	0.10000000D+02	-0.90713462D+02
4	0.00000000D+00	0.22791499D+00	0.10000000D+02	-0.12191830D+03
5	0.00000000D+00	0.17240108D+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-02	-0.13809153D-01	0.15251641D-01	-0.93829020D-02
	0.68455376D-02	0.24962517D-02	-0.52468915D-03	0.47670393D-03

10	0.10354692D-02	-0.24530879D-02		
	-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	0.43200998D-11	-0.34106051D-11	-0.52011728D-11
	0.17053026D-11	-0.14210855D-11	0.40358827D-11	0.15631940D-12
	-0.14210855D-12	0.96633812D-12		
2	-0.15916157D-11	0.10000000D+01	-0.68212103D-11	-0.63948846D-11
	0.22168933D-11	-0.26716407D-11	0.46611603D-11	0.41211479D-12
	-0.99475983D-13	0.18758328D-11		
3	-0.99475983D-12	0.70485839D-11	0.10000000D+01	-0.56559202D-11
	0.13926638D-11	-0.19895197D-11	0.36664005D-11	0.31263880D-12
	-0.17053026D-12	0.15347723D-11		
4	-0.73896445D-12	0.34106051D-11	-0.36379788D-11	0.10000000D+01
	0.16484591D-11	-0.11368684D-11	0.28705927D-11	0.19184654D-12
	-0.49737992D-13	0.79580786D-12		
5	-0.71054274D-12	0.36379788D-11	-0.20463631D-11	-0.47748472D-11
	0.10000000D+01	-0.11937118D-11	0.22737368D-11	0.18474111D-12
	-0.28421709D-13	0.85265128D-12		
6	-0.14210855D-11	0.63664629D-11	-0.56843419D-11	-0.69064754D-11
	0.17621460D-11	0.10000000D+01	0.47180038D-11	0.14210855D-12
	-0.15631940D-12	0.20463631D-11		
7	-0.14779289D-11	0.86401997D-11	-0.12505552D-10	-0.86046725D-11
	0.32400749D-11	-0.26716407D-11	0.10000000D+01	0.40500936D-12
	0.35527137D-13	0.17337243D-11		
8	-0.14779289D-11	0.65938366D-11	-0.65938366D-11	-0.62527761D-11
	0.17905677D-11	-0.19326762D-11	0.46043169D-11	0.10000000D+01
	-0.42632564D-13	0.15347723D-11		
9	-0.13073986D-11	0.22737368D-11	-0.50022209D-11	-0.50874860D-11
	0.16200374D-11	-0.19895197D-11	0.35242920D-11	0.32684966D-12
	0.10000000D+01	0.13073986D-11		
10	-0.62527761D-12	0.18189894D-11	-0.27284841D-11	-0.30269121D-11
	0.68212103D-12	-0.68212103D-12	0.22737368D-11	0.56843419D-13
	-0.14210855D-13	0.10000000D+01		

Row	*****	[FF] = The Identity Matrix	[DD] [DUMXX1]	*****
1	0.10000000D+01	0.17053026D-12	0.22737368D-12	-0.56843419D-13
	0.17053026D-12	0.28421709D-12	0.48316906D-12	-0.22737368D-12
	0.17053026D-12	0.56843419D-13		
2	-0.90949470D-12	0.10000000D+01	-0.13642421D-11	-0.68212103D-12
	0.00000000D+00	-0.15916157D-11	-0.90949470D-12	-0.36379788D-11
	-0.25011104D-11	-0.45474735D-12		
3	0.31832315D-11	0.34106051D-11	0.10000000D+01	0.27284841D-11
	0.90949470D-12	0.61390892D-11	0.93223207D-11	0.34106051D-11
	0.47748472D-11	0.45474735D-12		
4	0.71054274D-13	0.12079227D-12	-0.11013412D-11	0.10000000D+01
	0.00000000D+00	-0.47606363D-12	-0.24584779D-11	-0.32684966D-12
	0.21316282D-12	0.56843419D-13		
5	0.56843419D-13	0.65369932D-12	-0.28421709D-12	-0.17053026D-12
	0.10000000D+01	-0.34106051D-12	0.85265128D-13	-0.34106051D-12
	-0.22737368D-12	0.17053026D-12		
6	0.34106051D-12	0.51159077D-12	0.28421709D-12	0.73896445D-12
	0.28421709D-12	0.10000000D+01	0.85265128D-12	0.34106051D-12
	0.11937118D-11	0.22737368D-12		
7	0.22737368D-12	-0.45474735D-12	-0.11368684D-12	-0.14210855D-12
	0.28421709D-12	0.17053026D-12	0.10000000D+01	-0.17053026D-12
	-0.56843419D-13	-0.11368684D-12		
8	0.14210855D-13	-0.18474111D-12	-0.56843419D-13	0.71054274D-13
	-0.14210855D-13	-0.99475983D-13	0.71054274D-14	0.10000000D+01
	-0.71054274D-13	-0.56843419D-13		
9	-0.25579538D-12	-0.15631940D-12	-0.63948846D-13	-0.13500312D-12
	-0.12789769D-12	-0.14210855D-12	-0.34816594D-12	-0.24158453D-12
	0.10000000D+01	-0.85265128D-13		
10	0.45474735D-12	-0.17053026D-12	0.39790393D-12	0.56843419D-13
	0.17053026D-12	0.56843419D-12	0.48316906D-12	0.00000000D+00
	-0.11368684D-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	-0.33315546D+00	1	0.36998621D+00	-0.15421777D+03
3	0.76025432D-01			
4	0.23350939D+00	2	0.24557382D+00	0.18034090D+02
5	-0.15603567D+00			
6	-0.19430960D-02	3	0.15604777D+00	-0.90713462D+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	0.17240108D+00	-0.17449486D+03

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

Element	[EC] = [ZZ]
1	0.34556535D-09
2	-0.13503154D-09
3	-0.18047785D-09
4	-0.28747138D-09
5	0.19440449D-09
6	-0.13666579D-09
7	0.87602814D-10
8	0.64030559D-10
9	-0.86160412D-10
10	0.15676349D-10

\*\*\*\*\* Regulator Solution Performance Index = 0.32877516D-18 \*\*\*\*\*

\*\*\*\*\* End Case Number 1 \*\*\*\*\*

END of RUN.

\*\*\*\*\* END \*\*\*\*\*



## E.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**



\*\*\*\*\* INPUT \*\*\*\*\* INPUT \*\*\*\*\*

\$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,

! 2345678901234567890123456789012345678901234567890123456789012345678901234567890  
 !

TO(1,1)	=	-90.74040,	119.70700,	122.38400,	78.72380,	-69.68640,
TO(6,1)	=	66.34010,	-40.05610,	20.25200,	29.75040,	24.36730,
TO(1,2)	=	-135.69100,	79.44860,	87.60420,	115.95000,	-47.75700,
TO(6,2)	=	79.13310,	-30.01580,	33.37590,	38.47500,	13.77080,
TO(1,3)	=	-114.32000,	47.68370,	60.60960,	95.79040,	-56.22380,
TO(6,3)	=	49.49840,	-24.87710,	3.77782,	24.54600,	-6.34307,
TO(1,4)	=	-68.17730,	51.47110,	64.58900,	53.42570,	-30.91670,
TO(6,4)	=	80.52170,	-8.45332,	54.59550,	66.75300,	-12.35370,
TO(1,5)	=	-50.03930,	63.86900,	76.58370,	37.28330,	44.63530,
TO(6,5)	=	79.28500,	-5.47938,	73.25790,	123.17900,	-16.06650,
TO(1,6)	=	-76.47950,	107.92800,	113.11600,	66.38840,	-48.84220,
TO(6,6)	=	155.67100,	-59.09700,	67.74370,	73.07250,	85.04140,
TO(1,7)	=	-143.274,	110.904,	110.159,	131.805,	-89.7837,
TO(6,7)	=	253.607,	17.6567,	49.4077,	19.5904,	70.4063,
TO(1,8)	=	-137.09,	35.3513,	41.2782,	111.293,	-240.311,
TO(6,8)	=	32.0795,	-49.5137,	88.9283,	0.494424,	-9.84387,
TO(1,9)	=	-120.269,	35.5072,	40.179,	68.5191,	-148.798,
TO(6,9)	=	67.0002,	-82.3286,	119.065,	-13.4636,	-73.7842,
TO(1,10)	=	-35.6918,	52.9199,	96.5716,	18.697,	-48.3614,
TO(6,10)	=	-20.1547,	-115.603,	-21.8472,	119.166,	-50.0921,

! MULT = 1,

```

MULT      =      0,
!
! ***** End of Case 10 Input Data *****
!
$END

```

```

*****      OUTPUT      *****      OUTPUT      *****

```

RUN the NLP10x10 Case.

START RUN.

```

*****

```

```

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

```

```

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

```

```

&CDATA
A00      = 6*1.0000000000000000 ,
ACC      = 1.0000000000000000E-007,
ACCQP    = 1.0000000000000000E-012,
AL0      = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA    = 1.0000000000000000 ,
APRV0    = 6*0.0000000000000000E+000 ,
AU0      = 5*10.0000000000000000 , 3.0000000000000000 ,
CRAN1    = 2.0000000000000000 ,
CRAN2    = 3.0000000000000000 ,
CRAN3    = 1.0000000000000000 ,
CRAN4    = 1.0000000000000000 ,
CV00     = 14*0.0000000000000000E+000 ,
CVOUT    = 0,
CVPRV0   = 14*0.0000000000000000E+000 ,
ECPRV0   = -95.504700000000000 , 75.647200000000000 , 84.882200000000000 ,
80.737600000000000 ,
-65.848100000000000 , 77.724100000000000 , -37.301000000000000 ,
31.399400000000000 , 43.590700000000000 ,
12.152200000000000 ,
EPS      = 1.0000000000000000E-007,
ICASE    = 10,
ICYCLO   = 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  = 0.0000000000000000E+000,
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*90.0000000000000000 ,
PHSPRV0  = 6*0.0000000000000000E+000 ,
RHOB     = 100.0000000000000000 ,
STPMIN   = 0.0000000000000000E+000,
T0       = -90.7404000000000000 , 119.7070000000000000 , 122.3840000000000000 ,
78.7238000000000000 ,
-69.6864000000000000 , 66.3401000000000000 , -40.0561000000000000 ,
20.2520000000000000 , 29.7504000000000000 ,
24.3673000000000000 , -135.6910000000000000 , 79.4486000000000000 ,
87.6042000000000000 , 115.9500000000000000 ,
-47.7570000000000000 , 79.1331000000000000 , -30.0158000000000000 ,
33.3759000000000000 , 38.4750000000000000 ,
13.7708000000000000 , -114.3200000000000000 , 47.6837000000000000 ,
60.6096000000000000 , 95.7904000000000000 ,
-56.2238000000000000 , 49.4984000000000000 , -24.8771000000000000 ,
3.7778200000000000 , 24.5460000000000000 ,
-6.3430700000000000 , -68.1773000000000000 , 51.4711000000000000 ,
64.5890000000000000 , 53.4257000000000000 ,
-30.9167000000000000 , 80.5217000000000000 , -8.4533200000000000 ,
54.5955000000000000 , 66.7530000000000000 ,
-12.3537000000000000 , -50.0393000000000000 , 63.8690000000000000 ,
76.5837000000000000 , 37.2833000000000000 ,
44.6353000000000000 , 79.2850000000000000 , -5.4793800000000000 ,
73.2579000000000000 , 123.1790000000000000 ,
-16.0665000000000000 , -76.4795000000000000 , 107.9280000000000000 ,
113.1160000000000000 , 66.3884000000000000 ,
-48.8422000000000000 , 155.6710000000000000 , -59.0970000000000000 ,
67.7437000000000000 , 73.0725000000000000 ,
85.0414000000000000 , -143.2740000000000000 , 110.9040000000000000 ,
110.1590000000000000 , 131.8050000000000000 ,
-89.7837000000000000 , 253.6070000000000000 , 17.6567000000000000 ,
49.4077000000000000 , 19.5904000000000000 ,
70.4063000000000000 , -137.0900000000000000 , 35.3513000000000000 ,
41.2782000000000000 , 111.2930000000000000 ,
-240.3110000000000000 , 32.0795000000000000 , -49.5137000000000000 ,
88.9283000000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.2690000000000000 , 35.5072000000000000 ,
40.1790000000000000 , 68.5191000000000000 ,
-148.7980000000000000 , 67.0002000000000000 , -82.3286000000000000 ,
119.0650000000000000 , -13.4636000000000000 ,
-73.7842000000000000 , -35.6918000000000000 , 52.9199000000000000 ,
96.5716000000000000 , 18.6970000000000000 ,
-48.3614000000000000 , -20.1547000000000000 , -115.6030000000000000 ,
21.8472000000000000 , 119.1660000000000000 ,
-50.0921000000000000 ,
WDT0     = 10*1.0000000000000000 ,
WDX      = 10*0.0000000000000000E+000 ,
WX       = 10*0.0000000000000000E+000 ,
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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+02
5	-0.1000000D+02	0.0000000D+00	0.1000000D+02
6	-0.1000000D+02	0.0000000D+00	0.1000000D+02
7	-0.1000000D+02	0.0000000D+00	0.1000000D+02
8	-0.1000000D+02	0.0000000D+00	0.1000000D+02
9	-0.1000000D+02	0.0000000D+00	0.1000000D+02
10	-0.1000000D+02	0.0000000D+00	0.1000000D+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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
1	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
4	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+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 10 \*\*\*\*\*

Specification of CV, T-matrix, and EC Compression

MSAVE0/MSAVE

1	1	1	1	1	1	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	1	1	0	0	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

\*\*\*\*\* 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	0.19685857D+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
-0.93439145D+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	-0.38984240D+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 \*\*\*\*\*

END of RUN.

\*\*\*\*\* END \*\*\*\*\*

### E.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)].



\*\*\*\*\* INPUT \*\*\*\*\* INPUT \*\*\*\*\*

\$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,  
ALO = 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, 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,

!  
! 2345678901234567890123456789012345678901234567890123456789012345678901234567890

!  
! TO(1,1) = -90.74040, 119.70700, 122.38400, 78.72380, -69.68640,  
! TO(6,1) = 66.34010, -40.05610, 20.25200, 29.75040, 24.36730,  
! TO(1,2) = -135.69100, 79.44860, 87.60420, 115.95000, -47.75700,  
! TO(6,2) = 79.13310, -30.01580, 33.37590, 38.47500, 13.77080,  
! TO(1,3) = -114.32000, 47.68370, 60.60960, 95.79040, -56.22380,  
! TO(6,3) = 49.49840, -24.87710, 3.77782, 24.54600, -6.34307,  
! TO(1,4) = -68.17730, 51.47110, 64.58900, 53.42570, -30.91670,  
! TO(6,4) = 80.52170, -8.45332, 54.59550, 66.75300, -12.35370,  
! TO(1,5) = -50.03930, 63.86900, 76.58370, 37.28330, 44.63530,  
! TO(6,5) = 79.28500, -5.47938, 73.25790, 123.17900, -16.06650,  
! TO(1,6) = -76.47950, 107.92800, 113.11600, 66.38840, -48.84220,  
! TO(6,6) = 155.67100, -59.09700, 67.74370, 73.07250, 85.04140,  
! TO(1,7) = -143.274, 110.904, 110.159, 131.805, -89.7837,  
! TO(6,7) = 253.607, 17.6567, 49.4077, 19.5904, 70.4063,  
! TO(1,8) = -137.09, 35.3513, 41.2782, 111.293, -240.311,  
! TO(6,8) = 32.0795, -49.5137, 88.9283, 0.494424, -9.84387,  
! TO(1,9) = -120.269, 35.5072, 40.179, 68.5191, -148.798,  
! TO(6,9) = 67.0002, -82.3286, 119.065, -13.4636, -73.7842,  
! TO(1,10) = -35.6918, 52.9199, 96.5716, 18.697, -48.3614,  
! TO(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

\*\*\*\*\* OUTPUT \*\*\*\*\* OUTPUT \*\*\*\*\*

RUN the NLP10x10 Case.

START RUN.

\*\*\*\*\*

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

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

&CDATA  
A00 = 6\*1.0000000000000000 ,  
ACC = 1.0000000000000000E-007,  
ACCQP = 1.0000000000000000E-012,  
AL0 = 5\*0.0000000000000000E+000 , -1.0000000000000000E-007,  
ALPHA = 1.0000000000000000 ,  
APRV0 = 6\*0.0000000000000000E+000 ,  
AU0 = 5\*10.0000000000000000 , 3.0000000000000000 ,  
CRAN1 = 2.0000000000000000 ,  
CRAN2 = 3.0000000000000000 ,  
CRAN3 = 1.0000000000000000 ,  
CRAN4 = 1.0000000000000000 ,  
CV00 = 14\*0.0000000000000000E+000 ,  
CVOUT = 0 ,  
CVPRV0 = 14\*0.0000000000000000E+000 ,  
ECPRV0 = -95.5047000000000000 , 75.6472000000000000 , 84.8822000000000000 ,  
80.7376000000000000 ,  
-65.8481000000000000 , 77.7241000000000000 , -37.3010000000000000 ,  
31.3994000000000000 , 43.5907000000000000 ,  
12.1522000000000000 ,  
EPS = 1.0000000000000000E-007,  
ICASE = 20,  
ICYCLO = 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 = 0.0000000000000000E+000,  
MODE = 0,  
MSAVE0 = 1, 4\*0, 5\*1,  
MULT = 1,  
NSAVE0 = 2\*0, 1, 2\*0, 5\*1,  
NX0 = 10,



\*\*\*\*\* 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	1	0	0	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	1	1	0	0	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
(WDIT) for the Performance Index (F)    ****
WDIT  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	0.30802932D+02	0.00D+00	0	3	0.12D+00	0.00D+00	0.62D+02
	*****	Completed	CALL	to	NLPQLP	*****	
	*****	Completed	CALL	to	NLPQLP	*****	
5	0.78886964D-03	0.00D+00	0	1	0.10D+01	0.00D+00	0.16D-02
	*****	Completed	CALL	to	NLPQLP	*****	
	*****	Completed	CALL	to	NLPQLP	*****	
6	0.13390016D-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 0.46965991D-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*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 5*10.0000000000000000 , 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 1020,
ICYCLO = 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 = 0.0000000000000000E+000,
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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0 = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	1	0	0	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	1	1	0	0	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 *****					
ECPRVTT		-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			*****	
	*****	Completed	CALL			*****	
	*****	Completed	CALL			*****	
2	0.10206658D+05	0.00D+00	0	2	0.10D+00	0.00D+00	0.23D+05
	*****	Completed	CALL			*****	
	*****	Completed	CALL			*****	
3	0.23646710D+02	0.13D+01	1	1	0.10D+01	0.00D+00	0.77D+03
	*****	Completed	CALL			*****	
	*****	Completed	CALL			*****	
	*****	Completed	CALL			*****	
	*****	Completed	CALL			*****	
4	0.25742226D+02	0.00D+00	0	3	0.11D+00	0.00D+00	0.52D+02
	*****	Completed	CALL			*****	
	*****	Completed	CALL			*****	
5	0.78886926D-03	0.00D+00	0	1	0.10D+01	0.00D+00	0.16D-02
	*****	Completed	CALL			*****	
	*****	Completed	CALL			*****	
6	0.12610533D-06	0.00D+00	0	1	0.10D+01	0.00D+00	0.15D-06
	*****	Completed	CALL			*****	
	*****	Completed	CALL			*****	
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 \*\*\*\*\*

0.83148244D-04      0.95368095D-04

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

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

0.11745420D-03      0.46955475D-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*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 8.0000000000000000 , 2*10.0000000000000000 ,
3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 820,
ICYCLO = 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 = 0.0000000000000000E+000,
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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.843870000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDTO = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.8000000D+01	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+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	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0

NSAVE0/NSAVE

	0	0	0	0	1	1	0	0	0	0	0	0
0	0	0	0	1	1	0	0	0	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	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	*****		
ECPRVTT	-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	0.38949700D+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	0.89D-14	1	1	0.10D+01	0.00D+00	0.73D-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) =
-0.88817842D-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	-0.88817842D-14	0.80000000D+01	0.80000000D+01

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

\*\*\*\*\*

\*\*\*\*\* Start Case Number 620 \*\*\*\*\*

\*\*\*\*\* INPUT DATA for Case Number 620 \*\*\*\*\*

```
&CDATA
A00 = 5*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 6.0000000000000000 , 2*10.0000000000000000 ,
3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 620,
ICYCLO = 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 = 0.0000000000000000E+000,
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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0 = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	1	0	0	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	0	1	1	0	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 0.44635300D+02 -0.14879800D+03	-0.47757000D+02 -0.48842200D+02 -0.48361400D+02	-0.56223800D+02 -0.89783700D+02	-0.30916700D+02 -0.24031100D+03
T0	6	0.66340100D+02 0.79285000D+02 0.67000200D+02	0.79133100D+02 0.15567100D+03 -0.20154700D+02	0.49498400D+02 0.25360700D+03	0.80521700D+02 0.32079500D+02
T0	7	-0.40056100D+02 -0.54793800D+01 -0.82328600D+02	-0.30015800D+02 -0.59097000D+02 -0.11560300D+03	-0.24877100D+02 0.17656700D+02	-0.84533200D+01 -0.49513700D+02
T0	8	0.20252000D+02 0.73257900D+02 0.11906500D+03	0.33375900D+02 0.67743700D+02 -0.21847200D+02	0.37778200D+01 0.49407700D+02	0.54595500D+02 0.88928300D+02
T0	9	0.29750400D+02 0.12317900D+03 -0.13463600D+02	0.38475000D+02 0.73072500D+02 0.11916600D+03	0.24546000D+02 0.19590400D+02	0.66753000D+02 0.49442400D+00
T0	10	0.24367300D+02 -0.16066500D+02 -0.73784200D+02	0.13770800D+02 0.85041400D+02 -0.50092100D+02	-0.63430700D+01 0.70406300D+02	-0.12353700D+02 -0.98438700D+01
***** Initial End Conditions Vector (EC0) *****					
EC0		-0.95504700D+02 -0.65848100D+02 0.43590700D+02	0.75647200D+02 0.77724100D+02 0.12152200D+02	0.84882200D+02 -0.37301000D+02	0.80737600D+02 0.31399400D+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 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 0.00000000D+00 0.00000000D+00
***** Initial Previous Cycle End Conditions Vector (ECPRV0) *****					
ECPRV0		-0.95504700D+02 -0.65848100D+02 0.43590700D+02	0.75647200D+02 0.77724100D+02 0.12152200D+02	0.84882200D+02 -0.37301000D+02	0.80737600D+02 0.31399400D+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 (ECPRVT)			
	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	0.16635704D+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) =  
-0.90665253D-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 \*\*\*\*\*



\*\*\*\*\* Start Case Number 420 \*\*\*\*\*

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

```
&CDATA
A00 = 5*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 4.0000000000000000 , 2*10.0000000000000000
, 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 420,
ICYCLO = 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 = 0.0000000000000000E+000,
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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```



```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0 = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.4000000D+01	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+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	1	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0

NSAVE0/NSAVE

0	0	0	0	1	1	0	0	0	0	0	0
0	0	0	0	1	1	0	0	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		
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 *****				
ECPRVTT	-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	0.75D-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)  =
-0.28261837D-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	-0.28261837D-11	0.40000000D+01	0.40000000D+01

\*\*\*\*\* End Case Number 420 \*\*\*\*\*

\*\*\*\*\*



\*\*\*\*\* Start Case Number 220 \*\*\*\*\*

\*\*\*\*\* INPUT DATA for Case Number 220 \*\*\*\*\*

```
&CDATA
A00 = 5*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 2.0000000000000000 , 2*10.0000000000000000
, 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 220,
ICYCLO = 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 = 0.0000000000000000E+000,
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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0 = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.2000000D+01	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+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	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0

NSAVE0/NSAVE

	0		0		1	1		0		0		0
0	0	0	0	1	1	0	0	0	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		
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	0.61D-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) =
-0.16156187D-09
Multipliers for constraints:   U      =
0.19026639D+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	-0.16156187D-09	0.20000000D+01	0.20000000D+01

\*\*\*\*\* End Case Number 220 \*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\* Start Case Number 120 \*\*\*\*\*

\*\*\*\*\* INPUT DATA for Case Number 120 \*\*\*\*\*

```
&CDATA
A00 = 5*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 1.0000000000000000 , 2*10.0000000000000000
, 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 120,
ICYCLO = 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 = 0.0000000000000000E+000,
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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0 = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.1000000D+01	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+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 ECO, Previous Cycle End Conditions Vector ECPRV0, and Weighting Coefficient Vector WDT0 Before Compression \*\*\*\*\*

Element	ECO	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	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0

NSAVE0/NSAVE

	0	0	0	0	1	1	0	0	0	0	0	0
0	0	0	0	1	1	0	0	0	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)	*****	
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
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) =
-0.24809044D-11
Multipliers for constraints:   U     =
0.30719221D+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    -0.24809044D-11    0.10000000D+01    0.10000000D+01

***** End Case Number 120 *****

*****

```

\*\*\*\*\* Start Case Number 320 \*\*\*\*\*

\*\*\*\*\* INPUT DATA for Case Number 320 \*\*\*\*\*

```
&CDATA
A00 = 5*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 0.3000000000000000 , 2*10.0000000000000000
, 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 320,
ICYCLO = 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 = 0.0000000000000000E+000,
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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.84387000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDTO = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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
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 1 0 0 0 0 0 0 0 0 0 0

NSAVE0/NSAVE

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 -0.54793800D+01 -0.82328600D+02	-0.30015800D+02 -0.59097000D+02 -0.11560300D+03	-0.24877100D+02 0.17656700D+02	-0.84533200D+01 -0.49513700D+02
T0	8	0.20252000D+02 0.73257900D+02 0.11906500D+03	0.33375900D+02 0.67743700D+02 -0.21847200D+02	0.37778200D+01 0.49407700D+02	0.54595500D+02 0.88928300D+02
T0	9	0.29750400D+02 0.12317900D+03 -0.13463600D+02	0.38475000D+02 0.73072500D+02 0.11916600D+03	0.24546000D+02 0.19590400D+02	0.66753000D+02 0.49442400D+00
T0	10	0.24367300D+02 -0.16066500D+02 -0.73784200D+02	0.13770800D+02 0.85041400D+02 -0.50092100D+02	-0.63430700D+01 0.70406300D+02	-0.12353700D+02 -0.98438700D+01
*****		Initial End Conditions Vector (EC0) *****			
EC0		-0.95504700D+02 -0.65848100D+02 0.43590700D+02	0.75647200D+02 0.77724100D+02 0.12152200D+02	0.84882200D+02 -0.37301000D+02	0.80737600D+02 0.31399400D+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 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 0.00000000D+00 0.00000000D+00
*****		Initial Previous Cycle End Conditions Vector (ECPRV0) *****			
ECPRV0		-0.95504700D+02 -0.65848100D+02 0.43590700D+02	0.75647200D+02 0.77724100D+02 0.12152200D+02	0.84882200D+02 -0.37301000D+02	0.80737600D+02 0.31399400D+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 *****
      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	*****	
	*****	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) =
-0.35921266D-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 *****

***** 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     -0.35921266D-12    0.30000000D+00    0.30000000D+00

***** End Case Number 320 *****

END of RUN.

***** END *****

```

## E.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)].



\*\*\*\*\* INPUT \*\*\*\*\* INPUT \*\*\*\*\*

\$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,  
ALO = 0.00, 0.00, 0.00, 0.00, 0.00,  
AUO = 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,  
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,

! 1234567890123456789012345678901234567890123456789012345678901234567890  
!

TO (1,1) = -90.74040, 119.70700, 122.38400, 78.72380, -69.68640,  
TO (6,1) = 66.34010, -40.05610, 20.25200, 29.75040, 24.36730,  
TO (1,2) = -135.69100, 79.44860, 87.60420, 115.95000, -47.75700,  
TO (6,2) = 79.13310, -30.01580, 33.37590, 38.47500, 13.77080,  
TO (1,3) = -114.32000, 47.68370, 60.60960, 95.79040, -56.22380,  
TO (6,3) = 49.49840, -24.87710, 3.77782, 24.54600, -6.34307,  
TO (1,4) = -68.17730, 51.47110, 64.58900, 53.42570, -30.91670,  
TO (6,4) = 80.52170, -8.45332, 54.59550, 66.75300, -12.35370,  
TO (1,5) = -50.03930, 63.86900, 76.58370, 37.28330, 44.63530,  
TO (6,5) = 79.28500, -5.47938, 73.25790, 123.17900, -16.06650,  
TO (1,6) = -76.47950, 107.92800, 113.11600, 66.38840, -48.84220,  
TO (6,6) = 155.67100, -59.09700, 67.74370, 73.07250, 85.04140,  
TO (1,7) = -143.274, 110.904, 110.159, 131.805, -89.7837,  
TO (6,7) = 253.607, 17.6567, 49.4077, 19.5904, 70.4063,  
TO (1,8) = -137.09, 35.3513, 41.2782, 111.293, -240.311,  
TO (6,8) = 32.0795, -49.5137, 88.9283, 0.494424, -9.84387,  
TO (1,9) = -120.269, 35.5072, 40.179, 68.5191, -148.798,  
TO (6,9) = 67.0002, -82.3286, 119.065, -13.4636, -73.7842,  
TO (1,10) = -35.6918, 52.9199, 96.5716, 18.697, -48.3614,  
TO (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,
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

```

\*\*\*\*\* OUTPUT \*\*\*\*\* OUTPUT \*\*\*\*\*

RUN the NLP10x10 Case.

START RUN.

```

*****
***** Start Case Number 25 *****

```

```

***** INPUT DATA for Case Number 25 *****

```

```

&CDATA
A00      = 6*1.0000000000000000 ,
ACC      = 1.0000000000000000E-007,
ACCQP    = 1.0000000000000000E-012,
AL0      = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA    = 1.0000000000000000 ,
APRV0    = 6*0.0000000000000000E+000 ,
AU0      = 5*10.0000000000000000 , 3.0000000000000000 ,
CRAN1    = 2.0000000000000000 ,
CRAN2    = 3.0000000000000000 ,
CRAN3    = 1.0000000000000000 ,
CRAN4    = 1.0000000000000000 ,
CV00     = 14*0.0000000000000000E+000 ,
CVOUT    = 0,
CVPRV0   = 14*0.0000000000000000E+000 ,
ECPRV0   = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS      = 1.0000000000000000E-007,

```



```

ICASE      =      25,
ICYCLO    =     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   = 0.0000000000000000E+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    = 6*90.00000000000000 ,
PHSPRV0   = 6*0.0000000000000000E+000 ,
RHOB      = 100.00000000000000 ,
STPMIN    = 0.0000000000000000E+000,
T0        = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.843870000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 ,
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0     = 10*1.0000000000000000 ,

```

WDX = 10\*0.0000000000000000E+000 ,  
 WX = 10\*0.0000000000000000E+000 ,  
 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 \*\*\*\*\*

Element	ALO	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	0	1	1	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	1	1	0	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  *****

ECPRVTT  -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	*****	
	*****	Completed	CALL	to	NLPQLP	*****	
4	0.57961255D+03	0.00D+00	0	2	0.27D+00	0.00D+00	0.12D+04

```

***** Completed CALL to NLPQLP *****
***** Completed CALL to NLPQLP *****
5  0.10595045D-06  0.00D+00  0  1  0.10D+01  0.00D+00  0.23D-06
***** Completed CALL to NLPQLP *****
***** Completed CALL to NLPQLP *****
6  0.56974686D-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) = 0.56974686D-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 \*\*\*\*\*

0.56108699D-04      -0.50490347D-04

\*\*\*\*\* NLP Solution Performance Index = 0.56974686D-08 \*\*\*\*\*

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

0.16723715D-04      -0.73605611D-04

\*\*\*\*\* NLP Solution Performance Index = 0.56974686D-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*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 5*10.0000000000000000 , 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 1025,
ICYCLO = 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 = 0.0000000000000000E+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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDTO = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	0	1	1	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	1	1	0	0	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 0.44635300D+02 -0.14879800D+03	-0.47757000D+02 -0.48842200D+02 -0.48361400D+02	-0.56223800D+02 -0.89783700D+02	-0.30916700D+02 -0.24031100D+03
T0	6	0.66340100D+02 0.79285000D+02 0.67000200D+02	0.79133100D+02 0.15567100D+03 -0.20154700D+02	0.49498400D+02 0.25360700D+03	0.80521700D+02 0.32079500D+02
T0	7	-0.40056100D+02 -0.54793800D+01 -0.82328600D+02	-0.30015800D+02 -0.59097000D+02 -0.11560300D+03	-0.24877100D+02 0.17656700D+02	-0.84533200D+01 -0.49513700D+02
T0	8	0.20252000D+02 0.73257900D+02 0.11906500D+03	0.33375900D+02 0.67743700D+02 -0.21847200D+02	0.37778200D+01 0.49407700D+02	0.54595500D+02 0.88928300D+02
T0	9	0.29750400D+02 0.12317900D+03 -0.13463600D+02	0.38475000D+02 0.73072500D+02 0.11916600D+03	0.24546000D+02 0.19590400D+02	0.66753000D+02 0.49442400D+00
T0	10	0.24367300D+02 -0.16066500D+02 -0.73784200D+02	0.13770800D+02 0.85041400D+02 -0.50092100D+02	-0.63430700D+01 0.70406300D+02	-0.12353700D+02 -0.98438700D+01
***** Initial End Conditions Vector (EC0) *****					
EC0		-0.95504700D+02 -0.65848100D+02 0.43590700D+02	0.75647200D+02 0.77724100D+02 0.12152200D+02	0.84882200D+02 -0.37301000D+02	0.80737600D+02 0.31399400D+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 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 0.00000000D+00 0.00000000D+00
***** Initial Previous Cycle End Conditions Vector (ECPRV0) *****					
ECPRV0		-0.95504700D+02 -0.65848100D+02 0.43590700D+02	0.75647200D+02 0.77724100D+02 0.12152200D+02	0.84882200D+02 -0.37301000D+02	0.80737600D+02 0.31399400D+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	0.57962684D+03	0.00D+00	0	2	0.27D+00	0.00D+00	0.12D+04
	*****	Completed	CALL	to	NLPQLP	*****	
	*****	Completed	CALL	to	NLPQLP	*****	
5	0.10596380D-06	0.00D+00	0	1	0.10D+01	0.00D+00	0.23D-06
	*****	Completed	CALL	to	NLPQLP	*****	
	*****	Completed	CALL	to	NLPQLP	*****	
6	0.56974692D-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) = 0.56974692D-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
2	-0.10000000D+02	-0.34818226D+01	0.10000000D+02	-0.34818226D+01

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

0.56108700D-04      -0.50490351D-04

\*\*\*\*\* NLP Solution Performance Index = 0.56974692D-08 \*\*\*\*\*

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

0.16723716D-04      -0.73605615D-04

\*\*\*\*\* NLP Solution Performance Index = 0.56974692D-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 \*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\* Start Case Number 525 \*\*\*\*\*

\*\*\*\*\* INPUT DATA for Case Number 525 \*\*\*\*\*

```
&CDATA
A00 = 5*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 5.0000000000000000 , 2*10.0000000000000000
, 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 525,
ICYCLO = 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*,
MAXASUM = 3.0000000000000000 ,
MAXFUN = 30,
MAXIT = 300,
MAXNM = 10,
MI = 1,
MINASUM = 0.0000000000000000E+000,
MODE = 0,
MSAVE0 = 0, 1, 3*, 5*,
MULT = 1,
NSAVE0 = 2*, 1, 2*, 5*,
NX0 = 10,
NZ0 = 10,
OPTEND = 3,
PHASE0 = 5*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0 = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.5000000D+01	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+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 ECO, Previous Cycle End Conditions Vector ECPRV0, and Weighting Coefficient Vector WDT0 Before Compression \*\*\*\*\*

Element	ECO	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	0	0	1	1	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	0	1	1	0	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		
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) =
    -0.40909498D-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	-0.40909498D-11	0.50000000D+01	0.50000000D+01

\*\*\*\*\* End Case Number 525 \*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\* Start Case Number 325 \*\*\*\*\*

\*\*\*\*\* INPUT DATA for Case Number 325 \*\*\*\*\*

```
&CDATA
A00 = 5*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 3.0000000000000000 , 2*10.0000000000000000
, 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 325,
ICYCLO = 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 = 0.0000000000000000E+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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDTO = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.3000000D+01	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+02

5	-0.3000000D+01	0.0000000D+00	0.3000000D+01
6	-0.3000000D+01	0.0000000D+00	0.3000000D+01
7	-0.1000000D+02	0.0000000D+00	0.1000000D+02
8	-0.1000000D+02	0.0000000D+00	0.1000000D+02
9	-0.1000000D+02	0.0000000D+00	0.1000000D+02
10	-0.1000000D+02	0.0000000D+00	0.1000000D+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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
1	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.3000000D+01	0.0000000D+00
3	0.0000000D+00	0.1000000D-06	0.3000000D+01	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
4	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.1000000D-06	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+02
5	-0.3000000D+01	0.0000000D+00	0.3000000D+01
6	-0.3000000D+01	0.0000000D+00	0.3000000D+01
7	-0.1000000D+02	0.0000000D+00	0.1000000D+02
8	-0.1000000D+02	0.0000000D+00	0.1000000D+02
9	-0.1000000D+02	0.0000000D+00	0.1000000D+02
10	-0.1000000D+02	0.0000000D+00	0.1000000D+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	0.1000000D+01
2	0.75647200D+02	0.75647200D+02	0.1000000D+01
3	0.84882200D+02	0.84882200D+02	0.1000000D+01
4	0.80737600D+02	0.80737600D+02	0.1000000D+01
5	-0.65848100D+02	-0.65848100D+02	0.1000000D+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	0	1	1	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	1	1	0	0	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		
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)          *****
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) =
    -0.94987129D-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 \*\*\*\*\*

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*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 1.0000000000000000 , 2*10.0000000000000000
, 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 125,
ICYCLO = 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 = 0.0000000000000000E+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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.843870000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0 = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
WZ = 10*1.0000000000000000
/

```

\*\*\*\*\*

\*\*\*\*\* 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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.1000000D+01	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+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	0	1	1	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	1	1	0	0	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)	*****	
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*0.0000000000000000E+000 , 1.0000000000000000 ,
ACC = 1.0000000000000000E-007,
ACCQP = 1.0000000000000000E-012,
AL0 = 5*0.0000000000000000E+000 , -1.0000000000000000E-007,
ALPHA = 1.0000000000000000 ,
APRV0 = 6*0.0000000000000000E+000 ,
AU0 = 2*10.0000000000000000 , 0.3000000000000000 , 2*10.0000000000000000
, 3.0000000000000000 ,
CRAN1 = 2.0000000000000000 ,
CRAN2 = 3.0000000000000000 ,
CRAN3 = 1.0000000000000000 ,
CRAN4 = 1.0000000000000000 ,
CV00 = 14*0.0000000000000000E+000 ,
CVOUT = 0,
CVPRV0 = 14*0.0000000000000000E+000 ,
ECPRV0 = -95.50470000000000 , 75.64720000000000 , 84.88220000000000 ,
80.73760000000000 ,
-65.84810000000000 , 77.72410000000000 , -37.30100000000000 ,
31.39940000000000 , 43.59070000000000 ,
12.15220000000000 ,
EPS = 1.0000000000000000E-007,
ICASE = 325,
ICYCLO = 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 = 0.0000000000000000E+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*0.0000000000000000E+000 , 90.00000000000000 ,
PHSPRV0 = 6*0.0000000000000000E+000 ,
RHOB = 100.00000000000000 ,
STPMIN = 0.0000000000000000E+000,
T0 = -90.74040000000000 , 119.70700000000000 , 122.38400000000000 ,
78.72380000000000 ,
-69.68640000000000 , 66.34010000000000 , -40.05610000000000 ,
20.25200000000000 , 29.75040000000000 ,
24.36730000000000 , -135.69100000000000 , 79.44860000000000 ,
87.60420000000000 , 115.95000000000000 ,
-47.75700000000000 , 79.13310000000000 , -30.01580000000000 ,
33.37590000000000 , 38.47500000000000 ,
13.77080000000000 , -114.32000000000000 , 47.68370000000000 ,
60.60960000000000 , 95.79040000000000 ,
-56.22380000000000 , 49.49840000000000 , -24.87710000000000 ,
3.777820000000000 , 24.54600000000000 ,
-6.343070000000000 , -68.17730000000000 , 51.47110000000000 ,
64.58900000000000 , 53.42570000000000 ,
```

```

-30.91670000000000 , 80.52170000000000 , -8.45332000000000 ,
54.59550000000000 , 66.75300000000000 ,
-12.35370000000000 , -50.03930000000000 , 63.86900000000000 ,
76.58370000000000 , 37.28330000000000 ,
44.63530000000000 , 79.28500000000000 , -5.47938000000000 ,
73.25790000000000 , 123.17900000000000 ,
-16.06650000000000 , -76.47950000000000 , 107.92800000000000 ,
113.11600000000000 , 66.38840000000000 ,
-48.84220000000000 , 155.67100000000000 , -59.09700000000000 ,
67.74370000000000 , 73.07250000000000 ,
85.04140000000000 , -143.27400000000000 , 110.90400000000000 ,
110.15900000000000 , 131.80500000000000 ,
-89.78370000000000 , 253.60700000000000 , 17.65670000000000 ,
49.40770000000000 , 19.59040000000000 ,
70.40630000000000 , -137.09000000000000 , 35.35130000000000 ,
41.27820000000000 , 111.29300000000000 ,
-240.31100000000000 , 32.07950000000000 , -49.51370000000000 ,
88.92830000000000 , 0.4944240000000000 ,
-9.8438700000000000 , -120.26900000000000 , 35.50720000000000 ,
40.17900000000000 , 68.51910000000000 ,
-148.79800000000000 , 67.00020000000000 , -82.32860000000000 ,
119.06500000000000 , -13.46360000000000 ,
-73.78420000000000 , -35.69180000000000 , 52.91990000000000 ,
96.57160000000000 , 18.69700000000000 ,
-48.36140000000000 , -20.15470000000000 , -115.60300000000000 , -
21.84720000000000 , 119.16600000000000 ,
-50.09210000000000 ,
WDT0 = 10*1.0000000000000000 ,
WDX = 10*0.0000000000000000E+000 ,
WX = 10*0.0000000000000000E+000 ,
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	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
2	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
3	0.0000000D+00	0.0000000D+00	0.3000000D+00	0.0000000D+00
4	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00
5	0.0000000D+00	0.0000000D+00	0.1000000D+02	0.0000000D+00

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

Element	CVL0	CVPRV0	CVU0
1	-0.1000000D+02	0.0000000D+00	0.1000000D+02
2	-0.1000000D+02	0.0000000D+00	0.1000000D+02
3	-0.1000000D+02	0.0000000D+00	0.1000000D+02
4	-0.1000000D+02	0.0000000D+00	0.1000000D+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	0	1	1	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

0	0	0	0	1	1	0	0	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
-----

```

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 \*\*\*\*\*

## E.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**







!  
! \*\*\*\*\* End of Case 30 Input Data \*\*\*\*\*  
!  
\$END

\*\*\*\*\* OUTPUT \*\*\*\*\* OUTPUT \*\*\*\*\*

RUN the NLP10x10 Case.

START RUN.

\*\*\*\*\*

\*\*\*\*\* Start Case Number 30 \*\*\*\*\*

\*\*\*\*\* INPUT DATA for Case Number 30 \*\*\*\*\*

&CDATA  
A00 = 6\*1.0000000000000000 ,  
ACC = 1.0000000000000000E-007,  
ACCQP = 1.0000000000000000E-012,  
AL0 = 5\*0.0000000000000000E+000 , -1.0000000000000000E-007,  
ALPHA = 1.0000000000000000 ,  
APRV0 = 6\*0.0000000000000000E+000 ,  
AU0 = 5\*10.0000000000000000 , 3.0000000000000000 ,  
CRAN1 = 2.0000000000000000 ,  
CRAN2 = 3.0000000000000000 ,  
CRAN3 = 1.0000000000000000 ,  
CRAN4 = 1.0000000000000000 ,  
CV00 = 14\*0.0000000000000000E+000 ,  
CVOUT = 0 ,  
CVPRV0 = 14\*0.0000000000000000E+000 ,  
ECPRV0 = -95.5047000000000000 , 75.6472000000000000 , 84.8822000000000000 ,  
80.7376000000000000 ,  
-65.8481000000000000 , 77.7241000000000000 , -37.3010000000000000 ,  
31.3994000000000000 , 43.5907000000000000 ,  
12.1522000000000000 ,  
EPS = 1.0000000000000000E-007,  
ICASE = 30,  
ICYCLO = 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 = 0.0000000000000000E+000,  
MODE = 0,  
MSAVE0 = 2\*0, 1, 2\*0, 5\*1,  
MULT = 0,  
NSAVE0 = 2\*0, 1, 2\*0, 5\*1,  
NX0 = 10,



\*\*\*\*\* 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 (CVU0), 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 (CVU0) 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	0	0	1	1	0	0	0	0
---	---	---	---	---	---	---	---	---	---

NSAVE0/NSAVE

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 -0.50039300D+02 -0.12026900D+03	-0.13569100D+03 -0.76479500D+02 -0.35691800D+02	-0.11432000D+03 -0.14327400D+03	-0.68177300D+02 -0.13709000D+03
T0 2	0.11970700D+03 0.63869000D+02 0.35507200D+02	0.79448600D+02 0.10792800D+03 0.52919900D+02	0.47683700D+02 0.11090400D+03	0.51471100D+02 0.35351300D+02
T0 3	0.12238400D+03 0.76583700D+02 0.40179000D+02	0.87604200D+02 0.11311600D+03 0.96571600D+02	0.60609600D+02 0.11015900D+03	0.64589000D+02 0.41278200D+02
T0 4	0.78723800D+02 0.37283300D+02 0.68519100D+02	0.11595000D+03 0.66388400D+02 0.18697000D+02	0.95790400D+02 0.13180500D+03	0.53425700D+02 0.11129300D+03
T0 5	-0.69686400D+02 0.44635300D+02 -0.14879800D+03	-0.47757000D+02 -0.48842200D+02 -0.48361400D+02	-0.56223800D+02 -0.89783700D+02	-0.30916700D+02 -0.24031100D+03
T0 6	0.66340100D+02 0.79285000D+02 0.67000200D+02	0.79133100D+02 0.15567100D+03 -0.20154700D+02	0.49498400D+02 0.25360700D+03	0.80521700D+02 0.32079500D+02
T0 7	-0.40056100D+02 -0.54793800D+01 -0.82328600D+02	-0.30015800D+02 -0.59097000D+02 -0.11560300D+03	-0.24877100D+02 0.17656700D+02	-0.84533200D+01 -0.49513700D+02
T0 8	0.20252000D+02 0.73257900D+02 0.11906500D+03	0.33375900D+02 0.67743700D+02 -0.21847200D+02	0.37778200D+01 0.49407700D+02	0.54595500D+02 0.88928300D+02
T0 9	0.29750400D+02 0.12317900D+03 -0.13463600D+02	0.38475000D+02 0.73072500D+02 0.11916600D+03	0.24546000D+02 0.19590400D+02	0.66753000D+02 0.49442400D+00
T0 10	0.24367300D+02 -0.16066500D+02 -0.73784200D+02	0.13770800D+02 0.85041400D+02 -0.50092100D+02	-0.63430700D+01 0.70406300D+02	-0.12353700D+02 -0.98438700D+01

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

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

-----  
 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	0.51898347D+01	0.00D+00	0	2	0.39D+00	0.00D+00	0.11D+02
	*****	Completed	CALL	to	NLPQLP	*****	
	*****	Completed	CALL	to	NLPQLP	*****	
7	0.14933211D-02	0.00D+00	0	1	0.10D+01	0.00D+00	0.30D-02
	*****	Completed	CALL	to	NLPQLP	*****	
	*****	Completed	CALL	to	NLPQLP	*****	
8	0.68563847D-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) = 0.68563847D-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 \*\*\*\*\*

-0.10870550D-05 0.82087452D-05

\*\*\*\*\* NLP Solution Performance Index = 0.68563847D-10 \*\*\*\*\*

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

0.37971650D-05 -0.73583548D-05

\*\*\*\*\* NLP Solution Performance Index = 0.68563847D-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 \*\*\*\*\*

END of RUN.

\*\*\*\*\* END \*\*\*\*\*