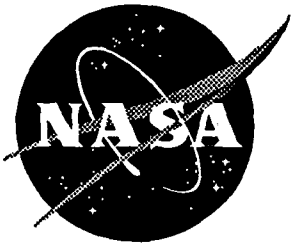
NASA Contractor Report 198219



NASA-CR-198219
19960003221

Divergence Analysis Report for the Bodies of Revolution Model Support Systems

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Contract NAS1-16331

April 1983

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23681-0001

DIVERGENCE ANALYSIS REPORT

FOR THE

BODIES OF REVOLUTION

MODEL SUPPORT SYSTEMS

Prepared by Wyle Laboratories
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Under Contract: NASI 16331

For: National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia

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WYLE
LABORATORIES

DIVERGENCE ANALYSIS

TABLE OF CONTENTS

1.0 INTRODUCTION

The model support system has been analyzed for divergence via a computer program. This report provides a brief description of the analysis technique, a review of the data required for the divergence analysis, and a tabulation of the summary and results.

Reduced copies of the computer data, output results, and relevant drawings of the model support systems have been included at the end of this report for reference.

2.0 DESCRIPTION OF ANALYSIS

For the model support systems, divergence pressure refers to the test dynamic pressure at which the aerodynamic loads acting on the model exceed the elastic restoring forces of the model support system. To provide a safe operating test pressure, a minimum safety factor of 2.0 is required by the "Wind Tunnel Model Systems Criteria," NASA report LHB8850.1. This factor requires that the maximum allowed test dynamic pressure for a particular configuration of model and model support system not exceed one-half the computed divergence pressure. The specific safety factor with respect to divergence of the model support system analyzed is included in the Summary and Results section.

The method employed in this report to determine the divergence pressure is an in-house computer program developed by the Systems Engineering Division at NASA, LaRC. Given the stiffness properties and constraints of the model support system, the program generates and solves a two-point boundary value problem by applying a second-order Runge-Kutta integration technique. For additional information about the divergence analysis program contact the Systems Engineering Division, NASA, LaRc. The current version of the program has been operational since 1978, and the results have been verified by comparison to known solutions.

The input to the program includes the stiffness properties in the form of area moments of inertia at selected stations along the model support system, the boundary conditions, and the aerodynamic loads. A listing of the data provided and the results obtained is included in the Computer Data section of this report.

The stations along the model support system are selected either at discontinuities or in relation to the degree of taper. At discontinuities multiple stations are required to define irregularities to the program. For the highly tapered portions of the model support system, a greater number of stations are required to avoid adversely affecting the computed divergence pressure. There is a limit however, beyond which additional stations produce no substantial improvement in the results. The determination of station selections for the tapered portions are included in the Calculations section of this report, and the total number of stations used in this analysis is given in the Summary and Results section.

To include as much flexibility of the model support system as is practical, the analysis has included the stiffness of components between the center of the model attachment and the roll mechanism within the arc sector of the NTF. The stiffness of the balance is determined from physical measurements of deformations due to known loads. The calculation for the development of the stiffness properties of the balance are included in the Calculations section. For the stiffness of the sting, the area moments of inertia are computed at the selected stations previously discussed. The results of the computations are listed in the Computer Data section. Similar computations are performed for the center spindle of the roll mechanism and are included in the report. The center spindle is relatively stiff when compared to the other components in the model support system, but the main advantage of including it in the divergence analysis is with respect to the boundary conditions. The actual center spindle is supported on roller bearings within the arc sector, and for the analysis equivalent supports have been provided at the same locations. Since the computer program only allows supports to be defined at the extreme ends, a stiff spring is used to define the intermediate bearing. An advantage to using the spring is that its stiffness can be distributed and better represents the roller bearing.

Generally the aerodynamic loads for a model are given about some reference point in the form of forces and moments. For the divergence analysis, the loads must be defined at the center of the model attachment and must be expressed in terms of to angles-of-attack. To obtain these loads, the given forces and moments must be transposed to the center of the model attachment and linearized over the range of angles-of-attack that are representative of the test conditions. The transposed loads produce the same forces and moments in the model support system as those that act on the model. The linearization of the loads provide loads that are functions of the angles-of-attack. The development of these equivalent aerodynamic loads can be found in the Calculations section.

3.0 SUMMARY AND RESULTS

For model support systems with several configurations and/or loading conditions, an individual divergence analysis is performed for each configuration and/or loading condition. Also, an individual Summary and Results sheet is compiled for each analysis. The sheet identifies the input data used and materials referenced for each analysis, as well as the resulting divergence pressure. This report covers the following configuration(s) and/or conditions:

A.) E-1 BODY OF REVOLUTION & BAL. NTF-107

B.) E-2 BODY OF REVOLUTION & BAL. NTF-105

C.) E-2 BODY OF REVOLUTION & BAL NTF-108

D.) E-3 BODY OF REVOLUTION & BAL NTF-105

E.) E-3 BODY OF REVOLUTION & BAL NTF-108

F.) C-2 BODY OF REVOLUTION & BAL NTF-105

G.) C-2 BODY OF REVOLUTION & BAL NTF-108

H.) C-3 BODY OF REVOLUTION & BAL NTF-105

I.) C-4 BODY OF REVOLUTION & BAL NTF-105

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

R
3-29-83

SYSTEM DESCRIPTION: A.) E-1 BODY OF REVOLUTION

BALANCE: NTF-107 LA 943372 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

title	drawing no.
STUB STINGS # 1 & 2	LE 1028005
STING ADAPTER	LE 541032
MODEL STING # E-1	LD 541034

AERODYNAMIC LOADS:

SOURCE: STO FLECHNER, TAD, 9-8-82 NOTES

NORMAL FORCE: $C_{N\alpha} = 0.025$/DEG

PITCHING MOMENT: $C_{M\alpha} = 0.022$/DEG

REFERENCE POINT: 0.7176 ℓ AFT OF NOSE

DRAG FORCE: $C_D = 0.24$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $\frac{N_\alpha}{Q} = 4.828$ IN^2/RAD $(= C_{N\alpha}S)$

PITCHING MOMENT: $M_\alpha/Q = 77.259$ IN^3/RAD $(= C_{M\alpha}Sh)$

DRAG FORCE: $\frac{DRAG}{Q} = 0.809$ IN^2

MAXIMUM TEST DYNAMIC PRESSURE: 3500 (REQUESTED) PSF

SOURCE: STO FLECHNER, TAD

DIVERGENCE PRESSURE: 5422 PSF

NOTE: LOWER TEST PRESSURE RECOMMENDED

SAFETY FACTOR (Minimum of 2.0 Required): 1.549

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 164

WYLE LABORATORIES

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

R
3-29-83

SYSTEM DESCRIPTION: B.) E-2 BODY OF REVOLUTION

BALANCE: NTF-105 LA 943298 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

title	drawing no.
STUB STINGS #1 & 2	LE 1028005
STING ADAPTER	LE 541032
MODEL STING #C-2 & E-2	LO 541033

AERODYNAMIC LOADS:

SOURCE: STU FLECHNER, TAO, 9-8-82 NOTES

NORMAL FORCE: $C_{N\alpha} = 0.025$ /DEG

PITCHING MOMENT: $C_{m\alpha} = 0.022$ /DEG

REFERENCE POINT: 0.7176 ℓ AFT OF NOSE

DRAG FORCE $C_D = 0.24$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $N_\alpha/Q = 19.319$ IN^2/RAD $(= C_{N\alpha} S)$

PITCHING MOMENT: $M_\alpha/Q = 541.996$ IN^3/RAD $(= C_{m\alpha} Sh)$

DRAG FORCE: $DRAG/Q = 3.237$ IN^2

MAXIMUM TEST DYNAMIC PRESSURE: 1750 PSF

SOURCE: STU FLECHNER, TAO

DIVERGENCE PRESSURE: 6340 PSF

SAFETY FACTOR (Minimum of 2.0 Required): 3.623

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 165

WYLE LABORATORIES

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

R
3-29-83

SYSTEM DESCRIPTION: C.) E-Z BODY OF REVOLUTION

BALANCE: NTF-108 LA 943343 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

title	drawing no.
STUB STINGS #1 & 2	LE 1028005
STING ADAPTER	LE 541032
MODEL STING #C-2 & E-2	LD 541033

AERODYNAMIC LOADS:

SOURCE: STU FLECHNER, TAD, 9-8-82 NOTES

NORMAL FORCE: $C_{N\alpha} = 0.025$ /DEG

PITCHING MOMENT: $C_{m\alpha} = 0.022$ /DEG

REFERENCE POINT: 0.7176 ℓ AFT OF NOSE

DRAG FORCE: $C_D = 0.24$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $N_\alpha/Q = 19.319$ IN²/RAD $(= C_{N\alpha} S)$

PITCHING MOMENT: $M_\alpha/Q = 560.146$ IN³/RAD $(= C_{m\alpha} Sh)$

DRAG FORCE: $DRAG/Q = 3.237$ IN²

MAXIMUM TEST DYNAMIC PRESSURE: 1750 PSF

SOURCE: STU FLECHNER, TAD

DIVERGENCE PRESSURE: 5606 PSF

SAFETY FACTOR (Minimum of 2.0 Required): 3.204

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 165

WYLE LABORATORIES

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

R
3-29-83

SYSTEM DESCRIPTION: D.) E-3 BODY OF REVOLUTION

BALANCE: NTF 105 LA 943298 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

title	drawing no.
STUB STINGS #1 & 2	LE 1028005
STING ADAPTER	LE 541032
MODEL STING #C-3 & E-3	LD 541035

AERODYNAMIC LOADS:

SOURCE: STU FLECHNER TAD, 9-8-82 NOTES

NORMAL FORCE: $C_{N\alpha} = 0.025$ /DEG

PITCHING MOMENT: $C_{M\alpha} = 0.022$ /DEG

REFERENCE POINT: 0.7176 ℓ AFT OF NOSE

DRAG FORCE: $C_D = 0.24$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $N_\alpha/Q = 38.632$ IN²/RAD ($= C_{N\alpha}S$)

PITCHING MOMENT: $M_\alpha/Q = 1654.053$ IN³/RAD ($= C_{M\alpha}Sh$)

DRAG FORCE: $DRAG/Q = 6.473$ IN²

MAXIMUM TEST DYNAMIC PRESSURE: 1237 PSF

SOURCE: STU FLECHNER, TAD

DIVERGENCE PRESSURE: 6473 PSF

SAFETY FACTOR (Minimum of 2.0 Required): 5.233

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 153

WYLE LABORATORIES

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

R
3-29-83

SYSTEM DESCRIPTION: E.) E-3 BODY OF REVOLUTION

BALANCE: NTF-108 LA 943343 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

STUE STINGS #1 & 2 (title)	LE 1028005 (drawing no.)
STING ADAPTER (title)	LE 541032 (drawing no.)
MODEL STING #C-3 & E-3 (title)	LD 541035 (drawing no.)
(title)	(drawing no.)

AERODYNAMIC LOADS:

SOURCE: STU FLECHNER, TAD, 9-8-82 NOTES

NORMAL FORCE: $C_{N\alpha} = 0.025$ /DEG

PITCHING MOMENT: $C_{m\alpha} = 0.072$ /DEG

REFERENCE POINT: 0.7176 ℓ AFT OF NOSE

DRAG FORCE: $C_D = 0.24$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $N_\alpha/Q = 38.632$ IN²/RAD $(= C_{N\alpha}S)$

PITCHING MOMENT: $M_\alpha/Q = 1690.348$ IN³/RAD $(= C_{m\alpha}Sh)$

DRAG FORCE: $DRAG/Q = 6.473$ IN²

MAXIMUM TEST DYNAMIC PRESSURE: 1237 PSF

SOURCE: STU FLECHNER, TAD

DIVERGENCE PRESSURE: 4654 PSF

SAFETY FACTOR (Minimum of 2.0 Required): 3.763

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 153

WYLE LABORATORIES

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

R
3-29-83

SYSTEM DESCRIPTION: F.) C-2 BODY OF REVOLUTION

BALANCE: NTF-105 LA 943298 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

title	drawing no.
STUB STINGS #1 & 2	LE 1028005
STING ADAPTER	LE 541032
MODEL STING # C-2 & E-2	LD 541033

AERODYNAMIC LOADS:

SOURCE: STU FLECHNER, TAD 9-8-82 NOTES

NORMAL FORCE: $C_{N\alpha} = 0.019$ /DEG

PITCHING MOMENT: $C_{m\alpha} = 0.026$ /DEG

REFERENCE POINT: 0.6161 ℓ AFT OF NOSE

DRAG FORCE: $C_D = 0.12$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $N_\alpha/Q = 14.654$ IN^2/RAD ($= C_{N\alpha}S$)

PITCHING MOMENT: $M_\alpha/Q = 715.408$ IN^3/RAD ($= C_{m\alpha}Sh$)

DRAG FORCE: $DRAG/Q = 1.615$ IN^2

MAXIMUM TEST DYNAMIC PRESSURE: 3500 (REQUESTED) PSF

SOURCE: STU FLECHNER, TAD

DIVERGENCE PRESSURE: 6154 PSF

NOTE: LOWER TEST PRESSURE RECOMMENDED

SAFETY FACTOR (Minimum of 2.0 Required): 1.758

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 165

WYLE LABORATORIES

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

L
3-29-83

SYSTEM DESCRIPTION: 8.) C-2 BODY OF REVOLUTION

BALANCE: NTF-108 LA 943343 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

title	drawing no.
STUB STINGS # 1 & 2	LE 1028005
STING ADAPTER	LE 541032
MODEL STING # C-2 & E-2	LD 541033

AERODYNAMIC LOADS:

SOURCE: STU FLECHNER TAD 9-8-82 NOTES

NORMAL FORCE: $C_{N\alpha} = 0.019$ /DEG

PITCHING MOMENT: $C_{m_q} = 0.026$ /DEG

REFERENCE POINT: 0.6161 ℓ AFT OF NOSE

DRAG FORCE: $C_D = 0.12$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $N_\alpha/Q = 14.654$ IN^2/RAD ($=C_{N\alpha}S$)

PITCHING MOMENT: $M_\alpha/Q = 729.176$ IN^3/RAD ($=C_{m_\alpha}Sh$)

DRAG FORCE: $DRAG/Q = 1.615$ IN^2

MAXIMUM TEST DYNAMIC PRESSURE: 3500 (REQUESTED) PSF

SOURCE: STU FLECHNER, TAD

DIVERGENCE PRESSURE: 5315 PSF

NOTE: LOWER TEST PRESSURE RECOMMENDED

SAFETY FACTOR (Minimum of 2.0 Required): 1.519

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 165

WYLE LABORATORIES

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

L
3-29-83

SYSTEM DESCRIPTION: H.) C-3 BODY OF REVOLUTION

BALANCE: NTF-105 LA 943298 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

title	drawing no.
STOB STING #1 & 2	LE 1028005
STING ADAPTER	LE 541032
MODEL STING #C-3 & E-3	LD 541035

AERODYNAMIC LOADS:

SOURCE: STU FLECHNER, TAD, 9-8-82 NOTES

NORMAL FORCE: $C_{N_\alpha} = 0.019$ /DEG

PITCHING MOMENT: $C_{M_\alpha} = 0.026$ /DEG

REFERENCE POINT: 0.6161 & AFT OF NOSE

DRAG FORCE: $C_D = 0.12$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $N_\alpha/Q = 29.308$ IN² RAD $(= C_{N_\alpha} S)$

PITCHING MOMENT: $M_\alpha/Q = 1916.464$ IN³ RAD $(= C_{M_\alpha} Sh)$

DRAG FORCE: $DRAG/Q = 3.231$ IN²

MAXIMUM TEST DYNAMIC PRESSURE: 2475 PSF

SOURCE: STU FLECHNER, TAD

DIVERGENCE PRESSURE: 6590 PSF

SAFETY FACTOR (Minimum of 2.0 Required): 2.663

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 153

WYLE LABORATORIES

DIVERGENCE ANALYSIS
SUMMARY AND RESULTS

R
3-29-83

SYSTEM DESCRIPTION: I.) C-4 BODY OF REVOLUTION

BALANCE: NTF-105 LA 943298 (drawing no.)

MODEL SUPPORT SYSTEM DRAWINGS:

title	drawing no.
STOB STINGS #1 & 2	LE 1028005
STING ADAPTER	LE 541032
MODEL STING # C-4	LD 541036

AERODYNAMIC LOADS:

SOURCE: STU FLECHNER, TAD, 9-8-82 NOTES

NORMAL FORCE: $C_{N\alpha} = 0.019$ /DEG

PITCHING MOMENT: $C_{M\alpha} = 0.026$ /DEG

REFERENCE POINT: 0.6161 ℓ AFT OF NOSE

DRAG FORCE: $C_D = 0.12$

EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE: $N_\alpha/Q = 45.008$ IN^2/RAD $(=C_{N\alpha}S)$

PITCHING MOMENT: $M_\alpha/Q = 3679.598$ IN^3/RAD $(=C_{M\alpha}Sh)$

DRAG FORCE: $DRAG/Q = 4.961$ IN^2

MAXIMUM TEST DYNAMIC PRESSURE: 1997 PSF

SOURCE: STU FLECHNER, TAD

DIVERGENCE PRESSURE: 5249 PSF

SAFETY FACTOR (Minimum of 2.0 Required): 2.628

TOTAL NUMBER OF STATIONS USED IN ANALYSIS: 136

WYLE LABORATORIES

4.0 CALCULATIONS

STATION SELECTIONS

FOR A DIVERGENCE ANALYSIS, THE STIFFNESS OF A MODEL SUPPORT SYSTEM IS APPROXIMATED WITH STIFFNESS PROPERTIES DEFINED AT A DESCRETE NUMBER OF STATIONS. THE ACCURACY OF THE RESULTS IMPROVES AS THE NUMBER OF STATIONS INCREASES, BUT THE TIME REQUIRED TO PREPARE THE DATA ALSO INCREASES (THE LOCATION AND SECTIONAL MOMENT OF INERTIA HAVE TO BE COMPUTED AND DEFINED AT EACH STATION).

TO MINIMIZE THE NUMBER OF STATIONS AND OBTAIN RESULTS WITHIN ACCEPTABLE LIMITS, AN EQUATION WAS DEVELOPED FOR PREDICTING THE ERROR IN THE COMPUTED STIFFNESS OF A TAPERED CIRCULAR STING. THE EQUATION YIELDS THE DIFFERENCE BETWEEN THE EXACT SOLUTION AS OBTAINED BY INTEGRATION AND THE NUMERICAL SOLUTION OBTAINED BY APPROXIMATING THE STING WITH PROPERTIES DEFINED AT SELECTED POINTS. THE DIVERGENCE ERROR WOULD BE CLOSELY RELATED TO THE ERRORS COMPUTED FOR THE SMALLEST STIFFNESS VALUES BUT BY CONTROLLING THE STIFFNESS ERRORS OVER THE FULL LENGTH OF A STING, THE RELATIVE FLEXIBILITY OF EACH REGION WOULD NOT HAVE TO BE CONSIDERED.

THE FOLLOWING ARE THE BASIC ASSUMPTIONS USED TO DEVELOP THE EQUATION:

1.) THE CROSS-SECTIONS ARE SOLID

2.) THE LOADING IN A SECTION CONSISTS OF A MOMENT DEVELOPED BY AN END FORCE.

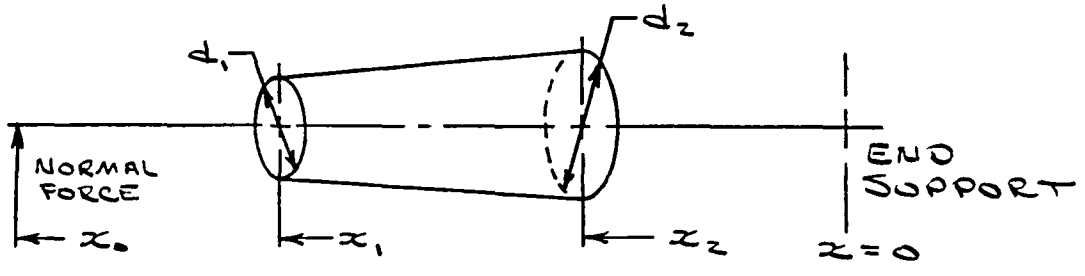
3.) THE TAPERED SECTION BEING EVALUATED IS AN INTERMEDIATE PORTION OF A SIMPLE CANTILEVER.

4.) THE ERROR FOR EACH TAPERED SECTION CAN BE EVALUATED INDEPENDENTLY.

THE STIFFNESS ERROR *:

$$e = \frac{-(d_2-d_1)^2}{12N^2}\left\{\frac{\frac{1}{d_2^4}-\frac{1}{d_1^4}+4\left(\frac{d_2-d_1}{x_1-x_2}\right)\left[\frac{x_0-x_1}{d_1^5}-\frac{x_0-x_2}{d_2^5}\right]}{\frac{1}{2}\left(\frac{1}{d_1^2}-\frac{1}{d_2^2}\right)+\frac{1}{3}\left(\frac{1}{d_2^3}-\frac{1}{d_1^3}\right)\left[d_1-\left(\frac{d_2-d_1}{x_1-x_2}\right)(x_0-x_1)\right]}\right\}$$

WHERE $N = \left(\begin{matrix}\text{Nº OF EQUAL}\\ \text{LENGTH SECTIONS}\end{matrix}\right) = \left(\begin{matrix}\text{Nº OF}\\ \text{STATIONS}\end{matrix}\right) - 1$



NOTE:

$$e \equiv \frac{\text{TRUE STIFFNESS} - \text{CALC'D STIFFNESS}}{\text{TRUE STIFFNESS}}$$

$$\left(\begin{matrix}\text{DIVERGENCE}\\ \text{PRESSURE}\end{matrix}\right) \propto \frac{1}{\Sigma(\text{STIFFNESS})}$$

CONCLUSION:

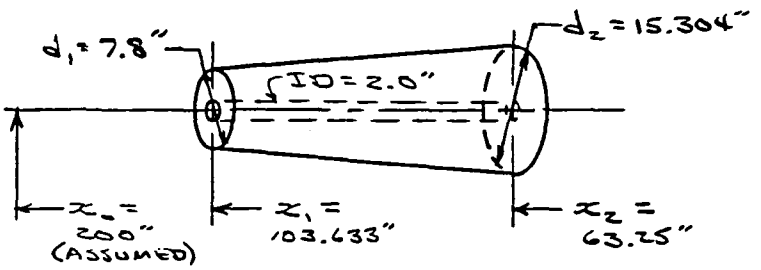
$$\text{NEG } e \Rightarrow \left(\begin{matrix}\text{TRUE}\\ \text{DIVERGENCE}\\ \text{PRESSURE}\end{matrix}\right) > \left(\begin{matrix}\text{COMPUTED}\\ \text{DIVERGENCE}\\ \text{PRESSURE}\end{matrix}\right)$$

$$\text{POS } e \Rightarrow \left(\begin{matrix}\text{TRUE}\\ \text{DIVERGENCE}\\ \text{PRESSURE}\end{matrix}\right) < \left(\begin{matrix}\text{COMPUTED}\\ \text{DIVERGENCE}\\ \text{PRESSURE}\end{matrix}\right)$$

* TO CALCULATE THE STIFFNESS ERROR, THE NUMBER OF SECTIONS THAT THE TAPERED PORTION IS DIVIDED INTO IS ASSUMED. IF THE STIFFNESS ERROR IS NOT CONSIDERED ACCEPTABLE, A NEW NUMBER OF SECTIONS IS ASSUMED.

FOR THE BODY OF REVOLUTION MODEL SUPPORT SYSTEMS THE TAPERED PORTIONS WERE EVALUATED FOR A MAXIMUM STIFFNESS ERROR OF ½ %. THE FOLLOWING ILLUSTRATES THE SECTIONS EVALUATED AND SUMMARIZES THE RESULTS OF THE STATION SELECTIONS:

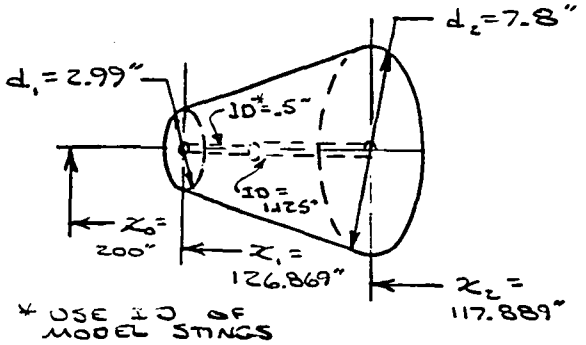
STUB STING (DWG LE-10-28005)



$N = 13$
$e = -0.478\ \%$

USE 14 STATIONS

STING ADAPTER (DWG LE-541032)

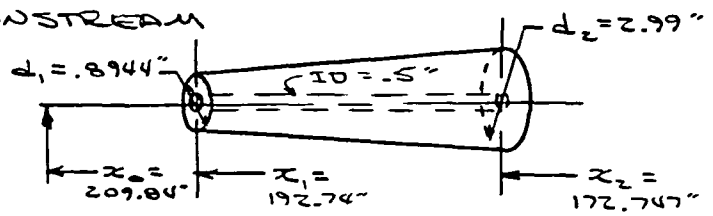


$N = 23$
$e = -0.491\ \%$

USE 24 STATIONS

E-1 STING (DWG LD-541034)

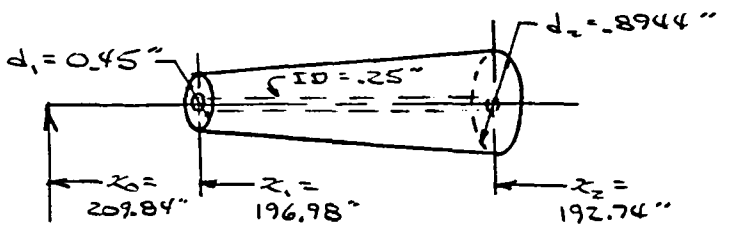
DOWNSTREAM



$N = 29$
$e = -0.486\ \%$

USE 30 STATIONS

UPSTREAM

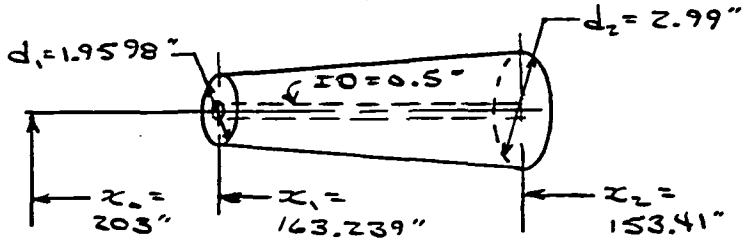


$N = 14$
$e = -0.458\ \%$

USE 15 STATIONS

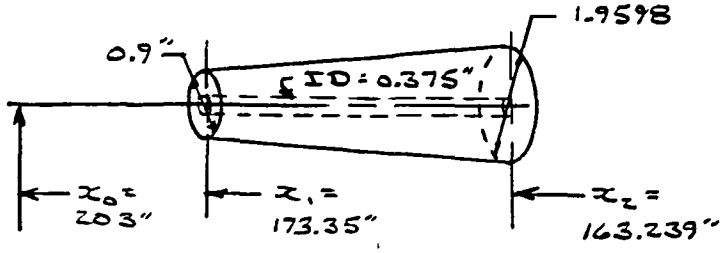
E-2 & C-2 STING (DWG LD-541033)

DOWNSTREAM



N = 8
e = -0.415%

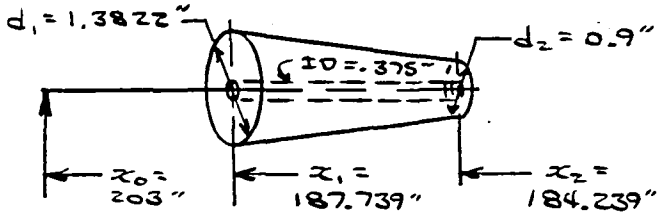
USE 9 STATIONS



N = 16
e = -0.497%

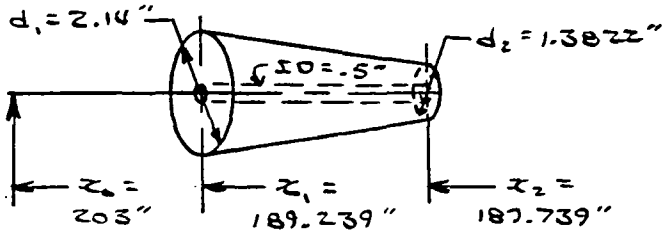
USE 17 STATIONS

UPSTREAM



N = 10
e = -0.415%

USE 11 STATIONS

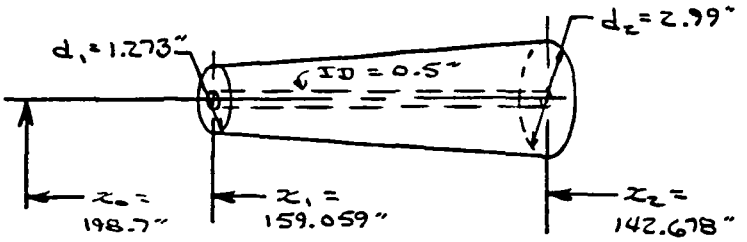


N = 9
e = -0.493%

USE 10 STATIONS

E-3 & C-3 STING (DWG LD-541035)

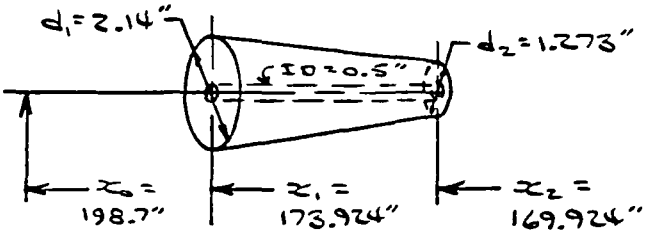
DOWNSTREAM



$N = 19$
$e = -0.449\ \%$

USE 20 STATIONS

UPSTREAM

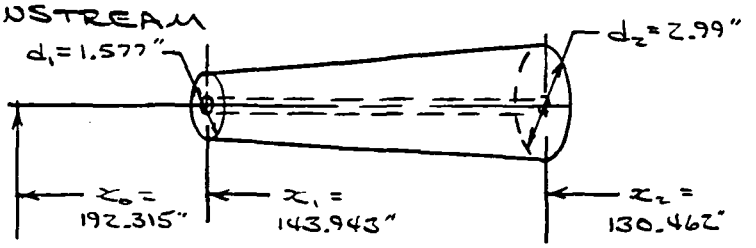


$N = 11$
$e = -0.499\ \%$

USE 12 STATIONS

C-4 STING (DWG LD-541036)

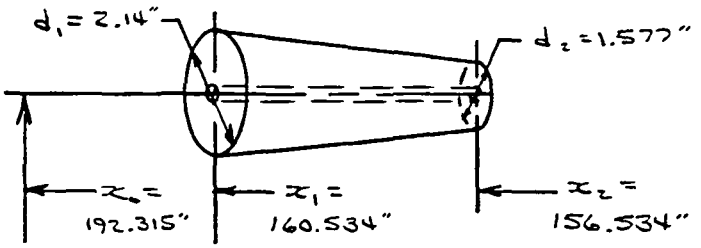
DOWNSTREAM



$N = 13$
$e = -0.450\ \%$

USE 14 STATIONS

UPSTREAM



$N = 7$
$e = -0.391\ \%$

USE 8 STATIONS

THE PRECEEDING RESULTS WERE OBTAINED FROM A CALCULATOR PROGRAM THAT COMPUTES THE STIFFNESS ERROR OF A TAPERED SECTION OF A STING FOR AN ASSUMED NUMBER OF SECTIONS. ONCE AN ACCEPTABLE ERROR IS OBTAINED THE NEXT PHASE OF THE PROGRAM COMPUTES THE SECTIONAL PROPERTIES AT EACH OF THE STATIONS PREVIOUSLY DETERMINED. THE ITERATIONS USED TO OBTAIN AN ACCEPTABLE STIFFNESS ERROR (1/2 % CONSIDERED ACCEPTABLE FOR BODIES OF REVOLUTION) AND THE COMPUTED STATION PROPERTIES FOR EACH OF THE TAPERED SECTIONS OF THE STINGS ARE LISTED ON THE FOLLOWING SHEETS.

NOTE:

FOR THE ANALYSES, STATIONS WERE ALSO REQUIRED FOR THE PORTIONS OF THE MODEL SUPPORT SYSTEMS THAT WERE NOT INCLUDED BY THE TAPERED SECTIONS. A COMPLETE LISTING OF THE STATION PROPERTIES ARE GIVEN IN THE "COMPUTER DATA AND OUTPUT LISTING" AND THOSE NOT INCLUDED ON THE FOLLOWING SHEETS WERE DEVELOPED FROM DETAILS ON THE DRAWINGS AS WERE NEEDED.

STUB STING

STIFFNESS ERROR

200.	X(0)
7.8	D(1)
15.304	D(2)
103.633	X(1)
63.25	X(2)
5.	N
-.0323169278	e
10.	N
-.0080792319	e
15.	N
-.0035907698	e
11.	N
-.0066770512	e
12.	N
-.0056105777	e
13.	N } USE
-.0047806106	e
14.	N
-.0041220571	e

66.356	X 00
14.72676923	D
2308.086429	I
69.463	X 02
14.14953846	D
1966.824482	I
72.569	X 03
13.57230769	D
1664.868195	I
75.676	X 04
12.99507692	D
1399.0769	I
78.782	X 05
12.41784615	D
1166.440725	I
81.888	X 06
11.84061538	D
964.0805859	I
84.995	X 07
11.26338462	D
789.2481912	I
88.101	X 08
10.68615385	D
639.3260405	I
91.207	X 09
10.10892308	D
511.827425	I
94.314	X 10
9.531692308	D
404.3964271	I
97.420	X 11
8.954461538	D
314.8079205	I
100.527	X 12
8.377230769	D
240.9675703	I
103.633	X 13
7.8	D
180.9118331	I

STATION PROPERTIES

2.	ID
7.8	D(1)
15.304	D(2)
103.633	X(1)
63.25	X(2)
13.	N
63.250	X 00
15.304	D
2691.925492	I

STING ADAPTER

STIFFNESS ERROR

200.	X(0)
2.99	D(1)
7.8	D(2)
126.869	X(1)
117.889	X(2)
10.	N
-.0259517414	e
20.	N
-.0064879353	e
25.	N
-.0041522786	e
21.	N
-.0058847486	e
22.	N
-0.00536193	e
23.	N
-.0049058112	e
24.	N
-.0045055107	e

USE N = 23

NOTE:
SEE NEXT SHT FOR STATION PROPERTIES OF X 14 THRU X23 (0.5" ID)

STATION PROPERTIES

1.125	ID	122.184	X 11	
2.99	D(1)	5.499565217	D	
7.8	D(2)	44.82519529	I	
126.869	X(1)			
117.889	X(2)	122.574	X 12	
23.	N	5.290434783	D	
		38.3748258	I	
117.889	X 00	122.965	X 13	
7.8	D	5.081304348	D	
181.6186028	I	32.64569903	I	
118.279	X 01	123.355	X 14	
7.590869565	D	4.872173913	D	
162.9020099	I	27.58193525	I	
118.670	X 02	123.746	X 15	
7.38173913	D	4.663043478	D	
145.6700654	I	23.12990815	I	
119.060	X 03	124.136	X 16	
7.172608696	D	4.453913043	D	
129.8421015	I	19.23824491	I	
119.451	X 04	124.526	X 17	
6.963478261	D	4.244782609	D	
115.3397039	I	15.85782618	I	
119.841	X 05	124.917	X 18	
6.754347826	D	4.035652174	D	
102.0867116	I	12.94178603	I	
120.232	X 06	125.307	X 19	
6.545217391	D	3.826521739	D	
90.00921716	I	10.44551203	I	
120.622	X 07	125.698	X 20	
6.336086957	D	3.617391304	D	
79.03556665	I	8.326645199	I	
121.012	X 08	126.088	X 21	
6.126956522	D	3.40826087	D	
69.09635953	I	6.545080014	I	
121.403	X 09	126.479	X 22	
5.917826087	D	3.199130435	D	
60.12444875	I	5.062964417	I	
121.793	X 10	126.869	X 23	
5.708695652	D	2.99	D	
52.05494072	I	3.84469981	I	

CONT'D STING ADAPTER STATION PROPERTIES

0.5	ID
2.99	D(1)
7.8	D(2)
126.869	X(1)
117.889	X(2)
23.	N
117.889	X 00
7.8	D
181.6941633	I
118.279	X 01
7.590869565	D
162.9775704	I
118.670	X 02
7.38173913	D
145.7456259	I
119.060	X 03
7.172608696	D
129.9176621	I
119.451	X 04
6.963478261	D
115.4152644	I
119.841	X 05
6.754347826	D
102.1622721	I
120.232	X 06
6.545217391	D
90.0847777	I
120.622	X 07
6.336086957	D
79.11112719	I
121.012	X 08
6.126956522	D
69.17192007	I
121.403	X 09
5.917826087	D
60.20000929	I
121.793	X 10
5.708695652	D
52.13050125	I
122.184	X 11
5.499565217	D
44.90075583	I
122.574	X 12
5.290434783	D
38.45038634	I
122.965	X 13
5.081304348	D
32.72125957	I
123.355	X 14
4.872173913	D
27.65749579	I
123.746	X 15
4.663043478	D
23.20546869	I
124.136	X 16
4.453913043	D
19.31380545	I
124.526	X 17
4.244782609	D
15.93338671	I
124.917	X 18
4.035652174	D
13.01734657	I
125.307	X 19
3.826521739	D
10.52107257	I
125.698	X 20
3.617391304	D
8.402205737	I
126.088	X 21
3.40826087	D
6.620640552	I
126.479	X 22
3.199130435	D
5.138524955	I
126.869	X 23
2.99	D
3.920260348	I

E-1 STING (DOWNSTREAM)

STIFFNESS ERROR

209.84	X(0)
.8944187678	D(1)
2.99	D(2)
192.74	X(1)
172.747	X(2)
10.	N
-.0408987863	e
20.	N
-.0102246966	e
30.	N
-.0045443096	e
29.	N
-.0048631137	e
28.	N
-.0052166819	e

USE N = 29

STATION PROPERTIES

0.5	ID
.8944187678	D(1)
2.99	D(2)
192.74	X(1)
172.747	X(2)
29.	N

172.747	X 00	
2.99	D	
3.920260348	I	
173.436	X 01	
2.917738578	D	
3.554518054	I	
174.126	X 02	
2.845477156	D	
3.214963698	I	
174.815	X 03	
2.773215735	D	
2.900316319	I	
175.505	X 04	
2.700954313	D	
2.609327081	I	
176.194	X 05	
2.628692891	D	
2.340779268	I	
176.883	X 06	
2.556431469	D	
2.093488287	I	
177.573	X 07	
2.484170047	D	
1.866301668	I	
178.262	X 08	
2.411908626	D	
1.658099063	I	
178.952	X 09	
2.339647204	D	
1.467792245	I	
179.641	X 10	
2.267385782	D	
1.294325111	I	
180.331	X 11	
2.19512436	D	
1.13667368	I	
181.020	X 12	
2.122862938	D	
.9938460935	I	
181.709	X 13	
2.050601517	D	
.8648826143	I	
182.399	X 14	
1.978340095	D	
.7488556287	I	
183.088	X 15	
1.906078673	D	
.6448696446	I	
183.778	X 16	
1.833817251	D	
.5520612927	I	
184.467	X 17	
1.761555829	D	
.4695993258	I	
185.156	X 18	
1.689294408	D	
.3966846191	I	
185.846	X 19	
1.617032986	D	
0.33255017	I	
186.535	X 20	
1.544771564	D	
.2764610986	I	
187.225	X 21	
1.472510142	D	
.2277146469	I	
187.914	X 22	
1.40024872	D	
.1856401795	I	
188.604	X 23	
1.327987299	D	
.1495991834	I	
189.293	X 24	
1.255725877	D	
.1189852676	I	
189.982	X 25	
1.183464455	D	
.0932241639	I	
190.672	X 26	
1.111203033	D	
0.071773726	I	
191.361	X 27	
1.038941611	D	
.0541239302	I	
192.051	X 28	
.9666801896	D	
.0397968751	I	
192.740	X 29	
.8944187678	D	
.0283467815	I	

E-1 STING (UPSTREAM)

STIFFNESS ERROR

209.84	X(0)
0.45	D(1)
.8944187678	D(2)
196.98	X(1)
192.74	X(2)
10.	N
-.0089744409	e
15.	N
-.0039886404	e
11.	N
-.0074168933	e
12.	N
-.0062322506	e
13.	N
-0.00531032	e
14.	N
-.0045787964	e

} USE

STATION PROPERTIES

0.25	ID
0.45	D(1)
.8944187678	D(2)
196.98	X(1)
192.74	X(2)
14.	N

192.740	X 00
.8944187678	D
.0312229955	I
193.043	X 01
.8626745701	D
.0269950393	I
193.346	X 02
.8309303724	D
0.02320893	I
193.649	X 03
.7991861747	D
.0198327555	I
193.951	X 04
0.767441977	D
.0168357999	I
194.254	X 05
.7356977793	D
.0141885436	I
194.557	X 06
.7039535816	D
.0118626633	I
194.860	X 07
.6722093839	D
0.009831032	I
195.163	X 08
.6404651862	D
.0080677192	I
195.466	X 09
.6087209885	D
.0065479902	I
195.769	X 10
.5769767908	D
.0052483072	I
196.071	X 11
.5452325931	D
.0041463282	I
196.374	X 12
.5134883954	D
.0032209078	I
196.677	X 13
.4817441977	D
.0024520967	I
196.980	X 14
0.45	D
0.001821142	I

E-2 & C-2 STING (DOWNSTREAM W/ 0.5" ID)

STIFFNESS ERROR

203.	X(0)
1.959778837	D(1)
2.99	D(2)
163.239	X(1)
153.41	X(2)
10.	N
-.0026587269	e
5.	N
-.0106349075	e
6.	N
-.0073853524	e
7.	N
-.0054259732	e
8.	N
-.0041542607	e

USE

STATION PROPERTIES

0.5	ID
1.959778837	D(1)
2.99	D(2)
163.239	X(1)
153.41	X(2)
8.	N
153.410	X 00
2.99	D
3.920260348	I
154.639	X 01
2.861222355	D
3.286783856	I
155.867	X 02
2.732444709	D
2.733305878	I
157.096	X 03
2.603667064	D
2.252789713	I
158.325	X 04
2.474889418	D
1.838522657	I
159.553	X 05
2.346111773	D
1.484116003	I
160.782	X 06
2.217334127	D
1.183505044	I
162.010	X 07
2.088556482	D
.9309490735	I
163.239	X 08
1.959778837	D
.7210313799	I

E-Z & C-Z STING (DOWNSTREAM w/ 0.5" ID)

STIFFNESS ERROR

203.	X(0)
1.959778837	D(1)
2.99	D(2)
163.239	X(1)
153.41	X(2)
10.	N
-.0026587269	e
5.	N
-.0106349075	e
6.	N
-.0073853524	e
7.	N
-.0054259732	e
8.	N
-.0041542607	e

USE

STATION PROPERTIES

0.5	ID
1.959778837	D(1)
2.99	D(2)
163.239	X(1)
153.41	X(2)
8.	N
153.410	X 00
2.99	D
3.920260348	I
154.639	X 01
2.861222355	D
3.286783856	I
155.867	X 02
2.732444709	D
2.733305878	I
157.096	X 03
2.603667064	D
2.252789713	I
158.325	X 04
2.474889418	D
1.838522657	I
159.553	X 05
2.346111773	D
1.484116003	I
160.782	X 06
2.217334127	D
1.183505044	I
162.010	X 07
2.088556482	D
.9309490735	I
163.239	X 08
1.959778837	D
.7210313799	I

E-2 & C-2 STING (DOWNSTREAM W/ 0.375" I.D.)

STIFFNESS ERROR

203.	X(0)
0.9	D(1)
1.959778837	D(2)
173.35	X(1)
163.239	X(2)
10.	N
-0.012725526	e
15.	N
-.0056557893	e
16.	N
-.0049709086	e

} USE

STATION PROPERTIES

0.375	ID
0.9	D(1)
1.959778837	D(2)
173.35	X(1)
163.239	X(2)
16.	N
163.239	X 00
1.959778837	D
.7231286192	I
163.871	X 01
1.893542659	D
.6300887262	I
164.503	X 02
1.827306482	D
.5463167133	I
165.135	X 03
1.761070305	D
.4711756693	I
165.767	X 04
1.694834127	D
.4040513585	I
166.399	X 05
1.62859795	D
.3443522212	I
167.031	X 06
1.562361773	D
.2915093733	I
167.663	X 07
1.496125596	D
.2449766066	I
168.295	X 08
1.429889418	D
.2042303887	I
168.926	X 09
1.363653241	D
.1687698628	I
169.558	X 10
1.297417064	D
.1381168481	I
170.190	X 11
1.231180886	D
.1118158394	I
170.822	X 12
1.164944709	D
.0894340074	I
171.454	X 13
1.098708532	D
.0705611985	I
172.086	X 14
1.032472355	D
.0548099349	I
172.718	X 15
.9662361773	D
.0418154145	I
173.350	X 16
0.9	D
.0312355112	I

SECT. 4.1

R
3-24-83

E-Z & C-Z STING (UPSTREAM W/ 0.375" ID)

STIFFNESS ERROR

203.	X(0)
1.382222222	D(1)
0.9	D(2)
187.739	X(1)
184.239	X(2)
10.	N
-0.00415086	e
9.	N
-.0051245185	e
10.	N
-0.00415086	e

≈ USE

STATION PROPERTIES

0.375	ID
1.382222222	D(1)
0.9	D(2)
187.739	X(1)
184.239	X(2)
10.	N
184.239	X 00
0.9	D
.0312355112	I
184.589	X 01
.9482222222	D
.0387128185	I
184.939	X 02
.9964444444	D
.0474222458	I
185.289	X 03
1.044666667	D
.0574922443	I
185.639	X 04
1.092888889	D
.0690576354	I
185.989	X 05
1.141111111	D
.0822596114	I
186.339	X 06
1.189333333	D
.0972457346	I
186.689	X 07
1.237555556	D
.1141699379	I
187.039	X 08
1.285777778	D
.1331925249	I
187.389	X 09
1.334	D
.1544801693	I
187.739	X 10
1.382222222	D
.1782059154	I

SECT. 4.1

3-24-83

(UPSTREAM W/ 0.5" ID)

STATION PROPERTIES

0.5	ID
2.14	D(1)
1.382222222	D(2)
189.239	X(1)
187.739	X(2)
9.	N
187.739	X 00
1.382222222	D
0.176108676	I
187.906	X 01
1.466419753	D
.2239201475	I
188.072	X 02
1.550617284	D
.2807163487	I
188.239	X 03
1.634814815	D
.3475580708	I
188.406	X 04
1.719012346	D
.4255653126	I
188.572	X 05
1.803209877	D
.5159172805	I
188.739	X 06
1.887407407	D
.6198523891	I
188.906	X 07
1.971604938	D
.7386682602	I
189.072	X 08
2.055802469	D
.8737217237	I
189.239	X 09
2.14	D
1.026428817	I

(0)
(1)
(2)
(1)
(2)

N
e

N
e

N
e

USE

E-3 & C-3 STNG (DOWNSTREAM)

STIFFNESS ERROR

198.7	X(0)
1.273	D(1)
2.99	D(2)
159.059	X(1)
142.678	X(2)
10.	N
-.0162195916	e
15.	N
-.0072087074	e
20.	N
-.0040548979	e
18.	N
-.0050060468	e
19.	N
-.0044929616	e

USE N = 19

STATION PROPERTIES

0.5	ID
1.273	D(1)
2.99	D(2)
159.059	X(1)
142.678	X(2)
19.	N

142.678	X 00	148.713	X 07	
2.99	D	2.357421053	D	
3.920260348	I	1.512999508	I	
143.540	X 01	149.575	X 08	
2.899631579	D	2.267052632	D	
3.467025581	I	1.293562767	I	
144.402	X 02	150.437	X 09	
2.809263158	D	2.176684211	D	
3.054242859	I	1.098855948	I	
145.264	X 03	151.300	X 10	
2.718894737	D	2.086315789	D	
2.679430458	I	.9269473059	I	
146.127	X 04	152.162	X 11	
2.628526316	D	1.995947368	D	
2.340185224	I	.7759836658	I	
146.989	X 05	153.024	X 12	
2.538157895	D	1.905578947	D	
2.034182572	I	.6441904204	I	
147.851	X 06	153.886	X 13	
2.447789474	D	1.815210526	D	
1.759176483	I	0.529871531	I	
		154.748	X 14	
		1.724842105	D	
		.4314095272	I	
		155.610	X 15	
		1.634473684	D	
		.3472655072	I	
		156.473	X 16	
		1.544105263	D	
		.2759791374	I	
		157.335	X 17	
		1.453736842	D	
		.2161686526	I	
		158.197	X 18	
		1.363368421	D	
		.1665308562	I	
		159.059	X 19	
		1.273	D	
		.1258411197	I	

E-3 & C-3 STING (UPSTREAM)

STIFFNESS ERROR

198.7	X(0)
2.14	D(1)
1.273	D(2)
173.924	X(1)
169.924	X(2)
10.	N
-.0060413791	e
11.	N
-.0049928753	e

STATION PROPERTIES

0.5	ID
2.14	D(1)
1.273	D(2)
173.924	X(1)
169.924	X(2)
11.	N

169.924	X 00
1.273	D
.1258411197	I
170.288	X 01
1.351818182	D
.1608562231	I
170.651	X 02
1.430636364	D
.2025622571	I
171.015	X 03
1.509454545	D
.2517617466	I
171.379	X 04
1.588272727	D
.3093026824	I
171.742	X 05
1.667090909	D
.3760785213	I
172.106	X 06
1.745909091	D
.4530281861	I
172.469	X 07
1.824727273	D
.5411360656	I
172.833	X 08
1.903545455	D
.6414320147	I
173.197	X 09
1.982363636	D
.7549913541	I
173.560	X 10
2.061181818	D
.8829348707	I
173.924	X 11
2.14	D
1.026428817	I

C-4 STING (DOWNSTREAM)

STIFFNESS ERROR

192.315	X(0)
1.577	D(1)
2.99	D(2)
143.943	X(1)
130.462	X(2)
10.	N
-.0076064359	e
11.	N
-.0062863107	e
12.	N
-.0052822471	e
13.	N
-.0045008496	e

USE

131.499	X 01
2.881307692	D
3.380138125	I
132.536	X 02
2.772615385	D
2.897803019	I
133.573	X 03
2.663923077	D
2.468978443	I
134.610	X 04
2.555230769	D
2.089552235	I
135.647	X 05
2.446538462	D
1.755576664	I
136.684	X 06
2.337846154	D
1.463268425	I
137.721	X 07
2.229153846	D
1.209008644	I
138.758	X 08
2.120461538	D
.9893428724	I
139.795	X 09
2.011769231	D
.8009810913	I
140.832	X 10
1.903076923	D
.6407977098	I
141.869	X 11
1.794384615	D
.5058315651	I
142.906	X 12
1.685692308	D
.3932859228	I
143.943	X 13
1.577	D
.3005284766	I

STATION PROPERTIES

0.5	ID
1.577	D(1)
2.99	D(2)
143.943	X(1)
130.462	X(2)
13.	N
130.462	X 00
2.99	D
3.920260348	I

C-4 STING (UPSTREAM)

STIFFNESS ERROR

192.315	X(0)
2.14	D(1)
1.577	D(2)
160.534	X(1)
156.534	X(2)
5.	N
-.0076708718	e
6.	N
-.0053269943	e
7.	N
-.0039137101	e

USE

STATION PROPERTIES

0.5	ID
2.14	D(1)
1.577	D(2)
160.534	X(1)
156.534	X(2)
7.	N
.	
156.534	X 00
1.577	D
.3005284766	I
157.105	X 01
1.657428571	D
.3673646242	I
157.677	X 02
1.737857143	D
.4446723444	I
158.248	X 03
1.818285714	D
.5334921766	I
158.820	X 04
1.898714286	D
.6349139575	I
159.391	X 05
1.979142857	D
0.750076821	I
159.963	X 06
2.059571429	D
.8801691981	I
160.534	X 07
2.14	D
1.026428817	I

EQUIVALENT STIFFNESS OF BALANCES

DUE TO THE COMPLEX SHAPE OF THE BALANCES, IN THE ANALYSIS THEY WERE REPLACED WITH UNIFORM BEAMS OF EQUIVALENT STIFFNESSES. THE END ROTATIONS OF THE ACTUAL BALANCES WERE OBTAINED FROM "DEFLECTION TESTS" THAT WERE CONDUCTED BY THE INSTRUMENTATION RESEARCH DIVISION AND USED TO DETERMINE EQUIVALENT SECTIONAL PROPERTIES OF A UNIFORM BEAM. THESE EQUIVALENT PROPERTIES PROVIDE THE SAME END ROTATIONS IN THE UNIFORM BEAM AS WERE MEASURED FOR THE BALANCES WHEN SUBJECTED TO THE SAME FORCES AND MOMENTS.

TO DETERMINE THE EQUIVALENT SECTIONAL PROPERTIES CONSIDER THE END ROTATIONS OF A SIMPLE CANTILEVER WHEN A FORCE AND MOMENT TYPE LOAD ARE INDEPENDENTLY APPLIED:

ROTATION DUE TO FORCE: $\theta_F = \frac{F l_{EQ}^2}{2EI_{EQ}}$

ROTATION DUE TO MOMENT: $\theta_M = \frac{M l_{EQ}}{EI_{EQ}}$

SOLVING EACH EQUATION IN TERMS OF I_{EQ} PROVIDES EXPRESSIONS FOR THE EQUIVALENT STIFFNESS OF A UNIFORM BEAM:

$$I_{EQ} = \frac{F l_{EQ}^2}{2E\theta_F} = \frac{M l_{EQ}}{E\theta_M}$$

THESE EQUATIONS CAN BE EQUATED AND SOLVED FOR l_{EQ}:

$$\frac{F l_{EQ}^2}{2E\theta_F} = \frac{M l_{EQ}}{E\theta_M}$$

$$l_{EQ} = 2\frac{M}{F}\frac{\theta_F}{\theta_M}$$

FOR THE ANALYSIS, A UNIFORM BEAM OF STIFFNESS I_{EQ} WAS DEFINED OVER A LENGTH l_{EQ} FOR EACH BALANCE, AND THEIR VALUES WERE DETERMINED FROM THE RESULTS OF THE "DEFLECTION TESTS" PERFORMED ON EACH BALANCE.

BALANCE NTF-105 (MATERIAL: VASCOMAX 200)

RESULTS OF DEFLECTION TEST RECEIVED FROM CHARLIE SCOTT, IRD, ON OCT 7, 1982:

VERTICAL DIRECTION:
NORMAL FORCE, F = 1000 LB, ROTATION, $\theta_F = 38/60$ DEG
PITCHING MOMENT, M = 6000 IN-LB, ROTATION, $\theta_M = 39/60$ DEG

HORIZONTAL DIRECTION:
SIDE FORCE, F = 500 LB, ROTATION, $\theta_F = 22/60$ DEG
YAW MOMENT, M = 3000 IN-LB, ROTATION, $\theta_M = 24/60$ DEG

EQUIVALENT STIFFNESS PROPERTIES:

VERTICAL DIRECTION:

$$\ell_{EQ} = 2\frac{M}{F}\frac{\theta_F}{\theta_M} = 2\left(\frac{6000\ \text{IN-LB}}{1000\ \text{LB}}\right)\left(\frac{38}{39}\right)$$

$$\ell_{EQ} = 11.69230769\ \text{IN}$$

$$I_{EQ} = \begin{cases} \dfrac{F\ell_{EQ}^2}{2E\theta_F} = \dfrac{(1000\ \text{LB})(11.6923\ \text{IN})^2}{2(26.2^{E6}\ \text{PSI})(\frac{38}{60}\ \text{DEG})} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .2360257957\ \text{IN}^4 \\ \dfrac{M\ell}{EI} = \dfrac{(6000\ \text{IN-LB})(11.6923\ \text{IN})^2}{(26.2^{E6}\ \text{PSI})(\frac{39}{60}\ \text{DEG})} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .2360257957\ \text{IN}^4 \end{cases}$$

HORIZONTAL DIRECTION:

$$\ell_{EQ} = 2\frac{M}{F}\frac{\theta_F}{\theta_M} = 2\left(\frac{3000\ \text{IN-LB}}{500\ \text{LB}}\right)\left(\frac{22}{24}\right)$$

$$\ell_{EQ} = 11.000\ \text{IN}$$

$$I_{EQ} = \begin{cases} \dfrac{F\ell_{EQ}^2}{2E\theta_F} = \dfrac{(500\ \text{LB})(11.0\ \text{IN})^2}{2(26.2^{E6}\ \text{PSI})(\frac{22}{60}\ \text{DEG})} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .1804160996\ \text{IN}^4 \\ \dfrac{M\ell}{E\theta_M} = \dfrac{(3000\ \text{IN-LB})(11.0\ \text{IN})}{(26.2^{E6}\ \text{PSI})(\frac{24}{60}\ \text{DEG})} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .1804160996\ \text{IN}^4 \end{cases}$$

THE BODIES OF REVOLUTION ARE TO BE TESTED AT ZERO ANGLE-OF-ATTACK, SO AS THE WORSE CASE CONDITION, USE THE EQUIVALENT STIFFNESS PROPERTIES FOR THE HORIZONTAL DIRECTION:

$\ell_{EQ} = 11.0$ IN & $I_{EQ} = 0.180416\ \text{IN}^4$

BALANCE NTF-107 (MATERIAL: VASCOMAX 200)

RESULTS OF DEFLECTION TEST RECEIVED FROM CHARLIE SCOTT, IRD, ON NOV 4, 1982:

VERTICAL DIRECTION:
NORMAL FORCE, F = 100 LB, ROTATION, $\theta_F = 77/60$ DEG
PITCHING MOMENT, M = 250 IN-LB, ROTATION, $\theta_M = 56/60$ DEG

HORIZONTAL DIRECTION:
SIDE FORCE, F = 50 LB, ROTATION, $\theta_F = 39/60$ DEG
YAW MOMENT, M = 125 IN-LB, ROTATION, $\theta_M = 29/60$ DEG

EQUIVALENT STIFFNESS PROPERTIES:

VERTICAL DIRECTION:

$$\ell_{EQ} = 2\frac{M}{F}\frac{\theta_F}{\theta_M} = 2\left(\frac{250\ \text{IN-LB}}{100\ \text{LB}}\right)\left(\frac{77}{56}\right)$$

$$\ell_{EQ} = 6.875\ \text{IN}$$

$$I_{EQ} = \begin{cases} \dfrac{F\ell_{EQ}^2}{2E\theta_F} = \dfrac{(100\ \text{LB})(6.875\ \text{IN})^2}{2(26.2\times10^6\ \text{PSI})\left(\frac{77}{60}\ \text{DEG}\right)} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .004027145\ \text{IN}^4 \\ \dfrac{M\ell_{EQ}}{E\theta_M} = \dfrac{(250\ \text{IN-LB})(6.875\ \text{IN})}{(26.2\times10^6\ \text{PSI})\left(\frac{56}{60}\ \text{DEG}\right)} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .004027145\ \text{IN}^4 \end{cases}$$

HORIZONTAL DIRECTION:

$$\ell_{EQ} = 2\frac{M}{F}\frac{\theta_F}{\theta_M} = 2\left(\frac{125\ \text{IN-LB}}{50\ \text{LB}}\right)\left(\frac{39}{29}\right)$$

$$\ell_{EQ} = 6.724137931\ \text{IN}$$

$$I_{EQ} = \begin{cases} \dfrac{F\ell_{EQ}^2}{2E\theta_F} = \dfrac{(50\ \text{LB})(6.724\ \text{IN})^2}{2(26.2\times10^6\ \text{PSI})\left(\frac{39}{60}\ \text{DEG}\right)} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .0038029553\ \text{IN}^4 \\ \dfrac{M\ell_{EQ}}{E\theta_M} = \dfrac{(125\ \text{IN-LB})(6.724\ \text{IN})}{(26.2\times10^6\ \text{PSI})\left(\frac{29}{60}\ \text{DEG}\right)} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .0038029553\ \text{IN}^4 \end{cases}$$

THE BODIES OF REVOLUTION ARE TO BE TESTED AT ZERO ANGLE-OF-ATTACK, SO AS THE WORSE CASE CONDITION, USE THE EQUIVALENT STIFFNESS PROPERTIES FOR THE HORIZONTAL DIRECTION:

$\ell_{EQ} = 6.724$ IN & $I_{EQ} = 0.003803\ \text{IN}^4$

BALANCE NTF-108 (MATERIAL: VASCOMAX 200)

RESULTS OF DEFLECTION TESTS RECEIVED FROM CHARLIE SCOTT

VERTICAL DIRECTION (REC'D AUG. 23, 1982)
NORMAL FORCE, $F = 600$ LB, ROTATION, $\theta_F = 50/60$ DEG
PITCHING MOMENT, $M = 3000$ IN-LB, ROTATION, $\theta_M = 50/60$ DEG

HORIZONTAL DIRECTION (REC'D MAR. 18, 1983)
SIDE FORCE, $F = 300$ LB, ROTATION, $\theta_F = 36/60$ DEG
YAW MOMENT, $M = 1500$ IN-LB, ROTATION, $\theta_M = 36/60$ DEG

EQUIVALENT STIFFNESS PROPERTIES:

VERTICAL DIRECTION:

$$\ell_{EQ} = 2\frac{M}{F}\frac{\theta_F}{\theta_M} = 2\left(\frac{3000\ \text{IN-LB}}{600\ \text{LB}}\right)\left(\frac{50}{50}\right)$$

$$= 10.000\ \text{IN}$$

$$I_{EQ} = \begin{cases} \dfrac{F\ell_{EQ}^2}{2E\theta_F} = \dfrac{(600\ \text{LB})(10.0\ \text{IN})^2}{2(26.2^{E6}\ \text{PSI})(50/60\ \text{DEG})} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .0787270253\ \text{IN}^4 \\ \dfrac{M\ell}{E\theta_M} = \dfrac{(3000\ \text{IN-LB})(10.0\ \text{IN})^2}{(26.2^{E6}\ \text{PSI})(50/60\ \text{DEG})} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .0787270253\ \text{IN}^4 \end{cases}$$

HORIZONTAL DIRECTION:

$$\ell_{EQ} = 2\frac{M}{F}\frac{\theta_F}{\theta_M} = 2\left(\frac{1500\ \text{IN-LB}}{300\ \text{LB}}\right)\left(\frac{36}{36}\right)$$

$$= 10.000\ \text{IN}$$

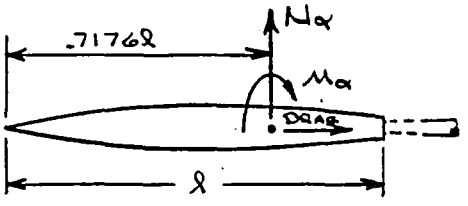
$$I_{EQ} = \begin{cases} \dfrac{F\ell_{EQ}}{2E\theta_F} = \dfrac{(300\ \text{LB})(10.0\ \text{IN})^2}{2(26.2^{E6}\ \text{PSI})(36/60\ \text{DEG})} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .0546715453\ \text{IN}^4 \\ \dfrac{M\ell}{E\theta_M} = \dfrac{(1500\ \text{IN-LB})(10.0\ \text{IN})}{(26.2^{E6}\ \text{PSI})(36/60\ \text{DEG})} \times \dfrac{180\ \text{DEG}}{\pi\ \text{RAD}} = .0546715453\ \text{IN}^4 \end{cases}$$

THE BODIES OF REVOLUTION ARE TO BE TESTED AT ZERO ANGLE-OF-ATTACK, SO AS THE WORSE CASE CONDITION, USE THE EQUIVALENT STIFFNESS PROPERTIES FOR THE HORIZONTAL DIRECTION:

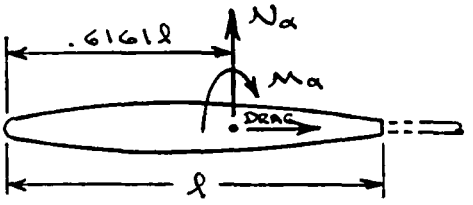
$$\ell_{EQ} = 10.0000\ \text{IN} \quad \& \quad I_{EQ} = 0.054672\ \text{IN}^4$$

EQUIVALENT AERODYNAMIC LOADS

THE AERODYNAMIC LOADS ACTING ON THE BODIES OF REVOLUTION ARE GIVEN* FOR A REFERENCE POINT LOCATED AS SHOWN



"E" BODIES



"C" BODIES

AERODYNAMIC COEFFICIENT	"E" BODY	"C" BODY	SOURCE (TAD RESEARCHERS)
$C_{N\alpha}$	.025/DEG	.019/DEG	STU FLECHNER'S NOTES 9-8-82
$C_{M\alpha}$	.027/DEG	.026/DEG	STU FLECHNER'S NOTES 9-8-82
C_D	.240	.120	JACK PETERSON'S NOTES 7-26-82

(α SUBSCRIBT DENOTES CORRELATION TO ANGLE-OF-ATTACK)

USING THE ABOVE DATA, THE DIMENSIONS OF THE MODELS, AND THE DYNAMIC PRESSURE, THE AERODYNAMIC LOADS FOR THE BODIES OF REVOLUTION CAN BE COMPUTED FROM THE FOLLOWING EQUATIONS*:

$$N_\alpha = \frac{\pi}{4} D^2 Q C_{N\alpha} \qquad \left(\frac{\text{NORMAL FORCE}}{\text{UNIT AOA ROTATION}}\right)$$

$$M_\alpha = \frac{\pi}{4} D^2 \ell Q C_{M\alpha} \qquad \left(\frac{\text{PITCHING MOMENT}}{\text{UNIT AOA ROTATION}}\right)$$

$$\text{DRAG} = \frac{\pi}{4} D^2 Q C_D \qquad (\text{DRAG FORCE})$$

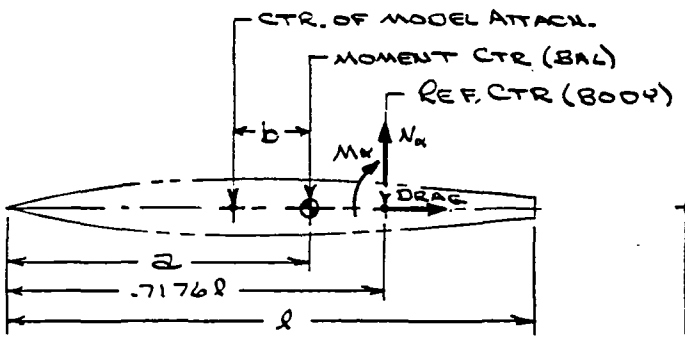
WHERE

D ≡ MAXIMUM BODY DIAMETER
Q ≡ DYNAMIC PRESSURE

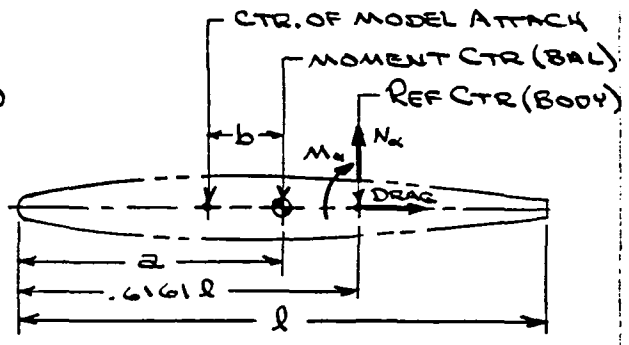
* DATA AND EQUATIONS WERE PROVIDED BY TRANSONIC AERODYNAMIC RESEARCHERS

THE PRECEEDING EQUATIONS ARE FOR THE AERODYNAMIC LOADS DEVELOPED ON THE BODIES OF REVOLUTION. FOR A DIVERGENCE ANALYSIS THE EQUIVALENT AERODYNAMIC LOADS ARE REQUIRED FOR THE MODEL SUPPORT SYSTEMS AT THE ATTACHMENT LOCATION OF THE BODIES.

NOTE:
THE DIMENSIONS SHOWN CORRESPOND TO GIVEN DRAWING DIMENSIONS.



"E" BODIES



"C" BODIES

THE EQUIVALENT FORCES ACTING ON THE MODEL SUPPORT SYSTEMS WOULD BE THE SAME AS THE FORCES DEVELOPED ON THE BODIES:

$$(N_\alpha)_{EQ} = (N_\alpha)_{BODY} = \frac{\pi}{4} D^2 Q C_{N\alpha}$$

$$(DRAG)_{EQ} = (DRAG)_{BODY} = \frac{\pi}{4} D^2 Q C_D$$

FOR THE EQUIVALENT MOMENTS A SIGN CONVENTION IS ASSUMED SUCH THAT A POSITIVE MOMENT PRODUCES A ROTATION IN THE SAME DIRECTION AS A POSITIVE LIFT FORCE. THE EQUIVALENT MOMENT IN THE MODEL SUPPORT SYSTEM AT THE CENTER OF THE MODEL ATTACHMENT WOULD THEN BE:

$$(M_\alpha)_{EQ} = (M_\alpha)_{BODY} - \left(\begin{array}{c}\text{DISTANCE BETWEEN} \\ \text{CTR OF MODEL ATTACH} \\ \text{\& REF. CTR (BODY)}\end{array}\right)(N_\alpha)_{BODY}$$

FOR "E" BODIES:

$$(M_\alpha)_{EQ} = (M_\alpha)_{BODY} - (.7176\ell - a + b)(N_\alpha)_{BODY}$$

$$= \frac{\pi}{4} D^2 \ell Q C_{M\alpha} - (.7176\ell - a + b)\frac{\pi}{4} D^2 Q C_{N\alpha}$$

FOR "C" BODIES:

$$(M_\alpha)_{EQ} = (M_\alpha)_{BODY} - (.6161\ell - a + b)(N_\alpha)_{BODY}$$

$$= \frac{\pi}{4} D^2 \ell Q C_{M\alpha} - (.6161\ell - a + b)\frac{\pi}{4} D^2 Q C_{N\alpha}$$

REARRANGING THE PRECEEDING EQUATIONS INTO TERMS OF LOAD PER UNIT DYNAMIC PRESSURE AND INCLUDING A CONVERSION FACTOR FROM DEGREES TO RADIANS (ALL TO SUIT THE FORM REQUIRED FOR THE DIVERGENCE ANALYSIS):

EQUATIONS FOR THE EQUIVALENT AERODYNAMIC LOADS:

NORMAL FORCE:

$$\frac{(N_\alpha)_{EQ}}{Q} = \frac{\pi}{4} D^2 C_{N\alpha} \times \frac{180 DEG}{\pi RAD}$$

$$= 45\, D^2 C_{N\alpha}$$

PITCHING MOMENT:

"E" BODIES $$\frac{(M_\alpha)_{EQ}}{Q} = \left[\frac{\pi}{4} D^2 \ell C_{M\alpha} - (.7176\ell - a + b)\frac{\pi}{4} D^2 C_{N\alpha}\right] \times \frac{180}{\pi}$$

$$= 45 D^2 \left[\ell C_{M\alpha} - (.7176\ell - a + b) C_{N\alpha}\right]$$

"C" BODIES $$\frac{(M_\alpha)_{EQ}}{Q} = 45 D^2 \left[\ell C_{M\alpha} - (.6161\ell - a + b) C_{N\alpha}\right]$$

DRAG FORCE:

$$\frac{(DRAG)_{EQ}}{Q} = \frac{\pi}{4} D^2 C_D$$

IN ADDITION TO THE PREVIOUSLY GIVEN AERODYNAMIC COEFFICIENTS, THE FOLLOWING DIMENSIONS OF THE BODIES AND BALANCES ARE REQUIRED TO COMPUTE THE EQUIVALENT AERODYNAMIC LOADS: (REFER TO THE PREVIOUSLY DIMENSIONED SKETCHES OF THE BODIES)

ANAL. GROUP	BODY	BAL	ℓ(IN)*	b(IN)**	ℓ(IN)*	D_{max}(IN)*
A.	E-1	107	14.650	2.24	22.120	2.0716
B.	E-2	105	26.435	5.565	44.240	4.144
C.	E-2	108	26.435	4.6255	44.240	4.144
D	E-3	105	38.220	5.565	62.565	5.860
E.	E-3	108	38.220	4.6255	62.565	5.860
F.	C-2	105	24.795	5.565	39.330	4.140
G.	C-2	108	24.795	4.6255	39.330	4.140
H.	C-3	105	29.110	5.565	55.621	5.8548
I.	C-4	105	35.465	5.565	68.926	7.2554

* BODY OF REVOLUTION DIMENSION

** BALANCE DIMENSION

USING THE PRECEEDING DATA IN THE EQUATIONS FOR THE EQUIVALENT AERODYNAMIC LOADS YIELDS THE LOADS THAT WERE USED IN THE DIVERGENCE ANALYSIS

SUMMARY OF EQUIVALENT AERODYNAMIC LOADS

ANAL GROUP	BODY	BAL	$(M_{\alpha})_{EQ}/Q$ [IN³/RAD]	$(N_{\alpha})_{EQ}/Q$ [IN²/RAD]	$(DRAG)_{EQ}/Q$ [IN²]
A.	E-1	107	77.259	4.828	.808934
B.	E-2	105	541.996	19.319	3.23698
C.	E-2	108	560.146	19.319	3.23698
D.	E-3	105	1654.053	38.632	6.47286
E.	E-3	108	1690.348	38.632	6.47286
F.	C-2	105	715.408	14.654	1.61537
G.	C-2	108	729.176	14.654	1.61537
H.	C-3	105	1916.464	29.308	3.23069
I.	C-4	105	3679.598	45.008	4.96128

NOTES

1. THE ABOVE "ANAL. GROUP" IS CORRELATED WITH THE ANALYSES INCLUDED WITH THE "COMPUTER DATA AND OUTPUT LISTINGS" INCLUDED WITH THIS REPORT.
2. DUE TO DIFFERENCES IN DIMENSIONS* & STIFFNESSES*, INDEPENDENT ANALYSES WERE PERFORMED FOR THE MODEL SUPPORT SYSTEMS THAT USED BOTH BALANCES NTF-105 & NTF-108.
3. TO ACCOMODATE THE COMPUTER PROGRAM, THE EQUIVALENT AERODYNAMIC LOADS M_{α}/Q & N_{α}/Q WERE DIVIDED BY 0.001 INCH AND ENTERED AS DISTRIBUTED LOADS OVER A 0.001 INCH LENGTH.
4. FOR THE COMPUTER PROGRAM, THE DRAG FORCE HAD TO BE INOUT WITH THE PITCHING MOMENT.

*RELATIVE TO THE BALANCES

5.0 COMPUTER DATA AND OUTPUT LISTING

A.J DIVERGENCE(E=I BODY WITH NTF=107 (UPDATED 3-25-83)

STATION	X	EI	DCMASH	DCNAS	K
1	0.	.2862990E+03	.8089340E+00	0.	0.
2	.7406000E+01	.3165080E+03	.8089340E+00	0.	0.
3	.1481200E+02	.3490420E+03	.8089340E+00	0.	0.
4	.1481200E+02	.3898560E+03	.8089340E+00	0.	0.
5	.2268200E+02	.4050440E+03	.8089340E+00	0.	0.
6	.3055200E+02	.4206720E+03	.8089340E+00	0.	0.
7	.3222500E+02	.4206720E+03	.8089340E+00	0.	0.
8	.3222500E+02	.4206720E+03	.8089340E+00	0.	.2777780E+06
9	.3582500E+02	.4206720E+03	.8089340E+00	0.	.2777780E+06
10	.3582500E+02	.4206720E+03	.8089340E+00	0.	0.
11	.3681200E+02	.4206720E+03	.8089340E+00	0.	0.
12	.3768400E+02	.4724710E+03	.8089340E+00	0.	0.
13	.3793700E+02	.6018070E+03	.8089340E+00	0.	0.
14	.3793700E+02	.7855000E+03	.8089340E+00	0.	0.
15	.3849700E+02	.8758440E+03	.8089340E+00	0.	0.
16	.3890700E+02	.1152276E+04	.8089340E+00	0.	0.
17	.3905700E+02	.1629655E+04	.8089340E+00	0.	0.
18	.4132600E+02	.1610312E+04	.8089340E+00	0.	0.
19	.4349100E+02	.1512582E+04	.8089340E+00	0.	0.
20	.4425000E+02	.1512582E+04	.8089340E+00	0.	0.

45

A-1

STATION	X	EI	DCMASH	DCNAS	K
21	.4425000E+02	.1629655E+04	.8089340E+00	0.	0.
22	.4875000E+02	.1629655E+04	.8089340E+00	0.	0.
23	.4875000E+02	.1627307E+04	.8089340E+00	0.	0.
24	.5575000E+02	.1626703E+04	.8089340E+00	0.	0.
25	.5575000E+02	.1629655E+04	.8089340E+00	0.	0.
26	.5725000E+02	.1629655E+04	.8089340E+00	0.	0.
27	.5725000E+02	.1174793E+04	.8089340E+00	0.	0.
28	.5825000E+02	.1174793E+04	.8089340E+00	0.	0.
29	.5925000E+02	.1474997E+04	.8089340E+00	0.	0.
30	.6025000E+02	.1775202E+04	.8089340E+00	0.	0.
31	.6025000E+02	.8363110E+03	.8089340E+00	0.	0.
32	.6050000E+02	.8363110E+03	.8089340E+00	0.	0.
33	.6125000E+02	.1058520E+04	.8089340E+00	0.	0.
34	.6125000E+02	.1786583E+04	.8089340E+00	0.	0.
35	.6200000E+02	.1886378E+04	.8089340E+00	0.	0.
36	.6275000E+02	.1186174E+04	.8089340E+00	0.	0.
37	.6325000E+02	.1186174E+04	.8089340E+00	0.	0.
38	.6325000E+02	.2691925E+04	.8089340E+00	0.	0.
39	.6635600E+02	.2308086E+04	.8089340E+00	0.	0.
40	.6946300E+02	.1966824E+04	.8089340E+00	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
41	.7256000E+02	.1664868E+04	.8089340E+00	0.	0.
42	.7567600E+02	.1399077E+04	.8089340E+00	0.	0.
43	.7878200E+02	.1166441E+04	.8089340E+00	0.	0.
44	.8188800E+02	.9640810E+03	.8089340E+00	0.	0.
45	.8499500E+02	.7892480E+03	.8089340E+00	0.	0.
46	.8810100E+02	.6393260E+03	.8089340E+00	0.	0.
47	.9120700E+02	.5118270E+03	.8089340E+00	0.	0.
48	.9431400E+02	.4043960E+03	.8089340E+00	0.	0.
49	.9742000E+02	.3148080E+03	.8089340E+00	0.	0.
50	.1005270E+03	.2409680E+03	.8089340E+00	0.	0.
51	.1036130E+03	.1809120E+03	.8089340E+00	0.	0.
52	.1040080E+03	.1176260E+03	.8089340E+00	0.	0.
53	.1045080E+03	.8467190E+02	.8089340E+00	0.	0.
54	.1052500E+03	.7411600E+02	.8089340E+00	0.	0.
55	.1052500E+03	.1809120E+03	.8089340E+00	0.	0.
56	.1152500E+03	.1809120E+03	.8089340E+00	0.	0.
57	.1152500E+03	.1398420E+03	.8089340E+00	0.	0.
58	.1162750E+03	.1460810E+03	.8089340E+00	0.	0.
59	.1169340E+03	.1612700E+03	.8089340E+00	0.	0.
60	.1171750E+03	.1816190E+03	.8089340E+00	0.	0.

47

A-3

STATION	X	EI	DCMASH	DCNAS	K
61	.1175890E+03	.1816190E+03	.8089340E+00	0.	0.
62	.1182790E+03	.1629020E+03	.8089340E+00	0.	0.
63	.1186700E+03	.1456700E+03	.8089340E+00	0.	0.
64	.1190600E+03	.1298420E+03	.8089340E+00	0.	0.
65	.1194510E+03	.1153400E+03	.8089340E+00	0.	0.
66	.1198410E+03	.1020870E+03	.8089340E+00	0.	0.
67	.1202320E+03	.9000920E+02	.8089340E+00	0.	0.
68	.1206220E+03	.7903560E+02	.8089340E+00	0.	0.
69	.1210120E+03	.6909640E+02	.8089340E+00	0.	0.
70	.1214030E+03	.6012440E+02	.8089340E+00	0.	0.
71	.1217930E+03	.5205490E+02	.8089340E+00	0.	0.
72	.1221840E+03	.4482520E+02	.8089340E+00	0.	0.
73	.1225740E+03	.3837480E+02	.8089340E+00	0.	0.
74	.1229650E+03	.3264570E+02	.8089340E+00	0.	0.
75	.1229650E+03	.3247070E+02	.8089340E+00	0.	0.
76	.1232060E+03	.2926540E+02	.8089340E+00	0.	0.
77	.1232060E+03	.2951600E+02	.8089340E+00	0.	0.
78	.1233550E+03	.2765750E+02	.8089340E+00	0.	0.
79	.1237460E+03	.2320550E+02	.8089340E+00	0.	0.
80	.1241360E+03	.1931380E+02	.8089340E+00	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
81	.1245200E+03	.1593340E+02	.8089340E+00	0.	0.
82	.1249170E+03	.1301730E+02	.8089340E+00	0.	0.
83	.1253170E+03	.1052110E+02	.8089340E+00	0.	0.
84	.1256980E+03	.8402210E+01	.8089340E+00	0.	0.
85	.1260880E+03	.6620640E+01	.8089340E+00	0.	0.
86	.1264790E+03	.5138520E+01	.8089340E+00	0.	0.
87	.1268690E+03	.3920260E+01	.8089340E+00	0.	0.
88	.1268690E+03	.5272800E+00	.8089340E+00	0.	0.
89	.1270660E+03	.5272800E+00	.8089340E+00	0.	0.
90	.1270460E+03	.3920260E+01	.8089340E+00	0.	0.
91	.1316340E+03	.3920260E+01	.8089340E+00	0.	0.
92	.1362020E+03	.3920260E+01	.8089340E+00	0.	0.
93	.1407700E+03	.3920260E+01	.8089340E+00	0.	0.
94	.1453380E+03	.3920260E+01	.8089340E+00	0.	0.
95	.1499070E+03	.3920260E+01	.8089340E+00	0.	0.
96	.1544750E+03	.3920260E+01	.8089340E+00	0.	0.
97	.1590430E+03	.3920260E+01	.8089340E+00	0.	0.
98	.1636110E+03	.3920260E+01	.8089340E+00	0.	0.
99	.1681790E+03	.3920260E+01	.8089340E+00	0.	0.
100	.1727470E+03	.3920260E+01	.8089340E+00	0.	0.

64

A-5

STATION	X	EI	DCMASH	DCNAS	K
101	.1734360E+03	.3554520E+01	.8089340E+00	0.	0.
102	.1741260E+03	.3214960E+01	.8089340E+00	0.	0.
103	.1748150E+03	.2900320E+01	.8089340E+00	0.	0.
104	.1755050E+03	.2609330E+01	.8089340E+00	0.	0.
105	.1761940E+03	.2340790E+01	.8089340E+00	0.	0.
106	.1768830E+03	.2093490E+01	.8089340E+00	0.	0.
107	.1775730E+03	.1866300E+01	.8089340E+00	0.	0.
108	.1782620E+03	.1658100E+01	.8089340E+00	0.	0.
109	.1789520E+03	.1467790E+01	.8089340E+00	0.	0.
110	.1796410E+03	.1294330E+01	.8089340E+00	0.	0.
111	.1803310E+03	.1136670E+01	.8089340E+00	0.	0.
112	.1810200E+03	.9938460E+00	.8089340E+00	0.	0.
113	.1817090E+03	.8648830E+00	.8089340E+00	0.	0.
114	.1823990E+03	.7488560E+00	.8089340E+00	0.	0.
115	.1830880E+03	.6448700E+00	.8089340E+00	0.	0.
116	.1837780E+03	.5520610E+00	.8089340E+00	0.	0.
117	.1844670E+03	.4696000E+00	.8089340E+00	0.	0.
118	.1651560E+03	.3966850E+00	.8089340E+00	0.	0.
119	.1858460E+03	.3325500E+00	.8089340E+00	0.	0.
120	.1865350E+03	.2764610E+00	.8089340E+00	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
121	.1872750E+03	.2277150E+00	.8089340E+00	0.	0.
122	.1879140E+03	.1856400E+00	.8089340E+00	0.	0.
123	.1886040E+03	.1495990E+00	.8089340E+00	0.	0.
124	.1892930E+03	.1189850E+00	.8089340E+00	0.	0.
125	.1899820E+03	.9322420E-01	.8089340E+00	0.	0.
126	.1906720E+03	.7177370E-01	.8089340E+00	0.	0.
127	.1913610E+03	.5412390E-01	.8089340E+00	0.	0.
128	.1920510E+03	.3979690E-01	.8089340E+00	0.	0.
129	.1927400E+03	.2834680E-01	.8089340E+00	0.	0.
130	.1927400E+03	.3122300E-01	.8089340E+00	0.	0.
131	.1930830E+03	.2699500E-01	.8089340E+00	0.	0.
132	.1933860E+03	.2320890E-01	.8089340E+00	0.	0.
133	.1936890E+03	.1983280E-01	.8089340E+00	0.	0.
134	.1939510E+03	.1683580E-01	.8089340E+00	0.	0.
135	.1942540E+03	.1418850E-01	.8089340E+00	0.	0.
136	.1945570E+03	.1186270E-01	.8089340E+00	0.	0.
137	.1948600E+03	.9831030E-02	.8089340E+00	0.	0.
138	.1951630E+03	.8067720E-02	.8089340E+00	0.	0.
139	.1954660E+03	.6547990E-02	.8089340E+00	0.	0.
140	.1957690E+03	.5248310E-02	.8089340E+00	0.	0.

STATION	X	EI	DCMASM	DCMAS	K
141	.1960710E+03	.8146330E-02	.8089340E+00	0.	0.
142	.1963740E+03	.3222091E-02	.8089340E+00	0.	0.
143	.1966770E+03	.2452100E-02	.8089340E+00	0.	0.
144	.1969800E+03	.1821140E-02	.8089340E+00	0.	0.
145	.1980250E+03	.1821140E-02	.8089340E+00	0.	0.
146	.1990700E+03	.1821140E-02	.8089340E+00	0.	0.
147	.2001150E+03	.1821140E-02	.8089340E+00	0.	0.
148	.2011600E+03	.1821140E-02	.8089340E+00	0.	0.
149	.2022050E+03	.1821140E-02	.8089340E+00	0.	0.
150	.2023120E+03	.2034580E-02	.8089340E+00	0.	0.
151	.2024190E+03	.2787190E-02	.8089340E+00	0.	0.
152	.2025260E+03	.4493950E-02	.8089340E+00	0.	0.
153	.2026330E+03	.8170190E-02	.8089340E+00	0.	0.
154	.2027400E+03	.1618490E-01	.8089340E+00	0.	0.
155	.2030200E+03	.1618490E-01	.8089340E+00	0.	0.
156	.2030200E+03	.1555210E-01	.8089340E+00	0.	0.
157	.2031160E+03	.1555210E-01	.8089340E+00	0.	0.
158	.2031160E+03	.3803000E-02	.8089340E+00	0.	0.
159	.2053580E+03	.3803000E-02	.8089340E+00	0.	0.
160	.2076000E+03	.3803000E-02	.8089340E+00	0.	0.

52

A-8

STATION	X	EI	DCMASH	DCNAS	K
161	.2047200E+03	.3803000E+02	.8089340E+00	0.	0.
162	.2098000E+03	.3803000E+02	.8089340E+00	0.	0.
163	.2098000E+03	.3803000E+02	.7725900E+05	.4828000E+04	0.
164	.2098010E+03	.3803000E+02	.7725900E+05	.4828000E+04	0.

53

```
$CNTL
 M       = 6,
 MC      = 2,
 MBS     = 1,
 MDATA   = 5,
 MHDM    = 0,
 MI      = 150,
$END
```

54

```
$MCNTL
 DEL    = .1E+01,
 EPS    = .1E-05,
 ITMAX  = 100,
 N      = 1,
 NORM   = 1,
 PVTC   = 0,
 PVTR   = 0,
 XO     = .1E+01,
$END
```

```
$PARAM
DUMMY  = -1,
EIMOD  = .262E+08,
$END
```

MATRIX C

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

MATRIX B

0.000

0.000

58

MATRIX D

0.	0.	.1000E+01	0.
0.	0.	0.	.1000E+01

MATRIX B

0.000

0.000

EIGENVALUES FROM SECANT METHOD

.3765091E+02

QDIV (1) = .3765091E+02

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.1647438E-05	0.	-.1047904E+03
2	7.406	.1220092E-04	.1993993E-05	.7760773E+03	-.1047904E+03
3	14.812	.2953503E-04	.2969055E-05	.1552154E+04	-.1047904E+03
4	14.812	.2953503E-04	.2969055E-05	.1552154E+04	-.1047904E+03
5	22.682	.5760746E-04	.4448358E-05	.2376854E+04	-.1047904E+03
6	30.552	.9955219E-04	.6472737E-05	.3201553E+04	-.1047904E+03
7	32.225	.1107876E-03	.6972015E-05	.3376867E+04	-.1047904E+03
8	32.225	.1107876E-03	.6972015E-05	.3376867E+04	-.1047904E+03
9	35.825	.1378722E-03	.8136615E-05	.3554694E+04	.1854692E+02
10	35.825	.1378722E-03	.8136615E-05	.3554694E+04	.1854692E+02
11	36.812	.1460602E-03	.8454123E-05	.3536388E+04	.1854692E+02
12	37.648	.1532399E-03	.8707134E-05	.3520882E+04	.1854692E+02
13	37.937	.1557682E-03	.8780452E-05	.3515522E+04	.1854692E+02
14	37.937	.1557682E-03	.8780452E-05	.3515522E+04	.1854692E+02
15	38.497	.1607120E-03	.8871052E-05	.3505136E+04	.1854692E+02
16	38.907	.1643620E-03	.8926115E-05	.3497532E+04	.1854692E+02
17	39.057	.1657022E-03	.8940942E-05	.3494749E+04	.1854692E+02
18	41.326	.1861999E-03	.9126644E-05	.3452666E+04	.1854692E+02
19	43.491	.2061509E-03	.9308449E-05	.3412511E+04	.1854692E+02
20	44.250	.2132408E-03	.9373668E-05	.3398434E+04	.1854692E+02

62

A-18

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	44.250	.2132408E-03	.9373668E-05	.3398434E+04	.1854692E+02
22	48.750	.2562282E-03	.9727444E-05	.3314971E+04	.1854692E+02
23	48.750	.2562282E-03	.9727444E-05	.3314971E+04	.1854692E+02
24	55.750	.3262252E-03	.1026114E-04	.3185141E+04	.1854692E+02
25	55.750	.3262252E-03	.1026114E-04	.3185141E+04	.1854692E+02
26	57.250	.3417008E-03	.1037255E-04	.3157320E+04	.1854692E+02
27	57.250	.3417008E-03	.1037255E-04	.3157320E+04	.1854692E+02
28	58.250	.3521247E-03	.1047483E-04	.3138773E+04	.1854692E+02
29	59.250	.3626505E-03	.1056619E-04	.3120226E+04	.1854692E+02
30	60.250	.3732571E-03	.1063990E-04	.3101678E+04	.1854692E+02
31	60.250	.3732571E-03	.1063990E-04	.3101678E+04	.1854692E+02
32	60.500	.3759215E-03	.1067527E-04	.3097042E+04	.1854692E+02
33	61.250	.3839677E-03	.1076996E-04	.3083131E+04	.1854692E+02
34	61.250	.3839677E-03	.1076996E-04	.3083131E+04	.1854692E+02
35	62.000	.3920637E-03	.1082421E-04	.3069221E+04	.1854692E+02
36	62.750	.4002040E-03	.1089064E-04	.3055310E+04	.1854692E+02
37	63.250	.4056616E-03	.1093972E-04	.3046037E+04	.1854692E+02
38	63.250	.4056616E-03	.1093972E-04	.3046037E+04	.1854692E+02
39	66.356	.4398487E-03	.1108354E-04	.2988429E+04	.1854692E+02
40	69.863	.4785238E-03	.1124866E-04	.2930802E+04	.1854692E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72.569	.5097364E-03	.1143928E-04	.2873195E+04	.1854692E+02
42	75.676	.5055962E-03	.1166094E-04	.2815568E+04	.1854692E+02
43	78.782	.5021856E-03	.1192038E-04	.2757960E+04	.1854692E+02
44	81.888	.6196456E-03	.1222655E-04	.2700353E+04	.1854692E+02
45	84.995	.6581495E-03	.1259117E-04	.2642726E+04	.1854692E+02
46	88.101	.6978742E-03	.1302933E-04	.2585118E+04	.1854692E+02
47	91.207	.7390877E-03	.1356172E-04	.2527510E+04	.1854692E+02
48	94.314	.7821337E-03	.1421667E-04	.2469884E+04	.1854692E+02
49	97.420	.8274151E-03	.1503290E-04	.2412276E+04	.1854692E+02
50	100.527	.8755340E-03	.1606665E-04	.2354649E+04	.1854692E+02
51	103.633	.9272361E-03	.1739847E-04	.2297040E+04	.1854692E+02
52	104.008	.9337946E-03	.1762867E-04	.2290085E+04	.1854692E+02
53	104.508	.9427018E-03	.1807147E-04	.2280811E+04	.1854692E+02
54	105.250	.9563938E-03	.1888604E-04	.2267049E+04	.1854692E+02
55	105.250	.9563938E-03	.1888604E-04	.2267049E+04	.1854692E+02
56	115.250	.1169169E-02	.2347330E-04	.2081574E+04	.1854692E+02
57	115.250	.1169169E-02	.2347330E-04	.2081574E+04	.1854692E+02
58	116.275	.1193528E-02	.2404074E-04	.2062562E+04	.1854692E+02
59	116.934	.1209488E-02	.2437772E-04	.2050339E+04	.1854692E+02
60	117.175	.1215377E-02	.2448800E-04	.2045869E+04	.1854692E+02

64

A-20

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117.889	.1232971E-02	.2479399E-04	.2032626E+04	.1854692E+02
62	118.279	.1242673E-02	.2496982E-04	.2025393E+04	.1854692E+02
63	118.670	.1252473E-02	.2516598E-04	.2018141E+04	.1854692E+02
64	119.060	.1262328E-02	.2538436E-04	.2010907E+04	.1854692E+02
65	119.451	.1272298E-02	.2562955E-04	.2003655E+04	.1854692E+02
66	119.841	.1282344E-02	.2590439E-04	.1996421E+04	.1854692E+02
67	120.232	.1292530E-02	.2621522E-04	.1989169E+04	.1854692E+02
68	120.622	.1302818E-02	.2656634E-04	.1981935E+04	.1854692E+02
69	121.012	.1313251E-02	.2696568E-04	.1974702E+04	.1854692E+02
70	121.403	.1323878E-02	.2742311E-04	.1967450E+04	.1854692E+02
71	121.793	.1334668E-02	.2794692E-04	.1960216E+04	.1854692E+02
72	122.184	.1345705E-02	.2855301E-04	.1952964E+04	.1854692E+02
73	122.574	.1356968E-02	.2925465E-04	.1945730E+04	.1854692E+02
74	122.965	.1368554E-02	.3007607E-04	.1938478E+04	.1854692E+02
75	122.965	.1368554E-02	.3007607E-04	.1938478E+04	.1854692E+02
76	123.206	.1375869E-02	.3065458E-04	.1934008E+04	.1854692E+02
77	123.206	.1375869E-02	.3065458E-04	.1934008E+04	.1854692E+02
78	123.355	.1380464E-02	.3103946E-04	.1931244E+04	.1854692E+02
79	123.746	.1392804E-02	.3217916E-04	.1923992E+04	.1854692E+02
80	124.136	.1405595E-02	.3353489E-04	.1916758E+04	.1854692E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124.526	.1818961E-02	.3516550E-04	.1909525E+04	.1854692E+02
82	124.917	.1833061E-02	.3715019E-04	.1902272E+04	.1854692E+02
83	125.307	.1847973E-02	.3957840E-04	.1895039E+04	.1854692E+02
84	125.698	.1863974E-02	.4259891E-04	.1887786E+04	.1854692E+02
85	126.088	.1881240E-02	.4638520E-04	.1880553E+04	.1854692E+02
86	126.479	.1900205E-02	.5122497E-04	.1873300E+04	.1854692E+02
87	126.869	.1921241E-02	.5748109E-04	.1866066E+04	.1854692E+02
88	126.869	.1921241E-02	.5748109E-04	.1866066E+04	.1854692E+02
89	127.066	.1935186E-02	.6406540E-04	.1862412E+04	.1854692E+02
90	127.066	.1935186E-02	.6406540E-04	.1862412E+04	.1854692E+02
91	131.634	.2100380E-02	.1650108E-03	.1777672E+04	.1854692E+02
92	136.202	.3042724E-02	.2421872E-03	.1692921E+04	.1854692E+02
93	140.770	.4321001E-02	.3155941E-03	.1608160E+04	.1854692E+02
94	145.339	.5925991E-02	.3852310E-03	.1523389E+04	.1854692E+02
95	149.907	.7840924E-02	.4511116E-03	.1438590E+04	.1854692E+02
96	154.475	.1004773E-01	.5132067E-03	.1353800E+04	.1854692E+02
97	159.043	.1252958E-01	.5715305E-03	.1269002E+04	.1854692E+02
98	163.611	.1526924E-01	.6260829E-03	.1184197E+04	.1854692E+02
99	169.179	.1824947E-01	.6768634E-03	.1099384E+04	.1854692E+02
100	172.747	.2145306E-01	.7238717E-03	.1014564E+04	.1854692E+02
101	173.036	.2195419E-01	.7309803E-03	.1001770E+04	.1854692E+02
102	174.126	.2246109E-01	.7387421E-03	.9889567E+03	.1854692E+02

103	174,815	.2297287E-01	.7472123E-03	.9761623E+03	.1854692E+02
104	175,505	.2349150E-01	.7565058E-03	.9633492E+03	.1854692E+02
105	176,198	.2401608E-01	.7666998E-03	.9505544E+03	.1854692E+02
106	176,883	.2454802E-01	.7779293E-03	.9377593E+03	.1854692E+02
107	177,573	.2508886E-01	.7903538E-03	.9249455E+03	.1854692E+02
108	178,262	.2563790E-01	.8041038E-03	.9121499E+03	.1854692E+02
109	178,952	.2619773E-01	.8194159E-03	.8993355E+03	.1854692E+02
110	179,641	.2676746E-01	.8364786E-03	.8865393E+03	.1854692E+02
111	180,331	.2735125E-01	.8556197E-03	.8737242E+03	.1854692E+02
112	181,020	.2794774E-01	.8771171E-03	.8609272E+03	.1854692E+02
113	181,709	.2855992E-01	.9014016E-03	.8481297E+03	.1854692E+02
114	182,399	.2919080E-01	.9290026E-03	.8353131E+03	.1854692E+02
115	183,088	.2984098E-01	.9604406E-03	.8225145E+03	.1854692E+02
116	183,778	.3051528E-01	.9965491E-03	.8096966E+03	.1854692E+02
117	184,467	.3121519E-01	.1038147E-02	.7968964E+03	.1854692E+02
118	185,156	.3194588E-01	.1086451E-02	.7840954E+03	.1854692E+02
119	185,846	.3271345E-01	.1143019E-02	.7712746E+03	.1854692E+02
120	186,535	.3352201E-01	.1209589E-02	.7584712E+03	.1854692E+02
121	187,225	.3438155E-01	.1288833E-02	.7456476E+03	.1854692E+02
122	187,914	.3529922E-01	.1383796E-02	.7328408E+03	.1854692E+02
123	188,604	.3628991E-01	.1499155E-02	.7200133E+03	.1854692E+02
124	189,293	.3736643E-01	.1640592E-02	.7072017E+03	.1854692E+02
125	189,982	.3855064E-01	.1816684E-02	.6943868E+03	.1854692E+02
126	190,672	.3987183E-01	.2039407E-02	.6815492E+03	.1854692E+02
127	191,361	.4136329E-01	.2327126E-02	.6687249E+03	.1854692E+02
128	192,051	.4308128E-01	.2706838E-02	.6558752E+03	.1854692E+02

67

A-23

129	192.740	.4509558E-01	.3221817E-02	.6430350E+03	.1854692E+02
130	192.740	.4509558E-01	.3221817E-02	.6430350E+03	.1854692E+02
131	193.043	.4610788E-01	.3477437E-02	.6373845E+03	.1854692E+02
132	193.346	.4720291E-01	.3771362E-02	.6317314E+03	.1854692E+02
133	193.649	.4839332E-01	.4111295E-02	.6260754E+03	.1854692E+02
134	193.951	.4968988E-01	.4505623E-02	.6204348E+03	.1854692E+02
135	194.254	.5111965E-01	.4969266E-02	.6147715E+03	.1854692E+02
136	194.557	.5270125E-01	.5516720E-02	.6091036E+03	.1854692E+02
137	194.860	.5446278E-01	.6168555E-02	.6034303E+03	.1854692E+02
138	195.163	.5643940E-01	.6951915E-02	.5977503E+03	.1854692E+02
139	195.466	.5867564E-01	.7903191E-02	.5920625E+03	.1854692E+02
140	195.769	.6122873E-01	.9072080E-02	.5863650E+03	.1854692E+02
141	196.071	.6416296E-01	.1052313E-01	.5806745E+03	.1854692E+02
142	196.374	.6759684E-01	.1236477E-01	.5749502E+03	.1854692E+02
143	196.677	.7165600E-01	.1473889E-01	.5692069E+03	.1854692E+02
144	196.980	.7652860E-01	.1787023E-01	.5634387E+03	.1854692E+02
145	197.025	.1016507E+00	.2999185E-01	.5432921E+03	.1854692E+02
146	199.070	.1392093E+00	.4166800E-01	.5227666E+03	.1854692E+02
147	200.115	.1587346E+00	.5289056E-01	.5018767E+03	.1854692E+02
148	201.160	.2497485E+00	.6365168E-01	.4806368E+03	.1854692E+02
149	202.205	.3217636E+00	.7394387E-01	.4590619E+03	.1854692E+02
150	202.312	.3297317E+00	.7491710E-01	.4568347E+03	.1854692E+02
151	202.419	.3377969E+00	.7570865E-01	.4546046E+03	.1854692E+02
152	202.526	.3459334E+00	.7624726E-01	.4523722E+03	.1854692E+02
153	202.633	.3541138E+00	.7656532E-01	.4501386E+03	.1854692E+02

89

A-24

154	202.740	.3623183E+00	.7673433E-01	.4479042E+03	.1854692E+02
155	203.020	.3938459E+00	.7702816E-01	.4420554E+03	.1854692E+02
156	203.020	.3938459E+00	.7702816E-01	.4420554E+03	.1854692E+02
157	203.116	.3912451E+00	.7713207E-01	.4400495E+03	.1854692E+02
158	203.116	.3912451E+00	.7713207E-01	.4400495E+03	.1854692E+02
159	205.358	.5752750E+00	.8650668E-01	.3928623E+03	.1854692E+02
160	207.600	.7791325E+00	.9481231E-01	.3450712E+03	.1854692E+02
161	208.720	.8974944E+00	.9855620E-01	.3209983E+03	.1854692E+02
162	209.840	.9998980E+00	.1020288E+00	.2968022E+03	.1854692E+02
163	209.840	.9998980E+00	.1020288E+00	.2968022E+03	.1854692E+02
164	209.841	.1000000E+01	.1020303E+00	-.1818419E-09	.2615339E-10

69

A-25

B.) DIVERGENCE: E=2 BODY WITH NTP=109 (UPDATED 3-25-83)

STATION	X	EI	DCMASM	DCNAS	K
1	0.	.2862990E+03	.3236980E+01	0.	0.
2	.7406500E+01	.3165080E+03	.3236980E+01	0.	0.
3	.1481200E+02	.3490420E+03	.3236980E+01	0.	0.
4	.1481200E+02	.3898560E+03	.3236980E+01	0.	0.
5	.2268200E+02	.4050440E+03	.3236980E+01	0.	0.
6	.3055200E+02	.4206720E+03	.3236980E+01	0.	0.
7	.3222500E+02	.4206720E+03	.3236980E+01	0.	0.
8	.3222500E+02	.4206720E+03	.3236980E+01	0.	.2777780E+00
9	.3582500E+02	.4206720E+03	.3236980E+01	0.	.2777780E+00
10	.3582500E+02	.4206720E+03	.3236980E+01	0.	0.
11	.3681200E+02	.4206720E+03	.3236980E+01	0.	0.
12	.3764800E+02	.4724710E+03	.3236980E+01	0.	0.
13	.3793700E+02	.6018070E+03	.3236980E+01	0.	0.
14	.3793700E+02	.7855000E+03	.3236980E+01	0.	0.
15	.3849700E+02	.8758440E+03	.3236980E+01	0.	0.
16	.3890700E+02	.1152276E+04	.3236980E+01	0.	0.
17	.3905700E+02	.1629655E+04	.3236980E+01	0.	0.
18	.4132600E+02	.1610312E+04	.3236980E+01	0.	0.
19	.4349100E+02	.1512582E+04	.3236980E+01	0.	0.
20	.4425000E+02	.1512582E+04	.3236980E+01	0.	0.

94

B-1

STATION	X	EI	DCMASH	DCNAS	K
21	.4425000E+02	.1629655E+04	.3236980E+01	0.	0.
22	.4875000E+02	.1629655E+04	.3236980E+01	0.	0.
23	.4875000E+02	.1627307E+04	.3236980E+01	0.	0.
24	.5575000E+02	.1626703E+04	.3236980E+01	0.	0.
25	.5575000E+02	.1629655E+04	.3236980E+01	0.	0.
26	.5725000E+02	.1629655E+04	.3236980E+01	0.	0.
27	.5725000E+02	.1174793E+04	.3236980E+01	0.	0.
28	.5825000E+02	.1174793E+04	.3236980E+01	0.	0.
29	.5925000E+02	.1474997E+04	.3236980E+01	0.	0.
30	.6025000E+02	.1775202E+04	.3236980E+01	0.	0.
31	.6025000E+02	.8363110E+03	.3236980E+01	0.	0.
32	.6050000E+02	.8363110E+03	.3236980E+01	0.	0.
33	.6125000E+02	.1058520E+04	.3236980E+01	0.	0.
34	.6125000E+02	.1786583E+04	.3236980E+01	0.	0.
35	.6200000E+02	.1486378E+04	.3236980E+01	0.	0.
36	.6275000E+02	.1186174E+04	.3236980E+01	0.	0.
37	.6325000E+02	.1186174E+04	.3236980E+01	0.	0.
38	.6325000E+02	.2691925E+04	.3236980E+01	0.	0.
39	.6035600E+02	.2308086E+04	.3236980E+01	0.	0.
40	.6946300E+02	.1966824E+04	.3236980E+01	0.	0.

B-2

STATION	X	EI	DCMASM	DCMAS	K
41	.7256900E+02	.1664868E+04	.3236980E+01	0.	0.
42	.7567600E+02	.1399077E+04	.3236980E+01	0.	0.
43	.7878200E+02	.1166441E+04	.3236980E+01	0.	0.
44	.8188800E+02	.9640810E+03	.3236980E+01	0.	0.
45	.8499500E+02	.7892480E+03	.3236980E+01	0.	0.
46	.8810100E+02	.6393260E+03	.3236980E+01	0.	0.
47	.9120700E+02	.5118270E+03	.3236980E+01	0.	0.
48	.9431400E+02	.4043960E+03	.3236980E+01	0.	0.
49	.9742000E+02	.3148080E+03	.3236980E+01	0.	0.
50	.1005270E+03	.2409680E+03	.3236980E+01	0.	0.
51	.1036330E+03	.1809120E+03	.3236980E+01	0.	0.
52	.1040080E+03	.1176260E+03	.3236980E+01	0.	0.
53	.1045080E+03	.8467190E+02	.3236980E+01	0.	0.
54	.1052500E+03	.7411600E+02	.3236980E+01	0.	0.
55	.1052500E+03	.1809120E+03	.3236980E+01	0.	0.
56	.1152500E+03	.1809120E+03	.3236980E+01	0.	0.
57	.1152500E+03	.1394420E+03	.3236980E+01	0.	0.
58	.1162750E+03	.1460810E+03	.3236980E+01	0.	0.
59	.1169340E+03	.1612700E+03	.3236980E+01	0.	0.
60	.1171750E+03	.1816190E+03	.3236980E+01	0.	0.

STATION	X	EI	DCMASM	DCNAS	K
61	.1178890E+03	.1818190E+03	.3236980E+01	0.	0.
62	.1182790E+03	.1629020E+03	.3236980E+01	0.	0.
63	.1186700E+03	.1456700E+03	.3236980E+01	0.	0.
64	.1190600E+03	.1298420E+03	.3236980E+01	0.	0.
65	.1194510E+03	.1153400E+03	.3236980E+01	0.	0.
66	.1198410E+03	.1020870E+03	.3236980E+01	0.	0.
67	.1202320E+03	.9000920E+02	.3236980E+01	0.	0.
68	.1206220E+03	.7903560E+02	.3236980E+01	0.	0.
69	.1210120E+03	.6909640E+02	.3236980E+01	0.	0.
70	.1214030E+03	.6012440E+02	.3236980E+01	0.	0.
71	.1217930E+03	.5205490E+02	.3236980E+01	0.	0.
72	.1221840E+03	.4482520E+02	.3236980E+01	0.	0.
73	.1225740E+03	.3837480E+02	.3236980E+01	0.	0.
74	.1229650E+03	.3264570E+02	.3236980E+01	0.	0.
75	.1229650E+03	.3247070E+02	.3236980E+01	0.	0.
76	.1232060E+03	.2926540E+02	.3236980E+01	0.	0.
77	.1232060E+03	.2951600E+02	.3236980E+01	0.	0.
78	.1233550E+03	.2765750E+02	.3236980E+01	0.	0.
79	.1237460E+03	.2320550E+02	.3236980E+01	0.	0.
80	.1241360E+03	.1931380E+02	.3236980E+01	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
81	.1285260E+03	.1593340E+02	.3236980E+01	0.	0.
82	.1249170E+03	.1301730E+02	.3236980E+01	0.	0.
83	.1253070E+03	.1052110E+02	.3236980E+01	0.	0.
84	.1256980E+03	.8402210E+01	.3236980E+01	0.	0.
85	.1260880E+03	.6620640E+01	.3236980E+01	0.	0.
86	.1264790E+03	.5138520E+01	.3236980E+01	0.	0.
87	.1268690E+03	.3920260E+01	.3236980E+01	0.	0.
88	.1268690E+03	.5272800E+00	.3236980E+01	0.	0.
89	.1270660E+03	.5272800E+00	.3236980E+01	0.	0.
90	.1270660E+03	.3920260E+01	.3236980E+01	0.	0.
91	.1297000E+03	.3920260E+01	.3236980E+01	0.	0.
92	.1323350E+03	.3920260E+01	.3236980E+01	0.	0.
93	.1349690E+03	.3920260E+01	.3236980E+01	0.	0.
94	.1376040E+03	.3920260E+01	.3236980E+01	0.	0.
95	.1402380E+03	.3920260E+01	.3236980E+01	0.	0.
96	.1428720E+03	.3920260E+01	.3236980E+01	0.	0.
97	.1455070E+03	.3920260E+01	.3236980E+01	0.	0.
98	.1481410E+03	.3920260E+01	.3236980E+01	0.	0.
99	.1507760E+03	.3920260E+01	.3236980E+01	0.	0.
100	.1534100E+03	.3920260E+01	.3236980E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
101	.1546390E+03	.3286780E+01	.3236980E+01	0.	0.
102	.1558670E+03	.2733310E+01	.3236980E+01	0.	0.
103	.1570960E+03	.2252790E+01	.3236980E+01	0.	0.
104	.1583250E+03	.1838520E+01	.3236980E+01	0.	0.
105	.1595530E+03	.1484120E+01	.3236980E+01	0.	0.
106	.1607820E+03	.1183510E+01	.3236980E+01	0.	0.
107	.1620100E+03	.9309490E+00	.3236980E+01	0.	0.
108	.1632390E+03	.7210310E+00	.3236980E+01	0.	0.
109	.1632390E+03	.7231290E+00	.3236980E+01	0.	0.
110	.1638710E+03	.6300890E+00	.3236980E+01	0.	0.
111	.1645030E+03	.5463170E+00	.3236980E+01	0.	0.
112	.1651350E+03	.4711760E+00	.3236980E+01	0.	0.
113	.1657670E+03	.4040510E+00	.3236980E+01	0.	0.
114	.1663990E+03	.3443520E+00	.3236980E+01	0.	0.
115	.1670310E+03	.2915090E+00	.3236980E+01	0.	0.
116	.1676630E+03	.2449770E+00	.3236980E+01	0.	0.
117	.1682950E+03	.2042300E+00	.3236980E+01	0.	0.
118	.1689260E+03	.1687700E+00	.3236980E+01	0.	0.
119	.1695580E+03	.1381170E+00	.3236980E+01	0.	0.
120	.1701900E+03	.1118160E+00	.3236980E+01	0.	0.

B=6

STATION	X	EI	DCMASM	DCMAS	K
121	.1708220E+03	.8943400E-01	.3236980E+01	0.	0.
122	.1714540E+03	.7056120E-01	.3236980E+01	0.	0.
123	.1720860E+03	.5480990E-01	.3236980E+01	0.	0.
124	.1727180E+03	.4181540E-01	.3236980E+01	0.	0.
125	.1733500E+03	.3123550E-01	.3236980E+01	0.	0.
126	.1739390E+03	.3123550E-01	.3236980E+01	0.	0.
127	.1755280E+03	.3123550E-01	.3236980E+01	0.	0.
128	.1766170E+03	.3123550E-01	.3236980E+01	0.	0.
129	.1777050E+03	.3123550E-01	.3236980E+01	0.	0.
130	.1787950E+03	.3123550E-01	.3236980E+01	0.	0.
131	.1798830E+03	.3123550E-01	.3236980E+01	0.	0.
132	.1809720E+03	.3123550E-01	.3236980E+01	0.	0.
133	.1820610E+03	.3123550E-01	.3236980E+01	0.	0.
134	.1831500E+03	.3123550E-01	.3236980E+01	0.	0.
135	.1842390E+03	.3123550E-01	.3236980E+01	0.	0.
136	.1845890E+03	.3871280E-01	.3236980E+01	0.	0.
137	.1849390E+03	.4702220E-01	.3236980E+01	0.	0.
138	.1852890E+03	.5749220E-01	.3236980E+01	0.	0.
139	.1856390E+03	.6905760E-01	.3236980E+01	0.	0.
140	.1859890E+03	.8225960E-01	.3236980E+01	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
141	.1863390E+03	.9724570E-01	.3236980E+01	0.	0.
142	.1866890E+03	.1141700E+00	.3236980E+01	0.	0.
143	.1870390E+03	.1331930E+00	.3236980E+01	0.	0.
144	.1873890E+03	.1544800E+00	.3236980E+01	0.	0.
145	.1877390E+03	.1782060E+00	.3236980E+01	0.	0.
146	.1877390E+03	.1761090E+00	.3236980E+01	0.	0.
147	.1879060E+03	.2239200E+00	.3236980E+01	0.	0.
148	.1880720E+03	.2807160E+00	.3236980E+01	0.	0.
149	.1882390E+03	.3475580E+00	.3236980E+01	0.	0.
150	.1884060E+03	.4255650E+00	.3236980E+01	0.	0.
151	.1885720E+03	.5159170E+00	.3236980E+01	0.	0.
152	.1887390E+03	.6198520E+00	.3236980E+01	0.	0.
153	.1889060E+03	.7386680E+00	.3236980E+01	0.	0.
154	.1890720E+03	.8737220E+00	.3236980E+01	0.	0.
155	.1892390E+03	.1026430E+01	.3236980E+01	0.	0.
156	.1898390E+03	.1026430E+01	.3236980E+01	0.	0.
157	.1898390E+03	.8819690E+00	.3236980E+01	0.	0.
158	.1920200E+03	.7820390E+00	.3236980E+01	0.	0.
159	.1920200E+03	.1804160E+00	.3236980E+01	0.	0.
160	.1947380E+03	.1804160E+00	.3236980E+01	0.	0.

STATION	X	EI	DCMASH	DCMAB	K
161	.1974350E+03	.1804160E+00	.3236980E+01	0.	0.
162	.2002180E+03	.1804160E+00	.3236980E+01	0.	0.
163	.2030000E+03	.1804160E+00	.3236980E+01	0.	0.
164	.2030200E+03	.1804160E+00	.5419960E+06	.1931900E+05	0.
165	.2030210E+03	.1804160E+00	.5419960E+06	.1931900E+05	0.

```
$CNTL
 M      = 6,
 MC     = 2,
 MSS    = 1,
 MDATA  = 5,
 MMON   = 0,
 MI     = 155,
$END
```


79

```
$MCNTL
DEL    = .1E+01,
EPS    = .1E-05,
ITMAX  = 100,
N      = 1,
NORM   = 1,
PVTC   = 0,
PVTR   = 0,
XO     = .1E+01,
$END
```

```
$PARAM
DUMMY = -1,
EIMOD = .2625+08,
$END
```

18

MATRIX C

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

MATRIX B

0.000

0.000

MATRIX D

0.	0.	.1000E+01	0.
0.	0.	0.	.1000E+01

MATRIX D

0.000

0.000

58

EIGENVALUES FROM DECAY METHOD

.4002773E+02

98

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.3072055E+05	0.	-.1979539E+03
2	7.406	.2275164E-04	.3726713E+05	.1466043E+04	-.1979539E+03
3	14.812	.5520008E-04	.5568647E+05	.2932086E+04	-.1979539E+03
4	14.812	.5520008E-04	.5568647E+05	.2932086E+04	-.1979539E+03
5	22.682	.1079151E-03	.8363113E+05	.4489975E+04	-.1979539E+03
6	30.552	.1868355E-03	.1218725E+04	.6047862E+04	-.1979539E+03
7	32.225	.2079927E-03	.1313040E+04	.6379035E+04	-.1979539E+03
8	32.225	.2079927E-03	.1313040E+04	.6379035E+04	-.1979539E+03
9	35.825	.2590126E-03	.1533038E+04	.6717275E+04	.3367366E+02
10	35.825	.2590126E-03	.1533038E+04	.6717275E+04	.3367366E+02
11	36.812	.2744405E-03	.1593043E+04	.6684037E+04	.3367366E+02
12	37.648	.2879703E-03	.1640868E+04	.6655844E+04	.3367366E+02
13	37.937	.2927388E-03	.1654728E+04	.6646152E+04	.3367366E+02
14	37.937	.2927388E-03	.1654728E+04	.6646152E+04	.3367366E+02
15	38.497	.3020520E-03	.1671857E+04	.6627293E+04	.3367366E+02
16	38.907	.3089309E-03	.1682269E+04	.6613486E+04	.3367366E+02
17	39.057	.3114567E-03	.1685072E+04	.6608434E+04	.3367366E+02
18	41.326	.3500894E-03	.1720196E+04	.6532023E+04	.3367366E+02
19	43.491	.3876945E-03	.1754599E+04	.6459115E+04	.3367366E+02
20	44.250	.4010589E-03	.1766946E+04	.6433554E+04	.3367366E+02

B-16

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	44.250	.4010589E-03	.1766946E-04	.6033554E+04	.3367366E+02
22	48.750	.4820971E-03	.1833953E-04	.6282011E+04	.3367366E+02
23	48.750	.4820971E-03	.1833953E-04	.6282011E+04	.3367366E+02
24	55.750	.6140837E-03	.1935176E-04	.6046277E+04	.3367366E+02
25	55.750	.6140837E-03	.1935176E-04	.6046277E+04	.3367366E+02
26	57.250	.6432706E-03	.1956328E-04	.5995762E+04	.3367366E+02
27	57.250	.6432706E-03	.1956328E-04	.5995762E+04	.3367366E+02
28	58.250	.6629313E-03	.1975753E-04	.5962086E+04	.3367366E+02
29	59.250	.6827857E-03	.1993109E-04	.5928409E+04	.3367366E+02
30	60.250	.7027935E-03	.2007116E-04	.5894733E+04	.3367366E+02
31	60.250	.7027935E-03	.2007116E-04	.5894733E+04	.3367366E+02
32	60.500	.7078197E-03	.2013837E-04	.5886314E+04	.3367366E+02
33	61.250	.7229990E-03	.2031836E-04	.5861056E+04	.3367366E+02
34	61.250	.7229990E-03	.2031836E-04	.5861056E+04	.3367366E+02
35	62.000	.7382730E-03	.2042151E-04	.5835799E+04	.3367366E+02
36	62.750	.7536313E-03	.2050782E-04	.5810541E+04	.3367366E+02
37	63.250	.7639286E-03	.2064117E-04	.5793703E+04	.3367366E+02
38	63.250	.7639286E-03	.2064117E-04	.5793703E+04	.3367366E+02
39	66.356	.8284363E-03	.2091485E-04	.5689104E+04	.3367366E+02
40	69.463	.8938728E-03	.2122936E-04	.5584470E+04	.3367366E+02

88

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72.569	.9603339E-03	.2159276E-04	.5479870E+04	.3367366E+02
42	75.676	.1028029E-02	.2201573E-04	.5375237E+04	.3367366E+02
43	78.782	.1097117E-02	.2251130E-04	.5270636E+04	.3367366E+02
44	81.888	.1167869E-02	.2309676E-04	.5166036E+04	.3367366E+02
45	84.995	.1240618E-02	.2379474E-04	.5061402E+04	.3367366E+02
46	88.101	.1315705E-02	.2463443E-04	.4956800E+04	.3367366E+02
47	91.207	.1393647E-02	.2565593E-04	.4852199E+04	.3367366E+02
48	94.314	.1475107E-02	.2691415E-04	.4747563E+04	.3367366E+02
49	97.420	.1560863E-02	.2848425E-04	.4642961E+04	.3367366E+02
50	100.527	.1652081E-02	.3047547E-04	.4538324E+04	.3367366E+02
51	103.633	.1750205E-02	.3304452E-04	.4433719E+04	.3367366E+02
52	104.008	.1762663E-02	.3348889E-04	.4421090E+04	.3367366E+02
53	104.508	.1779586E-02	.3434387E-04	.4404251E+04	.3367366E+02
54	105.250	.1805616E-02	.3591711E-04	.4379261E+04	.3367366E+02
55	105.250	.1805616E-02	.3591711E-04	.4379261E+04	.3367366E+02
56	115.250	.2210983E-02	.4480099E-04	.4042467E+04	.3367366E+02
57	115.250	.2210983E-02	.4480099E-04	.4042467E+04	.3367366E+02
58	116.275	.2257485E-02	.4590329E-04	.4007945E+04	.3367366E+02
59	116.934	.2287962E-02	.4655822E-04	.3985749E+04	.3367366E+02
60	117.175	.2299210E-02	.4677262E-04	.3977632E+04	.3367366E+02

89

B20

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117.889	.2332819E-02	.4736766E-04	.3953585E+04	.3367366E+02
62	118.279	.2351355E-02	.4770971E-04	.3940449E+04	.3367366E+02
63	118.670	.2370080E-02	.4809137E-04	.3927280E+04	.3367366E+02
64	119.060	.2388914E-02	.4851640E-04	.3914145E+04	.3367366E+02
65	119.451	.2407972E-02	.4899371E-04	.3900976E+04	.3367366E+02
66	119.841	.2427178E-02	.4952888E-04	.3887840E+04	.3367366E+02
67	120.232	.2446655E-02	.5013427E-04	.3874671E+04	.3367366E+02
68	120.622	.2466332E-02	.5081830E-04	.3861535E+04	.3367366E+02
69	121.012	.2486293E-02	.5159647E-04	.3848400E+04	.3367366E+02
70	121.403	.2506630E-02	.5248804E-04	.3835231E+04	.3367366E+02
71	121.793	.2527285E-02	.5350928E-04	.3822095E+04	.3367366E+02
72	122.184	.2548422E-02	.5469121E-04	.3808926E+04	.3367366E+02
73	122.574	.2569998E-02	.5605983E-04	.3795790E+04	.3367366E+02
74	122.965	.2592206E-02	.5766250E-04	.3782620E+04	.3367366E+02
75	122.965	.2592206E-02	.5766250E-04	.3782620E+04	.3367366E+02
76	123.206	.2606232E-02	.5879147E-04	.3774503E+04	.3367366E+02
77	123.206	.2606232E-02	.5879147E-04	.3774503E+04	.3367366E+02
78	123.355	.2615046E-02	.5954264E-04	.3769484E+04	.3367366E+02
79	123.706	.2638725E-02	.6176749E-04	.3756314E+04	.3367366E+02
80	124.136	.2663284E-02	.6441473E-04	.3743178E+04	.3367366E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124.526	.2688968E-02	.6759956E-04	.3730042E+04	.3367366E+02
82	124.917	.2716083E-02	.7147699E-04	.3716872E+04	.3367366E+02
83	125.307	.2744787E-02	.7622221E-04	.3703735E+04	.3367366E+02
84	125.698	.2775617E-02	.8212650E-04	.3690564E+04	.3367366E+02
85	126.088	.2808922E-02	.8952970E-04	.3677426E+04	.3367366E+02
86	126.479	.2845548E-02	.9899537E-04	.3664255E+04	.3367366E+02
87	126.869	.2886226E-02	.1112345E-03	.3651116E+04	.3367366E+02
88	126.869	.2886226E-02	.1112345E-03	.3651116E+04	.3367366E+02
89	127.066	.2913268E-02	.1632526E-03	.3644479E+04	.3367366E+02
90	127.066	.2913268E-02	.1632526E-03	.3644479E+04	.3367366E+02
91	129.700	.3066365E-02	.2555765E-03	.3555704E+04	.3367366E+02
92	132.335	.3259991E-02	.3456571E-03	.3466860E+04	.3367366E+02
93	134.969	.3487543E-02	.4334251E-03	.3378017E+04	.3367366E+02
94	137.604	.3743794E-02	.5189464E-03	.3289108E+04	.3367366E+02
95	140.238	.4021786E-02	.6021552E-03	.3200201E+04	.3367366E+02
96	142.872	.4315948E-02	.6830836E-03	.3111263E+04	.3367366E+02
97	145.507	.4621034E-02	.7617602E-03	.3022262E+04	.3367366E+02
98	148.141	.4937958E-02	.8381246E-03	.2933265E+04	.3367366E+02
99	150.776	.5267197E-02	.9122340E-03	.2844206E+04	.3367366E+02
100	153.410	.5608607E-02	.9840314E-03	.2755153E+04	.3367366E+02
101	154.639	.5776570E-02	.1019879E-02	.2713593E+04	.3367366E+02
102	155.867	.5946188E-02	.1062137E-02	.2672060E+04	.3367366E+02

16

B22

103	157.096	.2237542E-01	.1112452E-02	.2630485E+04	.3367366E+02
104	158.325	.2377628E-01	.1172866E-02	.2588901E+04	.3367366E+02
105	159.553	.2525709E-01	.1246090E-02	.2547338E+04	.3367366E+02
106	160.782	.2683801E-01	.1336004E-02	.2505728E+04	.3367366E+02
107	162.010	.2853955E-01	.1447651E-02	.2464134E+04	.3367366E+02
108	163.239	.3039501E-01	.1588533E-02	.2422485E+04	.3367366E+02
109	163.239	.3039501E-01	.1588533E-02	.2422485E+04	.3367366E+02
110	163.871	.3142450E-01	.1674899E-02	.2401056E+04	.3367366E+02
111	164.503	.3251208E-01	.1773394E-02	.2379620E+04	.3367366E+02
112	165.135	.3366607E-01	.1886293E-02	.2358174E+04	.3367366E+02
113	165.767	.3489636E-01	.2016409E-02	.2336716E+04	.3367366E+02
114	166.399	.3621481E-01	.2167254E-02	.2315247E+04	.3367366E+02
115	167.031	.3763577E-01	.2343250E-02	.2293763E+04	.3367366E+02
116	167.663	.3917668E-01	.2550026E-02	.2272261E+04	.3367366E+02
117	168.295	.4085900E-01	.2794818E-02	.2250740E+04	.3367366E+02
118	168.926	.4270627E-01	.3086587E-02	.2229228E+04	.3367366E+02
119	169.558	.4475767E-01	.3438683E-02	.2207654E+04	.3367366E+02
120	170.190	.4705276E-01	.3867267E-02	.2186045E+04	.3367366E+02
121	170.822	.4964590E-01	.4394958E-02	.2164394E+04	.3367366E+02
122	171.454	.5260799E-01	.5053104E-02	.2142690E+04	.3367366E+02
123	172.086	.5603302E-01	.5886077E-02	.2120920E+04	.3367366E+02
124	172.718	.6004798E-01	.6958250E-02	.2099066E+04	.3367366E+02
125	173.350	.6482824E-01	.8365756E-02	.2077103E+04	.3367366E+02
126	174.439	.7544354E-01	.1110448E-01	.2038920E+04	.3367366E+02
127	175.528	.8901365E-01	.1379211E-01	.2000315E+04	.3367366E+02
128	176.617	.1054826E+00	.1642810E-01	.1961298E+04	.3367366E+02

129	177.705	.1247749E+00	.1900954E-01	.1921911E+04	.3367366E+02
130	178.795	.1368904E+00	.2154296E-01	.1882055E+04	.3367366E+02
131	179.883	.1716903E+00	.2401852E-01	.1841884E+04	.3367366E+02
132	180.972	.1991810E+00	.2644262E-01	.1801295E+04	.3367366E+02
133	182.061	.2292822E+00	.2881247E-01	.1760335E+04	.3367366E+02
134	183.150	.2619344E+00	.3112756E-01	.1719011E+04	.3367366E+02
135	184.239	.2970779E+00	.3338742E-01	.1677331E+04	.3367366E+02
136	184.589	.3088890E+00	.3403318E-01	.1663862E+04	.3367366E+02
137	184.939	.3209011E+00	.3455272E-01	.1650365E+04	.3367366E+02
138	185.289	.3330759E+00	.3497534E-01	.1636844E+04	.3367366E+02
139	185.639	.3453838E+00	.3532251E-01	.1623304E+04	.3367366E+02
140	185.989	.3578016E+00	.3561023E-01	.1609748E+04	.3367366E+02
141	186.339	.3703110E+00	.3585058E-01	.1596180E+04	.3367366E+02
142	186.689	.3828971E+00	.3605280E-01	.1582600E+04	.3367366E+02
143	187.039	.3955479E+00	.3622407E-01	.1569011E+04	.3367366E+02
144	187.389	.4082539E+00	.3637001E-01	.1555415E+04	.3367366E+02
145	187.739	.4210069E+00	.3649505E-01	.1541812E+04	.3367366E+02
146	187.739	.4210069E+00	.3649505E-01	.1541812E+04	.3367366E+02
147	187.906	.4271063E+00	.3654481E-01	.1535319E+04	.3367366E+02
148	188.072	.4331763E+00	.3658378E-01	.1528864E+04	.3367366E+02
149	188.239	.4392887E+00	.3661510E-01	.1522369E+04	.3367366E+02
150	188.406	.4454058E+00	.3664041E-01	.1515874E+04	.3367366E+02
151	188.572	.4514900E+00	.3666096E-01	.1509417E+04	.3367366E+02
152	188.739	.4576139E+00	.3667802E-01	.1502921E+04	.3367366E+02
153	188.906	.4637404E+00	.3669220E-01	.1496424E+04	.3367366E+02

93

B24

154	189.072	.4698324E+00	.3670402E-01	.1489966E+04	.3367366E+02
155	189.239	.4759629E+00	.3671406E-01	.1483469E+04	.3367366E+02
156	189.839	.4980012E+00	.3674690E-01	.1460124E+04	.3367366E+02
157	189.839	.4980012E+00	.3674690E-01	.1460124E+04	.3367366E+02
158	192.020	.5782965E+00	.3688900E-01	.1375238E+04	.3367366E+02
159	192.020	.5782965E+00	.3688900E-01	.1375238E+04	.3367366E+02
160	194.738	.6796354E+00	.3764935E-01	.1269271E+04	.3367366E+02
161	197.455	.7829198E+00	.3838844E-01	.1163060E+04	.3367366E+02
162	200.238	.8905964E+00	.3900113E-01	.1054000E+04	.3367366E+02
163	203.020	.9999604E+00	.3958934E-01	.9447338E+03	.3367366E+02
164	203.020	.9999604E+00	.3958934E-01	.9447338E+03	.3367366E+02
165	203.021	.1000000E+01	.3958944E-01	.4384765E-09	-.1012714E-09

94

B-25

C.) DIVERGENCE: E=2 BODY WITH NTF=108 (UPDATED 3-25-83)

STATION	X	EI	DCMASH	DCNAS	K
1	0.	.2862990E+03	.3230740E+01	0.	0.
2	.7406000E+01	.3165080E+03	.3230740E+01	0.	0.
3	.1481200E+02	.3490420E+03	.3230740E+01	0.	0.
4	.1481200E+02	.3898560E+03	.3230740E+01	0.	0.
5	.2268200E+02	.4050440E+03	.3230740E+01	0.	0.
6	.3055200E+02	.4206720E+03	.3230740E+01	0.	0.
7	.3222500E+02	.4206720E+03	.3230740E+01	0.	0.
8	.3222500E+02	.4206720E+03	.3230740E+01	0.	.2777780E+06
9	.3582500E+02	.4206720E+03	.3230740E+01	0.	.2777780E+06
10	.3582500E+02	.4206720E+03	.3230740E+01	0.	0.
11	.3681200E+02	.4206720E+03	.3230740E+01	0.	0.
12	.3764900E+02	.4724710E+03	.3230740E+01	0.	0.
13	.3793700E+02	.6018070E+03	.3230740E+01	0.	0.
14	.3793700E+02	.7855060E+03	.3230740E+01	0.	0.
15	.3849700E+02	.8758440E+03	.3230740E+01	0.	0.
16	.3890700E+02	.1152276E+04	.3230740E+01	0.	0.
17	.3905700E+02	.1629655E+04	.3230740E+01	0.	0.
18	.4132600E+02	.1610312E+04	.3230740E+01	0.	0.
19	.4349100E+02	.1512582E+04	.3230740E+01	0.	0.
20	.4425000E+02	.1512582E+04	.3230740E+01	0.	0.

95

C-1

STATION	X	EI	DCMASH	DCNAS	K
21	.4425000E+02	.1629655E+04	.3230740E+01	0.	0.
22	.4875000E+02	.1629655E+04	.3230740E+01	0.	0.
23	.4875000E+02	.1627307E+04	.3230740E+01	0.	0.
24	.5575000E+02	.1626703E+04	.3230740E+01	0.	0.
25	.5575000E+02	.1629655E+04	.3230740E+01	0.	0.
26	.5725000E+02	.1629655E+04	.3230740E+01	0.	0.
27	.5725000E+02	.1174793E+04	.3230740E+01	0.	0.
28	.5825000E+02	.1174793E+04	.3230740E+01	0.	0.
29	.5925000E+02	.1474997E+04	.3230740E+01	0.	0.
30	.6025000E+02	.1775202E+04	.3230740E+01	0.	0.
31	.6025000E+02	.8363110E+03	.3230740E+01	0.	0.
32	.6050000E+02	.8363110E+03	.3230740E+01	0.	0.
33	.6125000E+02	.1058520E+04	.3230740E+01	0.	0.
34	.6125000E+02	.1786583E+04	.3230740E+01	0.	0.
35	.6200000E+02	.1486378E+04	.3230740E+01	0.	0.
36	.6275000E+02	.1186174E+04	.3230740E+01	0.	0.
37	.6325000E+02	.1186174E+04	.3230740E+01	0.	0.
38	.6325000E+02	.2691925E+04	.3230740E+01	0.	0.
39	.6635600E+02	.2308086E+04	.3230740E+01	0.	0.
40	.6946300E+02	.1966824E+04	.3230740E+01	0.	0.

96

C-2

STATION	X	EI	DCMASH	DCNAS	K
01	.7256900E+02	.1664868E+08	.3230740E+01	0.	0.
02	.7567600E+02	.1399077E+08	.3230740E+01	0.	0.
03	.7878300E+02	.1166441E+08	.3230740E+01	0.	0.
04	.8188800E+02	.9640810E+03	.3230740E+01	0.	0.
05	.8499500E+02	.7892480E+03	.3230740E+01	0.	0.
06	.8810100E+02	.6393260E+03	.3230740E+01	0.	0.
07	.9120700E+02	.5118270E+03	.3230740E+01	0.	0.
08	.9431400E+02	.4043960E+03	.3230740E+01	0.	0.
09	.9742000E+02	.3148080E+03	.3230740E+01	0.	0.
50	.1005270E+03	.2409680E+03	.3230740E+01	0.	0.
51	.1036330E+03	.1809120E+03	.3230740E+01	0.	0.
52	.1040000E+03	.1176260E+03	.3230740E+01	0.	0.
53	.1045000E+03	.8467190E+02	.3230740E+01	0.	0.
54	.1052500E+03	.7411600E+02	.3230740E+01	0.	0.
55	.1052500E+03	.1809120E+03	.3230740E+01	0.	0.
56	.1152500E+03	.1809120E+03	.3230740E+01	0.	0.
57	.1152500E+03	.1394420E+03	.3230740E+01	0.	0.
58	.1162750E+03	.1064810E+03	.3230740E+01	0.	0.
59	.1169340E+03	.1612700E+03	.3230740E+01	0.	0.
60	.1171750E+03	.1816190E+03	.3230740E+01	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
61	.1178A90E+03	.1816190E+03	.3230740E+01	0.	0.
62	.1182790E+03	.1629020E+03	.3230740E+01	0.	0.
63	.1186700E+03	.1456700E+03	.3230740E+01	0.	0.
64	.1190600E+03	.1298420E+03	.3230740E+01	0.	0.
65	.1194510E+03	.1153400E+03	.3230740E+01	0.	0.
66	.1198410E+03	.1020870E+03	.3230740E+01	0.	0.
67	.1202320E+03	.9000920E+02	.3230740E+01	0.	0.
68	.1206220E+03	.7903560E+02	.3230740E+01	0.	0.
69	.1210120E+03	.6909640E+02	.3230740E+01	0.	0.
70	.1214030E+03	.6012440E+02	.3230740E+01	0.	0.
71	.1217930E+03	.5205490E+02	.3230740E+01	0.	0.
72	.1221A30E+03	.4482520E+02	.3230740E+01	0.	0.
73	.1225740E+03	.3837480E+02	.3230740E+01	0.	0.
74	.1229650E+03	.3264570E+02	.3230740E+01	0.	0.
75	.1229650E+03	.3247070E+02	.3230740E+01	0.	0.
76	.1232060E+03	.2926540E+02	.3230740E+01	0.	0.
77	.1232060E+03	.2951600E+02	.3230740E+01	0.	0.
78	.1233550E+03	.2765750E+02	.3230740E+01	0.	0.
79	.1237460E+03	.2320550E+02	.3230740E+01	0.	0.
80	.1241360E+03	.1931380E+02	.3230740E+01	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
81	.1245260E+03	.1593340E+02	.3230740E+01	0.	0.
82	.1249170E+03	.1301730E+02	.3230740E+01	0.	0.
83	.1253070E+03	.1052110E+02	.3230740E+01	0.	0.
84	.1256980E+03	.8402210E+01	.3230740E+01	0.	0.
85	.1260880E+03	.6620640E+01	.3230740E+01	0.	0.
86	.1264790E+03	.5138520E+01	.3230740E+01	0.	0.
87	.1268690E+03	.3920260E+01	.3230740E+01	0.	0.
88	.1268690E+03	.5272800E+00	.3230740E+01	0.	0.
89	.1270660E+03	.5272800E+00	.3230740E+01	0.	0.
90	.1270660E+03	.3920260E+01	.3230740E+01	0.	0.
91	.1297000E+03	.3920260E+01	.3230740E+01	0.	0.
92	.1323350E+03	.3920260E+01	.3230740E+01	0.	0.
93	.1349690E+03	.3920260E+01	.3230740E+01	0.	0.
94	.1376040E+03	.3920260E+01	.3230740E+01	0.	0.
95	.1402380E+03	.3920260E+01	.3230740E+01	0.	0.
96	.1428720E+03	.3920260E+01	.3230740E+01	0.	0.
97	.1455070E+03	.3920260E+01	.3230740E+01	0.	0.
98	.1481410E+03	.3920260E+01	.3230740E+01	0.	0.
99	.1507760E+03	.3920260E+01	.3230740E+01	0.	0.
100	.1534100E+03	.3920260E+01	.3230740E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
101	.1586390E+03	.3286780E+01	.3230740E+01	0.	0.
102	.1558670E+03	.2733310E+01	.3230740E+01	0.	0.
103	.1570960E+03	.2252790E+01	.3230740E+01	0.	0.
104	.1583250E+03	.1838520E+01	.3230740E+01	0.	0.
105	.1595530E+03	.1484120E+01	.3230740E+01	0.	0.
106	.1607820E+03	.1183510E+01	.3230740E+01	0.	0.
107	.1620100E+03	.9309490E+00	.3230740E+01	0.	0.
108	.1632390E+03	.7210310E+00	.3230740E+01	0.	0.
109	.1632390E+03	.7231290E+00	.3230740E+01	0.	0.
110	.1638710E+03	.6300890E+00	.3230740E+01	0.	0.
111	.1645030E+03	.5463170E+00	.3230740E+01	0.	0.
112	.1651350E+03	.4711760E+00	.3230740E+01	0.	0.
113	.1657670E+03	.4040510E+00	.3230740E+01	0.	0.
114	.1663990E+03	.3443520E+00	.3230740E+01	0.	0.
115	.1670310E+03	.2915090E+00	.3230740E+01	0.	0.
116	.1676630E+03	.2449770E+00	.3230740E+01	0.	0.
117	.1682950E+03	.2042300E+00	.3230740E+01	0.	0.
118	.1689260E+03	.1687700E+00	.3230740E+01	0.	0.
119	.1695580E+03	.1381170E+00	.3230740E+01	0.	0.
120	.1701900E+03	.1118160E+00	.3230740E+01	0.	0.

C-6

STATION	X	EI	DCMASH	DCNAS	K
121	.1708220E+03	.8943400E-01	.3230740E+01	0.	0.
122	.1714540E+03	.7056120E-01	.3230740E+01	0.	0.
123	.1720860E+03	.5480990E-01	.3230740E+01	0.	0.
124	.1727180E+03	.4181540E-01	.3230740E+01	0.	0.
125	.1733500E+03	.3123550E-01	.3230740E+01	0.	0.
126	.1739820E+03	.3123550E-01	.3230740E+01	0.	0.
127	.1746140E+03	.3123550E-01	.3230740E+01	0.	0.
128	.1752460E+03	.3123550E-01	.3230740E+01	0.	0.
129	.1758780E+03	.3123550E-01	.3230740E+01	0.	0.
130	.1765100E+03	.3123550E-01	.3230740E+01	0.	0.
131	.1771420E+03	.3123550E-01	.3230740E+01	0.	0.
132	.1777740E+03	.3123550E-01	.3230740E+01	0.	0.
133	.1784060E+03	.3123550E-01	.3230740E+01	0.	0.
134	.1790380E+03	.3123550E-01	.3230740E+01	0.	0.
135	.1796700E+03	.3123550E-01	.3230740E+01	0.	0.
136	.1803020E+03	.3871280E-01	.3230740E+01	0.	0.
137	.1809340E+03	.4742220E-01	.3230740E+01	0.	0.
138	.1815660E+03	.5749220E-01	.3230740E+01	0.	0.
139	.1821980E+03	.6905760E-01	.3230740E+01	0.	0.
140	.1828300E+03	.8225960E-01	.3230740E+01	0.	0.

STATION	X	EI	DCWASH	DCWAS	K
141	.1863390E+03	.9724570E+01	.3230740E+01	0.	0.
142	.1866890E+03	.1141700E+00	.3230740E+01	0.	0.
143	.1870390E+03	.1331930E+00	.3230740E+01	0.	0.
144	.1873890E+03	.1544800E+00	.3230740E+01	0.	0.
145	.1877390E+03	.1782060E+00	.3230740E+01	0.	0.
146	.1877390E+03	.1761090E+00	.3230740E+01	0.	0.
147	.1879060E+03	.2239200E+00	.3230740E+01	0.	0.
148	.1880720E+03	.2807160E+00	.3230740E+01	0.	0.
149	.1882390E+03	.3475580E+00	.3230740E+01	0.	0.
150	.1884060E+03	.4255650E+00	.3230740E+01	0.	0.
151	.1885720E+03	.5159170E+00	.3230740E+01	0.	0.
152	.1887390E+03	.6198520E+00	.3230740E+01	0.	0.
153	.1889060E+03	.7386680E+00	.3230740E+01	0.	0.
154	.1890720E+03	.8737220E+00	.3230740E+01	0.	0.
155	.1892390E+03	.1026430E+01	.3230740E+01	0.	0.
156	.1898390E+03	.1026430E+01	.3230740E+01	0.	0.
157	.1898390E+03	.8819690E+00	.3230740E+01	0.	0.
158	.1920810E+03	.7786640E+00	.3230740E+01	0.	0.
159	.1920910E+03	.5467200E-01	.3230740E+01	0.	0.
160	.1947680E+03	.5467200E-01	.3230740E+01	0.	0.

102

STATION	X	EI	DCMASH	DCNAS	K
161	.1974550E+03	.5467200E+01	.3230740E+01	0.	0.
162	.1997680E+03	.5467200E+01	.3230740E+01	0.	0.
163	.2020810E+03	.5467200E+01	.3230740E+01	0.	0.
164	.2020810E+03	.5467200E+01	.5601460E+06	.1931900E+05	0.
165	.2020820E+03	.5467200E+01	.5601460E+06	.1931900E+05	0.

103

```
$CMTL
M       = 0,
MC      = 2,
MBS     = 1,
MDATA   = 5,
MHOM    = 0,
MI      = 155,
$END
```

401

C-10

```
$NEWTL
DEL    = .1E+01,
EPS    = .1E-05,
ITMAX  = 100,
N      = 1,
NORM   = 1,
PVTC   = 0,
PVTR   = 0,
XJ     = .1E+01,
$END
```

```
$PARAM
DUMMY   =  -1,
EIMOD   =  .2625+08,
$END
```

MATRIX C

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

MATRIX B

0.000

0.000

MATRIX D

0. 0. .1000E+01 0.

0. 0. 0. .1000E+01

MATRIX C

0.000

0.000

EIGENVALUES FROM SECANT METHOD

.3893292E+02

QDIV (1) = .3893292E+02

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.3112053E-05	0.	-.2003540E+03
2	7.406	.2304780E-04	.3774648E-05	.1483819E+04	-.2003540E+03
3	14.812	.5591009E-04	.5638915E-05	.2967636E+04	-.2003540E+03
4	14.812	.5591009E-04	.5638915E-05	.2967636E+04	-.2003540E+03
5	22.662	.1092654E-03	.8467263E-05	.4544415E+04	-.2003540E+03
6	30.552	.1991848E-03	.1233776E-04	.6121190E+04	-.2003540E+03
7	32.225	.2106031E-03	.1329235E-04	.6456380E+04	-.2003540E+03
8	32.225	.2106031E-03	.1329235E-04	.6456380E+04	-.2003540E+03
9	35.825	.2622515E-03	.1551900E-04	.6798562E+04	.3417558E+02
10	35.825	.2622515E-03	.1551900E-04	.6798562E+04	.3417558E+02
11	36.812	.2778692E-03	.1612631E-04	.6764829E+04	.3417558E+02
12	37.648	.2915653E-03	.1661034E-04	.6736256E+04	.3417558E+02
13	37.937	.2963884E-03	.1675062E-04	.6726379E+04	.3417558E+02
14	37.937	.2963884E-03	.1675062E-04	.6726379E+04	.3417558E+02
15	38.497	.3058240E-03	.1692397E-04	.6707239E+04	.3417558E+02
16	38.907	.3127834E-03	.1702934E-04	.6693226E+04	.3417558E+02
17	39.057	.3153403E-03	.1705772E-04	.6688100E+04	.3417558E+02
18	41.326	.3540475E-03	.1741319E-04	.6610550E+04	.3417558E+02
19	43.491	.3925143E-03	.1776135E-04	.6536555E+04	.3417558E+02
20	44.250	.4060426E-03	.1788629E-04	.6510614E+04	.3417558E+02

C-18

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	48.250	.4060426E-03	.1788629E-04	.6510614E+04	.3417558E+02
22	48.750	.4880749E-03	.1856436E-04	.6356814E+04	.3417558E+02
23	48.750	.4880749E-03	.1856436E-04	.6356814E+04	.3417558E+02
24	55.750	.6216783E-03	.1958859E-04	.6117568E+04	.3417558E+02
25	55.750	.6216783E-03	.1958859E-04	.6117568E+04	.3417558E+02
26	57.250	.6512223E-03	.1980261E-04	.6066301E+04	.3417558E+02
27	57.250	.6512223E-03	.1980261E-04	.6066301E+04	.3417558E+02
28	58.250	.6711235E-03	.1999914E-04	.6032123E+04	.3417558E+02
29	59.250	.6912206E-03	.2017473E-04	.5997945E+04	.3417558E+02
30	60.250	.7114730E-03	.2031645E-04	.5963767E+04	.3417558E+02
31	60.250	.7114730E-03	.2031645E-04	.5963767E+04	.3417558E+02
32	60.500	.7165606E-03	.2038444E-04	.5955222E+04	.3417558E+02
33	61.250	.7319254E-03	.2056654E-04	.5929549E+04	.3417558E+02
34	61.250	.7319254E-03	.2056654E-04	.5929589E+04	.3417558E+02
35	62.000	.7473859E-03	.2067090E-04	.5903955E+04	.3417558E+02
36	62.750	.7629317E-03	.2079868E-04	.5878321E+04	.3417558E+02
37	63.250	.7733547E-03	.2089312E-04	.5861232E+04	.3417558E+02
38	63.250	.7733547E-03	.2089312E-04	.5861232E+04	.3417558E+02
39	66.356	.8386496E-03	.2116998E-04	.5755075E+04	.3417558E+02
40	69.463	.9048840E-03	.2148812E-04	.5648883E+04	.3417558E+02

113

C-19

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72.569	.9721509E-03	.2185570E-04	.5542725E+04	.3417558E+02
42	75.676	.1040674E-02	.2228351E-04	.5436533E+04	.3417558E+02
43	78.782	.1110802E-02	.2278471E-04	.5330375E+04	.3417558E+02
44	81.888	.1182213E-02	.2337678E-04	.5224216E+04	.3417558E+02
45	84.995	.1255842E-02	.2408259E-04	.5118024E+04	.3417558E+02
46	88.101	.1331837E-02	.2493164E-04	.5011865E+04	.3417558E+02
47	91.207	.1410718E-02	.2596445E-04	.4905705E+04	.3417558E+02
48	94.314	.1493155E-02	.2723648E-04	.4799511E+04	.3417558E+02
49	97.420	.1579937E-02	.2882368E-04	.4693351E+04	.3417558E+02
50	100.527	.1672238E-02	.3083641E-04	.4587156E+04	.3417558E+02
51	103.633	.1771521E-02	.3343296E-04	.4480994E+04	.3417558E+02
52	104.008	.1784125E-02	.3388207E-04	.4468177E+04	.3417558E+02
53	104.508	.1801247E-02	.3474614E-04	.4451087E+04	.3417558E+02
54	105.250	.1827581E-02	.3633609E-04	.4425725E+04	.3417558E+02
55	105.250	.1827581E-02	.3633609E-04	.4425725E+04	.3417558E+02
56	115.250	.2237628E-02	.4531271E-04	.4083918E+04	.3417558E+02
57	115.250	.2237628E-02	.4531271E-04	.4083918E+04	.3417558E+02
58	116.275	.2284661E-02	.4642630E-04	.4048882E+04	.3417558E+02
59	116.930	.2315485E-02	.4708791E-04	.4026356E+04	.3417558E+02
60	117.175	.2326861E-02	.4730449E-04	.4018119E+04	.3417558E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117.889	.2360851E-02	.4790558E-04	.3993713E+04	.3417558E+02
62	118.279	.2379598E-02	.4825110E-04	.3980382E+04	.3417558E+02
63	118.670	.2398536E-02	.4863663E-04	.3967017E+04	.3417558E+02
64	119.060	.2417583E-02	.4906595E-04	.3953686E+04	.3417558E+02
65	119.451	.2436857E-02	.4954808E-04	.3940321E+04	.3417558E+02
66	119.841	.2456280E-02	.5008864E-04	.3926990E+04	.3417558E+02
67	120.232	.2475976E-02	.5070012E-04	.3913625E+04	.3417558E+02
68	120.622	.2495876E-02	.5139102E-04	.3900294E+04	.3417558E+02
69	121.012	.2516061E-02	.5217699E-04	.3886963E+04	.3417558E+02
70	121.403	.2536627E-02	.5307749E-04	.3873598E+04	.3417558E+02
71	121.793	.2557514E-02	.5410894E-04	.3860267E+04	.3417558E+02
72	122.184	.2578887E-02	.5530266E-04	.3846902E+04	.3417558E+02
73	122.574	.2600704E-02	.5668492E-04	.3833570E+04	.3417558E+02
74	122.965	.2623159E-02	.5830353E-04	.3820205E+04	.3417558E+02
75	122.965	.2623159E-02	.5830353E-04	.3820205E+04	.3417558E+02
76	123.206	.2637341E-02	.5944370E-04	.3811967E+04	.3417558E+02
77	123.206	.2637341E-02	.5944370E-04	.3811967E+04	.3417558E+02
78	123.355	.2646253E-02	.6020233E-04	.3806873E+04	.3417558E+02
79	123.746	.2670193E-02	.6244922E-04	.3793508E+04	.3417558E+02
80	124.136	.2695023E-02	.6512265E-04	.3780176E+04	.3417558E+02

115

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124.526	.2720989E-02	.6833893E-04	.3766844E+04	.3417558E+02
82	124.917	.2748399E-02	.7225458E-04	.3753478E+04	.3417558E+02
83	125.307	.2777416E-02	.7704648E-04	.3740146E+04	.3417558E+02
84	125.698	.2808578E-02	.8300877E-04	.3726780E+04	.3417558E+02
85	126.088	.2842239E-02	.9048454E-04	.3713447E+04	.3417558E+02
86	126.479	.2879255E-02	.1000428E-03	.3700080E+04	.3417558E+02
87	126.869	.2920362E-02	.1124015E-03	.3686746E+04	.3417558E+02
88	126.869	.2920362E-02	.1124015E-03	.3686746E+04	.3417558E+02
89	127.066	.2947683E-02	.1649270E-03	.3680010E+04	.3417558E+02
90	127.066	.2947683E-02	.1649270E-03	.3680010E+04	.3417558E+02
91	129.700	.3506390E-02	.2581452E-03	.3589921E+04	.3417558E+02
92	132.335	.4307942E-02	.3490868E-03	.3499768E+04	.3417558E+02
93	134.969	.5345638E-02	.4376820E-03	.3409619E+04	.3417558E+02
94	137.604	.6514175E-02	.5239972E-03	.3319407E+04	.3417558E+02
95	140.239	.8106494E-02	.6079663E-03	.3229200E+04	.3417558E+02
96	142.872	.9816941E-02	.6896217E-03	.3138967E+04	.3417558E+02
97	145.507	.1174019E-01	.7689925E-03	.3048672E+04	.3417558E+02
98	148.141	.1386868E-01	.8460176E-03	.2958386E+04	.3417558E+02
99	150.776	.1619793E-01	.9207549E-03	.2868040E+04	.3417558E+02
100	153.410	.1872007E-01	.9931471E-03	.2777705E+04	.3417558E+02
101	154.639	.1996107E-01	.1029286E-02	.2735547E+04	.3417558E+02
102	155.867	.2124899E-01	.1071884E-02	.2693417E+04	.3417558E+02

C-22

103	157.096	.2259474E-01	.1122599E-02	.2651246E+04	.3417558E+02
104	158.325	.2800833E-01	.1183485E-02	.2609066E+04	.3417558E+02
105	159.553	.2550249E-01	.1257276E-02	.2566911E+04	.3417558E+02
106	160.782	.2709754E-01	.1347875E-02	.2524708E+04	.3417558E+02
107	162.010	.2881412E-01	.1460362E-02	.2482525E+04	.3417558E+02
108	163.239	.3068577E-01	.1602286E-02	.2440288E+04	.3417558E+02
109	163.239	.3068577E-01	.1602286E-02	.2440288E+04	.3417558E+02
110	163.871	.3172414E-01	.1689283E-02	.2418558E+04	.3417558E+02
111	164.503	.3282103E-01	.1788493E-02	.2396821E+04	.3417558E+02
112	165.135	.3398480E-01	.1902205E-02	.2375076E+04	.3417558E+02
113	165.767	.3522541E-01	.2033249E-02	.2353321E+04	.3417558E+02
114	166.399	.3655482E-01	.2185161E-02	.2331555E+04	.3417558E+02
115	167.031	.3798746E-01	.2362391E-02	.2309776E+04	.3417558E+02
116	167.663	.3954088E-01	.2570602E-02	.2287981E+04	.3417558E+02
117	168.295	.4123670E-01	.2817080E-02	.2266169E+04	.3417558E+02
118	168.926	.4309859E-01	.3110839E-02	.2244370E+04	.3417558E+02
119	169.558	.4516601E-01	.3465314E-02	.2222511E+04	.3417558E+02
120	170.190	.4747874E-01	.3896767E-02	.2200621E+04	.3417558E+02
121	170.822	.5009152E-01	.4427959E-02	.2178693E+04	.3417558E+02
122	171.454	.5307588E-01	.5090431E-02	.2156719E+04	.3417558E+02
123	172.086	.5652582E-01	.5928830E-02	.2134686E+04	.3417558E+02
124	172.718	.6056972E-01	.7007928E-02	.2112579E+04	.3417558E+02
125	173.350	.6538384E-01	.8424454E-02	.2090374E+04	.3417558E+02
126	174.439	.7607267E-01	.1118057E-01	.2051812E+04	.3417558E+02
127	175.528	.8973498E-01	.1388512E-01	.2012877E+04	.3417558E+02
128	176.617	.1063143E+00	.1653762E-01	.1973574E+04	.3417558E+02

117

C-23

129	177.705	.1257346E+00	.1913521E-01	.1933948E+04	.3417558E+02
130	178.795	.1479958E+00	.2168451E-01	.1893897E+04	.3417558E+02
131	179.883	.1729583E+00	.2417570E-01	.1853574E+04	.3417558E+02
132	180.972	.2006287E+00	.2661528E-01	.1812876E+04	.3417558E+02
133	182.061	.2309263E+00	.2900047E-01	.1771848E+04	.3417558E+02
134	183.150	.2637916E+00	.3133085E-01	.1730497E+04	.3417558E+02
135	184.239	.2991648E+00	.3360600E-01	.1688831E+04	.3417558E+02
136	184.589	.3110532E+00	.3425620E-01	.1675374E+04	.3417558E+02
137	184.939	.3231441E+00	.3477935E-01	.1661892E+04	.3417558E+02
138	185.289	.3353988E+00	.3520493E-01	.1648389E+04	.3417558E+02
139	185.639	.3477875E+00	.3555457E-01	.1634869E+04	.3417558E+02
140	185.989	.3602870E+00	.3584435E-01	.1621335E+04	.3417558E+02
141	186.339	.3728780E+00	.3608643E-01	.1607790E+04	.3417558E+02
142	186.689	.3855475E+00	.3629013E-01	.1594235E+04	.3417558E+02
143	187.039	.3982817E+00	.3646267E-01	.1580672E+04	.3417558E+02
144	187.389	.4110714E+00	.3660970E-01	.1567102E+04	.3417558E+02
145	187.739	.4239085E+00	.3673568E-01	.1553526E+04	.3417558E+02
146	187.739	.4239085E+00	.3673568E-01	.1553526E+04	.3417558E+02
147	187.906	.4300480E+00	.3678582E-01	.1547046E+04	.3417558E+02
148	188.072	.4361581E+00	.3682509E-01	.1540604E+04	.3417558E+02
149	188.239	.4423100E+00	.3685665E-01	.1534123E+04	.3417558E+02
150	188.406	.4484892E+00	.3688215E-01	.1527641E+04	.3417558E+02
151	188.572	.4545925E+00	.3690287E-01	.1521198E+04	.3417558E+02
152	188.739	.4607569E+00	.3692005E-01	.1514715E+04	.3417558E+02
153	188.906	.4669238E+00	.3693435E-01	.1508232E+04	.3417558E+02

811

C-24

154	189.072	.4730560E+00	.3694626E-01	.1501788E+04	.3417558E+02
155	189.239	.4792270E+00	.3695638E-01	.1495304E+04	.3417558E+02
156	189.839	.5014108E+00	.3698948E-01	.1472009E+04	.3417558E+02
157	189.839	.5014108E+00	.3698948E-01	.1472009E+04	.3417558E+02
158	192.081	.5845013E+00	.3713700E-01	.1384936E+04	.3417558E+02
159	192.081	.5845013E+00	.3713700E-01	.1384936E+04	.3417558E+02
160	194.768	.6877788E+00	.3963704E-01	.1280115E+04	.3417558E+02
161	197.455	.7975097E+00	.4193967E-01	.1174483E+04	.3417558E+02
162	199.768	.8967095E+00	.4376251E-01	.1082958E+04	.3417558E+02
163	202.081	.9999546E+00	.4543713E-01	.9909232E+03	.3417558E+02
164	202.081	.9999546E+00	.4543713E-01	.9909232E+03	.3417558E+02
165	202.082	.1000000E+01	.4543748E-01	-.2023231E-09	-.2036176E-07

119

D.) DIVERGENCE: E-3 BODY WITH NTP=105 (UPDATED 3-25-83)

STATION	X	EI	DCMASM	DCMAS	K
1	0.	.2862990E+03	.6472860E+01	0.	0.
2	.7408000E+01	.3165080E+03	.6472860E+01	0.	0.
3	.1481200E+02	.3490420E+03	.6472860E+01	0.	0.
4	.1481200E+02	.3898560E+03	.6472860E+01	0.	0.
5	.2268200E+02	.4050440E+03	.6472860E+01	0.	0.
6	.3055200E+02	.4206720E+03	.6472860E+01	0.	0.
7	.3222500E+02	.4206720E+03	.6472860E+01	0.	0.
8	.3222500E+02	.4206720E+03	.6472860E+01	0.	.2777780E+06
9	.3582500E+02	.4206720E+03	.6472860E+01	0.	.2777780E+06
10	.3582500E+02	.4206720E+03	.6472860E+01	0.	0.
11	.3681200E+02	.4206720E+03	.6472860E+01	0.	0.
12	.3764800E+02	.4724710E+03	.6472860E+01	0.	0.
13	.3793700E+02	.6018070E+03	.6472860E+01	0.	0.
14	.3793700E+02	.7855000E+03	.6472860E+01	0.	0.
15	.3849700E+02	.8758440E+03	.6472860E+01	0.	0.
16	.3890700E+02	.1152276E+04	.6472860E+01	0.	0.
17	.3905700E+02	.1629655E+04	.6472860E+01	0.	0.
18	.4132600E+02	.1610312E+04	.6472860E+01	0.	0.
19	.4349100E+02	.1512582E+04	.6472860E+01	0.	0.
20	.4425000E+02	.1512582E+04	.6472860E+01	0.	0.

120

D-1

STATION	X	EI	DCMASH	DCNAS	K
21	.4425000E+02	.1629655E+04	.6472860E+01	0.	0.
22	.4875000E+02	.1629655E+04	.6472860E+01	0.	0.
23	.4875000E+02	.1627307E+04	.6472860E+01	0.	0.
24	.5575000E+02	.1626703E+04	.6472860E+01	0.	0.
25	.5575000E+02	.1629655E+04	.6472860E+01	0.	0.
26	.5725000E+02	.1629655E+04	.6472860E+01	0.	0.
27	.5725000E+02	.1174793E+04	.6472860E+01	0.	0.
28	.5825000E+02	.1174793E+04	.6472860E+01	0.	0.
29	.5925000E+02	.1474997E+04	.6472860E+01	0.	0.
30	.6025000E+02	.1775202E+04	.6472860E+01	0.	0.
31	.6025000E+02	.8363110E+03	.6472860E+01	0.	0.
32	.6050000E+02	.8363110E+03	.6472860E+01	0.	0.
33	.6125000E+02	.1058520E+04	.6472860E+01	0.	0.
34	.6125000E+02	.1786583E+04	.6472860E+01	0.	0.
35	.6200000E+02	.1486378E+04	.6472860E+01	0.	0.
36	.6275000E+02	.1186174E+04	.6472860E+01	0.	0.
37	.6325000E+02	.1186174E+04	.6472860E+01	0.	0.
38	.6325000E+02	.2691925E+04	.6472860E+01	0.	0.
39	.6635600E+02	.2309086E+04	.6472860E+01	0.	0.
40	.6946300E+02	.1966824E+04	.6472860E+01	0.	0.

121

STATION	X	EI	DCMASH	DCMAS	K
41	.7256900E+02	.1664868E+04	.6472860E+01	0.	0.
42	.7567600E+02	.1399077E+04	.6472860E+01	0.	0.
43	.7878700E+02	.1166441E+04	.6472860E+01	0.	0.
44	.8188800E+02	.9640810E+03	.6472860E+01	0.	0.
45	.8499500E+02	.7892480E+03	.6472860E+01	0.	0.
46	.8810100E+02	.6393260E+03	.6472860E+01	0.	0.
47	.9120700E+02	.5118270E+03	.6472860E+01	0.	0.
48	.9431400E+02	.4043960E+03	.6472860E+01	0.	0.
49	.9742000E+02	.3148080E+03	.6472860E+01	0.	0.
50	.1005270E+03	.2409680E+03	.6472860E+01	0.	0.
51	.1036330E+03	.1809120E+03	.6472860E+01	0.	0.
52	.1040080E+03	.1776260E+03	.6472860E+01	0.	0.
53	.1045080E+03	.8467190E+02	.6472860E+01	0.	0.
54	.1052500E+03	.7411600E+02	.6472860E+01	0.	0.
55	.1052500E+03	.1809120E+03	.6472860E+01	0.	0.
56	.1152500E+03	.1809120E+03	.6472860E+01	0.	0.
57	.1152500E+03	.1394420E+03	.6472860E+01	0.	0.
58	.1162750E+03	.1464810E+03	.6472860E+01	0.	0.
59	.1169340E+03	.1612700E+03	.6472860E+01	0.	0.
60	.1171750E+03	.1816190E+03	.6472860E+01	0.	0.

122

D-3

STATION	X	EI	DCMASH	DCMAS	K
61	.1178890E+03	.1818190E+03	.6472860E+01	0.	0.
62	.1182790E+03	.1629020E+03	.6472860E+01	0.	0.
63	.1186700E+03	.1456700E+03	.6472860E+01	0.	0.
64	.1190600E+03	.1298420E+03	.6472860E+01	0.	0.
65	.1194510E+03	.1153400E+03	.6472860E+01	0.	0.
66	.1198410E+03	.1020870E+03	.6472860E+01	0.	0.
67	.1202320E+03	.9000920E+02	.6472860E+01	0.	0.
68	.1206220E+03	.7903560E+02	.6472860E+01	0.	0.
69	.1210120E+03	.6909640E+02	.6472860E+01	0.	0.
70	.1214030E+03	.6012440E+02	.6472860E+01	0.	0.
71	.1217930E+03	.5205490E+02	.6472860E+01	0.	0.
72	.1221840E+03	.4482520E+02	.6472860E+01	0.	0.
73	.1225740E+03	.3837480E+02	.6472860E+01	0.	0.
74	.1229650E+03	.3264570E+02	.6472860E+01	0.	0.
75	.1229650E+03	.3247070E+02	.6472860E+01	0.	0.
76	.1232060E+03	.2926540E+02	.6472860E+01	0.	0.
77	.1232060E+03	.2951600E+02	.6472860E+01	0.	0.
78	.1233550E+03	.2765750E+02	.6472860E+01	0.	0.
79	.1237460E+03	.2320550E+02	.6472860E+01	0.	0.
80	.1241360E+03	.1931380E+02	.6472860E+01	0.	0.

123

D-4

STATION	X	EI	DCMASH	DCMAS	K
81	.1245260E+03	.1593340E+02	.6472860E+01	0.	0.
82	.1249170E+03	.1301730E+02	.6472860E+01	0.	0.
83	.1253070E+03	.1052110E+02	.6472860E+01	0.	0.
84	.1256980E+03	.8402210E+01	.6472860E+01	0.	0.
85	.1260880E+03	.6620640E+01	.6472860E+01	0.	0.
86	.1264790E+03	.5138520E+01	.6472860E+01	0.	0.
87	.1268690E+03	.3920260E+01	.6472860E+01	0.	0.
88	.1268690E+03	.5272800E+00	.6472860E+01	0.	0.
89	.1270660E+03	.5272800E+00	.6472860E+01	0.	0.
90	.1270660E+03	.3920260E+01	.6472860E+01	0.	0.
91	.1296680E+03	.3920260E+01	.6472860E+01	0.	0.
92	.1322700E+03	.3920260E+01	.6472860E+01	0.	0.
93	.1348720E+03	.3920260E+01	.6472860E+01	0.	0.
94	.1374740E+03	.3920260E+01	.6472860E+01	0.	0.
95	.1400760E+03	.3920260E+01	.6472860E+01	0.	0.
96	.1426780E+03	.3920260E+01	.6472860E+01	0.	0.
97	.1435400E+03	.3467030E+01	.6472860E+01	0.	0.
98	.1444020E+03	.3054240E+01	.6472860E+01	0.	0.
99	.1452640E+03	.2679430E+01	.6472860E+01	0.	0.
100	.1461270E+03	.2340190E+01	.6472860E+01	0.	0.

STATION	X	EI	DCMABM	DCMAB	K
101	.1469890E+03	.2034180E+01	.6472860E+01	0.	0.
102	.1478510E+03	.1759180E+01	.6472860E+01	0.	0.
103	.1487130E+03	.1513000E+01	.6472860E+01	0.	0.
104	.1495750E+03	.1293560E+01	.6472860E+01	0.	0.
105	.1504370E+03	.1098860E+01	.6472860E+01	0.	0.
106	.1513000E+03	.9269470E+00	.6472860E+01	0.	0.
107	.1521620E+03	.7759840E+00	.6472860E+01	0.	0.
108	.1530240E+03	.6441900E+00	.6472860E+01	0.	0.
109	.1538860E+03	.5298720E+00	.6472860E+01	0.	0.
110	.1547480E+03	.4314100E+00	.6472860E+01	0.	0.
111	.1556100E+03	.3472660E+00	.6472860E+01	0.	0.
112	.1564730E+03	.2759790E+00	.6472860E+01	0.	0.
113	.1573350E+03	.2161690E+00	.6472860E+01	0.	0.
114	.1581970E+03	.1665310E+00	.6472860E+01	0.	0.
115	.1590590E+03	.1258410E+00	.6472860E+01	0.	0.
116	.1601060E+03	.1258410E+00	.6472860E+01	0.	0.
117	.1612320E+03	.1258410E+00	.6472860E+01	0.	0.
118	.1623190E+03	.1258410E+00	.6472860E+01	0.	0.
119	.1634050E+03	.1258410E+00	.6472860E+01	0.	0.
120	.1644920E+03	.1258410E+00	.6472860E+01	0.	0.

D=6

STATION	X	EI	DCMASH	DCMAS	K
121	.1655780E+03	.1258410E+00	.6472860E+01	0.	0.
122	.1666650E+03	.1258410E+00	.6472860E+01	0.	0.
123	.1677510E+03	.1258410E+00	.6472860E+01	0.	0.
124	.1688380E+03	.1258410E+00	.6472860E+01	0.	0.
125	.1699240E+03	.1258410E+00	.6472860E+01	0.	0.
126	.1702980E+03	.1608560E+00	.6472860E+01	0.	0.
127	.1706510E+03	.2025620E+00	.6472860E+01	0.	0.
128	.1710150E+03	.2517620E+00	.6472860E+01	0.	0.
129	.1713790E+03	.3093030E+00	.6472860E+01	0.	0.
130	.1717420E+03	.3760790E+00	.6472860E+01	0.	0.
131	.1721060E+03	.4530280E+00	.6472860E+01	0.	0.
132	.1724690E+03	.5411360E+00	.6472860E+01	0.	0.
133	.1728330E+03	.6414320E+00	.6472860E+01	0.	0.
134	.1731970E+03	.7549910E+00	.6472860E+01	0.	0.
135	.1735600E+03	.8829350E+00	.6472860E+01	0.	0.
136	.1739240E+03	.1026430E+01	.6472860E+01	0.	0.
137	.1753740E+03	.1026430E+01	.6472860E+01	0.	0.
138	.1768240E+03	.1026430E+01	.6472860E+01	0.	0.
139	.1782740E+03	.1026430E+01	.6472860E+01	0.	0.
140	.1797240E+03	.1026430E+01	.6472860E+01	0.	0.

126

STATION	X	EI	DCWASH	DCNAS	K
141	.1811740E+03	.1026430E+01	.6472860E+01	0.	0.
142	.1826240E+03	.1026430E+01	.6472860E+01	0.	0.
143	.1840740E+03	.1026430E+01	.6472860E+01	0.	0.
144	.1855240E+03	.1026430E+01	.6472860E+01	0.	0.
145	.1855240E+03	.8811969E+00	.6472860E+01	0.	0.
146	.1877050E+03	.7820390E+00	.6472860E+01	0.	0.
147	.1877050E+03	.1804160E+00	.6472860E+01	0.	0.
148	.1904230E+03	.1804160E+00	.6472860E+01	0.	0.
149	.1931400E+03	.1804160E+00	.6472860E+01	0.	0.
150	.1959230E+03	.1804160E+00	.6472860E+01	0.	0.
151	.1987050E+03	.1804160E+00	.6472860E+01	0.	0.
152	.1987050E+03	.1804160E+00	.1654053E+07	.3863200E+05	0.
153	.1987060E+03	.1804160E+00	.1654053E+07	.3863200E+05	0.

127

```
$CNTL
%       = 0,
%C      = 2,
%BS     = 1,
%DATA   = 5,
%HCM    = 0,
%I      = 155,
$END
```

```
$NCNTL
DEL    = .1E+01,
EPS    = .1E-05,
ITMAX  = 100,
N      = 1,
NORM   = 1,
PVTC   = 0,
PVTR   = 0,
XO     = .1E+01,
$END
```

```
$PARAM
 DUMMY  = -1,
 EINOD  = .2e2E+08,
$END
```

130

D-11

MATRIX C

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

/3/

MATRIX B

0.000

0.000

MATRIX B

0. 0. .1000E+01 0.

0. 0. 0. .1000E+01

D=14

MATRIX 3

0.000

0.000

EIGENVALUES FROM SECANT METHOD

.0095337E+02

135

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.5417585E-05	0.	-.3551763E+03
2	7.406	.4012263E-04	.6592194E-05	.2630424E+04	-.3551763E+03
3	10.812	.9764358E-04	.9897052E-05	.5260842E+04	-.3551763E+03
4	10.812	.9764358E-04	.9897052E-05	.5260842E+04	-.3551763E+03
5	22.682	.1914837E-03	.1491097E-04	.8056052E+04	-.3551763E+03
6	30.552	.3323423E-03	.2177235E-04	.1085125E+05	-.3551763E+03
7	32.225	.3701452E-03	.2346458E-04	.1144545E+05	-.3551763E+03
8	32.225	.3701452E-03	.2346458E-04	.1144545E+05	-.3551763E+03
9	35.825	.4613469E-03	.2741184E-04	.1205779E+05	.5720555E+02
10	35.825	.4613469E-03	.2741184E-04	.1205779E+05	.5720555E+02
11	36.812	.4889353E-03	.2848910E-04	.1200132E+05	.5720555E+02
12	37.648	.5131327E-03	.2934790E-04	.1195349E+05	.5720555E+02
13	37.937	.5216546E-03	.2959683E-04	.1193696E+05	.5720555E+02
14	37.937	.5216546E-03	.2959683E-04	.1193696E+05	.5720555E+02
15	38.497	.5383197E-03	.2990450E-04	.1190492E+05	.5720555E+02
16	38.907	.5506202E-03	.3009154E-04	.1188146E+05	.5720555E+02
17	39.057	.5551423E-03	.3014191E-04	.1187288E+05	.5720555E+02
18	41.326	.6242502E-03	.3077316E-04	.1174306E+05	.5720555E+02
19	43.091	.6915263E-03	.3139184E-04	.1161919E+05	.5720555E+02
20	44.250	.7154372E-03	.3161396E-04	.1157576E+05	.5720555E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	48.250	.7158372E-03	.3161396E-04	.1157576E+05	.5720555E+02
22	48.750	.8604450E-03	.3282040E-04	.1131830E+05	.5720555E+02
23	49.750	.8604450E-03	.3282040E-04	.1131830E+05	.5720555E+02
24	55.750	.1096692E-02	.3464613E-04	.1091779E+05	.5720555E+02
25	55.750	.1096692E-02	.3464613E-04	.1091779E+05	.5720555E+02
26	57.250	.1148949E-02	.3502818E-04	.1083196E+05	.5720555E+02
27	57.250	.1148949E-02	.3502818E-04	.1083196E+05	.5720555E+02
28	58.250	.1184153E-02	.3537917E-04	.1077475E+05	.5720555E+02
29	59.250	.1219707E-02	.3569286E-04	.1071753E+05	.5720555E+02
30	60.250	.1255539E-02	.3594613E-04	.1066032E+05	.5720555E+02
31	60.250	.1255539E-02	.3594613E-04	.1066032E+05	.5720555E+02
32	60.500	.1264540E-02	.3606768E-04	.1064601E+05	.5720555E+02
33	61.250	.1291728E-02	.3639325E-04	.1060310E+05	.5720555E+02
34	61.250	.1291728E-02	.3639325E-04	.1060310E+05	.5720555E+02
35	62.000	.1319086E-02	.3657989E-04	.1056019E+05	.5720555E+02
36	62.750	.1346598E-02	.3680848E-04	.1051728E+05	.5720555E+02
37	63.250	.1365044E-02	.3697746E-04	.1048867E+05	.5720555E+02
38	63.250	.1365044E-02	.3697746E-04	.1048867E+05	.5720555E+02
39	66.356	.1480613E-02	.3747322E-04	.1031095E+05	.5720555E+02
40	69.463	.1597866E-02	.3804359E-04	.1013318E+05	.5720555E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72,569	.1716978E-02	.3870342E-04	.9955467E+04	.5720555E+02
42	75,676	.1838331E-02	.3947237E-04	.9777694E+04	.5720555E+02
43	78,782	.1962219E-02	.4037446E-04	.9599978E+04	.5720555E+02
44	81,888	.2089137E-02	.4144161E-04	.9422260E+04	.5720555E+02
45	84,995	.2219696E-02	.4271562E-04	.9244485E+04	.5720555E+02
46	88,101	.2354528E-02	.4425053E-04	.9066765E+04	.5720555E+02
47	91,207	.2494581E-02	.4612059E-04	.8889044E+04	.5720555E+02
48	94,314	.2641077E-02	.4842764E-04	.8711263E+04	.5720555E+02
49	97,420	.2795459E-02	.5131127E-04	.8533538E+04	.5720555E+02
50	100,527	.2959877E-02	.5497462E-04	.8355753E+04	.5720555E+02
51	103,633	.3137012E-02	.5970951E-04	.8178021E+04	.5720555E+02
52	104,008	.3159525E-02	.6052926E-04	.8156562E+04	.5720555E+02
53	104,508	.3190120E-02	.6210690E-04	.8127950E+04	.5720555E+02
54	105,250	.3237212E-02	.6501098E-04	.8085490E+04	.5720555E+02
55	105,250	.3237212E-02	.6501098E-04	.8085490E+04	.5720555E+02
56	115,250	.3972614E-02	.8146571E-04	.7513221E+04	.5720555E+02
57	115,250	.3972614E-02	.8146571E-04	.7513221E+04	.5720555E+02
58	116,275	.4057197E-02	.8351516E-04	.7454560E+04	.5720555E+02
59	116,938	.4112655E-02	.8473357E-04	.7416846E+04	.5720555E+02
60	117,175	.4133127E-02	.8513256E-04	.7403053E+04	.5720555E+02

138

D-19

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117,889	.4194308E-02	.8624032E-04	.7362191E+04	.5720555E+02
62	118,279	.4228059E-02	.8687737E-04	.7339871E+04	.5720555E+02
63	118,670	.4262160E-02	.8758841E-04	.7317493E+04	.5720555E+02
64	119,060	.4296465E-02	.8838046E-04	.7295173E+04	.5720555E+02
65	119,451	.4331186E-02	.8927021E-04	.7272796E+04	.5720555E+02
66	119,841	.4366180E-02	.9026811E-04	.7250475E+04	.5720555E+02
67	120,232	.4401686E-02	.9139729E-04	.7228098E+04	.5720555E+02
68	120,622	.4437564E-02	.9267353E-04	.7205777E+04	.5720555E+02
69	121,012	.4473971E-02	.9412587E-04	.7183456E+04	.5720555E+02
70	121,403	.4511078E-02	.9579036E-04	.7161078E+04	.5720555E+02
71	121,793	.4548782E-02	.9769751E-04	.7138757E+04	.5720555E+02
72	122,184	.4587382E-02	.9990545E-04	.7116378E+04	.5720555E+02
73	122,574	.4626806E-02	.1024629E-03	.7094057E+04	.5720555E+02
74	122,965	.4667408E-02	.1054587E-03	.7071678E+04	.5720555E+02
75	122,965	.4667408E-02	.1054587E-03	.7071678E+04	.5720555E+02
76	123,206	.4693065E-02	.1075696E-03	.7057884E+04	.5720555E+02
77	123,205	.4693065E-02	.1075696E-03	.7057884E+04	.5720555E+02
78	123,355	.4709194E-02	.1089743E-03	.7049355E+04	.5720555E+02
79	123,746	.4752547E-02	.1131357E-03	.7026975E+04	.5720555E+02
80	124,136	.4797549E-02	.1180888E-03	.7004652E+04	.5720555E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124.526	.4844656E-02	.1240496E-03	.6982328E+04	.5720555E+02
82	124.917	.4894438E-02	.1313092E-03	.6959946E+04	.5720555E+02
83	125.307	.4947200E-02	.1401963E-03	.6937621E+04	.5720555E+02
84	125.698	.5003941E-02	.1512579E-03	.6915237E+04	.5720555E+02
85	126.088	.5065321E-02	.1651323E-03	.6892909E+04	.5720555E+02
86	126.479	.5132925E-02	.1828780E-03	.6870522E+04	.5720555E+02
87	126.869	.5208128E-02	.2058309E-03	.6848190E+04	.5720555E+02
88	126.869	.5208128E-02	.2058309E-03	.6848190E+04	.5720555E+02
89	127.066	.5258296E-02	.3034066E-03	.6836906E+04	.5720555E+02
90	127.066	.5258296E-02	.3034066E-03	.6836906E+04	.5720555E+02
91	129.668	.6273095E-02	.4747194E-03	.6687761E+04	.5720555E+02
92	132.270	.7728734E-02	.6422522E-03	.6538489E+04	.5720555E+02
93	134.872	.9615373E-02	.8060019E-03	.6389091E+04	.5720555E+02
94	137.474	.1192317E-01	.9659653E-03	.6239571E+04	.5720555E+02
95	140.076	.1464225E-01	.1122139E-02	.6089931E+04	.5720555E+02
96	142.678	.1776278E-01	.1274521E-02	.5940174E+04	.5720555E+02
97	143.500	.1888290E-01	.1327397E-02	.5890537E+04	.5720555E+02
98	144.802	.2005121E-01	.1386806E-02	.5840886E+04	.5720555E+02
99	145.264	.2127375E-01	.1453821E-02	.5791219E+04	.5720555E+02
100	146.127	.2255912E-01	.1529824E-02	.5741476E+04	.5720555E+02
101	146.989	.2391262E-01	.1616213E-02	.5691771E+04	.5720555E+02
102	147.851	.2534547E-01	.1715002E-02	.5642043E+04	.5720555E+02

041

D-21

103	148.713	.2686928E-01	.1828569E-02	.5592289E+04	.5720555E+02
104	149.575	.2849792E-01	.1959853E-02	.5542504E+04	.5720555E+02
105	150.437	.3024807E-01	.2112566E-02	.5492683E+04	.5720555E+02
106	151.300	.3214226E-01	.2291593E-02	.5442764E+04	.5720555E+02
107	152.162	.3420087E-01	.2502511E-02	.5392853E+04	.5720555E+02
108	153.024	.3645659E-01	.2753276E-02	.5342886E+04	.5720555E+02
109	153.886	.3894752E-01	.3054037E-02	.5292850E+04	.5720555E+02
110	154.748	.4172175E-01	.3418274E-02	.5242731E+04	.5720555E+02
111	155.610	.4484062E-01	.3864166E-02	.5192513E+04	.5720555E+02
112	156.473	.4838792E-01	.4417293E-02	.5142112E+04	.5720555E+02
113	157.335	.5245984E-01	.5111277E-02	.5091616E+04	.5720555E+02
114	158.197	.5719976E-01	.5996713E-02	.5040926E+04	.5720555E+02
115	159.059	.6279816E-01	.7146994E-02	.4989986E+04	.5720555E+02
116	160.146	.7146108E-01	.8781521E-02	.4925282E+04	.5720555E+02
117	161.232	.8187874E-01	.1039316E-01	.4860126E+04	.5720555E+02
118	162.319	.9404697E-01	.1198470E-01	.4794403E+04	.5720555E+02
119	163.405	.1079199E+00	.1355306E-01	.4728241E+04	.5720555E+02
120	164.492	.1234993E+00	.1510096E-01	.4661525E+04	.5720555E+02
121	165.578	.1407327E+00	.1662538E-01	.4594385E+04	.5720555E+02
122	166.665	.1596277E+00	.1812899E-01	.4526705E+04	.5720555E+02
123	167.751	.1801254E+00	.1960885E-01	.4458615E+04	.5720555E+02
124	168.838	.2022392E+00	.2106754E-01	.4389998E+04	.5720555E+02
125	169.924	.2259037E+00	.2250222E-01	.4320987E+04	.5720555E+02
126	170.288	.2341813E+00	.2292634E-01	.4297756E+04	.5720555E+02
127	170.651	.2425706E+00	.2325762E-01	.4274549E+04	.5720555E+02
128	171.015	.2510899E+00	.2352151E-01	.4251247E+04	.5720555E+02

141

129	171.379	.2596944E+00	.2373376E-01	.4227921E+04	.5720555E+02
130	171.742	.2683442E+00	.2390591E-01	.4204638E+04	.5720555E+02
131	172.106	.2770742E+00	.2404769E-01	.4181275E+04	.5720555E+02
132	172.469	.2858267E+00	.2416485E-01	.4157963E+04	.5720555E+02
133	172.833	.2946421E+00	.2426301E-01	.4134575E+04	.5720555E+02
134	173.197	.3034902E+00	.2434561E-01	.4111178E+04	.5720555E+02
135	173.560	.3123413E+00	.2441540E-01	.4087837E+04	.5720555E+02
136	173.924	.3212402E+00	.2447507E-01	.4064424E+04	.5720555E+02
137	175.374	.3568880E+00	.2469171E-01	.3971104E+04	.5720555E+02
138	176.824	.3928462E+00	.2490330E-01	.3877693E+04	.5720555E+02
139	178.274	.4291076E+00	.2510986E-01	.3784193E+04	.5720555E+02
140	179.724	.4656648E+00	.2531138E-01	.3690608E+04	.5720555E+02
141	181.174	.5025106E+00	.2550785E-01	.3596939E+04	.5720555E+02
142	182.624	.5396375E+00	.2569926E-01	.3503188E+04	.5720555E+02
143	184.074	.5770384E+00	.2588562E-01	.3409357E+04	.5720555E+02
144	185.524	.6147058E+00	.2606692E-01	.3315448E+04	.5720555E+02
145	185.524	.6147058E+00	.2606692E-01	.3315448E+04	.5720555E+02
146	187.705	.6718993E+00	.2639245E-01	.3174041E+04	.5720555E+02
147	187.705	.6718993E+00	.2639245E-01	.3174041E+04	.5720555E+02
148	190.423	.7461143E+00	.2816685E-01	.2996961E+04	.5720555E+02
149	193.140	.8249839E+00	.2983842E-01	.2818585E+04	.5720555E+02
150	195.923	.9103333E+00	.3144390E-01	.2634547E+04	.5720555E+02
151	198.705	.9999671E+00	.3294013E-01	.2449320E+04	.5720555E+02
152	198.705	.9999671E+00	.3294013E-01	.2449320E+04	.5720555E+02
153	198.706	.1000000E+01	.3294039E-01	.1582736E-08	-.1805787E-07

142

D-23

E.1 DIVERGENCE: E=3 BODY WITH NTP=108 (UPDATED 3-25-83)

STATION	X	EI	DCMASH	DCNAS	K
1	0.	.2862990E+03	.6472860E+01	0.	0.
2	.7406000E+01	.3165080E+03	.6472860E+01	0.	0.
3	.1481700E+02	.3490420E+03	.6472860E+01	0.	0.
4	.1481700E+02	.3898560E+03	.6472860E+01	0.	0.
5	.2268200E+02	.4050440E+03	.6472860E+01	0.	0.
6	.3055200E+02	.4206720E+03	.6472860E+01	0.	0.
7	.3222500E+02	.4206720E+03	.6472860E+01	0.	0.
8	.3222500E+02	.4206720E+03	.6472860E+01	0.	.2777780E+06
9	.3582500E+02	.4206720E+03	.6472860E+01	0.	.2777780E+06
10	.3582500E+02	.4206720E+03	.6472860E+01	0.	0.
11	.3681200E+02	.4206720E+03	.6472860E+01	0.	0.
12	.3764800E+02	.4724710E+03	.6472860E+01	0.	0.
13	.3793700E+02	.6018070E+03	.6472860E+01	0.	0.
14	.3793700E+02	.7855000E+03	.6472860E+01	0.	0.
15	.3849700E+02	.8758440E+03	.6472860E+01	0.	0.
16	.3890700E+02	.1152276E+04	.6472860E+01	0.	0.
17	.3905700E+02	.1629655E+04	.6472860E+01	0.	0.
18	.4132600E+02	.1610312E+04	.6472860E+01	0.	0.
19	.4389100E+02	.1512582E+04	.6472860E+01	0.	0.
20	.4425000E+02	.1512582E+04	.6472860E+01	0.	0.

E1

STATION	X	EI	DCMASM	DCMAS	K
21	.4825000E+02	.1629655E+04	.6472860E+01	0.	0.
22	.4875000E+02	.1629655E+04	.6472860E+01	0.	0.
23	.4875000E+02	.1627307E+04	.6472860E+01	0.	0.
24	.5575000E+02	.1626703E+04	.6472860E+01	0.	0.
25	.5575000E+02	.1629655E+04	.6472860E+01	0.	0.
26	.5725000E+02	.1629655E+04	.6472860E+01	0.	0.
27	.5725000E+02	.1174793E+04	.6472860E+01	0.	0.
28	.5825000E+02	.1174793E+04	.6472860E+01	0.	0.
29	.5925000E+02	.1174997E+04	.6472860E+01	0.	0.
30	.6025000E+02	.1775202E+04	.6472860E+01	0.	0.
31	.6025000E+02	.8363110E+03	.6472860E+01	0.	0.
32	.6050000E+02	.8363110E+03	.6472860E+01	0.	0.
33	.6125000E+02	.1058520E+04	.6472860E+01	0.	0.
34	.6125000E+02	.1786583E+04	.6472860E+01	0.	0.
35	.6200000E+02	.1486378E+04	.6472860E+01	0.	0.
36	.6275000E+02	.1186174E+04	.6472860E+01	0.	0.
37	.6325000E+02	.1186174E+04	.6472860E+01	0.	0.
38	.6325000E+02	.2691925E+04	.6472860E+01	0.	0.
39	.6635600E+02	.2308086E+04	.6472860E+01	0.	0.
40	.6946300E+02	.1966824E+04	.6472860E+01	0.	0.

E2

STATION	X	EI	DCHASH	DCNAS	K
41	.7256900E+02	.1664868E+04	.6472860E+01	0.	0.
42	.7567600E+02	.1399077E+04	.6472860E+01	0.	0.
43	.7878200E+02	.1166841E+04	.6472860E+01	0.	0.
44	.8188900E+02	.9640810E+03	.6472860E+01	0.	0.
45	.8499600E+02	.7892480E+03	.6472860E+01	0.	0.
46	.8810300E+02	.6393260E+03	.6472860E+01	0.	0.
47	.9120700E+02	.5118270E+03	.6472860E+01	0.	0.
48	.9431400E+02	.4043960E+03	.6472860E+01	0.	0.
49	.9742000E+02	.3148080E+03	.6472860E+01	0.	0.
50	.1005270E+03	.2409680E+03	.6472860E+01	0.	0.
51	.1036330E+03	.1809120E+03	.6472860E+01	0.	0.
52	.1040080E+03	.1176260E+03	.6472860E+01	0.	0.
53	.1045080E+03	.8467190E+02	.6472860E+01	0.	0.
54	.1052500E+03	.7411600E+02	.6472860E+01	0.	0.
55	.1052500E+03	.1809120E+03	.6472860E+01	0.	0.
56	.1152500E+03	.1809120E+03	.6472860E+01	0.	0.
57	.1152500E+03	.1394420E+03	.6472860E+01	0.	0.
58	.1162750E+03	.1464810E+03	.6472860E+01	0.	0.
59	.1169340E+03	.1612700E+03	.6472860E+01	0.	0.
60	.1171950E+03	.1816190E+03	.6472860E+01	0.	0.

145

STATION	X	EI	DCWASH	DCNAS	K
61	.1178890E+03	.1816190E+03	.6472860E+01	0.	0.
62	.1182790E+03	.1629020E+03	.6472860E+01	0.	0.
63	.1186700E+03	.1456700E+03	.6472860E+01	0.	0.
64	.1190600E+03	.1298420E+03	.6472860E+01	0.	0.
65	.1194510E+03	.1153400E+03	.6472860E+01	0.	0.
66	.1198410E+03	.1020870E+03	.6472860E+01	0.	0.
67	.1202320E+03	.9000920E+02	.6472860E+01	0.	0.
68	.1206220E+03	.7903560E+02	.6472860E+01	0.	0.
69	.1210120E+03	.6909640E+02	.6472860E+01	0.	0.
70	.1214030E+03	.6012440E+02	.6472860E+01	0.	0.
71	.1217930E+03	.5205490E+02	.6472860E+01	0.	0.
72	.1221840E+03	.4482520E+02	.6472860E+01	0.	0.
73	.1225740E+03	.3837480E+02	.6472860E+01	0.	0.
74	.1229650E+03	.3264570E+02	.6472860E+01	0.	0.
75	.1229650E+03	.3247070E+02	.6472860E+01	0.	0.
76	.1232060E+03	.2926540E+02	.6472860E+01	0.	0.
77	.1232060E+03	.2951600E+02	.6472860E+01	0.	0.
78	.1233550E+03	.2765750E+02	.6472860E+01	0.	0.
79	.1237460E+03	.2320550E+02	.6472860E+01	0.	0.
80	.1241360E+03	.1931380E+02	.6472860E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
81	.1245260E+03	.1593340E+02	.6472860E+01	0.	0.
82	.1249170E+03	.1301730E+02	.6472860E+01	0.	0.
83	.1253070E+03	.1052110E+02	.6472860E+01	0.	0.
84	.1256980E+03	.8402210E+01	.6472860E+01	0.	0.
85	.1260880E+03	.6620640E+01	.6472860E+01	0.	0.
86	.1264790E+03	.5138520E+01	.6472860E+01	0.	0.
87	.1268690E+03	.3920260E+01	.6472860E+01	0.	0.
88	.1268690E+03	.5272800E+00	.6472860E+01	0.	0.
89	.1270660E+03	.5272800E+00	.6472860E+01	0.	0.
90	.1270660E+03	.3920260E+01	.6472860E+01	0.	0.
91	.1296680E+03	.3920260E+01	.6472860E+01	0.	0.
92	.1322700E+03	.3920260E+01	.6472860E+01	0.	0.
93	.1348720E+03	.3920260E+01	.6472860E+01	0.	0.
94	.1374740E+03	.3920260E+01	.6472860E+01	0.	0.
95	.1400760E+03	.3920260E+01	.6472860E+01	0.	0.
96	.1426780E+03	.3920260E+01	.6472860E+01	0.	0.
97	.1435400E+03	.3467030E+01	.6472860E+01	0.	0.
98	.1444020E+03	.3054240E+01	.6472860E+01	0.	0.
99	.1452640E+03	.2679430E+01	.6472860E+01	0.	0.
100	.1461270E+03	.2340190E+01	.6472860E+01	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
101	.1469890E+03	.2034180E+01	.6472860E+01	0.	0.
102	.1478510E+03	.1759180E+01	.6472860E+01	0.	0.
103	.1487130E+03	.1513000E+01	.6472860E+01	0.	0.
104	.1495750E+03	.1293560E+01	.6472860E+01	0.	0.
105	.1504370E+03	.1098860E+01	.6472860E+01	0.	0.
106	.1513000E+03	.9269470E+00	.6472860E+01	0.	0.
107	.1521620E+03	.7759840E+00	.6472860E+01	0.	0.
108	.1530240E+03	.6441900E+00	.6472860E+01	0.	0.
109	.1538860E+03	.5298720E+00	.6472860E+01	0.	0.
110	.1547480E+03	.4314100E+00	.6472860E+01	0.	0.
111	.1556100E+03	.3472660E+00	.6472860E+01	0.	0.
112	.1564730E+03	.2759790E+00	.6472860E+01	0.	0.
113	.1573350E+03	.2161690E+00	.6472860E+01	0.	0.
114	.1581970E+03	.1665310E+00	.6472860E+01	0.	0.
115	.1590590E+03	.1258410E+00	.6472860E+01	0.	0.
116	.1601460E+03	.1258410E+00	.6472860E+01	0.	0.
117	.1612320E+03	.1258410E+00	.6472860E+01	0.	0.
118	.1623190E+03	.1258410E+00	.6472860E+01	0.	0.
119	.1634050E+03	.1258410E+00	.6472860E+01	0.	0.
120	.1644920E+03	.1258410E+00	.6472860E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
121	.1655780E+03	.1258410E+00	.6472860E+01	0.	0.
122	.1666650E+03	.1258410E+00	.6472860E+01	0.	0.
123	.1677510E+03	.1258410E+00	.6472860E+01	0.	0.
124	.1688380E+03	.1258410E+00	.6472860E+01	0.	0.
125	.1699240E+03	.1258410E+00	.6472860E+01	0.	0.
126	.1702880E+03	.1608560E+00	.6472860E+01	0.	0.
127	.1706510E+03	.2025620E+00	.6472860E+01	0.	0.
128	.1710150E+03	.2517620E+00	.6472860E+01	0.	0.
129	.1713790E+03	.3093030E+00	.6472860E+01	0.	0.
130	.1717420E+03	.3760790E+00	.6472860E+01	0.	0.
131	.1721060E+03	.4530280E+00	.6472860E+01	0.	0.
132	.1724690E+03	.5411360E+00	.6472860E+01	0.	0.
133	.1728330E+03	.6414320E+00	.6472860E+01	0.	0.
134	.1731970E+03	.7549910E+00	.6472860E+01	0.	0.
135	.1735600E+03	.8829350E+00	.6472860E+01	0.	0.
136	.1739240E+03	.1026430E+01	.6472860E+01	0.	0.
137	.1753740E+03	.1026430E+01	.6472860E+01	0.	0.
138	.1768240E+03	.1026430E+01	.6472860E+01	0.	0.
139	.1782740E+03	.1026430E+01	.6472860E+01	0.	0.
140	.1797240E+03	.1026430E+01	.6472860E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
141	.1811740E+03	.1026430E+01	.6472860E+01	0.	0.
142	.1826240E+03	.1026430E+01	.6472860E+01	0.	0.
143	.1840740E+03	.1026430E+01	.6472860E+01	0.	0.
144	.1855240E+03	.1026430E+01	.6472860E+01	0.	0.
145	.1855240E+03	.8819690E+00	.6472860E+01	0.	0.
146	.1877660E+03	.7786640E+00	.6472860E+01	0.	0.
147	.1877650E+03	.5467200E-01	.6472860E+01	0.	0.
148	.1904530E+03	.5467200E-01	.6472860E+01	0.	0.
149	.1931800E+03	.5467200E-01	.6472860E+01	0.	0.
150	.1954530E+03	.5467200E-01	.6472860E+01	0.	0.
151	.1977660E+03	.5467200E-01	.6472860E+01	0.	0.
152	.1977660E+03	.5467200E-01	.1690348E+07	.3863200E+05	0.
153	.1977670E+03	.5467200E-01	.1690348E+07	.3863200E+05	0.

051

```
$CNTL
 N      = 4,
 NC     = 2,
 NBS    = 1,
 NDATA  = 5,
 NHDN   = 0,
 NI     = 153,
$END
```

151

E9

```
$HCVTL
DEL    = .1E+01,
EPS    = .1E-05,
ITMAX  = 100,
N      = 1,
NORM   = 1,
PVTC   = 0,
PVTR   = 0,
XO     = .1E+01,
$END
```

152

E10

```
$PARAM
DUMMY = -1,
EINOD = .262E+08,
$END
```

153

MATRIX C

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

E12

MATRIX B

0.000

0.000

155

E-13

MATRIX D

0. 0. .1000E+01 0.

0. 0. 0. .1000E+01

MATRIX D

0.000

0.000

EIGENVALUES FROM SECANT METHOD

.3232118E+02

158

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.5246991E-05	0.	-.3433236E+03
2	7.406	.3885921E-04	.6382403E-05	.2542647E+04	-.3433236E+03
3	14.812	.9453616E-04	.9576978E-05	.5085290E+04	-.3433236E+03
4	14.812	.9453616E-04	.9576978E-05	.5085290E+04	-.3433236E+03
5	22.682	.1853250E-03	.1442359E-04	.7787228E+04	-.3433236E+03
6	30.552	.3215634E-03	.2105600E-04	.1048916E+05	-.3433236E+03
7	32.225	.3581219E-03	.2269177E-04	.1106353E+05	-.3433236E+03
8	32.225	.3581219E-03	.2269177E-04	.1106353E+05	-.3433236E+03
9	35.825	.4463170E-03	.2650732E-04	.1165486E+05	.5564383E+02
10	35.825	.4463170E-03	.2650732E-04	.1165486E+05	.5564383E+02
11	36.812	.4729948E-03	.2754857E-04	.1159993E+05	.5564383E+02
12	37.648	.4963932E-03	.2837863E-04	.1155341E+05	.5564383E+02
13	37.937	.5046336E-03	.2861923E-04	.1153732E+05	.5564383E+02
14	37.937	.5046336E-03	.2861923E-04	.1153732E+05	.5564383E+02
15	38.497	.5207482E-03	.2891660E-04	.1150616E+05	.5564383E+02
16	38.907	.5326462E-03	.2909736E-04	.1148334E+05	.5564383E+02
17	39.057	.5370151E-03	.2914603E-04	.1147500E+05	.5564383E+02
18	41.326	.6038393E-03	.2975612E-04	.1134873E+05	.5564383E+02
19	43.491	.6688917E-03	.3035401E-04	.1122824E+05	.5564383E+02
20	44.250	.6920120E-03	.3056865E-04	.1118600E+05	.5564383E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	44.250	.6920120E-03	.3056865E-04	.1118600E+05	.5564383E+02
22	48.750	.8322235E-03	.3173439E-04	.1093558E+05	.5564383E+02
23	48.750	.8322235E-03	.3173439E-04	.1093558E+05	.5564383E+02
24	55.750	.1060648E-02	.3349816E-04	.1054602E+05	.5564383E+02
25	55.750	.1060648E-02	.3349816E-04	.1054602E+05	.5564383E+02
26	57.250	.1111173E-02	.3386719E-04	.1046255E+05	.5564383E+02
27	57.250	.1111173E-02	.3386719E-04	.1046255E+05	.5564383E+02
28	58.250	.1145211E-02	.3420621E-04	.1040690E+05	.5564383E+02
29	59.250	.1179586E-02	.3450919E-04	.1035125E+05	.5564383E+02
30	60.250	.1214229E-02	.3475380E-04	.1029559E+05	.5564383E+02
31	60.250	.1214229E-02	.3475380E-04	.1029559E+05	.5564383E+02
32	60.500	.1222932E-02	.3487119E-04	.1028168E+05	.5564383E+02
33	61.250	.1249217E-02	.3518561E-04	.1023994E+05	.5564383E+02
34	61.250	.1249217E-02	.3518561E-04	.1023994E+05	.5564383E+02
35	62.000	.1275668E-02	.3536585E-04	.1019820E+05	.5564383E+02
36	62.750	.1302266E-02	.3558661E-04	.1015647E+05	.5564383E+02
37	63.250	.1320100E-02	.3574979E-04	.1012864E+05	.5564383E+02
38	63.250	.1320100E-02	.3574979E-04	.1012864E+05	.5564383E+02
39	66.356	.1431832E-02	.3622849E-04	.9955788E+04	.5564383E+02
40	69.463	.1545188E-02	.3677918E-04	.9782879E+04	.5564383E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72.569	.1660340E-02	.3741616E-04	.9610025E+04	.5564383E+02
42	75.676	.1777656E-02	.3815837E-04	.9437115E+04	.5564383E+02
43	78.782	.1897417E-02	.3902897E-04	.9264260E+04	.5564383E+02
44	81.888	.2020104E-02	.4005872E-04	.9091405E+04	.5564383E+02
45	84.995	.2146303E-02	.4128789E-04	.8918493E+04	.5564383E+02
46	88.101	.2276624E-02	.4276854E-04	.8745636E+04	.5564383E+02
47	91.207	.2411982E-02	.4457221E-04	.8572778E+04	.5564383E+02
48	94.314	.2553553E-02	.4679696E-04	.8399863E+04	.5564383E+02
49	97.420	.2702729E-02	.4957723E-04	.8227002E+04	.5564383E+02
50	100.527	.2861580E-02	.5310861E-04	.8054083E+04	.5564383E+02
51	103.633	.3032688E-02	.5767204E-04	.7881218E+04	.5564383E+02
52	104.008	.3054432E-02	.5846204E-04	.7860347E+04	.5564383E+02
53	104.508	.3083982E-02	.5998235E-04	.7832519E+04	.5564383E+02
54	105.250	.3129461E-02	.6278080E-04	.7791221E+04	.5564383E+02
55	105.250	.3129461E-02	.6278080E-04	.7791221E+04	.5564383E+02
56	115.250	.3839457E-02	.7863123E-04	.7234635E+04	.5564383E+02
57	115.250	.3839457E-02	.7863123E-04	.7234635E+04	.5564383E+02
58	116.275	.3921094E-02	.8060461E-04	.7177583E+04	.5564383E+02
59	116.938	.3974619E-02	.8177772E-04	.7140902E+04	.5564383E+02
60	117.175	.3994376E-02	.8216187E-04	.7127488E+04	.5564383E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117,889	.4053422E+02	.8322836E+04	.7087746E+04	.5564383E+02
62	118,279	.4085994E+02	.8384166E+04	.7066038E+04	.5564383E+02
63	118,670	.4118903E+02	.8452616E+04	.7044274E+04	.5564383E+02
64	119,060	.4152008E+02	.8528862E+04	.7022566E+04	.5564383E+02
65	119,451	.4185514E+02	.8614510E+04	.7000802E+04	.5564383E+02
66	119,841	.4219287E+02	.8710568E+04	.6979094E+04	.5564383E+02
67	120,232	.4253544E+02	.8819257E+04	.6957330E+04	.5564383E+02
68	120,622	.4288164E+02	.8942098E+04	.6935622E+04	.5564383E+02
69	121,012	.4323293E+02	.9081884E+04	.6913914E+04	.5564383E+02
70	121,403	.4359095E+02	.9242085E+04	.6892149E+04	.5564383E+02
71	121,793	.4395472E+02	.9425635E+04	.6870441E+04	.5564383E+02
72	122,184	.4432711E+02	.9638126E+04	.6848676E+04	.5564383E+02
73	122,574	.4470743E+02	.9884249E+04	.6826967E+04	.5564383E+02
74	122,965	.4509910E+02	.1017254E+03	.6805202E+04	.5564383E+02
75	122,965	.4509910E+02	.1017254E+03	.6805202E+04	.5564383E+02
76	123,206	.4534658E+02	.1037567E+03	.6791787E+04	.5564383E+02
77	123,206	.4534658E+02	.1037567E+03	.6791787E+04	.5564383E+02
78	123,355	.4550215E+02	.1051084E+03	.6783493E+04	.5564383E+02
79	123,746	.4592028E+02	.1091129E+03	.6761727E+04	.5564383E+02
80	124,136	.4635428E+02	.1138789E+03	.6740017E+04	.5564383E+02

162

E-20

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124.526	.4680853E-02	.1196144E-03	.6718306E+04	.5564383E+02
82	124.917	.4728853E-02	.1265993E-03	.6696540E+04	.5564383E+02
83	125.307	.4779720E-02	.1351500E-03	.6674828E+04	.5564383E+02
84	125.698	.4834415E-02	.1457924E-03	.6653060E+04	.5564383E+02
85	126.088	.4893572E-02	.1591405E-03	.6631346E+04	.5564383E+02
86	126.479	.4958718E-02	.1762124E-03	.6609576E+04	.5564383E+02
87	126.869	.5031175E-02	.1982932E-03	.6587860E+04	.5564383E+02
88	126.869	.5031175E-02	.1982932E-03	.6587860E+04	.5564383E+02
89	127.066	.5079492E-02	.2921587E-03	.6576888E+04	.5564383E+02
90	127.066	.5079492E-02	.2921587E-03	.6576888E+04	.5564383E+02
91	129.668	.6056454E-02	.4569368E-03	.6431898E+04	.5564383E+02
92	132.270	.7457389E-02	.6180406E-03	.6286820E+04	.5564383E+02
93	134.872	.9272736E-02	.7754681E-03	.6141655E+04	.5564383E+02
94	137.474	.1149292E-01	.9292170E-03	.5996405E+04	.5564383E+02
95	140.076	.1410838E-01	.1079285E-02	.5851073E+04	.5564383E+02
96	142.678	.1710952E-01	.1225670E-02	.5705659E+04	.5564383E+02
97	143.540	.1818669E-01	.1276456E-02	.5657469E+04	.5564383E+02
98	144.402	.1931013E-01	.1333512E-02	.5609269E+04	.5564383E+02
99	145.264	.2048566E-01	.1397866E-02	.5561058E+04	.5564383E+02
100	146.127	.2172152E-01	.1470845E-02	.5512779E+04	.5564383E+02
101	146.989	.2302279E-01	.1553789E-02	.5464542E+04	.5564383E+02
102	147.851	.2440025E-01	.1648629E-02	.5416289E+04	.5564383E+02

163

E-21

103	148.713	.2586503E-01	.1757643E-02	.5368017E+04	.5564383E+02
104	149.575	.2743043E-01	.1883659E-02	.5319725E+04	.5564383E+02
105	150.437	.2911246E-01	.2030226E-02	.5271408E+04	.5564383E+02
106	151.300	.3093273E-01	.2202033E-02	.5223006E+04	.5564383E+02
107	152.162	.3291078E-01	.2404424E-02	.5174628E+04	.5564383E+02
108	153.024	.3507795E-01	.2645029E-02	.5126209E+04	.5564383E+02
109	153.886	.3747081E-01	.2933579E-02	.5077744E+04	.5564383E+02
110	154.748	.4013544E-01	.3282996E-02	.5029221E+04	.5564383E+02
111	155.610	.4313069E-01	.3710708E-02	.4980630E+04	.5564383E+02
112	156.473	.4653688E-01	.4241241E-02	.4931896E+04	.5564383E+02
113	157.335	.5044624E-01	.4906825E-02	.4883113E+04	.5564383E+02
114	158.197	.5499625E-01	.5755970E-02	.4834197E+04	.5564383E+02
115	159.059	.6036953E-01	.6859042E-02	.4785107E+04	.5564383E+02
116	160.146	.6868274E-01	.8426418E-02	.4722883E+04	.5564383E+02
117	161.232	.7867855E-01	.9971806E-02	.4660363E+04	.5564383E+02
118	162.319	.9035297E-01	.1149794E-01	.4597436E+04	.5564383E+02
119	163.405	.1036620E+00	.1300189E-01	.4534222E+04	.5564383E+02
120	164.492	.1186075E+00	.1448632E-01	.4470611E+04	.5564383E+02
121	165.578	.1351393E+00	.1594839E-01	.4406723E+04	.5564383E+02
122	166.665	.1532648E+00	.1739067E-01	.4342446E+04	.5564383E+02
123	167.751	.1729278E+00	.1881041E-01	.4277903E+04	.5564383E+02
124	168.838	.1941412E+00	.2021012E-01	.4212980E+04	.5564383E+02
125	169.924	.2168429E+00	.2158711E-01	.4147801E+04	.5564383E+02
126	170.288	.2247840E+00	.2199425E-01	.4125886E+04	.5564383E+02
127	170.651	.2328324E+00	.2231230E-01	.4104003E+04	.5564383E+02
128	171.015	.2410053E+00	.2256567E-01	.4082039E+04	.5564383E+02

129	171,379	.2492602E+00	.2276948E-01	.4060058E+04	.5564383E+02
130	171,742	.2575585E+00	.2293480E-01	.4038123E+04	.5564383E+02
131	172,106	.2659340E+00	.2307097E-01	.4016116E+04	.5564383E+02
132	172,469	.2743310E+00	.2318351E-01	.3994161E+04	.5564383E+02
133	172,833	.2827885E+00	.2327780E-01	.3972137E+04	.5564383E+02
134	173,197	.2912773E+00	.2335717E-01	.3950107E+04	.5564383E+02
135	173,560	.2997691E+00	.2342423E-01	.3928131E+04	.5564383E+02
136	173,924	.3083067E+00	.2348157E-01	.3906091E+04	.5564383E+02
137	175,378	.3425077E+00	.2368981E-01	.3818252E+04	.5564383E+02
138	176,824	.3770072E+00	.2389332E-01	.3730351E+04	.5564383E+02
139	178,278	.4117983E+00	.2409208E-01	.3642389E+04	.5564383E+02
140	179,724	.4468742E+00	.2428610E-01	.3554367E+04	.5564383E+02
141	181,178	.4822280E+00	.2447538E-01	.3466287E+04	.5564383E+02
142	182,624	.5178528E+00	.2465990E-01	.3378150E+04	.5564383E+02
143	184,078	.5537417E+00	.2483966E-01	.3289958E+04	.5564383E+02
144	185,524	.5898878E+00	.2501468E-01	.3201713E+04	.5564383E+02
145	185,524	.5898878E+00	.2501468E-01	.3201713E+04	.5564383E+02
146	187,766	.6463190E+00	.2533843E-01	.3065153E+04	.5564383E+02
147	187,766	.6463190E+00	.2533843E-01	.3065153E+04	.5564383E+02
148	190,453	.7221282E+00	.3093464E-01	.2899778E+04	.5564383E+02
149	193,140	.8125577E+00	.3621769E-01	.2731344E+04	.5564383E+02
150	195,453	.9014299E+00	.4051010E-01	.2584047E+04	.5564383E+02
151	197,766	.9999554E+00	.4456299E-01	.2434731E+04	.5564383E+02
152	197,766	.9999554E+00	.4456299E-01	.2434731E+04	.5564383E+02
153	197,767	.1000000E+01	.4456384E-01	.1045907E-08	-.7958742E-10

165

E-23

P.J DIVERGENCE1 C=2 BODY WITH NTF=103 (UPDATED 3-25-83)

STATION	X	EI	DCMASH	DCMAS	K
1	0.	.2862990E+03	.1615370E+01	0.	0.
2	.7406600E+01	.3165080E+03	.1615370E+01	0.	0.
3	.1481200E+02	.3490420E+03	.1615370E+01	0.	0.
4	.1481200E+02	.3898560E+03	.1615370E+01	0.	0.
5	.2268900E+02	.4050440E+03	.1615370E+01	0.	0.
6	.3055900E+02	.4206720E+03	.1615370E+01	0.	0.
7	.3222500E+02	.4206720E+03	.1615370E+01	0.	0.
8	.3222500E+02	.4206720E+03	.1615370E+01	0.	.2777780E+06
9	.3582500E+02	.4206720E+03	.1615370E+01	0.	.2777780E+06
10	.3582500E+02	.4206720E+03	.1615370E+01	0.	0.
11	.3681200E+02	.4206720E+03	.1615370E+01	0.	0.
12	.3764800E+02	.4724710E+03	.1615370E+01	0.	0.
13	.3793700E+02	.6018070E+03	.1615370E+01	0.	0.
14	.3793700E+02	.7855000E+03	.1615370E+01	0.	0.
15	.3849700E+02	.8758440E+03	.1615370E+01	0.	0.
16	.3890700E+02	.1152276E+04	.1615370E+01	0.	0.
17	.3905700E+02	.1629655E+04	.1615370E+01	0.	0.
18	.4132600E+02	.1610312E+04	.1615370E+01	0.	0.
19	.4349100E+02	.1512582E+04	.1615370E+01	0.	0.
20	.4425000E+02	.1512582E+04	.1615370E+01	0.	0.

F1

STATION	K	EI	DCHASH	DCNAS	K
21	.4425000E+02	.1629655E+04	.1615370E+01	0.	0.
22	.4875000E+02	.1629655E+04	.1615370E+01	0.	0.
23	.4875000E+02	.1627307E+04	.1615370E+01	0.	0.
24	.5575000E+02	.1626703E+04	.1615370E+01	0.	0.
25	.5575000E+02	.1629655E+04	.1615370E+01	0.	0.
26	.5725000E+02	.1629655E+04	.1615370E+01	0.	0.
27	.5725000E+02	.1174793E+04	.1615370E+01	0.	0.
28	.5825000E+02	.1174793E+04	.1615370E+01	0.	0.
29	.5925000E+02	.1474997E+04	.1615370E+01	0.	0.
30	.6025000E+02	.1775202E+04	.1615370E+01	0.	0.
31	.6025000E+02	.8363110E+03	.1615370E+01	0.	0.
32	.6050000E+02	.8363110E+03	.1615370E+01	0.	0.
33	.6125000E+02	.1058520E+04	.1615370E+01	0.	0.
34	.6125000E+02	.1786583E+04	.1615370E+01	0.	0.
35	.6200000E+02	.1486378E+04	.1615370E+01	0.	0.
36	.6275000E+02	.1186174E+04	.1615370E+01	0.	0.
37	.6325000E+02	.1186174E+04	.1615370E+01	0.	0.
38	.6325000E+02	.2691925E+04	.1615370E+01	0.	0.
39	.6635606E+02	.2308086E+04	.1615370E+01	0.	0.
40	.6946300E+02	.1966824E+04	.1615370E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
01	.7256900E+02	.1664868E+04	.1615370E+01	0.	0.
02	.7567600E+02	.1399077E+04	.1615370E+01	0.	0.
03	.7878300E+02	.1166441E+04	.1615370E+01	0.	0.
04	.8188800E+02	.9640810E+03	.1615370E+01	0.	0.
05	.8499500E+02	.7892480E+03	.1615370E+01	0.	0.
06	.8810100E+02	.6393260E+03	.1615370E+01	0.	0.
07	.9120700E+02	.5118270E+03	.1615370E+01	0.	0.
08	.9431400E+02	.4043960E+03	.1615370E+01	0.	0.
09	.9742000E+02	.3148080E+03	.1615370E+01	0.	0.
50	.1005270E+03	.2409680E+03	.1615370E+01	0.	0.
51	.1036330E+03	.1809120E+03	.1615370E+01	0.	0.
52	.1040080E+03	.1176260E+03	.1615370E+01	0.	0.
53	.1045080E+03	.8467190E+02	.1615370E+01	0.	0.
54	.1052500E+03	.7411600E+02	.1615370E+01	0.	0.
55	.1052500E+03	.1809120E+03	.1615370E+01	0.	0.
56	.1152500E+03	.1809120E+03	.1615370E+01	0.	0.
57	.1152500E+03	.1394420E+03	.1615370E+01	0.	0.
58	.1162750E+03	.1464810E+03	.1615370E+01	0.	0.
59	.1169340E+03	.1612700E+03	.1615370E+01	0.	0.
60	.1171750E+03	.1816190E+03	.1615370E+01	0.	0.

891

F-3

STATION	X	EI	DCMASH	DCMAB	K
61	.1178890E+03	.1816190E+03	.1615370E+01	0.	0.
62	.1182790E+03	.1629020E+03	.1615370E+01	0.	0.
63	.1186700E+03	.1456700E+03	.1615370E+01	0.	0.
64	.1190600E+03	.1298420E+03	.1615370E+01	0.	0.
65	.1194510E+03	.1153400E+03	.1615370E+01	0.	0.
66	.1198410E+03	.1020870E+03	.1615370E+01	0.	0.
67	.1202320E+03	.9000920E+02	.1615370E+01	0.	0.
68	.1206220E+03	.7903560E+02	.1615370E+01	0.	0.
69	.1210120E+03	.6909640E+02	.1615370E+01	0.	0.
70	.1214030E+03	.6012440E+02	.1615370E+01	0.	0.
71	.1217930E+03	.5205490E+02	.1615370E+01	0.	0.
72	.1221840E+03	.4482520E+02	.1615370E+01	0.	0.
73	.1225740E+03	.3837480E+02	.1615370E+01	0.	0.
74	.1229650E+03	.3264570E+02	.1615370E+01	0.	0.
75	.1229650E+03	.3247070E+02	.1615370E+01	0.	0.
76	.1232660E+03	.2926540E+02	.1615370E+01	0.	0.
77	.1232660E+03	.2951600E+02	.1615370E+01	0.	0.
78	.1233550E+03	.2765750E+02	.1615370E+01	0.	0.
79	.1237460E+03	.2320550E+02	.1615370E+01	0.	0.
80	.1241360E+03	.1931380E+02	.1615370E+01	0.	0.

169

F-4

STATION	X	EI	DCHASH	DCNAB	K
81	.1245260E+03	.1593340E+02	.1615370E+01	0.	0.
82	.1249170E+03	.1301730E+02	.1615370E+01	0.	0.
83	.1253070E+03	.1052110E+02	.1615370E+01	0.	0.
84	.1256980E+03	.8402210E+01	.1615370E+01	0.	0.
85	.1260880E+03	.6620640E+01	.1615370E+01	0.	0.
86	.1264790E+03	.5138520E+01	.1615370E+01	0.	0.
87	.1268690E+03	.3920260E+01	.1615370E+01	0.	0.
88	.1268690E+03	.5272800E+00	.1615370E+01	0.	0.
89	.1270660E+03	.5272800E+00	.1615370E+01	0.	0.
90	.1270660E+03	.3920260E+01	.1615370E+01	0.	0.
91	.1297000E+03	.3920260E+01	.1615370E+01	0.	0.
92	.1323350E+03	.3920260E+01	.1615370E+01	0.	0.
93	.1349690E+03	.3920260E+01	.1615370E+01	0.	0.
94	.1376040E+03	.3920260E+01	.1615370E+01	0.	0.
95	.1402380E+03	.3920260E+01	.1615370E+01	0.	0.
96	.1428720E+03	.3920260E+01	.1615370E+01	0.	0.
97	.1455070E+03	.3920260E+01	.1615370E+01	0.	0.
98	.1481410E+03	.3920260E+01	.1615370E+01	0.	0.
99	.1507760E+03	.3920260E+01	.1615370E+01	0.	0.
100	.1534100E+03	.3920260E+01	.1615370E+01	0.	0.

170

F5

STATION	X	EI	DCWASH	DCWAB	K
101	.1546390E+03	.3286780E+01	.1615370E+01	0.	0.
102	.1558670E+03	.2733310E+01	.1615370E+01	0.	0.
103	.1570960E+03	.2252790E+01	.1615370E+01	0.	0.
104	.1583250E+03	.1838520E+01	.1615370E+01	0.	0.
105	.1595530E+03	.1484120E+01	.1615370E+01	0.	0.
106	.1607820E+03	.1183510E+01	.1615370E+01	0.	0.
107	.1620100E+03	.9309490E+00	.1615370E+01	0.	0.
108	.1632390E+03	.7210310E+00	.1615370E+01	0.	0.
109	.1632390E+03	.7231290E+00	.1615370E+01	0.	0.
110	.1638710E+03	.6300890E+00	.1615370E+01	0.	0.
111	.1645030E+03	.5463170E+00	.1615370E+01	0.	0.
112	.1651350E+03	.4711760E+00	.1615370E+01	0.	0.
113	.1657670E+03	.4040510E+00	.1615370E+01	0.	0.
114	.1663990E+03	.3443520E+00	.1615370E+01	0.	0.
115	.1670310E+03	.2915090E+00	.1615370E+01	0.	0.
116	.1676630E+03	.2449770E+00	.1615370E+01	0.	0.
117	.1682950E+03	.2042300E+00	.1615370E+01	0.	0.
118	.1689260E+03	.1687700E+00	.1615370E+01	0.	0.
119	.1695580E+03	.1381170E+00	.1615370E+01	0.	0.
120	.1701900E+03	.1118160E+00	.1615370E+01	0.	0.

STATION	X	EI	DCMASM	DCMAS	K
121	.1708220E+03	.8943400E-01	.1615370E+01	0.	0.
122	.1714540E+03	.7056120E-01	.1615370E+01	0.	0.
123	.1720660E+03	.5480990E-01	.1615370E+01	0.	0.
124	.1727180E+03	.4181540E-01	.1615370E+01	0.	0.
125	.1733500E+03	.3123550E-01	.1615370E+01	0.	0.
126	.1744190E+03	.3123550E-01	.1615370E+01	0.	0.
127	.1755280E+03	.3123550E-01	.1615370E+01	0.	0.
128	.1766170E+03	.3123550E-01	.1615370E+01	0.	0.
129	.1777050E+03	.3123550E-01	.1615370E+01	0.	0.
130	.1787950E+03	.3123550E-01	.1615370E+01	0.	0.
131	.1798830E+03	.3123550E-01	.1615370E+01	0.	0.
132	.1809720E+03	.3123550E-01	.1615370E+01	0.	0.
133	.1820610E+03	.3123550E-01	.1615370E+01	0.	0.
134	.1831500E+03	.3123550E-01	.1615370E+01	0.	0.
135	.1842390E+03	.3123550E-01	.1615370E+01	0.	0.
136	.1845890E+03	.3871280E-01	.1615370E+01	0.	0.
137	.1849390E+03	.4742220E-01	.1615370E+01	0.	0.
138	.1852890E+03	.5749220E-01	.1615370E+01	0.	0.
139	.1856390E+03	.6905760E-01	.1615370E+01	0.	0.
140	.1859890E+03	.8225960E-01	.1615370E+01	0.	0.

B F-7

STATION	X	EI	DCNASH	DCNAS	K
141	.1863390E+03	.9724570E+01	.1615370E+01	0.	0.
142	.1866890E+03	.1141700E+00	.1615370E+01	0.	0.
143	.1870390E+03	.1331930E+00	.1615370E+01	0.	0.
144	.1873890E+03	.1540800E+00	.1615370E+01	0.	0.
145	.1877390E+03	.1782060E+00	.1615370E+01	0.	0.
146	.1880890E+03	.1761090E+00	.1615370E+01	0.	0.
147	.1884060E+03	.2239200E+00	.1615370E+01	0.	0.
148	.1887720E+03	.2807160E+00	.1615370E+01	0.	0.
149	.1891390E+03	.3475580E+00	.1615370E+01	0.	0.
150	.1894560E+03	.4255650E+00	.1615370E+01	0.	0.
151	.1898220E+03	.5159170E+00	.1615370E+01	0.	0.
152	.1901890E+03	.6198520E+00	.1615370E+01	0.	0.
153	.1905060E+03	.7386680E+00	.1615370E+01	0.	0.
154	.1908720E+03	.8737220E+00	.1615370E+01	0.	0.
155	.1912390E+03	.1026430E+01	.1615370E+01	0.	0.
156	.1915890E+03	.1026430E+01	.1615370E+01	0.	0.
157	.1919390E+03	.8819690E+00	.1615370E+01	0.	0.
158	.1922900E+03	.7820390E+00	.1615370E+01	0.	0.
159	.1926400E+03	.1804160E+00	.1615370E+01	0.	0.
160	.1947380E+03	.1804160E+00	.1615370E+01	0.	0.

173

F-8

STATION	X	EI	DCNASH	DCNAS	K
161	.1978550E+03	.1804160E+00	.1615370E+01	0.	0.
162	.2002380E+03	.1804160E+00	.1615370E+01	0.	0.
163	.2030200E+03	.1804160E+00	.1615370E+01	0.	0.
164	.2030200E+03	.1804160E+00	.7154080E+06	.1465400E+05	0.
165	.2030210E+03	.1804160E+00	.7154080E+06	.1465400E+05	0.

```
SCNTC
M       = 0,
MC      = 2,
MBS     = 1,
MDATA   = 5,
MHDM    = 0,
MI      = 165,
SEND
```

S41

F10

```
$MCNTL
 DEL    = .1E+01,
 EPS    = .1E-05,
 ITMAX  = 100,
 N      = 1,
 NORM   = 1,
 PVTC   = 0,
 PVTR   = 0,
 XO     = .1E+01,
$END
```

176

F11

```
$PARAM
DUMMY   =  -1,
EIMDO   =  .262E+08,
$END
```

177

F-12

MATRIX C

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

841

MATRIX B

0.000

0.000

MATRIX D

0. 0. .1000E+01 0.

0. 0. 0. .1000E+01

081

MATRIX B

0.000

0.000

181

F-16

EIGENVALUES FROM SECANT METHOD

.0273416E+02

ADIV (1) = .4273416E+02

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.2458899E-05	0.	=.1630330E+03
2	7.406	.1821060E-04	.2998069E-05	.1207421E+04	=.1630330E+03
3	14.812	.4440740E-04	.4515070E-05	.2414841E+04	=.1630330E+03
4	14.812	.4440740E-04	.4515070E-05	.2414841E+04	=.1630330E+03
5	22.682	.8726255E-04	.6816570E-05	.3697908E+04	=.1630330E+03
6	30.552	.1517002E-03	.9966096E-05	.4980973E+04	=.1630330E+03
7	32.225	.1690059E-03	.1074287E-04	.5253726E+04	=.1630330E+03
8	32.225	.1690059E-03	.1074287E-04	.5253726E+04	=.1630330E+03
9	35.825	.2107691E-03	.1255476E-04	.5536431E+04	.2531030E+02
10	35.825	.2107691E-03	.1255476E-04	.5536431E+04	.2531030E+02
11	36.812	.2234054E-03	.1304943E-04	.5511448E+04	.2531030E+02
12	37.648	.2344894E-03	.1344385E-04	.5490288E+04	.2531030E+02
13	37.937	.2383932E-03	.1355819E-04	.5482973E+04	.2531030E+02
14	37.937	.2383932E-03	.1355819E-04	.5482973E+04	.2531030E+02
15	38.497	.2460276E-03	.1369952E-04	.5468799E+04	.2531030E+02
16	38.907	.2516644E-03	.1378544E-04	.5458421E+04	.2531030E+02
17	39.057	.2537343E-03	.1380858E-04	.5454625E+04	.2531030E+02
18	41.326	.2853948E-03	.1409864E-04	.5397194E+04	.2531030E+02
19	43.491	.3162182E-03	.1438305E-04	.5342395E+04	.2531030E+02
20	44.250	.3271737E-03	.1448519E-04	.5323183E+04	.2531030E+02

183

F-18

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	44.250	.3271737E-03	.1448519E-04	.5323183E+04	.2531030E+02
22	48.750	.3936194E-03	.1504022E-04	.5209282E+04	.2531030E+02
23	48.750	.3936194E-03	.1504022E-04	.5209282E+04	.2531030E+02
24	55.750	.5018944E-03	.1588110E-04	.5032103E+04	.2531030E+02
25	55.750	.5018944E-03	.1588110E-04	.5032103E+04	.2531030E+02
26	57.250	.5258486E-03	.1605722E-04	.4994136E+04	.2531030E+02
27	57.250	.5258486E-03	.1605722E-04	.4994136E+04	.2531030E+02
28	58.250	.5419870E-03	.1621906E-04	.4968824E+04	.2531030E+02
29	59.250	.5582867E-03	.1636374E-04	.4943513E+04	.2531030E+02
30	60.250	.5747144E-03	.1648057E-04	.4918201E+04	.2531030E+02
31	60.250	.5747144E-03	.1648057E-04	.4918201E+04	.2531030E+02
32	60.500	.5788416E-03	.1653665E-04	.4911674E+04	.2531030E+02
33	61.250	.5913071E-03	.1668687E-04	.4892890E+04	.2531030E+02
34	61.250	.5913071E-03	.1668687E-04	.4892890E+04	.2531030E+02
35	62.000	.6038517E-03	.1677301E-04	.4873906E+04	.2531030E+02
36	62.750	.6164666E-03	.1687852E-04	.4854923E+04	.2531030E+02
37	63.250	.6249254E-03	.1695653E-04	.4842267E+04	.2531030E+02
38	63.250	.6249254E-03	.1695653E-04	.4842267E+04	.2531030E+02
39	66.356	.6779236E-03	.1718549E-04	.4763650E+04	.2531030E+02
40	69.463	.7316991E-03	.1744910E-04	.4685007E+04	.2531030E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72.569	.7863346E-03	.1775430E-04	.4606389E+04	.2531030E+02
42	75.676	.8420069E-03	.1811025E-04	.4527746E+04	.2531030E+02
43	78.782	.8988532E-03	.1852816E-04	.4449129E+04	.2531030E+02
44	81.888	.9571039E-03	.1902297E-04	.4370511E+04	.2531030E+02
45	84.995	.1017043E-02	.1961420E-04	.4291868E+04	.2531030E+02
46	88.101	.1078966E-02	.2032716E-04	.4213249E+04	.2531030E+02
47	91.207	.1143316E-02	.2119663E-04	.4134631E+04	.2531030E+02
48	94.314	.1210662E-02	.2227031E-04	.4055987E+04	.2531030E+02
49	97.420	.1281680E-02	.2361372E-04	.3977369E+04	.2531030E+02
50	100.527	.1357375E-02	.2532220E-04	.3898724E+04	.2531030E+02
51	103.633	.1439005E-02	.2753286E-04	.3820105E+04	.2531030E+02
52	104.008	.1449386E-02	.2791582E-04	.3810613E+04	.2531030E+02
53	104.508	.1463499E-02	.2865295E-04	.3797957E+04	.2531030E+02
54	105.250	.1485231E-02	.3001014E-04	.3779175E+04	.2531030E+02
55	105.250	.1485231E-02	.3001014E-04	.3779175E+04	.2531030E+02
56	115.250	.1825198E-02	.3771625E-04	.3526049E+04	.2531030E+02
57	115.250	.1825198E-02	.3771625E-04	.3526049E+04	.2531030E+02
58	116.275	.1864364E-02	.3867829E-04	.3500103E+04	.2531030E+02
59	116.930	.1890051E-02	.3925045E-04	.3483422E+04	.2531030E+02
60	117.175	.1899534E-02	.3943785E-04	.3477321E+04	.2531030E+02

S81

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117.889	.1927879E-02	.3995826E-04	.3459248E+04	.2531030E+02
62	118.279	.1943518E-02	.4025762E-04	.3449376E+04	.2531030E+02
63	118.670	.1959321E-02	.4059181E-04	.3439478E+04	.2531030E+02
64	119.060	.1975220E-02	.4096413E-04	.3429606E+04	.2531030E+02
65	119.451	.1991314E-02	.4138246E-04	.3419709E+04	.2531030E+02
66	119.841	.2007539E-02	.4185173E-04	.3409836E+04	.2531030E+02
67	120.232	.2024001E-02	.4238282E-04	.3399939E+04	.2531030E+02
68	120.622	.2040640E-02	.4298320E-04	.3390067E+04	.2531030E+02
69	121.012	.2057528E-02	.4366654E-04	.3380195E+04	.2531030E+02
70	121.403	.2074744E-02	.4444985E-04	.3370297E+04	.2531030E+02
71	121.793	.2092242E-02	.4534752E-04	.3360425E+04	.2531030E+02
72	122.184	.2110161E-02	.4638697E-04	.3350527E+04	.2531030E+02
73	122.574	.2128469E-02	.4759120E-04	.3340655E+04	.2531030E+02
74	122.965	.2147331E-02	.4900209E-04	.3330757E+04	.2531030E+02
75	122.965	.2147331E-02	.4900209E-04	.3330757E+04	.2531030E+02
76	123.206	.2159255E-02	.4999636E-04	.3324657E+04	.2531030E+02
77	123.206	.2159255E-02	.4999636E-04	.3324657E+04	.2531030E+02
78	123.355	.2166752E-02	.5065808E-04	.3320885E+04	.2531030E+02
79	123.706	.2186909E-02	.5261870E-04	.3310987E+04	.2531030E+02
80	124.136	.2207845E-02	.5495275E-04	.3301115E+04	.2531030E+02

981

F-21

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124,526	.2229772E-02	.5776226E-04	.3291242E+04	.2531030E+02
82	124,917	.2252960E-02	.6118454E-04	.3281344E+04	.2531030E+02
83	125,307	.2277554E-02	.6537495E-04	.3271472E+04	.2531030E+02
84	125,698	.2304023E-02	.7059170E-04	.3261574E+04	.2531030E+02
85	126,088	.2332680E-02	.7713630E-04	.3251701E+04	.2531030E+02
86	126,479	.2364273E-02	.8550869E-04	.3241802E+04	.2531030E+02
87	126,869	.2399453E-02	.9634012E-04	.3231929E+04	.2531030E+02
88	126,869	.2399453E-02	.9634012E-04	.3231929E+04	.2531030E+02
89	127,066	.2422972E-02	.1423923E-03	.3226941E+04	.2531030E+02
90	127,066	.2422972E-02	.1423923E-03	.3226941E+04	.2531030E+02
91	129,700	.2907020E-02	.2242914E-03	.3160240E+04	.2531030E+02
92	132,335	.3604844E-02	.3045100E-03	.3093499E+04	.2531030E+02
93	134,969	.4511404E-02	.3829867E-03	.3026769E+04	.2531030E+02
94	137,604	.5622878E-02	.4597807E-03	.2960000E+04	.2531030E+02
95	140,238	.6933912E-02	.5348334E-03	.2893242E+04	.2531030E+02
96	142,872	.8440381E-02	.6081740E-03	.2826471E+04	.2531030E+02
97	145,507	.1013845E-01	.6798290E-03	.2759661E+04	.2531030E+02
98	148,141	.1202233E-01	.7497436E-03	.2692864E+04	.2531030E+02
99	150,776	.1408892E-01	.8179705E-03	.2626028E+04	.2531030E+02
100	153,410	.1633215E-01	.8844578E-03	.2559206E+04	.2531030E+02
101	154,639	.1743796E-01	.9178089E-03	.2528023E+04	.2531030E+02
102	155,867	.1858717E-01	.9572418E-03	.2496863E+04	.2531030E+02

481

F-22

103	157.096	.1978995E-01	.1004338E-02	.2465674E+04	.2531030E+02
104	158.325	.2105583E-01	.1061065E-02	.2434480E+04	.2531030E+02
105	159.553	.2239692E-01	.1130046E-02	.2403306E+04	.2531030E+02
106	160.782	.2383243E-01	.1215036E-02	.2372101E+04	.2531030E+02
107	162.010	.2538217E-01	.1320936E-02	.2340913E+04	.2531030E+02
108	163.239	.2707809E-01	.1455044E-02	.2309689E+04	.2531030E+02
109	163.239	.2707809E-01	.1455044E-02	.2309689E+04	.2531030E+02
110	163.871	.2802202E-01	.1537471E-02	.2293628E+04	.2531030E+02
111	164.503	.2902145E-01	.1631658E-02	.2277563E+04	.2531030E+02
112	165.135	.3008444E-01	.1739829E-02	.2261494E+04	.2531030E+02
113	165.767	.3122059E-01	.1864745E-02	.2245419E+04	.2531030E+02
114	166.399	.3244147E-01	.2009855E-02	.2229339E+04	.2531030E+02
115	167.031	.3376105E-01	.2179511E-02	.2213251E+04	.2531030E+02
116	167.663	.3519638E-01	.2379257E-02	.2197156E+04	.2531030E+02
117	168.295	.3676843E-01	.2616236E-02	.2181052E+04	.2531030E+02
118	168.926	.3850042E-01	.2899310E-02	.2164961E+04	.2531030E+02
119	169.558	.4043057E-01	.3241676E-02	.2148832E+04	.2531030E+02
120	170.190	.4259790E-01	.3659366E-02	.2132686E+04	.2531030E+02
121	170.822	.4505601E-01	.4174844E-02	.2116520E+04	.2531030E+02
122	171.454	.4787490E-01	.4819291E-02	.2100330E+04	.2531030E+02
123	172.086	.5114759E-01	.5636919E-02	.2084108E+04	.2531030E+02
124	172.718	.5499997E-01	.6691979E-02	.2067846E+04	.2531030E+02
125	173.350	.5960625E-01	.8080595E-02	.2051532E+04	.2531030E+02
126	174.439	.6989248E-01	.1079181E-01	.2023259E+04	.2531030E+02
127	175.528	.8311074E-01	.1346527E-01	.1994783E+04	.2531030E+02
128	176.617	.9921977E-01	.1610070E-01	.1966108E+04	.2531030E+02

881

F23

129	177.705	.1181593E+00	.1869548E-01	.1937263E+04	.2531030E+02
130	178.795	.1399836E+00	.2125644E-01	.1908171E+04	.2531030E+02
131	179.883	.1644507E+00	.2377394E-01	.1878942E+04	.2531030E+02
132	180.972	.1917019E+00	.2625470E-01	.1849498E+04	.2531030E+02
133	182.061	.2216334E+00	.2869617E-01	.1819869E+04	.2531030E+02
134	183.150	.2542021E+00	.3109808E-01	.1790057E+04	.2531030E+02
135	184.239	.2893649E+00	.3346020E-01	.1760067E+04	.2531030E+02
136	184.589	.3012077E+00	.3413859E-01	.1750391E+04	.2531030E+02
137	184.939	.3132619E+00	.3468577E-01	.1740700E+04	.2531030E+02
138	185.289	.3254877E+00	.3513205E-01	.1730998E+04	.2531030E+02
139	185.639	.3378504E+00	.3549965E-01	.1721285E+04	.2531030E+02
140	185.989	.3503375E+00	.3580511E-01	.1711565E+04	.2531030E+02
141	186.339	.3629179E+00	.3606098E-01	.1701838E+04	.2531030E+02
142	186.689	.3755802E+00	.3627687E-01	.1692105E+04	.2531030E+02
143	187.039	.3883117E+00	.3646023E-01	.1682368E+04	.2531030E+02
144	187.389	.4011023E+00	.3661692E-01	.1672626E+04	.2531030E+02
145	187.739	.4139436E+00	.3675156E-01	.1662881E+04	.2531030E+02
146	187.739	.4139436E+00	.3675156E-01	.1662881E+04	.2531030E+02
147	187.906	.4200861E+00	.3680526E-01	.1658230E+04	.2531030E+02
148	188.072	.4261997E+00	.3684738E-01	.1653607E+04	.2531030E+02
149	188.239	.4323563E+00	.3688127E-01	.1648955E+04	.2531030E+02
150	188.406	.4385180E+00	.3690871E-01	.1644303E+04	.2531030E+02
151	188.572	.4446469E+00	.3693102E-01	.1639678E+04	.2531030E+02
152	188.739	.4508161E+00	.3694955E-01	.1635026E+04	.2531030E+02
153	188.906	.4569881E+00	.3696499E-01	.1630373E+04	.2531030E+02

681

F-24

154	189.072	.4631254E+00	.3697788E-01	.1625747E+04	.2531030E+02
155	189.239	.4693017E+00	.3698884E-01	.1621094E+04	.2531030E+02
156	189.839	.4915059E+00	.3702483E-01	.1604375E+04	.2531030E+02
157	189.839	.4915059E+00	.3702483E-01	.1604375E+04	.2531030E+02
158	192.020	.5724221E+00	.3718270E-01	.1543588E+04	.2531030E+02
159	192.020	.5724221E+00	.3718270E-01	.1543588E+04	.2531030E+02
160	194.738	.6746909E+00	.3804848E-01	.1467735E+04	.2531030E+02
161	197.455	.7792147E+00	.3887032E-01	.1391751E+04	.2531030E+02
162	200.238	.8885310E+00	.3966679E-01	.1313766E+04	.2531030E+02
163	203.020	.9999596E+00	.4041704E-01	.1235661E+04	.2531030E+02
164	203.020	.9999596E+00	.4041704E-01	.1235661E+04	.2531030E+02
165	203.021	.1000000E+01	.4041717E-01	.1800998E-09	.5621952E-08

961

F25

6.) DIVERGENCE! C=2 BODY WITH NTF=108 (UPDATED 3-25-83)

STATION	X	EI	DCMASH	DCNAS	K
1	0.	.2862990E+03	.1615370E+01	0.	0.
2	.7406600E+01	.3165080E+03	.1615370E+01	0.	0.
3	.1481200E+02	.3490420E+03	.1615370E+01	0.	0.
4	.1481200E+02	.3894560E+03	.1615370E+01	0.	0.
5	.2268200E+02	.4050440E+03	.1615370E+01	0.	0.
6	.3055200E+02	.4206720E+03	.1615370E+01	0.	0.
7	.3222500E+02	.4206720E+03	.1615370E+01	0.	0.
8	.3222500E+02	.4206720E+03	.1615370E+01	0.	.2777780E+06
9	.3582500E+02	.4206720E+03	.1615370E+01	0.	.2777780E+06
10	.3582500E+02	.4206720E+03	.1615370E+01	0.	0.
11	.3681200E+02	.4206720E+03	.1615370E+01	0.	0.
12	.3764800E+02	.4724710E+03	.1615370E+01	0.	0.
13	.3793700E+02	.6018070E+03	.1615370E+01	0.	0.
14	.3793700E+02	.7855000E+03	.1615370E+01	0.	0.
15	.3849700E+02	.8758440E+03	.1615370E+01	0.	0.
16	.3890700E+02	.1152276E+04	.1615370E+01	0.	0.
17	.3905700E+02	.1629655E+04	.1615370E+01	0.	0.
18	.4132600E+02	.1610312E+04	.1615370E+01	0.	0.
19	.4349100E+02	.1512582E+04	.1615370E+01	0.	0.
20	.4425000E+02	.1512582E+04	.1615370E+01	0.	0.

191

6-1

STATION	X	EI	DCMASM	DCMAS	K
21	.4825000E+02	.1629655E+04	.1615370E+01	0.	0.
22	.4875000E+02	.1629655E+04	.1615370E+01	0.	0.
23	.4875000E+02	.1627307E+04	.1615370E+01	0.	0.
24	.5575000E+02	.1626703E+04	.1615370E+01	0.	0.
25	.5575000E+02	.1629655E+04	.1615370E+01	0.	0.
26	.5725000E+02	.1629655E+04	.1615370E+01	0.	0.
27	.5725000E+02	.1174793E+04	.1615370E+01	0.	0.
28	.5925000E+02	.1174793E+04	.1615370E+01	0.	0.
29	.5925000E+02	.1474997E+04	.1615370E+01	0.	0.
30	.6025000E+02	.1775202E+04	.1615370E+01	0.	0.
31	.6025000E+02	.8363110E+03	.1615370E+01	0.	0.
32	.6050000E+02	.8363110E+03	.1615370E+01	0.	0.
33	.6125000E+02	.1058520E+04	.1615370E+01	0.	0.
34	.6125000E+02	.1786583E+04	.1615370E+01	0.	0.
35	.6200000E+02	.1486378E+04	.1615370E+01	0.	0.
36	.6275000E+02	.1186174E+04	.1615370E+01	0.	0.
37	.6325000E+02	.1186174E+04	.1615370E+01	0.	0.
38	.6325000E+02	.2691925E+04	.1615370E+01	0.	0.
39	.6635600E+02	.2308086E+04	.1615370E+01	0.	0.
40	.6946300E+02	.1966824E+04	.1615370E+01	0.	0.

192

6-2

STATION	X	EI	DCWASH	DCNAS	K
41	.7256600E+02	.1664868E+04	.1615370E+01	0.	0.
42	.7567600E+02	.1399077E+04	.1615370E+01	0.	0.
43	.7878700E+02	.1166441E+04	.1615370E+01	0.	0.
44	.8189800E+02	.9640810E+03	.1615370E+01	0.	0.
45	.8499500E+02	.7892480E+03	.1615370E+01	0.	0.
46	.8810100E+02	.6393260E+03	.1615370E+01	0.	0.
47	.9120700E+02	.5118270E+03	.1615370E+01	0.	0.
48	.9431400E+02	.4043960E+03	.1615370E+01	0.	0.
49	.9742000E+02	.3148080E+03	.1615370E+01	0.	0.
50	.1005270E+03	.2409680E+03	.1615370E+01	0.	0.
51	.1036330E+03	.1809120E+03	.1615370E+01	0.	0.
52	.1040080E+03	.1176260E+03	.1615370E+01	0.	0.
53	.1045080E+03	.8467190E+02	.1615370E+01	0.	0.
54	.1052500E+03	.7411600E+02	.1615370E+01	0.	0.
55	.1052500E+03	.1809120E+03	.1615370E+01	0.	0.
56	.1152500E+03	.1809120E+03	.1615370E+01	0.	0.
57	.1152500E+03	.1394420E+03	.1615370E+01	0.	0.
58	.1162750E+03	.1064810E+03	.1615370E+01	0.	0.
59	.1169340E+03	.1612700E+03	.1615370E+01	0.	0.
60	.1171750E+03	.1816190E+03	.1615370E+01	0.	0.

193

STATION	X	EI	DCMASH	DCMAS	K
61	.1178890E+03	.1816190E+03	.1615370E+01	0.	0.
62	.1182790E+03	.1629020E+03	.1615370E+01	0.	0.
63	.1186700E+03	.1456700E+03	.1615370E+01	0.	0.
64	.1190600E+03	.1298420E+03	.1615370E+01	0.	0.
65	.1194510E+03	.1153400E+03	.1615370E+01	0.	0.
66	.1198410E+03	.1020870E+03	.1615370E+01	0.	0.
67	.1202320E+03	.9000920E+02	.1615370E+01	0.	0.
68	.1206220E+03	.7903560E+02	.1615370E+01	0.	0.
69	.1210120E+03	.6909640E+02	.1615370E+01	0.	0.
70	.1214030E+03	.6012440E+02	.1615370E+01	0.	0.
71	.1217930E+03	.5205490E+02	.1615370E+01	0.	0.
72	.1221840E+03	.4482520E+02	.1615370E+01	0.	0.
73	.1225740E+03	.3837480E+02	.1615370E+01	0.	0.
74	.1229650E+03	.3264570E+02	.1615370E+01	0.	0.
75	.1229650E+03	.3247070E+02	.1615370E+01	0.	0.
76	.1232060E+03	.2926540E+02	.1615370E+01	0.	0.
77	.1232060E+03	.2951600E+02	.1615370E+01	0.	0.
78	.1233550E+03	.2765750E+02	.1615370E+01	0.	0.
79	.1237460E+03	.2320550E+02	.1615370E+01	0.	0.
80	.1241360E+03	.1931340E+02	.1615370E+01	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
81	.1245260E+03	.1593340E+02	.1615370E+01	0.	0.
82	.1249170E+03	.1301730E+02	.1615370E+01	0.	0.
83	.1253070E+03	.1052110E+02	.1615370E+01	0.	0.
84	.1256980E+03	.8402210E+01	.1615370E+01	0.	0.
85	.1260880E+03	.6620640E+01	.1615370E+01	0.	0.
86	.1264790E+03	.5138520E+01	.1615370E+01	0.	0.
87	.1268690E+03	.3920260E+01	.1615370E+01	0.	0.
88	.1268690E+03	.5272800E+00	.1615370E+01	0.	0.
89	.1270660E+03	.5272800E+00	.1615370E+01	0.	0.
90	.1270660E+03	.3920260E+01	.1615370E+01	0.	0.
91	.1297000E+03	.3920260E+01	.1615370E+01	0.	0.
92	.1323350E+03	.3920260E+01	.1615370E+01	0.	0.
93	.1349690E+03	.3920260E+01	.1615370E+01	0.	0.
94	.1376040E+03	.3920260E+01	.1615370E+01	0.	0.
95	.1402380E+03	.3920260E+01	.1615370E+01	0.	0.
96	.1428720E+03	.3920260E+01	.1615370E+01	0.	0.
97	.1455070E+03	.3920260E+01	.1615370E+01	0.	0.
98	.1481410E+03	.3920260E+01	.1615370E+01	0.	0.
99	.1507760E+03	.3920260E+01	.1615370E+01	0.	0.
100	.1534100E+03	.3920260E+01	.1615370E+01	0.	0.

STATION	X	EI	DCHASH	DCNAS	K
101	.1546390E+03	.3286780E+01	.1615370E+01	0.	0.
102	.1558670E+03	.2733310E+01	.1615370E+01	0.	0.
103	.1570660E+03	.2252790E+01	.1615370E+01	0.	0.
104	.1583250E+03	.1838520E+01	.1615370E+01	0.	0.
105	.1595530E+03	.1484120E+01	.1615370E+01	0.	0.
106	.1607820E+03	.1183510E+01	.1615370E+01	0.	0.
107	.1620100E+03	.9309490E+00	.1615370E+01	0.	0.
108	.1632390E+03	.7210310E+00	.1615370E+01	0.	0.
109	.1632390E+03	.7231290E+00	.1615370E+01	0.	0.
110	.1638710E+03	.6300890E+00	.1615370E+01	0.	0.
111	.1645030E+03	.5463170E+00	.1615370E+01	0.	0.
112	.1651350E+03	.4711760E+00	.1615370E+01	0.	0.
113	.1657670E+03	.4040510E+00	.1615370E+01	0.	0.
114	.1663990E+03	.3443520E+00	.1615370E+01	0.	0.
115	.1670310E+03	.2915090E+00	.1615370E+01	0.	0.
116	.1676630E+03	.2449770E+00	.1615370E+01	0.	0.
117	.1682950E+03	.2042300E+00	.1615370E+01	0.	0.
118	.1689260E+03	.1687700E+00	.1615370E+01	0.	0.
119	.1695580E+03	.1381170E+00	.1615370E+01	0.	0.
120	.1701900E+03	.1118160E+00	.1615370E+01	0.	0.

196

STATION	X	EI	DCMASH	DCMAS	K
121	.1708220E+03	.8943400E-01	.1615370E+01	0.	0.
122	.1714540E+03	.7056120E-01	.1615370E+01	0.	0.
123	.1720860E+03	.5080990E-01	.1615370E+01	0.	0.
124	.1727180E+03	.4181540E-01	.1615370E+01	0.	0.
125	.1733500E+03	.3123550E-01	.1615370E+01	0.	0.
126	.1740390E+03	.3123550E-01	.1615370E+01	0.	0.
127	.1755280E+03	.3123550E-01	.1615370E+01	0.	0.
128	.1766170E+03	.3123550E-01	.1615370E+01	0.	0.
129	.1777050E+03	.3123550E-01	.1615370E+01	0.	0.
130	.1787950E+03	.3123550E-01	.1615370E+01	0.	0.
131	.1798830E+03	.3123550E-01	.1615370E+01	0.	0.
132	.1809720E+03	.3123550E-01	.1615370E+01	0.	0.
133	.1820610E+03	.3123550E-01	.1615370E+01	0.	0.
134	.1831500E+03	.3123550E-01	.1615370E+01	0.	0.
135	.1842390E+03	.3123550E-01	.1615370E+01	0.	0.
136	.1845890E+03	.3071280E-01	.1615370E+01	0.	0.
137	.1849390E+03	.4742220E-01	.1615370E+01	0.	0.
138	.1852890E+03	.5749220E-01	.1615370E+01	0.	0.
139	.1856390E+03	.6905760E-01	.1615370E+01	0.	0.
140	.1859890E+03	.8225960E-01	.1615370E+01	0.	0.

461

6-7

STATION	X	EI	DCNASH	DCNAS	K
141	.1863390E+03	.9724570E-01	.1615370E+01	0.	0.
142	.1866890E+03	.1141700E+00	.1615370E+01	0.	0.
143	.1870390E+03	.1331930E+00	.1615370E+01	0.	0.
144	.1873890E+03	.1544800E+00	.1615370E+01	0.	0.
145	.1877390E+03	.1782060E+00	.1615370E+01	0.	0.
146	.1877390E+03	.1761090E+00	.1615370E+01	0.	0.
147	.1879060E+03	.2239200E+00	.1615370E+01	0.	0.
148	.1880720E+03	.2807160E+00	.1615370E+01	0.	0.
149	.1882390E+03	.3475580E+00	.1615370E+01	0.	0.
150	.1884060E+03	.4255650E+00	.1615370E+01	0.	0.
151	.1885720E+03	.5159170E+00	.1615370E+01	0.	0.
152	.1887390E+03	.6198520E+00	.1615370E+01	0.	0.
153	.1889060E+03	.7386680E+00	.1615370E+01	0.	0.
154	.1890720E+03	.8737220E+00	.1615370E+01	0.	0.
155	.1892390E+03	.1026430E+01	.1615370E+01	0.	0.
156	.1898390E+03	.1026430E+01	.1615370E+01	0.	0.
157	.1898390E+03	.8819690E+00	.1615370E+01	0.	0.
158	.1920810E+03	.7786640E+00	.1615370E+01	0.	0.
159	.1920810E+03	.5467200E-01	.1615370E+01	0.	0.
160	.1947680E+03	.5467200E-01	.1615370E+01	0.	0.

STATION	X	EI	QCWASH	QCNAS	K
161	.1974550E+03	.5467200E-01	.1615370E+01	0.	0.
162	.1997680E+03	.5467200E-01	.1615370E+01	0.	0.
163	.2020810E+03	.5467200E-01	.1615370E+01	0.	0.
164	.2020810E+03	.5467200E-01	.7291760E+06	.1465400E+05	0.
165	.2020820E+03	.5467200E-01	.7291760E+06	.1465400E+05	0.

```
$CNTL
N       = 4,
NC      = 2,
NSS     = 1,
NDATA   = 5,
NMOM    = 0,
NI      = 165,
$END
```

200

```
$MCNTL
DEL    = .1E+01,
EPS    = .1E-05,
ITMAX  = 100,
N      = 1,
NORM   = 1,
PVTC   = 0,
PVTR   = 0,
XO     = .1E+01,
$END
```

201

6-11

```
$PARAM
DUMMY   =  0.,
EINCD   =  .262E+06,
$END
```

202

6-12

MATRIX C

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

MATRIX P

0.000

0.000

MATRIX 5

0. 0. .1000E+01 0.

0. 0. 0. .1000E+01

205

6-15

MATRIX B

0.000

0.000

206

6-16

EIGENVALUES FROM SECANT METHOD

.3690911E+02

ADIV (1) = .3690911E+02

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.2472627E-05	0.	-.1638560E+03
2	7.406	.1831227E-04	.3014519E-05	.1213516E+04	-.1638560E+03
3	14.812	.4465106E-04	.4539179E-05	.2427032E+04	-.1638560E+03
4	14.812	.4465106E-04	.4539179E-05	.2427032E+04	-.1638560E+03
5	22.682	.8773290E-04	.6852297E-05	.3716577E+04	-.1638560E+03
6	30.552	.1525062E-03	.1001772E-04	.5006119E+04	-.1638560E+03
7	32.225	.1699015E-03	.1079842E-04	.5280250E+04	-.1638560E+03
8	32.225	.1699015E-03	.1079842E-04	.5280250E+04	-.1638560E+03
9	35.825	.2118803E-03	.1261945E-04	.5564306E+04	.2548283E+02
10	35.825	.2118803E-03	.1261945E-04	.5564306E+04	.2548283E+02
11	36.812	.2245816E-03	.1311662E-04	.5539153E+04	.2548283E+02
12	37.648	.2357227E-03	.1351302E-04	.5517849E+04	.2548283E+02
13	37.937	.2396466E-03	.1362793E-04	.5510484E+04	.2548283E+02
14	37.937	.2396466E-03	.1362793E-04	.5510484E+04	.2548283E+02
15	38.497	.2473202E-03	.1376997E-04	.5496213E+04	.2548283E+02
16	38.907	.2529860E-03	.1385632E-04	.5485765E+04	.2548283E+02
17	39.057	.2550665E-03	.1387957E-04	.5481943E+04	.2548283E+02
18	41.326	.2868878E-03	.1417109E-04	.5424120E+04	.2548283E+02
19	43.491	.3178715E-03	.1445692E-04	.5368948E+04	.2548283E+02
20	44.250	.3288833E-03	.1455956E-04	.5349606E+04	.2548283E+02

208

6-18

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	48.250	.3288833E+03	.1455956E+04	.5349606E+04	.2548283E+02
22	48.750	.3956699E+03	.1511733E+04	.5234929E+04	.2548283E+02
23	48.750	.3956699E+03	.1511733E+04	.5234929E+04	.2548283E+02
24	55.750	.5044994E+03	.1596233E+04	.5056543E+04	.2548283E+02
25	55.750	.5044994E+03	.1596233E+04	.5056543E+04	.2548283E+02
26	57.250	.5285762E+03	.1613930E+04	.5018317E+04	.2548283E+02
27	57.250	.5285762E+03	.1613930E+04	.5018317E+04	.2548283E+02
28	58.250	.5447970E+03	.1630192E+04	.4992833E+04	.2548283E+02
29	59.250	.5611800E+03	.1644730E+04	.4967350E+04	.2548283E+02
30	60.250	.5776916E+03	.1656470E+04	.4941866E+04	.2548283E+02
31	60.250	.5776916E+03	.1656470E+04	.4941866E+04	.2548283E+02
32	60.500	.5818398E+03	.1662104E+04	.4935495E+04	.2548283E+02
33	61.250	.5943689E+03	.1677199E+04	.4916382E+04	.2548283E+02
34	61.250	.5943689E+03	.1677199E+04	.4916382E+04	.2548283E+02
35	62.000	.6069775E+03	.1685853E+04	.4897269E+04	.2548283E+02
36	62.750	.6196567E+03	.1696455E+04	.4878156E+04	.2548283E+02
37	63.250	.6281586E+03	.1704294E+04	.4865414E+04	.2548283E+02
38	63.250	.6281586E+03	.1704294E+04	.4865414E+04	.2548283E+02
39	66.356	.6810267E+03	.1727299E+04	.4786261E+04	.2548283E+02
40	69.463	.7350759E+03	.1753785E+04	.4707083E+04	.2548283E+02

209

6-19

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72,569	.7903891E-03	.1784448E-04	.4627930E+04	.2548283E+02
42	75,676	.8863440E-03	.1820208E-04	.4548752E+04	.2548283E+02
43	78,782	.9034782E-03	.1862193E-04	.4469599E+04	.2548283E+02
44	81,888	.9620234E-03	.1911900E-04	.4390445E+04	.2548283E+02
45	84,995	.1022265E-02	.1971292E-04	.4311267E+04	.2548283E+02
46	88,101	.1084499E-02	.2042908E-04	.4232113E+04	.2548283E+02
47	91,207	.1149171E-02	.2130242E-04	.4152960E+04	.2548283E+02
48	94,314	.1216852E-02	.2238084E-04	.4073781E+04	.2548283E+02
49	97,420	.1288222E-02	.2373010E-04	.3994627E+04	.2548283E+02
50	100,527	.1364289E-02	.2544594E-04	.3915447E+04	.2548283E+02
51	103,633	.1446315E-02	.2766603E-04	.3836292E+04	.2548283E+02
52	104,008	.1456747E-02	.2805061E-04	.3826736E+04	.2548283E+02
53	104,508	.1470927E-02	.2879085E-04	.3813993E+04	.2548283E+02
54	105,250	.1492764E-02	.3015376E-04	.3795084E+04	.2548283E+02
55	105,250	.1492764E-02	.3015376E-04	.3795084E+04	.2548283E+02
56	115,250	.1834335E-02	.3789162E-04	.3540235E+04	.2548283E+02
57	115,250	.1834335E-02	.3789162E-04	.3540235E+04	.2548283E+02
58	116,275	.1873693E-02	.3885752E-04	.3514113E+04	.2548283E+02
59	116,934	.1899488E-02	.3943196E-04	.3497318E+04	.2548283E+02
60	117,175	.1909016E-02	.3962011E-04	.3491176E+04	.2548283E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117.889	.1937491E-02	.4014259E-04	.3472980E+04	.2548283E+02
62	118.279	.1953202E-02	.4044314E-04	.3463041E+04	.2548283E+02
63	118.670	.1969078E-02	.4077865E-04	.3453076E+04	.2548283E+02
64	119.060	.1985050E-02	.4115244E-04	.3443137E+04	.2548283E+02
65	119.451	.2001218E-02	.4157242E-04	.3433172E+04	.2548283E+02
66	119.841	.2017518E-02	.4204353E-04	.3423233E+04	.2548283E+02
67	120.232	.2034055E-02	.4257671E-04	.3413268E+04	.2548283E+02
68	120.622	.2050770E-02	.4317944E-04	.3403329E+04	.2548283E+02
69	121.012	.2067735E-02	.4386545E-04	.3393389E+04	.2548283E+02
70	121.403	.2085029E-02	.4465181E-04	.3383424E+04	.2548283E+02
71	121.793	.2102607E-02	.4555298E-04	.3373485E+04	.2548283E+02
72	122.184	.2120607E-02	.4659646E-04	.3363520E+04	.2548283E+02
73	122.574	.2138998E-02	.4780536E-04	.3353581E+04	.2548283E+02
74	122.965	.2157944E-02	.4922170E-04	.3343616E+04	.2548283E+02
75	122.965	.2157944E-02	.4922170E-04	.3343616E+04	.2548283E+02
76	123.206	.2169921E-02	.5021981E-04	.3337474E+04	.2548283E+02
77	123.206	.2169921E-02	.5021981E-04	.3337474E+04	.2548283E+02
78	123.355	.2177452E-02	.5088407E-04	.3333676E+04	.2548283E+02
79	123.746	.2197699E-02	.5285223E-04	.3323711E+04	.2548283E+02
80	124.136	.2218727E-02	.5519525E-04	.3313772E+04	.2548283E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124.526	.2240751E-02	.5801551E-04	.3303832E+04	.2548283E+02
82	124.917	.2264040E-02	.6145087E-04	.3293867E+04	.2548283E+02
83	125.307	.2288741E-02	.6565725E-04	.3283927E+04	.2548283E+02
84	125.698	.2315323E-02	.7089383E-04	.3273962E+04	.2548283E+02
85	126.088	.2344103E-02	.7746326E-04	.3264022E+04	.2548283E+02
86	126.479	.2375829E-02	.8586733E-04	.3254056E+04	.2548283E+02
87	126.869	.2411156E-02	.9673965E-04	.3244116E+04	.2548283E+02
88	126.869	.2411156E-02	.9673965E-04	.3244116E+04	.2548283E+02
89	127.066	.2434770E-02	.1429654E-03	.3239094E+04	.2548283E+02
90	127.066	.2434770E-02	.1429654E-03	.3239094E+04	.2548283E+02
91	129.700	.2920739E-02	.2251704E-03	.3171944E+04	.2548283E+02
92	132.335	.3621274E-02	.3056834E-03	.3104755E+04	.2548283E+02
93	134.969	.4531305E-02	.3844430E-03	.3037579E+04	.2548283E+02
94	137.604	.5646982E-02	.4615086E-03	.2970365E+04	.2548283E+02
95	140.238	.6962918E-02	.5368215E-03	.2903165E+04	.2548283E+02
96	142.872	.8474958E-02	.6104109E-03	.2835953E+04	.2548283E+02
97	145.507	.1017925E-01	.6823035E-03	.2768704E+04	.2548283E+02
98	148.141	.1206994E-01	.7524443E-03	.2701469E+04	.2548283E+02
99	150.776	.1414394E-01	.8208865E-03	.2634198E+04	.2548283E+02
100	153.410	.1639513E-01	.8875777E-03	.2566942E+04	.2548283E+02
101	154.639	.1750483E-01	.9210288E-03	.2535558E+04	.2548283E+02
102	155.867	.1865806E-01	.9605783E-03	.2504196E+04	.2548283E+02

212

6-22

103	157,096	.1986502E-01	.1007811E-02	.2472806E+04	.2548283E+02
104	158,325	.2113526E-01	.1064702E-02	.2441412E+04	.2548283E+02
105	159,553	.2248093E-01	.1133878E-02	.2410039E+04	.2548283E+02
106	160,782	.2392127E-01	.1219103E-02	.2378634E+04	.2548283E+02
107	162,010	.2547817E-01	.1325291E-02	.2347249E+04	.2548283E+02
108	163,239	.2717763E-01	.1459759E-02	.2315829E+04	.2548283E+02
109	163,239	.2717763E-01	.1459759E-02	.2315829E+04	.2548283E+02
110	163,871	.2812461E-01	.1542404E-02	.2299667E+04	.2548283E+02
111	164,503	.2912723E-01	.1636837E-02	.2283502E+04	.2548283E+02
112	165,135	.3019357E-01	.1745289E-02	.2267334E+04	.2548283E+02
113	165,767	.3133328E-01	.1870526E-02	.2251160E+04	.2548283E+02
114	166,399	.3255792E-01	.2016005E-02	.2234982E+04	.2548283E+02
115	167,031	.3388151E-01	.2186088E-02	.2218798E+04	.2548283E+02
116	167,663	.3532113E-01	.2386332E-02	.2202607E+04	.2548283E+02
117	168,295	.3689783E-01	.2623896E-02	.2186408E+04	.2548283E+02
118	168,926	.3863485E-01	.2907662E-02	.2170225E+04	.2548283E+02
119	169,558	.4057052E-01	.3250855E-02	.2154004E+04	.2548283E+02
120	170,190	.4274393E-01	.3669545E-02	.2137770E+04	.2548283E+02
121	170,822	.4520882E-01	.4186245E-02	.2121517E+04	.2548283E+02
122	171,454	.4803535E-01	.4832206E-02	.2105244E+04	.2548283E+02
123	172,086	.5131673E-01	.5651737E-02	.2088943E+04	.2548283E+02
124	172,718	.5517910E-01	.6709234E-02	.2072608E+04	.2548283E+02
125	173,350	.5979720E-01	.8101035E-02	.2056227E+04	.2548283E+02
126	174,439	.7010909E-01	.1081843E-01	.2027861E+04	.2548283E+02
127	175,528	.8335967E-01	.1349796E-01	.1999321E+04	.2548283E+02
128	176,617	.9950759E-01	.1613940E-01	.1970607E+04	.2548283E+02

213

G-23

129	177.705	.1184925E+00	.1874014E-01	.1941750E+04	.2548283E+02
130	178.795	.1403287E+00	.2130708E-01	.1912672E+04	.2548283E+02
131	179.883	.1648941E+00	.2383057E-01	.1883482E+04	.2548283E+02
132	180.972	.1922103E+00	.2631741E-01	.1854102E+04	.2548283E+02
133	182.061	.2222134E+00	.2876506E-01	.1824563E+04	.2548283E+02
134	183.150	.2548605E+00	.3117328E-01	.1794865E+04	.2548283E+02
135	184.239	.2901087E+00	.3354189E-01	.1765013E+04	.2548283E+02
136	184.589	.3019805E+00	.3422219E-01	.1755386E+04	.2548283E+02
137	184.939	.3140643E+00	.3477095E-01	.1745747E+04	.2548283E+02
138	185.289	.3263202E+00	.3521853E-01	.1736097E+04	.2548283E+02
139	185.639	.3387172E+00	.3558722E-01	.1726439E+04	.2548283E+02
140	185.989	.3512312E+00	.3589360E-01	.1716774E+04	.2548283E+02
141	186.339	.3638428E+00	.3615025E-01	.1707103E+04	.2548283E+02
142	186.689	.3765364E+00	.3636681E-01	.1697427E+04	.2548283E+02
143	187.039	.3892995E+00	.3655076E-01	.1687747E+04	.2548283E+02
144	187.389	.4021219E+00	.3670795E-01	.1678064E+04	.2548283E+02
145	187.739	.4149951E+00	.3684304E-01	.1668377E+04	.2548283E+02
146	187.739	.4149951E+00	.3684304E-01	.1668377E+04	.2548283E+02
147	187.906	.4211529E+00	.3689691E-01	.1663754E+04	.2548283E+02
148	188.072	.4272817E+00	.3693918E-01	.1659159E+04	.2548283E+02
149	188.239	.4334537E+00	.3697318E-01	.1654535E+04	.2548283E+02
150	188.406	.4396300E+00	.3700071E-01	.1649911E+04	.2548283E+02
151	188.572	.4457749E+00	.3702310E-01	.1645315E+04	.2548283E+02
152	188.739	.4519595E+00	.3704170E-01	.1640690E+04	.2548283E+02
153	188.906	.4581469E+00	.3705719E-01	.1636066E+04	.2548283E+02

214

6-24

154	189.072	.4642995E+00	.3707012E-01	.1631469E+04	.2548283E+02
155	189.239	.4704912E+00	.3708112E-01	.1626844E+04	.2548283E+02
156	189.839	.4927508E+00	.3711724E-01	.1610227E+04	.2548283E+02
157	189.839	.4927508E+00	.3711724E-01	.1610227E+04	.2548283E+02
158	192.081	.5761428E+00	.3728042E-01	.1548123E+04	.2548283E+02
159	192.081	.5761428E+00	.3728042E-01	.1548123E+04	.2548283E+02
160	194.768	.6802169E+00	.4011466E-01	.1473405E+04	.2548283E+02
161	197.455	.7917184E+00	.4280840E-01	.1398325E+04	.2548283E+02
162	199.768	.8933455E+00	.4501401E-01	.1333324E+04	.2548283E+02
163	202.081	.9999529E+00	.4711441E-01	.1268026E+04	.2548283E+02
164	202.081	.9999529E+00	.4711441E-01	.1268026E+04	.2548283E+02
165	202.082	.1000000E+01	.4711485E-01	.7391512E-09	-.8430602E-08

215

6-25

M.) DIVERGENCE1 C=3 BODY WITH NTF=103 (UPDATED 3-25-83)

STATION	X	EI	DCMASH	DCMAS	K
1	0.	.2862990E+03	.3230690E+01	0.	0.
2	.7406000E+01	.3165080E+03	.3230690E+01	0.	0.
3	.1481200E+02	.3490420E+03	.3230690E+01	0.	0.
4	.1481200E+02	.3898560E+03	.3230690E+01	0.	0.
5	.2268200E+02	.4050440E+03	.3230690E+01	0.	0.
6	.3055200E+02	.4206720E+03	.3230690E+01	0.	0.
7	.3222500E+02	.4206720E+03	.3230690E+01	0.	0.
8	.3222500E+02	.4206720E+03	.3230690E+01	0.	.2777780E+06
9	.3582500E+02	.4206720E+03	.3230690E+01	0.	.2777780E+06
10	.3582500E+02	.4206720E+03	.3230690E+01	0.	0.
11	.3681200E+02	.4206720E+03	.3230690E+01	0.	0.
12	.3768800E+02	.4724710E+03	.3230690E+01	0.	0.
13	.3793700E+02	.6018070E+03	.3230690E+01	0.	0.
14	.3793700E+02	.7855000E+03	.3230690E+01	0.	0.
15	.3849700E+02	.8758440E+03	.3230690E+01	0.	0.
16	.3890700E+02	.1152276E+04	.3230690E+01	0.	0.
17	.3905700E+02	.1629655E+04	.3230690E+01	0.	0.
18	.4132600E+02	.1610312E+04	.3230690E+01	0.	0.
19	.4349100E+02	.1512582E+04	.3230690E+01	0.	0.
20	.4425000E+02	.1512582E+04	.3230690E+01	0.	0.

216

H-1

STATION	X	EI	OCWASH	OCNAS	K
21	.4425000E+02	.1629655E+04	.3230690E+01	0.	0.
22	.4875000E+02	.1629655E+04	.3230690E+01	0.	0.
23	.4875000E+02	.1627307E+04	.3230690E+01	0.	0.
24	.5575000E+02	.1626703E+04	.3230690E+01	0.	0.
25	.5575000E+02	.1629655E+04	.3230690E+01	0.	0.
26	.5725000E+02	.1629655E+04	.3230690E+01	0.	0.
27	.5725000E+02	.1174793E+04	.3230690E+01	0.	0.
28	.5825000E+02	.1174793E+04	.3230690E+01	0.	0.
29	.5925000E+02	.1474997E+04	.3230690E+01	0.	0.
30	.6025000E+02	.1775202E+04	.3230690E+01	0.	0.
31	.6025000E+02	.8363110E+03	.3230690E+01	0.	0.
32	.6050000E+02	.8363110E+03	.3230690E+01	0.	0.
33	.6125000E+02	.1058520E+04	.3230690E+01	0.	0.
34	.6125000E+02	.1786583E+04	.3230690E+01	0.	0.
35	.6200000E+02	.1486378E+04	.3230690E+01	0.	0.
36	.6275000E+02	.1186174E+04	.3230690E+01	0.	0.
37	.6325000E+02	.1186174E+04	.3230690E+01	0.	0.
38	.6325000E+02	.2691925E+04	.3230690E+01	0.	0.
39	.6635000E+02	.2308086E+04	.3230690E+01	0.	0.
40	.6986300E+02	.1966824E+04	.3230690E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
41	.7256000E+02	.1664868E+04	.3230690E+01	0.	0.
42	.7567600E+02	.1399077E+04	.3230690E+01	0.	0.
43	.7878200E+02	.1166441E+04	.3230690E+01	0.	0.
44	.8188800E+02	.9640810E+03	.3230690E+01	0.	0.
45	.8499500E+02	.7892480E+03	.3230690E+01	0.	0.
46	.8810100E+02	.6393260E+03	.3230690E+01	0.	0.
47	.9120700E+02	.5118270E+03	.3230690E+01	0.	0.
48	.9431400E+02	.4043960E+03	.3230690E+01	0.	0.
49	.9742000E+02	.3148080E+03	.3230690E+01	0.	0.
50	.1005270E+03	.2409680E+03	.3230690E+01	0.	0.
51	.1036330E+03	.1809120E+03	.3230690E+01	0.	0.
52	.1040080E+03	.1176260E+03	.3230690E+01	0.	0.
53	.1045080E+03	.8467190E+02	.3230690E+01	0.	0.
54	.1052500E+03	.7411600E+02	.3230690E+01	0.	0.
55	.1052500E+03	.1809120E+03	.3230690E+01	0.	0.
56	.1152500E+03	.1809120E+03	.3230690E+01	0.	0.
57	.1152500E+03	.1394420E+03	.3230690E+01	0.	0.
58	.1162750E+03	.1464810E+03	.3230690E+01	0.	0.
59	.1169340E+03	.1612700E+03	.3230690E+01	0.	0.
60	.1171750E+03	.1816190E+03	.3230690E+01	0.	0.

818

H=3

STATION	X	EI	DCMASH	DCMAS	K
61	.1178890E+03	.1816190E+03	.3230690E+01	0.	0.
62	.1182990E+03	.1629020E+03	.3230690E+01	0.	0.
63	.1186700E+03	.1456700E+03	.3230690E+01	0.	0.
64	.1190600E+03	.1298420E+03	.3230690E+01	0.	0.
65	.1194510E+03	.1153400E+03	.3230690E+01	0.	0.
66	.1198410E+03	.1020870E+03	.3230690E+01	0.	0.
67	.1202320E+03	.9000920E+02	.3230690E+01	0.	0.
68	.1206220E+03	.7903560E+02	.3230690E+01	0.	0.
69	.1210120E+03	.6909640E+02	.3230690E+01	0.	0.
70	.1214030E+03	.6012440E+02	.3230690E+01	0.	0.
71	.1217930E+03	.5205490E+02	.3230690E+01	0.	0.
72	.1221840E+03	.4482520E+02	.3230690E+01	0.	0.
73	.1225740E+03	.3837480E+02	.3230690E+01	0.	0.
74	.1229650E+03	.3264570E+02	.3230690E+01	0.	0.
75	.1229650E+03	.3247070E+02	.3230690E+01	0.	0.
76	.1232000E+03	.2926540E+02	.3230690E+01	0.	0.
77	.1232060E+03	.2951600E+02	.3230690E+01	0.	0.
78	.1233550E+03	.2765750E+02	.3230690E+01	0.	0.
79	.1237460E+03	.2320550E+02	.3230690E+01	0.	0.
80	.1241360E+03	.1931380E+02	.3230690E+01	0.	0.

STATION	X	EI	DCWASH	DCNAB	K
81	.1245260E+03	.1593340E+02	.3230690E+01	0.	0.
82	.1249170E+03	.1301730E+02	.3230690E+01	0.	0.
83	.1253070E+03	.1052110E+02	.3230690E+01	0.	0.
84	.1256980E+03	.8402210E+01	.3230690E+01	0.	0.
85	.1260880E+03	.6620640E+01	.3230690E+01	0.	0.
86	.1264790E+03	.5138520E+01	.3230690E+01	0.	0.
87	.1268690E+03	.3920260E+01	.3230690E+01	0.	0.
88	.1268690E+03	.5272800E+00	.3230690E+01	0.	0.
89	.1270660E+03	.5272800E+00	.3230690E+01	0.	0.
90	.1270660E+03	.3920260E+01	.3230690E+01	0.	0.
91	.1296680E+03	.3920260E+01	.3230690E+01	0.	0.
92	.1322700E+03	.3920260E+01	.3230690E+01	0.	0.
93	.1348720E+03	.3920260E+01	.3230690E+01	0.	0.
94	.1374740E+03	.3920260E+01	.3230690E+01	0.	0.
95	.1400760E+03	.3920260E+01	.3230690E+01	0.	0.
96	.1426780E+03	.3920260E+01	.3230690E+01	0.	0.
97	.1435400E+03	.3467030E+01	.3230690E+01	0.	0.
98	.1444020E+03	.3054240E+01	.3230690E+01	0.	0.
99	.1452640E+03	.2679430E+01	.3230690E+01	0.	0.
100	.1461270E+03	.2340190E+01	.3230690E+01	0.	0.

220

N-5

STATION	X	EI	DCWASH	DCNAS	K
101	.1469890E+03	.2034180E+01	.3230690E+01	0.	0.
102	.1478510E+03	.1759180E+01	.3230690E+01	0.	0.
103	.1487130E+03	.1513000E+01	.3230690E+01	0.	0.
104	.1495750E+03	.1293560E+01	.3230690E+01	0.	0.
105	.1504370E+03	.1098860E+01	.3230690E+01	0.	0.
106	.1513000E+03	.9269470E+00	.3230690E+01	0.	0.
107	.1521620E+03	.7759840E+00	.3230690E+01	0.	0.
108	.1530240E+03	.6441900E+00	.3230690E+01	0.	0.
109	.1538860E+03	.5298720E+00	.3230690E+01	0.	0.
110	.1547480E+03	.4314100E+00	.3230690E+01	0.	0.
111	.1556100E+03	.3472660E+00	.3230690E+01	0.	0.
112	.1564730E+03	.2759790E+00	.3230690E+01	0.	0.
113	.1573350E+03	.2161690E+00	.3230690E+01	0.	0.
114	.1581970E+03	.1665310E+00	.3230690E+01	0.	0.
115	.1590590E+03	.1258410E+00	.3230690E+01	0.	0.
116	.1601460E+03	.1258410E+00	.3230690E+01	0.	0.
117	.1612320E+03	.1258410E+00	.3230690E+01	0.	0.
118	.1623190E+03	.1258410E+00	.3230690E+01	0.	0.
119	.1634050E+03	.1258410E+00	.3230690E+01	0.	0.
120	.1644920E+03	.1258410E+00	.3230690E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
121	.1655780E+03	.1258410E+00	.3230690E+01	0.	0.
122	.1666650E+03	.1258410E+00	.3230690E+01	0.	0.
123	.1677510E+03	.1258410E+00	.3230690E+01	0.	0.
124	.1688380E+03	.1258410E+00	.3230690E+01	0.	0.
125	.1699240E+03	.1258410E+00	.3230690E+01	0.	0.
126	.1702480E+03	.1608560E+00	.3230690E+01	0.	0.
127	.1706510E+03	.2025620E+00	.3230690E+01	0.	0.
128	.1710150E+03	.2517620E+00	.3230690E+01	0.	0.
129	.1713790E+03	.3093030E+00	.3230690E+01	0.	0.
130	.1717820E+03	.3760790E+00	.3230690E+01	0.	0.
131	.1721060E+03	.4530280E+00	.3230690E+01	0.	0.
132	.1724690E+03	.5411360E+00	.3230690E+01	0.	0.
133	.1728330E+03	.6414320E+00	.3230690E+01	0.	0.
134	.1731970E+03	.7549910E+00	.3230690E+01	0.	0.
135	.1735600E+03	.8829350E+00	.3230690E+01	0.	0.
136	.1739240E+03	.1026430E+01	.3230690E+01	0.	0.
137	.1753740E+03	.1026430E+01	.3230690E+01	0.	0.
138	.1768240E+03	.1026430E+01	.3230690E+01	0.	0.
139	.1782740E+03	.1026430E+01	.3230690E+01	0.	0.
140	.1797240E+03	.1026430E+01	.3230690E+01	0.	0.

222

STATION	X	EI	DCMASH	DCMAS	K
141	.1811740E+03	.1026430E+01	.3230690E+01	0.	0.
142	.1826240E+03	.1026430E+01	.3230690E+01	0.	0.
143	.1840740E+03	.1026430E+01	.3230690E+01	0.	0.
144	.1855240E+03	.1026430E+01	.3230690E+01	0.	0.
145	.1855240E+03	.6811969E+00	.3230690E+01	0.	0.
146	.1877050E+03	.7820390E+00	.3230690E+01	0.	0.
147	.1877050E+03	.1804160E+00	.3230690E+01	0.	0.
148	.1900230E+03	.1804160E+00	.3230690E+01	0.	0.
149	.1931000E+03	.1804160E+00	.3230690E+01	0.	0.
150	.1959230E+03	.1804160E+00	.3230690E+01	0.	0.
151	.1987050E+03	.1804160E+00	.3230690E+01	0.	0.
152	.1987050E+03	.1804160E+00	.1916464E+07	.2930800E+05	0.
153	.1987060E+03	.1804160E+00	.1916464E+07	.2930800E+05	0.

```
$CNTL
 N       = 0,
 NC      = 2,
 NSS     = 1,
 NDATA   = 5,
 NHDN    = 0,
 NI      = 153,
$END
```

224

```
 $MCNTL
 DEL    = .1E+01,
 EPS    = .1E-05,
 ITMAX  = 100,
 N      = 1,
 NORM   = 1,
 PVTC   = 0,
 PVTR   = 0,
 XO     = .1E+01,
 $END
```

225

```
$PARAM
 DUMMY = -1,
 EINOD = .262E+08,
$END
```

226

N=11

MATRIX 2

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

227

MATRIX B

0.005

0.000

228

MATRIX D

0. 0. .1000E+01 0.

0. 0. 0. .1000E+01

MATRIX B

0.000

0.000

230

H-15

EIGENVALUES FROM SECANT METHOD

.857818#E+02

23

H-16

QDIV (1) = .4576184E+02

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.4616145E+05	0.	-.3112183E+03
2	7.406	.3418717E-04	.5645382E+05	.2304877E+04	-.3112183E+03
3	14.812	.8361940E-04	.8541225E+05	.4609753E+04	-.3112183E+03
4	14.812	.8361940E-04	.8541225E+05	.4609753E+04	-.3112183E+03
5	22.682	.1648151E-03	.1293462E+04	.7059028E+04	-.3112183E+03
6	30.552	.2872102E-03	.1894682E+04	.9508298E+04	-.3112183E+03
7	32.225	.3201156E-03	.2042963E+04	.1002896E+05	-.3112183E+03
8	32.225	.3201156E-03	.2042963E+04	.1002896E+05	-.3112183E+03
9	35.825	.3995586E-03	.2388838E+04	.1057313E+05	.4567093E+02
10	35.825	.3995586E-03	.2388838E+04	.1057313E+05	.4567093E+02
11	36.812	.4236037E-03	.2483320E+04	.1052805E+05	.4567093E+02
12	37.648	.4446981E-03	.2558669E+04	.1048986E+05	.4567093E+02
13	37.937	.4521280E-03	.2580516E+04	.1047666E+05	.4567093E+02
14	37.937	.4521280E-03	.2580516E+04	.1047666E+05	.4567093E+02
15	38.497	.4666587E-03	.2607522E+04	.1045108E+05	.4567093E+02
16	38.907	.4773879E-03	.2623943E+04	.1043236E+05	.4567093E+02
17	39.057	.4813277E-03	.2628366E+04	.1042551E+05	.4567093E+02
18	41.326	.5415938E-03	.2683823E+04	.1032187E+05	.4567093E+02
19	43.491	.6002720E-03	.2738231E+04	.1022298E+05	.4567093E+02
20	44.250	.6211294E-03	.2757777E+04	.1018832E+05	.4567093E+02

N-17

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	44.250	.6211299E-03	.2757777E-04	.1018832E+05	.4567093E+02
22	46.750	.7476454E-03	.2864073E-04	.9982779E+04	.4567093E+02
23	48.750	.7476454E-03	.2864073E-04	.9982779E+04	.4567093E+02
24	55.750	.9538670E-03	.3025377E-04	.9663052E+04	.4567093E+02
25	55.750	.9538670E-03	.3025377E-04	.9663052E+04	.4567093E+02
26	57.250	.9995023E-03	.3059205E-04	.9594538E+04	.4567093E+02
27	57.250	.9995023E-03	.3059205E-04	.9594538E+04	.4567093E+02
28	58.250	.1030250E-02	.3090302E-04	.9548863E+04	.4567093E+02
29	59.250	.1061308E-02	.3118109E-04	.9503187E+04	.4567093E+02
30	60.250	.1092612E-02	.3140572E-04	.9457512E+04	.4567093E+02
31	60.250	.1092612E-02	.3140572E-04	.9457512E+04	.4567093E+02
32	60.500	.1100477E-02	.3151356E-04	.9446093E+04	.4567093E+02
33	61.250	.1124234E-02	.3180249E-04	.9411836E+04	.4567093E+02
34	61.250	.1124234E-02	.3180249E-04	.9411836E+04	.4567093E+02
35	62.000	.1148142E-02	.3196819E-04	.9377580E+04	.4567093E+02
36	62.750	.1172186E-02	.3217123E-04	.9343323E+04	.4567093E+02
37	63.250	.1188309E-02	.3232137E-04	.9320485E+04	.4567093E+02
38	63.250	.1188309E-02	.3232137E-04	.9320485E+04	.4567093E+02
39	66.356	.1289337E-02	.3276232E-04	.9178616E+04	.4567093E+02
40	69.463	.1391862E-02	.3327055E-04	.9036701E+04	.4567093E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72,569	.1496046E-02	.3385958E-04	.8894832E+04	.4567093E+02
42	75,676	.1602232E-02	.3454732E-04	.8752917E+04	.4567093E+02
43	78,782	.1710686E-02	.3535574E-04	.8611047E+04	.4567093E+02
44	81,888	.1821862E-02	.3631404E-04	.8469176E+04	.4567093E+02
45	84,995	.1936308E-02	.3746052E-04	.8327260E+04	.4567093E+02
46	88,101	.2054603E-02	.3884483E-04	.8185388E+04	.4567093E+02
47	91,207	.2177612E-02	.4053525E-04	.8043516E+04	.4567093E+02
48	94,314	.2306450E-02	.4262563E-04	.7901598E+04	.4567093E+02
49	97,420	.2442443E-02	.4524489E-04	.7759724E+04	.4567093E+02
50	100,527	.2587560E-02	.4858090E-04	.7617803E+04	.4567093E+02
51	103,633	.2740272E-02	.5290422E-04	.7475926E+04	.4567093E+02
52	104,008	.2760222E-02	.5365376E-04	.7458796E+04	.4567093E+02
53	104,508	.2791352E-02	.5509681E-04	.7435957E+04	.4567093E+02
54	105,250	.2833156E-02	.5775459E-04	.7402063E+04	.4567093E+02
55	105,250	.2833156E-02	.5775459E-04	.7402063E+04	.4567093E+02
56	115,250	.3388785E-02	.7288924E-04	.6945256E+04	.4567093E+02
57	115,250	.3388785E-02	.7288924E-04	.6945256E+04	.4567093E+02
58	116,275	.3564495E-02	.7478474E-04	.6898432E+04	.4567093E+02
59	116,934	.3614168E-02	.7591263E-04	.6868328E+04	.4567093E+02
60	117,175	.3632510E-02	.7628216E-04	.6857318E+04	.4567093E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117.889	.3687343E-02	.7730865E-04	.6824701E+04	.4567093E+02
62	118.279	.3717603E-02	.7789933E-04	.6806885E+04	.4567093E+02
63	118.670	.3748183E-02	.7855888E-04	.6789023E+04	.4567093E+02
64	119.060	.3778956E-02	.7929389E-04	.6771207E+04	.4567093E+02
65	119.451	.3810113E-02	.8011993E-04	.6753345E+04	.4567093E+02
66	119.841	.3841529E-02	.8104677E-04	.6735529E+04	.4567093E+02
67	120.232	.3873411E-02	.8209599E-04	.6717667E+04	.4567093E+02
68	120.622	.3905645E-02	.8328239E-04	.6699850E+04	.4567093E+02
69	121.012	.3938371E-02	.8463307E-04	.6682034E+04	.4567093E+02
70	121.403	.3971745E-02	.8618174E-04	.6664172E+04	.4567093E+02
71	121.793	.4005678E-02	.8795698E-04	.6646355E+04	.4567093E+02
72	122.184	.4040441E-02	.9001312E-04	.6628492E+04	.4567093E+02
73	122.574	.4075976E-02	.9239584E-04	.6610675E+04	.4567093E+02
74	122.965	.4112605E-02	.9518818E-04	.6592813E+04	.4567093E+02
75	122.965	.4112605E-02	.9518818E-04	.6592813E+04	.4567093E+02
76	123.206	.4135770E-02	.9715637E-04	.6581803E+04	.4567093E+02
77	123.206	.4135770E-02	.9715637E-04	.6581803E+04	.4567093E+02
78	123.355	.4150301E-02	.9846644E-04	.6574995E+04	.4567093E+02
79	123.746	.4189535E-02	.1023488E-03	.6557132E+04	.4567093E+02
80	124.136	.4230271E-02	.1069719E-03	.6539315E+04	.4567093E+02

235

N-20

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124.526	.4272973E-02	.1125382E-03	.6521497E+04	.4567093E+02
82	124.917	.4318170E-02	.1193203E-03	.6503633E+04	.4567093E+02
83	125.307	.4366155E-02	.1276269E-03	.6485814E+04	.4567093E+02
84	125.698	.4417856E-02	.1379709E-03	.6467949E+04	.4567093E+02
85	126.088	.4473899E-02	.1509513E-03	.6450129E+04	.4567093E+02
86	126.479	.4535763E-02	.1675615E-03	.6432263E+04	.4567093E+02
87	126.869	.4604746E-02	.1890562E-03	.6414441E+04	.4567093E+02
88	126.869	.4604746E-02	.1890562E-03	.6414441E+04	.4567093E+02
89	127.066	.4651000E-02	.2804628E-03	.6405437E+04	.4567093E+02
90	127.066	.4651000E-02	.2804628E-03	.6405437E+04	.4567093E+02
91	129.668	.5591878E-02	.4412268E-03	.6286462E+04	.4567093E+02
92	132.270	.6947143E-02	.5989760E-03	.6167426E+04	.4567093E+02
93	134.872	.8708948E-02	.7537088E-03	.6048329E+04	.4567093E+02
94	137.474	.1086944E-01	.9054238E-03	.5929174E+04	.4567093E+02
95	140.076	.1342077E-01	.1054119E-02	.5809961E+04	.4567093E+02
96	142.678	.1635508E-01	.1199794E-02	.5690692E+04	.4567093E+02
97	143.540	.1740989E-01	.1250488E-02	.5651167E+04	.4567093E+02
98	144.402	.1851092E-01	.1307526E-02	.5611636E+04	.4567093E+02
99	145.264	.1966406E-01	.1371961E-02	.5572097E+04	.4567093E+02
100	146.127	.2087762E-01	.1445146E-02	.5532504E+04	.4567093E+02
101	146.989	.2215686E-01	.1528458E-02	.5492946E+04	.4567093E+02
102	147.851	.2351268E-01	.1623875E-02	.5453378E+04	.4567093E+02

H-21

103	148.713	.2495642E-01	.1733733E-02	.5413796E+04	.4567093E+02
104	149.575	.2650184E-01	.1860940E-02	.5374199E+04	.4567093E+02
105	150.437	.2816466E-01	.2009146E-02	.5334585E+04	.4567093E+02
106	151.300	.2996758E-01	.2183176E-02	.5294904E+04	.4567093E+02
107	152.162	.3193047E-01	.2388553E-02	.5255246E+04	.4567093E+02
108	153.024	.3408544E-01	.2633148E-02	.5215559E+04	.4567093E+02
109	153.886	.3647002E-01	.2927025E-02	.5175838E+04	.4567093E+02
110	154.748	.3913163E-01	.3283562E-02	.5136076E+04	.4567093E+02
111	155.610	.4213088E-01	.3720826E-02	.5096264E+04	.4567093E+02
112	156.473	.4555054E-01	.4264268E-02	.5056345E+04	.4567093E+02
113	157.335	.4948614E-01	.4947413E-02	.5016395E+04	.4567093E+02
114	159.197	.5407987E-01	.5820740E-02	.4976347E+04	.4567093E+02
115	159.059	.5952109E-01	.6957600E-02	.4936174E+04	.4567093E+02
116	160.146	.6796850E-01	.8576640E-02	.4885281E+04	.4567093E+02
117	161.232	.7815650E-01	.1017739E-01	.4834176E+04	.4567093E+02
118	162.319	.9008554E-01	.1176272E-01	.4782768E+04	.4567093E+02
119	163.405	.1037153E+00	.1332962E-01	.4731155E+04	.4567093E+02
120	164.492	.1190523E+00	.1488090E-01	.4679243E+04	.4567093E+02
121	165.578	.1360499E+00	.1641362E-01	.4627131E+04	.4567093E+02
122	166.665	.1547206E+00	.1793052E-01	.4574727E+04	.4567093E+02
123	167.751	.1750114E+00	.1942873E-01	.4522128E+04	.4567093E+02
124	168.838	.1969408E+00	.2091094E-01	.4469242E+04	.4567093E+02
125	169.924	.2204494E+00	.2237433E-01	.4416168E+04	.4567093E+02
126	170.288	.2286828E+00	.2280805E-01	.4398326E+04	.4567093E+02
127	170.651	.2370305E+00	.2314728E-01	.4380513E+04	.4567093E+02
128	171.015	.2455107E+00	.2341787E-01	.4362635E+04	.4567093E+02

337

H-22

129	171.379	.2540787E+00	.2363582E-01	.4344745E+04	.4567093E+02
130	171.742	.2626938E+00	.2381284E-01	.4326892E+04	.4567093E+02
131	172.106	.2713908E+00	.2395883E-01	.4308982E+04	.4567093E+02
132	172.469	.2801117E+00	.2407965E-01	.4291114E+04	.4567093E+02
133	172.833	.2888968E+00	.2418102E-01	.4273191E+04	.4567093E+02
134	173.197	.2977155E+00	.2426645E-01	.4255263E+04	.4567093E+02
135	173.560	.3065394E+00	.2433874E-01	.4237380E+04	.4567093E+02
136	173.924	.3154098E+00	.2440063E-01	.4219445E+04	.4567093E+02
137	175.374	.3509557E+00	.2462621E-01	.4147967E+04	.4567093E+02
138	176.824	.3868259E+00	.2484794E-01	.4076441E+04	.4567093E+02
139	178.274	.4230147E+00	.2506580E-01	.4004868E+04	.4567093E+02
140	179.724	.4595167E+00	.2527981E-01	.3933248E+04	.4567093E+02
141	181.174	.4963262E+00	.2548995E-01	.3861583E+04	.4567093E+02
142	182.624	.5334375E+00	.2569623E-01	.3789874E+04	.4567093E+02
143	184.074	.5708452E+00	.2589864E-01	.3718121E+04	.4567093E+02
144	185.524	.6085436E+00	.2609718E-01	.3646324E+04	.4567093E+02
145	185.524	.6085436E+00	.2609718E-01	.3646324E+04	.4567093E+02
146	187.705	.6658372E+00	.2645773E-01	.3538246E+04	.4567093E+02
147	187.705	.6658372E+00	.2645773E-01	.3538246E+04	.4567093E+02
148	190.423	.7405142E+00	.2845350E-01	.3403072E+04	.4567093E+02
149	193.140	.8204797E+00	.3037062E-01	.3267161E+04	.4567093E+02
150	195.923	.9076777E+00	.3225309E-01	.3127168E+04	.4567093E+02
151	198.705	.9999659E+00	.3405228E-01	.2986467E+04	.4567093E+02
152	198.705	.9999659E+00	.3405228E-01	.2986467E+04	.4567093E+02
153	198.706	.1000000E+01	.3405260E-01	-.3338647E-09	-.1718597E-07

I,J DIVERGENCE1 C=4 WITH NTP=105 (UPDATED 3-25-83)

STATION	X	EI	DCMASH	DCMAS	K
1	0.	.2862990E+03	.4961280E+01	0.	0.
2	.7406600E+01	.3165080E+03	.4961280E+01	0.	0.
3	.1481200E+02	.3490420E+03	.4961280E+01	0.	0.
4	.1481200E+02	.3898560E+03	.4961280E+01	0.	0.
5	.2268200E+02	.4050440E+03	.4961280E+01	0.	0.
6	.3055200E+02	.4206720E+03	.4961280E+01	0.	0.
7	.3222500E+02	.4206720E+03	.4961280E+01	0.	0.
8	.3222500E+02	.4206720E+03	.4961280E+01	0.	.2777780E+06
9	.3582500E+02	.4206720E+03	.4961280E+01	0.	.2777780E+06
10	.3582500E+02	.4206720E+03	.4961280E+01	0.	0.
11	.3681200E+02	.4206720E+03	.4961280E+01	0.	0.
12	.3764900E+02	.4724710E+03	.4961280E+01	0.	0.
13	.3793700E+02	.6018070E+03	.4961280E+01	0.	0.
14	.3793700E+02	.7855000E+03	.4961280E+01	0.	0.
15	.3849700E+02	.8758440E+03	.4961280E+01	0.	0.
16	.3890700E+02	.1152276E+04	.4961280E+01	0.	0.
17	.3905700E+02	.1629655E+04	.4961280E+01	0.	0.
18	.4132600E+02	.1610312E+04	.4961280E+01	0.	0.
19	.4349100E+02	.1512582E+04	.4961280E+01	0.	0.
20	.4425000E+02	.1512582E+04	.4961280E+01	0.	0.

STATION	X	EI	DCMASH	DCMAS	K
21	.4425000E+02	.1629655E+04	.4961280E+01	0.	0.
22	.4875000E+02	.1629655E+04	.4961280E+01	0.	0.
23	.4875000E+02	.1627307E+04	.4961280E+01	0.	0.
24	.5575000E+02	.1626703E+04	.4961280E+01	0.	0.
25	.5575000E+02	.1629655E+04	.4961280E+01	0.	0.
26	.5725000E+02	.1629655E+04	.4961280E+01	0.	0.
27	.5725000E+02	.1174793E+04	.4961280E+01	0.	0.
28	.5825000E+02	.1174793E+04	.4961280E+01	0.	0.
29	.5925000E+02	.1474997E+04	.4961280E+01	0.	0.
30	.6025000E+02	.1775202E+04	.4961280E+01	0.	0.
31	.6025000E+02	.8363110E+03	.4961280E+01	0.	0.
32	.6050000E+02	.8363110E+03	.4961280E+01	0.	0.
33	.6125000E+02	.1058520E+04	.4961280E+01	0.	0.
34	.6125000E+02	.1786583E+04	.4961280E+01	0.	0.
35	.6200000E+02	.1486378E+04	.4961280E+01	0.	0.
36	.6275000E+02	.1186174E+04	.4961280E+01	0.	0.
37	.6325000E+02	.1186174E+04	.4961280E+01	0.	0.
38	.6325000E+02	.2691925E+04	.4961280E+01	0.	0.
39	.6635600E+02	.2308086E+04	.4961280E+01	0.	0.
40	.6946300E+02	.1966824E+04	.4961280E+01	0.	0.

240

I-2

STATION	X	EI	DCMASH	DCNAS	K
81	.7256000E+02	.1664868E+04	.4961280E+01	0.	0.
82	.7567600E+02	.1399077E+04	.4961280E+01	0.	0.
83	.7878200E+02	.1166441E+04	.4961280E+01	0.	0.
84	.8188800E+02	.9640810E+03	.4961280E+01	0.	0.
85	.8499500E+02	.7892480E+03	.4961280E+01	0.	0.
86	.8810100E+02	.6393260E+03	.4961280E+01	0.	0.
87	.9120700E+02	.5118270E+03	.4961280E+01	0.	0.
88	.9431400E+02	.4043960E+03	.4961280E+01	0.	0.
89	.9742000E+02	.3148080E+03	.4961280E+01	0.	0.
90	.1005270E+03	.2409680E+03	.4961280E+01	0.	0.
91	.1036330E+03	.1809120E+03	.4961280E+01	0.	0.
92	.1040000E+03	.1176260E+03	.4961280E+01	0.	0.
93	.1045000E+03	.8467190E+02	.4961280E+01	0.	0.
94	.1052500E+03	.7411600E+02	.4961280E+01	0.	0.
95	.1052500E+03	.1809120E+03	.4961280E+01	0.	0.
96	.1152500E+03	.1809120E+03	.4961280E+01	0.	0.
97	.1152500E+03	.1394420E+03	.4961280E+01	0.	0.
98	.1162750E+03	.1464810E+03	.4961280E+01	0.	0.
99	.1169340E+03	.1612700E+03	.4961280E+01	0.	0.
100	.1171750E+03	.1816190E+03	.4961280E+01	0.	0.

STATION	X	EI	DCMASH	DCNAB	K
61	.1178A90E+03	.1816190E+03	.4961280E+01	0.	0.
62	.1182790E+03	.1629020E+03	.4961280E+01	0.	0.
63	.1186700E+03	.1456700E+03	.4961280E+01	0.	0.
64	.1190600E+03	.1298420E+03	.4961280E+01	0.	0.
65	.1194510E+03	.1153400E+03	.4961280E+01	0.	0.
66	.1198410E+03	.1020870E+03	.4961280E+01	0.	0.
67	.1202320E+03	.9000920E+02	.4961280E+01	0.	0.
68	.1206220E+03	.7903560E+02	.4961280E+01	0.	0.
69	.1210120E+03	.6909640E+02	.4961280E+01	0.	0.
70	.1214030E+03	.6012440E+02	.4961280E+01	0.	0.
71	.1217930E+03	.5205490E+02	.4961280E+01	0.	0.
72	.1221840E+03	.4482520E+02	.4961280E+01	0.	0.
73	.1225740E+03	.3837480E+02	.4961280E+01	0.	0.
74	.1229650E+03	.3264570E+02	.4961280E+01	0.	0.
75	.1229650E+03	.3247070E+02	.4961280E+01	0.	0.
76	.1232060E+03	.2926540E+02	.4961280E+01	0.	0.
77	.1232060E+03	.2951600E+02	.4961280E+01	0.	0.
78	.1233550E+03	.2765750E+02	.4961280E+01	0.	0.
79	.1237060E+03	.2320550E+02	.4961280E+01	0.	0.
80	.1241360E+03	.1931380E+02	.4961280E+01	0.	0.

242

I-4

STATION	X	EI	DCMASH	DCMAS	K
81	.1245260E+03	.1593340E+02	.4961280E+01	0.	0.
82	.1249170E+03	.1301730E+02	.4961280E+01	0.	0.
83	.1253070E+03	.1052110E+02	.4961280E+01	0.	0.
84	.1256980E+03	.8402210E+01	.4961280E+01	0.	0.
85	.1260880E+03	.6620640E+01	.4961280E+01	0.	0.
86	.1264790E+03	.5138520E+01	.4961280E+01	0.	0.
87	.1268690E+03	.3920260E+01	.4961280E+01	0.	0.
88	.1268690E+03	.5272800E+00	.4961280E+01	0.	0.
89	.1270660E+03	.5272800E+00	.4961280E+01	0.	0.
90	.1270660E+03	.3920260E+01	.4961280E+01	0.	0.
91	.1276640E+03	.3920260E+01	.4961280E+01	0.	0.
92	.1304620E+03	.3920260E+01	.4961280E+01	0.	0.
93	.1314990E+03	.3380140E+01	.4961280E+01	0.	0.
94	.1325360E+03	.2897800E+01	.4961280E+01	0.	0.
95	.1335730E+03	.2468980E+01	.4961280E+01	0.	0.
96	.1346100E+03	.2089550E+01	.4961280E+01	0.	0.
97	.1356470E+03	.1755580E+01	.4961280E+01	0.	0.
98	.1366840E+03	.1463270E+01	.4961280E+01	0.	0.
99	.1377210E+03	.1209010E+01	.4961280E+01	0.	0.
100	.1387580E+03	.9893430E+00	.4961280E+01	0.	0.

STATION	K	EI	DCMASH	DCMAS	K
101	.1397050E+03	.8009810E+00	.4961280E+01	0.	0.
102	.1408320E+03	.6407980E+00	.4961280E+01	0.	0.
103	.1418690E+03	.5058320E+00	.4961280E+01	0.	0.
104	.1429060E+03	.3932860E+00	.4961280E+01	0.	0.
105	.1439430E+03	.3005280E+00	.4961280E+01	0.	0.
106	.1453620E+03	.3005280E+00	.4961280E+01	0.	0.
107	.1467810E+03	.3005280E+00	.4961280E+01	0.	0.
108	.1481400E+03	.3005280E+00	.4961280E+01	0.	0.
109	.1495390E+03	.3005280E+00	.4961280E+01	0.	0.
110	.1509380E+03	.3005280E+00	.4961280E+01	0.	0.
111	.1523370E+03	.3005280E+00	.4961280E+01	0.	0.
112	.1537360E+03	.3005280E+00	.4961280E+01	0.	0.
113	.1551350E+03	.3005280E+00	.4961280E+01	0.	0.
114	.1565340E+03	.3005280E+00	.4961280E+01	0.	0.
115	.1571650E+03	.3673650E+00	.4961280E+01	0.	0.
116	.1576770E+03	.4446720E+00	.4961280E+01	0.	0.
117	.1582080E+03	.5334920E+00	.4961280E+01	0.	0.
118	.1588200E+03	.6349140E+00	.4961280E+01	0.	0.
119	.1593910E+03	.7500770E+00	.4961280E+01	0.	0.
120	.1599630E+03	.8801690E+00	.4961280E+01	0.	0.

STATION	X	EI	DCMASH	DCNAS	K
121	.1605340E+03	.1026430E+01	.4961280E+01	0.	0.
122	.1636340E+03	.1026430E+01	.4961280E+01	0.	0.
123	.1667340E+03	.1026430E+01	.4961280E+01	0.	0.
124	.1698340E+03	.1026430E+01	.4961280E+01	0.	0.
125	.1729340E+03	.1026430E+01	.4961280E+01	0.	0.
126	.1760340E+03	.1026430E+01	.4961280E+01	0.	0.
127	.1791340E+03	.1026430E+01	.4961280E+01	0.	0.
128	.1791340E+03	.8819690E+00	.4961280E+01	0.	0.
129	.1813150E+03	.7820390E+00	.4961280E+01	0.	0.
130	.1813150E+03	.1804160E+00	.4961280E+01	0.	0.
131	.1840330E+03	.1804160E+00	.4961280E+01	0.	0.
132	.1867500E+03	.1804160E+00	.4961280E+01	0.	0.
133	.1895330E+03	.1804160E+00	.4961280E+01	0.	0.
134	.1923150E+03	.1804160E+00	.4961280E+01	0.	0.
135	.1923150E+03	.1804160E+00	.3679598E+07	.4500800E+05	0.
136	.1923160E+03	.1804160E+00	.3679598E+07	.4500800E+05	0.

548

```
SENTL
V       = 0,
VC      = 2,
VSS     = 1,
VDATA   = 5,
VHOM    = 0,
VI      = 136,
SEND
```

```
$MCNTL
DEL    = .1E+01,
EPS    = .1E-05,
ITMAX  = 500,
N      = 1,
NORM   = 1,
PVTC   = 0,
PVTR   = 0,
XU     = .1E+01,
$END
```

247

```
$PARAM
DUMMY = 1.,
EINOD = .202E+05,
$END
```

248

I=10

MATRIX C

.1000E+01	0.	0.	0.
0.	0.	.1000E+01	0.

MATRIX B

0.000

0.000

250

MATRIX D

0. 0. .1000E+01 0.

0. 0. 0. .1000E+01

251

MATRIX 3

0.000

0.000

252

I-14

EIGENVALUES FROM SECANT METHOD

.3005209E+02

253

QDIV (I) = .3645209E+02

STATION	X	Y(1)	Y(2)	Y(3)	Y(4)
1	0.000	0.	.5984749E-05	0.	-.4083155E+03
2	7.406	.4432305E-04	.7335098E-05	.3023976E+04	-.4083155E+03
3	14.812	.1086475E-03	.1113441E-04	.6047949E+04	-.4083155E+03
4	14.812	.1086475E-03	.1113441E-04	.6047949E+04	-.4083155E+03
5	22.682	.2146121E-03	.1689850E-04	.9261372E+04	-.4083155E+03
6	30.552	.3746298E-03	.2478645E-04	.1247479E+05	-.4083155E+03
7	32.225	.4176816E-03	.2673188E-04	.1315789E+05	-.4083155E+03
8	32.225	.4176816E-03	.2673188E-04	.1315789E+05	-.4083155E+03
9	35.825	.5216523E-03	.3126972E-04	.1387598E+05	.5748386E+02
10	35.825	.5216523E-03	.3126972E-04	.1387598E+05	.5748386E+02
11	36.812	.5531288E-03	.3250979E-04	.1381924E+05	.5748386E+02
12	37.648	.5807451E-03	.3349891E-04	.1377118E+05	.5748386E+02
13	37.937	.5904727E-03	.3378572E-04	.1375456E+05	.5748386E+02
14	37.937	.5904727E-03	.3378572E-04	.1375456E+05	.5748386E+02
15	38.497	.6094975E-03	.3414029E-04	.1372237E+05	.5748386E+02
16	38.907	.6235453E-03	.3435590E-04	.1369880E+05	.5748386E+02
17	39.057	.6287038E-03	.3441398E-04	.1369017E+05	.5748386E+02
18	41.326	.7076145E-03	.3514237E-04	.1355973E+05	.5748386E+02
19	43.491	.7844510E-03	.3585727E-04	.1343526E+05	.5748386E+02
20	44.250	.8117643E-03	.3611417E-04	.1339163E+05	.5748386E+02

458

I-16

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
21	44.250	.8117683E-03	.3611417E-04	.1339163E+05	.5748386E+02
22	48.750	.9774537E-03	.3751193E-04	.1313292E+05	.5748386E+02
23	48.750	.9774537E-03	.3751193E-04	.1313292E+05	.5748386E+02
24	55.750	.1247584E-02	.3963548E-04	.1273048E+05	.5748386E+02
25	55.750	.1247584E-02	.3963548E-04	.1273048E+05	.5748386E+02
26	57.250	.1307373E-02	.4008120E-04	.1264425E+05	.5748386E+02
27	57.250	.1307373E-02	.4008120E-04	.1264425E+05	.5748386E+02
28	58.250	.1347659E-02	.4049107E-04	.1258675E+05	.5748386E+02
29	59.250	.1388355E-02	.4085764E-04	.1252926E+05	.5748386E+02
30	60.250	.1429374E-02	.4115382E-04	.1247177E+05	.5748386E+02
31	60.250	.1429374E-02	.4115382E-04	.1247177E+05	.5748386E+02
32	60.500	.1439681E-02	.4129604E-04	.1245740E+05	.5748386E+02
33	61.250	.1470813E-02	.4167710E-04	.1241428E+05	.5748386E+02
34	61.250	.1470813E-02	.4167710E-04	.1241428E+05	.5748386E+02
35	62.000	.1502105E-02	.4189569E-04	.1237116E+05	.5748386E+02
36	62.750	.1533656E-02	.4216357E-04	.1232804E+05	.5748386E+02
37	63.250	.1554787E-02	.4236168E-04	.1229930E+05	.5748386E+02
38	63.250	.1554787E-02	.4236168E-04	.1229930E+05	.5748386E+02
39	66.356	.1687204E-02	.4294378E-04	.1212073E+05	.5748386E+02
40	69.063	.1821598E-02	.4361518E-04	.1194210E+05	.5748386E+02

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
41	72,569	.1958184E-02	.4439390E-04	.1176353E+05	.5748386E+02
42	75,676	.2097418E-02	.4530383E-04	.1158491E+05	.5748386E+02
43	78,782	.2239656E-02	.4637429E-04	.1140633E+05	.5748386E+02
44	81,888	.2385495E-02	.4764424E-04	.1122776E+05	.5748386E+02
45	84,995	.2535671E-02	.4916487E-04	.1104913E+05	.5748386E+02
46	88,101	.2690955E-02	.5100255E-04	.1087056E+05	.5748386E+02
47	91,207	.2852499E-02	.5324865E-04	.1069199E+05	.5748386E+02
48	94,314	.3021791E-02	.5602879E-04	.1051335E+05	.5748386E+02
49	97,420	.3200603E-02	.5951572E-04	.1033478E+05	.5748386E+02
50	100,527	.3391566E-02	.6396135E-04	.1015614E+05	.5748386E+02
51	103,633	.3597990E-02	.6972871E-04	.9977558E+04	.5748386E+02
52	104,008	.3624286E-02	.7072913E-04	.9955996E+04	.5748386E+02
53	104,508	.3660054E-02	.7265552E-04	.9927248E+04	.5748386E+02
54	105,250	.3715197E-02	.7620423E-04	.9884585E+04	.5748386E+02
55	105,250	.3715197E-02	.7620423E-04	.9884585E+04	.5748386E+02
56	115,250	.4581509E-02	.9645172E-04	.9309590E+04	.5748386E+02
57	115,250	.4581509E-02	.9645172E-04	.9309590E+04	.5748386E+02
58	116,275	.4681711E-02	.9899301E-04	.9250651E+04	.5748386E+02
59	116,930	.4741470E-02	.1005057E-03	.9212757E+04	.5748386E+02
60	117,175	.4771756E-02	.1010014E-03	.9198899E+04	.5748386E+02

256

I-18

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
61	117.889	.4884363E-02	.1023786E-03	.9157842E+04	.5748386E+02
62	118.279	.4884437E-02	.1031713E-03	.9135416E+04	.5748386E+02
63	118.670	.4924941E-02	.1040565E-03	.9112933E+04	.5748386E+02
64	119.060	.4965705E-02	.1050432E-03	.9090507E+04	.5748386E+02
65	119.451	.5006981E-02	.1061523E-03	.9068023E+04	.5748386E+02
66	119.841	.5048608E-02	.1073969E-03	.9045597E+04	.5748386E+02
67	120.232	.5090859E-02	.1088061E-03	.9023113E+04	.5748386E+02
68	120.622	.5133584E-02	.1103998E-03	.9000687E+04	.5748386E+02
69	121.012	.5176971E-02	.1122145E-03	.8978260E+04	.5748386E+02
70	121.403	.5221226E-02	.1142955E-03	.8955776E+04	.5748386E+02
71	121.793	.5266233E-02	.1166814E-03	.8933349E+04	.5748386E+02
72	122.184	.5312357E-02	.1194453E-03	.8910864E+04	.5748386E+02
73	122.574	.5359517E-02	.1226488E-03	.8888437E+04	.5748386E+02
74	122.965	.5408149E-02	.1264036E-03	.8865952E+04	.5748386E+02
75	122.965	.5408149E-02	.1264036E-03	.8865952E+04	.5748386E+02
76	123.206	.5438915E-02	.1290506E-03	.8852093E+04	.5748386E+02
77	123.206	.5438915E-02	.1290506E-03	.8852093E+04	.5748386E+02
78	123.355	.5458270E-02	.1308126E-03	.8843524E+04	.5748386E+02
79	123.746	.5510351E-02	.1360149E-03	.8821039E+04	.5748386E+02
80	124.136	.5564508E-02	.1422548E-03	.8798610E+04	.5748386E+02

257

I=19

STATION	LOCATION	Y(1)	Y(2)	Y(3)	Y(4)
81	124.526	.5821310E-02	.1497449E-03	.8776181E+04	.5748386E+02
82	124.917	.5681467E-02	.1588727E-03	.8753694E+04	.5748386E+02
83	125.307	.5745379E-02	.1700543E-03	.8731264E+04	.5748386E+02
84	125.698	.5810292E-02	.1839808E-03	.8708775E+04	.5748386E+02
85	126.088	.5889053E-02	.2014601E-03	.8686343E+04	.5748386E+02
86	126.479	.5971652E-02	.2238312E-03	.8663852E+04	.5748386E+02
87	126.869	.6063840E-02	.2527861E-03	.8641417E+04	.5748386E+02
88	126.869	.6063840E-02	.2527861E-03	.8641417E+04	.5748386E+02
89	127.066	.6125777E-02	.3759331E-03	.8630081E+04	.5748386E+02
90	127.066	.6125777E-02	.3759331E-03	.8630081E+04	.5748386E+02
91	128.760	.6885239E-02	.5177966E-03	.8532336E+04	.5748386E+02
92	130.462	.7884213E-02	.6580437E-03	.8434548E+04	.5748386E+02
93	131.499	.8610759E-02	.7496556E-03	.8374806E+04	.5748386E+02
94	132.536	.9438999E-02	.8554749E-03	.8315045E+04	.5748386E+02
95	133.573	.1038501E-01	.9784312E-03	.8255263E+04	.5748386E+02
96	134.610	.1146827E-01	.1122220E-02	.8195457E+04	.5748386E+02
97	135.647	.1271250E-01	.1291550E-02	.8135621E+04	.5748386E+02
98	136.684	.1414694E-01	.1492481E-02	.8075751E+04	.5748386E+02
99	137.721	.1580790E-01	.1732912E-02	.8015840E+04	.5748386E+02
100	138.758	.1774100E-01	.2023266E-02	.7955879E+04	.5748386E+02
101	139.795	.2000416E-01	.2377495E-02	.7895859E+04	.5748386E+02
102	140.832	.2267192E-01	.2814578E-02	.7835766E+04	.5748386E+02

258

I-20

103	141.869	.2584159E-01	.3360786E-02	.7775582E+04	.5748386E+02
104	142.906	.2964219E-01	.4053231E-02	.7715284E+04	.5748386E+02
105	143.943	.3424799E-01	.4945546E-02	.7648840E+04	.5748386E+02
106	145.342	.4211819E-01	.6298380E-02	.7572997E+04	.5748386E+02
107	146.741	.5187083E-01	.7636643E-02	.7490813E+04	.5748386E+02
108	148.140	.6348549E-01	.8960273E-02	.7408293E+04	.5748386E+02
109	149.539	.7694166E-01	.1026921E-01	.7325439E+04	.5748386E+02
110	150.938	.9221872E-01	.1156340E-01	.7242257E+04	.5748386E+02
111	152.337	.1092960E+00	.1284278E-01	.7158748E+04	.5748386E+02
112	153.736	.1281528E+00	.1410729E-01	.7074918E+04	.5748386E+02
113	155.135	.1487682E+00	.1535688E-01	.6990770E+04	.5748386E+02
114	156.534	.1711213E+00	.1659149E-01	.6906307E+04	.5748386E+02
115	157.105	.1807381E+00	.1704574E-01	.6871745E+04	.5748386E+02
116	157.677	.1906050E+00	.1741777E-01	.6837080E+04	.5748386E+02
117	158.248	.2006462E+00	.1772426E-01	.6802441E+04	.5748386E+02
118	158.820	.2108641E+00	.1797981E-01	.6767712E+04	.5748386E+02
119	159.391	.2211969E+00	.1819378E-01	.6733020E+04	.5748386E+02
120	159.963	.2316598E+00	.1837484E-01	.6698247E+04	.5748386E+02
121	160.534	.2421992E+00	.1852851E-01	.6663518E+04	.5748386E+02
122	163.634	.3008282E+00	.1928577E-01	.6474715E+04	.5748386E+02
123	166.734	.3617709E+00	.2002124E-01	.6285493E+04	.5748386E+02
124	169.834	.4249598E+00	.2073488E-01	.6095866E+04	.5748386E+02
125	172.934	.4903271E+00	.2142663E-01	.5905844E+04	.5748386E+02
126	176.034	.5578049E+00	.2209646E-01	.5715441E+04	.5748386E+02
127	179.134	.6273251E+00	.2274431E-01	.5524668E+04	.5748386E+02
128	179.134	.6273251E+00	.2274431E-01	.5524668E+04	.5748386E+02

259

I-21

129	181.315	.6774991E+00	.2329192E-01	.5390222E+04	.5748386E+02
130	181.315	.6774991E+00	.2329192E-01	.5390222E+04	.5748386E+02
131	184.033	.7450186E+00	.2634312E-01	.5221770E+04	.5748386E+02
132	186.750	.8206704E+00	.2929597E-01	.5051905E+04	.5748386E+02
133	189.533	.9063399E+00	.3221888E-01	.4876434E+04	.5748386E+02
134	192.315	.9999650E+00	.3503706E-01	.4699582E+04	.5748386E+02
135	192.315	.9999650E+00	.3503706E-01	.4699582E+04	.5748386E+02
136	192.316	.1000000E+01	.3503756E-01	.1021029E-08	-.1559425E-10

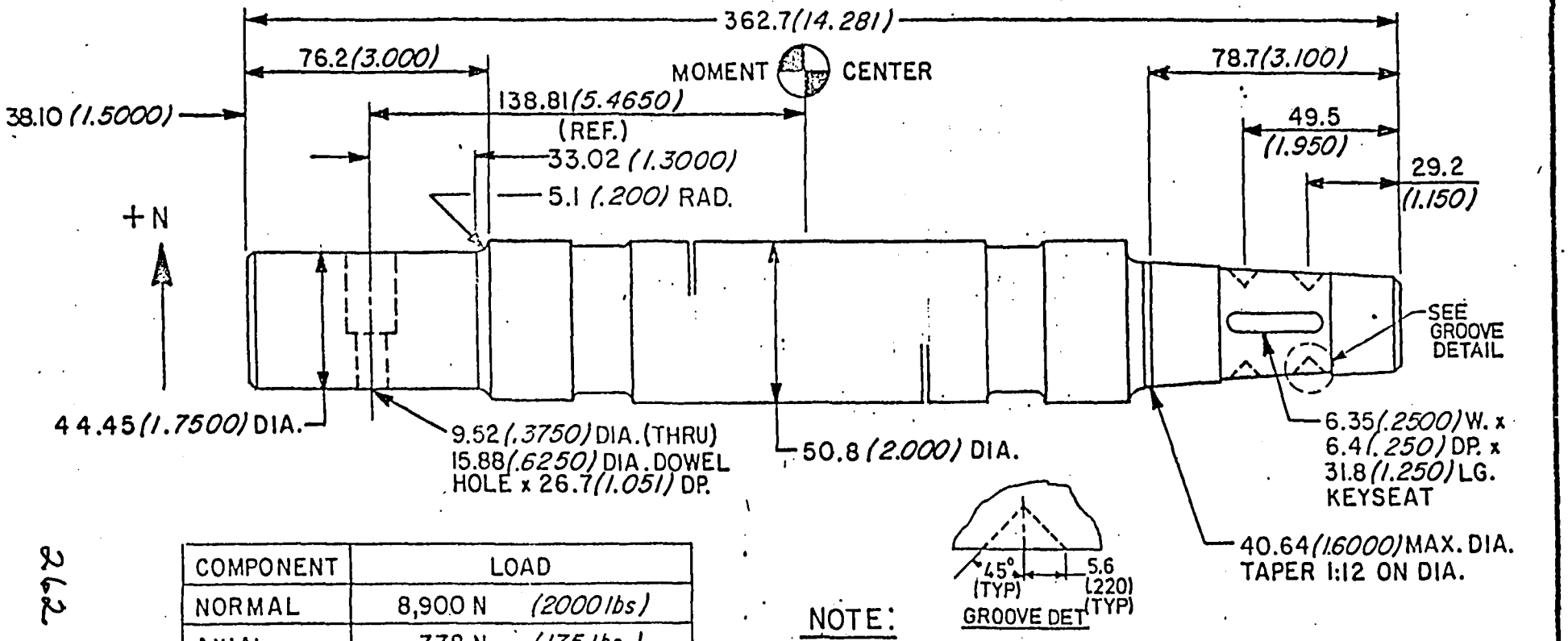
260

I-22

6.0 DRAWINGS

DWG.NO.	TITLE
LA 943298 -	Outline, Balance NTF-105
LA 943372 -	Outline, Balance NTF-107
LA 943343 -	Outline, Balance NTF-108
LE 541032 -	Sting Adapter #1
LD 541034 -	Model Sting #E-1
LD 541033 -	Model Sting #C-2 & E-2
LD 541035 -	Model Sting #C-3 & E-3
LD 541036 -	Model Sting #C-4
LE 996211 -	NTF Roll Drive Center Roll Spindle
LE 1028005 -	NTF Stub Stings Nos. 1 & 2

REC'D 9-15-82



COMPONENT	LOAD
NORMAL	8,900 N (2000 lbs)
AXIAL	778 N (175 lbs.)
PITCH	677,880 N-mm (6000 in. lbs.)
ROLL	338,940 N-mm (3000 in. lbs.)
YAW	338,940 N-mm (3000 in. lbs.)
SIDE	3113 N (700 lbs.)

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS WITH INCH EQUIVALENTS IN PRENTHESES.

10-6-81

MATERIAL: 200 CVM		SCALE: 1/2	
TOLERANCE ON DIMENSIONS UNLESS SHOWN OTHERWISE: X.X (1 DECIMAL PLACE) ± .1; X.XX (2 DECIMAL PLACES) ± .02; X.XXX (3 DECIMAL PLACES) ± .005; ANGULAR ±			
SURFACE FINISH IN MICROINCHES RMS UNLESS SHOWN OTHERWISE: √		EST. FIN. WEIGHT	
DR. WILSON	STRESS		
DES. PATEL	APPD. J. L. Bright OCT 7 1981		
CHK PATEL	APPD. 8-24-82		

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
LANGLEY STATION HAMPTON, VIRGINIA 23665

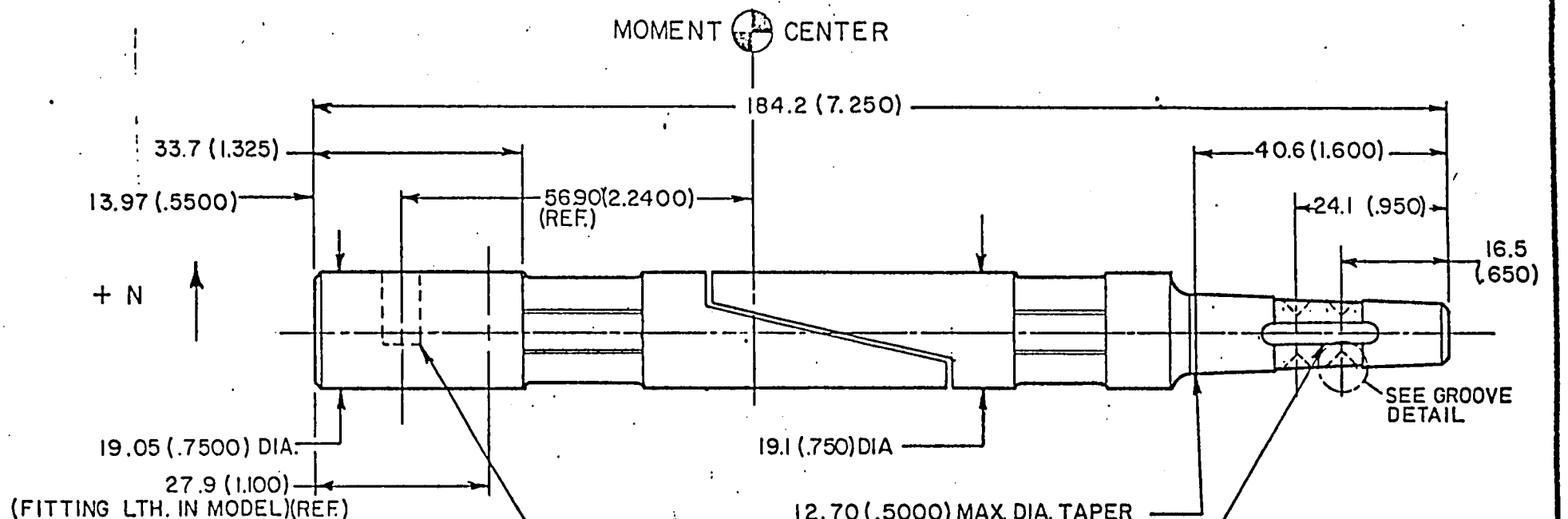
PROJECT TITLE: BALANCE NTF-105

DRAWING TITLE: OUTLINE

PROJECT NO.	BLDG. NO.	LA- 943298
JOB ORDER NO.	SHEET NO.	DRAWING NO.

2 of 2

Recd 9-15-82

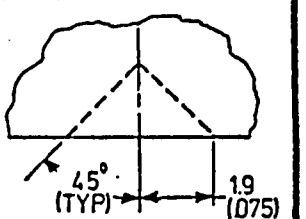


COMPONENT	LOAD
NORMAL	712 N (160 lbs.)
AXIAL	222 N (50 lbs.)
PITCH	28,246 Nmm (250 in. lbs.)
ROLL	11,298 Nmm (100 in. lbs.)
YAW	14,123 Nmm (125 in. lbs.)
SIDE	356 N (80 lbs.)

263

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS WITH INCH EQUIVALENTS IN PARENTHESES.



GROOVE DET.

MATERIAL: 200 CVM

SCALE: 1/1

TOLERANCE ON DIMENSIONS UNLESS SHOWN OTHERWISE
ANGULAR ±
X.X (1 DECIMAL PLACE) ± .1
X.XX (2 DECIMAL PLACES) ± .02
X.XXX (3 DECIMAL PLACES) ± .005

SURFACE FINISH IN MICROINCHES RMS UNLESS SHOWN OTHERWISE

EST. FIN. WEIGHT

DR.	ALJL	STRESS	
DES.	PATEL	APPD.	J. S. Bright 9/7/82
CHK.	J. S. Bright	APPD.	9-22-82

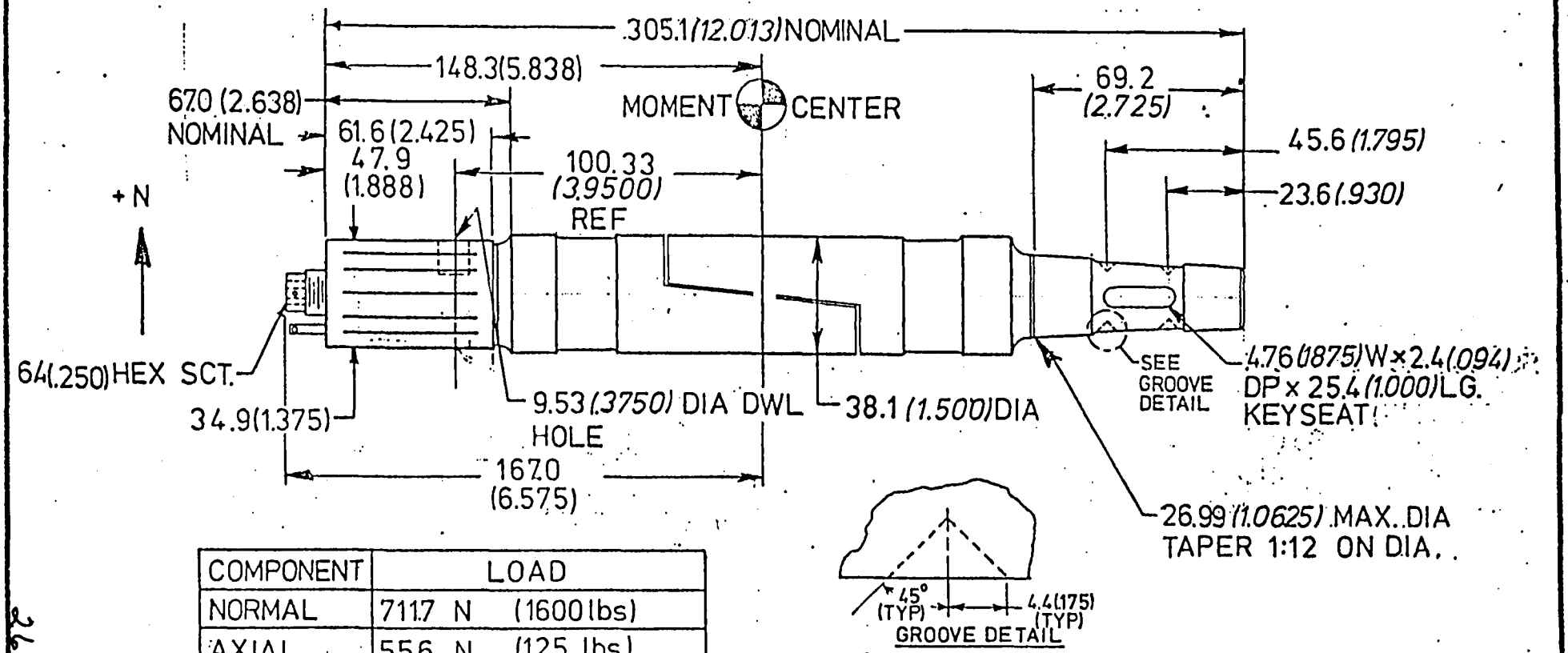
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
LANGLEY STATION HAMPTON, VIRGINIA 23665

PROJECT TITLE: BALANCE NTF-107

DRAWING TITLE: OUTLINE

PROJECT NO.	BLDG. NO.	LA- 943372
JOB ORDER NO	SHEET NO	DRAWING NO.

Recd 9-15-82



COMPONENT	LOAD
NORMAL	711.7 N (1600 lbs)
AXIAL	556. N (125 lbs)
PITCH	338,954 Nmm (3000 in.lbs.)
ROLL	169,477 Nmm (1500 in.lbs.)
YAW	169,477 Nmm (1500 in.lbs.)
SIDE	2224 N (500 lbs.)

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS WITH INCH EQUIVALENTS IN PARENTHESES.

2-24-82

MATERIAL	200 CVM
SCALE	1/2
TOLERANCE ON DIMENSIONS UNLESS SHOWN OTHERWISE	X.X (1 DECIMAL PLACE) ± .1 X.XX (2 DECIMAL PLACES) ± .02 X.XXX (3 DECIMAL PLACES) ± .005
ANGULAR ±	
SURFACE FINISH IN MICROINCHES RMS UNLESS SHOWN OTHERWISE	32
EST. FIN. WEIGHT	
DR. D. L. SPIERS	STRESS
DES. J. BRIGHT	APPD. 3/1/82
CHK. N. PATEL	APPD. 3/19/82

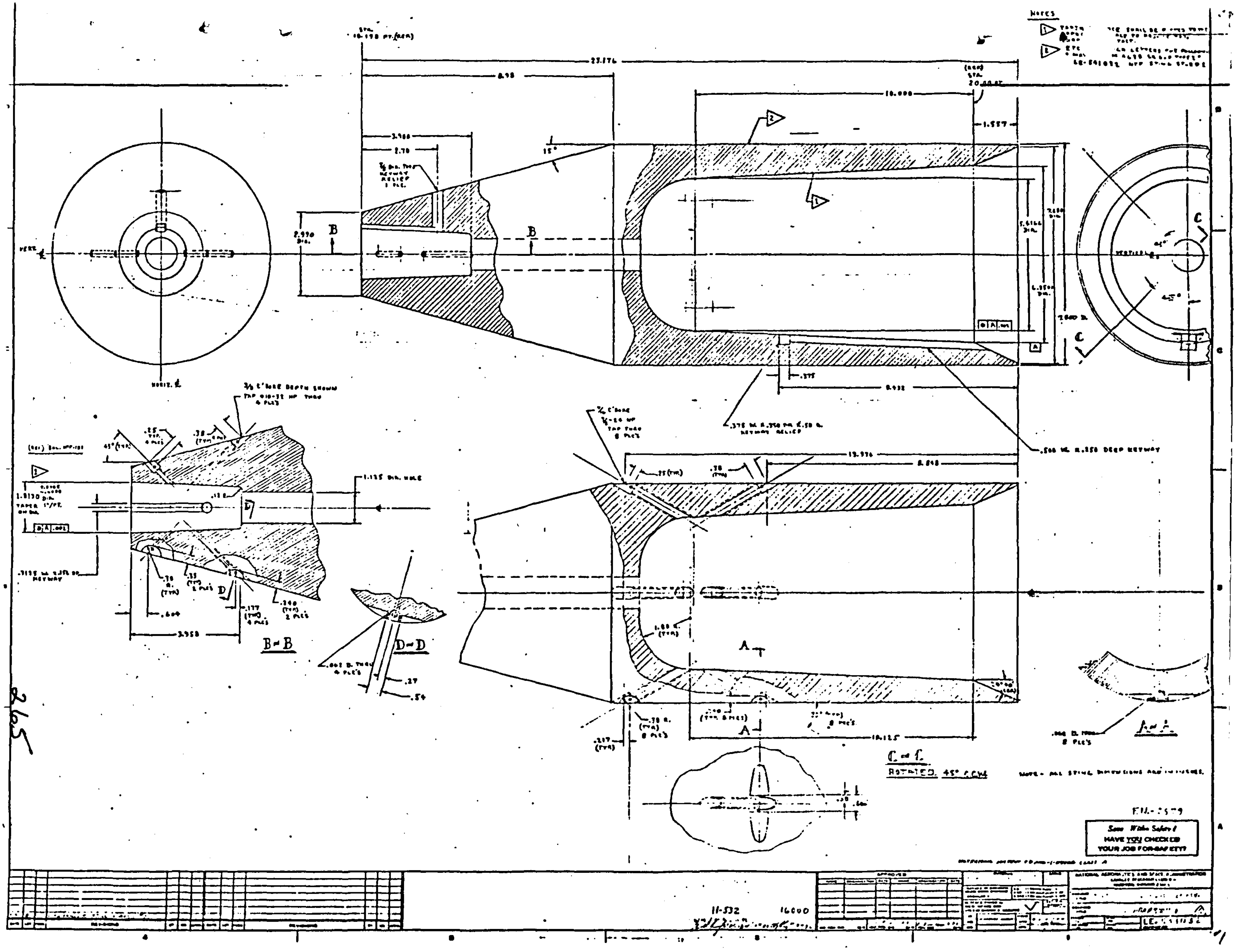
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
LANGLEY STATION HAMPTON, VIRGINIA 23665

PROJECT TITLE: BALANCE NTF-108

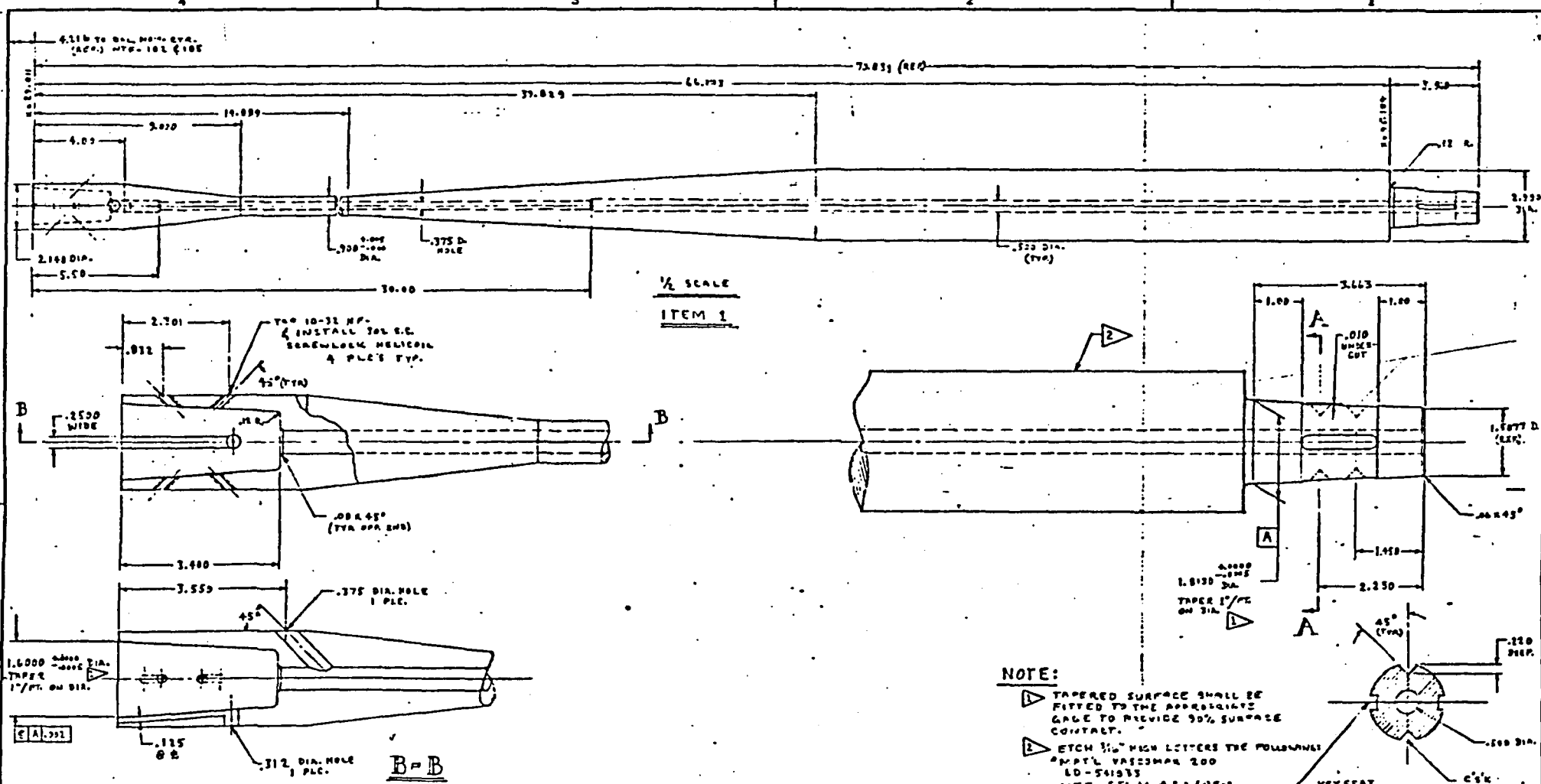
DRAWING TITLE: OUTLINE

PROJECT NO.	BLDG. NO.	LA-943343
JOB ORDER NO	SHEET NO	DRAWING NO.

247



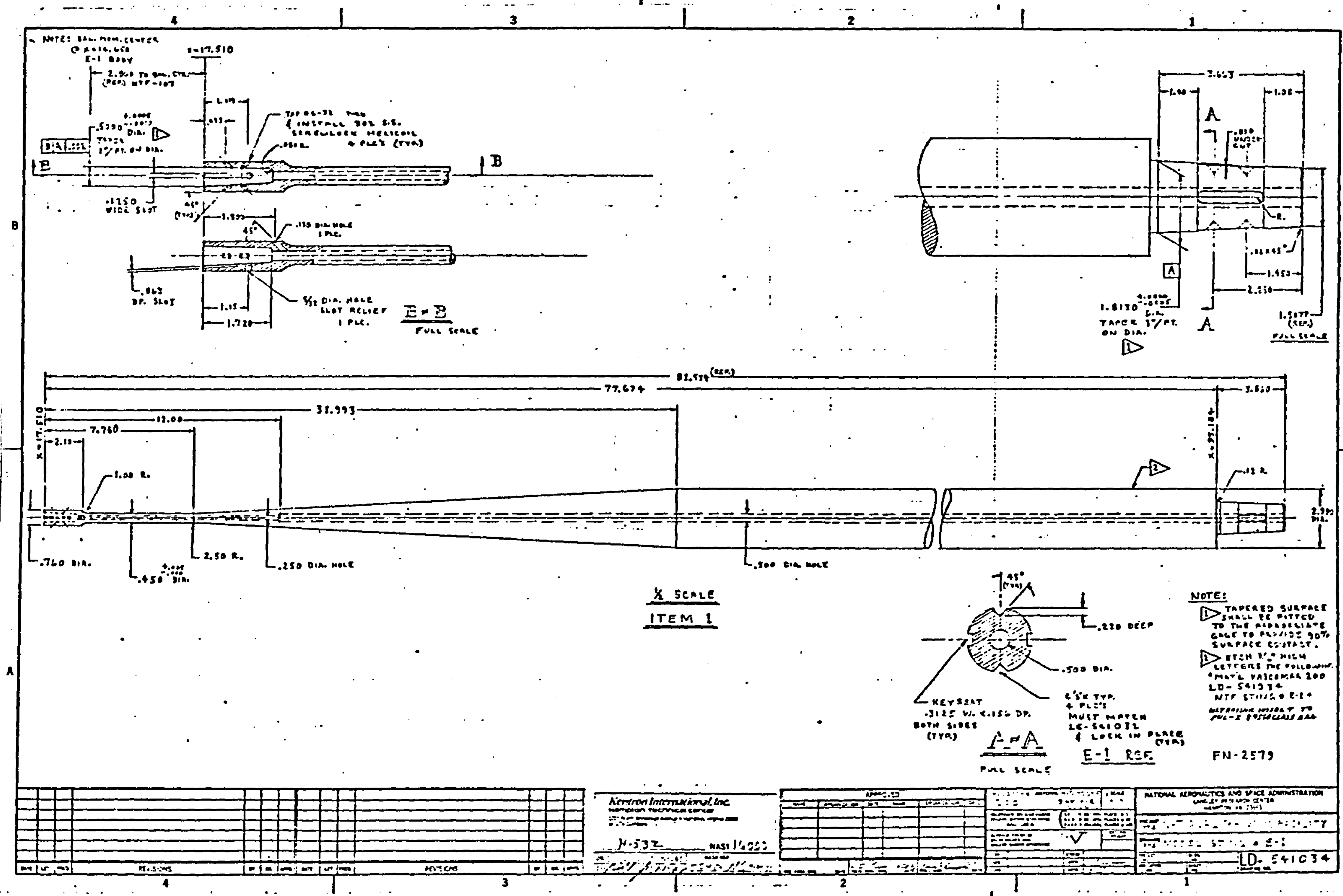
NOTES
23.176
8.95
10.000
1.557
15°
2.990 DIA.
B
B
C
C
.375
8.432
13.976
8.848
10.125
3.958
B-B
D-D
C-C
ROTATED 45° CCW
A-A
NOTE - ALL STING DIMENSIONS ARE IN INCHES.
HAVE YOU CHECKED YOUR JOB FOR SAFETY?
11-532
16000

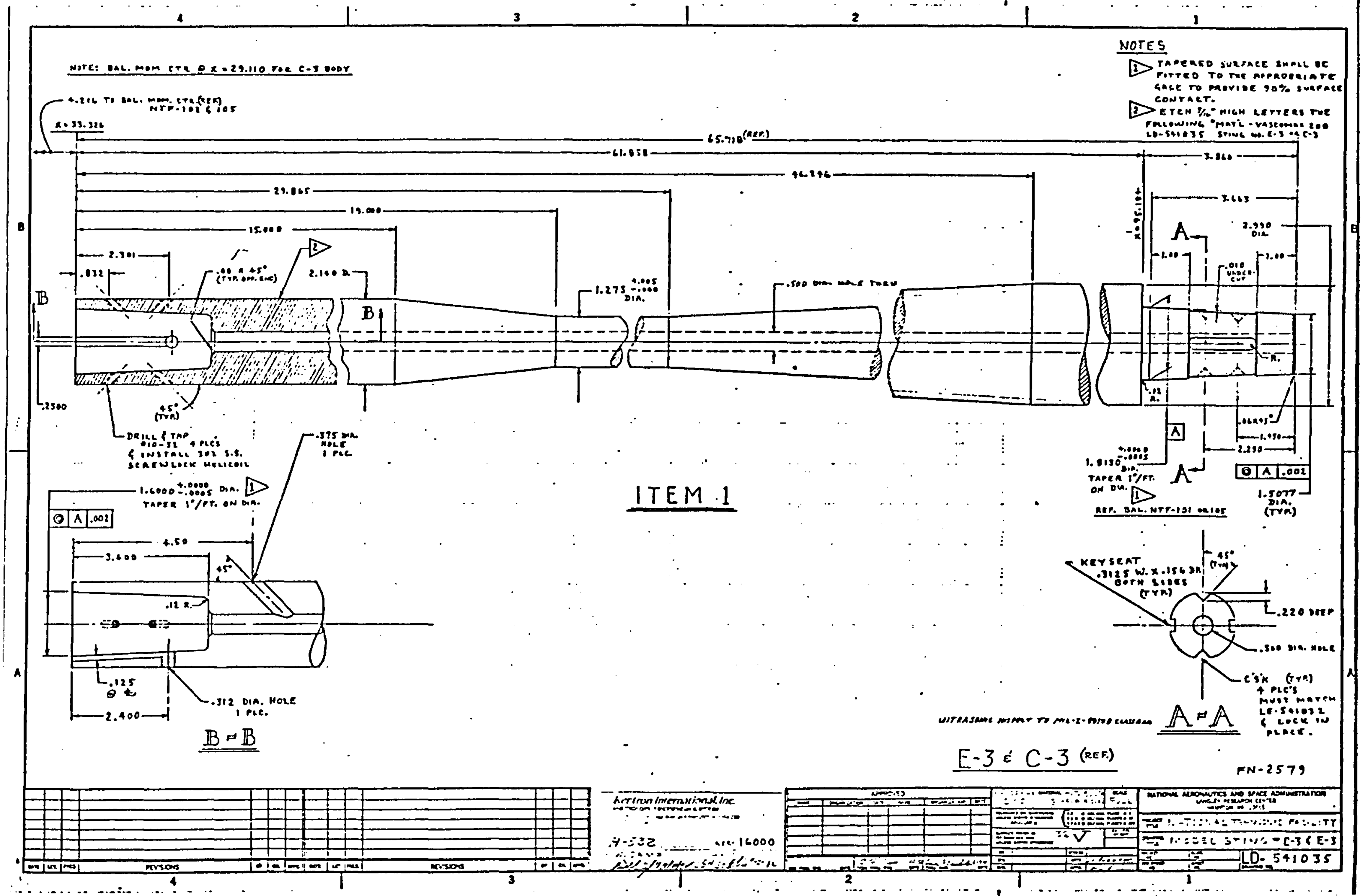


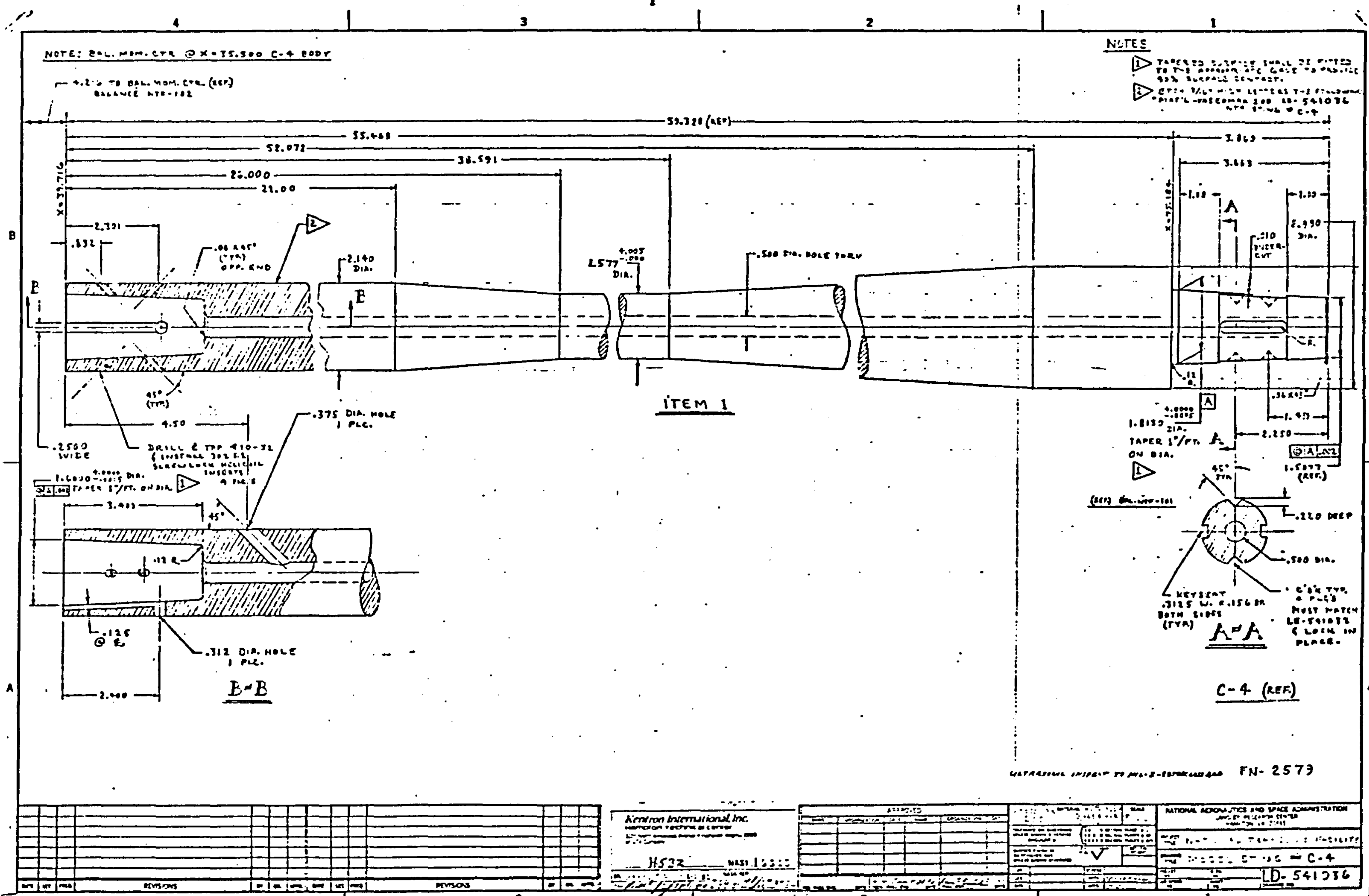
FII-2579

Kenton International, Inc.

LD-541033


E-B
FULL SCALE
A-A
FULL SCALE
½ SCALE
ITEM 1
.760 DIA.
.250 DIA. HOLE
.500 DIA. HOLE
2.50 R.
1.00 R.
77.674
38.993
12.00
7.760
3.810
.220 DEEP
.500 DIA.
KEYSEAT
BOTH SIDES
(TYP.)
NOTE:
TAPERED SURFACE SHALL BE FITTED TO THE APPROPRIATE GAGE TO PROVIDE 90% SURFACE CONTACT.
E-1 REF.
FN-2579
Kentron International, Inc.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LD-541034


NOTES
TAPERED SURFACE SHALL BE FITTED TO THE APPROPRIATE GAGE TO PROVIDE 90% SURFACE CONTACT.
ETCH 1/16" HIGH LETTERS THE FOLLOWING
NOTE: BAL. MOM CTR @ X = 29.110 FOR C-3 BODY
65.718 (REF.)
61.858
46.396
29.865
19.000
15.000
2.301
.832
1.273
DIA.
.500 DIA. HOLE THRU
3.860
3.663
2.990 DIA.
.010 UNDER-CUT
.2500
45° (TYP.)
DRILL & TAP
INSTALL 303 S.S. SCREWLOCK HELICOIL
.375 DIA. HOLE 1 PLC.
1.6000 +.0000 -.0005 DIA.
TAPER 1°/FT. ON DIA.
.002
4.50
3.400
.12 R.
45°
.125
2.400
.312 DIA. HOLE 1 PLC.
B - B
ITEM 1
1.8130 +.0000 -.0005 DIA.
TAPER 1°/FT. ON DIA.
1.5077 DIA. (TYP.)
2.250
KEYSEAT .3125 W. X .1563 R. BOTH SIDES (TYP.)
45° (TYP.)
.220 DEEP
.500 DIA. HOLE
C'S'K (TYP.) 4 PLC'S
A - A
E-3 & C-3 (REF.)
FN-2579
REVISIONS
Kentron International, Inc.
16000
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MODEL STING
LD-541035



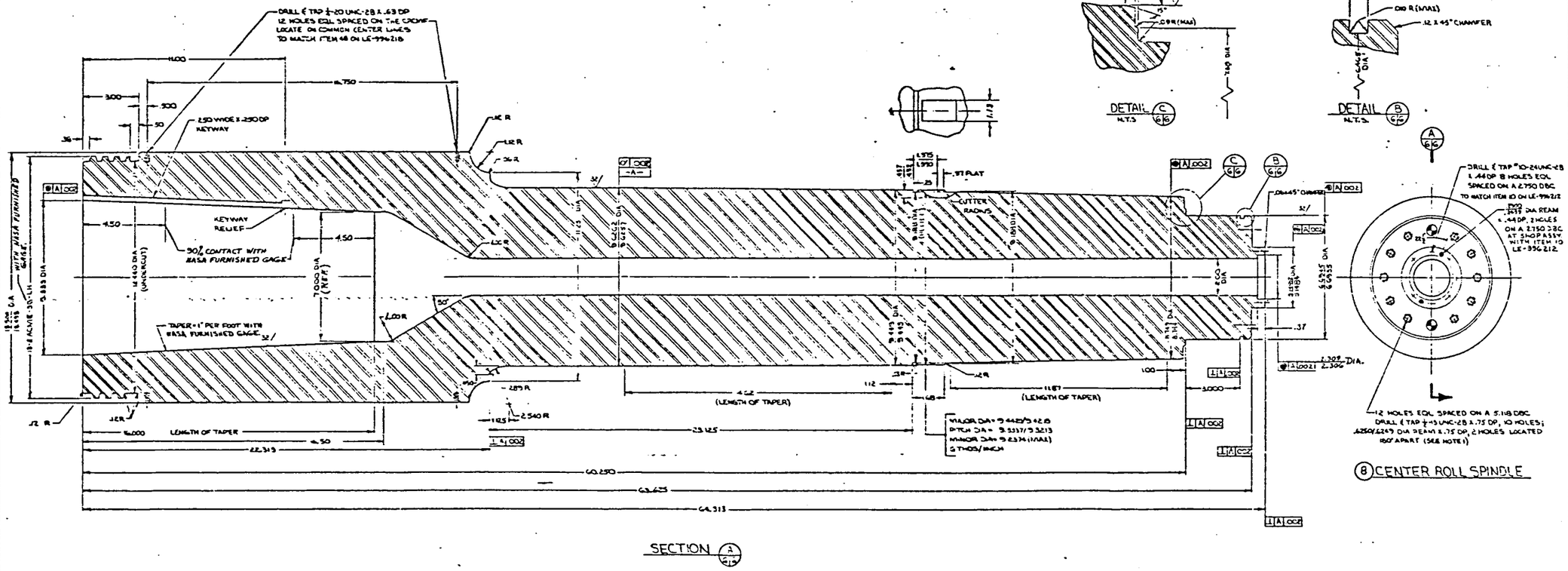
NOTES
ITEM 1
B-B
A-A
C-4 (REF.)
.375 DIA. HOLE 1 PLC.
.312 DIA. HOLE 1 PLC.
.500 DIA.
.220 DEEP
FN- 2579
Kentron International, Inc.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LD- 541036

269

NOTES

1. HARMONIC DRIVE (ITEM 13 ON LE-996218), HARMONIC DRIVE SPACER (ITEM 44 ON LE-996213) AND CENTER ROLL SPINDLE SHALL BE DOWELLED AT ASSEMBLY.

2. MATERIAL SHALL BE A PRECIPITATION HARDENING IRON BASE SUPERALLOY FORGING CONFORMING TO THE REQUIREMENTS OF ASTM A638 GRADE 660 TYPE 2 (SEE PARAGRAPH 3.3.1 OF SPECIFICATIONS.)



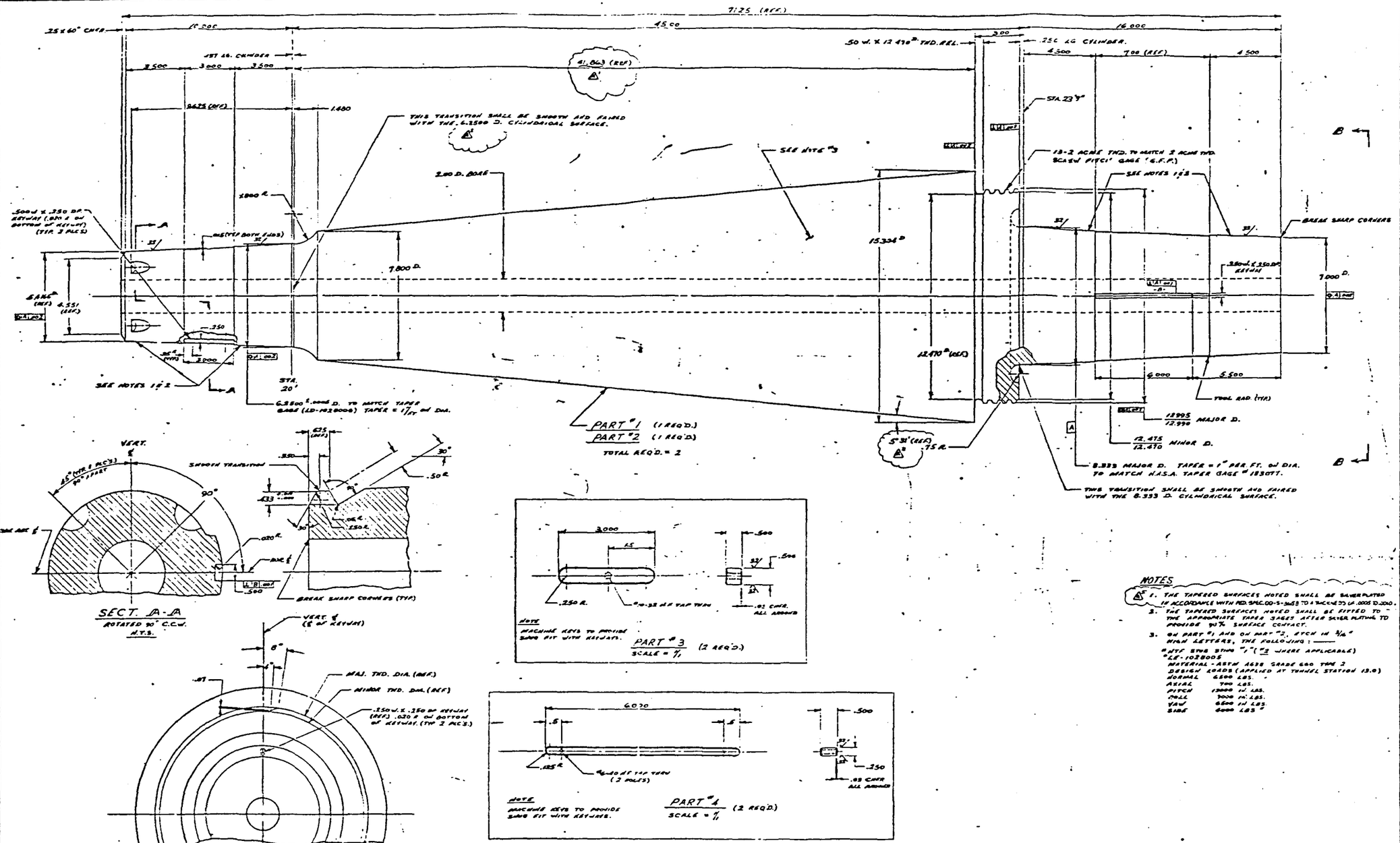
CONFIGURATION CONTROLLED DOCUMENT

SEE LE-996250 FOR ASSEMBLY

L. E. M. ASSOCIATES
ENGINEERING INCORPORATED, PC
STRUCTURAL • MECHANICAL • MARINE

SEE NOTE 2

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NATIONAL TRANSONIC FACILITY
ROLL DRIVE CENTER ROLL SPINDLE
LE-99621I



NOTES

1. THE TAPERED SURFACES NOTED SHALL BE SILVER PLATED IN ACCORDANCE WITH FED. SPEC. QQ-S-365 TO A THICKNESS OF .0005 TO .0010.
2. THE TAPERED SURFACES NOTED SHALL BE FITTED TO THE APPROPRIATE TAPER GAGES AFTER SILVER PLATING TO PROVIDE 90% SURFACE CONTACT.
3. ON PART #1 AND ON PART #2, ETCH IN 3/16" HIGH LETTERS, THE FOLLOWING: ——
   "NTF STUB STUB #1 (#2 WHERE APPLICABLE)
   "LE-102800S
   MATERIAL - ASTM A579 GRADE 660 TYPE 3
   DESIGN LOADS (APPLIED AT TUNNEL STATION 13.0)
   NORMAL 6500 LBS.
   AXIAL 700 LBS.
   PITCH 17000 IN. LBS.
   ROLL 7000 IN. LBS.
   YAW 6500 IN LBS
   SIDE 6000 LBS"

CONFIGURATION CONTROLLED DOCUMENT

Save With Safety!
HAVE YOU CHECKED YOUR JOB FOR SAFETY?

REVISIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
HAMPTON, VIRGINIA 23665

PROJECT TITLE: NATIONAL TRANSONIC FACILITY

DRAWING TITLE: STUB STUBS #1 & #2

LE-102800S

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (*Leave blank*)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	April 1983	Contractor Report

4. TITLE AND SUBTITLE
Divergence Analysis Report for the Bodies of Revolution Model Support Systems

5. FUNDING NUMBERS
NAS1-16331

6. AUTHOR(S)
Larry C. Rash

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Wyle Laboratories
3200 Magruder Blvd.
Hampton, VA 23666

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
National Aeronautics and Space Administration
Langley Research Center
Hampton, VA 23681-0001

10. SPONSORING / MONITORING AGENCY REPORT NUMBER
NASA CR-198219

11. SUPPLEMENTARY NOTES
Langley Technical Monitor: Ed Bruce

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Unclassified-Unlimited
Subject Category 08

12b. DISTRIBUTION CODE

13. ABSTRACT (*Maximum 200 words*)

This report documents the sting divergence analyses of nine different model and model support systems that were performed in preparation for a series of wind tunnel tests at the National Transonic Facility at NASA Langley Research Center in Hampton, Virginia. The models were missile shaped bodies of revolution and the model support systems included a force and moment balance and tapered sting sections. The sting divergence results were obtained from a computer program that solved a two-point boundary value problem which used a second order Runge-Kutta integration technique. The computer solution was based on constant section properties between discrete stations along the sting sections, a procedure was developed and included to evaluate the properties for the minimum number of stations along the tapered sections that would produce no more than one half of one percent error in the divergence results. Also included in the report are development of the aerodynamic input data, listings of all input and output computer data, and summary sheets that highlight the input and the critical sting divergence dynamic pressure for each respective configuration.

14. SUBJECT TERMS	15. NUMBER OF PAGES
Analysis; Bodies of Revolution	275
	16. PRICE CODE: A12

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	Unlimited