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NASA CR-132684

A NUMERICALLY EFFICIENT FINITE ELEMENT HYDROELASTIC ANALYSIS

Volume II: Implementation in NASTRAN

PART I

by

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November 1974

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FOREWORD

The work described in this report was performed at the Grumman Aerospace Corporation, Bethpage, New York, and administered by the Vibration Section of the Structures and Dynamics Division, NASA Langley Research Center, Hampton, Virginia.

The work performed under NASA Contract NAS1-10635-21 with supplementary funding provided by the Space Division, Rockwell International (POM3WXMZ-483002) included development of a fundamental finite element hydroelastic formulation applicable to NASTRAN, implementation of the theoretical developments into NASTRAN and verification, and demonstration of the new technique on various problems including the 1/8-scale space shuttle external tank model.

Volume II

ABSTRACT

A fundamental reformulation of the NASTRAN hydroelastic analysis is developed in Volume I on the basis of Toupin's complementary variational principle of classical mechanics and on the basis of a physical interpretation of the NASTRAN fluid matrix equations. Emphasis is placed on the special case of an incompressible fluid model which is applicable to propellant tank hydroelastic analysis. A concise fluid inertia representation results from the assumption of incompressibility and the NASTRAN hydroelastic equations reduce to a simplified form associated with non-fluid structures. The efficiency of the incompressible hydroelastic formulation is enhanced for both fluid and structure by introduction of harmonic reduction as an alternative to Guyan reduction. The theoretical developments are implemented in NASTRAN by use of ALTER-DMAP statements and the modified NASTRAN hydroelastic analysis technique is verified and demonstrated as an efficient and accurate approach by several illustrative problems.

In Volume II the detailed modifications to the NASTRAN hydroelastic analysis are described. The DMAP operations are listed and applied to the 1/8-Scale Shuttle Model External Tank. The resulting mode shapes and frequencies are compared with experimental results.

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VOLUME II CONTENTS (Cont)

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VOLUME II ILLUSTRATIONS (Cont)

VOLUME II ILLUSTRATIONS (Cont)

VOLUME II ILLUSTRATIONS (Cont)

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Volume II

1 - INTRODUCTION

A numerically efficient finite element hydroelastic analysis technique and a special purpose reduction technique for geometrically axisymmetric structures have been developed and presented in Volume I (low number NASA CR to be published). While the formulation is quite general, it is particularly applicable to the NASTRAN program which contains a set of fluid finite elements currently limited to axisymmetric geometry. The present report contains details of the implementation of the new formulation into NASTRAN including descriptions of the DMAP statements required for conversion of the program and details pertaining to problem definition and bulk data considerations. Details of the current 1/8-scale space shuttle external tank mathematical model, numerical results and analysis/test comparisons are also presented. The appendices include a description and listing of a FORTRAN program used to develop harmonic transformation bulk data (multipoint constraint statements) and sample bulk data information for a number of hydroelastic problems.

2 - MODIFICATION OF THE NASTRAN HYDROELASTIC ANALYSIS

Modification of the NASTRAN hydroelastic analysis according to the theoretical considerations discussed previously has been implemented by the use of ALTER-DMAP statements in Rigid Formats 7 (complex eigenvalue analysis), 3 (normal modes analysis), and 13 (undamped vibration analysis with static pre-load effects).* Rigid Format 7 has been modified and condensed considerably since its function in the present application is to calculate fluid matrix data. The fluid matrix data formed in Rigid Format 7 is output onto cards or tape and used as input data for a normal modes analysis in either Rigid Format 3 or 13. Rigid Format 3 is used in cases where differential stiffness due to pressurization and/or fluid weight is negligible and Rigid Format 13 is used when such effects are significant. The modifications in Rigid Formats 3 and 13 are minimal, consisting of the addition of the fluid mass matrix to the structural mass matrix in the analysis set and the recovery of pressure and dependent displacement data after calculation of the modal solutions. In addition to the modifications of the Rigid Formats, special bulk data information must be formed to perform the operations required in the present applications.

2.1 DESCRIPTION OF DMAP OPERATIONS FOR FORMULATION OF FLUID DATA

The following is an outline of the major operations performed in Rigid Format 7 for the preparation of fluid matrix data. Operations utilized in both the general case (gravitational and/or ullage stiffness included) and the special case (zero free surface pressure) are presented.

3. GP1 generates coordinate system transformation matrices, tables of grid point locations, and tables for relating internal and external grid point numbers.

8. GP2 generates Element Connection Table with internal indices.

23. TA1 generates element tables for use in matrix assembly and stress recovery.

---

*Note: Rigid Format 13, although not documented in the latest NASTRAN manuals is included in the level 15 series programs.

28. SMA1 generates stiffness matrix $\left[K^{X}_{gg}\right]$, structural damping matrix $\left[K^{4}_{gg}\right]$ and Grid Point singularity Table.

42. Equivalence $\left[K^{X}_{gg}\right]$ to $\left[K_{gg}\right]$ if no general elements.

44. Go to DMAP No. 47 if no general elements.

45. SMA3 adds general elements to $\left[K^{X}_{gg}\right]$ to obtain stiffness matrix $\left[K_{gg}\right]$.

49. GP4 generates flags defining members of various displacement sets (USET) and forms multipoint constraint equations $\left[R_g\right]\left\{u_g\right\} = 0$.

52. Equivalence $\left[K_{gg}\right]$ to $\left[K_{nn}\right]$, $\left[M_{gg}\right]$ to $\left[M_{nn}\right]$, $\left[B_{gg}\right]$ to $\left[B_{nn}\right]$ and $\left[K^{4}_{gg}\right]$ to $\left[K^{4}_{nn}\right]$ if no multipoint constraints.

54. Go to DMAP No. 59 if general elements present.

55. Go to DMAP No. 59 if no structural elements.

56. GPSP determines if possible grid point singularities remain.

57. OFP formats table of possible grid point singularities and places it on the system output file for printing.

60. Go to DMAP No. 65 if MCE1 and MCE2 have already been executed for current set of multipoint constraints.

61. MCE1 partitions multipoint constraint equations $\left[R_g\right] = \left[R_m \mid R_n\right]$ and solves for multipoint constraint transformation matrix $\left[G_m\right] = -\left[R_m\right]^{-1}\left[R_n\right]$.

63. MCE2 partitions stiffness, matrix

$$K_{gg} = \begin{bmatrix} \overline{K}_{nn} & K_{nm} \\ K_{mn} & K_{mm} \end{bmatrix}$$

and performs matrix reduction

$$\left[K_{nn}\right] = \left[K_{nn}\right] + \left[G^{T}_{m}\right]\left[K_{mn}\right] + \left[K^{T}_{mn}\right]\left[G_m\right] + \left[G^{T}_{m}\right]\left[K_{mm}\right]\left[G_m\right],$$

66. Equivalence $\left[K_{nn}\right]$ to $\left[K_{ff}\right]$, if no single-point constraints.

68. Go to DMAP No. 71 if no single-point constraints.

69. SCE1 partitions out single-point constraints

$$K_{nn} = \begin{bmatrix} K_{ff} & K_{fs} \\ K_{sf} & K_{ss} \end{bmatrix}$$

72. Equivalence $\left[K_{ff}\right]$ to $\left[K_{aa}\right]$ if no omitted coordinates.

74. Go to DMAP No. 88 if no omitted coordinates.

95. BMG generates DMIG card images describing the interconnection of the fluid and the structure.

100. MTRXIN generates fluid boundary matrices $A_{b,f\ell}$ and $K_{b,f\ell}$ if a fluid structure interface is defined. The matrix $K_{b,f\ell}$ is generated only for a nonzero gravity in the fluid.

104. Go to next DMAP instruction if cold start or modified restart. LBL13 will be altered by the Executive System to the proper location inside the loop for unmodified starts within the loop.

105. Beginning of loop for additional sets of direct input matrices.

107. CASE extracts user requests from CASECC for current loop.

110. MTRXIN selects the direct input matrices for current loop, $\left[K_{pp}^{2d}\right]$.

114. Equivalence $\left[K_{pp}^{2d}\right]$ to $\left[K_{pp}^{2x}\right]$ of no $\left[K_{b,f\ell}\right]$

115. Go to DMAP No. 112 if no $\left[K_{b,f\ell}\right]$.

116. Equivalence $\left[K_{b,f\ell}\right]$ to $\left[K_{pp}^{2x}\right]$ if no $\left[K_{pp}^{2d}\right]$.

117. Go to DMAP No. 112 if no $\left[K_{pp}^{2d}\right]$.

118. ADD assembles matrix $\left[K_{pp}^{2x}\right] = \left[K_{b,f\ell}\right] + \left[K_{pp}^{2d}\right]$.

122. ADD subtracts $\left[A_{b,f\ell}\right]$ from $\left[K_{pp}^{2x}\right]$ to obtain $\left[K_{pp}^{2}\right]$.

130. Equivalence $\left[K^2_{pp}\right]$ to $\left[K^2_{dd}\right]$ if no constraints applied.

The following set of statements is utilized when either gravitational stiffness is included in the analysis or free surface displacement data is desired. Copies of the ALTER-DMAP statements and the complete DMAP listing are presented in Figs. 2-1 and 2-2, respectively

136a. Partition $\left[K_{dd}\right]$ to form the fluid inertance matrix $\left[K_{bp}\right]$, the surface area matrix $\left[A_{em}\right]$ and the surface gravitational stiffness matrix $\left[K_e\right]$

$$\left[K_{dd}\right] = \begin{bmatrix} K_{bp} & 0 \\ A_{em} & K_e \end{bmatrix}$$

The vector $\left\{P_9\right\}$ partitions the "d" set as follows

$$\begin{Bmatrix} p \\ \overline{u} \end{Bmatrix}$$

136b. Partition $\left[K_{bp}\right]$ to form free surface and structural interface matrices (Note: in the case where gravitational effects are included the free surface pressure subset consists of a single zeroth harmonic pressure)

$$K_{bp} = \begin{bmatrix} K_{11} & K_{12} \\ K_{21} & K_{22} \end{bmatrix}$$

136c. Partition $\left[A_{em}\right]$ to form free surface and structural interface matrices (Note: in the case where gravitational effects are included the free surface displacement subset consists of a single zeroth harmonic displacement)

$$A_{em} = \begin{bmatrix} A_{1m} & 0 \\ 0 & A_{2m} \end{bmatrix}$$

136d. Partition K_e to form free surface and structural interface matrices

$$K_e = \begin{bmatrix} K_{e11} & 0 \\ 0 & K_{e22} \end{bmatrix}$$

136e. Calculate the transpose of A_{2m}, A_{2m}^T

136f. Solve for the pressure deviation recovery matrix

$$\left[P_{du2}\right] = \left[K_{22}\right]^{-1} \left[A_{2m}^T\right]$$

136g. Calculate the symmetric fluid mass matrix

$$\left[M_{fLd}\right] = \left[A_{2m}\right] \left[P_{du2}\right]$$

136k,l. Solve $\left[M_2\right] = \left[A_{1m}\right]^{-1} \left[K_{12}\right]$

and form the displacement recovery matrix

$$\left[T_{u12}\right] = \left[M_2\right] \left[P_{du2}\right]$$

136m. Output onto cards or tape: $\left[M_{fld}\right]$, $\left[P_{du2}\right]$, $\left[T_{u12}\right]$ *

136n. Form the reduced gravity stiffness matrix

$$\left[K_{eb}\right] = \left[T_{u12}{}^T\right]\left[K_{e11}\right] \left[T_{u12}\right] + \left[K_{e22}\right]$$

136o. Solve for the pressure recovery matrix (for the case of nonzero gravitational stiffness)

$$\left[C_{p2}\right] = - \left[K_{22}{}^{-1}\right] \left[K_{21}\right]$$

136p. Output into cards or tape

$$\left[K_{eb}\right], \left[K_{11}\right], \text{ and } \left[C_{p2}\right]$$

170. EXIT

---

*OUTPUT 3 for punched card DMI output is utilized in the listings presented in this report; if tape output is desired OUTPUT 1 should be used.

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N A S T R A N E X E C U T I V E C O N T R O L D E C K E C H O

```
ID HYDRO,COPPOLINO
APP DISP
SOL 7,G
TIME 5
CHKPNT YES
DIAG 7,8,13,14,19,21,22
ALTER 50
MATGPR GPL,USET,SIL,MGG//C,N,G
MATGPR GPL,USET,SIL,KGG//C,N,G
ALTER 73
MATGPR GPL,USET,SIL,MFF//C,N,F
MATGPR GPL,USET,SIL,KFF//C,N,F
ALTER 101
MATGPR GPL,USET,SIL,AMFL//C,N,P
MATGPR GPL,USET,SIL,K3FL//C,N,P
ALTER 122
ADD A3FL,M2DPP/M2PP/V,N,MFACT $
ALTER 123,124
ALTER 136
MATGPR GPLD,USETD,SILD,MDD//C,N,D
MATGPR GPLD,USETD,SILD,KDD//C,N,D
SEEMAT MGG,KGG,MFF,KFF,AMFL//C,N,PRINT
SEEMAT KBFL,MDD,KDD,,//C,N,PRINT
PARTN KDD,PD,/KBP,AEM,,KE/C,N,-1 $
PARTN KBP,GD,/K11,K21,K12,K22/C,N,-1 $
PARTN AEM,GD,UP/A1M,,,A2M/C,N,1 $
PARTN KE,UP,/KE1,,,KE2/C,N,-1 $
TRNSP A2M/A2MT $
SOLVE K22,A2MT/PDU2/C,N,1/C,N,-1 $
SOLVE A1M,K12/M2L/C,N,1 $
MPYAD M2L,PDU2,/TU12/C,N,0/C,N,-1 $
ADD PDU2,/PDU3/C,Y,ASSS=(1.0,0.0) $
PARAM //C,N,NOP/V,N,TRUE=-1 $
EQUIV PDU3,PDU2/TRUE $
COND PDUNCS,TRUE $
MATPRN PDU3,,,,// $
LABEL PDUNCS $
MPYAD A2M,PDU2,/MFLD/C,N,0/C,N,-1 $
OUTPUT3 MFLD,PDU2,TU12,,//C,N,0/C,Y,N1=AMF/C,Y,N2=APD/C,Y,N3=ATU $
SMPYAD TU12,KE1,TU12,,,KE2/KEB/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
SOLVE K22,K21/CP2/C,N,1/C,N,-1 $
MATPRN K11,K12,K22,,// $
MATPRN A1M,A2M,KE1,,// $
MATPRN PDU2,MFLD,TU12,,// $
MATPRN KEB,K11,CP2,,// $
LABEL ERROR3 $
ALTER 137,170
EXIT
ENDALTER
```

Fig. 2-1 Rigid Format 7 ALTER-DMAP Statements (with Free Surface Displacement Recovery)

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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
   1  BEGIN     NO.7 DIRECT COMPLEX EIGENVALUE ANALYSIS - SERIES M1 $
   2  FILE      KGGX=TAPE/ KGG=TAPE/ GOD=SAVE/ GMD=SAVE $
   3  GP1       GEOM1,GECM2,/GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL/V,N,LUSET/  C,N,
                123/V,N,NOGPDT $
   4  SAVE      LUSET,NOGPDT $
   5  PURGE     USET,GM,GO,KAA,BAA,MAA,K4AA,KFS,EST,ECT,PLTSETX,PLTPAR,GPSETS,
                ELSETS/NOGPDT $
   6  CHKPNT    GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL,USET,GM,GO,KAA,BAA,MAA,K4AA,EST,
                ECT,PLTSETX,PLTPAR,GPSETS,ELSETS $
   7  COND      LBLS,NOGPDT $
   8  GP2       GEOM2,EQEXIN/ECT $
   9  CHKPNT    ECT $
  10  PLTSET    PCDB,EQEXIN,ECT/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,NSIL/  V,N,
                JUMPPLOT $
  11  SAVE      NSIL,JUMPPLOT $
  12  PRTMSG    PLTSETX// $
  13  SETVAL    //V,N,PLTFLG/C,N,1/V,N,PFILE/C,N,0 $
  14  SAVE      PLTFLG,PFILE $
  15  COND      P1,JUMPPLOT $
  16  PLOT      PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,/PLOTX1/ V,N,
                NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
  17  SAVE      PFILE $
  18  PRTMSG    PLOTX1// $
  19  LABEL     P1 $
  20  CHKPNT    PLTPAR,GPSETS,ELSETS $
  21  GP3       GEOM3,EQEXIN,GECM2/,GPTT/C,N,123/V,N,NOGRAV/C,N,123 $
  22  CHKPNT    GPTT $
```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 1 of 8)

```
    N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
 NO.

 23  TA1      ,ECT,EPT,BGPDT,SIL,GPTT,CSTM/EST,,CEI,ECPT,GPCT/V,N,LUSET/ C,N,
              123/V,N,NOSIMP=-1/C,N,0/V,N,NOGENL=-1/V,N,GENEL $

 24  SAVE     NOSIMP,NOGENL,GENEL $

 25  PURGE    K4GG,GPST,DGPST,MGG,EGG,K4NN,K4FF,K4AA,BNN,BFF,BAA,ENN,EFF,EAA,
              KGGX/NOSIMP / DGPST/GENEL $

 26  CHKPNT   EST,ECPT,GPCT,CEI,K4GG,GPST,MGG,EGG,KGGX,DGPST,  K4NN,K4FF,
              K4AA,BNN,BFF,BAA,ENN,EFF,EAA $

 27  COND     LBL1,NOSIMP $

 28  SMA1     CSTM,MPT,ECPT,GPCT,DIT/KGGX,K4GG,GPST/V,N,NOGENL/V,N,NCK4GG $

 29  SAVE     NOK4GG $

 30  PURGE    K4NN,K4FF,K4AA/NCK4GG $

 31  CHKPNT   KGGX,GPST,K4GG,K4NN,K4FF,K4AA $

 32  SMA2     CSTM,MPT,ECPT,GPCT,DIT/MGG,EGG/V,Y,WTMASS=1.0/V,N,NOMGG/   V,N,
              NOBGG=-1/V,Y,CDUMMASS/V,Y,CPBAR/V,Y,CPROD,/V,Y, CPQUAD1/  V,Y,
              CPQUAD2/V,Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPQDPLT/ V,Y,
              CPTRPLT/V,Y,CPTRBSC $

 33  SAVE     NOMGG,NOBGG $

 34  PURGE    BNN,BFF,BAA/NOBGG/ENN,EFF,EAA/NOMGG $

 35  CHKPNT   MGG,BNN,BFF,BAA,EGG,ENN,EFF,EAA $

 36  COND     LBL1,GRDPNT $

 37  COND     ERROR3,NOMGG $

 38  GPWG     BGPDT,CSTM,EQEXIN,MGG/OGPWG/V,Y,GRDPNT=-1/V,Y,WTMASS $

 39  OFP      OGPWG,,,,,,//V,N,CARDNO $

 40  SAVE     CARDNO $

 41  LABEL    LBL1 $

 42  EQUIV    KGGX,KGG/NOGENL $

 43  CHKPNT   KGG $

 44  COND     LBL11,NOGENL $
```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 2 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.

 45  SHA3      GET,KGG,//KGG/V,N,LUSET/V,N,NOGENL/V,N,NCSIMP $

 46  CHKPNT    KGG $

 47  LABEL     LBL11 $

 48  PARAM     //C,N,MPY/V,N,NSKIP/C,N,C/C,N,C $

 49  GP4       CASECC,GECOM,EQEXIN,SIL,GPDT/BG,,USET,//V,N,LUSET/V,N,MPCF1/ V,
               N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
               V,N,NOSET=-1/V,N,NCL/V,N,NOA=-1 $

 50  SAVE      MPCF1,MPCF2,SINGLE,OMIT,NSKIP,NOSET,REACT,REPEAT,NCL,NOA $

 50  MATGPR    GPL,USET,SIL,MGG//C,N,G

 50  MATGPR    GPL,USET,SIL,PGG//C,N,G

 51  PURGE,    GM,GMD/MPCF1/GO,GOD/OMIT/KFS,QRC/SINGLE $

 52  EQUIV     KGG,KNN/MPCF1/PGG,PNN/MPCF1/ BGG,BNN/MPCF1/K4GG,K4NN/MPCF1 $

 53  CHKPNT    GM,GMD,BG,GO,GOD,KFS,QRC,USET,KNN,PNN,BNN,K4NN $

 54  COND      LBL4,GENEL $

 55  COND      LBL4,NCSIMP $

 56  GPSP      GPL,GPST,USET,SIL/OGPST $

 57  OFP       OGPST,,,,,//V,N,CARDNO $

 58  SAVE      CARDNO $

 59  LABEL     LBL4 $

 60  COND      LBL2,MPCF2 $

 61  MCE1      USET,BG/GM $

 62  CHKPNT    GM $

 63  MCE2      USET,GM,KGG,PGG,BGG,K4GG/KNN,PNN,BNN,K4NN $

 64  CHKPNT    KNN,PNN,BNN,K4NN $

 65  LABEL     LBL2 $

 66  EQUIV     KNN,KFF/SINGLE/PNN,PFF/SINGLE/BNN,BFF/SINGLE/K4NN,K4FF/SINGLE $
```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 3 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.

 67  CHKPNT   KFF,MFF,BFF,K4FF $
 68  COND     LBL3,SINGLE $
 69  SCE1     USET,KAA,MAA,BAA,K4AA/KFF,KFS,,MFF,BFF,K4FF $
 70  CHKPNT   KFS,KFF,MFF,BFF,K4FF $
 71  LABEL    LBL3 $
 72  EQUIV    KFF,KAA/OMIT/ MFF,MAA/OMIT/BFF,BAA/OMIT/K4FF,K4AA/OMIT $
 73  CHKPNT   KAA,MAA,BAA,K4AA $
 73  MATGPR GPL,USET,SIL,MFF//C,N,F
 73  MATGPR GPL,USET,SIL,KFF//C,N,F
 74  COND     LBL5,OMIT $
 75  SMP1     USET,KFF,,,/GO,KAA,KOO,LOO,UOO,,,,, $
 76  CHKPNT   GO,KAA $
 77  COND     LBLM,NORGG $
 78  SMP2     USET,GO,MFF/MAA $
 79  CHKPNT   MAA $
 80  LABEL    LBLM $
 81  COND     LBLB,NORGG $
 82  SMP2     USET,GO,BFF/BAA $
 83  CHKPNT   BAA $
 84  LABEL    LBLB $
 85  COND     LBL5,NOK4GG $
 86  SMP2     USET,GO,K4FF/K4AA $
 87  CHKPNT   K4AA $
 88  LABEL    LBL5 $
 89  DPD      DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,TFPOOL,,,,,,ELD,FODYN/V,
              N,LUSET/V,N,LUSETD/V,N,NCTFL/V,N,NCOLT/V,N,NOPSDL/V,N,NOFRL/
```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 4 of 8)

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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N .

```
DMAP-DMAP INSTRUCTION
 NO.
                V,N,NONLFT/V,N,NCTRL/V,N,NOEED/C,N,123/V,N,NOUE $
  90  SAVE      LUSETD,NCLE $
  91  EQUIV     GO,GOD/NCLE/GM,GMD/NCUE $
  92  CHKPNT    USETD,EED,EQDYN,TFPOOL,GOD,GMD,SILD,GPLE $
  93  PARAM     //C,N,ADD/V,N,NEVER/C,N,1/C,N,C $
  94  PARAM     //C,N,MPY/V,N,REPEATE/C,N,1/C,N,-1 $
  95  DMG       MATPOOL,BGPDT,EQEXIN,CSTM/BDPOOL/V,N,NCKBFL/V,N,NOABFL/ V,N,
                MPACT $
  96  SAVE      MPACT,NCKBFL,NOABFL $
  97  PARAM     //C,N,AND/V,N,NCPL/V,N,NOAOFL/V,N,NCKBFL $
  98  PURGE     KBFL/NCKBFL/ ABFL/NOABFL $
  99  COND      LBLFL3,NCPL $
 100  MTRXIN,   ,BDPOOL,EQDYN,,/ABFL,KBFL,/V,N,LUSETD/V,N,NOAUFL/V,N,NCKBFL/C,
                N,0 $
 101  SAVE      NOABFL,NCKBFL $
 101  MATGPR GPL,USET,SIL,ABFL//C,N,P
 101  MATGPR GPL,USET,SIL,KBFL//C,N,P
 102  LABEL     LBLFL3 $
 103  CHKPNT    ABFL,KBFL $
 104  JUMP      LBL13 $
 105  LABEL     LBL13 $
 106  PURGE     PHID,CLAMA,OPHID,COPC1,CCPHIP,CESC1,CEFC1,CPHIP,QPC,  K2PP,
                M2PP,B2PP,K2DD,M2DD,B2DD/NEVER $
 107  CASE      CASECC,/CASEXX/C,N,CEIGN/V,N,REPEATE/V,N,NOLOJP $
 108  SAVE      REPEATE,NCLOOP $
 109  CHKPNT    CASEXX $
 110  MTRXIN    CASEXX,MATPOOL,EQDYN,,TFPOOL/K2CPP,M2CPP,B2PP/V,N,LUSETD/V,N,
```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery (Sheet 5 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
                NOK2DPP/V,N,NCM2DPP/V,N,NCB2PP $
111   SAVE      NOK2DPP,NCM2DPP,NCB2PP $
112   PARAM     //C,N,AND/V,N,NCM2PP/V,N,NOABFL/V,N,NCM2FPP $
113   PARAM     //C,N,AND/V,N,NCK2PP/V,N,NOFL /V,N,NCK2FPP $
114   EQUIV     K2DPP,K2XPP/NOKHFL/ M2DPP,M2PP/NOABFL $
115   COND      LBLFL1,NOKBFL $
116   EQUIV     K3FL,K2XPP/NCK2DPP $
117   COND      LBLFL1,NOK2DPP $
118   ADD       K3FL,K2DPP/K2XPP $
119   LABEL     LBLFL1 $
120   EQUIV     K2XPP,K2PP/NOABFL $
121   COND      LBLFL2,NOABFL $
122   ADD       ABFL,K2XPP/K2PP/C,N,(-1.0,0.0,0) $
122   ADD ABFL,M2DPP/M2PP/V,N,MFACT $
125   LABEL     LBLFL2 $
126   PARAM     //C,N,AND/V,N,NDEBA/V,N,NOUE/V,N,NCB2PP $
127   PARAM     //C,N,AND/V,N,NDEMA/V,N,NOUE/V,N,NCM2PP $
128   PARAM     //C,N,AND/V,N,NDEK2/V,N,NOGENL/V,N,NOSIMP $
129   PURGE     K2DD/NCK2PP/M2DD/NCM2PP/B2DD/NCF2PP $
130   EQUIV     M2PP,M2DD/NOA/B2PP,B2DD/NOA/K2PP,K2DD/NOA/MAA,MDD/NDEMA/EAA,
                BDD/NDEBA $
131   CHKPNT    K2PP,M2PP,B2PP,K2DD,M2DD,B2DD,PDD,MDD $
132   COND      LBL18,NOGPDT $
133   GKAD      USETD,GM,GO,KAA,BAA,MAA,K4AA,K2PP,M2PP,B2PP/KDD,BDD,MDD,CMD,
                GOD,K2DD,M2DD,B2DD/C,N,SMPLEV/C,N,DISP/C,N,DIRECT/C,Y,C=0.0/C,
                N,0.0/C,N,C.0/V,N,NCK2PP/V,N,NCM2PP/V,N,NCU2PP/    V,N,MPCF1/V,
                N,SINGLE/V,N,OMIT/V,N,NOUE/V,N,NOKAGG/V,N,NOMGG/V,N,KDFK2/C,N,
                -1 $
```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery (Sheet 6 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.

134  LABEL    LOOP10 $
135  EQUIV    B2DD,BDD/NOBGG/ M2DD,MDD/NOSIMP/ K2DD,KDD/KDEK2 $
136  CHKPNT   KDD,BDD,MDD,GOO,GPO $
136  MATGPR GPLD,USETD,SILD,MDD//C,N,D
136  MATGPR GPLD,USETD,SILD,KDD//C,N,D
136  SEEMAT MGG,KGG,MFF,KFF,ABFL//C,N,PRINT
136  SEEMAT KOFL,MDD,KDD,,//C,N,PRINT
136  PARTN KDD,P9,/KBP,AEM,,,KE/C,N,-1 $
136  PARTN KBP,G9,/K11,K21,K12,K22/C,N,-1 $
136  PARTN AEM,G9,UP/A1M,,,A2M/C,N,1 $
136  PARTN KE,UP,/KE1,,,KE2/C,N,-1 $
136  TRNSP A2M/A2MT $
136  SOLVE K22,A2MT/PDL2/C,N,1/C,N,-1 $
136  SOLVE A1M,K12/M2L/C,N,1 $
136  MPYAD M2L,PDU2,/TL12/C,N,0/C,N,-1 $
136  ADD PDU2,/PDL3/C,Y,A999=(1.0,0.0) $
136  PARAM //C,N,NOP/V,N,TRUE=-1 $
136  EQUIV PDU3,PDL2/TRUE $
136  COND PDUM99,TRUE $
136  MATPRN PDU3,,,,// $
136  LABEL PDUM99 $
136  MPYAD A2M,PDU2,/MFLD/C,N,0/C,N,-1 $
136  OUTPUT3 MFLD,PDL2,TL12,,//C,N,0/C,Y,N1=AMF/C,Y,N2=PPO/C,Y,N3=ATU $
136  SMPYAD TU12,KE1,TL12,,,KE2/KEB/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
136  SOLVE K22,K21/CP2/C,N,1/C,N,-1 $
```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 7 of 8)

```
    N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
 NO.

136  MATPRN K11,K12,K22,,// $

136  MATPRN A1M,A2M,KE1,,// $

136  MATPRN PDU2,MFLD,TL12,,// $

136  MATPRN KEG,K11,CP2,,// $

136  LABEL ERROR3 $

170  EXIT

171  END      $

      **NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM**
```


Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 8 of 8)

The following set of DMAP statements are utilized when gravitational stiffness is ignored and free surface displacement data is not desired. Copies of the ALTER-DMAP statements and the complete DMAP listing are presented in Figs. 2-3 and 2-4, respectively.

136a. Partition $[K_{dd}]$ to form the fluid inertance matrix $[K_{bp}]$ and the surface area matrix $[A_{em}]$

$$[K_{dd}] = \left[\begin{array}{c|c} K_{bp} & 0 \\ \hline A_{em} & 0 \end{array}\right]$$

136b. Calculate the transpose of $[A_{em}]$, $[A_{em}^T]$

136c. Solve for the pressure recovery matrix

$$[P_{du2}] = [K_{bp}^{-1}] [A_{em}^T]$$

136d. Calculate the fluid mass matrix

$$[M_{fld}] = [A_{em}] [P_{du2}]$$

136e. Output into cards or tape $[P_{du2}]$ and $[M_{fld}]$.

170. EXIT.

2.2 DESCRIPTION OF DMAP OPERATIONS FOR HYDROELASTIC NORMAL MODES ANALYSIS

The following is an outline of the major operations performed in Rigid Format 3 for free vibration analysis of a hydroelastic system. The special case of zero free surface pressure has been verified in test cases and the general case which has not been verified is also presented. The modifications required for a Rigid Format 13 hydroelastic analysis with differential stiffness are nearly identical as those required in Rigid Format 3; thus a description of DMAP operations is not included. ALTER-DMAP statements and modified Rigid Format DMAP listings, however, are presented for Rigid Format 13 as well as Rigid Format 3.

JUNE 13, 1974 NASTRAN 2/ 1/73

N A S T R A N E X E C U T I V E C O N T R O L D E C K E C H O

```
ID HYDRO,COUPLING
APP DISP
SOL 7,0
TIME 15
CHKPNT YES
DIAG 7,8,13,14,19,21,22
ALTER 50
MATGPR GPL,USET,SIL,MGG//C,N,G
MATGPR GPL,USET,SIL,KGG//C,N,G
ALTER 75
MATGPR GPL,USET,SIL,MFF//C,N,F
MATGPR GPL,USET,SIL,KFF//C,N,F
ALTER 101
MATGPR GPL,USET,SIL,ABFL//C,N,P
MATGPR GPL,USET,SIL,KBFL//C,N,P
ALTER 122
ADD ABFL,M2DPP/M2PP/V,N,MFACT $
ALTER 123,124
ALTER 135
MATGPR GPLD,USETD,SILD,MDD//C,N,D
MATGPR GPLD,USETD,SILD,KDD//C,N,D
SELMAT MGG,KGG,MFF,KFF,ABFL//C,N,PRINT
SELMAT KBFL,MDD,KDD,,//C,N,PRINT
PARTN ABD,P9,/ABP,AEM,,KE/C,N,-1 $
TRNSP AEM/AEMT $
SOLVE KOP,AEMT/PDU2/C,N,1/C,N,-1 $
ADD PDU2,/PDU3/C,Y,ASSS=(1.0,0.0) $
PARAM //C,N,NOP/V,N,TRUE=-1 $
EQUIV PDU3,PDU2/TRUE $
COND PDUNC9,TRUE $
MATPRN PDU2,,,,// $
LABEL PDUNC9 $
MPYAD AL4,PDU2,/MFLD/C,N,0/C,N,-1 $
OUTPUT3 MFLD,PDU2,,,//C,N,7/C,Y,N1=AM/C,Y,N2=APC $
MATPRN PDU2,MFLD,AEM,,// $
LABEL ERROR3 $
ALTER 167,170
EXIT
ENDALTER
CEND
```

Fig. 2-3 Rigid Format 7 ALTER-DMAP Statements (without Free Surface Displacement Recovery)

N A S T R A N S Y S T E M P R O G R A M C O M P I L A T I O N

```
DMAP=DMAP INSTRUCTION
 NO.
   1  BEGIN    $3.7 DIRECT COMPLEX EIGENVALUE ANALYSIS - SERIES 41 $
   2  FILE     KGGA=TAPE/,KGG=TAPE/,GOD=SAVE/ GMD=SAVE $
   3  GP1      GEOM1,GEOM2,/GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL/V,N,LUSET/  C,N,
               123/V,N,NOGPDT $
   4  SAVE     LUSET,NOGPDT $
   5  PURGE    USET,GM,GO,KAA,LAA,MAA,K4AA,MFS,EST,MPT,PLTSETX,PLTPAR,GPSETS,
               ELSETS/NOGPDT $
   6  CHKPNT   GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL,LSET,GM,GO,KAA,LAA,MAA,K4AA,EST,
               MPT,PLTSETX,PLTPAR,GPSETS,ELSETS $
   7  COND     LBL1,NOGPDT $
   8  GP2      GEOM2,EQEXIN/EST $
   9  CHKPNT   EST $
  10  PLTSET   PLTSET,CASECC,EST/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,NSIL/  V,N,
               JUMPPLOT $
  11  SAVE     NSIL,JUMPPLOT $
  12  PRTMSG   PLTSETX// $
  13  XSORT    //V,N,PLTFLG/C,N,1/V,N,PFILE/C,N,0 $
  14  SAVE     PLTFLG,PFILE $
  15  COND     P1,JUMPPLOT $
  16  PLOT     PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,/PLOTX1/ V,N,
               NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
  17  SAVE     PFILE $
  18  PRTMSG   PLOTX1// $
  19  LABEL    P1 $
  20  CHKPNT   PLTPAR,GPSETS,ELSETS $
  21  GP3      GEOM3,EQEXIN,GEOM2/,GPTT/C,N,123/V,N,NOGRAV/C,N,123 $
  22  CHKPNT   GPTT $
```

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 1 of 7)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP=DMAP INSTRUCTION
 ID,
  23  TA1,      ,ECT,EPT,BGPDT,SIL,GPTT,CSTM/EST,,GEI,ECPT,GPCT/V,N,LUSET/ C,N,
                123/V,N,NDSIMP=-1/C,N,0/V,N,NOGENL=-1/V,N,UGNEL $
  24  SAVE      NDSIMP,NOGENL,UGNEL $
  25  PURGE     K4GG,GPST,DOPST,MGG,BGG,K4NN,K4FF,K4AA,MNN,MFF,MAA,BNN,BFF,BAA,
                KGGX/NDSIMP / UGPST/UGNEL $
  26  CHKPNT    EST,ECPT,GPCT,GEI,K4GG,GPST,MGG,BGG,KGGX,BGPST,  K4NN,K4FF,
                K4AA,MNN,MFF,MAA,BNN,BFF,BAA $
  27  COND      LBL1,NOSIMP $
  28  SMA1      CSTM,MPT,ECPT,GPCT,DIT/KGGX,K4GG,GPST/V,N,NOGENL/V,N,NOK4GG $
  29  SAVE      NOK4GG $
  30  PURGE     K4NN,K4FF,K4AA/NOK4GG $
  31  CHKPNT    KGGX,GPST,K4GG,K4NN,K4FF,K4AA $
  32  SMA2      CSTM,MPT,ECPT,GPCT,DIT/MGG,BGG/V,Y,WTMASS=1.0/V,N,NOMGG/   V,N,
                NOBGG=-1/V,Y,COUPMASS/V,Y,CPBAR/V,Y,CPROD/V,Y,CPQUAD1/   V,Y,
                CPQUAD2/V,Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPGDPLT / V,Y,
                CPTRPLT/V,Y,CPTHBSC $
  33  SAVE      NOMGG,NOBGG $
  34  PURGE     BNN,BFF,BAA/NOBGG/MNN,MFF,MAA/NOMGG $
  35  CHKPNT    MGG,MNN,MFF,MAA,BGG,BNN,BFF,BAA $
  36  COND      LBL1,GRDPNT $
  37  COND      EXPOP3,NOMGG $
  38  GPSP      BGPDT,CSTM,SEQEXIN,MGG/OGPWG/V,Y,GRDPNT=-1/V,Y,WTMASS $
  39  OFP       CGPWG,,,,,//V,N,CARDNO $
  40  SAVE      CARDNO $
  41  LABEL     LBL1 $
  42  EQUIV     KGGX,KGG/NOGENL $
  43  CHKPNT    KGG $
  44  COND      LBL11,NOGENL $
```

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 2 of 7)

N A S T R A N S C A L E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION NO.

```
 45  SMA3     GM,KGG,/KGG/V,N,LUSET/V,N,NOGENL/V,N,NOSIMP $
 46  CHKPNT   KGG $
 47  LABEL    LBL 1 $
 48  PARAM    //C,N,MPY/V,N,NSKIP/C,N,0/C,N,G $
 49  GP4      CASECC,GEOM4,DIT,XIN,SIL,GPDT/BG,USET/V,N,LUSET/V,N,MPCF1/V,
              N,MPCF2/V,N,SINGLE/V,N,LMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
              V,N,NOSET=-1/V,N,NOL/V,N,NOA=-1 $
 50  SAVE     MPCF1,MPCF2,SINGLE,LMIT,NSKIP,NOSET,REACT,REPEAT,NOL,NOA $
 51  MATGPR   GPL,USET,SIL,MGG//C,N,G $
 52  MATGPR   GPL,USET,SIL,KGG//C,N,G
 53  PURGE    GM,GMD/MPCF1/GO,GOD/LMIT/KFS,UPC/SINGLE $
 54  EQUIV    KGG,KAA/MPCF1/GG,MNN/MPCF1/ BGG,BNN/MPCF1/KGG,KANN/MPCF1 $
 55  CHKPNT   GM,GMD,KG,GO,GOD,KFS,UPC,LSET,KNN,MNN,BNN,KANN $
 56  COND     LBL4,GENEL $
 57  COND     LBL4,NOSIMP $
 58  GPSP     GPL,USET,LSET,SIL/OGPST $
 59  OFP      OGPST,,,,,//V,N,CARDNO $
 60  SAVE     CARDNO $
 61  LABEL    LBL4 $
 62  COND     LBL2,MPCF2 $
 63  MLE1     USET,GM,KGG,MGG,BGG/KNN,MNN,BNN,KANN $
 64  CHKPNT   KNN,MNN,BNN,KANN $
 65  LABEL    LBL 2 $
 66  EQUIV    KNN,KFF/SINGLE/MNN,MFF/SINGLE/BNN,BFF/SINGLE/KANN,KAFF/SINGLE $
```

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 3 of 7)

ORIGINAL PAGE IS OF POOR QUALITY

```
N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
NO.

 67  CHKPNT   KFF,MFF,BFF,K4FF $
 68  COND     LBL3,SINGLE $
 69  SCE1     USET,KNN,MNN,BNN,K4NN/KFF,KFS,,MFF,BFF,K4FF $
 70  CHKPNT   KFS,KFF,MFF,BFF,K4FF $
 71  LABEL    LBL3 $
 72  EQUIV    KFF,KAA/OMIT/ MFF,MAA/OMIT/BFF,BAA/OMIT/K4FF,K4AA/OMIT $
 73  CHKPNT   KAA,MAA,BAA,K4AA $
 73  MATGPR   GPL,USET,SIL,MFF//C,N,F
 7_  MATGPR   GPL,USET,SIL,KFF//C,N,F
 74  COND     LBL5,OMIT $
 75  SMP1     USET,KFF,,,/GO,KAA,KOO,LOO,UOO,,,,, $
 76  CHKPNT   GO,KAA $
 77  COND     LBLM,NOMGG $
 78  SMP2     USET,GO,MFF/MAA $
 79  CHKPNT   MAA $
 80  LABEL    LBLM $
 81  COND     LBLB,NOBGG $
 82  SMP2     USET,GO,BFF/BAA $
 83  CHKPNT   BAA $
 84  LABEL    LBLB $
 85  COND     LBL5,NOK4GG $
 86  SMP2     USET,GO,K4FF/K4AA $
 87  CHKPNT   K4AA $
 88  LABEL    LBL5 $
 89  DPD      DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,TFPOOL,,,,,,EED,EQDYN/V,
              N,LUSET/V,N,LUSETD/V,N,NOTFL/V,N,NODLT/V,N,NOPSDL/V,N,NOFRL/
```

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 4 of 7)

```
CYLINDRICAL FLUID                                              JUNE 13, 1974   NASTRAN  2/ 1/73

      N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP  INSTRUCTION
 NO.
                 V,N,NOMLFT/V,N,NOTFL/V,N,NOEED/C,N,123/V,N,NOUE $

  90  SAVE       LUSETD,NOUE $

  91  EQUIV      GI,GUD/NOUE/GM,GMD/NOUE $

  92  CHKPNT     USETD,EED,EQDYN,TFPOOL,GOD,GMD,SILD,GPLD $

  93  PARAM      //C,N,ADD/V,N,NEVER/C,N,1/C,N,0 $

  94  PARAM      //C,N,MPY/V,N,REPEATE/C,N,1/C,N,-1 $

  95  BMG        MATPOOL,BGPDT,EQEXIN,CSTM/BDPOOL/V,N,NOKBFL/V,N,NOABFL/V,N,
                 MFACT $

  96  SAVE       MFACT,NOKBFL,NOABFL $

  97  PARAM      //C,N,AND/V,N,NOFL/V,N,NOABFL/V,N,NOKBFL $

  98  PURGE      KBFL/NOKBFL/ ABFL/NOABFL $

  99  COND       LBLFL3,NOFL $

 100  MTRXIN,    ,BDPOOL,EQDYN,,/ABFL,KBFL,/V,N,LUSETD/V,N,NOABFL/V,N,NOKBFL/C,
                 N,2 $

 101  SAVE       NOABFL,NOKBFL $

 101  MATGPR     GPL,USET,SIL,ABFL//C,N,P

 101  MATGPR     GPL,USET,SIL,KBFL//C,N,P

 102  LABEL      LBLFL3 $

 103  CHKPNT     ABFL,KBFL $

 104  JUMP       LBL13 $

 105  LABEL      LBL13 $

 106  PURGE      PHID,CLAMA,OPHID,OQPC1,OCPHIP,OESC1,OEFC1,CPHIP,QPC,  K2PP,
                 M2PP,B2PP,K2DD,M2DD,B2DD/NEVER $

 107  CASE       CASECC,/CASEXX/C,N,CEIGN/V,N,REPEATE/V,N,NOLOOP $

 108  SAVE       REPEATE,NOLOOP $

 109  CHKPNT     CASEXX $

 110  MTRXIN     CASEXX,MATPOOL,EQDYN,,TFPOOL/K2DPP,M2DPP,B2PP/V,N,LUSETD/V,N,
```

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 5 of 7)

```
CYLINDRICAL FLUID                                          JUNE 13, 1974   NASTRAN  2/ 1/73

   N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
 NO.
               NOK2DPP/V,N,NOM2DPP/V,N,NOB2PP $

111  SAVE      NOK2DPP,NOM2DPP,NOB2PP $

112  PARAM     //C,N,AND/V,N,NCM2PP/V,N,NOABFL/V,N,NCM2DPP $

113  PARAM     //C,N,AND/V,N,NCK2PP/V,N,NOFL /V,N,NCK2DPP $

114  EQUIV     K2DPP,K2XPP/NOKBFL/ M2DPP,M2PP/NCABFL $

115  COND      LBLFL1,NCKBFL $

116  EQUIV     KBFL,K2XPP/NCK2DPP $

117  COND      LBLFL1,NCK2DPP $

118  ADD       KBFL,K2DPP/K2XPP $

119  LABEL     LBLFL1 $

120  EQUIV     K2XPP,K2PP/NOABFL $

121  COND      LBLFL2,NOABFL $

122  ADD       ABFL,K2XPP/K2PP/C,N,(-1.0,0.0) $

124  ADD  ABFL,M2DPP/M2PP/V,N,MFACT $

125  LABEL     LBLFL2 $

126  PARAM     //C,N,AND/V,N,NOBEHA/V,N,NOUE/V,N,NCB2PP $

127  PARAM     //C,N,AND/V,N,NDEMA/V,N,NOUE/V,N,NCM2PP $

128  PARAM     //C,N,AND/V,N,KDEK2/V,N,NOGENL/V,N,NCSING $

129  PURGE     K2DD/NCK2PP/M2DD/NCM2PP/B2DD/NCB2PP $

130  EQUIV     M2PP,M2DD/NOA/B2PP,B2DD/NOA/K2PP,K2DD/NCA/MAA,MDD/MDEMA/BAA,
               BDD/NDEBA $

131  CHKPNT    K2PP,M2PP,B2PP,K2DD,M2DD,B2DD,BDD,MDD $

132  COND      LBL13,NOGPDT $

133  GKAD      USETD,GM,GO,KAA,BAA,MAA,K4AA,K2PP,M2PP,B2PP/KDD,BDD,MDD,GMD,
               GOD,K2DD,M2DD,B2DD/C,N,CMPLEV/C,N,DISP/C,N,DIRECT/C,Y,G=0.0/C,
               N,0.0/C,N,0.0/V,N,NCK2PP/V,N,NOM2PP/V,N,NOB2PP/ V,N,MPCF1/V,
               N,SINGLE/V,N,OMIT/V,N,NOUE/V,N,NOK4GG/V,N,NOBGG/V,N,KDEKP/C,N,
               -1 $
```

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 6 of 7)

```
CYLINDRICAL FLUID                                        JUNE 13, 1974   NASTRAN  2/ 1/73

     N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
 NO.

134  LABEL    LBL18 $

135  EQUIV    B2DD,BDD/NOJGS/ M2DD,MDD/NOSIMP/ K2DD,KDD/KDLK2 $

136  CHKPNT   KDD,BDD,MDD,GDD,GMD $

136  MATGPR   GPLD,USETD,SILD,MDD//C,N,D

136  MATGPR   GPLD,USETD,SILD,KDD//C,N,D

136  SEEMAT   MGG,KGG,MFF,KFF,ABFL//C,N,PRINT

136  SEEMAT   KBFL,ADD,KFD,,//C,N,PRINT

136  PARTN    KDD,P9,/KBP,AEM,,KF/C,N,-1 $

136  TRNSP    AEM/ALMT $

136  SOLVE    KBP,ALMT/PDU2/C,N,1/C,N,-1 $

136  ADD      PDU2,/PDU3/C,Y,ALPHA=(1.0,0.0) $

136  PARAM    //C,N,NOP/V,N,TRUE=-1 $

136  EQUIV    PDU3,PDU2/TRUE $

136  COND     PDUN39,TRUE $

136  MATPRN   PDU3,,,,// $

136  LABEL    PDUN39 $

136  MPYAD    AEM,PDU2,/MFLD/C,N,0/C,N,-1 $

136  OUTPUT3  MFLD,PDU2,,,//C,N,0/C,Y,N1=AMF/C,Y,N2=AFC $

136  MATPRN   PDU2,MFLD,AEM,,// $

136  LABEL    ERROR3 $

170  EXIT

171  END      $

     **NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM**
```

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 7 of 7)

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3. GP1 generates coordinate system transformation matrices, tables of grid point locations, and tables for relating internal and external grid point numbers.

6. GP2 generates Element Connection Table with internal indices.

8. PLTSET transforms user input into a form used to drive structure plotter.

10. PRTMSG prints error messages associated with structure plotter.

13. Go to DMAP No. 17 if no undeformed structure plot request.

14. PLOT generates all requested undeformed structure plots.

16. PRTMSG prints plotter data and engineering data for each undeformed plot generated.

19. GP3 generates Grid Point Temperature Table.

21. TA1 generates element tables for use in matrix assembly and stress recovery.

26. SMA1 generates stiffness matrix $\left[K^{x}_{gg}\right]$ and Grid Point Singularity Table.

28. SMA2 generates mass matrix $\left[M_{gg}\right]$.

37. Equivalence $\left[K^{x}_{gg}\right]$ to $\left[K_{gg}\right]$ if no general elements.

39. Go to DMAP No. 42 if no general elements.

40. SMA3 adds general elements to stiffness matrix $\left[K^{x}_{gg}\right]$ to obtain stiffness matrix $\left[K_{gg}\right]$.

44. GP4 generates flags defining members of various displacement sets (USET) and forms multipoint constraint equations $\left[R_{g}\right] \left\{u_{g}\right\} = 0$.

46. Go to DMAP No. 118 and print error message if no independent degrees of freedom are defined.

48. Equivalence $\left[K_{gg}\right]$ to $\left[K_{nn}\right]$ and $\left[M_{gg}\right]$ to $\left[M_{nn}\right]$ if no multipoint constraints.

50. Go to DMAP No. 54 if general elements present.

51. GPSP determines if possible grid point singularities remain.

52. OFP formats table of possible grid point singularities and places it on the system output file for printing.

55. Go to DMAP No. 60 if MCE1 and MCE2 have already been executed for current set of multipoint constraints.

56. MCE1 partitions multipoint constraint equations $[R_g] = [R_m \mid R_n]$ and solves for multipoint constraint transformation matrix $[G_m] = -[R_m]^{-1}[R_n]$.

58. MCE2 partitions stiffness and mass matrices

$$[K_{gg}] = \begin{bmatrix} \overline{K}_{nn} & K_{nm} \\ K_{mn} & K_{mm} \end{bmatrix} \text{ and } [M_{gg}] = \begin{bmatrix} \overline{M}_{nn} & M_{nm} \\ M_{mn} & M_{mm} \end{bmatrix}$$

and performs matrix reductions

$$[K_{nn}] = [\overline{K}_{nn}] + [G_m^T][K_{mn}] + [K_{mn}^T][G_m] + [G_m^T][K_{mm}][G_m] \text{ and}$$

$$[M_{nn}] = [\overline{M}_{nn}] + [G_m^T][M_{mn}] + [M_{Mn}^T][G_m] + [G_m^T][M_{mm}][G_m]$$

61. Equivalence $[K_{nn}]$ to $[K_{ff}]$ and $[M_{nn}]$ to $[M_{ff}]$ if no single-point constraints.

63. Go to DMAP No. 66 if no single point constraints.

64. SCE1 partitions out single-point constraints

$$[K_{nn}] = \begin{bmatrix} K_{ff} & K_{fs} \\ K_{sf} & K_{ss} \end{bmatrix} \text{ and } [M_{nn}] = \begin{bmatrix} M_{ff} & M_{fs} \\ M_{sf} & M_{ss} \end{bmatrix}$$

67. Equivalence $[K_{ff}]$ to $[K_{aa}]$ and $[M_{ff}]$ to $[M_{aa}]$ if no omitted coordinates.

69. Go to DMAP No. 74 if no omitted coordinates.

70. SMP1 partitions constrained stiffness matrix

$$\left[K_{ff}\right] = \begin{bmatrix} \overline{K}_{aa} & K_{ao} \\ K_{oa} & K_{oo} \end{bmatrix}$$

solves for transformation matrix $\left[G_o\right] = -\left[K_{oo}\right]^{-1}\left[K_{oa}\right]$

and performs matrix reduction $\left[K_{aa}\right] = \left[\overline{K}_{aa}\right] + \left[K_{oa}^T\right]\left[G_o\right]$

71. Form the total structure plus fluid gravitational and/or ullage stiffness matrix

$$\left[K'_{aa}\right] = \left[K_{aa}\right] + \left[K_{eb}\right]$$

72. SMP2 partitions constrained mass matrix

$$\left[M_{ff}\right] = \begin{bmatrix} \overline{M}_{aa} & M_{ao} \\ M_{oa} & M_{oo} \end{bmatrix}$$

and performs matrix reduction

$$\left[M_{aa}\right] = \left[\overline{M}_{aa}\right] + \left[M_{oa}^T\right]\left[G_o\right] + \left[G_o^T\right]\left[M_{oa}\right] + \left[G_o^T\right]\left[M_{oo}\right]\left[G_o\right].$$

74. Form the total structure plus fluid mass matrix

$$\left[M'_{aa}\right] = \left[M_{aa}\right] + \left[M_{fld}\right]$$

75. Go to DMAP No. 84 if no free-body supports.

76. RBMG1 partitions out free-body supports

$$\left[K_{aa}\right] = \begin{bmatrix} K_{\ell\ell} & K_{\ell r} \\ K_{r\ell} & K_{rr} \end{bmatrix} \text{ and } \left[M_{aa}\right] = \begin{bmatrix} M_{\ell\ell} & M_{\ell r} \\ M_{r\ell} & M_{rr} \end{bmatrix}$$

78. RBMG2 decomposes constrained stiffness matrix

$$\left[K_{\ell\ell}\right] = \left[L_{\ell\ell}\right]\left[U_{\ell\ell}\right]$$

80. RBMG3 forms rigid body transformation matrix

$$[D] = -[K_{\ell\ell}]^{-1} [K_{\ell r}]$$

calculates rigid body check matrix

$$[X] = [K_{rr}] + [K_{\ell r}^T]$$

and calculates rigid body error ratio

$$E = \frac{\|X\|}{\|K_{rr}\|}$$

82. RBMG4 forms rigid body mass matrix

$$[m_r] = [M_{rr}] + [M_{\ell r}^T][D] + [D^T][M_{\ell r}] + [D^T][M_{\ell\ell}][D].$$

85. DPD extracts Eigenvalue Extraction Data from Dynamics data block.

87. Go to DMAP No. 116 and print error message if no Eigenvalue Extraction Data.

89. READ extracts real eigenvalues from the equation

$$[K'_{aa} - M'_{aa}] \{u_a\} = 0$$

calculates rigid body modes by finding a square matrix $[\phi_{ro}]$ such that

$$[m_o] = [\phi_{ro}^T][m_r][\phi_{ro}]$$

is diagonal and normalized, computes rigid body eigenvectors

$$[\phi_{ao}] = \begin{bmatrix} D\phi_{ro} \\ -\phi_{ro} \end{bmatrix}$$

calculates modal mass matrix

$$[m] = [\phi_a^T][M_{aa}][\phi_a]$$

and normalizes eigenvectors according to one of the following user requests:

1) Unit value of selected coordinate

2) Unit value of largest component

3) Unit value of generalized mass.

92. OFP formats eigenvalues and summary of eigenvalue extraction information and places them on the system output file for printing.

94. Go to DMAP No. 120 and exit if no eigenvalues found.

95. SDR1 recovers dependent components of the eigenvectors

$$\{\phi_o\} = [G_o]\ \{\phi_a\}, \begin{Bmatrix}\phi_a\\ \phi_o\end{Bmatrix} = \{\phi_f\},$$

$$\begin{Bmatrix}\phi_f\\ \phi_s\end{Bmatrix} = \{\phi_n\},\ \{\phi_m\} = [G_m]\ \{\phi_n\},$$

$$\begin{Bmatrix}\phi_n\\ \phi_m\end{Bmatrix} = \{\phi_g\}$$

and recovers single point forces of constraint $\{q_s\} = [K_{fs}]^T\{\phi_f\}$.

98. Equivalence SIL to SIP and BGPDT to BGPDP when one or more geometric grid points exists.

101. PLTTRAN modifies BGPDT and SIL for functional modules SDR2 and PLOT.

105. SDR2 calculates element forces and stresses (OEF1, OES1) and prepares eigenvectors and single-point froces of constraint for output (OPHIG, PPHIG, OOG1).

106. OFP formats tables prepared by SDR2 and places them on the system output file for printing.

107a. Calculate the modal stiffness matrix

$$\left[K_h\right] = \left[\phi_a^T\right] \left[K'_{aa}\right] \left[\phi_a\right]$$

107b. Solve

$$\left[\omega^2\right] = \left[M_I^{-1}\right] \left[K_h\right]$$

107c. Calculate the modal pressures (pressure deviations in the general case)

$$\left[P'_{s\phi}\right] = \left[P_{du2}\right] \left[\phi_a\right] \left[\omega^2\right]$$

107d. Calculate the free surface modal displacements

$$\left[\phi_1\right] = \left[T_{u12}\right] \left[\phi_a\right]$$

107e. Print $\left[\omega^2\right]$, $\left[P'_{s\phi}\right]$, $\left[\phi_1\right]$

When recovery of free surface displacements is not desired (107d) and (107e) are replaced by the statement.

107e. Print $\left[\omega^2\right]$, $\left[P'_{s\phi}\right]$

When the gravitational and/or ullage stiffness are included in the analysis the following additional operations are required for complete pressure recovery:

107f. Calculate the reduced out modal pressures

$$\left[P_{f\phi}\right] = \left[K_{11}\right] \left[\phi_1\right]$$

107g. Calculate the remaining modal pressures

$$\left[P_{s\phi}\right] = \left[C^T\right] \left[P_{f\phi}\right] + \left[P'_{s\phi}\right]$$

108. Go to DMAP No. 112 if no deformed structure plots are requested.

109. PLOT generates all requested deformed structure plots.

111. PRTMSG prints plotter data and engineering data for each deformed plot generated.

113. Go to DMAP No. 120 and make normal exit.

115. NORMAL MODE ANALYSIS ERROR MESSAGE NO. 1 - MASS MATRIX REQUIRED FOR REAL EIGENVALUE ANALYSIS.

117. NORMAL MODE ANALYSIS ERROR MESSAGE NO. 2 - EIGENVALUE EXTRACTION DATA REQUIRED FOR REAL EIGENVALUE ANALYSIS.

119. NORMAL MODE ANALYSIS ERROR MESSAGE NO. 3 - NO INDEPENDENT DEGREES OF FREEDOM HAVE BEEN DEFINED.

Copies of the ALTER-DMAP statements and the complete DMAP listing for the Rigid Format 3 hydroelastic normal modes analysis are presented in Figs. 2-5 and 2-6, respectively. The corresponding information for the Rigid Format 13 hydroelastic normal modes analysis with differential stiffness is presented in Figs 2-7 and 2-8, respectively.

2.3 PROBLEM DEFINITION AND BULK DATA CONSIDERATIONS

2.3.1 Grid Sequence

The modified NASTRAN hydroelastic technique defined by the altered Rigid Formats requires special purpose bulk data for individual problem definition. The Rigid Format 7 grid set must be ordered according to the following convention:

(1) generalized free surface pressures, $\{P_f\}$

(2) generalized structural interface pressures, $\{P_s\}$

(3) generalized internal pressures, $\{P_I\}$

(4) discrete free surface displacements, $\{U_f\}$

(5) harmonic free surface displacements, $\{U_{f_h}\}$

(6) discrete structural displacements, $\{U_S\}$

(7) harmonic structural displacements, $\{U_{S_h}\}$

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N A S T R A N E X E C U T I V E C O N T R O L D E C K E C H O

```
ID,CAP60,COPPOLINO
APP DISP
SOL 3,0
TIME 20
DIAG 2
DIAG 7,8,13,14,19,21,22
ALTER 74
ADD MAA,MFLD/MAH $
PARAM //C,N,NOP/V,N,TRUE=-1 $
EQUIV MAH,MAA/TRUE $
COND MAHNO9,TRUE $
MATPRN MAH,,,,// $
LABEL MAHNO9 $
ALTER 88
SEMAT MGG,KGG,,,//C,N,PRINT
ALTER 91
MATGPR GPL,USET,SIL,PHIA//C,N,A
ALTER 107
SMPYAD PHIA,KAA,PHIA,,,/KH/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
SOLVE MH,KH/WH/C,N,1 $
SMPYAD PDU2,PHIA,WH,,,/PD2/C,N,3 $
MPYAD TU12,PHIA,/PHF/C,N,0 $
MATPRN WH,PD2,PHF,,// $
ENDALTER
CEND
```

PD2 represents the negative of the modal pressure matrix, add parameter/C, N, -1/for positive pressure recovery

delete when free surface displacement recovery is not desired

Fig. 2-5 Rigid Format 3 ALTER-DMAP Statements

```
    N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
 NO.

  1  BEGIN     NO.3 NORMAL MODES ANALYSIS - SERIES M $

  2  FILE      LLL=TAPE $

  3  GP1       GEOM1,GEOM2,/GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL/V,N,LUSET/  C,N,
               123/V,N,NOGPDT $

  4  SAVE      LUSET $

  5  CHKPNT    GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL $

  6  GP2       GEOM2,EQEXIN/ECT $

  7  CHKPNT    ECT $

  8  PLTSET    PCDB,EQEXIN,ECT/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,-1/SIL/  V,N,
               JUMPPLOT $

  9  SAVE      NSIL,JUMPPLOT $

 10  PRTMSG    PLTSETX// $

 11  SETVAL    //V,N,PLTFLG/C,N,1/V,N,PFILE/C,N,0 $

 12  SAVE      PLTFLG,PFILE $

 13  COND      P1,JUMPPLOT $

 14  PLOT      PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,/PLOTX1/ V,N,
               NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $

 15  SAVE      JUMPPLOT,PLTFLG,PFILE $

 16  PRTMSG    PLOTX1//$

 17  LABEL     P1 $

 18  CHKPNT    PLTPAR,GPSETS,ELSETS $

 19  GP3       GEOM3,EQEXIN,GEOM2/,GPTT/C,N,123/V,N,NOGRAV/C,N,123 $

 20  CHKPNT    GPTT $

 21  TA1,      ,ECT,EPT,BGPDT,SIL,GPTT,CSTM/EST,,GEI,ECPT,GPCT/V,N,LUSET/ C,N,
               123/V,N,NOSIMP/C,N,0/V,N,NOGENL/V,N,GENEL $

 22  SAVE      NOGENL,NOSIMP,GENEL $
```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 1 of 6)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.

 23  COND      ERROR1,NOSIMP $

 24  PURGE     OGPST/GENEL $

 25  CHKPNT    EST,ECPT,GPCT,GEI,OGPST $

 26  SMA1      CSTM,MPT,ECPT,GPCT,DIT/KGGX,,GPST/V,N,NOGENL/V,N,NOK4GG $

 27  CHKPNT    KGGX,GPST $

 28  SMA2      CSTM,MPT,ECPT,GPCT,DIT/MGG,/V,Y,WTMASS=1.0/V,N,NOMGG/V,N,NOBGG/
               V,Y,COUPMASS/V,Y,CPBAR/V,Y,CPROD/V,Y,CPQUAD1/V,Y,CPQUAD2/   V,
               Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPCOPLT/V,Y,CPTRPLT/ V,Y,
               CPTRBSC $

 29  SAVE      NOMGG $

 30  COND      ERROR1,NOMGG $

 31  CHKPNT    MGG $

 32  COND      LGPWG,GRDPNT $

 33  GPWG      BGPDT,CSTM,EQEXIN,MGG/OGPWG/V,Y,GRDPNT=-1/V,Y,WTMASS $

 34  OFP       OGPWG,,,,,,//V,N,CARDNO $

 35  SAVE      CARDNO $

 36  LABEL     LGPWG $

 37  EQUIV     KGGX,KGG/NOGENL $

 38  CHKPNT    KGG $

 39  COND      LBL11,NOGENL $

 40  SMA3      GEI,KGGX/KGG/V,N,LUSET/V,N,NOGENL/V,N,NOSIMP $

 41  CHKPNT    KGG $

 42  LABEL     LBL11 $

 43  PARAM     //C,N,MPY/V,N,NSKIP/C,N,0/C,N,0 $

 44  GP4       CASECC,GEOM4,EQEXIN,SIL,GPDT/BG,,USET,//V,N,LUSET/V,N,MPCF1/ V,
               N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
               V,N,NOSET/V,N,NCL/V,N,NOA $

 45  SAVE      MPCF1,MPCF2,SINGLE,OMIT,REACT,NSKIP,REPEAT,NOSET,NOL,NOA $
```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 2 of 6)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
  46  COND     ERROR3,NGL $
  47  PURGE    KRR,KLR,DM,MLR,MR/REACT/GM/MPCF1/GO/OMIT/KFS/SINGLE/QG/NOSET $
  48  EQUIV    KGG,KNN/MPCF1/MGG,MNN/MPCF1 $
  49  CHKPNT   KRR,KLR,DM,MLR,MR,GM,RG,GO,KFS,CG,USET,KNN,MNN $
  50  COND     LBL4,GENEL $
  51  GPSP     GPL,GPST,USET,SIL/OGPST $
  52  OFP      OGPST,,,,,//V,N,CARDNO $
  53  SAVE     CARDNO $
  54  LABEL    LBL4 $
  55  COND     LBL2,MPCF2 $
  56  MCE1     USET,RG/GM $
  57  CHKPNT   GM $
  58  MCE2     USET,GM,KGG,MGG,,/KNN,MNN,, $
  59  CHKPNT   KNN,MNN $
  60  LABEL    LBL2 $
  61  EQUIV    KNN,KFF/SINGLE/MNN,MFF/SINGLE $
  62  CHKPNT   KFF,MFF $
  63  COND     LBL3,SINGLE $
  64  SCE1     USET,KNN,MNN,,/KFF,KFS,,MFF,, $
  65  CHKPNT   KFS,KFF,MFF $
  66  LABEL    LBL3 $
  67  EQUIV    KFF,KAA/OMIT/ MFF,MAA/OMIT $
  68  CHKPNT   KAA,MAA $
  69  COND     LBL5,OMIT $
  70  SMP1     USET,KFF,,,/GO,KAA,K00,L00,U00,,,,, $
```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 3 of 6)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.

 71  CHKPNT   GO,KAA $
 72  SMP2     USET,GO,PFF/PAA $
 73  CHKPNT   PAA $
 74  LABEL    LBL5 $
 74  ADD PAA,NFLD/PAH $
 74  PARAM //C,N,NOP/V,N,TRUE=-1 $
 74  EQUIV PAH,PAA/TRUE $
 74  COND PAHNO9,TRUE $
 74  MATPRN PAH,,,,// $
 74  LABEL PAHNO9 $
 75  COND     LBL6,REACT $
 76  RBMG1    USET,KAA,PAA/KLL,KLR,KPR,MLL,MLR,MRR $
 77  CHKPNT   KLL,KLR,KRR,MLL,MLR,MRR $
 78  RBMG2    KLL/LLL,ULL $
 79  CHKPNT   ULL,LLL $
 80  RBMG3    LLL,ULL,KLR,KRR/DM $
 81  CHKPNT   DM $
 82  RBMG4    DM,MLL,MLR,MRR/MR $
 83  CHKPNT   MR $
 84  LABEL    L3L6 $
 85  DPD      DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,,,,,,,EED,EQDYN/V,N,
              _USET/V,N,LLSETD/V,N,NOTFL/V,N,NEDLT/V,N,NOPSDL/V,N,NOFRL/  V,
              N,NONLFT/V,N,NOTRL/V,N,NCEED/C,N,123/V,N,NOUE $
 86  SAVE     NOEED $
 87  COND     ERROR2,NOEED $
 88  CHKPNT   EED $
```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 4 of 6)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
NO.
 88  SEEMAT MGG,KGG,,,//C,N,PRINT
 89  READ    KAA,MAA,MR,DM,EED,USET,CASECC/LAMA,PHIA,MI,OEIGS/C,N,NODES/V,N,
             NEIGV $
 90  SAVE    NEIGV $
 91  CHKPNT  LAMA,PHIA,MI,OEIGS $
 91  MATGPR  GPL,USET,SIL,PHIA//C,N,A
 92  OFP     LAMA,OEIGS,,,,//V,N,CARDNO $
 93  SAVE    CARDNO $
 94  COND    FINIS,NEIGV $
 95  SDR1    USET,,PHIA,,,GO,GM,,KFS,,/PHIG,,QG/C,N,1/C,N,REIG $
 96  CHKPNT  PHIG,QG $
 97  PARAM   //C,N,SUB/V,N,SCALAR/V,N,SIL/V,N,LUSET $
 98  EQUIV   SIL,SIP/SCALAR/BGPDT,BGPDP/SCALAR $
 99  CHKPNT  SIP,BGPDP $
100  COND    LBL7,SCALAR $
101  PLTTRAN BGPDT,SIL/BGPDP,SIP/V,N,LUSET/V,N,LUSEP $
102  SAVE    LUSEP $
103  CHKPNT  BGPDP,SIP $
104  LABEL   LBL7 $
105  SDR2    CASECC,CSTM,MPT,DIT,EQEXIN,SIL,,,BGPDP,LAMA,QG,PHIG,ESTA,,,QQG1,
             QPHIG,QES1,QEF1,PPHIG/C,N,REIG $
106  OFP     QPHIG,QQG1,QEF1,QES1,,,//V,N,CARDNO $
107  SAVE    CARDNO $
107  SMPYAD  PHIA,KAA,PHIA,,,,/KH/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
107  SOLVE   MI,KH/UH/C,N,1 $
107  SMPYAD  PDU2,PHIA,UH,,,,/PD2/C,N,3 $
```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 5 of 6)

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```
AXISYMMETRIC CIRC. CYL. WITH FLUID                    APRIL 11, 1974   NASTRAN 5/13/72
HARMONIC REDUCTION

    N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
 NO.
107  MPYAD  TU12,PHIA,/PHF/C,N,0 $
107  MATPRN WH,PD2,PHF,,// $
108  COND   P2,JUMPPLOT $
109  PLOT   PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,PPHIG /  PLOTX2/
            V,N,NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
110  SAVE   PFILE $
111  PRTMSG PLOTX2// $
112  LABEL  P2 $
113  JUMP   FINIS $
114  LABEL  ERROR1 $
115  PRTPARM //C,N,-1/C,N,MODES $
116  LABEL  ERROR2 $
117  PRTPARM //C,N,-2/C,N,MODES $
118  LABEL  ERROR3 $
119  PRTPARM //C,N,-3/C,N,MODES $
120  LABEL  FINIS $
121  END    $
     **NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM**
```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 6 of 6)

N A S T R A N E X E C U T I V E C O N T R O L D E C K E C H O

```
ID,CAP60,COPPCLIND
APP DISP
SOL 13,0
TIME 30
DIAG 2
DIAG 7,8,13,14,19,21,22
ALTER 1,3
ADD MAA,HFLD/MAH $
PARAM //C,N,NOP/V,N,TRUE=-1 $
EQUIV MAH,MAA/TRUE $
COND MAHND9,TRUE $
MATPRN MAH,,,,// $
LABEL MAHND9 $
ALTER 1,9
SEEMAT MGG,KBGG,,,//C,N,PRINT $
ALTER 1,0
SMPYAD PHIA,KDAA,PHIA,,,/KH/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
SMPYAD PHIA,MAA,PHIA,,,/MI/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
SOLVE MI,KH/WH/C,N,1 $
SMPYAD PD02,PHIA,WH,,,/PD2/C,N,3 $
MPYAD TU12,PHIA,/PHF/C,N,0 $
MATPRN WH,PD2,PHF,,,// $
ENDALTER
CEND
```

PD2 represents the negative of the modal pressure matrix, add parameter/C, N, -1/for positive pressure recovery

delete when free surface displacement recovery is not desired

Fig. 2-7 Rigid Format 13 ALTER-DMAP Statements

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OF POOR QUALITY


```
    N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP=DMAP INSTRUCTION
 NO.
   1   BEGIN    NO.13 NORMAL MODES WITH DIFFERENTIAL STIFFNESS - SERIES M $

   2   FILE     LLL=TAPE $

   3   GP1      GEOM1,GEOM2,/GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL/V,N,LUSET/  C,N,
                123/V,N,NOGPDT $

   4   SAVE     LUSET $

   5   CHKPNT   GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL $

   6   GP2      GEOM2,EQEXIN/ECT $

   7   CHKPNT   ECT $

   8   PLTSET   PCDB,EQEXIN,ECT/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,NSIL/   V,N,
                JUMPPLOT $

   9   SAVE     NSIL,JUMPPLOT $

  10   PRTMSG   PLTSETX// $

  11   SETVAL   //V,N,PLTFLG/C,N,1/V,N,PFILE/C,N,C $

  12   SAVE     PLTFLG,PFILE $

  13   COND     P1,JUMPPLOT $

  14   PLOT     PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,/PLOTX1/ V,N,
                NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $

  15   SAVE     JUMPPLOT,PLTFLG,PFILE $

  16   PRTMSG   PLOTX1// $

  17   LABEL    P1 $

  18   CHKPNT   PLTPAR,GPSETS,ELSETS $

  19   GP3      GEOM3,EQEXIN,GEOM2/SLT,GPTT/C,N,123/V,N,NOGRAV/C,N,123 $

  20   CHKPNT   SLT,GPTT $

  21   TA1      ,ECT,EPT,PCDB,SIL,GPTT,CSTM/EST,,GEI,ECPT,GPCT/V,N,LUSET/ C,N,
                123/V,N,NCSIMP/C,N,0/V,N,NOGENL/V,N,GENEL $

  22   SAVE     NOSIMP,NOGENL,GENEL $
```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 1 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
  23   COND      ERROR1,NOSIMP $
  24   PURGE     OGPST/CENEL $
  25   CHKPNT    EST,ECPT,GPCT,CEI,OGPST $
  26   SMA1      CSTM,MPT,ECPT,GPCT,DIT/KGGX,,GPST/V,N,NOGENL/V,N,NOK4GG $
  27   CHKPNT    GPST,KGGX $
  28   SMA2      CSTM,MPT,ECPT,GPCT,DIT/MGG,/V,Y,RTMASS=1.0/V,N,NOMGG/V,N,NOBGG/
                 V,Y,COUPMASS/V,Y,CPLIAR/V,Y,CPROD/V,Y,CPQUAD1/V,Y,CPQUAD2/   V,
                 Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPQDPLT/V,Y,CPTRPLT/ V,Y,
                 CPTRESC $
  29   SAVE      NOMGG $
  30   CHKPNT    MGG $
  31   COND      ERROR5,NOMGG $
  32   COND      LBL1,GRDPNT $
  33   GPWG      UGPDT,CSTM,EQEXIN,MGG/UGPWG/V,Y,GRDPNT=-1/V,Y,RTMASS $
  34   OFP       UGPWG,,,,,,//V,N,CARDNO $
  35   SAVE      CARDNO $
  36   LABEL     LBL1 $
  37   EQUIV     KGGX,KGG/NOGENL $
  38   CHKPNT    KGG $
  39   COND      LBL11,NOGENL $
  40   SMA3      GEI,KGGX/KGG/V,N,LUSET/V,N,NOGENL/C,N,-1 $
  41   CHKPNT    KGG $
  42   LABEL     LBL11 $
  43   PARAM     //C,N,MPY/V,N,NSKIP/C,N,0/C,N,0 $
  44   GP4       CASECC,CSTM,EQEXIN,SIL,GPDT/RG,YS,LSET/V,N,LUSET/V,N,MPCF1/
                 V,N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,RLACT/V,N,NSKIP/V,N,REPEAT/
                 V,N,NOSET/V,N,NOL/V,N,NOA $
  45   SAVE      MPCF1,MPCF2,SINGLE,OMIT,RLACT,NSKIP,REPEAT,NOSET,NOL,NOA $
```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 2 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION
NO.

```
46  COND    ERROR6,NOA $
47  PARAM   //C,N,ADD/V,N,NOSR/V,N,SINGLE/V,N,REACT $
48  PURGE   GM/MPCF1/GO,KOO,LOO,UOO,PO,UOOV,RUOV/OMIT/PS,KFS,KSS/SINGLE/
            QG/NUSR $
49  EQUIV   KGG,KNN/MPCF1 $
50  CHKPNT  GM,KO,GO,KOO,LOO,UOO,PO,UOOV,RUOV,YS,PS,KFS,KSS,USET,QG,KNN $
51  COND    LBL40,REACT $
52  JUMP    ERROR2 $
53  LABEL   LBL40 $
54  COND    LBL4,GENEL $
55  GPSP    GPL,GPST,USET,SIL/OGPST $
56  UPP     OGPST,,,,,//V,N,CARDNO $
57  SAVE    CARDNO $
58  LABEL   LBL4 $
59  COND    LBL2,MPCF2 $
60  MCE1    USET,RG/GM $
61  CHKPNT  GM $
62  MCE2    USET,GM,KGG,,,,/KNN,,, $
63  CHKPNT  KNN $
64  LABEL   LBL2 $
65  EQUIV   KNN,KFF/SINGLE $
66  CHKPNT  KFF $
67  COND    LBL3,SINGLE $
68  SCE1    USET,KNN,,,/KFF,KFS,KSS,,, $
69  CHKPNT  KFS,KSS,KFF $
70  LABEL   LBL3 $
```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 3 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
UNAP-DMAP INSTRUCTION
 NO.
  71  EQUIV    KFF,KAA/CMIT $
  72  CHKPNT   KAA $
  73  COND     LBL5,CMIT $
  74  SMP1     USET,KFF,,,,/GO,KAA,KOO,LOO,UOO,,,,, $
  75  CHKPNT   GO,KAA,KOO,LOO,UOO $
  76  LABEL    LBL5 $
  77  RBMG2    KAA/LLL,ULL $
  78  CHKPNT   ULL,LLL $
  79  SSG1     SLT,BGPDT,CSTM,SIL,EST,MPT,GPTT,EDT,MGG,CASECC,DIT/PG/ V,N,
               LUSET/C,N,1 $
  80  CHKPNT   PG $
  81  EQUIV    PG,PL/NOSET $
  82  CHKPNT   PL $
  83  COND     LBL10,NOSET $
  84  SSG2     USET,GM,YS,KFS,KO,,PG/,PO,PS,PL $
  85  CHKPNT   PO,PS,PL $
  86  LABEL    LBL10 $
  87  SSG3     LLL,ULL,KAA,PL,LOO,UOO,KOO,PO/ULV,UOOV,RULV,RUOV/V,N,CMIT/ V,Y,
               IRES=-1/C,N,1/V,N,EPSI $
  88  SAVE     EPSI $
  89  CHKPNT   ULV,UOOV,RULV,RUOV $
  90  COND     LBL9,IRES $
  91  MATGPR   GPL,USET,SIL,RULV//C,N,L $
  92  MATGPR   GPL,USET,SIL,RUOV//C,N,O $
  93  LABEL    LBL9 $
  94  SDR1     USET,PG,ULV,UOOV,YS,GO,GM,PS,KFS,KSS,/UGV,PGG,UG/C,N,1/C,N,
               BKLO $
```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 4 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.

  95  CHKPNT   UGV,GG,PGG $

  96  SDR2     CASECC,CSTM,MPT,DIT,EQEXIN,SIL,GPTT,EDT,BGPDT,PGG,QG,UGV,EST,/
               OPG1,QUG1,CUGV1,QES1,QEF1,PUGV1/C,N,BKLO $

  97  OFP      QUGV1,OPG1,QUG1,QEF1,QES1,,//V,N,CARDNO $

  98  SAVE     CARDNO $

  99  COND     P2,JUMPPLOT $

 100  PLOT     PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,PUGV1,/PLOTX2/V,N,
               NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $

 101  SAVE     PFILE $

 102  PRTMSG   PLOTX2// $

 103  LABEL    P2 $

 104  DSMG1    CASECC,GPTT,SIL,ECT,UGV,CSTM,MPT,ECPT,GPCT,DIT/KDGG/  ',N,
               DSCUSET $

 105  CHKPNT   KDGG $

 106  ADD      KDGG,KGG/KBGG $

 107  EQUIV    KBGG,KDNN/MPCF2 / MGG,MNN/MPCF2 $

 108  CHKPNT   KDNN,MNN $

 109  COND     LBL2D,MPCF2 $

 110  MCE2     USET,GM,KBGG,MGG,,/KDNN,MNN,, $

 111  CHKPNT   KDNN,MNN $

 112  LABEL    LBL2D $

 113  EQUIV    KDNN,KDFF/SINGLE / MNN,MFF/SINGLE $

 114  CHKPNT   KDFF,MFF $

 115  COND     LBL3D,SINGLE $

 116  SCE1     USET,KDNN,MNN,,/KDFF,KDFS,,MFF,, $

 117  CHKPNT   KDFF,KDFS,MFF $

 118  LABEL    LBL3D $
```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 5 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
  119  EQUIV     KDFF,KDAA/CMIT / MFF,MAA/CMIT $
  120  CHKPNT    KDAA,MAA $
  121  COND      LBLSD,CMIT $
  122  SMP2      USET,GO,KDFF/KDAA $
  123  SMP2      USET,GO,MFF/MAA $
  124  CHKPNT    KDAA,MAA $
  125  LABEL     LBLSC $
  126  ADD MAA,MFLD/MAH $
  127  PARAM //C,N,NEP/V,N,TRUE=-1 $
  128  EQUIV MAH,MAA/TRUE $
  129  COND MAHNO9,TRUE $
  130  MATPRN MAH,,,,// $
  131  LABEL MAHNO9 $
  132  DPD       DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,,,,,,,ELD,EQDYN/V,N,
                 LUSET/V,N,LUSETD/V,N,NOTFL/V,N,NODLT/V,N,NUPSOL/V,N,NUFRL/  V,
                 N,NINLFT/V,N,NCTRL/V,N,NUEED/C,N,123/V,N,NOUE $
  133  SAVE      NOEED $
  134  COND      ERROR3,NOEED $
  135  CHKPNT    ELD $
  136  SELMAT MGG,KUGG,,,//C,N,PRINT $
  137  READ      KDAA,MAA,,,ELD,USET,CASECC/LAMA,PHIA,,OEIGS/C,N,MODES/ V,N,
                 NEIGV/C,N,2 $
  138  SAVE      NEIGV $
  139  CHKPNT    LAMA,PHIA,OEIGS $
  140  OFP       OEIGS,LAMA,,,,//V,N,CARDNO $
  141  SAVE      CARDNO $
  142  COND      ERROR4,NEIGV $
```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 6 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
 136  SDR1      USET,,PHIA,,,,GO,GM,,,KDFS,,/PHIG,,BOG/C,N,1/C,N,BKL1 $
 137  CHKPNT    PHIG,BOG $
 138  SDR2      CASECC,CSTM,MPT,DIT,EQEXIN,SIL,,,BGPDT,LAMA,BUG,PHIG,EST,/ ,
                BBUG1,BPHIG,UBES1,UBEF1,PPHIG/C,N,BKL1 $
 139  OFP       OPHIG,CCCC1,UBEF1,UBES1,,//V,N,CARDNO $
 140  SAVE      CARDNO $
 140  SMPYAD PHIA,KDAA,PHIA,,,,/KH/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
 140  SMPYAD PHIA,MAA,PHIA,,,,/MI/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
 140  SOLVE MI,KH//HF/C,N,1 $
 140  SMPYAD PD12,PHIA,WH,,,,/PE2/C,N,3 $
 140  MPYAD TU12,PHIA,/PHF/C,N,0 $
 140  MATPRN WH,PD2,PHF,,// $
 141  COND      P3,JUMPPLOT $
 142  PLOT      PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,PPHIG/PLOTX3/V,N,
                NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
 143  SAVE      PFILE $
 144  PRTMSG    PLOTX3// $
 145  LABEL     P3 $
 146  JUMP      FINIS $
 147  LABEL     ERROR1 $
 148  PRTPARM   //C,N,-1/C,N,BUCKLING $
 149  LABEL     ERROR2 $
 150  PRTPARM   //C,N,-2/C,N,BUCKLING $
 151  LABEL     ERROR3 $
 152  PRTPARM   //C,N,-3/C,N,BUCKLING $
 153  LABEL     ERROR4 $
```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 7 of 8)

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```
AXISYMMETRIC CIRC. CYL. WITH FLUID                                    MAY  4, 1974   NASTRAN  5/13/72
HARMONIC REDUCTION


     N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
 NO.

 154   PRTPARM   //C,N,-4/C,N,BUCKLING $

 155   LABEL     ERROR5 $

 156   PRTPARM   //C,N,-5/C,N,BUCKLING $

 157   LABEL     ERROR6 $

 158   PRTPARM   //C,N,-6/C,N,BUCKLING $

 159   LABEL     FINIS $

 160   END       $

      **NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM**
```


Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 8 of 8)

When free surface displacement recovery is not desired, categories (4) and (5) are absent. Although the external grid indexing, I_E, is such that the generalized pressures (1), (2) and (3) are of lowest indices, the NASTRAN internal indices for the pressures I_I, are:

$$I_I = 1,000,000 \times I_n + I_E$$

where

$$I_n = N+1 \text{ for a cosine series}$$

$$I_n = N+1/2 \text{ for a sine series}$$

In order to avoid conflicting indices and to accommodate partitioning operations, external grid index bounds must be strictly adhered to (Note: external and internal indices for displacements are equivalent). The chosen external index bounds are:

$$1 \leq I_E\ (P_s,\ P_f,\ P_I) \leq 999$$

$$1000 \leq I_E\ (U_f,\ U_{f_h}) \leq 2999$$

$$3000 \leq I_E\ (U_S) \leq 9999$$

$$10,000 \leq I_E\ (U_{S_h}) \leq 999,000$$

The above sequencing bounds also hold for U_S and U_{S_h} in Rigid Formats 3 and 13 for modal hydroelastic analysis.

2.3.2 Coordinate Systems

The most convenient displacement set coordinate systems for hydroelastic problems are local spherical or cylindrical reference frames in which one of the linear displacements is normal to the fluid bounding surface and the other two linear displacements are tangent to bounding surface; such reference frames are also ideal for structural grid points defining the surface of a plate or shell not interfacing with a fluid. In the case of the free surface, when displacement recovery is desired, a cylindrical reference frame with the i_3 (z) displacement component directed normal to the free surface should be defined.

Typical reference frames with defining parameters are illustrated in Fig. 2-9.

2.3.3 Constraints and Reductions

The required and recommended constraints in the Rigid Format 7 fluid data calculation and Rigid Format 3 or 13 hydroelastic normal modes analysis follow differing rules due to the special purpose of each respective calculation. The final analysis sets, however, must be compatible. The definition of local spherical and cylindrical reference frames described in Section 5.3.2 plays a crucial role in the considerations outlined below.

The constraints and reductions applied in the Rigid Format 7 fluid data calculation are:

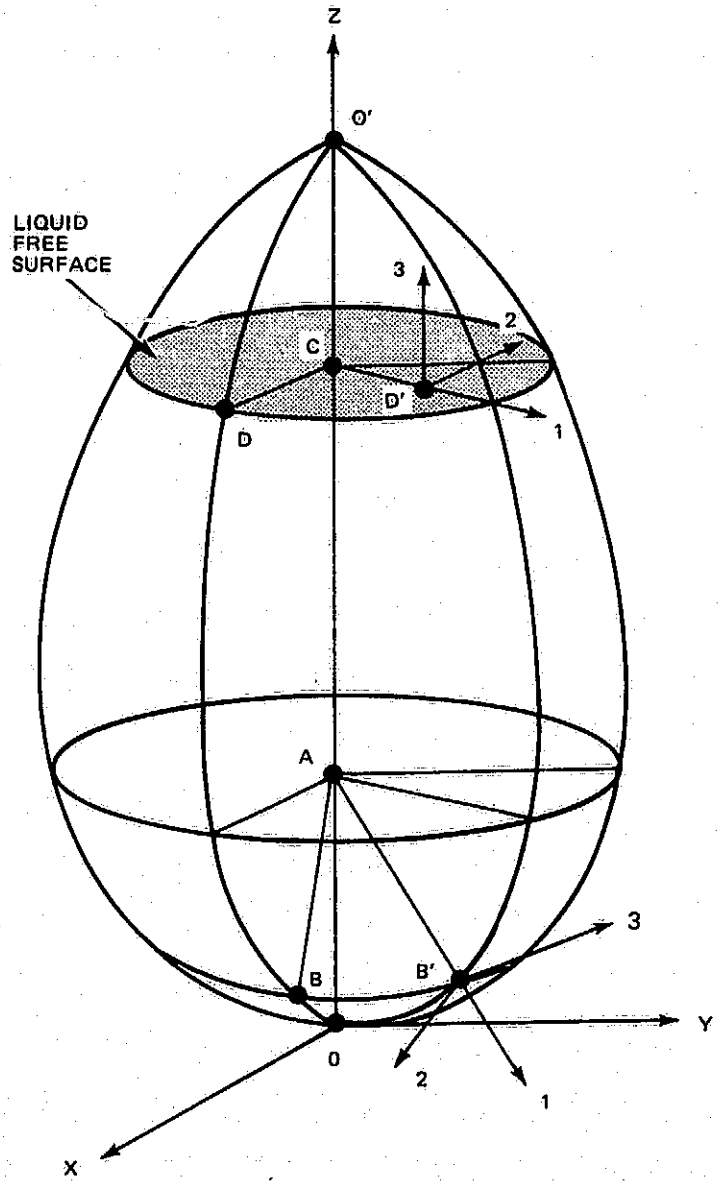
- Multipoint Constraints (MPC) - The multipoint constraints are used for harmonic transformation of discrete free surface and structural displacements. Only the displacement components to be retained in the analysis set should be transformed (e.g., outward normal only, normal and tangential only). As a general rule only those free surface displacements normal to the surface are transformed.

- Single Point Constraints (SPC) - The single point constraint set includes all structural displacements (Harmonic or discrete) to be omitted by Guyan reduction in the Rigid Format 3 or 13 modal analysis; components normal to the fluid/structure interface should not be constrained. It should be noted that there is no structural stiffness matrix to be decomposed in the Rigid Format 7 calculation. Single point constraints defining physical structural constraints are included in the SPC set.

  In the cases where fluid free surface displacement sets are not defined, the free surface pressures become members of the SPC set; in addition, for intermediate fluid fill conditions the pressures above the intermediate free surface become members of the SPC set.

- Guyan Reduction (OMIT) - The OMIT set must include all fluid internal pressures. Structural displacements may not appear in this set since the structural stiffness matrix is not defined in Rigid Format 7.

II



- FREE SURFACE CYLINDRICAL REF. FRAME DEFINED BY LOCATION OF POINTS C, O', D
- LOCAL SPHERICAL REF. FRAME DEFINED BY LOCATION OF POINTS A, O', B WHERE LINE AB DEFINES A NORMAL W.R.T. THE STRUCTURAL SURFACE.

Fig. 2-9 Local Reference Frames

- Special Partitioning - A partitioning vector, $\{P_9\}$ is defined by DMI statements to partition the analysis set into generalized pressure and generalized displacement subsets. If fluid free surface displacements have not been defined in the formulation, further partitioning is not required.

  When fluid free surface displacements are defined partitioning of the pressure and displacement subsets is required. The vector $\{G9\}$ is defined by DMI statements to partition the pressure subset into free surface pressure and structural interface pressure subsets. The vector $\{UP\}$ is defined to partition the displacement subset into free surface and structural displacement subsets. It should be noted that the structural displacement subset corresponds to the Rigid Format 3 analysis set to be defined below.

The constraints and reductions applied in the Rigid Format 3 or 13 hydroelastic normal modes analyses are:

- Multipoint Constraints (MPC) - The multipoint constraints are used for harmonic transformation of discrete structural displacements if harmonic reduction is utilized. All six displacement degrees of freedom must be transformed for each grid point associated with the harmonic constraints. Additional multipoint constraints not associated with the harmonic transformation may also be defined.
- Single Point Constraints (SPC) - Single point constraints are utilized to define structural supports on harmonic as well as discrete displacements as required.
- Guyan Reduction (OMIT) - The OMIT set includes harmonic displacement components to be reduced out (e.g., tangential displacements and rotations). Discrete displacement components are also members of this set as required.

2.3.4 Special Bulk Data Considerations

The bulk data required in the modified Rigid Format 7 calculation of fluid matrix data closely follows the unmodified Rigid Format 7 bulk data with a few exceptions. These are:

(1) A free surface may not be defined in terms of FSLIST. If free surface displacement recovery is required (or gravitational stiffness is included)

the free surface is defined as part of the BDYLIST. If free surface displacement recovery is not desired the BDYLIST only includes the fluid points at the structural interface.

(2) A dummy EIGC card is required to avoid an error message.

(3) A PARAM card is required with the following data:

Field 1 = PARAM
Field 2 = A999
Field 3 = N (floating point number)
Field 4 = 0.

Where N is equal to the number of symmetric sections of structural boundary about the fluid circumference being modeled by structural elements.

(4) The partitioning vectors $\{P_9\}$, $\{G9\}$ and $\{UP\}$ must be defined on DMI cards as described in Section 5.3.3.

The fluid matrix output from the Rigid Format 7 run may be placed on cards or tape. If it is output onto DMI cards, these cards must be used as part of the input data for a Rigid Format 3 or 13 hydroelastic normal modes analysis run. The remaining bulk data for the hydroelastic normal modes analysis is the same as for a dry structure.

3 - 1/8-SCALE SPACE SHUTTLE EXTERNAL TANK HYDROELASTIC ANALYSIS

An investigation of 1/8-scale external tank dynamics in a free-free supported condition utilizing the modified versions of Rigid Formats 7 and 3 has been undertaken. The finite element hydroelastic model illustrated in Figs. 3-1 through 3-4 is described by a grid set consisting of 348 pressure degrees of freedom, 2,058 structural degrees of freedom, and 768 harmonic structural degrees of freedom. The structural model contains elements representing all rings, stringers, internal stiffening members and asymmetries present in the 1/8-scale test article. Normal and tangential motion of the tank surface is conveniently described in terms of local spherical and cylindrical reference frames.

The fluid model describing the dynamics of the fluids consists of 204 and 144 degrees of freedom for the LOX and LH_2 model fluids, respectively, in the liftoff condition; harmonics n = 0, 1, 2, 3 were chosen to describe asymmetric dynamics with the pitch plane taken as an axis of symmetry. The respective LO_2 and LH_2 free surface motions in this application were not desired. Free surface displacement sets are therefore not defined, however the fluid free surface condition is described in Rigid Format 7 by application of single point constraints (SPC's) on free surface pressures. In addition, for liquid levels other than the liftoff condition, single point constraints are applied to pressure degrees of freedom at and above the appropriate free surfaces. This feature of the analysis provides capability for study of many liquid fill conditions utilizing a single grid set fluid model.

Harmonic reduction retaining harmonics n = 0, 1, 2, 3 was applied to the structural grid of the external tank (ET) for consistency with the fluid pressure grid. The multipoint constraint data for this study was generated by a general purpose data preparation program HARM which is discussed in Appendix A. Since consistency is desirable mainly at the fluid/structure interface, the harmonic transformation was limited to the interface points associated with the liftoff condition. Many of the remaining grid set displacements were "omitted" by Guyan reduction. In addition, in the basic analysis, all generalized rotations and tangential displacements in the harmonic set of displacements were "omitted". The analysis set of displacements therefore consists of 128 harmonic, outward normal displacement degrees of freedom (32 meridional locations, harmonics n = 0, 1, 2, 3).

II

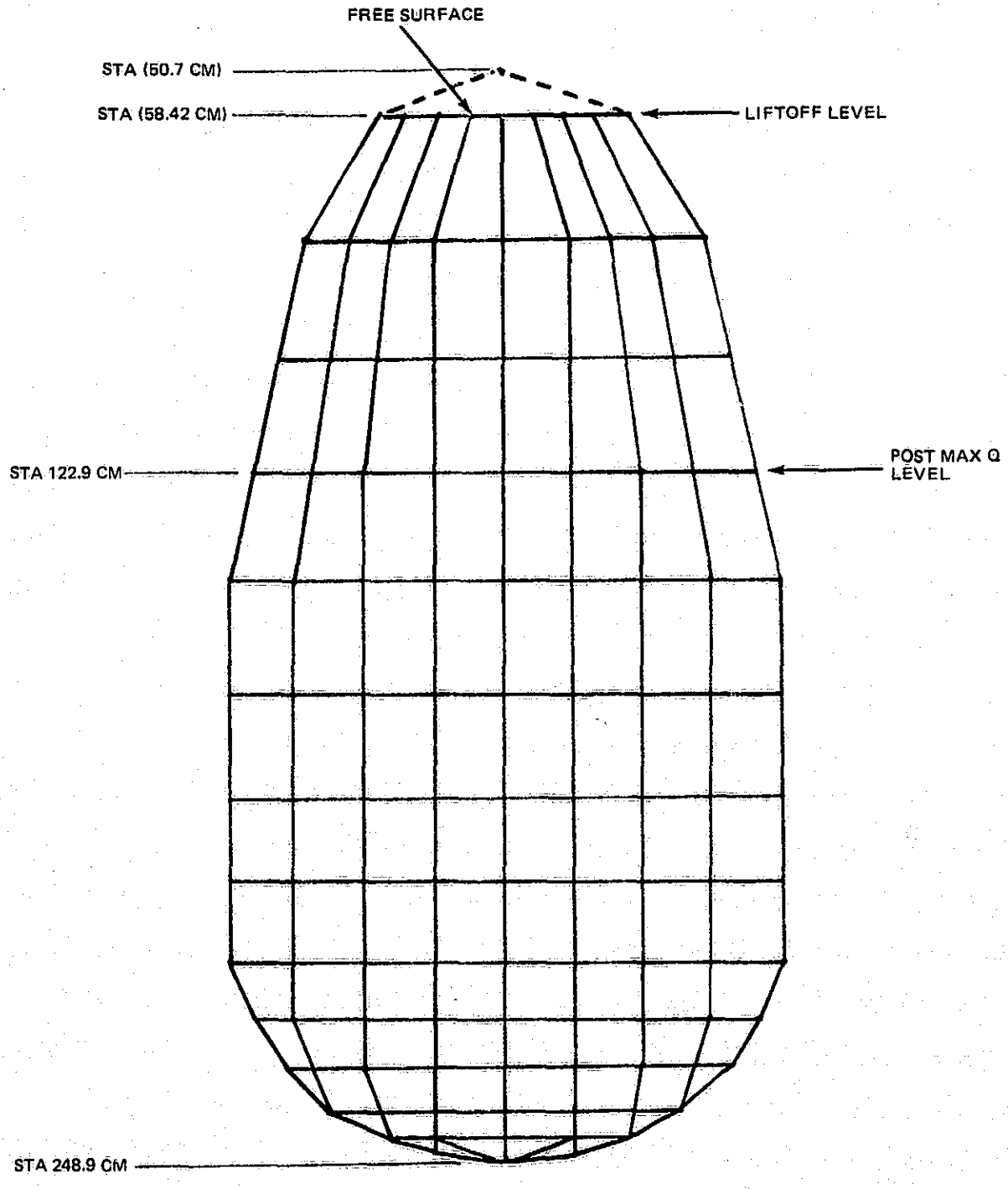


Fig. 3-1 LO_2 Fluid Idealization (Rings)

II

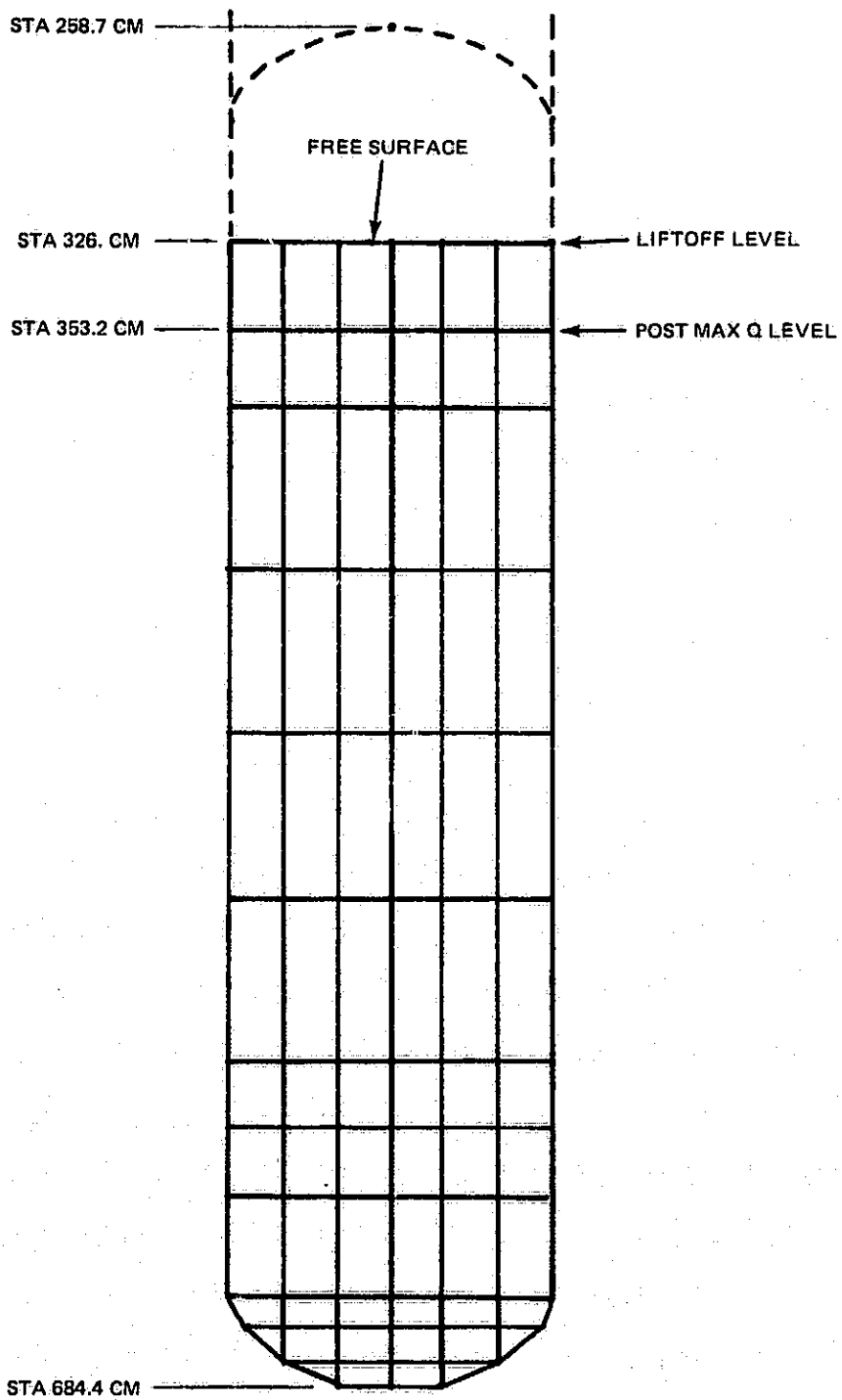


Fig. 3-2 LH_2 Fluid Idealization (Rings)

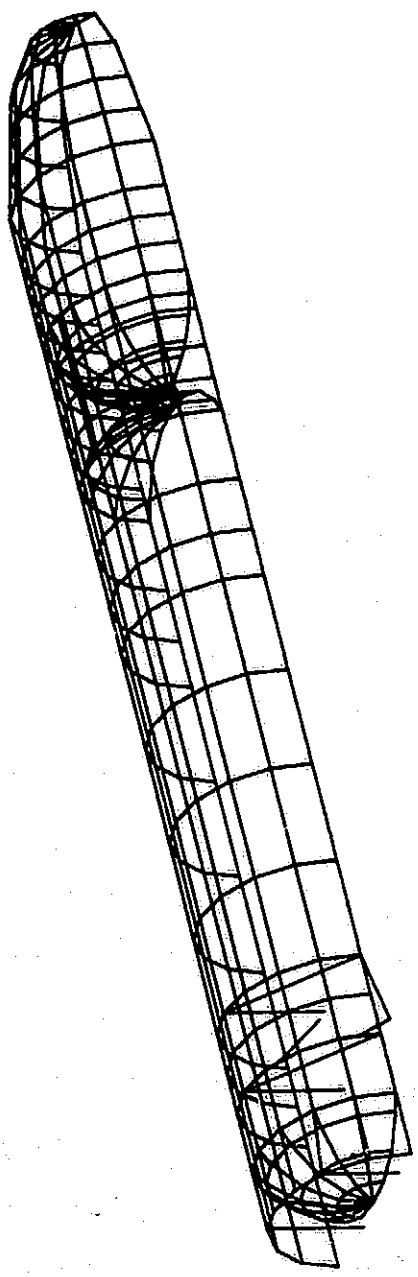


Fig. 3-3 1/8-Scale External Tank Structural Grid

II

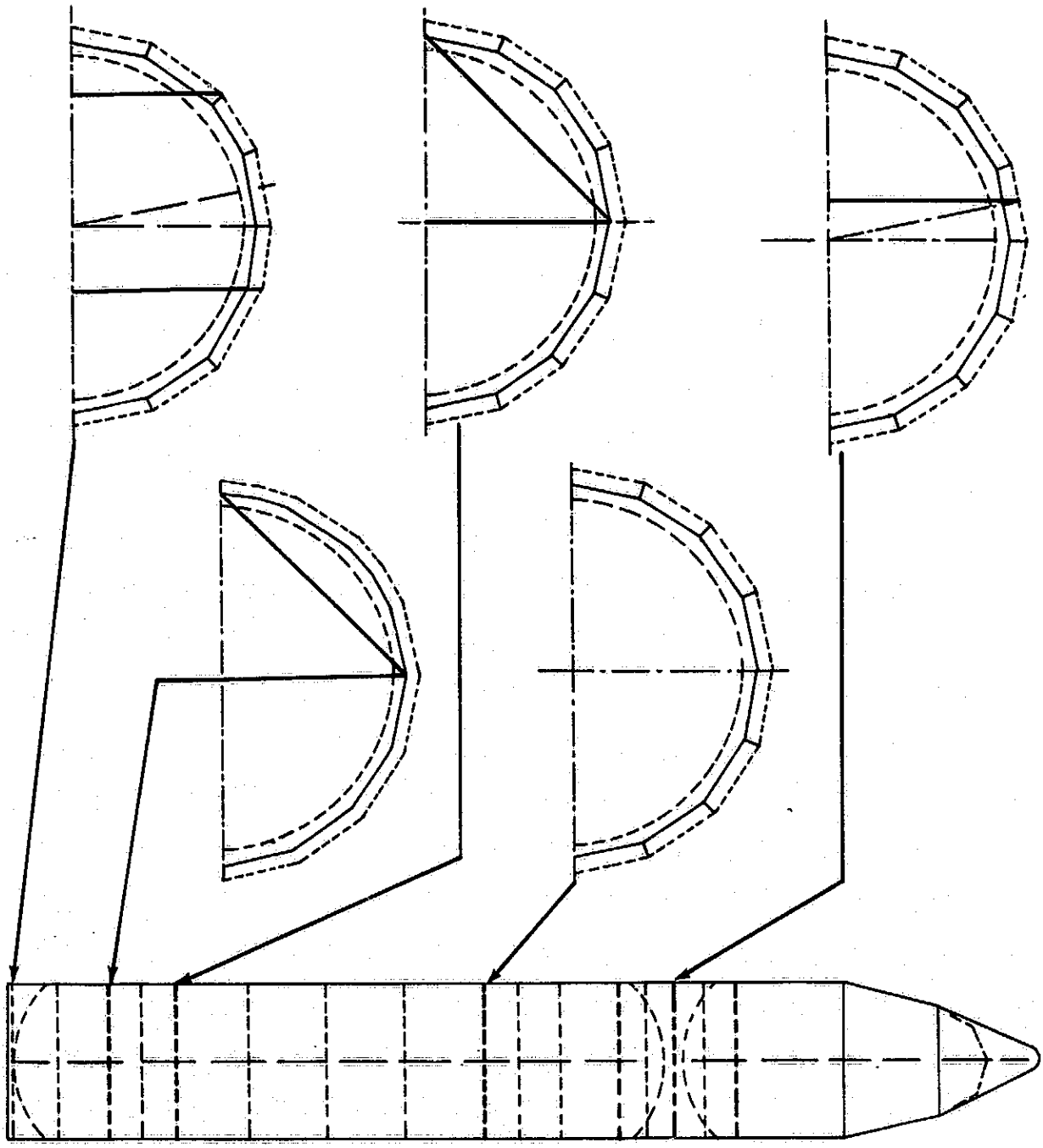


Fig. 3-4 1/8-Scale External Tank Heavy Frame Idealizations

Three liquid fill conditions have been studied consisting of liftoff, post max Q and empty. In terms of liquid height above the respective bulkheads the conditions are identified as:

- liftoff: $h_{LOX} = 190.5$ cm, $h_{LH_2} = 358.14$ cm
- post max - Q: $h_{LOX} = 127$ cm, $h_{LH_2} = 330.2$ cm
- empty: $h_{LOX} = h_{LH_2} = 0$

The liquid free surfaces are normal to the tank axis since the NASTRAN hydroelastic analysis is currently limited to axisymmetric fluid configurations.

Normal modes analysis for each of the fill conditions was performed with the modified version of Rigid Format 3. All 128 eigenvalues and 25 mode shapes and modal pressure distributions were extracted by the Given's method. Computational efficiency was quite satisfactory for this rather complex mathematical model. Computation time on the Grumman IBM 370/165 computer for the fluid mass and pressure recovery matrices (LOX and LH_2 combined) on Rigid Format 7 was on the average slightly less than 5 CPU minutes per liquid level and computation time for normal modes analysis in Rigid Format 3 was on the average about 18 CPU minutes per liquid level (16 min. computation, 2 min. plot preparation). In previous attempts to study the dynamics of the same finite element representation with the standard NASTRAN hydroelastic analysis, computation times were in excess of 70 CPU minutes with only one eigenvalue and mode shape extracted by the unsymmetric inverse power method. Actually the computation time for normal modes analysis can be significantly reduced by utilization of NASTRAN's checkpoint-restart capability. By utilization of checkpointing in a first case liquid level NASTRAN run, structural and fluid data may be saved on tapes eliminating much of the computation time associated with preparation of matrix data common to all liquid levels (especially reduction of the structural model representation), total computation time per liquid level may be reduced to about 10 CPU minutes for cases subsequent to the initial run.

Modal data for each of the three fill conditions studied are summarized in Tables 3-1 through 3-3 with dome pressure gain presented as a measure of relative significance in Pogo susceptibility. The pressure gain is defined as the dome pressure

(LO_2 and LH_2) in the vicinity of the feedline interface resulting from a unit modal acceleration. Plots of the mode shapes are presented in Figs. 3-5 through 3-8. Unrealistic behavior of the individual tank dome apexes is present in the liftoff configuration illustrated in Figs. 3-5 through 3-26 and in the post max Q configuration illustrated in Figs. 3-27 through 3-31. This localized behavior was eliminated by incorporation of an "apex fix" in the post max Q configuration illustrated in Figs. 3-32 through 3-53 and in the empty configuration illustrated in Figs. 3-54 through 3-75 with negligible effect on natural frequencies and overall mode shapes. The "apex fix" consists of a set of multipoint constraints (MPC's) forcing the apex and the set of grid points connected to it by triangular elements to move as a rigid body in the zeroth harmonic as shown in Fig. 3-76.

An assessment of the accuracy of the current NASTRAN analysis results was made on the basis of available test and previous analysis data. Comparisons of the current results with limited test, previous NASTRAN finite element, and NASTRAN equivalent beam model results are presented in Table 3-4. For the liftoff condition, the current and previous NASTRAN first axial mode frequencies are in disagreement. This is attributed to the extreme Guyan reduction required in the previous analysis to keep computation time at a reasonable level. Test data for the liftoff condition is not available at the present time. In the case of the post max Q fill condition, limited test results are available with some uncertainty in the second overall bending frequency. Excellent agreement between current NASTRAN finite element and test frequencies in the first axial mode and poor agreement in the respective bending frequencies were noted; the bending mode discrepancy is also present in the empty condition results. An effort to locate the source of discrepancy was initiated. The present first bending mode and n = 3 shell mode of the LH_2 cylinder presented in Figs. 3-54 and 3-55 respectively, compared well with the previous NASTRAN results (see Table 3-4). No comparisons were made with the third empty External Tank mode calculated in the previous analysis since this mode is predominently an n = 4 shell mode and the current analysis is limited to the harmonics n = 0, 1, 2, 3.

A comparison of the current NASTRAN and test firing bending frequencies in the empty condition indicates a frequency error

$$\frac{\omega \text{ Test Empty}}{\omega \text{ Anal Empty}} = \frac{89}{105.6} = 0.8428 \qquad (3\text{-}1)$$

which applied as a correction to the post max Q first bending frequency results in

$$\omega \text{ corrected} = 0.8428 \times 49.2 \text{ Hz} = 41.5 \text{ Hz} \quad (3\text{-}2)$$

which is much closer to the test result, 37 Hz. This leads one to suspect strongly that an inaccuracy exists in the structural finite element model. A series of modifications in the structural model were implemented in search of sources of error. In one case, the large elements on the LH_2 tank cylinder were converted from CQUAD2 membrane-plate elements to CQDMEM membrane elements since it was suspected that individual plate bending strain energy was unrealistically high; the results of the study showed no change in the fundamental bending mode frequency.

In another attempt to find the source of inaccuracy, ring frame torsional and axial stiffnesses were reduced to reflect partial effectiveness in the axial direction; again there was no change in the fundamental bending mode frequency. At this point the effort to locate the discrepancy was halted because further effort was considered to be outside the scope of the present task.

In order to verify the fluid model, modal pressure distributions in the first axial and bending modes for the post max Q fill conditions were studied; the pressure distributions are illustrated in Figs. 3-77 and 3-78. Since nearly all of the system mass is associated with the fluids, the pressure distributions in the free-free supported modes must reflect an overall state of equilibrium. This condition is apparent in the axial (n = 0) pressure distributions by the nearly equal and opposite bulkhead pressures (note that a small n = 0 pressure contribution appears in the bending mode since the tank structure is not purely axisymmetric). In the bending mode the net lateral force and pitch moment are nearly zero; thus confidence is gained in the fluid representation in the lower mode shapes. Further verification of the fluid representation in the higher modes is effected by examination of pressure distributions in the LOX tank in the post max Q fill condition illustrated in Fig. 3-79; it is noted that the pressure and displacement profiles below the level of the free surface have similar shapes with nearly coincident vibration nodes. In addition, pressure distributions near the free surface in all lateral pressure distributions ($n \geq 1$) approach zero pressure indicating the "effective slosh mass" contributions which are out of phase with shell motion in the hydroelastic frequency range. Further quantitative checks were made by hand computation of modal generalized mass of the

fluid on the basis of pressure distributions which compared well with approximated modal mass values based on a NASA LaRC beam model and with the NASTRAN computed modal mass. With verification of the fluid representation fairly complete, a checkout of the structural model was initiated.

An initial verification of the accuracy of the harmonic reduction scheme applied the structurally asymmetric tank was made by comparison of the current empty tank results with previous NASTRAN results for the same finite element model without any reductions. Only three modes were obtained by the inverse power method in the previous analysis and these are presented in Figs. 3-80 through 3-82.

In the event that the reader wishes to review and/or revise the 1/8-scale external tank mathematical model, he must be aware of the fact that some shell grid point displacements are not expressed in terms of local cylindrical or spherical reference frames. Thus displacements associated with shell grid points 8134, 8352, 8355 must not be related to the harmonic displacement set; it should also be noted that any grid point displacements not associated with shell surface motion may not be related to the harmonic set.

Table 3-1 1/8-Scale External Tank Hydroelastic Mode Summary (Post Max Q)

Mode No.	Freq. (Hz)	Modal Mass	Description of Mode	LOX Dome Pressure Gain X 10^3	LH_2 Dome Pressure Gain X 10^3
4	42.0	.549	LOX n=2 (No Dome)	0.013	0.009
5	45.5	.294	LOX n=3 (No Dome)	0.007	0.006
6*	49.2	.427	ET 1st Bending n=1	0.078	0.074
7*	51.8	1.809	ET 1st Axial n=0	0.124	0.106
8	58.6	.140	LH_2 Cylinder n=2,3	0.006	0.005
9*	61.7	.074	LH_2 Cylinder n=3,2	0.019	0.015
10*	79.2	1.158	ET 2nd Axial n=0	0.082	0.040
11*	79.7	1.135	ET 2nd Bending n=1	0.111	0.016
12	105.7	.359	LOX n=2 (No Dome)	0.003	0.001
13	107.8	.177	LOX n=3 (No Dome)	0.005	0.001
14*	113.7	.244	LOX n=0	0.422	0.005
15*	120.7	.160	LOX n=1, ET n=1	0.412	0.003
16*	120.9	.346	LOX n=0	0.198	0.033
17	125.5	.126	LH_2 Cylinder n=3,2	0.006	—
18	130.6	.106	LH_2 Cylinder n=3,2	0.013	0.002
19	144.6	.396	LOX n=2	0.015	0.002
20*	146.2	.125	LOX n=1	0.401	0.009
21*	148.6	.338	LOX n=0	0.194	0.015
22	149.1	.211	LOX n=3 (No Dome)	0.005	0.001
23*	150.6	.283	ET Bending, LOX Dome n=1	0.128	0.018
24*	162.9	.089	LOX n=2	0.141	0.001
25*	167.8	.079	LOX Dome, ET n=0	0.662	0.273

*Denotes Pogo Sensitive Mode

Table 3-2 1/8-Scale External Tank Hydroelastic Mode Summary (at Liftoff)

Mode No.	Freq. (Hz)	Modal Mass	Description of Mode	LOX Dome Pressure Gain X 10^3	LH_2 Dome Pressure Gain X 10^3
4*	29.7	4.751	ET 1st Axial n=0	0.130	0.034
5	34.5	0.857	LOX n=2 (No Dome)	0.003	0.001
6*	35.7	0.760	ET 1st Bending n=1	0.040	0.017
7	36.6	0.428	LOX n=3 (No Dome)	0.008	0.005
8*	54.9	2.667	ET 2nd Axial n=0	0.067	0.091
9*	57.8	0.131	LH_2 Cylinder n=2,3	0.016	0.019
10*	61.4	0.067	LH_2 Cylinder n=3,2	0.018	0.034
11	62.1	0.395	LOX n=3 (No Dome)	0.011	0.005
12*	63.8	0.520	ET 2nd Bending n=1	0.070	0.006
13	68.4	0.581	LOX n=2 (No Dome)	0.002	0.003
14*	96.0	0.518	LOZ n=1	0.102	0.001
15*	96.1	0.433	LOX n=0	0.302	0.006
16*	109.4	0.455	LOX, LH_2 n=0	0.155	0.028
17	114.5	0.741	LOX, LH_2 n=2,3	0.009	0.001
18	117.8	0.277	LOX n=3 (No Dome)	0.006	—
19*	119.7	0.142	LH_2 Cylinder, LOX n=2,0	0.085	0.002
20*	119.8	0.254	LOX n=0	0.276	0.017
21*	124.2	0.221	LOX n=1	0.253	0.003
22	128.6	0.062	LH_2 Cylinder n=3	0.002	0.001
23*	135.0	0.475	LOX n=0	0.150	0.25
24*	135.9	0.431	ET, LOX Dome n=1,0	0.194	0.005
25	138.2	0.589	LOX n=2	0.006	0.002

*Denotes Pogo Sensitive Mode

NOTE: Modes 1, 2, 3 are Rigid Body Pitch Plane Modes

II

Table 3-3 Empty 1/8-Scale External Tank Mode Summary

Mode No.	Freq. (Hz)	Modal Mass	Description of Mode
4	105.6	0.0425	ET 1st Bending n=1
5	153.0	0.0094	LH_2 Cylinder n=3
6	161.7	0.0172	LH_2 Cylinder n-2,3
7	226.0	0.0497	ET 2nd Bending n=1
8	257.8	0.0770	ET 1st Axial n=0
9	274.7	0.0271	LH_2 Cylinder n=2, 3
10	328.3	0.0122	LH_2 Cylinder, LOX n=3, 2
11	332.0	0.0149	LOX, LH_2 n=3,2
12	332.8	0.0234	LOX, LH_2 n=3,2
13	343.7	0.0118	ET n=3
14	357.8	0.0696	ET Bending n=1,3
15	431.0	0.0210	LH_2 Cylinder n=2
16	459.1	0.0615	LH_2 Cylinder n=3, ET n=1
17	472.9	0.0114	LH_2 Cylinder n=3
18	482.2	0.0185	ET n=2
19	498.6	0.0076	LOX n=3
20	513.2	0.0697	ET n=1, 2, 3
21	533.1	0.0243	ET n=2, 1
22	567.2	0.0487	ET n=1, 2, 3
23	604.6	0.0391	ET n=2, 1, 3
24	625.4	0.0116	LOX n=3
25	628.0	0.0144	ET n=3,2

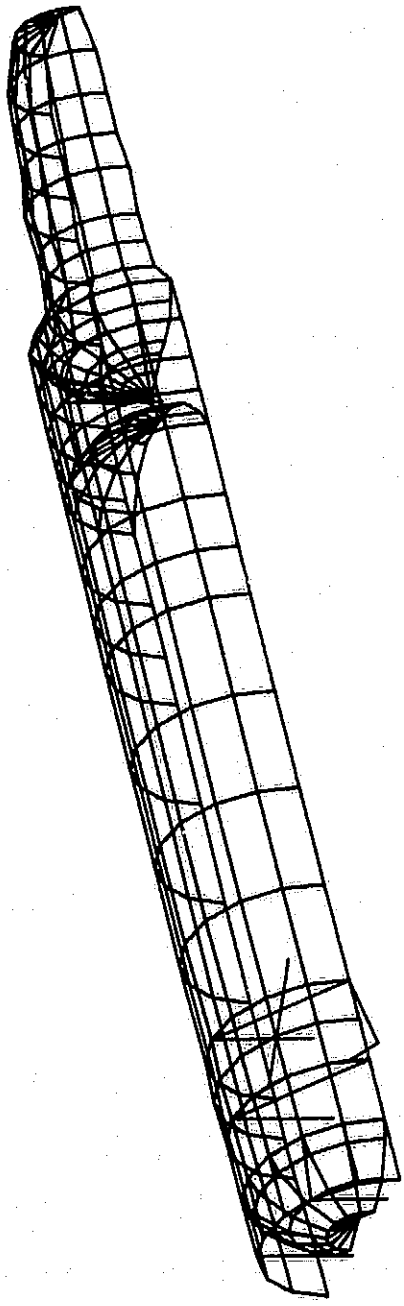


Fig. 3-5 Liftoff Mode 4 (Modes 1, 2, 3 are Rigid Body Modes)

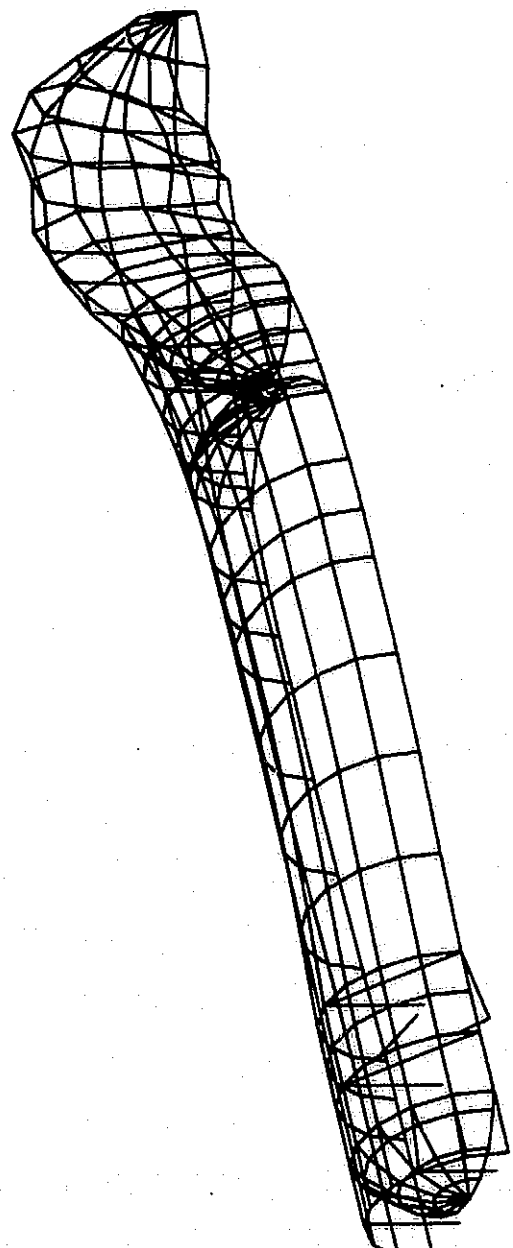


Fig. 3-6 Liftoff Mode 5

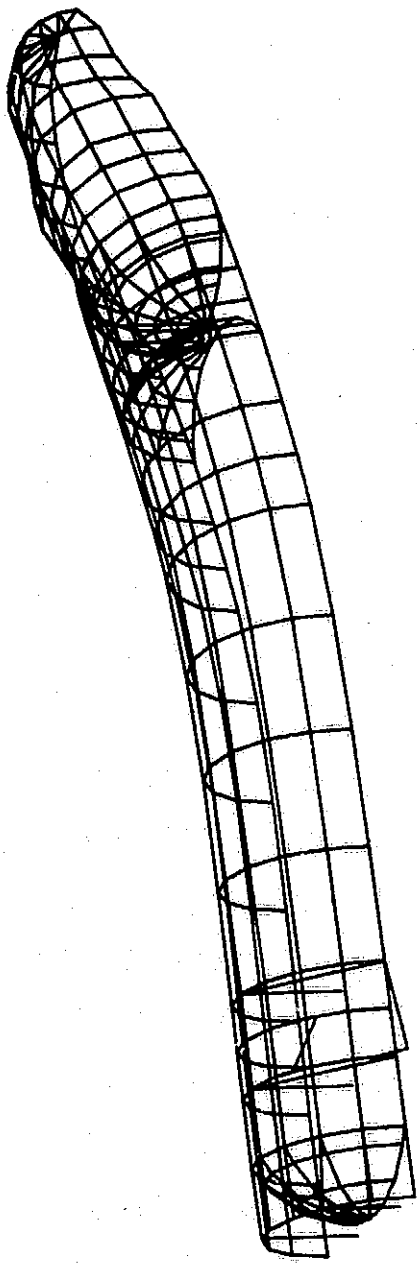


Fig. 3-7 Liftoff Mode 6

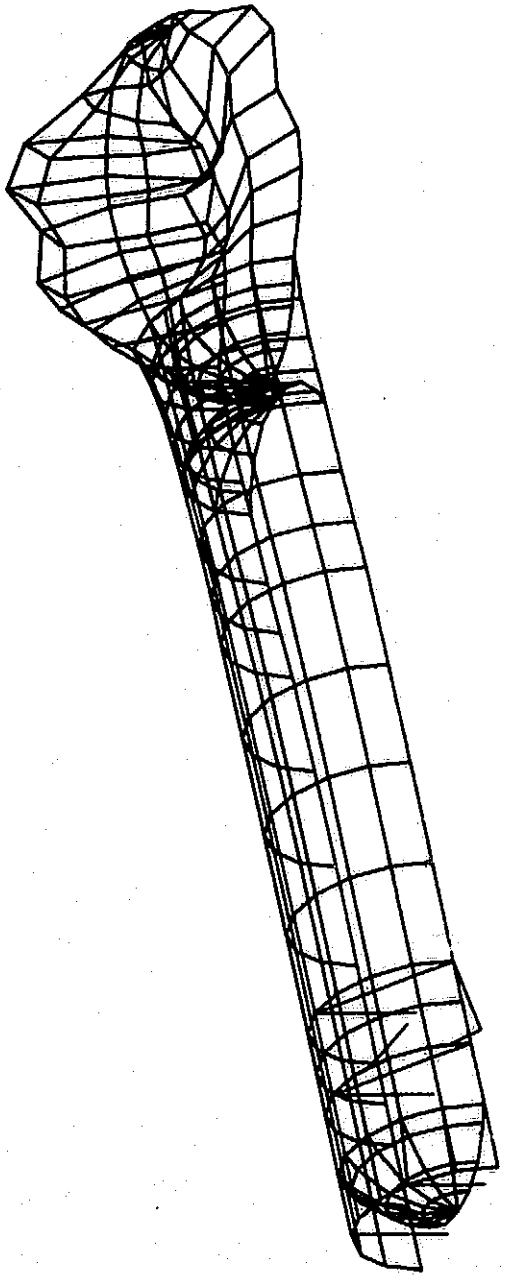


Fig. 3-8 Liftoff Mode 7

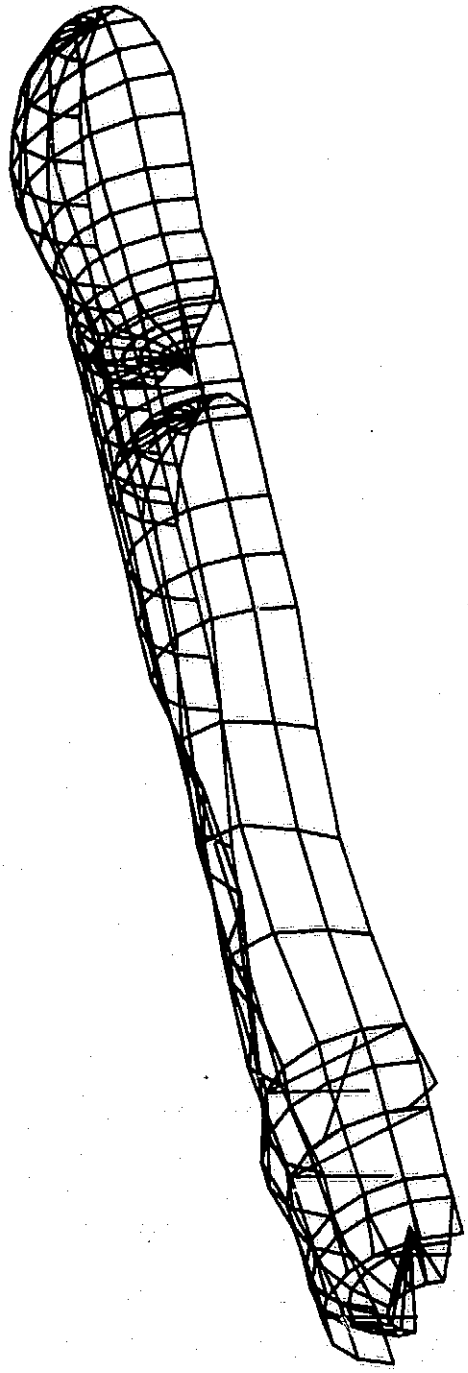


Fig. 3-9 Liftoff Mode 8

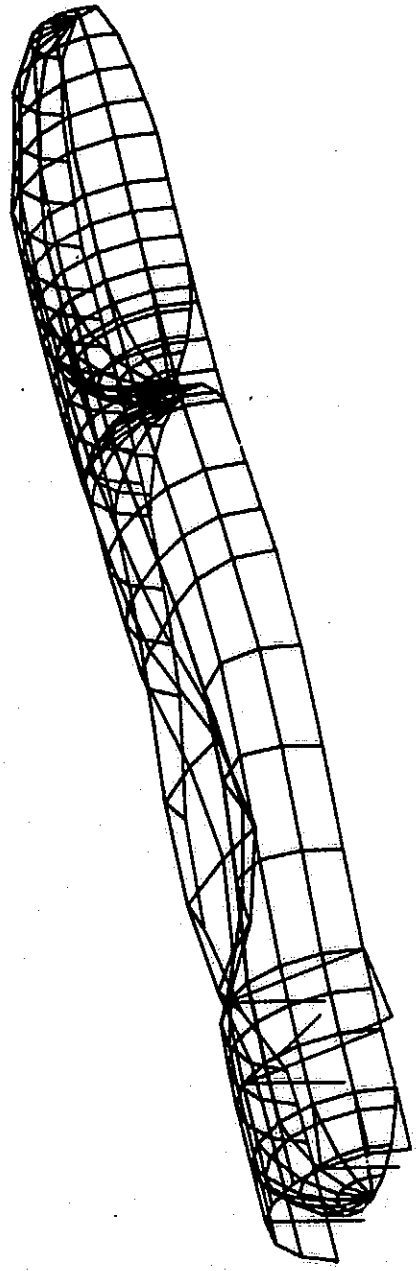


Fig. 3-10 Liftoff Mode 9

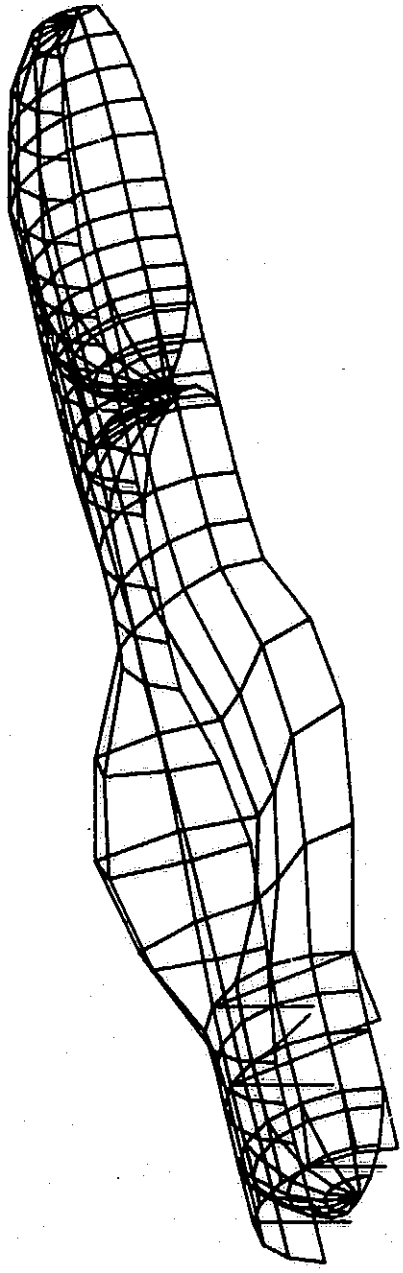


Fig. 3-11 Liftoff Mode 10

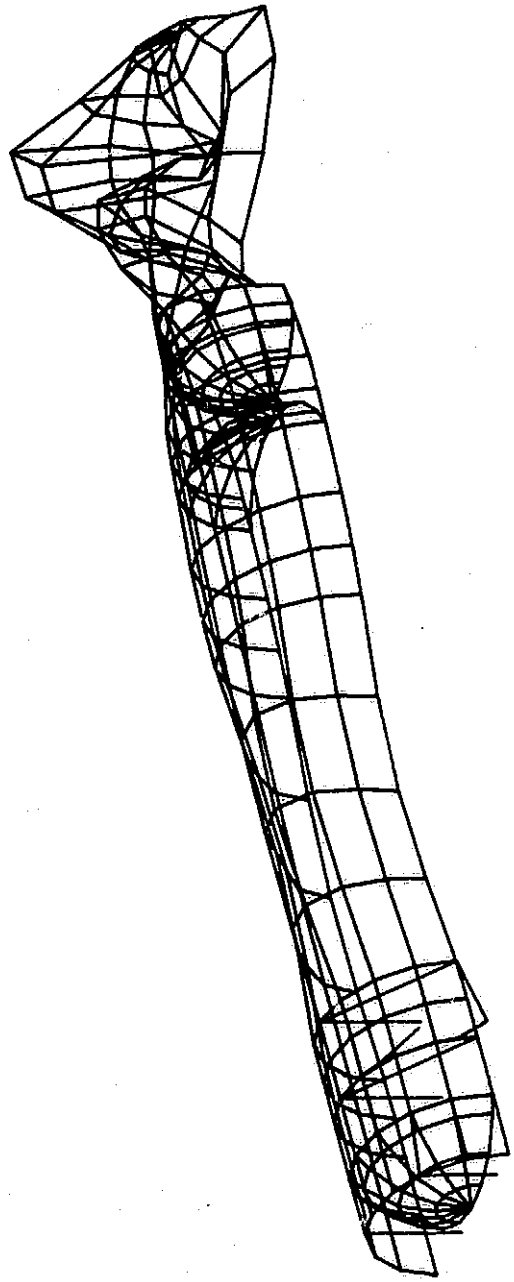


Fig. 3-12 Liftoff Mode 11

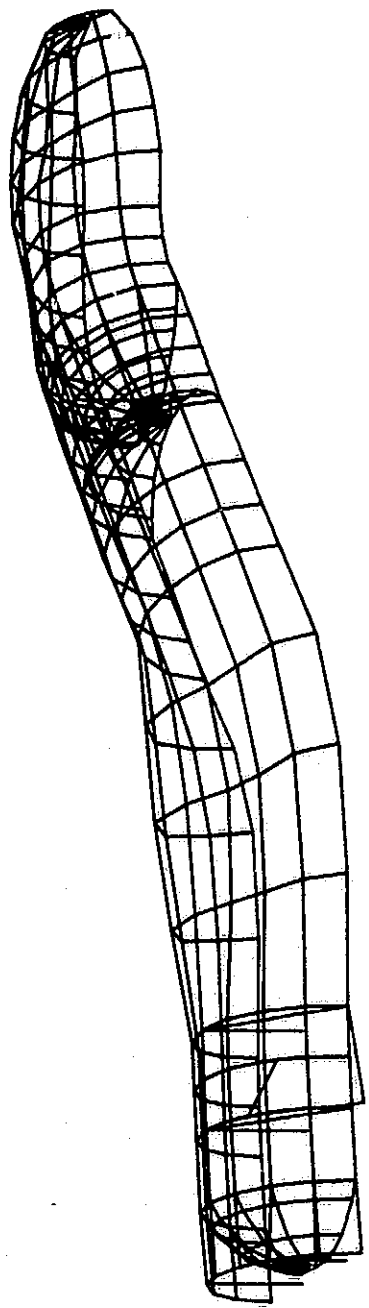


Fig. 3-13 Liftoff Mode 12

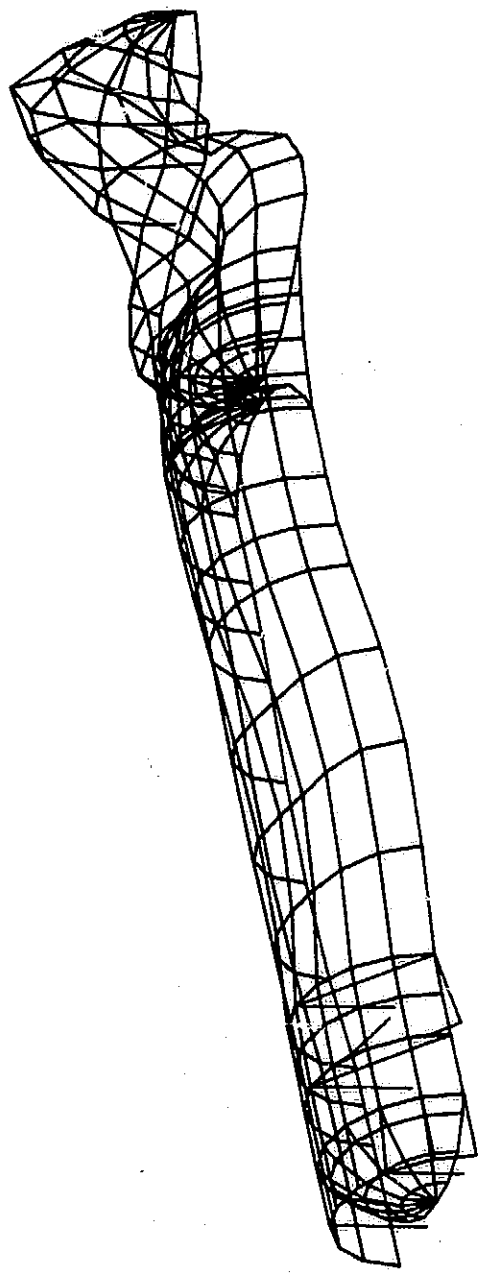


Fig. 3-14 Liftoff Mode 13

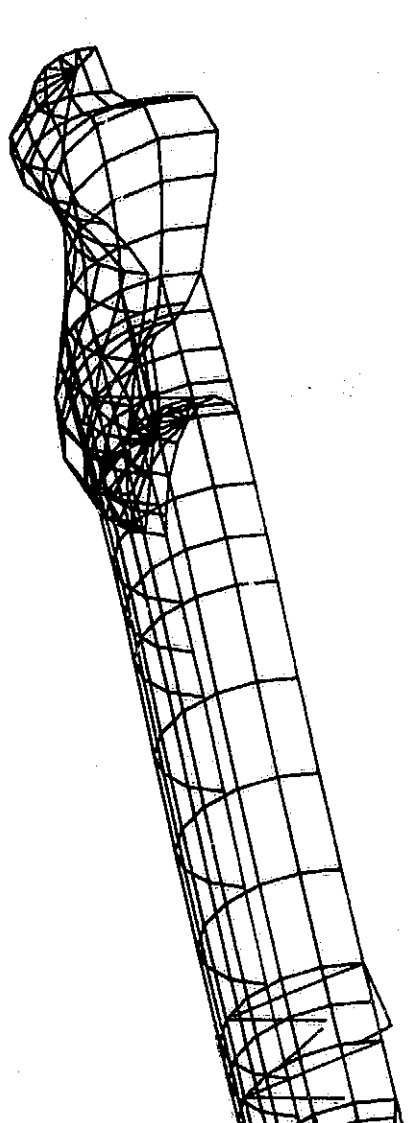


Fig. 3-15 Liftoff Mode 14

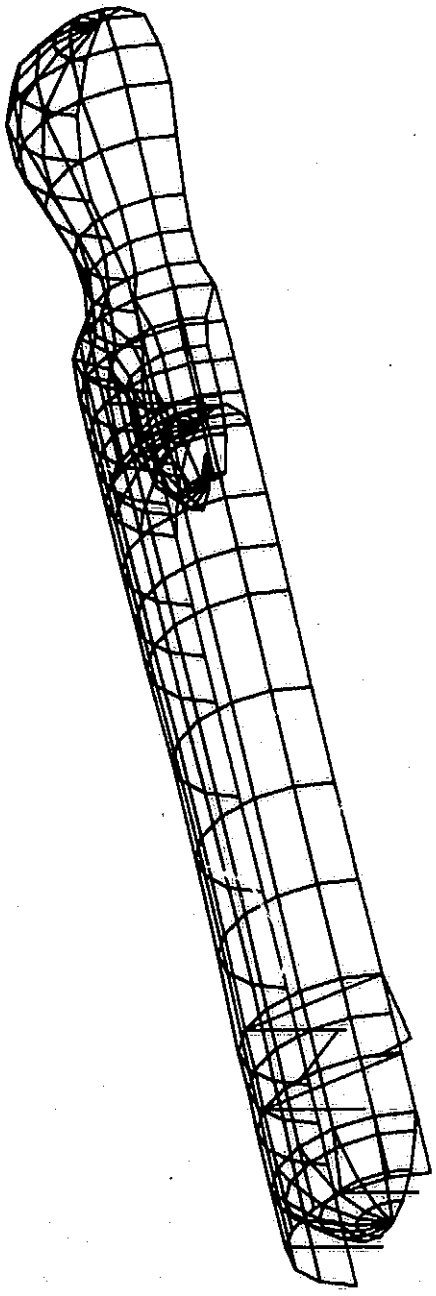


Fig. 3-16 Liftoff Mode 15

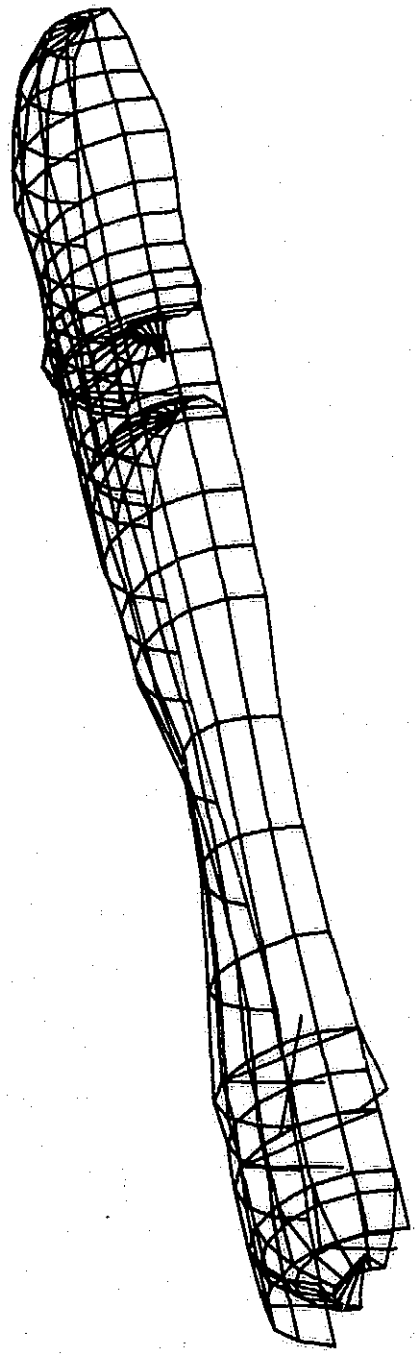


Fig. 3-17 Liftoff Mode 16

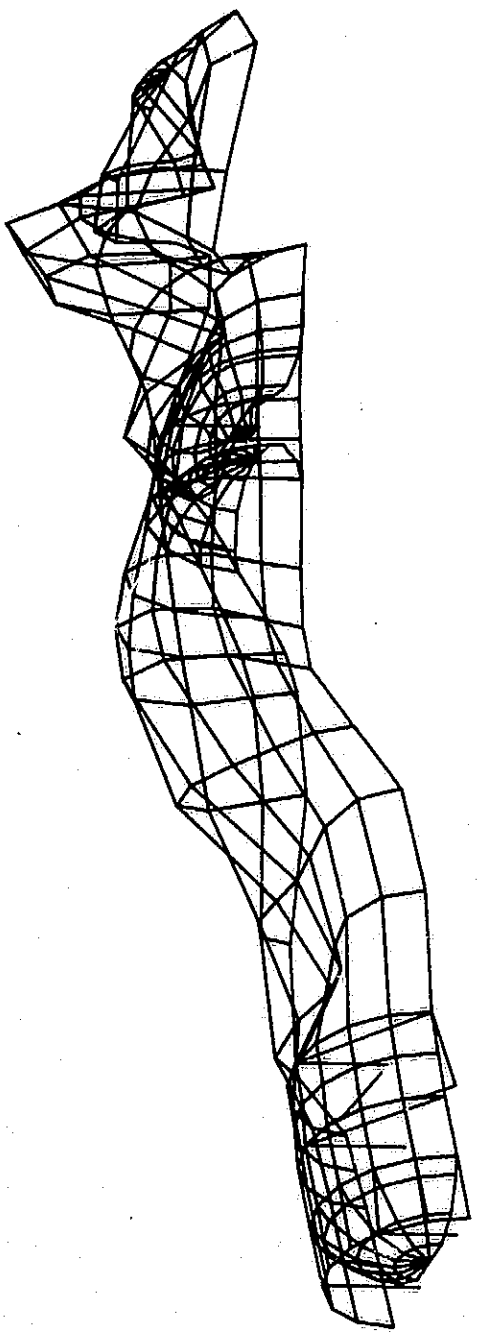


Fig. 3-18 Liftoff Mode 17

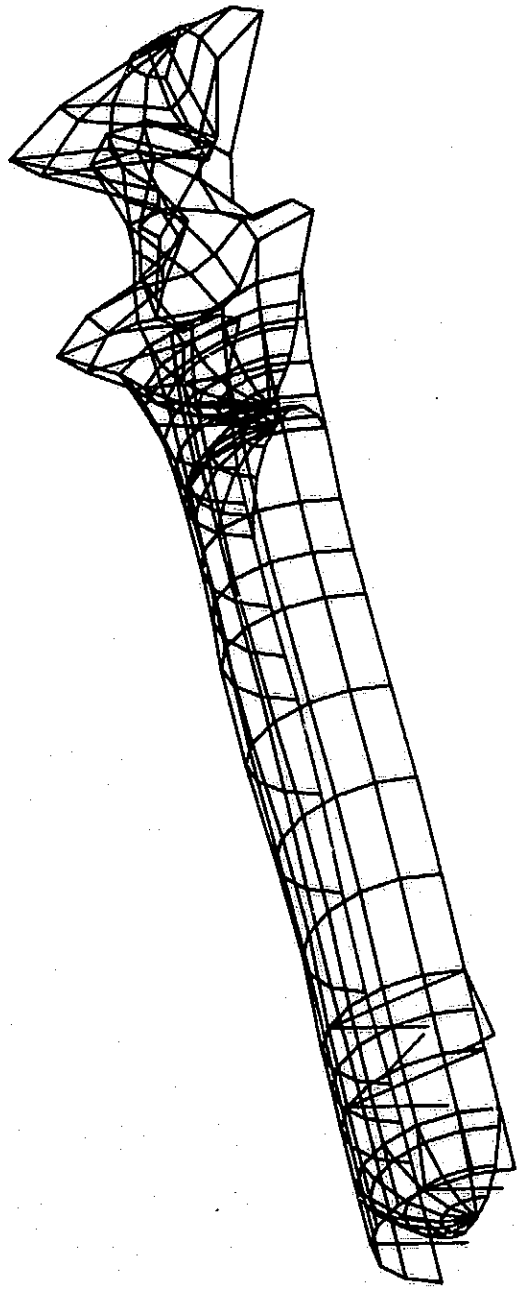


Fig. 3-19 Liftoff Mode 18

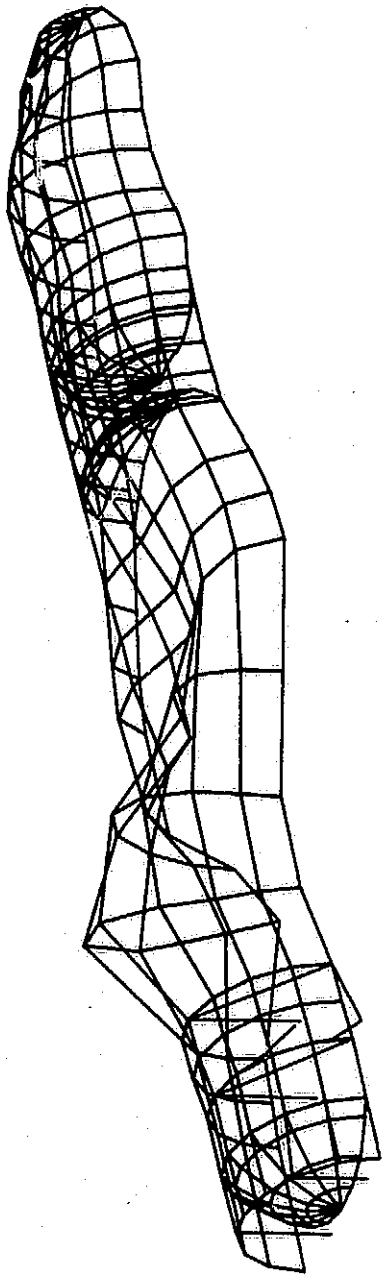


Fig. 3-20 Liftoff Mode 19

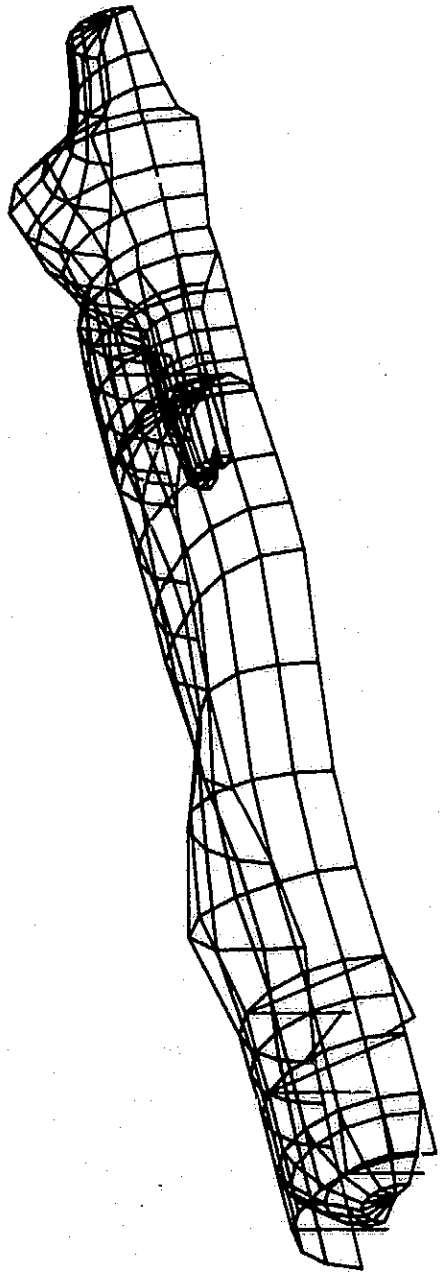


Fig. 3-21 Liftoff Mode 20

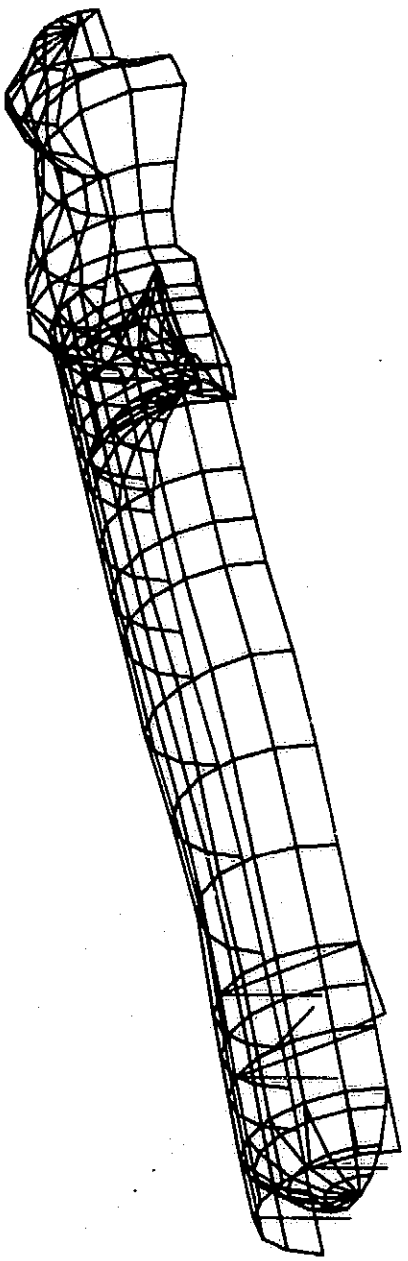


Fig. 3-22 Liftoff Mode 21

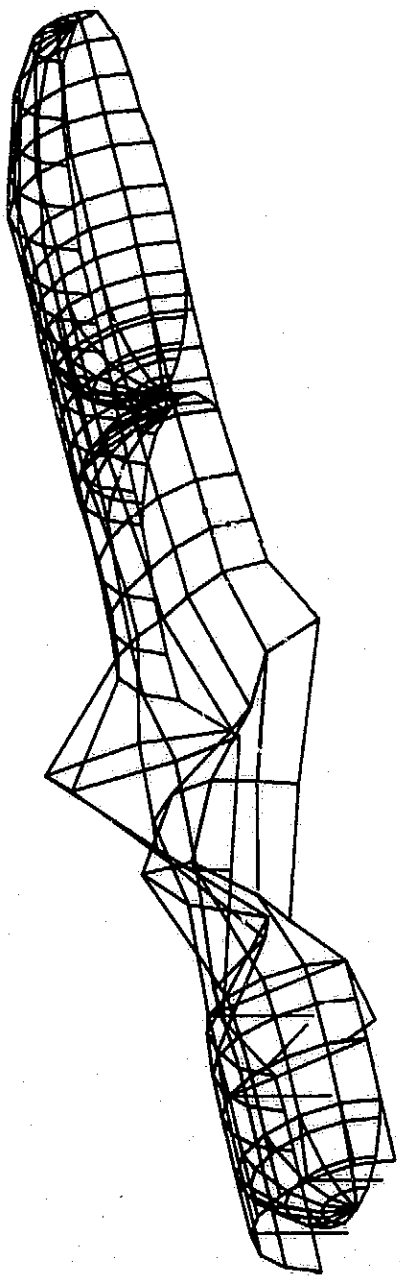


Fig. 3-23 Liftoff Mode 22

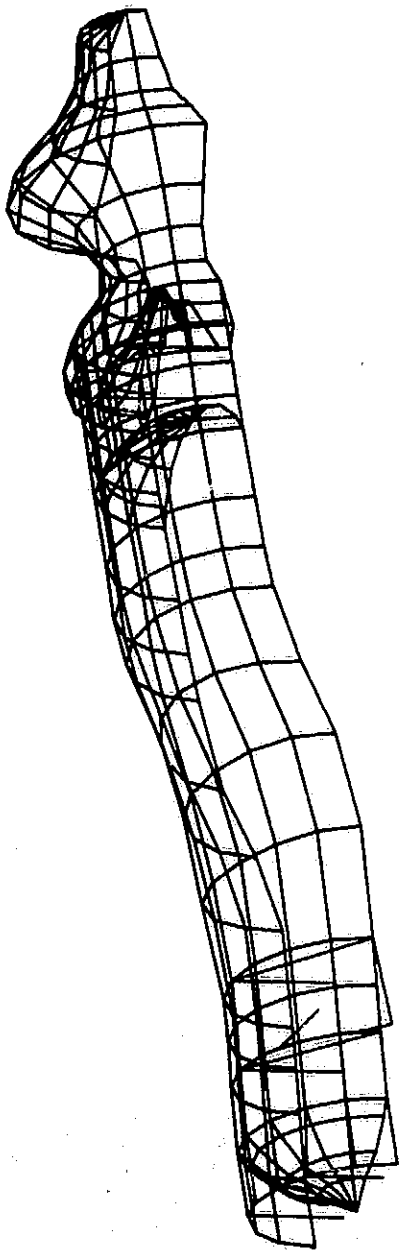


Fig. 3-24 Liftoff Mode 23

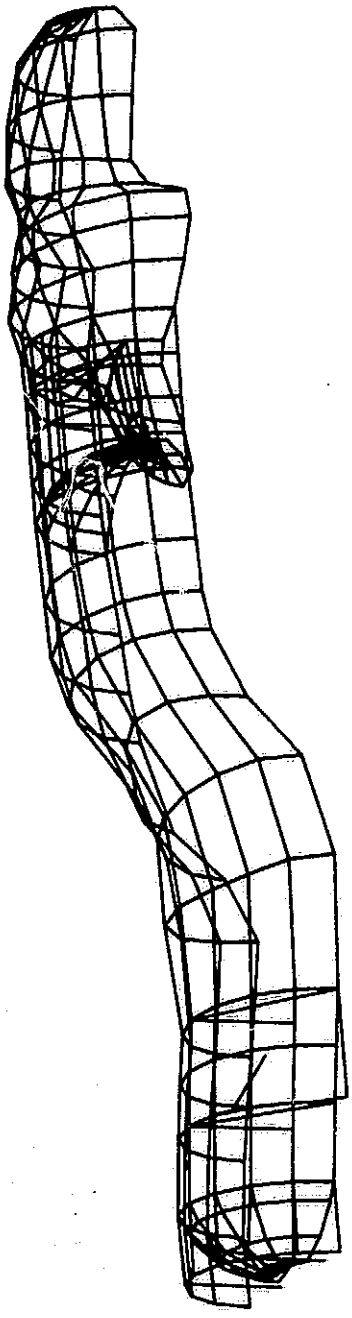


Fig. 3-25 Liftoff Mode 24

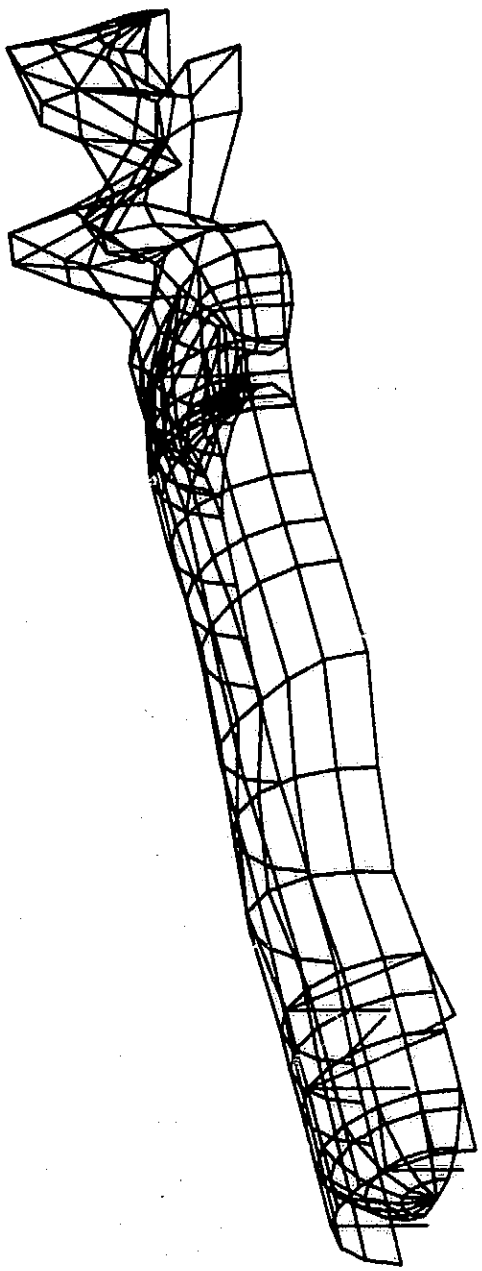


Fig. 3-26 Liftoff Mode 25

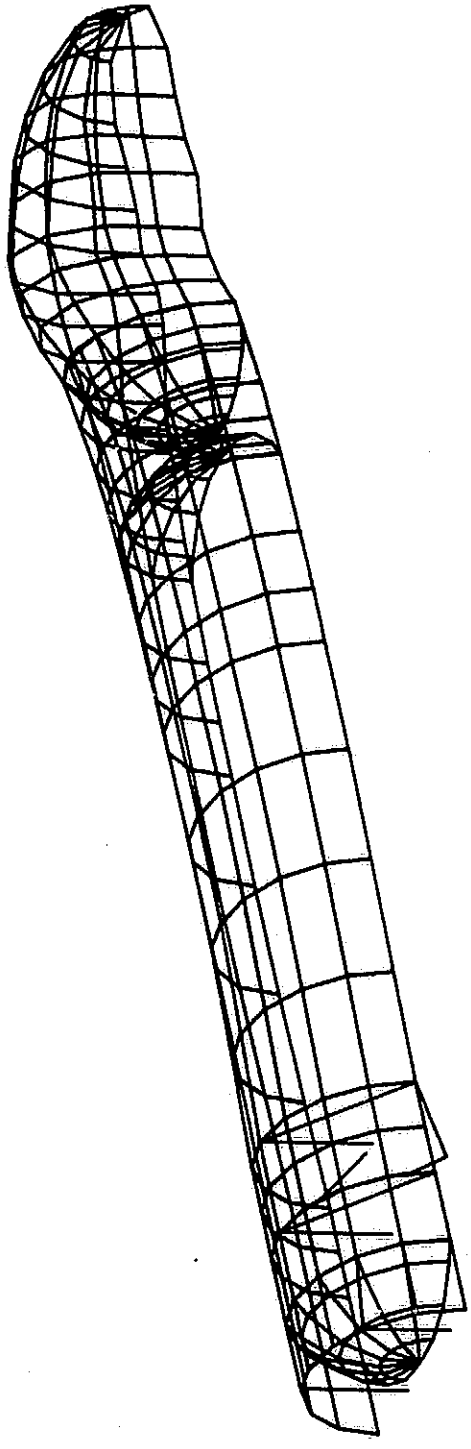


Fig. 3-27 Post Max Q Mode 4 (without Apex Fix)

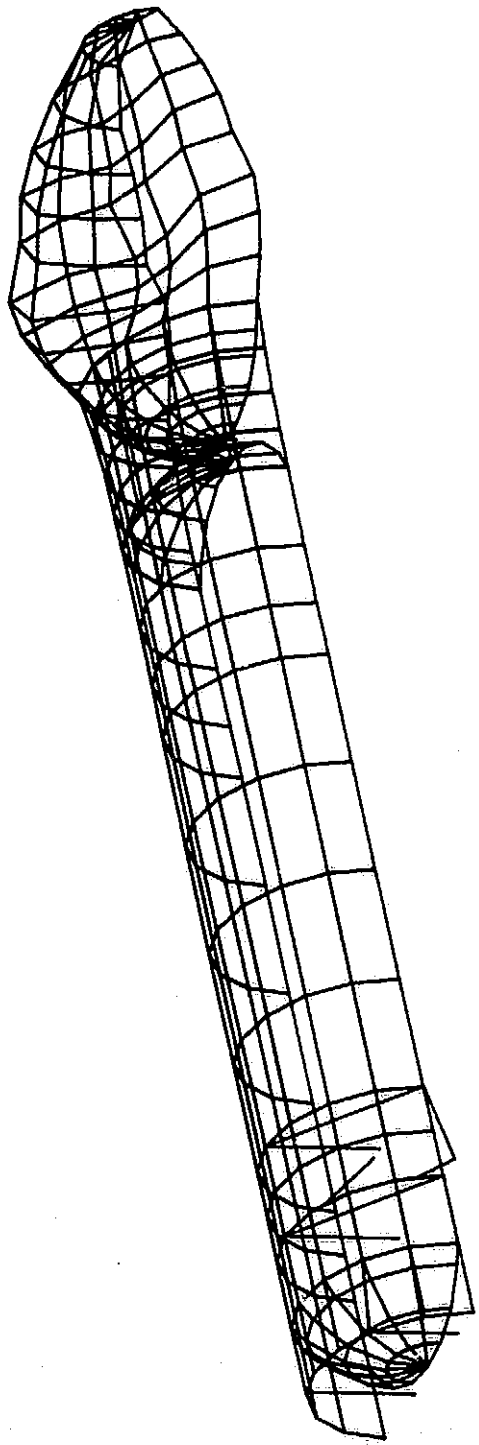


Fig. 3-28 Post Max Q Mode 5 (without Apex Fix)

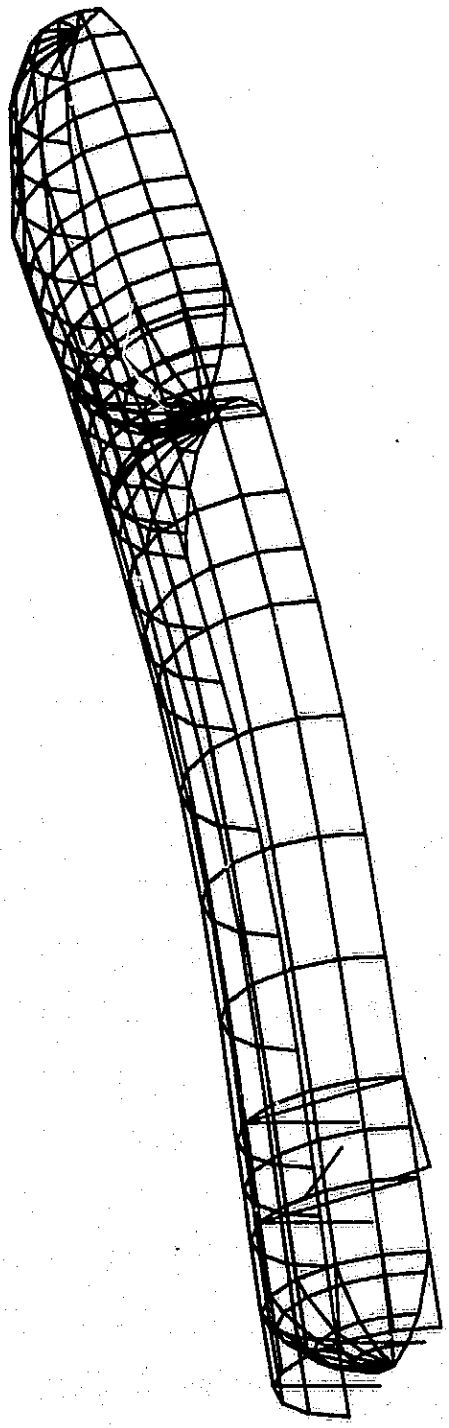


Fig. 3-29 Post Max Q Mode 6 (without Apex Fix)

C.2

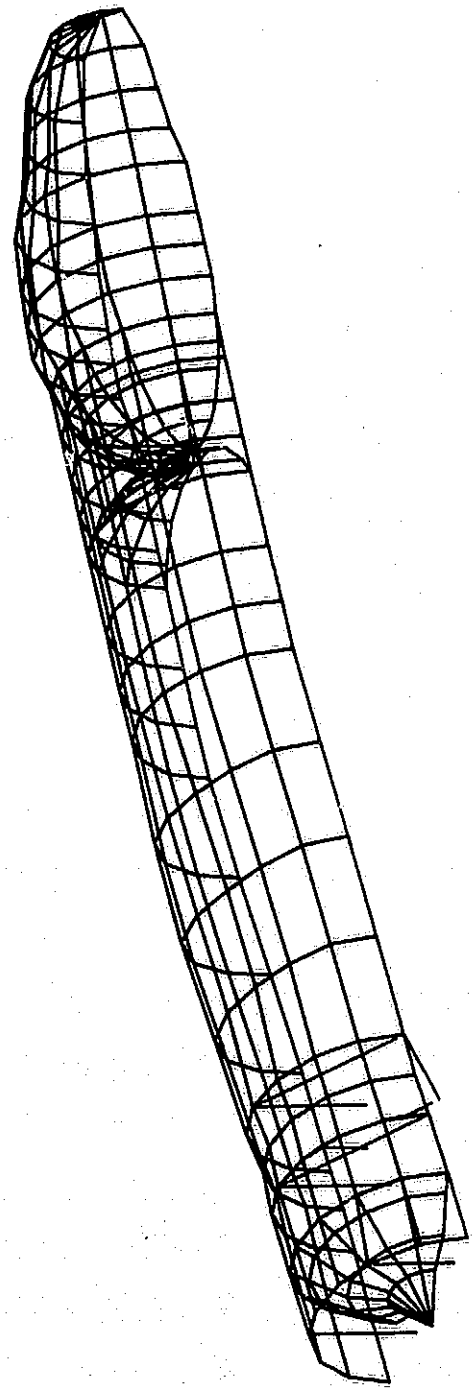


Fig. 3-30 Post Max Q Mode 7 (without Apex Fix)

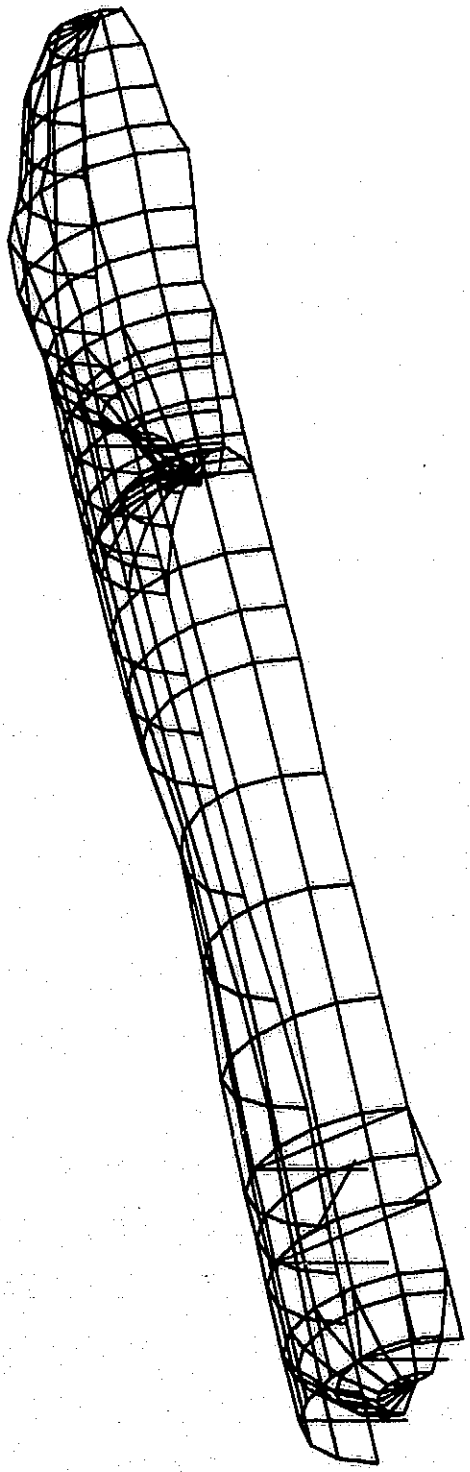


Fig. 3-31 Post Max Q Mode 15 (without Apex Fix)

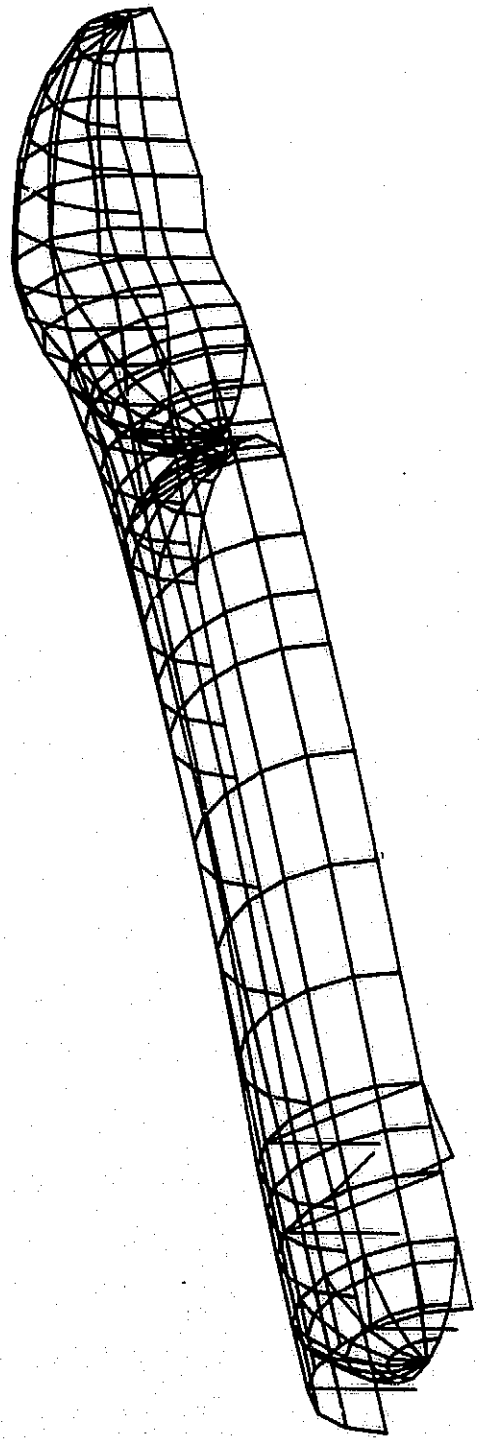


Fig. 3-32 Post Max Q Mode 4

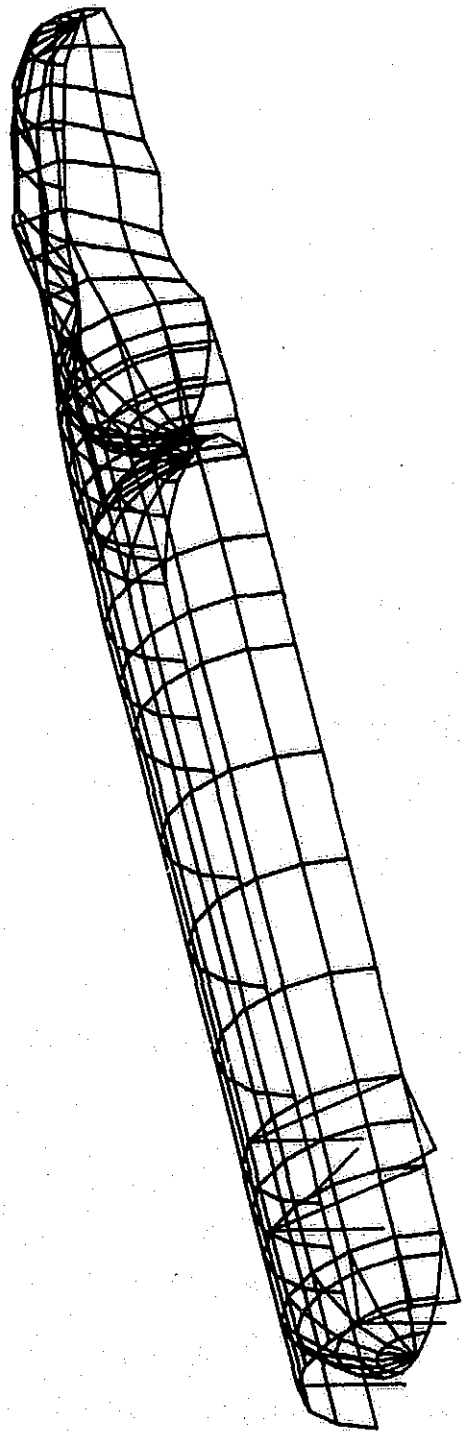


Fig. 3-33 Post Max Q Mode 5

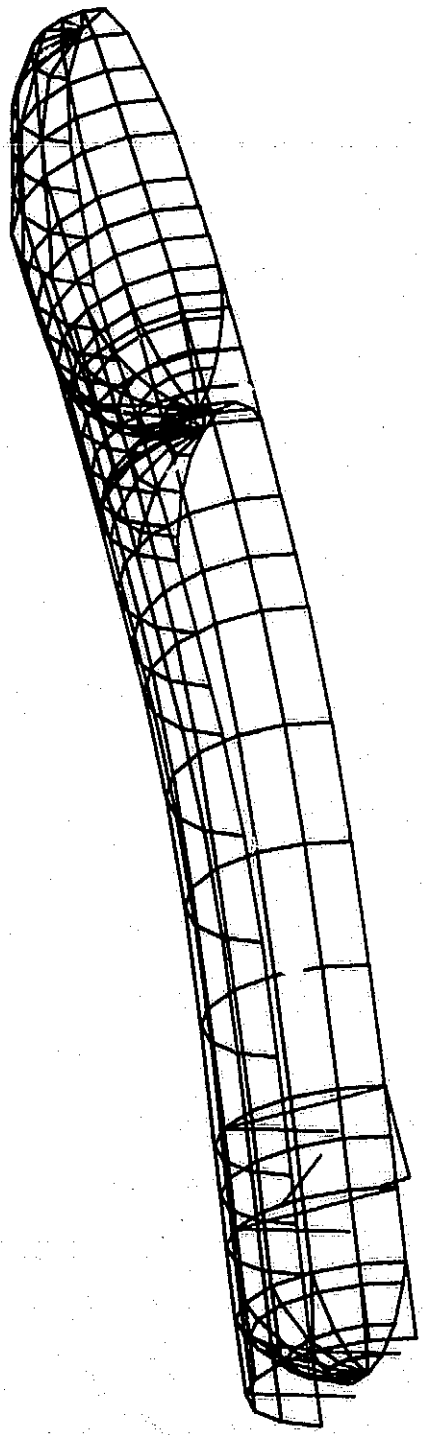


Fig. 3-34 Post Max Q Mode 6

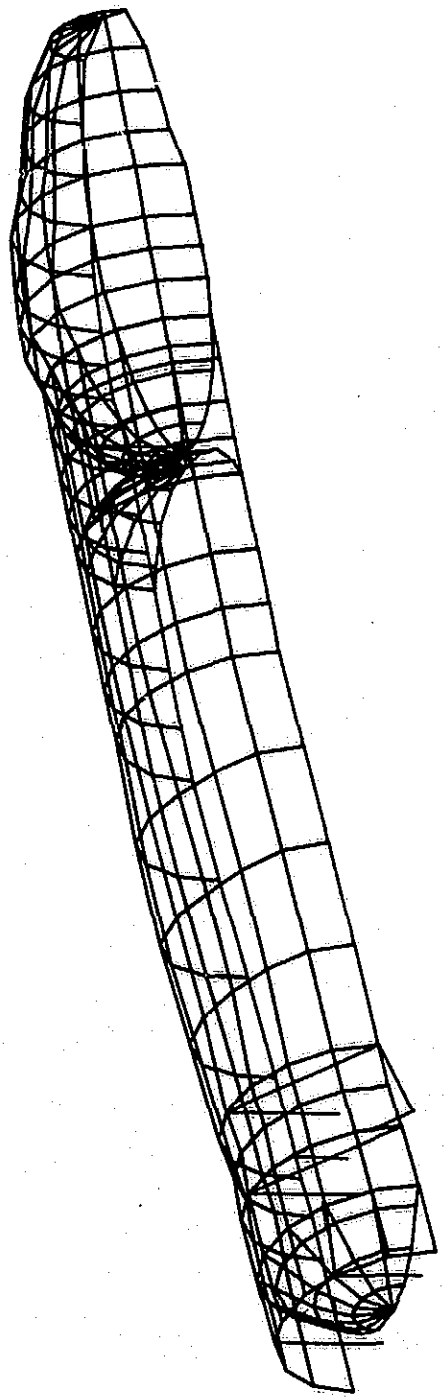


Fig. 3-35 Post Max Q Mode 7

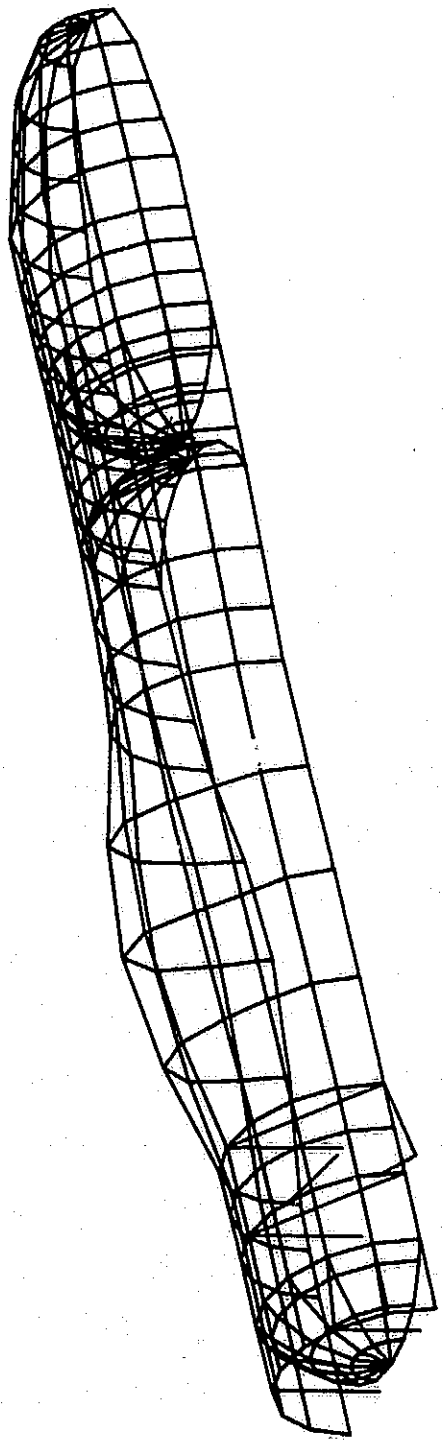


Fig. 3-36 Post Max Q Mode 8

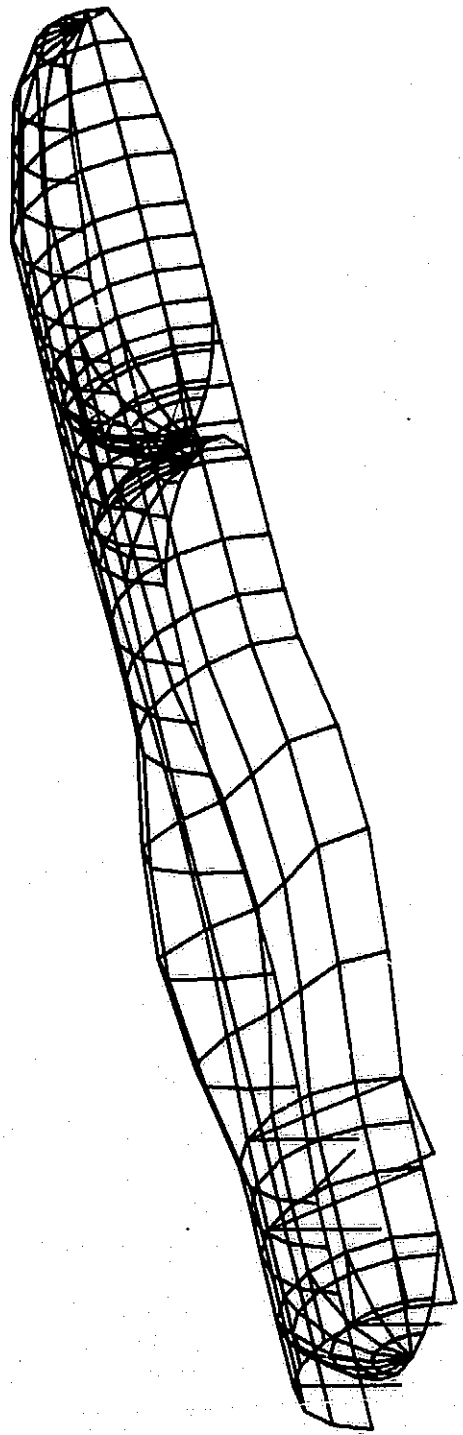


Fig. 3-37 Post Max Q Mode 9

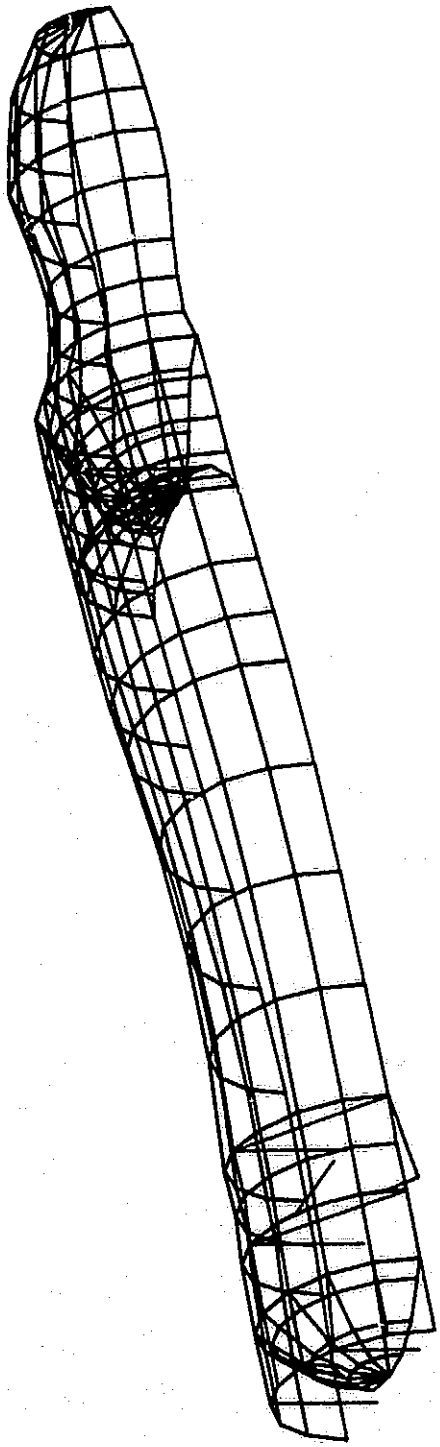


Fig. 3-38 Post Max Q Mode 10

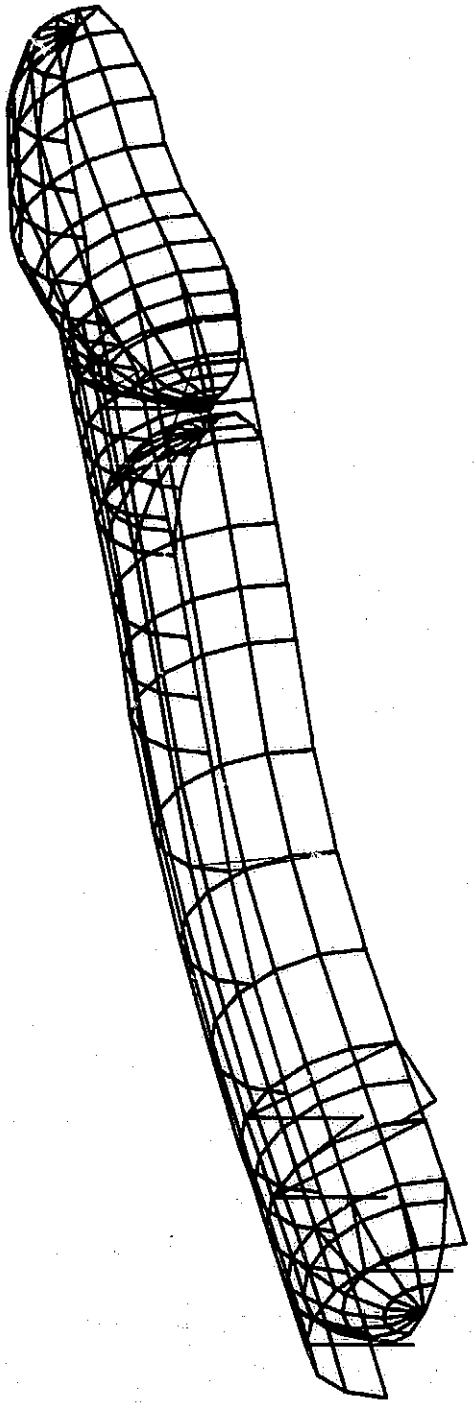


Fig. 3-39 Post Max Q Mode 11

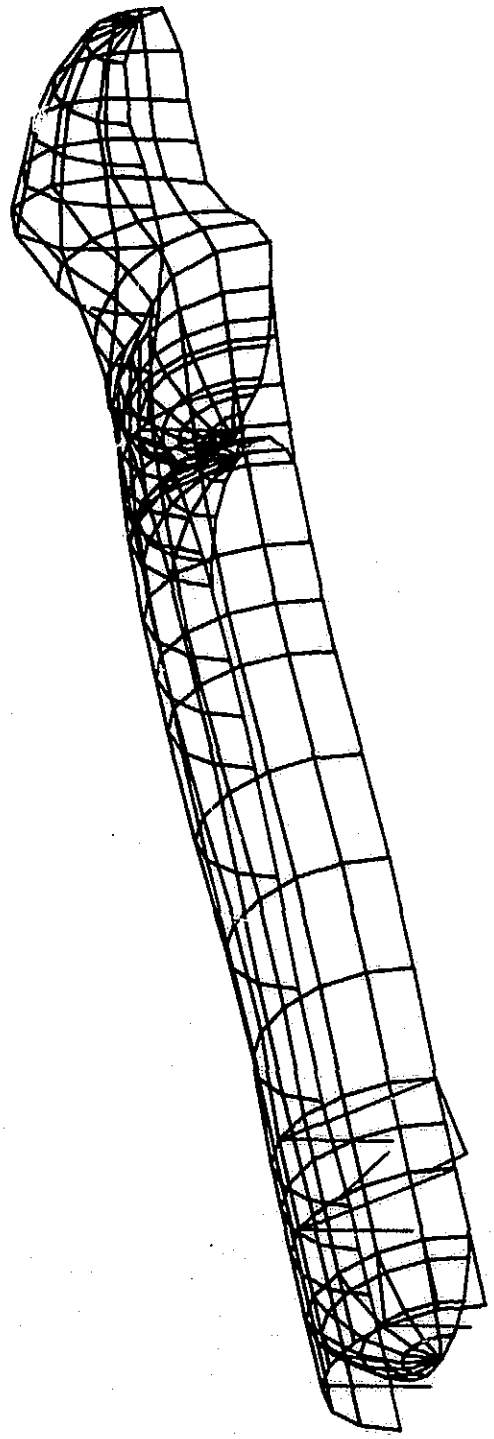


Fig. 3-40 Post Max Q Mode 12

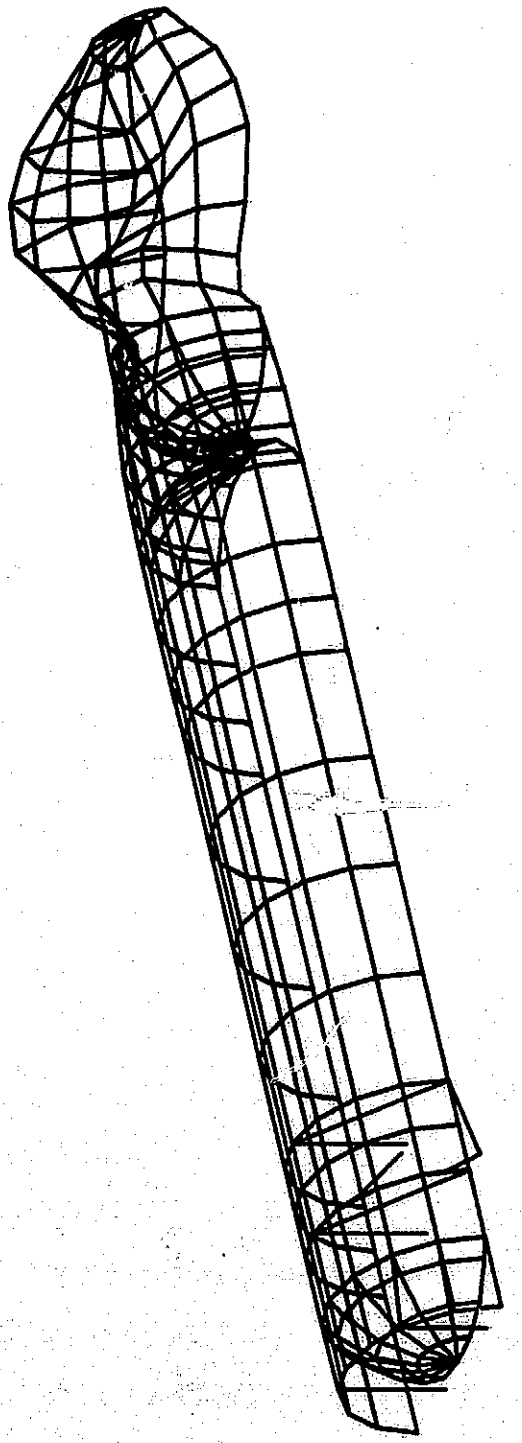


Fig. 3-41 Post Max Q Mode 13

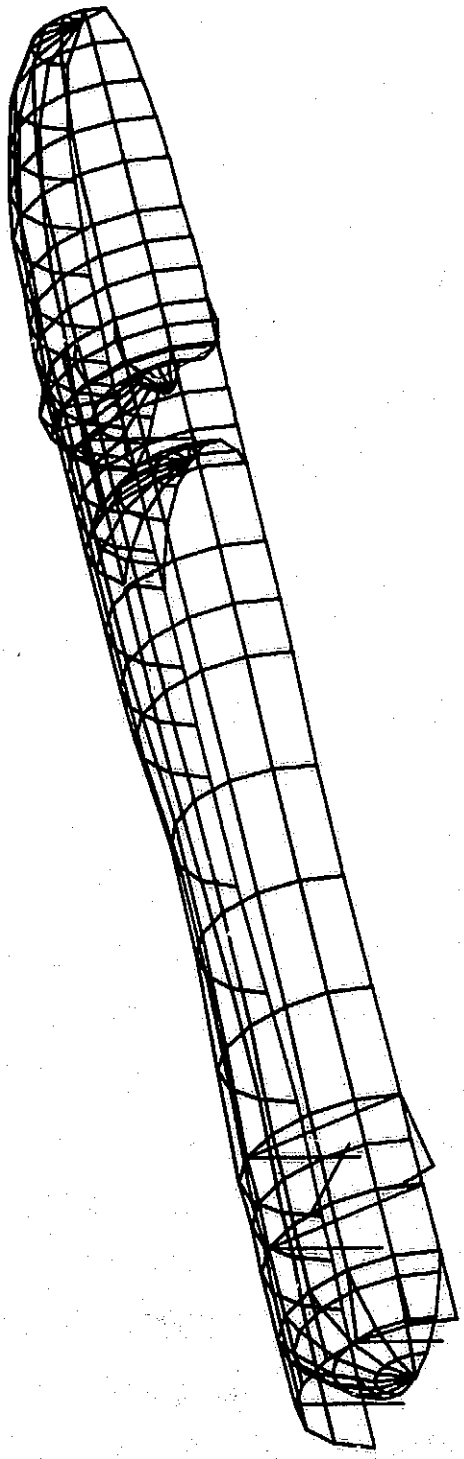


Fig. 3-42 Post Max Q Mode 14

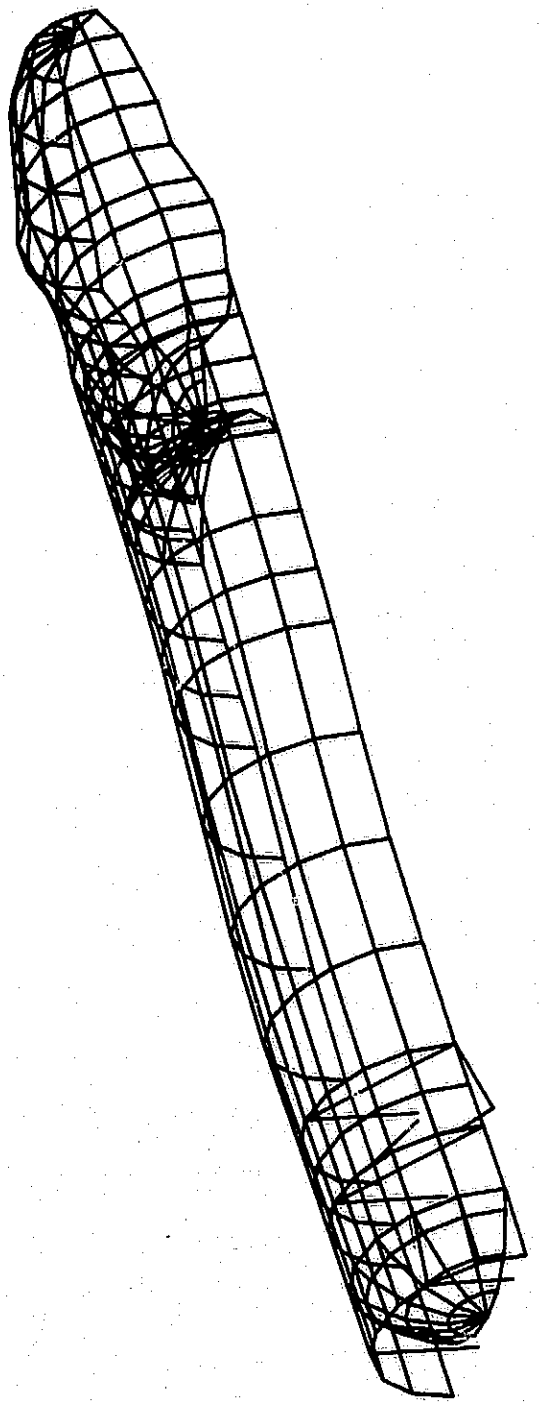


Fig. 3-43 Post Max Q Mode 15

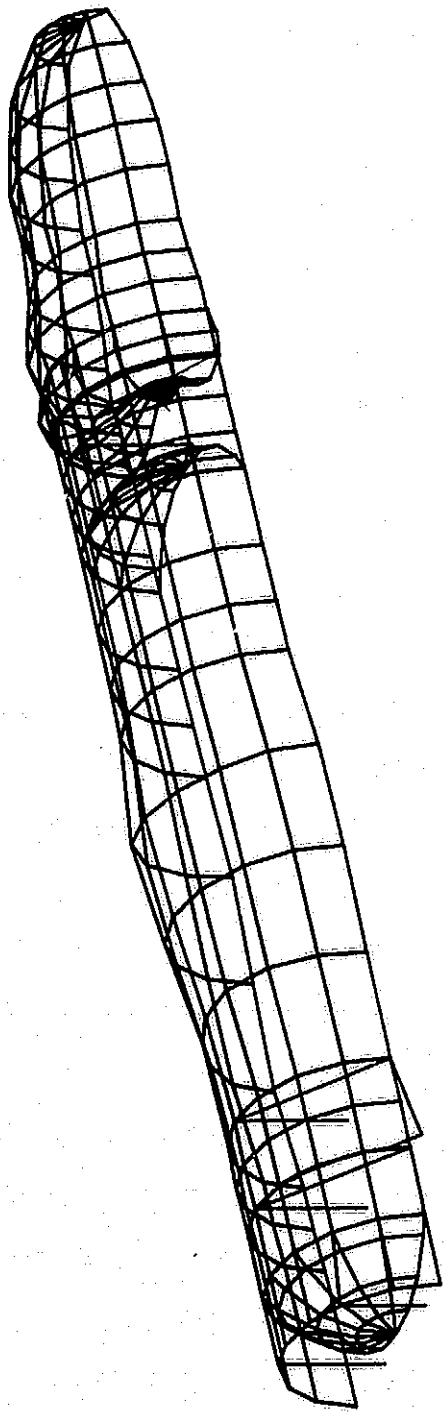


Fig. 3-44 Post Max Q Mode 16

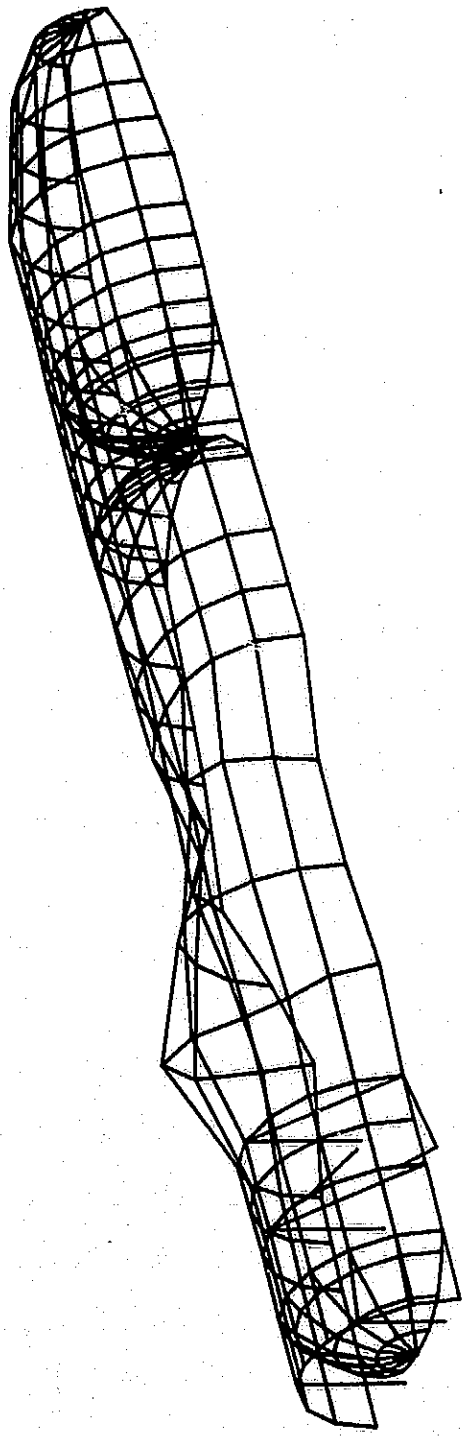


Fig. 3-45 Post Max Q Mode 17

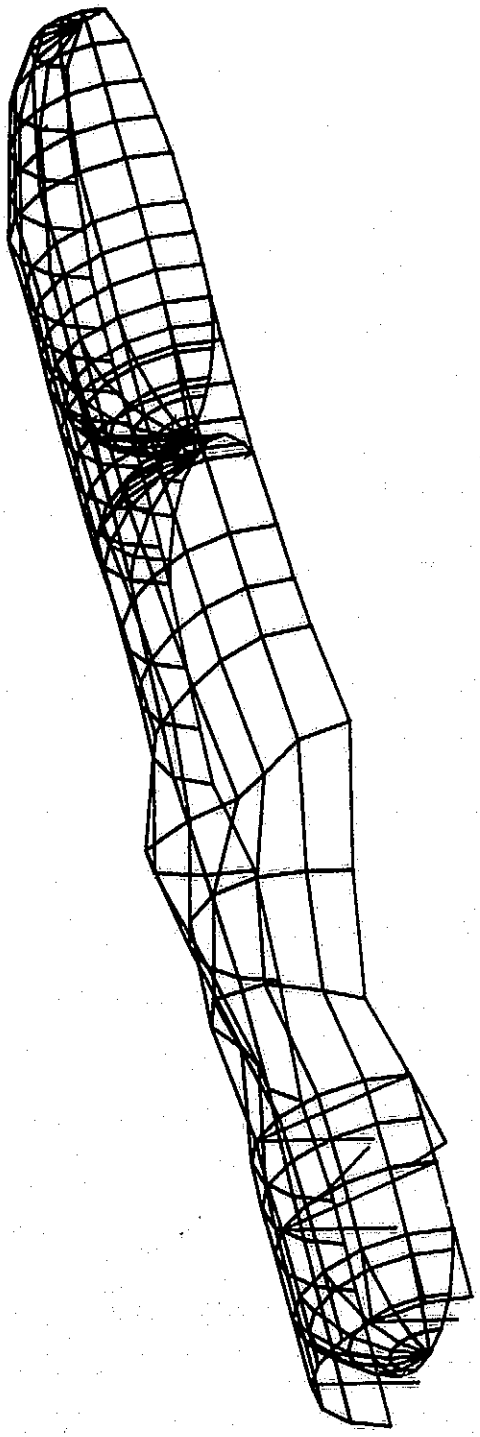


Fig. 3-46 Post Max Q Mode 18

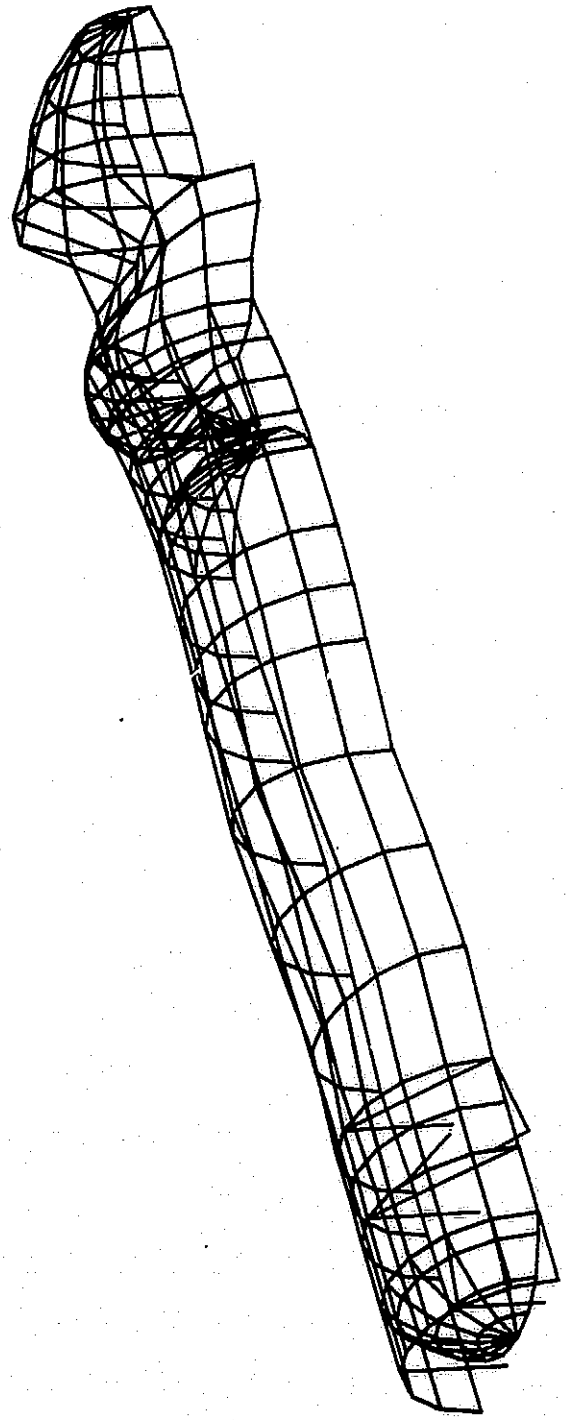


Fig. 3-47 Post Max Q Mode 19

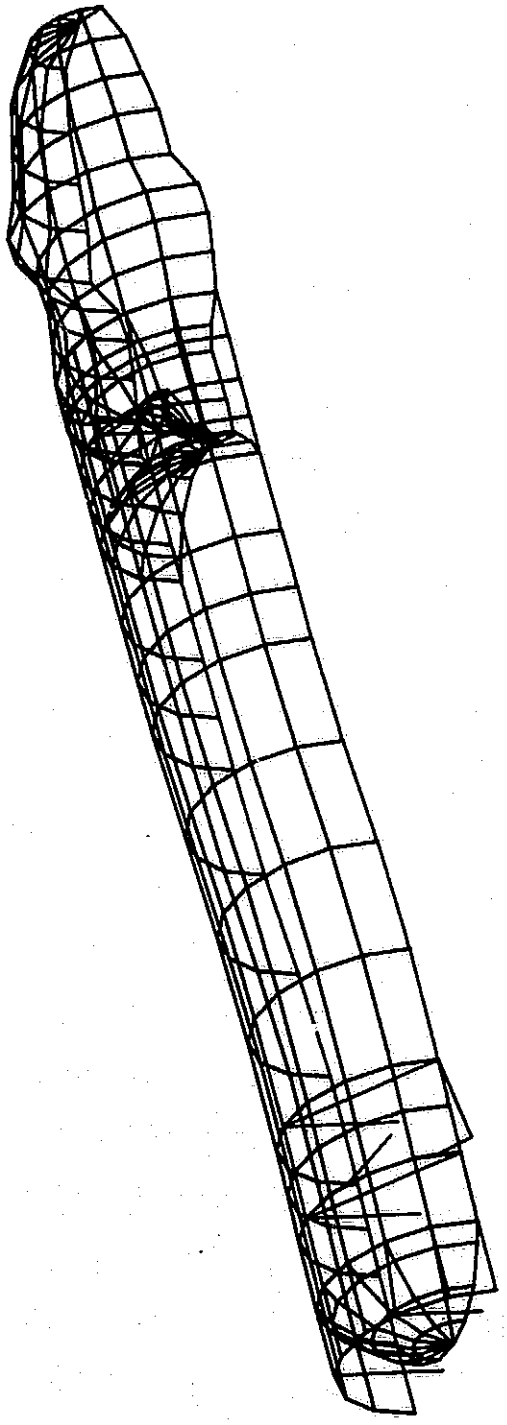


Fig. 3-48 Post Max Q Mode 20

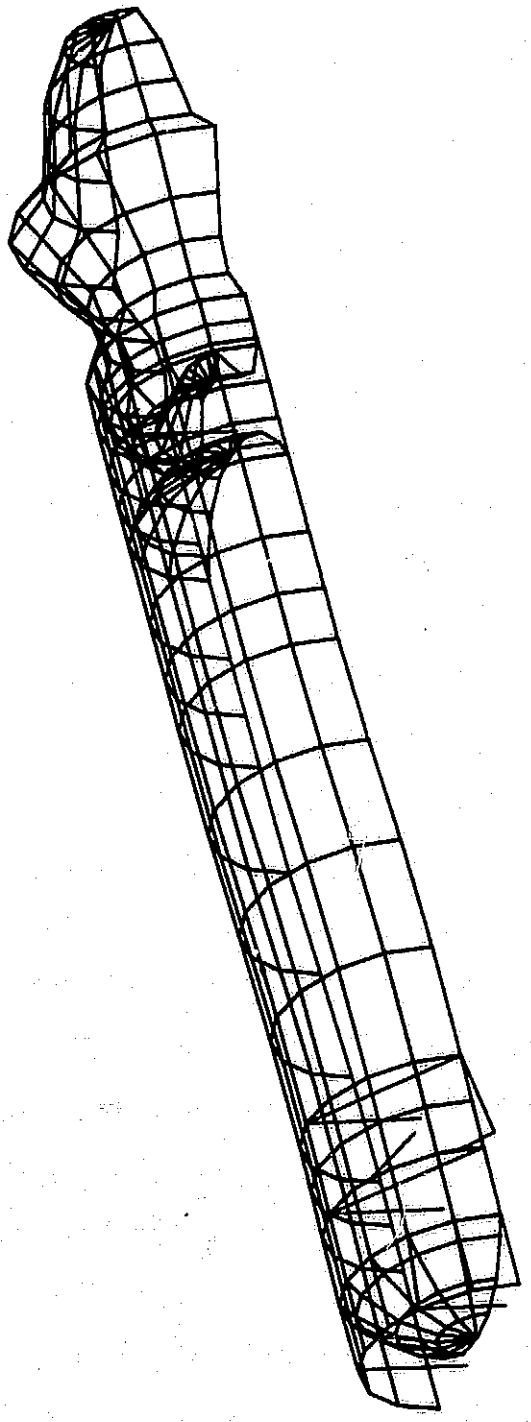


Fig. 3-49 Post Max Q Mode 21

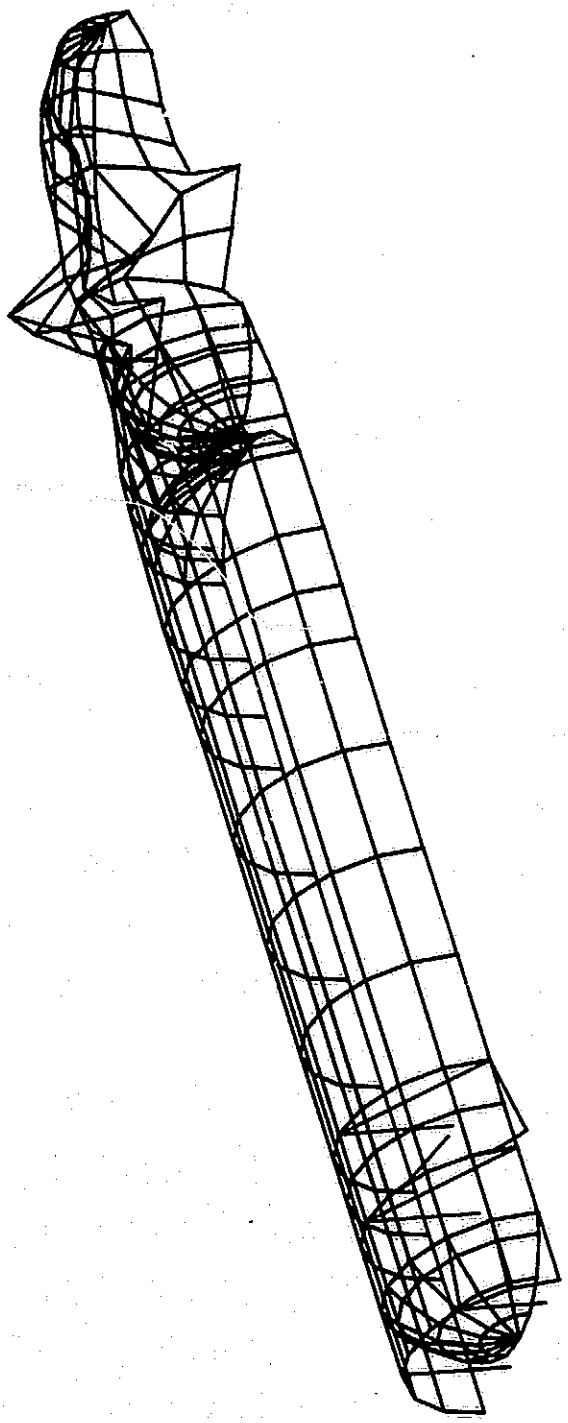


Fig. 3-50 Post Max Q Mode 22

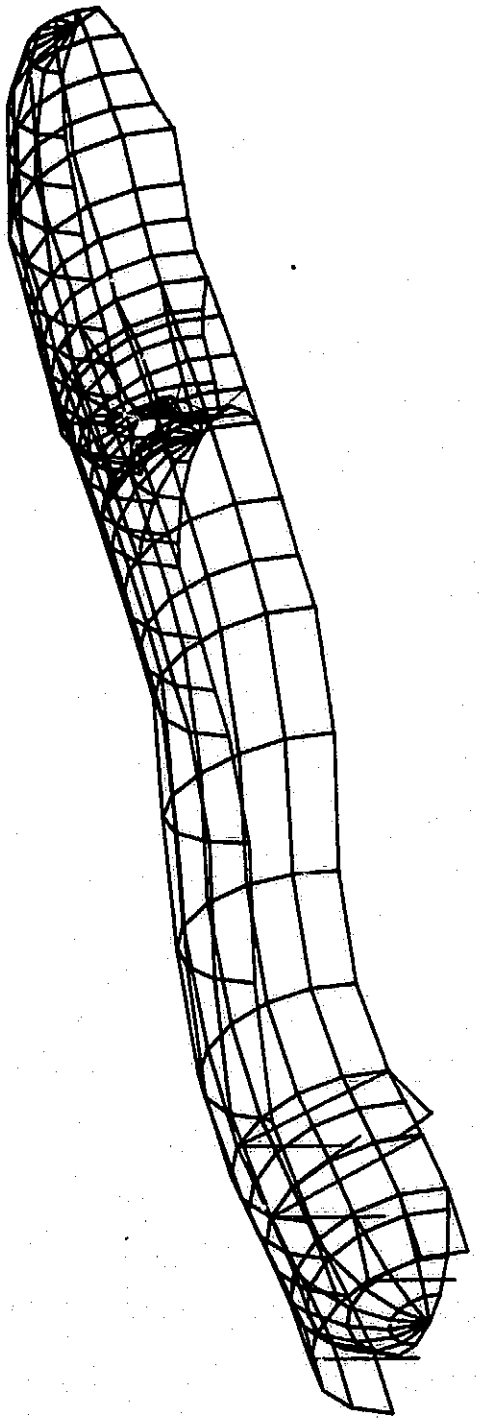


Fig. 3-51 Post Max Q. Mode 23

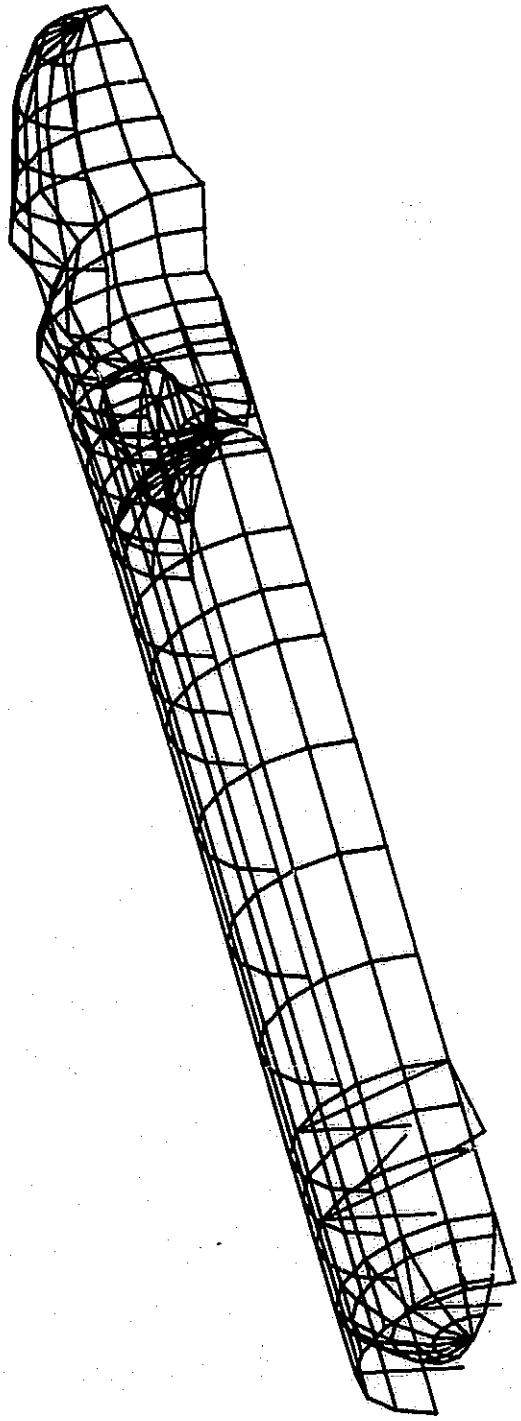


Fig. 3-52 Post Max Q Mode 24

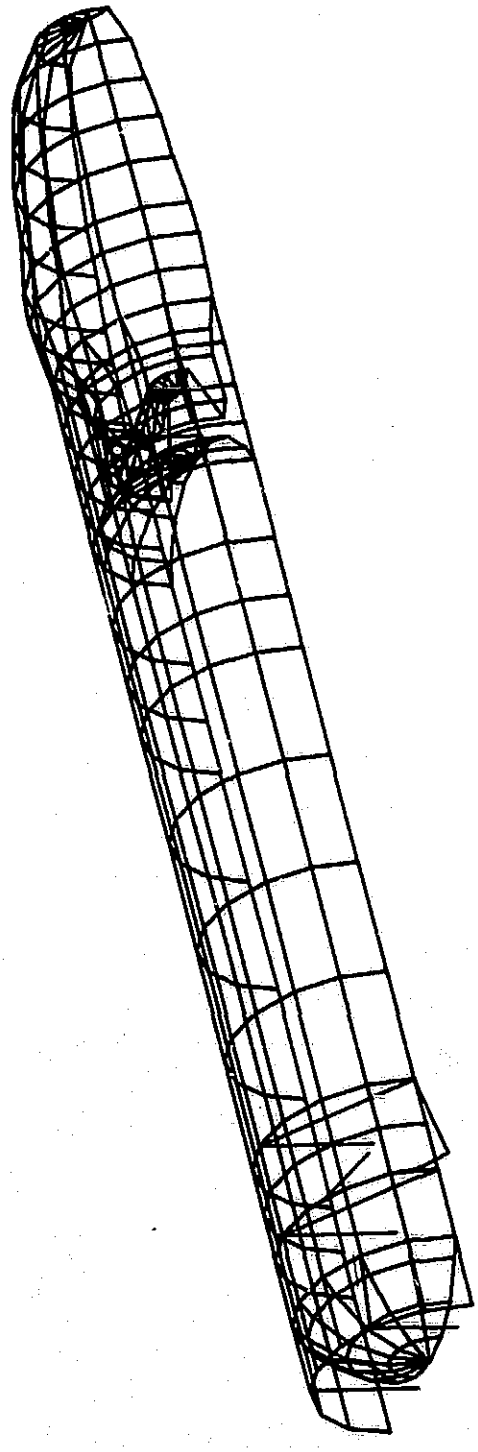


Fig. 3-53 Post Max Q Mode 25

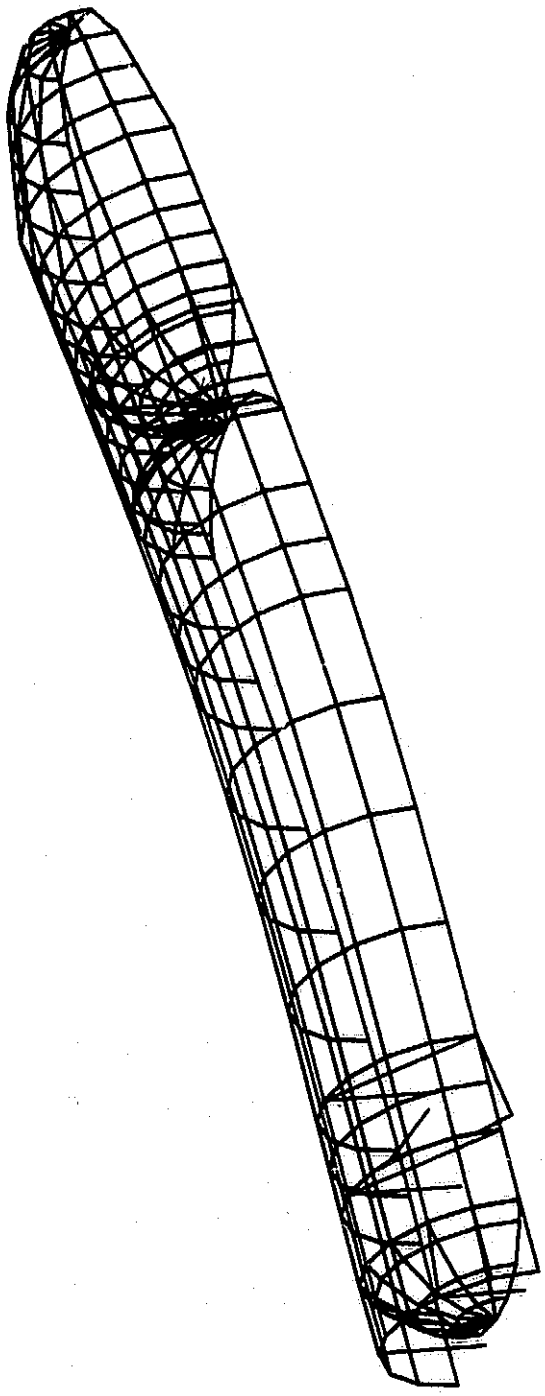


Fig. 3-54 Empty External Tank, Mode 4

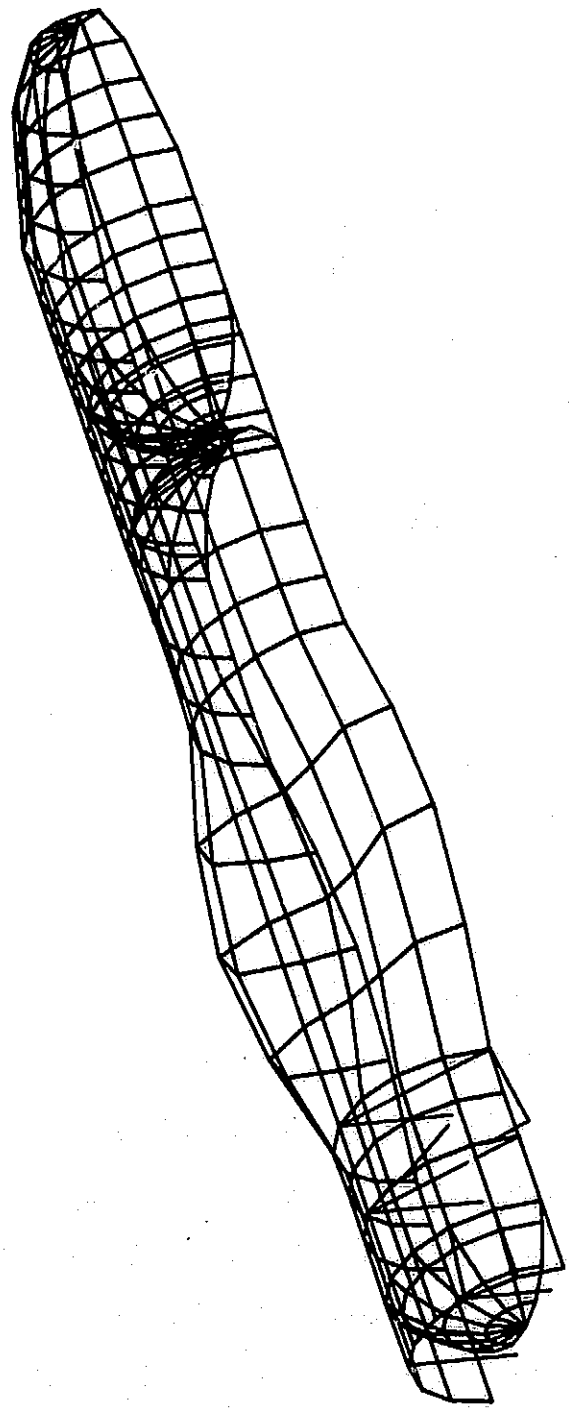


Fig. 3-55 Empty External Tank, Mode 5

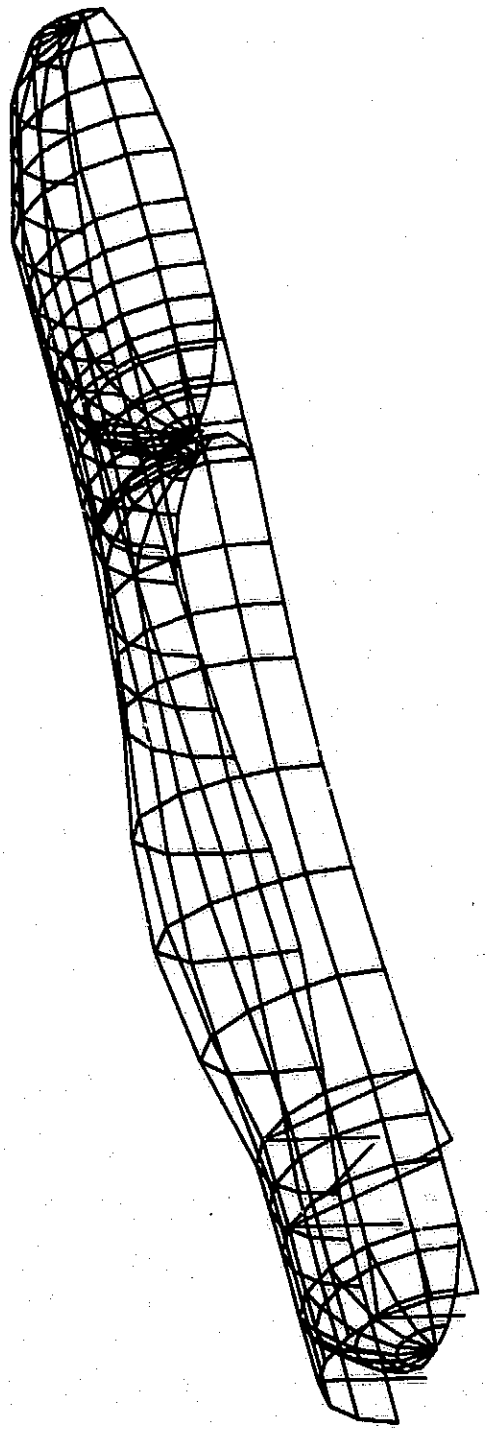


Fig. 3-56 Empty External Tank, Mode 6

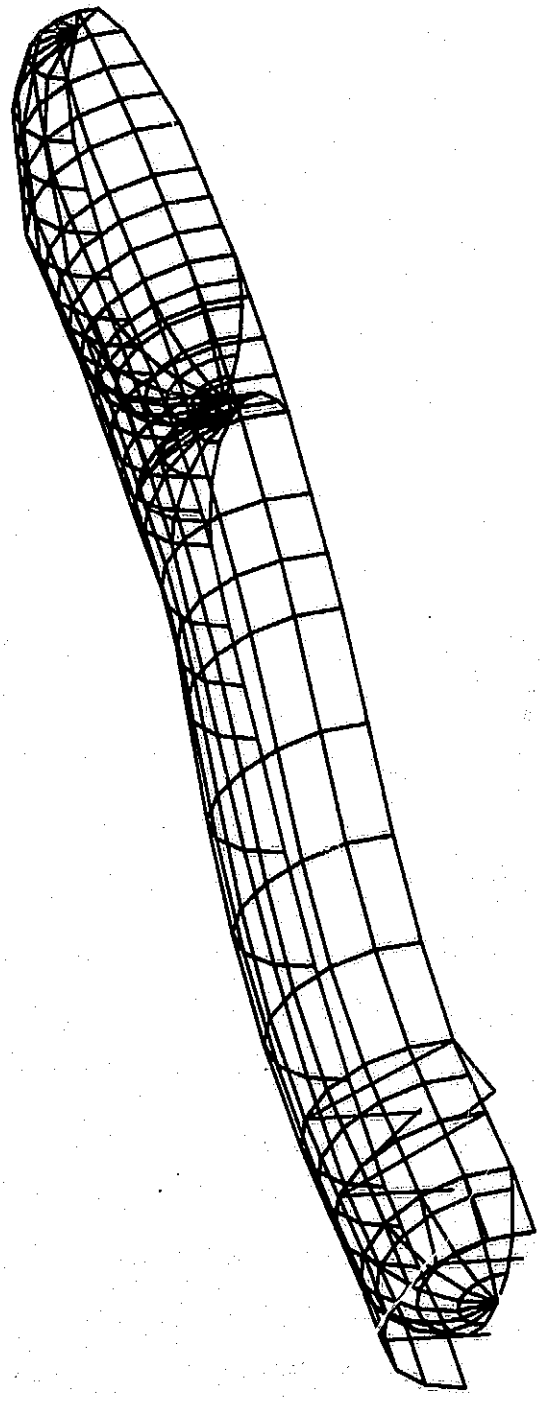


Fig. 3-57 Empty External Tank, Mode 7

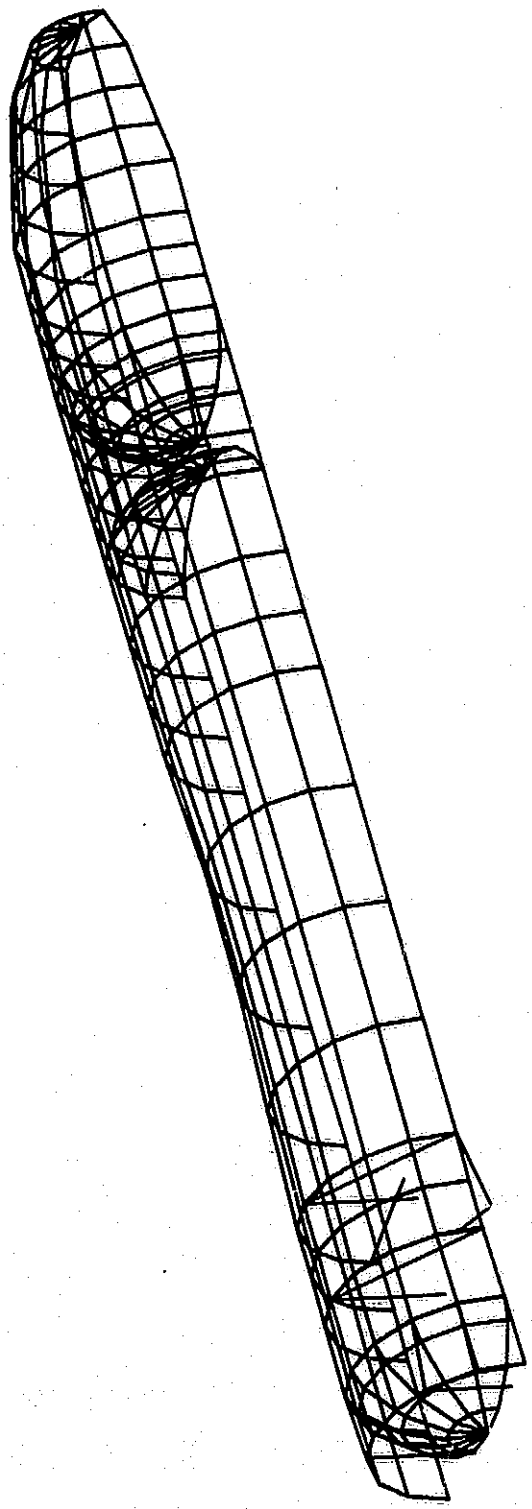


Fig. 3-58 Empty External Tank, Mode 8

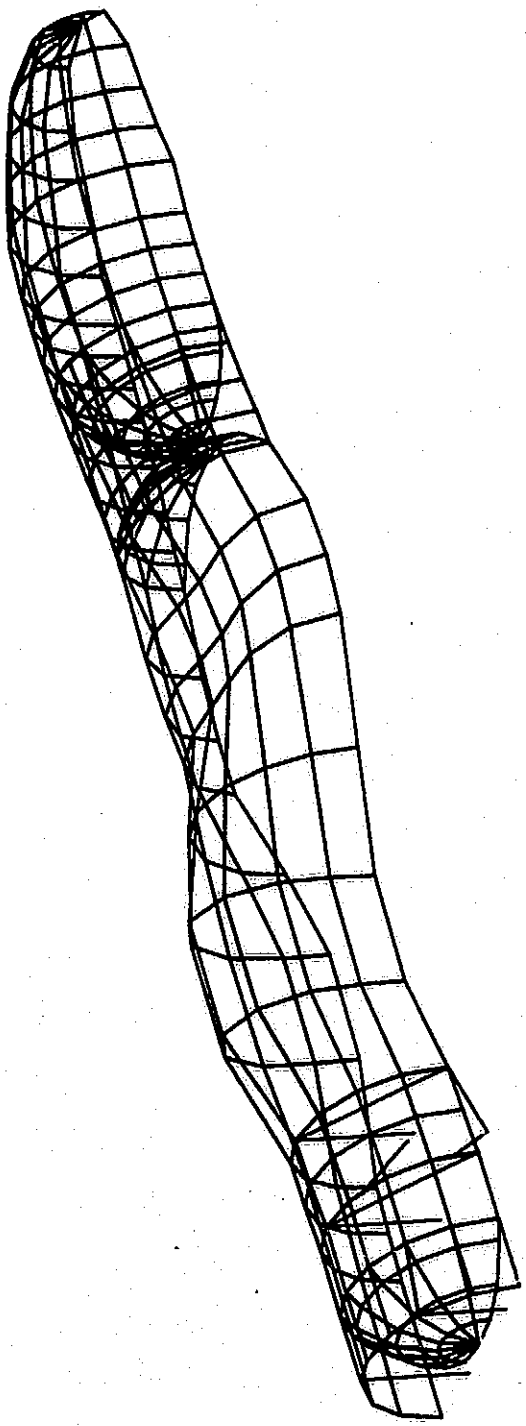


Fig. 3-59 Empty External Tank, Mode 9

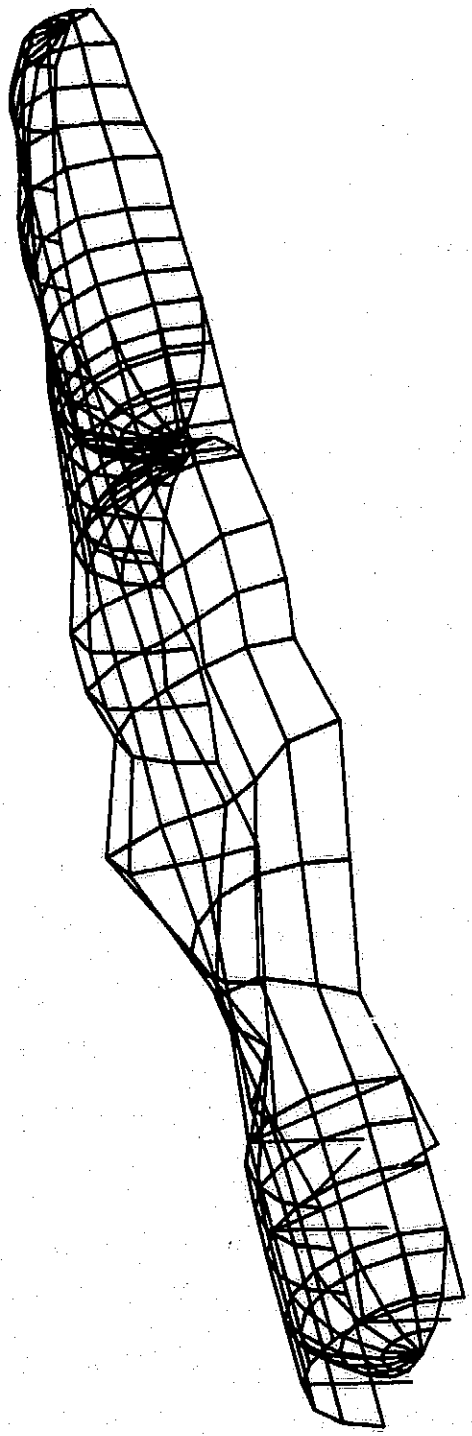


Fig. 3-60 Empty External Tank, Mode 10

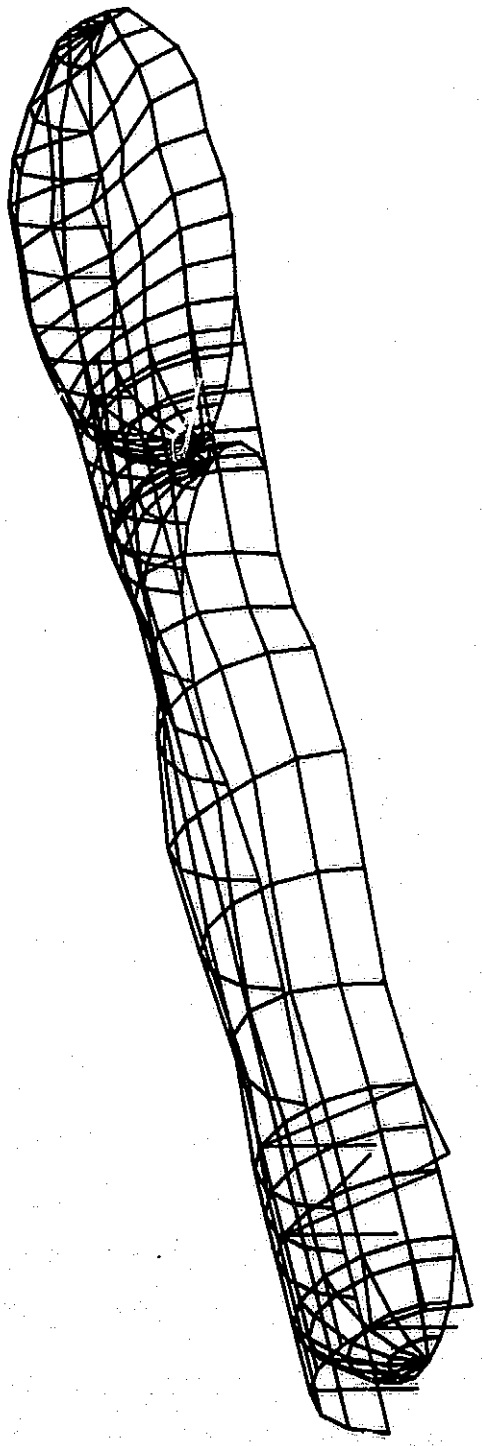


Fig. 3-61 Empty External Tank, Mode 11

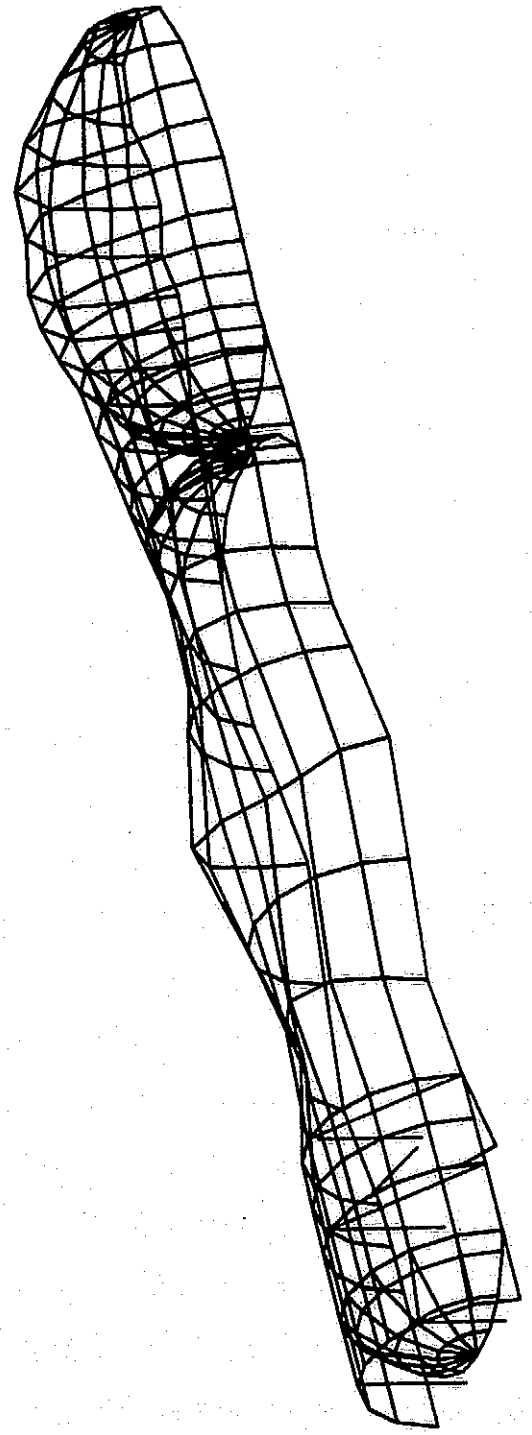


Fig. 3-62 Empty External Tank, Mode 12

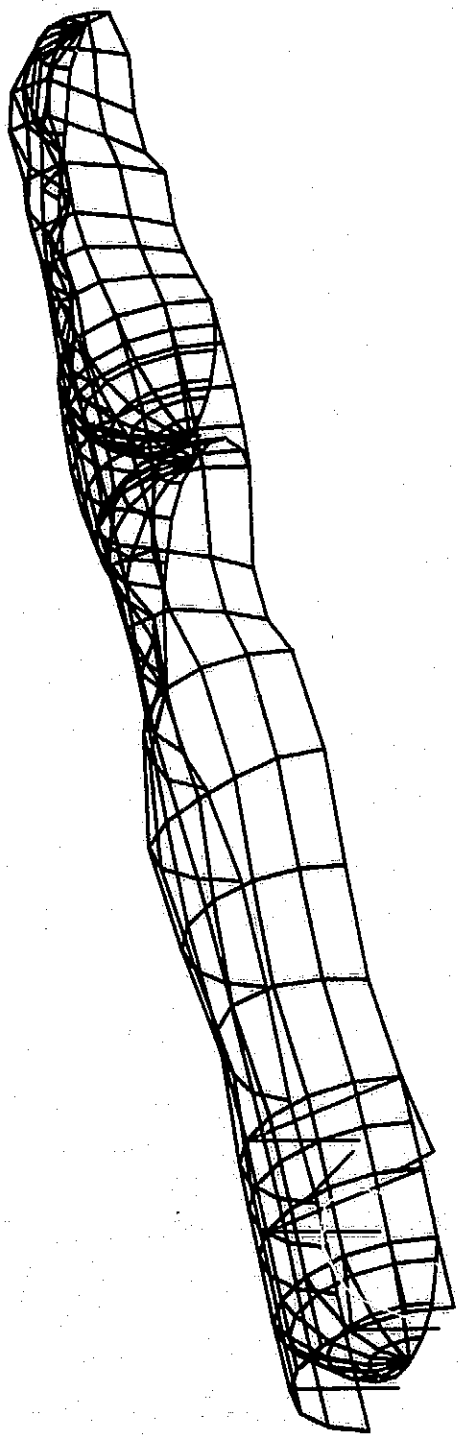


Fig. 3-63 Empty External Tank, Mode 13

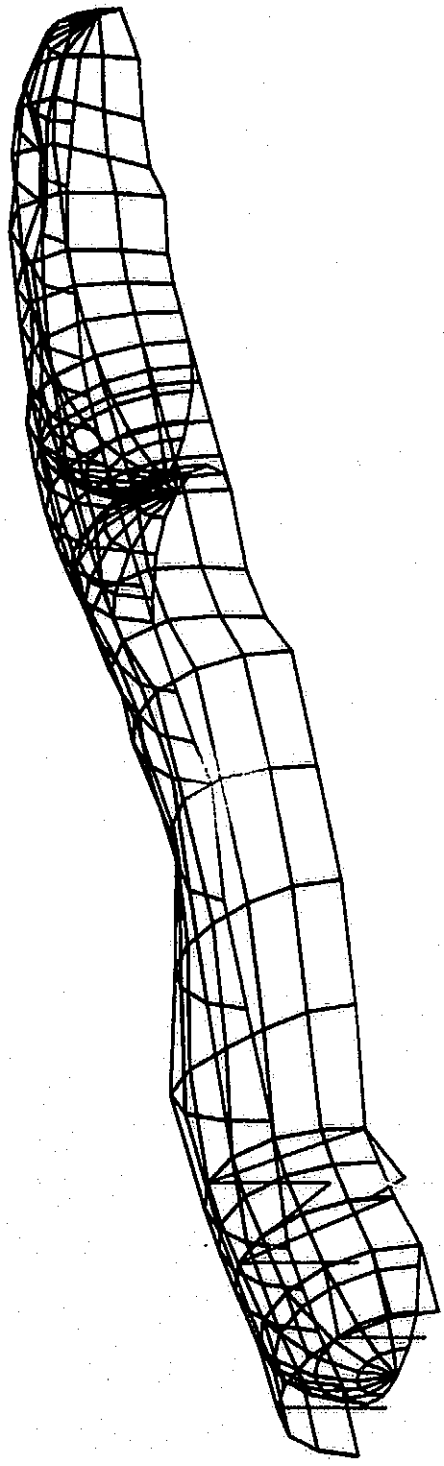


Fig. 3-64 Empty External Tank, Mode 14

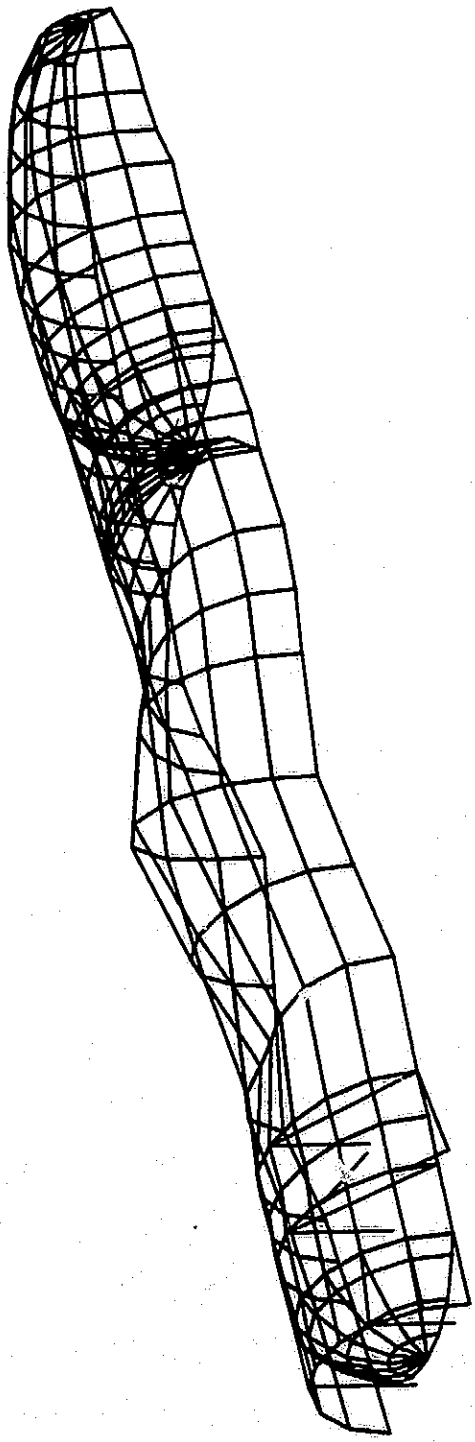


Fig. 3-65 Empty External Tank, Mode 15

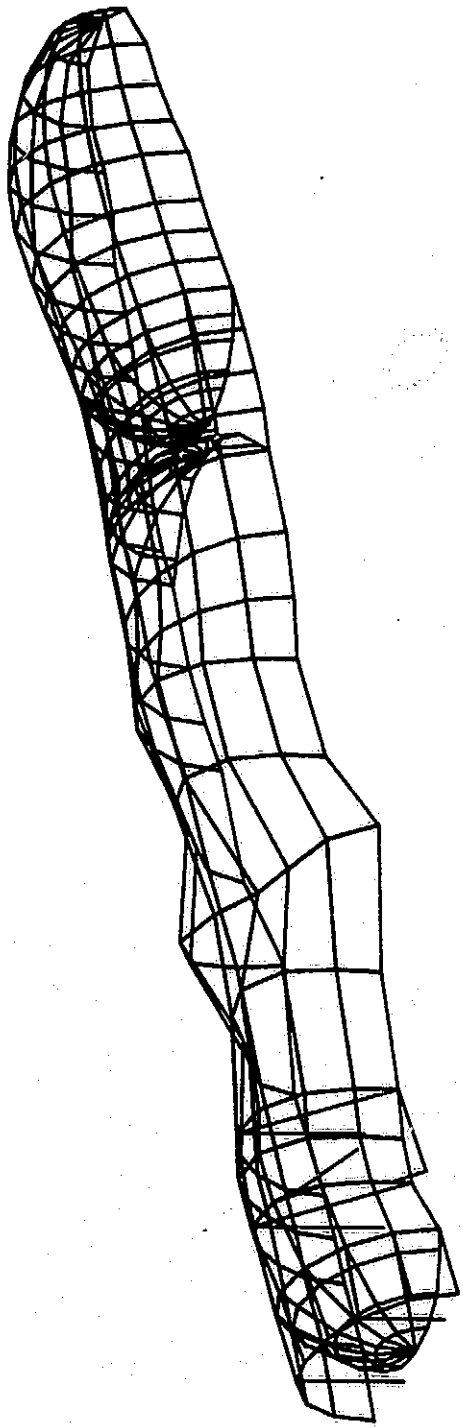


Fig. 3-66 Empty External Tank, Mode 16

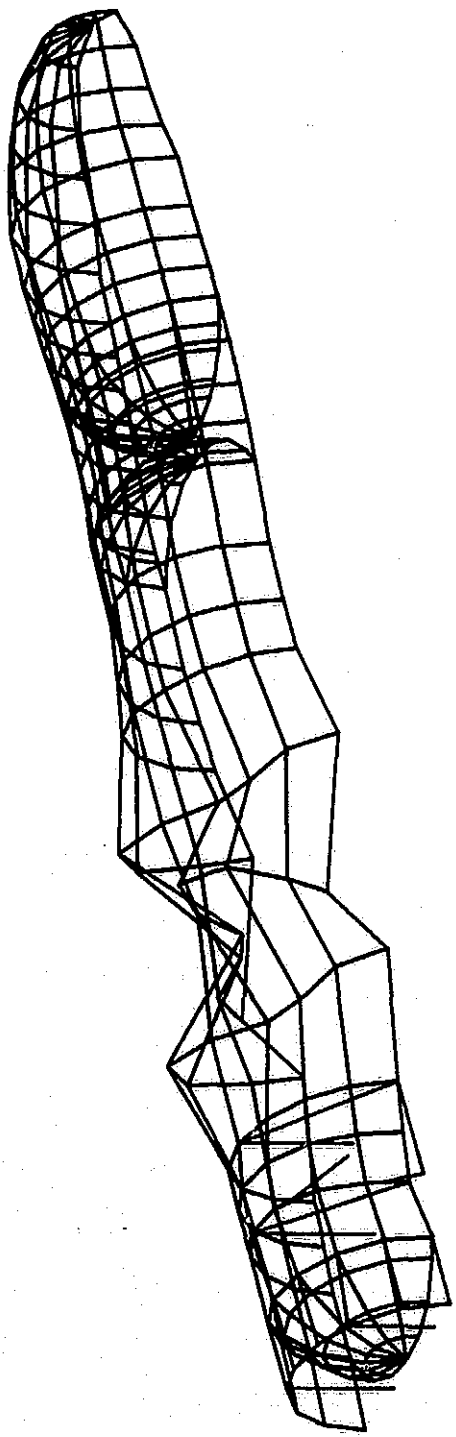


Fig. 3-67 Empty External Tank, Mode 17

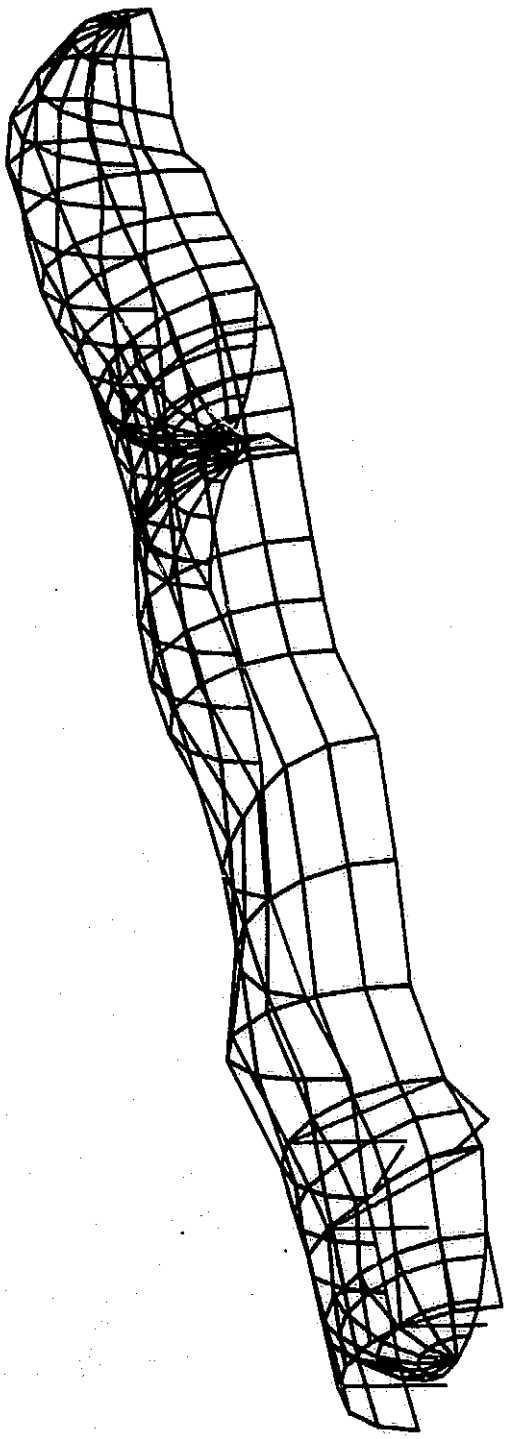


Fig. 3-68 Empty External Tank, Mode 18

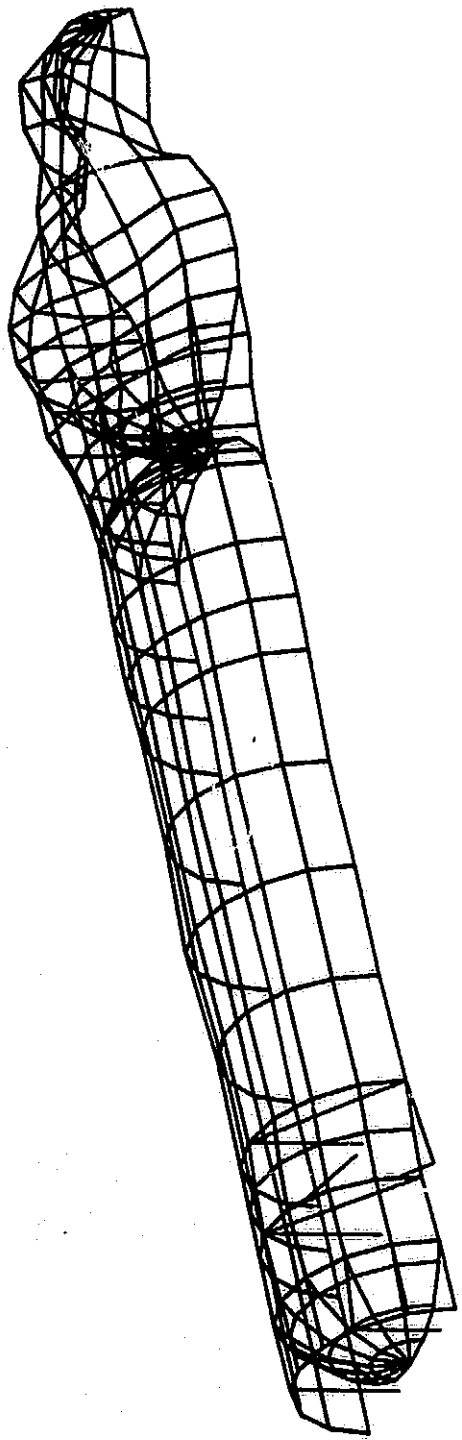


Fig. 3-69 Empty External Tank, Mode 19

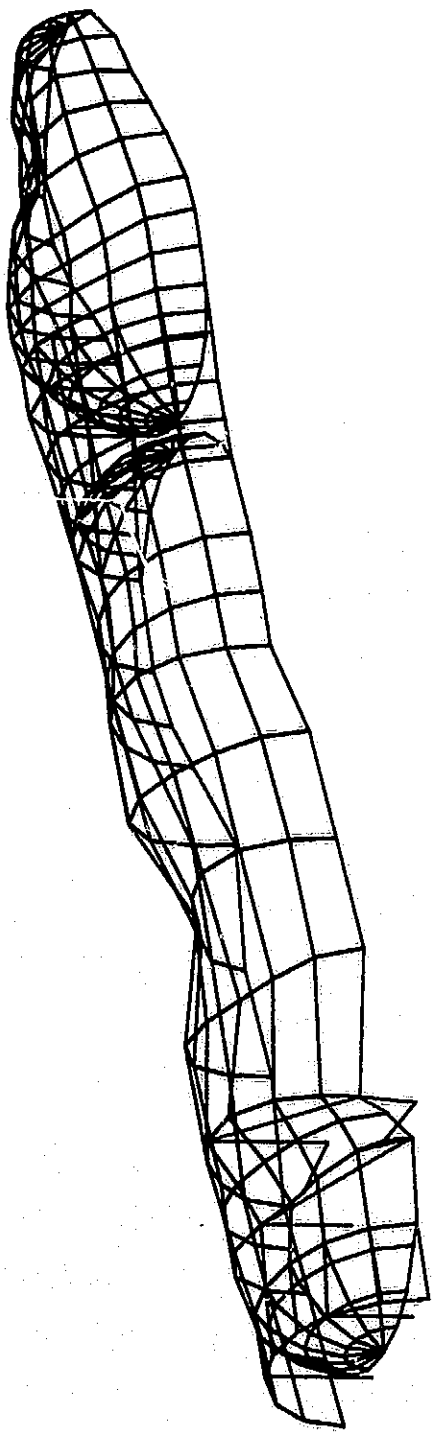


Fig. 3-70 Empty External Tank, Mode 20

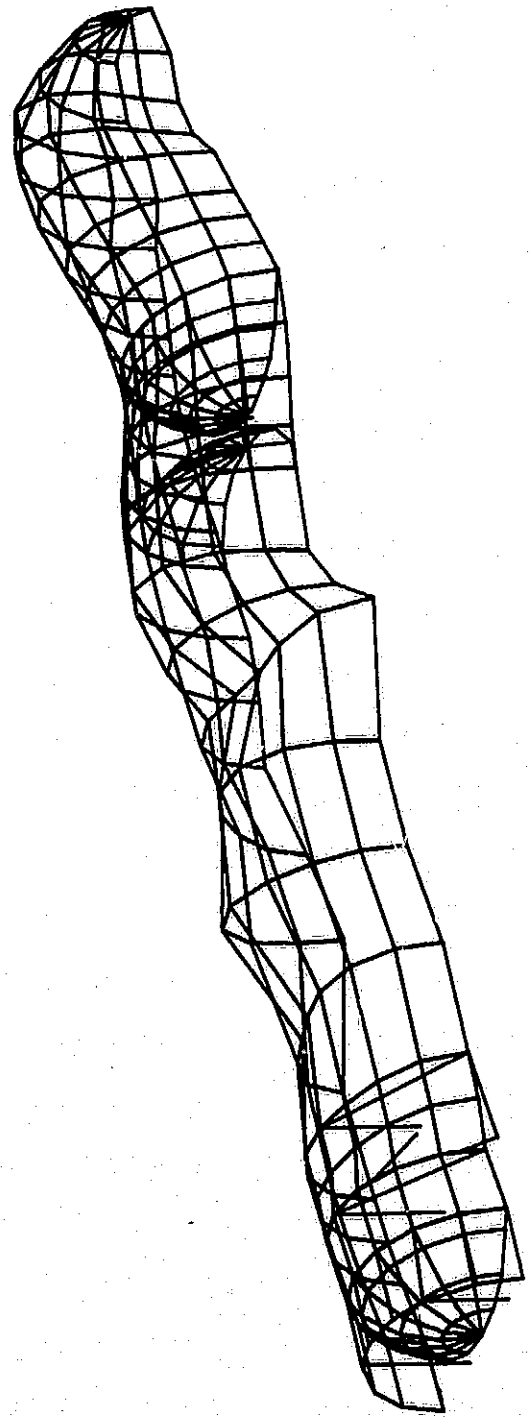


Fig. 3-71 Empty External Tank, Mode 21

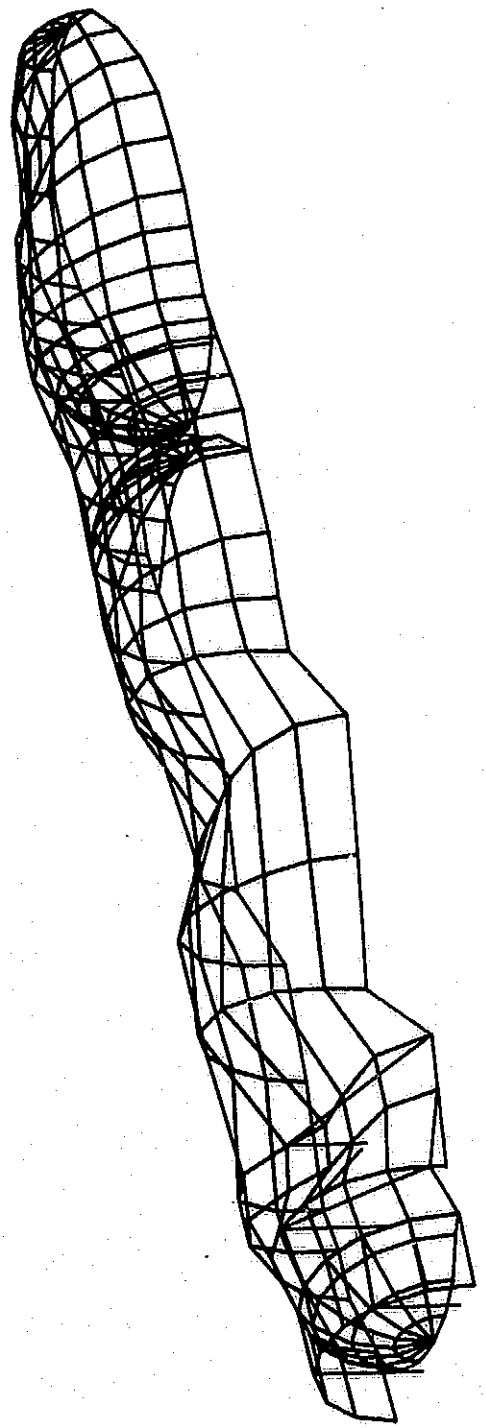


Fig. 3-72 Empty External Tank, Mode 22

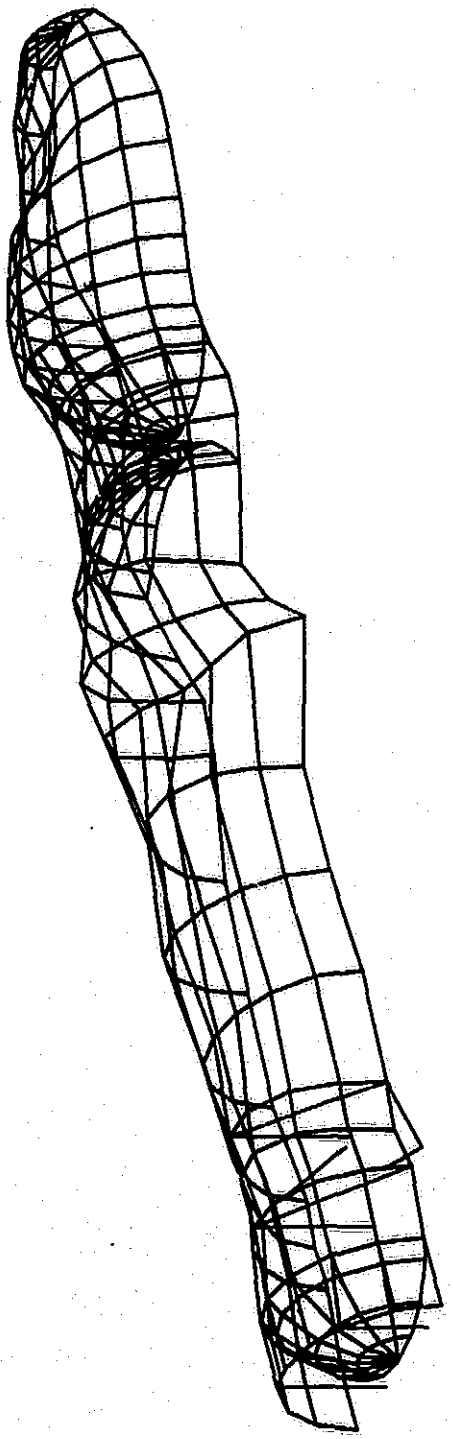


Fig. 3-73 Empty External Tank, Mode 23

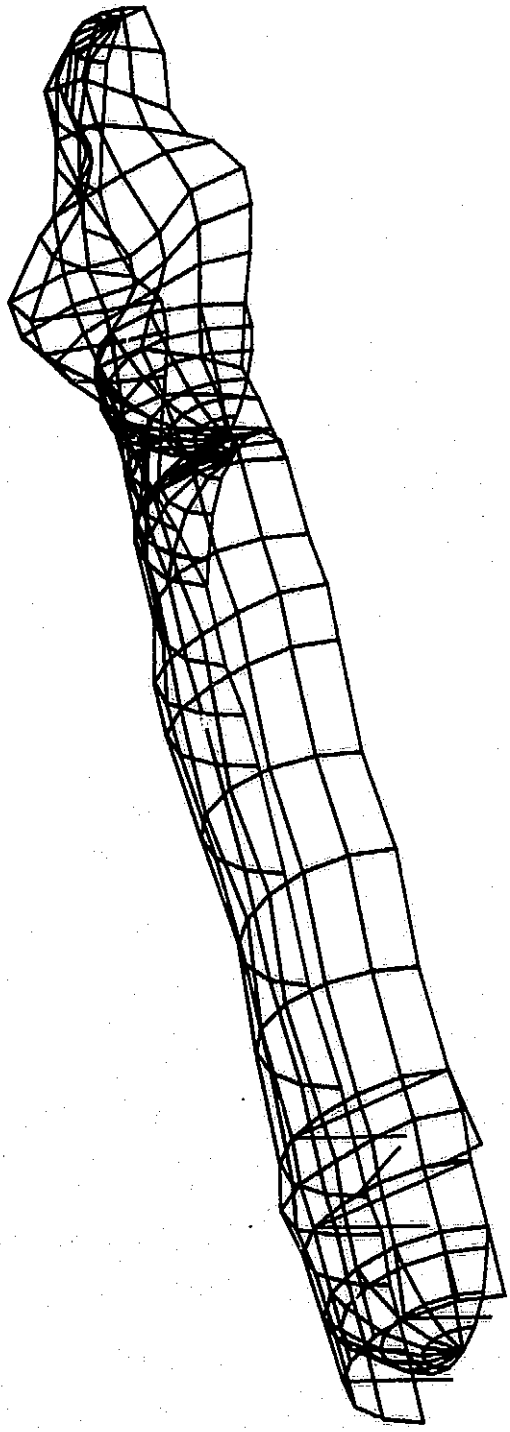


Fig. 3-74 Empty External Tank, Mode 24

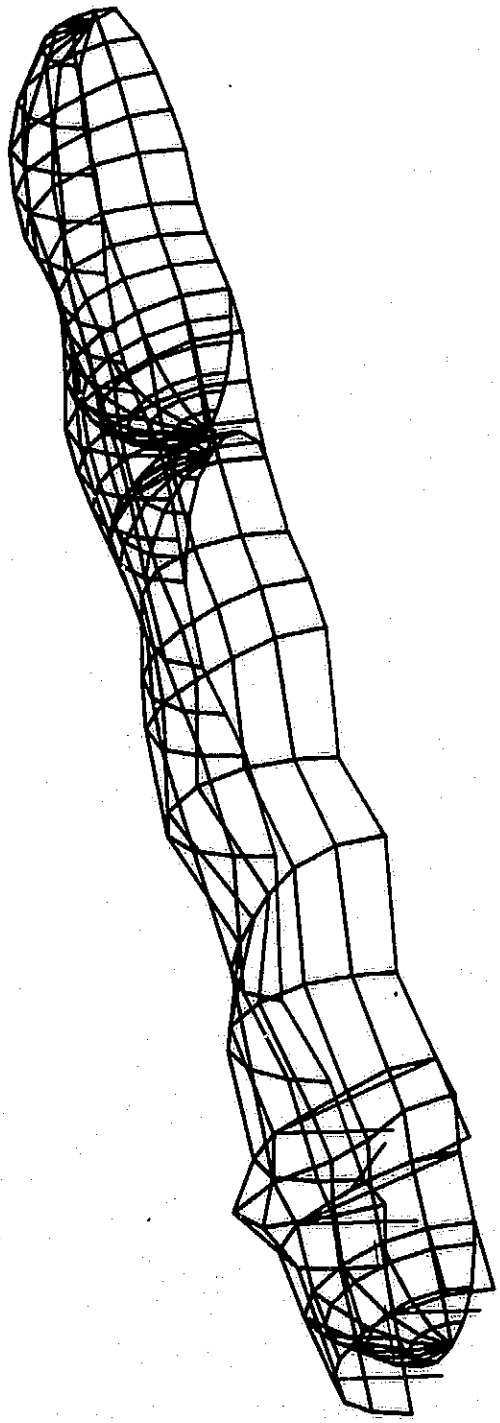
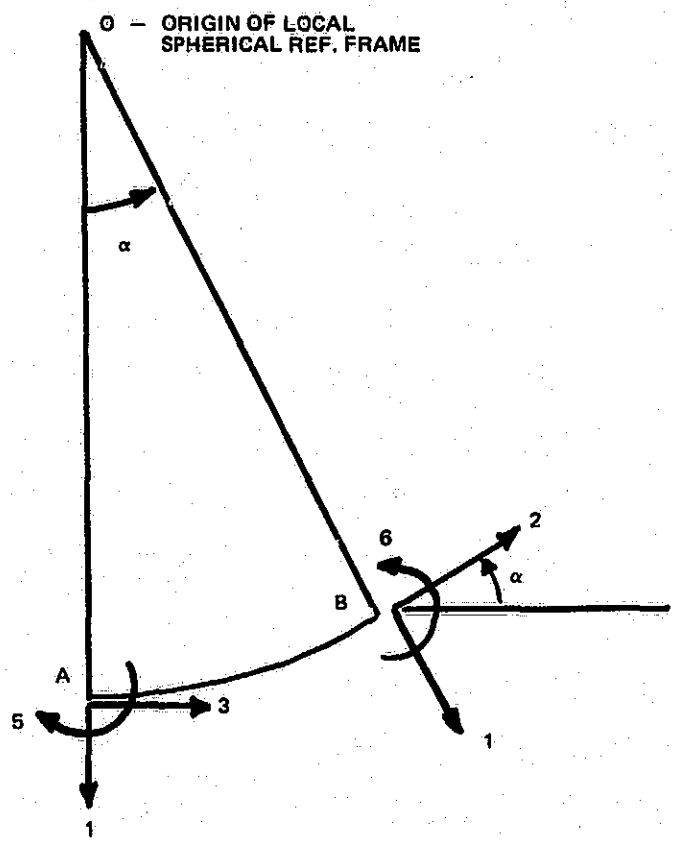


Fig. 3-75 Empty External Tank, Mode 25

II



- CONSTRAINTS

$$U_{1_A} = U^{O}_{1_B} \cos\alpha - U^{O}_{2_B} \sin\alpha ;$$

$$U_{6_B} = 0; \; U^{O}_{2_B} \cos\alpha + U^{O}_{1_B} \sin\alpha = 0$$

NOTE: SUPERSCRIPT "0" DENOTES ZEROTH HARMONIC.

Figure 3-76 Zeroth Harmonic "Apex Fix"

Table 3-4 Summary of 1/8-Scale External Tank Analysis/Test Comparisons

Fill Condition	Mode	Frequency (HZ)			
		Test	Current NASTRAN	Previous NASTRAN	Beam
• Lift Off	1st Z Bending	--	35.7	45.2*	30
	1st Axial	—	29.7	45.2*	41.4
	2nd Z Bending	—	63.8	—	59.2
• Post Max Q	1st Z Bending	37	49.2	—	40.5
	1st Axial	49	51.8	—	40
	2nd Z Bending	102.4			
• Empty	1st Z Bending	89	105.6	104.3**	94
	LH_2 Cylinder n=3	—	153	151.6**	—
	2nd Z Bending	184.8	226	—	243.8

*Extreme Guyan Reduction. In the current NASTRAN analysis, the second axial mode, from Table 3-1 occurs at 54.9 Hz.
**Inverse Power, No Reductions

II

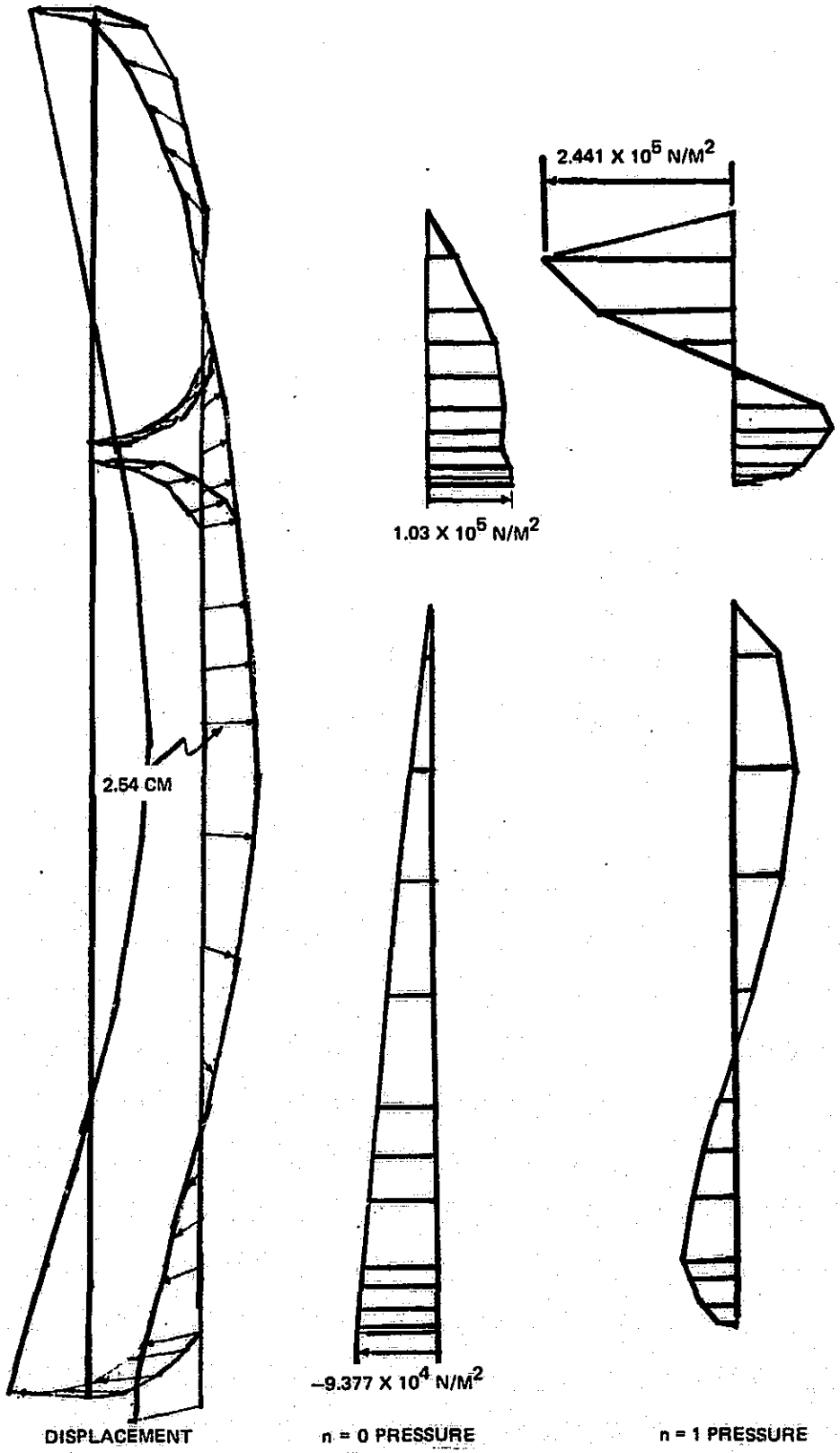


Fig. 3-77 Post Max Q External Tank First Bending Mode (Mode 6) with Modal Pressures

II

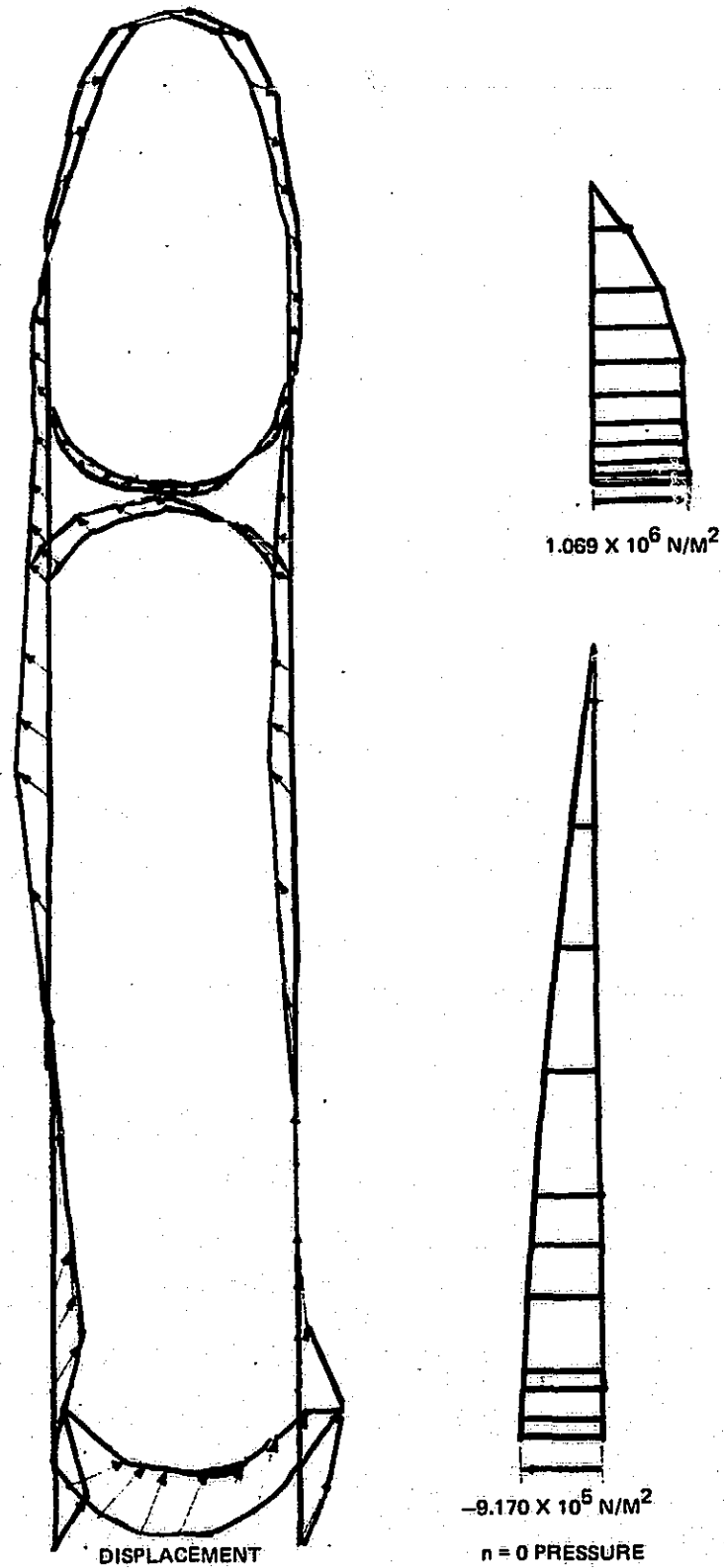
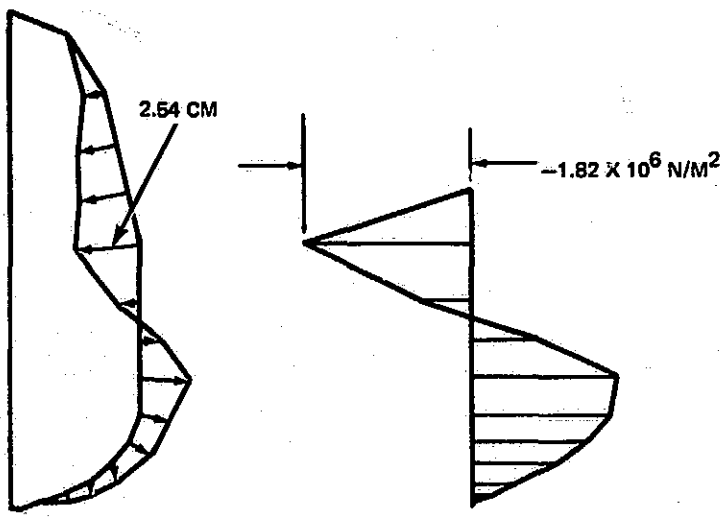
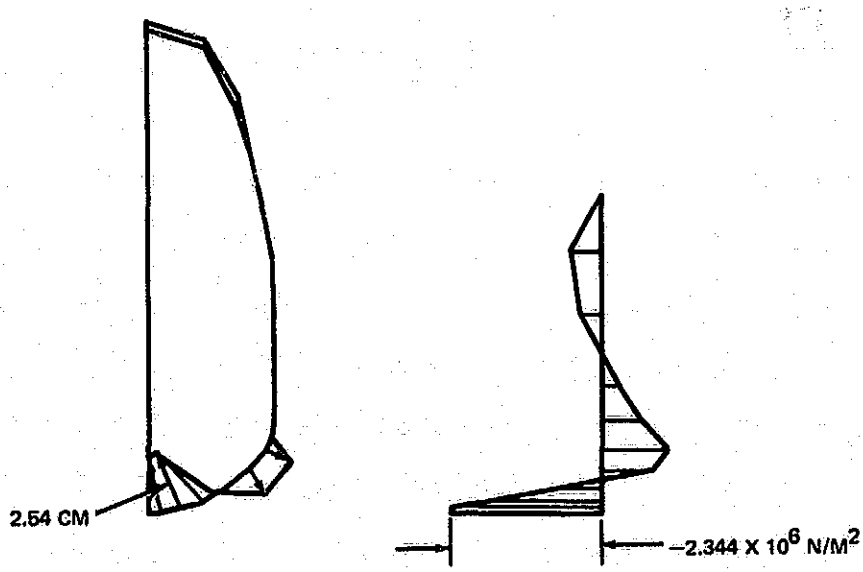


Fig. 3-78 Post Max Q External Tank First Axial Mode (Mode 7) with Modal Pressures

II

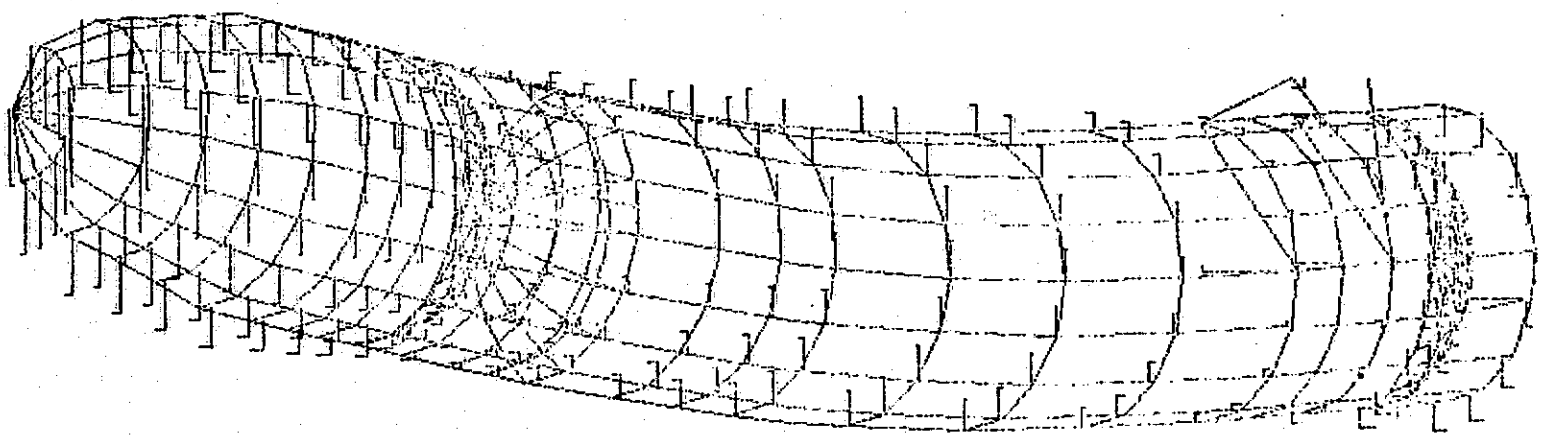


(A) LOX N = 2 "NO DOME" (MODE 12)



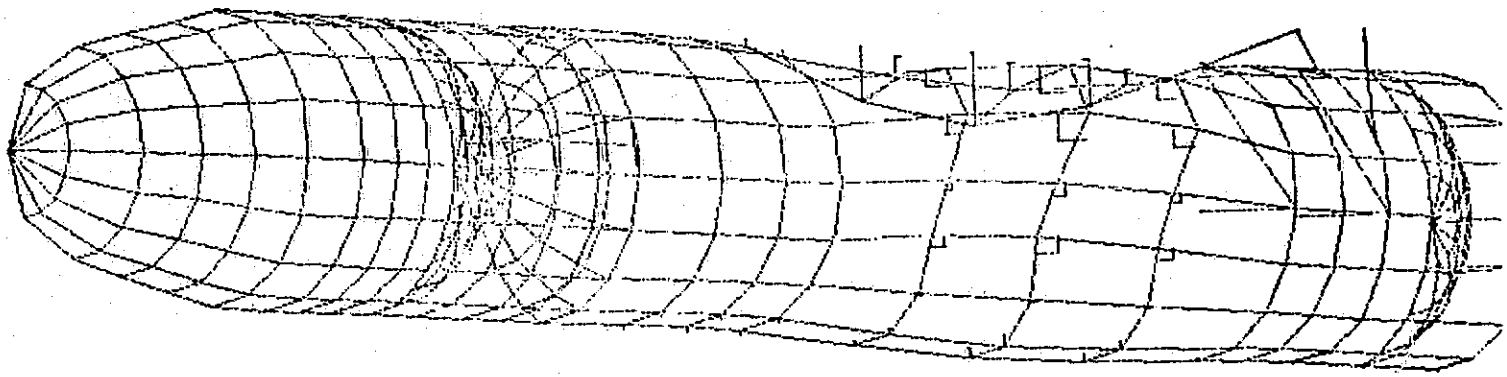
(B) LOX N = 0 "DOME" (MODE 14)

Fig. 3-79 Two Post Max Q External Tank Modes with Modal Pressure (LO_2 Tank Illustrated)



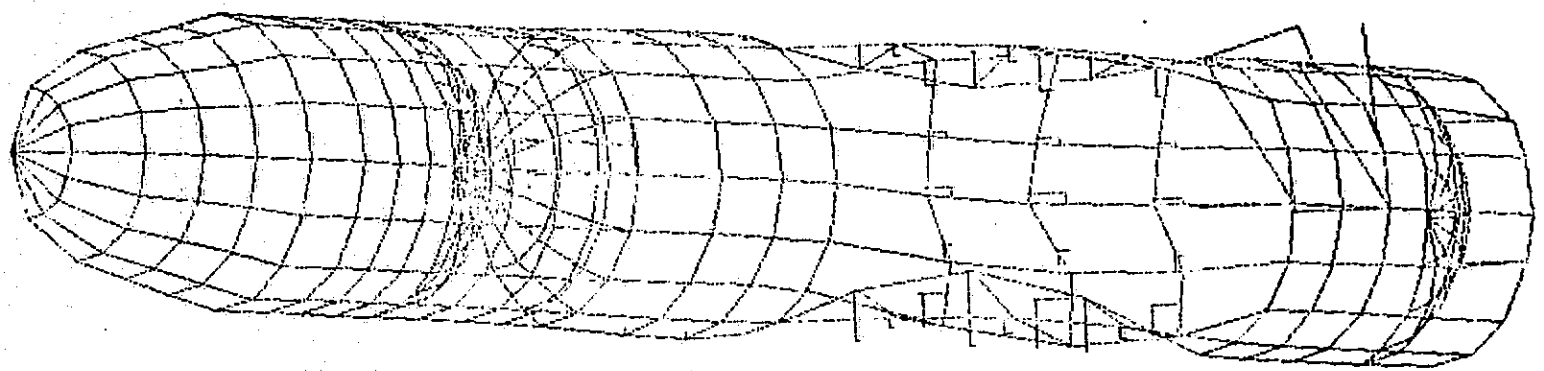
f = 104.3752 HZ

Fig. 3-80 Empty External Tank, Mode 1 (1st Bending) Calculated with No Reductions



f = 151.6242 HZ

Fig. 3-81 Empty External Tank Mode 2 (LH_2 Cylinder n = 3) Calculated with No Reductions



f = 154.2074 HZ

Fig. 3-82 Empty External Tank, Mode 3 (LH_2 Cylinder n = 4) Calculated with No Reductions

APPENDIX A - "HARM" - A FORTRAN PROGRAM FOR AUTOMATIC HARMONIC MULTIPOINT CONSTRAINT DATA GENERATION

The FORTRAN IV computer program listing presented in Fig. A-1 has been written to aid the analyst in preparation of harmonic transformation data required in Rigid Format 7 fluid matrix data calculations and in Rigid Format 3 or 13 hydroelastic normal modes calculations. The harmonic transformations are limited to descriptions of symmetric dynamics of geometrically axisymmetric bodies. The author has utilized this program on the Grumman Calldata time sharing system. On this system input data was prepared on a file, FTO4F001 and the output data was placed on a file FTO7F001 (note the read and write parameters 4 and 7 respectively, in the listing). The output file is punched onto cards and listed in typical runs.

The input data for "HARM" is as follows:

NH = number of harmonics

NPT = number of grid points to be transformed

NFS = parameter -

if = 0 transform only the "1" degree of freedom (the radial)

and

if ≠ 0 transform all 6 degrees of freedom.

KHARM (I), I = 1, NH; harmonic numbers to be included.

For each of the "NPT" grid points, the following input data is required:

NGR\ = grid point identification number

NROW = meridianal row number associated with the grid point; convention chosen by analyst

THET = circumferential location of grid point in degrees

NTYP = parameter identifying reference frame type -

= 1 (cylindrical reference frame)

= 2 (local spherical reference frame)

It should be noted that harmonic grid point identification numbers, KH (I), following the convention KH (I) = 1000000 + 100 * NROW + KHARM (I) are generated by "HARM". The analyst should separately prepare GRID or GRIDB cards for NASTRAN bulk data.

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FILE0 HARM FORTRAN P1 G R U M M A N D A T A S Y S T E M S

```
      DIMENSION KHARM(10),KH(10)                                        HAR00010
      READ(4,10)NH,NPT,NFS                                              HAR00020
   10 FORMAT(8X,3I0)                                                    HAR00030
      READ(4,20) (KHARM(I),I=1,NH)                                      HAR00040
   20 FORMAT(8X,7I8)                                                    HAR00050
      NH1=NH-1                                                          HAR00060
      NH2=NH1/2                                                         HAR00070
      NH3=NH1-2*NH2                                                     HAR00080
      DO 1000 K9=1,NPT                                                  HAR00090
      READ(4,100) NGP,NPOW,THET,NTYP                                    HAR00100
  100 FORMAT(8X,I9,I8,F8.3,I8)                                          HAR00110
      THET= THET/57.2958                                                HAR00120
      DO 120 I=2,NH                                                     HAR00130
  120 KH(I)=100000+100*NPOW+KHARM(I)                                    HAR00140
      IF(NTYP.EQ.2) GO TO 500                                           HAR00150
      J=1                                                               HAR00160
      A= KHARM(1)*THET                                                  HAR00170
      NB=KH(1)                                                          HAR00180
      CS1= COS(A)                                                       HAR00190
      SN1= SIN(A)                                                       HAR00200
      NC1=100*NGP+11                                                    HAR00210
      L=1                                                               HAR00220
      WRITE(7,130) NGP,L,NB,L,CS1,NC1                                   HAR00230
  130 FORMAT('NPC',5X,'1',7X,2I9,'-1.',5X,2I8,F8.5,8X,'+',I7)           HAR00240
      IF(NFS.EQ.0) GO TO 29                                             HAR00250
      L=2                                                               HAR00260
      NC1=100*NGP+12                                                    HAR00270
      WRITE(7,130) NGP,L,NB,L,SN1,NC1                                   HAR00280
      L=3                                                               HAR00290
      NC1=100*NGP+13                                                    HAR00300
      WRITE(7,130) NGP,L,NB,L,CS1,NC1                                   HAR00310
      L=4                                                               HAR00320
      NC1=100*NGP+14                                                    HAR00330
      WRITE(7,130) NGP,L,NB,L,SN1,NC1                                   HAR00340
      L=5                                                               HAR00350
      NC1=100*NGP+15                                                    HAR00360
      WRITE(7,130) NGP,L,NB,L,CS1,NC1                                   HAR00370
      L=6                                                               HAR00380
      NC1=100*NGP+16                                                    HAR00390
      WRITE(7,130) NGP,L,NB,L,SN1,NC1                                   HAR00400
   29 CONTINUE                                                          HAR00410
      IF(NH1.EQ.2) GO TO 1000                                           HAR00420
      IF(NH2.EQ.0) GO TO 300                                            HAR00430
      DO 200 J=1,NH2                                                    HAR00440
      J1=2*J                                                            HAR00450
      J2=J1+1                                                           HAR00460
      A=  KHARM(J1)*THET                                                HAR00470
      CS1= COS(A)                                                       HAR00480
      SN1= SIN(A)                                                       HAR00490
      A= KHARM(J2)*THET                                                 HAR00500
      CS2 =COS(A)                                                       HAR00510
      SN2= SIN(A)                                                       HAR00520
      NB1=KH(J1)                                                        HAR00530
      NB2=KH(J2)                                                        HAR00540
      L=1                                                               HAR00550
```

Fig. A-1 "HARM" Fortran Listing (Sheet 1 of 4)

```
FILE: HARM      FORTRAN  P1                    G R U M M A N   D A T A   S Y S T E M S
      NC1=100*NGR+10*J+1                                              HAR00560
      NC2=100*NGR+10*(J+1)+1                                          HAR00570
      WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2                        HAR00580
  150 FORMAT('+',I7,8X,2I8,F8.5,2I8,F8.5,8X,'+',I7)                   HAR00590
      IF(NES.EQ.0) GO TO 200                                          HAR00600
      L=2                                                             HAR00610
      NC1=NC1+1                                                       HAR00620
      NC2=NC2+1                                                       HAR00630
      WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2                        HAR00640
      L=3                                                             HAR00650
      NC1=NC1+1                                                       HAR00660
      NC2=NC2+1                                                       HAR00670
      WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2                        HAR00680
      L=4                                                             HAR00690
      NC1=NC1+1                                                       HAR00700
      NC2=NC2+1                                                       HAR00710
      WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2                        HAR00720
      L=5                                                             HAR00730
      NC1=NC1+1                                                       HAR00740
      NC2=NC2+1                                                       HAR00750
      WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2                        HAR00760
      L=6                                                             HAR00770
      NC1=NC1+1                                                       HAR00780
      NC2=NC2+1                                                       HAR00790
      WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2                        HAR00800
  200 CONTINUE                                                        HAR00810
      J=J+1                                                           HAR00820
      IF(NB3.EQ.0) GO TO 1000                                         HAR00830
  300 CONTINUE                                                        HAR00840
      A= KHARM(NH)*THET                                               HAR00850
      NB=KH(NH)                                                       HAR00860
      CS1= COS(A)                                                     HAR00870
      SN1= SIN(A)                                                     HAR00880
      L=1                                                             HAR00890
      NC1=100*NGR+10*J+1                                              HAR00900
      WRITE(7,150) NC1,NB,L,CS1                                       HAR00910
  160 FORMAT('+',I6,8X,2I8,F8.5)                                      HAR00920
      IF(NES.EQ.0) GO TO 1000                                         HAR00930
      L=2                                                             HAR00940
      NC1=NC1+1                                                       HAR00950
      WRITE(7,150) NC1,NB,L,SN1                                       HAR00960
      L=3                                                             HAR00970
      NC1=NC1+1                                                       HAR00980
      WRITE(7,160) NC1,NB,L,CS1                                       HAR00990
      L=4                                                             HAR01000
      NC1=NC1+1                                                       HAR01010
      WRITE(7,160) NC1,NB,L,SN1                                       HAR01020
      L=5                                                             HAR01030
      NC1=NC1+1                                                       HAR01040
      WRITE(7,160) NC1,NB,L,CS1                                       HAR01050
      L=6                                                             HAR01060
      NC1=NC1+1                                                       HAR01070
      WRITE(7,160) NC1,NB,L,SN1                                       HAR01080
      GO TO 1000                                                      HAR01090
  500 CONTINUE                                                        HAR01100
```

Fig. A-1 "HARM" Fortran Listing (Sheet 2 of 4)

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```
      J=1                                                              HAR01110
      A= KHARM(1)*THET                                                 HAR01120
      NB=KH(1)                                                         HAR01130
      CS1= COS(A)                                                      HAR01140
      SN1= SIN(A)                                                      HAR01150
      NC1=100*NGP+11                                                   HAR01160
      L=1                                                              HAR01170
      WRITE(7,130) NGP,L,NB,L,CS1,NC1                                  HAR01180
      IF(NFS.EQ.0)GO TO 229                                            HAR01190
      L=2                                                              HAR01200
      NC1=100*NGP+12                                                   HAR01210
      WRITE(7,130) NGP,L,NB,L,CS1,NC1                                  HAR01220
      L=3                                                              HAR01230
      NC1=100*NGP+13                                                   HAR01240
      WRITE(7,130) NGP,L,NB,L,SN1,NC1                                  HAR01250
      L=4                                                              HAR01260
      NC1=100*NGP+14                                                   HAR01270
      WRITE(7,130) NGP,L,NB,L,SN1,NC1                                  HAR01280
      L=5                                                              HAR01290
      NC1=100*NGP+15                                                   HAR01300
      WRITE(7,130) NGP,L,NB,L,SN1,NC1                                  HAR01310
      L=6                                                              HAR01320
      NC1=100*NGP+16                                                   HAR01330
      WRITE(7,130) NGP,L,NB,L,CS1,NC1                                  HAR01340
  229 CONTINUE                                                         HAR01350
      IF(NH1.EQ.0) GO TO 1000                                          HAR01360
      IF(NH2.EQ.0) GO TO 800                                           HAR01370
      DO 730 J=1,NH2                                                   HAR01380
      J1=2*J                                                           HAR01390
      J2=N+1                                                           HAR01400
      A= KHARM(J1)*THET                                                HAR01410
      CS1= COS(A)                                                      HAR01420
      SN1= SIN(A)                                                      HAR01430
      A= KHARM(J2)*THET                                                HAR01440
      CS2 =COS(A)                                                      HAR01450
      SN2= SIN(A)                                                      HAR01460
      NB1=KH(J1)                                                       HAR01470
      NB2=KH(J2)                                                       HAR01480
      L=1                                                              HAR01490
      NC1=100*NGP+10*J+1                                               HAR01500
      NC2=100*NGP+10*(J+1)+1                                           HAR01510
      WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2                         HAR01520
      IF(NFS.EQ.0) GO TO 700                                           HAR01530
      L=2                                                              HAR01540
      NC1=NC1+1                                                        HAR01550
      NC2=NC2+1                                                        HAR01560
      WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2                         HAR01570
      L=3                                                              HAR01580
      NC1=NC1+1                                                        HAR01590
      NC2=NC2+1                                                        HAR01600
      WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2                         HAR01610
      L=4                                                              HAR01620
      NC1=NC1+1                                                        HAR01630
      NC2=NC2+1                                                        HAR01640
      WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2                         HAR01650
```

Fig. A-1 "HARM" Fortran Listing (Sheet 3 of 4)

```
FILED HARM      FORTRAN  P1                    G R U M M A N   D A T A   S Y S T E M S

          L=5                                                               HAR01660
          NC1=NC1+1                                                         HAR01670
          NC2=NC2+1                                                         HAR01680
          WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2                          HAR01690
          L=6                                                               HAR01700
          NC1=NC1+1                                                         HAR01710
          NC2=NC2+1                                                         HAR01720
          WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2                          HAR01730
  700     CONTINUE                                                          HAR01740
          J=J+1                                                             HAR01750
          IF(NH3.EQ.0) GO TO 1000                                           HAR01760
  800     CONTINUE                                                          HAR01770
          A= KHARM(NH)*THET                                                 HAR01780
          NB=KH(NH)                                                         HAR01790
          CS1= COS(A)                                                       HAR01800
          SN1= SIN(A)                                                       HAR01810
          L=1                                                               HAR01820
          NC1=100*NSF+10*J+1                                                HAR01830
          WRITE(7,160) NC1,NB,L,CS1                                         HAR01840
          IF(NFS.EQ.0) GO TO 1000                                           HAR01850
          L=2                                                               HAR01860
          NC1=NC1+1                                                         HAR01870
          WRITE(7,160) NC1,NB,L,CS1                                         HAR01880
          L=3                                                               HAR01890
          NC1=NC1+1                                                         HAR01900
          WRITE(7,160) NC1,NB,L,SN1                                         HAR01910
          L=4                                                               HAR01920
          NC1=NC1+1                                                         HAR01930
          WRITE(7,150) NC1,NB,L,SN1                                         HAR01940
          L=5                                                               HAR01950
          NC1=NC1+1                                                         HAR01960
          WRITE(7,150) NC1,NB,L,SN1                                         HAR01970
          L=6                                                               HAR01980
          NC1=NC1+1                                                         HAR01990
          WRITE(7,160) NC1,NB,L,CS1                                         HAR02000
 1000     CONTINUE                                                          HAR02010
          STOP                                                              HAR02020
          END                                                               HAR02030
```

Fig. A-1 "HARM" Fortran Listing (Sheet 4 of 4)

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N A S T R A N E X E C U T I V E C O N T R O L D E C K E C H O

```
ID HYDRO,COPPOLINO
APP DISP
SOL 7,0
TIME 5
CHKPNT YES
DIAG 7,8,13,14,19,21,22
ALTER 50
MATGPR GPL,USET,SIL,MGG//C,N,G
MATGPR GPL,USET,SIL,KGG//C,N,G
ALTER 73
MATGPR GPL,USET,SIL,MFF//C,N,F
MATGPR GPL,USET,SIL,KFF//C,N,F
ALTER 101
MATGPR GPL,USET,SIL,ABFL//C,N,P
MATGPR GPL,USET,SIL,KBFL//C,N,P
ALTER 136
MATGPR GPLD,USETD,SILD,MDD//C,N,D
MATGPR GPLD,USETD,SILD,KDD//C,N,D
SEEMAT MGG,KGG,MFF,KFF,ABFL//C,N,PRINT
SEEMAT KBFL,MDD,KDD,,//C,N,PRINT
PARTN KDD,P9,/KBP,AEM,,KE/C,N,-1 $
PARTN KBP,G9,/K11,K21,K12,K22/C,N,-1 $
PARTN AEM,G9,UP/A1M,,,A2M/C,N,1 $
PARTN KE,UP,/KE1,,,KE2/C,N,-1 $
TRNSP A2M/A2MT $
SOLVE K22,A2MT/PDU2/C,N,1/C,N,-1 $
SOLVE A1M,K12/M2L/C,N,1 $
MPYAD M2L,PDU2,/TU12/C,N,0/C,N,-1 $
ADD PDU2,/PDU3/C,Y,A999#%1.0,0.0 $
PARAM //C,N,NOP/V,N,TRUE#-1 $
EQUIV PDU3,PDU2/TRUE $
COND PDUN09,TRUE $
MATPRN PDU3,,,,// $
LABEL PDUN09 $
MPYAD A2M,PDU2,/MFLD/C,N,0/C,N,-1 $
OUTPUT3 MFLD,PDU2,TU12,,//C,N,0/C,Y,N1#AMF/C,Y,N2#APD/C,Y,N3#ATU $
SMPYAD TU12,KE1,TU12,,,KE2/KEB/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
SOLVE K22,K21/CP2/C,N,1/C,N,-1 $
MATPRN K11,K12,K22,,// $
MATPRN A1M,A2M,KE1,,// $
MATPRN PDU2,MFLD,TU12,,// $
MATPRN KEB,K11,CP2,,// $
EXIT
ENDALTER
CEND
```

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APRIL 9, 1974 NASTRAN 2/ 1/73

N A S T R A N E X E C U T I V E C O N T R O L D E C K E C H O

ECHO OF FIRST CARD IN CHECKPOINT DICTIONARY TO BE PUNCHED OUT FOR THIS PROBLEM

RESTART HYDRO ,COPPOLIN, 4/ 9/74, 48911,

C A S E C O N T R O L D E C K E C H O

CARD COUNT	
1	TITLE=CYLINDRICAL FLUID
2	AXISYM=FLUID
3	MPC=1
4	CMETHOD=1
5	OUTPUT
6	DISP=ALL
7	HARMONICS=ALL
8	BEGIN BULK

*** USER INFORMATION MESSAGE 207, BULK DATA NOT SORTED. XSORT WILL RE-ORDER DECK.

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1-	AXIF	1	0.0	1.		NO				CAX
2-	CAX	0	2	4						
3-	BDYLIST		AXIS	1	2	3	4	5	10	CBD1
4-	CBD1	15	20	25	30	35	40	45	50	CBD2
5-	CBD2	55								
6-	CFLUID2	1	1	6						
7-	CFLUID2	6	6	11						
8-	CFLUID2	11	11	16						
9-	CFLUID2	16	16	21						
10-	CFLUID2	21	21	26						
11-	CFLUID2	26	26	31						
12-	CFLUID2	31	31	36						
13-	CFLUID2	36	36	41						
14-	CFLUID2	41	41	46						
15-	CFLUID2	46	46	51						
16-	CFLUID4	2	1	2	7	6				
17-	CFLUID4	3	2	3	8	7				
18-	CFLUID4	4	3	4	9	8				
19-	CFLUID4	5	4	5	10	9				
20-	CFLUID4	7	6	7	12	11				
21-	CFLUID4	8	7	8	13	12				
22-	CFLUID4	9	8	9	14	13				
23-	CFLUID4	10	9	10	15	14				
24-	CFLUID4	12	11	12	17	16				
25-	CFLUID4	13	12	13	18	17				
26-	CFLUID4	14	13	14	19	18				
27-	CFLUID4	15	14	15	20	19				
28-	CFLUID4	17	16	17	22	21				
29-	CFLUID4	18	17	18	23	22				
30-	CFLUID4	19	18	19	24	23				
31-	CFLUID4	20	19	20	25	24				
32-	CFLUID4	22	21	22	27	26				
33-	CFLUID4	23	22	23	28	27				
34-	CFLUID4	24	23	24	29	28				
35-	CFLUID4	25	24	25	30	29				
36-	CFLUID4	27	26	27	32	31				
37-	CFLUID4	28	27	28	33	32				
38-	CFLUID4	29	28	29	34	33				
39-	CFLUID4	30	29	30	35	34				
40-	CFLUID4	32	31	32	37	36				
41-	CFLUID4	33	32	33	38	37				
42-	CFLUID4	34	33	34	39	38				
43-	CFLUID4	35	34	35	40	39				
44-	CFLUID4	37	36	37	42	41				
45-	CFLUID4	38	37	38	43	42				
46-	CFLUID4	39	38	39	44	43				
47-	CFLUID4	40	39	40	45	44				
48-	CFLUID4	42	41	42	47	46				
49-	CFLUID4	43	42	43	48	47				
50-	CFLUID4	44	43	44	49	48				

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
51-	CFLUID4	45	44	45	50	49				
52-	CFLUID4	47	46	47	52	51				
53-	CFLUID4	48	47	48	53	52				
54-	CFLUID4	49	48	49	54	53				
55-	CFLUID4	50	49	50	55	54				
56-	CORD2C	1		0.0	0.0	0.0	0.0	0.0	1.	&COC
57-	&COC	1.	0.	0.						
58-	DMI	G9	0	2	1	2		45	1	
59-	DMI	G9	1	16	1.	1.	1.	1.	1.	&PP1
60-	&PP1	1.	1.	1.	1.	1.	1.	1.	1.	&PP2
61-	&PP2	1.	1.	1.	1.	1.	1.	1.	1.	&PP3
62-	&PP3	1.	1.	1.	1.	1.	1.	1.	1.	&PP4
63-	&PP4	1.								
64-	DMI	P9	0	2	1	2		90	1	
65-	DMI	P9	1	46	1.	1.	1.	1.	1.	&PUE1
66-	&PUE1	1.	1.	1.	1.	1.	1.	1.	1.	&PUE2
67-	&PUE2	1.	1.	1.	1.	1.	1.	1.	1.	&PUE3
68-	&PUE3	1.	1.	1.	1.	1.	1.	1.	1.	&PUE4
69-	&PUE4	1.	1.	1.	1.	1.	1.	1.	1.	&PUE5
70-	&PUE5	1.	1.	1.	1.	1.	1.	1.	1.	
71-	DMI	UP	0	2	1	2		45	1	
72-	DMI	UP	1	16	1.	1.	1.	1.	1.	&UP1
73-	&UP1	1.	1.	1.	1.	1.	1.	1.	1.	&UP2
74-	&UP2	1.	1.	1.	1.	1.	1.	1.	1.	&UP3
75-	&UP3	1.	1.	1.	1.	1.	1.	1.	1.	&UP4
76-	&UP4	1.								
77-	EIGC	1	DET	MAX						&EI
78-	&EI	0.	0.	0.	500.	.001	10	10		
79-	FLSYM	4	S	S						
80-	GRID	100600	1	1.	0.0	0.0	1	12456		
81-	GRID	100602	1	1.	0.0	0.0	1	12456		
82-	GRID	100604	1	1.	0.0	0.0	1	12456		
83-	GRID	100700	1	1.	0.0	0.0	1	12456		
84-	GRID	100702	1	1.	0.0	0.0	1	12456		
85-	GRID	100704	1	1.	0.0	0.0	1	12456		
86-	GRID	100800	1	1.	0.0	0.0	1	12456		
87-	GRID	100802	1	1.	0.0	0.0	1	12456		
88-	GRID	100804	1	1.	0.0	0.0	1	12456		
89-	GRID	100900	1	1.	0.0	0.0	1	12456		
90-	GRID	100902	1	1.	0.0	0.0	1	12456		
91-	GRID	100904	1	1.	0.0	0.0	1	12456		
92-	GRID	101000	1	1.	0.0	0.0	1	12456		
93-	GRID	101002	1	1.	0.0	0.0	1	12456		
94-	GRID	101004	1	1.	0.0	0.0	1	12456		
95-	GRID	102000	1	1.	0.0	0.0	1	23456		
96-	GRID	102002	1	1.	0.0	0.0	1	23456		
97-	GRID	102004	1	1.	0.0	0.0	1	23456		
98-	GRID	103000	1	1.	0.0	0.0	1	23456		
99-	GRID	103002	1	1.	0.0	0.0	1	23456		
100-	GRID	103004	1	1.	0.0	0.0	1	23456		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
101-	GRID	104000	1	1.	0.0	0.0	1	23456		
102-	GRID	104002	1	1.	0.0	0.0	1	23456		
103-	GRID	104004	1	1.	0.0	0.0	1	23456		
104-	GRID	105000	1	1.	0.0	0.0	1	23456		
105-	GRID	105002	1	1.	0.0	0.0	1	23456		
106-	GRID	105004	1	1.	0.0	0.0	1	23456		
107-	GRID	106000	1	1.	0.0	0.0	1	23456		
108-	GRID	106002	1	1.	0.0	0.0	1	23456		
109-	GRID	106004	1	1.	0.0	0.0	1	23456		
110-	GRID	107000	1	1.	0.0	0.0	1	23456		
111-	GRID	107002	1	1.	0.0	0.0	1	23456		
112-	GRID	107004	1	1.	0.0	0.0	1	23456		
113-	GRID	108000	1	1.	0.0	0.0	1	23456		
114-	GRID	108002	1	1.	0.0	0.0	1	23456		
115-	GRID	108004	1	1.	0.0	0.0	1	23456		
116-	GRID	109000	1	1.	0.0	0.0	1	23456		
117-	GRID	109002	1	1.	0.0	0.0	1	23456		
118-	GRID	109004	1	1.	0.0	0.0	1	23456		
119-	GRID	110000	1	1.	0.0	0.0	1	23456		
120-	GRID	110002	1	1.	0.0	0.0	1	23456		
121-	GRID	110004	1	1.	0.0	0.0	1	23456		
122-	GRID	111000	1	1.	0.0	0.0	1	23456		
123-	GRID	111002	1	1.	0.0	0.0	1	23456		
124-	GRID	111004	1	1.	0.0	0.0	1	23456		
125-	GRIDB	601			0.0		1	12456	1	
126-	GRIDB	602			9.		1	12456	1	
127-	GRIDB	603			18.		1	12456	1	
128-	GRIDB	604			27.		1	12456	1	
129-	GRIDB	605			36.		1	12456	1	
130-	GRIDB	606			45.		1	12456	1	
131-	GRIDB	607			54.		1	12456	1	
132-	GRIDB	608			63.		1	12456	1	
133-	GRIDB	609			72.		1	12456	1	
134-	GRIDB	610			81.		1	12456	1	
135-	GRIDB	611			90.		1	12456	1	
136-	GRIDB	701			0.0		1	12456	2	
137-	GRIDB	702			9.		1	12456	2	
138-	GRIDB	703			18.		1	12456	2	
139-	GRIDB	704			27.		1	12456	2	
140-	GRIDB	705			36.		1	12456	2	
141-	GRIDB	706			45.		1	12456	2	
142-	GRIDB	707			54.		1	12456	2	
143-	GRIDB	708			63.		1	12456	2	
144-	GRIDB	709			72.		1	12456	2	
145-	GRIDB	710			81.		1	12456	2	
146-	GRIDB	711			90.		1	12456	2	
147-	GRIDB	801			0.0		1	12456	3	
148-	GRIDB	802			9.		1	12456	3	
149-	GRIDB	803			18.		1	12456	3	
150-	GRIDB	804			27.		1	12456	3	

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
151-	GRIDB	805			36.		1	12456	3	
152-	GRIDB	806			45.		1	12456	3	
153-	GRIDB	807			54.		1	12456	3	
154-	GRIDB	808			63.		1	12456	3	
155-	GRIDB	809			72.		1	12456	3	
156-	GRIDB	810			81.		1	12456	3	
157-	GRIDB	811			90.		1	12456	3	
158-	GRIDB	901			0.0		1	12456	4	
159-	GRIDB	902			9.		1	12456	4	
160-	GRIDB	903			18.		1	12456	4	
161-	GRIDB	904			27.		1	12456	4	
162-	GRIDB	905			36.		1	12456	4	
163-	GRIDB	906			45.		1	12456	4	
164-	GRIDB	907			54.		1	12456	4	
165-	GRIDB	908			63.		1	12456	4	
166-	GRIDB	909			72.		1	12456	4	
167-	GRIDB	910			81.		1	12456	4	
168-	GRIDB	911			90.		1	12456	4	
169-	GRIDB	1001			0.0		1	12456	5	
170-	GRIDB	1002			9.		1	12456	5	
171-	GRIDB	1003			18.		1	12456	5	
172-	GRIDB	1004			27.		1	12456	5	
173-	GRIDB	1005			36.		1	12456	5	
174-	GRIDB	1006			45.		1	12456	5	
175-	GRIDB	1007			54.		1	12456	5	
176-	GRIDB	1008			63.		1	12456	5	
177-	GRIDB	1009			72.		1	12456	5	
178-	GRIDB	1010			81.		1	12456	5	
179-	GRIDB	1011			90.		1	12456	5	
180-	GRIDB	2001			0.0		1	23456	10	
181-	GRIDB	2002			9.		1	23456	10	
182-	GRIDB	2003			18.		1	23456	10	
183-	GRIDB	2004			27.		1	23456	10	
184-	GRIDB	2005			36.		1	23456	10	
185-	GRIDB	2006			45.		1	23456	10	
186-	GRIDB	2007			54.		1	23456	10	
187-	GRIDB	2008			63.		1	23456	10	
188-	GRIDB	2009			72.		1	23456	10	
189-	GRIDB	2010			81.		1	23456	10	
190-	GRIDB	2011			90.		1	23456	10	
191-	GRIDB	3001			0.0		1	23456	15	
192-	GRIDB	3002			9.		1	23456	15	
193-	GRIDB	3003			18.		1	23456	15	
194-	GRIDB	3004			27.		1	23456	15	
195-	GRIDB	3005			36.		1	23456	15	
196-	GRIDB	3006			45.		1	23456	15	
197-	GRIDB	3007			54.		1	23456	15	
198-	GRIDB	3008			63.		1	23456	15	
199-	GRIDB	3009			72.		1	23456	15	
200-	GRIDB	3010			81.		1	23456	15	

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
201-	GRIDB	3011			90.		1	23456	15	
202-	GRIDB	4001			0.0		1	23456	20	
203-	GRIDB	4002			9.		1	23456	20	
204-	GRIDB	4003			18.		1	23456	20	
205-	GRIDB	4004			27.		1	23456	20	
206-	GRIDB	4005			36.		1	23456	20	
207-	GRIDB	4006			45.		1	23456	20	
208-	GRIDB	4007			54.		1	23456	20	
209-	GRIDB	4008			63.		1	23456	20	
210-	GRIDB	4009			72.		1	23456	20	
211-	GRIDB	4010			81.		1	23456	20	
212-	GRIDB	4011			90.		1	23456	20	
213-	GRIDB	5001			0.0		1	23456	25	
214-	GRIDB	5002			9.		1	23456	25	
215-	GRIDB	5003			18.		1	23456	25	
216-	GRIDB	5004			27.		1	23456	25	
217-	GRIDB	5005			36.		1	23456	25	
218-	GRIDB	5006			45.		1	23456	25	
219-	GRIDB	5007			54.		1	23456	25	
220-	GRIDB	5008			63.		1	23456	25	
221-	GRIDB	5009			72.		1	23456	25	
222-	GRIDB	5010			81.		1	23456	25	
223-	GRIDB	5011			90.		1	23456	25	
224-	GRIDB	6001			0.0		1	23456	30	
225-	GRIDB	6002			9.		1	23456	30	
226-	GRIDB	6003			18.		1	23456	30	
227-	GRIDB	6004			27.		1	23456	30	
228-	GRIDB	6005			36.		1	23456	30	
229-	GRIDB	6006			45.		1	23456	30	
230-	GRIDB	6007			54.		1	23456	30	
231-	GRIDB	6008			63.		1	23456	30	
232-	GRIDB	6009			72.		1	23456	30	
233-	GRIDB	6010			81.		1	23456	30	
234-	GRIDB	6011			90.		1	23456	30	
235-	GRIDB	7001			0.0		1	23456	35	
236-	GRIDB	7002			9.		1	23456	3	
237-	GRIDB	7003			18.		1	23456	3	
238-	GRIDB	7004			27.		1	23456	3	
239-	GRIDB	7005			36.		1	23456	3	
240-	GRIDB	7006			45.		1	23456	3	
241-	GRIDB	7007			54.		1	23456	3	
242-	GRIDB	7008			63.		1	23456	3	
243-	GRIDB	7009			72.		1	23456	3	
244-	GRIDB	7010			81.		1	23456	35	
245-	GRIDB	7011			90.		1	23456	35	
246-	GRIDB	8001			0.0		1	23456	4	
247-	GRIDB	8002			9.		1	23456	4	
248-	GRIDB	8003			18.		1	23456	4	
249-	GRIDB	8004			27.		1	23456	40	
250-	GRIDB	8005			36.		1	23456	40	

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
251-	GRIDB	8006			45.		1	23456	40	
252-	GRIDB	8007			54.		1	23456	40	
253-	GRIDB	8008			63.		1	23456	40	
254-	GRIDB	8009			72.		1	23456	40	
255-	GRIDB	8010			81.		1	23456	40	
256-	GRIDB	8011			90.		1	23456	40	
257-	GRIDB	9001			0.0		1	23456	45	
258-	GRIDB	9002			9.		1	23456	45	
259-	GRIDB	9003			18.		1	23456	45	
260-	GRIDB	9004			27.		1	23456	45	
261-	GRIDB	9005			36.		1	23456	45	
262-	GRIDB	9006			45.		1	23456	45	
263-	GRIDB	9007			54.		1	23456	45	
264-	GRIDB	9008			63.		1	23456	45	
265-	GRIDB	9009			72.		1	23456	45	
266-	GRIDB	9010			81.		1	23456	45	
267-	GRIDB	9011			90.		1	23456	45	
268-	GRIDB	10001			0.0		1	23456	50	
269-	GRIDB	10002			9.		1	23456	50	
270-	GRIDB	10003			18.		1	23456	50	
271-	GRIDB	10004			27.		1	23456	50	
272-	GRIDB	10005			36.		1	23456	50	
273-	GRIDB	10006			45.		1	23456	50	
274-	GRIDB	10007			54.		1	23456	50	
275-	GRIDB	10008			63.		1	23456	50	
276-	GRIDB	10009			72.		1	23456	50	
277-	GRIDB	10010			81.		1	23456	50	
278-	GRIDB	10011			90.		1	23456	50	
279-	GRIDB	11001			0.0		1	23456	55	
280-	GRIDB	11002			9.		1	23456	55	
281-	GRIDB	11003			18.		1	23456	55	
282-	GRIDB	11004			27.		1	23456	55	
283-	GRIDB	11005			36.		1	23456	55	
284-	GRIDB	11006			45.		1	23456	55	
285-	GRIDB	11007			54.		1	23456	55	
286-	GRIDB	11008			63.		1	23456	55	
287-	GRIDB	11009			72.		1	23456	55	
288-	GRIDB	11010			81.		1	23456	55	
289-	GRIDB	11011			90.		1	23456	55	
290-	MPC	1	601	3	-1.	100600	3	1.		EM00601
291-	EM00601		100602	3	1.	100604	3	1.		
292-	MPC	1	602	3	-1.	100600	3	1.		EM00602
293-	EM00602		100602	3	.9511	100604	3	.8090		
294-	MPC	1	603	3	-1.	100600	3	1.		EM00603
295-	EM00603		100602	3	.8090	100604	3	.3090		
296-	MPC	1	604	3	-1.	100600	3	1.		EM00604
297-	EM00604		100602	3	.5878	100604	3	-.3090		
298-	MPC	1	605	3	-1.	100600	3	1.		EM00605
299-	EM00605		100602	3	.3090	100604	3	-.8090		
300-	MPC	1	606	3	-1.	100600	3	1.		EM00606

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
301-	&M00606		100602	3	0.	100604	3	-1.		
302-	MPC	1	607	3	-1.	100600	3	1.		&M00607
303-	&M00607		100602	3	-.3090	100604	3	-.8090		
304-	MPC	1	608	3	-1.	100600	3	1.		&M00608
305-	&M00608		100602	3	-.5878	100604	3	-.3090		
306-	MPC	1	609	3	-1.	100600	3	1.		&M00609
307-	&M00609		100602	3	-.8090	100604	3	.3090		
308-	MPC	1	610	3	-1.	100600	3	1.		&M00610
309-	&M00610		100602	3	-.9511	100604	3	.8090		
310-	MPC	1	611	3	-1.	100600	3	1.		&M00611
311-	&M00611		100602	3	-1.	100604	3	1.		
312-	MPC	1	701	3	-1.	100700	3	1.		&M00701
313-	&M00701		100702	3	1.	100704	3	1.		
314-	MPC	1	702	3	-1.	100700	3	1.		&M00702
315-	&M00702		100702	3	.9511	100704	3	.8090		
316-	MPC	1	703	3	-1.	100700	3	1.		&M00703
317-	&M00703		100702	3	.8090	100704	3	.3090		
318-	MPC	1	704	3	-1.	100700	3	1.		&M00704
319-	&M00704		100702	3	.5878	100704	3	-.3090		
320-	MPC	1	705	3	-1.	100700	3	1.		&M00705
321-	&M00705		100702	3	.3090	100704	3	-.8090		
322-	MPC	1	706	3	-1.	100700	3	1.		&M00706
323-	&M00706		100702	3	0.	100704	3	-1.		
324-	MPC	1	707	3	-1.	100700	3	1.		&M00707
325-	&M00707		100702	3	-.3090	100704	3	-.8090		
326-	MPC	1	708	3	-1.	100700	3	1.		&M00708
327-	&M00708		100702	3	-.5878	100704	3	-.3090		
328-	MPC	1	709	3	-1.	100700	3	1.		&M00709
329-	&M00709		100702	3	-.8090	100704	3	.3090		
330-	MPC	1	710	3	-1.	100700	3	1.		&M00710
331-	&M00710		100702	3	-.9511	100704	3	.8090		
332-	MPC	1	711	3	-1.	100700	3	1.		&M00711
333-	&M00711		100702	3	-1.	100704	3	1.		
334-	MPC	1	801	3	-1.	100800	3	1.		&M00801
335-	&M00801		100802	3	1.	100804	3	1.		
336-	MPC	1	802	3	-1.	100800	3	1.		&M00802
337-	&M00802		100802	3	.9511	100804	3	.8090		
338-	MPC	1	803	3	-1.	100800	3	1.		&M00803
339-	&M00803		100802	3	.8090	100804	3	.3090		
340-	MPC	1	804	3	-1.	100800	3	1.		&M00804
341-	&M00804		100802	3	.5878	100804	3	-.3090		
342-	MPC	1	805	3	-1.	100800	3	1.		&M00805
343-	&M00805		100802	3	.3090	100804	3	-.8090		
344-	MPC	1	806	3	-1.	100800	3	1.		&M00806
345-	&M00806		100802	3	0.	100804	3	-1.		
346-	MPC	1	807	3	-1.	100800	3	1.		&M00807
347-	&M00807		100802	3	-.3090	100804	3	-.8090		
348-	MPC	1	808	3	-1.	100800	3	1.		&M00808
349-	&M00808		100802	3	-.5878	100804	3	-.3090		
350-	MPC	1	809	3	-1.	100800	3	1.		&M00809

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
351-	GM00809		100802	3	-.8090	100804	3	.3090		
352-	MPC	1	810	3	-1.	100800	3	1.		GM00810
353-	GM00810		100802	3	-.9511	100804	3	.8090		
354-	MPC	1	811	3	-1.	100800	3	1.		GM00811
355-	GM00811		100802	3	-1.	100804	3	1.		
356-	MPC	1	901	3	-1.	100900	3	1.		GM00901
357-	GM00901		100902	3	1.	100904	3	1.		
358-	MPC	1	902	3	-1.	100900	3	1.		GM00902
359-	GM00902		100902	3	.9511	100904	3	.8090		
360-	MPC	1	903	3	-1.	100900	3	1.		GM00903
361-	GM00903		100902	3	.8090	100904	3	.3090		
362-	MPC	1	904	3	-1.	100900	3	1.		GM00904
363-	GM00904		100902	3	.5878	100904	3	-.3090		
364-	MPC	1	905	3	-1.	100900	3	1.		GM00905
365-	GM00905		100902	3	.3090	100904	3	-.8090		
366-	MPC	1	906	3	-1.	100900	3	1.		GM00906
367-	GM00906		100902	3	0.	100904	3	-1.		
368-	MPC	1	907	3	-1.	100900	3	1.		GM00907
369-	GM00907		100902	3	-.3090	100904	3	-.8090		
370-	MPC	1	908	3	-1.	100900	3	1.		GM00908
371-	GM00908		100902	3	-.5878	100904	3	-.3090		
372-	MPC	1	909	3	-1.	100900	3	1.		GM00909
373-	GM00909		100902	3	-.8090	100904	3	.3090		
374-	MPC	1	910	3	-1.	100900	3	1.		GM00910
375-	GM00910		100902	3	-.9511	100904	3	.8090		
376-	MPC	1	911	3	-1.	100900	3	1.		GM00911
377-	GM00911		100902	3	-1.	100904	3	1.		
378-	MPC	1	1001	3	-1.	101000	3	1.		GM01001
379-	GM01001		101002	3	1.	101004	3	1.		
380-	MPC	1	1002	3	-1.	101000	3	1.		GM01002
381-	GM01002		101002	3	.9511	101004	3	.8090		
382-	MPC	1	1003	3	-1.	101000	3	1.		GM01003
383-	GM01003		101002	3	.8090	101004	3	.3090		
384-	MPC	1	1004	3	-1.	101000	3	1.		GM01004
385-	GM01004		101002	3	.5878	101004	3	-.3090		
386-	MPC	1	1005	3	-1.	101000	3	1.		GM01005
387-	GM01005		101002	3	.3090	101004	3	-.8090		
388-	MPC	1	1006	3	-1.	101000	3	1.		GM01006
389-	GM01006		101002	3	0.	101004	3	-1.		
390-	MPC	1	1007	3	-1.	101000	3	1.		GM01007
391-	GM01007		101002	3	-.3090	101004	3	-.8090		
392-	MPC	1	1008	3	-1.	101000	3	1.		GM01008
393-	GM01008		101002	3	-.5878	101004	3	-.3090		
394-	MPC	1	1009	3	-1.	101000	3	1.		GM01009
395-	GM01009		101002	3	-.8090	101004	3	.3090		
396-	MPC	1	1010	3	-1.	101000	3	1.		GM01010
397-	GM01010		101002	3	-.9511	101004	3	.8090		
398-	MPC	1	1011	3	-1.	101000	3	1.		GM01011
399-	GM01011		101002	3	-1.	101004	3	1.		
400-	MPC	1	2001	1	-1.	102000	1	1.		GM02001

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
401-	&M02001		102002	1	1.	102004	1	1.		
402-	MPC	1	2002	1	-1.	102000	1	1.		&M02002
403-	&M02002		102002	1	.9511	102004	1	.8090		
404-	MPC	1	2003	1	-1.	102000	1	1.		&M02003
405-	&M02003		102002	1	.8090	102004	1	.3090		
406-	MPC	1	2004	1	-1.	102000	1	1.		&M02004
407-	&M02004		102002	1	.5878	102004	1	-.3090		
408-	MPC	1	2005	1	-1.	102000	1	1.		&M02005
409-	&M02005		102002	1	.3090	102004	1	-.8090		
410-	MPC	1	2006	1	-1.	102000	1	1.		&M02006
411-	&M02006		102002	1	0.	102004	1	-1.		
412-	MPC	1	2007	1	-1.	102000	1	1.		&M02007
413-	&M02007		102002	1	-.3090	102004	1	-.8090		
414-	MPC	1	2008	1	-1.	102000	1	1.		&M02008
415-	&M02008		102002	1	-.5878	102004	1	-.3090		
416-	MPC	1	2009	1	-1.	102000	1	1.		&M02009
417-	&M02009		102002	1	-.8090	102004	1	.3090		
418-	MPC	1	2010	1	-1.	102000	1	1.		&M02010
419-	&M02010		102002	1	-.9511	102004	1	.8090		
420-	MPC	1	2011	1	-1.	102000	1	1.		&M02011
421-	&M02011		102002	1	-1.	102004	1	1.		
422-	MPC	1	3001	1	-1.	103000	1	1.		&M03001
423-	&M03001		103002	1	1.	103004	1	1.		
424-	MPC	1	3002	1	-1.	103000	1	1.		&M03002
425-	&M03002		103002	1	.9511	103004	1	.8090		
426-	MPC	1	3003	1	-1.	103000	1	1.		&M03003
427-	&M03003		103002	1	.8090	103004	1	.3090		
428-	MPC	1	3004	1	-1.	103000	1	1.		&M03004
429-	&M03004		103002	1	.5878	103004	1	-.3090		
430-	MPC	1	3005	1	-1.	103000	1	1.		&M03005
431-	&M03005		103002	1	.3090	103004	1	-.8090		
432-	MPC	1	3006	1	-1.	103000	1	1.		&M03006
433-	&M03006		103002	1	0.	103004	1	-1.		
434-	MPC	1	3007	1	-1.	103000	1	1.		&M03007
435-	&M03007		103002	1	-.3090	103004	1	-.8090		
436-	MPC	1	3008	1	-1.	103000	1	1.		&M03008
437-	&M03008		103002	1	-.5878	103004	1	-.3090		
438-	MPC	1	3009	1	-1.	103000	1	1.		&M03009
439-	&M03009		103002	1	-.8090	103004	1	.3090		
440-	MPC	1	3010	1	-1.	103000	1	1.		&M03010
441-	&M03010		103002	1	-.9511	103004	1	.8090		
442-	MPC	1	3011	1	-1.	103000	1	1.		&M03011
443-	&M03011		103002	1	-1.	103004	1	1.		
444-	MPC	1	4001	1	-1.	104000	1	1.		&M04001
445-	&M04001		104002	1	1.	104004	1	1.		
446-	MPC	1	4002	1	-1.	104000	1	1.		&M04002
447-	&M04002		104002	1	.9511	104004	1	.8090		
448-	MPC	1	4003	1	-1.	104000	1	1.		&M04003
449-	&M04003		104002	1	.8090	104004	1	.3090		
450-	MPC	1	4004	1	-1.	104000	1	1.		&M04004

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
451-	GM04004		104002	1	.5878	104004	1	-.3090		
452-	MPC	1	4005	1	-1.	104000	1	1.		GM04005
453-	GM04005		104002	1	.3090	104004	1	-.8090		
454-	MPC	1	4006	1	-1.	104000	1	1.		GM04006
455-	GM04006		104002	1	0.	104004	1	-1.		
456-	MPC	1	4007	1	-1.	104000	1	1.		GM04007
457-	GM04007		104002	1	-.3090	104004	1	-.8090		
458-	MPC	1	4008	1	-1.	104000	1	1.		GM04008
459-	GM04008		104002	1	-.5878	104004	1	-.3090		
460-	MPC	1	4009	1	-1.	104000	1	1.		GM04009
461-	GM04009		104002	1	-.8090	104004	1	.3090		
462-	MPC	1	4010	1	-1.	104000	1	1.		GM04010
463-	GM04010		104002	1	-.9511	104004	1	.8090		
464-	MPC	1	4011	1	-1.	104000	1	1.		GM04011
465-	GM04011		104002	1	-1.	104004	1	1.		
466-	MPC	1	5001	1	-1.	105000	1	1.		GM05001
467-	GM05001		105002	1	1.	105004	1	1.		
468-	MPC	1	5002	1	-1.	105000	1	1.		GM05002
469-	GM05002		105002	1	.9511	105004	1	.8090		
470-	MPC	1	5003	1	-1.	105000	1	1.		GM05003
471-	GM05003		105002	1	.8090	105004	1	.3090		
472-	MPC	1	5004	1	-1.	105000	1	1.		GM05004
473-	GM05004		105002	1	.5878	105004	1	-.3090		
474-	MPC	1	5005	1	-1.	105000	1	1.		GM05005
475-	GM05005		105002	1	.3090	105004	1	-.8090		
476-	MPC	1	5006	1	-1.	105000	1	1.		GM05006
477-	GM05006		105002	1	0.	105004	1	-1.		
478-	MPC	1	5007	1	-1.	105000	1	1.		GM05007
479-	GM05007		105002	1	-.3090	105004	1	-.8090		
480-	MPC	1	5008	1	-1.	105000	1	1.		GM05008
481-	GM05008		105002	1	-.5878	105004	1	-.3090		
482-	MPC	1	5009	1	-1.	105000	1	1.		GM05009
483-	GM05009		105002	1	-.8090	105004	1	.3090		
484-	MPC	1	5010	1	-1.	105000	1	1.		GM05010
485-	GM05010		105002	1	-.9511	105004	1	.8090		
486-	MPC	1	5011	1	-1.	105000	1	1.		GM05011
487-	GM05011		105002	1	-1.	105004	1	1.		
488-	MPC	1	6001	1	-1.	106000	1	1.		GM06001
489-	GM06001		106002	1	1.	106004	1	1.		
490-	MPC	1	6002	1	-1.	106000	1	1.		GM06002
491-	GM06002		106002	1	.9511	106004	1	.8090		
492-	MPC	1	6003	1	-1.	106000	1	1.		GM06003
493-	GM06003		106002	1	.8090	106004	1	.3090		
494-	MPC	1	6004	1	-1.	106000	1	1.		GM06004
495-	GM06004		106002	1	.5878	106004	1	-.3090		
496-	MPC	1	6005	1	-1.	106000	1	1.		GM06005
497-	GM06005		106002	1	.3090	106004	1	-.8090		
498-	MPC	1	6006	1	-1.	106000	1	1.		GM06006
499-	GM06006		106002	1	0.	106004	1	-1.		
500-	MPC	1	6007	1	-1.	106000	1	1.		GM06007

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
501-	&M06007		106002	1	-.3090	106004	1	-.8090		
502-	MPC	1	6008	1	-1.	106000	1	1.		&M06008
503-	&M06008		106002	1	-.5878	106004	1	-.3090		
504-	MPC	1	6009	1	-1.	106000	1	1.		&M06009
505-	&M06009		106002	1	-.8090	106004	1	.3090		
506-	MPC	1	6010	1	-1.	106000	1	1.		&M06010
507-	&M06010		106002	1	-.9511	106004	1	.8090		
508-	MPC	1	6011	1	-1.	106000	1	1.		&M06011
509-	&M06011		106002	1	-1.	106004	1	1.		
510-	MPC	1	7001	1	-1.	107000	1	1.		&M07001
511-	&M07001		107002	1	1.	107004	1	1.		
512-	MPC	1	7002	1	-1.	107000	1	1.		&M07002
513-	&M07002		107002	1	.9511	107004	1	.8090		
514-	MPC	1	7003	1	-1.	107000	1	1.		&M07003
515-	&M07003		107002	1	.8090	107004	1	.3090		
516-	MPC	1	7004	1	-1.	107000	1	1.		&M07004
517-	&M07004		107002	1	.5878	107004	1	-.3090		
518-	MPC	1	7005	1	-1.	107000	1	1.		&M07005
519-	&M07005		107002	1	.3090	107004	1	-.8090		
520-	MPC	1	7006	1	-1.	107000	1	1.		&M07006
521-	&M07006		107002	1	0.	107004	1	-1.		
522-	MPC	1	7007	1	-1.	107000	1	1.		&M07007
523-	&M07007		107002	1	-.3090	107004	1	-.8090		
524-	MPC	1	7008	1	-1.	107000	1	1.		&M07008
525-	&M07008		107002	1	-.5878	107004	1	-.3090		
526-	MPC	1	7009	1	-1.	107000	1	1.		&M07009
527-	&M07009		107002	1	-.8090	107004	1	.3090		
528-	MPC	1	7010	1	-1.	107000	1	1.		&M07010
529-	&M07010		107002	1	-.9511	107004	1	.8090		
530-	MPC	1	7011	1	-1.	107000	1	1.		&M07011
531-	&M07011		107002	1	-1.	107004	1	1.		
532-	MPC	1	8001	1	-1.	108000	1	1.		&M08001
533-	&M08001		108002	1	1.	108004	1	1.		
534-	MPC	1	8002	1	-1.	108000	1	1.		&M08002
535-	&M08002		108002	1	.9511	108004	1	.8090		
536-	MPC	1	8003	1	-1.	108000	1	1.		&M08003
537-	&M08003		108002	1	.8090	108004	1	.3090		
538-	MPC	1	8004	1	-1.	108000	1	1.		&M08004
539-	&M08004		108002	1	.5878	108004	1	-.3090		
540-	MPC	1	8005	1	-1.	108000	1	1.		&M08005
541-	&M08005		108002	1	.3090	108004	1	-.8090		
542-	MPC	1	8006	1	-1.	108000	1	1.		&M08006
543-	&M08006		108002	1	0.	108004	1	-1.		
544-	MPC	1	8007	1	-1.	108000	1	1.		&M08007
545-	&M08007		108002	1	-.3090	108004	1	-.8090		
546-	MPC	1	8008	1	-1.	108000	1	1.		&M08008
547-	&M08008		108002	1	-.5878	108004	1	-.3090		
548-	MPC	1	8009	1	-1.	108000	1	1.		&M08009
549-	&M08009		108002	1	-.8090	108004	1	.3090		
550-	MPC	1	8010	1	-1.	108000	1	1.		&M08010

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
551-	&M08010		108002	1	-.9511	108004	1	.8090		
552-	MPC	1	8011	1	-1.	108000	1	1.		&M08011
553-	&M08011		108002	1	-1.	108004	1	1.		
554-	MPC	1	9001	1	-1.	109000	1	1.		&M09001
555-	&M09001		109002	1	1.	109004	1	1.		
556-	MPC	1	9002	1	-1.	109000	1	1.		&M09002
557-	&M09002		109002	1	.9511	109004	1	.8090		
558-	MPC	1	9003	1	-1.	109000	1	1.		&M09003
559-	&M09003		109002	1	.8090	109004	1	.3090		
560-	MPC	1	9004	1	-1.	109000	1	1.		&M09004
561-	&M09004		109002	1	.5878	109004	1	-.3090		
562-	MPC	1	9005	1	-1.	109000	1	1.		&M09005
563-	&M09005		109002	1	.3090	109004	1	-.8090		
564-	MPC	1	9006	1	-1.	109000	1	1.		&M09006
565-	&M09006		109002	1	0.	109004	1	-1.		
566-	MPC	1	9007	1	-1.	109000	1	1.		&M09007
567-	&M09007		109002	1	-.3090	109004	1	-.8090		
568-	MPC	1	9008	1	-1.	109000	1	1.		&M09008
569-	&M09008		109002	1	-.5878	109004	1	-.3090		
570-	MPC	1	9009	1	-1.	109000	1	1.		&M09009
571-	&M09009		109002	1	-.8090	109004	1	.3090		
572-	MPC	1	9010	1	-1.	109000	1	1.		&M09010
573-	&M09010		109002	1	-.9511	109004	1	.8090		
574-	MPC	1	9011	1	-1.	109000	1	1.		&M09011
575-	&M09011		109002	1	-1.	109004	1	1.		
576-	MPC	1	10001	1	-1.	110000	1	1.		&M10001
577-	&M10001		110002	1	1.	110004	1	1.		
578-	MPC	1	10002	1	-1.	110000	1	1.		&M10002
579-	&M10002		110002	1	.9511	110004	1	.8090		
580-	MPC	1	10003	1	-1.	110000	1	1.		&M10003
581-	&M10003		110002	1	.8090	110004	1	.3090		
582-	MPC	1	10004	1	-1.	110000	1	1.		&M10004
583-	&M10004		110002	1	.5878	110004	1	-.3090		
584-	MPC	1	10005	1	-1.	110000	1	1.		&M10005
585-	&M10005		110002	1	.3090	110004	1	-.8090		
586-	MPC	1	10006	1	-1.	110000	1	1.		&M10006
587-	&M10006		110002	1	0.	110004	1	-1.		
588-	MPC	1	10007	1	-1.	110000	1	1.		&M10007
589-	&M10007		110002	1	-.3090	110004	1	-.8090		
590-	MPC	1	10008	1	-1.	110000	1	1.		&M10008
591-	&M10008		110002	1	-.5878	110004	1	-.3090		
592-	MPC	1	10009	1	-1.	110000	1	1.		&M10009
593-	&M10009		110002	1	-.8090	110004	1	.3090		
594-	MPC	1	10010	1	-1.	110000	1	1.		&M10010
595-	&M10010		110002	1	-.9511	110004	1	.8090		
596-	MPC	1	10011	1	-1.	110000	1	1.		&M10011
597-	&M10011		110002	1	-1.	110004	1	1.		
598-	MPC	1	11001	1	-1.	111000	1	1.		&M11001
599-	&M11001		111002	1	1.	111004	1	1.		
600-	MPC	1	11002	1	-1.	111000	1	1.		&M11002

ORIGINAL PAGE IS OF POOR QUALITY

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
601-	GM11002		111002	1	.9511	111004	1	.8090		
602-	MPC	1	11003	1	-1.	111000	1	1.		GM11003
603-	GM11003		111002	1	.8090	111004	1	.3090		
604-	MPC	1	11004	1	-1.	111000	1	1.		GM11004
605-	GM11004		111002	1	.5878	111004	1	-.3090		
606-	MPC	1	11005	1	-1.	111000	1	1.		GM11005
607-	GM11005		111002	1	.3090	111004	1	-.8090		
608-	MPC	1	11006	1	-1.	111000	1	1.		GM11006
609-	GM11006		111002	1	0.	111004	1	-1.		
610-	MPC	1	11007	1	-1.	111000	1	1.		GM11007
611-	GM11007		111002	1	-.3090	111004	1	-.8090		
612-	MPC	1	11008	1	-1.	111000	1	1.		GM11008
613-	GM11008		111002	1	-.5878	111004	1	-.3090		
614-	MPC	1	11009	1	-1.	111000	1	1.		GM11009
615-	GM11009		111002	1	-.8090	111004	1	.3090		
616-	MPC	1	11010	1	-1.	111000	1	1.		GM11010
617-	GM11010		111002	1	-.9511	111004	1	.8090		
618-	MPC	1	11011	1	-1.	111000	1	1.		GM11011
619-	GM11011		111002	1	-1.	111004	1	1.		
620-	OMIT1		1000006	THRU	1000009					
621-	OMIT1		1000011	THRU	1000014					
622-	OMIT1		1000016	THRU	1000019					
623-	OMIT1		1000021	THRU	1000024					
624-	OMIT1		1000026	THRU	1000029					
625-	OMIT1		1000031	THRU	1000034					
626-	OMIT1		1000036	THRU	1000039					
627-	OMIT1		1000041	THRU	1000044					
628-	OMIT1		1000046	THRU	1000049					
629-	OMIT1		1000051	THRU	1000054					
630-	OMIT1		3000006	THRU	3000009					
631-	OMIT1		3000011	THRU	3000014					
632-	OMIT1		3000016	THRU	3000019					
633-	OMIT1		3000021	THRU	3000024					
634-	OMIT1		3000026	THRU	3000029					
635-	OMIT1		3000031	THRU	3000034					
636-	OMIT1		3000036	THRU	3000039					
637-	OMIT1		3000041	THRU	3000044					
638-	OMIT1		3000046	THRU	3000049					
639-	OMIT1		3000051	THRU	3000054					
640-	OMIT1		5000006	THRU	5000009					
641-	OMIT1		5000011	THRU	5000014					
642-	OMIT1		5000016	THRU	5000019					
643-	OMIT1		5000021	THRU	5000024					
644-	OMIT1		5000026	THRU	5000029					
645-	OMIT1		5000031	THRU	5000034					
646-	OMIT1		5000036	THRU	5000039					
647-	OMIT1		5000041	THRU	5000044					
648-	OMIT1		5000046	THRU	5000049					
649-	OMIT1		5000051	THRU	5000054					
650-	PARAM	A999	4.0	.0						

CYLINDRICAL FLUID APRIL 9, 1974 NASTRAN 2/ 1/73

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
651-	RINGFL	1	.2		1.	2	.4		1.	
652-	RINGFL	3	.6		1.	4	.8		1.	
653-	RINGFL	5	1.		1.	6	.2		.8	
654-	RINGFL	7	.4		.8	8	.6		.8	
655-	RINGFL	9	.8		.8	10	1.		.8	
656-	RINGFL	11	.2		.6	12	.4		.6	
657-	RINGFL	13	.6		.6	14	.8		.6	
658-	RINGFL	15	1.		.6	16	.2		.4	
659-	RINGFL	17	.4		.4	18	.6		.4	
660-	RINGFL	19	.8		.4	20	1.		.4	
661-	RINGFL	21	.2		.2	22	.4		.2	
662-	RINGFL	23	.6		.2	24	.8		.2	
663-	RINGFL	25	1.		.2	26	.2		0.0	
664-	RINGFL	27	.4		0.0	28	.6		0.0	
665-	RINGFL	29	.8		0.0	30	1.		0.0	
666-	RINGFL	31	.2		-.2	32	.4		-.2	
667-	RINGFL	33	.6		-.2	34	.8		-.2	
668-	RINGFL	35	1.		-.2	36	.2		-.4	
669-	RINGFL	37	.4		-.4	38	.6		-.4	
670-	RINGFL	39	.8		-.4	40	1.		-.4	
671-	RINGFL	41	.2		-.6	42	.4		-.6	
672-	RINGFL	43	.6		-.6	44	.8		-.6	
673-	RINGFL	45	1.		-.6	46	.2		-.8	
674-	RINGFL	47	.4		-.8	48	.6		-.8	
675-	RINGFL	49	.8		-.8	50	1.		-.8	
676-	RINGFL	51	.2		-1.	52	.4		-1.	
677-	RINGFL	53	.6		-1.	54	.8		-1.	
678-	RINGFL	55	1.		-1.					
	ENDDATA									

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

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DMAP-DMAP INSTRUCTION
 NO.
   1  BEGIN     NO.7 DIRECT COMPLEX EIGENVALUE ANALYSIS - SERIES M1 $
   2  FILE      KGGX#TAPE/ KGG#TAPE/ GOD#SAVE/ GMD#SAVE $
   3  GP1       GEOM1,GEOM2,/GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL/V,N,LUSET/  C,N,
                123/V,N,NOGPDT $
   4  SAVE      LUSET,NOGPDT $
   5  PURGE     USET,GM,GO,KAA,BAA,MAA,K4AA,KFS,EST,ECT,PLTSETX,PLTPAR,GPSETS,
                ELSETS/NOGPDT $
   6  CHKPNT    GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL,USET,GM,GO,KAA,BAA,MAA,K4AA,EST,
                ECT,PLTSETX,PLTPAR,GPSETS,ELSETS $
   7  COND      LBL5,NOGPDT $
   8  GP2       GEOM2,EQEXIN/ECT $
   9  CHKPNT    ECT $
  10  PLTSET    PCDB,EQEXIN,ECT/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,NSIL/   V,N,
                JUMPPLOT $
  11  SAVE      NSIL,JUMPPLOT $
  12  PRTMSG    PLTSETX// $
  13  SETVAL    //V,N,PLTFLG/C,N,1/V,N,PFILE/C,N,0 $
  14  SAVE      PLTFLG,PFILE $
  15  COND      P1,JUMPPLOT $
  16  PLOT      PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,/PLOTX1/ V,N,
                NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
  17  SAVE      PFILE $
  18  PRTMSG    PLOTX1// $
  19  LABEL     P1 $
  20  CHKPNT    PLTPAR,GPSETS,ELSETS $
  21  GP3       GEOM3,EQEXIN,GEOM2/,GPTT/C,N,123/V,N,NOGRAV/C,N,123 $
  22  CHKPNT    GPTT $
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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
   23   TA1      ,ECT,EPT,BGPDT,SIL,GPTT,CSTM/EST,,GEI,ECPT,GPCT/V,N,LUSET/ C,N,
                 123/V,N,NOSIMP#-1/C,N,0/V,N,NOGENL#-1/V,N,GENEL $
   24   SAVE     NOSIMP,NOGENL,GENEL $
   25   PURGE    K4GG,GPST,OGPST,MGG,BGG,K4NN,K4FF,K4AA,MNN,MFF,MAA,BNN,BFF,BAA,
                 KGGX/NOSIMP / OGPST/GENEL $
   26   CHKPNT   EST,ECPT,GPCT,GEI,K4GG,GPST,MGG,BGG,KGGX,OGPST,  K4NN,K4FF,
                 K4AA,MNN,MFF,MAA,BNN,BFF,BAA $
   27   COND     LBL1,NOSIMP $
   28   SMA1     CSTM,MPT,ECPT,GPCT,DIT/KGGX,K4GG,GPST/V,N,NOGENL/V,N,NOK4GG $
   29   SAVE     NOK4GG $
   30   PURGE    K4NN,K4FF,K4AA/NOK4GG $
   31   CHKPNT   KGGX,GPST,K4GG,K4NN,K4FF,K4AA $
   32   SMA2     CSTM,MPT,ECPT,GPCT,DIT/MGG,BGG/V,Y,WTMASS#1.0/V,N,NOMGG/   V,N,
                 NOBGG#-1/V,Y,COUPMASS/V,Y,CPBAR/V,Y,CPROD/V,Y,CPQUAD1/ V,Y,
                 CPQUAD2/V,Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPQDPLT/ V,Y,
                 CPTRPLT/V,Y,CPTRBSC $
   33   SAVE     NOMGG,NOBGG $
   34   PURGE    BNN,BFF,BAA/NOBGG/MNN,MFF,MAA/NOMGG $
   35   CHKPNT   MGG,MNN,MFF,MAA,BGG,BNN,BFF,BAA $
   36   COND     LBL1,GRDPNT $
   37   COND     ERROR3,NOMGG $
   38   GPWG     BGPDT,CSTM,EQEXIN,MGG/OGPWG/V,Y,GRDPNT#-1/V,Y,WTMASS $
   39   OFP      OGPWG,,,,,//V,N,CARDNO $
   40   SAVE     CARDNO $
   41   LABEL    LBL1 $
   42   EQUIV    KGGX,KGG/NOGENL $
   43   CHKPNT   KGG $
   44   COND     LBL11,NOGENL $
```

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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
  45   SMA3      GE1,KGGX/KGG/V,N,LUSET/V,N,NDGENL/V,N,NOSIMP $
  46   CHKPNT    KGG $
  47   LABEL     LBL11 $
  48   PARAM     //C,N,MPY/V,N,NSKIP/C,N,0/C,N,0 $
  49   GP4       CASECC,GEOM4,EQEXIN,SIL,GPDT/RG,,USET,/V,N,LUSET/V,N,MPCF1/ V,
                 N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
                 V,N,NOSET#-1/V,N,NOL/V,N,NOA#-1 $
  50   SAVE      MPCF1,MPCF2,SINGLE,OMIT,NSKIP,NOSET,REACT,REPEAT,NOL,NOA $
  50   MATGPR    GPL,USET,SIL,MGG//C,N,G
  50   MATGPR    GPL,USET,SIL,KGG//C,N,G
  51   PURGE     GM,GMD/MPCF1/GO,GOD/OMIT/KFS,QPC/SINGLE $
  52   EQUIV     KGG,KNN/MPCF1/MGG,MNN/MPCF1/ BGG,BNN/MPCF1/K4GG,K4NN/MPCF1 $
  53   CHKPNT    GM,GMD,RG,GO,GOD,KFS,QPC,USET,KNN,MNN,BNN,K4NN $
  54   COND      LBL4,GENEL $
  55   COND      LBL4,NOSIMP $
  56   GPSP      GPL,GPST,USET,SIL/OGPST $
  57   OFP       OGPST,,,,,//V,N,CARDNO $
  58   SAVE      CARDNO $
  59   LABEL     LBL4 $
  60   COND      LBL2,MPCF2 $
  61   MCE1      USET,RG/GM $
  62   CHKPNT    GM $
  63   MCE2      USET,GM,KGG,MGG,BGG,K4GG/KNN,MNN,BNN,K4NN $
  64   CHKPNT    KNN,MNN,BNN,K4NN $
  65   LABEL     LBL2 $
  66   EQUIV     KNN,KFF/SINGLE/MNN,MFF/SINGLE/BNN,BFF/SINGLE/K4NN,K4FF/SINGLE $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

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DMAP-DMAP INSTRUCTION
 NO.

  67  CHKPNT   KFF,MFF,BFF,K4FF $
  68  COND     LBL3,SINGLE $
  69  SCE1     USET,KNN,MNN,BNN,K4NN/KFF,KFS,,MFF,BFF,K4FF $
  70  CHKPNT   KFS,KFF,MFF,BFF,K4FF $
  71  LABEL    LBL3 $
  72  EQUIV    KFF,KAA/OMIT/ MFF,MAA/OMIT/BFF,BAA/OMIT/K4FF,K4AA/OMIT $
  73  CHKPNT   KAA,MAA,BAA,K4AA $
  73  MATGPR GPL,USET,SIL,MFF//C,N,F
  73  MATGPR GPL,USET,SIL,KFF//C,N,F
  74  COND     LBL5,OMIT $
  75  SMP1     USET,KFF,,,/GO,KAA,KOO,LOO,UOO,,,,, $
  76  CHKPNT   GO,KAA $
  77  COND     LBLM,NOMGG $
  78  SMP2     USET,GO,MFF/MAA $
  79  CHKPNT   MAA $
  80  LABEL    LBLM $
  81  COND     LBLB,NOBGG $
  82  SMP2     USET,GO,BFF/BAA $
  83  CHKPNT   BAA $
  84  LABEL    LBLB $
  85  COND     LBL5,NOK4GG $
  86  SMP2     USET,GO,K4FF/K4AA $
  87  CHKPNT   K4AA $
  88  LABEL    LBL5 $
  89  OPD      DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,TFPOOL,,,,,EED,EQDYN/V,
               N,LUSET/V,N,LUSETD/V,N,NOTFL/V,N,NODLT/V,N,NOPSDL/V,N,NOFRL/
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

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DMAP-DMAP INSTRUCTION
 NO.
                V,N,NONLFT/V,N,NOTRL/V,N,NOEED/C,N,123/V,N,NOUE $
  90  SAVE      LUSETD,NOUE $
  91  EQUIV     GO,GOD/NOUE/GM,GMD/NOUE $
  92  CHKPNT    USETD,EED,EQDYN,TFPOOL,GOD,GMD,SILD,GPLD $
  93  PARAM     //C,N,ADD/V,N,NEVER/C,N,1/C,N,0 $
  94  PARAM     //C,N,MPY/V,N,REPEATE/C,N,1/C,N,-1 $
  95  BMG       MATPOOL,BGPDT,EQEXIN,CSTM/BDPOOL/V,N,NOKBFL/V,N,NOABFL/ V,N,
                MFACT $
  96  SAVE      MFACT,NOKBFL,NOABFL $
  97  PARAM     //C,N,AND/V,N,NOFL/V,N,NOABFL/V,N,NOKBFL $
  98  PURGE     KBFL/NOKBFL/ ABFL/NOABFL $
  99  COND      LBLFL3,NOFL $
 100  MTRXIN    ,BDPOOL,EQDYN,,/ABFL,KBFL,/V,N,LUSETD/V,N,NOABFL/V,N,NOKBFL/C,
                N,0 $
 101  SAVE      NOABFL,NOKBFL $
 101  MATGPR GPL,USET,SIL,ABFL//C,N,P
 101  MATGPR GPL,USET,SIL,KBFL//C,N,P
 102  LABEL     LBLFL3 $
 103  CHKPNT    ABFL,KBFL $
 104  JUMP      LBL13 $
 105  LABEL     LBL13 $
 106  PURGE     PHID,CLAMA,OPHID,OQPC1,OCPHIP,OESC1,OEFC1,CPHIP,OPC,  K2PP,
                M2PP,B2PP,K2DD,M2DD,B2DD/NEVER $
 107  CASE      CASECC,/CASEXX/C,N,CEIGN/V,N,REPEATE/V,N,NOLOOP $
 108  SAVE      REPEATE,NOLOOP $
 109  CHKPNT    CASEXX $
 110  MTRXIN    CASEXX,MATPOOL,EQDYN,,TFPOOL/K2DPP,M2DPP,B2PP/V,N,LUSETD/V,N,
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION NO.

```
                NOK2DPP/V,N,NOM2DPP/V,N,NOB2PP $
 111  SAVE      NOK2DPP,NOM2DPP,NOB2PP $
 112  PARAM     //C,N,AND/V,N,NOM2PP/V,N,NOABFL/V,N,NOM2DPP $
 113  PARAM     //C,N,AND/V,N,NOK2PP/V,N,NOFL /V,N,NOK2DPP $
 114  EQUIV     K2DPP,K2XPP/NOKBFL/ M2DPP,M2PP/NOABFL $
 115  COND      LBLFL1,NOKBFL $
 116  EQUIV     KBFL,K2XPP/NOK2DPP $
 117  COND      LBLFL1,NOK2DPP $
 118  ADD       KBFL,K2DPP/K2XPP $
 119  LABEL     LBLFL1 $
 120  EQUIV     K2XPP,K2PP/NOABFL $
 121  COND      LBLFL2,NOABFL $
 122  ADD       ABFL,K2XPP/K2PP/C,N,-1.0,0.0,0 $
 123  TRNSP     ABFL/ABFLT $
 124  ADD       ABFLT,M2DPP/M2PP/V,N,MPACT $
 125  LABEL     LBLFL2 $
 126  PARAM     //C,N,AND/V,N,BDEBA/V,N,NOUE/V,N,NOB2PP $
 127  PARAM     //C,N,AND/V,N,MDEMA/V,N,NOUE/V,N,NOM2PP $
 128  PARAM     //C,N,AND/V,N,KDEK2/V,N,NOGRNL/V,N,NOSINP $
 129  PURGE     K2DD/NOK2PP/M2DD/NOM2PP/B2DD/NOB2PP $
 130  EQUIV     M2PP,M2DD/NOA/B2PP,B2DD/NOA/K2PP,K2DD/NOA/MAA,MDD/MDEMA/BAA,
                BDD/BDEBA $
 131  CHKPNT    K2PP,M2PP,B2PP,K2DD,M2DD,B2DD,BDD,MDD $
 132  COND      LBL18,NOGPDT $
 133  GKAD      USETD,GM,GO,KAA,BAA,MAA,K4AA,K2PP,M2PP,B2PP/KDD,BDD,MDD,GMD,
                GOD,K2DD,M2DD,B2DD/C,N,CMPLEV/C,N,DISP/C,N,DIRECT/C,Y,G=0.0/C,
                N,0.0/C,N,0.0/V,N,NOK2PP/V,N,NOM2PP/V,N,NOB2PP/    V,N,MPCF1/V,
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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

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DMAP-DMAP INSTRUCTION
 NO.
                N,SINGLE/V,N,OMIT/V,N,NDUE/V,N,NOK4GG/V,N,NOBGG/V,N,KDEK2/C,N,
                -1 $
 134  LABEL     LBL18 $
 135  EQUIV     B2DD,BDD/NOBGG/ M2DD,MDD/NOSIMP/ K2DD,KDD/KDEK2 $
 136  CHKPNT    KDD,BDD,MDD,GOD,GMD $
 136  MATGPR GPLD,USETD,SILD,MDD//C,N,D
 136  MATGPR GPLD,USETD,SILD,KDD//C,N,D
 136  SEEMAT MGG,KGG,MFF,KFF,ABFL//C,N,PRINT
 136  SEEMAT KBFL,MDD,KDD,,//C,N,PRINT
 136  PARTN KDD,P9,/KBP,AEM,,KE/C,N,-1 $
 136  PARTN KBP,G9,/K11,K21,K12,K22/C,N,-1 $
 136  PARTN AEM,G9,UP/A1M,,,A2M/C,N,1 $
 136  PARTN KE,UP,/KE1,,,KE2/C,N,-1 $
 136  TRNSP A2M/A2MT $
 136  SOLVE K22,A2MT/PDU2/C,N,1/C,N,-1 $
 136  SOLVE A1M,K12/M2L/C,N,1 $
 136  MPYAD M2L,PDU2,/TU12/C,N,0/C,N,-1 $
 136  ADD PDU2,/PDU3/C,Y,A999#%1.0,0.0# $
 136  PARAM //C,N,NOP/V,N,TRUE#-1 $
 136  EQUIV PDU3,PDU2/TRUE $
 136  COND PDUN09,TRUE $
 136  MATPRN PDU3,,,,// $
 136  LABEL PDUN09 $
 136  MPYAD A2M,PDU2,/MFLD/C,N,0/C,N,-1 $
 136  OUTPUT3 MFLD,PDU2,TU12,,//C,N,0/C,Y,N1#AMF/C,Y,N2#APD/C,Y,N3#ATU $
 136  SMPYAD TU12,KE1,TU12,,,KE2/KEB/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
136   SOLVE K22,K21/CP2/C,N,1/C,N,-1 $
136   MATPRN K11,K12,K22,,// $
136   MATPRN A1M,A2M,KE1,,// $
136   MATPRN PDU2,MFLD,TUI2,,// $
136   MATPRN KEB,K11,CP2,,// $
136   EXIT
137   COND      ERROR1,NOEED $
138   CEAD      KDD,BDD,MDD,EED,CASEXX/PHID,CLAMA,OCEIGS/V,N,EIGVS $
139   SAVE      EIGVS $
140   CHKPNT    PHID,CLAMA,OCEIGS $
141   OFP       OCEIGS,CLAMA,,,,//V,N,CARDNO $
142   SAVE      CARDNO $
143   COND      LBL16,EIGVS $
144   VDR       CASEXX,EQDYN,USETD,PHID,CLAMA,,/OPHID,/C,N,CEIGN/C,N,DIRECT/C,
                N,0/V,N,NOD/V,N,NOP/C,N,0 $
145   SAVE      NOD,NOP $
146   COND      LBL15,NOD $
147   OFP       OPHID,,,,,//V,N,CARDNO $
148   SAVE      CARDNO $
149   LABEL     LBL15 $
150   COND      LBL16,NOP $
151   EQUIV     PHID,CPHIP/NOA $
152   COND      LBL17,NOA $
153   SDR1      USETD,, PHID,,,GOD,GMD,,KFS,,/CPHIP,,QPC/C,N,1/C,N,DYNAMICS $
154   LABEL     LBL17 $
155   CHKPNT    CPHIP,QPC $
```

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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.

 156  SDR2      CASEXX,CSTM,MPT,DIT,EQDYN,SILD,,,,CLAMA,OPC,CPHIP,EST,/,OQPC1,
                OCPHIP,OESC1,OEFC1,/C,N,CEIG $

 157  OFP       OCPHIP,OQPC1,OEFC1,OESC1,,//V,N,CARDNO $

 158  SAVE      CARDNO $

 159  LABEL     LBL16 $

 160  COND      FINIS,REPEATE $

 161  REPT      LBL13,100 $

 162  JUMP      ERROR2 $

 163  JUMP      FINIS $

 164  LABEL     ERROR2 $

 165  PRTPARM   //C,N,-2/C,N,DIRCEAD $

 166  LABEL     ERROR1 $

 167  PRTPARM   //C,N,-1/C,N,DIRCEAD $

 168  LABEL     ERROR3 $

 169  PRTPARM   //C,N,-3/C,N,DIRCEAD $

 170  LABEL     FINIS $

 171  END       $

      **NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM**
```

APRIL 11, 1974 NASTRAN 5/13/72

N A S T R A N   E X E C U T I V E   C O N T R O L   D E C K   E C H O

```
ID,CAP60,COPPOLINO
APP DISP
SOL 3,0
TIME 20
DIAG 2
DIAG 7,8,13,14,19,21,22
ALTER 74
ADD MAA,MFLD/MAH $
PARAM //C,N,NOP/V,N,TRUE=-1 $
EQUIV MAH,MAA/TRUE $
COND MAHNO9,TRUE $
MATPRN MAH,,,,// $
LABEL MAHNO9 $
ALTER 88
SEEMAT MGG,KGG,,,//C,N,PRINT
ALTER 91
MATGPR GPL,USET,SIL,PHIA//C,N,A
ALTER 107
SMPYAD PHIA,KAA,PHIA,,,/KH/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
SOLVE MI,KH/WH/C,N,1 $
SMPYAD PDU2,PHIA,WH,,,/PD2/C,N,3 $
MPYAD TU12,PHIA,/PHF/C,N,0 $
MATPRN WH,PD2,PHF,,// $
ENDALTER
CEND
```

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AXIS ..ERIC CIRC. CYL. WITH FLUID APRIL 11, 1974 NASTRAN 5/13/72
HARMONIC REDUCTION

C A S E C O N T R O L D E C K E C H O

CARD COUNT	
1	TITLE=AXISYMMETRIC CIRC. CYL. WITH FLUID
2	SUBTITLE=HARMONIC REDUCTION
3	MAXLINES=120000
4	SPC=1
5	MPC=1
6	METHOD=1
7	VECTOR=ALL
8	BEGIN BULK

*** USER INFORMATION MESSAGE 207, BULK DATA NOT SORTED.XSORT WILL RE-ORDER DECK.

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1-	CORD2C	1		0.0	0.0	0.0	0.0	0.0	1.	6CDC
2-	6CDC	1.	0.	0.						
3-	CQUAD2	2	1	2	3	14	13	.00000		
4-	CQUAD2	3	1	3	4	15	14	.00000		
5-	CQUAD2	4	1	4	5	16	15	.00000		
6-	CQUAD2	5	1	5	6	17	16	.00000		
7-	CQUAD2	6	1	6	7	18	17	.00000		
8-	CQUAD2	7	1	7	8	19	18	.00000		
9-	CQUAD2	8	1	8	9	20	19	.00000		
10-	CQUAD2	9	1	9	10	21	20	.00000		
11-	CQUAD2	10	1	10	11	22	21	.00000		
12-	CQUAD2	11	1	11	12	23	22	.00000		
13-	CQUAD2	13	1	13	14	25	24	.00000		
14-	CQUAD2	14	1	14	15	26	25	.00000		
15-	CQUAD2	15	1	15	16	27	26	.00000		
16-	CQUAD2	16	1	16	17	28	27	.00000		
17-	CQUAD2	17	1	17	18	29	28	.00000		
18-	CQUAD2	18	1	18	19	30	29	.00000		
19-	CQUAD2	19	1	19	20	31	30	.00000		
20-	CQUAD2	20	1	20	21	32	31	.00000		
21-	CQUAD2	21	1	21	22	33	32	.00000		
22-	CQUAD2	22	1	22	23	34	33	.00000		
23-	CQUAD2	24	1	24	25	36	35	.00000		
24-	CQUAD2	25	1	25	26	37	36	.00000		
25-	CQUAD2	26	1	26	27	38	37	.00000		
26-	CQUAD2	27	1	27	28	39	38	.00000		
27-	CQUAD2	28	1	28	29	40	39	.00000		
28-	CQUAD2	29	1	29	30	41	40	.00000		
29-	CQUAD2	30	1	30	31	42	41	.00000		
30-	CQUAD2	31	1	31	32	43	42	.00000		
31-	CQUAD2	32	1	32	33	44	43	.00000		
32-	CQUAD2	33	1	33	34	45	44	.00000		
33-	CQUAD2	35	1	35	36	47	46	.00000		
34-	CQUAD2	36	1	36	37	48	47	.00000		
35-	CQUAD2	37	1	37	38	49	48	.00000		
36-	CQUAD2	38	1	38	39	50	49	.00000		
37-	CQUAD2	39	1	39	40	51	50	.00000		
38-	CQUAD2	40	1	40	41	52	51	.00000		
39-	CQUAD2	41	1	41	42	53	52	.00000		
40-	CQUAD2	42	1	42	43	54	53	.00000		
41-	CQUAD2	43	1	43	44	55	54	.00000		
42-	CQUAD2	44	1	44	45	56	55	.00000		
43-	CQUAD2	46	1	46	47	58	57	.00000		
44-	CQUAD2	47	1	47	48	59	58	.00000		
45-	CQUAD2	48	1	48	49	60	59	.00000		
46-	CQUAD2	49	1	49	50	61	60	.00000		
47-	CQUAD2	50	1	50	51	62	61	.00000		
48-	CQUAD2	51	1	51	52	63	62	.00000		
49-	CQUAD2	52	1	52	53	64	63	.00000		
50-	CQUAD2	53	1	53	54	65	64	.00000		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
51-	CQUAD2	54	1	54	55	66	65	.00000		
52-	CQUAD2	55	1	55	56	67	66	.00000		
53-	CQUAD2	57	1	57	58	69	68	.00000		
54-	CQUAD2	58	1	58	59	70	69	.00000		
55-	CQUAD2	59	1	59	60	71	70	.00000		
56-	CQUAD2	60	1	60	61	72	71	.00000		
57-	CQUAD2	61	1	61	62	73	72	.00000		
58-	CQUAD2	62	1	62	63	74	73	.00000		
59-	CQUAD2	63	1	63	64	75	74	.00000		
60-	CQUAD2	64	1	64	65	76	75	.00000		
61-	CQUAD2	65	1	65	66	77	76	.00000		
62-	CQUAD2	66	1	66	67	78	77	.00000		
63-	CQUAD2	68	1	68	69	80	79	.00000		
64-	CQUAD2	69	1	69	70	81	80	.00000		
65-	CQUAD2	70	1	70	71	82	81	.00000		
66-	CQUAD2	71	1	71	72	83	82	.00000		
67-	CQUAD2	72	1	72	73	84	83	.00000		
68-	CQUAD2	73	1	73	74	85	84	.00000		
69-	CQUAD2	74	1	74	75	86	85	.00000		
70-	CQUAD2	75	1	75	76	87	86	.00000		
71-	CQUAD2	76	1	76	77	88	87	.00000		
72-	CQUAD2	77	1	77	78	89	88	.00000		
73-	CQUAD2	79	1	79	80	91	90	.00000		
74-	CQUAD2	80	1	80	81	92	91	.00000		
75-	CQUAD2	81	1	81	82	93	92	.00000		
76-	CQUAD2	82	1	82	83	94	93	.00000		
77-	CQUAD2	83	1	83	84	95	94	.00000		
78-	CQUAD2	84	1	84	85	96	95	.00000		
79-	CQUAD2	85	1	85	86	97	96	.00000		
80-	CQUAD2	86	1	86	87	98	97	.00000		
81-	CQUAD2	87	1	87	88	99	98	.00000		
82-	CQUAD2	88	1	88	89	100	99	.00000		
83-	CQUAD2	90	1	90	91	102	101	.00000		
84-	CQUAD2	91	1	91	92	103	102	.00000		
85-	CQUAD2	92	1	92	93	104	103	.00000		
86-	CQUAD2	93	1	93	94	105	104	.00000		
87-	CQUAD2	94	1	94	95	106	105	.00000		
88-	CQUAD2	95	1	95	96	107	106	.00000		
89-	CQUAD2	96	1	96	97	108	107	.00000		
90-	CQUAD2	97	1	97	98	109	108	.00000		
91-	CQUAD2	98	1	98	99	110	109	.00000		
92-	CQUAD2	99	1	99	100	111	110	.00000		
93-	CQUAD2	101	1	101	102	113	112	.00000		
94-	CQUAD2	102	1	102	103	114	113	.00000		
95-	CQUAD2	103	1	103	104	115	114	.00000		
96-	CQUAD2	104	1	104	105	116	115	.00000		
97-	CQUAD2	105	1	105	106	117	116	.00000		
98-	CQUAD2	106	1	106	107	118	117	.00000		
99-	CQUAD2	107	1	107	108	119	118	.00000		
100-	CQUAD2	108	1	108	109	120	119	.00000		

SORTED BULK DATA ECHO

CARD COUNT	. 1	.. 2	.. 3	.. 4	.. 5	.. 6	.. 7	.. 8	.. 9	.. 10	.
101-	CQUAD2	109	1	109	110	121	120	.00000			
102-	CQUAD2	110	1	110	111	122	121	.00000			
103-	DMI	MFLD	0	1	1	2		30	30	CAMF	0
104-	DMI	*MFLD		1		1		5.61138317E-02		*AMF	1
105-	*AMF	1	1.03753539E-09	1.74902981E-09	3.84101434E-02	-1.17619758E-09				*AMF	2
106-	*AMF	2	3.99240818E-09	2.90458575E-02	-2.14204410E-09	4.51854376E-09				*AMF	3
107-	*AMF	3	2.67748497E-02	-2.62538569E-09	4.61171368E-09	2.58644857E-02				*AMF	4
108-	*AMF	4	-2.88329072E-09	4.60591210E-09	2.54706564E-02	-3.02422776E-09				*AMF	5
109-	*AMF	5	4.58629046E-09	2.52929702E-02	-3.10135118E-09	4.57119853E-09				*AMF	6
110-	*AMF	6	2.52118781E-02	-3.14255666E-09	4.56220661E-09	2.51769051E-02				*AMF	7
111-	*AMF	7	-3.16256843E-09	4.55771954E-09	1.25835799E-02	-2.14254015E-09				*AMF	8
112-	*AMF	8	2.37640809E-09							*AMF	9
113-	DMI	*MFLD		2		1		1.03753539E-09		*AMF	10
114-	*AMF	10	2.26114988E-02	7.61923413E-10	-1.17619758E-09	9.21048224E-03				*AMF	11
115-	*AMF	11	-1.17605836E-09	-2.14204410E-09	4.30269912E-03	-1.12416187E-09				*AMF	12
116-	*AMF	12	-2.62538569E-09	2.16825819E-03	-7.68552999E-10	-2.88329072E-09				*AMF	13
117-	*AMF	13	1.13540888E-03	-4.70962380E-10	-3.02422776E-09	6.07476337E-04				*AMF	14
118-	*AMF	14	-2.75142797E-10	-3.10135118E-09	3.31870979E-04	-1.58317554E-10				*AMF	15
119-	*AMF	15	-3.14255666E-09	1.89498416E-04	-9.33349370E-11	-3.16256843E-09				*AMF	16
120-	*AMF	16	1.21905570E-04	-6.12229434E-11	-1.58183555E-09	5.10035024E-05				*AMF	17
121-	*AMF	17	-2.39782222E-11							*AMF	18
122-	DMI	*MFLD		3		1		1.74902981E-09		*AMF	19
123-	*AMF	19	7.61923413E-10	1.83615163E-02	3.99240818E-09	-1.17605836E-09				*AMF	20
124-	*AMF	20	5.28116524E-03	4.51854376E-09	-1.12416187E-09	1.61713664E-03				*AMF	21
125-	*AMF	21	4.61171368E-09	-7.68552999E-10	5.16120810E-04	4.60591210E-09				*AMF	22
126-	*AMF	22	-4.70962380E-10	1.68953789E-04	4.58629046E-09	-2.75142797E-10				*AMF	23
127-	*AMF	23	5.61394263E-05	4.57119853E-09	-1.58317554E-10	1.88335543E-05				*AMF	24
128-	*AMF	24	4.56220661E-09	-9.33349370E-11	6.41311362E-06	4.55771954E-09				*AMF	25
129-	*AMF	25	-6.12229434E-11	2.38093708E-06	2.27821051E-09	-2.58151139E-11				*AMF	26
130-	*AMF	26	7.22207631E-07							*AMF	27
131-	DMI	*MFLD		4		1		3.84101434E-02		*AMF	28
132-	*AMF	28	-1.17619758E-09	3.99240818E-09	8.81596594E-02	-1.10450804E-09				*AMF	29
133-	*AMF	29	6.26756957E-09	6.21849899E-02	-3.80158127E-09	8.60412166E-09				*AMF	30
134-	*AMF	30	5.49103394E-02	-5.02533126E-09	9.12445586E-09	5.22455387E-02				*AMF	31
135-	*AMF	31	-5.64961056E-09	9.19800414E-09	5.11574484E-02	-5.90463856E-09				*AMF	32
136-	*AMF	32	9.17711418E-09	5.06825671E-02	-6.16678264E-09	9.14249707E-09				*AMF	33
137-	*AMF	33	5.04698716E-02	-6.26391738E-09	9.12892162E-09	5.03790267E-02				*AMF	34
138-	*AMF	34	-6.31108321E-09	9.11859033E-09	2.51765088E-02	-4.27954916E-09				*AMF	35
139-	*AMF	35	4.74222261E-09							*AMF	36
140-	DMI	*MFLD		5		1		-1.17619758E-09		*AMF	37
141-	*AMF	37	9.21048224E-03	-1.17605836E-09	-1.10450804E-09	2.69141980E-02				*AMF	38
142-	*AMF	38	-3.62237795E-10	-3.80158127E-09	1.13787390E-02	-1.94461114E-09				*AMF	39
143-	*AMF	39	-5.02533126E-09	5.43810800E-03	-1.59512425E-09	-5.64961056E-09				*AMF	40
144-	*AMF	40	2.77573429E-03	-1.04369580E-09	-5.98463856E-09	1.46727962E-03				*AMF	41
145-	*AMF	41	-6.29279961E-10	-6.16678264E-09	7.96974637E-04	-3.68477653E-10				*AMF	42
146-	*AMF	42	-6.26391738E-09	4.53770447E-04	-2.19540483E-10	-6.31108321E-09				*AMF	43
147-	*AMF	43	2.91505363E-04	-1.44935050E-10	-3.15676263E-09	1.21905570E-04				*AMF	44
148-	*AMF	44	-5.68684683E-11							*AMF	45
149-	DMI	*MFLD		6		1		3.99240818E-09		*AMF	46
150-	*AMF	46	-1.17605836E-09	5.28116524E-03	6.26756957E-09	-3.62237795E-10				*AMF	47

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10	
151-	*AMF	47	1.99786499E-02	8.60412186E-09	-1.94461114E-09	5.79728559E-03	*AMF	48			
152-	*AMF	48	9.12445586E-09	-1.59512425E-09	1.78609043E-03	9.19800414E-09	*AMF	49			
153-	*AMF	49	-1.04369580E-09	5.72260236E-04	9.17711418E-09	-6.29279961E-10	*AMF	50			
154-	*AMF	50	1.87787344E-04	9.14849707E-09	-3.68477693E-10	6.25525427E-05	*AMF	51			
155-	*AMF	51	9.12892162E-09	-2.19540483E-10	2.12144951E-05	9.11859033E-09	*AMF	52			
156-	*AMF	52	-1.44935050E-10	7.85752854E-06	4.55777993E-09	-6.12724038E-11	*AMF	53			
157-	*AMF	53	2.38093617E-06				*AMF	54			
158-	DMI	*MFLD	7	1		2.90468675E-02	*AMF	55			
159-	*AMF	55	-2.14204410E-09	4.51854376E-09	6.21849895E-02	-3.80158127E-09	*AMF	56			
160-	*AMF	56	8.60412186E-09	1.11024141E-01	-3.98779676E-09	1.08734852E-08	*AMF	57			
161-	*AMF	57	8.76556635E-02	-6.82580747E-09	1.31904123E-08	8.02032948E-02	*AMF	58			
162-	*AMF	58	-8.12668333E-09	1.36956544E-08	7.74573684E-02	-8.79216699E-09	*AMF	59			
163-	*AMF	59	1.37602107E-08	7.63342977E-02	-9.14720744E-09	1.37348337E-08	*AMF	60			
164-	*AMF	60	7.58497119E-02	-9.33530941E-09	1.37048808E-08	7.56467581E-02	*AMF	61			
165-	*AMF	61	-9.42648626E-09	1.36866412E-08	3.77954500E-02	-6.40362785E-09	*AMF	62			
166-	*AMF	62	7.11737158E-09				*AMF	63			
167-	DMI	*MFLD	8	1		-2.14204410E-09	*AMF	64			
168-	*AMF	64	4.30269912E-03	-1.12416187E-09	-3.80158127E-09	1.13787390E-02	*AMF	65			
169-	*AMF	65	-1.94461114E-09	-3.98779676E-09	2.80496068E-02	-8.33200176E-10	*AMF	66			
170-	*AMF	66	-6.82580747E-09	1.19862184E-02	-2.21975394E-09	-8.12668333E-09	*AMF	67			
171-	*AMF	67	5.76997921E-03	-1.75344161E-09	-8.79216699E-09	2.96523259E-03	*AMF	68			
172-	*AMF	68	-1.13703069E-09	-9.14720744E-09	1.58918533E-03	-6.90502766E-10	*AMF	69			
173-	*AMF	69	-9.33530941E-09	8.98981467E-04	-4.20077750E-10	-9.42648626E-09	*AMF	70			
174-	*AMF	70	5.75681916E-04	-2.80763413E-10	-4.71536410E-09	2.40501904E-04	*AMF	71			
175-	*AMF	71	-1.10544240E-10				*AMF	72			
176-	DMI	*MFLD	9	1		4.51654376E-09	*AMF	73			
177-	*AMF	73	-1.12416187E-09	1.61713664E-03	8.60412186E-09	-1.94461114E-09	*AMF	74			
178-	*AMF	74	5.79728559E-03	1.08734852E-08	-8.33200176E-10	2.01476067E-02	*AMF	75			
179-	*AMF	75	1.31904123E-08	-2.21975394E-09	5.85342571E-03	1.36956544E-08	*AMF	76			
180-	*AMF	76	-1.75344161E-09	1.80492307E-03	1.37602107E-08	-1.13703069E-09	*AMF	77			
181-	*AMF	77	5.78673324E-04	1.37348337E-08	-6.90503766E-10	1.90168270E-04	*AMF	78			
182-	*AMF	78	1.37048808E-08	-4.20077750E-10	6.39969512E-05	1.36866412E-08	*AMF	79			
183-	*AMF	79	-2.80763413E-10	2.35954358E-05	6.84057255E-09	-1.19282903E-10	*AMF	80			
184-	*AMF	80	7.13532063E-06				*AMF	81			
185-	DMI	*MFLD	10	1		2.67748497E-02	*AMF	82			
186-	*AMF	82	-2.62538569E-09	4.61171368E-09	5.49103394E-02	-5.02533126E-09	*AMF	83			
187-	*AMF	83	9.12445586E-09	8.76556635E-02	-6.82580747E-09	1.31904123E-08	*AMF	84			
188-	*AMF	84	1.36317074E-01	-7.08914527E-09	1.54446838E-08	1.12867534E-01	*AMF	85			
189-	*AMF	85	-9.96836391E-09	1.77526189E-08	1.05380177E-01	-1.12892486E-08	*AMF	86			
190-	*AMF	86	1.82533775E-08	1.02624536E-01	-1.19606938E-08	1.83165945E-08	*AMF	87			
191-	*AMF	87	1.01511240E-01	-1.23097728E-08	1.82925532E-08	1.01061563E-01	*AMF	88			
192-	*AMF	88	-1.24778659E-08	1.82670874E-08	5.04698791E-02	-8.50303254E-09	*AMF	89			
193-	*AMF	89	9.49877332E-09				*AMF	90			
194-	DMI	*MFLD	11	1		-2.62538569E-09	*AMF	91			
195-	*AMF	91	2.16825819E-03	-7.68552999E-10	-5.02533126E-09	5.43810800E-03	*AMF	92			
196-	*AMF	92	-1.59512425E-09	-6.82580747E-09	1.19862184E-02	-2.21975394E-09	*AMF	93			
197-	*AMF	93	-7.08914527E-09	2.83814748E-02	-9.91517535E-10	-9.96836391E-09	*AMF	94			
198-	*AMF	94	1.21757155E-02	-2.31308883E-09	-1.12892486E-08	5.89188188E-03	*AMF	95			
199-	*AMF	95	-1.81466464E-09	-1.19606938E-08	3.06723965E-02	-1.18863075E-09	*AMF	96			
200-	*AMF	96	-1.23097728E-08	1.71109079E-03	-7.51725793E-10	-1.24778659E-08	*AMF	97			

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10	
201-	*AMF	97	1.08848000E-03	-5.13412646E-10	-6.24230623E-09	4.83776447E-04	*AMF	98			
202-	*AMF	98	-2.03331504E-10							*AMF	99
203-	DMI		*MFLD	12		1			4.61171368E-09	*AMF	100
204-	*AMF	100	-7.68552999E-10	5.16120810E-04	9.12445886E-09	-1.59512425E-09	*AMF	101			
205-	*AMF	101	1.78609043E-03	1.31904123E-08	-2.21975394E-09	5.85342571E-03	*AMF	102			
206-	*AMF	102	1.54446838E-08	-9.91517535E-10	2.01664381E-02	1.77526185E-08	*AMF	103			
207-	*AMF	103	-2.31308883E-09	5.85983694E-03	1.82533775E-08	-1.81466464E-09	*AMF	104			
208-	*AMF	104	1.80730480E-03	1.83165945E-08	-1.18863075E-09	5.80117805E-04	*AMF	105			
209-	*AMF	105	1.82925532E-08	-7.51725793E-10	1.92549211E-04	1.82670874E-08	*AMF	106			
210-	*AMF	106	-5.13412646E-10	7.04100676E-05	9.12943321E-09	-2.19979729E-10	*AMF	107			
211-	*AMF	107	2.12144951E-05							*AMF	108
212-	DMI		*MFLD	13		1			2.58644657E-02	*AMF	109
213-	*AMF	109	-2.88329072E-09	4.60591210E-09	5.22455387E-02	-5.64961056E-09	*AMF	110			
214-	*AMF	110	9.19800414E-09	8.02032948E-02	-8.12668333E-09	1.36956544E-08	*AMF	111			
215-	*AMF	111	1.12867534E-01	-9.96836391E-09	1.77526189E-08	1.61494017E-01	*AMF	112			
216-	*AMF	112	-1.02517141E-08	2.00024033E-08	1.38034642E-01	-1.31368907E-08	*AMF	113			
217-	*AMF	113	2.23090026E-08	1.30557060E-01	-1.44518175E-08	2.28110970E-08	*AMF	114			
218-	*AMF	114	1.27836406E-01	-1.51032502E-08	2.28788011E-08	1.26804173E-01	*AMF	115			
219-	*AMF	115	-1.54111248E-08	2.28637553E-08	6.32660985E-02	-1.05578728E-08	*AMF	116			
220-	*AMF	116	1.18903145E-08							*AMF	117
221-	DMI		*MFLD	14		1			-2.88329072E-09	*AMF	118
222-	*AMF	118	1.13540888E-03	-4.70962380E-10	-5.64961056E-09	2.77573429E-03	*AMF	119			
223-	*AMF	119	-1.04369580E-09	-8.12668333E-09	5.76997921E-03	-1.75344161E-09	*AMF	120			
224-	*AMF	120	-9.96836391E-09	1.21757165E-02	-2.31308883E-09	-1.02517141E-08	*AMF	121			
225-	*AMF	121	2.85033807E-02	-1.05274056E-09	-1.31368907E-08	1.22777224E-02	*AMF	122			
226-	*AMF	122	-2.36468889E-09	-1.44518175E-08	6.01378828E-03	-1.87588745E-09	*AMF	123			
227-	*AMF	123	-1.51032502E-08	3.25673795E-03	-1.28196564E-09	-1.54111248E-08	*AMF	124			
228-	*AMF	124	2.04296177E-03	-9.10043152E-10	-7.71066055E-09	8.47978052E-04	*AMF	125			
229-	*AMF	125	-3.63987729E-10							*AMF	126
230-	DMI		*MFLD	15		1			4.60591210E-09	*AMF	127
231-	*AMF	127	-4.70962380E-10	1.68953789E-04	9.19800414E-09	-1.04369580E-09	*AMF	128			
232-	*AMF	128	5.72260236E-04	1.36955544E-08	-1.75344161E-09	1.80492387E-03	*AMF	129			
233-	*AMF	129	1.77526189E-08	-2.31308883E-09	5.85983694E-03	2.00024033E-08	*AMF	130			
234-	*AMF	130	-1.05274056E-09	2.01664381E-02	2.23090026E-08	-2.36468889E-09	*AMF	131			
235-	*AMF	131	5.86128235E-03	2.28110970E-08	-1.87588745E-09	1.80960577E-03	*AMF	132			
236-	*AMF	132	2.28788011E-08	-1.28196564E-09	5.86530892E-04	2.28637553E-08	*AMF	133			
237-	*AMF	133	-9.10043152E-10	2.11382750E-04	1.14282166E-08	-3.95587119E-10	*AMF	134			
238-	*AMF	134	6.32747397E-05							*AMF	135
239-	DMI		*MFLD	16		1			2.54706964E-02	*AMF	136
240-	*AMF	136	-3.02422776E-09	4.58629046E-09	5.11574484E-02	-5.98463856E-09	*AMF	137			
241-	*AMF	137	9.17711418E-09	7.74573684E-02	-8.79216699E-09	1.37602107E-08	*AMF	138			
242-	*AMF	138	1.05380177E-01	-1.12892496E-08	1.82533775E-08	1.38034642E-01	*AMF	139			
243-	*AMF	139	-1.31368907E-08	2.23090026E-08	1.86670899E-01	-1.34142830E-08	*AMF	140			
244-	*AMF	140	2.45601264E-08	1.63246572E-01	-1.62794471E-08	2.68712093E-08	*AMF	141			
245-	*AMF	141	1.55850053E-01	-1.75531696E-08	2.73822955E-08	1.53307080E-01	*AMF	142			
246-	*AMF	142	-1.81274764E-08	2.74650915E-08	7.63343573E-02	-1.25338104E-08	*AMF	143			
247-	*AMF	143	1.42942262E-08							*AMF	144
248-	DMI		*MFLD	17		1			-3.02422776E-09	*AMF	145
249-	*AMF	145	6.07476337E-04	-2.75142797E-10	-5.98463856E-09	1.46727962E-03	*AMF	146			
250-	*AMF	146	-6.29279961E-10	-8.79216699E-09	2.96522259E-03	-1.13703069E-09	*AMF	147			

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                              S O R T E D   B U L K   D A T A   E C H O
CARD
COUNT     .   1  ..    2  ..    3  ..    4  ..    5  ..    6  ..    7  ..    8  ..    9  ..   10  .
  251-    *AMF 147 -1.12892486E-08  5.89188188E-03 -1.81466464E-09 -1.31368907E-08*AMF 148
  252-    *AMF 148  1.22777224E-02 -2.36468889E-09 -1.34142830E-08  2.86252871E-02*AMF 149
  253-    *AMF 149 -1.11396337E-09 -1.62794471E-08  1.24672204E-02 -2.45802378E-09*AMF 150
  254-    *AMF 150 -1.75531696E-08  6.34565949E-03 -2.03420503E-09 -1.81274764E-08*AMF 151
  255-    *AMF 151  3.86421406E-03 -1.55710844E-09 -9.07152042E-09  1.58918533E-03*AMF 152
  256-    *AMF 152 -6.33736841E-10                                                *AMF 153
  257-    DMI     *MFLD           18               1               4.58629046E-09 *AMF 154
  258-    *AMF 154 -2.75142797E-10  5.61394263E-05  9.17711418E-09 -6.29279961E-10*AMF 155
  259-    *AMF 155  1.87737344E-04  1.37602107E-08 -1.13703069E-09  5.78673324E-04*AMF 156
  260-    *AMF 156  1.82533775E-08 -1.81466464E-09  1.80730480E-03  2.23090026E-08*AMF 157
  261-    *AMF 157 -2.36468889E-09  5.86128235E-03  2.45601264E-08 -1.11396337E-09*AMF 158
  262-    *AMF 158  2.01712027E-02  2.68712093E-08 -2.45802378E-09  5.86769357E-03*AMF 159
  263-    *AMF 159  2.73822955E-08 -2.03420503E-09  1.82851939E-03  2.74650915E-08*AMF 160
  264-    *AMF 160 -1.55710844E-09  6.42670036E-04  1.37394203E-08 -6.94437174E-10*AMF 161
  265-    *AMF 161  1.93168255E-04                                                *AMF 162
  266-    DMI     *MFLD           19               1               2.52529702E-02 *AMF 163
  267-    *AMF 163 -3.10135118E-09  4.57119853E-09  5.06825671E-02 -6.16678264E-09*AMF 164
  268-    *AMF 164  9.14849707E-09  7.63342977E-02 -9.14720744E-09  1.37348337E-08*AMF 165
  269-    *AMF 165  1.02624536E-01 -1.19606938E-08  1.83165945E-08  1.30557060E-01*AMF 166
  270-    *AMF 166 -1.44518175E-08  2.28110970E-08  1.63246572E-01 -1.62794471E-08*AMF 167
  271-    *AMF 167  2.68712093E-08  2.11963892E-01 -1.65156315E-08  2.91313249E-08*AMF 168
  272-    *AMF 168  1.88717246E-01 -1.93036733E-08  3.14574997E-08  1.81714535E-01*AMF 169
  273-    *AMF 169 -2.04364596E-08  3.19882112E-08  9.00409818E-02 -1.43711354E-08*AMF 170
  274-    *AMF 170  1.66982410E-08                                                *AMF 171
  275-    DMI     *MFLD           20               1              -3.10135118E-09 *AMF 172
  276-    *AMF 172  3.31870979E-04 -1.58317554E-10 -6.16678264E-09  7.96974637E-04*AMF 173
  277-    *AMF 173 -3.68477693E-10 -9.14720744E-09  1.58918533E-03 -6.90502766E-10*AMF 174
  278-    *AMF 174 -1.19606938E-08  3.06723965E-03 -1.18863075E-09 -1.44518175E-08*AMF 175
  279-    *AMF 175  6.01378828E-03 -1.87588745E-09 -1.62794471E-08  1.24672204E-02*AMF 176
  280-    *AMF 176 -2.45802378E-09 -1.65156315E-08  2.89571583E-02 -1.27228055E-09*AMF 177
  281-    *AMF 177 -1.93036733E-08  1.30746961E-02 -2.73316658E-09 -2.04364596E-08*AMF 178
  282-    *AMF 178  7.48108837E-03 -2.50516741E-09 -1.02327782E-08  3.01623624E-03*AMF 179
  283-    *AMF 179 -1.05509002E-09                                                *AMF 180
  284-    DMI     *MFLD           21               1               4.57119853E-09 *AMF 181
  285-    *AMF 181 -1.58317554E-10  1.88335543E-05  9.14849707E-09 -3.68477693E-10*AMF 182
  286-    *AMF 182  6.25525427E-05  1.37348337E-08 -6.90502766E-10  1.90168270E-04*AMF 183
  287-    *AMF 183  1.83165945E-08 -1.18863075E-09  5.80117805E-04  2.28110970E-08*AMF 184
  288-    *AMF 184 -1.87588745E-09  1.80968572E-03  2.68712093E-08 -2.45802378E-09*AMF 185
  289-    *AMF 185  5.86769357E-03  2.91313249E-08 -1.27228095E-09  2.01900341E-02*AMF 186
  290-    *AMF 186  3.14574997E-08 -2.73316658E-09  5.92382370E-03  3.19882112E-08*AMF 187
  291-    *AMF 187 -2.50516741E-09  1.99747295E-03  1.60523754E-08 -1.17481624E-09*AMF 188
  292-    *AMF 188  5.79395331E-04                                                *AMF 189
  293-    DMI     *MFLD           22               1               2.52118781E-02 *AMF 190
  294-    *AMF 190 -3.14255666E-09  4.56220661E-09  5.04698716E-02 -6.26391738E-09*AMF 191
  295-    *AMF 191  9.12892162E-09  7.58497119E-02 -9.33530941E-09  1.37048808E-08*AMF 192
  296-    *AMF 192  1.01511240E-01 -1.23097728E-08  1.82925532E-08  1.27836406E-01*AMF 193
  297-    *AMF 193 -1.51032502E-08  2.28788014E-08  1.55850053E-01 -1.75531696E-08*AMF 194
  298-    *AMF 194  2.73822955E-08  1.88717246E-01 -1.93036733E-08  3.14574997E-08*AMF 195
  299-    *AMF 195  2.37828374E-01 -1.93989216E-08  3.37372370E-08  2.15492070E-01*AMF 196
  300-    *AMF 196 -2.19290613E-08  3.60692134E-08  1.05380177E-01 -1.59644848E-08*AMF 197
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SORTED BULK DATA ECHO

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301-	*AMF 197	1.90256237E-08							*AMF 198	
302-	DMI	*MFLD	23		1			-3.14255666E-09	*AMF 199	
303-	*AMF 199	1.89498416E-04	-9.33349370E-11	-6.26391738E-09		4.53776447E-04	*AMF 200			
304-	*AMF 200	-2.19540483E-10	-9.33530941E-09	8.98981467E-04		-4.20077750E-10	*AMF 201			
305-	*AMF 201	-1.23097728E-08	1.71109079E-03	-7.51725793E-10		-1.51032502E-08	*AMF 202			
306-	*AMF 202	3.25673795E-03	-1.28196564E-09	-1.75531696E-08		6.34565949E-03	*AMF 203			
307-	*AMF 203	-2.03420503E-09	-1.93036733E-08	1.30746961E-02		-2.73316658E-09	*AMF 204			
308-	*AMF 204	-1.93989216E-08	3.00925672E-02	-1.74324311E-09		-2.19290612E-08	*AMF 205			
309-	*AMF 205	1.52429529E-02	-3.50171936E-09	-1.10086411E-08		5.89188188E-03	*AMF 206			
310-	*AMF 206	-1.60420499E-09							*AMF 207	
311-	DMI	*MFLD	24		1			4.56220661E-09	*AMF 208	
312-	*AMF 208	-9.33349370E-11	6.41311302E-06		9.12892162E-09		-2.19540483E-10	*AMF 209		
313-	*AMF 209	2.12144951E-05	1.37048808E-08		-4.20077750E-10		6.39969512E-05	*AMF 210		
314-	*AMF 210	1.82925532E-08	-7.51725793E-10		1.92549211E-04		2.28788011E-08	*AMF 211		
315-	*AMF 211	-1.28196564E-09	5.86530892E-04		2.73822955E-08		-2.03420503E-09	*AMF 212		
316-	*AMF 212	1.82851939E-03	3.14574997E-08		-2.73316658E-09		5.92383370E-03	*AMF 213		
317-	*AMF 213	3.37372370E-08	-1.74324311E-09		2.03589872E-02		3.60692134E-08	*AMF 214		
318-	*AMF 214	-3.50171936E-09	6.43995404E-03		1.82969551E-08		-1.85204985E-09	*AMF 215		
319-	*AMF 215	1.80730456E-03							*AMF 216	
320-	DMI	*MFLD	25		1			2.51769051E-02	*AMF 217	
321-	*AMF 217	-3.16256843E-09	4.55771954E-09		5.03790267E-02		-6.31108321E-09	*AMF 218		
322-	*AMF 218	9.11859033E-09	7.56467581E-02		-9.42648626E-09		1.36866412E-08	*AMF 219		
323-	*AMF 219	1.01061583E-01	-1.24778659E-08		1.82670874E-08		1.26804173E-01	*AMF 220		
324-	*AMF 220	-1.54111248E-08	2.28637553E-08		1.53307080E-01		-1.81274764E-08	*AMF 221		
325-	*AMF 221	2.74650915E-08	1.81714535E-01		-2.04364596E-08		3.19882112E-08	*AMF 222		
326-	*AMF 222	2.15492070E-01	-2.19290612E-08		3.60692134E-08		2.66874194E-01	*AMF 223		
327-	*AMF 223	-2.15409663E-08	3.82557808E-08		1.25451088E-01		-1.71183174E-08	*AMF 224		
328-	*AMF 224	2.09501430E-08							*AMF 225	
329-	DMI	*MFLD	26		1			-3.16256843E-09	*AMF 226	
330-	*AMF 226	1.21055570E-04	-6.12229434E-11		-6.31108321E-09		2.91505363E-04	*AMF 227		
331-	*AMF 227	-1.44935050E-10	-9.42648626E-09		5.75681916E-04		-2.80763413E-10	*AMF 228		
332-	*AMF 228	-1.24778659E-08	1.08848000E-03		-5.13412644E-10		-1.54111248E-08	*AMF 229		
333-	*AMF 229	2.04296177E-03	-9.10043152E-10		-1.81274764E-08		3.88421406E-03	*AMF 230		
334-	*AMF 230	-1.55710844E-09	-2.00361090E-08		7.48186837E-03		-8.10616741E-09	*AMF 231		
335-	*AMF 231	-2.19290612E-08	1.52429529E-02		-3.50171936E-09		-2.15409663E-08	*AMF 232		
336-	*AMF 232	3.43952626E-02	-2.86740498E-09		-1.09703109E-08		1.22267194E-02	*AMF 233		
337-	*AMF 233	-1.90214733E-09							*AMF 234	
338-	DMI	*MFLD	27		1			4.55771954E-09	*AMF 235	
339-	*AMF 235	-6.12229434E-11	2.38093708E-06		9.11859033E-09		-1.44935050E-10	*AMF 236		
340-	*AMF 236	7.85752854E-06	1.36866412E-08		-2.80763413E-10		2.35954358E-05	*AMF 237		
341-	*AMF 237	1.82670874E-08	-5.13412646E-10		7.04100676E-05		2.28637553E-08	*AMF 238		
342-	*AMF 238	-9.10043152E-10	2.11382750E-04		2.74650915E-08		-1.55710844E-09	*AMF 239		
343-	*AMF 239	6.42570086E-04	3.19882112E-08		-2.50516741E-09		1.99747295E-03	*AMF 240		
344-	*AMF 240	3.60692134E-08	-3.50171936E-09		6.43995404E-03		3.82557808E-08	*AMF 241		
345-	*AMF 241	-2.66740498E-09	2.19761245E-02		2.01721200E-08		-2.46011569E-09	*AMF 242		
346-	*AMF 242	5.86055964E-03							*AMF 243	
347-	DMI	*MFLD	28		1			1.25835799E-02	*AMF 244	
348-	*AMF 244	-1.58183555E-09	2.27821051E-09		2.51769088E-02		-3.15676263E-09	*AMF 245		
349-	*AMF 245	4.55777993E-09	3.77954580E-02		-4.71536410E-09		6.84057255E-09	*AMF 246		
350-	*AMF 246	5.04698791E-02	-6.24230623E-09		9.12943321E-09		6.32660985E-02	*AMF 247		

ORIGINAL PAGE IS
OF POOR QUALITY

S O R T E D   B U L K   D A T A   E C H O

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CARD
COUNT     .   1  ..   2  ..   3  ..   4  ..   5  ..   6  ..   7  ..   8  ..   9  ..  10  .
 351-     *AMF 247 -7.71066055E-09  1.14282166E-08  7.63343573E-02 -9.07152042E-09*AMF 248
 352-     *AMF 248  1.37394203E-08  9.00409818E-02 -1.02327782E-08  1.60523754E-08*AMF 249
 353-     *AMF 249  1.05380177E-01 -1.10086411E-08  1.82969551E-08  1.25451028E-01*AMF 250
 354-     *AMF 250 -1.09703109E-08  2.01721200E-08  8.07470083E-02 -8.02946687E-09*AMF 251
 355-     *AMF 251  1.08360823E-08                                                *AMF 252
 356-     DMI     *MFLD          29               1              -2.14254015E-09 *AMF 253
 357-     *AMF 253  5.10035024E-05 -2.58151139E-11 -4.27954916E-09  1.21905570E-04*AMF 254
 358-     *AMF 254 -6.12724038E-11 -6.40362735E-09  2.40501904E-04 -1.19282903E-10*AMF 255
 359-     *AMF 255 -8.50303294E-09  4.53776447E-04 -2.19975729E-10 -1.05578728E-08*AMF 256
 360-     *AMF 256  8.47978052E-04 -3.95587119E-10 -1.25338104E-08  1.58918533E-03*AMF 257
 361-     *AMF 257 -6.94437174E-10 -1.43711354E-08  3.01623624E-03 -1.17481624E-09*AMF 258
 362-     *AMF 258 -1.59644848E-08  5.89188188E-03 -1.85204985E-09 -1.71183174E-08*AMF 259
 363-     *AMF 259  1.22267194E-02 -2.46011689E-09 -8.02946687E-09  1.42516978E-02*AMF 260
 364-     *AMF 260 -2.25891930E-10                                                *AMF 261
 365-     DMI     *MFLD          30               1               2.37040805E-09 *AMF 262
 366-     *AMF 262 -2.39782222E-11  7.22207631E-07  4.74222261E-09 -5.68684683E-11*AMF 263
 367-     *AMF 263  2.38093617E-06  7.11737158E-09 -1.10544240E-10  7.13532063E-06*AMF 264
 368-     *AMF 264  9.49877332E-09 -2.03331504E-10  2.12144951E-05  1.18903145E-08*AMF 265
 369-     *AMF 265 -3.63987729E-10  6.32747397E-05  1.42942262E-08 -6.33736841E-10*AMF 266
 370-     *AMF 266  1.90168255E-04  1.66982410E-08 -1.05509002E-09  5.79395331E-04*AMF 267
 371-     *AMF 267  1.90256237E-08 -1.60420499E-09  1.80730456E-03  2.09501430E-08*AMF 268
 372-     *AMF 268 -1.93214733E-09  5.86055964E-03  1.08360823E-08 -2.25891930E-10*AMF 269
 373-     *AMF 269  1.00844130E-02                                                *AMF 270
 374-     DMI      PDU2    0      2       1       2               30      30      &APD   0
 375-     DMI     *PDU2          1                1               1.78615928E-01 *APD   1
 376-     *APD   1  5.23188142E-08 -5.44416601E-08  1.12713993E-01  2.13113509E-08*APD   2
 377-     *APD   2 -1.56585855E-08  9.24558640E-02  9.95564875E-09 -4.79478857E-09*APD   3
 378-     *APD   3  8.52270126E-02  5.01694686E-09 -1.53029167E-09  8.23292136E-02*APD   4
 379-     *APD   4  2.62712541E-09 -5.00945729E-10  8.10757279E-02  1.40558765E-09*APD   5
 380-     *APD   5 -1.66452699E-10  8.05100203E-02  7.67887975E-10 -5.58412760E-11*APD   6
 381-     *APD   6  8.02519321E-02  4.38464154E-10 -1.90147897E-11  8.01489907E-02*APD   7
 382-     [illegible]
 383-     *APD   8 -4.28267144E-12                                                *APD   9
 384-     DMI     *PDU2          2                1              -2.27496812E-08 *APD  10
 385-     *APD  10  1.44541204E-01  8.03613034E-08 -1.43559866E-08  5.88768981E-02*APD  11
 386-     *APD  11  2.31136390E-08 -1.17757786E-08  2.75024851E-02  7.07758829E-09*APD  12
 387-     *APD  12 -1.08550644E-08  1.38603263E-02  2.25886332E-09 -1.04859836E-09*APD  13
 388-     *APD  13  7.25796074E-03  7.39446060E-10 -1.03263353E-08  3.88321863E-03*APD  14
 389-     *APD  14  2.45700793E-10 -1.02542828E-08  2.12144526E-03  8.24273011E-11*APD  15
 390-     *APD  15 -1.02214059E-08  1.21134543E-03  2.80677426E-11 -1.02072271E-08*APD  16
 391-     *APD  16  7.79266469E-04  1.04204531E-11 -1.02032729E-08  6.52067130E-04*APD  17
 392-     *APD  17  6.32165067E-12                                                *APD  18
 393-     DMI     *PDU2          3                1               3.23422036E-08 *APD  19
 394-     *APD  19 -7.44992121E-08  1.18840098E-01  2.04092636E-08 -3.03462429E-08*APD  20
 395-     *APD  20  3.41809653E-02  1.67410974E-08 -1.41763188E-08  1.04664937E-02*APD  21
 396-     *APD  21  1.54321604E-08 -7.14386772E-09  3.34045757E-03  1.49074530E-08*APD  22
 397-     *APD  22 -3.74088671E-09  1.09350914E-03  1.46804879E-08 -2.00148276E-09*APD  23
 398-     *APD  23  3.63147819E-04  1.45780525E-08 -1.09343201E-09  1.21895340E-04*APD  24
 399-     *APD  24  1.45313130E-08 -6.24349905E-10  4.15071991E-05  1.45111549E-08*APD  25
 400-     *APD  25 -4.01648270E-10  1.54099835E-05  1.45055346E-08 -3.36087380E-10*APD  26
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SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
401-	*APD	26	9.34859872E-06							*APD 27
402-	DMI	*PDU2		4		1			1.12713993E-01	*APD 28
403-	*APD	28	2.13113509E-08	-1.56585855E-08		2.71071792E-01			6.22744056E-08	*APD 29
404-	*APD	29	-5.92364486E-08	1.97941005E-01		2.63282978E-08			-1.71888779E-08	*APD 30
405-	*APD	30	1.74785078E-01	1.25827739E-08		-5.29573185E-09			1.66302741E-01	*APD 31
406-	*APD	31	6.42253184E-09	-1.69674430E-09		1.62839234E-01			3.39501316E-09	*APD 32
407-	*APD	32	-5.56786839E-10	1.61327660E-01		1.84405158E-09			-1.85467489E-10	*APD 33
408-	*APD	33	1.60650611E-01	1.04995479E-09		-6.29007124E-11			1.60361469E-01	*APD 34
409-	*APD	34	6.74489353E-10	-2.32974612E-11		1.60281181E-01			5.64133629E-10	*APD 35
410-	*APD	35	-1.41188910E-11							*APD 36
411-	DMI	*PDU2		5		1			-1.43559866E-08	*APD 37
412-	*APD	37	5.88768981E-02	2.31136390E-08		-3.45254598E-08			1.72045708E-01	*APD 38
413-	*APD	38	8.74389775E-08	-2.52110510E-08		7.27372169E-02			2.93726065E-08	*APD 39
414-	*APD	39	-2.22617622E-08	3.47624458E-02		7.81703235E-09			-2.11813962E-08	*APD 40
415-	*APD	40	1.77435428E-02	2.50456411E-09		-2.07402664E-08			9.37940553E-03	*APD 41
416-	*APD	41	8.21873236E-10	-2.05477377E-08		5.09456173E-02			2.73768341E-10	*APD 42
417-	*APD	42	-2.04615063E-08	2.90071149E-03		9.28477434E-11			-2.04246753E-08	*APD 43
418-	*APD	43	1.86341233E-03	3.43893941E-11		-2.04144506E-08			1.55853271E-03	*APD 44
419-	*APD	44	2.08408846E-11							*APD 45
420-	DMI	*PDU2		6		1			2.04092636E-08	*APD 46
421-	*APD	46	-3.03462429E-08	3.41809653E-02		4.90832974E-08			-8.66755060E-08	*APD 47
422-	*APD	47	1.29306614E-01	3.58414205E-08		-3.74901106E-08			3.75214219E-02	*APD 48
423-	*APD	48	3.16485469E-08	-1.79172055E-08		1.15600042E-02			3.01126448E-08	*APD 49
424-	*APD	49	-9.14534937E-09	3.70380539E-03		2.94655056E-08			-4.83431961E-09	*APD 50
425-	*APD	50	1.21540460E-03	2.92117974E-08		-2.62583244E-05			4.04855004E-04	*APD 51
426-	*APD	51	2.90892075E-08	-1.49508028E-09		1.37305324E-04			2.90368476E-08	*APD 52
427-	*APD	52	-9.60437285E-10	5.08558005E-05		2.90223099E-08			-8.03296540E-10	*APD 53
428-	*APD	53	3.08199669E-05							*APD 54
429-	DMI	*PDU2		7		1			9.24558640E-02	*APD 55
430-	*APD	55	9.95564875E-09	-4.79478857E-09		1.97941005E-01			2.63282978E-08	*APD 56
431-	*APD	56	-1.71888779E-08	3.53401005E-01		6.49015419E-08			-5.97373742E-08	*APD 57
432-	*APD	57	2.79016793E-01	2.77338827E-08		-1.73853296E-08			2.55295058E-01	*APD 58
433-	*APD	58	1.33506610E-08	-5.35157341E-09		2.46554673E-01			6.86099710E-09	*APD 59
434-	*APD	59	-1.71575909E-09	2.42979825E-01		3.67707597E-09			-5.63046303E-10	*APD 60
435-	*APD	60	2.41437197E-01	2.08007679E-09		-1.89750160E-10			2.40791262E-01	*APD 61
436-	*APD	61	1.33202160E-09	-6.99601627E-11		2.40613401E-01			1.11295329E-09	*APD 62
437-	*APD	62	-4.23122509E-11							*APD 63
438-	DMI	*PDU2		8		1			-1.17757786E-08	*APD 64
439-	*APD	64	2.75044851E-02	7.07758829E-09		-2.52110510E-08			7.27372169E-02	*APD 65
440-	*APD	65	2.53725005E-08	-4.50114399E-08		1.79303646E-01			8.81783535E-08	*APD 66
441-	*APD	66	-3.55373828E-08	7.66204000E-02		2.56182027E-08			-3.25160414E-08	*APD 67
442-	*APD	67	3.68838906E-02	7.89945386E-09		-3.14028021E-08			1.89548886E-02	*APD 68
443-	*APD	68	2.53263188E-09	-3.09474899E-08		1.01586729E-02			8.32293567E-10	*APD 69
444-	*APD	69	-3.07510106E-08	5.74662909E-03		2.80090173E-10			-3.06687298E-08	*APD 70
445-	*APD	70	3.67997750E-03	1.03268186E-10		-3.06460812E-08			3.07475729E-03	*APD 71
446-	*APD	71	6.24571089E-11							*APD 72
447-	DMI	*PDU2		9		1			1.67410974E-08	*APD 73
448-	*APD	73	-1.41763188E-08	1.04664937E-02		3.58414205E-08			-3.74901106E-08	*APD 74
449-	*APD	74	3.75214219E-02	6.39907398E-08		-9.24164283E-08			1.30400121E-01	*APD 75
450-	*APD	75	5.05219049E-08	-3.94915922E-08		3.78847681E-02			4.62265994E-08	*APD 76

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10	
431-	*APD	76	-1.90106384E-08	1.16818994E-02	4.46439543E-08	-9.76969972E-09				*APD	77
432-	*APD	77	3.74531257E-03	4.39966570E-08	-5.23596810E-09	1.23081449E-03				*APD	78
433-	*APD	78	4.37173320E-08	-2.96191982E-09	4.14203620E-04	4.36003589E-08				*APD	79
434-	*APD	79	-1.89672855E-09	1.52715307E-04	4.35681571E-08	-1.58478697E-09				*APD	80
435-	*APD	80	9.23629705E-05							*APD	81
436-	DMI		*PDU2	10	1	8.52270126E-02				*APD	82
437-	*APD	82	5.01694686E-09	-1.53029167E-09	1.74785078E-01	1.25827739E-08				*APD	83
438-	*APD	83	-5.29573185E-09	2.79016793E-01	2.77338827E-08	-1.73553296E-08				*APD	84
439-	*APD	84	4.33911026E-01	6.56694397E-08	-5.97931944E-08	3.59268665E-01				*APD	85
440-	*APD	85	2.81723480E-08	-1.73743437E-08	3.35435688E-01	1.36327287E-08				*APD	86
441-	*APD	86	-5.35863265E-09	3.26664209E-01	7.09702164E-09	-1.72004166E-09				*APD	87
442-	*APD	87	3.23120475E-01	3.95914412E-09	-5.70905767E-10	3.21689129E-01				*APD	88
443-	*APD	88	2.51854071E-09	-2.08764936E-10	3.21301281E-01	2.09990914E-09				*APD	89
444-	*APD	89	-1.25801397E-10							*APD	90
445-	DMI		*PDU2	11	1	-1.08550644E-08				*APD	91
446-	*APD	91	1.38603263E-02	2.25886332E-09	-2.22617622E-08	3.47628458E-02				*APD	92
447-	*APD	92	7.81703235E-09	-3.55373828E-08	7.66204000E-02	2.56182027E-08				*APD	93
448-	*APD	93	-5.52657227E-08	1.81425095E-01	8.82607765E-08	-4.57587888E-08				*APD	94
449-	*APD	94	7.78317451E-02	2.56462691E-08	-4.27232649E-08	3.76631543E-02				*APD	95
450-	*APD	95	7.90987897E-09	-4.16060715E-08	1.96069553E-02	2.53895349E-09				*APD	96
451-	*APD	96	-4.11547134E-08	1.09379366E-02	8.42714121E-10	-4.09724130E-08				*APD	97
452-	*APD	97	6.95797428E-03	3.08157722E-10	-4.09230125E-08	5.80142066E-03				*APD	98
453-	*APD	98	1.85695431E-10							*APD	99
454-	DMI		*PDU2	12	1	1.54321604E-08				*APD	100
455-	*APD	100	-7.14386772E-09	3.34045757E-03	3.16485469E-08	-1.79172055E-08				*APD	101
456-	*APD	101	1.15600042E-02	5.05219049E-08	-3.94915922E-08	3.78847681E-02				*APD	102
457-	*APD	102	7.85687462E-08	-9.35098683E-08	1.30522013E-01	6.80532002E-08				*APD	103
458-	*APD	103	-4.01159426E-08	3.79262753E-02	6.07377046E-08	-1.94122869E-08				*APD	104
459-	*APD	104	1.16973072E-02	5.91494889E-08	-1.01057864E-08	3.75466119E-03				*APD	105
460-	*APD	105	5.85078119E-08	-5.63761660E-09	1.24622439E-03	5.82486419E-08				*APD	106
461-	*APD	106	-3.58626959E-09	4.55710804E-04	5.81784114E-08	-2.99016034E-09				*APD	107
462-	*APD	107	2.74610473E-04							*APD	108
463-	DMI		*PDU2	13	1	8.23202130E-02				*APD	109
464-	*APD	109	2.02712641E-09	-5.00945729E-10	1.66302741E-01	6.42253104E-09				*APD	110
465-	*APD	110	-1.69674430E-09	2.55295098E-01	1.33506610E-08	-5.35157341E-09				*APD	111
466-	*APD	111	3.59268665E-01	2.81723480E-08	-1.73743437E-08	5.14051616E-01				*APD	112
467-	*APD	112	6.59514967E-08	-5.98002430E-08	4.39378262E-01	2.84063725E-08				*APD	113
468-	*APD	113	-1.73786283E-08	4.15576279E-01	1.39147929E-08	-5.36569189E-09				*APD	114
469-	*APD	114	4.06916142E-01	7.53548690E-09	-1.73905645E-09	4.03630455E-01				*APD	115
470-	*APD	115	4.72703121E-09	-6.26747099E-10	4.02764916E-01	3.92412502E-09				*APD	116
471-	*APD	116	-3.75217413E-10							*APD	117
472-	DMI		*PDU2	14	1	-1.04859836E-08				*APD	118
473-	*APD	118	7.25796074E-03	7.39446060E-10	-2.11813962E-08	1.77435428E-02				*APD	119
474-	*APD	119	2.50456411E-09	-3.25160414E-08	3.68838906E-02	7.89945866E-09				*APD	120
475-	*APD	120	-4.57587888E-08	7.78317451E-02	2.56462691E-08	-6.54729326E-08				*APD	121
476-	*APD	121	1.82204366E-01	8.82711788E-08	-5.59620581E-08	7.84838200E-02				*APD	122
477-	*APD	122	2.56525929E-08	-5.29304920E-08	3.84424217E-02	7.92029908E-09				*APD	123
478-	*APD	123	-5.18274774E-08	2.08182968E-02	2.56702126E-09	-5.14089962E-08				*APD	124
479-	*APD	124	1.30593814E-02	9.25141297E-10	-5.12987448E-08	1.08411908E-02				*APD	125
480-	*APD	125	5.53858515E-10							*APD	126

S O R T E D B U L K D A T A E C H O

CARD COUNT	. 1 .. 2 .. 3 .. 4 .. 5 .. 6 .. 7 .. 8 .. 9 .. 10 .									
501-	DMI	*PDU2		15		1			1.49074530E-08	*APD 127
502-	*APD 127	-3.74088671E-09	1.09350914E-03	3.01126448E-08	-9.14534937E-09	*APD 128				
503-	*APD 128	3.70380539E-03	4.62265994E-08	-1.90106384E-08	1.16818994E-02	*APD 129				
504-	*APD 129	6.50532002E-08	-4.01159426E-08	3.79262753E-02	9.30799047E-08	*APD 130				
505-	*APD 130	-9.39114670E-08	1.30537391E-01	7.95587312E-08	-4.04520293E-08	*APD 131				
506-	*APD 131	3.79356258E-02	7.52488631E-08	-1.99139354E-08	1.17127188E-02	*APD 132				
507-	*APD 132	7.36807806E-08	-1.07301368E-08	3.79616814E-03	7.30858574E-08	*APD 133				
508-	*APD 133	-6.73184594E-09	1.36811961E-03	7.29290832E-08	-5.88775071E-09	*APD 134				
509-	*APD 134	8.19058390E-04				*APD 135				
510-	DMI	*PDU2		16		1			8.10757279E-02	*APD 136
511-	*APD 136	1.40558765E-09	-1.66452699E-10	1.62839234E-01	3.39501316E-09	*APD 137				
512-	*APD 137	-5.56786839E-10	2.46554673E-01	6.86099710E-09	-1.71575909E-09	*APD 138				
513-	*APD 138	3.35435688E-01	1.36327287E-08	-5.35863265E-09	4.39378262E-01	*APD 139				
514-	*APD 139	2.84083725E-08	-1.73786283E-08	5.94192207E-01	6.62335536E-08	*APD 140				
515-	*APD 140	-5.98073484E-08	5.19630134E-01	2.88468378E-08	-1.73976424E-08	*APD 141				
516-	*APD 141	4.96086359E-01	1.46826835E-08	-5.42152344E-09	4.87991869E-01	*APD 142				
517-	*APD 142	8.94107188E-09	-1.90550908E-09	4.85959709E-01	7.35415639E-09	*APD 143				
518-	*APD 143	-1.12769238E-09				*APD 144				
519-	DMI	*PDU2		17		1			-1.03263353E-08	*APD 145
520-	*APD 145	3.88321863E-03	2.45700793E-10	-2.07402664E-08	9.37940553E-03	*APD 146				
521-	*APD 146	8.21873236E-10	-3.14028021E-08	1.89548880E-02	2.53263188E-09	*APD 147				
522-	*APD 147	-4.27232649E-08	3.76631543E-02	7.90987897E-09	-5.59620561E-08	*APD 148				
523-	*APD 148	7.84838200E-02	2.56525929E-08	-7.56801342E-08	1.82983637E-01	*APD 149				
524-	*APD 149	8.82815812E-08	-6.61834179E-08	7.96951652E-02	2.56806554E-08	*APD 150				
525-	*APD 150	-6.31847570E-08	4.05638665E-02	8.00272915E-09	-6.21537879E-08	*APD 151				
526-	*APD 151	2.47015134E-02	2.81272183E-09	-6.18949230E-08	2.03173421E-02	*APD 152				
527-	*APD 152	1.66458691E-09				*APD 153				
528-	DMI	*PDU2		18		1			1.46E04E79E-08	*APD 154
529-	*APD 154	-2.00148276E-09	3.63347819E-04	2.94855056E-08	-4.83431961E-09	*APD 155				
530-	*APD 155	1.21540460E-03	4.46439543E-08	-9.76969972E-09	3.74531257E-03	*APD 156				
531-	*APD 156	6.07377046E-08	-1.94122869E-08	1.16973072E-02	7.68587312E-08	*APD 157				
532-	*APD 157	-4.04520293E-08	3.79356258E-02	1.07591063E-07	-9.43131226E-08	*APD 158				
533-	*APD 158	1.30552828E-01	9.40903122E-08	-4.10763796E-08	3.79771329E-02	*APD 159				
534-	*APD 159	8.98269263E-08	-2.09373683E-08	1.18346140E-02	8.83612756E-08	*APD 160				
535-	*APD 160	-1.27316184E-08	4.15951386E-03	8.79932713E-08	-1.04719327E-08	*APD 161				
536-	*APD 161	2.46162829E-03				*APD 162				
537-	DMI	*PDU2		19		1			8.05100203E-02	*APD 163
538-	*APD 163	7.67867975E-10	-5.58412760E-11	1.61327660E-01	1.84405158E-09	*APD 164				
539-	*APD 164	-1.85467489E-10	2.42979825E-01	3.67707997E-09	-5.63846303E-10	*APD 165				
540-	*APD 165	3.26664209E-01	7.09702164E-09	-1.72004166E-09	4.15576279E-01	*APD 166				
541-	*APD 166	1.39147929E-08	-5.36569189E-09	5.19630134E-01	2.88468378E-08	*APD 167				
542-	*APD 167	-1.73976424E-08	6.74702287E-01	6.70014515E-08	-5.98631686E-08	*APD 168				
543-	*APD 168	6.00705922E-01	3.02524228E-08	-1.75640942E-08	5.78415573E-01	*APD 169				
544-	*APD 169	1.73098051E-08	-5.92248028E-09	5.73210882E-01	1.39560167E-08	*APD 170				
545-	*APD 170	-3.43579964E-09				*APD 171				
546-	DMI	*PDU2		20		1			-1.02542826E-08	*APD 172
547-	*APD 172	2.12144526E-03	8.24273011E-11	-2.05477377E-08	5.09456173E-03	*APD 173				
548-	*APD 173	2.73768341E-10	-3.09474899E-08	1.01586729E-02	8.32293567E-10	*APD 174				
549-	*APD 174	-4.16060715E-08	1.96069553E-02	2.53895349E-09	-5.29304920E-08	*APD 175				
550-	*APD 175	3.84424217E-02	7.92029908E-09	-6.61834179E-08	7.96951652E-02	*APD 176				

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S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10	
551-	*APD	176	2.56806594E-08	-8.59344027E-08		1.85105085E-01		8.83640041E-08	*APD	177	
552-	*APD	177	-7.65097639E-08	8.35784078E-02		2.59263579E-08		-7.36707193E-08	*APD	178	
553-	*APD	178	4.78218235E-02	8.74217321E-09		-7.30088345E-08		3.85618359E-02	*APD	179	
554-	*APD	179	5.07158049E-09						*APD	180	
555-	DMI	*PDU2		21	1			1.45780525E-08	*APD	181	
556-	*APD	181	-1.09343201E-09	1.21895340E-04		2.92117974E-08		-2.62583244E-09	*APD	182	
557-	*APD	182	4.04855004E-04	4.39966570E-08		-5.23596810E-09		1.23081449E-03	*APD	183	
558-	*APD	183	5.91494889E-08	-1.01057864E-08		3.75466119E-03		7.52488631E-08	*APD	184	
559-	*APD	184	-1.98139354E-08	1.17127188E-02		9.40900122E-08		-4.10763756E-08	*APD	185	
560-	*APD	185	3.79771329E-02	1.22169126E-07		-9.54065627E-08		1.30674720E-01	*APD	186	
561-	*APD	186	1.08770507E-07	-4.30778613E-08		3.83404791E-02		1.04734397E-07	*APD	187	
562-	*APD	187	-2.46482550E-08	1.29281208E-02		1.03793411E-07		-1.98754826E-08	*APD	188	
563-	*APD	188	7.49997050E-03						*APD	189	
564-	DMI	*PDU2		22	1			8.02519321E-02	*APD	190	
565-	*APD	190	4.38464154E-10	-1.90147897E-11		1.60650611E-01		1.04995475E-09	*APD	191	
566-	*APD	191	-6.29007124E-11	2.41437197E-01		2.08007678E-09		-1.89750160E-10	*APD	192	
567-	*APD	192	3.23120475E-01	3.95914412E-09		-5.70905767E-10		4.06916142E-01	*APD	193	
568-	*APD	193	7.53548690E-09	-1.73905645E-09		4.96086359E-01		1.46826835E-08	*APD	194	
569-	*APD	194	-5.42153344E-09	6.00705922E-01		3.02524228E-08		-1.75640942E-08	*APD	195	
570-	*APD	195	7.57031500E-01	6.96285838E-08		-6.03641297E-08		6.85932934E-01	*APD	196	
571-	*APD	196	3.52693696E-08	-1.90943830E-08		6.70871437E-01		2.72654503E-08	*APD	197	
572-	*APD	197	-1.07172653E-08						*APD	198	
573-	DMI	*PDU2		23	1			-1.02214055E-08	*APD	199	
574-	*APD	199	1.21134543E-03	2.80677426E-11		-2.04615063E-08		2.90071145E-03	*APD	200	
575-	*APD	200	9.28477434E-11	-3.07510106E-08		5.74662909E-03		2.80090173E-10	*APD	201	
576-	*APD	201	-4.11547134E-08	1.09379366E-02		8.42714121E-10		-5.18274774E-08	*APD	202	
577-	*APD	202	2.00102968E-02	2.86702126E-09		-8.31047870E-08		4.05630668E-02	*APD	203	
578-	*APD	203	8.00272915E-09	-7.65097639E-08		8.35784078E-02		2.59263579E-08	*APD	204	
579-	*APD	204	-9.64204219E-08	1.92363024E-01		8.91034801E-08		-8.73648105E-08	*APD	205	
580-	*APD	205	9.74386930E-02	2.81852195E-08		-8.54465156E-08		7.53262635E-02	*APD	206	
581-	*APD	206	1.58197579E-08						*APD	207	
582-	DMI	*PDU2		24	1			1.46213130E-08	*APD	208	
583-	*APD	208	-6.24349905E-10	4.15071991E-05		2.90892075E-08		-1.49508028E-09	*APD	209	
584-	*APD	209	1.37305324E-04	4.37173320E-08		-2.96191582E-09		4.14203620E-04	*APD	210	
585-	*APD	210	5.85078119E-08	-5.63701660E-09		1.24622439E-03		7.36807806E-08	*APD	211	
586-	*APD	211	-1.07301368E-08	3.79616814E-03		8.98269263E-08		-2.09073683E-08	*APD	212	
587-	*APD	212	1.18346140E-02	1.08770507E-07		-4.30778613E-08		3.83404791E-02	*APD	213	
588-	*APD	213	1.37076597E-07	-9.91474849E-08		1.31768227E-01		1.24202700E-07	*APD	214	
589-	*APD	214	-5.02217254E-08	4.16809320E-02		1.21475466E-07		-3.88245667E-08	*APD	215	
590-	*APD	215	2.33946107E-02						*APD	216	
591-	DMI	*PDU2		25	1			8.01405907E-02	*APD	217	
592-	*APD	217	2.82066814E-10	-7.05944764E-12		1.60361469E-01		6.74489353E-10	*APD	218	
593-	*APD	218	-2.32974612E-11	2.40791202E-01		1.33202160E-09		-6.59601627E-11	*APD	219	
594-	*APD	219	3.21689129E-01	2.51854071E-09		-2.08764936E-10		4.03630495E-01	*APD	220	
595-	*APD	220	4.72703121E-09	-6.26747099E-10		4.87991869E-01		8.94107188E-09	*APD	221	
596-	*APD	221	-1.90550908E-09	5.78415573E-01		1.73956051E-08		-5.92248028E-09	*APD	222	
597-	*APD	222	6.85932934E-01	3.52693696E-08		-1.90943830E-08		8.49487364E-01	*APD	223	
598-	*APD	223	7.95842539E-08	-6.51588721E-08		7.98646927E-01		5.65807099E-08	*APD	224	
599-	*APD	224	-3.47529614E-08						*APD	225	
600-	DMI	*PDU2		26	1			-1.02072271E-08	*APD	226	

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AXISYMMETRIC CIRC. CYL. WITH FLUID                                              APRIL  11, 1974   NASTRAN   5/13/72
HARMONIC REDUCTION

                                   S O R T E D   B U L K   D A T A   E C H O
CARD
COUNT      .   1  ..   2  ..   3  ..   4  ..   5  ..   6  ..   7  ..   8  ..   9  ..  10  .
  601-     *APD 226  7.79266469E-04  1.04204501E-11 -2.04246753E-08  1.86341233E-03*APD 227
  602-     *APD 227  3.43893941E-11 -3.06687298E-08  3.67997750E-03  1.03268186E-10*APD 228
  603-     *APD 228 -4.09724130E-08  6.95797428E-03  3.08157722E-10 -5.14089962E-08*APD 229
  604-     *APD 229  1.30593814E-02  9.25141297E-10 -6.21537879E-08  2.47015134E-02*APD 230
  605-     *APD 230  2.81272183E-09 -7.36707193E-08  4.78218235E-02  8.74217321E-09*APD 231
  606-     *APD 231 -8.73648105E-08  9.74386930E-02  2.81852195E-08 -1.08196161E-07*APD 232
  607-     *APD 232  2.19867527E-01  9.61810542E-08 -1.01720843E-07  1.56315565E-01*APD 233
  608-     *APD 233  5.12988443E-08                                                *APD 234
  609-     DMI      *PDU2           27              1               1.45111549E-08  *APD 235
  610-     *APD 235 -4.01648270E-10  1.54099835E-05  2.90368476E-08 -9.60437285E-10*APD 236
  611-     *APD 236  5.08558005E-05  4.36003589E-08 -1.89672855E-09  1.52715307E-04*APD 237
  612-     *APD 237  5.82486415E-08 -3.58626950E-09  4.55710804E-04  7.30858574E-08*APD 238
  613-     *APD 238 -6.73104594E-09  1.36811961E-03  8.83612756E-08 -1.27316184E-08*APD 239
  614-     *APD 239  4.15951386E-03  1.04734397E-07 -2.46482550E-08  1.29281208E-02*APD 240
  615-     *APD 240  1.24202700E-07 -5.02217254E-08  4.16809320E-02  1.53617666E-07*APD 241
  616-     *APD 241 -1.13323779E-07  1.42234683E-01  1.44611931E-07 -8.05679252E-08*APD 242
  617-     *APD 242  7.58618712E-02                                                *APD 243
  618-     DMI      *PDU2           28              1               4.00547944E-02  *APD 244
  619-     *APD 244  1.33540595E-10 -2.02863334E-12  8.01405907E-02  3.19180682E-10*APD 245
  620-     *APD 245 -6.68789503E-12  1.20306730E-01  6.29697183E-10 -2.00426481E-11*APD 246
  621-     *APD 246  1.60650671E-01  1.18810650E-09 -5.95901245E-11  2.01382458E-01*APD 247
  622-     *APD 247  2.22023022E-09 -1.77734605E-10  2.42975884E-01  4.16090273E-09*APD 248
  623-     *APD 248 -5.34170042E-10  2.86609471E-01  7.89729881E-09 -1.62748353E-09*APD 249
  624-     *APD 249  3.35435748E-01  1.54265045E-08 -5.07660047E-09  3.99323523E-01*APD 250
  625-     *APD 250  3.20127711E-08 -1.64619287E-08  5.14051735E-01  7.46293267E-08*APD 251
  626-     *APD 251 -5.66529046E-08                                                *APD 252
  627-     DMI      *PDU2           29              1              -6.67868251E-09  *APD 253
  628-     *APD 253  3.26033449E-04  3.06413835E-12 -1.37626941E-08  7.79266469E-04*APD 254
  629-     *APD 254  1.01016938E-11 -2.06604973E-08  1.53737886E-03  3.02732978E-11*APD 255
  630-     *APD 255 -2.75888361E-08  2.90071149E-03  9.00075847E-11 -3.45837883E-08*APD 256
  631-     *APD 256  5.42059541E-03  2.68458145E-10 -4.17273895E-08  1.01586729E-02*APD 257
  632-     *APD 257  8.06834155E-10 -4.92199810E-08  1.92809217E-02  2.45822407E-09*APD 258
  633-     *APD 258 -5.76059070E-08  3.76631580E-02  7.66798141E-09 -6.85765278E-08*APD 259
  634-     *APD 259  7.81577826E-02  2.40548284E-08 -8.82790232E-08  1.82204425E-01*APD 260
  635-     *APD 260  8.55710596E-08                                                *APD 261
  636-     DMI      *PDU2           30              1               7.54629781E-09  *APD 262
  637-     *APD 262 -1.56397770E-10  4.67430073E-06  1.50984434E-08 -3.73812759E-10*APD 263
  638-     *APD 263  1.54099835E-05  2.26657129E-08 -7.37477857E-10  4.61814925E-05*APD 264
  639-     *APD 264  3.02664880E-08 -1.39146605E-09  1.37305309E-04  3.79403389E-08*APD 265
  640-     *APD 265 -2.60025090E-09  4.09529079E-04  4.57772664E-08 -4.87309748E-09*APD 266
  641-     *APD 266  1.23081426E-03  5.39970593E-08 -9.24902110E-09  3.74998641E-03*APD 267
  642-     *APD 267  6.31958283E-08 -1.80669488E-08  1.16973072E-02  7.52322649E-08*APD 268
  643-     *APD 268 -3.74921640E-08  3.79309468E-02  9.68470317E-08 -8.74031230E-08*APD 269
  644-     *APD 269  1.30537450E-01                                                *APD 270
  645-     DMI      TU12    0       2       1       2               15      30      *ATU    0
  646-     DMI      *TU12           1               1              -1.69992805E-01  *ATU    1
  647-     *ATU   1 -6.53458869E-08 -7.94370294E-08 -1.74978077E-01  4.56155472E-08*ATU    2
  648-     *ATU   2 -8.09579319E-08 -2.44192898E-01  6.51131700E-08 -1.07940553E-07*ATU    3
  649-     *ATU   3 -4.15904641E-01  6.76216132E-08 -1.56354929E-07 -8.77412558E-01*ATU    4
  650-     *ATU   4  7.80204346E-08 -2.38857353E-07                                *ATU    5
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ORIGINAL PAGE IS
OF POOR QUALITY

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10	
651-	DMI	*TU12		2		1		2.18358203E-08	*ATU		6
652-	*ATU	6	9.58415912E-04	1.18971766E-09	2.65904170E-08	-2.56741680E-02	*ATU				7
653-	*ATU	7	1.93318144E-08	4.79086353E-08	-8.57254267E-02	4.63720617E-08	*ATU				8
654-	*ATU	8	9.81684138E-08	-2.42767751E-01	8.17950649E-08	2.42849524E-07	*ATU				9
655-	*ATU	9	-6.98323548E-01	1.13016938E-07			*ATU				10
656-	DMI	*TU12		3		1		-3.01365191E-08	*ATU		11
657-	*ATU	11	-2.66084488E-09	2.85030296E-03	-3.14193720E-08	1.23995001E-08	*ATU				12
658-	*ATU	12	1.16847618E-03	-4.92969683E-08	5.92054654E-08	-2.14229114E-02	*ATU				13
659-	*ATU	13	-1.06516609E-07	2.08539859E-07	-1.23851180E-01	-3.09364793E-07	*ATU				14
660-	*ATU	14	7.34759794E-07	-5.48023820E-01			*ATU				15
661-	DMI	*TU12		4		1		-2.56080705E-01	*ATU		16
662-	*ATU	16	-1.14026705E-07	-1.36756228E-07	-2.85390079E-01	8.58086681E-08	*ATU				17
663-	*ATU	17	-1.31515037E-07	-3.45734298E-01	1.06588800E-07	-1.60320951E-07	*ATU				18
664-	*ATU	18	-4.45234716E-01	1.03763909E-07	-1.99007843E-07	-5.53683519E-01	*ATU				19
665-	*ATU	19	1.06212781E-07	-2.37836446E-07			*ATU				20
666-	DMI	*TU12		5		1		3.79191967E-08	*ATU		21
667-	*ATU	21	1.08317728E-03	1.59774333E-10	4.11064143E-08	-2.83775739E-02	*ATU				22
668-	*ATU	22	2.10037285E-08	6.00306862E-08	-8.15893412E-02	4.84767497E-08	*ATU				23
669-	*ATU	23	8.83549483E-08	-1.73212349E-01	7.51426796E-08	1.23696509E-07	*ATU				24
670-	*ATU	24	-2.83256173E-01	9.08859761E-08			*ATU				25
671-	DMI	*TU12		6		1		-5.32795923E-08	*ATU		26
672-	*ATU	26	-1.67522130E-09	1.46920094E-03	-5.15055625E-08	1.40887373E-08	*ATU				27
673-	*ATU	27	7.53710745E-04	-6.59152306E-08	5.18466940E-08	-1.39601995E-02	*ATU				28
674-	*ATU	28	-9.66321068E-08	1.32075911E-07	-6.35478497E-02	-1.43006673E-07	*ATU				29
675-	*ATU	29	2.52475331E-07	-1.55679464E-01			*ATU				30
676-	DMI	*TU12		7		1		-3.74758601E-01	*ATU		31
677-	*ATU	31	-1.44523312E-07	-1.72530179E-07	-3.44076931E-01	1.08084919E-07	*ATU				32
678-	*ATU	32	-1.58305227E-07	-3.81478608E-01	1.29978844E-07	-1.81004680E-07	*ATU				33
679-	*ATU	33	-4.28499937E-01	1.23733969E-07	-2.07947210E-07	-4.54169651E-01	*ATU				34
680-	*ATU	34	1.23443726E-07	-2.31939623E-			*ATU				35
681-	DMI	*TU12		8		1		4.78512590E-08	*ATU		36
682-	*ATU	36	8.29251250E-04	-2.16874440E-10	4.72136873E-08	-2.12155514E-02	*ATU				37
683-	*ATU	37	1.57082845E-08	5.95369904E-09	-5.28494627E-02	3.52916238E-08	*ATU				38
684-	*ATU	38	7.33342631E-08	-1.00755d11E-01	5.15856538E-08	8.26270252E-08	*ATU				39
685-	*ATU	39	-1.32003367E-01	5.94559388E-08			*ATU				40
686-	DMI	*TU12		9		1		-6.77171101E-08	*ATU		41
687-	*ATU	41	-9.01174912E-10	6.23160973E-04	-6.22223979E-08	1.07876552E-08	*ATU				42
688-	*ATU	42	3.53835989E-04	-7.06029368E-08	3.33038983E-08	-6.44360483E-03	*ATU				43
689-	*ATU	43	-8.39685868E-08	6.89827857E-08	-2.53177881E-02	-5.52150572E-08	*ATU				44
690-	*ATU	44	1.00361660E-07	-4.72604670E-02			*ATU				45
691-	DMI	*TU12		10		1		-4.19153631E-01	*ATU		46
692-	*ATU	46	-1.61784556E-07	-1.92758023E-07	-3.73153269E-01	1.20630887E-07	*ATU				47
693-	*ATU	47	-1.71572879E-07	-3.93532634E-01	1.42695740E-07	-1.88587137E-07	*ATU				48
694-	*ATU	48	-4.14906681E-01	1.34973220E-07	-2.08345057E-07	-4.18659508E-01	*ATU				49
695-	*ATU	49	1.33787410E-07	-2.26890222E-07			*ATU				50
696-	DMI	*TU12		11		1		5.34898525E-08	*ATU		51
697-	*ATU	51	5.39066503E-04	-2.54483545E-10	4.98411303E-08	-1.38026811E-02	*ATU				52
698-	*ATU	52	1.00653743E-08	5.67548817E-08	-3.38278338E-02	2.22703243E-08	*ATU				53
699-	*ATU	53	6.32082902E-08	-5.56646660E-02	3.17056461E-08	6.57962005E-08	*ATU				54
700-	*ATU	54	-6.64411783E-02	3.58671350E-18			*ATU				55

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10	
701-	DMI	*TU12		12		1		-7.58429906E-08	*ATU	56	
702-	*ATU	56	-4.58221239E-10	2.37231143E-04	-6.75348133E-08	7.01167835E-09	*ATU	57			
703-	*ATU	57	1.43702666E-04	-7.18693514E-08	1.92447764E-08	-2.58036546E-03	*ATU	58			
704-	*ATU	58	-7.74575142E-08	3.49179459E-08	-9.24630463E-03	-7.99266786E-08	*ATU	59			
705-	*ATU	59	4.45056507E-08	-1.50015876E-02			*ATU	60			
706-	DMI	*TU12		13		1		-4.42730427E-01	*ATU	61	
707-	*ATU	61	-1.70973919E-07	-2.03524905E-07	-3.87164593E-01	1.27367002E-07	*ATU	62			
708-	*ATU	62	-1.77971685E-07	-3.97632957E-01	1.49531672E-07	-1.91305958E-07	*ATU	63			
709-	*ATU	63	-4.07383442E-01	1.41339304E-07	-2.07236837E-07	-4.04424787E-01	*ATU	64			
710-	*ATU	64	1.39883696E-07	-2.23572044E-07			*ATU	65			
711-	DMI	*TU12		14		1		5.64511602E-08	*ATU	66	
712-	*ATU	66	3.22924461E-04	-1.90480770E-10	5.06905877E-08	-8.22463259E-03	*ATU	67			
713-	*ATU	67	5.97638206E-09	5.44489751E-08	-1.94023177E-02	1.31239091E-08	*ATU	68			
714-	*ATU	68	5.75337751E-08	-3.03125777E-02	1.84845490E-08	5.80380615E-08	*ATU	69			
715-	*ATU	69	-3.47727127E-02	2.07705320E-08			*ATU	70			
716-	DMI	*TU12		15		1		-8.01463216E-08	*ATU	71	
717-	*ATU	71	-2.31736977E-10	8.58500280E-05	-7.00920850E-08	4.20054391E-09	*ATU	72			
718-	*ATU	72	5.41246263E-05	-7.22279196E-08	1.06746150E-08	-9.61648067E-04	*ATU	73			
719-	*ATU	73	-7.45846478E-08	1.78230337E-08	-3.25128413E-03	-7.45738475E-08	*ATU	74			
720-	*ATU	74	2.12705373E-08	-4.89497930E-03			*ATU	75			
721-	DMI	*TU12		16		1		-4.54785228E-01	*ATU	76	
722-	*ATU	76	-1.75682089E-07	-2.09040024E-07	-3.93851578E-01	1.30888793E-07	*ATU	77			
723-	*ATU	77	-1.81029293E-07	-3.99081230E-01	1.53190342E-07	-1.92287075E-07	*ATU	78			
724-	*ATU	78	-4.03595984E-01	1.44913599E-07	-2.06271409E-07	-3.98267329E-01	*ATU	79			
725-	*ATU	79	1.43416401E-07	-2.21632718E-07			*ATU	80			
726-	DMI	*TU12		17		1		5.79601291E-08	*ATU	81	
727-	*ATU	81	1.85694924E-04	-1.22482621E-10	5.09538474E-08	-4.71456721E-03	*ATU	82			
728-	*ATU	82	3.41804873E-09	5.29062226E-08	-1.08698085E-02	7.48385176E-09	*ATU	83			
729-	*ATU	83	5.44800542E-08	-1.65195614E-02	1.05035804E-08	5.42176130E-08	*ATU	84			
730-	*ATU	84	-1.85996480E-02	1.17827028E-08			*ATU	85			
731-	DMI	*TU12		18		1		-8.23416713E-08	*ATU	86	
732-	*ATU	86	-1.18702201E-10	3.02016124E-05	-7.13107511E-08	2.41607068E-09	*ATU	87			
733-	*ATU	87	1.95277244E-05	-7.23437665E-08	5.84402926E-09	-3.44428699E-04	*ATU	88			
734-	*ATU	88	-7.33625143E-08	9.27067970E-09	-1.12278201E-03	-7.25605673E-08	*ATU	89			
735-	*ATU	89	1.06970397E-08	-1.62148244E-03			*ATU	90			
736-	DMI	*TU12		19		1		-4.60786581E-01	*ATU	91	
737-	*ATU	91	-1.78030291E-07	-2.11789256E-07	-3.97028327E-01	1.32697153E-07	*ATU	92			
738-	*ATU	92	-1.82483575E-07	-3.99620175E-01	1.55135965E-07	-1.92649452E-07	*ATU	93			
739-	*ATU	93	-4.01751068E-01	1.46910224E-07	-2.05665344E-07	-3.95488381E-01	*ATU	94			
740-	*ATU	94	1.45423598E-07	-2.20575944E-07			*ATU	95			
741-	DMI	*TU12		20		1		5.87090625E-08	*ATU	96	
742-	*ATU	96	1.05495579E-04	-7.40951189E-11	5.10162820E-08	-2.67342900E-03	*ATU	97			
743-	*ATU	97	1.93540139E-09	5.20904173E-08	-6.08104095E-03	4.23547419E-09	*ATU	98			
744-	*ATU	98	5.28640278E-08	-9.10000876E-03	5.94527449E-09	5.22793044E-08	*ATU	99			
745-	*ATU	99	-1.01599619E-02	6.66802080E-09			*ATU	100			
746-	DMI	*TU12		21		1		-8.34327807E-08	*ATU	101	
747-	*ATU	101	-6.23653906E-11	1.04690889E-05	-7.18888487E-08	1.37305389E-09	*ATU	102			
748-	*ATU	102	6.87701959E-06	-7.23883318E-08	3.21894400E-09	-1.20705357E-04	*ATU	103			
749-	*ATU	103	-7.28427949E-08	4.94939911E-09	-3.84650426E-04	-7.17609516E-08	*ATU	104			
750-	*ATU	104	5.60878988E-09	-5.44076087E-04			*ATU	105			

S O R T E D B U L K D A T A E C H O

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CARD
COUNT      .   1  ..   2  ..   3  ..   4  ..   5  ..   6  ..   7  ..   8  ..   9  ..  10  .
  751-     DMI     *TU12              22                 1                -4.63685215E-01 *ATU 106
  752-     *ATU 106 -1.79166364E-07 -2.13118369E-07 -3.98516715E-01  1.23601930E-07*ATU 107
  753-     *ATU 107 -1.83165639E-07 -3.99830520E-01  1.56147109E-07 -1.52786899E-07*ATU 108
  754-     *ATU 108 -4.00879323E-01  1.47988999E-07 -2.05333151E-07 -3.94220412E-01*ATU 109
  755-     *ATU 109  1.46523348E-07 -2.20032007E-07                                *ATU 110
  756-     DMI     *TU12              23                 1                 5.90697279E-08  *ATU 111
  757-     *ATU 111  6.15481113E-05 -4.48905496E-11  5.10188656E-08 -1.55803584E-03*ATU 112
  758-     *ATU 112  1.12685350E-09  5.16143395E-08 -3.51606798E-03  2.46764764E-09*ATU 113
  759-     *ATU 113  5.20298649E-08 -5.21713868E-03  3.46802831E-09  5.12994944E-08*ATU 114
  760-     *ATU 114 -5.80099225E-03  3.89208665E-09                                *ATU 115
  761-     DMI     *TU12              24                 1                -8.39592076E-08 *ATU 116
  762-     *ATU 116 -3.45174167E-11  3.63309027E-06 -7.21593096E-08  8.01345656E-10*ATU 117
  763-     *ATU 117  2.41035650E-06 -7.24077722E-08  1.84184401E-09 -4.21711593E-05*ATU 118
  764-     *ATU 118 -7.26210487E-08  2.77927938E-09 -1.32504298E-04 -7.14327939E-08*ATU 119
  765-     *ATU 119  3.11660941E-09 -1.85157551E-04                                *ATU 120
  766-     DMI     *TU12              25                 1                -4.64975417E-01 *ATU 121
  767-     *ATU 121 -1.79672725E-07 -2.13710337E-07 -3.99167240E-01  1.34018137E-07*ATU 122
  768-     *ATU 122 -1.83463897E-07 -3.99911940E-01  1.56627777E-07 -1.92838172E-07*ATU 123
  769-     *ATU 123 -4.00495172E-01  1.48516563E-07 -2.05174331E-07 -3.93673599E-01*ATU 124
  770-     *ATU 124  1.47066203E-07 -2.19779963E-07                                *ATU 125
  771-     DMI     *TU12              26                 1                 5.92259898E-08  *ATU 126
  772-     *ATU 126  4.00548161E-05 -2.98809449E-11  5.10104030E-08 -1.01333461E-03*ATU 127
  773-     *ATU 127  7.32460981E-10  5.13817362E-08 -2.27672490E-03  1.60557057E-09*ATU 128
  774-     *ATU 128  5.16357268E-08 -3.36289173E-03  2.25971553E-09  5.08413756E-08*ATU 129
  775-     *ATU 129 -3.73170897E-03  2.53781707E-09                                *ATU 130
  776-     DMI     *TU12              27                 1                -8.41933456E-08 *ATU 131
  777-     *ATU 131 -2.17147272E-11  1.36434301E-06 -7.22774871E-08  5.21665822E-10*ATU 132
  778-     *ATU 132  9.11016571E-07 -7.24162987E-08  1.18464660E-09 -1.59047486E-05*ATU 133
  779-     *ATU 133 -7.25306109E-08  1.76667725E-09 -4.95233689E-05 -7.13017698E-08*ATU 134
  780-     *ATU 134  1.97041983E-09 -6.87181455E-05                                *ATU 135
  781-     DMI     *TU12              28                 1                -2.32670188E-01 *ATU 136
  782-     *ATU 136 -8.99072461E-08 -1.06938899E-07 -1.99674845E-01  6.70488589E-08*ATU 137
  783-     *ATU 137 -9.17738134E-08 -1.99966729E-01  7.83391556E-08 -9.64258220E-08*ATU 138
  784-     *ATU 138 -2.00193884E-01  7.42700763E-08 -1.02564343E-07 -1.96760595E-01*ATU 139
  785-     *ATU 139  7.35402637E-08 -1.09854113E-07                                *ATU 140
  786-     DMI     *TU12              29                 1                 3.95601241E-08  *ATU 141
  787-     *ATU 141  1.68243278E-05 -1.26588722E-11  3.43618716E-08 -4.25543403E-04*ATU 142
  788-     *ATU 142  3.07522230E-10  3.45278188E-08 -9.54627758E-04  6.74544198E-10*ATU 143
  789-     *ATU 143  3.46417295E-08 -1.40788918E-03  9.50190371E-10  3.40831612E-08*ATU 144
  790-     *ATU 144 -1.56127731E-03  1.06756182E-09                                *ATU 145
  791-     DMI     *TU12              30                 1                -4.38348305E-08 *ATU 146
  792-     *ATU 146 -8.40378114E-12  4.15984232E-07 -3.76185589E-08  2.03946401E-10*ATU 147
  793-     *ATU 147  2.78612731E-07 -3.76747700E-08  4.61354984E-10 -4.85905184E-06*ATU 148
  794-     *ATU 148 -3.77281523E-08  6.85522750E-10 -1.50657806E-05 -3.70752993E-08*ATU 149
  795-     *ATU 149  7.63210606E-10 -2.08410784E-05                                *ATU 150
  796-     EIGR    1       GIV     0.0      10.64   25       25       0        .0      EEIG
  797-     EEIG    MAX
  798-     GRID    2       1       1.0000   .0000   1.0000   1
  799-     GRID    3       1       1.0000   9.0000  1.0000   1
  800-     GRID    4       1       1.0000   18.0000 1.0000   1
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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
801-	GRID	5	1	1.0000	27.0000	1.0000	1			
802-	GRID	6	1	1.0000	36.0000	1.0000	1			
803-	GRID	7	1	1.0000	45.0000	1.0000	1			
804-	GRID	8	1	1.0000	54.0000	1.0000	1			
805-	GRID	9	1	1.0000	63.0000	1.0000	1			
806-	GRID	10	1	1.0000	72.0000	1.0000	1			
807-	GRID	11	1	1.0000	81.0000	1.0000	1			
808-	GRID	12	1	1.0000	90.0000	1.0000	1			
809-	GRID	13	1	1.0000	.0000	.8000	1			
810-	GRID	14	1	1.0000	9.0000	.8000	1			
811-	GRID	15	1	1.0000	18.0000	.8000	1			
812-	GRID	16	1	1.0000	27.0000	.8000	1			
813-	GRID	17	1	1.0000	36.0000	.8000	1			
814-	GRID	18	1	1.0000	45.0000	.8000	1			
815-	GRID	19	1	1.0000	54.0000	.8000	1			
816-	GRID	20	1	1.0000	63.0000	.8000	1			
817-	GRID	21	1	1.0000	72.0000	.8000	1			
818-	GRID	22	1	1.0000	81.0000	.8000	1			
819-	GRID	23	1	1.0000	90.0000	.8000	1			
820-	GRID	24	1	1.0000	.0000	.6000	1			
821-	GRID	25	1	1.0000	9.0000	.6000	1			
822-	GRID	26	1	1.0000	18.0000	.6000	1			
823-	GRID	27	1	1.0000	27.0000	.6000	1			
824-	GRID	28	1	1.0000	36.0000	.6000	1			
825-	GRID	29	1	1.0000	45.0000	.6000	1			
826-	GRID	30	1	1.0000	54.0000	.6000	1			
827-	GRID	31	1	1.0000	63.0000	.6000	1			
828-	GRID	32	1	1.0000	72.0000	.6000	1			
829-	GRID	33	1	1.0000	81.0000	.6000	1			
830-	GRID	34	1	1.0000	90.0000	.6000	1			
831-	GRID	35	1	1.0000	.0000	.4000	1			
832-	GRID	36	1	1.0000	9.0000	.4000	1			
833-	GRID	37	1	1.0000	18.0000	.4000	1			
834-	GRID	38	1	1.0000	27.0000	.4000	1			
835-	GRID	39	1	1.0000	36.0000	.4000	1			
836-	GRID	40	1	1.0000	45.0000	.4000	1			
837-	GRID	41	1	1.0000	54.0000	.4000	1			
838-	GRID	42	1	1.0000	63.0000	.4000	1			
839-	GRID	43	1	1.0000	72.0000	.4000	1			
840-	GRID	44	1	1.0000	81.0000	.4000	1			
841-	GRID	45	1	1.0000	90.0000	.4000	1			
842-	GRID	46	1	1.0000	.0000	.2000	1			
843-	GRID	47	1	1.0000	9.0000	.2000	1			
844-	GRID	48	1	1.0000	18.0000	.2000	1			
845-	GRID	49	1	1.0000	27.0000	.2000	1			
846-	GRID	50	1	1.0000	36.0000	.2000	1			
847-	GRID	51	1	1.0000	45.0000	.2000	1			
848-	GRID	52	1	1.0000	54.0000	.2000	1			
849-	GRID	53	1	1.0000	63.0000	.2000	1			
850-	GRID	54	1	1.0000	72.0000	.2000	1			

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S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
851-	GRID	55	1	1.0000	81.0000	.2000	1			
852-	GRID	56	1	1.0000	90.0000	.2000	1			
853-	GRID	57	1	1.0000	.0000	.0000	1			
854-	GRID	58	1	1.0000	9.0000	.0000	1			
855-	GRID	59	1	1.0000	18.0000	.0000	1			
856-	GRID	60	1	1.0000	27.0000	.0000	1			
857-	GRID	61	1	1.0000	36.0000	.0000	1			
858-	GRID	62	1	1.0000	45.0000	.0000	1			
859-	GRID	63	1	1.0000	54.0000	.0000	1			
860-	GRID	64	1	1.0000	63.0000	.0000	1			
861-	GRID	65	1	1.0000	72.0000	.0000	1			
862-	GRID	66	1	1.0000	81.0000	.0000	1			
863-	GRID	67	1	1.0000	90.0000	.0000	1			
864-	GRID	68	1	1.0000	.0000	-0.1999	1			
865-	GRID	69	1	1.0000	9.0000	-0.1999	1			
866-	GRID	70	1	1.0000	18.0000	-0.1999	1			
867-	GRID	71	1	1.0000	27.0000	-0.1999	1			
868-	GRID	72	1	1.0000	36.0000	-0.1999	1			
869-	GRID	73	1	1.0000	45.0000	-0.1999	1			
870-	GRID	74	1	1.0000	54.0000	-0.1999	1			
871-	GRID	75	1	1.0000	63.0000	-0.1999	1			
872-	GRID	76	1	1.0000	72.0000	-0.1999	1			
873-	GRID	77	1	1.0000	81.0000	-0.1999	1			
874-	GRID	78	1	1.0000	90.0000	-0.1999	1			
875-	GRID	79	1	1.0000	.0000	-0.3999	1			
876-	GRID	80	1	1.0000	9.0000	-0.3999	1			
877-	GRID	81	1	1.0000	18.0000	-0.3999	1			
878-	GRID	82	1	1.0000	27.0000	-0.3999	1			
879-	GRID	83	1	1.0000	36.0000	-0.3999	1			
880-	GRID	84	1	1.0000	45.0000	-0.3999	1			
881-	GRID	85	1	1.0000	54.0000	-0.3999	1			
882-	GRID	86	1	1.0000	63.0000	-0.3999	1			
883-	GRID	87	1	1.0000	72.0000	-0.3999	1			
884-	GRID	88	1	1.0000	81.0000	-0.3999	1			
885-	GRID	89	1	1.0000	90.0000	-0.3999	1			
886-	GRID	90	1	1.0000	.0000	-0.6000	1			
887-	GRID	91	1	1.0000	9.0000	-0.6000	1			
888-	GRID	92	1	1.0000	18.0000	-0.6000	1			
889-	GRID	93	1	1.0000	27.0000	-0.6000	1			
890-	GRID	94	1	1.0000	36.0000	-0.6000	1			
891-	GRID	95	1	1.0000	45.0000	-0.6000	1			
892-	GRID	96	1	1.0000	54.0000	-0.6000	1			
893-	GRID	97	1	1.0000	63.0000	-0.6000	1			
894-	GRID	98	1	1.0000	72.0000	-0.6000	1			
895-	GRID	99	1	1.0000	81.0000	-0.6000	1			
896-	GRID	100	1	1.0000	90.0000	-0.6000	1			
897-	GRID	101	1	1.0000	.0000	-0.7999	1			
898-	GRID	102	1	1.0000	9.0000	-0.7999	1			
899-	GRID	103	1	1.0000	18.0000	-0.7999	1			
900-	GRID	104	1	1.0000	27.0000	-0.7999	1			

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
901-	GRID	105	1	1.0000	36.0000	-0.7999	1			
902-	GRID	106	1	1.0000	45.0000	-0.7999	1			
903-	GRID	107	1	1.0000	54.0000	-0.7999	1			
904-	GRID	108	1	1.0000	63.0000	-0.7999	1			
905-	GRID	109	1	1.0000	72.0000	-0.7999	1			
906-	GRID	110	1	1.0000	81.0000	-0.7999	1			
907-	GRID	111	1	1.0000	90.0000	-0.7999	1			
908-	GRID	112	1	1.0000	.0000	-1.0000	1			
909-	GRID	113	1	1.0000	9.0000	-1.0000	1			
910-	GRID	114	1	1.0000	18.0000	-1.0000	1			
911-	GRID	115	1	1.0000	27.0000	-1.0000	1			
912-	GRID	116	1	1.0000	36.0000	-1.0000	1			
913-	GRID	117	1	1.0000	45.0000	-1.0000	1			
914-	GRID	118	1	1.0000	54.0000	-1.0000	1			
915-	GRID	119	1	1.0000	63.0000	-1.0000	1			
916-	GRID	120	1	1.0000	72.0000	-1.0000	1			
917-	GRID	121	1	1.0000	81.0000	-1.0000	1			
918-	GRID	122	1	1.0000	90.0000	-1.0000	1			
919-	GRID	1001	1	1.	0.0	0.0	1			
920-	GRID	1002	1	1.	0.0	0.0	1			
921-	GRID	1003	1	1.	0.0	0.0	1			
922-	GRID	2001	1	1.	0.0	0.0	1			
923-	GRID	2002	1	1.	0.0	0.0	1			
924-	GRID	2003	1	1.	0.0	0.0	1			
925-	GRID	3001	1	1.	0.0	0.0	1			
926-	GRID	3002	1	1.	0.0	0.0	1			
927-	GRID	3003	1	1.	0.0	0.0	1			
928-	GRID	4001	1	1.	0.0	0.0	1			
929-	GRID	4002	1	1.	0.0	0.0	1			
930-	GRID	4003	1	1.	0.0	0.0	1			
931-	GRID	5001	1	1.	0.0	0.0	1			
932-	GRID	5002	1	1.	0.0	0.0	1			
933-	GRID	5003	1	1.	0.0	0.0	1			
934-	GRID	6001	1	1.	0.0	0.0	1			
935-	GRID	6002	1	1.	0.0	0.0	1			
936-	GRID	6003	1	1.	0.0	0.0	1			
937-	GRID	7001	1	1.	0.0	0.0	1			
938-	GRID	7002	1	1.	0.0	0.0	1			
939-	GRID	7003	1	1.	0.0	0.0	1			
940-	GRID	8001	1	1.	0.0	0.0	1			
941-	GRID	8002	1	1.	0.0	0.0	1			
942-	GRID	8003	1	1.	0.0	0.0	1			
943-	GRID	9001	1	1.	0.0	0.0	1			
944-	GRID	9002	1	1.	0.0	0.0	1			
945-	GRID	9003	1	1.	0.0	0.0	1			
946-	GRID	10001	1	1.	0.0	0.0	1			
947-	GRID	10002	1	1.	0.0	0.0	1			
948-	GRID	10003	1	1.	0.0	0.0	1			
949-	GRID	11001	1	1.	0.0	0.0	1			
950-	GRID	11002	1	1.	0.0	0.0	1			

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
951-	GRID	11003	1	1.	0.0	0.0	1			
952-	MAT1	1	1.		.3	3.				
953-	MPC	1	2	1	-1.00000	1001	1	1.00000		EM11011
954-	EM11011			1002	1 1.00000		1003	1 1.00000		
955-	MPC	1	2	2	-1.00000	1001	2	.00000		EM11012
956-	EM11012			1002	2 0.00000		1003	2 0.00000		
957-	MPC	1	2	3	-1.00000	1001	3	1.00000		EM11013
958-	EM11013			1002	3 1.00000		1003	3 1.00000		
959-	MPC	1	2	4	-1.00000	1001	4	.00000		EM11014
960-	EM11014			1002	4 0.00000		1003	4 0.00000		
961-	MPC	1	2	5	-1.00000	1001	5	1.00000		EM11015
962-	EM11015			1002	5 1.00000		1003	5 1.00000		
963-	MPC	1	2	6	-1.00000	1001	6	.00000		EM11016
964-	EM11016			1002	6 0.00000		1003	6 0.00000		
965-	MPC	1	3	1	-1.00000	1001	1	1.00000		EM11021
966-	EM11021			1002	1 0.95105		1003	1 0.80901		
967-	MPC	1	3	2	-1.00000	1001	2	.00000		EM11022
968-	EM11022			1002	2 0.30901		1003	2 0.58778		
969-	MPC	1	3	3	-1.00000	1001	3	1.00000		EM11023
970-	EM11023			1002	3 0.95105		1003	3 0.80901		
971-	MPC	1	3	4	-1.00000	1001	4	.00000		EM11024
972-	EM11024			1002	4 0.30901		1003	4 0.58778		
973-	MPC	1	3	5	-1.00000	1001	5	1.00000		EM11025
974-	EM11025			1002	5 0.95105		1003	5 0.80901		
975-	MPC	1	3	6	-1.00000	1001	6	.00000		EM11026
976-	EM11026			1002	6 0.30901		1003	6 0.58778		
977-	MPC	1	4	1	-1.00000	1001	1	1.00000		EM11031
978-	EM11031			1002	1 0.80901		1003	1 0.30901		
979-	MPC	1	4	2	-1.00000	1001	2	.00000		EM11032
980-	EM11032			1002	2 0.58778		1003	2 0.95105		
981-	MPC	1	4	3	-1.00000	1001	3	1.00000		EM11033
982-	EM11033			1002	3 0.80901		1003	3 0.30901		
983-	MPC	1	4	4	-1.00000	1001	4	.00000		EM11034
984-	EM11034			1002	4 0.58778		1003	4 0.95105		
985-	MPC	1	4	5	-1.00000	1001	5	1.00000		EM11035
986-	EM11035			1002	5 0.80901		1003	5 0.30901		
987-	MPC	1	4	6	-1.00000	1001	6	.00000		EM11036
988-	EM11036			1002	6 0.58778		1003	6 0.95105		
989-	MPC	1	5	1	-1.00000	1001	1	1.00000		EM11041
990-	EM11041			1002	1 0.58778		1003	1-0.30901		
991-	MPC	1	5	2	-1.00000	1001	2	.00000		EM11042
992-	EM11042			1002	2 0.80901		1003	2 0.95105		
993-	MPC	1	5	3	-1.00000	1001	3	1.00000		EM11043
994-	EM11043			1002	3 0.58778		1003	3-0.30901		
995-	MPC	1	5	4	-1.00000	1001	4	.00000		EM11044
996-	EM11044			1002	4 0.80901		1003	4 0.95105		
997-	MPC	1	5	5	-1.00000	1001	5	1.00000		EM11045
998-	EM11045			1002	5 0.58778		1003	5-0.30901		
999-	MPC	1	5	6	-1.00000	1001	6	.00000		EM11046
1000-	EM11046			1002	6 0.80901		1003	6 0.95105		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1001-	MPC	1	6	1	-1.00000	1001	1	1.00000		GM11051
1002-	GM11051		1002	1	0.30901	1003	1	-0.80901		
1003-	MPC	1	6	2	-1.00000	1001	2	.00000		GM11052
1004-	GM11052		1002	2	0.95105	1003	2	0.58778		
1005-	MPC	1	6	3	-1.00000	1001	3	1.00000		GM11053
1006-	GM11053		1002	3	0.30901	1003	3	-0.80901		
1007-	MPC	1	6	4	-1.00000	1001	4	.00000		GM11054
1008-	GM11054		1002	4	0.95105	1003	4	0.58778		
1009-	MPC	1	6	5	-1.00000	1001	5	1.00000		GM11055
1010-	GM11055		1002	5	0.30901	1003	5	-0.80901		
1011-	MPC	1	6	6	-1.00000	1001	6	.00000		GM11056
1012-	GM11056		1002	6	0.95105	1003	6	0.58778		
1013-	MPC	1	7	1	-1.00000	1001	1	1.00000		GM11061
1014-	GM11061		1002	1	0.00000	1003	1	-1.00000		
1015-	MPC	1	7	2	-1.00000	1001	2	.00000		GM11062
1016-	GM11062		1002	2	1.00000	1003	2	0.00000		
1017-	MPC	1	7	3	-1.00000	1001	3	1.00000		GM11063
1018-	GM11063		1002	3	0.00000	1003	3	-1.00000		
1019-	MPC	1	7	4	-1.00000	1001	4	.00000		GM11064
1020-	GM11064		1002	4	1.00000	1003	4	0.00000		
1021-	MPC	1	7	5	-1.00000	1001	5	1.00000		GM11065
1022-	GM11065		1002	5	0.00000	1003	5	-1.00000		
1023-	MPC	1	7	6	-1.00000	1001	6	.00000		GM11066
1024-	GM11066		1002	6	1.00000	1003	6	0.00000		
1025-	MPC	1	8	1	-1.00000	1001	1	1.00000		GM11071
1026-	GM11071		1002	1	-0.30901	1003	1	-0.80901		
1027-	MPC	1	8	2	-1.00000	1001	2	.00000		GM11072
1028-	GM11072		1002	2	0.95105	1003	2	-0.58778		
1029-	MPC	1	8	3	-1.00000	1001	3	1.00000		GM11073
1030-	GM11073		1002	3	-0.30901	1003	3	-0.80901		
1031-	MPC	1	8	4	-1.00000	1001	4	.00000		GM11074
1032-	GM11074		1002	4	0.95105	1003	4	-0.58778		
1033-	MPC	1	8	5	-1.00000	1001	5	1.00000		GM11075
1034-	GM11075		1002	5	-0.30901	1003	5	-0.80901		
1035-	MPC	1	8	6	-1.00000	1001	6	.00000		GM11076
1036-	GM11076		1002	6	0.95105	1003	6	-0.58778		
1037-	MPC	1	9	1	-1.00000	1001	1	1.00000		GM11081
1038-	GM11081		1002	1	-0.58778	1003	1	-0.30901		
1039-	MPC	1	9	2	-1.00000	1001	2	.00000		GM11082
1040-	GM11082		1002	2	0.80901	1003	2	-0.95105		
1041-	MPC	1	9	3	-1.00000	1001	3	1.00000		GM11083
1042-	GM11083		1002	3	-0.58778	1003	3	-0.30901		
1043-	MPC	1	9	4	-1.00000	1001	4	.00000		GM11084
1044-	GM11084		1002	4	0.80901	1003	4	-0.95105		
1045-	MPC	1	9	5	-1.00000	1001	5	1.00000		GM11085
1046-	GM11085		1002	5	-0.58778	1003	5	-0.30901		
1047-	MPC	1	9	6	-1.00000	1001	6	.00000		GM11086
1048-	GM11086		1002	6	0.80901	1003	6	-0.95105		
1049-	MPC	1	10	1	-1.00000	1001	1	1.00000		GM11091
1050-	GM11091		1002	1	-0.80901	1003	1	0.30901		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1051-	MPC	1	10	2	-1.00000	1001	2	.00000		&M11092
1052-	&M11092		1002	2	0.58778	1003	2	-0.95105		
1053-	MPC	1	10	3	-1.00000	1001	3	1.00000		&M11093
1054-	&M11093		1002	3	-0.80901	1003	3	0.30901		
1055-	MPC	1	10	4	-1.00000	1001	4	.00000		&M11094
1056-	&M11094		1002	4	0.58778	1003	4	-0.95105		
1057-	MPC	1	10	5	-1.00000	1001	5	1.00000		&M11095
1058-	&M11095		1002	5	-0.80901	1003	5	0.30901		
1059-	MPC	1	10	6	-1.00000	1001	6	.00000		&M11096
1060-	&M11096		1002	6	0.58778	1003	6	-0.95105		
1061-	MPC	1	11	1	-1.00000	1001	1	1.00000		&M11101
1062-	&M11101		1002	1	-0.95105	1003	1	0.80901		
1063-	MPC	1	11	2	-1.00000	1001	2	.00000		&M11102
1064-	&M11102		1002	2	0.30901	1003	2	-0.58778		
1065-	MPC	1	11	3	-1.00000	1001	3	1.00000		&M11103
1066-	&M11103		1002	3	-0.95105	1003	3	0.80901		
1067-	MPC	1	11	4	-1.00000	1001	4	.00000		&M11104
1068-	&M11104		1002	4	0.30901	1003	4	-0.58778		
1069-	MPC	1	11	5	-1.00000	1001	5	1.00000		&M11105
1070-	&M11105		1002	5	-0.95105	1003	5	0.80901		
1071-	MPC	1	11	6	-1.00000	1001	6	.00000		&M11106
1072-	&M11106		1002	6	0.30901	1003	6	-0.58778		
1073-	MPC	1	12	1	-1.00000	1001	1	1.00000		&M11111
1074-	&M11111		1002	1	-1.00000	1003	1	1.00000		
1075-	MPC	1	12	2	-1.00000	1001	2	.00000		&M11112
1076-	&M11112		1002	2	0.00000	1003	2	-0.00000		
1077-	MPC	1	12	3	-1.00000	1001	3	1.00000		&M11113
1078-	&M11113		1002	3	-1.00000	1003	3	1.00000		
1079-	MPC	1	12	4	-1.00000	1001	4	.00000		&M11114
1080-	&M11114		1002	4	0.00000	1003	4	-0.00000		
1081-	MPC	1	12	5	-1.00000	1001	5	1.00000		&M11115
1082-	&M11115		1002	5	-1.00000	1003	5	1.00000		
1083-	MPC	1	12	6	-1.00000	1001	6	.00000		&M11116
1084-	&M11116		1002	6	0.00000	1003	6	-0.00000		
1085-	MPC	1	13	1	-1.00000	2001	1	1.00000		&M12011
1086-	&M12011		2002	1	1.00000	2003	1	1.00000		
1087-	MPC	1	13	2	-1.00000	2001	2	.00000		&M12012
1088-	&M12012		2002	2	0.00000	2003	2	0.00000		
1089-	MPC	1	13	3	-1.00000	2001	3	1.00000		&M12013
1090-	&M12013		2002	3	1.00000	2003	3	1.00000		
1091-	MPC	1	13	4	-1.00000	2001	4	.00000		&M12014
1092-	&M12014		2002	4	0.00000	2003	4	0.00000		
1093-	MPC	1	13	5	-1.00000	2001	5	1.00000		&M12015
1094-	&M12015		2002	5	1.00000	2003	5	1.00000		
1095-	MPC	1	13	6	-1.00000	2001	6	.00000		&M12016
1096-	&M12016		2002	6	0.00000	2003	6	0.00000		
1097-	MPC	1	14	1	-1.00000	2001	1	1.00000		&M12021
1098-	&M12021		2002	1	0.95105	2003	1	0.80901		
1099-	MPC	1	14	2	-1.00000	2001	2	.00000		&M12022
1100-	&M12022		2002	2	0.30901	2003	2	0.58778		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1101-	MPC	1	14	3	-1.00000200	1	3	1.00000		&M12023
1102-	&M12023		2002	3	0.95105	2003	3	0.80901		
1103-	MPC	1	14	4	-1.00000200	1	4	.00000		&M12024
1104-	&M12024		2002	4	0.30901	2003	4	0.58778		
1105-	MPC	1	14	5	-1.00000200	1	5	1.00000		&M12025
1106-	&M12025		2002	5	0.95105	2003	5	0.80901		
1107-	MPC	1	14	6	-1.00000200	1	6	.00000		&M12026
1108-	&M12026		2002	6	0.30901	2003	6	0.58778		
1109-	MPC	1	15	1	-1.00000200	1	1	1.00000		&M12031
1110-	&M12031		2002	1	0.80901	2003	1	0.30901		
1111-	MPC	1	15	2	-1.00000200	1	2	.00000		&M12032
1112-	&M12032		2002	2	0.58778	2003	2	0.95105		
1113-	MPC	1	15	3	-1.00000200	1	3	1.00000		&M12033
1114-	&M12033		2002	3	0.80901	2003	3	0.30901		
1115-	MPC	1	15	4	-1.00000200	1	4	.00000		&M12034
1116-	&M12034		2002	4	0.58778	2003	4	0.95105		
1117-	MPC	1	15	5	-1.00000200	1	5	1.00000		&M12035
1118-	&M12035		2002	5	0.80901	2003	5	0.30901		
1119-	MPC	1	15	6	-1.00000200	1	6	.00000		&M12036
1120-	&M12036		2002	6	0.58778	2003	6	0.95105		
1121-	MPC	1	16	1	-1.00000200	1	1	1.00000		&M12041
1122-	&M12041		2002	1	0.58778	2003	1	-0.30901		
1123-	MPC	1	16	2	-1.00000200	1	2	.00000		&M12042
1124-	&M12042		2002	2	0.80901	2003	2	0.95105		
1125-	MPC	1	16	3	-1.00000200	1	3	1.00000		&M12043
1126-	&M12043		2002	3	0.58778	2003	3	-0.30901		
1127-	MPC	1	16	4	-1.00000200	1	4	.00000		&M12044
1128-	&M12044		2002	4	0.80901	2003	4	0.95105		
1129-	MPC	1	16	5	-1.00000200	1	5	1.00000		&M12045
1130-	&M12045		2002	5	0.58778	2003	5	-0.30901		
1131-	MPC	1	16	6	-1.00000200	1	6	.00000		&M12046
1132-	&M12046		2002	6	0.80901	2003	6	0.95105		
1133-	MPC	1	17	1	-1.00000200	1	1	1.00000		&M12051
1134-	&M12051		2002	1	0.30901	2003	1	-0.80901		
1135-	MPC	1	17	2	-1.00000200	1	2	.00000		&M12052
1136-	&M12052		2002	2	0.95105	2003	2	0.58778		
1137-	MPC	1	17	3	-1.00000200	1	3	1.00000		&M12053
1138-	&M12053		2002	3	0.30901	2003	3	-0.80901		
1139-	MPC	1	17	4	-1.00000200	1	4	.00000		&M12054
1140-	&M12054		2002	4	0.95105	2003	4	0.58778		
1141-	MPC	1	17	5	-1.00000200	1	5	1.00000		&M12055
1142-	&M12055		2002	5	0.30901	2003	5	-0.80901		
1143-	MPC	1	17	6	-1.00000200	1	6	.00000		&M12056
1144-	&M12056		2002	6	0.95105	2003	6	0.58778		
1145-	MPC	1	18	1	-1.00000200	1	1	1.00000		&M12061
1146-	&M12061		2002	1	0.00000	2003	1	-1.00000		
1147-	MPC	1	18	2	-1.00000200	1	2	.00000		&M12062
1148-	&M12062		2002	2	1.00000	2003	2	0.00000		
1149-	MPC	1	18	3	-1.00000200	1	3	1.00000		&M12063
1150-	&M12063		2002	3	0.00000	2003	3	-1.00000		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1151-	MPC	1	18	4	-1.00000	2001	4	.00000		&M12064
1152-	&M12064			2002	4 1.00000	2003		4 0.00000		
1153-	MPC	1	18	5	-1.00000	2001	5	1.00000		&M12065
1154-	&M12065			2002	5 0.00000	2003		5-1.00000		
1155-	MPC	1	18	6	-1.00000	2001	6	.00000		&M12066
1156-	&M12066			2002	6 1.00000	2003		6 0.00000		
1157-	MPC	1	19	1	-1.00000	2001	1	1.00000		&M12071
1158-	&M12071			2002	1-0.30901	2003		1-0.80901		
1159-	MPC	1	19	2	-1.00000	2001	2	.00000		&M12072
1160-	&M12072			2002	2 0.95105	2003		2-0.58778		
1161-	MPC	1	19	3	-1.00000	2001	3	1.00000		&M12073
1162-	&M12073			2002	3-0.30901	2003		3-0.80901		
1163-	MPC	1	19	4	-1.00000	2001	4	.00000		&M12074
1164-	&M12074			2002	4 0.95105	2003		4-0.58778		
1165-	MPC	1	19	5	-1.00000	2001	5	1.00000		&M12075
1166-	&M12075			2002	5-0.30901	2003		5-0.80901		
1167-	MPC	1	19	6	-1.00000	2001	6	.00000		&M12076
1168-	&M12076			2002	6 0.95105	2003		6-0.58778		
1169-	MPC	1	20	1	-1.00000	2001	1	1.00000		&M12081
1170-	&M12081			2002	1-0.58778	2003		1-0.30901		
1171-	MPC	1	20	2	-1.00000	2001	2	.00000		&M12082
1172-	&M12082			2002	2 0.80901	2003		2-0.95105		
1173-	MPC	1	20	3	-1.00000	2001	3	1.00000		&M12083
1174-	&M12083			2002	3-0.58778	2003		3-0.30901		
1175-	MPC	1	20	4	-1.00000	2001	4	.00000		&M12084
1176-	&M12084			2002	4 0.80901	2003		4-0.95105		
1177-	MPC	1	20	5	-1.00000	2001	5	1.00000		&M12085
1178-	&M12085			2002	5-0.58778	2003		5-0.30901		
1179-	MPC	1	20	6	-1.00000	2001	6	.00000		&M12086
1180-	&M12086			2002	6 0.80901	2003		6-0.95105		
1181-	MPC	1	21	1	-1.00000	2001	1	1.00000		&M12091
1182-	&M12091			2002	1-0.80901	2003		1 0.30901		
1183-	MPC	1	21	2	-1.00000	2001	2	.00000		&M12092
1184-	&M12092			2002	2 0.58778	2003		2-0.95105		
1185-	MPC	1	21	3	-1.00000	2001	3	1.00000		&M12093
1186-	&M12093			2002	3-0.80901	2003		3 0.30901		
1187-	MPC	1	21	4	-1.00000	2001	4	.00000		&M12094
1188-	&M12094			2002	4 0.58778	2003		4-0.95105		
1189-	MPC	1	21	5	-1.00000	2001	5	1.00000		&M12095
1190-	&M12095			2002	5-0.80901	2003		5 0.30901		
1191-	MPC	1	21	6	-1.00000	2001	6	.00000		&M12096
1192-	&M12096			2002	6 0.58778	2003		6-0.95105		
1193-	MPC	1	22	1	-1.00000	2001	1	1.00000		&M12101
1194-	&M12101			2002	1-0.95105	2003		1 0.80901		
1195-	MPC	1	22	2	-1.00000	2001	2	.00000		&M12102
1196-	&M12102			2002	2 0.30901	2003		2-0.58778		
1197-	MPC	1	22	3	-1.00000	2001	3	1.00000		&M12103
1198-	&M12103			2002	3-0.95105	2003		3 0.80901		
1199-	MPC	1	22	4	-1.00000	2001	4	.00000		&M12104
1200-	&M12104			2002	4 0.30901	2003		4-0.58778		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1201-	MPC	1	22	5	-1.00000200 1	5		1.00000		&M12105
1202-	&M12105		2002	5-0.95105		2003	5	0.80901		
1203-	MPC	1	22	6	-1.00000200 1	6		.00000		&M12106
1204-	&M12106		2002	6 0.30901		2003	6	-0.58778		
1205-	MPC	1	23	1	-1.00000200 1	1		1.00000		&M12111
1206-	&M12111		2002	1-1.00000		2003	1	1.00000		
1207-	MPC	1	23	2	-1.00000200 1	2		.00000		&M12112
1208-	&M12112		2002	2 0.00000		2003	2	-0.00000		
1209-	MPC	1	23	3	-1.00000200 1	3		1.00000		&M12113
1210-	&M12113		2002	3-1.00000		2003	3	1.00000		
1211-	MPC	1	23	4	-1.00000200 1	4		.00000		&M12114
1212-	&M12114		2002	4 0.00000		2003	4	-0.00000		
1213-	MPC	1	23	5	-1.00000200 1	5		1.00000		&M12115
1214-	&M12115		2002	5-1.00000		2003	5	1.00000		
1215-	MPC	1	23	6	-1.00000200 1	6		.00000		&M12116
1216-	&M12116		2002	6 0.00000		2003	6	-0.00000		
1217-	MPC	1	24	1	-1.00000300 1	1		1.00000		&M13011
1218-	&M13011		3002	1 1.00000		3003	1	1.00000		
1219-	MPC	1	24	2	-1.00000300 1	2		.00000		&M13012
1220-	&M13012		3002	2 0.00000		3003	2	0.00000		
1221-	MPC	1	24	3	-1.00000300 1	3		1.00000		&M13013
1222-	&M13013		3002	3 1.00000		3003	3	1.00000		
1223-	MPC	1	24	4	-1.00000300 1	4		.00000		&M13014
1224-	&M13014		3002	4 0.00000		3003	4	0.00000		
1225-	MPC	1	24	5	-1.00000300 1	5		1.00000		&M13015
1226-	&M13015		3002	5 1.00000		3003	5	1.00000		
1227-	MPC	1	24	6	-1.00000300 1	6		.00000		&M13016
1228-	&M13016		3002	6 0.00000		3003	6	0.00000		
1229-	MPC	1	25	1	-1.00000300 1	1		1.00000		&M13021
1230-	&M13021		3002	1 0.95105		3003	1	0.80901		
1231-	MPC	1	25	2	-1.00000300 1	2		.00000		&M13022
1232-	&M13022		3002	2 0.30901		3003	2	0.58778		
1233-	MPC	1	25	3	-1.00000300 1	3		1.00000		&M13023
1234-	&M13023		3002	3 0.95105		3003	3	0.80901		
1235-	MPC	1	25	4	-1.00000300 1	4		.00000		&M13024
1236-	&M13024		3002	4 0.30901		3003	4	0.58778		
1237-	MPC	1	25	5	-1.00000300 1	5		1.00000		&M13025
1238-	&M13025		3002	5 0.95105		3003	5	0.80901		
1239-	MPC	1	25	6	-1.00000300 1	6		.00000		&M13026
1240-	&M13026		3002	6 0.30901		3003	6	0.58778		
1241-	MPC	1	26	1	-1.00000300 1	1		1.00000		&M13031
1242-	&M13031		3002	1 0.80901		3003	1	0.30901		
1243-	MPC	1	26	2	-1.00000300 1	2		.00000		&M13032
1244-	&M13032		3002	2 0.58778		3003	2	0.95105		
1245-	MPC	1	26	3	-1.00000300 1	3		1.00000		&M13033
1246-	&M13033		3002	3 0.80901		3003	3	0.30901		
1247-	MPC	1	26	4	-1.00000300 1	4		.00000		&M13034
1248-	&M13034		3002	4 0.58778		3003	4	0.95105		
1249-	MPC	1	26	5	-1.00000300 1	5		1.00000		&M13035
1250-	&M13035		3002	5 0.80901		3003	5	0.30901		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1251-	MPC	1	26	6	-1.0000030	01	6	.00000		&M13036
1252-	&M13036		3002	6	0.58778	3003	6	0.95105		
1253-	MPC	1	27	1	-1.0000030	01	1	1.00000		&M13041
1254-	&M13041		3002	1	0.58778	3003	1	-0.30901		
1255-	MPC	1	27	2	-1.0000030	01	2	.00000		&M13042
1256-	&M13042		3002	2	0.80901	3003	2	0.95105		
1257-	MPC	1	27	3	-1.0000030	01	3	1.00000		&M13043
1258-	&M13043		3002	3	0.58778	3003	3	-0.30901		
1259-	MPC	1	27	4	-1.0000030	01	4	.00000		&M13044
1260-	&M13044		3002	4	0.80901	3003	4	0.95105		
1261-	MPC	1	27	5	-1.0000030	01	5	1.00000		&M13045
1262-	&M13045		3002	5	0.58778	3003	5	-0.30901		
1263-	MPC	1	27	6	-1.0000030	01	6	.00000		&M13046
1264-	&M13046		3002	6	0.80901	3003	6	0.95105		
1265-	MPC	1	28	1	-1.0000030	01	1	1.00000		&M13051
1266-	&M13051		3002	1	0.30901	3003	1	-0.80901		
1267-	MPC	1	28	2	-1.0000030	01	2	.00000		&M13052
1268-	&M13052		3002	2	0.95105	3003	2	0.58778		
1269-	MPC	1	28	3	-1.0000030	01	3	1.00000		&M13053
1270-	&M13053		3002	3	0.30901	3003	3	-0.80901		
1271-	MPC	1	28	4	-1.0000030	01	4	.00000		&M13054
1272-	&M13054		3002	4	0.95105	3003	4	0.58778		
1273-	MPC	1	28	5	-1.0000030	01	5	1.00000		&M13055
1274-	&M13055		3002	5	0.30901	3003	5	-0.80901		
1275-	MPC	1	28	6	-1.0000030	01	6	.00000		&M13056
1276-	&M13056		3002	6	0.95105	3003	6	0.58778		
1277-	MPC	1	29	1	-1.0000030	01	1	1.00000		&M13061
1278-	&M13061		3002	1	0.00000	3003	1	-1.00000		
1279-	MPC	1	29	2	-1.0000030	01	2	.00000		&M13062
1280-	&M13062		3002	2	1.00000	3003	2	0.00000		
1281-	MPC	1	29	3	-1.0000030	01	3	1.00000		&M13063
1282-	&M13063		3002	3	0.00000	3003	3	-1.00000		
1283-	MPC	1	29	4	-1.0000030	01	4	.00000		&M13064
1284-	&M13064		3002	4	1.00000	3003	4	0.00000		
1285-	MPC	1	29	5	-1.0000030	01	5	1.00000		&M13065
1286-	&M13065		3002	5	0.00000	3003	5	-1.00000		
1287-	MPC	1	29	6	-1.0000030	01	6	.00000		&M13066
1288-	&M13066		3002	6	1.00000	3003	6	0.00000		
1289-	MPC	1	30	1	-1.0000030	01	1	1.00000		&M13071
1290-	&M13071		3002	1	-0.30901	3003	1	-0.80901		
1291-	MPC	1	30	2	-1.0000030	01	2	.00000		&M13072
1292-	&M13072		3002	2	0.95105	3003	2	-0.58778		
1293-	MPC	1	30	3	-1.0000030	01	3	1.00000		&M13073
1294-	&M13073		3002	3	-0.30901	3003	3	-0.80901		
1295-	MPC	1	30	4	-1.0000030	01	4	.00000		&M13074
1296-	&M13074		3002	4	0.95105	3003	4	-0.58778		
1297-	MPC	1	30	5	-1.0000030	01	5	1.00000		&M13075
1298-	&M13075		3002	5	-0.30901	3003	5	-0.80901		
1299-	MPC	1	30	6	-1.0000030	01	6	.00000		&M13076
1300-	&M13076		3002	6	0.95105	3003	6	-0.58778		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1301-	MPC	1	31	1	-1.00000	300 1	1	1.00000		&M13081
1302-	&M13081			3002	1-0.58778		3003	1-0.30901		
1303-	MPC	1	31	2	-1.00000	300 1	2	.00000		&M13082
1304-	&M13082			3002	2 0.80901		3003	2-0.95105		
1305-	MPC	1	31	3	-1.00000	300 1	3	1.00000		&M13083
1306-	&M13083			3002	3-0.58778		3003	3-0.30901		
1307-	MPC	1	31	4	-1.00000	300 1	4	.00000		&M13084
1308-	&M13084			3002	4 0.80901		3003	4-0.95105		
1309-	MPC	1	31	5	-1.00000	300 1	5	1.00000		&M13085
1310-	&M13085			3002	5-0.58778		3003	5-0.30901		
1311-	MPC	1	31	6	-1.00000	300 1	6	.00000		&M13086
1312-	&M13086			3002	6 0.80901		3003	6-0.95105		
1313-	MPC	1	32	1	-1.00000	300 1	1	1.00000		&M13091
1314-	&M13091			3002	1-0.80901		3003	1 0.30901		
1315-	MPC	1	32	2	-1.00000	300 1	2	.00000		&M13092
1316-	&M13092			3002	2 0.58778		3003	2-0.95105		
1317-	MPC	1	32	3	-1.00000	300 1	3	1.00000		&M13093
1318-	&M13093			3002	3-0.80901		3003	3 0.30901		
1319-	MPC	1	32	4	-1.00000	300 1	4	.00000		&M13094
1320-	&M13094			3002	4 0.58778		3003	4-0.95105		
1321-	MPC	1	32	5	-1.00000	300 1	5	1.00000		&M13095
1322-	&M13095			3002	5-0.80901		3003	5 0.30901		
1323-	MPC	1	32	6	-1.00000	300 1	6	.00000		&M13096
1324-	&M13096			3002	6 0.58778		3003	6-0.95105		
1325-	MPC	1	33	1	-1.00000	300 1	1	1.00000		&M13101
1326-	&M13101			3002	1-0.95105		3003	1 0.80901		
1327-	MPC	1	33	2	-1.00000	300 1	2	.00000		&M13102
1328-	&M13102			3002	2 0.30901		3003	2-0.58778		
1329-	MPC	1	33	3	-1.00000	300 1	3	1.00000		&M13103
1330-	&M13103			3002	3-0.95105		3003	3 0.80901		
1331-	MPC	1	33	4	-1.00000	300 1	4	.00000		&M13104
1332-	&M13104			3002	4 0.30901		3003	4-0.58778		
1333-	MPC	1	33	5	-1.00000	300 1	5	1.00000		&M13105
1334-	&M13105			3002	5-0.95105		3003	5 0.80901		
1335-	MPC	1	33	6	-1.00000	300 1	6	.00000		&M13106
1336-	&M13106			3002	6 0.30901		3003	6-0.58778		
1337-	MPC	1	34	1	-1.00000	300 1	1	1.00000		&M13111
1338-	&M13111			3002	1-1.00000		3003	1 1.00000		
1339-	MPC	1	34	2	-1.00000	300 1	2	.00000		&M13112
1340-	&M13112			3002	2 0.00000		3003	2-0.00000		
1341-	MPC	1	34	3	-1.00000	300 1	3	1.00000		&M13113
1342-	&M13113			3002	3-1.00000		3003	3 1.00000		
1343-	MPC	1	34	4	-1.00000	300 1	4	.00000		&M13114
1344-	&M13114			3002	4 0.00000		3003	4-0.00000		
1345-	MPC	1	34	5	-1.00000	300 1	5	1.00000		&M13115
1346-	&M13115			3002	5-1.00000		3003	5 1.00000		
1347-	MPC	1	34	6	-1.00000	300 1	6	.00000		&M13116
1348-	&M13116			3002	6 0.00000		3003	6-0.00000		
1349-	MPC	1	35	1	-1.00000	400 1	1	1.00000		&M14011
1350-	&M14011			4002	1 1.00000		4003	1 1.00000		

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1351-	MPC	1	35	2	-1.00000	4001	2	.00000		&M14012
1352-	&M14012		4002	2	0.00000	4003	2	0.00000		
1353-	MPC	1	35	3	-1.00000	4001	3	1.00000		&M14013
1354-	&M14013		4002	3	1.00000	4003	3	1.00000		
1355-	MPC	1	35	4	-1.00000	4001	4	.00000		&M14014
1356-	&M14014		4002	4	0.00000	4003	4	0.00000		
1357-	MPC	1	35	5	-1.00000	4001	5	1.00000		&M14015
1358-	&M14015		4002	5	1.00000	4003	5	1.00000		
1359-	MPC	1	35	6	-1.00000	4001	6	.00000		&M14016
1360-	&M14016		4002	6	0.00000	4003	6	0.00000		
1361-	MPC	1	36	1	-1.00000	4001	1	1.00000		&M14021
1362-	&M14021		4002	1	0.95105	4003	1	0.80901		
1363-	MPC	1	36	2	-1.00000	4001	2	.00000		&M14022
1364-	&M14022		4002	2	0.30901	4003	2	0.58778		
1365-	MPC	1	36	3	-1.00000	4001	3	1.00000		&M14023
1366-	&M14023		4002	3	0.95105	4003	3	0.80901		
1367-	MPC	1	36	4	-1.00000	4001	4	.00000		&M14024
1368-	&M14024		4002	4	0.30901	4003	4	0.58778		
1369-	MPC	1	36	5	-1.00000	4001	5	1.00000		&M14025
1370-	&M14025		4002	5	0.95105	4003	5	0.80901		
1371-	MPC	1	36	6	-1.00000	4001	6	.00000		&M14026
1372-	&M14026		4002	6	0.30901	4003	6	0.58778		
1373-	MPC	1	37	1	-1.00000	4001	1	1.00000		&M14031
1374-	&M14031		4002	1	0.80901	4003	1	0.30901		
1375-	MPC	1	37	2	-1.00000	4001	2	.00000		&M14032
1376-	&M14032		4002	2	0.58778	4003	2	0.95105		
1377-	MPC	1	37	3	-1.00000	4001	3	1.00000		&M14033
1378-	&M14033		4002	3	0.80901	4003	3	0.30901		
1379-	MPC	1	37	4	-1.00000	4001	4	.00000		&M14034
1380-	&M14034		4002	4	0.58778	4003	4	0.95105		
1381-	MPC	1	37	5	-1.00000	4001	5	1.00000		&M14035
1382-	&M14035		4002	5	0.80901	4003	5	0.30901		
1383-	MPC	1	37	6	-1.00000	4001	6	.00000		&M14036
1384-	&M14036		4002	6	0.58778	4003	6	0.95105		
1385-	MPC	1	38	1	-1.00000	4001	1	1.00000		&M14041
1386-	&M14041		4002	1	0.58778	4003	1	-0.30901		
1387-	MPC	1	38	2	-1.00000	4001	2	.00000		&M14042
1388-	&M14042		4002	2	0.80901	4003	2	0.95105		
1389-	MPC	1	38	3	-1.00000	4001	3	1.00000		&M14043
1390-	&M14043		4002	3	0.58778	4003	3	-0.30901		
1391-	MPC	1	38	4	-1.00000	4001	4	.00000		&M14044
1392-	&M14044		4002	4	0.80901	4003	4	0.95105		
1393-	MPC	1	38	5	-1.00000	4001	5	1.00000		&M14045
1394-	&M14045		4002	5	0.58778	4003	5	-0.30901		
1395-	MPC	1	38	6	-1.00000	4001	6	.00000		&M14046
1396-	&M14046		4002	6	0.80901	4003	6	0.95105		
1397-	MPC	1	39	1	-1.00000	4001	1	1.00000		&M14051
1398-	&M14051		4002	1	0.30901	4003	1	-0.80901		
1399-	MPC	1	39	2	-1.00000	4001	2	.00000		&M14052
1400-	&M14052		4002	2	0.95105	4003	2	0.58778		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1401-	MPC	1	39	3	-1.00000400	1	3	1.00000		&M14053
1402-	&M14053			4002	3 0.30901		4003	3-0.80901		
1403-	MPC	1	39	4	-1.00000400	1	4	.00000		&M14054
1404-	&M14054			4002	4 0.95105		4003	4 0.58778		
1405-	MPC	1	39	5	-1.00000400	1	5	1.00000		&M14055
1406-	&M14055			4002	5 0.30901		4003	5-0.80901		
1407-	MPC	1	39	6	-1.00000400	1	6	.00000		&M14056
1408-	&M14056			4002	6 0.95105		4003	6 0.58778		
1409-	MPC	1	40	1	-1.00000400	1	1	1.00000		&M14061
1410-	&M14061			4002	1 0.00000		4003	1-1.00000		
1411-	MPC	1	40	2	-1.00000400	1	2	.00000		&M14062
1412-	&M14062			4002	2 1.00000		4003	2 0.00000		
1413-	MPC	1	40	3	-1.00000400	1	3	1.00000		&M14063
1414-	&M14063			4002	3 0.00000		4003	3-1.00000		
1415-	MPC	1	40	4	-1.00000400	1	4	.00000		&M14064
1416-	&M14064			4002	4 1.00000		4003	4 0.00000		
1417-	MPC	1	40	5	-1.00000400	1	5	1.00000		&M14065
1418-	&M14065			4002	5 0.00000		4003	5-1.00000		
1419-	MPC	1	40	6	-1.00000400	1	6	.00000		&M14066
1420-	&M14066			4002	6 1.00000		4003	6 0.00000		
1421-	MPC	1	41	1	-1.00000400	1	1	1.00000		&M14071
1422-	&M14071			4002	1-0.30901		4003	1-0.80901		
1423-	MPC	1	41	2	-1.00000400	1	2	.00000		&M14072
1424-	&M14072			4002	2 0.95105		4003	2-0.58778		
1425-	MPC	1	41	3	-1.00000400	1	3	1.00000		&M14073
1426-	&M14073			4002	3-0.30901		4003	3-0.80901		
1427-	MPC	1	41	4	-1.00000400	1	4	.00000		&M14074
1428-	&M14074			4002	4 0.95105		4003	4-0.58778		
1429-	MPC	1	41	5	-1.00000400	1	5	1.00000		&M14075
1430-	&M14075			4002	5-0.30901		4003	5-0.80901		
1431-	MPC	1	41	6	-1.00000400	1	6	.00000		&M14076
1432-	&M14076			4002	6 0.95105		4003	6-0.58778		
1433-	MPC	1	42	1	-1.00000400	1	1	1.00000		&M14081
1434-	&M14081			4002	1-0.58778		4003	1-0.30901		
1435-	MPC	1	42	2	-1.00000400	1	2	.00000		&M14082
1436-	&M14082			4002	2 0.80901		4003	2-0.95105		
1437-	MPC	1	42	3	-1.00000400	1	3	1.00000		&M14083
1438-	&M14083			4002	3-0.58778		4003	3-0.30901		
1439-	MPC	1	42	4	-1.00000400	1	4	.00000		&M14084
1440-	&M14084			4002	4 0.80901		4003	4-0.95105		
1441-	MPC	1	42	5	-1.00000400	1	5	1.00000		&M14085
1442-	&M14085			4002	5-0.58778		4003	5-0.30901		
1443-	MPC	1	42	6	-1.00000400	1	6	.00000		&M14086
1444-	&M14086			4002	6 0.80901		4003	6-0.95105		
1445-	MPC	1	43	1	-1.00000400	1	1	1.00000		&M14091
1446-	&M14091			4002	1-0.80901		4003	1 0.30901		
1447-	MPC	1	43	2	-1.00000400	1	2	.00000		&M14092
1448-	&M14092			4002	2 0.58778		4003	2-0.95105		
1449-	MPC	1	43	3	-1.00000400	1	3	1.00000		&M14093
1450-	&M14093			4002	3-0.80901		4003	3 0.30901		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1451-	MPC	1	43	4	-1.00000	4001	4	.00000		&M14094
1452-	&M14094			4002	4 0.58778		4003	4-0.95105		
1453-	MPC	1	43	5	-1.00000	4001	5	1.00000		&M14095
1454-	&M14095			4002	5-0.80901		4003	5 0.30901		
1455-	MPC	1	43	6	-1.00000	4001	6	.00000		&M14096
1456-	&M14096			4002	6 0.58778		4003	6-0.95105		
1457-	MPC	1	44	1	-1.00000	4001	1	1.00000		&M14101
1458-	&M14101			4002	1-0.95105		4003	1 0.80901		
1459-	MPC	1	44	2	-1.00000	4001	2	.00000		&M14102
1460-	&M14102			4002	2 0.30901		4003	2-0.58778		
1461-	MPC	1	44	3	-1.00000	4001	3	1.00000		&M14103
1462-	&M14103			4002	3-0.95105		4003	3 0.80901		
1463-	MPC	1	44	4	-1.00000	4001	4	.00000		&M14104
1464-	&M14104			4002	4 0.30901		4003	4-0.58778		
1465-	MPC	1	44	5	-1.00000	4001	5	1.00000		&M14105
1466-	&M14105			4002	5-0.95105		4003	5 0.80901		
1467-	MPC	1	44	6	-1.00000	4001	6	.00000		&M14106
1468-	&M14106			4002	6 0.30901		4003	6-0.58778		
1469-	MPC	1	45	1	-1.00000	4001	1	1.00000		&M14111
1470-	&M14111			4002	1-1.00000		4003	1 1.00000		
1471-	MPC	1	45	2	-1.00000	4001	2	.00000		&M14112
1472-	&M14112			4002	2 0.00000		4003	2-0.00000		
1473-	MPC	1	45	3	-1.00000	4001	3	1.00000		&M14113
1474-	&M14113			4002	3-1.00000		4003	3 1.00000		
1475-	MPC	1	45	4	-1.00000	4001	4	.00000		&M14114
1476-	&M14114			4002	4 0.00000		4003	4-0.00000		
1477-	MPC	1	45	5	-1.00000	4001	5	1.00000		&M14115
1478-	&M14115			4002	5-1.00000		4003	5 1.00000		
1479-	MPC	1	45	6	-1.00000	4001	6	.00000		&M14116
1480-	&M14116			4002	6 0.00000		4003	6-0.00000		
1481-	MPC	1	46	1	-1.00000	5001	1	1.00000		&M15011
1482-	&M15011			5002	1 1.00000		5003	1 1.00000		
1483-	MPC	1	46	2	-1.00000	5001	2	.00000		&M15012
1484-	&M15012			5002	2 0.00000		5003	2 0.00000		
1485-	MPC	1	46	3	-1.00000	5001	3	1.00000		&M15013
1486-	&M15013			5002	3 1.00000		5003	3 1.00000		
1487-	MPC	1	46	4	-1.00000	5001	4	.00000		&M15014
1488-	&M15014			5002	4 0.00000		5003	4 0.00000		
1489-	MPC	1	46	5	-1.00000	5001	5	1.00000		&M15015
1490-	&M15015			5002	5 1.00000		5003	5 1.00000		
1491-	MPC	1	46	6	-1.00000	5001	6	.00000		&M15016
1492-	&M15016			5002	6 0.00000		5003	6 0.00000		
1493-	MPC	1	47	1	-1.00000	5001	1	1.00000		&M15021
1494-	&M15021			5002	1 0.95105		5003	1 0.80901		
1495-	MPC	1	47	2	-1.00000	5001	2	.00000		&M15022
1496-	&M15022			5002	2 0.30901		5003	2 0.58778		
1497-	MPC	1	47	3	-1.00000	5001	3	1.00000		&M15023
1498-	&M15023			5002	3 0.95105		5003	3 0.80901		
1499-	MPC	1	47	4	-1.00000	5001	4	.00000		&M15024
1500-	&M15024			5002	4 0.30901		5003	4 0.58778		

SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
1501-	MPC	1	47	5	-1.00000	5001	5	1.00000		GM15025
1502-	GM15025		5002	5	0.95105	5003	5	0.80901		
1503-	MPC	1	47	6	-1.00000	5001	6	.00000		GM15026
1504-	GM15026		5002	6	0.30901	5003	6	0.58778		
1505-	MPC	1	48	1	-1.00000	5001	1	1.00000		GM15031
1506-	GM15031		5002	1	0.80901	5003	1	0.30901		
1507-	MPC	1	48	2	-1.00000	5001	2	.00000		GM15032
1508-	GM15032		5002	2	0.58778	5003	2	0.95105		
1509-	MPC	1	48	3	-1.00000	5001	3	1.00000		GM15033
1510-	GM15033		5002	3	0.80901	5003	3	0.30901		
1511-	MPC	1	48	4	-1.00000	5001	4	.00000		GM15034
1512-	GM15034		5002	4	0.58778	5003	4	0.95105		
1513-	MPC	1	48	5	-1.00000	5001	5	1.00000		GM15035
1514-	GM15035		5002	5	0.80901	5003	5	0.30901		
1515-	MPC	1	48	6	-1.00000	5001	6	.00000		GM15036
1516-	GM15036		5002	6	0.58778	5003	6	0.95105		
1517-	MPC	1	49	1	-1.00000	5001	1	1.00000		GM15041
1518-	GM15041		5002	1	0.58778	5003	1	-0.30901		
1519-	MPC	1	49	2	-1.00000	5001	2	.00000		GM15042
1520-	GM15042		5002	2	0.80901	5003	2	0.95105		
1521-	MPC	1	49	3	-1.00000	5001	3	1.00000		GM15043
1522-	GM15043		5002	3	0.58778	5003	3	-0.30901		
1523-	MPC	1	49	4	-1.00000	5001	4	.00000		GM15044
1524-	GM15044		5002	4	0.80901	5003	4	0.95105		
1525-	MPC	1	49	5	-1.00000	5001	5	1.00000		GM15045
1526-	GM15045		5002	5	0.58778	5003	5	-0.30901		
1527-	MPC	1	49	6	-1.00000	5001	6	.00000		GM15046
1528-	GM15046		5002	6	0.80901	5003	6	0.95105		
1529-	MPC	1	50	1	-1.00000	5001	1	1.00000		GM15051
1530-	GM15051		5002	1	0.30901	5003	1	-0.80901		
1531-	MPC	1	50	2	-1.00000	5001	2	.00000		GM15052
1532-	GM15052		5002	2	0.95105	5003	2	0.58778		
1533-	MPC	1	50	3	-1.00000	5001	3	1.00000		GM15053
1534-	GM15053		5002	3	0.30901	5003	3	-0.80901		
1535-	MPC	1	50	4	-1.00000	5001	4	.00000		GM15054
1536-	GM15054		5002	4	0.95105	5003	4	0.58778		
1537-	MPC	1	50	5	-1.00000	5001	5	1.00000		GM15055
1538-	GM15055		5002	5	0.30901	5003	5	-0.80901		
1539-	MPC	1	50	6	-1.00000	5001	6	.00000		GM15056
1540-	GM15056		5002	6	0.95105	5003	6	0.58778		
1541-	MPC	1	51	1	-1.00000	5001	1	1.00000		GM15061
1542-	GM15061		5002	1	0.00000	5003	1	-1.00000		
1543-	MPC	1	51	2	-1.00000	5001	2	.00000		GM15062
1544-	GM15062		5002	2	1.00000	5003	2	0.00000		
1545-	MPC	1	51	3	-1.00000	5001	3	1.00000		GM15063
1546-	GM15063		5002	3	0.00000	5003	3	-1.00000		
1547-	MPC	1	51	4	-1.00000	5001	4	.00000		GM15064
1548-	GM15064		5002	4	1.00000	5003	4	0.00000		
1549-	MPC	1	51	5	-1.00000	5001	5	1.00000		GM15065
1550-	GM15065		5002	5	0.00000	5003	5	-1.00000		

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1551-	MPC	1	51	6	-1.00000	5001	6	.00000		&M15066
1552-	&M15066		5002	6	1.00000	5003	6	0.00000		
1553-	MPC	1	52	1	-1.00000	5001	1	1.00000		&M15071
1554-	&M15071		5002	1	-0.30901	5003	1	-0.80901		
1555-	MPC	1	52	2	-1.00000	5001	2	.00000		&M15072
1556-	&M15072		5002	2	0.95105	5003	2	-0.58778		
1557-	MPC	1	52	3	-1.00000	5001	3	1.00000		&M15073
1558-	&M15073		5002	3	-0.30901	5003	3	-0.80901		
1559-	MPC	1	52	4	-1.00000	5001	4	.00000		&M15074
1560-	&M15074		5002	4	0.95105	5003	4	-0.58778		
1561-	MPC	1	52	5	-1.00000	5001	5	1.00000		&M15075
1562-	&M15075		5002	5	-0.30901	5003	5	-0.80901		
1563-	MPC	1	52	6	-1.00000	5001	6	.00000		&M15076
1564-	&M15076		5002	6	0.95105	5003	6	-0.58778		
1565-	MPC	1	53	1	-1.00000	5001	1	1.00000		&M15081
1566-	&M15081		5002	1	-0.58778	5003	1	-0.30901		
1567-	MPC	1	53	2	-1.00000	5001	2	.00000		&M15082
1568-	&M15082		5002	2	0.80901	5003	2	-0.95105		
1569-	MPC	1	53	3	-1.00000	5001	3	1.00000		&M15083
1570-	&M15083		5002	3	-0.58778	5003	3	-0.30901		
1571-	MPC	1	53	4	-1.00000	5001	4	.00000		&M15084
1572-	&M15084		5002	4	0.80901	5003	4	-0.95105		
1573-	MPC	1	53	5	-1.00000	5001	5	1.00000		&M15085
1574-	&M15085		5002	5	-0.58778	5003	5	-0.30901		
1575-	MPC	1	53	6	-1.00000	5001	6	.00000		&M15086
1576-	&M15086		5002	6	0.80901	5003	6	-0.95105		
1577-	MPC	1	54	1	-1.00000	5001	1	1.00000		&M15091
1578-	&M15091		5002	1	-0.80901	5003	1	0.30901		
1579-	MPC	1	54	2	-1.00000	5001	2	.00000		&M15092
1580-	&M15092		5002	2	0.58778	5003	2	-0.95105		
1581-	MPC	1	54	3	-1.00000	5001	3	1.00000		&M15093
1582-	&M15093		5002	3	-0.80901	5003	3	0.30901		
1583-	MPC	1	54	4	-1.00000	5001	4	.00000		&M15094
1584-	&M15094		5002	4	0.58778	5003	4	-0.95105		
1585-	MPC	1	54	5	-1.00000	5001	5	1.00000		&M15095
1586-	&M15095		5002	5	-0.80901	5003	5	0.30901		
1587-	MPC	1	54	6	-1.00000	5001	6	.00000		&M15096
1588-	&M15096		5002	6	0.58778	5003	6	-0.95105		
1589-	MPC	1	55	1	-1.00000	5001	1	1.00000		&M15101
1590-	&M15101		5002	1	-0.95105	5003	1	0.80901		
1591-	MPC	1	55	2	-1.00000	5001	2	.00000		&M15102
1592-	&M15102		5002	2	0.30901	5003	2	-0.58778		
1593-	MPC	1	55	3	-1.00000	5001	3	1.00000		&M15103
1594-	&M15103		5002	3	-0.95105	5003	3	0.80901		
1595-	MPC	1	55	4	-1.00000	5001	4	.00000		&M15104
1596-	&M15104		5002	4	0.30901	5003	4	-0.58778		
1597-	MPC	1	55	5	-1.00000	5001	5	1.00000		&M15105
1598-	&M15105		5002	5	-0.95105	5003	5	0.80901		
1599-	MPC	1	55	6	-1.00000	5001	6	.00000		&M15106
1600-	&M15106		5002	6	0.30901	5003	6	-0.58778		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1601-	MPC	1	56	1	-1.00000	5001	1	1.00000		&M15111
1602-	&M15111		5002	1	-1.00000	5003	1	1.00000		
1603-	MPC	1	56	2	-1.00000	5001	2	.00000		&M15112
1604-	&M15112		5002	2	0.00000	5003	2	-0.00000		
1605-	MPC	1	56	3	-1.00000	5001	3	1.00000		&M15113
1606-	&M15113		5002	3	-1.00000	5003	3	1.00000		
1607-	MPC	1	56	4	-1.00000	5001	4	.00000		&M15114
1608-	&M15114		5002	4	0.00000	5003	4	-0.00000		
1609-	MPC	1	56	5	-1.00000	5001	5	1.00000		&M15115
1610-	&M15115		5002	5	-1.00000	5003	5	1.00000		
1611-	MPC	1	56	6	-1.00000	5001	6	.00000		&M15116
1612-	&M15116		5002	6	0.00000	5003	6	-0.00000		
1613-	MPC	1	57	1	-1.00000	6001	1	1.00000		&M16011
1614-	&M16011		6002	1	1.00000	6003	1	1.00000		
1615-	MPC	1	57	2	-1.00000	6001	2	.00000		&M16012
1616-	&M16012		6002	2	0.00000	6003	2	0.00000		
1617-	MPC	1	57	3	-1.00000	6001	3	1.00000		&M16013
1618-	&M16013		6002	3	1.00000	6003	3	1.00000		
1619-	MPC	1	57	4	-1.00000	6001	4	.00000		&M16014
1620-	&M16014		6002	4	0.00000	6003	4	0.00000		
1621-	MPC	1	57	5	-1.00000	6001	5	1.00000		&M16015
1622-	&M16015		6002	5	1.00000	6003	5	1.00000		
1623-	MPC	1	57	6	-1.00000	6001	6	.00000		&M16016
1624-	&M16016		6002	6	0.00000	6003	6	0.00000		
1625-	MPC	1	58	1	-1.00000	6001	1	1.00000		&M16021
1626-	&M16021		6002	1	0.95105	6003	1	0.80901		
1627-	MPC	1	58	2	-1.00000	6001	2	.00000		&M16022
1628-	&M16022		6002	2	0.30901	6003	2	0.58778		
1629-	MPC	1	58	3	-1.00000	6001	3	1.00000		&M16023
1630-	&M16023		6002	3	0.95105	6003	3	0.80901		
1631-	MPC	1	58	4	-1.00000	6001	4	.00000		&M16024
1632-	&M16024		6002	4	0.30901	6003	4	0.58778		
1633-	MPC	1	58	5	-1.00000	6001	5	1.00000		&M16025
1634-	&M16025		6002	5	0.95105	6003	5	0.80901		
1635-	MPC	1	58	6	-1.00000	6001	6	.00000		&M16026
1636-	&M16026		6002	6	0.30901	6003	6	0.58778		
1637-	MPC	1	59	1	-1.00000	6001	1	1.00000		&M16031
1638-	&M16031		6002	1	0.80901	6003	1	0.30901		
1639-	MPC	1	59	2	-1.00000	6001	2	.00000		&M16032
1640-	&M16032		6002	2	0.58778	6003	2	0.95105		
1641-	MPC	1	59	3	-1.00000	6001	3	1.00000		&M16033
1642-	&M16033		6002	3	0.80901	6003	3	0.30901		
1643-	MPC	1	59	4	-1.00000	6001	4	.00000		&M16034
1644-	&M16034		6002	4	0.58778	6003	4	0.95105		
1645-	MPC	1	59	5	-1.00000	6001	5	1.00000		&M16035
1646-	&M16035		6002	5	0.80901	6003	5	0.30901		
1647-	MPC	1	59	6	-1.00000	6001	6	.00000		&M16036
1648-	&M16036		6002	6	0.58778	6003	6	0.95105		
1649-	MPC	1	60	1	-1.00000	6001	1	1.00000		&M16041
1650-	&M16041		6002	1	0.58778	6003	1	-0.30901		

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1651-	MPC	1	60	2	-1.000006001	2		.00000		&M16042
1652-	&M16042		6002		2 0.80901	6003		2 0.95105		
1653-	MPC	1	60	3	-1.000006001	3		1.00000		&M16043
1654-	&M16043		6002		3 0.58778	6003		3-0.30901		
1655-	MPC	1	60	4	-1.000006001	4		.00000		&M16044
1656-	&M16044		6002		4 0.80901	6003		4 0.95105		
1657-	MPC	1	60	5	-1.000006001	5		1.00000		&M16045
1658-	&M16045		6002		5 0.58778	6003		5-0.30901		
1659-	MPC	1	60	6	-1.000006001	6		.00000		&M16046
1660-	&M16046		6002		6 0.80901	6003		6 0.95105		
1661-	MPC	1	61	1	-1.000006001	1		1.00000		&M16051
1662-	&M16051		6002		1 0.30901	6003		1-0.80901		
1663-	MPC	1	61	2	-1.000006001	2		.00000		&M16052
1664-	&M16052		6002		2 0.95105	6003		2 0.58778		
1665-	MPC	1	61	3	-1.000006001	3		1.00000		&M16053
1666-	&M16053		6002		3 0.30901	6003		3-0.80901		
1667-	MPC	1	61	4	-1.000006001	4		.00000		&M16054
1668-	&M16054		6002		4 0.95105	6003		4 0.58778		
1669-	MPC	1	61	5	-1.000006001	5		1.00000		&M16055
1670-	&M16055		6002		5 0.30901	6003		5-0.80901		
1671-	MPC	1	61	6	-1.000006001	6		.00000		&M16056
1672-	&M16056		6002		6 0.95105	6003		6 0.58778		
1673-	MPC	1	62	1	-1.000006001	1		1.00000		&M16061
1674-	&M16061		6002		1 0.00000	6003		1-1.00000		
1675-	MPC	1	62	2	-1.000006001	2		.00000		&M16062
1676-	&M16062		6002		2 1.00000	6003		2 0.00000		
1677-	MPC	1	62	3	-1.000006001	3		1.00000		&M16063
1678-	&M16063		6002		3 0.00000	6003		3-1.00000		
1679-	MPC	1	62	4	-1.000006001	4		.00000		&M16064
1680-	&M16064		6002		4 1.00000	6003		4 0.00000		
1681-	MPC	1	62	5	-1.000006001	5		1.00000		&M16065
1682-	&M16065		6002		5 0.00000	6003		5-1.00000		
1683-	MPC	1	62	6	-1.000006001	6		.00000		&M16066
1684-	&M16066		6002		6 1.00000	6003		6 0.00000		
1685-	MPC	1	63	1	-1.000006001	1		1.00000		&M16071
1686-	&M16071		6002		1-0.30901	6003		1-0.80901		
1687-	MPC	1	63	2	-1.000006001	2		.00000		&M16072
1688-	&M16072		6002		2 0.95105	6003		2-0.58778		
1689-	MPC	1	63	3	-1.000006001	3		1.00000		&M16073
1690-	&M16073		6002		3-0.30901	6003		3-0.80901		
1691-	MPC	1	63	4	-1.000006001	4		.00000		&M16074
1692-	&M16074		6002		4 0.95105	6003		4-0.58778		
1693-	MPC	1	63	5	-1.000006001	5		1.00000		&M16075
1694-	&M16075		6002		5-0.30901	6003		5-0.80901		
1695-	MPC	1	63	6	-1.000006001	6		.00000		&M16076
1696-	&M16076		6002		6 0.95105	6003		6-0.58778		
1697-	MPC	1	64	1	-1.000006001	1		1.00000		&M16081
1698-	&M16081		6002		1-0.58778	6003		1-0.30901		
1699-	MPC	1	64	2	-1.000006001	2		.00000		&M16082
1700-	&M16082		6002		2 0.80901	6003		2-0.95105		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1701-	MPC	1	64	3	-1.00000600	1	3	1.00000		&M16083
1702-	&M16083		6002	3	-0.58778	6003	3	-0.30901		
1703-	MPC	1	64	4	-1.00000600	1	4	.00000		&M16084
1704-	&M16084		6002	4	0.80901	6003	4	-0.95105		
1705-	MPC	1	64	5	-1.00000600	1	5	1.00000		&M16085
1706-	&M16085		6002	5	-0.58778	6003	5	-0.30901		
1707-	MPC	1	64	6	-1.00000600	1	6	.00000		&M16086
1708-	&M16086		6002	6	0.80901	6003	6	-0.95105		
1709-	MPC	1	65	1	-1.00000600	1	1	1.00000		&M16091
1710-	&M16091		6002	1	-0.80901	6003	1	0.30901		
1711-	MPC	1	65	2	-1.00000600	1	2	.00000		&M16092
1712-	&M16092		6002	2	0.58778	6003	2	-0.95105		
1713-	MPC	1	65	3	-1.00000600	1	3	1.00000		&M16093
1714-	&M16093		6002	3	-0.80901	6003	3	0.30901		
1715-	MPC	1	65	4	-1.00000600	1	4	.00000		&M16094
1716-	&M16094		6002	4	0.58778	6003	4	-0.95105		
1717-	MPC	1	65	5	-1.00000600	1	5	1.00000		&M16095
1718-	&M16095		6002	5	-0.80901	6003	5	0.30901		
1719-	MPC	1	65	6	-1.00000600	1	6	.00000		&M16096
1720-	&M16096		6002	6	0.58778	6003	6	-0.95105		
1721-	MPC	1	66	1	-1.00000600	1	1	1.00000		&M16101
1722-	&M16101		6002	1	-0.95105	6003	1	0.80901		
1723-	MPC	1	66	2	-1.00000600	1	2	.00000		&M16102
1724-	&M16102		6002	2	0.30901	6003	2	-0.58778		
1725-	MPC	1	66	3	-1.00000600	1	3	1.00000		&M16103
1726-	&M16103		6002	3	-0.95105	6003	3	0.80901		
1727-	MPC	1	66	4	-1.00000600	1	4	.00000		&M16104
1728-	&M16104		6002	4	0.30901	6003	4	-0.58778		
1729-	MPC	1	66	5	-1.00000600	1	5	1.00000		&M16105
1730-	&M16105		6002	5	-0.95105	6003	5	0.80901		
1731-	MPC	1	66	6	-1.00000600	1	6	.00000		&M16106
1732-	&M16106		6002	6	0.30901	6003	6	-0.58778		
1733-	MPC	1	67	1	-1.00000600	1	1	1.00000		&M16111
1734-	&M16111		6002	1	-1.00000	6003	1	1.00000		
1735-	MPC	1	67	2	-1.00000600	1	2	.00000		&M16112
1736-	&M16112		6002	2	0.00000	6003	2	-0.00000		
1737-	MPC	1	67	3	-1.00000600	1	3	1.00000		&M16113
1738-	&M16113		6002	3	-1.00000	6003	3	1.00000		
1739-	MPC	1	67	4	-1.00000600	1	4	.00000		&M16114
1740-	&M16114		6002	4	0.00000	6003	4	-0.00000		
1741-	MPC	1	67	5	-1.00000600	1	5	1.00000		&M16115
1742-	&M16115		6002	5	-1.00000	6003	5	1.00000		
1743-	MPC	1	67	6	-1.00000600	1	6	.00000		&M16116
1744-	&M16116		6002	6	0.00000	6003	6	-0.00000		
1745-	MPC	1	68	1	-1.00000700	1	1	1.00000		&M17011
1746-	&M17011		7002	1	1.00000	7003	1	1.00000		
1747-	MPC	1	68	2	-1.00000700	1	2	.00000		&M17012
1748-	&M17012		7002	2	0.00000	7003	2	0.00000		
1749-	MPC	1	68	3	-1.00000700	1	3	1.00000		&M17013
1750-	&M17013		7002	3	1.00000	7003	3	1.00000		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1751-	MPC	1	68	4	-1.000007001	4		.00000		EM17014
1752-	EM17014		7002	4	0.00000	7003	4	0.00000		
1753-	MPC	1	68	5	-1.000007001	5		1.00000		EM17015
1754-	EM17015		7002	5	1.00000	7003	5	1.00000		
1755-	MPC	1	68	6	-1.000007001	6		.00000		EM17016
1756-	EM17016		7002	6	0.00000	7003	6	0.00000		
1757-	MPC	1	69	1	-1.000007001	1		1.00000		EM17021
1758-	EM17021		7002	1	0.95105	7003	1	0.80901		
1759-	MPC	1	69	2	-1.000007001	2		.00000		EM17022
1760-	EM17022		7002	2	0.30901	7003	2	0.58778		
1761-	MPC	1	69	3	-1.000007001	3		1.00000		EM17023
1762-	EM17023		7002	3	0.95105	7003	3	0.80901		
1763-	MPC	1	69	4	-1.000007001	4		.00000		EM17024
1764-	EM17024		7002	4	0.30901	7003	4	0.58778		
1765-	MPC	1	69	5	-1.000007001	5		1.00000		EM17025
1766-	EM17025		7002	5	0.95105	7003	5	0.80901		
1767-	MPC	1	69	6	-1.000007001	6		.00000		EM17026
1768-	EM17026		7002	6	0.30901	7003	6	0.58778		
1769-	MPC	1	70	1	-1.000007001	1		1.00000		EM17031
1770-	EM17031		7002	1	0.80901	7003	1	0.30901		
1771-	MPC	1	70	2	-1.000007001	2		.00000		EM17032
1772-	EM17032		7002	2	0.58778	7003	2	0.95105		
1773-	MPC	1	70	3	-1.000007001	3		1.00000		EM17033
1774-	EM17033		7002	3	0.80901	7003	3	0.30901		
1775-	MPC	1	70	4	-1.000007001	4		.00000		EM17034
1776-	EM17034		7002	4	0.58778	7003	4	0.95105		
1777-	MPC	1	70	5	-1.000007001	5		1.00000		EM17035
1778-	EM17035		7002	5	0.80901	7003	5	0.30901		
1779-	MPC	1	70	6	-1.000007001	6		.00000		EM17036
1780-	EM17036		7002	6	0.58778	7003	6	0.95105		
1781-	MPC	1	71	1	-1.000007001	1		1.00000		EM17041
1782-	EM17041		7002	1	0.58778	7003	1	-0.30901		
1783-	MPC	1	71	2	-1.000007001	2		.00000		EM17042
1784-	EM17042		7002	2	0.80901	7003	2	0.95106		
1785-	MPC	1	71	3	-1.000007001	3		1.00000		EM17043
1786-	EM17043		7002	3	0.58778	7003	3	-0.30901		
1787-	MPC	1	71	4	-1.000007001	4		.00000		EM17044
1788-	EM17044		7002	4	0.80901	7003	4	0.95105		
1789-	MPC	1	71	5	-1.000007001	5		1.00000		EM17045
1790-	EM17045		7002	5	0.58778	7003	5	-0.30901		
1791-	MPC	1	71	6	-1.000007001	6		.00000		EM17046
1792-	EM17046		7002	6	0.80901	7003	6	0.95105		
1793-	MPC	1	72	1	-1.000007001	1		1.00000		EM17051
1794-	EM17051		7002	1	0.30901	7003	1	-0.80901		
1795-	MPC	1	72	2	-1.000007001	2		.00000		EM17052
1796-	EM17052		7002	2	0.95105	7003	2	0.58778		
1797-	MPC	1	72	3	-1.000007001	3		1.00000		EM17053
1798-	EM17053		7002	3	0.30901	7003	3	-0.80901		
1799-	MPC	1	72	4	-1.000007001	4		.00000		EM17054
1800-	EM17054		7002	4	0.95105	7003	4	0.58778		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1801-	MPC	1	72	5	-1.00000	7001	5	1.00000		&M17055
1802-	&M17055		7002	5	0.30901	7003	5	-0.80901		
1803-	MPC	1	72	6	-1.00000	7001	6	.00000		&M17056
1804-	&M17056		7002	6	0.95105	7003	6	0.58778		
1805-	MPC	1	73	1	-1.00000	7001	1	1.00000		&M17061
1806-	&M17061		7002	1	0.00000	7003	1	-1.00000		
1807-	MPC	1	73	2	-1.00000	7001	2	.00000		&M17062
1808-	&M17062		7002	2	1.00000	7003	2	0.00000		
1809-	MPC	1	73	3	-1.00000	7001	3	1.00000		&M17063
1810-	&M17063		7002	3	0.00000	7003	3	-1.00000		
1811-	MPC	1	73	4	-1.00000	7001	4	.00000		&M17064
1812-	&M17064		7002	4	1.00000	7003	4	0.00000		
1813-	MPC	1	73	5	-1.00000	7001	5	1.00000		&M17065
1814-	&M17065		7002	5	0.00000	7003	5	-1.00000		
1815-	MPC	1	73	6	-1.00000	7001	6	.00000		&M17066
1816-	&M17066		7002	6	1.00000	7003	6	0.00000		
1817-	MPC	1	74	1	-1.00000	7001	1	1.00000		&M17071
1818-	&M17071		7002	1	-0.30901	7003	1	-0.80901		
1819-	MPC	1	74	2	-1.00000	7001	2	.00000		&M17072
1820-	&M17072		7002	2	0.95105	7003	2	-0.58778		
1821-	MPC	1	74	3	-1.00000	7001	3	1.00000		&M17073
1822-	&M17073		7002	3	-0.30901	7003	3	-0.80901		
1823-	MPC	1	74	4	-1.00000	7001	4	.00000		&M17074
1824-	&M17074		7002	4	0.95105	7003	4	-0.58778		
1825-	MPC	1	74	5	-1.00000	7001	5	1.00000		&M17075
1826-	&M17075		7002	5	-0.30901	7003	5	-0.80901		
1827-	MPC	1	74	6	-1.00000	7001	6	.00000		&M17076
1828-	&M17076		7002	6	0.95105	7003	6	-0.58778		
1829-	MPC	1	75	1	-1.00000	7001	1	1.00000		&M17081
1830-	&M17081		7002	1	-0.58778	7003	1	-0.30901		
1831-	MPC	1	75	2	-1.00000	7001	2	.00000		&M17082
1832-	&M17082		7002	2	0.30901	7003	2	-0.95105		
1833-	MPC	1	75	3	-1.00000	7001	3	1.00000		&M17083
1834-	&M17083		7002	3	-0.58778	7003	3	-0.30901		
1835-	MPC	1	75	4	-1.00000	7001	4	.00000		&M17084
1836-	&M17084		7002	4	0.80901	7003	4	-0.95105		
1837-	MPC	1	75	5	-1.00000	7001	5	1.00000		&M17085
1838-	&M17085		7002	5	-0.58778	7003	5	-0.30901		
1839-	MPC	1	75	6	-1.00000	7001	6	.00000		&M17086
1840-	&M17086		7002	6	0.80901	7003	6	-0.95105		
1841-	MPC	1	76	1	-1.00000	7001	1	1.00000		&M17091
1842-	&M17091		7002	1	-0.80901	7003	1	0.30901		
1843-	MPC	1	76	2	-1.00000	7001	2	.00000		&M17092
1844-	&M17092		7002	2	0.58778	7003	2	-0.95105		
1845-	MPC	1	76	3	-1.00000	7001	3	1.00000		&M17093
1846-	&M17093		7002	3	-0.80901	7003	3	0.30901		
1847-	MPC	1	76	4	-1.00000	7001	4	.00000		&M17094
1848-	&M17094		7002	4	0.58778	7003	4	-0.95105		
1849-	MPC	1	76	5	-1.00000	7001	5	1.00000		&M17095
1850-	&M17095		7002	5	-0.80901	7003	5	0.30901		

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S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1851-	MPC	1	76	6	-1.00000700 1	6		.00000		&M17096
1852-	&M17056.		7002	6 0.58778	7003			6-0.95105		
1853-	MPC	1	77	1	-1.00000700 1	1		1.00000		&M17101
1854-	&M17101		7002	1-0.95105	7003			1 0.80901		
1855-	MPC	1	77	2	-1.00000700 1	2		.00000		&M17102
1856-	&M17102		7002	2 0.30901	7003			2-0.58778		
1857-	MPC	1	77	3	-1.00000700 1	3		1.00000		&M17103
1858-	&M17103		7002	3-0.95105	7003			3 0.80901		
1859-	MPC	1	77	4	-1.00000700 1	4		.00000		&M17104
1860-	&M17104		7002	4 0.30901	7003			4-0.58778		
1861-	MPC	1	77	5	-1.00000700 1	5		1.00000		&M17105
1862-	&M17105		7002	5-0.95105	7003			5 0.80901		
1863-	MPC	1	77	6	-1.00000700 1	6		.00000		&M17106
1864-	&M17106		7002	6 0.30901	7003			6-0.58778		
1865-	MPC	1	78	1	-1.00000700 1	1		1.00000		&M17111
1866-	&M17111		7002	1-1.00000	7003			1 1.00000		
1867-	MPC	1	78	2	-1.00000700 1	2		.00000		&M17112
1868-	&M17112		7002	2 0.00000	7003			2-0.00000		
1869-	MPC	1	78	3	-1.00000700 1	3		1.00000		&M17113
1870-	&M17113		7002	3-1.00000	7003			3 1.00000		
1871-	MPC	1	78	4	-1.00000700 1	4		.00000		&M17114
1872-	&M17114		7002	4 0.00000	7003			4-0.00000		
1873-	MPC	1	78	5	-1.00000700 1	5		1.00000		&M17115
1874-	&M17115		7002	5-1.00000	7003			5 1.00000		
1875-	MPC	1	78	6	-1.00000700 1	6		.00000		&M17116
1876-	&M17116		7002	6 0.00000	7003			6-0.00000		
1877-	MPC	1	79	1	-1.00000800 1	1		1.00000		&M18011
1878-	&M18011		8002	1 1.00000	8003			1 1.00000		
1879-	MPC	1	79	2	-1.00000800 1	2		.00000		&M18012
1880-	&M18012		8002	2 0.00000	8003			2 0.00000		
1881-	MPC	1	79	3	-1.00000800 1	3		1.00000		&M18013
1882-	&M18013		8002	3 1.00000	8003			3 1.00000		
1883-	MPC	1	79	4	-1.00000800 1	4		.00000		&M18014
1884-	&M18014		8002	4 0.00000	8003			4 0.00000		
1885-	MPC	1	79	5	-1.00000800 1	5		1.00000		&M18015
1886-	&M18015		8002	5 1.00000	8003			5 1.00000		
1887-	MPC	1	79	6	-1.00000800 1	6		.00000		&M18016
1888-	&M18016		8002	6 0.00000	8003			6 0.00000		
1889-	MPC	1	80	1	-1.00000800 1	1		1.00000		&M18021
1890-	&M18021		8002	1 0.95105	8003			1 0.80901		
1891-	MPC	1	80	2	-1.00000800 1	2		.00000		&M18022
1892-	&M18022		8002	2 0.30901	8003			2 0.58778		
1893-	MPC	1	80	3	-1.00000800 1	3		1.00000		&M18023
1894-	&M18023		8002	3 0.95105	8003			3 0.80901		
1895-	MPC	1	80	4	-1.00000800 1	4		.00000		&M18024
1896-	&M18024		8002	4 0.30901	8003			4 0.58778		
1897-	MPC	1	80	5	-1.00000800 1	5		1.00000		&M18025
1898-	&M18025		8002	5 0.95105	8003			5 0.80901		
1899-	MPC	1	80	6	-1.00000800 1	6		.00000		&M18026
1900-	&M18026		8002	6 0.30901	8003			6 0.58778		

SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
1901-	MPC	1	81	1	-1.00000	8001	1	1.00000		&M18031
1902-	&M18031		8002	1	0.80901	8003	1	0.30901		
1903-	MPC	1	81	2	-1.00000	8001	2	.00000		&M18032
1904-	&M18032		8002	2	0.58778	8003	2	0.95105		
1905-	MPC	1	81	3	-1.00000	8001	3	1.00000		&M18033
1906-	&M18033		8002	3	0.80901	8003	3	0.30901		
1907-	MPC	1	81	4	-1.00000	8001	4	.00000		&M18034
1908-	&M18034		8002	4	0.58778	8003	4	0.95105		
1909-	MPC	1	81	5	-1.00000	8001	5	1.00000		&M18035
1910-	&M18035		8002	5	0.80901	8003	5	0.30901		
1911-	MPC	1	81	6	-1.00000	8001	6	.00000		&M18036
1912-	&M18036		8002	6	0.58778	8003	6	0.95105		
1913-	MPC	1	82	1	-1.00000	8001	1	1.00000		&M18041
1914-	&M18041		8002	1	0.58778	8003	1	-0.30901		
1915-	MPC	1	82	2	-1.00000	8001	2	.00000		&M18042
1916-	&M18042		8002	2	0.80901	8003	2	0.95105		
1917-	MPC	1	82	3	-1.00000	8001	3	1.00000		&M18043
1918-	&M18043		8002	3	0.58778	8003	3	-0.30901		
1919-	MPC	1	82	4	-1.00000	8001	4	.00000		&M18044
1920-	&M18044		8002	4	0.80901	8003	4	0.95105		
1921-	MPC	1	82	5	-1.00000	8001	5	1.00000		&M18045
1922-	&M18045		8002	5	0.58778	8003	5	-0.30901		
1923-	MPC	1	82	6	-1.00000	8001	6	.00000		&M18046
1924-	&M18046		8002	6	0.80901	8003	6	0.95105		
1925-	MPC	1	83	1	-1.00000	8001	1	1.00000		&M18051
1926-	&M18051		8002	1	0.30901	8003	1	-0.80901		
1927-	MPC	1	83	2	-1.00000	8001	2	.00000		&M18052
1928-	&M18052		8002	2	0.95105	8003	2	0.58778		
1929-	MPC	1	83	3	-1.00000	8001	3	1.00000		&M18053
1930-	&M18053		8002	3	0.30901	8003	3	-0.80901		
1931-	MPC	1	83	4	-1.00000	8001	4	.00000		&M18054
1932-	&M18054		8002	4	0.95105	8003	4	0.58778		
1933-	MPC	1	83	5	-1.00000	8001	5	1.00000		&M18055
1934-	&M18055		8002	5	0.30901	8003	5	-0.80901		
1935-	MPC	1	83	6	-1.00000	8001	6	.00000		&M18056
1936-	&M18056		8002	6	0.95105	8003	6	0.58778		
1937-	MPC	1	84	1	-1.00000	8001	1	1.00000		&M18061
1938-	&M18061		8002	1	0.00000	8003	1	-1.00000		
1939-	MPC	1	84	2	-1.00000	8001	2	.00000		&M18062
1940-	&M18062		8002	2	1.00000	8003	2	0.00000		
1941-	MPC	1	84	3	-1.00000	8001	3	1.00000		&M18063
1942-	&M18063		8002	3	0.00000	8003	3	-1.00000		
1943-	MPC	1	84	4	-1.00000	8001	4	.00000		&M18064
1944-	&M18064		8002	4	1.00000	8003	4	0.00000		
1945-	MPC	1	84	5	-1.00000	8001	5	1.00000		&M18065
1946-	&M18065		8002	5	0.00000	8003	5	-1.00000		
1947-	MPC	1	84	6	-1.00000	8001	6	.00000		&M18066
1948-	&M18066		8002	6	1.00000	8003	6	0.00000		
1949-	MPC	1	85	1	-1.00000	8001	1	1.00000		&M18071
1950-	&M18071		8002	1	-0.30901	8003	1	-0.80901		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1951-	MPC	1	85	2	-1.00000800	1	2	.00000		&M18072
1952-	&M18072		8002	2	0.95105	8003	2	-0.58778		
1953-	MPC	1	85	3	-1.00000800	1	3	1.00000		&M18073
1954-	&M18073		8002	3	-0.30901	8003	3	-0.80901		
1955-	MPC	1	85	4	-1.00000800	1	4	.00000		&M18074
1956-	&M18074		8002	4	0.95105	8003	4	-0.58778		
1957-	MPC	1	85	5	-1.00000800	1	5	1.00000		&M18075
1958-	&M18075		8002	5	-0.30901	8003	5	-0.80901		
1959-	MPC	1	85	6	-1.00000800	1	6	.00000		&M18076
1960-	&M18076		8002	6	0.95105	8003	6	-0.58778		
1961-	MPC	1	86	1	-1.00000800	1	1	1.00000		&M18081
1962-	&M18081		8002	1	-0.58778	8003	1	-0.30901		
1963-	MPC	1	86	2	-1.00000800	1	2	.00000		&M18082
1964-	&M18082		8002	2	0.80901	8003	2	-0.95105		
1965-	MPC	1	86	3	-1.00000800	1	3	1.00000		&M18083
1966-	&M18083		8002	3	-0.58778	8003	3	-0.30901		
1967-	MPC	1	86	4	-1.00000800	1	4	.00000		&M18084
1968-	&M18084		8002	4	0.80901	8003	4	-0.95105		
1969-	MPC	1	86	5	-1.00000800	1	5	1.00000		&M18085
1970-	&M18085		8002	5	-0.58778	8003	5	-0.30901		
1971-	MPC	1	86	6	-1.00000800	1	6	.00000		&M18086
1972-	&M18086		8002	6	0.80901	8003	6	-0.95105		
1973-	MPC	1	87	1	-1.00000800	1	1	1.00000		&M18091
1974-	&M18091		8002	1	-0.80901	8003	1	0.30901		
1975-	MPC	1	87	2	-1.00000800	1	2	.00000		&M18092
1976-	&M18092		8002	2	0.58778	8003	2	-0.95105		
1977-	MPC	1	87	3	-1.00000800	1	3	1.00000		&M18093
1978-	&M18093		8002	3	-0.80901	8003	3	0.30901		
1979-	MPC	1	87	4	-1.00000800	1	4	.00000		&M18094
1980-	&M18094		8002	4	0.58778	8003	4	-0.95105		
1981-	MPC	1	87	5	-1.00000800	1	5	1.00000		&M18095
1982-	&M18095		8002	5	-0.80901	8003	5	0.30901		
1983-	MPC	1	87	6	-1.00000800	1	6	.00000		&M18096
1984-	&M18096		8002	6	0.58778	8003	6	-0.95105		
1985-	MPC	1	88	1	-1.00000800	1	1	1.00000		&M18101
1986-	&M18101		8002	1	-0.95105	8003	1	0.80901		
1987-	MPC	1	88	2	-1.00000800	1	2	.00000		&M18102
1988-	&M18102		8002	2	0.30901	8003	2	-0.58778		
1989-	MPC	1	88	3	-1.00000800	1	3	1.00000		&M18103
1990-	&M18103		8002	3	-0.95105	8003	3	0.80901		
1991-	MPC	1	88	4	-1.00000800	1	4	.00000		&M18104
1992-	&M18104		8002	4	0.30901	8003	4	-0.58778		
1993-	MPC	1	88	5	-1.00000800	1	5	1.00000		&M18105
1994-	&M18105		8002	5	-0.95105	8003	5	0.80901		
1995-	MPC	1	88	6	-1.00000800	1	6	.00000		&M18106
1996-	&M18106		8002	6	0.30901	8003	6	-0.58778		
1997-	MPC	1	89	1	-1.00000800	1	1	1.00000		&M18111
1998-	&M18111		8002	1	-1.00000	8003	1	1.00000		
1999-	MPC	1	89	2	-1.00000800	1	2	.00000		&M18112
2000-	&M18112		8002	2	0.00000	8003	2	-0.00000		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
2001-	MPC	1	89	3	-1.00000	8001	3	1.00000		GM18113
2002-	GM18113		8002	3	-1.00000	8003	3	1.00000		
2003-	MPC	1	89	4	-1.00000	8001	4	.00000		GM18114
2004-	GM18114		8002	4	0.00000	8003	4	-0.00000		
2005-	MPC	1	89	5	-1.00000	8001	5	1.00000		GM18115
2006-	GM18115		8002	5	-1.00000	8003	5	1.00000		
2007-	MPC	1	89	6	-1.00000	8001	6	.00000		GM18116
2008-	GM18116		8002	6	0.00000	8003	6	-0.00000		
2009-	MPC	1	90	1	-1.00000	9001	1	1.00000		GM19011
2010-	GM19011		9002	1	1.00000	9003	1	1.00000		
2011-	MPC	1	90	2	-1.00000	9001	2	.00000		GM19012
2012-	GM19012		9002	2	0.00000	9003	2	0.00000		
2013-	MPC	1	90	3	-1.00000	9001	3	1.00000		GM19013
2014-	GM19013		9002	3	1.00000	9003	3	1.00000		
2015-	MPC	1	90	4	-1.00000	9001	4	.00000		GM19014
2016-	GM19014		9002	4	0.00000	9003	4	0.00000		
2017-	MPC	1	90	5	-1.00000	9001	5	1.00000		GM19015
2018-	GM19015		9002	5	1.00000	9003	5	1.00000		
2019-	MPC	1	90	6	-1.00000	9001	6	.00000		GM19016
2020-	GM19016		9002	6	0.00000	9003	6	0.00000		
2021-	MPC	1	91	1	-1.00000	9001	1	1.00000		GM19021
2022-	GM19021		9002	1	0.95105	9003	1	0.80901		
2023-	MPC	1	91	2	-1.00000	9001	2	.00000		GM19022
2024-	GM19022		9002	2	0.30901	9003	2	0.58778		
2025-	MPC	1	91	3	-1.00000	9001	3	1.00000		GM19023
2026-	GM19023		9002	3	0.95105	9003	3	0.80901		
2027-	MPC	1	91	4	-1.00000	9001	4	.00000		GM19024
2028-	GM19024		9002	4	0.30901	9003	4	0.58778		
2029-	MPC	1	91	5	-1.00000	9001	5	1.00000		GM19025
2030-	GM19025		9002	5	0.95105	9003	5	0.80901		
2031-	MPC	1	91	6	-1.00000	9001	6	.00000		GM19026
2032-	GM19026		9002	6	0.30901	9003	6	0.58778		
2033-	MPC	1	92	1	-1.00000	9001	1	1.00000		GM19031
2034-	GM19031		9002	1	0.80901	9003	1	0.30901		
2035-	MPC	1	92	2	-1.00000	9001	2	.00000		GM19032
2036-	GM19032		9002	2	0.58778	9003	2	0.95105		
2037-	MPC	1	92	3	-1.00000	9001	3	1.00000		GM19033
2038-	GM19033		9002	3	0.80901	9003	3	0.30901		
2039-	MPC	1	92	4	-1.00000	9001	4	.00000		GM19034
2040-	GM19034		9002	4	0.58778	9003	4	0.95105		
2041-	MPC	1	92	5	-1.00000	9001	5	1.00000		GM19035
2042-	GM19035		9002	5	0.80901	9003	5	0.30901		
2043-	MPC	1	92	6	-1.00000	9001	6	.00000		GM19036
2044-	GM19036		9002	6	0.58778	9003	6	0.95105		
2045-	MPC	1	93	1	-1.00000	9001	1	1.00000		GM19041
2046-	GM19041		9002	1	0.58778	9003	1	-0.30901		
2047-	MPC	1	93	2	-1.00000	9001	2	.00000		GM19042
2048-	GM19042		9002	2	0.80901	9003	2	0.95105		
2049-	MPC	1	93	3	-1.00000	9001	3	1.00000		GM19043
2050-	GM19043		9002	3	0.58778	9003	3	-0.30901		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
2051-	MPC	1	93	4	-1.00000900	1	4	.00000		&M19044
2052-	&M19044		9002	4	0.80901	9003	4	0.95105		
2053-	MPC	1	93	5	-1.00000900	1	5	1.00000		&M19045
2054-	&M19045		9002	5	0.58778	9003	5	-0.30901		
2055-	MPC	1	93	6	-1.00000900	1	6	.00000		&M19046
2056-	&M19046		9002	6	0.80901	9003	6	0.95105		
2057-	MPC	1	94	1	-1.00000900	1	1	1.00000		&M19051
2058-	&M19051		9002	1	0.30901	9003	1	-0.80901		
2059-	MPC	1	94	2	-1.00000900	1	2	.00000		&M19052
2060-	&M19052		9002	2	0.95105	9003	2	0.58778		
2061-	MPC	1	94	3	-1.00000900	1	3	1.00000		&M19053
2062-	&M19053		9002	3	0.30901	9003	3	-0.80901		
2063-	MPC	1	94	4	-1.00000900	1	4	.00000		&M19054
2064-	&M19054		9002	4	0.95105	9003	4	0.58778		
2065-	MPC	1	94	5	-1.00000900	1	5	1.00000		&M19055
2066-	&M19055		9002	5	0.30901	9003	5	-0.80901		
2067-	MPC	1	94	6	-1.00000900	1	6	.00000		&M19056
2068-	&M19056		9002	6	0.95105	9003	6	0.58778		
2069-	MPC	1	95	1	-1.00000900	1	1	1.00000		&M19061
2070-	&M19061		9002	1	0.00000	9003	1	-1.00000		
2071-	MPC	1	95	2	-1.00000900	1	2	.00000		&M19062
2072-	&M19062		9002	2	1.00000	9003	2	0.00000		
2073-	MPC	1	95	3	-1.00000900	1	3	1.00000		&M19063
2074-	&M19063		9002	3	0.00000	9003	3	-1.00000		
2075-	MPC	1	95	4	-1.00000900	1	4	.00000		&M19064
2076-	&M19064		9002	4	1.00000	9003	4	0.00000		
2077-	MPC	1	95	5	-1.00000900	1	5	1.00000		&M19065
2078-	&M19065		9002	5	0.00000	9003	5	-1.00000		
2079-	MPC	1	95	6	-1.00000900	1	6	.00000		&M19066
2080-	&M19066		9002	6	1.00000	9003	6	0.00000		
2081-	MPC	1	96	1	-1.00000900	1	1	1.00000		&M19071
2082-	&M19071		9002	1	-0.30901	9003	1	-0.80901		
2083-	MPC	1	96	2	-1.00000900	1	2	.00000		&M19072
2084-	&M19072		9002	2	0.95105	9003	2	-0.58778		
2085-	MPC	1	96	3	-1.00000900	1	3	1.00000		&M19073
2086-	&M19073		9002	3	-0.30901	9003	3	-0.80901		
2087-	MPC	1	96	4	-1.00000900	1	4	.00000		&M19074
2088-	&M19074		9002	4	0.95105	9003	4	-0.58778		
2089-	MPC	1	96	5	-1.00000900	1	5	1.00000		&M19075
2090-	&M19075		9002	5	-0.30901	9003	5	-0.80901		
2091-	MPC	1	96	6	-1.00000900	1	6	.00000		&M19076
2092-	&M19076		9002	6	0.95105	9003	6	-0.58778		
2093-	MPC	1	97	1	-1.00000900	1	1	1.00000		&M19081
2094-	&M19081		9002	1	-0.58778	9003	1	-0.30901		
2095-	MPC	1	97	2	-1.00000900	1	2	.00000		&M19082
2096-	&M19082		9002	2	0.80901	9003	2	-0.95105		
2097-	MPC	1	97	3	-1.00000900	1	3	1.00000		&M19083
2098-	&M19083		9002	3	-0.58778	9003	3	-0.30901		
2099-	MPC	1	97	4	-1.00000900	1	4	.00000		&M19084
2100-	&M19084		9002	4	0.80901	9003	4	-0.95105		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
2101-	MPC	1	97	5	-1.00000	9001	5	1.00000		GM19085
2102-	GM19085		9002	5	-0.58778	9003	5	-0.30901		
2103-	MPC	1	97	6	-1.00000	9001	6	.00000		GM19086
2104-	GM19086		9002	6	0.80901	9003	6	-0.95105		
2105-	MPC	1	98	1	-1.00000	9001	1	1.00000		GM19091
2106-	GM19091		9002	1	-0.80901	9003	1	0.30901		
2107-	MPC	1	98	2	-1.00000	9001	2	.00000		GM19092
2108-	GM19092		9002	2	0.58778	9003	2	-0.95105		
2109-	MPC	1	98	3	-1.00000	9001	3	1.00000		GM19093
2110-	GM19093		9002	3	-0.80901	9003	3	0.30901		
2111-	MPC	1	98	4	-1.00000	9001	4	.00000		GM19094
2112-	GM19094		9002	4	0.58778	9003	4	-0.95105		
2113-	MPC	1	98	5	-1.00000	9001	5	1.00000		GM19095
2114-	GM19095		9002	5	-0.80901	9003	5	0.30901		
2115-	MPC	1	98	6	-1.00000	9001	6	.00000		GM19096
2116-	GM19096		9002	6	0.58778	9003	6	-0.95105		
2117-	MPC	1	99	1	-1.00000	9001	1	1.00000		GM19101
2118-	GM19101		9002	1	-0.95105	9003	1	0.80901		
2119-	MPC	1	99	2	-1.00000	9001	2	.00000		GM19102
2120-	GM19102		9002	2	0.30901	9003	2	-0.58778		
2121-	MPC	1	99	3	-1.00000	9001	3	1.00000		GM19103
2122-	GM19103		9002	3	-0.95105	9003	3	0.80901		
2123-	MPC	1	99	4	-1.00000	9001	4	.00000		GM19104
2124-	GM19104		9002	4	0.30901	9003	4	-0.58778		
2125-	MPC	1	99	5	-1.00000	9001	5	1.00000		GM19105
2126-	GM19105		9002	5	-0.95105	9003	5	0.80901		
2127-	MPC	1	99	6	-1.00000	9001	6	.00000		GM19106
2128-	GM19106		9002	6	0.30901	9003	6	-0.58778		
2129-	MPC	1	100	1	-1.00000	9001	1	1.00000		GM19111
2130-	GM19111		9002	1	-1.00000	9003	1	1.00000		
2131-	MPC	1	100	2	-1.00000	9001	2	.00000		GM19112
2132-	GM19112		9002	2	0.00000	9003	2	-0.00000		
2133-	MPC	1	100	3	-1.00000	9001	3	1.00000		GM19113
2134-	GM19113		9002	3	-1.00000	9003	3	1.00000		
2135-	MPC	1	100	4	-1.00000	9001	4	.00000		GM19114
2136-	GM19114		9002	4	0.00000	9003	4	-0.00000		
2137-	MPC	1	100	5	-1.00000	9001	5	1.00000		GM19115
2138-	GM19115		9002	5	-1.00000	9003	5	1.00000		
2139-	MPC	1	100	6	-1.00000	9001	6	.00000		GM19116
2140-	GM19116		9002	6	0.00000	9003	6	-0.00000		
2141-	MPC	1	101	1	-1.00000	10001	1	1.00000		GM20011
2142-	GM20011		10002	1	1.00000	10003	1	1.00000		
2143-	MPC	1	101	2	-1.00000	10001	2	.00000		GM20012
2144-	GM20012		10002	2	0.00000	10003	2	0.00000		
2145-	MPC	1	101	3	-1.00000	10001	3	1.00000		GM20013
2146-	GM20013		10002	3	1.00000	10003	3	1.00000		
2147-	MPC	1	101	4	-1.00000	10001	4	.00000		GM20014
2148-	GM20014		10002	4	0.00000	10003	4	0.00000		
2149-	MPC	1	101	5	-1.00000	10001	5	1.00000		GM20015
2150-	GM20015		10002	5	1.00000	10003	5	1.00000		

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2151-	MPC	1	101	6	-1.00000	10001	6	.00000		&M20016
2152-	&M20016		10002		6 0.00000	10003		6 0.00000		
2153-	MPC	1	102	1	-1.00000	10001	1	1.00000		&M20021
2154-	&M20021		10002		1 0.95105	10003		1 0.80901		
2155-	MPC	1	102	2	-1.00000	10001	2	.00000		&M20022
2156-	&M20022		10002		2 0.30901	10003		2 0.58778		
2157-	MPC	1	102	3	-1.00000	10001	3	1.00000		&M20023
2158-	&M20023		10002		3 0.95105	10003		3 0.80901		
2159-	MPC	1	102	4	-1.00000	10001	4	.00000		&M20024
2160-	&M20024		10002		4 0.30901	10003		4 0.58778		
2161-	MPC	1	102	5	-1.00000	10001	5	1.00000		&M20025
2162-	&M20025		10002		5 0.95105	10003		5 0.80901		
2163-	MPC	1	102	6	-1.00000	10001	6	.00000		&M20026
2164-	&M20026		10002		6 0.30901	10003		6 0.58778		
2165-	MPC	1	103	1	-1.00000	10001	1	1.00000		&M20031
2166-	&M20031		10002		1 0.80901	10003		1 0.30901		
2167-	MPC	1	103	2	-1.00000	10001	2	.00000		&M20032
2168-	&M20032		10002		2 0.58778	10003		2 0.95105		
2169-	MPC	1	103	3	-1.00000	10001	3	1.00000		&M20033
2170-	&M20033		10002		3 0.80901	10003		3 0.30901		
2171-	MPC	1	103	4	-1.00000	10001	4	.00000		&M20034
2172-	&M20034		10002		4 0.58778	10003		4 0.95105		
2173-	MPC	1	103	5	-1.00000	10001	5	1.00000		&M20035
2174-	&M20035		10002		5 0.80901	10003		5 0.30901		
2175-	MPC	1	103	6	-1.00000	10001	6	.00000		&M20036
2176-	&M20036		10002		6 0.58778	10003		6 0.95105		
2177-	MPC	1	104	1	-1.00000	10001	1	1.00000		&M20041
2178-	&M20041		10002		1 0.58778	10003		1-0.30901		
2179-	MPC	1	104	2	-1.00000	10001	2	.00000		&M20042
2180-	&M20042		10002		2 0.80901	10003		2 0.95105		
2181-	MPC	1	104	3	-1.00000	10001	3	1.00000		&M20043
2182-	&M20043		10002		3 0.58778	10003		3-0.30901		
2183-	MPC	1	104	4	-1.00000	10001	4	.00000		&M20044
2184-	&M20044		10002		4 0.80901	10003		4 0.95105		
2185-	MPC	1	104	5	-1.00000	10001	5	1.00000		&M20045
2186-	&M20045		10002		5 0.58778	10003		5-0.30901		
2187-	MPC	1	104	6	-1.00000	10001	6	.00000		&M20046
2188-	&M20046		10002		6 0.80901	10003		6 0.95105		
2189-	MPC	1	105	1	-1.00000	10001	1	1.00000		&M20051
2190-	&M20051		10002		1 0.30901	10003		1-0.80901		
2191-	MPC	1	105	2	-1.00000	10001	2	.00000		&M20052
2192-	&M20052		10002		2 0.95105	10003		2 0.58778		
2193-	MPC	1	105	3	-1.00000	10001	3	1.00000		&M20053
2194-	&M20053		10002		3 0.30901	10003		3-0.80901		
2195-	MPC	1	105	4	-1.00000	10001	4	.00000		&M20054
2196-	&M20054		10002		4 0.95105	10003		4 0.58778		
2197-	MPC	1	105	5	-1.00000	10001	5	1.00000		&M20055
2198-	&M20055		10002		5 0.30901	10003		5-0.80901		
2199-	MPC	1	105	6	-1.00000	10001	6	.00000		&M20056
2200-	&M20056		10002		6 0.95105	10003		6 0.58778		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
2201-	MPC	1	106	1	-1.00000	10001	1	1.00000		&M20061
2202-	&M20061		10002		1 0.00000	10003		1-1.00000		
2203-	MPC	1	106	2	-1.00000	10001	2	.00000		&M20062
2204-	&M20062		10002		2 1.00000	10003		2 0.00000		
2205-	MPC	1	106	3	-1.00000	10001	3	1.00000		&M20063
2206-	&M20063		10002		3 0.00000	10003		3-1.00000		
2207-	MPC	1	106	4	-1.00000	10001	4	.00000		&M20064
2208-	&M20064		10002		4 1.00000	10003		4 0.00000		
2209-	MPC	1	106	5	-1.00000	10001	5	1.00000		&M20065
2210-	&M20065		10002		5 0.00000	10003		5-1.00000		
2211-	MPC	1	106	6	-1.00000	10001	6	.00000		&M20066
2212-	&M20066		10002		6 1.00000	10003		6 0.00000		
2213-	MPC	1	107	1	-1.00000	10001	1	1.00000		&M20071
2214-	&M20071		10002		1-0.30901	10003		1-0.80901		
2215-	MPC	1	107	2	-1.00000	10001	2	.00000		&M20072
2216-	&M20072		10002		2 0.95105	10003		2-0.58778		
2217-	MPC	1	107	3	-1.00000	10001	3	1.00000		&M20073
2218-	&M20073		10002		3-0.30901	10003		3-0.80901		
2219-	MPC	1	107	4	-1.00000	10001	4	.00000		&M20074
2220-	&M20074		10002		4 0.95105	10003		4-0.58778		
2221-	MPC	1	107	5	-1.00000	10001	5	1.00000		&M20075
2222-	&M20075		10002		5-0.30901	10003		5-0.80901		
2223-	MPC	1	107	6	-1.00000	10001	6	.00000		&M20076
2224-	&M20076		10002		6 0.95105	10003		6-0.58778		
2225-	MPC	1	108	1	-1.00000	10001	1	1.00000		&M20081
2226-	&M20081		10002		1-0.58778	10003		1-0.30901		
2227-	MPC	1	108	2	-1.00000	10001	2	.00000		&M20082
2228-	&M20082		10002		2 0.80901	10003		2-0.95105		
2229-	MPC	1	108	3	-1.00000	10001	3	1.00000		&M20083
2230-	&M20083		10002		3-0.58778	10003		3-0.30901		
2231-	MPC	1	108	4	-1.00000	10001	4	.00000		&M20084
2232-	&M20084		10002		4 0.80901	10003		4-0.95105		
2233-	MPC	1	108	5	-1.00000	10001	5	1.00000		&M20085
2234-	&M20085		10002		5-0.58778	10003		5-0.30901		
2235-	MPC	1	108	6	-1.00000	10001	6	.00000		&M20086
2236-	&M20086		10002		6 0.30901	10003		6-0.95105		
2237-	MPC	1	109	1	-1.00000	10001	1	1.00000		&M20091
2238-	&M20091		10002		1-0.80901	10003		1 0.30901		
2239-	MPC	1	109	2	-1.00000	10001	2	.00000		&M20092
2240-	&M20092		10002		2 0.58778	10003		2-0.95105		
2241-	MPC	1	109	3	-1.00000	10001	3	1.00000		&M20093
2242-	&M20093		10002		3-0.80901	10003		3 0.30901		
2243-	MPC	1	109	4	-1.00000	10001	4	.00000		&M20094
2244-	&M20094		10002		4 0.58778	10003		4-0.95105		
2245-	MPC	1	109	5	-1.00000	10001	5	1.00000		&M20095
2246-	&M20095		10002		5-0.80901	10003		5 0.30901		
2247-	MPC	1	109	6	-1.00000	10001	6	.00000		&M20096
2248-	&M20096		10002		6 0.58778	10003		6-0.95105		
2249-	MPC	1	110	1	-1.00000	10001	1	1.00000		&M20101
2250-	&M20101		10002		1-0.95105	10003		1 0.80901		

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OF POOR QUALITY

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2251-	MPC	1	110	2	-1.00000	10001	2	.00000		&M20102
2252-	&M20102		10002		2 0.30901	10003		2-0.58778		
2253-	MPC	1	110	3	-1.00000	10001	3	1.00000		&M20103
2254-	&M20103		10002		3-0.95105	10003		3 0.80901		
2255-	MPC	1	110	4	-1.00000	10001	4	.00000		&M20104
2256-	&M20104		10002		4 0.30901	10003		4-0.58778		
2257-	MPC	1	110	5	-1.00000	10001	5	1.00000		&M20105
2258-	&M20105		10002		5-0.95105	10003		5 0.80901		
2259-	MPC	1	110	6	-1.00000	10001	6	.00000		&M20106
2260-	&M20106		10002		6 0.30901	10003		6-0.58778		
2261-	MPC	1	111	1	-1.00000	10001	1	1.00000		&M20111
2262-	&M20111		10002		1-1.00000	10003		1 1.00000		
2263-	MPC	1	111	2	-1.00000	10001	2	.00000		&M20112
2264-	&M20112		10002		2 0.30000	10003		2-0.00000		
2265-	MPC	1	111	3	-1.00000	10001	3	1.00000		&M20113
2266-	&M20113		10002		3-1.00000	10003		3 1.00000		
2267-	MPC	1	111	4	-1.00000	10001	4	.00000		&M20114
2268-	&M20114		10002		4 0.00000	10003		4-0.00000		
2269-	MPC	1	111	5	-1.00000	10001	5	1.00000		&M20115
2270-	&M20115		10002		5-1.00000	10003		5 1.00000		
2271-	MPC	1	111	6	-1.00000	10001	6	.00000		&M20116
2272-	&M20116		10002		6 0.00000	10003		6-0.00000		
2273-	MPC	1	112	1	-1.00000	11001	1	1.00000		&M21011
2274-	&M21011		11002		1 1.00000	11003		1 1.00000		
2275-	MPC	1	112	2	-1.00000	11001	2	.00000		&M21012
2276-	&M21012		11002		2 0.00000	11003		2 0.00000		
2277-	MPC	1	112	3	-1.00000	11001	3	1.00000		&M21013
2278-	&M21013		11002		3 1.00000	11003		3 1.00000		
2279-	MPC	1	112	4	-1.00000	11001	4	.00000		&M21014
2280-	&M21014		11002		4 0.00000	11003		4 0.00000		
2281-	MPC	1	112	5	-1.00000	11001	5	1.00000		&M21015
2282-	&M21015		11002		5 1.00000	11003		5 1.00000		
2283-	MPC	1	112	6	-1.00000	11001	6	.00000		&M21016
2284-	&M21016		11002		6 0.00000	11003		6 0.00000		
2285-	MPC	1	113	1	-1.00000	11001	1	1.00000		&M21021
2286-	&M21021		11002		1 0.95105	11003		1 0.80901		
2287-	MPC	1	113	2	-1.00000	11001	2	.00000		&M21022
2288-	&M21022		11002		2 0.30901	11003		2 0.58778		
2289-	MPC	1	113	3	-1.00000	11001	3	1.00000		&M21023
2290-	&M21023		11002		3 0.95105	11003		3 0.80901		
2291-	MPC	1	113	4	-1.00000	11001	4	.00000		&M21024
2292-	&M21024		11002		4 0.30901	11003		4 0.58778		
2293-	MPC	1	113	5	-1.00000	11001	5	1.00000		&M21025
2294-	&M21025		11002		5 0.95105	11003		5 0.80901		
2295-	MPC	1	113	6	-1.00000	11001	6	.00000		&M21026
2296-	&M21026		11002		6 0.30901	11003		6 0.58778		
2297-	MPC	1	114	1	-1.00000	11001	1	1.00000		&M21031
2298-	&M21031		11002		1 0.80901	11003		1 0.30901		
2299-	MPC	1	114	2	-1.00000	11001	2	.00000		&M21032
2300-	&M21032		11002		2 0.58778	11003		2 0.95105		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2301-	MPC	1	114	3	-1.0000011001	3		1.00000		&M21033
2302-	&M21033		11002		3 0.80901	11003		3 0.30901		
2303-	MPC	1	114	4	-1.0000011001	4		.00000		&M21034
2304-	&M21034		11002		4 0.58778	11003		4 0.95105		
2305-	MPC	1	114	5	-1.0000011001	5		1.00000		&M21035
2306-	&M21035		11002		5 0.80901	11003		5 0.30901		
2307-	MPC	1	114	6	-1.0000011001	6		.00000		&M21036
2308-	&M21036		11002		6 0.58778	11003		6 0.95105		
2309-	MPC	1	115	1	-1.0000011001	1		1.00000		&M21041
2310-	&M21041		11002		1 0.58778	11003		1-0.30901		
2311-	MPC	1	115	2	-1.0000011001	2		.00000		&M21042
2312-	&M21042		11002		2 0.80901	11003		2 0.95105		
2313-	MPC	1	115	3	-1.0000011001	3		1.00000		&M21043
2314-	&M21043		11002		3 0.58778	11003		3-0.30901		
2315-	MPC	1	115	4	-1.0000011001	4		.00000		&M21044
2316-	&M21044		11002		4 0.80901	11003		4 0.95105		
2317-	MPC	1	115	5	-1.0000011001	5		1.00000		&M21045
2318-	&M21045		11002		5 0.58778	11003		5-0.30901		
2319-	MPC	1	115	6	-1.0000011001	6		.00000		&M21046
2320-	&M21046		11002		6 0.80901	11003		6 0.95105		
2321-	MPC	1	116	1	-1.0000011001	1		1.00000		&M21051
2322-	&M21051		11002		1 0.30901	11003		1-0.80901		
2323-	MPC	1	116	2	-1.0000011001	2		.00000		&M21052
2324-	&M21052		11002		2 0.95105	11003		2 0.58778		
2325-	MPC	1	116	3	-1.0000011001	3		1.00000		&M21053
2326-	&M21053		11002		3 0.30901	11003		3-0.80901		
2327-	MPC	1	116	4	-1.0000011001	4		.00000		&M21054
2328-	&M21054		11002		4 0.95105	11003		4 0.58778		
2329-	MPC	1	116	5	-1.0000011001	5		1.00000		&M21055
2330-	&M21055		11002		5 0.30901	11003		5-0.80901		
2331-	MPC	1	116	6	-1.0000011001	6		.00000		&M21056
2332-	&M21056		11002		6 0.95105	11003		6 0.58778		
2333-	MPC	1	117	1	-1.0000011001	1		1.00000		&M21061
2334-	&M21061		11002		1 0.00000	11003		1-1.00000		
2335-	MPC	1	117	2	-1.0000011001	2		.00000		&M21062
2336-	&M21062		11002		2 1.00000	11003		2 0.00000		
2337-	MPC	1	117	3	-1.0000011001	3		1.00000		&M21063
2338-	&M21063		11002		3 0.00000	11003		3-1.00000		
2339-	MPC	1	117	4	-1.0000011001	4		.00000		&M21064
2340-	&M21064		11002		4 1.00000	11003		4 0.00000		
2341-	MPC	1	117	5	-1.0000011001	5		1.00000		&M21065
2342-	&M21065		11002		5 0.00000	11003		5-1.00000		
2343-	MPC	1	117	6	-1.0000011001	6		.00000		&M21066
2344-	&M21066		11002		6 1.00000	11003		6 0.00000		
2345-	MPC	1	118	1	-1.0000011001	1		1.00000		&M21071
2346-	&M21071		11002		1-0.30901	11003		1-0.80901		
2347-	MPC	1	118	2	-1.0000011001	2		.00000		&M21072
2348-	&M21072		11002		2 0.95105	11003		2-0.58778		
2349-	MPC	1	118	3	-1.0000011001	3		1.00000		&M21073
2350-	&M21073		11002		3-0.30901	11003		3-0.80901		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2351-	MPC	1	118	4	-1.0000011001	4		.00000		&M21074
2352-	&M21074		11002		4 0.95105	11003		4-0.58778		
2353-	MPC	1	118	5	-1.0000011001	5		1.00000		&M21075
2354-	&M21075		11002		5-0.30901	11003		5-0.80901		
2355-	MPC	1	118	6	-1.0000011001	6		.00000		&M21076
2356-	&M21076		11002		6 0.95105	11003		6-0.58778		
2357-	MPC	1	119	1	-1.0000011001	1		1.00000		&M21081
2358-	&M21081		11002		1-0.58778	11003		1-0.30901		
2359-	MPC	1	119	2	-1.0000011001	2		.00000		&M21082
2360-	&M21082		11002		2 0.80901	11003		2-0.95105		
2361-	MPC	1	119	3	-1.0000011001	3		1.00000		&M21083
2362-	&M21083		11002		3-0.58778	11003		3-0.30901		
2363-	MPC	1	119	4	-1.0000011001	4		.00000		&M21084
2364-	&M21084		11002		4 0.80901	11003		4-0.95105		
2365-	MPC	1	119	5	-1.0000011001	5		1.00000		&M21085
2366-	&M21085		11002		5-0.58778	11003		5-0.30901		
2367-	MPC	1	119	6	-1.0000011001	6		.00000		&M21086
2368-	&M21086		11002		6 0.80901	11003		6-0.95105		
2369-	MPC	1	120	1	-1.0000011001	1		1.00000		&M21091
2370-	&M21091		11002		1-0.80901	11003		1 0.30901		
2371-	MPC	1	120	2	-1.0000011001	2		.00000		&M21092
2372-	&M21092		11002		2 0.58778	11003		2-0.95105		
2373-	MPC	1	120	3	-1.0000011001	3		1.00000		&M21093
2374-	&M21093		11002		3-0.80901	11003		3 0.30901		
2375-	MPC	1	120	4	-1.0000011001	4		.00000		&M21094
2376-	&M21094		11002		4 0.58778	11003		4-0.95105		
2377-	MPC	1	120	5	-1.0000011001	5		1.00000		&M21095
2378-	&M21095		11002		5-0.80901	11003		5 0.30901		
2379-	MPC	1	120	6	-1.0000011001	6		.00000		&M21096
2380-	&M21096		11002		6 0.58778	11003		6-0.95105		
2381-	MPC	1	121	1	-1.0000011001	1		1.00000		&M21101
2382-	&M21101		11002		1-0.95105	11003		1 0.80901		
2383-	MPC	1	121	2	-1.0000011001	2		.00000		&M21102
2384-	&M21102		11002		2 0.30901	11003		2-0.58778		
2385-	MPC	1	121	3	-1.0000011001	3		1.00000		&M21103
2386-	&M21103		11002		3-0.95105	11003		3 0.80901		
2387-	MPC	1	121	4	-1.0000011001	4		.00000		&M21104
2388-	&M21104		11002		4 0.30901	11003		4-0.58778		
2389-	MPC	1	121	5	-1.0000011001	5		1.00000		&M21105
2390-	&M21105		11002		5-0.95105	11003		5 0.80901		
2391-	MPC	1	121	6	-1.0000011001	6		.00000		&M21106
2392-	&M21106		11002		6 0.30901	11003		6-0.58778		
2393-	MPC	1	122	1	-1.0000011001	1		1.00000		&M21111
2394-	&M21111		11002		1-1.00000	11003		1 1.00000		
2395-	MPC	1	122	2	-1.0000011001	2		.00000		&M21112
2396-	&M21112		11002		2 0.00000	11003		2-0.00000		
2397-	MPC	1	122	3	-1.0000011001	3		1.00000		&M21113
2398-	&M21113		11002		3-1.00000	11003		3 1.00000		
2399-	MPC	1	122	4	-1.0000011001	4		.00000		&M21114
2400-	&M21114		11002		4 0.00000	11003		4-0.00000		

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
2401-	MPC	1	122	5	-1.00000	11001	5	1.00000		GM21115
2402-	GM21115		11002		5-1.00000	11003		5 1.00000		
2403-	MPC	1	122	6	-1.00000	11001	6	.00000		GM21116
2404-	GM21116		11002		6 0.00000	11003		6-0.00000		
2405-	OMIT1	26	11002	11003						
2406-	CMIT1	35	1001							
2407-	OMIT1	35	2001	3001	4001	5001	6001	7001	8001	
2408-	CMIT1	35	9001	10001						
2409-	CMIT1	345	1002	1003						
2410-	OMIT1	23456	2002	2003	3002	3003	4002	4003		
2411-	CMIT1	23456	5002	5003	6002	6003	7002	7003		
2412-	CMIT1	23456	8002	8003	9002	9003	10002	10003		
2413-	PQUAD2	1	1.	.01	.0					
2414-	SPC1	1	1	1001						
2415-	SPC1	1	35	11001						
2416-	SPC1	1	126	1002	1003					
2417-	SPC1	1	246	1001	2001	3001	4001	5001	6001	
2418-	SPC1	1	246	7001	8001	9001	10001	11001		
2419-	SPC1	1	345	11002	11003					
	ENDDATA									

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP NO.	INSTRUCTION	
1	BEGIN	NO.3 NORMAL MODES ANALYSIS - SERIES M $
2	FILE	LLL=TAPE $
3	GP1	GEOM1,GEOM2,/GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL/V,N,LUSET/ C,N, 123/V,N,NOGPDT $
4	SAVE	LUSET $
5	CHKPNT	GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL $
6	GP2	GEOM2,EQEXIN/ECT $
7	CHKPNT	ECT $
8	PLTSET	PCDB,EQEXIN,ECT/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,NSIL/ V,N, JUMPPLOT $
9	SAVE	NSIL,JUMPPLOT $
10	PRTMSG	PLTSETX// $
11	SETVAL	//V,N,PLTFLG/C,N,1/V,N,PFILE/C,N,0 $
12	SAVE	PLTFLG,PFILE $
13	COND	P1,JUMPPLOT $
14	PLOT1	PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,/PLOTX1/ V,N, NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
15	SAVE	JUMPPLOT,PLTFLG,PFILE $
16	PRTMSG	PLOTX1//$
17	LABEL	P1 $
18	CHKPNT	PLTPAR,GPSETS,ELSETS $
19	GP3	GEOM3,EQEXIN,GEOM2/,GPTT/C,N,123/V,N,NOGRAV/C,N,123 $
20	CHKPNT	GPTT $
21	TA1,	,ECT,EPT,BGPDT,SIL,GPTT,CSTM/EST,,GEI,ECPT,GPCT/V,N,LUSET/ C,N, 123/V,N,NOSIMP/C,N,0/V,N,NOGENL/V,N,GENEL $
22	SAVE	NOGENL,NOSIMP,GENEL $

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION

```
NO.
 23  COND      ERROR1,NOSIMP $
 24  PURGE     OGPST/GENEL $
 25  CHKPNT    EST,ECPT,GPCT,GEI,OGPST $
 26  SMA1      CSTM,MPT,ECPT,GPCT,DIT/KGGX,,GPST/V,N,NOGENL/V,N,NOK4GG $
 27  CHKPNT    KGGX,GPST $
 28  SMA2      CSTM,MPT,ECPT,GPCT,DIT/MGG,/V,Y,WTMASS=1.0/V,N,NOMGG/V,N,NOBGG/
               V,Y,COUPMASS/V,Y,CPBAR/V,Y,CPROD/V,Y,CPQUAD1/V,Y,CPQUAD2/ V,
               Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPCOPLT/V,Y,CPTRPLT/ V,Y,
               CPTRBSC $
 29  SAVE      NOMGG $
 30  COND      ERROR1,NOMGG $
 31  CHKPNT    MGG $
 32  COND      LGPWG,GRDPNT $
 33  GPWG      BGPDT,CSTM,EQEXIN,MGG/OGPWG/V,Y,GRDPNT=-1/V,Y,WTMASS $
 34  DFP       OGPWG,,,,,//V,N,CARDNO $
 35  SAVE      CARDNO $
 36  LABEL     LGPWG $
 37  EQUIV     KGGX,KGG/NOGENL $
 38  CHKPNT    KGG $
 39  COND      LBL11,NOGENL $
 40  SMA3      GEI,KGGX/KGG/V,N,LUSET/V,N,NOGENL/V,N,NOSIMP $
 41  CHKPNT    KGG $
 42  LABEL     LBL11 $
 43  PARAM     //C,N,MPY/V,N,NSKIP/C,N,0/C,N,0 $
 44  GP4       CASECC,GEOM4,EQEXIN,SIL,GPDT/BGPDT,,USET,/V,N,LUSET/V,N,MPCF1/ V,
               N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
               V,N,NOSET/V,N,NCL/V,N,NOA $
 45  SAVE      MPCF1,MPCF2,SINGLE,OMIT,REACT,NSKIP,REPEAT,NOSET,NOL,NOA $
```

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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
  46  COND      ERROR3,NOL $
  47  PURGE     KRR,KLR,DM,MLR,MR/REACT/GM/MPCF1/GO/OMIT/KFS/SINGLE/OG/NOSET $
  48  EQUIV     KGG,KNN/MPCF1/MGG,MNN/MPCF1 $
  49  CHKPNT    KRR,KLR,DM,MLR,MR,GM,RG,GO,KFS,CG,USET,KNN,MNN $
  50  COND      LBL4,GENEL $
  51  GPSP      GPL,GPST,LSET,SIL/OGPST $
  52  OFP       OGPST////V,N,CARDNO $
  53  SAVE      CARDNO $
  54  LABEL     LBL4 $
  55  COND      LBL2,MPCF2 $
  56  MCE1      USET,RG/GM $
  57  CHKPNT    GM $
  58  MCE2      USET,GM,KGG,MGG//KNN,MNN// $
  59  CHKPNT    KNN,MNN $
  60  LABEL     LBL2 $
  61  EQUIV     KNN,KFF/SINGLE/MNN,MFF/SINGLE $
  62  CHKPNT    KFF,MFF $
  63  COND      LBL3,SINGLE $
  64  SCE1      USET,KNN,MNN//KFF,KFS//MFF// $
  65  CHKPNT    KFS,KFF,MFF $
  66  LABEL     LBL3 $
  67  EQUIV     KFF,KAA/OMIT/ MFF,MAA/OMIT $
  68  CHKPNT    KAA,MAA $
  69  COND      LBL5,OMIT $
  70  SMP1      USET,KFF///GO,KAA,K00,L00,U00///// $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
NO.
 71  CHKPNT   GO,KAA $
 72  SMP2     USET,GO,NFF/MAA $
 73  CHKPNT   MAA $
 74  LABEL    LBL5 $
 74  ADD MAA,MFLD/MAH $
 74  PARAM //C,N,NOP/V,N,TRUE=-1 $
 74  EQUIV MAH,MAA/TRUE $
 74  COND MAHNO9,TRUE $
 74  MATPRN MAH,,,,// $
 74  LABEL MAHNO9 $
 75  COND     LBL6,REACT $
 76  READ1    USET,KAA,PAA/KLL,KLR,KRR,MLL,MLR,MRR $
 77  CHKPNT   KLL,KLR,KRR,MLL,MLR,MRR $
 78  READ2    KLL/LLL,ULL $
 79  CHKPNT   ULL,LLL $
 80  READ3    LLL,ULL,KLR,KRR/DM $
 81  CHKPNT   DM $
 82  READ4    DM,MLL,MLR,MRR/MR $
 83  CHKPNT   MR $
 84  LABEL    LBL6 $
 85  OPD      DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,,,,,,,EED,EQDYN/V,N,
              _USET/V,N,LLSETD/V,N,NOTFL/V,N,NCOLT/V,N,NOPSDL/V,N,NOFRL/ V,
              N,NJNLFT/V,N,NOTRL/V,N,NOEED/C,N,123/V,N,NOUE $
 86  SAVE     NOEED $
 87  COND     ERROR2,NOEED $
 88  CHKPNT   EED $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
NO.
 88  SEEMAT MGG,KGG,,,//C,N,PRINT $
 89  READ    KAA,MAA,MR,DM,EED,USET,CASECC/LAMA,PHIA,MI,OEIGS/C,N,MODES/V,N,
             NEIGV $
 90  SAVE    NEIGV $
 91  CHKPNT  LAMA,PHIA,MI,OEIGS $
 91  MATGPR  GPL,USET,SIL,PHIA//C,N,A $
 92  OFP     LAMA,OEIGS,,,,//V,N,CARDNO $
 93  SAVE    CARDNO $
 94  COND    FINIS,NEIGV $
 95  SDR1    USET,,PHIA,,,GO,GM,,KFS,,/PHIG,,QG/C,N,1/C,N,REIG $
 96  CHKPNT  PHIG,QG $
 97  PARAM   //C,N,SUB/V,N,SCALAR/V,N,SIL/V,N,LUSET $
 98  EQUIV   SIL,SIP/SCALAR/BGPDT,BGPDP/SCALAR $
 99  CHKPNT  SIP,BGPDP $
100  COND    LBL7,SCALAR $
101  PLTTRAN BGPDT,SIL/BGPDP,SIP/V,N,LUSET/V,N,LUSEP $
102  SAVE    LUSEP $
103  CHKPNT  BGPDP,SIP $
104  LABEL   LBL7 $
105  SDR2    CASECC,CSTM,MPT,DIT,EQEXIN,SIL,,,BGPDP,LAMA,QG,PHIG,EST,/,QQG1,
             QPHIG,QES1,QEF1,PPHIG/C,N,REIG $
106  OFP     QPHIG,QQG1,QEF1,QES1,,//V,N,CARDNO $
107  SAVE    CARDNO $
107  SMPYAD  PHIA,KAA,PHIA,,,/KH/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
107  SOLVE   MI,KH/WH/C,N,1 $
107  SMPYAD  PDU2,PHIA,WH,,,/PD2/C,N,3 $
```

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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
107   MPYAD    TU12,PHIA,/PHF/C,N,0 $
107   MATPRN   WH,PD2,PHF,,// $
108   COND     P2,JUMPPLOT $
109   PLOT     PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,ECEXIN,SIP,,PPHIG /  PLOTX2/
               V,N,NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
110   SAVE     PFILE $
111   PRTMSG   PLOTX2// $
112   LABEL    P2 $
113   JUMP     FINIS $
114   LABEL    ERROR1 $
115   PRTPARM  //C,N,-1/C,N,NODES $
116   LABEL    ERROR2 $
117   PRTPARM  //C,N,-2/C,N,NODES $
118   LABEL    ERROR3 $
119   PRTPARM  //C,N,-3/C,N,NODES $
120   LABEL    FINIS $
121   END      $
```

NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM

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N A S T R A N E X E C U T I V E C O N T R O L D E C K E C H O

```
ID,CAP60,COPPOLINO
APP DISP
SOL 13,0
TIME 30
DIAG 2
DIAG 7,8,13,14,19,21,22
ALTER 1,5
ADD MAA,MFLD/MAH $
PARAM //C,N,NOP/V,N,TRUE=-1 $
EQUIV MAH,MAA/TRUE $
COND MAHN09,TRUE $
MATPRN MAH,,,,// $
LABEL MAHN09 $
ALTER 1,9
SEEMAT MGG,KBGG,,,//C,N,PRINT $
ALTER 140
SMPYAD PHIA,KDAA,PHIA,,,/KH/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
SMPYAD PHIA,MAA,PHIA,,,/M1/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
SOLVE M1,KH/WH/C,N,1 $
SMPYAD PD02,PHIA,WH,,,/PE2/C,N,3 $
MPYAD TU12,PHIA,/PHF/C,N,0 $
MATPRN WH,PD2,PHF,,// $
ENDALTER
CEND
```

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

MAY 4, 1974 NASTRAN 5/13/72

C A S E C O N T R O L D E C K E C H O

CARD COUNT	
1	TITLE=AXISYMMETRIC CIRC. CYL. WITH FLUID
2	SUBTITLE=HARMONIC REDUCTION
3	MAXLINES=120000
4	SPC=1
5	MPC=1
6	DISP=ALL
7	SUBCASE 10
8	LABEL=STATIC ANALYSIS
9	LOAD=1
10	SUBCASE 20
11	LABEL=NORMAL MODE ANALYSIS
12	METHOD=1
13	BEGIN BULK

*** USER INFORMATION MESSAGE 207, BULK DATA NOT SORTED,XSORT WILL RE-ORDER DECK.

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1-	CORD2C	1		0.0	0.0	0.0	0.0	0.0	1.	&COC
2-	&COC	1.	0.	0.						
3-	CQUAD2	2	1	2	3	14	13	.00000		
4-	CQUAD2	3	1	3	4	15	14	.00000		
5-	CQUAD2	4	1	4	5	16	15	.00000		
6-	CQUAD2	5	1	5	6	17	16	.00000		
7-	CQUAD2	6	1	6	7	18	17	.00000		
8-	CQUAD2	7	1	7	8	19	18	.00000		
9-	CQUAD2	8	1	8	9	20	19	.00000		
10-	CQUAD2	9	1	9	10	21	20	.00000		
11-	CQUAD2	10	1	10	11	22	21	.00000		
12-	CQUAD2	11	1	11	12	23	22	.00000		
13-	CQUAD2	13	1	13	14	25	24	.00000		
14-	CQUAD2	14	1	14	15	26	25	.00000		
15-	CQUAD2	15	1	15	16	27	26	.00000		
16-	CQUAD2	16	1	16	17	28	27	.00000		
17-	CQUAD2	17	1	17	18	29	28	.00000		
18-	CQUAD2	18	1	18	19	30	29	.00000		
19-	CQUAD2	19	1	19	20	31	30	.00000		
20-	CQUAD2	20	1	20	21	32	31	.00000		
21-	CQUAD2	21	1	21	22	33	32	.00000		
22-	CQUAD2	22	1	22	23	34	33	.00000		
23-	CQUAD2	24	1	24	25	36	35	.00000		
24-	CQUAD2	25	1	25	26	37	36	.00000		
25-	CQUAD2	26	1	26	27	38	37	.00000		
26-	CQUAD2	27	1	27	28	39	38	.00000		
27-	CQUAD2	28	1	28	29	40	39	.00000		
28-	CQUAD2	29	1	29	30	41	40	.00000		
29-	CQUAD2	30	1	30	31	42	41	.00000		
30-	CQUAD2	31	1	31	32	43	42	.00000		
31-	CQUAD2	32	1	32	33	44	43	.00000		
32-	CQUAD2	33	1	33	34	45	44	.00000		
33-	CQUAD2	35	1	35	36	47	46	.00000		
34-	CQUAD2	36	1	36	37	48	47	.00000		
35-	CQUAD2	37	1	37	38	49	48	.00000		
36-	CQUAD2	38	1	38	39	50	49	.00000		
37-	CQUAD2	39	1	39	40	51	50	.00000		
38-	CQUAD2	40	1	40	41	52	51	.00000		
39-	CQUAD2	41	1	41	42	53	52	.00000		
40-	CQUAD2	42	1	42	43	54	53	.00000		
41-	CQUAD2	43	1	43	44	55	54	.00000		
42-	CQUAD2	44	1	44	45	56	55	.00000		
43-	CQUAD2	46	1	46	47	58	57	.00000		
44-	CQUAD2	47	1	47	48	59	58	.00000		
45-	CQUAD2	48	1	48	49	60	59	.00000		
46-	CQUAD2	49	1	49	50	61	60	.00000		
47-	CQUAD2	50	1	50	51	62	61	.00000		
48-	CQUAD2	51	1	51	52	63	62	.00000		
49-	CQUAD2	52	1	52	53	64	63	.00000		
50-	CQUAD2	53	1	53	54	65	64	.00000		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
51-	CQUAD2	54	1	54	55	66	65	.00000		
52-	CQUAD2	55	1	55	56	67	66	.00000		
53-	CQUAD2	57	1	57	58	69	68	.00000		
54-	CQUAD2	58	1	58	59	70	69	.00000		
55-	CQUAD2	59	1	59	60	71	70	.00000		
56-	CQUAD2	60	1	60	61	72	71	.00000		
57-	CQUAD2	61	1	61	62	73	72	.00000		
58-	CQUAD2	62	1	62	63	74	73	.00000		
59-	CQUAD2	63	1	63	64	75	74	.00000		
60-	CQUAD2	64	1	64	65	76	75	.00000		
61-	CQUAD2	65	1	65	66	77	76	.00000		
62-	CQUAD2	66	1	66	67	78	77	.00000		
63-	CQUAD2	68	1	68	69	80	79	.00000		
64-	CQUAD2	69	1	69	70	81	80	.00000		
65-	CQUAD2	70	1	70	71	82	81	.00000		
66-	CQUAD2	71	1	71	72	83	82	.00000		
67-	CQUAD2	72	1	72	73	84	83	.00000		
68-	CQUAD2	73	1	73	74	85	84	.00000		
69-	CQUAD2	74	1	74	75	86	85	.00000		
70-	CQUAD2	75	1	75	76	87	86	.00000		
71-	CQUAD2	76	1	76	77	88	87	.00000		
72-	CQUAD2	77	1	77	78	89	88	.00000		
73-	CQUAD2	79	1	79	80	91	90	.00000		
74-	CQUAD2	80	1	80	81	92	91	.00000		
75-	CQUAD2	81	1	81	82	93	92	.00000		
76-	CQUAD2	82	1	82	83	94	93	.00000		
77-	CQUAD2	83	1	83	84	95	94	.00000		
78-	CQUAD2	84	1	84	85	96	95	.00000		
79-	CQUAD2	85	1	85	86	97	96	.00000		
80-	CQUAD2	86	1	86	87	98	97	.00000		
81-	CQUAD2	87	1	87	88	99	98	.00000		
82-	CQUAD2	88	1	88	89	100	99	.00000		
83-	CQUAD2	90	1	90	91	102	101	.00000		
84-	CQUAD2	91	1	91	92	103	102	.00000		
85-	CQUAD2	92	1	92	93	104	103	.00000		
86-	CQUAD2	93	1	93	94	105	104	.00000		
87-	CQUAD2	94	1	94	95	106	105	.00000		
88-	CQUAD2	95	1	95	96	107	106	.00000		
89-	CQUAD2	96	1	96	97	108	107	.00000		
90-	CQUAD2	97	1	97	98	109	108	.00000		
91-	CQUAD2	98	1	98	99	110	109	.00000		
92-	CQUAD2	99	1	99	100	111	110	.00000		
93-	CQUAD2	101	1	101	102	113	112	.00000		
94-	CQUAD2	102	1	102	103	114	113	.00000		
95-	CQUAD2	103	1	103	104	115	114	.00000		
96-	CQUAD2	104	1	104	105	116	115	.00000		
97-	CQUAD2	105	1	105	106	117	116	.00000		
98-	CQUAD2	106	1	106	107	118	117	.00000		
99-	CQUAD2	107	1	107	108	119	118	.00000		
100-	CQUAD2	108	1	108	109	120	119	.00000		

S O R T E D B U L K D A T A E C H O

```
CARD
COUNT      .  1  ..  2  ..  3  ..  4  ..  5  ..  6  ..  7  ..  8  ..  9  .. 10  .
  101-     CQUAD2  109     1     109     110     121     120    .00000
  102-     CQUAD2  110     1     110     111     122     121    .00000
  103-     DMI     MFLD    0     1       1       2              30      30      &AMF    0
  104-     DMI     *MFLD         1               1                      5.61138317E-02  *AMF    1
  105-     *AMF    1  1.03753539E-09  1.74902981E-09  3.54101434E-02 -1.17619758E-09*AMF    2
  106-     *AMF    2  3.99240818E-09  2.90458575E-02 -2.14204410E-09  4.51854376E-09*AMF    3
  107-     *AMF    3  2.67748457E-02 -2.62538569E-09  4.61171368E-09  2.58644857E-02*AMF    4
  108-     *AMF    4 -2.88329072E-09  4.60591210E-09  2.54706964E-02 -3.02422776E-09*AMF    5
  109-     *AMF    5  4.58629046E-09  2.52929702E-02 -3.10135118E-09  4.57119853E-09*AMF    6
  110-     *AMF    6  2.52110781E-02 -3.14255666E-09  4.56220661E-09  2.51769051E-02*AMF    7
  111-     *AMF    7 -3.16256843E-09  4.55771954E-09  1.25835799E-02 -2.14254015E-09*AMF    8
  112-     *AMF    8  2.37040809E-09                                                 *AMF    9
  113-     DMI     *MFLD         2               1                      1.03753539E-09  *AMF   10
  114-     *AMF   10  2.26114988E-02  7.61923413E-10 -1.17619758E-09  9.21048224E-03*AMF   11
  115-     *AMF   11 -1.17605836E-09 -2.14204410E-09  4.30269912E-03 -1.12416187E-09*AMF   12
  116-     *AMF   12 -2.62538569E-09  2.16825819E-03 -7.69552999E-10 -2.88329072E-09*AMF   13
  117-     *AMF   13  1.13540888E-03 -4.70962380E-10 -3.02422776E-09  6.07476337E-04*AMF   14
  118-     *AMF   14 -2.75142797E-10 -3.10135118E-09  3.31870979E-04 -1.58317554E-10*AMF   15
  119-     *AMF   15 -3.14255666E-09  1.89498416E-04 -9.33349370E-11 -3.16256843E-09*AMF   16
  120-     *AMF   16  1.21905570E-04 -6.12229434E-11 -1.58183555E-09  5.10035024E-05*AMF   17
  121-     *AMF   17 -2.39782222E-11                                                 *AMF   18
  122-     DMI     *MFLD         3               1                      1.74902981E-09  *AMF   19
  123-     *AMF   19  7.61923413E-10  1.83615163E-02  3.99240818E-09 -1.17605836E-09*AMF   20
  124-     *AMF   20  5.28116524E-03  4.51854376E-09 -1.12416187E-09  1.61713664E-03*AMF   21
  125-     *AMF   21  4.61171368E-09 -7.68552999E-10  5.16120810E-04  4.60591210E-09*AMF   22
  126-     *AMF   22 -4.70962380E-10  1.68953789E-04  4.58629046E-09 -2.75142797E-10*AMF   23
  127-     *AMF   23  5.61394263E-05  4.57119853E-09 -1.58317554E-10  1.88335543E-05*AMF   24
  128-     *AMF   24  4.56220661E-09 -9.33349370E-11  6.41311362E-06  4.55771954E-09*AMF   25
  129-     *AMF   25 -6.12229434E-11  2.38093708E-06  2.27821051E-09 -2.58151139E-11*AMF   26
  130-     *AMF   26  7.22207631E-07                                                 *AMF   27
  131-     DMI     *MFLD         4               1                      3.54101434E-02  *AMF   28
  132-     *AMF   28 -1.17619758E-09  3.99240818E-09  8.51596594E-02 -1.10450804E-09*AMF   29
  133-     *AMF   29  6.26756957E-09  6.21849695E-02 -3.60158127E-09  8.60412186E-09*AMF   30
  134-     *AMF   30  5.49103394E-02 -5.02533126E-09  9.12445586E-09  5.22455387E-02*AMF   31
  135-     *AMF   31 -5.64961056E-09  9.19830414E-09  5.11574484E-02 -5.98463856E-09*AMF   32
  136-     *AMF   32  9.17711418E-09  5.06825671E-02 -6.16678264E-09  9.14849707E-09*AMF   33
  137-     *AMF   33  5.04698716E-02 -6.26391738E-09  9.12892162E-09  5.03790267E-02*AMF   34
  138-     *AMF   34 -6.31106321E-09  9.11859033E-09  2.51769088E-02 -4.27954916E-09*AMF   35
  139-     *AMF   35  4.74222261E-09                                                 *AMF   36
  140-     DMI     *MFLD         5               1                     -1.17619758E-09  *AMF   37
  141-     *AMF   37  9.21048224E-03 -1.17605836E-09 -1.10450804E-09  2.69141980E-02*AMF   38
  142-     *AMF   38 -3.62237795E-10 -3.80158127E-09  1.13787390E-02 -1.94461114E-09*AMF   39
  143-     *AMF   39 -5.02533126E-09  5.43810d00E-03 -1.59512425E-09 -5.64961056E-09*AMF   40
  144-     *AMF   40  2.77573429E-03 -1.94369580E-09 -5.98463856E-09  1.46727962E-03*AMF   41
  145-     *AMF   41 -6.29279961E-10 -6.16678264E-09  7.96974637E-04 -3.68477693E-10*AMF   42
  146-     *AMF   42 -6.26391738E-09  4.53770447E-04 -2.19540483E-10 -6.31109321E-09*AMF   43
  147-     *AMF   43  2.91505363E-04 -1.44935050E-10 -3.15676263E-09  1.21905570E-04*AMF   44
  148-     *AMF   44 -5.68684683E-11                                                 *AMF   45
  149-     DMI     *MFLD         6               1                      3.99240818E-09  *AMF   46
  150-     *AMF   46 -1.17605836E-09  5.28116524E-03  6.26756957E-09 -3.62237795E-10*AMF   47
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ORIGINAL PAGE IS
OF POOR QUALITY

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                                    S O R T E D   B U L K   D A T A   E C H O
 CARD
 COUNT      .   1  ..   2  ..   3  ..   4  ..   5  ..   6  ..   7  ..   8  ..   9  ..  10  .
  151-      *AMF    47  1.99786499E-02  8.60412186E-09 -1.94461114E-09  5.79728559E-03*AMF   48
  152-      *AMF    48  9.12445586E-09 -1.59512425E-09  1.78609043E-03  9.19800414E-09*AMF   49
  153-      *AMF    49 -1.04369580E-09  5.72260236E-04  9.17711418E-09 -6.29279961E-10*AMF   50
  154-      *AMF    50  1.67767344E-04  9.14849707E-09 -3.68477693E-10  6.25525427E-05*AMF   51
  155-      *AMF    51  9.12892162E-09 -2.19540483E-10  2.12144951E-05  9.11859033E-09*AMF   52
  156-      *AMF    52 -1.44935050E-10  7.85752854E-06  4.55777993E-09 -6.12724038E-11*AMF   53
  157-      *AMF    53  2.38093617E-06                                                 *AMF   54
  158-      DMI     *MFLD           7               1               2.90458575E-02   *AMF   55
  159-      *AMF    55 -2.14204410E-09  4.51854376E-09  6.21849895E-02 -3.80158127E-09*AMF   56
  160-      *AMF    56  8.60412186E-09  1.11024141E-01 -3.98779676E-09  1.08734852E-08*AMF   57
  161-      *AMF    57  8.76556635E-02 -6.82580747E-09  1.31904123E-08  8.02032948E-02*AMF   58
  162-      *AMF    58 -8.12668333E-09  1.36956544E-08  7.74573684E-02 -8.79216699E-09*AMF   59
  163-      *AMF    59  1.37602107E-08  7.63342977E-02 -9.14720744E-09  1.37348337E-08*AMF   60
  164-      *AMF    60  7.58497119E-02 -9.33530941E-09  1.37048808E-08  7.56467581E-02*AMF   61
  165-      *AMF    61 -9.42648626E-09  1.36866412E-08  3.77954580E-02 -6.40362785E-09*AMF   62
  166-      *AMF    62  7.11737158E-09                                                 *AMF   63
  167-      DMI     *MFLD           8               1              -2.14204410E-09   *AMF   64
  168-      *AMF    64  4.30269912E-03 -1.12416187E-09 -3.80158127E-09  1.13787390E-02*AMF   65
  169-      *AMF    65 -1.94461114E-09 -3.98779676E-09  2.80496068E-02 -8.33200176E-10*AMF   66
  170-      *AMF    66 -6.82580747E-09  1.19862184E-02 -2.21975394E-09 -8.12668333E-09*AMF   67
  171-      *AMF    67  5.76997921E-03 -1.75344161E-09 -8.79216699E-09  2.96523259E-03*AMF   68
  172-      *AMF    68 -1.13703069E-09 -9.14720744E-09  1.58918533E-03 -6.90502766E-10*AMF   69
  173-      *AMF    69 -9.33530941E-09  8.98981467E-04 -4.20077750E-10 -9.42648626E-09*AMF   70
  174-      *AMF    70  5.75681916E-04 -2.80763413E-10 -4.71536410E-09  2.40501904E-04*AMF   71
  175-      *AMF    71 -1.10544240E-10                                                 *AMF   72
  176-      DMI     *MFLD           9               1               4.51854376E-09   *AMF   73
  177-      *AMF    73 -1.12416187E-09  1.61713664E-03  8.60412186E-09 -1.94461114E-09*AMF   74
  178-      *AMF    74  5.79728559E-03  1.08734852E-08 -8.33200176E-10  2.01476067E-02*AMF   75
  179-      *AMF    75  1.31904123E-08 -2.21975394E-09  5.85342571E-03  1.36956544E-08*AMF   76
  180-      *AMF    76 -1.75344161E-09  1.80492387E-03  1.37602107E-08 -1.13703069E-09*AMF   77
  181-      *AMF    77  5.78673324E-04  1.37348337E-08 -6.90502766E-10  1.90168270E-04*AMF   78
  182-      *AMF    78  1.37048808E-08 -4.20077750E-10  6.39965512E-05  1.36866412E-08*AMF   79
  183-      *AMF    79 -2.80763413E-10  2.35554353E-05  6.84057255E-09 -1.19282903E-10*AMF   80
  184-      *AMF    80  7.13532063E-06                                                 *AMF   81
  185-      DMI     *MFLD          10               1               2.67748497E-02   *AMF   82
  186-      *AMF    82 -2.62538569E-09  4.61171368E-09  5.49103394E-02 -5.02533126E-09*AMF   83
  187-      *AMF    83  9.12445586E-09  8.76556635E-02 -6.82580747E-09  1.31904123E-08*AMF   84
  188-      *AMF    84  1.36317074E-01 -7.08914527E-09  1.54446838E-08  1.12867534E-01*AMF   85
  189-      *AMF    85 -9.96836391E-09  1.77526183E-08  1.05380177E-01 -1.12892486E-08*AMF   86
  190-      *AMF    86  1.62533775E-08  1.02624536E-01 -1.19606938E-08  1.83165945E-08*AMF   87
  191-      *AMF    87  1.01511240E-01 -1.23097728E-08  1.82925532E-08  1.01061583E-01*AMF   88
  192-      *AMF    88 -1.24778659E-08  1.82670874E-08  5.04698791E-02 -8.50303294E-09*AMF   89
  193-      *AMF    89  9.49877332E-09                                                 *AMF   90
  194-      DMI     *MFLD          11               1              -2.62538569E-09   *AMF   91
  195-      *AMF    91  2.16825819E-03 -7.68552997E-10 -5.02533126E-09  5.43810800E-03*AMF   92
  196-      *AMF    92 -1.59512425E-09 -6.82580747E-09  1.19862184E-02 -2.21975394E-09*AMF   93
  197-      *AMF    93 -7.08914527E-09  2.83214743E-02 -9.91517535E-10 -9.96836391E-09*AMF   94
  198-      *AMF    94  1.21757165E-02 -2.31308883E-09 -1.12992496E-08  5.83198188E-03*AMF   95
  199-      *AMF    95 -1.81466464E-09 -1.19606938E-08  3.06723965E-03 -1.18863075E-09*AMF   96
  200-      *AMF    96 -1.23097728E-08  1.71109079E-03 -7.51725793E-10 -1.24778659E-08*AMF   97
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SORTED BULK DATA ECHO

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CARD
COUNT      *   1   **   2   **   3   **   4   **   5   **   6   **   7   **   8   **   9   **  10   *
  201-     *AMF   97  1.08848000E-03 -5.13412646E-10 -6.24230623E-09  4.53776447E-04*AMF   98
  202-     *AMF   98 -2.03331504E-10                                                *AMF   99
  203-     CMI     *MFLD              12                1                4.61171368E-09  *AMF  100
  204-     *AMF  100 -7.68552999E-10  5.16120810E-04  9.12445586E-09 -1.59512425E-09*AMF  101
  205-     *AMF  101  1.78609043E-03  1.31904123E-08 -2.21975394E-09  5.85342571E-03*AMF  102
  206-     *AMF  102  1.54446838E-08 -9.91517535E-10  2.01664381E-02  1.77526189E-08*AMF  103
  207-     *AMF  103 -2.31308883E-09  5.85983694E-03  1.82533775E-08 -1.81466464E-09*AMF  104
  208-     *AMF  104  1.80730480E-03  1.83165945E-08 -1.18863075E-09  5.80117805E-04*AMF  105
  209-     *AMF  105  1.82925532E-08 -7.51725793E-10  1.92549211E-04  1.82670874E-08*AMF  106
  210-     *AMF  106 -5.13412646E-10  7.04100676E-05  9.12943321E-09 -2.19979729E-10*AMF  107
  211-     *AMF  107  2.12144951E-05                                                *AMF  108
  212-     CMI     *MFLD              13                1                2.58644857E-02  *AMF  109
  213-     *AMF  109 -2.88329072E-09  4.66591210E-09  5.22455387E-02 -5.64961056E-09*AMF  110
  214-     *AMF  110  9.19800414E-09  8.02032948E-02 -8.12668333E-09  1.36956544E-08*AMF  111
  215-     *AMF  111  1.12867534E-01 -9.56836391E-09  1.77526189E-08  1.61494017E-01*AMF  112
  216-     *AMF  112 -1.02517141E-08  2.00024033E-08  1.38034642E-01 -1.31368907E-08*AMF  113
  217-     *AMF  113  2.23090026E-08  1.30557060E-01 -1.44518175E-08  2.28110970E-08*AMF  114
  218-     *AMF  114  1.27836406E-01 -1.51032502E-08  2.28788011E-08  1.26804173E-01*AMF  115
  219-     *AMF  115 -1.54111248E-08  2.28637553E-08  6.32660985E-02 -1.05578728E-08*AMF  116
  220-     *AMF  116  1.18903145E-08                                                *AMF  117
  221-     CMI     *MFLD              14                1               -2.88329072E-09  *AMF  118
  222-     *AMF  118  1.13540886E-03 -4.70962380E-10 -5.64961056E-09  2.77573429E-03*AMF  119
  223-     *AMF  119 -1.04369580E-09 -8.12668333E-09  5.76097921E-03 -1.79344161E-09*AMF  120
  224-     *AMF  120 -9.96836391E-09  1.21757165E-02 -2.31308883E-09 -1.02517141E-08*AMF  121
  225-     *AMF  121  2.85033807E-02 -1.05274056E-09 -1.31368907E-08  1.22777224E-02*AMF  122
  226-     *AMF  122 -2.36468889E-09 -1.44518175E-08  6.01378828E-03 -1.87586745E-09*AMF  123
  227-     *AMF  123 -1.51032502E-08  3.25673795E-03 -1.28196564E-09 -1.54111248E-08*AMF  124
  228-     *AMF  124  2.04296177E-03 -9.10043152E-10 -7.71066055E-09  8.47978052E-04*AMF  125
  229-     *AMF  125 -3.63987729E-10                                                *AMF  126
  230-     CMI     *MFLD              15                1                4.60591210E-09  *AMF  127
  231-     *AMF  127 -4.70962380E-10  1.68953789E-04  9.19800414E-09 -1.04369580E-09*AMF  128
  232-     *AMF  128  5.72260236E-04  1.36956544E-08 -1.75344161E-09  1.80492387E-03*AMF  129
  233-     *AMF  129  1.77526189E-08 -2.31308883E-09  5.85983694E-03  2.00024033E-08*AMF  130
  234-     *AMF  130 -1.05274056E-09  2.01688185E-02  2.23090026E-08 -2.36468889E-09*AMF  131
  235-     *AMF  131  5.86128235E-03  2.28110970E-08 -1.87586745E-09  1.80968572E-03*AMF  132
  236-     *AMF  132  2.28788011E-08 -1.28196564E-09  5.86530892E-04  2.28637553E-08*AMF  133
  237-     *AMF  133 -9.10043152E-10  2.11382750E-04  1.14282166E-08 -3.95587119E-10*AMF  134
  238-     *AMF  134  6.32747397E-05                                                *AMF  135
  239-     CMI     *MFLD              16                1                2.54706964E-02  *AMF  136
  240-     *AMF  136 -3.02422776E-09  4.58629046E-09  5.11574484E-02 -5.98463856E-09*AMF  137
  241-     *AMF  137  9.17711418E-09  7.74573684E-02 -8.79216699E-09  1.37602107E-08*AMF  138
  242-     *AMF  138  1.05380177E-01 -1.12892480E-08  1.82533775E-08  1.38034642E-01*AMF  139
  243-     *AMF  139 -1.31368907E-08  2.23090026E-08  1.80670899E-01 -1.34142830E-08*AMF  140
  244-     *AMF  140  2.45601264E-08  1.63246572E-01 -1.62794471E-08  2.68712093E-08*AMF  141
  245-     *AMF  141  1.55850053E-01 -1.75531096E-08  2.73822955E-08  1.53307080E-01*AMF  142
  246-     *AMF  142 -1.81274704E-08  2.74650915E-08  7.63343573E-02 -1.25338104E-08*AMF  143
  247-     *AMF  143  1.42942262E-08                                                *AMF  144
  248-     CMI     *MFLD              17                1               -3.02422776E-09  *AMF  145
  249-     *AMF  145  6.07476337E-04 -2.75142797E-10 -5.98463856E-09  1.46727962E-03*AMF  146
  250-     *AMF  146 -8.29279961E-10 -8.79216699E-09  2.96523259E-03 -1.13703669E-09*AMF  147
```

SORTED BULK DATA ECHO

CARD COUNT	. 1 .. 2 .. 3 .. 4 .. 5 .. 6 .. 7 .. 8 .. 9 .. 10 .	
251-	*AMF 147 -1.12892486E-08 5.89188158E-03 -1.81466464E-09 -1.31368907E-08	*AMF 148
252-	*AMF 148 1.22777224E-02 -2.3346886[illegible]9E-09 -1.34142830E-08 2.86252871E-02	*AMF 149
253-	*AMF 149 -1.11396337E-09 -1.62794471E-08 1.24672204E-02 -2.45802378E-09	*AMF 150
254-	*AMF 150 -1.75531696E-08 6.34565919E-03 -2.03420503E-09 -1.81274764E-08	*AMF 151
255-	*AMF 151 3.86421406E-03 -1.55710814E-09 -9.07152042E-09 1.58918533E-03	*AMF 152
256-	*AMF 152 -6.33736841E-10	*AMF 153
257-	DMI *MFLD 18 1 4.58629046E-09	*AMF 154
258-	*AMF 154 -2.75142797E-10 5.61394263E-05 9.17711418E-09 -6.29279961E-10	*AMF 155
259-	*AMF 155 1.87787344E-04 1.37602107E-08 -1.13703069E-09 5.78673324E-04	*AMF 156
260-	*AMF 156 1.82533775E-08 -1.81466464E-09 1.80730480E-03 2.23090026E-08	*AMF 157
261-	*AMF 157 -2.36468889E-09 5.86128235E-03 2.45601264E-08 -1.11396337E-09	*AMF 158
262-	*AMF 158 2.01712027E-02 2.68712093E-08 -2.45802378E-09 5.86769357E-03	*AMF 159
263-	*AMF 159 2.73822955E-08 -2.03420503E-09 1.82851939E-03 2.74650915E-08	*AMF 160
264-	*AMF 160 -1.55710844E-09 6.42670386E-04 1.37394203E-08 -6.94437174E-10	*AMF 161
265-	*AMF 161 1.90168255E-04	*AMF 162
266-	DMI *MFLD 19 1 2.52229702E-02	*AMF 163
267-	*AMF 163 -3.10135118E-09 4.57119853E-09 5.06825671E-02 -6.16678264E-09	*AMF 164
268-	*AMF 164 5.14349707E-09 7.63342977E-02 -9.14720744E-09 1.37348337E-08	*AMF 165
269-	*AMF 165 1.02624536E-01 -1.19606938E-08 1.83165945E-08 1.30557060E-01	*AMF 166
270-	*AMF 166 -1.44518175E-08 2.28110970E-08 1.63246572E-01 -1.62794471E-08	*AMF 167
271-	*AMF 167 2.68712093E-08 2.11963892E-01 -1.65156315E-08 2.91313249E-08	*AMF 168
272-	*AMF 168 1.88717246E-01 -1.93036733E-08 3.14574997E-08 1.81714535E-01	*AMF 169
273-	*AMF 169 -2.04364596E-08 3.19882112E-08 9.00409818E-02 -1.43711354E-08	*AMF 170
274-	*AMF 170 1.66982410E-08	*AMF 171
275-	DMI *MFLD 20 1 -3.10135118E-09	*AMF 172
276-	*AMF 172 3.31870979E-04 -1.58317554E-10 -6.16678264E-09 7.96974637E-04	*AMF 173
277-	*AMF 173 -3.68477693E-10 -9.14720744E-09 1.58918533E-03 -6.90502766E-10	*AMF 174
278-	*AMF 174 -1.19606938E-08 3.06723965E-03 -1.18363075E-09 -1.44518175E-08	*AMF 175
279-	*AMF 175 6.01378828E-03 -1.87588745E-09 -1.62794471E-08 1.24672204E-02	*AMF 176
280-	*AMF 176 -2.45802378E-09 -1.65156315E-08 2.89571583E-02 -1.27228095E-09	*AMF 177
281-	*AMF 177 -1.93036733E-08 1.30746903E-02 -2.73316658E-09 -2.04364596E-08	*AMF 178
282-	*AMF 178 7.48106837E-03 -2.50516741E-09 -1.02327782E-08 3.01623624E-03	*AMF 179
283-	*AMF 179 -1.05509002E-09	*AMF 180
284-	DMI *MFLD 21 1 4.57119853E-09	*AMF 181
285-	*AMF 181 -1.58317554E-10 1.88335543E-05 9.14849707E-09 -3.68477693E-10	*AMF 182
286-	*AMF 182 6.25525427E-05 1.37348337E-08 -6.90502766E-10 1.90166270E-04	*AMF 183
287-	*AMF 183 1.83165945E-08 -1.18863075E-09 5.80117805E-04 2.28110970E-08	*AMF 184
288-	*AMF 184 -1.87588745E-09 1.80968572E-03 2.68712093E-08 -2.45802378E-09	*AMF 185
289-	*AMF 185 5.86769357E-03 2.91313249E-08 -1.27228095E-09 2.01900341E-02	*AMF 186
290-	*AMF 186 3.14574997E-08 -2.73316658E-09 5.92383370E-03 3.19882112E-08	*AMF 187
291-	*AMF 187 -2.50516741E-09 1.59747495E-03 1.60523754E-08 -1.17461624E-09	*AMF 188
292-	*AMF 188 5.79395331E-04	*AMF 189
293-	DMI *MFLD 22 1 2.52118781E-02	*AMF 190
294-	*AMF 190 -3.14255666E-09 4.56220661E-09 5.04698716E-02 -6.20391738E-09	*AMF 191
295-	*AMF 191 9.12892162E-09 7.58497119E-02 -9.33530941E-09 1.37048808E-08	*AMF 192
296-	*AMF 192 1.01511240E-01 -1.23095728E-08 1.82925532E-08 1.27836406E-01	*AMF 193
297-	*AMF 193 -1.51032902E-08 2.28780011E-08 1.55850053E-01 -1.75531696E-08	*AMF 194
298-	*AMF 194 2.73822955E-08 1.88717246E-01 -1.93036733E-08 3.14574997E-08	*AMF 195
299-	*AMF 195 2.37822374E-01 -1.93988216E-08 3.37372370E-08 2.15492070E-01	*AMF 196
300-	*AMF 196 -2.19290612E-08 3.60692134E-08 1.05380177E-01 -1.59644848E-08	*AMF 197

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AXISYMMETRIC CIRC. CYL. WITH FLUID                                              MAY   4, 1974   NASTRAN  5/13/72
HARMONIC REDUCTION
                                 S O R T E D   B U L K   D A T A   E C H O
CARD
COUNT       .   1  ..   2  ..   3  ..   4  ..   5  ..   6  ..   7  ..   8  ..   9  ..  10  .
  301-      *AMF 197  1.90256237E-08                                                    *AMF 198
  302-      DMI     *MFLD         23                1                  -3.14255666E-09 *AMF 199
  303-      *AMF 199  1.89498416E-04 -9.33349370E-11 -6.26391738E-09  4.53776447E-04*AMF 200
  304-      *AMF 200 -2.19540483E-10 -9.33530941E-09  8.98981467E-04 -4.20077750E-10*AMF 201
  305-      *AMF 201 -1.23097728E-08  1.71109079E-03 -7.51725793E-10 -1.51032502E-08*AMF 202
  306-      *AMF 202  3.25673755E-03 -1.28196564E-09 -1.75531696E-08  6.34565949E-03*AMF 203
  307-      *AMF 203 -2.03420503E-09 -1.93036733E-08  1.30746961E-02 -2.73316658E-09*AMF 204
  308-      *AMF 204 -1.93989216E-08  3.00925672E-02 -1.74324311E-09 -2.19290612E-08*AMF 205
  309-      *AMF 205  1.52429529E-02 -3.50171936E-09 -1.10086411E-08  5.89188188E-03*AMF 206
  310-      *AMF 206 -1.60420499E-09                                                    *AMF 207
  311-      DMI     *MFLD         24                1                   4.56220661E-09 *AMF 208
  312-      *AMF 208 -9.33349370E-11  6.41311362E-06  9.12892162E-09 -2.19540483E-10*AMF 209
  313-      *AMF 209  2.12144951E-05  1.37048608E-08 -4.20077750E-10  6.39969512E-05*AMF 210
  314-      *AMF 210  1.82925532E-08 -7.51725793E-10  1.92549211E-04  2.28788011E-08*AMF 211
  315-      *AMF 211 -1.28196564E-09  5.86530892E-04  2.73822955E-08 -2.03420503E-09*AMF 212
  316-      *AMF 212  1.82851939E-03  3.14574997E-08 -2.73316658E-09  5.92383370E-03*AMF 213
  317-      *AMF 213  3.37372370E-08 -1.74324311E-09  2.03589872E-02  3.60692134E-08*AMF 214
  318-      *AMF 214 -3.50171936E-09  6.43995404E-03  1.82969551E-08 -1.85204985E-09*AMF 215
  319-      *AMF 215  1.80730456E-03                                                    *AMF 216
  320-      DMI     *MFLD         25                1                   2.51769051E-02 *AMF 217
  321-      *AMF 217 -3.16256843E-09  4.55771954E-09  5.03790267E-02 -6.31108321E-09*AMF 218
  322-      *AMF 218  9.11859033E-09  7.56467581E-02 -9.42648626E-09  1.36866412E-08*AMF 219
  323-      *AMF 219  1.01061583E-01 -1.24778659E-08  1.82670874E-08  1.26864173E-01*AMF 220
  324-      *AMF 220 -1.54111248E-08  2.28637553E-08  1.53307080E-01 -1.81274764E-08*AMF 221
  325-      *AMF 221  2.74650915E-08  1.81714535E-01 -2.04364596E-08  3.19882112E-08*AMF 222
  326-      *AMF 222  2.15492070E-01 -2.19290612E-08  3.60692134E-08  2.66874194E-01*AMF 223
  327-      *AMF 223 -2.15409663E-08  3.82557808E-08  1.25451088E-01 -1.71183174E-08*AMF 224
  328-      *AMF 224  2.09501430E-08                                                    *AMF 225
  329-      DMI     *MFLD         26                1                  -3.16256843E-09 *AMF 226
  330-      *AMF 226  1.21905570E-04 -6.12229434E-11 -6.31108321E-09  2.91505363E-04*AMF 227
  331-      *AMF 227 -1.44935050E-10 -9.42648626E-09  5.75681916E-04 -2.80763413E-10*AMF 228
  332-      *AMF 228 -1.24778659E-08  1.08848000E-03 -5.13412646E-10 -1.54111248E-08*AMF 229
  333-      *AMF 229  2.04296177E-03 -9.10043152E-10 -1.81274764E-08  3.86421406E-03*AMF 230
  334-      *AMF 230 -1.55710844E-09 -2.04364596E-08  7.48106837E-03 -2.50516741E-09*AMF 231
  335-      *AMF 231 -2.19290612E-08  1.52429529E-02 -3.50171936E-09 -2.15409663E-08*AMF 232
  336-      *AMF 232  3.43952626E-02 -2.86740498E-09 -1.09703109E-08  1.22267194E-02*AMF 233
  337-      *AMF 233 -1.90214733E-09                                                    *AMF 234
  338-      DMI     *MFLD         27                1                   4.55771954E-09 *AMF 235
  339-      *AMF 235 -6.12229434E-11  2.38093708E-06  9.11859033E-09 -1.44935050E-10*AMF 236
  340-      *AMF 236  7.85752854E-06  1.36866412E-08 -2.80763413E-10  2.35954358E-05*AMF 237
  341-      *AMF 237  1.82670874E-08 -5.13412646E-10  7.04100676E-05  2.28637553E-08*AMF 238
  342-      *AMF 238 -9.10043152E-10  2.11382750E-04  2.74650915E-08 -1.55710844E-09*AMF 239
  343-      *AMF 239  6.42670086E-04  3.19882112E-08 -2.50516741E-09  1.99747295E-03*AMF 240
  344-      *AMF 240  3.60692134E-08 -3.50171936E-09  6.43995404E-03  3.82557808E-08*AMF 241
  345-      *AMF 241 -2.86740498E-09  2.19761245E-02  2.01721200E-08 -2.46011509E-09*AMF 242
  346-      *AMF 242  5.86055964E-03                                                    *AMF 243
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  348-      *AMF 244 -1.58183555E-09  2.27821051E-09  2.51769088E-02 -3.15676263E-09*AMF 245
  349-      *AMF 245  4.55777993E-09  3.77954580E-02 -4.71536410E-09  6.84057255E-09*AMF 246
  350-      *AMF 246  5.04696791E-02 -6.24230623E-09  9.12343321E-09  6.32660985E-02*AMF 247
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ORIGINAL PAGE IS
OF POOR QUALITY

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357-	*AMF 253 5.10035024E-05 -2.58151139E-11 -4.27954916E-09 1.21905570E-04	*AMF 254
358-	*AMF 254 -6.12724038E-11 -6.40362785E-09 2.40501904E-04 -1.192829C3E-10	*AMF 255
359-	*AMF 255 -8.50303294E-09 4.53776447E-04 -2.19979729E-10 -1.05578728E-08	*AMF 256
360-	*AMF 256 8.47978052E-04 -3.9556711 9E-10 -1.25338104E-08 1.58918533E-03	*AMF 257
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364-	*AMF 260 -2.25891930E-10	*AMF 261
365-	DMI *MFLD 30 1 2.37040809E-09	*AMF 262
366-	*AMF 262 -2.39782222E-11 7.22207631E-07 4.74222261E-09 -5.68684683E-11	*AMF 263
367-	*AMF 263 2.38093617E-06 7.1173715EE-09 -1.10544240E-10 7.13532063E-06	*AMF 264
368-	*AMF 264 9.49677332E-09 -2.0333150 4E-10 2.12144951E-05 1.18903145E-08	*AMF 265
369-	*AMF 265 -3.63927729E-10 6.32747397E-05 1.42942262E-08 -6.33736041E-10	*AMF 266
370-	*AMF 266 1.90168255E-04 1.6698241 0E-08 -1.05509002E-09 5.79395331E-04	*AMF 267
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373-	*AMF 269 1.00844130E-02	*AMF 270
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378-	*APD 3 6.52270126E-02 5.01594686E-09 -1.53029167E-09 8.23292136E-02	*APD 4
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387-	*APD 12 -1.08550544E-08 1.3860320 3E-02 2.25886332E-09 -1.04859836E-08	*APD 13
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390-	*APD 15 -1.02214059E-08 1.2113454 3E-03 2.80677426E-11 -1.02072271E-08	*APD 16
391-	*APD 16 7.79266469E-04 1.0420450 1E-11 -1.02032729E-08 6.52067130E-04	*APD 17
392-	*APD 17 6.32165967E-12	*APD 18
393-	DMI *PDU2 3 1 3.23422036E-08	*APD 19
394-	*APD 19 -7.44992121E-08 1.1894019 8E-01 2.04092636E-08 -3.03 2429E-08	*APD 20
395-	*APD 20 3.41809653E-02 1.6741097 4E-08 -1.41763188E-08 1.04664937E-02	*APD 21
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397-	*APD 22 -3.7408d071E-09 1.2 39C914E-03 1.46804879E-08 -2.00148276E-09	*APD 23
398-	*APD 23 3.63347819E-04 1.4578052 5E-08 -1.09343291E-09 1.21895340E-04	*APD 24
399-	*APD 24 1.45313130E-08 -6.2434990 5E-10 4.15071991E-05 1.45115549E-08	*APD 25
400-	*APD 25 -4.01648270E-10 1.5409963 5E-05 1.45055346E-08 -3.36007380E-10	*APD 26

SORTED BULK DATA ECHO

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  405-     *APD  30  1.74785078E-01  1.25827739E-08 -5.29573185E-09  1.66302741E-01*APD  31
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  408-     *APD  33  1.60650611E-01  1.04995479E-09 -6.29007124E-11  1.60361469E-01*APD  34
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  414-     *APD  39 -2.22617622E-08  3.47624458E-02  7.81703235E-09 -2.11813962E-08*APD  40
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  421-     *APD  46 -3.03462429E-08  3.41809653E-02  4.90832974E-08 -8.86755060E-08*APD  47
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  426-     *APD  51  2.90892075E-08 -1.49508028E-09  1.37305324E-04  2.90368476E-08*APD  52
  427-     *APD  52 -9.60437285E-10  5.08558005E-05  2.90223099E-08 -8.03296540E-10*APD  53
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  436-     *APD  61  1.33202160E-09 -6.99601627E-11  2.40613401E-01  1.11295329E-09*APD  62
  437-     *APD  62 -4.23122509E-11                                                *APD  63
  438-     DMI     *PDU2          8                1               -1.17757786E-08  *APD  64
  439-     *APD  64  2.75044851E-02  7.07758829E-09 -2.52110510E-08  7.27372169E-02*APD  65
  440-     *APD  65  2.53725005E-08 -4.50114399E-08  1.79303646E-01  8.81783535E-08*APD  66
  441-     *APD  66 -3.55373828E-08  7.66204003E-02  2.56182027E-08 -3.25160414E-08*APD  67
  442-     *APD  67  3.06838906E-02  7.89945836E-09 -3.14028021E-08  1.89548880E-02*APD  68
  443-     *APD  68  2.53263188E-09 -3.09474899E-08  1.01596729E-02  8.32293567E-10*APD  69
  444-     *APD  69 -3.07510106E-08  5.74602909E-03  2.80090173E-10 -3.06687298E-08*APD  70
  445-     *APD  70  3.67997750E-03  1.03268136E-10 -3.06460812E-08  3.07475729E-03*APD  71
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  447-     DMI     *PDU2          9                1                1.67410974E-08  *APD  73
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  449-     *APD  74  3.75214219E-02  6.39907598E-08 -9.24164283E-08  1.30400121E-01*APD  75
  450-     *APD  75  5.05219049E-08 -3.94915922E-08  3.78847681E-02  4.62265594E-08*APD  76
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S O R T E D B U L K D A T A E C H O

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  453-     *APD   78  4.37173320E-08 -2.96191982E-09  4.14203620E-04  4.36003589E-08*APD   79
  454-     *APD   79 -1.89672855E-09  1.52715307E-04  4.35681571E-08 -1.58478697E-09*APD   80
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  458-     *APD   83 -5.29573185E-09  2.79016793E-01  2.77338827E-08 -1.73553296E-08*APD   84
  459-     *APD   84  4.33911026E-01  6.56694397E-08 -5.97931944E-08  3.59268665E-01*APD   85
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  462-     *APD   87  3.23123475E-01  3.95914412E-09 -5.70905767E-10  3.21689129E-01*APD   88
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  464-     *APD   89 -5.25801397E-10                                                 *APD   90
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  469-     *APD   94  7.78317451E-02  2.56462691E-08 -4.27232649E-08  3.76631543E-02*APD   95
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  471-     *APD   96 -4.11547134E-08  1.09379306E-02  8.42714121E-10 -4.09724130E-08*APD   97
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  473-     *APD   98  1.85695431E-10                                                 *APD   99
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  477-     *APD  102  7.85687462E-08 -9.35038683E-08  1.30522013E-01  6.50532002E-08*APD  103
  478-     *APD  103 -4.01159426E-08  3.79206753E-02  6.07377046E-08 -1.94122869E-08*APD  104
  479-     *APD  104  1.16973972E-02  5.91494885E-08 -1.01057864E-08  3.75466119E-03*APD  105
  480-     *APD  105  5.65078119E-08 -5.63761660E-09  1.24622439E-03  5.82486415E-08*APD  106
  481-     *APD  106 -3.56826950E-09  4.55710804E-04  5.81784114E-08 -2.99016034E-09*APD  107
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  485-     *APD  110 -1.09674430E-09  2.55295098E-01  1.33506610E-08 -5.35157141E-09*APD  111
  486-     *APD  111  3.59268665E-01  2.81723480E-08 -1.73743437E-08  5.14051916E-01*APD  112
  487-     *APD  112  6.59514967E-08 -5.98002430E-08  4.39378262E-01  2.84083725E-08*APD  113
  488-     *APD  113 -1.73786283E-08  4.15576279E-01  1.39147929E-08 -5.36569189E-09*APD  114
  489-     *APD  114  4.06916142E-01  7.53548690E-09 -1.73905645E-09  4.03630495E-01*APD  115
  490-     *APD  115  4.72703121E-09 -6.26747095E-10  4.02764916E-01  3.92412502E-09*APD  116
  491-     *APD  116 -3.75217413E-10                                                 *APD  117
  492-     DMI     *PDU2          14          1                -1.04859836E-08  *APD  118
  493-     *APD  118  7.25796074E-03  7.39446061E-10 -2.11813962E-08  1.77435428E-02*APD  119
  494-     *APD  119  2.50456411E-09 -3.25160414E-08  3.68838906E-02  7.89945866E-09*APD  120
  495-     *APD  120 -4.57587888E-08  7.78317451E-02  2.56462691E-08 -6.54729320E-08*APD  121
  496-     *APD  121  1.82204366E-01  8.82711788E-08 -5.59620581E-08  7.84838200E-02*APD  122
  497-     *APD  122  2.56525929E-08 -5.29304920E-08  5.84424217E-02  7.92029908E-09*APD  123
  498-     *APD  123 -5.18274774E-08  2.06182966E-02  2.56702126E-09 -5.14089962E-08*APD  124
  499-     *APD  124  1.30593814E-02  9.25141297E-10 -5.12987448E-08  1.06411908E-02*APD  125
  500-     *APD  125  5.53858515E-10                                                 *APD  126
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SORTED BULK DATA ECHO

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CARD
COUNT     .  1  ..  2  ..  3  ..  4  ..  5  ..  6  ..  7  ..  8  ..  9  .. 10  .
  501-    DMI     *PDU2          15          1                 1.49074530E-08 *APD 127
  502-    *APD 127 -3.74088671E-09  1.09350914E-03  3.01126448E-08 -9.14534937E-09*APD 128
  503-    *APD 128  3.70380539E-03  4.62265994E-08 -1.90106384E-08  1.16818994E-02*APD 129
  504-    *APD 129  6.50532002E-08 -4.01159426E-08  3.79262753E-02  9.30799047E-08*APD 130
  505-    *APD 130 -9.39114670E-08  1.30537391E-01  7.95587312E-08 -4.04520293E-08*APD 131
  506-    *APD 131  3.79356258E-02  7.52486631E-08 -1.98139354E-08  1.17127188E-02*APD 132
  507-    *APD 132  7.36807866E-08 -1.07301368E-08  3.79616814E-03  7.30858574E-08*APD 133
  508-    *APD 133 -6.73104594E-09  1.36811961E-03  7.29290832E-08 -5.58775071E-09*APD 134
  509-    *APD 134  8.19058390E-04                                               *APD 135
  510-    DMI     *PDU2          16          1                 8.10757279E-02 *APD 136
  511-    *APD 136  1.40558765E-09 -1.66452699E-10  1.62839234E-01  3.39501316E-09*APD 137
  512-    *APD 137 -5.56786839E-10  2.46554673E-01  6.86099710E-09 -1.71575909E-09*APD 138
  513-    *APD 138  3.35436668E-01  1.36327287E-08 -5.35863265E-09  4.39378262E-01*APD 139
  514-    *APD 139  2.84083725E-08 -1.73786283E-08  5.94192207E-01  6.62336538E-08*APD 140
  515-    *APD 140 -5.98673484E-08  5.19630134E-01  2.88468378E-08 -1.73976424E-08*APD 141
  516-    *APD 141  4.96086359E-01  1.46826835E-08 -5.42153344E-09  4.87991869E-01*APD 142
  517-    *APD 142  8.94107188E-09 -1.90550938E-09  4.85959709E-01  7.35415639E-09*APD 143
  518-    *APD 143 -1.12769238E-09                                               *APD 144
  519-    DMI     *PDU2          17          1                 -1.03263353E-08 *APD 145
  520-    *APD 145  3.88321883E-03  2.45700793E-10 -2.07402664E-08  9.37940553E-03*APD 146
  521-    *APD 146  6.21673236E-10 -3.14028021E-08  1.89548880E-02  2.53263188E-09*APD 147
  522-    *APD 147 -4.27232649E-08  3.76631543E-02  7.90987897E-09 -5.59620561E-08*APD 148
  523-    *APD 148  7.84838200E-02  2.56525929E-08 -7.56801342E-08  1.82983537E-01*APD 149
  524-    *APD 149  8.82815812E-08 -6.61834179E-08  7.96951652E-02  2.56806594E-08*APD 150
  525-    *APD 150 -6.31847570E-08  4.65638665E-02  8.00272915E-09 -6.21537879E-08*APD 151
  526-    *APD 151  2.47015134E-02  2.81272183E-09 -6.18949230E-08  2.03173421E-02*APD 152
  527-    *APD 152  1.66458691E-09                                               *APD 153
  528-    DMI     *PDU2          18          1                 1.46804879E-08 *APD 154
  529-    *APD 154 -2.00148276E-09  3.63347819E-04  2.94855056E-08 -4.83431961E-09*APD 155
  530-    *APD 155  1.21540460E-03  4.46439543E-08 -9.75969972E-09  3.74531257E-03*APD 156
  531-    *APD 156  6.07377046E-08 -1.94122869E-08  1.16973072E-02  7.95587312E-08*APD 157
  532-    *APD 157 -4.04520293E-08  3.79356258E-02  1.07591063E-07 -9.43131226E-08*APD 158
  533-    *APD 158  1.30552828E-01  9.40900122E-08 -4.10763796E-08  3.79771329E-02*APD 159
  534-    *APD 159  8.58269263E-08 -2.09073683E-08  1.18346140E-02  8.83612756E-08*APD 160
  535-    *APD 160 -1.27316184E-08  4.15951386E-03  8.79932713E-08 -1.04719327E-08*APD 161
  536-    *APD 161  2.46162829E-03                                               *APD 162
  537-    DMI     *PDU2          19          1                 8.05100203E-02 *APD 163
  538-    *APD 163  7.67887975E-10 -5.58412760E-11  1.61327660E-01  1.84405158E-09*APD 164
  539-    *APD 164 -1.85467489E-10  2.42979825E-01  3.67707997E-09 -5.63846303E-10*APD 165
  540-    *APD 165  3.26664299E-01  7.09702164E-09 -1.72004166E-09  4.15576279E-01*APD 166
  541-    *APD 166  1.39147929E-08 -5.36659189E-09  5.19630134E-01  2.88468378E-08*APD 167
  542-    *APD 167 -1.73976424E-08  6.74702287E-01  6.70014515E-08 -5.98631686E-08*APD 168
  543-    *APD 168  6.00705922E-01  3.02524228E-08 -1.75640942E-08  5.78415573E-01*APD 169
  544-    *APD 169  1.73098051E-08 -5.92248028E-09  5.73218882E-01  1.39580187E-08*APD 170
  545-    *APD 170 -3.43579964E-09                                               *APD 171
  546-    DMI     *PDU2          20          1                 -1.02542828E-08 *APD 172
  547-    *APD 172  2.12144526E-03  8.24273016E-11 -2.05477377E-08  5.09456173E-03*APD 173
  548-    *APD 173  2.73768341E-10 -3.05474899E-08  1.01586729E-02  8.32293567E-10*APD 174
  549-    *APD 174 -4.16060715E-08  1.96609553E-02  2.53895349E-09 -5.29304920E-08*APD 175
  550-    *APD 175  3.84424217E-02  7.92029908E-09 -6.61834179E-08  7.96951652E-02*APD 176
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OF POOR QUALITY

SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
551-	*APD 176	2.56806594E-08	-8.5934402?E-08	1.85105085E-01	8.83640041E-08	*APD 177				
552-	*APD 177	-7.65097639E-08	8.35784078E-02	2.59263579E-08	-7.36707193E-08	*APD 178				
553-	*APD 178	4.78218235E-02	8.74217321E-09	-7.30088345E-08	3.85618359E-02	*APD 179				
554-	*APD 179	5.07158049E-09				*APD 180				
555-	DMI	*PDU2	21	1	1.45780525E-08	*APD 181				
556-	*APD 181	-1.09343201E-09	1.21895340E-04	2.92117974E-08	-2.62583244E-09	*APD 182				
557-	*APD 182	4.04855004E-04	4.39966570E-08	-5.23596810E-09	1.23081449E-03	*APD 183				
558-	*APD 183	5.91494889E-08	-1.01057804E-08	3.75466119E-03	7.52488631E-09	*APD 184				
559-	*APD 184	-1.98139354E-08	1.17127180E-02	9.40900122E-08	-4.10763796E-08	*APD 185				
560-	*APD 185	3.79771329E-02	1.22169126E-07	-9.54065627E-08	1.30674720E-01	*APD 186				
561-	*APD 186	1.08773507E-07	-4.30778613E-08	3.83404791E-02	1.04734397E-07	*APD 187				
562-	*APD 187	-2.46482559E-08	1.29281208E-02	1.03793411E-07	-1.98754826E-08	*APD 188				
563-	*APD 188	7.49597050E-03				*APD 189				
564-	DMI	*PDU2	22	1	8.02519321E-02	*APD 190				
565-	*APD 190	4.38464154E-10	-1.90147897E-11	1.60650611E-01	1.04995479E-09	*APD 191				
566-	*APD 191	-6.29007124E-11	2.41437197E-01	2.08007678E-09	-1.89750160E-10	*APD 192				
567-	*APD 192	3.23120475E-01	3.95914412E-09	-5.70905767E-10	4.06916142E-01	*APD 193				
568-	*APD 193	7.53548690E-09	-1.73905649E-09	4.96086359E-01	1.46826835E-08	*APD 194				
569-	*APD 194	-5.42153344E-09	6.00705922E-01	3.02524228E-08	-1.75640942E-08	*APD 195				
570-	*APD 195	7.57031500E-01	6.96285830E-08	-6.03641297E-08	6.85932934E-01	*APD 196				
571-	*APD 196	3.52693696E-08	-1.90943830E-08	6.70871437E-01	2.72654503E-08	*APD 197				
572-	*APD 197	-1.07172653E-08				*APD 198				
573-	DMI	*PDU2	23	1	-1.02214059E-08	*APD 199				
574-	*APD 199	1.21134543E-03	2.80677426E-11	-2.04615063E-08	2.90071149E-03	*APD 200				
575-	*APD 200	9.28477434E-11	-3.07510106E-08	5.74662909E-03	2.80090173E-10	*APD 201				
576-	*APD 201	-4.11547134E-08	1.09379366E-02	8.42714121E-10	-5.18274774E-08	*APD 202				
577-	*APD 202	2.08182968E-02	2.56702126E-09	-6.31847570E-08	4.05638665E-02	*APD 203				
578-	*APD 203	8.00272915E-09	-7.65097639E-08	8.35784078E-02	2.59263579E-08	*APD 204				
579-	*APD 204	-9.64204219E-08	1.92263024E-01	8.91034801E-08	-8.73648105E-08	*APD 205				
580-	*APD 205	9.74386930E-02	2.81852195E-08	-8.54465156E-08	7.53262639E-02	*APD 206				
581-	*APD 206	1.58197579E-08				*APD 207				
582-	CMI	*PDU2	24	1	1.45313130E-08	*APD 208				
583-	*APD 208	-6.24349905E-10	4.15071991E-05	2.90892075E-08	-1.49508028E-09	*APD 209				
584-	*APD 209	1.37305324E-04	4.37173326E-08	-2.96191982E-09	4.14203620E-04	*APD 210				
585-	*APD 210	5.85078119E-08	-5.63761006E-09	1.24622439E-03	7.36807806E-08	*APD 211				
586-	*APD 211	-1.07301368E-08	3.79616814E-03	8.98269263E-08	-2.09073083E-08	*APD 212				
587-	*APD 212	1.18346140E-02	1.08770507E-07	-4.30778613E-08	3.83404791E-02	*APD 213				
588-	*APD 213	1.37076597E-07	-9.91474849E-08	1.31768227E-01	1.24202700E-07	*APD 214				
589-	*APD 214	-5.02217254E-08	4.16809326E-02	1.21475466E-07	-3.88245667E-08	*APD 215				
590-	*APD 215	2.33946107E-02				*APD 216				
591-	DMI	*PDU2	25	1	8.01405907E-02	*APD 217				
592-	*APD 217	2.82066814E-10	-7.05944764E-12	1.60361469E-01	6.74489353E-10	*APD 218				
593-	*APD 218	-2.32974612E-11	2.40791202E-01	1.33202160E-09	-6.99601627E-11	*APD 219				
594-	*APD 219	3.21689129E-01	2.51654071E-09	-2.08764936E-10	4.03630495E-01	*APD 220				
595-	*APD 220	4.72703121E-09	-6.26747099E-10	4.87991869E-01	8.94107188E-09	*APD 221				
596-	*APD 221	-1.90550908E-09	5.78415573E-01	1.73098051E-08	-5.92248028E-09	*APD 222				
597-	*APD 222	6.85932934E-01	3.52693696E-08	-1.90943830E-08	8.49487364E-01	*APD 223				
598-	*APD 223	7.55842539E-09	-6.51588721E-08	7.98046927E-01	5.65807099E-08	*APD 224				
599-	*APD 224	-3.47529614E-08				*APD 225				
600-	DMI	*PDU2	26	1	-1.02072271E-08	*APD 226				

SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .	
601-	*APD	226	7.79266469E-04	1.04204501E-11	-2.04246753E-08	1.86341233E-03	*APD	227			
602-	*APD	227	3.43893941E-11	-3.06687298E-08	3.67997750E-03	1.03268186E-10	*APD	228			
603-	*APD	228	-4.09724130E-08	6.95797428E-03	3.08157722E-10	-5.14089962E-08	*APD	229			
604-	*APD	229	1.30593814E-02	9.25141297E-10	-6.21537879E-08	2.47015134E-02	*APD	230			
605-	*APD	230	2.81272183E-09	-7.36707193E-08	4.78218235E-02	8.74217321E-09	*APD	231			
606-	*APD	231	-8.73648105E-08	9.74386930E-02	2.81852195E-08	-1.08196161E-07	*APD	232			
607-	*APD	232	2.19867527E-01	9.61810542E-08	-1.01720843E-07	1.56315565E-01	*APD	233			
608-	*APD	233	5.12988443E-08							*APD	234
609-	DMI	*PDU2		27	1			1.45111549E-08		*APD	235
610-	*APD	235	-4.01648270E-10	1.54099835E-05	2.90368476E-08	-9.60437285E-10	*APD	236			
611-	*APD	236	5.08558609E-05	4.36003589E-08	-1.89672855E-09	1.52715307E-04	*APD	237			
612-	*APD	237	5.82486415E-08	-3.58626950E-09	4.55710804E-04	7.30858574E-08	*APD	238			
613-	*APD	238	-6.73104594E-09	1.36811961E-03	8.83612756E-08	-1.27316184E-08	*APD	239			
614-	*APD	239	4.15951386E-03	1.04734397E-07	-2.46482550E-08	1.29281208E-02	*APD	240			
615-	*APD	240	1.24202700E-07	-5.02217254E-08	4.16809320E-02	1.53817666E-07	*APD	241			
616-	*APD	241	-1.13323779E-07	1.42234683E-01	1.44611931E-07	-8.05679292E-08	*APD	242			
617-	*APD	242	7.58618712E-02							*APD	243
618-	DMI	*PDU2		28	1			4.00547944E-02		*APD	244
619-	*APD	244	1.33540595E-10	-2.02863334E-12	8.01405907E-02	3.19180682E-10	*APD	245			
620-	*APD	245	-6.68789503E-12	1.20306730E-01	6.29697183E-10	-2.00426481E-11	*APD	246			
621-	*APD	246	1.60650671E-01	1.18810650E-09	-5.95901245E-11	2.01382458E-01	*APD	247			
622-	*APD	247	2.22023022E-09	-1.77734605E-10	2.42979884E-01	4.16090273E-09	*APD	248			
623-	*APD	248	-5.34170042E-10	2.86609471E-01	7.89729881E-09	-1.62748393E-09	*APD	249			
624-	*APD	249	3.35435748E-01	1.54265045E-08	-5.07660047E-09	3.99323523E-01	*APD	250			
625-	*APD	250	3.20127711E-08	-1.64619287E-08	5.14051735E-01	7.46293267E-08	*APD	251			
626-	*APD	251	-5.66529046E-08							*APD	252
627-	DMI	*PDU2		29	1			-6.87868251E-09		*APD	253
628-	*APD	253	3.26033449E-04	3.06413835E-12	-1.37626941E-08	7.79266469E-04	*APD	254			
629-	*APD	254	1.01016938E-11	-2.06604973E-08	1.53737888E-03	3.02732978E-11	*APD	255			
630-	*APD	255	-2.75688361E-08	2.90071149E-03	9.00075847E-11	-3.45837883E-08	*APD	256			
631-	*APD	256	5.42059541E-03	2.68458145E-10	-4.17273895E-08	1.01586729E-02	*APD	257			
632-	*APD	257	8.06834155E-10	-4.92198810E-08	1.92809217E-02	2.45822407E-09	*APD	258			
633-	*APD	258	-5.76050070E-08	3.76631580E-02	7.66792141E-09	-6.85765258E-08	*APD	259			
634-	*APD	259	7.81577826E-02	2.46648284E-08	-8.82790232E-08	1.82204425E-01	*APD	260			
635-	*APD	260	8.55710596E-08							*APD	261
636-	DMI	*PDU2		30	1			7.54629781E-09		*APD	262
637-	*APD	262	-1.56397770E-10	4.67430073E-06	1.50984434E-08	-3.73812759E-10	*APD	263			
638-	*APD	263	1.54099835E-05	2.26657129E-08	-7.37477857E-10	4.61814925E-05	*APD	264			
639-	*APD	264	3.02664880E-08	-1.39146605E-09	1.37305309E-04	3.79403389E-08	*APD	265			
640-	*APD	265	-2.60025090E-09	4.09529079E-04	4.57772664E-08	-4.87309748E-09	*APD	266			
641-	*APD	266	1.23081426E-03	5.39970593E-08	-9.24902110E-09	3.74998641E-03	*APD	267			
642-	*APD	267	6.31058983E-08	-1.80669488E-08	1.16973072E-02	7.52322649E-08	*APD	268			
643-	*APD	268	-3.74921640E-08	3.79309463E-02	9.68479317E-08	-8.74031230E-08	*APD	269			
644-	*APD	269	1.30537450E-01							*APD	270
645-	DMI	TU12	0	2	1	2		15	30	EATU	0
646-	DMI	*TU12		1	1			-1.69992805E-01		*ATU	1
647-	*ATU	1	-6.53458869E-08	-7.94370294E-08	-1.74978077E-01	4.96155472E-08	*ATU	2			
648-	*ATU	2	-8.09579319E-08	-2.44192878E-01	6.51131700E-08	-1.07940593E-07	*ATU	3			
649-	*ATU	3	-4.15904641E-01	6.76216132E-08	-1.56354929E-07	-8.77412558E-01	*ATU	4			
650-	*ATU	4	7.80204344E-08	-2.38857353E-07						*ATU	5

ORIGINAL PAGE IS
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SORTED BULK DATA ECHO

CARD COUNT	. 1	.. 2	.. 3	.. 4	.. 5	.. 6	.. 7	.. 8	.. 9	.. 10 .	
651-	DMI	*TU12	2		1			2.18358203E-08	*ATU	6	
652-	*ATU	6	9.58415912E-04	1.18971766E-09	2.65904170E-08	-2.56741680E-02	*ATU	7			
653-	*ATU	7	1.93318144E-08	4.7908633[illegible]E-08	-8.57254267E-02	4.63720617E-08	*ATU	8			
654-	*ATU	8	9.81684130E-08	-2.42767751E-01	8.17950649E-08	2.42849524E-07	*ATU	9			
655-	*ATU	9	-6.98323548E-01	1.1301693[illegible]E-07				*ATU	10		
656-	DMI	*TU12	3		1			-3.01365191E-08	*ATU	11	
657-	*ATU	11	-2.66084488E-09	2.8503029[illegible]E-03	-3.14193720E-08	1.23995001E-08	*ATU	12			
658-	*ATU	12	1.16847618E-03	-4.92969683E-08	5.92054654E-08	-2.14229114E-02	*ATU	13			
659-	*ATU	13	-1.06516609E-07	2.08539859E-07	-1.23851180E-01	-3.09364793E-07	*ATU	14			
660-	*ATU	14	7.34759794E-07	-5.48023820E-01				*ATU	15		
661-	DMI	*TU12	4		1			-2.96080709E-01	*ATU	16	
662-	*ATU	16	-1.14026705E-07	-1.3675822[illegible]E-07	-2.85390079E-01	8.58086651E-08	*ATU	17			
663-	*ATU	17	-1.31515037E-07	-3.4573429[illegible]E-01	1.06588800E-07	-1.60320951E-07	*ATU	18			
664-	*ATU	18	-4.45234716E-01	1.0376390[illegible]E-07	-1.9900784[illegible]E-07	-5.53683519E-01	*ATU	19			
665-	*ATU	19	1.06212781E-07	-2.3783644[illegible]E-07				*ATU	20		
666-	DMI	*TU12	5		1			3.79191967E-08	*ATU	21	
667-	*ATU	21	1.08317728E-03	1.5977433[illegible]E-10	4.11064143E-08	-2.83775739E-02	*ATU	22			
668-	*ATU	22	2.10037285E-08	6.0030606[illegible]E-08	-8.15093412E-02	4.84767497E-08	*ATU	23			
669-	*ATU	23	8.89549483E-08	-1.7321234[illegible]E-01	7.51426796E-08	1.23696509E-07	*ATU	24			
670-	*ATU	24	-2.83256173E-01	9.0885976[illegible]E-08				*ATU	25		
671-	DMI	*TU12	6		1			-5.32795923E-08	*ATU	26	
672-	*ATU	26	-1.67522130E-09	1.4692009[illegible]E-03	-5.15055625E-08	1.40887373E-08	*ATU	27			
673-	*ATU	27	7.53710745E-04	-6.5915230[illegible]E-08	5.18466940E-08	-1.39681995E-02	*ATU	28			
674-	*ATU	28	-9.66321068E-08	1.3207591[illegible]E-07	-6.35476497E-02	-1.43006673E-07	*ATU	29			
675-	*ATU	29	2.52475331E-07	-1.55679464E-01				*ATU	30		
676-	DMI	*TU12	7		1			-3.74758601E-01	*ATU	31	
677-	*ATU	31	-1.44523312E-07	-1.72530179E-07	-3.44076931E-01	1.08084919E-07	*ATU	32			
678-	*ATU	32	-1.58305227E-07	-3.8147860[illegible]E-01	1.25978844E-07	-1.81004680E-07	*ATU	33			
679-	*ATU	33	-4.28499937E-01	1.2373396[illegible]E-07	-2.07947210E-07	-4.54169691E-01	*ATU	34			
680-	*ATU	34	1.23443726E-07	-2.3143962[illegible]E-07				*ATU	35		
681-	DMI	*TU12	8		1			4.78912590E-08	*ATU	36	
682-	*ATU	36	8.29251250E-04	-2.1687444[illegible]E-10	4.74146873E-08	-2.14195214E-02	*ATU	37			
683-	*ATU	37	1.57082845E-08	5.9536990[illegible]E-08	-5.58494627E-02	3.52916238E-08	*ATU	38			
684-	*ATU	38	7.33342631E-08	-1.0075[illegible]E-01	5.15858538E-08	8.26270252E-08	*ATU	39			
685-	*ATU	39	-1.32003367E-01	5.9455936[illegible]E-08				*ATU	40		
686-	DMI	*TU12	9		1			-6.77171101E-02	*ATU	41	
687-	*ATU	41	-9.01174912E-10	6.2316097[illegible]E-04	-6.22223979E-08	1.07876552E-08	*ATU	42			
688-	*ATU	42	3.53635989E-04	-7.0602936[illegible]E-08	3.33038983E-08	-6.44360483E-03	*ATU	43			
689-	*ATU	43	-8.39685808E-08	6.8982735[illegible]E-08	-2.53177881E-02	-9.52150572E-08	*ATU	44			
690-	*ATU	44	1.00361660E-07	-4.7260467[illegible]E-02				*ATU	45		
691-	DMI	*TU12	10		1			-4.19153631E-01	*ATU	46	
692-	*ATU	46	-1.61784556E-07	-1.9275802[illegible]E-07	-3.73153269E-01	1.20630887E-07	*ATU	47			
693-	*ATU	47	-1.71572879E-07	-3.9353263[illegible]E-01	1.42695740E-07	-1.88587137E-07	*ATU	48			
694-	*ATU	48	-4.14900681E-01	1.3497322[illegible]E-07	-2.08345057E-07	-4.18659508E-01	*ATU	49			
695-	*ATU	49	1.33787410E-07	-2.2689022[illegible]E-07				*ATU	50		
696-	DMI	*TU12	11		1			5.34898525E-08	*ATU	51	
697-	*ATU	51	5.39066503E-04	-2.5443354[illegible]E-10	4.98411303E-08	-1.38076811E-02	*ATU	52			
698-	*ATU	52	1.00653743E-08	5.6754531[illegible]E-08	-3.38278238E-02	2.22703243E-08	*ATU	53			
699-	*ATU	53	6.32062902E-08	-5.5664000[illegible]E-02	3.17056461E-08	6.57962005E-08	*ATU	54			
700-	*ATU	54	-6.64411783E-02	3.5867135[illegible]E-04				*ATU	55		

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10	
701-	DMI	*TU12		12		1			-7.58429906E-08	*ATU	56
702-	*ATU	56	-4.58221239E-10	2.37231143E-04	-6.75348133E-08			7.01167835E-09	*ATU		57
703-	*ATU	57	1.43702666E-04	-7.18693514E-08	1.92447764E-08			-2.58036540E-03	*ATU		58
704-	*ATU	58	-7.74575142E-08	3.49179459E-08	-9.24630463E-03			-7.99266786E-08	*ATU		59
705-	*ATU	59	4.45056507E-08	-1.50015875E-02					*ATU		60
706-	DMI	*TU12		13		1			-4.42730427E-01	*ATU	61
707-	*ATU	61	-1.70973919E-07	-2.03524903E-07	-3.87164593E-01			1.27367002E-07	*ATU		62
708-	*ATU	62	-1.77971685E-07	-3.97632957E-01	1.49531672E-07			-1.91305958E-07	*ATU		63
709-	*ATU	63	-4.07383442E-01	1.41330304E-07	-2.07236837E-07			-4.04424787E-01	*ATU		64
710-	*ATU	64	1.39883696E-07	-2.23572044E-07					*ATU		65
711-	DMI	*TU12		14		1			5.64511602E-08	*ATU	66
712-	*ATU	66	3.22924461E-04	-1.90480770E-10	5.06905877E-08			-8.22463259E-03	*ATU		67
713-	*ATU	67	5.97638206E-09	5.44489751E-08	-1.94023177E-02			1.31239091E-08	*ATU		68
714-	*ATU	68	5.75337751E-08	-3.03312577E-02	1.84845490E-08			5.80380615E-08	*ATU		69
715-	*ATU	69	-3.47727127E-02	2.07705320E-08					*ATU		70
716-	DMI	*TU12		15		1			-8.01463216E-08	*ATU	71
717-	*ATU	71	-2.31736977E-10	8.58502805E-05	-7.00920850E-08			4.20054391E-09	*ATU		72
718-	*ATU	72	5.41246263E-05	-7.22279195E-08	1.06746150E-08			-9.61648067E-04	*ATU		73
719-	*ATU	73	-7.45646478E-08	1.78230337E-08	-3.25128413E-03			-7.45738475E-08	*ATU		74
720-	*ATU	74	2.12705373E-08	-4.89497930E-03					*ATU		75
721-	DMI	*TU12		16		1			-4.54785228E-01	*ATU	76
722-	*ATU	76	-1.75682089E-07	-2.09040023E-07	-3.93851578E-01			1.30688793E-07	*ATU		77
723-	*ATU	77	-1.81029293E-07	-3.99081230E-01	1.53190342E-07			-1.92287075E-07	*ATU		78
724-	*ATU	78	-4.03595984E-01	1.44913599E-07	-2.06271409E-07			-3.98267329E-01	*ATU		79
725-	*ATU	79	1.43416401E-07	-2.21632718E-07					*ATU		80
726-	DMI	*TU12		17		1			5.79601291E-08	*ATU	81
727-	*ATU	81	1.85694924E-04	-1.22482621E-10	5.09538474E-08			-4.71456721E-03	*ATU		82
728-	*ATU	82	3.41804873E-09	5.29606225E-08	-1.08698085E-02			7.48385176E-09	*ATU		83
729-	*ATU	83	5.44800542E-08	-1.65195614E-02	1.05055804E-08			5.42176330E-08	*ATU		84
730-	*ATU	84	-1.85996480E-02	1.17827029E-08					*ATU		85
731-	DMI	*TU12		18		1			-8.23416713E-08	*ATU	86
732-	*ATU	86	-1.18702201E-10	3.02016124E-05	-7.13107511E-08			2.41607068E-09	*ATU		87
733-	*ATU	87	1.95277244E-05	-7.23437665E-08	5.84402926E-09			-3.44428699E-04	*ATU		88
734-	*ATU	88	-7.33625143E-08	9.27069978E-09	-1.12278201E-03			-7.25605573E-08	*ATU		89
735-	*ATU	89	1.06570397E-08	-1.62348245E-03					*ATU		90
736-	DMI	*TU12		19		1			-4.60786581E-01	*ATU	91
737-	*ATU	91	-1.78030291E-07	-2.11789256E-07	-3.97028327E-01			1.32697153E-07	*ATU		92
738-	*ATU	92	-1.82483575E-07	-3.99620175E-01	1.55135865E-07			-1.92649452E-07	*ATU		93
739-	*ATU	93	-4.01753068E-01	1.46910224E-07	-2.05665344E-07			-3.95488381E-01	*ATU		94
740-	*ATU	94	1.45423598E-07	-2.20575544E-07					*ATU		95
741-	DMI	*TU12		20		1			5.87090625E-08	*ATU	96
742-	*ATU	96	1.05495579E-04	-7.40951180E-11	5.10162828E-08			-2.67342920E-03	*ATU		97
743-	*ATU	97	1.93540139E-09	5.20904173E-08	-6.08104C95E-03			4.23547419E-09	*ATU		98
744-	*ATU	98	5.28640278E-08	-9.10000870E-03	5.94527449E-09			5.22793044E-08	*ATU		99
745-	*ATU	99	-1.01599619E-02	6.66802060E-09					*ATU		100
746-	DMI	*TU12		21		1			-8.34327807E-08	*ATU	101
747-	*ATU	101	-6.23653906E-11	1.04690689E-05	-7.18888487E-08			1.37305389E-09	*ATU		102
748-	*ATU	102	6.87701959E-C6	-7.23883318E-08	3.21894400E-09			-1.20705357E-04	*ATU		103
749-	*ATU	103	-7.28427949E-08	4.94035911E-09	-3.84650426E-04			-7.17609510E-08	*ATU		104
750-	*ATU	104	5.60878988E-09	-5.44076087E-04					*ATU		105

ORIGINAL PAGE IS
OF POOR QUALITY

HARMONIC REDUCTION

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                                   S O R T E D   B U L K   D A T A   E C H O
CARD
COUNT      .   1  ..   2  ..   3  ..   4  ..   5  ..   6  ..   7  ..   8  ..   9  ..  10  .
  751-     DMI     *TU12            22              1                      -4.63685215E-01 *ATU 106
  752-     *ATU 106 -1.79166364E-07 -2.13118369E-07 -3.98516715E-01  1.33601930E-07*ATU 107
  753-     *ATU 107 -1.83165639E-07 -3.99830520E-01  1.56147109E-07 -1.92786899E-07*ATU 108
  754-     *ATU 108 -4.00879323E-01  1.47588999E-07 -2.05333151E-07 -3.94220412E-01*ATU 109
  755-     *ATU 109  1.46523348E-07 -2.20032007E-07                                 *ATU 110
  756-     DMI     *TU12            23              1                      5.90697979E-08  *ATU 111
  757-     *ATU 111  6.15481113E-05 -4.48905490E-11  5.10188656E-08 -1.55803584E-03*ATU 112
  758-     *ATU 112  1.12685350E-09  5.16143398E-08 -3.51606798E-03  2.46764764E-09*ATU 113
  759-     *ATU 113  5.20298649E-08 -5.21713868E-03  3.46802831E-09  5.12994944E-08*ATU 114
  760-     *ATU 114 -5.80059225E-03  3.89208665E-09                                 *ATU 115
  761-     DMI     *TU12            24              1                      -8.39592076E-08 *ATU 116
  762-     *ATU 116 -3.45174167E-11  3.63309027E-06 -7.21593096E-08  8.01345656E-10*ATU 117
  763-     *ATU 117  2.41035550E-06 -7.24077722E-08  1.84184401E-09 -4.21711593E-05*ATU 118
  764-     *ATU 118 -7.26210487E-08  2.77827938E-09 -1.32504298E-04 -7.14327939E-08*ATU 119
  765-     *ATU 119  3.11660941E-09 -1.85157551E-04                                 *ATU 120
  766-     DMI     *TU12            25              1                      -4.64975417E-01 *ATU 121
  767-     *ATU 121 -1.79672725E-07 -2.13710337E-07 -3.99167240E-01  1.34018137E-07*ATU 122
  768-     *ATU 122 -1.83463897E-07 -3.99911940E-01  1.56627777E-07 -1.92838172E-07*ATU 123
  769-     *ATU 123 -4.00495172E-01  1.48516563E-07 -2.05174331E-07 -3.93673599E-01*ATU 124
  770-     *ATU 124  1.47066203E-07 -2.19779963E-07                                 *ATU 125
  771-     DMI     *TU12            26              1                      5.92299898E-08  *ATU 126
  772-     *ATU 126  4.00548161E-05 -2.98809449E-11  5.10104030E-08 -1.01333461E-03*ATU 127
  773-     *ATU 127  7.32460981E-10  5.13817362E-08 -2.27672490E-03  1.60557057E-09*ATU 128
  774-     *ATU 128  5.16357268E-08 -3.36289173E-03  2.25971553E-09  5.08413756E-08*ATU 129
  775-     *ATU 129 -3.73170897E-03  2.53781707E-09                                 *ATU 130
  776-     DMI     *TU12            27              1                      -8.41933456E-08 *ATU 131
  777-     *ATU 131 -2.17147272E-11  1.36434301E-06 -7.22774871E-08  5.21665822E-10*ATU 132
  778-     *ATU 132  9.11016571E-07 -7.24162987E-08  1.18464660E-09 -1.59047486E-05*ATU 133
  779-     *ATU 133 -7.25306109E-08  1.76667725E-09 -4.95233689E-05 -7.13017658E-08*ATU 134
  780-     *ATU 134  1.97041963E-09 -6.87181455E-05                                 *ATU 135
  781-     DMI     *TU12            28              1                      -2.32670198E-01 *ATU 136
  782-     *ATU 136 -8.99072461E-08 -1.06938899E-07 -1.99674845E-01  6.70488589E-08*ATU 137
  783-     *ATU 137 -9.17738134E-08 -1.99966729E-01  7.83391556E-08 -9.64258220E-08*ATU 138
  784-     *ATU 138 -2.00193584E-01  7.42707763E-08 -1.02564343E-07 -1.95760595E-01*ATU 139
  785-     *ATU 139  7.35402637E-08 -1.09854113E-07                                 *ATU 140
  786-     DMI     *TU12            29              1                      3.99601241E-08  *ATU 141
  787-     *ATU 141  1.68243278E-05 -1.26588722E-11  3.43618716E-08 -4.25543403E-04*ATU 142
  788-     *ATU 142  3.07522230E-10  3.45278188E-08 -9.54627758E-04  6.74544198E-10*ATU 143
  789-     *ATU 143  3.46417295E-08 -1.40788918E-03  9.50190371E-10  3.40831612E-08*ATU 144
  790-     *ATU 144 -1.56127731E-03  1.06756182E-09                                 *ATU 145
  791-     DMI     *TU12            30              1                      -4.38348309E-08 *ATU 146
  792-     *ATU 146 -8.40378114E-12  4.15984212E-07 -3.76185589E-08  2.03946401E-10*ATU 147
  793-     *ATU 147  2.78612731E-07 -3.76747709E-08  4.61354954E-10 -4.85905184E-06*ATU 148
  794-     *ATU 148 -3.77201523E-08  6.85522750E-10 -1.50657806E-05 -3.70752993E-08*ATU 149
  795-     *ATU 149  7.63210606E-10 -2.08410784E-05                                 *ATU 150
  796-     EIGR    1       GIV     0.0     10.64   25      25      0       .0      &EIG
  797-     &EIG    MAX
  798-     GRID    2       1       1.0000  .0000   1.0000  1
  799-     GRID    3       1       1.0000  9.0000  1.0000  1
  800-     GRID    4       1       1.0000  18.0000 1.0000  1
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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
801-	GRID	5	1	1.0000	27.0000	1.0000	1			
802-	GRID	6	1	1.0000	36.0000	1.0000	1			
803-	GRID	7	1	1.0000	45.0000	1.0000	1			
804-	GRID	8	1	1.0000	54.0000	1.0000	1			
805-	GRID	9	1	1.0000	63.0000	1.0000	1			
806-	GRID	10	1	1.0000	72.0000	1.0000	1			
807-	GRID	11	1	1.0000	81.0000	1.0000	1			
808-	GRID	12	1	1.0000	90.0000	1.0000	1			
809-	GRID	13	1	1.0000	.0000	.8000	1			
810-	GRID	14	1	1.0000	9.0000	.8000	1			
811-	GRID	15	1	1.0000	18.0000	.8000	1			
812-	GRID	16	1	1.0000	27.0000	.8000	1			
813-	GRID	17	1	1.0000	36.0000	.8000	1			
814-	GRID	18	1	1.0000	45.0000	.8000	1			
815-	GRID	19	1	1.0000	54.0000	.8000	1			
816-	GRID	20	1	1.0000	63.0000	.8000	1			
817-	GRID	21	1	1.0000	72.0000	.8000	1			
818-	GRID	22	1	1.0000	81.0000	.8000	1			
819-	GRID	23	1	1.0000	90.0000	.8000	1			
820-	GRID	24	1	1.0000	.0000	.6000	1			
821-	GRID	25	1	1.0000	9.0000	.6000	1			
822-	GRID	26	1	1.0000	18.0000	.6000	1			
823-	GRID	27	1	1.0000	27.0000	.6000	1			
824-	GRID	28	1	1.0000	36.0000	.6000	1			
825-	GRID	29	1	1.0000	45.0000	.6000	1			
826-	GRID	30	1	1.0000	54.0000	.6000	1			
827-	GRID	31	1	1.0000	63.0000	.6000	1			
828-	GRID	32	1	1.0000	72.0000	.6000	1			
829-	GRID	33	1	1.0000	81.0000	.6000	1			
830-	GRID	34	1	1.0000	90.0000	.6000	1			
831-	GRID	35	1	1.0000	.0000	.4000	1			
832-	GRID	36	1	1.0000	9.0000	.4000	1			
833-	GRID	37	1	1.0000	18.0000	.4000	1			
834-	GRID	38	1	1.0000	27.0000	.4000	1			
835-	GRID	39	1	1.0000	36.0000	.4000	1			
836-	GRID	40	1	1.0000	45.0000	.4000	1			
837-	GRID	41	1	1.0000	54.0000	.4000	1			
838-	GRID	42	1	1.0000	63.0000	.4000	1			
839-	GRID	43	1	1.0000	72.0000	.4000	1			
840-	GRID	44	1	1.0000	81.0000	.4000	1			
841-	GRID	45	1	1.0000	90.0000	.4000	1			
842-	GRID	46	1	1.0000	.0000	.2000	1			
843-	GRID	47	1	1.0000	9.0000	.2000	1			
844-	GRID	48	1	1.0000	18.0000	.2000	1			
845-	GRID	49	1	1.0000	27.0000	.2000	1			
846-	GRID	50	1	1.0000	36.0000	.2000	1			
847-	GRID	51	1	1.0000	45.0000	.2000	1			
848-	GRID	52	1	1.0000	54.0000	.2000	1			
849-	GRID	53	1	1.0000	63.0000	.2000	1			
850-	GRID	54	1	1.0000	72.0000	.2000	1			

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
851-	GRID	55	1	1.0000	81.0000	.2000	1			
852-	GRID	56	1	1.0000	90.0000	.2000	1			
853-	GRID	57	1	1.0000	.0000	.0000	1			
854-	GRID	58	1	1.0000	9.0000	.0000	1			
855-	GRID	59	1	1.0000	18.0000	.0000	1			
856-	GRID	60	1	1.0000	27.0000	.0000	1			
857-	GRID	61	1	1.0000	36.0000	.0000	1			
858-	GRID	62	1	1.0000	45.0000	.0000	1			
859-	GRID	63	1	1.0000	54.0000	.0000	1			
860-	GRID	64	1	1.0000	63.0000	.0000	1			
861-	GRID	65	1	1.0000	72.0000	.0000	1			
862-	GRID	66	1	1.0000	81.0000	.0000	1			
863-	GRID	67	1	1.0000	90.0000	.0000	1			
864-	GRID	68	1	1.0000	.0000	-0.1999	1			
865-	GRID	69	1	1.0000	9.0000	-0.1999	1			
866-	GRID	70	1	1.0000	18.0000	-0.1999	1			
867-	GRID	71	1	1.0000	27.0000	-0.1999	1			
868-	GRID	72	1	1.0000	36.0000	-0.1999	1			
869-	GRID	73	1	1.0000	45.0000	-0.1999	1			
870-	GRID	74	1	1.0000	54.0000	-0.1999	1			
871-	GRID	75	1	1.0000	63.0000	-0.1999	1			
872-	GRID	76	1	1.0000	72.0000	-0.1999	1			
873-	GRID	77	1	1.0000	81.0000	-0.1999	1			
874-	GRID	78	1	1.0000	90.0000	-0.1999	1			
875-	GRID	79	1	1.0000	.0000	-0.3999	1			
876-	GRID	80	1	1.0000	9.0000	-0.3999	1			
877-	GRID	81	1	1.0000	18.0000	-0.3999	1			
878-	GRID	82	1	1.0000	27.0000	-0.3999	1			
879-	GRID	83	1	1.0000	36.0000	-0.3999	1			
880-	GRID	84	1	1.0000	45.0000	-0.3999	1			
881-	GRID	85	1	1.0000	54.0000	-0.3999	1			
882-	GRID	86	1	1.0000	63.0000	-0.3999	1			
883-	GRID	87	1	1.0000	72.0000	-0.3999	1			
884-	GRID	88	1	1.0000	81.0000	-0.3999	1			
885-	GRID	89	1	1.0000	90.0000	-0.3999	1			
886-	GRID	90	1	1.0000	.0000	-0.6000	1			
887-	GRID	91	1	1.0000	9.0000	-0.6000	1			
888-	GRID	92	1	1.0000	18.0000	-0.6000	1			
889-	GRID	93	1	1.0000	27.0000	-0.6000	1			
890-	GRID	94	1	1.0000	36.0000	-0.6000	1			
891-	GRID	95	1	1.0000	45.0000	-0.6000	1			
892-	GRID	96	1	1.0000	54.0000	-0.6000	1			
893-	GRID	97	1	1.0000	63.0000	-0.6000	1			
894-	GRID	98	1	1.0000	72.0000	-0.6000	1			
895-	GRID	99	1	1.0000	81.0000	-0.6000	1			
896-	GRID	100	1	1.0000	90.0000	-0.6000	1			
897-	GRID	101	1	1.0000	.0000	-0.7999	1			
898-	GRID	102	1	1.0000	9.0000	-0.7999	1			
899-	GRID	103	1	1.0000	18.0000	-0.7999	1			
900-	GRID	104	1	1.0000	27.0000	-0.7999	1			

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
901-	GRID	105	1	1.0000	36.0000	-0.7999	1			
902-	GRID	106	1	1.0000	45.0000	-0.7999	1			
903-	GRID	107	1	1.0000	54.0000	-0.7999	1			
904-	GRID	108	1	1.0000	63.0000	-0.7999	1			
905-	GRID	109	1	1.0000	72.0000	-0.7999	1			
906-	GRID	110	1	1.0000	81.0000	-0.7999	1			
907-	GRID	111	1	1.0000	90.0000	-0.7999	1			
908-	GRID	112	1	1.0000	.0000	-1.0000	1			
909-	GRID	113	1	1.0000	9.0000	-1.0000	1			
910-	GRID	114	1	1.0000	18.0000	-1.0000	1			
911-	GRID	115	1	1.0000	27.0000	-1.0000	1			
912-	GRID	116	1	1.0000	36.0000	-1.0000	1			
913-	GRID	117	1	1.0000	45.0000	-1.0000	1			
914-	GRID	118	1	1.0000	54.0000	-1.0000	1			
915-	GRID	119	1	1.0000	63.0000	-1.0000	1			
916-	GRID	120	1	1.0000	72.0000	-1.0000	1			
917-	GRID	121	1	1.0000	81.0000	-1.0000	1			
918-	GRID	122	1	1.0000	90.0000	-1.0000	1			
919-	GRID	1001	1	1.	0.0	0.0	1			
920-	GRID	1002	1	1.	0.0	0.0	1			
921-	GRID	1003	1	1.	0.0	0.0	1			
922-	GRID	2001	1	1.	0.0	0.0	1			
923-	GRID	2002	1	1.	0.0	0.0	1			
924-	GRID	2003	1	1.	0.0	0.0	1			
925-	GRID	3001	1	1.	0.0	0.0	1			
926-	GRID	3002	1	1.	0.0	0.0	1			
927-	GRID	3003	1	1.	0.0	0.0	1			
928-	GRID	4001	1	1.	0.0	0.0	1			
929-	GRID	4002	1	1.	0.0	0.0	1			
930-	GRID	4003	1	1.	0.0	0.0	1			
931-	GRID	5001	1	1.	0.0	0.0	1			
932-	GRID	5002	1	1.	0.0	0.0	1			
933-	GRID	5003	1	1.	0.0	0.0	1			
934-	GRID	6001	1	1.	0.0	0.0	1			
935-	GRID	6002	1	1.	0.0	0.0	1			
936-	GRID	6003	1	1.	0.0	0.0	1			
937-	GRID	7001	1	1.	0.0	0.0	1			
938-	GRID	7002	1	1.	0.0	0.0	1			
939-	GRID	7003	1	1.	0.0	0.0	1			
940-	GRID	8001	1	1.	0.0	0.0	1			
941-	GRID	8002	1	1.	0.0	0.0	1			
942-	GRID	8003	1	1.	0.0	0.0	1			
943-	GRID	9001	1	1.	0.0	0.0	1			
944-	GRID	9002	1	1.	0.0	0.0	1			
945-	GRID	9003	1	1.	0.0	0.0	1			
946-	GRID	10001	1	1.	0.0	0.0	1			
947-	GRID	10002	1	1.	0.0	0.0	1			
948-	GRID	10003	1	1.	0.0	0.0	1			
949-	GRID	11001	1	1.	0.0	0.0	1			
950-	GRID	11002	1	1.	0.0	0.0	1			

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
951-	GRID	11003	1		0.0	0.0	1			
952-	MAT1	1	1.		.3	3.				
953-	MPC	1	2	1	-1.000001001	1	1.00000		&M11011	
954-	&M11011			1002	1 1.00000	1003	1 1.00000			
955-	MPC	1	2	2	-1.000001001	2	.00000		&M11012	
956-	&M11012			1002	2 0.00000	1003	2 0.00000			
957-	MPC	1	2	3	-1.000001001	3	1.00000		&M11013	
958-	&M11013			1002	3 1.00000	1003	3 1.00000			
959-	MPC	1	2	4	-1.000001001	4	.00000		&M11014	
960-	&M11014			1002	4 0.00000	1003	4 0.00000			
961-	MPC	1	2	5	-1.000001001	5	1.00000		&M11015	
962-	&M11015			1002	5 1.00000	1003	5 1.00000			
963-	MPC	1	2	6	-1.000001001	6	.00000		&M11016	
964-	&M11016			1002	6 0.00000	1003	6 0.00000			
965-	MPC	1	3	1	-1.000001001	1	1.00000		&M11021	
966-	&M11021			1002	1 0.95105	1003	1 0.80901			
967-	MPC	1	3	2	-1.000001001	2	.00000		&M11022	
968-	&M11022			1002	2 0.80901	1003	2 0.58778			
969-	MPC	1	3	3	-1.000001001	3	1.00000		&M11023	
970-	&M11023			1002	3 0.95105	1003	3 0.80901			
971-	MPC	1	3	4	-1.000001001	4	.00000		&M11024	
972-	&M11024			1002	4 0.80901	1003	4 0.58778			
973-	MPC	1	3	5	-1.000001001	5	1.00000		&M11025	
974-	&M11025			1002	5 0.95105	1003	5 0.80901			
975-	MPC	1	3	6	-1.000001001	6	.00000		&M11026	
976-	&M11026			1002	6 0.80901	1003	6 0.58778			
977-	MPC	1	4	1	-1.000001001	1	1.00000		&M11031	
978-	&M11031			1002	1 0.80901	1003	1 0.30901			
979-	MPC	1	4	2	-1.000001001	2	.00000		&M11032	
980-	&M11032			1002	2 0.58778	1003	2 0.95105			
981-	MPC	1	4	3	-1.000001001	3	1.00000		&M11033	
982-	&M11033			1002	3 0.80901	1003	3 0.30901			
983-	MPC	1	4	4	-1.000001001	4	.00000		&M11034	
984-	&M11034			1002	4 0.58778	1003	4 0.95105			
985-	MPC	1	4	5	-1.000001001	5	1.00000		&M11035	
986-	&M11035			1002	5 0.80901	1003	5 0.30901			
987-	MPC	1	4	6	-1.000001001	6	.00000		&M11036	
988-	&M11036			1002	6 0.58778	1003	6 0.95105			
989-	MPC	1	5	1	-1.000001001	1	1.00000		&M11041	
990-	&M11041			1002	1 0.58778	1003	1-0.30901			
991-	MPC	1	5	2	-1.000001001	2	.00000		&M11042	
992-	&M11042			1002	2 0.80901	1003	2 0.95105			
993-	MPC	1	5	3	-1.000001001	3	1.00000		&M11043	
994-	&M11043			1002	3 0.58778	1003	3-0.30901			
995-	MPC	1	5	4	-1.000001001	4	.00000		&M11044	
996-	&M11044			1002	4 0.80901	1003	4 0.95105			
997-	MPC	1	5	5	-1.000001001	5	1.00000		&M11045	
998-	&M11045			1002	5 0.58778	1003	5-0.30901			
999-	MPC	1	5	6	-1.000001001	6	.00000		&M11046	
1000-	&M11046			1002	6 0.80901	1003	6 0.95105			

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1001-	MPC	1	6	1	-1.000001001	1	1.00000			&M11051
1002-	&M11051		1002	1	0.30901	1003	1-0.80901			
1003-	MPC	1	6	2	-1.000001001	2	.00000			&M11052
1004-	&M11052		1002	2	0.95105	1003	2 0.58778			
1005-	MPC	1	6	3	-1.000001001	3	1.00000			&M11053
1006-	&M11053		1002	3	0.30901	1003	3-0.80901			
1007-	MPC	1	6	4	-1.000001001	4	.00000			&M11054
1008-	&M11054		1002	4	0.95105	1003	4 0.58778			
1009-	MPC	1	6	5	-1.000001001	5	1.00000			&M11055
1010-	&M11055		1002	5	0.30901	1003	5-0.80901			
1011-	MPC	1	6	6	-1.000001001	6	.00000			&M11056
1012-	&M11056		1002	6	0.95105	1003	6 0.58778			
1013-	MPC	1	7	1	-1.000001001	1	1.00000			&M11061
1014-	&M11061		1002	1	0.00000	1003	1-1.00000			
1015-	MPC	1	7	2	-1.000001001	2	.00000			&M11062
1016-	&M11062		1002	2	1.00000	1003	2 0.00000			
1017-	MPC	1	7	3	-1.000001001	3	1.00000			&M11063
1018-	&M11063		1002	3	0.00000	1003	3-1.00000			
1019-	MPC	1	7	4	-1.000001001	4	.00000			&M11064
1020-	&M11064		1002	4	1.00000	1003	4 0.00000			
1021-	MPC	1	7	5	-1.000001001	5	1.00000			&M11065
1022-	&M11065		1002	5	0.00000	1003	5-1.00000			
1023-	MPC	1	7	6	-1.000001001	6	.00000			&M11066
1024-	&M11066		1002	6	1.00000	1003	6 0.00000			
1025-	MPC	1	8	1	-1.000001001	1	1.00000			&M11071
1026-	&M11071		1002	1-0.30901		1003	1-0.80901			
1027-	MPC	1	8	2	-1.000001001	2	.00000			&M11072
1028-	&M11072		1002	2	0.95105	1003	2-0.58778			
1029-	MPC	1	8	3	-1.000001001	3	1.00000			&M11073
1030-	&M11073		1002	3-0.30901		1003	3-0.80901			
1031-	MPC	1	8	4	-1.000001001	4	.00000			&M11074
1032-	&M11074		1002	4	0.95105	1003	4-0.58778			
1033-	MPC	1	8	5	-1.000001001	5	1.00000			&M11075
1034-	&M11075		1002	5-0.30901		1003	5-0.80901			
1035-	MPC	1	8	6	-1.000001001	6	.00000			&M11076
1036-	&M11076		1002	6	0.95105	1003	6-0.58778			
1037-	MPC	1	9	1	-1.000001001	1	1.00000			&M11081
1038-	&M11081		1002	1-0.58778		1003	1-0.30901			
1039-	MPC	1	9	2	-1.000001001	2	.00000			&M11082
1040-	&M11082		1002	2	0.80901	1003	2-0.95105			
1041-	MPC	1	9	3	-1.000001001	3	1.00000			&M11083
1042-	&M11083		1002	3-0.58778		1003	3-0.30901			
1043-	MPC	1	9	4	-1.000001001	4	.00000			&M11084
1044-	&M11084		1002	4	0.80901	1003	4-0.95105			
1045-	MPC	1	9	5	-1.000001001	5	1.00000			&M11085
1046-	&M11085		1002	5-0.58778		1003	5-0.30901			
1047-	MPC	1	9	6	-1.000001001	6	.00000			&M11086
1048-	&M11086		1002	6	0.80901	1003	6-0.95105			
1049-	MPC	1	10	1	-1.000001001	1	1.00000			&M11091
1050-	&M11091		1002	1-0.80901		1003	1 0.30901			

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CARD
COUNT    .   1  ..   2  ..   3  ..   4  ..   5  ..   6  ..   7  ..   8  ..   9  ..  10  .
1051-       MPC     1       10       2          -1.000001001    2          .00000          &M11092
1052-       &M11092                  1002       2 0.58778      1003        2-0.95105
1053-       MPC     1       10       3          -1.000001001    3          1.00000         &M11093
1054-       &M11093                  1002       3-0.80901      1003        3 0.30901
1055-       MPC     1       10       4          -1.000001001    4          .00000          &M11094
1056-       &M11094                  1002       4 0.58778      1003        4-0.95105
1057-       MPC     1       10       5          -1.000001001    5          1.00000         &M11095
1058-       &M11095                  1002       5-0.80901      1003        5 0.30901
1059-       MPC     1       10       6          -1.000001001    6          .00000          &M11096
1060-       &M11096                  1002       6 0.58778      1003        6-0.95105
1061-       MPC     1       11       1          -1.000001001    1          1.00000         &M11101
1062-       &M11101                  1002       1-0.95105      1003        1 0.80901
1063-       MPC     1       11       2          -1.000001001    2          .00000          &M11102
1064-       &M11102                  1002       2 0.30901      1003        2-0.58778
1065-       MPC     1       11       3          -1.000001001    3          1.00000         &M11103
1066-       &M11103                  1002       3-0.95105      1003        3 0.80901
1067-       MPC     1       11       4          -1.000001001    4          .00000          &M11104
1068-       &M11104                  1002       4 0.30901      1003        4-0.58778
1069-       MPC     1       11       5          -1.000001001    5          1.00000         &M11105
1070-       &M11105                  1002       5-0.95105      1003        5 0.80901
1071-       MPC     1       11       6          -1.000001001    6          .00000          &M11106
1072-       &M11106                  1002       6 0.30901      1003        6-0.58778
1073-       MPC     1       12       1          -1.000001001    1          1.00000         &M11111
1074-       &M11111                  1002       1-1.00000      1003        1 1.00000
1075-       MPC     1       12       2          -1.000001001    2          .00000          &M11112
1076-       &M11112                  1002       2 0.00000      1003        2-0.00000
1077-       MPC     1       12       3          -1.000001001    3          1.00000         &M11113
1078-       &M11113                  1002       3-1.00000      1003        3 1.00000
1079-       MPC     1       12       4          -1.000001001    4          .00000          &M11114
1080-       &M11114                  1002       4 0.00000      1003        4-0.00000
1081-       MPC     1       12       5          -1.000001001    5          1.00000         &M11115
1082-       &M11115                  1002       5-1.00000      1003        5 1.00000
1083-       MPC     1       12       6          -1.000001001    6          .00000          &M11116
1084-       &M11116                  1002       6 0.00000      1003        6-0.00000
1085-       MPC     1       13       1          -1.000002001    1          1.00000         &M12011
1086-       &M12011                  2002       1 1.00000      2003        1 1.00000
1087-       MPC     1       13       2          -1.000002001    2          .00000          &M12012
1088-       &M12012                  2002       2 0.00000      2003        2 0.00000
1089-       MPC     1       13       3          -1.000002001    3          1.00000         &M12013
1090-       &M12013                  2002       3 1.00000      2003        3 1.00000
1091-       MPC     1       13       4          -1.000002001    4          .00000          &M12014
1092-       &M12014                  2002       4 0.00000      2003        4 0.00000
1093-       MPC     1       13       5          -1.000002001    5          1.00000         &M12015
1094-       &M12015                  2002       5 1.00000      2003        5 1.00000
1095-       MPC     1       13       6          -1.000002001    6          .00000          &M12016
1096-       &M12016                  2002       6 0.00000      2003        6 0.00000
1097-       MPC     1       14       1          -1.000002001    1          1.00000         &M12021
1098-       &M12021                  2002       1 0.95105      2003        1 0.80901
1099-       MPC     1       14       2          -1.000002001    2          .00000          &M12022
1100-       &M12022                  2002       2 0.30901      2003        2 0.58778
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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1101-	MPC	1	14	3	-1.000002001	3		1.00000		&M12023
1102-	&M12023		2002	3	0.95105	2003	3	0.80901		
1103-	MPC	1	14	4	-1.000002001	4		.00000		&M12024
1104-	&M12024		2002	4	0.30901	2003	4	0.58778		
1105-	MPC	1	14	5	-1.000002001	5		1.00000		&M12025
1106-	&M12025		2002	5	0.95105	2003	5	0.80901		
1107-	MPC	1	14	6	-1.000002001	6		.00000		&M12026
1108-	&M12026		2002	6	0.30901	2003	6	0.58778		
1109-	MPC	1	15	1	-1.000002001	1		1.00000		&M12031
1110-	&M12031		2002	1	0.80901	2003	1	0.30901		
1111-	MPC	1	15	2	-1.000002001	2		.00000		&M12032
1112-	&M12032		2002	2	0.58778	2003	2	0.95105		
1113-	MPC	1	15	3	-1.000002001	3		1.00000		&M12033
1114-	&M12033		2002	3	0.80901	2003	3	0.30901		
1115-	MPC	1	15	4	-1.000002001	4		.00000		&M12034
1116-	&M12034		2002	4	0.58778	2003	4	0.95105		
1117-	MPC	1	15	5	-1.000002001	5		1.00000		&M12035
1118-	&M12035		2002	5	0.80901	2003	5	0.30901		
1119-	MPC	1	15	6	-1.000002001	6		.00000		&M12036
1120-	&M12036		2002	6	0.58778	2003	6	0.95105		
1121-	MPC	1	16	1	-1.000002001	1		1.00000		&M12041
1122-	&M12041		2002	1	0.58778	2003	1	-0.30901		
1123-	MPC	1	16	2	-1.000002001	2		.00000		&M12042
1124-	&M12042		2002	2	0.80901	2003	2	0.95105		
1125-	MPC	1	16	3	-1.000002001	3		1.00000		&M12043
1126-	&M12043		2002	3	0.58778	2003	3	-0.30901		
1127-	MPC	1	16	4	-1.000002001	4		.00000		&M12044
1128-	&M12044		2002	4	0.80901	2003	4	0.95105		
1129-	MPC	1	16	5	-1.000002001	5		1.00000		&M12045
1130-	&M12045		2002	5	0.58778	2003	5	-0.30901		
1131-	MPC	1	16	6	-1.000002001	6		.00000		&M12046
1132-	&M12046		2002	6	0.80901	2003	6	0.95105		
1133-	MPC	1	17	1	-1.000002001	1		1.00000		&M12051
1134-	&M12051		2002	1	0.30901	2003	1	-0.80901		
1135-	MPC	1	17	2	-1.000002001	2		.00000		&M12052
1136-	&M12052		2002	2	0.95105	2003	2	0.58778		
1137-	MPC	1	17	3	-1.000002001	3		1.00000		&M12053
1138-	&M12053		2002	3	0.30901	2003	3	-0.80901		
1139-	MPC	1	17	4	-1.000002001	4		.00000		&M12054
1140-	&M12054		2002	4	0.95105	2003	4	0.58778		
1141-	MPC	1	17	5	-1.000002001	5		1.00000		&M12055
1142-	&M12055		2002	5	0.30901	2003	5	-0.80901		
1143-	MPC	1	17	6	-1.000002001	6		.00000		&M12056
1144-	&M12056		2002	6	0.95105	2003	6	0.58778		
1145-	MPC	1	18	1	-1.000002001	1		1.00000		&M12061
1146-	&M12061		2002	1	0.00000	2003	1	-1.00000		
1147-	MPC	1	18	2	-1.000002001	2		.00000		&M12062
1148-	&M12062		2002	2	1.00000	2003	2	0.00000		
1149-	MPC	1	18	3	-1.000002001	3		1.00000		&M12063
1150-	&M12063		2002	3	0.00000	2003	3	-1.00000		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1151-	MPC	1	18	4	-1.000002001	4		.00000		&M12064
1152-	&M12064		2002	4	1.00000	2003	4	0.00000		
1153-	MPC	1	18	5	-1.000002001	5		1.00000		&M12065
1154-	&M12065		2002	5	0.00000	2003	5	-1.00000		
1155-	MPC	1	18	6	-1.000002001	6		.00000		&M12066
1156-	&M12066		2002	6	1.00000	2003	6	0.00000		
1157-	MPC	1	19	1	-1.000002001	1		1.00000		&M12071
1158-	&M12071		2002	1	-0.30901	2003	1	-0.80901		
1159-	MPC	1	19	2	-1.000002001	2		.00000		&M12072
1160-	&M12072		2002	2	0.95105	2003	2	-0.58778		
1161-	MPC	1	19	3	-1.000002001	3		1.00000		&M12073
1162-	&M12073		2002	3	-0.30901	2003	3	-0.80901		
1163-	MPC	1	19	4	-1.000002001	4		.00000		&M12074
1164-	&M12074		2002	4	0.95105	2003	4	-0.58778		
1165-	MPC	1	19	5	-1.000002001	5		1.00000		&M12075
1166-	&M12075		2002	5	-0.30901	2003	5	-0.80901		
1167-	MPC	1	19	6	-1.000002001	6		.00000		&M12076
1168-	&M12076		2002	6	0.95105	2003	6	-0.58778		
1169-	MPC	1	20	1	-1.000002001	1		1.00000		&M12081
1170-	&M12081		2002	1	-0.58778	2003	1	-0.30901		
1171-	MPC	1	20	2	-1.000002001	2		.00000		&M12082
1172-	&M12082		2002	2	0.80901	2003	2	-0.95105		
1173-	MPC	1	20	3	-1.000002001	3		1.00000		&M12083
1174-	&M12083		2002	3	-0.58778	2003	3	-0.30901		
1175-	MPC	1	20	4	-1.000002001	4		.00000		&M12084
1176-	&M12084		2002	4	0.80901	2003	4	-0.95105		
1177-	MPC	1	20	5	-1.000002001	5		1.00000		&M12085
1178-	&M12085		2002	5	-0.58778	2003	5	-0.30901		
1179-	MPC	1	20	6	-1.000002001	6		.00000		&M12086
1180-	&M12086		2002	6	0.80901	2003	6	-0.95105		
1181-	MPC	1	21	1	-1.000002001	1		1.00000		&M12091
1182-	&M12091		2002	1	-0.80901	2003	1	0.30901		
1183-	MPC	1	21	2	-1.000002001	2		.00000		&M12092
1184-	&M12092		2002	2	0.58778	2003	2	-0.95105		
1185-	MPC	1	21	3	-1.000002001	3		1.00000		&M12093
1186-	&M12093		2002	3	-0.80901	2003	3	0.30901		
1187-	MPC	1	21	4	-1.000002001	4		.00000		&M12094
1188-	&M12094		2002	4	0.58778	2003	4	-0.95105		
1189-	MPC	1	21	5	-1.000002001	5		1.00000		&M12095
1190-	&M12095		2002	5	-0.80901	2003	5	0.30901		
1191-	MPC	1	21	6	-1.000002001	6		.00000		&M12096
1192-	&M12096		2002	6	0.58778	2003	6	-0.95105		
1193-	MPC	1	22	1	-1.000002001	1		1.00000		&M12101
1194-	&M12101		2002	1	-0.95105	2003	1	0.80901		
1195-	MPC	1	22	2	-1.000002001	2		.00000		&M12102
1196-	&M12102		2002	2	0.30901	2003	2	-0.58778		
1197-	MPC	1	22	3	-1.000002001	3		1.00000		&M12103
1198-	&M12103		2002	3	-0.95105	2003	3	0.80901		
1199-	MPC	1	22	4	-1.000002001	4		.00000		&M12104
1200-	&M12104		2002	4	0.30901	2003	4	-0.58778		

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CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
1201-	MPC	1	22	5	-1.000002001	5		1.00000		&M12105
1202-	&M12105		2002	5-0.95105		2003	5 0.80901			
1203-	MPC	1	22	6	-1.000002001	6		.00000		&M12106
1204-	&M12106		2002	6 0.30901		2003	6-0.58778			
1205-	MPC	1	23	1	-1.000002001	1		1.00000		&M12111
1206-	&M12111		2002	1-1.00000		2003	1 1.00000			
1207-	MPC	1	23	2	-1.000002001	2		.00000		&M12112
1208-	&M12112		2002	2 0.00000		2003	2-0.00000			
1209-	MPC	1	23	3	-1.000002001	3		1.00000		&M12113
1210-	&M12113		2002	3-1.00000		2003	3 1.00000			
1211-	MPC	1	23	4	-1.000002001	4		.00000		&M12114
1212-	&M12114		2002	4 0.00000		2003	4-0.00000			
1213-	MPC	1	23	5	-1.000002001	5		1.00000		&M12115
1214-	&M12115		2002	5-1.00000		2003	5 1.00000			
1215-	MPC	1	23	6	-1.000002001	6		.00000		&M12116
1216-	&M12116		2002	6 0.00000		2003	6-0.00000			
1217-	MPC	1	24	1	-1.000003001	1		1.00000		&M13011
1218-	&M13011		3002	1 1.00000		3003	1 1.00000			
1219-	MPC	1	24	2	-1.000003001	2		.00000		&M13012
1220-	&M13012		3002	2 0.00000		3003	2 0.00000			
1221-	MPC	1	24	3	-1.000003001	3		1.00000		&M13013
1222-	&M13013		3002	3 1.00000		3003	3 1.00000			
1223-	MPC	1	24	4	-1.000003001	4		.00000		&M13014
1224-	&M13014		3002	4 0.00000		3003	4 0.00000			
1225-	MPC	1	24	5	-1.000003001	5		1.00000		&M13015
1226-	&M13015		3002	5 1.00000		3003	5 1.00000			
1227-	MPC	1	24	6	-1.000003001	6		.00000		&M13016
1228-	&M13016		3002	6 0.00000		3003	6 0.00000			
1229-	MPC	1	25	1	-1.000003001	1		1.00000		&M13021
1230-	&M13021		3002	1 0.95105		3003	1 0.80901			
1231-	MPC	1	25	2	-1.000003001	2		.00000		&M13022
1232-	&M13022		3002	2 0.30901		3003	2 0.58778			
1233-	MPC	1	25	3	-1.000003001	3		1.00000		&M13023
1234-	&M13023		3002	3 0.95105		3003	3 0.80901			
1235-	MPC	1	25	4	-1.000003001	4		.00000		&M13024
1236-	&M13024		3002	4 0.30901		3003	4 0.58778			
1237-	MPC	1	25	5	-1.000003001	5		1.00000		&M13025
1238-	&M13025		3002	5 0.95105		3003	5 0.80901			
1239-	MPC	1	25	6	-1.000003001	6		.00000		&M13026
1240-	&M13026		3002	6 0.30901		3003	6 0.58778			
1241-	MPC	1	26	1	-1.000003001	1		1.00000		&M13031
1242-	&M13031		3002	1 0.80901		3003	1 0.30901			
1243-	MPC	1	26	2	-1.000003001	2		.00000		&M13032
1244-	&M13032		3002	2 0.58778		3003	2 0.95105			
1245-	MPC	1	26	3	-1.000003001	3		1.00000		&M13033
1246-	&M13033		3002	3 0.80901		3003	3 0.30901			
1247-	MPC	1	26	4	-1.000003001	4		.00000		&M13034
1248-	&M13034		3002	4 0.58778		3003	4 0.95105			
1249-	MPC	1	26	5	-1.000003001	5		1.00000		&M13035
1250-	&M13035		3002	5 0.80901		3003	5 0.30901			

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1251-	MPC	1	26	6	-1.00000	3001	6	.00000		&M13036
1252-	&M13036		3002	6	0.58778	3003	6	0.95105		
1253-	MPC	1	27	1	-1.00000	3001	1	1.00000		&M13041
1254-	&M13041		3002	1	0.58778	3003	1	-0.30901		
1255-	MPC	1	27	2	-1.00000	3001	2	.00000		&M13042
1256-	&M13042		3002	2	0.80901	3003	2	0.95105		
1257-	MPC	1	27	3	-1.00000	3001	3	1.00000		&M13043
1258-	&M13043		3002	3	0.58778	3003	3	-0.30901		
1259-	MPC	1	27	4	-1.00000	3001	4	.00000		&M13044
1260-	&M13044		3002	4	0.80901	3003	4	0.95105		
1261-	MPC	1	27	5	-1.00000	3001	5	1.00000		&M13045
1262-	&M13045		3002	5	0.58778	3003	5	-0.30901		
1263-	MPC	1	27	6	-1.00000	3001	6	.00000		&M13046
1264-	&M13046		3002	6	0.80901	3003	6	0.95105		
1265-	MPC	1	28	1	-1.00000	3001	1	1.00000		&M13051
1266-	&M13051		3002	1	0.30901	3003	1	-0.80901		
1267-	MPC	1	28	2	-1.00000	3001	2	.00000		&M13052
1268-	&M13052		3002	2	0.95105	3003	2	0.58778		
1269-	MPC	1	28	3	-1.00000	3001	3	1.00000		&M13053
1270-	&M13053		3002	3	0.30901	3003	3	-0.80901		
1271-	MPC	1	28	4	-1.00000	3001	4	.00000		&M13054
1272-	&M13054		3002	4	0.95105	3003	4	0.58778		
1273-	MPC	1	28	5	-1.00000	3001	5	1.00000		&M13055
1274-	&M13055		3002	5	0.30901	3003	5	-0.80901		
1275-	MPC	1	28	6	-1.00000	3001	6	.00000		&M13056
1276-	&M13056		3002	6	0.95105	3003	6	0.58778		
1277-	MPC	1	29	1	-1.00000	3001	1	1.00000		&M13061
1278-	&M13061		3002	1	0.00000	3003	1	-1.00000		
1279-	MPC	1	29	2	-1.00000	3001	2	.00000		&M13062
1280-	&M13062		3002	2	1.00000	3003	2	0.00000		
1281-	MPC	1	29	3	-1.00000	3001	3	1.00000		&M13063
1282-	&M13063		3002	3	0.00000	3003	3	-1.00000		
1283-	MPC	1	29	4	-1.00000	3001	4	.00000		&M13064
1284-	&M13064		3002	4	1.00000	3003	4	0.00000		
1285-	MPC	1	29	5	-1.00000	3001	5	1.00000		&M13065
1286-	&M13065		3002	5	0.00000	3003	5	-1.00000		
1287-	MPC	1	29	6	-1.00000	3001	6	.00000		&M13066
1288-	&M13066		3002	6	1.00000	3003	6	0.00000		
1289-	MPC	1	30	1	-1.00000	3001	1	1.00000		&M13071
1290-	&M13071		3002	1	-0.80901	3003	1	-0.80901		
1291-	MPC	1	30	2	-1.00000	3001	2	.00000		&M13072
1292-	&M13072		3002	2	0.95105	3003	2	-0.58778		
1293-	MPC	1	30	3	-1.00000	3001	3	1.00000		&M13073
1294-	&M13073		3002	3	-0.80901	3003	3	-0.80901		
1295-	MPC	1	30	4	-1.00000	3001	4	.00000		&M13074
1296-	&M13074		3002	4	0.95105	3003	4	-0.58778		
1297-	MPC	1	30	5	-1.00000	3001	5	1.00000		&M13075
1298-	&M13075		3002	5	-0.80901	3003	5	-0.80901		
1299-	MPC	1	30	6	-1.00000	3001	6	.00000		&M13076
1300-	&M13076		3002	6	0.95105	3003	6	-0.58778		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1301-	MPC	1	31	1	-1.000003001	1		1.00000		&M13081
1302-	&M13081			3002	1-0.58778	3003		1-0.30901		
1303-	MPC	1	31	2	-1.000003001	2		.00000		&M13082
1304-	&M13082			3002	2 0.30901	3003		2-0.95105		
1305-	MPC	1	31	3	-1.000003001	3		1.00000		&M13083
1306-	&M13083			3002	3-0.58778	3003		3-0.30901		
1307-	MPC	1	31	4	-1.000003001	4		.00000		&M13084
1308-	&M13084			3002	4 0.80901	3003		4-0.95105		
1309-	MPC	1	31	5	-1.000003001	5		1.00000		&M13085
1310-	&M13085			3002	5-0.58778	3003		5-0.30901		
1311-	MPC	1	31	6	-1.000003001	6		.00000		&M13086
1312-	&M13086			3002	6 0.80901	3003		6-0.95105		
1313-	MPC	1	32	1	-1.000003001	1		1.00000		&M13091
1314-	&M13091			3002	1-0.80901	3003		1 0.30901		
1315-	MPC	1	32	2	-1.000003001	2		.00000		&M13092
1316-	&M13092			3002	2 0.58778	3003		2-0.95105		
1317-	MPC	1	32	3	-1.000003001	3		1.00000		&M13093
1318-	&M13093			3002	3-0.30901	3003		3 0.30901		
1319-	MPC	1	32	4	-1.000003001	4		.00000		&M13094
1320-	&M13094			3002	4 0.58778	3003		4-0.95105		
1321-	MPC	1	32	5	-1.000003001	5		1.00000		&M13095
1322-	&M13095			3002	5-0.80901	3003		5 0.30901		
1323-	MPC	1	32	6	-1.000003001	6		.00000		&M13096
1324-	&M13096			3002	6 0.58778	3003		6-0.95105		
1325-	MPC	1	33	1	-1.000003001	1		1.00000		&M13101
1326-	&M13101			3002	1-0.95105	3003		1 0.80901		
1327-	MPC	1	33	2	-1.000003001	2		.00000		&M13102
1328-	&M13102			3002	2 0.30901	3003		2-0.58778		
1329-	MPC	1	33	3	-1.000003001	3		1.00000		&M13103
1330-	&M13103			3002	3-0.95105	3003		3 0.80901		
1331-	MPC	1	33	4	-1.000003001	4		.00000		&M13104
1332-	&M13104			3002	4 0.30901	3003		4-0.58778		
1333-	MPC	1	33	5	-1.000003001	5		1.00000		&M13105
1334-	&M13105			3002	5-0.95105	3003		5 0.80901		
1335-	MPC	1	33	6	-1.000003001	6		.00000		&M13106
1336-	&M13106			3002	6 0.30901	3003		6-0.58778		
1337-	MPC	1	34	1	-1.000003001	1		1.00000		&M13111
1338-	&M13111			3002	1-1.00000	3003		1 1.00000		
1339-	MPC	1	34	2	-1.000003001	2		.00000		&M13112
1340-	&M13112			3002	2 0.00000	3003		2-0.00000		
1341-	MPC	1	34	3	-1.000003001	3		1.00000		&M13113
1342-	&M13113			3002	3-1.00000	3003		3 1.00000		
1343-	MPC	1	34	4	-1.000003001	4		.00000		&M13114
1344-	&M13114			3002	4 0.00000	3003		4-0.00000		
1345-	MPC	1	34	5	-1.000003001	5		1.00000		&M13115
1346-	&M13115			3002	5-1.00000	3003		5 1.00000		
1347-	MPC	1	34	6	-1.000003001	6		.00000		&M13116
1348-	&M13116			3002	6 0.00000	3003		6-0.00000		
1349-	MPC	1	35	1	-1.000004001	1		1.00000		&M14011
1350-	&M14011			4002	1 1.00000	4003		1 1.00000		

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1351-	MPC	1	35	2	-1.000004001	2		.00000		&M14012
1352-	&M14012		4002	2 0.00000	4003	2 0.00000				
1353-	MPC	1	35	3	-1.000004001	3		1.00000		&M14013
1354-	&M14013		4002	3 1.00000	4003	3 1.00000				
1355-	MPC	1	35	4	-1.000004001	4		.00000		&M14014
1356-	&M14014		4002	4 0.00000	4003	4 0.00000				
1357-	MPC	1	35	5	-1.000004001	5		1.00000		&M14015
1358-	&M14015		4002	5 1.00000	4003	5 1.00000				
1359-	MPC	1	35	6	-1.000004001	6		.00000		&M14016
1360-	&M14016		4002	6 0.00000	4003	6 0.00000				
1361-	MPC	1	36	1	-1.000004001	1		1.00000		&M14021
1362-	&M14021		4002	1 0.95105	4003	1 0.80901				
1363-	MPC	1	36	2	-1.000004001	2		.00000		&M14022
1364-	&M14022		4002	2 0.30901	4003	2 0.58778				
1365-	MPC	1	36	3	-1.000004001	3		1.00000		&M14023
1366-	&M14023		4002	3 0.95105	4003	3 0.80901				
1367-	MPC	1	36	4	-1.000004001	4		.00000		&M14024
1368-	&M14024		4002	4 0.30901	4003	4 0.58778				
1369-	MPC	1	36	5	-1.000004001	5		1.00000		&M14025
1370-	&M14025		4002	5 0.95105	4003	5 0.80901				
1371-	MPC	1	36	6	-1.000004001	6		.00000		&M14026
1372-	&M14026		4002	6 0.30901	4003	6 0.58778				
1373-	MPC	1	37	1	-1.000004001	1		1.00000		&M14031
1374-	&M14031		4002	1 0.30901	4003	1 0.30901				
1375-	MPC	1	37	2	-1.000004001	2		.00000		&M14032
1376-	&M14032		4002	2 0.58778	4003	2 0.95105				
1377-	MPC	1	37	3	-1.000004001	3		1.00000		&M14033
1378-	&M14033		4002	3 0.80901	4003	3 0.30901				
1379-	MPC	1	37	4	-1.000004001	4		.00000		&M14034
1380-	&M14034		4002	4 0.58778	4003	4 0.95105				
1381-	MPC	1	37	5	-1.000004001	5		1.00000		&M14035
1382-	&M14035		4002	5 0.80901	4003	5 0.30901				
1383-	MPC	1	37	6	-1.000004001	6		.00000		&M14036
1384-	&M14036		4002	6 0.58778	4003	6 0.95105				
1385-	MPC	1	38	1	-1.000004001	1		1.00000		&M14041
1386-	&M14041		4002	1 0.95778	4003	1-0.30901				
1387-	MPC	1	38	2	-1.000004001	2		.00000		&M14042
1388-	&M14042		4002	2 0.80901	4003	2 0.95105				
1389-	MPC	1	38	3	-1.000004001	3		1.00000		&M14043
1390-	&M14043		4002	3 0.58778	4003	3-0.30901				
1391-	MPC	1	38	4	-1.000004001	4		.00000		&M14044
1392-	&M14044		4002	4 0.30901	4003	4 0.95105				
1393-	MPC	1	38	5	-1.000004001	5		1.00000		&M14045
1394-	&M14045		4002	5 0.58778	4003	5-0.30901				
1395-	MPC	1	38	6	-1.000004001	6		.00000		&M14046
1396-	&M14046		4002	6 0.30901	4003	6 0.95105				
1397-	MPC	1	39	1	-1.000004001	1		1.00000		&M14051
1398-	&M14051		4002	1 0.30901	4003	1-0.30901				
1399-	MPC	1	39	2	-1.000004001	2		.00000		&M14052
1400-	&M14052		4002	2 0.95105	4003	2 0.58778				

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1401-	MPC	1	39	3	-1.000004001	3	1.00000			&M14053
1402-	&M14053			4002	3 0.30901	4003	3-0.80901			
1403-	MPC	1	39	4	-1.000004001	4	.00000			&M14054
1404-	&M14054			4002	4 0.95105	4003	4 0.58778			
1405-	MPC	1	39	5	-1.000004001	5	1.00000			&M14055
1406-	&M14055			4002	5 0.30901	4003	5-0.80901			
1407-	MPC	1	39	6	-1.000004001	6	.00000			&M14056
1408-	&M14056			4002	6 0.95105	4003	6 0.58778			
1409-	MPC	1	40	1	-1.000004001	1	1.00000			&M14061
1410-	&M14061			4002	1 0.00000	4003	1-1.00000			
1411-	MPC	1	40	2	-1.000004001	2	.00000			&M14062
1412-	&M14062			4002	2 1.00000	4003	2 0.00000			
1413-	MPC	1	40	3	-1.000004001	3	1.00000			&M14063
1414-	&M14063			4002	3 0.00000	4003	3-1.00000			
1415-	MPC	1	40	4	-1.000004001	4	.00000			&M14064
1416-	&M14064			4002	4 1.00000	4003	4 0.00000			
1417-	MPC	1	40	5	-1.000004001	5	1.00000			&M14065
1418-	&M14065			4002	5 0.00000	4003	5-1.00000			
1419-	MPC	1	40	6	-1.000004001	6	.00000			&M14066
1420-	&M14066			4002	6 1.00000	4003	6 0.00000			
1421-	MPC	1	41	1	-1.000004001	1	1.00000			&M14071
1422-	&M14071			4002	1-0.30901	4003	1-0.80901			
1423-	MPC	1	41	2	-1.000004001	2	.00000			&M14072
1424-	&M14072			4002	2 0.95105	4003	2-0.58778			
1425-	MPC	1	41	3	-1.000004001	3	1.00000			&M14073
1426-	&M14073			4002	3-0.30901	4003	3-0.80901			
1427-	MPC	1	41	4	-1.000004001	4	.00000			&M14074
1428-	&M14074			4002	4 0.95105	4003	4-0.58778			
1429-	MPC	1	41	5	-1.000004001	5	1.00000			&M14075
1430-	&M14075			4002	5-0.30901	4003	5-0.80901			
1431-	MPC	1	41	6	-1.000004001	6	.00000			&M14076
1432-	&M14076			4002	6 0.95105	4003	6-0.58778			
1433-	MPC	1	42	1	-1.000004001	1	1.00000			&M14081
1434-	&M14081			4002	1-0.58778	4003	1-0.30901			
1435-	MPC	1	42	2	-1.000004001	2	.00000			&M14082
1436-	&M14082			4002	2 0.80901	4003	2-0.95105			
1437-	MPC	1	42	3	-1.000004001	3	1.00000			&M14083
1438-	&M14083			4002	3-0.58778	4003	3-0.30901			
1439-	MPC	1	42	4	-1.000004001	4	.00000			&M14084
1440-	&M14084			4002	4 0.80901	4003	4-0.95105			
1441-	MPC	1	42	5	-1.000004001	5	1.00000			&M14085
1442-	&M14085			4002	5-0.58778	4003	5-0.30901			
1443-	MPC	1	42	6	-1.000004001	6	.00000			&M14086
1444-	&M14086			4002	6 0.80901	4003	6-0.95105			
1445-	MPC	1	43	1	-1.000004001	1	1.00000			&M14091
1446-	&M14091			4002	1-0.80901	4003	1 0.30901			
1447-	MPC	1	43	2	-1.000004001	2	.00000			&M14092
1448-	&M14092			4002	2 0.58778	4003	2-0.95105			
1449-	MPC	1	43	3	-1.000004001	3	1.00000			&M14093
1450-	&M14093			4002	3-0.80901	4003	3 0.30901			

SORTED BULK DATA ECHO

CARD COUNT	• 1 ••	2 ••	3 ••	4 ••	5 ••	6 ••	7 ••	8 ••	9 ••	10 •
1451-	MPC	1	43	4	-1.000004001	4		.00000		&M14094
1452-	&M1409			4002	4 0.58778	4003		4-0.95105		
1453-	MPC	1	43	5	-1.000004001	5		1.00000		&M14095
1454-	&M14095			4002	5-0.80901	4003		5 0.30901		
1455-	MPC	1	43	6	-1.000004001	6		.00000		&M14096
1456-	&M14096			4002	6 0.58778	4003		6-0.95105		
1457-	MPC	1	44	1	-1.000004001	1		1.00000		&M14101
1458-	&M14101			4002	1-0.95105	4003		1 0.80901		
1459-	MPC	1	44	2	-1.000004001	2		.00000		&M14102
1460-	&M14102			4002	2 0.30901	4003		2-0.58778		
1461-	MPC	1	44	3	-1.000004001	3		1.00000		&M14103
1462-	&M14103			4002	3-0.95105	4003		3 0.80901		
1463-	MPC	1	44	4	-1.000004001	4		.00000		&M14104
1464-	&M14104			4002	4 0.30901	4003		4-0.58778		
1465-	MPC	1	44	5	-1.000004001	5		1.00000		&M14105
1466-	&M14105			4002	5-0.95105	4003		5 0.80901		
1467-	MPC	1	44	6	-1.000004001	6		.00000		&M14106
1468-	&M14106			4002	6 0.30901	4003		6-0.58778		
1469-	MPC	1	45	1	-1.000004001	1		1.00000		&M14111
1470-	&M14111			4002	1-1.00000	4003		1 1.00000		
1471-	MPC	1	45	2	-1.000004001	2		.00000		&M14112
1472-	&M14112			4002	2 0.00000	4003		2-0.00000		
1473-	MPC	1	45	3	-1.000004001	3		1.00000		&M14113
1474-	&M14113			4002	3-1.00000	4003		3 1.00000		
1475-	MPC	1	45	4	-1.000004001	4		.00000		&M14114
1476-	&M14114			4002	4 0.00000	4003		4-0.00000		
1477-	MPC	1	45	5	-1.000004001	5		1.00000		&M14115
1478-	&M14115			4002	5-1.00000	4003		5 1.00000		
1479-	MPC	1	45	6	-1.000004001	6		.00000		&M14116
1480-	&M14116			4002	6 0.00000	4003		6-0.00000		
1481-	MPC	1	46	1	-1.000005001	1		1.00000		&M15011
1482-	&M15011			5002	1 1.00000	5003		1 1.00000		
1483-	MPC	1	46	2	-1.000005001	2		.00000		&M15012
1484-	&M15012			5002	2 0.00000	5003		2 0.00000		
1485-	MPC	1	46	3	-1.000005001	3		1.00000		&M15013
1486-	&M15013			5002	3 1.00000	5003		3 1.00000		
1487-	MPC	1	46	4	-1.000005001	4		.00000		&M15014
1488-	&M15014			5002	4 0.00000	5003		4 0.00000		
1489-	MPC	1	46	5	-1.000005001	5		1.00000		&M15015
1490-	&M15015			5002	5 1.00000	5003		5 1.00000		
1491-	MPC	1	46	6	-1.000005001	6		.00000		&M15016
1492-	&M15016			5002	6 0.00000	5003		6 0.00000		
1493-	MPC	1	47	1	-1.000005001	1		1.00000		&M15021
1494-	&M15021			5002	1 0.95105	5003		1 0.80901		
1495-	MPC	1	47	2	-1.000005001	2		.00000		&M15022
1496-	&M15022			5002	2 0.30901	5003		2 0.58778		
1497-	MPC	1	47	3	-1.000005001	3		1.00000		&M15023
1498-	&M15023			5002	3 0.00000	5003		3 0.80901		
1499-	MPC	1	47	4	-1.000005001	4		.00000		&M15024
1500-	&M15024			5002	4 0.30901	5003		4 0.58778		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1501-	MPC	1	47	5	-1.000005001	5		1.00000		&M15025
1502-	&M15025			5002	5 0.95105	5003		5 0.80901		
1503-	MPC	1	47	6	-1.000005001	6		.00000		&M15026
1504-	&M15026			5002	6 0.30901	5003		6 0.58778		
1505-	MPC	1	48	1	-1.000005001	1		1.00000		&M15031
1506-	&M15031			5002	1 0.80901	5003		1 0.30901		
1507-	MPC	1	48	2	-1.000005001	2		.00000		&M15032
1508-	&M15032			5002	2 0.58778	5003		2 0.95105		
1509-	MPC	1	48	3	-1.000005001	3		1.00000		&M15033
1510-	&M15033			5002	3 0.80901	5003		3 0.30901		
1511-	MPC	1	48	4	-1.000005001	4		.00000		&M15034
1512-	&M15034			5002	4 0.58778	5003		4 0.95105		
1513-	MPC	1	48	5	-1.000005001	5		1.00000		&M15035
1514-	&M15035			5002	5 0.80901	5003		5 0.30901		
1515-	MPC	1	48	6	-1.000005001	6		.00000		&M15036
1516-	&M15036			5002	6 0.58778	5003		6 0.95105		
1517-	MPC	1	49	1	-1.000005001	1		1.00000		&M15041
1518-	&M15041			5002	1 0.58778	5003		1-0.30901		
1519-	MPC	1	49	2	-1.000005001	2		.00000		&M15042
1520-	&M15042			5002	2 0.80901	5003		2 0.95105		
1521-	MPC	1	49	3	-1.000005001	3		1.00000		&M15043
1522-	&M15043			5002	3 0.58778	5003		3-0.30901		
1523-	MPC	1	49	4	-1.000005001	4		.00000		&M15044
1524-	&M15044			5002	4 0.80901	5003		4 0.95105		
1525-	MPC	1	49	5	-1.000005001	5		1.00000		&M15045
1526-	&M15045			5002	5 0.58778	5003		5-0.30901		
1527-	MPC	1	49	6	-1.000005001	6		.00000		&M15046
1528-	&M15046			5002	6 0.80901	5003		6 0.95105		
1529-	MPC	1	50	1	-1.000005001	1		1.00000		&M15051
1530-	&M15051			5002	1 0.30901	5003		1-0.80901		
1531-	MPC	1	50	2	-1.000005001	2		.00000		&M15052
1532-	&M15052			5002	2 0.95105	5003		2 0.58778		
1533-	MPC	1	50	3	-1.000005001	3		1.00000		&M15053
1534-	&M15053			5002	3 0.30901	5003		3-0.80901		
1535-	MPC	1	50	4	-1.000005001	4		.00000		&M15054
1536-	&M15054			5002	4 0.95105	5003		4 0.58778		
1537-	MPC	1	50	5	-1.000005001	5		1.00000		&M15055
1538-	&M15055			5002	5 0.30901	5003		5-0.80901		
1539-	MPC	1	50	6	-1.000005001	6		.00000		&M15056
1540-	&M15056			5002	6 0.95105	5003		6 0.58778		
1541-	MPC	1	51	1	-1.000005001	1		1.00000		&M15061
1542-	&M15061			5002	1 0.00000	5003		1-1.00000		
1543-	MPC	1	51	2	-1.000005001	2		.00000		&M15062
1544-	&M15062			5002	2 1.00000	5003		2 0.00000		
1545-	MPC	1	51	3	-1.000005001	3		1.00000		&M15063
1546-	&M15063			5002	3 0.00000	5003		3-1.00000		
1547-	MPC	1	51	4	-1.000005001	4		.00000		&M15064
1548-	&M15064			5002	4 1.00000	5003		4 0.00000		
1549-	MPC	1	51	5	-1.000005001	5		1.00000		&M15065
1550-	&M15065			5002	5 0.00000	5003		5-1.00000		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1551-	MPC	1	51	6	-1.000005001	6		.00000		&M15066
1552-	&M15066		5002	6 1.00000		5003	6 0.00000			
1553-	MPC	1	52	1	-1.000005001	1		1.00000		&M15071
1554-	&M15071		5002	1-0.30901		5003	1-0.80901			
1555-	MPC	1	52	2	-1.000005001	2		.00000		&M15072
1556-	&M15072		5002	2 0.95105		5003	2-0.58778			
1557-	MPC	1	52	3	-1.000005001	3		1.00000		&M15073
1558-	&M15073		5002	3-0.30901		5003	3-0.80901			
1559-	MPC	1	52	4	-1.000005001	4		.00000		&M15074
1560-	&M15074		5002	4 0.95105		5003	4-0.58778			
1561-	MPC	1	52	5	-1.000005001	5		1.00000		&M15075
1562-	&M15075		5002	5-0.30901		5003	5-0.80901			
1563-	MPC	1	52	6	-1.000005001	6		.00000		&M15076
1564-	&M15076		5002	6 0.95105		5003	6-0.58778			
1565-	MPC	1	53	1	-1.000005001	1		1.00000		&M15081
1566-	&M15081		5002	1-0.58778		5003	1-0.30901			
1567-	MPC	1	53	2	-1.000005001	2		.00000		&M15082
1568-	&M15082		5002	2 0.80901		5003	2-0.95105			
1569-	MPC	1	53	3	-1.000005001	3		1.00000		&M15083
1570-	&M15083		5002	3-0.58778		5003	3-0.30901			
1571-	MPC	1	53	4	-1.000005001	4		.00000		&M15084
1572-	&M15084		5002	4 0.80901		5003	4-0.95105			
1573-	MPC	1	53	5	-1.000005001	5		1.00000		&M15085
1574-	&M15085		5002	5-0.58778		5003	5-0.30901			
1575-	MPC	1	53	6	-1.000005001	6		.00000		&M15086
1576-	&M15086		5002	6 0.80901		5003	6-0.95105			
1577-	MPC	1	54	1	-1.000005001	1		1.00000		&M15091
1578-	&M15091		5002	1-0.80901		5003	1 0.30901			
1579-	MPC	1	54	2	-1.000005001	2		.00000		&M15092
1580-	&M15092		5002	2 0.58778		5003	2-0.95105			
1581-	MPC	1	54	3	-1.000005001	3		1.00000		&M15093
1582-	&M15093		5002	3-0.80901		5003	3 0.30901			
1583-	MPC	1	54	4	-1.000005001	4		.00000		&M15094
1584-	&M15094		5002	4 0.58778		5003	4-0.95105			
1585-	MPC	1	54	5	-1.000005001	5		1.00000		&M15095
1586-	&M15095		5002	5-0.80901		5003	5 0.30901			
1587-	MPC	1	54	6	-1.000005001	6		.00000		&M15096
1588-	&M15096		5002	6 0.58778		5003	6-0.95105			
1589-	MPC	1	55	1	-1.000005001	1		1.00000		&M15101
1590-	&M15101		5002	1-0.95105		5003	1 0.80901			
1591-	MPC	1	55	2	-1.000005001	2		.00000		&M15102
1592-	&M15102		5002	2 0.30901		5003	2-0.58778			
1593-	MPC	1	55	3	-1.000005001	3		1.00000		&M15103
1594-	&M15103		5002	3-0.95105		5003	3 0.80901			
1595-	MPC	1	55	4	-1.000005001	4		.00000		&M15104
1596-	&M15104		5002	4 0.30901		5003	4-0.58778			
1597-	MPC	1	55	5	-1.000005001	5		1.00000		&M15105
1598-	&M15105		5002	5-0.95105		5003	5 0.80901			
1599-	MPC	1	55	6	-1.000005001	6		.00000		&M15106
1600-	&M15106		5002	6 0.30901		5003	6-0.58778			

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1601-	MPC	1	56	1	-1.000005001	1		1.00000		&M15111
1602-	&M15111			5002	1-1.00000	5003		1 1.00000		
1603-	MPC	1	56	2	-1.000005001	2		.00000		&M15112
1604-	&M15112			5002	2 0.00000	5003		2-0.00000		
1605-	MPC	1	56	3	-1.000005001	3		1.00000		&M15113
1606-	&M15113			5002	3-1.00000	5003		3 1.00000		
1607-	MPC	1	56	4	-1.000005001	4		.00000		&M15114
1608-	&M15114			5002	4 0.00000	5003		4-0.00000		
1609-	MPC	1	56	5	-1.000005001	5		1.00000		&M15115
1610-	&M15115			5002	5-1.00000	5003		5 1.00000		
1611-	MPC	1	56	6	-1.000005001	6		.00000		&M15116
1612-	&M15116			5002	6 0.00000	5003		6-0.00000		
1613-	MPC	1	57	1	-1.000006001	1		1.00000		&M16011
1614-	&M16011			6002	1 1.00000	6003		1 1.00000		
1615-	MPC	1	57	2	-1.000006001	2		.00000		&M16012
1616-	&M16012			6002	2 0.00000	6003		2 0.00000		
1617-	MPC	1	57	3	-1.000006001	3		1.00000		&M16013
1618-	&M16013			6002	3 1.00000	6003		3 1.00000		
1619-	MPC	1	57	4	-1.000006001	4		.00000		&M16014
1620-	&M16014			6002	4 0.00000	6003		4 0.00000		
1621-	MPC	1	57	5	-1.000006001	5		1.00000		&M16015
1622-	&M16015			6002	5 1.00000	6003		5 1.00000		
1623-	MPC	1	57	6	-1.000006001	6		.00000		&M16016
1624-	&M16016			6002	6 0.00000	6003		6 0.00000		
1625-	MPC	1	58	1	-1.000006001	1		1.00000		&M16021
1626-	&M16021			6002	1 0.95105	6003		1 0.80901		
1627-	MPC	1	58	2	-1.000006001	2		.00000		&M16022
1628-	&M16022			6002	2 0.80901	6003		2 0.58778		
1629-	MPC	1	58	3	-1.000006001	3		1.00000		&M16023
1630-	&M16023			6002	3 0.95105	6003		3 0.80901		
1631-	MPC	1	58	4	-1.000006001	4		.00000		&M16024
1632-	&M16024			6002	4 0.80901	6003		4 0.58778		
1633-	MPC	1	58	5	-1.000006001	5		1.00000		&M16025
1634-	&M16025			6002	5 0.95105	6003		5 0.80901		
1635-	MPC	1	58	6	-1.000006001	6		.00000		&M16026
1636-	&M16026			6002	6 0.80901	6003		6 0.58778		
1637-	MPC	1	59	1	-1.000006001	1		1.00000		&M16031
1638-	&M16031			6002	1 0.80901	6003		1 0.30901		
1639-	MPC	1	59	2	-1.000006001	2		.00000		&M16032
1640-	&M16032			6002	2 0.58778	6003		2 0.95105		
1641-	MPC	1	59	3	-1.000006001	3		1.00000		&M16033
1642-	&M16033			6002	3 0.80901	6003		3 0.30901		
1643-	MPC	1	59	4	-1.000006001	4		.00000		&M16034
1644-	&M16034			6002	4 0.58778	6003		4 0.95105		
1645-	MPC	1	59	5	-1.000006001	5		1.00000		&M16035
1646-	&M16035			6002	5 0.80901	6003		5 0.30901		
1647-	MPC	1	59	6	-1.000006001	6		.00000		&M16036
1648-	&M16036			6002	6 0.58778	6003		6 0.95105		
1649-	MPC	1	60	1	-1.000006001	1		1.00000		&M16041
1650-	&M16041			6002	1 0.58778	6003		1-0.30901		

SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
1651-	MPC	1	60	2	-1.000006001	2		.00000		&M16042
1652-	&M16042			6002	2 0.80901	6003		2 0.95105		
1653-	MPC	1	60	3	-1.000006001	3		1.00000		&M16043
1654-	&M16043			6002	3 0.58778	6003		3-0.30901		
1655-	MPC	1	60	4	-1.000006001	4		.00000		&M16044
1656-	&M16044			6002	4 0.80901	6003		4 0.95105		
1657-	MPC	1	60	5	-1.000006001	5		1.00000		&M16045
1658-	&M16045			6002	5 0.58778	6003		5-0.30901		
1659-	MPC	1	60	6	-1.000006001	6		.00000		&M16046
1660-	&M16046			6002	6 0.80901	6003		6 0.95105		
1661-	MPC	1	61	1	-1.000006001	1		1.00000		&M16051
1662-	&M16051			6002	1 0.30901	6003		1-0.80901		
1663-	MPC	1	61	2	-1.000006001	2		.00000		&M16052
1664-	&M16052			6002	2 0.95105	6003		2 0.58778		
1665-	MPC	1	61	3	-1.000006001	3		1.00000		&M16053
1666-	&M16053			6002	3 0.30901	6003		3-0.80901		
1667-	MPC	1	61	4	-1.000006001	4		.00000		&M16054
1668-	&M16054			6002	4 0.95105	6003		4 0.58778		
1669-	MPC	1	61	5	-1.000006001	5		1.00000		&M16055
1670-	&M16055			6002	5 0.30901	6003		5-0.80901		
1671-	MPC	1	61	6	-1.000006001	6		.00000		&M16056
1672-	&M16056			6002	6 0.95105	6003		6 0.58778		
1673-	MPC	1	62	1	-1.000006001	1		1.00000		&M16061
1674-	&M16061			6002	1 0.00000	6003		1-1.00000		
1675-	MPC	1	62	2	-1.000006001	2		.00000		&M16062
1676-	&M16062			6002	2 1.00000	6003		2 0.00000		
1677-	MPC	1	62	3	-1.000006001	3		1.00000		&M16063
1678-	&M16063			6002	3 0.00000	6003		3-1.00000		
1679-	MPC	1	62	4	-1.000006001	4		.00000		&M16064
1680-	&M16064			6002	4 1.00000	6003		4 0.00000		
1681-	MPC	1	62	5	-1.000006001	5		1.00000		&M16065
1682-	&M16065			6002	5 0.00000	6003		5-1.00000		
1683-	MPC	1	62	6	-1.000006001	6		.00000		&M16066
1684-	&M16066			6002	6 1.00000	6003		6 0.00000		
1685-	MPC	1	63	1	-1.000006001	1		1.00000		&M16071
1686-	&M16071			6002	1-0.30901	6003		1-0.80901		
1687-	MPC	1	63	2	-1.000006001	2		.00000		&M16072
1688-	&M16072			6002	2 0.95105	6003		2-0.58778		
1689-	MPC	1	63	3	-1.000006001	3		1.00000		&M16073
1690-	&M16073			6002	3-0.30901	6003		3-0.80901		
1691-	MPC	1	63	4	-1.000006001	4		.00000		&M16074
1692-	&M16074			6002	4 0.95105	6003		4-0.58778		
1693-	MPC	1	63	5	-1.000006001	5		1.00000		&M16075
1694-	&M16075			6002	5-0.80901	6003		5-0.80901		
1695-	MPC	1	63	6	-1.000006001	6		.00000		&M16076
1696-	&M16076			6002	6 0.95105	6003		6-0.58778		
1697-	MPC	1	64	1	-1.000006001	1		1.00000		&M16081
1698-	&M16081			6002	1-0.58778	6003		1-0.30901		
1699-	MPC	1	64	2	-1.000006001	2		.00000		&M16082
1700-	&M16082			6002	2 0.80901	6003		2-0.95105		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1701-	MPC	1	64	3	-1.000006001	3		1.00000		&M16083
1702-	&M16083		6002	3-0.58778		6003		3-0.30901		
1703-	MPC	1	64	4	-1.000006001	4		.00000		&M16084
1704-	&M16084		6002	4 0.80901		6003		4-0.95105		
1705-	MPC	1	64	5	-1.000006001	5		1.00000		&M16085
1706-	&M16085		6002	5-0.58778		6003		5-0.30901		
1707-	MPC	1	64	6	-1.000006001	6		.00000		&M16086
1708-	&M16086		6002	6 0.80901		6003		6-0.95105		
1709-	MPC	1	65	1	-1.000006001	1		1.00000		&M16091
1710-	&M16091		6002	1-0.30901		6003		1 0.30901		
1711-	MPC	1	65	2	-1.000006001	2		.00000		&M16092
1712-	&M16092		6002	2 0.58778		6003		2-0.95105		
1713-	MPC	1	65	3	-1.000006001	3		1.00000		&M16093
1714-	&M16093		6002	3-0.80901		6003		3 0.30901		
1715-	MPC	1	65	4	-1.000006001	4		.00000		&M16094
1716-	&M16094		6002	4 0.95778		6003		4-0.95105		
1717-	MPC	1	65	5	-1.000006001	5		1.00000		&M16095
1718-	&M16095		6002	5-0.80901		6003		5 0.30901		
1719-	MPC	1	65	6	-1.000006001	6		.00000		&M16096
1720-	&M16096		6002	6 0.58778		6003		6-0.95105		
1721-	MPC	1	66	1	-1.000006001	1		1.00000		&M16101
1722-	&M16101		6002	1-0.95105		6003		1 0.80901		
1723-	MPC	1	66	2	-1.000006001	2		.00000		&M16102
1724-	&M16102		6002	2 0.30901		6003		2-0.58778		
1725-	MPC	1	66	3	-1.000006001	3		1.00000		&M16103
1726-	&M16103		6002	3-0.95105		6003		3 0.80901		
1727-	MPC	1	66	4	-1.000006001	4		.00000		&M16104
1728-	&M16104		6002	4 0.80901		6003		4-0.58778		
1729-	MPC	1	66	5	-1.000006001	5		1.00000		&M16105
1730-	&M16105		6002	5-0.95105		6003		5 0.80901		
1731-	MPC	1	66	6	-1.000006001	6		.00000		&M16106
1732-	&M16106		6002	6 0.30901		6003		6-0.58778		
1733-	MPC	1	67	1	-1.000006001	1		1.00000		&M16111
1734-	&M16111		6002	1-1.00000		6003		1 1.00000		
1735-	MPC	1	67	2	-1.000006001	2		.00000		&M16112
1736-	&M16112		6002	2 0.00000		6003		2-0.00000		
1737-	MPC	1	67	3	-1.000006001	3		1.00000		&M16113
1738-	&M16113		6002	3-1.00000		6003		3 1.00000		
1739-	MPC	1	67	4	-1.000006001	4		.00000		&M16114
1740-	&M16114		6002	4 0.00000		6003		4-0.00000		
1741-	MPC	1	67	5	-1.000006001	5		1.00000		&M16115
1742-	&M16115		6002	5-1.00000		6003		5 1.00000		
1743-	MPC	1	67	6	-1.000006001	6		.00000		&M16116
1744-	&M16116		6002	6 0.00000		6003		6-0.00000		
1745-	MPC	1	68	1	-1.000007001	1		1.00000		&M17011
1746-	&M17011		7002	1 1.00000		7003		1 1.00000		
1747-	MPC		68	2	-1.000007001	2		.00000		&M17012
1748-	&M17012		7002	2 0.00000		7003		2 0.00000		
1749-	MPC	1	68	3	-1.000007001	3		1.00000		&M17013
1750-	&M17013		7002	3 1.00000		7003		3 1.00000		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1751-	MPC	1	68	4	-1.000007001	4		.00000		&M17014
1752-	&M17014		7002	4 0.00000	7003		4 0.00000			
1753-	MPC	1	68	5	-1.000007001	5		1.00000		&M17015
1754-	&M17015		7002	5 1.00000	7003		5 1.00000			
1755-	MPC	1	68	6	-1.000007001	6		.00000		&M17016
1756-	&M17016		7002	6 0.00000	7003		6 0.00000			
1757-	MPC	1	69	1	-1.000007001	1		1.00000		&M17021
1758-	&M17021		7002	1 0.95105	7003		1 0.80901			
1759-	MPC	1	69	2	-1.000007001	2		.00000		&M17022
1760-	&M17022		7002	2 0.30901	7003		2 0.58778			
1761-	MPC	1	69	3	-1.000007001	3		1.00000		&M17023
1762-	&M17023		7002	3 0.95105	7003		3 0.80901			
1763-	MPC	1	69	4	-1.000007001	4		.00000		&M17024
1764-	&M17024		7002	4 0.30901	7003		4 0.58778			
1765-	MPC	1	69	5	-1.000007001	5		1.00000		&M17025
1766-	&M17025		7002	5 0.95105	7003		5 0.80901			
1767-	MPC	1	69	6	-1.000007001	6		.00000		&M17026
1768-	&M17026		7002	6 0.30901	7003		6 0.58778			
1769-	MPC	1	70	1	-1.000007001	1		1.00000		&M17031
1770-	&M17031		7002	1 0.80901	7003		1 0.30901			
1771-	MPC	1	70	2	-1.000007001	2		.00000		&M17032
1772-	&M17032		7002	2 0.58778	7003		2 0.95105			
1773-	MPC	1	70	3	-1.000007001	3		1.00000		&M17033
1774-	&M17033		7002	3 0.80901	7003		3 0.30901			
1775-	MPC	1	70	4	-1.000007001	4		.00000		&M17034
1776-	&M17034		7002	4 0.58778	7003		4 0.95105			
1777-	MPC	1	70	5	-1.000007001	5		1.00000		&M17035
1778-	&M17035		7002	5 0.80901	7003		5 0.30901			
1779-	MPC	1	70	6	-1.000007001	6		.00000		&M17036
1780-	&M17036		7002	6 0.58778	7003		6 0.95105			
1781-	MPC	1	71	1	-1.000007001	1		1.00000		&M17041
1782-	&M17041		7002	1 0.58778	7003		1-0.30901			
1783-	MPC	1	71	2	-1.000007001	2		.00000		&M17042
1784-	&M17042		7002	2 0.80901	7003		2 0.95105			
1785-	MPC	1	71	3	-1.000007001	3		1.00000		&M17043
1786-	&M17043		7002	3 0.58778	7003		3-0.30901			
1787-	MPC	1	71	4	-1.000007001	4		.00000		&M17044
1788-	&M17044		7002	4 0.80901	7003		4 0.95105			
1789-	MPC	1	71	5	-1.000007001	5		1.00000		&M17045
1790-	&M17045		7002	5 0.58778	7003		5-0.30901			
1791-	MPC	1	71	6	-1.000007001	6		.00000		&M17046
1792-	&M17046		7002	6 0.80901	7003		6 0.95105			
1793-	MPC	1	72	1	-1.000007001	1		1.00000		&M17051
1794-	&M17051		7002	1 0.80901	7003		1-0.80901			
1795-	MPC	1	72	2	-1.000007001	2		.00000		&M17052
1796-	&M17052		7002	2 0.95105	7003		2 0.58778			
1797-	MPC	1	72	3	-1.000007001	3		1.00000		&M17053
1798-	&M17053		7002	3 0.30901	7003		3-0.80901			
1799-	MPC	1	72	4	-1.000007001	4		.00000		&M17054
1800-	&M17054		7002	4 0.95105	7003		4 0.58778			

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1801-	MPC	1	72	5	-1.000007001	5		1.00000		&M17055
1802-	&M17055		7002	5	0.30901	7003		5-0.80901		
1803-	MPC	1	72	6	-1.000007001	6		.00000		&M17056
1804-	&M17056		7002	6	0.95105	7003		6 0.58778		
1805-	MPC	1	73	1	-1.000007001	1		1.00000		&M17061
1806-	&M17061		7002	1	0.00000	7003		1-1.00000		
1807-	MPC	1	73	2	-1.000007001	2		.00000		&M17062
1808-	&M17062		7002	2	1.00000	7003		2 0.00000		
1809-	MPC	1	73	3	-1.000007001	3		1.00000		&M17063
1810-	&M17063		7002	3	0.00000	7003		3-1.00000		
1811-	MPC	1	73	4	-1.000007001	4		.00000		&M17064
1812-	&M17064		7002	4	1.00000	7003		4 0.00000		
1813-	MPC	1	73	5	-1.000007001	5		1.00000		&M17065
1814-	&M17065		7002	5	0.00000	7003		5-1.00000		
1815-	MPC	1	73	6	-1.000007001	6		.00000		&M17066
1816-	&M17066		7002	6	1.00000	7003		6 0.00000		
1817-	MPC	1	74	1	-1.000007001	1		1.00000		&M17071
1818-	&M17071		7002	1	-0.30901	7003		1-0.80901		
1819-	MPC	1	74	2	-1.000007001	2		.00000		&M17072
1820-	&M17072		7002	2	0.95105	7003		2-0.58778		
1821-	MPC	1	74	3	-1.000007001	3		1.00000		&M17073
1822-	&M17073		7002	3	-0.30901	7003		3-0.80901		
1823-	MPC	1	74	4	-1.000007001	4		.00000		&M17074
1824-	&M17074		7002	4	0.95105	7003		4-0.58778		
1825-	MPC	1	74	5	-1.000007001	5		1.00000		&M17075
1826-	&M17075		7002	5	-0.30901	7003		5-0.80901		
1827-	MPC	1	74	6	-1.000007001	6		.00000		&M17076
1828-	&M17076		7002	6	0.95105	7003		6-0.58778		
1829-	MPC	1	75	1	-1.000007001	1		1.00000		&M17081
1830-	&M17081		7002	1	-0.58778	7003		1-0.30901		
1831-	MPC	1	75	2	-1.000007001	2		.00000		&M17082
1832-	&M17082		7002	2	0.80901	7003		2-0.95105		
1833-	MPC	1	75	3	-1.000007001	3		1.00000		&M17083
1834-	&M17083		7002	3	-0.58778	7003		3-0.30901		
1835-	MPC	1	75	4	-1.000007001	4		.00000		&M17084
1836-	&M17084		7002	4	0.80901	7003		4-0.95105		
1837-	MPC	1	75	5	-1.000007001	5		1.00000		&M17085
1838-	&M17085		7002	5	-0.58778	7003		5-0.30901		
1839-	MPC	1	75	6	-1.000007001	6		.00000		&M17086
1840-	&M17086		7002	6	0.80901	7003		6-0.95105		
1841-	MPC	1	76	1	-1.000007001	1		1.00000		&M17091
1842-	&M17091		7002	1	-0.80901	7003		1 0.30901		
1843-	MPC	1	76	2	-1.000007001	2		.00000		&M17092
1844-	&M17092		7002	2	0.58778	7003		2-0.95105		
1845-	MPC	1	76	3	-1.000007001	3		1.00000		&M17093
1846-	&M17093		7002	3	-0.80901	7003		3 0.30901		
1847-	MPC	1	76	4	-1.000007001	4		.00000		&M17094
1848-	&M17094		7002	4	0.58778	7003		4-0.95105		
1849-	MPC	1	76	5	-1.000007001	5		1.00000		&M17095
1850-	&M17095		7002	5	-0.80901	7003		5 0.30901		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1851-	MPC	1	76	6	-1.000007001	6		.00000		&M17096
1852-	&M17096		7002	6 0.58778	7003	6-0.95105				
1853-	MPC	1	77	1	-1.000007001	1		1.00000		&M17101
1854-	&M17101		7002	1-0.95105	7003	1 0.80901				
1855-	MPC	1	77	2	-1.000007001	2		.00000		&M17102
1856-	&M17102		7002	2 0.30901	7003	2-0.58778				
1857-	MPC	1	77	3	-1.000007001	3		1.00000		&M17103
1858-	&M17103		7002	3-0.95105	7003	3 0.80901				
1859-	MPC	1	77	4	-1.000007001	4		.00000		&M17104
1860-	&M17104		7002	4 0.30901	7003	4-0.58778				
1861-	MPC	1	77	5	-1.000007001	5		1.00000		&M17105
1862-	&M17105		7002	5-0.95105	7003	5 0.80901				
1863-	MPC	1	77	6	-1.000007001	6		.00000		&M17106
1864-	&M17106		7002	6 0.30901	7003	6-0.58778				
1865-	MPC	1	78	1	-1.000007001	1		1.00000		&M17111
1866-	&M17111		7002	1-1.00000	7003	1 1.00000				
1867-	MPC	1	78	2	-1.000007001	2		.00000		&M17112
1868-	&M17112		7002	2 0.00000	7003	2-0.00000				
1869-	MPC	1	78	3	-1.000007001	3		1.00000		&M17113
1870-	&M17113		7002	3-1.00000	7003	3 1.00000				
1871-	MPC	1	78	4	-1.000007001	4		.00000		&M17114
1872-	&M17114		7002	4 0.00000	7003	4-0.00000				
1873-	MPC	1	78	5	-1.000007001	5		1.00000		&M17115
1874-	&M17115		7002	5-1.00000	7003	5 1.00000				
1875-	MPC	1	78	6	-1.000007001	6		.00000		&M17116
1876-	&M17116		7002	6 0.00000	7003	6-0.00000				
1877-	MPC	1	79	1	-1.000008001	1		1.00000		&M18011
1878-	&M18011		8002	1 1.00000	8003	1 1.00000				
1879-	MPC	1	79	2	-1.000008001	2		.00000		&M18012
1880-	&M18012		8002	2 0.00000	8003	2 0.00000				
1881-	MPC	1	79	3	-1.000008001	3		1.00000		&M18013
1882-	&M18013		8002	3 1.00000	8003	3 1.00000				
1883-	MPC	1	79	4	-1.000008001	4		.00000		&M18014
1884-	&M18014		8002	4 0.00000	8003	4 0.00000				
1885-	MPC	1	79	5	-1.000008001	5		1.00000		&M18015
1886-	&M18015		8002	5 1.00000	8003	5 1.00000				
1887-	MPC	1	79	6	-1.000008001	6		.00000		&M18016
1888-	&M18016		8002	6 0.00000	8003	6 0.00000				
1889-	MPC	1	80	1	-1.000008001	1		1.00000		&M18021
1890-	&M18021		8002	1 0.95105	8003	1 0.80901				
1891-	MPC	1	80	2	-1.000008001	2		.00000		&M18022
1892-	&M18022		8002	2 0.30901	8003	2 0.58778				
1893-	MPC	1	80	3	-1.000008001	3		1.00000		&M18023
1894-	&M18023		8002	3 0.95105	8003	3 0.80901				
1895-	MPC	1	80	4	-1.000008001	4		.00000		&M18024
1896-	&M18024		8002	4 0.30901	8003	4 0.58778				
1897-	MPC	1	80	5	-1.000008001	5		1.00000		&M18025
1898-	&M18025		8002	5 0.95105	8003	5 0.80901				
1899-	MPC	1	80	6	-1.000008001	6		.00000		&M18026
1900-	&M18026		8002	6 0.30901	8003	6 0.58778				

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
1901-	MPC	1	81	1	-1.000008001	1		1.00000		&M18031
1902-	&M18031		8002	1	0.80901	8003		1 0.30901		
1903-	MPC	1	81	2	-1.000008001	2		.00000		&M18032
1904-	&M18032		8002	2	0.58778	8003		2 0.95105		
1905-	MPC	1	81	3	-1.000008001	3		1.00000		&M18033
1906-	&M18033		8002	3	0.80901	8003		3 0.30901		
1907-	MPC	1	81	4	-1.000008001	4		.00000		&M18034
1908-	&M18034		8002	4	0.58778	8003		4 0.95105		
1909-	MPC	1	81	5	-1.000008001	5		1.00000		&M18035
1910-	&M18035		8002	5	0.80901	8003		5 0.30901		
1911-	MPC	1	81	6	-1.000008001	6		.00000		&M18036
1912-	&M18036		8002	6	0.58778	8003		6 0.95105		
1913-	MPC	1	82	1	-1.000008001	1		1.00000		&M18041
1914-	&M18041		8002	1	0.58778	8003		1-0.30901		
1915-	MPC	1	82	2	-1.000008001	2		.00000		&M18042
1916-	&M18042		8002	2	0.80901	8003		2 0.95105		
1917-	MPC	1	82	3	-1.000008001	3		1.00000		&M18043
1918-	&M18043		8002	3	0.58778	8003		3-0.30901		
1919-	MPC	1	82	4	-1.000008001	4		.00000		&M18044
1920-	&M18044		8002	4	0.80901	8003		4 0.95105		
1921-	MPC	1	82	5	-1.000008001	5		1.00000		&M18045
1922-	&M18045		8002	5	0.58778	8003		5-0.30901		
1923-	MPC	1	82	6	-1.000008001	6		.00000		&M18046
1924-	&M18046		8002	6	0.80901	8003		6 0.95105		
1925-	MPC	1	83	1	-1.000008001	1		1.00000		&M18051
1926-	&M18051		8002	1	0.30901	8003		1-0.80901		
1927-	MPC	1	83	2	-1.000008001	2		.00000		&M18052
1928-	&M18052		8002	2	0.95105	8003		2 0.58778		
1929-	MPC	1	83	3	-1.000008001	3		1.00000		&M18053
1930-	&M18053		8002	3	0.30901	8003		3-0.80901		
1931-	MPC	1	83	4	-1.000008001	4		.00000		&M18054
1932-	&M18054		8002	4	0.95105	8003		4 0.58778		
1933-	MPC	1	83	5	-1.000008001	5		1.00000		&M18055
1934-	&M18055		8002	5	0.30901	8003		5-0.80901		
1935-	MPC	1	83	6	-1.000008001	6		.00000		&M18056
1936-	&M18056		8002	6	0.95105	8003		6 0.58778		
1937-	MPC	1	84	1	-1.000008001	1		1.00000		&M18061
1938-	&M18061		8002	1	0.00000	8003		1-1.00000		
1939-	MPC	1	84	2	-1.000008001	2		.00000		&M18062
1940-	&M18062		8002	2	1.00000	8003		2 0.00000		
1941-	MPC	1	84	3	-1.000008001	3		1.00000		&M18063
1942-	&M18063		8002	3	0.00000	8003		3-1.00000		
1943-	MPC	1	84	4	-1.000008001	4		.00000		&M18064
1944-	&M18064		8002	4	1.00000	8003		4 0.00000		
1945-	MPC	1	84	5	-1.000008001	5		1.00000		&M18065
1946-	&M18065		8002	5	0.00000	8003		5-1.00000		
1947-	MPC	1	84	6	-1.000008001	6		.00000		&M18066
1948-	&M18066		8002	6	1.00000	8003		6 0.00000		
1949-	MPC	1	85	1	-1.000008001	1		1.00000		&M18071
1950-	&M18071		8002	1	-0.30901	8003		1-0.80901		

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SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
1951-	MPC	1 85	2		-1.000008001	2		.00000		&M18072
1952-	&M18072		8002		2 0.95105	8003		2-0.58778		
1953-	MPC	1 85	3		-1.000008001	3		1.00000		&M18073
1954-	&M18073		8002		3-0.30901	8003		3-0.80901		
1955-	MPC	1 85	4		-1.000008001	4		.00000		&M18074
1956-	&M18074		8002		4 0.95105	8003		4-0.58778		
1957-	MPC	1 85	5		-1.000008001	5		1.00000		&M18075
1958-	&M18075		8002		5-0.30901	8003		5-0.80901		
1959-	MPC	1 85	6		-1.000008001	6		.00000		&M18076
1960-	&M18076		8002		6 0.95105	8003		6-0.58778		
1961-	MPC	1 86	1		-1.000008001	1		1.00000		&M18081
1962-	&M18081		8002		1-0.58778	8003		1-0.30901		
1963-	MPC	1 86	2		-1.000008001	2		.00000		&M18082
1964-	&M18082		8002		2 0.80901	8003		2-0.95105		
1965-	MPC	1 86	3		-1.000008001	3		1.00000		&M18083
1966-	&M18083		8002		3-0.58778	8003		3-0.30901		
1967-	MPC	1 86	4		-1.000008001	4		.00000		&M18084
1968-	&M18084		8002		4 0.80901	8003		4-0.95105		
1969-	MPC	1 86	5		-1.000008001	5		1.00000		&M18085
1970-	&M18085		8002		5-0.58778	8003		5-0.30901		
1971-	MPC	1 86	6		-1.000008001	6		.00000		&M18086
1972-	&M18086		8002		6 0.80901	8003		6-0.95105		
1973-	MPC	1 87	1		-1.000008001	1		1.00000		&M18091
1974-	&M18091		8002		1-0.80901	8003		1 0.30901		
1975-	MPC	1 87	2		-1.000008001	2		.00000		&M18092
1976-	&M18092		8002		2 0.58778	8003		2-0.95105		
1977-	MPC	1 87	3		-1.000008001	3		1.00000		&M18093
1978-	&M18093		8002		3-0.80901	8003		3 0.30901		
1979-	MPC	1 87	4		-1.000008001	4		.00000		&M18094
1980-	&M18094		8002		4 0.58778	8003		4-0.95105		
1981-	MPC	1 87	5		-1.000008001	5		1.00000		&M18095
1982-	&M18095		8002		5-0.80901	8003		5 0.30901		
1983-	MPC	1 87	6		-1.000008001	6		.00000		&M18096
1984-	&M18096		8002		6 0.58778	8003		6-0.95105		
1985-	MPC	1 88	1		-1.000008001	1		1.00000		&M18101
1986-	&M18101		8002		1-0.95105	8003		1 0.80901		
1987-	MPC	1 88	2		-1.000008001	2		.00000		&M18102
1988-	&M18102		8002		2 0.30901	8003		2-0.58778		
1989-	MPC	1 88	3		-1.000008001	3		1.00000		&M18103
1990-	&M18103		8002		3-0.95105	8003		3 0.80901		
1991-	MPC	1 88	4		-1.000008001	4		.00000		&M18104
1992-	&M18104		8002		4 0.30901	8003		4-0.58778		
1993-	MPC	1 88	5		-1.000008001	5		1.00000		&M18105
1994-	&M18105		8002		5-0.95105	8003		5 0.80901		
1995-	MPC	1 88	6		-1.000008001	6		.00000		&M18106
1996-	&M18106		8002		6 0.30901	8003		6-0.58778		
1997-	MPC	1 89	1		-1.000008001	1		1.00000		&M18111
1998-	&M18111		8002		1-1.00000	8003		1 1.00000		
1999-	MPC	1 89	2		-1.000008001	2		.00000		&M18112
2000-	&M18112		8002		2 0.00000	8003		2-0.00000		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2001-	MPC	1	89	3	-1.000308001	3		1.00000		&M18113
2002-	&M18113			8002	3-1.00000	8003		3 1.00000		
2003-	MPC	1	89	4	-1.000308001	4		.00000		&M18114
2004-	&M18114			8002	4 0.00000	8003		4-0.00000		
2005-	MPC	1	89	5	-1.000308001	5		1.00000		&M18115
2006-	&M18115			8002	5-1.00000	8003		5 1.00000		
2007-	MPC	1	89	6	-1.000308001	6		.00000		&M18116
2008-	&M18116			8002	6 0.00000	8003		6-0.00000		
2009-	MPC	1	90	1	-1.000309001	1		1.00000		&M19011
2010-	&M19011			9002	1 1.00000	9003		1 1.00000		
2011-	MPC	1	90	2	-1.000309001	2		.00000		&M19012
2012-	&M19012			9002	2 0.00000	9003		2 0.00000		
2013-	MPC	1	90	3	-1.000309001	3		1.00000		&M19013
2014-	&M19013			9002	3 1.00000	9003		3 1.00000		
2015-	MPC	1	90	4	-1.000309001	4		.00000		&M19014
2016-	&M19014			9002	4 0.00000	9003		4 0.00000		
2017-	MPC	1	90	5	-1.000309001	5		1.00000		&M19015
2018-	&M19015			9002	5 1.00000	9003		5 1.00000		
2019-	MPC	1	90	6	-1.000309001	6		.00000		&M19016
2020-	&M19016			9002	6 0.00000	9003		6 0.00000		
2021-	MPC	1	91	1	-1.000309001	1		1.00000		&M19021
2022-	&M19021			9002	1 0.95105	9003		1 0.80901		
2023-	MPC	1	91	2	-1.000309001	2		.00000		&M19022
2024-	&M19022			9002	2 0.30901	9003		2 0.58778		
2025-	MPC	1	91	3	-1.000309001	3		1.00000		&M19023
2026-	&M19023			9002	3 0.95105	9003		3 0.80901		
2027-	MPC	1	91	4	-1.000309001	4		.00000		&M19024
2028-	&M19024			9002	4 0.30901	9003		4 0.58778		
2029-	MPC	1	91	5	-1.000309001	5		1.00000		&M19025
2030-	&M19025			9002	5 0.95105	9003		5 0.80901		
2031-	MPC	1	91	6	-1.000309001	6		.00000		&M19026
2032-	&M19026			9002	6 0.30901	9003		6 0.58778		
2033-	MPC	1	92	1	-1.000309001	1		1.00000		&M19031
2034-	&M19031			9002	1 0.80901	9003		1 0.30901		
2035-	MPC	1	92	2	-1.000309001	2		.00000		&M19032
2036-	&M19032			9002	2 0.58778	9003		2 0.95105		
2037-	MPC	1	92	3	-1.000309001	3		1.00000		&M19033
2038-	&M19033			9002	3 0.80901	9003		3 0.30901		
2039-	MPC	1	92	4	-1.000309001	4		.00000		&M19034
2040-	&M19034			9002	4 0.58778	9003		4 0.95105		
2041-	MPC	1	92	5	-1.000309001	5		1.00000		&M19035
2042-	&M19035			9002	5 0.80901	9003		5 0.30901		
2043-	MPC	1	92	6	-1.000309001	6		.00000		&M19036
2044-	&M19036			9002	6 0.58778	9003		6 0.95105		
2045-	MPC	1	93	1	-1.000309001	1		1.00000		&M19041
2046-	&M19041			9002	1 0.58778	9003		1-0.30901		
2047-	MPC	1	93	2	-1.000309001	2		.00000		&M19042
2048-	&M19042			9002	2 0.80901	9003		2 0.95105		
2049-	MPC	1	93	3	-1.000309001	3		1.00000		&M19043
2050-	&M19043			9002	3 0.58778	9003		3-0.30901		

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2051-	MPC	1	93	4	-1.00000	9001	4	.00000		&M19044
2052-	&M19044		9002	4	0.80901	9003	4	0.95105		
2053-	MPC	1	93	5	-1.00000	9001	5	1.00000		&M19045
2054-	&M19045		9002	5	0.58778	9003	5	-0.30901		
2055-	MPC	1	93	6	-1.00000	9001	6	.00000		&M19046
2056-	&M19046		9002	6	0.80901	9003	6	0.95105		
2057-	MPC	1	94	1	-1.00000	9001	1	1.00000		&M19051
2058-	&M19051		9002	1	0.80901	9003	1	-0.80901		
2059-	MPC	1	94	2	-1.00000	9001	2	.00000		&M19052
2060-	&M19052		9002	2	0.95105	9003	2	0.58778		
2061-	MPC	1	94	3	-1.00000	9001	3	1.00000		&M19053
2062-	&M19053		9002	3	0.30901	9003	3	-0.80901		
2063-	MPC	1	94	4	-1.00000	9001	4	.00000		&M19054
2064-	&M19054		9002	4	0.95105	9003	4	0.58778		
2065-	MPC	1	94	5	-1.00000	9001	5	1.00000		&M19055
2066-	&M19055		9002	5	0.30901	9003	5	-0.80901		
2067-	MPC	1	94	6	-1.00000	9001	6	.00000		&M19056
2068-	&M19056		9002	6	0.95105	9003	6	0.58778		
2069-	MPC	1	95	1	-1.00000	9001	1	1.00000		&M19061
2070-	&M19061		9002	1	0.00000	9003	1	-1.00000		
2071-	MPC	1	95	2	-1.00000	9001	2	.00000		&M19062
2072-	&M19062		9002	2	1.00000	9003	2	0.00000		
2073-	MPC	1	95	3	-1.00000	9001	3	1.00000		&M19063
2074-	&M19063		9002	3	0.00000	9003	3	-1.00000		
2075-	MPC	1	95	4	-1.00000	9001	4	.00000		&M19064
2076-	&M19064		9002	4	1.00000	9003	4	0.00000		
2077-	MPC	1	95	5	-1.00000	9001	5	1.00000		&M19065
2078-	&M19065		9002	5	0.00000	9003	5	-1.00000		
2079-	MPC	1	95	6	-1.00000	9001	6	.00000		&M19066
2080-	&M19066		9002	6	1.00000	9003	6	0.00000		
2081-	MPC	1	96	1	-1.00000	9001	1	1.00000		&M19071
2082-	&M19071		9002	1	-0.30901	9003	1	-0.80901		
2083-	MPC	1	96	2	-1.00000	9001	2	.00000		&M19072
2084-	&M19072		9002	2	0.95105	9003	2	-0.58778		
2085-	MPC	1	96	3	-1.00000	9001	3	1.00000		&M19073
2086-	&M19073		9002	3	-0.30901	9003	3	-0.80901		
2087-	MPC	1	96	4	-1.00000	9001	4	.00000		&M19074
2088-	&M19074		9002	4	0.95105	9003	4	-0.58778		
2089-	MPC	1	96	5	-1.00000	9001	5	1.00000		&M19075
2090-	&M19075		9002	5	-0.30901	9003	5	-0.80901		
2091-	MPC	1	96	6	-1.00000	9001	6	.00000		&M19076
2092-	&M19076		9002	6	0.95105	9003	6	-0.58778		
2093-	MPC	1	97	1	-1.00000	9001	1	1.00000		&M19081
2094-	&M19081		9002	1	-0.58778	9003	1	-0.30901		
2095-	MPC	1	97	2	-1.00000	9001	2	.00000		&M19082
2096-	&M19082		9002	2	0.80901	9003	2	-0.95105		
2097-	MPC	1	97	3	-1.00000	9001	3	1.00000		&M19083
2098-	&M19083		9002	3	-0.58778	9003	3	-0.30901		
2099-	MPC	1	97	4	-1.00000	9001	4	.00000		&M19084
2100-	&M19084		9002	4	0.80901	9003	4	-0.95105		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2101-	MPC	1	97	5	-1.000009001	5		1.00000		&M19085
2102-	&M19085		9002		5-0.58778	9003		5-0.30901		
2103-	MPC	1	97	6	-1.000009001	6		.00000		&M19086
2104-	&M19086		9002		6 0.80901	9003		6-0.95105		
2105-	MPC	1	98	1	-1.000009001	1		1.00000		&M19091
2106-	&M19091		9002		1-0.80901	9003		1 0.30901		
2107-	MPC	1	98	2	-1.000009001	2		.00000		&M19092
2108-	&M19092		9002		2 0.58778	9003		2-0.95105		
2109-	MPC	1	98	3	-1.000009001	3		1.00000		&M19093
2110-	&M19093		9002		3-0.80901	9003		3 0.30901		
2111-	MPC	1	98	4	-1.000009001	4		.00000		&M19094
2112-	&M19094		9002		4 0.58778	9003		4-0.95105		
2113-	MPC	1	98	5	-1.000009001	5		1.00000		&M19095
2114-	&M19095		9002		5-0.80901	9003		5 0.30901		
2115-	MPC	1	98	6	-1.000009001	6		.00000		&M19096
2116-	&M19096		9002		6 0.58778	9003		6-0.95105		
2117-	MPC	1	99	1	-1.000009001	1		1.00000		&M19101
2118-	&M19101		9002		1-0.95105	9003		1 0.80901		
2119-	MPC	1	99	2	-1.000009001	2		.00000		&M19102
2120-	&M19102		9002		2 0.30901	9003		2-0.58778		
2121-	MPC	1	99	3	-1.000009001	3		1.00000		&M19103
2122-	&M19103		9002		3-0.95105	9003		3 0.80901		
2123-	MPC	1	99	4	-1.000009001	4		.00000		&M19104
2124-	&M19104		9002		4 0.30901	9003		4-0.58778		
2125-	MPC	1	99	5	-1.000009001	5		1.00000		&M19105
2126-	&M19105		9002		5-0.95105	9003		5 0.80901		
2127-	MPC	1	99	6	-1.000009001	6		.00000		&M19106
2128-	&M19106		9002		6 0.30901	9003		6-0.58778		
2129-	MPC	1	100	1	-1.000009001	1		1.00000		&M19111
2130-	&M19111		9002		1-1.00000	9003		1 1.00000		
2131-	MPC	1	100	2	-1.000009001	2		.00000		&M19112
2132-	&M19112		9002		2 0.00000	9003		2-0.00000		
2133-	MPC	1	100	3	-1.000009001	3		1.00000		&M19113
2134-	&M19113		9002		3-1.00000	9003		3 1.00000		
2135-	MPC	1	100	4	-1.000009001	4		.00000		&M19114
2136-	&M19114		9002		4 0.00000	9003		4-0.00000		
2137-	MPC	1	100	5	-1.000009001	5		1.00000		&M19115
2138-	&M19115		9002		5-1.00000	9003		5 1.00000		
2139-	MPC	1	100	6	-1.000009001	6		.00000		&M19116
2140-	&M19116		9002		6 0.00000	9003		6-0.00000		
2141-	MPC	1	101	1	-1.000010001	1		1.00000		&M20011
2142-	&M20011		10002		1 1.00000	10003		1 1.00000		
2143-	MPC	1	101	2	-1.000010001	2		.00000		&M20012
2144-	&M20012		10002		2 0.00000	10003		2 0.00000		
2145-	MPC	1	101	3	-1.000010001	3		1.00000		&M20013
2146-	&M20013		10002		3 1.00000	10003		3 1.00000		
2147-	MPC	1	101	4	-1.000010001	4		.00000		&M20014
2148-	&M20014		10002		4 0.00000	10003		4 0.00000		
2149-	MPC	1	101	5	-1.000010001	5		1.00000		&M20015
2150-	&M20015		10002		5 1.00000	10003		5 1.00000		

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SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2151-	MPC	1	101	6	-1.0000010001	6		.00000		&M20016
2152-	&M20016		10002		6 0.00000	10003		6 0.00000		
2153-	MPC	1	102	1	-1.0000010001	1		1.00000		&M20021
2154-	&M20021		10002		1 0.95105	10003		1 0.80901		
2155-	MPC	1	102	2	-1.0000010001	2		.30000		&M20022
2156-	&M20022		10002		2 0.30901	10003		2 0.58778		
2157-	MPC	1	102	3	-1.0000010001	3		1.00000		&M20023
2158-	&M20023		10002		3 0.95105	10003		3 0.80901		
2159-	MPC	1	102	4	-1.0000010001	4		.00000		&M20024
2160-	&M20024		10002		4 0.30901	10003		4 0.58778		
2161-	MPC	1	102	5	-1.0000010001	5		1.00000		&M20025
2162-	&M20025		10002		5 0.95105	10003		5 0.80901		
2163-	MPC	1	102	6	-1.0000010001	6		.00000		&M20026
2164-	&M20026		10002		6 0.30901	10003		6 0.58778		
2165-	MPC	1	103	1	-1.0000010001	1		1.00000		&M20031
2166-	&M20031		10002		1 0.80901	10003		1 0.30901		
2167-	MPC	1	103	2	-1.0000010001	2		.00000		&M20032
2168-	&M20032		10002		2 0.58778	10003		2 0.95105		
2169-	MPC	1	103	3	-1.0000010001	3		1.00000		&M20033
2170-	&M20033		10002		3 0.80901	10003		3 0.30901		
2171-	MPC	1	103	4	-1.0000010001	4		.00000		&M20034
2172-	&M20034		10002		4 0.58778	10003		4 0.95105		
2173-	MPC	1	103	5	-1.0000010001	5		1.00000		&M20035
2174-	&M20035		10002		5 0.80901	10003		5 0.30901		
2175-	MPC	1	103	6	-1.0000010001	6		.00000		&M20036
2176-	&M20036		10002		6 0.58778	10003		6 0.95105		
2177-	MPC	1	104	1	-1.0000010001	1		1.00000		&M20041
2178-	&M20041		10002		1 0.58778	10003		1-0.30901		
2179-	MPC	1	104	2	-1.0000010001	2		.00000		&M20042
2180-	&M20042		10002		2 0.80901	10003		2 0.95105		
2181-	MPC	1	104	3	-1.0000010001	3		1.00000		&M20043
2182-	&M20043		10002		3 0.58778	10003		3-0.30901		
2183-	MPC	1	104	4	-1.0000010001	4		.00000		&M20044
2184-	&M20044		10002		4 0.30901	10003		4 0.95105		
2185-	MPC	1	104	5	-1.0000010001	5		1.00000		&M20045
2186-	&M20045		10002		5 0.58778	10003		5-0.30901		
2187-	MPC	1	104	6	-1.0000010001	6		.00000		&M20046
2188-	&M20046		10002		6 0.30901	10003		6 0.95105		
2189-	MPC	1	105	1	-1.0000010001	1		1.00000		&M20051
2190-	&M20051		10002		1 0.30901	10003		1-0.80901		
2191-	MPC	1	105	2	-1.0000010001	2		.00000		&M20052
2192-	&M20052		10002		2 0.95105	10003		2 0.58778		
2193-	MPC	1	105	3	-1.0000010001	3		1.00000		&M20053
2194-	&M20053		10002		3 0.30901	10003		3-0.80901		
2195-	MPC	1	105	4	-1.0000010001	4		.00000		&M20054
2196-	&M20054		10002		4 0.95105	10003		4 0.58778		
2197-	MPC	1	105	5	-1.0000010001	5		1.00000		&M20055
2198-	&M20055		10002		5 0.30901	10003		5-0.80901		
2199-	MPC	1	105	6	-1.0000010001	6		.00000		&M20056
2200-	&M20056		10002		6 0.95105	10003		6 0.58778		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
2201-	MPC	1	106	1	-1.0000010001	1		1.00000		&M20061
2202-	&M20061		10002		1 0.00000	10003		1-1.00000		
2203-	MPC	1	106	2	-1.0000010001	2		.00000		&M20062
2204-	&M20062		10002		2 1.00000	10003		2 0.00000		
2205-	MPC	1	106	3	-1.0000010001	3		1.00000		&M20063
2206-	&M20063		10002		3 0.00000	10003		3-1.00000		
2207-	MPC	1	106	4	-1.0000010001	4		.00000		&M20064
2208-	&M20064		10002		4 1.00000	10003		4 0.00000		
2209-	MPC	1	106	5	-1.0000010001	5		1.00000		&M20065
2210-	&M20065		10002		5 0.00000	10003		5-1.00000		
2211-	MPC	1	106	6	-1.0000010001	6		.00000		&M20066
2212-	&M20066		10002		6 1.00000	10003		6 0.00000		
2213-	MPC	1	107	1	-1.0000010001	1		1.00000		&M20071
2214-	&M20071		10002		1-0.80901	10003		1-0.80901		
2215-	MPC	1	107	2	-1.0000010001	2		.00000		&M20072
2216-	&M20072		10002		2 0.95105	10003		2-0.58778		
2217-	MPC	1	107	3	-1.0000010001	3		1.00000		&M20073
2218-	&M20073		10002		3-0.30901	10003		3-0.80901		
2219-	MPC	1	107	4	-1.0000010001	4		.00000		&M20074
2220-	&M20074		10002		4 0.95105	10003		4-0.58778		
2221-	MPC	1	107	5	-1.0000010001	5		1.00000		&M20075
2222-	&M20075		10002		5-0.30901	10003		5-0.80901		
2223-	MPC	1	107	6	-1.0000010001	6		.00000		&M20076
2224-	&M20076		10002		6 0.95105	10003		6-0.58778		
2225-	MPC	1	108	1	-1.0000010001	1		1.00000		&M20081
2226-	&M20081		10002		1-0.58778	10003		1-0.30901		
2227-	MPC	1	108	2	-1.0000010001	2		.00000		&M20082
2228-	&M20082		10002		2 0.80901	10003		2-0.95105		
2229-	MPC	1	108	3	-1.0000010001	3		1.00000		&M20083
2230-	&M20083		10002		3-0.58778	10003		3-0.30901		
2231-	MPC	1	108	4	-1.0000010001	4		.00000		&M20084
2232-	&M20084		10002		4 0.80901	10003		4-0.95105		
2233-	MPC	1	108	5	-1.0000010001	5		1.00000		&M20085
2234-	&M20085		10002		5-0.58778	10003		5-0.30901		
2235-	MPC	1	108	6	-1.0000010001	6		.00000		&M20086
2236-	&M20086		10002		6 0.80901	10003		6-0.95105		
2237-	MPC	1	109	1	-1.0000010001	1		1.00000		&M20091
2238-	&M20091		10002		1-0.80901	10003		1 0.30901		
2239-	MPC	1	109	2	-1.0000010001	2		.00000		&M20092
2240-	&M20092		10002		2 0.58778	10003		2-0.95105		
2241-	MPC	1	109	3	-1.0000010001	3		1.00000		&M20093
2242-	&M20093		10002		3-0.80901	10003		3 0.30901		
2243-	MPC	1	109	4	-1.0000010001	4		.00000		&M20094
2244-	&M20094		10002		4 0.58778	10003		4-0.95105		
2245-	MPC	1	109	5	-1.0000010001	5		1.00000		&M20095
2246-	&M20095		10002		5-0.80901	10003		5 0.30901		
2247-	MPC	1	109	6	-1.0000010001	6		.00000		&M20096
2248-	&M20096		10002		6 0.58778	10003		6-0.95105		
2249-	MPC	1	110	1	-1.0000010001	1		1.00000		&M20101
2250-	&M20101		10002		1-0.95105	10003		1 0.80901		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
2251-	MPC	1	110	2	-1.0000010001	2		.00000		&M20102
2252-	&M20102		10002		2 0.30901	10003		2-0.58778		
2253-	MPC	1	110	3	-1.0000010001	3		1.00000		&M20103
2254-	&M20103		10002		3-0.95105	10003		3 0.80901		
2255-	MPC	1	110	4	-1.0000010001	4		.00000		&M20104
2256-	&M20104		10002		4 0.30901	10003		4-0.58778		
2257-	MPC	1	110	5	-1.0000010001	5		1.00000		&M20105
2258-	&M20105		10002		5-0.95105	10003		5 0.80901		
2259-	MPC	1	110	6	-1.0000010001	6		.00000		&M20106
2260-	&M20106		10002		6 0.30901	10003		6-0.58778		
2261-	MPC	1	111	1	-1.0000010001	1		1.00000		&M20111
2262-	&M20111		10002		1-1.00000	10003		1 1.00000		
2263-	MPC	1	111	2	-1.0000010001	2		.00000		&M20112
2264-	&M20112		10002		2 0.00000	10003		2-0.00000		
2265-	MPC	1	111	3	-1.0000010001	3		1.00000		&M20113
2266-	&M20113		10002		3-1.00000	10003		3 1.00000		
2267-	MPC	1	111	4	-1.0000010001	4		.00000		&M20114
2268-	&M20114		10002		4 0.00000	10003		4-0.00000		
2269-	MPC	1	111	5	-1.0000010001	5		1.00000		&M20115
2270-	&M20115		10002		5-1.00000	10003		5 1.00000		
2271-	MPC	1	111	6	-1.0000010001	6		.00000		&M20116
2272-	&M20116		10002		6 0.00000	10003		6-0.00000		
2273-	MPC	1	112	1	-1.0000011001	1		1.00000		&M21011
2274-	&M21011		11002		1 1.00000	11003		1 1.00000		
2275-	MPC	1	112	2	-1.0000011001	2		.00000		&M21012
2276-	&M21012		11002		2 0.00000	11003		2 0.00000		
2277-	MPC	1	112	3	-1.0000011001	3		1.00000		&M21013
2278-	&M21013		11002		3 1.00000	11003		3 1.00000		
2279-	MPC	1	112	4	-1.0000011001	4		.00000		&M21014
2280-	&M21014		11002		4 0.00000	11003		4 0.00000		
2281-	MPC	1	112	5	-1.0000011001	5		1.00000		&M21015
2282-	&M21015		11002		5 1.00000	11003		5 1.00000		
2283-	MPC	1	112	6	-1.0000011001	6		.00000		&M21016
2284-	&M21016		11002		6 0.00000	11003		6 0.00000		
2285-	MPC	1	113	1	-1.0000011001	1		1.00000		&M21021
2286-	&M21021		11002		1 0.95105	11003		1 0.80901		
2287-	MPC	1	113	2	-1.0000011001	2		.00000		&M21022
2288-	&M21022		11002		2 0.30901	11003		2 0.58778		
2289-	MPC	1	113	3	-1.0000011001	3		1.00000		&M21023
2290-	&M21023		11002		3 0.95105	11003		3 0.80901		
2291-	MPC	1	113	4	-1.0000011001	4		.00000		&M21024
2292-	&M21024		11002		4 0.30901	11003		4 0.58778		
2293-	MPC	1	113	5	-1.0000011001	5		1.00000		&M21025
2294-	&M21025		11002		5 0.95105	11003		5 0.80901		
2295-	MPC	1	113	6	-1.0000011001	6		.00000		&M21026
2296-	&M21026		11002		6 0.30901	11003		6 0.58778		
2297-	MPC	1	114	1	-1.0000011001	1		1.00000		&M21031
2298-	&M21031		11002		1 0.30901	11003		1 0.30901		
2299-	MPC	1	114	2	-1.0000011001	2		.00000		&M21032
2300-	&M21032		11002		2 0.58778	11003		2 0.95105		

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CARD COUNT	1	2	3	4	5	6	7	8	9	10
2301-	MPC	1	114	3	-1.0000011001	3		1.00000		&M21033
2302-	&M21033		11002		3 0.80901	11003		3 0.30901		
2303-	MPC	1	114	4	-1.0000011001	4		.00000		&M21034
2304-	&M21034		11002		4 0.58778	11003		4 0.95105		
2305-	MPC	1	114	5	-1.0000011001	5		1.00000		&M21035
2306-	&M21035		11002		5 0.80901	11003		5 0.30901		
2307-	MPC	1	114	6	-1.0000011001	6		.00000		&M21036
2308-	&M21036		11002		6 0.58778	11003		6 0.95105		
2309-	MPC	1	115	1	-1.0000011001	1		1.00000		&M21041
2310-	&M21041		11002		1 0.58778	11003		1-0.30901		
2311-	MPC	1	115	2	-1.0000011001	2		.00000		&M21042
2312-	&M21042		11002		2 0.80901	11003		2 0.95105		
2313-	MPC	1	115	3	-1.0000011001	3		1.00000		&M21043
2314-	&M21043		11002		3 0.58778	11003		3-0.30901		
2315-	MPC	1	115	4	-1.0000011001	4		.00000		&M21044
2316-	&M21044		11002		4 0.80901	11003		4 0.95105		
2317-	MPC	1	115	5	-1.0000011001	5		1.00000		&M21045
2318-	&M21045		11002		5 0.58778	11003		5-0.30901		
2319-	MPC	1	115	6	-1.0000011001	6		.00000		&M21046
2320-	&M21046		11002		6 0.80901	11003		6 0.95105		
2321-	MPC	1	116	1	-1.0000011001	1		1.00000		&M21051
2322-	&M21051		11002		1 0.30901	11003		1-0.80901		
2323-	MPC	1	116	2	-1.0000011001	2		.00000		&M21052
2324-	&M21052		11002		2 0.95105	11003		2 0.58778		
2325-	MPC	1	116	3	-1.0000011001	3		1.00000		&M21053
2326-	&M21053		11002		3 0.30901	11003		3-0.80901		
2327-	MPC	1	116	4	-1.0000011001	4		.00000		&M21054
2328-	&M21054		11002		4 0.95105	11003		4 0.58778		
2329-	MPC	1	116	5	-1.0000011001	5		1.00000		&M21055
2330-	&M21055		11002		5 0.30901	11003		5-0.80901		
2331-	MPC	1	116	6	-1.0000011001	6		.00000		&M21056
2332-	&M21056		11002		6 0.95105	11003		6 0.58778		
2333-	MPC	1	117	1	-1.0000011001	1		1.00000		&M21061
2334-	&M21061		11002		1 0.00000	11003		1-1.00000		
2335-	MPC	1	117	2	-1.0000011001	2		.00000		&M21062
2336-	&M21062		11002		2 1.00000	11003		2 0.00000		
2337-	MPC	1	117	3	-1.0000011001	3		1.00000		&M21063
2338-	&M21063		11002		3 0.00000	11003		3-1.00000		
2339-	MPC	1	117	4	-1.0000011001	4		.00000		&M21064
2340-	&M21064		11002		4 1.00000	11003		4 0.00000		
2341-	MPC	1	117	5	-1.0000011001	5		1.00000		&M21065
2342-	&M21065		11002		5 0.00000	11003		5-1.00000		
2343-	MPC	1	117	6	-1.0000011001	6		.00000		&M21066
2344-	&M21066		11002		6 1.00000	11003		6 0.00000		
2345-	MPC	1	118	1	-1.0000011001	1		1.00000		&M21071
2346-	&M21071		11002		1-0.30901	11003		1-0.80901		
2347-	MPC	1	118	2	-1.0000011001	2		.00000		&M21072
2348-	&M21072		11002		2 0.95105	11003		2-0.58778		
2349-	MPC	1	118	3	-1.0000011001	3		1.00000		&M21073
2350-	&M21073		11002		3-0.30901	11003		3-0.80901		

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
2351-	MPC	1	118	4	-1.0000011001	4		.00000		&M21074
2352-	&M21074		11002		4 0.95105	11003		4-0.58778		
2353-	MPC	1	118	5	-1.0000011001	5		1.00000		&M21075
2354-	&M21075		11002		5-0.30901	11003		5-0.80901		
2355-	MPC	1	118	6	-1.0000011001	6		.00000		&M21076
2356-	&M21076		11002		6 0.95105	11003		6-0.58778		
2357-	MPC	1	119	1	-1.0000011001	1		1.00000		&M21081
2358-	&M21081		11002		1-0.58778	11003		1-0.30901		
2359-	MPC	1	119	2	-1.0000011001	2		.00000		&M21082
2360-	&M21082		11002		2 0.80901	11003		2-0.95105		
2361-	MPC	1	119	3	-1.0000011001	3		1.00000		&M21083
2362-	&M21083		11002		3-0.58778	11003		3-0.30901		
2363-	MPC	1	119	4	-1.0000011001	4		.00000		&M21084
2364-	&M21084		11002		4 0.80901	11003		4-0.95105		
2365-	MPC	1	119	5	-1.0000011001	5		1.00000		&M21085
2366-	&M21085		11002		5-0.58778	11003		5-0.30901		
2367-	MPC	1	119	6	-1.0000011001	6		.00000		&M21086
2368-	&M21086		11002		6 0.80901	11003		6-0.95105		
2369-	MPC	1	120	1	-1.0000011001	1		1.00000		&M21091
2370-	&M21091		11002		1-0.80901	11003		1 0.30901		
2371-	MPC	1	120	2	-1.0000011001	2		.00000		&M21092
2372-	&M21092		11002		2 0.58778	11003		2-0.95105		
2373-	MPC	1	120	3	-1.0000011001	3		1.00000		&M21093
2374-	&M21093		11002		3-0.80901	11003		3 0.30901		
2375-	MPC	1	120	4	-1.0000011001	4		.00000		&M21094
2376-	&M21094		11002		4 0.58778	11003		4-0.95105		
2377-	MPC	1	120	5	-1.0000011001	5		1.00000		&M21095
2378-	&M21095		11002		5-0.80901	11003		5 0.30901		
2379-	MPC	1	120	6	-1.0000011001	6		.00000		&M21096
2380-	&M21096		11002		6 0.58778	11003		6-0.95105		
2381-	MPC	1	121	1	-1.0000011001	1		1.00000		&M21101
2382-	&M21101		11002		1-0.95105	11003		1 0.80901		
2383-	MPC	1	121	2	-1.0000011001	2		.00000		&M21102
2384-	&M21102		11002		2 0.30901	11003		2-0.58778		
2385-	MPC	1	121	3	-1.0000011001	3		1.00000		&M21103
2386-	&M21103		11002		3-0.95105	11003		3 0.80901		
2387-	MPC	1	121	4	-1.0000011001	4		.00000		&M21104
2388-	&M21104		11002		4 0.30901	11003		4-0.58778		
2389-	MPC	1	121	5	-1.0000011001	5		1.00000		&M21105
2390-	&M21105		11002		5-0.95105	11003		5 0.80901		
2391-	MPC	1	121	6	-1.0000011001	6		.00000		&M21106
2392-	&M21106		11002		6 0.30901	11003		6-0.58778		
2393-	MPC	1	122	1	-1.0000011001	1		1.00000		&M21111
2394-	&M21111		11002		1-1.00000	11003		1 1.00000		
2395-	MPC	1	122	2	-1.0000011001	2		.00000		&M21112
2396-	&M21112		11002		2 0.00000	11003		2-0.00000		
2397-	MPC	1	122	3	-1.0000011001	3		1.00000		&M21113
2398-	&M21113		11002		3-1.00000	11003		3 1.00000		
2399-	MPC	1	122	4	-1.0000011001	4		.00000		&M21114
2400-	&M21114		11002		4 0.00000	11003		4-0.00000		

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SORTED BULK DATA ECHO

CARD COUNT	. 1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 .
2401-	MPC	1	122	5	-1.00000	11001	5	1.00000		&M21115
2402-	&M21115		11002		5-1.00000	11003		5 1.00000		
2403-	MPC	1	122	6	-1.00000	11001	6	.00000		&M21116
2404-	&M21116		11002		6 0.00000	11003		6-0.00000		
2405-	OMIT1	26	11002	11003						
2406-	OMIT1	35	1001							
2407-	OMIT1	35	2001	3001	4001	5001	6001	7001	8001	
2408-	OMIT1	35	9001	10001						
2409-	OMIT1	345	1002	1003						
2410-	OMIT1	23456	2002	2003	3002	3003	4002	4003		
2411-	OMIT1	23456	5002	5003	6002	6003	7002	7003		
2412-	OMIT1	23456	8002	8003	9002	9003	10002	10003		
2413-	PLOAD2	1	-1.C99-52		THRU	11				
2414-	PLOAD2	1	-1.C99-513		THRU	22				
2415-	PLOAD2	1	-1.C99-524		THRU	33				
2416-	PLOAD2	1	-1.C99-535		THRU	44				
2417-	PLOAD2	1	-1.C99-546		THRU	55				
2418-	PLOAD2	1	-1.C99-557		THRU	66				
2419-	PLOAD2	1	-1.C99-568		THRU	77				
2420-	PLOAD2	1	-1.C99-579		THRU	88				
2421-	PLOAD2	1	-1.C99-590		THRU	99				
2422-	PLOAD2	1	-1.C99-5101		THRU	110				
2423-	PQUAD2	1	1	.01	.0					
2424-	SPC1	1	1	1001						
2425-	SPC1	1	35	11001						
2426-	SPC1	1	126	1002	1003					
2427-	SPC1	1	246	1001	2001	3001	4001	5001	6001	
2428-	SPC1	1	246	7001	8001	9001	10001	11001		
2429-	SPC1	1	345	11002	11003					
	ENDDATA									

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
   1  BEGIN    NO.13 NORMAL MODES WITH DIFFERENTIAL STIFFNESS - SERIES M $
   2  FILE     LLL=TAPE $
   3  GP1      GEOM1,GEOM2,/GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL/V,N,LUSET/  C,N,
               123/V,N,NOGPDT $
   4  SAVE     LUSET $
   5  CHKPNT   GPL,EQEXIN,GPDT,CSTM,BGPDT,SIL $
   6  GP2      GEOM2,EQEXIN/ECT $
   7  CHKPNT   ECT $
   8  PLTSET   PCDB,EQEXIN,ECT/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,NSIL/  V,N,
               JUMPPLOT $
   9  SAVE     NSIL,JUMPPLOT $
  10  PRTMSG   PLTSETX// $
  11  SETVAL   //V,N,PLTFLG/C,N,1/V,N,PFILE/C,N,0 $
  12  SAVE     PLTFLG,PFILE $
  13  COND     P1,JUMPPLOT $
  14  PLOT     PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,/PLOTX1/ V,N,
               NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
  15  SAVE     JUMPPLOT,PLTFLG,PFILE $
  16  PRTMSG   PLOTX1// $
  17  LABEL    P1 $
  18  CHKPNT   PLTPAR,GPSETS,ELSETS $
  19  GP3      GEOM3,EQEXIN,GEOM2/SLT,GPTT/C,N,123/V,N,NOGRAV/C,N,123 $
  20  CHKPNT   SLT,GPTT $
  21  TA1,     ,ECT,EPT,BGPDT,SIL,GPTT,CSTM/EST,,GEI,ECPT,GPCT/V,N,LUSET/ C,N,
               123/V,N,NOSIMP/C,N,0/V,N,NOGENL/V,N,GENEL $
  22  SAVE     NOSIMP,NOGENL,GENEL $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
   23   COND      ERROR1,NOSIMP $
   24   PURGE     OGPST/CENEL $
   25   CHKPNT    EST,ECPT,GPCT,GEI,OGPST $
   26   SMA1      CSTM,MPT,ECPT,GPCT,DIT/KGGX,,GPST/V,N,NOGENL/V,N,NOK4GG $
   27   CHKPNT    GPST,KGGX $
   28   SMA2      CSTM,MPT,ECPT,GPCT,DIT/MGG,/V,Y,WTMASS=1.0/V,N,NOMGG/V,N,NOBGG/
                  V,Y,COUPMASS/V,Y,CPBAR/V,Y,CPROD/V,Y,CPQUAD1/V,Y,CPQUAD2/  V,
                  Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPQDPLT/V,Y,CPTRPLT/ V,Y,
                  CPTRESC $
   29   SAVE      NOMGG $
   30   CHKPNT    MGG $
   31   COND      ERROR5,NOMGG $
   32   COND      LBL1,GRDPNT $
   33   GPWG      OGPDT,CSTM,EQEXIN,MGG/OGPWG/V,Y,GRDPNT=-1/V,Y,WTMASS $
   34   OFP       OGPWG,,,,,//V,N,CARDNO $
   35   SAVE      CARDNO $
   36   LABEL     LBL1 $
   37   EQUIV     KGGX,KGG/NOGENL $
   38   CHKPNT    KGG $
   39   COND      LBL11,NOGENL $
   40   SMA3      GEI,KGGX/KGG/V,N,LUSET/V,N,NOGENL/C,N,-1 $
   41   CHKPNT    KGG $
   42   LABEL     LBL11 $
   43   PARAM     //C,N,MPY/V,N,NSKIP/C,N,0/C,N,0 $
   44   GP4       CASECC,CEOM4,EQEXIN,SIL,GPDT/RG,YS,LSET,/V,N,LUSET/V,N,MPCF1/
                  V,N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
                  V,N,NUSET/V,N,NUL/V,N,NOA $
   45   SAVE      MPCF1,MPCF2,SINGLE,OMIT,REACT,NSKIP,REPEAT,NUSET,NUL,NOA $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION

```
NO.
   46  COND      ERROR6,NOA $
   47  PARAM     //C,N,AND/V,N,NOSR/V,N,SINGLE/V,N,REACT $
   48  PURGE     GM/MPCF1/GO,KOO,LOO,UOO,PO,UOOV,RUOV/OMIT/PS,KFS,KSS/SINGLE/
                 QG/NOSR $
   49  EQUIV     KGG,KNN/MPCF1 $
   50  CHKPNT    GM,KG,GO,KOO,LOO,UOO,PO,UOOV,RUOV,YS,PS,KFS,KSS,USET,QG,KNN $
   51  COND      LBL4D,REACT $
   52  JUMP      ERROR2 $
   53  LABEL     LBL4C $
   54  COND      LBL4,GENEL $
   55  GPSP      GPL,GPST,USET,SIL/OGPST $
   56  UPP       OGPST,,,,,//V,N,CARDNO $
   57  SAVE      CARDNO $
   58  LABEL     LBL4 $
   59  COND      LBL2,MPCF2 $
   60  MCE1      USET,RG/GM $
   61  CHKPNT    GM $
   62  MCE2      USET,GM,KGG,,,/KNN,,, $
   63  CHKPNT    KNN $
   64  LABEL     LBL2 $
   65  EQUIV     KNN,KFF/SINGLE $
   66  CHKPNT    KFF $
   67  COND      LBL3,SINGLE $
   68  SCE1      USET,KNN,,,/KFF,KFS,KSS,,, $
   69  CHKPNT    KFS,KSS,KFF $
   70  LABEL     LBL3 $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION NO.

```
   71  EQUIV     KFF,KAA/CMIT $
   72  CHKPNT    KAA $
   73  COND      LBL5,CMIT $
   74  SMP1      USET,KFF,,,,/GO,KAA,KOO,LOO,UOO,,,,, $
   75  CHKPNT    GO,KAA,KOO,LOO,UOO $
   76  LABEL     LBL5 $
   77  KBMG2     KAA/LLL,ULL $
   78  CHKPNT    ULL,LLL $
   79  SSG1      SLT,BGPDT,CSTM,SIL,EST,MPT,GPTT,EDT,MGG,CASECC,DIT/PG/ V,N,
                 LUSET/C,N,1 $
   80  CHKPNT    PG $
   81  EQUIV     PG,PL/NOSET $
   82  CHKPNT    PL $
   83  COND      LBL10,NOSET $
   84  SSG2      USET,GM,YS,KFS,QG,,PG/,PO,PS,PL $
   85  CHKPNT    PO,PS,PL $
   86  LABEL     LBL10 $
   87  SSG3      LLL,ULL,KAA,PL,LOO,UOO,KOO,PO/ULV,UOOV,RULV,RUOV/V,N,CMIT/ V,Y,
                 IRES=-1/C,N,1/V,N,EPSI $
   88  SAVE      EPSI $
   89  CHKPNT    ULV,UOOV,RULV,RUOV $
   90  COND      LBL9,IRES $
   91  MATGPR    GPL,USET,SIL,RULV//C,N,L $
   92  MATGPR    GPL,USET,SIL,RUOV//C,N,O $
   93  LABEL     LBL9 $
   94  SDR1      USET,PG,ULV,UOOV,YS,GO,GM,PS,KFS,KSS,/UGV,PGG,QG/C,N,1/C,N,
                 BKLO $
```

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N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
   95   CHKPNT   UGV,QG,PGG $
   96   SDR2     CASECC,CSTM,MPT,DIT,EQEXIN,SIL,GPTT,EDT,BGPDT,PGG,QG,UGV,EST,/
                 OPG1,UQG1,CUGV1,OES1,OEF1,PUGV1/C,N,BKL0 $
   97   OFP      OUGV1,OPG1,UQG1,OEF1,OES1,//V,N,CARDNO $
   98   SAVE     CARDNO $
   99   COND     P2,JUMPPLOT $
  100   PLOT     PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,PUGV1,/PLOTX2/V,N,
                 NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
  101   SAVE     PFILE $
  102   PRTMSG   PLOTX2// $
  103   LABEL    P2 $
  104   DSMG1    CASECC,GPTT,SIL,ECT,UGV,CSTM,MPT,ECPT,GPCT,DIT/KDGG/ V,N,
                 DSCOSET $
  105   CHKPNT   KDGG $
  106   ADD      KDGG,KGG/KBGG $
  107   EQUIV    KBGG,KDNN/MPCF2 / MGG,MNN/MPCF2 $
  108   CHKPNT   KDNN,MNN $
  109   COND     LBL2D,MPCF2 $
  110   MCE2     USET,GM,KBGG,MGG,,/KDNN,MNN,, $
  111   CHKPNT   KDNN,MNN $
  112   LABEL    LBL2C $
  113   EQUIV    KDNN,KDFF/SINGLE / MNN,MFF/SINGLE $
  114   CHKPNT   KDFF,MFF $
  115   COND     LBL3D,SINGLE $
  116   SCE1     USET,KDNN,MNN,,/KDFF,KDFS,,MFF,, $
  117   CHKPNT   KDFF,KDFS,MFF $
  118   LABEL    LBL3C $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
 119  EQUIV    KDFF,KDAA/CMIT / MFF,MAA/CMIT $
 120  CHKPNT   KDAA,MAA $
 121  COND     LBLSD,CMIT $
 122  SMP2     USET,GO,KDFF/KDAA $
 123  SMP2     USET,GO,MFF/MAA $
 124  CHKPNT   KDAA,MAA $
 125  LABEL    LBLSD $
 125  ADD MAA,MFLD/MAH $
 126  PARAM //C,N,NOP/V,N,TRUE=-1 $
 125  EQUIV MAH,MAA/TRUE $
 125  COND MAHN09,TRUE $
 125  MATPRN MAH,,,,// $
 125  LABEL MAHN09 $
 126  DPD      DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,,,,,,,EED,EQDYN/V,N,
                LUSET/V,N,LUSETD/V,N,NOTFL/V,N,NODLT/V,N,NOPSDL/V,N,NOFRL/  V,
                N,NJNLFT/V,N,NCTRL/V,N,NOEED/C,N,123/V,N,NOUE $
 127  SAVE     NOEED $
 128  COND     ERROR3,NOEED $
 129  CHKPNT   EED $
 129  SEEMAT MGG,KBGG,,,//C,N,PRINT $
 130  READ     KDAA,MAA,,,EED,USET,CASECC/LAMA,PHIA,,OEIGS/C,N,MODES/  V,N,
                NEIGV/C,N,2 $
 131  SAVE     NEIGV $
 132  CHKPNT   LAMA,PHIA,OEIGS $
 133  OFP      OEIGS,LAMA,,,,//V,N,CARDNO $
 134  SAVE     CARDNO $
 135  COND     ERROR4,NEIGV $
```

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

```
DMAP-DMAP INSTRUCTION
 NO.
 136  SDR1      USET,,PHIA,,,GO,GM,,KDFS,,/PHIG,,BQG/C,N,1/C,N,BKL1 $
 137  CHKPNT    PHIG,BQG $
 138  SDR2      CASECC,CSTM,MPT,DIT,EQEXIN,SIL,,,BGPDT,LAMA,BQG,PHIG,EST,/ ,
                OBQG1,OPHIG,OBES1,OBEF1,PPHIG/C,N,BKL1 $
 139  OFP       OPHIG,OBQG1,OBEF1,OBES1,,//V,N,CARDNO $
 140  SAVE      CARDNO $
 140  SMPYAD PHIA,KCAA,PHIA,,,/KH/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
 140  SMPYAD PHIA,MAA,PHIA,,,/MI/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
 140  SOLVE MI,KH/WH/C,N,1 $
 140  SMPYAD PDJ2,PHIA,WH,,,/PD2/C,N,3 $
 140  MPYAD TU12,PHIA,/PHF/C,N,0 $
 140  MATPRN WH,PD2,PHF,,// $
 141  COND      P3,JUMPPLOT $
 142  PLOT      PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EQEXIN,SIL,,PPHIG/PLOTX3/V,N,
                NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
 143  SAVE      PFILE $
 144  PRTMSG    PLOTX3// $
 145  LABEL     P3 $
 146  JUMP      FINIS $
 147  LABEL     ERROR1 $
 148  PRTPARM   //C,N,-1/C,N,BUCKLING $
 149  LABEL     ERROR2 $
 150  PRTPARM   //C,N,-2/C,N,BUCKLING $
 151  LABEL     ERROR3 $
 152  PRTPARM   //C,N,-3/C,N,BUCKLING $
 153  LABEL     ERROR4 $
```

```
AXISYMMETRIC CIRC. CYL. WITH FLUID                                    MAY   4. 1974   NASTRAN  5/13/72
HARMONIC REDUCTION

     N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
 NO.

154  PRTPARM  //C.N.-4/C.N.BUCKLING $

155  LABEL    ERRORS $

156  PRTPARM  //C.N.-5/C.N.BUCKLING $

157  LABEL    ERROR6 $

158  PRTPARM  //C.N.-6/C.N.BUCKLING $

159  LABEL    FINIS $

160  END      $

        **NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM**
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