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**NASA CR-132492**

**DEVELOPMENT OF TECHNOLOGY FOR MODELING OF A 1/8-SCALE  
DYNAMIC MODEL OF THE SHUTTLE SOLID ROCKET BOOSTER (SRB)**

by

**A. Levy, J. Zalesak, M. Bernstein, and P.W. Mason**

**July 1974**

**Final Report – Prepared Under Contract No. NAS 1-10635-14**

by

**Grumman Aerospace Corporation**

**Bethpage, New York 11714**

**Langley Research Center**

**Hampton, Virginia 23665**

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**

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- Page 22, The column vector on the right of the first matrix equation should be changed to indicate that it represents reaction forces at the support points as follows:

$$\text{from } \begin{pmatrix} R_1 \\ \theta_1 \\ Z_1 \\ R_2 \\ \theta_2 \\ \theta_3 \end{pmatrix} \quad \text{to} \quad \begin{pmatrix} F_{R_1} \\ F_{\theta_1} \\ F_{Z_1} \\ F_{R_2} \\ F_{\theta_2} \\ F_{\theta_3} \end{pmatrix}$$

- Page 32, Reference in the first statement, change from Reference 5-1 to Reference 5-5
- Page 34, Reference 5-6, delete and change to:  
 MacNeal, R. H. "The NASTRAN Theoretical Manual" NASA SP 221(01)  
 December 1972.

## ABSTRACT

This report describes a NASTRAN analysis of the solid rocket booster (SRB) substructure of the space shuttle 1/8-scale structural dynamics model.

The NASTRAN finite element modeling capability was first used to formulate a model of a cylinder 10 in. radius by a 200 in. length to investigate the accuracy and adequacy of the proposed grid point spacing. Results were compared with a shell analysis and demonstrated relatively accurate results for NASTRAN for the lower modes, which were of primary interest.

A finite element model of the full SRB was then formed using CQUAD2 plate elements containing membrane and bending stiffness and CBAR offset bar elements to represent the longerons and frames. Three layers of three-dimensional CHEXAI elements were used to model the propellant. This model, consisting of 4000 degrees of freedom (DOF) initially, was reduced to 176 DOF using Guyan reduction, and solved in Rigid Format 3 to obtain undamped modes and frequencies. The fundamental NASTRAN mode was 56.4 Hz compared to 58.4 Hz calculated for the beam model.

The model was then submitted for complex Eigenvalue analysis under Rigid Format 7. After experiencing considerable difficulty with attempts to run the complete model, it was split into two substructures. These were run separately and combined into a single 116 degree of freedom A set which was successfully run and are reported herein. The calculated modes included:

- First bending at 56.1 Hz with a critical damping of 2.8%
- First torsion mode at 168.3 Hz with 13.6% of critical damping.

The NASTRAN model in the form of IBM cards, listings, and drawings has been delivered to the NASA Langley Research Center Structures and Dynamics Division.



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## ABBREVIATIONS

DOF	degrees of freedom
ET	external tank
NASTRAN	Nasa Structural Analysis System
SRB	Solid Rocket Booster

DEVELOPMENT OF TECHNOLOGY  
FOR MODELING OF A 1/8-SCALE DYNAMIC MODEL OF THE  
SHUTTLE SOLID ROCKET BOOSTER (SRB)

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INTRODUCTION

This report discusses work that was performed under Master Agreement Contract NAS 1-10635, Task Order 14 for the Structural Mechanics Branch, Structures and Dynamics Division, NASA Langley Research Center, Hampton, Virginia.

The basic objectives of the task were:

- (1) Formulation of an analytical NASTRAN representation of the significant dynamic characteristics of the 1/8-scale model of the shuttle solid rocket booster as specified by drawings and design details developed under NAS 1-10635-11 and later revised under a Rockwell International task
- (2) Construction of the solid rocket booster models
- (3) Participation in a comparison of experimentally determined structural dynamic characteristics with results of the analysis, and proposing modifications in analysis technology as required.

Part (3) of this task was later modified because of unavailable experimental data and the necessity to devote the time to other analytical tasks.

## DESCRIPTION OF THE 1/8-SCALE SOLID ROCKET BOOSTER

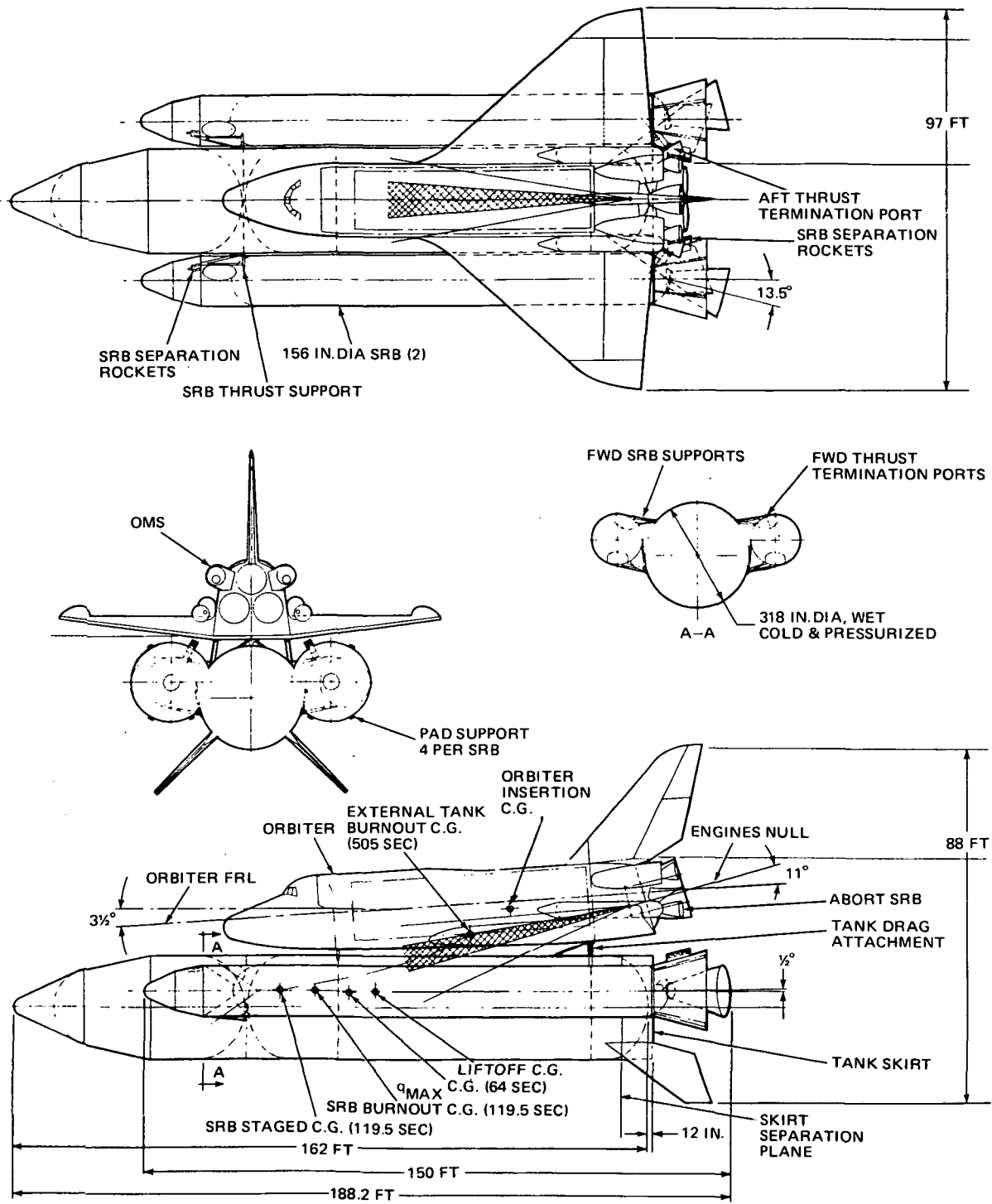
The 1/8-scale shuttle dynamic model is based on Grumman's parallel-burn Space Shuttle Design 619 shown schematically in Fig. 1. A mockup of the 1/8-scale Shuttle model basic configuration is shown in Fig. 2. A detailed structural arrangement of the prototype SRB is shown in Fig. 3. In simplifying the design, a major objective was to keep the model fabrication cost within target while retaining as many of the significant structural dynamic characteristics as possible. For the allotted funds it was thus impossible to consider a replica at the small scale necessary for testing in the existing NASA/Langley facilities. Hence, only the general characteristics of the major SRB components were simulated without attempting to model local details.

The 1/8-scale solid rocket booster model shown assembled in Fig. 4 and schematically in Fig. 5 consists of three separable parts:

- A forward skirt
- A propellant cylinder
- An aft skirt.

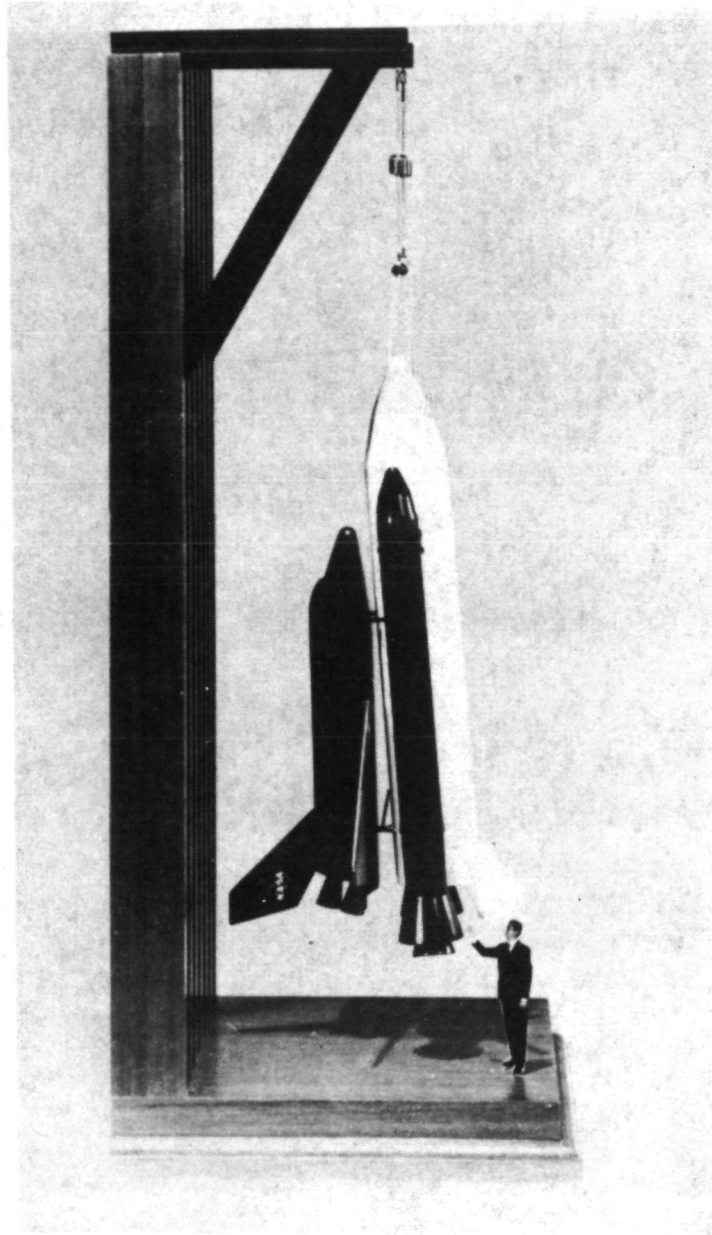
The design is described in Reference 5-1 and in the drawings listed in Table 1. The model described, provides a basis for comparison with the analytical NASTRAN model.

The scaling relationships that must exist between the model and the prototype are shown in Table 2. These directly follow from a dimensional analysis of the various parameters that influence the dynamic behavior of the structure, and from the choice of the model material. Extrapolating prototype behavior from model test data is accomplished by using these scaling relationships directly. It should be noted however, that because of design expediency, some of the scaling rules have been compromised. Some liberty has also been taken in modeling the stiffness characteristics in so far as some lumping was necessary in order to avoid the large expense of exact scaling of very small dimensions. Thus, stiffeners have been lumped to some extent but not eliminated completely.



3-55  
T14-1

Fig. 1 Mated Space Shuttle Flight System (Grumman-Proposed Design 619)



S-3  
T14-2

**Fig. 2 Mockup of 1/8-Scale Shuttle Model During Vertical Suspension**



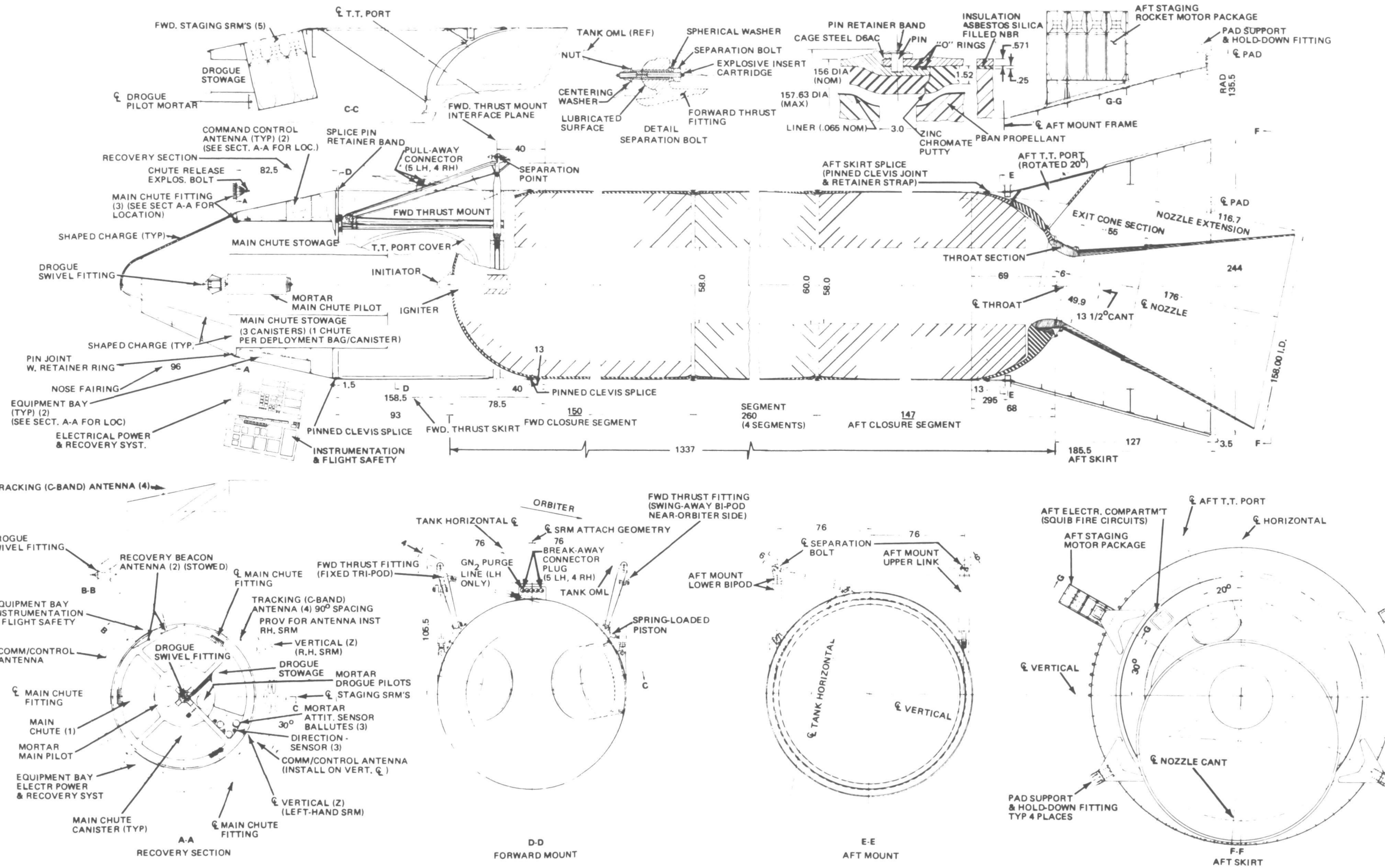
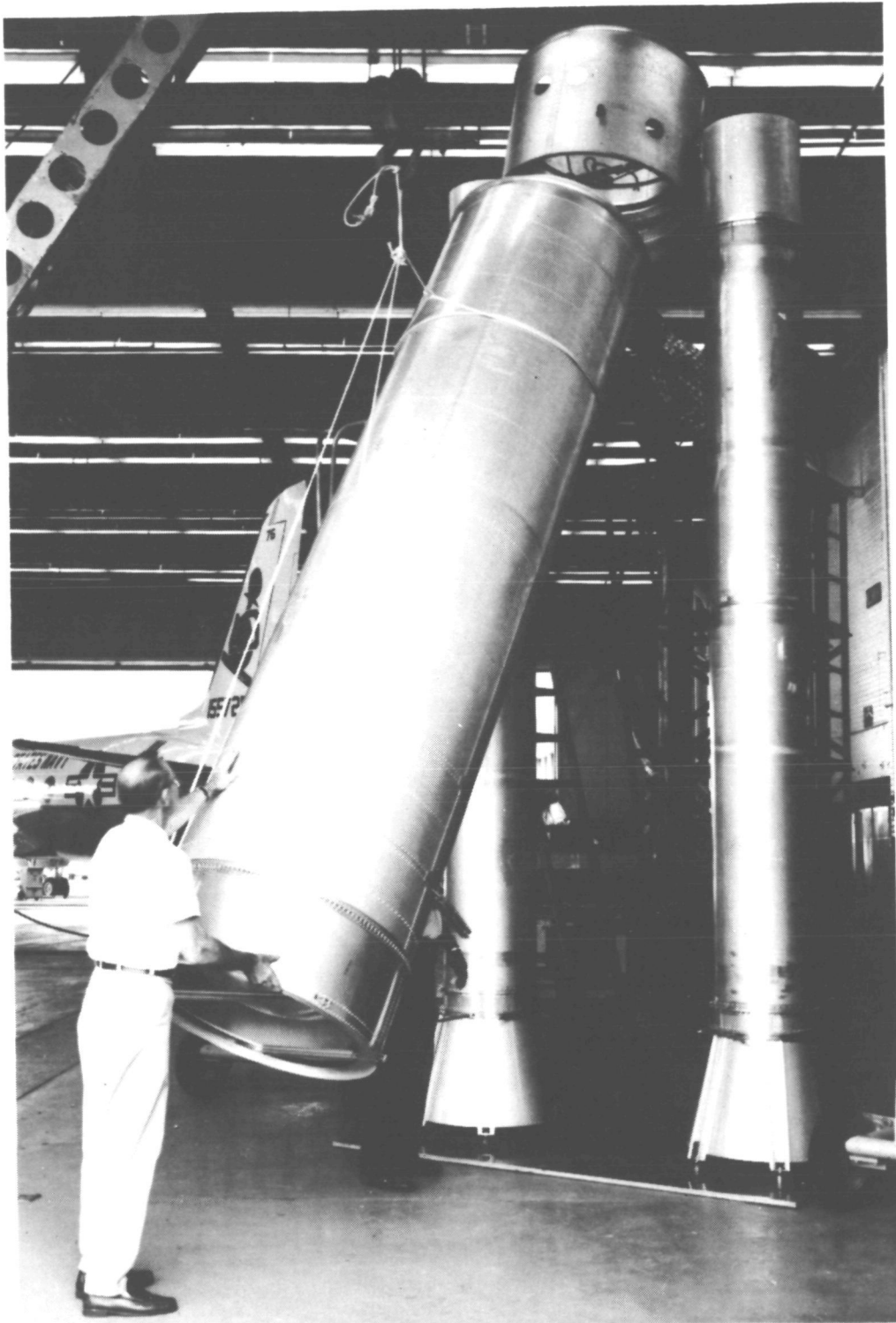


Fig. 3 Prototype SRB Inboard Profile



T14-4

Fig. 4 Assembled 1/8-Scale Model of the Space Shuttle Solid Rocket Booster

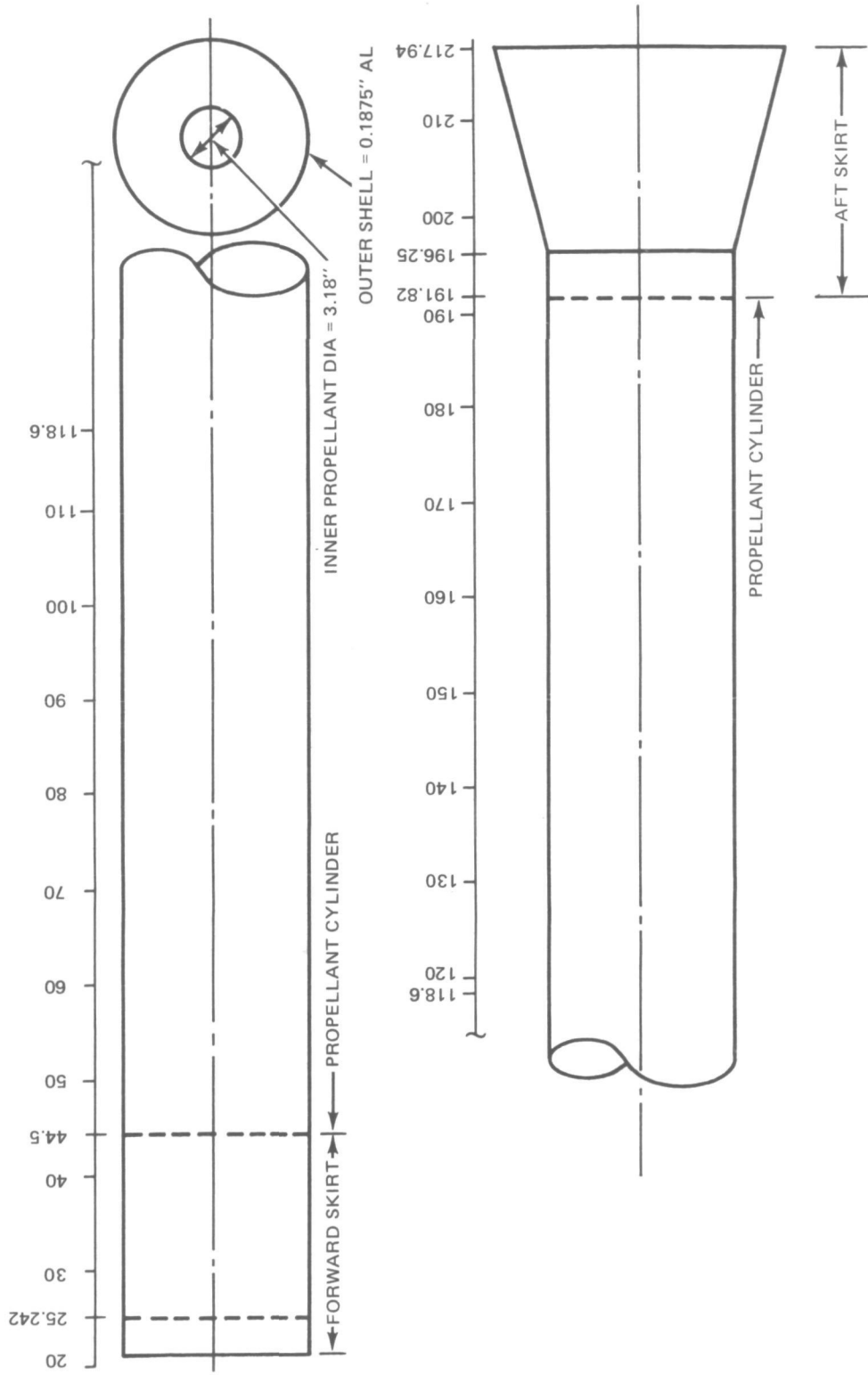


Fig. 5 Assembled View of 1/8-Scale Model of the Solid Rocket Booster

T14-5

Table 1 Drawing Descriptions of 1/8-Scale Model

Drawing Number	Description
AD383 -500 A	Model Assembly Suspended (3 Sheets)
-501 A	Shuttle Model Assembly
-502 A	External Tank Assembly
-503 A	SRB Assembly
-504 N/C	Orbiter Assembly
-505 N/C	LO <sub>2</sub> Tank Assembly (2 Sheets)
-506 N/C	Intertank Skirt Assembly
-507 A	LH <sub>2</sub> Tank Assembly (2 Sheets)
-508 N/C	Aft Skirt Assembly
-510 N/C	SRB Forward Skirt Assembly
-511 N/C	SRB Propellant Cylinder Assembly
-512 A	SRB Aft Skirt Assembly
-514 N/C	LH <sub>2</sub> Tank Fitting Installation
-515 A	Rings for External Tank
-516 A	Intertank Skirt Frame Assembly
-517 N/C	LH <sub>2</sub> Tank Frame Assembly
-518 N/C	External Tank Aft Skirt Frame Assembly
-520 A	SRB Rings
-521 N/C	SRB-to-External Tank Thrust Fittings
-522 A	External Tank-to-SRB Thrust Fitting
-525 N/C	Orbiter Forward Section Assembly and Installation
-526 N/C	Orbiter Payload Bay Cover Assembly and Installation
-527 N/C	Orbiter Payload Module Installation
-528 N/C	Orbiter Aft Section Assembly
-529 A	Orbiter Wing Installation
-530 A	Orbiter Fuselage Side and Bottom Skin Panel Assembly and Installation
-531 N/C	Orbiter Keel Assembly and Installation
-532 N/C	Orbiter Wing Beam Carry-Through Assembly
-533 N/C	Orbiter Aft Interstage Fitting Assembly
-534 N/C	Orbiter Engine Support Bulkhead Assembly (2 Sheets)
-535 N/C	Orbiter Fin-Stub Installation
-536 A	Orbiter Fuselage Forward Frame Assembly
-537 N/C	Orbiter Abort SRB Installation
-538 N/C	Model Cosmetic Lines (2 Sheets)
-539 N/C	Orbiter Engine Bulkhead (Station 180.009) Fittings
-541 N/C	Intertank Skirt Assembly (NAR Configuration)
-542 N/C	Frame Installation Intertank Skirt (NAR Configuration)
-543 N/C	SRB Forward Skirt Assembly (NAR Configuration)
-544 N/C	Thrust Fitting-Intertank Skirt (NAR Configuration)
-545 N/C	Thrust Pin (NAR Configuration)
-546	Comparison NAR Shuttle Configuration and 1/8-Scale Dynamic Model
<p>T14-1(T) NOTE:</p> <ol style="list-style-type: none"> <li>(1) Copies of each of the above drawings have been submitted separately to NASA/Langley and to North American Rockwell</li> <li>(2) These drawings are available from the Structural Mechanics Branch, Structures and Dynamics Division, NASA/Langley Research Center, Hampton, Virginia, 23365.</li> </ol>	

Table 2 Pertinent Scaling Relations for 1/8-Scale Model of SRB

Physical Quantity	Magnitude	
	Propellant	Structure *
Length (Overall) and Displacement	$8L_m = L_p$	$8L_m = L_p$
Mass Density	$\rho_m = \rho_p$	$3\rho_m = \rho_p$
Modulus of Elasticity	$E_m = E_p$	$3E_m = E_p$
Area	$8^2 A_m = A_p$	$8^2 A_m = 3A_p$
Area Moment of Inertia	$8^4 I_m = I_p$	$8^4 I_m = 3I_p$
Volume	$8^3 V_m = V_p$	$8^3 V_m = 3V_p$
Weight	$8^3 \rho_m V_m = \rho_p V_p$	$8^3 \rho_m V_m = \rho_p V_p$
Longitudinal Stiffness	$8^2 E_m A_m = E_p A_p$	$8^2 E_m A_m = E_p A_p$
Bending Stiffness	$8^4 E_m I_m = E_p I_p$	$8^4 E_m I_m = E_p I_p$
Frequency	$f_m = 8f_p$	$f_m = 8f_p$

\* Aluminum Used in Model to Represent Steel Prototype

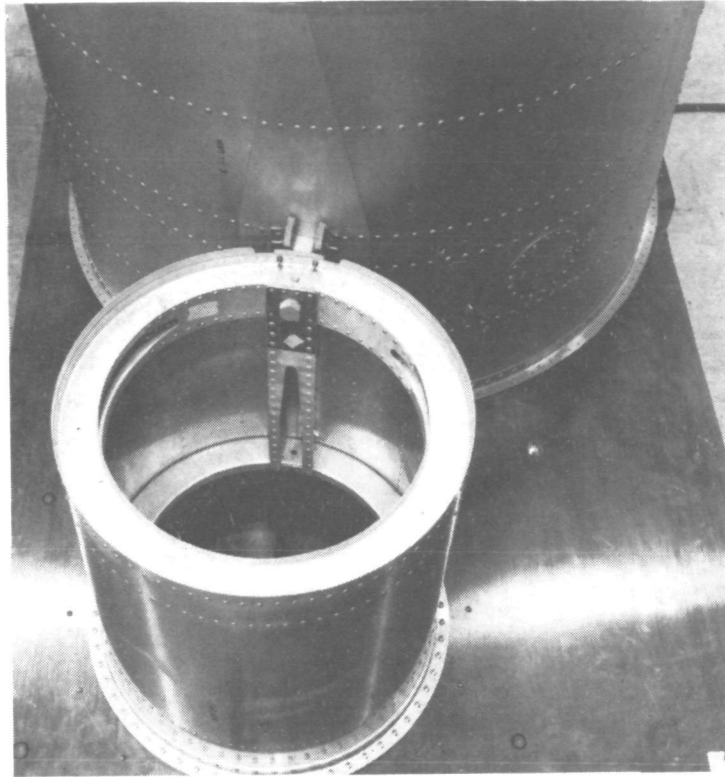
T14-2(T)

While accurate modeling of the prototype was desirable for extrapolating basic Shuttle dynamic characteristics, another prime object of the study was the NASTRAN dynamic analysis and its correlation with model test data. A complete static and dynamic analysis was made using NASTRAN with the structure modeled to a degree of refinement considered sufficient for preliminary design purposes. Therefore, the need for direct scaling of the prototype design to obtain an exact model in every detail was not considered to be crucial. It should also be pointed out that the Shuttle design was still in a state of flux at the beginning of this study, thus any attempt to model the then current vehicle exactly was not overly beneficial to the Shuttle Project.

Forward Skirt - The forward skirt shown in Fig. 6 is designed to typify the solid rocket booster/external tank (ET) interstage connection of the proposed Rockwell International configuration of Nov. 29, 1972. This was a modification to the original design for the 1/8-scale shuttle model. It is constructed of aluminum, consists of a cylinder 19.5 inches in dia and 21 inches long containing one longeron along the azimuth where it is fastened to the ET. In that local area the skin is increased in two steps from the basic 0.040 in. thickness by a riveted doubler which itself is chem milled. The net result is a multi-step variation in thickness from 0.040 in. to 0.188 in. at the ET connectionpoint. Refer to Fig. 13 for a developed view of the forward skirt. The single longeron is designed to distribute the axial loads. It is a variable cross-sectional area, being a maximum at the forward ring where a single pin is used to fasten the SRB to the ET.

Around the top and bottom of the cylinder are frames consisting of two back-to-back channel members separated and fastened by cylindrical inner spacers. A ring riveted to the bottom of the forward skirt contains provisions for machine screw fasteners every 0.66 in. for attaching to the propellant cylinder.

Propellant Cylinders - Three sets of propellant cylinders were formed and loaded with inert solid propellant to represent different weight configurations. All had a 0.1875 in. thick aluminum shell and were 19.5 in. in dia and 147.32 in. long. This length included the machined rings riveted to the ends for fastening the skirts. The length of propellant material in these cylinders is about 145.4 inches. The propellant weight configurations simulated were for lift-off, maximum dynamic pressure, and end burn. The simulated propellant which consisted of inert PBAN described in

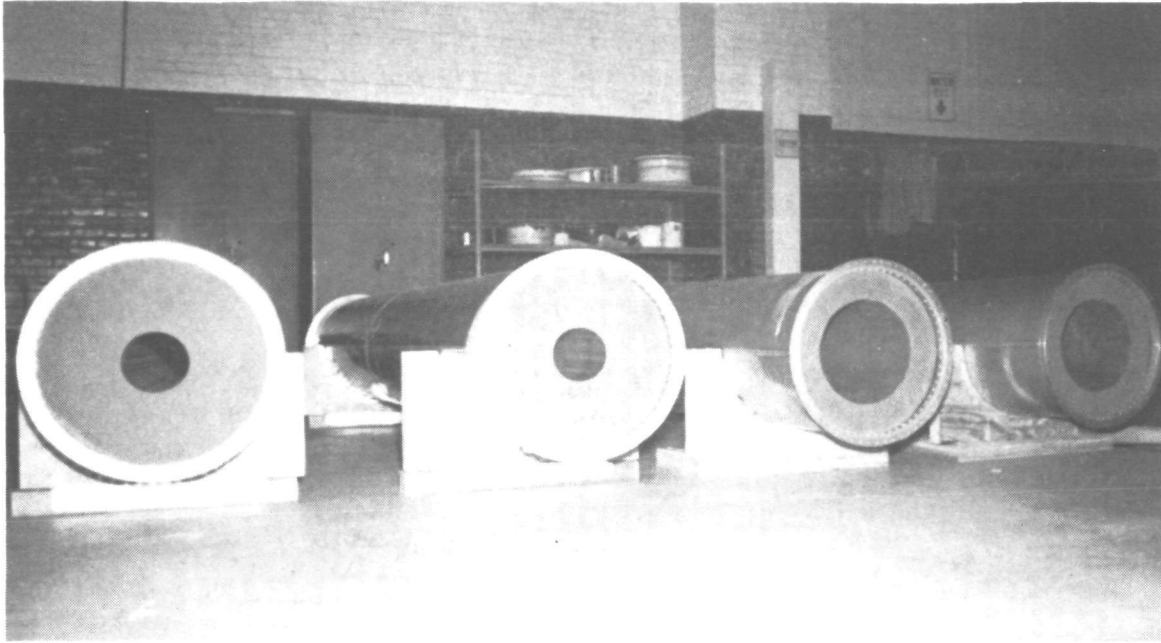


T14-6

**Fig. 6 1/8-Scale Solid Rocket Booster Forward Skirt**

more detail later was supplied by United Technology Corp (UTC). A photograph showing end views of the two heavier pairs of cylinders for the lift-off and mid-burn weights is presented in Fig. 7. The weight of each cylinder before and after pouring of the simulated propellant as recorded by UTC is shown in Table 3.

Aft Skirt - The aft SRB skirt shown in Fig. 8 is constructed of aluminum and consists of a short cylindrical section and a longer conical section. Skin thickness is 0.062 inches. At the intersection of the conical and upper cylindrical section is the U-shaped ring used for mounting the fittings for the struts attaching the SRB to the ET. At the top of the conical section is the machined ring which mates with the propellant cylinders. The conical section contains four longerons made of double channel sections which terminate in the fittings used to fasten the entire model to the base support structures. At the bottom of the aft SRB skirt, the conical skin is fastened to a ring made of four segments of a channel.



T14-7

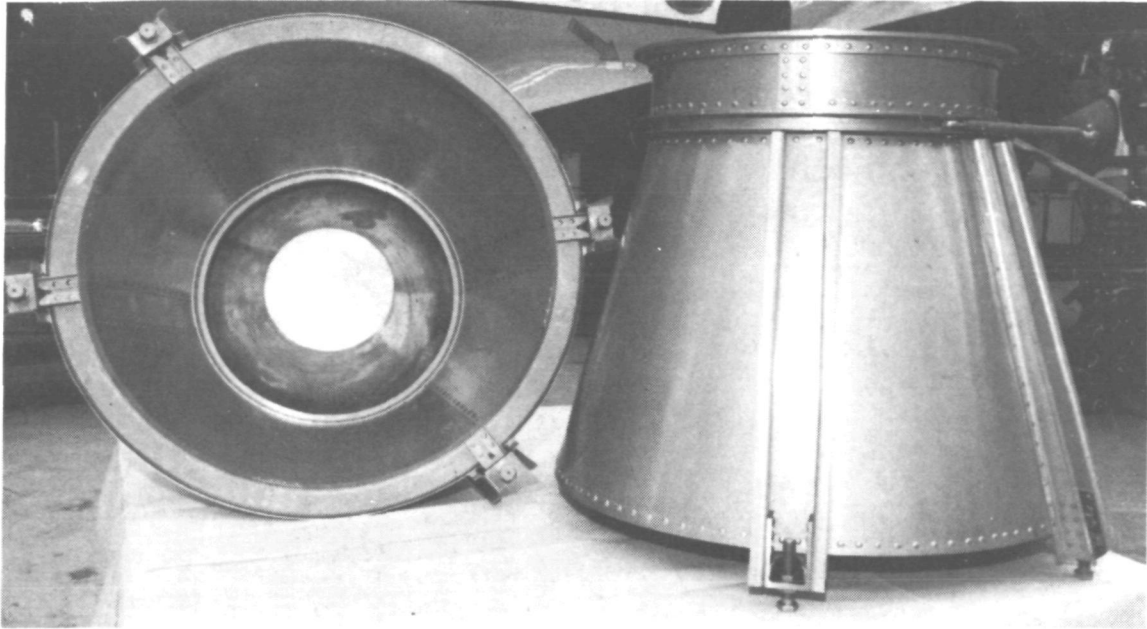
Fig. 7 End View of Propellant Cylinders for 1/8-Scale Model of Solid Rocket Booster

Table 3 Summary of Propellant Cylinder Weights

Propellant Cylinder Serial No.	Weight of Empty Container, lb	Weight of Container with Liner, lb	Weight of Loaded Cylinders, lb
1	172.5	179.0	542.0
2	172.0	179.5	580.0
3	172.5	177.0	1720.0
4	173.0	179.5	1706.0
5	173.0	178.0	2526.0
6	172.0	178.5	2520.0

T14-3(T)





T14-8

Fig. 8 1/8-Scale Model Solid Rocket Booster Aft Skirt

Propellant Characteristics - The most significant characteristics of the solid propellant for vibration are the complex moduli corresponding to the range of frequencies encountered. The simulated propellant used for the 1/8-scale model was inert UTI-610 manufactured by United Technology Center Division of United Aircraft Corp. in Sunnyvale, California. This consists of essentially the same binder-fuel-curative components as UTP-3001 propellant used in Titan. Inert sodium chloride and inert ammonium sulphate were substituted for the ammonium perchlorate in the inert UTI-610.

Batch 400-1384 which was used in the 1/8-scale model, yielded samples having a density of 0.0627 lb/cu in., a stress at maximum load of 132 psi and a strain at maximum load of 40 per cent. Estimated tensile and shear properties believed applicable were furnished by UTC (Reference 5-2) and are listed in Table 4.

The moduli vary with both frequency and temperature. The variation with temperature is shown in Fig. 9. The data is applicable for 18°C since the value of  $a_T$  is 1.0. If the temperature should be 5°C higher, then the value of  $a_T$  becomes 1.58, because the  $\log 1.58 = 0.2$ . To determine the modulus for this temperature at a specific frequency, form the product and find the corresponding value in Table 4. For the analyses described, the Modulus of Elasticity  $E$ , was taken as 25,000 and the loss factor,  $\rho$ , as 0.52.

Four containers of propellant were poured as samples during the filling of the SRB cylinders. Each sample contained about 8 lb (two quarts) of propellant. These were delivered to the Langley Research Center with the 1/8-scale SRB model.

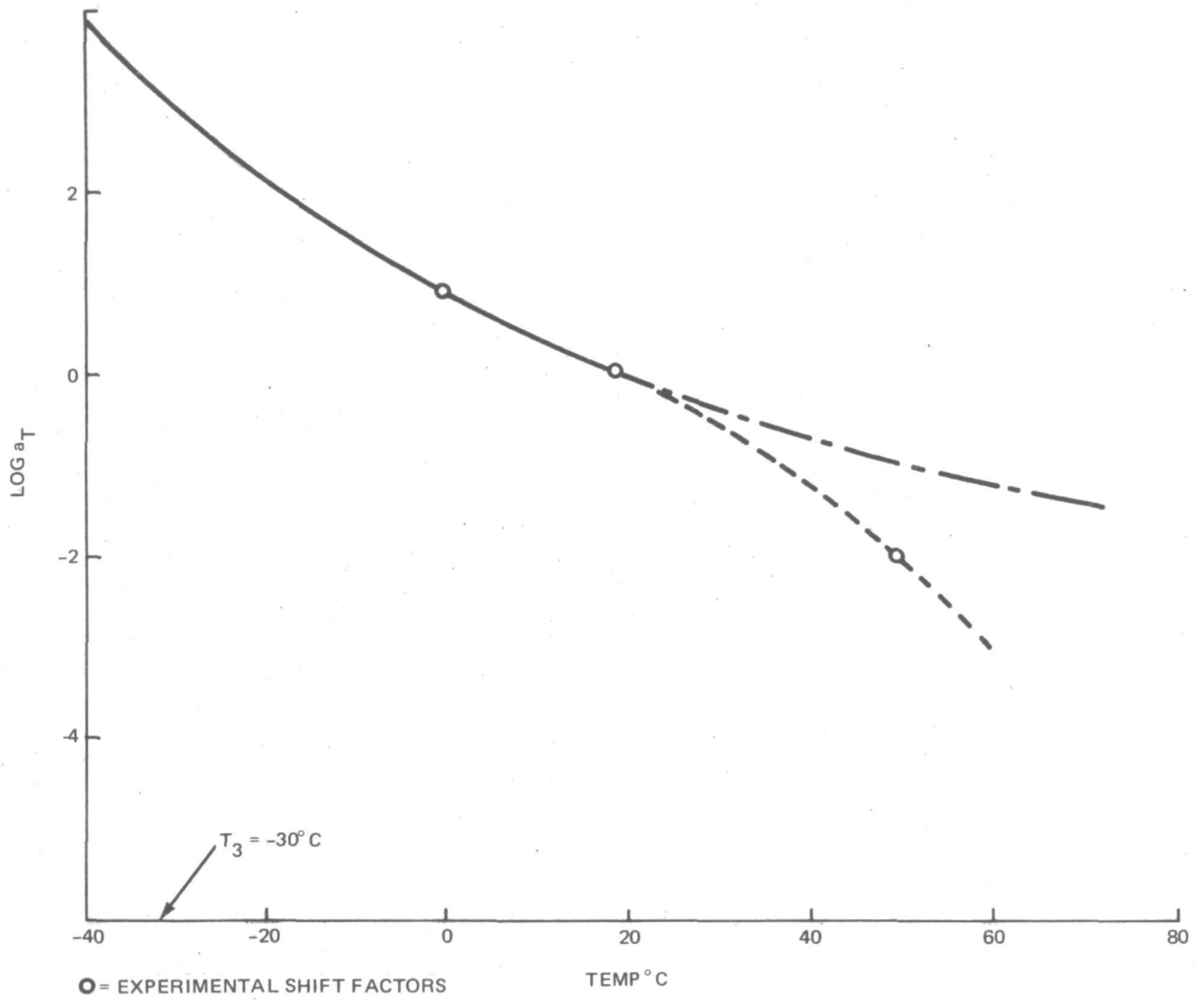
Table 4 Inert Propellant Properties of UTI-610 (UTP 6055/1141) \*

$a_T f$ (Hz)	$E = E' + iE''$		$G = G' + iG''$		$\rho = \frac{G''}{G'}$
	$E'$ (psi)	$E''$ (psi)	$G'$ (psi)	$G''$ (psi)	
5	9,618	6,110	3,206	2,037	0.64
10	12,831	8,191	4,277	2,730	0.64
20	17,052	9,429	5,684	3,143	0.55
30	19,313	10,140	6,438	3,380	0.52
40	20,995	10,978	6,998	3,659	0.52
50	22,537	11,830	7,512	3,977	0.52
60	24,048	12,592	8,016	4,197	0.52
70	25,540	13,214	8,513	4,405	0.52
80	26,996	13,678	9,000	4,559	0.51
90	28,375	13,991	9,465	4,664	0.49
100	29,719	14,167	9,966	4,722	0.48
200	38,354	12,285	12,785	4,095	0.32
300	41,744	9,560	13,915	3,187	0.23
400	43,231	7,622	14,410	2,541	0.18
500	43,988	6,282	14,663	2,094	0.15

\*Taken from Ref. 5-2.

T14-4(T)

$E$  = Complex Modulus of Elasticity;  $G$  = Complex Shear Modules



T14-9

Fig. 9 WLF and Experimental Shift Factors for UTP 6055/1141 Inert Propellant

## NASTRAN FINITE ELEMENT MODEL OF SRB

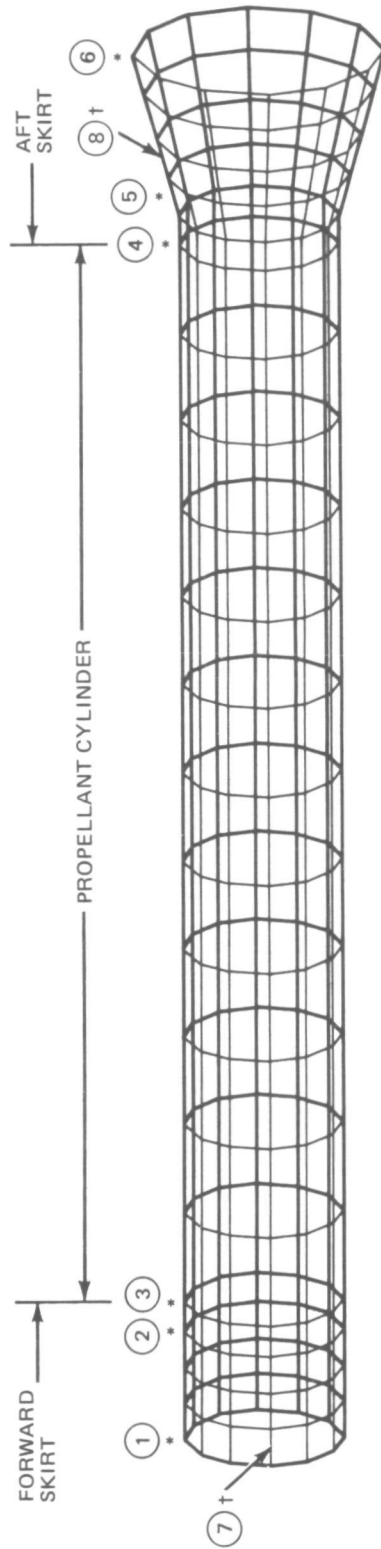
The idealization of the solid rocket booster, shown in Fig. 10, is a NASTRAN generated plot of the outer shell. The locations of the frames and longerons of the experimental model are indicated by the number and symbol key. The dimensions used to model the frames and longerons are shown in Fig 11. Figure 12 shows the complete finite-element idealization including:

- All the properties
- Geometry of the model
- Tie down points
- Summary of the type and number of elements.

Plate elements (CQUAD2) containing membrane and bending stiffness are used to represent the outer skin. The thickness of the plate elements in the forward skirt includes the effects of the doubler and various straps and plates. Figure 13 shows a developed view. Offset bar elements (CBAR) are used to represent the frames and longerons. Three heavy frames exist: the first at STA 44.5 which is the forward skirt-propellant cylinder connection; the second at STA 191.820 which is at the aft skirt-propellant cylinder connection; and the third at STA 196.250 which is the transition to the conical section of the aft skirt (also the SRB/ET interstage connection). Three-dimensional elements (CHEXAI) are used to model the propellant. Three layers of elements (in the radial direction) are used in the full propellant load (lift-off) condition. The incompressibility of the solid fuel is approximated by using a Poisson ratio of 0.49.

A preprocessor has been developed to generate the finite-element model. This program generates:

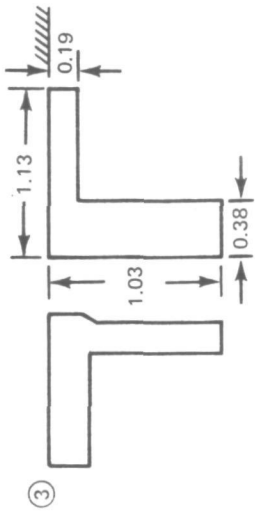
- (1) A cylindrical shell
- (2) A cylindrical shell with a solid cylindrical interior
- (3) A cone-shaped shell (used for the aft skirt)



\* - FRAME STATIONS FOR EXPERIMENTAL MODEL  
† - LONGERON DESIGNATIONS FOR EXPERIMENTAL MODEL

Fig. 10 NASTRAN Idealization of 1/8-Scale Solid Rocket Booster Model

T14-10



⊗ = LOCATIONS SHOWN ON FIG. 10  
 • = ALL DIMENSIONS IN INCHES.

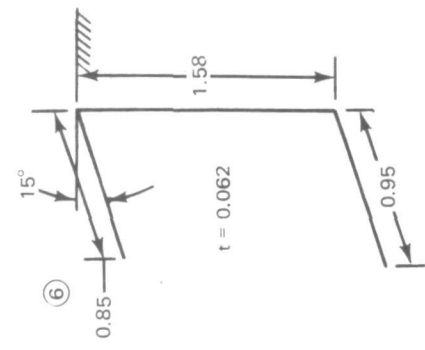
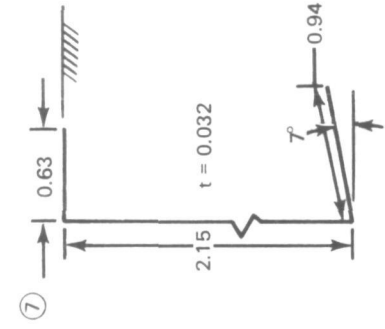
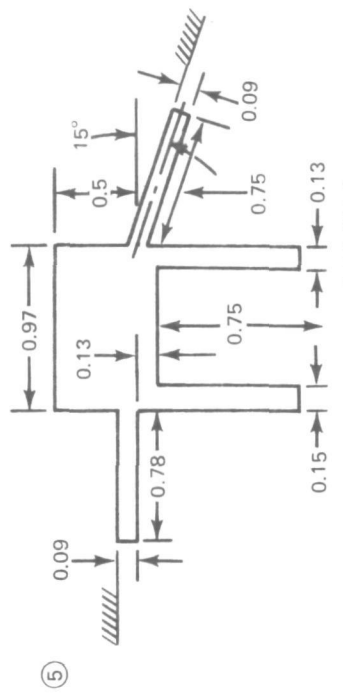
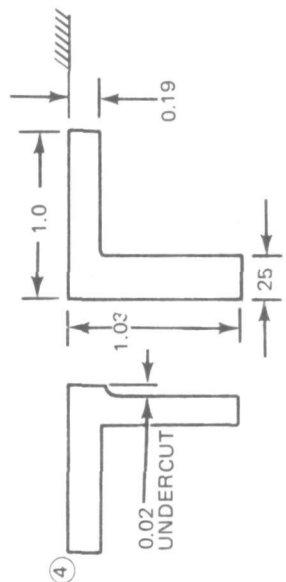
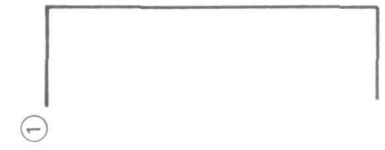
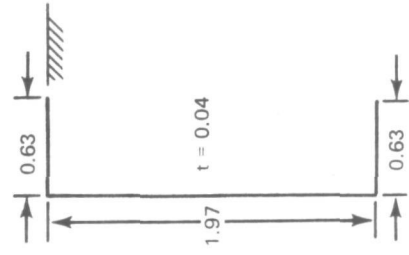
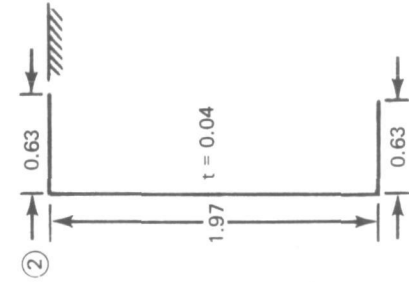


Fig. 11 Frame and Longeron Sections — Schematic

T14-11



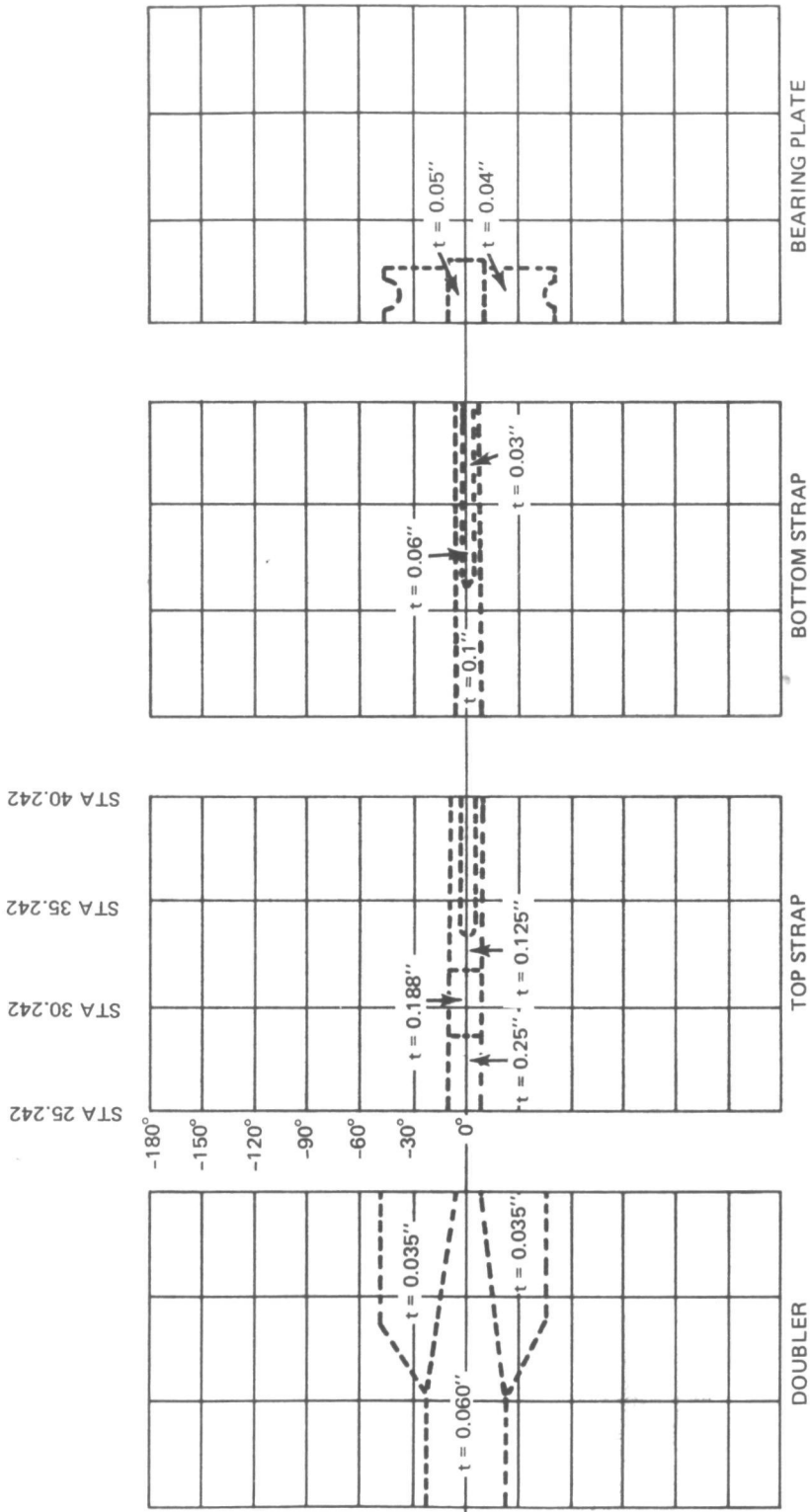


Fig. 13 Idealization of 1/8-Scale Model Solid Rocket Booster Forward Skirt

T14-13



Minor changes are made in the forward skirt model to adjust the thickness of the various elements.

In order to obtain a guide for the accuracy of the NASTRAN program and the adequacy of the SRB finite-element model, the SRB was modeled as a cylinder of radius 0.25 m. (10 in.) and length 5.08 m. (200 in.). The finite-element idealization consisted of 21 bays along the length and 12 bays around the circumference. The following table represents a comparison of results between NASTRAN using the Givens method (Rigid Format 3), Grumman's STARS-2V program (Ref. 5-3) and NASA Langley's SRA program (Ref. 5-4). The STARS -2V and SRA programs are based on thin-shell orthotropic theory. The accuracy of the NASTRAN results are relatively good for the lower modes, which are of primary interest, and depend upon the relative complexity of the Eigenvectors.

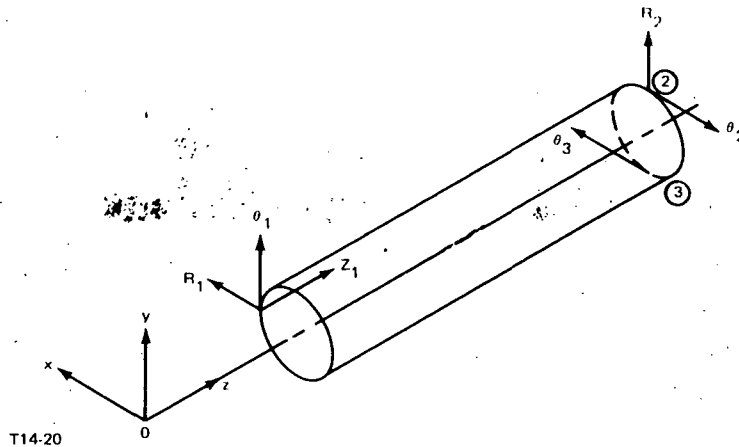
Empty Cylinder Vibration Analysis

Frequency, Hz			% Error
Stars-2V	SRA	NASTRAN (Givens method)	
52.0 (n = 2, 1st)	51.56 (n = 2, 1st)	55.2	6
52.4 (n = 2, 2nd)	51.66 (n = 2, 2nd)	54.9	5
66.6 (n = 2, 3rd)	66.04 (n = 2, 3rd)	73.9	11
119.3 (n = 1, 1st)	120.46 (n = 1, 1st)	122.5	3
120.4 (n = 2, 4th)	—	171.8	42
147.1 (n = 3, 1st)	—	165.1	12
n = number of circumferential full waves; 1st, 2nd etc. = number of lateral half waves.			

T14-7(T)

After establishing confidence in the number and spacing of the grid points, a model was formulated representing the complete SRB including full propellant elements, forward skirt, and aft skirt. This was submitted for NASTRAN real Eigenvalue analysis using Rigid Format 3. As part of this analysis, an equilibrium check

is made on the entire SRB model (skin plus propellant) after the generation of the reduced stiffness and mass matrices. For this purpose, temporary rigid body supports are included as shown below:



Equilibrium matrices for the free degrees of freedom are formulated and represent the resultant forces about a chosen point (0). These resultants are compared to the overall resultants at the support points (shown below).

$$\begin{pmatrix} F_x \\ F_y \\ F_z \\ M_x \\ M_y \\ M_z \end{pmatrix}_0 = \begin{bmatrix} 1.0 & 0.0 & 0.0 & 0.0 & -1.0 & 0.0 \\ 0.0 & 1.0 & 0.0 & 1.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 1.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & -Z_1 & 0.0 & -Z_2 & 0.0 & 0.0 \\ Z_1 & 0.0 & R_1 & 0.0 & -Z_2 & Z_3 \\ 0.0 & R_1 & 0.0 & 0.0 & R_2 & R_3 \end{bmatrix} \begin{pmatrix} R_1 \\ \theta_1 \\ Z_1 \\ R_2 \\ \theta_2 \\ \theta_3 \end{pmatrix}$$

where

i	Node	$R_i$	$\theta_i$	$Z_i$
1	6907	9.75	0.0	25.242
2	7805	9.75	90.0	196.25
3	7813	9.75	-90.0	196.25

T14-8(T)

A detailed description of the DMAP Alter package used for this purpose is presented in Ref. 5-5.

The undamped vibrational modes for the full cylinders are listed in the tables that follow. The model consisted of 4,000 DOF which were reduced to 176 DOF after a Guyan reduction was employed. The modes of most interest are the 1st and 2nd

bending modes and the longitudinal rod and thickness shear mode. The latter involves extension of the outer case and extension and shear deformation of the propellant. Figure 14 shows schematic cross-sectional views of the lateral and longitudinal vibrational motion, and Fig. 15 presents orthographic views of the motion obtained from the NASTRAN analysis. The table titled Vibration Analysis of Full Propellant Cylinder-Undamped, includes the results for simple beam theory for the modes of interest (bending and longitudinal) based on the composite properties of the SRB cylinder.

Using a structural damping factor of 0.52 for the propellant elements which is the material property determined from Table 4, the complex Eigenvalues for the lowest bending and longitudinal modes were obtained using Rigid Format 7. These are compared with the undamped modes as tabulated in the second table below. Simple beam theory (no shear) predicts a value of  $1/Q = 0.028$ , which agrees with the bending mode damping coefficient,  $c/cc$ . The difference between this value and that for the longitudinal mode is due to the thickness shear effects. (Refer to Fig. 14b).

**Vibration Analysis of Full Propellant Cylinder – Undamped**

Mode	Frequency, Hz	
	NASTRAN	Simple Beam Theory
n = 1, m = 1	56.4	58.4
n = 0, torsion	171.4	—
n = 1, m = 2	173.0	161.0
n = 0, longitudinal	196.1	180.2

T14-9(T)

**Vibration Analysis Using Damped Solid Finite Elements**

Mode	Frequency, Hz		Damping value, $1/Q^*$
	Undamped	Damped	
Bending – 1st	56.38	56.39	0.027
Longitudinal – 1st	196.0	197.1	0.056

\* $1/Q = \eta$  where  $\eta$  is the equivalent damping constant.

T14-10(T)

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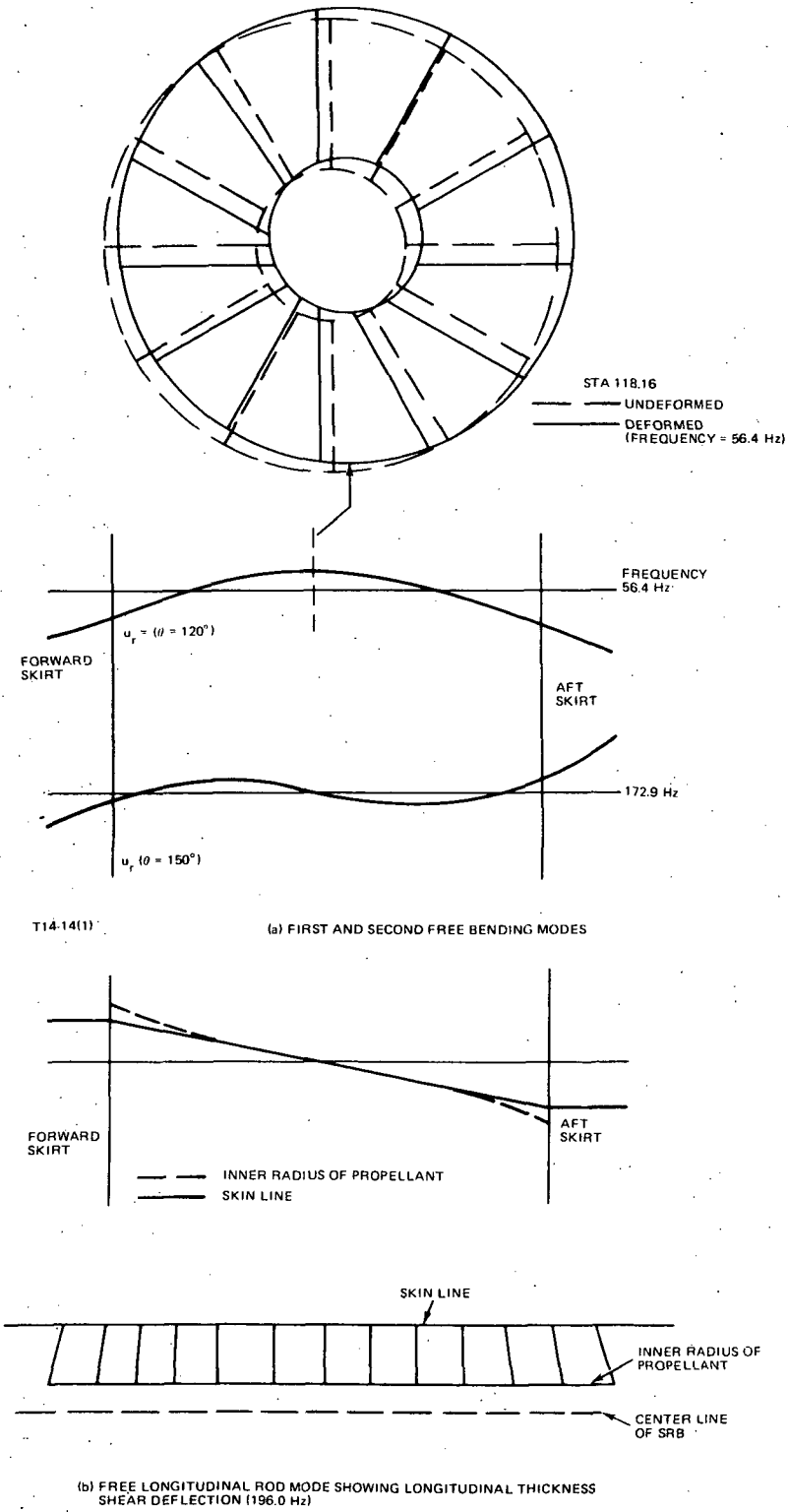
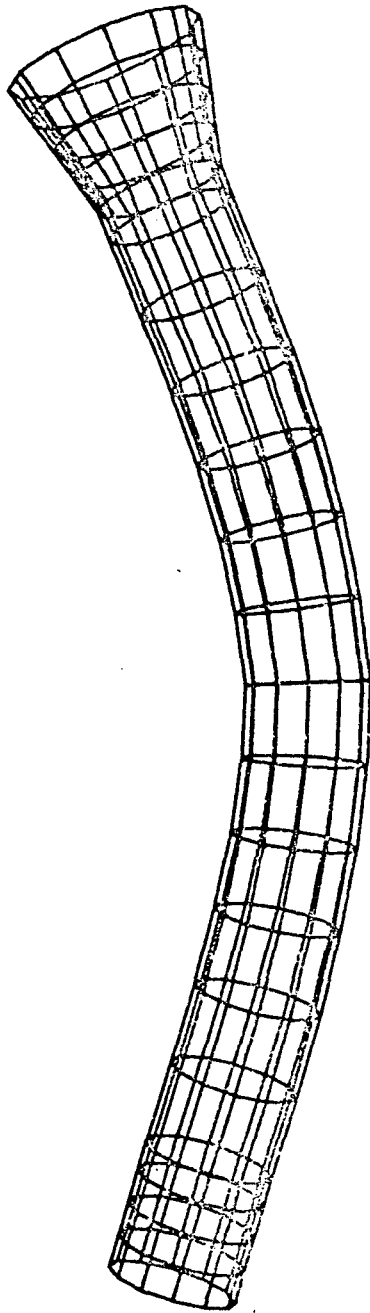
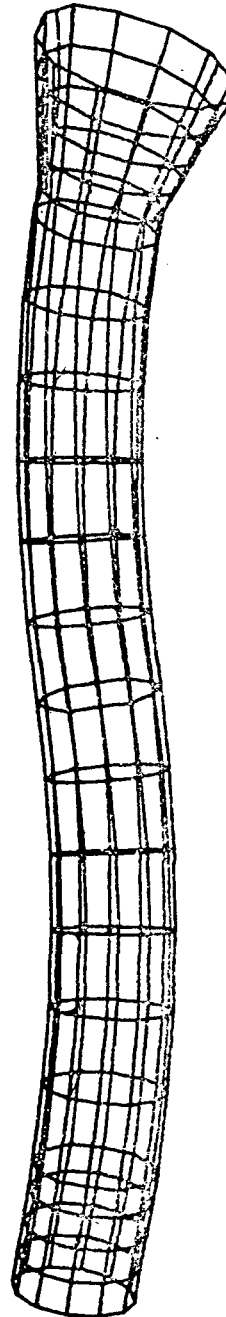


Fig. 14 Shapes for SRB Modes



(a) FIRST FREE BENDING MODE.  
56.4 Hz



(b) SECOND FREE BENDING  
MODE. 173.0 Hz

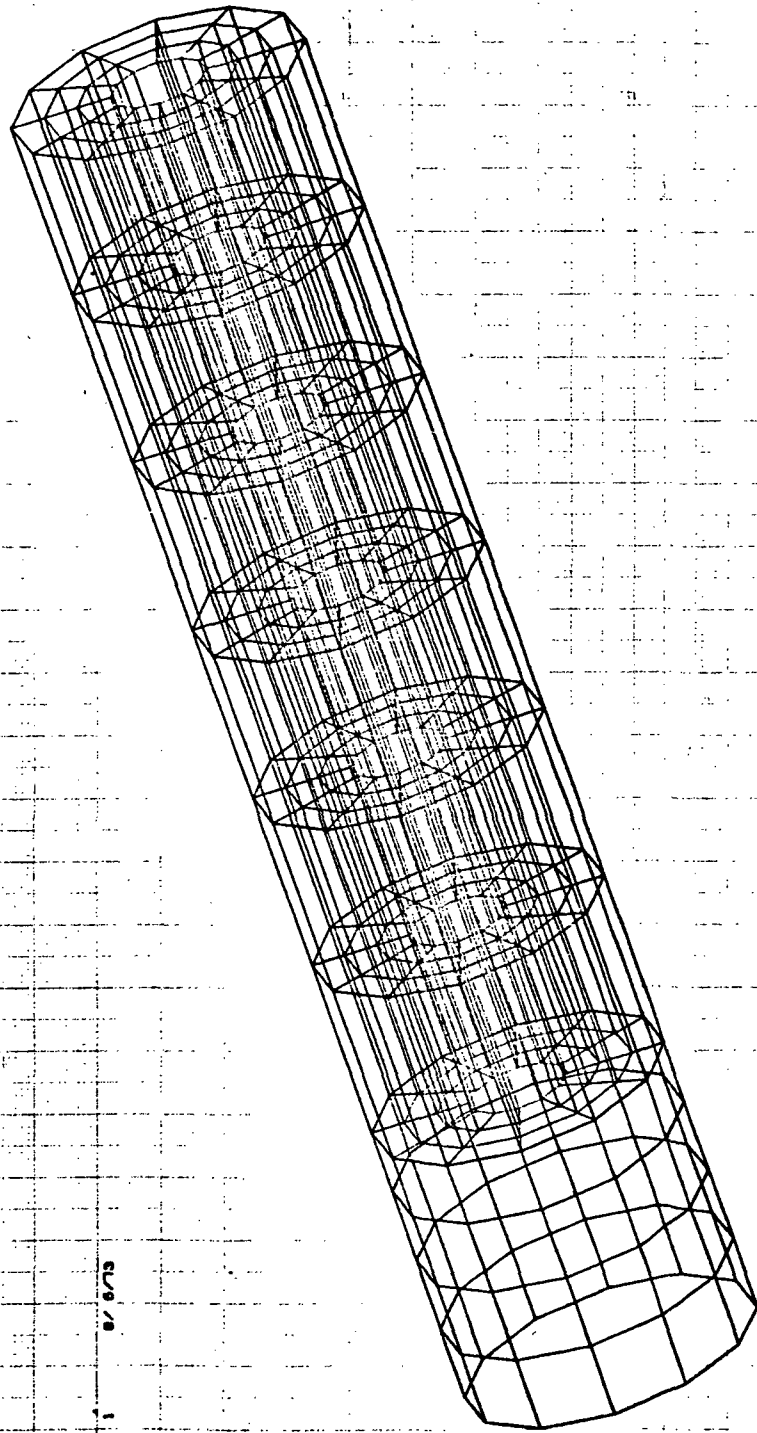


(c) LONGITUDINAL MODE  
SHOWING SOME TOR-  
SION. 196.1 Hz

T-14-15

Fig. 15 Shapes for SRB Bending Modes

After these initial two Eigenvalues and Eigenvectors were obtained, the NASTRAN model was submitted unsuccessfully several times in an effort to calculate other modes. The model during these submissions had 3,114 degrees of freedom (DOF) in the F set and was set up to omit 2,902 coordinates with 212 remaining. The OMIT Set was finally eliminated but the run took 70 min of CPU time. Attempts to run from the checkpoint tape were not successful, therefore the model was split into two parts. The forward portion consisted of 2,508 DOF in the G set (1,746 in the F set) and 282 in the A set. The NASTRAN data used in this submission is listed in Appendix A. This portion of the model is shown in Fig. 16. The aft portion consisted of 2,310 DOF in the G set (1,548 in the F set) and 266 in the A set. The NASTRAN data used is also included in Appendix A. Figure 17 presents a view of the aft portion of the model. In order to keep the computation time at a reasonable level, these half structure models were not permitted to proceed into the Eigenvalue routines, as may be noted from the alter statements in the Executive Control Data which effectively eliminates all steps between 89 and 162, and 164 through 167. Instead, the submissions were scheduled for EXIT after DMAP statement 88. The reduced models of both portions of the SRB were then copied onto tapes. The DMAP statements and data for the tape copy run are also listed in the appendix. The combined NASTRAN model was then reduced to 116 DOF and successfully ran in Rigid Format 7. Twelve Eigenvalues were obtained (Table 5), using 17 CPU min of computer time. A description of each mode is also shown in the table. NASTRAN plot capability has not been extended to Rigid Format 7. The DMAP Alter statements in the Executive Control Cards for this submission did include statements designed to plot the real part of the complete Eigenvector but they did not function properly for this run, and only two plots were generated. The undeformed model is shown in Fig. 18, and the first bending mode in Fig. 19. These views are included to demonstrate that the DMAP alter statements will work.



PHASE 1 (PART 2 )  
SRM + PROPELLANT FWD HALF  
REAL PART OF COMPLEX EIGENVECTORS  
UNDEFORMED SHAPE

Fig. 16 1/8-Scale Model SRB Finite Element Representation - Forward Half

T14-16

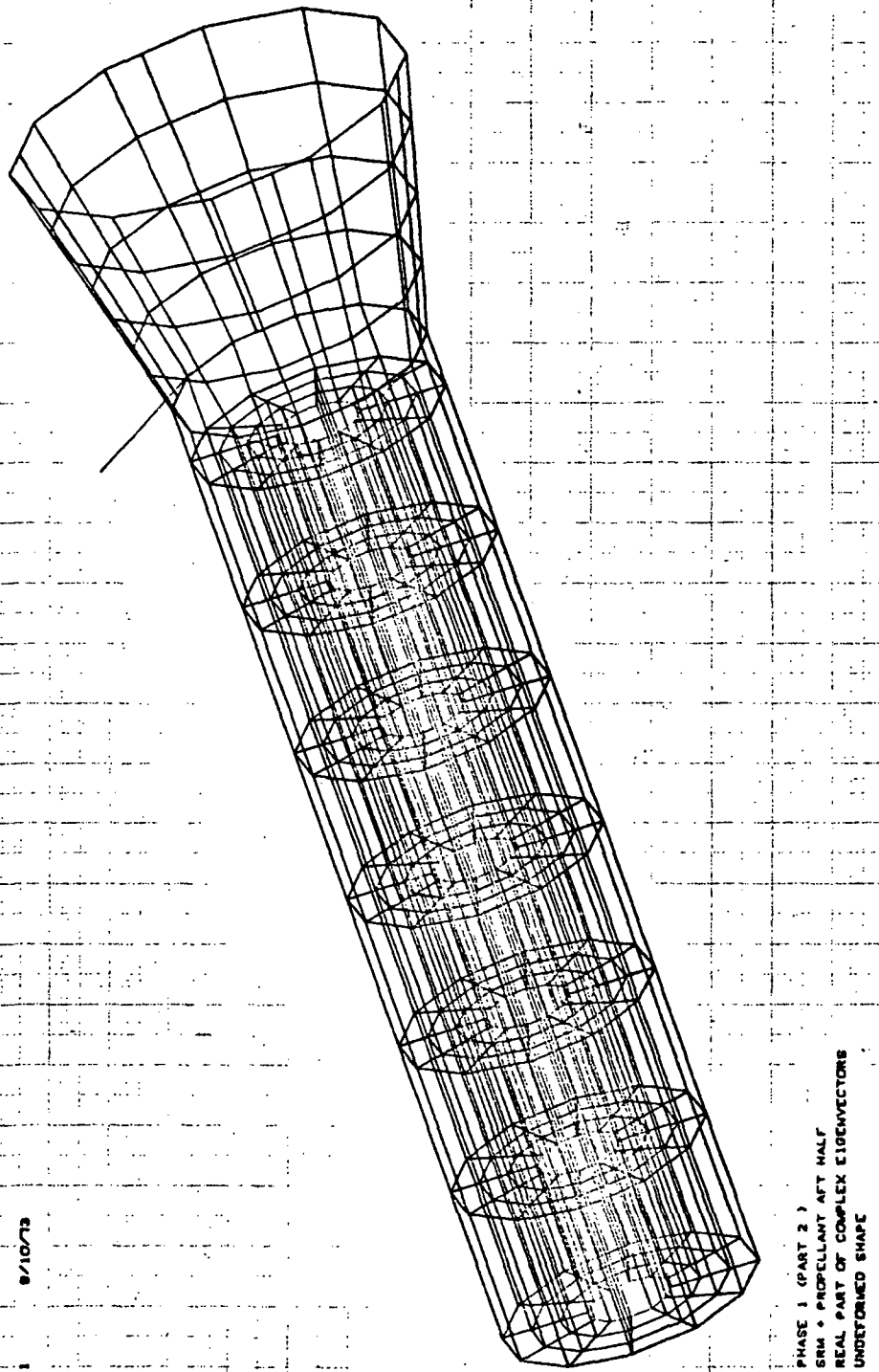


Fig. 17 1/8-Scale Model SRB Finite Element Representation - Aft Half

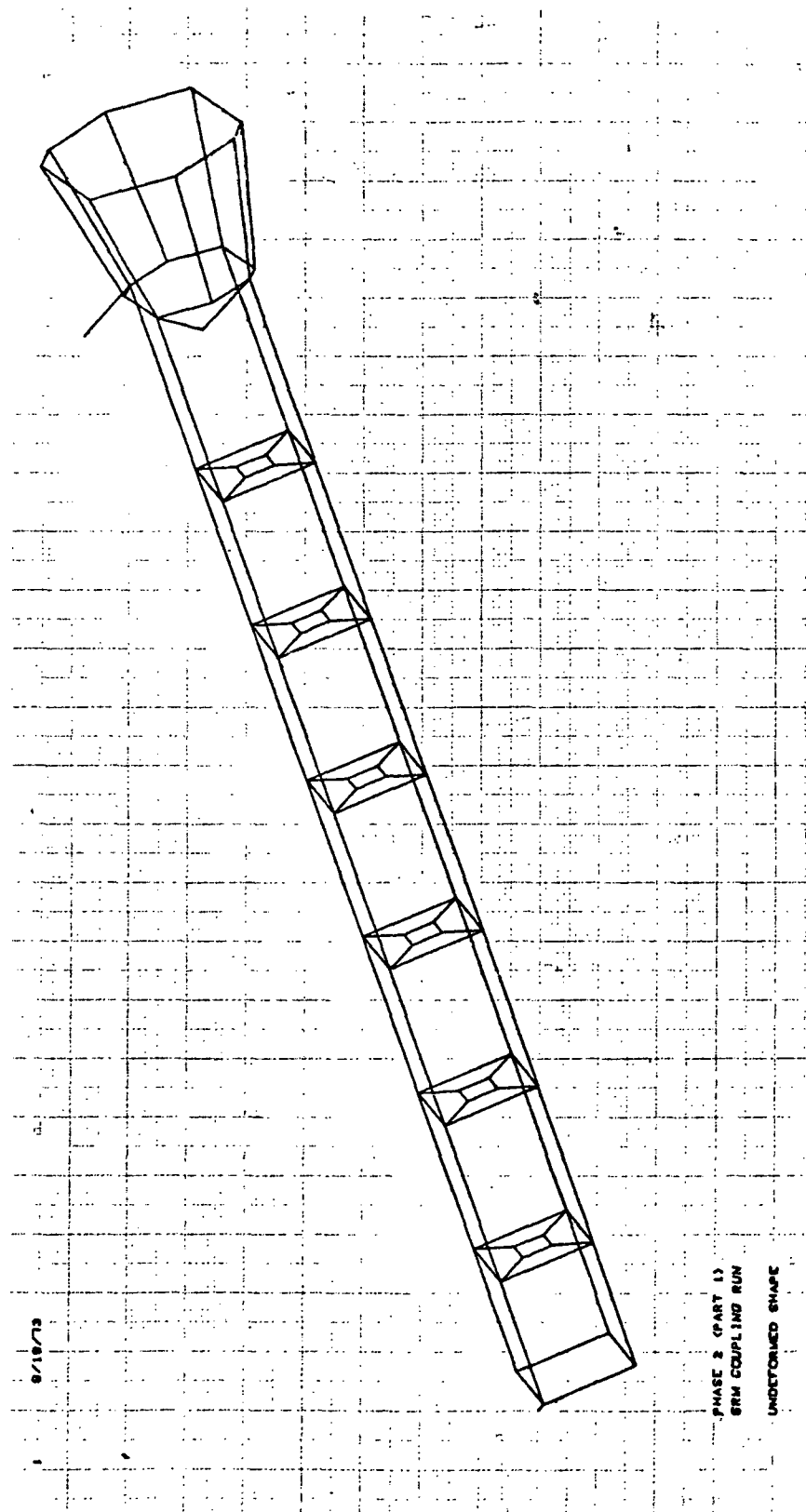
T14-17



Table 5 Summary of SRB Vibration Analysis (Full Propellant Load [Lift-Off])

Mode Number	Frequency (Hz)	Damping (C/C <sub>c</sub> )	Description
1	56.15	0.028	1st Bending Mode about Z Axis
2	56.15	0.028	1st Bending Mode about Y Axis
3	136.65	0.056	2nd Bending Mode about Y Axis
4	136.67	0.056	2nd Bending Mode about Z Axis
5	168.29	0.136	1st Torsion Mode
6	195.11	0.053	1st Axial Mode
7	224.28	0.067	3rd Bending Mode about Y Axis
8	224.42	0.067	3rd Bending Mode about Z Axis
9	245.65	0.005	Local Mode of Aft Skirt Longerons
10	269.35	0.005	Local Ring Mode of Aft Skirt
11	320.87	0.116	4th Bending Mode about Z Axis
12	321.21	0.116	4th Bending Mode about Y Axis

T14-5(T)



9/18/73

PHASE 2 (PART 1)  
SRM COUPLING RING  
UNDEFORMED SHAPE

Fig. 18 1/8 Scale Model SRB Undeformed Plot

T14-18

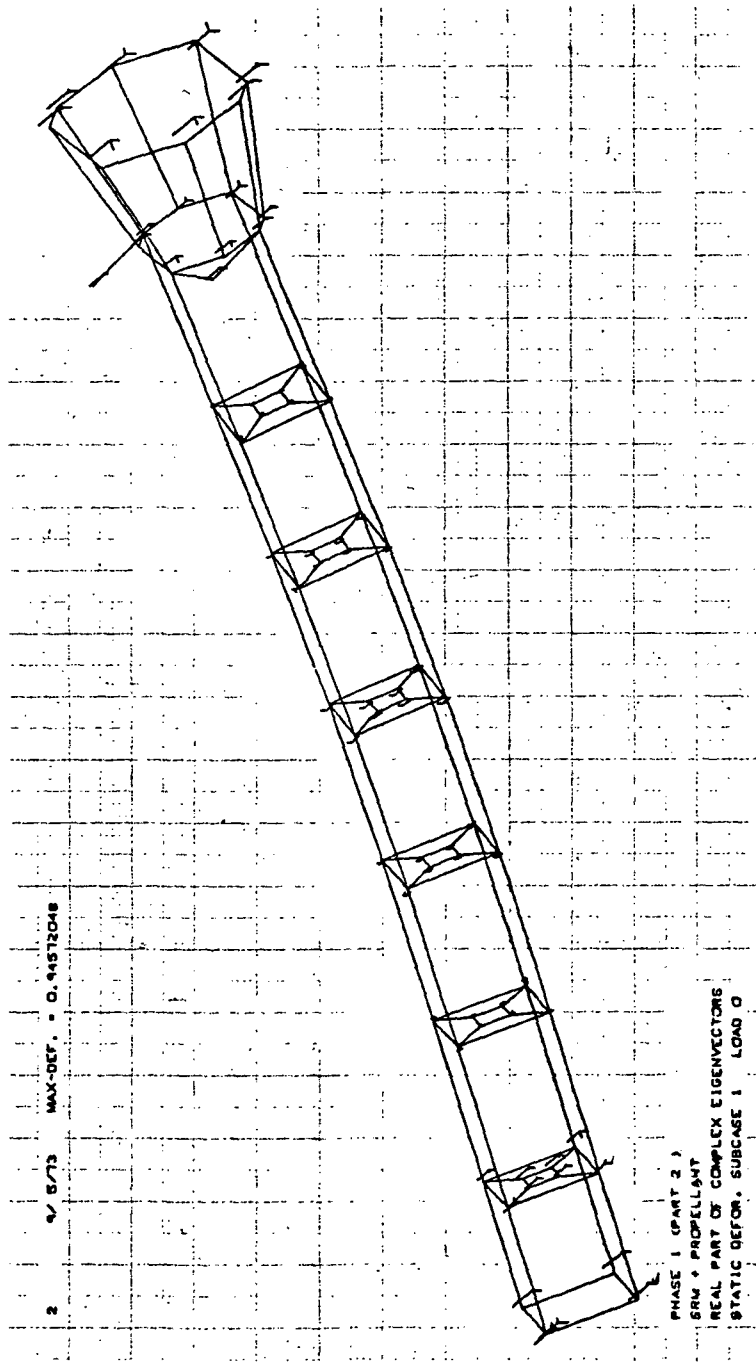


Fig. 19 1/8-Scale Model SRB First Bending Mode

T14-19

## OBSERVATIONS AND CONCLUSIONS

- The NASTRAN model weight was not changed by the Guyan reduction procedure. Table 6 compares the output of the Grid Point Weight Generator (MO) with the weights determined from the reduced mass matrix (MOGG). The latter is determined from the L set (Reference 5-1).
- The NASTRAN model reduced stiffness matrix has adequately low value for the (X) Matrix. This indicates no constraint errors as discussed in Subsection 3.5.5 of the NASTRAN Theoretical Manual (Ref. 5-6).
- Experience has indicated that NASTRAN Eigenvalue problems should be kept to less than 250 DOF in the A set for both an IBM 370-165 with less than 400K core and a CDC 6600 with less than 300K (octal) core. This is particularly true of the Inverse Power or Determinant methods which are to be used as required in Rigid Format 7. The complex arithmetic in Rigid Format 7, while necessary to calculate the damping, results in using two storage locations for each DOF, therefore these numbers would have to be halved, leaving 125 as the practical upper limit.
- The large Guyan reductions required, limit the adequacy of the model, particularly for shell modes. The model does not take advantage of symmetry since the original intent was to use substructuring procedures to couple this model to the remainder of the shuttle. Subsequent work at Langley has shown that limiting the model to  $90^{\circ}$  between vertical and lateral planes of symmetry (and/or antisymmetry), employing harmonic reduction, and planning for modal coupling, would allow more adequate definition of the shell modes.
- No work was done in comparing analysis with experiments. This task was modified to eliminate that objective due to unavailable experimental data and the necessity to devote the time to other analytical tasks.

Table 6 Weight and Residual Error Comparisons

Direction	SRB Forward Half		SRB Aft Half		Combined SRB Phase II – 116 DOF
	MO	MOGG	MO	MOGG	MOGG
X	1253.79	1253.78	1267.57	1267.56	2521.34
Y	1253.79	1253.79	1267.57	1267.57	2521.37
Z	1253.79	1253.78	1267.57	1267.56	2521.34
R <sub>X</sub>	2.5399x10 <sup>6</sup>	2.5399x10 <sup>6</sup>	2.222x10 <sup>6</sup>	2.2219x10 <sup>6</sup>	4.76185x10 <sup>6</sup>
R <sub>Y</sub>	8.8320x10 <sup>6</sup>	8.8322x10 <sup>6</sup>	2.988x10 <sup>7</sup>	2.9879x10 <sup>7</sup>	3.8710x10 <sup>7</sup>
R <sub>Z</sub>	8.6925x10 <sup>6</sup>	8.6923x10 <sup>6</sup>	3.0086x10 <sup>7</sup>	3.0086x10 <sup>7</sup>	3.8778x10 <sup>7</sup>

Weight Comparison

MO = Weight from Grid Point Weight Generator for Original Model Before Reduction  
 MOGG = Weight from Reduced Mass Matrix Used in Dynamic Analysis

Parameter	SRB Forward Half	SRB Aft Half	Combined SRB Phase II – 116 DOF
X	None > 10 <sup>-6</sup>	None > 10 <sup>-6</sup>	None > 10 <sup>-6</sup>
Ext	None > 10 <sup>-6</sup>	None > 10 <sup>-4</sup>	None > 10 <sup>-4</sup>

Residual Error Comparison

X = Rigid Body Stiffness Matrix (Ref. 5-6), Should = 0

Ext = Resultant about Arbitrary Origin of X (Ref. 5-5), Should = 0

T14-6(T)

## REFERENCES

- 5-1 Bernstein, M. et al, "Design of a Space Shuttle Structural Dynamics Model," NASA CR 112205, Rev. A, 1973.
- 5-2 United Technology Center Letter, GRS-27-73M, 13 April 1973.
- 5-3 Svalbonas, V., "Numerical Analyses of Stiffened Shells of Revolution - Theoretical Manual for STARS-25 -2B -2V Programs," IOM 000-STMECH-038, Grumman Aerospace Corp., 10 May 73.
- 5-4 Cohen, G. A, "User Document for Computer Programs for Ring-Stiffened Shells of Revolution", NASA CR 2086, 1973.
- 5-5 Bernstein, M. et al, "NASTRAN Analysis of the 1/8-Scale Shuttle Dynamic Model", NASA TMX 2893.
- 5-6 McCormick, C.W., "The NASTRAN Users' Manual", Level 15.5.

## APPENDIX

The Appendix contains the following information:

- NASTRAN data for SRB Aft Half Model - 32 pages
- NASTRAN data for SRB Forward Half Model - 30 pages
- NASTRAN data for SRB Copy Run - 5 pages
- NASTRAN data for SRB Combined Model - 212 DOF  
for Phase II, Part 1 - 17 pages
- NASTRAN data for SRB Combined Model - 116 DOF  
for Phase II, Part 1 - 17 pages
- NASTRAN data for SRB Combined Model - 116 DOF  
for Phase II, Part 2 - 14 Pages
- Complex Eigenvalue Summary from 116 DOF  
Phase II, Part 2 Run - 1 page.

SOLID ROCKET BOOSTER AFT HALF NASTRAN DATA Z703218

NASTRAN EXECUTIVE CONTROL DECK ECHO

```

ID PHASE1 SRMRIA
CHKPNT YES
TIME 60
APP DISP
SQL 7,0
DIAG 2,7,8,13,14,19,21,22
ALTER 2,2 $ PARAMETER DEFAULTS
PARAM //C,N,NOP/V,Y,NOSUB#0
PARAM //C,N,NOP/V,Y,TPCOPY#-1
PARAM //C,N,NOP/V,Y,SUBGK#-1
PARAM //C,N,NOP/V,Y,SUBK4#-1
PARAM //C,N,NOP/V,Y,SUBB#-1
PARAM //C,N,NOP/V,N,TRUE#-1
ALTER 25,27
CHKPNT EST,GEI,ECPT,GPCT
PARAM //C,N,SUB/V,N,COUPLE/V,Y,NOSUB/C,N,1
PARAM //C,N,NOP/V,N,NOK4GG#-1
PURGE KGGX,K4GG,GPST,OGPST/NOSIMP
CHKPNT KGGX,K4GG,GPST,OGPST
COND L30,NOSIMP
COND L25A,GENEL
COND L25B,COUPLE
LABEL L25A
PURGE OGPST/TRUE
CHKPNT OGPST
LABEL L25B
ALTER 30,31
CHKPNT KGGX,K4GG,GPST
LABEL L30
ALTER 34,35
PARAM //C,N,AND/V,N,NDBG/V,N,NDBGG/V,Y,SUBB
PARAM //C,N,AND/V,N,NORK4/V,Y,SUBGK/V,Y,SUBK4
PARAM //C,N,AND/V,N,NOK4/V,N,NORK4/V,N,NOK4GG
COND L34A,NOMGG
JUMP L34B
LABEL L34A
COND ERROR3,COUPLE
LABEL L34B
PURGE BNN,BFF,BAA,BGGY/NOBG
PURGE K4GGY,K4NN,K4FF,K4AA/NOK4
CHKPNT BGGY,K4GGY,K4NN,K4FF,K4AA,MGG,BGG,BNN,BFF,BAA
ALTER 37,37
COND LBL1,NOMGG
ALTER 42,42 $ IF COUPLING RUN,COMBINES SUBSTRUCTURES.
PURGE CPGI,KI,MI,KGGI,MGGI,KGGS,MGGS,KGT,MGT/COUPLE
PURGE K4GGS,K4GGI,K4GT,GIKI,K4II,K4I/COUPLE
PURGE HI,BGGS,BGCI,BGT,GFAC,KFAC,BFAC/COUPLE
COND LPC9,COUPLE $ SKIP,NOT A COUPLING RUN
INPUT1 /.../C,N,-3/C,N,9/V,Y,TPNAME9 $ LIST TAPE & REWIND
    
```



NASTRAN EXECUTIVE CONTROL DECK ECHO

```

PARAM //C,N,NOP/V,N,PASS#1 $ INITIAL LOOP PASS PARAMETER
PURGE K4GGS,K4GGI,K4GT,GIKI,K4I1,K4I,GFAC,KFAC/NORK4
PURGE GIKI,GFAC/SUBGK/K4I,KFAC/SUBK4/BGGS,BGGI,BGT,BFAC/SUBB
JUMP LOOPC
LABEL LOOPC $ TOP OF LOOP
PARAM //C,N,SUB/V,N,PASS1/V,N,PASS/C,N,2
INPUTT1 /CPGI,KI,MI,,/C,N,0/C,N,9 $
COND LPC1,PASS1
JUMP LPC3
LABEL LPC1
MERGE. ...KI,CPGI,/KGGG/C,N,-1/C,N,2/C,N,6
MERGE. ...MI,CPGI,/MGGG/C,N,-1/C,N,2/C,N,6
COND LPC2,NORK4
MERGE. ....CPGI,/K4GGS/C,N,-1/C,N,2/C,N,6
LABEL LPC2
COND LPC3,SUBB
MERGE. ....CPGI,/BGGS /C,N,-1/C,N,2/C,N,6
LABEL LPC3
COND LPC4,PASS1
MERGE. ...KI,CPGI,/KGGI/C,N,-1/C,N,2/C,N,6
MERGE. ...MI,CPGI,/MGGI/C,N,-1/C,N,2/C,N,6
ADD KGGG,KGGI/KGT $
EQUIV KGT,KGGG/TRUL
ADD MGGG,MGGI/MGT $
EQUIV MGT,MGGG/TRUE
LABEL LPC4
COND LPC7,NORK4
COND LPC5,SURGK
PARAML GFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,GIR $
PARAMR //C,N,EU/C,N,0,0/C,N,0,0/V,N,GIR/V,N,OUTC/V,N,INCI/V,N,INC2/
V,N,NOGI $
PURGE GIKI/NOGI
COND LPC5,NOGI
PARAMR //C,N,COMPLEX/C,N,0,0/V,N,GIR/C,N,0,0/V,N,GI $
ADD KI,/GIKI/V,N,GI $
LABEL LPC5
COND LPC6,SUBK4
PARAML KFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,K4R $
PARAMR //C,N,EU/C,N,0,0/C,N,0,0/V,N,K4R/V,N,OUTC/V,N,INCI/V,N,INC2/
V,N,NOK4I $
PURGE K4I/NOK4I
COND LPC6,NOK4I
INPUTT1 /K4I,.,.,./C,N,0/C,N,9 $
LABEL LPC6
ADD GIKI,K4I/K4I1
MERGE. ...K4I1,CPGI,/K4GGI/C,N,-1/C,N,2/C,N,6
ADD K4GGS,K4GGI/K4GT
EQUIV K4GT,K4GGS/TRUE
LABEL LPC7
COND LPC8,SUBB

```

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

```

PARAML    BFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,BIR $
PARAMR    //C,N,EQ/C,N,0.0/C,N,0.0/V,N,BIR/V,N,OUTC/V,N,INC1/V,N,INC2/
          V,N,NOBJ $
COND      LPC8,NOBJ
INPUTT1   /B1,.../C,N,0/C,N,9 $
MERGE,    ...BI,CPGI,/BGG1/C,N,-1/C,N,2/C,N,6
ADD       BGG5,BGG1/BGT $
EQUIV     BGT,BGG5/TRUE
LABEL     LPC8
PARAM     //C,N,ADD/V,N,PASS/V,N,PASS/C,N,1
PARAM     //C,N,SUB/V,N,SKIP2/V,Y,NOSUB/V,N,PASS
COND      LPC9,SKIP2
REPT      LUOPC,20
LABEL     LPC9
CHKPNT    KGG5,MGG5,K4GG5,BGG5
ADD       KGGX,KGG5/KGGY $
CHKPNT    KGGY
ADD       MGG,MGG5/MGGY $
CHKPNT    MGGY
COND      LPC11,NOK4
ADD       K4GG,K4GG5/K4GGY
CHKPNT    K4GGY
LABEL     LPC11
COND      LPC12,NOBG
ADD       BGG,BGG5/BGGY
CHKPNT    BGGY
LABEL     LPC12
EQUIV     KGGY,KGG/NOGENL $
ALTER    45,45
SMA3      GE1,KGGY/KGG/V,N,LUSET/V,N,NOGENL/V,N,NOSIM#1 $
ALTER    51,53
PURGE     GM/MPCF1/GO/UNIT/KFS/SINGLE
EQUIV     KGG,KNN/MPCF1/MGGY,MNN/MPCF1/BGGY,BNN/MPCF1/K4GGY,K4NN/MPCF1
CHKPNT    GM,RG,GD,KFS,uset,KNN,MNN,BNN,K4NN
COND      L53A,NUMGG
ADD       MGG,/WGG/C,Y,ALPHA#X386.4,0.00 $
MATGPR    GPL,uset,SIL,WGG//C,N,6
LABEL     L53A
COND      L53B,COUPLE
JUMP      LBL4
LABEL     L53B
ALTER    63,63
MCE2      USET,GM,KGG,MGGY,BGGY,K4GGY/KNN,MNN,BNN,K4NN
ALTER    74,74
COND      L87,OMIT
ALTER    77,77
ALTER    80,81
COND      LBLB,NOBG
ALTER    85,85
COND      L87,NOK4

```

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

```

ALTER 87
LABEL      L87
PURGE     CPARL,CPFOA,CPNSF,CPGMN,EQR,EQL,EOA,EQQ,EOF,EON,EQM,EOG/REACT
PURGE     EX,EXT,EOMT,EQNT,EOGT,EOGTC,MOGG,MOGGY/REACT
PURGE     KLL,KLR,KRR,LLL,ULL,DM,X,EQRT,DMT,GOT,GMT/REACT
COND      LCP5,REACT $ R-SET MUST BE DEFINED TO GENERATE EOG
-----
RBMG1     USET,KAA,/KLL,KLR,KRR,,, $
RBMG2     KLL/LLL,ULL
RBMG3     LLL,ULL,KLR,KRR/DM
CHKPNT    KLL,KLR,KRR,DM
TRNSP     EQR/EQRT
MATGPR    GPL,USET,SIL,EQNT//C,N,R
MPYAD     KLR,DM,KRR/X/C,N,1 $
MATGPR    GPL,USET,SIL,X//C,N,R
MPYAD     EQR,X,/EX/C,N,0/C,N,1/C,N,0 $
TRNSP     EX/EXT
MATGPR    GPL,USET,SIL,EXT//C,N,R
PURGE     CPFOA/OMIT/CPNSF/SINGLE/CPGMN/MPCF1
PURGE     EQO/DMIT/EQM/MPCF1
PURGE     GOT/DMIT/GMT,EQMT/MPCF1
VEC       USET/CPARL/C,N,A/C,N,R/C,N,L $
TRNSP     DM/DMT
MPYAD     EQR,DMT,/EQL/C,N,0/C,N,1/C,N,0
MERGE     EQR,,EQL,,CPARL,/EOA/C,N,1/C,N,2/C,N,2
EQUIV     EOA,EQF/DMIT
COND      LCP1,OMIT
VEC       USET/CPFOA/C,N,F/C,N,U/C,N,A $
TRNSP     GO/GOT
MPYAD     EOA,GOT,/EQO/C,N,0/C,N,1/C,N,0
MERGE     EGO,,EOA,,CPFOA,/EQF/C,N,1/C,N,2/C,N,2
-----
LABEL     LCP1
EQUIV     EQF,EON/SINGLE
COND      LCP2,SINGLE
VEC       USET/CPNSF/C,N,N/C,N,S/C,N,F $
MERGE     ,,EQF,,CPNSF,/EON/C,N,1/C,N,2/C,N,2
-----
LABEL     LCP2
TRNSP     EON/EQNT
MATGPR    GPL,USET,SIL,EQNT//C,N,N
EQUIV     EON,EOG/MPCF1
COND      LCP3,MPCF1
VEC       USET/CPGMN/C,N,G/C,N,M/C,N,N $
TRNSP     GM/GMT
MPYAD     EON,GMT,/EON/C,N,0/C,N,1/C,N,0
MERGE     EON,,EON,,CPGMN,/EOG/C,N,1/C,N,2/C,N,2
TRNSP     EOM/EQMT
MATGPR    GPL,USET,SIL,EQMT//C,N,M
-----
LABEL     LCP3
CHKPNT    CPFOA,CPNSF,CPGMN,CPARL
CHKPNT    EOG
TRNSP     EOG/EOGT

```

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

ADD EOGT./EOGTC/C.Y.ALPHA#X386.4,0.00 \$  
\$ ASSUME CONVERSION OF MASS TO LBS # 386.4  
PURGE MOGG/MOMGG/MOGGY/COUPLE  
COND LCP4,NOMGG  
SMPYAD EOG,MGG,EOGTC.../MOGG/C,N,3/C,N,1/C,N,0 \$  
LABEL LCP4  
COND LCP5,COUPLE  
SMPYAD EOG,MGGY,EOGTC.../MOGGY/C,N,3/C,N,1/C,N,0 \$  
LABEL LCP5  
MATPRN MOGG,MGGY...// \$  
COND LCP8,TPCOPY  
SEEMAT KAA...//C,N,PRINT  
SEEMAT MAA...//C,N,PRINT  
OUTPUT1 GM,GD,KFS,KAA...//C,N,-1/C,N,0/V,Y,TPNAME  
OUTPUT1 MAA...// \$  
COND LCP7,NOK4  
SEEMAT K4AA...//C,N,PRINT  
OUTPUT1 K4AA...// \$  
LABEL LCP7  
COND LCP8,NORG  
SEEMAT BAA...//C,N,PRINT  
OUTPUT1 BAA...// \$  
LABEL LCP8  
ALTER 89,162  
ALTER 164,167  
ENDALTER  
CEND

NASTRAN EXECUTIVE CONTROL DECK ECHO

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

RESTART PHASE1 .SRMRIA . 8/ 7/73. 3495.

PHASE 1 XPART 1 #  
SRM & PROPELLANT AFT HALF

CASE CONTROL DECK ECHO

CARD  
COUNT

1 TITLE # PHASE 1 XPART 1 #  
2 SUBTITLE # SRM & PROPELLANT AFT HALF  
3 MAXLINES # 60000  
4 SPC # 1  
5 BEGIN BULK

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

PHASE 1 XPART 1 U  
SRM & PROPELLANT AFT HALF

SORTED HULK DATA ECHU

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
1-	ASET1	123	7290	THRU	7292						
2-	ASET1	123	7294	THRU	7296						
3-	ASET1	123	7298	THRU	7300						
4-	ASET1	123	7302	THRU	7304						
5-	ASET1	123	7306	THRU	7308						
6-	ASET1	123	7310	THRU	7312						
7-	ASET1	123	7314	THRU	7316						
8-	ASET1	123	7318	THRU	7320						
9-	ASET1	123	7322	THRU	7324						
10-	ASET1	123	7326	THRU	7328						
11-	ASET1	123	7330	THRU	7332						
12-	ASET1	123	7334	THRU	7336						
13-	ASET1	123	7385	7388	7397						
14-	ASET1	123	7400	7409	7412	7421	7424	7481	7484		
15-	ASET1	123	7493	7496	7505	7508	7517	7520	7801		
16-	ASET1	123	7803	7805	7806	7809	7811	7813	7814		
17-	ASET1	123	7865	7867	7869	7870	7873	7875	7877		
18-	ASET1	123	7878	8352	8355						
19-	ASET1	123456	7289	7293	7297	7301	7305	7309	7313		
20-	ASET1	123456	7317	7321	7325	7329	7333				
21-	CBAR	4001	101	7577	7581	1.0	.0	.0	1		ECB01
22-	ECB01			0.365			0.365				
23-	CHAR	4002	101	7581	7585	1.0	.0	.0	1		ECB02
24-	ECB02			0.365			0.365				
25-	CBAR	4003	101	7585	7589	1.0	.0	.0	1		ECB03
26-	ECB03			0.365			0.365				
27-	CBAR	4004	101	7589	7593	1.0	.0	.0	1		ECB04
28-	ECB04			0.365			0.365				
29-	CBAR	4005	101	7593	7597	1.0	.0	.0	1		ECB05
30-	ECB05			0.365			0.365				
31-	CHAR	4006	101	7597	7601	1.0	.0	.0	1		ECB06
32-	ECB06			0.365			0.365				
33-	CHAR	4007	101	7601	7605	1.0	.0	.0	1		ECB07
34-	ECB07			0.365			0.365				
35-	CBAR	4008	101	7605	7609	1.0	.0	.0	1		ECB08
36-	ECB08			0.365			0.365				
37-	CBAR	4009	101	7609	7613	1.0	.0	.0	1		ECB09
38-	ECB09			0.365			0.365				
39-	CBAR	4010	101	7613	7617	1.0	.0	.0	1		ECB10
40-	ECB10			0.365			0.365				
41-	CBAR	4011	101	7617	7621	1.0	.0	.0	1		ECB11
42-	ECB11			0.365			0.365				
43-	CBAR	4012	101	7621	7577	1.0	.0	.0	1		ECB12
44-	ECB12			0.365			0.365				
45-	CBAR	4013	102	7801	7802	1.0	.0	.0	1		
46-	CBAR	4014	102	7802	7803	1.0	.0	.0	1		
47-	CBAR	4015	102	7803	7804	1.0	.0	.0	1		
48-	CBAR	4016	102	7804	7805	1.0	.0	.0	1		
49-	CBAR	4017	102	7805	7806	1.0	.0	.0	1		
50-	CBAR	4018	102	7806	7807	1.0	.0	.0	1		

PHASE I XPART I II  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
51-CBAR	4019	102	7807	7808	1.0	.0	.0	1		
52-CBAR	4020	102	7808	7809	1.0	.0	.0	1		
53-CBAR	4021	102	7809	7810	1.0	.0	.0	1		
54-CBAR	4022	102	7810	7811	1.0	.0	.0	1		
55-CBAR	4023	102	7811	7812	1.0	.0	.0	1		
56-CBAR	4024	102	7812	7813	1.0	.0	.0	1		
57-CBAR	4025	102	7813	7814	1.0	.0	.0	1		
58-CBAR	4026	102	7814	7815	1.0	.0	.0	1		
59-CBAR	4027	102	7815	7816	1.0	.0	.0	1		
60-CBAR	4028	102	7816	7801	1.0	.0	.0	1		
61-CBAR	4029	103	7865	7866	1.0	.0	.0	1		ECB29
62-ECB29			-0.78				-0.78			
63-CBAR	4030	103	7866	7867	1.0	.0	.0	1		ECB30
64-ECB30			-0.78				-0.78			
65-CBAR	4031	103	7867	7868	1.0	.0	.0	1		ECB31
66-ECB31			-0.78				-0.78			
67-CBAR	4032	103	7868	7869	1.0	.0	.0	1		ECB32
68-ECB32			-0.78				-0.78			
69-CBAR	4033	103	7869	7870	1.0	.0	.0	1		ECB33
70-ECB33			-0.78				-0.78			
71-CBAR	4034	103	7870	7871	1.0	.0	.0	1		ECB34
72-ECB34			-0.78				-0.78			
73-CBAR	4035	103	7871	7872	1.0	.0	.0	1		ECB35
74-ECB35			-0.78				-0.78			
75-CBAR	4036	103	7872	7873	1.0	.0	.0	1		ECB36
76-ECB36			-0.78				-0.78			
77-CBAR	4037	103	7873	7874	1.0	.0	.0	1		ECB37
78-ECB37			-0.78				-0.78			
79-CBAR	4038	103	7874	7875	1.0	.0	.0	1		ECB38
80-ECB38			-0.78				-0.78			
81-CBAR	4039	103	7875	7876	1.0	.0	.0	1		ECB39
82-ECB39			-0.78				-0.78			
83-CBAR	4040	103	7876	7877	1.0	.0	.0	1		ECB40
84-ECB40			-0.78				-0.78			
85-CBAR	4041	103	7877	7878	1.0	.0	.0	1		ECB41
86-ECB41			-0.78				-0.78			
87-CBAR	4042	103	7878	7879	1.0	.0	.0	1		ECB42
88-ECB42			-0.78				-0.78			
89-CBAR	4043	103	7879	7880	1.0	.0	.0	1		ECB43
90-ECB43			-0.78				-0.78			
91-CBAR	4044	103	7880	7865	1.0	.0	.0	1		ECB44
92-ECB44			-0.78				-0.78			
93-CBAR	4101	104	7803	7819	.9659	.0	-0.2588	1		ECB101
94-ECB101			0.7727		-0.2071	0.7727		-0.2071		
95-CBAR	4102	104	7819	7835	.9659	.0	-0.2588	1		ECB102
96-ECB102			0.7727		-0.2071	0.7727		-0.2071		
97-CBAR	4103	104	7835	7851	.9659	.0	-0.2588	1		ECB103
98-ECB103			0.7727		-0.2071	0.7727		-0.2071		
99-CBAR	4104	104	7851	7867	.9659	.0	-0.2588	1		ECB104
100-ECB104			0.7727		-0.2071	0.7727		-0.2071		



PHASE 1 XPART 1 U  
SRM 6 PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARS

COUNT	1	2	3	4	5	6	7	8	9	10
101-	CBAR	4105	104	7806	7822	.9659	.0	-0.2588	1	ECB105
102-	ECB105			0.7727		-0.2071	0.7727			-0.2071
103-	CBAR	4106	104	7822	7838	.9659	.0	-0.2588	1	ECB106
104-	ECB106			0.7727		-0.2071	0.7727			-0.2071
105-	CBAR	4107	104	7838	7854	.9659	.0	-0.2588	1	ECB107
106-	ECB107			0.7727		-0.2071	0.7727			-0.2071
107-	CBAR	4108	104	7854	7870	.9659	.0	-0.2588	1	ECB108
108-	ECB108			0.7727		-0.2071	0.7727			-0.2071
109-	CBAR	4109	104	7811	7827	.9659	.0	-0.2588	1	ECB109
110-	ECB109			0.7727		-0.2071	0.7727			-0.2071
111-	CBAR	4110	104	7827	7843	.9659	.0	-0.2588	1	ECB110
112-	ECB110			0.7727		-0.2071	0.7727			-0.2071
113-	CBAR	4111	104	7843	7859	.9659	.0	-0.2588	1	ECB111
114-	ECB111			0.7727		-0.2071	0.7727			-0.2071
115-	CBAR	4112	104	7859	7875	.9659	.0	-0.2588	1	ECB112
116-	ECB112			0.7727		-0.2071	0.7727			-0.2071
117-	CBAR	4113	104	7814	7830	.9659	.0	-0.2588	1	ECB113
118-	ECB113			0.7727		-0.2071	0.7727			-0.2071
119-	CBAR	4114	104	7830	7846	.9659	.0	-0.2588	1	ECB114
120-	ECB114			0.7727		-0.2071	0.7727			-0.2071
121-	CBAR	4115	104	7846	7862	.9659	.0	-0.2588	1	ECB115
122-	ECB115			0.7727		-0.2071	0.7727			-0.2071
123-	CBAR	4116	104	7862	7878	.9659	.0	-0.2588	1	ECB116
124-	ECB116			0.7727		-0.2071	0.7727			-0.2071
125-	CHEXA1	1217	1000	7290	7338	7342	7294	7289	7337	EMX1217
126-	EMX1217		7341	7293						
127-	CHEXA1	1218	1000	7291	7339	7343	7295	7290	7338	EMX1218
128-	EMX1218		7342	7294						
129-	CHEXA1	1219	1000	7292	7340	7344	7296	7291	7339	EMX1219
130-	EMX1219		7343	7295						
131-	CHEXA1	1220	1000	7294	7342	7346	7298	7293	7341	EMX1220
132-	EMX1220		7345	7297						
133-	CHEXA1	1221	1000	7295	7343	7347	7299	7294	7342	EMX1221
134-	EMX1221		7346	7298						
135-	CHEXA1	1222	1000	7296	7344	7348	7300	7295	7343	EMX1222
136-	EMX1222		7347	7299						
137-	CHEXA1	1223	1000	7298	7346	7350	7302	7297	7345	EMX1223
138-	EMX1223		7349	7301						
139-	CHEXA1	1224	1000	7299	7347	7351	7303	7298	7346	EMX1224
140-	EMX1224		7350	7302						
141-	CHEXA1	1225	1000	7300	7348	7352	7304	7299	7347	EMX1225
142-	EMX1225		7351	7303						
143-	CHEXA1	1226	1000	7302	7350	7354	7306	7301	7349	EMX1226
144-	EMX1226		7353	7305						
145-	CHEXA1	1227	1000	7303	7351	7355	7307	7302	7350	EMX1227
146-	EMX1227		7354	7306						
147-	CHEXA1	1228	1000	7304	7352	7356	7308	7303	7351	EMX1228
148-	EMX1228		7355	7307						
149-	CHEXA1	1229	1000	7306	7354	7358	7310	7305	7353	EMX1229
150-	EMX1229		7357	7309						

PHASE 1 XPART 1 H  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO										
CARD	1	2	3	4	5	6	7	8	9	10
COUNT										
151- CHEXA1	1230	1000	7307	7355	7359	7311	7306	7354	EHX1230	
152- EHX1230		7358	7310							
153- CHEXA1	1231	1000	7308	7356	7360	7312	7307	7355	EHX1231	
154- EHX1231		7359	7311							
155- CHEXA1	1232	1000	7310	7358	7362	7314	7309	7357	EHX1232	
156- EHX1232		7361	7313							
157- CHEXA1	1233	1000	7311	7359	7363	7315	7310	7358	EHX1233	
158- EHX1233		7362	7314							
159- CHEXA1	1234	1000	7312	7360	7364	7316	7311	7359	EHX1234	
160- EHX1234		7363	7315							
161- CHEXA1	1235	1000	7314	7362	7366	7318	7313	7361	EHX1235	
162- EHX1235		7365	7317							
163- CHEXA1	1236	1000	7315	7363	7367	7319	7314	7362	EHX1236	
164- EHX1236		7366	7318							
165- CHEXA1	1237	1000	7316	7364	7368	7320	7315	7363	EHX1237	
166- EHX1237		7367	7319							
167- CHEXA1	1238	1000	7318	7366	7370	7322	7317	7365	EHX1238	
168- EHX1238		7369	7321							
169- CHEXA1	1239	1000	7319	7367	7371	7323	7318	7366	EHX1239	
170- EHX1239		7370	7322							
171- CHEXA1	1240	1000	7320	7368	7372	7324	7319	7367	EHX1240	
172- EHX1240		7371	7323							
173- CHEXA1	1241	1000	7322	7370	7374	7326	7321	7369	EHX1241	
174- EHX1241		7373	7325							
175- CHEXA1	1242	1000	7323	7371	7375	7327	7322	7370	EHX1242	
176- EHX1242		7374	7326							
177- CHEXA1	1243	1000	7324	7372	7376	7328	7323	7371	EHX1243	
178- EHX1243		7375	7327							
179- CHEXA1	1244	1000	7326	7374	7378	7330	7325	7373	EHX1244	
180- EHX1244		7377	7329							
181- CHEXA1	1245	1000	7327	7375	7379	7331	7326	7374	EHX1245	
182- EHX1245		7378	7330							
183- CHEXA1	1246	1000	7328	7376	7380	7332	7327	7375	EHX1246	
184- EHX1246		7379	7331							
185- CHEXA1	1247	1000	7330	7378	7382	7334	7329	7377	EHX1247	
186- EHX1247		7381	7333							
187- CHEXA1	1248	1000	7331	7379	7383	7335	7330	7378	EHX1248	
188- EHX1248		7382	7334							
189- CHEXA1	1249	1000	7332	7380	7384	7336	7331	7379	EHX1249	
190- EHX1249		7383	7335							
191- CHEXA1	1250	1000	7334	7382	7338	7290	7333	7381	EHX1250	
192- EHX1250		7337	7289							
193- CHEXA1	1251	1000	7335	7383	7339	7291	7334	7382	EHX1251	
194- EHX1251		7338	7290							
195- CHEXA1	1252	1000	7336	7384	7340	7292	7335	7383	EHX1252	
196- EHX1252		7339	7291							
197- CHEXA1	1253	1000	7338	7386	7390	7342	7337	7385	EHX1253	
198- EHX1253		7389	7341							
199- CHEXA1	1254	1000	7339	7387	7391	7343	7338	7386	EHX1254	
200- EHX1254		7390	7342							

PHASE 1 XPART 1 II  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
201- CHEXA1	1255	1000	7340	7388	7392	7344	7339	7387		CHX1255
202- CHX1255		7391	7343							
203- CHEXA1	1256	1000	7342	7390	7394	7346	7341	7389		CHX1256
204- CHX1256		7393	7345							
205- CHEXA1	1257	1000	7343	7391	7395	7347	7342	7390		CHX1257
206- CHX1257		7394	7346							
207- CHEXA1	1258	1000	7344	7392	7396	7348	7343	7391		CHX1258
208- CHX1258		7395	7347							
209- CHEXA1	1259	1000	7346	7394	7398	7350	7345	7393		CHX1259
210- CHX1259		7397	7349							
211- CHEXA1	1260	1000	7347	7395	7399	7351	7346	7394		CHX1260
212- CHX1260		7398	7350							
213- CHEXA1	1261	1000	7348	7396	7400	7352	7347	7395		CHX1261
214- CHX1261		7399	7351							
215- CHEXA1	1262	1000	7350	7398	7402	7354	7349	7397		CHX1262
216- CHX1262		7401	7353							
217- CHEXA1	1263	1000	7351	7399	7403	7355	7350	7398		CHX1263
218- CHX1263		7402	7354							
219- CHEXA1	1264	1000	7352	7400	7404	7356	7351	7399		CHX1264
220- CHX1264		7403	7355							
221- CHEXA1	1265	1000	7354	7402	7406	7358	7353	7401		CHX1265
222- CHX1265		7405	7357							
223- CHEXA1	1266	1000	7355	7403	7407	7359	7354	7402		CHX1266
224- CHX1266		7406	7358							
225- CHEXA1	1267	1000	7356	7404	7408	7360	7355	7403		CHX1267
226- CHX1267		7407	7359							
227- CHEXA1	1268	1000	7358	7406	7410	7362	7357	7405		CHX1268
228- CHX1268		7409	7361							
229- CHEXA1	1269	1000	7359	7407	7411	7363	7358	7406		CHX1269
230- CHX1269		7410	7362							
231- CHEXA1	1270	1000	7360	7408	7412	7364	7359	7407		CHX1270
232- CHX1270		7411	7363							
233- CHEXA1	1271	1000	7362	7410	7414	7366	7361	7409		CHX1271
234- CHX1271		7413	7365							
235- CHEXA1	1272	1000	7363	7411	7415	7367	7362	7410		CHX1272
236- CHX1272		7414	7366							
237- CHEXA1	1273	1000	7364	7412	7416	7368	7363	7411		CHX1273
238- CHX1273		7415	7367							
239- CHEXA1	1274	1000	7366	7414	7418	7370	7365	7413		CHX1274
240- CHX1274		7417	7369							
241- CHEXA1	1275	1000	7367	7415	7419	7371	7366	7414		CHX1275
242- CHX1275		7418	7370							
243- CHEXA1	1276	1000	7368	7416	7420	7372	7367	7415		CHX1276
244- CHX1276		7419	7371							
245- CHEXA1	1277	1000	7370	7418	7422	7374	7369	7417		CHX1277
246- CHX1277		7421	7373							
247- CHEXA1	1278	1000	7371	7419	7423	7375	7370	7418		CHX1278
248- CHX1278		7422	7374							
249- CHEXA1	1279	1000	7372	7420	7424	7376	7371	7419		CHX1279
250- CHX1279		7423	7375							

PHASE 1 XPART 1 □  
SRM & PROPELLANT AFI HALF

SORTED BULK DATA ECHO											
CARD	COUNT	1	2	3	4	5	6	7	8	9	10
251- CHEXA1	1280		1000	7374	7422	7426	7378	7373	7421	CHX1280	
252- CHX1280		7425	7377								
253- CHEXA1	1281		1000	7375	7423	7427	7379	7374	7422	CHX1281	
254- CHX1281		7426	7378								
255- CHEXA1	1282		1000	7376	7424	7428	7380	7375	7423	CHX1282	
256- CHX1282		7427	7379								
257- CHEXA1	1283		1000	7378	7426	7430	7382	7377	7425	CHX1283	
258- CHX1283		7429	7381								
259- CHEXA1	1284		1000	7379	7427	7431	7383	7378	7426	CHX1284	
260- CHX1284		7430	7382								
261- CHEXA1	1285		1000	7380	7428	7432	7384	7379	7427	CHX1285	
262- CHX1285		7431	7383								
263- CHEXA1	1286		1000	7382	7430	7386	7338	7381	7429	CHX1286	
264- CHX1286		7385	7337								
265- CHEXA1	1287		1000	7383	7431	7387	7339	7382	7430	CHX1287	
266- CHX1287		7386	7338								
267- CHEXA1	1288		1000	7384	7432	7388	7340	7383	7431	CHX1288	
268- CHX1288		7387	7339								
269- CHEXA1	1289		1000	7386	7434	7438	7380	7384	7433	CHX1289	
270- CHX1289		7437	7389								
271- CHEXA1	1290		1000	7387	7435	7439	7381	7386	7434	CHX1290	
272- CHX1290		7438	7390								
273- CHEXA1	1291		1000	7388	7436	7440	7392	7387	7435	CHX1291	
274- CHX1291		7439	7391								
275- CHEXA1	1292		1000	7390	7438	7442	7394	7389	7437	CHX1292	
276- CHX1292		7441	7393								
277- CHEXA1	1293		1000	7391	7439	7443	7395	7390	7438	CHX1293	
278- CHX1293		7442	7394								
279- CHEXA1	1294		1000	7392	7440	7444	7396	7391	7439	CHX1294	
280- CHX1294		7443	7395								
281- CHEXA1	1295		1000	7394	7442	7446	7398	7393	7441	CHX1295	
282- CHX1295		7445	7397								
283- CHEXA1	1296		1000	7395	7443	7447	7399	7394	7442	CHX1296	
284- CHX1296		7446	7398								
285- CHEXA1	1297		1000	7396	7444	7448	7400	7395	7443	CHX1297	
286- CHX1297		7447	7399								
287- CHEXA1	1298		1000	7398	7446	7450	7402	7397	7445	CHX1298	
288- CHX1298		7449	7401								
289- CHEXA1	1299		1000	7399	7447	7451	7403	7398	7446	CHX1299	
290- CHX1299		7450	7402								
291- CHEXA1	1300		1000	7400	7448	7452	7404	7399	7447	CHX1300	
292- CHX1300		7451	7403								
293- CHEXA1	1301		1000	7402	7450	7454	7406	7401	7449	CHX1301	
294- CHX1301		7453	7405								
295- CHEXA1	1302		1000	7403	7451	7455	7407	7402	7450	CHX1302	
296- CHX1302		7454	7406								
297- CHEXA1	1303		1000	7404	7452	7456	7408	7403	7451	CHX1303	
298- CHX1303		7455	7407								
299- CHEXA1	1304		1000	7406	7454	7458	7410	7405	7453	CHX1304	
300- CHX1304		7457	7409								

PHASE I XPART 1 II  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO										
CARD	1	2	3	4	5	6	7	8	9	10
COUNT	..	..	..	..	..	..	..	..	..	..
301-CHEXA1	1305	1000	7407	7455	7459	7411	7406	7454	EHX1305	
302-EHX1305		7458	7410							
303-CHEXA1	1306	1000	7408	7456	7460	7412	7407	7455	EHX1306	
304-EHX1306		7459	7411							
305-CHEXA1	1307	1000	7410	7458	7462	7414	7409	7457	EHX1307	
306-EHX1307		7461	7413							
307-CHEXA1	1308	1000	7411	7459	7463	7415	7410	7458	EHX1308	
308-EHX1308		7462	7414							
309-CHEXA1	1309	1000	7412	7460	7464	7416	7411	7459	EHX1309	
310-EHX1309		7463	7415							
311-CHEXA1	1310	1000	7414	7462	7466	7418	7413	7461	EHX1310	
312-EHX1310		7465	7417							
313-CHEXA1	1311	1000	7415	7463	7467	7419	7414	7462	EHX1311	
314-EHX1311		7466	7418							
315-CHEXA1	1312	1000	7416	7464	7468	7420	7415	7463	EHX1312	
316-EHX1312		7467	7419							
317-CHEXA1	1313	1000	7418	7466	7470	7422	7417	7465	EHX1313	
318-EHX1313		7469	7421							
319-CHEXA1	1314	1000	7419	7467	7471	7423	7418	7466	EHX1314	
320-EHX1314		7470	7422							
321-CHEXA1	1315	1000	7420	7468	7472	7424	7419	7467	EHX1315	
322-EHX1315		7471	7423							
323-CHEXA1	1316	1000	7422	7470	7474	7426	7421	7469	EHX1316	
324-EHX1316		7473	7425							
325-CHEXA1	1317	1000	7423	7471	7475	7427	7422	7470	EHX1317	
326-EHX1317		7474	7426							
327-CHEXA1	1318	1000	7424	7472	7476	7428	7423	7471	EHX1318	
328-EHX1318		7475	7427							
329-CHEXA1	1319	1000	7426	7474	7478	7430	7425	7473	EHX1319	
330-EHX1319		7477	7429							
331-CHEXA1	1320	1000	7427	7475	7479	7431	7426	7474	EHX1320	
332-EHX1320		7478	7430							
333-CHEXA1	1321	1000	7428	7476	7480	7432	7427	7475	EHX1321	
334-EHX1321		7479	7431							
335-CHEXA1	1322	1000	7430	7478	7434	7386	7429	7477	EHX1322	
336-EHX1322		7433	7385							
337-CHEXA1	1323	1000	7431	7479	7435	7387	7430	7478	EHX1323	
338-EHX1323		7434	7386							
339-CHEXA1	1324	1000	7432	7480	7436	7388	7431	7479	EHX1324	
340-EHX1324		7435	7387							
341-CHEXA1	1325	1000	7434	7482	7486	7438	7433	7481	EHX1325	
342-EHX1325		7485	7437							
343-CHEXA1	1326	1000	7435	7483	7487	7439	7434	7482	EHX1326	
344-EHX1326		7486	7438							
345-CHEXA1	1327	1000	7436	7484	7488	7440	7435	7483	EHX1327	
346-EHX1327		7487	7439							
347-CHEXA1	1328	1000	7438	7486	7490	7442	7437	7485	EHX1328	
348-EHX1328		7489	7441							
349-CHEXA1	1329	1000	7439	7487	7491	7443	7438	7486	EHX1329	
350-EHX1329		7490	7442							

PHASE I XPART I II  
SRM & PROPELLANT AFI HALF

SORTED BULK DATA ECHO										
CARD	1	2	3	4	5	6	7	8	9	10
351-CHEXA1	1330	1000	7440	7488	7492	7444	7439	7487	6HX1330	
352-CHX1330		7491	7443							
353-CHEXA1	1331	1000	7442	7490	7494	7446	7441	7489	6HX1331	
354-CHX1331		7493	7445							
355-CHEXA1	1332	1000	7443	7491	7495	7447	7442	7490	CHX1332	
356-CHX1332		7494	7446							
357-CHEXA1	1333	1000	7444	7492	7496	7448	7443	7491	CHX1333	
358-CHX1333		7495	7447							
359-CHEXA1	1334	1000	7446	7494	7498	7450	7445	7493	6HX1334	
360-CHX1334		7497	7449							
361-CHEXA1	1335	1000	7447	7495	7499	7451	7446	7494	CHX1335	
362-CHX1335		7498	7450							
363-CHEXA1	1336	1000	7448	7496	7500	7452	7447	7495	CHX1336	
364-CHX1336		7499	7451							
365-CHEXA1	1337	1000	7450	7498	7502	7454	7449	7497	CHX1337	
366-CHX1337		7501	7453							
367-CHEXA1	1338	1000	7451	7499	7503	7455	7450	7498	CHX1338	
368-CHX1338		7502	7454							
369-CHEXA1	1339	1000	7452	7500	7504	7456	7451	7499	CHX1339	
370-CHX1339		7503	7455							
371-CHEXA1	1340	1000	7454	7502	7506	7458	7453	7501	6HX1340	
372-CHX1340		7505	7457							
373-CHEXA1	1341	1000	7455	7503	7507	7459	7454	7502	CHX1341	
374-CHX1341		7506	7458							
375-CHEXA1	1342	1000	7456	7504	7508	7460	7455	7503	6HX1342	
376-CHX1342		7507	7459							
377-CHEXA1	1343	1000	7458	7506	7510	7462	7457	7505	6HX1343	
378-CHX1343		7509	7461							
379-CHEXA1	1344	1000	7459	7507	7511	7463	7458	7506	CHX1344	
380-CHX1344		7510	7462							
381-CHEXA1	1345	1000	7460	7508	7512	7464	7459	7507	6HX1345	
382-CHX1345		7511	7463							
383-CHEXA1	1346	1000	7462	7510	7514	7466	7461	7509	6HX1346	
384-CHX1346		7513	7465							
385-CHEXA1	1347	1000	7463	7511	7515	7467	7462	7510	CHX1347	
386-CHX1347		7514	7466							
387-CHEXA1	1348	1000	7464	7512	7516	7468	7463	7511	CHX1348	
388-CHX1348		7515	7467							
389-CHEXA1	1349	1000	7466	7514	7518	7470	7465	7513	CHX1349	
390-CHX1349		7517	7469							
391-CHEXA1	1350	1000	7467	7515	7519	7471	7466	7514	CHX1350	
392-CHX1350		7518	7470							
393-CHEXA1	1351	1000	7468	7516	7520	7472	7467	7515	6HX1351	
394-CHX1351		7519	7471							
395-CHEXA1	1352	1000	7470	7518	7522	7474	7469	7517	CHX1352	
396-CHX1352		7521	7473							
397-CHEXA1	1353	1000	7471	7519	7523	7475	7470	7518	CHX1353	
398-CHX1353		7522	7474							
399-CHEXA1	1354	1000	7472	7520	7524	7476	7471	7519	CHX1354	
400-CHX1354		7523	7475							

PHASE 1 PART 1  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO											
CARD	1	2	3	4	5	6	7	8	9	10	
COUNT	1	2	3	4	5	6	7	8	9	10	
401-CHEXA1	1355	1000	7474	7522	7526	7478	7473	7521	EHX1355		
402-EHX1355		7525	7477								
403-CHEXA1	1356	1000	7475	7523	7527	7479	7474	7522	EHX1356		
404-EHX1356		7526	7478								
405-CHEXA1	1357	1000	7476	7524	7528	7480	7475	7523	EHX1357		
406-EHX1357		7527	7479								
407-CHEXA1	1358	1000	7478	7526	7482	7434	7477	7525	EHX1358		
408-EHX1358		7481	7433								
409-CHEXA1	1359	1000	7479	7527	7483	7435	7478	7526	EHX1359		
410-EHX1359		7482	7434								
411-CHEXA1	1360	1000	7480	7528	7484	7436	7479	7527	EHX1360		
412-EHX1360		7483	7435								
413-CHEXA1	1361	1000	7482	7530	7534	7486	7481	7529	EHX1361		
414-EHX1361		7533	7485								
415-CHEXA1	1362	1000	7483	7531	7535	7487	7482	7530	EHX1362		
416-EHX1362		7534	7486								
417-CHEXA1	1363	1000	7484	7532	7536	7488	7483	7531	EHX1363		
418-EHX1363		7535	7487								
419-CHEXA1	1364	1000	7486	7534	7538	7490	7485	7533	EHX1364		
420-EHX1364		7537	7489								
421-CHEXA1	1365	1000	7487	7535	7539	7491	7486	7534	EHX1365		
422-EHX1365		7538	7490								
423-CHEXA1	1366	1000	7488	7536	7540	7492	7487	7535	EHX1366		
424-EHX1366		7539	7491								
425-CHEXA1	1367	1000	7490	7538	7542	7494	7489	7537	EHX1367		
426-EHX1367		7541	7493								
427-CHEXA1	1368	1000	7491	7539	7543	7495	7490	7538	EHX1368		
428-EHX1368		7542	7494								
429-CHEXA1	1369	1000	7492	7540	7544	7496	7491	7539	EHX1369		
430-EHX1369		7543	7495								
431-CHEXA1	1370	1000	7494	7542	7546	7498	7493	7541	EHX1370		
432-EHX1370		7545	7497								
433-CHEXA1	1371	1000	7495	7543	7547	7499	7494	7542	EHX1371		
434-EHX1371		7546	7498								
435-CHEXA1	1372	1000	7496	7544	7548	7500	7495	7543	EHX1372		
436-EHX1372		7547	7499								
437-CHEXA1	1373	1000	7498	7546	7550	7502	7497	7545	EHX1373		
438-EHX1373		7549	7501								
439-CHEXA1	1374	1000	7499	7547	7551	7503	7498	7546	EHX1374		
440-EHX1374		7550	7502								
441-CHEXA1	1375	1000	7500	7548	7552	7504	7499	7547	EHX1375		
442-EHX1375		7551	7503								
443-CHEXA1	1376	1000	7502	7550	7554	7506	7501	7549	EHX1376		
444-EHX1376		7553	7505								
445-CHEXA1	1377	1000	7503	7551	7555	7507	7502	7550	EHX1377		
446-EHX1377		7554	7506								
447-CHEXA1	1378	1000	7504	7552	7556	7508	7503	7551	EHX1378		
448-EHX1378		7555	7507								
449-CHEXA1	1379	1000	7506	7554	7558	7510	7505	7553	EHX1379		
450-EHX1379		7557	7509								

PHASE 1 XPART 1 #  
SRM & PROPELLANT AFT HALF

S O R T E D B U L K D A T A E C H O											
CARD	1	2	3	4	5	6	7	8	9	10	
COUNT	..	..	..	..	..	..	..	..	..	..	
451-CHEXA1	1380	1000	7507	7555	7559	7511	7506	7554		EHX1380	
452-EHX1380		7558	7510								
453-CHEXA1	1381	1000	7508	7556	7560	7512	7507	7555		EHX1381	
454-EHX1381		7559	7511								
455-CHEXA1	1382	1000	7510	7558	7562	7514	7509	7557		EHX1382	
456-EHX1382		7561	7513								
457-CHEXA1	1383	1000	7511	7559	7563	7515	7510	7558		EHX1383	
458-EHX1383		7562	7514								
459-CHEXA1	1384	1000	7512	7560	7564	7516	7511	7559		EHX1384	
460-EHX1384		7563	7515								
461-CHEXA1	1385	1000	7514	7562	7566	7518	7513	7561		EHX1385	
462-EHX1385		7565	7517								
463-CHEXA1	1386	1000	7515	7563	7567	7519	7514	7562		EHX1386	
464-EHX1386		7566	7518								
465-CHEXA1	1387	1000	7516	7564	7568	7520	7515	7563		EHX1387	
466-EHX1387		7567	7519								
467-CHEXA1	1388	1000	7518	7566	7570	7522	7517	7565		EHX1388	
468-EHX1388		7569	7521								
469-CHEXA1	1389	1000	7519	7567	7571	7523	7518	7566		EHX1389	
470-EHX1389		7570	7522								
471-CHEXA1	1390	1000	7520	7568	7572	7524	7519	7567		EHX1390	
472-EHX1390		7571	7523								
473-CHEXA1	1391	1000	7522	7570	7574	7526	7521	7569		EHX1391	
474-EHX1391		7573	7525								
475-CHEXA1	1392	1000	7523	7571	7575	7527	7522	7570		EHX1392	
476-EHX1392		7574	7526								
477-CHEXA1	1393	1000	7524	7572	7576	7528	7523	7571		EHX1393	
478-EHX1393		7575	7527								
479-CHEXA1	1394	1000	7526	7574	7530	7482	7525	7573		EHX1394	
480-EHX1394		7529	7481								
481-CHEXA1	1395	1000	7527	7575	7531	7483	7526	7574		EHX1395	
482-EHX1395		7530	7482								
483-CHEXA1	1396	1000	7528	7576	7532	7484	7527	7575		EHX1396	
484-EHX1396		7531	7483								
485-CHEXA1	1397	1000	7530	7578	7582	7534	7529	7577		EHX1397	
486-EHX1397		7581	7533								
487-CHEXA1	1398	1000	7531	7579	7583	7535	7530	7578		EHX1398	
488-EHX1398		7582	7534								
489-CHEXA1	1399	1000	7532	7580	7584	7536	7531	7579		EHX1399	
490-EHX1399		7583	7535								
491-CHEXA1	1400	1000	7534	7582	7586	7538	7533	7581		EHX1400	
492-EHX1400		7585	7537								
493-CHEXA1	1401	1000	7535	7583	7587	7539	7534	7582		EHX1401	
494-EHX1401		7586	7538								
495-CHEXA1	1402	1000	7536	7584	7588	7540	7535	7583		EHX1402	
496-EHX1402		7587	7539								
497-CHEXA1	1403	1000	7538	7586	7590	7542	7537	7585		EHX1403	
498-EHX1403		7589	7541								
499-CHEXA1	1404	1000	7539	7587	7591	7543	7538	7586		EHX1404	
500-EHX1404		7590	7542								



PHASE 1 XPART 1 n  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO										
CARD	1	2	3	4	5	6	7	8	9	10
501-CHEXA1	1405	1000	7540	7588	7592	7544	7539	7587	6HX1405	
502-6HX1405		7591	7543							
503-CHEXA1	1406	1000	7542	7590	7594	7546	7541	7589	6HX1406	
504-6HX1406		7593	7545							
505-CHEXA1	1407	1000	7543	7591	7595	7547	7542	7590	6HX1407	
506-6HX1407		7594	7546							
507-CHEXA1	1408	1000	7544	7592	7596	7548	7543	7591	6HX1408	
508-6HX1408		7595	7547							
509-CHEXA1	1409	1000	7546	7594	7598	7550	7545	7593	6HX1409	
510-6HX1409		7597	7549							
511-CHEXA1	1410	1000	7547	7595	7599	7551	7546	7594	6HX1410	
512-6HX1410		7598	7550							
513-CHEXA1	1411	1000	7548	7596	7600	7552	7547	7595	6HX1411	
514-6HX1411		7599	7551							
515-CHEXA1	1412	1000	7550	7598	7602	7554	7549	7597	6HX1412	
516-6HX1412		7601	7553							
517-CHEXA1	1413	1000	7551	7599	7603	7555	7550	7598	6HX1413	
518-6HX1413		7602	7554							
519-CHEXA1	1414	1000	7552	7600	7604	7556	7551	7599	6HX1414	
520-6HX1414		7603	7555							
521-CHEXA1	1415	1000	7554	7602	7606	7558	7553	7601	6HX1415	
522-6HX1415		7605	7557							
523-CHEXA1	1416	1000	7555	7603	7607	7559	7554	7602	6HX1416	
524-6HX1416		7606	7558							
525-CHEXA1	1417	1000	7556	7604	7608	7560	7555	7603	6HX1417	
526-6HX1417		7607	7559							
527-CHEXA1	1418	1000	7558	7606	7610	7562	7557	7605	6HX1418	
528-6HX1418		7609	7561							
529-CHEXA1	1419	1000	7559	7607	7611	7563	7558	7606	6HX1419	
530-6HX1419		7610	7562							
531-CHEXA1	1420	1000	7560	7608	7612	7564	7559	7607	6HX1420	
532-6HX1420		7611	7563							
533-CHEXA1	1421	1000	7562	7610	7614	7566	7561	7609	6HX1421	
534-6HX1421		7613	7565							
535-CHEXA1	1422	1000	7563	7611	7615	7567	7562	7610	6HX1422	
536-6HX1422		7614	7566							
537-CHEXA1	1423	1000	7564	7612	7616	7568	7563	7611	6HX1423	
538-6HX1423		7615	7567							
539-CHEXA1	1424	1000	7566	7614	7618	7570	7565	7613	6HX1424	
540-6HX1424		7617	7569							
541-CHEXA1	1425	1000	7567	7615	7619	7571	7566	7614	6HX1425	
542-6HX1425		7618	7570							
543-CHEXA1	1426	1000	7568	7616	7620	7572	7567	7615	6HX1426	
544-6HX1426		7619	7571							
545-CHEXA1	1427	1000	7570	7618	7622	7574	7569	7617	6HX1427	
546-6HX1427		7621	7573							
547-CHEXA1	1428	1000	7571	7619	7623	7575	7570	7618	6HX1428	
548-6HX1428		7622	7574							
549-CHEXA1	1429	1000	7572	7620	7624	7576	7571	7619	6HX1429	
550-6HX1429		7623	7575							

PHASE 1 PART 1 II  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO										
CARD	1	2	3	4	5	6	7	8	9	10
COUNT	1	2	3	4	5	6	7	8	9	10
551-CHEXA1	1430	1000	7574	7622	7578	7530	7573	7621	6HX1430	
552-6HX1430		7577	7529							
553-CHEXA1	1431	1000	7575	7623	7579	7531	7574	7622	6HX1431	
554-6HX1431		7578	7530							
555-CHEXA1	1432	1000	7576	7624	7580	7532	7575	7623	6HX1432	
556-6HX1432		7579	7531							
557-CONROD	3001	7805	8352	100	.308					
558-CONROD	3002	7809	8355	100	.308					
559-CONROD	3003	7813	8355	100	.308					
560-CORD2C	100	696	74.738	-30.494	6.138	200.0	-30.494	6.138	6CSSRM	
561-6CSSRM		74.738	0.0	0.0						
562-CORD2R	101	696	74.738	-30.494	6.138	74.738	-28.570115	6.6963	6RSSRM	
563-6RSSRM		200.0	-30.494	6.138						
564-CORD2R	696	0	-81.5683.0		35.5985	-80.2278.0		57.5136	6RSTANK	
565-6RSTANK		68.25	0.0	48.432						
566-CQUAD2	73	100	7289	7337	7341	7293	.0			
567-CQUAD2	74	100	7293	7341	7345	7297	.0			
568-CQUAD2	75	100	7297	7345	7349	7301	.0			
569-CQUAD2	76	100	7301	7349	7353	7305	.0			
570-CQUAD2	77	100	7305	7353	7357	7309	.0			
571-CQUAD2	78	100	7309	7357	7361	7313	.0			
572-CQUAD2	79	100	7313	7361	7365	7317	.0			
573-CQUAD2	80	100	7317	7365	7369	7321	.0			
574-CQUAD2	81	100	7321	7369	7373	7325	.0			
575-CQUAD2	82	100	7325	7373	7377	7329	.0			
576-CQUAD2	83	100	7329	7377	7381	7333	.0			
577-CQUAD2	84	100	7333	7381	7337	7289	.0			
578-CQUAD2	85	100	7337	7385	7389	7341	.0			
579-CQUAD2	86	100	7341	7389	7393	7345	.0			
580-CQUAD2	87	100	7345	7393	7397	7349	.0			
581-CQUAD2	88	100	7349	7397	7401	7353	.0			
582-CQUAD2	89	100	7353	7401	7405	7357	.0			
583-CQUAD2	90	100	7357	7405	7409	7361	.0			
584-CQUAD2	91	100	7361	7409	7413	7365	.0			
585-CQUAD2	92	100	7365	7413	7417	7369	.0			
586-CQUAD2	93	100	7369	7417	7421	7373	.0			
587-CQUAD2	94	100	7373	7421	7425	7377	.0			
588-CQUAD2	95	100	7377	7425	7429	7381	.0			
589-CQUAD2	96	100	7381	7429	7385	7337	.0			
590-CQUAD2	97	100	7385	7433	7437	7389	.0			
591-CQUAD2	98	100	7389	7437	7441	7393	.0			
592-CQUAD2	99	100	7393	7441	7445	7397	.0			
593-CQUAD2	100	100	7397	7445	7449	7401	.0			
594-CQUAD2	101	100	7401	7449	7453	7405	.0			
595-CQUAD2	102	100	7405	7453	7457	7409	.0			
596-CQUAD2	103	100	7409	7457	7461	7413	.0			
597-CQUAD2	104	100	7413	7461	7465	7417	.0			
598-CQUAD2	105	100	7417	7465	7469	7421	.0			
599-CQUAD2	106	100	7421	7469	7473	7425	.0			
600-CQUAD2	107	100	7425	7473	7477	7429	.0			

PHASE 1 XPART 1 □  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9
601-	CQUAD2	108	100	7429	7477	7433	7385	.0	
602-	CQUAD2	109	100	7433	7481	7485	7437	.0	
603-	CQUAD2	110	100	7437	7485	7489	7441	.0	
604-	CQUAD2	111	100	7441	7489	7493	7445	.0	
605-	CQUAD2	112	100	7445	7493	7497	7449	.0	
606-	CQUAD2	113	100	7449	7497	7501	7453	.0	
607-	CQUAD2	114	100	7453	7501	7505	7457	.0	
608-	CQUAD2	115	100	7457	7505	7509	7461	.0	
609-	CQUAD2	116	100	7461	7509	7513	7465	.0	
610-	CQUAD2	117	100	7465	7513	7517	7469	.0	
611-	CQUAD2	118	100	7469	7517	7521	7473	.0	
612-	CQUAD2	119	100	7473	7521	7525	7477	.0	
613-	CQUAD2	120	100	7477	7525	7481	7433	.0	
614-	CQUAD2	121	100	7481	7529	7533	7485	.0	
615-	CQUAD2	122	100	7485	7533	7537	7489	.0	
616-	CQUAD2	123	100	7489	7537	7541	7493	.0	
617-	CQUAD2	124	100	7493	7541	7545	7497	.0	
618-	CQUAD2	125	100	7497	7545	7549	7501	.0	
619-	CQUAD2	126	100	7501	7549	7553	7505	.0	
620-	CQUAD2	127	100	7505	7553	7557	7509	.0	
621-	CQUAD2	128	100	7509	7557	7561	7513	.0	
622-	CQUAD2	129	100	7513	7561	7565	7517	.0	
623-	CQUAD2	130	100	7517	7565	7569	7521	.0	
624-	CQUAD2	131	100	7521	7569	7573	7525	.0	
625-	CQUAD2	132	100	7525	7573	7529	7481	.0	
626-	CQUAD2	133	100	7529	7577	7581	7533	.0	
627-	CQUAD2	134	100	7533	7581	7585	7537	.0	
628-	CQUAD2	135	100	7537	7585	7589	7541	.0	
629-	CQUAD2	136	100	7541	7589	7593	7545	.0	
630-	CQUAD2	137	100	7545	7593	7597	7549	.0	
631-	CQUAD2	138	100	7549	7597	7601	7553	.0	
632-	CQUAD2	139	100	7553	7601	7605	7557	.0	
633-	CQUAD2	140	100	7557	7605	7609	7561	.0	
634-	CQUAD2	141	100	7561	7609	7613	7565	.0	
635-	CQUAD2	142	100	7565	7613	7617	7569	.0	
636-	CQUAD2	143	100	7569	7617	7621	7573	.0	
637-	CQUAD2	144	100	7573	7621	7577	7529	.0	
638-	CQUAD2	201	200	7577	7801	7802	7581		
639-	CQUAD2	202	200	7581	7802	7804	7585		
640-	CQUAD2	203	200	7585	7804	7805	7589		
641-	CQUAD2	204	200	7589	7805	7807	7593		
642-	CQUAD2	205	200	7593	7807	7808	7597		
643-	CQUAD2	206	200	7597	7808	7809	7601		
644-	CQUAD2	207	200	7601	7809	7810	7605		
645-	CQUAD2	208	200	7605	7810	7812	7609		
646-	CQUAD2	209	200	7609	7812	7813	7613		
647-	CQUAD2	210	200	7613	7813	7815	7617		
648-	CQUAD2	211	200	7617	7815	7816	7621		
649-	CQUAD2	212	200	7621	7816	7801	7577		
650-	CQUAD2	213	300	7801	7817	7818	7802	.0	

SORTED BULK DATA ECHO

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
651- CQUAD2	214	300	7802	7818	7819	7803	.0				
652- CQUAD2	215	300	7803	7819	7820	7804	.0				
653- CQUAD2	216	300	7804	7820	7821	7805	.0				
654- CQUAD2	217	300	7805	7821	7822	7806	.0				
655- CQUAD2	218	300	7806	7822	7823	7807	.0				
656- CQUAD2	219	300	7807	7823	7824	7808	.0				
657- CQUAD2	220	300	7808	7824	7825	7809	.0				
658- CQUAD2	221	300	7809	7825	7826	7810	.0				
659- CQUAD2	222	300	7810	7826	7827	7811	.0				
660- CQUAD2	223	300	7811	7827	7828	7812	.0				
661- CQUAD2	224	300	7812	7828	7829	7813	.0				
662- CQUAD2	225	300	7813	7829	7830	7814	.0				
663- CQUAD2	226	300	7814	7830	7831	7815	.0				
664- CQUAD2	227	300	7815	7831	7832	7816	.0				
665- CQUAD2	228	300	7816	7832	7817	7801	.0				
666- CQUAD2	229	300	7817	7833	7834	7818	.0				
667- CQUAD2	230	300	7818	7834	7835	7819	.0				
668- CQUAD2	231	300	7819	7835	7836	7820	.0				
669- CQUAD2	232	300	7820	7836	7837	7821	.0				
670- CQUAD2	233	300	7821	7837	7838	7822	.0				
671- CQUAD2	234	300	7822	7838	7839	7823	.0				
672- CQUAD2	235	300	7823	7839	7840	7824	.0				
673- CQUAD2	236	300	7824	7840	7841	7825	.0				
674- CQUAD2	237	300	7825	7841	7842	7826	.0				
675- CQUAD2	238	300	7826	7842	7843	7827	.0				
676- CQUAD2	239	300	7827	7843	7844	7828	.0				
677- CQUAD2	240	300	7828	7844	7845	7829	.0				
678- CQUAD2	241	300	7829	7845	7846	7830	.0				
679- CQUAD2	242	300	7830	7846	7847	7831	.0				
680- CQUAD2	243	300	7831	7847	7848	7832	.0				
681- CQUAD2	244	300	7832	7848	7833	7817	.0				
682- CQUAD2	245	300	7833	7849	7850	7834	.0				
683- CQUAD2	246	300	7834	7850	7851	7835	.0				
684- CQUAD2	247	300	7835	7851	7852	7836	.0				
685- CQUAD2	248	300	7836	7852	7853	7837	.0				
686- CQUAD2	249	300	7837	7853	7854	7838	.0				
687- CQUAD2	250	300	7838	7854	7855	7839	.0				
688- CQUAD2	251	300	7839	7855	7856	7840	.0				
689- CQUAD2	252	300	7840	7856	7857	7841	.0				
690- CQUAD2	253	300	7841	7857	7858	7842	.0				
691- CQUAD2	254	300	7842	7858	7859	7843	.0				
692- CQUAD2	255	300	7843	7859	7860	7844	.0				
693- CQUAD2	256	300	7844	7860	7861	7845	.0				
694- CQUAD2	257	300	7845	7861	7862	7846	.0				
695- CQUAD2	258	300	7846	7862	7863	7847	.0				
696- CQUAD2	259	300	7847	7863	7864	7848	.0				
697- CQUAD2	260	300	7848	7864	7849	7833	.0				
698- CQUAD2	261	300	7849	7865	7866	7850	.0				
699- CQUAD2	262	300	7850	7866	7867	7851	.0				
700- CQUAD2	263	300	7851	7867	7868	7852	.0				

PHASE 1 XPART 1 R  
SRM 6 PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
701- CQUAD2	264	300	7852	7868	7869	7853	.0			
702- CQUAD2	265	300	7853	7869	7870	7854	.0			
703- CQUAD2	266	300	7854	7870	7871	7855	.0			
704- CQUAD2	267	300	7855	7871	7872	7856	.0			
705- CQUAD2	268	300	7856	7872	7873	7857	.0			
706- CQUAD2	269	300	7857	7873	7874	7858	.0			
707- CQUAD2	270	300	7858	7874	7875	7859	.0			
708- CQUAD2	271	300	7859	7875	7876	7860	.0			
709- CQUAD2	272	300	7860	7876	7877	7861	.0			
710- CQUAD2	273	300	7861	7877	7878	7862	.0			
711- CQUAD2	274	300	7862	7878	7879	7863	.0			
712- CQUAD2	275	300	7863	7879	7880	7864	.0			
713- CQUAD2	276	300	7864	7880	7885	7849	.0			
714- DMI	BFAC	0	2	1	2		1		1	
715- DMI	BFAC	1	1	1.0						
716- DMI	CPAJC	0	2	1	1		1		1	
717- DMI	CPAJC	1	1	1.0						
718- DMI	EQR	0	2	1	2		6		9	
719- DMI	EQR	1	1	.012047	-.980338	.196959	33.0854		-21.56976E01	
720- EEO1	-109.382									
721- DMI	EQR	2	1	.05985	.197328	.978504	-26.0164		-107.1606E02	
722- EEO2	23.2010									
723- DMI	EQR	3	1	.99813	3		-.06105	1.27813	34.7662	EEO3
724- EEO3	20.0966									
725- DMI	EQR	4	1	.99813	3		-.06105	.913934	43.5110	EEO4
726- EEO4	14.9423									
727- DMI	EQR	5	1	-.012047	.980338	-.196959	-28.411836		.9790	EEO5
728- EEO5	185.7937									
729- DMI	EQR	6	1	.05985	.197328	.978504	-20.9608		-183.7146	EEO6
730- EEO6	38.3298									
731- DMI	EQR	7	1	.99813	3		-.06105	1.14885	24.3945	EEO7
732- EEO7	18.7829									
733- DMI	EQR	8	1	-.012047	.980338	-.196959	-8.9482536		.979	EEO8
734- EEO8	184.6032									
735- DMI	EQR	9	1	.05985	.197328	.978504	-20.9608		-183.7146	EEO9
736- EEO9	38.3298									
737- DMI	GFAC	0	2	1	2		1		1	
738- DMI	GFAC	1	1	1.0						
739- DMI	KFAC	0	2	1	2		1		1	
740- DMI	KFAC	1	1	1.0						
741- GROSET		100					100			
742- GRID	7289		9.750	180.000	118.160					
743- GRID	7290		7.560	180.000	118.160					
744- GRID	7291		5.370	180.000	118.160					
745- GRID	7292		3.180	180.000	118.160					
746- GRID	7293		9.750	150.000	118.160					
747- GRID	7294		7.560	150.000	118.160					
748- GRID	7295		5.370	150.000	118.160					
749- GRID	7296		3.180	150.000	118.160					
750- GRID	7297		9.750	120.000	118.160					

PHASE I PART I  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
751- GRID	7298		7.560	120.000	118.160					
752- GRID	7299		5.370	120.000	118.160					
753- GRID	7300		3.180	120.000	118.160					
754- GRID	7301		9.750	90.000	118.160					
755- GRID	7302		7.560	90.000	118.160					
756- GRID	7303		5.370	90.000	118.160					
757- GRID	7304		3.180	90.000	118.160					
758- GRID	7305		9.750	60.000	118.160					
759- GRID	7306		7.560	60.000	118.160					
760- GRID	7307		5.370	60.000	118.160					
761- GRID	7308		3.180	60.000	118.160					
762- GRID	7309		9.750	30.000	118.160					
763- GRID	7310		7.560	30.000	118.160					
764- GRID	7311		5.370	30.000	118.160					
765- GRID	7312		3.180	30.000	118.160					
766- GRID	7313		9.750	0.0	118.160					
767- GRID	7314		7.560	0.0	118.160					
768- GRID	7315		5.370	0.0	118.160					
769- GRID	7316		3.180	0.0	118.160					
770- GRID	7317		9.750	-30.000	118.160					
771- GRID	7318		7.560	-30.000	118.160					
772- GRID	7319		5.370	-30.000	118.160					
773- GRID	7320		3.180	-30.000	118.160					
774- GRID	7321		9.750	-60.000	118.160					
775- GRID	7322		7.560	-60.000	118.160					
776- GRID	7323		5.370	-60.000	118.160					
777- GRID	7324		3.180	-60.000	118.160					
778- GRID	7325		9.750	-90.000	118.160					
779- GRID	7326		7.560	-90.000	118.160					
780- GRID	7327		5.370	-90.000	118.160					
781- GRID	7328		3.180	-90.000	118.160					
782- GRID	7329		9.750	-120.000	118.160					
783- GRID	7330		7.560	-120.000	118.160					
784- GRID	7331		5.370	-120.000	118.160					
785- GRID	7332		3.180	-120.000	118.160					
786- GRID	7333		9.750	-150.000	118.160					
787- GRID	7334		7.560	-150.000	118.160					
788- GRID	7335		5.370	-150.000	118.160					
789- GRID	7336		3.180	-150.000	118.160					
790- GRID	7337		9.750	180.000	130.437					
791- GRID	7338		7.560	180.000	130.437					
792- GRID	7339		5.370	180.000	130.437					
793- GRID	7340		3.180	180.000	130.437					
794- GRID	7341		9.750	150.000	130.437					
795- GRID	7342		7.560	150.000	130.437					
796- GRID	7343		5.370	150.000	130.437					
797- GRID	7344		3.180	150.000	130.437					
798- GRID	7345		9.750	120.000	130.437					
799- GRID	7346		7.560	120.000	130.437					
800- GRID	7347		5.370	120.000	130.437					

PHASE I PART I II  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA LIST

CARD	1	2	3	4	5	6	7	8	9	10
801- GRID	7348		3.180	120.000	130.437					
802- GRID	7349		9.750	90.000	130.437					
803- GRID	7350		7.560	90.000	130.437					
804- GRID	7351		5.370	90.000	130.437					
805- GRID	7352		3.180	90.000	130.437					
806- GRID	7353		9.750	60.000	130.437					
807- GRID	7354		7.560	60.000	130.437					
808- GRID	7355		5.370	60.000	130.437					
809- GRID	7356		3.180	60.000	130.437					
810- GRID	7357		9.750	30.000	130.437					
811- GRID	7358		7.560	30.000	130.437					
812- GRID	7359		5.370	30.000	130.437					
813- GRID	7360		3.180	30.000	130.437					
814- GRID	7361		9.750	0.0	130.437					
815- GRID	7362		7.560	0.0	130.437					
816- GRID	7363		5.370	0.0	130.437					
817- GRID	7364		3.180	0.0	130.437					
818- GRID	7365		9.750	-30.000	130.437					
819- GRID	7366		7.560	-30.000	130.437					
820- GRID	7367		5.370	-30.000	130.437					
821- GRID	7368		3.180	-30.000	130.437					
822- GRID	7369		9.750	-60.000	130.437					
823- GRID	7370		7.560	-60.000	130.437					
824- GRID	7371		5.370	-60.000	130.437					
825- GRID	7372		3.180	-60.000	130.437					
826- GRID	7373		9.750	-90.000	130.437					
827- GRID	7374		7.560	-90.000	130.437					
828- GRID	7375		5.370	-90.000	130.437					
829- GRID	7376		3.180	-90.000	130.437					
830- GRID	7377		9.750	-120.000	130.437					
831- GRID	7378		7.560	-120.000	130.437					
832- GRID	7379		5.370	-120.000	130.437					
833- GRID	7380		3.180	-120.000	130.437					
834- GRID	7381		9.750	-150.000	130.437					
835- GRID	7382		7.560	-150.000	130.437					
836- GRID	7383		5.370	-150.000	130.437					
837- GRID	7384		3.180	-150.000	130.437					
838- GRID	7385		9.750	180.000	142.713					
839- GRID	7386		7.560	180.000	142.713					
840- GRID	7387		5.370	180.000	142.713					
841- GRID	7388		3.180	180.000	142.713					
842- GRID	7389		9.750	150.000	142.713					
843- GRID	7390		7.560	150.000	142.713					
844- GRID	7391		5.370	150.000	142.713					
845- GRID	7392		3.180	150.000	142.713					
846- GRID	7393		9.750	120.000	142.713					
847- GRID	7394		7.560	120.000	142.713					
848- GRID	7395		5.370	120.000	142.713					
849- GRID	7396		3.180	120.000	142.713					
850- GRID	7397		9.750	90.000	142.713					

PHASE 1 XPART 1 R  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
851- GRID	7398			7.560	90.000	142.713					
852- GRID	7399			5.370	90.000	142.713					
853- GRID	7400			3.180	90.000	142.713					
854- GRID	7401			9.750	60.000	142.713					
855- GRID	7402			7.560	60.000	142.713					
856- GRID	7403			5.370	60.000	142.713					
857- GRID	7404			3.180	60.000	142.713					
858- GRID	7405			9.750	30.000	142.713					
859- GRID	7406			7.560	30.000	142.713					
860- GRID	7407			5.370	30.000	142.713					
861- GRID	7408			3.180	30.000	142.713					
862- GRID	7409			9.750	0.0	142.713					
863- GRID	7410			7.560	0.0	142.713					
864- GRID	7411			5.370	0.0	142.713					
865- GRID	7412			3.180	0.0	142.713					
866- GRID	7413			9.750	-30.000	142.713					
867- GRID	7414			7.560	-30.000	142.713					
868- GRID	7415			5.370	-30.000	142.713					
869- GRID	7416			3.180	-30.000	142.713					
870- GRID	7417			9.750	-60.000	142.713					
871- GRID	7418			7.560	-60.000	142.713					
872- GRID	7419			5.370	-60.000	142.713					
873- GRID	7420			3.180	-60.000	142.713					
874- GRID	7421			9.750	-90.000	142.713					
875- GRID	7422			7.560	-90.000	142.713					
876- GRID	7423			5.370	-90.000	142.713					
877- GRID	7424			3.180	-90.000	142.713					
878- GRID	7425			9.750	-120.000	142.713					
879- GRID	7426			7.560	-120.000	142.713					
880- GRID	7427			5.370	-120.000	142.713					
881- GRID	7428			3.180	-120.000	142.713					
882- GRID	7429			9.750	-150.000	142.713					
883- GRID	7430			7.560	-150.000	142.713					
884- GRID	7431			5.370	-150.000	142.713					
885- GRID	7432			3.180	-150.000	142.713					
886- GRID	7433			9.750	180.000	154.990					
887- GRID	7434			7.560	180.000	154.990					
888- GRID	7435			5.370	180.000	154.990					
889- GRID	7436			3.180	180.000	154.990					
890- GRID	7437			9.750	150.000	154.990					
891- GRID	7438			7.560	150.000	154.990					
892- GRID	7439			5.370	150.000	154.990					
893- GRID	7440			3.180	150.000	154.990					
894- GRID	7441			9.750	120.000	154.990					
895- GRID	7442			7.560	120.000	154.990					
896- GRID	7443			5.370	120.000	154.990					
897- GRID	7444			3.180	120.000	154.990					
898- GRID	7445			9.750	90.000	154.990					
899- GRID	7446			7.560	90.000	154.990					
900- GRID	7447			5.370	90.000	154.990					



PHASE 1 XPART 1 U  
SRM. & PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
901- GRID	7448		3.180	90.000	154.990					
902- GRID	7449		9.750	60.000	154.990					
903- GRID	7450		7.560	60.000	154.990					
904- GRID	7451		5.370	60.000	154.990					
905- GRID	7452		3.180	60.000	154.990					
906- GRID	7453		9.750	30.000	154.990					
907- GRID	7454		7.560	30.000	154.990					
908- GRID	7455		5.370	30.000	154.990					
909- GRID	7456		3.180	30.000	154.990					
910- GRID	7457		9.750	0.0	154.990					
911- GRID	7458		7.560	0.0	154.990					
912- GRID	7459		5.370	0.0	154.990					
913- GRID	7460		3.180	0.0	154.990					
914- GRID	7461		9.750	-30.000	154.990					
915- GRID	7462		7.560	-30.000	154.990					
916- GRID	7463		5.370	-30.000	154.990					
917- GRID	7464		3.180	-30.000	154.990					
918- GRID	7465		9.750	-60.000	154.990					
919- GRID	7466		7.560	-60.000	154.990					
920- GRID	7467		5.370	-60.000	154.990					
921- GRID	7468		3.180	-60.000	154.990					
922- GRID	7469		9.750	-90.000	154.990					
923- GRID	7470		7.560	-90.000	154.990					
924- GRID	7471		5.370	-90.000	154.990					
925- GRID	7472		3.180	-90.000	154.990					
926- GRID	7473		9.750	-120.000	154.990					
927- GRID	7474		7.560	-120.000	154.990					
928- GRID	7475		5.370	-120.000	154.990					
929- GRID	7476		3.180	-120.000	154.990					
930- GRID	7477		9.750	-150.000	154.990					
931- GRID	7478		7.560	-150.000	154.990					
932- GRID	7479		5.370	-150.000	154.990					
933- GRID	7480		3.180	-150.000	154.990					
934- GRID	7481		9.750	180.000	167.267					
935- GRID	7482		7.560	180.000	167.267					
936- GRID	7483		5.370	180.000	167.267					
937- GRID	7484		3.180	180.000	167.267					
938- GRID	7485		9.750	150.000	167.267					
939- GRID	7486		7.560	150.000	167.267					
940- GRID	7487		5.370	150.000	167.267					
941- GRID	7488		3.180	150.000	167.267					
942- GRID	7489		9.750	120.000	167.267					
943- GRID	7490		7.560	120.000	167.267					
944- GRID	7491		5.370	120.000	167.267					
945- GRID	7492		3.180	120.000	167.267					
946- GRID	7493		9.750	90.000	167.267					
947- GRID	7494		7.560	90.000	167.267					
948- GRID	7495		5.370	90.000	167.267					
949- GRID	7496		3.180	90.000	167.267					
950- GRID	7497		9.750	60.000	167.267					

PHASE 1 XPART 1 D  
SRM 6 PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
951- GRID	7498		7.560	60.000	167.267					
952- GRID	7499		5.370	60.000	167.267					
953- GRID	7500		3.180	60.000	167.267					
954- GRID	7501		9.750	30.000	167.267					
955- GRID	7502		7.560	30.000	167.267					
956- GRID	7503		5.370	30.000	167.267					
957- GRID	7504		3.180	30.000	167.267					
958- GRID	7505		9.750	0.0	167.267					
959- GRID	7506		7.560	0.0	167.267					
960- GRID	7507		5.370	0.0	167.267					
961- GRID	7508		3.180	0.0	167.267					
962- GRID	7509		9.750	-30.000	167.267					
963- GRID	7510		7.560	-30.000	167.267					
964- GRID	7511		5.370	-30.000	167.267					
965- GRID	7512		3.180	-30.000	167.267					
966- GRID	7513		9.750	-60.000	167.267					
967- GRID	7514		7.560	-60.000	167.267					
968- GRID	7515		5.370	-60.000	167.267					
969- GRID	7516		3.180	-60.000	167.267					
970- GRID	7517		9.750	-90.000	167.267					
971- GRID	7518		7.560	-90.000	167.267					
972- GRID	7519		5.370	-90.000	167.267					
973- GRID	7520		3.180	-90.000	167.267					
974- GRID	7521		9.750	-120.000	167.267					
975- GRID	7522		7.560	-120.000	167.267					
976- GRID	7523		5.370	-120.000	167.267					
977- GRID	7524		3.180	-120.000	167.267					
978- GRID	7525		9.750	-150.000	167.267					
979- GRID	7526		7.560	-150.000	167.267					
980- GRID	7527		5.370	-150.000	167.267					
981- GRID	7528		3.180	-150.000	167.267					
982- GRID	7529		9.750	180.000	179.543					
983- GRID	7530		7.560	180.000	179.543					
984- GRID	7531		5.370	180.000	179.543					
985- GRID	7532		3.180	180.000	179.543					
986- GRID	7533		9.750	150.000	179.543					
987- GRID	7534		7.560	150.000	179.543					
988- GRID	7535		5.370	150.000	179.543					
989- GRID	7536		3.180	150.000	179.543					
990- GRID	7537		9.750	120.000	179.543					
991- GRID	7538		7.560	120.000	179.543					
992- GRID	7539		5.370	120.000	179.543					
993- GRID	7540		3.180	120.000	179.543					
994- GRID	7541		9.750	90.000	179.543					
995- GRID	7542		7.560	90.000	179.543					
996- GRID	7543		5.370	90.000	179.543					
997- GRID	7544		3.180	90.000	179.543					
998- GRID	7545		9.750	60.000	179.543					
999- GRID	7546		7.560	60.000	179.543					
1000- GRID	7547		5.370	60.000	179.543					

PHASE 1 XPART 1 B  
SRM 6 PROPELLANT AFT HALF

SORTED BULK DATA ECHO										
CARD	1	2	3	4	5	6	7	8	9	10
COUNT										
1001- GRID	7548		3.180	60.000	179.543					
1002- GRID	7549		9.750	30.000	179.543					
1003- GRID	7550		7.560	30.000	179.543					
1004- GRID	7551		5.370	30.000	179.543					
1005- GRID	7552		3.180	30.000	179.543					
1006- GRID	7553		9.750	0.0	179.543					
1007- GRID	7554		7.560	0.0	179.543					
1008- GRID	7555		5.370	0.0	179.543					
1009- GRID	7556		3.180	0.0	179.543					
1010- GRID	7557		9.750	-30.000	179.543					
1011- GRID	7558		7.560	-30.000	179.543					
1012- GRID	7559		5.370	-30.000	179.543					
1013- GRID	7560		3.180	-30.000	179.543					
1014- GRID	7561		9.750	-60.000	179.543					
1015- GRID	7562		7.560	-60.000	179.543					
1016- GRID	7563		5.370	-60.000	179.543					
1017- GRID	7564		3.180	-60.000	179.543					
1018- GRID	7565		9.750	-90.000	179.543					
1019- GRID	7566		7.560	-90.000	179.543					
1020- GRID	7567		5.370	-90.000	179.543					
1021- GRID	7568		3.180	-90.000	179.543					
1022- GRID	7569		9.750	-120.000	179.543					
1023- GRID	7570		7.560	-120.000	179.543					
1024- GRID	7571		5.370	-120.000	179.543					
1025- GRID	7572		3.180	-120.000	179.543					
1026- GRID	7573		9.750	-150.000	179.543					
1027- GRID	7574		7.560	-150.000	179.543					
1028- GRID	7575		5.370	-150.000	179.543					
1029- GRID	7576		3.180	-150.000	179.543					
1030- GRID	7577		9.750	180.000	191.820					
1031- GRID	7578		7.560	180.000	191.820					
1032- GRID	7579		5.370	180.000	191.820					
1033- GRID	7580		3.180	180.000	191.820					
1034- GRID	7581		9.750	150.000	191.820					
1035- GRID	7582		7.560	150.000	191.820					
1036- GRID	7583		5.370	150.000	191.820					
1037- GRID	7584		3.180	150.000	191.820					
1038- GRID	7585		9.750	120.000	191.820					
1039- GRID	7586		7.560	120.000	191.820					
1040- GRID	7587		5.370	120.000	191.820					
1041- GRID	7588		3.180	120.000	191.820					
1042- GRID	7589		9.750	90.000	191.820					
1043- GRID	7590		7.560	90.000	191.820					
1044- GRID	7591		5.370	90.000	191.820					
1045- GRID	7592		3.180	90.000	191.820					
1046- GRID	7593		9.750	60.000	191.820					
1047- GRID	7594		7.560	60.000	191.820					
1048- GRID	7595		5.370	60.000	191.820					
1049- GRID	7596		3.180	60.000	191.820					
1050- GRID	7597		9.750	30.000	191.820					

PHASE 1 XPART 1 B  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
1051-GRID	7598		7.560	30.000	191.820					
1052-GRID	7599		5.370	30.000	191.820					
1053-GRID	7600		3.180	30.000	191.820					
1054-GRID	7601		9.750	0.0	191.820					
1055-GRID	7602		7.560	0.0	191.820					
1056-GRID	7603		5.370	0.0	191.820					
1057-GRID	7604		3.180	0.0	191.820					
1058-GRID	7605		9.750	-30.000	191.820					
1059-GRID	7606		7.560	-30.000	191.820					
1060-GRID	7607		5.370	-30.000	191.820					
1061-GRID	7608		3.180	-30.000	191.820					
1062-GRID	7609		9.750	-60.000	191.820					
1063-GRID	7610		7.560	-60.000	191.820					
1064-GRID	7611		5.370	-60.000	191.820					
1065-GRID	7612		3.180	-60.000	191.820					
1066-GRID	7613		9.750	-90.000	191.820					
1067-GRID	7614		7.560	-90.000	191.820					
1068-GRID	7615		5.370	-90.000	191.820					
1069-GRID	7616		3.180	-90.000	191.820					
1070-GRID	7617		9.750	-120.000	191.820					
1071-GRID	7618		7.560	-120.000	191.820					
1072-GRID	7619		5.370	-120.000	191.820					
1073-GRID	7620		3.180	-120.000	191.820					
1074-GRID	7621		9.750	-150.000	191.820					
1075-GRID	7622		7.560	-150.000	191.820					
1076-GRID	7623		5.370	-150.000	191.820					
1077-GRID	7624		3.180	-150.000	191.820					
1078-GRID	7801		9.75	180.0	196.25		0			
1079-GRID	7802		9.75	150.0	196.25		0			
1080-GRID	7803		9.43657	131.383	196.25		0			
1081-GRID	7804		9.75	120.0	196.25		0			
1082-GRID	7805		9.75	90.0	196.25		0			
1083-GRID	7806		9.43657	71.383	196.25		0			
1084-GRID	7807		9.75	60.0	196.25		0			
1085-GRID	7808		9.75	30.0	196.25		0			
1086-GRID	7809		9.75	0.0	196.25		0			
1087-GRID	7810		9.75	-30.0	196.25		0			
1088-GRID	7811		9.43657	-48.617	196.25		0			
1089-GRID	7812		9.75	-60.0	196.25		0			
1090-GRID	7813		9.75	-90.0	196.25		0			
1091-GRID	7814		9.43657	-108.617	196.25		0			
1092-GRID	7815		9.75	-120.0	196.25		0			
1093-GRID	7816		9.75	-150.0	196.25		0			
1094-GRID	7817		11.125	180.0	201.6725		0			
1095-GRID	7818		11.125	150.0	201.6725		0			
1096-GRID	7819		10.76737	131.383	201.6725		0			
1097-GRID	7820		11.125	120.0	201.6725		0			
1098-GRID	7821		11.125	90.0	201.6725		0			
1099-GRID	7822		10.76737	71.383	201.6725		0			
1100-GRID	7823		11.125	60.0	201.6725		0			

PHASE 1 XPART 1 #  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO										
CARD	1	2	3	4	5	6	7	8	9	10
COUNT	1	2	3	4	5	6	7	8	9	10
1101- GRID	7824		11.125	30.0	201.6725		0			
1102- GRID	7825		11.125	0.0	201.6725		0			
1103- GRID	7826		11.125	-30.0	201.6725		0			
1104- GRID	7827		10.76737	-48.617	201.6725		0			
1105- GRID	7828		11.125	-60.0	201.6725		0			
1106- GRID	7829		11.125	-90.0	201.6725		0			
1107- GRID	7830		10.76737	-108.617	201.6725		0			
1108- GRID	7831		11.125	-120.0	201.6725		0			
1109- GRID	7832		11.125	-150.0	201.6725		0			
1110- GRID	7833		12.5	180.0	207.095		0			
1111- GRID	7834		12.5	150.0	207.095		0			
1112- GRID	7835		12.09817	131.383	207.095		0			
1113- GRID	7836		12.5	120.0	207.095		0			
1114- GRID	7837		12.5	90.0	207.095		0			
1115- GRID	7838		12.09817	71.383	207.095		0			
1116- GRID	7839		12.5	60.0	207.095		0			
1117- GRID	7840		12.5	30.0	207.095		0			
1118- GRID	7841		12.5	0.0	207.095		0			
1119- GRID	7842		12.5	-30.0	207.095		0			
1120- GRID	7843		12.09817	-48.617	207.095		0			
1121- GRID	7844		12.5	-60.0	207.095		0			
1122- GRID	7845		12.5	-90.0	207.095		0			
1123- GRID	7846		12.09817	-108.617	207.095		0			
1124- GRID	7847		12.5	-120.0	207.095		0			
1125- GRID	7848		12.5	-150.0	207.095		0			
1126- GRID	7849		13.875	180.0	212.5175		0			
1127- GRID	7850		13.875	150.0	212.5175		0			
1128- GRID	7851		13.42897	131.383	212.5175		0			
1129- GRID	7852		13.875	120.0	212.5175		0			
1130- GRID	7853		13.875	90.0	212.5175		0			
1131- GRID	7854		13.42897	71.383	212.5175		0			
1132- GRID	7855		13.875	60.0	212.5175		0			
1133- GRID	7856		13.875	30.0	212.5175		0			
1134- GRID	7857		13.875	0.0	212.5175		0			
1135- GRID	7858		13.875	-30.0	212.5175		0			
1136- GRID	7859		13.42897	-48.617	212.5175		0			
1137- GRID	7860		13.875	-60.0	212.5175		0			
1138- GRID	7861		13.875	-90.0	212.5175		0			
1139- GRID	7862		13.42897	-108.617	212.5175		0			
1140- GRID	7863		13.875	-120.0	212.5175		0			
1141- GRID	7864		13.875	-150.0	212.5175		0			
1142- GRID	7865		15.25	180.0	217.94		0			
1143- GRID	7866		15.25	150.0	217.94		0			
1144- GRID	7867		14.75977	131.383	217.94		0			
1145- GRID	7868		15.25	120.0	217.94		0			
1146- GRID	7869		15.25	90.0	217.94		0			
1147- GRID	7870		14.75977	71.383	217.94		0			
1148- GRID	7871		15.25	60.0	217.94		0			
1149- GRID	7872		15.25	30.0	217.94		0			
1150- GRID	7873		15.25	0.0	217.94		0			

PHASE I XPART I #  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO										
CARD	1	2	3	4	5	6	7	8	9	10
1151- GRID	7874			15.25	-30.0	217.94				0
1152- GRID	7875			14.75977	-48.617	217.94				0
1153- GRID	7876			15.25	-60.0	217.94				0
1154- GRID	7877			15.25	-90.0	217.94				0
1155- GRID	7878			14.75977	-108.617	217.94				0
1156- GRID	7879			15.25	-120.0	217.94				0
1157- GRID	7880			15.25	-150.0	217.94				0
1158- GRID	8352	101		196.25	13.872589	75	101	456		
1159- GRID	8355	101		196.25	13.87258	-9.75	101	456		
1160- MAT1	100	1.0567			.3	.1				
1161- MAT1	1000	25.063			.49	.0615			.52	
1162- PARAM	GRDPNT	0								
1163- PARAM	TPCOPY	1								
1164- PARAM	TPNAME	SRMP1A								
1165- PARAM	WTMASS	.002588								
1166- PHAR	101	100		.80	.054					
1167- PHAR	102	100		.948	.130					
1168- PHAR	103	100		.210	.077					
1169- PHAR	104	100		.356	.060					
1170- PQUAD2	100	100		.1875						
1171- PQUAD2	200	100		.062						
1172- PQUAD2	300	100		.062						
1173- SPC1	1	456		7290	7291	7292	7294	7295	7296	
1174- SPC1	1	456		7298	7299	7300	7302	7303	7304	
1176- SPC1	1	456		7306	7307	7308	7310	7311	7312	
1176- SPC1	1	456		7314	7315	7316	7318	7319	7320	
1177- SPC1	1	456		7322	7323	7324	7326	7327	7328	
1178- SPC1	1	456		7330	7331	7332	7334	7335	7336	
1179- SPC1	1	456		7338	7339	7340	7342	7343	7344	
1180- SPC1	1	456		7346	7347	7348	7350	7351	7352	
1181- SPC1	1	456		7354	7355	7356	7358	7359	7360	
1182- SPC1	1	456		7362	7363	7364	7366	7367	7368	
1183- SPC1	1	456		7370	7371	7372	7374	7375	7376	
1184- SPC1	1	456		7378	7379	7380	7382	7383	7384	
1185- SPC1	1	456		7386	7387	7388	7390	7391	7392	
1186- SPC1	1	456		7394	7395	7396	7398	7399	7400	
1187- SPC1	1	456		7402	7403	7404	7406	7407	7408	
1188- SPC1	1	456		7410	7411	7412	7414	7415	7416	
1189- SPC1	1	456		7418	7419	7420	7422	7423	7424	
1190- SPC1	1	456		7426	7427	7428	7430	7431	7432	
1191- SPC1	1	456		7434	7435	7436	7438	7439	7440	
1192- SPC1	1	456		7442	7443	7444	7446	7447	7448	
1193- SPC1	1	456		7450	7451	7452	7454	7455	7456	
1194- SPC1	1	456		7458	7459	7460	7462	7463	7464	
1195- SPC1	1	456		7466	7467	7468	7470	7471	7472	
1196- SPC1	1	456		7474	7475	7476	7478	7479	7480	
1197- SPC1	1	456		7482	7483	7484	7486	7487	7488	
1198- SPC1	1	456		7490	7491	7492	7494	7495	7496	
1199- SPC1	1	456		7498	7499	7500	7502	7503	7504	
1200- SPC1	1	456		7506	7507	7508	7510	7511	7512	

PHASE 1 XPART 1  
SRM & PROPELLANT AFT HALF

SORTED BULK DATA ECHO

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
1201-	SPC1	1	456	7514	7515	7516	7518	7519	7520		
1202-	SPC1	1	456	7522	7523	7524	7526	7527	7528		
1203-	SPC1	1	456	7530	7531	7532	7534	7535	7536		
1204-	SPC1	1	456	7538	7539	7540	7542	7543	7544		
1205-	SPC1	1	456	7546	7547	7548	7550	7551	7552		
1206-	SPC1	1	456	7554	7555	7556	7558	7559	7560		
1207-	SPC1	1	456	7562	7563	7564	7566	7567	7568		
1208-	SPC1	1	456	7570	7571	7572	7574	7575	7576		
1209-	SPC1	1	456	7578	7579	7580	7582	7583	7584		
1210-	SPC1	1	456	7586	7587	7588	7590	7591	7592		
1211-	SPC1	1	456	7594	7595	7596	7598	7599	7600		
1212-	SPC1	1	456	7602	7603	7604	7606	7607	7608		
1213-	SPC1	1	456	7610	7611	7612	7614	7615	7616		
1214-	SPC1	1	456	7618	7619	7620	7622	7623	7624		
1215-	SUPPORT	7301	2	7313	23	8352	123	8355	123		

ENDDATA

SOLID ROCKET BOOSTER FORWARD HALF NASTRAN DATA Z703213

NASTRAN EXECUTIVE CONTROL DECK ECHO

```

ID PHASE1 SRMRIF
CHKPNT YES
TIME 60
APP DISP
SOL 7.0
DIAG 2,7,8,13,14,19,21,22
ALTER 2,2$ PARAMETER DEFAULTS
PARAM //C,N,NUP/V,Y,NUSUB#0
PARAM //C,N,NUP/V,Y,TPCOPY#-1
PARAM //C,N,NUP/V,Y,SUBGK#-1
PARAM //C,N,NUP/V,Y,SUBK#-1
PARAM //C,N,NOP/V,Y,SUBB#-1
PARAM //C,N,NOP/V,N,TRUE#-1
ALTER 25,27
CHKPNT EST,GEI,FCPT,GPCT
PARAM //C,N,SU#/V,N,COUPLE/V,Y,NUSUB/C,N,I
PARAM //C,N,NUP/V,N,NUK4GG#-1
PURGE KGGX,K4GG,GPST,UGPST/NUSTMP
CHKPNT KGGX,K4GG,GPST,UGPST
COND L30,NOSTMP
COND L25A,GENEL
COND L25B,COUPLE
LABEL L25A
PURGE OGPST/TRUE
CHKPNT OGPST
LABEL L25B
ALTER 30,31
CHKPNT KGGX,K4GG,GPST
LABEL L30
ALTER 34,35
PARAM //C,N,AND/V,N,NURG/V,N,NUBGG/V,Y,SUBB
PARAM //C,N,AND/V,N,NUK4/V,Y,SUBGK/V,Y,SUBK4
PARAM //C,N,AND/V,N,NUK4/V,N,NUK4/V,N,NUK4GG
COND L34A,NURG
JUMP L34B
LABEL L34A
COND ERROR3,COUPLE
LABEL L34B
PURGE BNN,BFF,HAA,BGGY/NURG
PURGE K4GGY,K4NR,K4FF,K4AA/NUK4
CHKPNT BGGY,K4GGY,K4NR,K4FF,K4AA,MGG,BGG,BFF,BAA
ALTER 37,37
COND LBL1,NUMGG
ALTER 42,42 $ IF COUPLING RUN, COMBINES SUBSTRUCTURES.
PURGE LPCI,K1,M1,KGG1,MGG1,KGG5,MGG5,KGT,MGT/COUPLE
PURGE K4GG5,K4GG1,K4GT,MKI,K411,K41/COUPLE
PURGE M1,MGG5,MGG1,MGT,INFAC,SEAC,IFAC/COUPLE
COND LPC9,COUPLE $ SKIP, NOT A COUPLING RUN
INPUTT /,.,./,C,N,-3/C,N,9/V,Y,TPNAME9 $ LIST TAPL & REWIND
    
```



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

```

PARAM //C.N,NOP/V.N,PASS/1 $ INITIAL LOOP PASS PARAMETER
PURGE K46GS,K46G1,K46I,K46L,K46M,K46N,GFAC,KFAC/SUBK4
PURGE GIKI,GFAC/SUBK4,K41,KFAC/SUBK4/MGS,MGT,GFAC/SUBK
JUMP LOOPC
LABEL LOOPC $ 1DE OF LOOP
PARAM //C.N,SUB/V.N,PASS1/V.N,PASS/C.N,2
INPUT11 /CPG1,K1,M1,,/C.N,0/C.N,9 $
COND LPC1,PASS1
JUMP LPC3
LABEL LPC1
MERGE, ...K1,CPG1,/K6GS/C.N,-1/C.N,2/C.N,0
MERGE, ...M1,CPG1,/MGS/C.N,-1/C.N,2/C.N,0
COND LPC2,SUBK4
MERGE, ...CPG1,/K46GS/C.N,-1/C.N,2/C.N,0
LABEL LPC2
COND LPC3,SUBH
MERGE, ...CPG1,/MGS /C.N,-1/C.N,2/C.N,0
LABEL LPC3
COND LPC4,PASS1
MERGE, ...K1,CPG1,/K6G1/C.N,-1/C.N,2/C.N,0
MERGE, ...M1,CPG1,/MGS1/C.N,-1/C.N,2/C.N,0
ADD K6GS,K6G1/K6I $
EQUIV K6L,K6GS/TRUE
ADD MGS,MGS1/MGT $
EQUIV MGT,MGS/TRUE
LABEL LPC4
COND LPC7,SUBK4
COND LPC5,SUBK4
PARAM1 GFAC//C.N,DMI/C.N,1/V.N,PASS/V.N,GIR $
PARAMR //C.N,EU/C.N,0,0/C.N,0,0/V.N,GIR/V.N,OUT/C/V.N,INC1/V.N,INC2/
V.N,NOG1 $
PURGE GIKI/NOG1
COND LPC5,NOG1
PARAMR //C.N,COMPLEX/C.N,0,0/V.N,GIR/C.N,0,0/V.N,GI $
ADD K1,/GIK1/V.N,GI $
LABEL LPC5
COND LPC6,SUBK4
PARAM1 KFAC//C.N,DMI/C.N,1/V.N,PASS/V.N,K41 $
PARAMR //C.N,EU/C.N,0,0/C.N,0,0/V.N,K4R/V.N,OUT/C/V.N,INC1/V.N,INC2/
V.N,NUK41 $
PURGE K41/NUK41
COND LPC6,NUK41
INPUT11 /K41,,,/C.N,0/C.N,9 $
LABEL LPC6
ADD GIK1,K41/K41I
MERGE, ...K41I,CPG1,/K46G1/C.N,-1/C.N,2/C.N,0
ADD K46GS,K46G1/K46I
EQUIV K46T,K46GS/TRUE
LABEL LPC7
COND LPC8,SUBH

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MASTRAN EXECUTIVE CONTROL DECK ECHO

```

PARAML BFAC//C.N.DMI/C.N.I/V.N.PASS/V.N.BIP 3
PARAMR //C.N.EQ/C.N.O.O/C.N.O.O/V.N.DIR/V.N.OUTC/V.N.INCI/V.N.INC2/
V.N.NOBI 3
COND LPC8,NOBI
INPUT11 /BI.../C.N.O/A.N.9 3
MERGE. ...BI,CPGI./BGGI/C.N.-1/C.N.2/C.N.6
ADD BGG5,BGG1/BGT 3
EQUIV BGT,BGG5/TRUE
LABEL LPC8
PARAM //C.N.ADD/V.N.PASS/V.N.PASS/C.N.I
PARAM //C.N.SUB/V.N.SKIP2/V.Y.NUSUH/V.N.PASS
COND LPC9,SKIP2
NEPT LOOFC,20
LABEL LPC9
CHKPNT KGG5,MGG5,K4GG5,BGG5
ADD KGGX,KGG5/KGGY 3
CHKPNT KGGY
ADD MGG,MGG5/MGGY 3
CHKPNT MGGY
COND LPC11,NUK4
ADD K4GG,K4GG5/K4GGY
CHKPNT K4GGY
LABEL LPC11
COND LPC12,NOBG
ADD BGG,BGG5/BGGY
CHKPNT BGGY
LABEL LPC12
EQUIV KGGY,KGG/NOBLEL 3
ALTER 45,45
SMA3 GE1,KGGY/KGG/V.N.LUSET/V.N.NUGENL/V.N.NUSIM#1 3
ALTER 51,53
PURGE GM/MPCF1/GU/UNIT/KFS/SINGLE
EQUIV KGG,KNN/MPCF1/MGGY,MNN/MPLF1/BGGY,BN1/MPCF1/KAGGY,K4GN/MPCF1
CHKPNT GM,KG,GU,KFS,USE1,KNN,MNN,BNN,K4GN
COND L53A,NUMGG
ADD MGG,/WGG/C.Y.ALPHA#1385.4,0.0M 3
MATGPR GPL,USE1,SIL,WGG//C.N.G
LABEL L53A
COND L53B,COUPLE
JUMP LBL4
LABEL L53B
ALTER 63,63
MCE2 USE1,GM,KGG,MGGY,BGGY,K4GGY/KNN,MNN,BNN,K4NN
ALTER 74,74
COND L87,UNIT
ALTER 77,77
ALTER 80,81
COND LBL8,NOBG
ALTER 85,85
COND L87,NUK4

```

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 L C H U

ALTLR 87

LABEL L67  
PURGE CPARL,CPFUA,CPNSF,CPGMN,EGR,EQL,LOA,EGG,EGT,EGN,EGM,EGG/REACT  
PURGE LX,EXT,FQMT,EGNT,EGGT,EGGTC,MURG,MUG,Y/REACT  
PURGE KLL,KLR,KRR,LLL,ULL,DM,X,EQRT,DMI,GOL,GMT/REACT  
COND LCPS,REACT \* K-SET MUST BE DEFINED TO GENERATE EOC  
RBMG1 USET,KAA,/KLL,KLR,KRR... \*  
RBMG2 KLL/LLL,ULL  
RBMG3 LLL,ULL,KLR,KRR/DM  
CHKPNT KLL,KLR,KRR,DM  
TRNSP EGR/EQRT  
MATGPR GPL,USET,SIL,EQRT//C,N,R  
MPYAD KLR,DM,KRR/X/C,N,I \*  
MATGPR GPL,USET,SIL,X//C,N,R  
MPYAD EGR,X,/EX/C,N,0/C,N,1/C,N,0 \*  
TRNSP EX/LXT  
MATGPR GPL,USET,SIL,EXT//C,N,R  
PURGE CPFUA/DMT/CPNSF/SINGLE/CPGMN/MPCF1  
PURGE EGG/DMT/EGM/MPCF1  
PURGE GGT/DMT/GMT,EQMT/MPCF1  
VEC USET/CPARL/C,N,A/C,N,R/C,N,L \*  
TRNSP DM/DMT  
MPYAD EGR,DMI,/EQL/C,N,0/C,N,1/C,N,0  
MERGE EGR,,EQL,,CPARL,/EQA/C,N,1/C,N,2/C,N,2  
EQUIV EQA,EOF/DMT  
COND LCP1,DMT  
VEC USET/CPFUA/C,N,F/C,N,0/C,N,A \*  
TRNSP GO/GOT  
MPYAD LGA,GOL,/EGG/C,N,0/C,N,1/C,N,0  
MERGE EQU,,EQA,,CPFUA,/EOF/C,N,1/C,N,2/C,N,2  
LABEL LCP1  
EQUIV EQE,EGN/SINGLE  
COND LCP2,SINGLE  
VEC USET/CPNSF/C,N,N/C,N,S/C,N,F \*  
MERGE ,,EOF,,CPNSF,/EGN/C,N,1/C,N,2/C,N,2  
LABEL LCP2  
TRNSP EGN/EQNT  
MATGPR GPL,USET,SIL,EQNT//C,N,N  
EQUIV EGN,EGG/MPCF1  
COND LCP3,MPCF1  
VEC USET/CPGMN/C,N,0/C,N,1/MZ/C,N,N \*  
TRNSP GM/GMT  
MPYAD EGN,GMT,/EGM/C,N,0/C,N,1/C,N,0  
MERGE EGM,,EQN,,CPGMN,/EGG/C,N,1/C,N,2/C,N,2  
TRNSP EGM/EQMT  
MATGPR GPL,USET,SIL,EQMT//C,N,M  
LABEL LCP3  
CHKPNT CPFUA,CPNSF,CPGMN,CPARL  
CHKPNT EOG  
TRNSP EGG/EGGT

MASTRAN EXECUTIVE CONTROL DECK ECHO

ADD EOGT,EOGTC/C,Y,ALPHA#X386.4,0.0# \$  
\$ ASSUME CONVERSION OF MASS TO LBS # 386.4  
PURGE MOGG/NOMGG/MOGGY/COUPLE  
COND LCP4,NOMGG  
SMPYAD EOG,MGG,EOGTC.../MOGG/C,N,3/C,N,1/C,N,0 \$  
LABEL LCP4  
COND LCP5,COUPLE  
SMPYAD EOG,MGGY,EOGTC.../MOGGY/C,N,3/C,N,1/C,N,0 \$  
LABEL LCP5  
MATPRN MOGG,MGGY...// \$  
COND LCP8,IPCOPY  
SEEMAT KAA...//C,N,PRINT  
SEEMAT MAA...//C,N,PRINT  
OUTPUT1 GM,GO,KFS,KAA...//C,N,-1/C,N,0,ZV,Y,IPNAME  
OUTPUT1 MAA...// \$  
COND LCP7,NUK4  
SEEMAT K4AA...//C,N,PRINT  
OUTPUT1 K4AA...// \$  
LABEL LCP7  
COND LCP8,NUBG  
SEEMAT BAA...//C,N,PRINT  
OUTPUT1 BAA...// \$  
LABEL LCP8  
ALTER 89,162  
ALTER 164,167  
ENDALTER  
CEND

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   PHASE1   .58MK1F   . 8/ 27J.   17719.

PHASE 1 XPART 1 D  
SRM & PROPELLANT FWD HALF

CASE CONTROL DECK FCHD

CARD  
COUNT

1 TITLE # PHASE 1 XPART 1 D  
2 SUBTITLE # SRM 1 PROPELLANT FWD HALF  
3 MAXLINES # 60000  
4 MPC # 2  
5 SPC # 1  
6 BEGIN BULK

\*\*\* USER INFORMATION MESSAGE 207. BULK DATA NOT SORTED. SORT WILL RE-ORDER DECK.

PHASE I PART I B  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
1-ASET	6907	23								
2-ASET1	123	6901	6904	6910						
3-ASET1	123	7001	7004	7013	7016	7025	7028	7037		
4-ASET1	123	7040	7097	7100	7109	7112	7121	7124		
5-ASET1	123	7133	7136	7193	7196	7205	7208	7217		
6-ASET1	123	7220	7229	7232						
7-ASET1	123	7290	THRU	7292						
8-ASET1	123	7294	THRU	7296						
9-ASET1	123	7298	THRU	7300						
10-ASET1	123	7302	THRU	7304						
11-ASET1	123	7306	THRU	7308						
12-ASET1	123	7310	THRU	7312						
13-ASET1	123	7314	THRU	7316						
14-ASET1	123	7318	THRU	7320						
15-ASET1	123	7322	THRU	7324						
16-ASET1	123	7326	THRU	7328						
17-ASET1	123	7330	THRU	7332						
18-ASET1	123	7334	THRU	7336						
19-ASET1	123	8134								
20-ASET1	123456	7289	7293	7297	7301	7305	7309	7313		
21-ASET1	123456	7317	7321	7325	7329	7333				
22-CHAR	4201	106	6937	6938	1.0	.0	.0	1		ECB201
23-ECB201			-0.96			-0.96				
24-CHAR	4202	106	6938	6939	1.0	.0	.0	1		ECB202
25-ECB202			-0.96			-0.96				
26-CHAR	4203	106	6939	6940	1.0	.0	.0	1		ECB203
27-ECB203			-0.96			-0.96				
28-CHAR	4204	106	6940	6941	1.0	.0	.0	1		ECB204
29-ECB204			-0.96			-0.96				
30-CHAR	4205	106	6941	6942	1.0	.0	.0	1		ECB205
31-ECB205			-0.96			-0.96				
32-CHAR	4206	106	6942	6943	1.0	.0	.0	1		ECB206
33-ECB206			-0.96			-0.96				
34-CHAR	4207	106	6943	6944	1.0	.0	.0	1		ECB207
35-ECB207			-0.96			-0.96				
36-CHAR	4208	106	6944	6945	1.0	.0	.0	1		ECB208
37-ECB208			-0.96			-0.96				
38-CHAR	4209	106	6945	6946	1.0	.0	.0	1		ECB209
39-ECB209			-0.96			-0.96				
40-CHAR	4210	106	6946	6947	1.0	.0	.0	1		ECB210
41-ECB210			-0.96			-0.96				
42-CHAR	4211	106	6947	6948	1.0	.0	.0	1		ECB211
43-ECB211			-0.96			-0.96				
44-CHAR	4212	106	6948	6937	1.0	.0	.0	1		ECB212
45-ECB212			-0.96			-0.96				
46-CHAR	4213	107	6901	6902	1.0	.0	.0	1		ECB213
47-ECB213			-0.96			-0.96				
48-CHAR	4214	107	6902	6903	1.0	.0	.0	1		ECB214
49-ECB214			-0.96			-0.96				
50-CHAR	4215	107	6903	6904	1.0	.0	.0	1		ECB215

PHASE 1 PART 1 U  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
51- ECH215				-0.96			-0.96			
52- CBAR	4216	107	6904	6905	1.0	.0	.0	1		ECB216
53- ECH216				-0.96			-0.96			
54- CBAR	4217	107	6905	6906	1.0	.0	.0	1		ECB217
55- ECH217				-0.96			-0.96			
56- CBAR	4218	107	6906	6907	1.0	.0	.0	1		ECB218
57- ECH218				-0.96			-0.96			
58- CBAR	4219	107	6907	6908	1.0	.0	.0	1		ECB219
59- ECH219				-0.96			-0.96			
60- CBAR	4220	107	6908	6909	1.0	.0	.0	1		ECB220
61- ECH220				-0.96			-0.96			
62- CBAR	4221	107	6909	6910	1.0	.0	.0	1		ECB221
63- ECH221				-0.96			-0.96			
64- CBAR	4222	107	6910	6911	1.0	.0	.0	1		ECB222
65- ECH222				-0.96			-0.96			
66- CBAR	4223	107	6911	6912	1.0	.0	.0	1		ECB223
67- ECH223				-0.96			-0.96			
68- CBAR	4224	107	6912	6901	1.0	.0	.0	1		ECB224
69- ECH224				-0.96			-0.96			
70- CBAR	4225	108	7001	7005	1.0	.0	.0	1		ECB225
71- ECH225				0.41			0.41			
72- CBAR	4226	108	7005	7009	1.0	.0	.0	1		ECB226
73- ECH226				0.41			0.41			
74- CBAR	4227	108	7009	7013	1.0	.0	.0	1		ECB227
75- ECH227				0.41			0.41			
76- CBAR	4228	108	7013	7017	1.0	.0	.0	1		ECB228
77- ECH228				0.41			0.41			
78- CBAR	4229	108	7017	7021	1.0	.0	.0	1		ECB229
79- ECH229				0.41			0.41			
80- CBAR	4230	108	7021	7025	1.0	.0	.0	1		ECB230
81- ECH230				0.41			0.41			
82- CBAR	4231	108	7025	7029	1.0	.0	.0	1		ECB231
83- ECH231				0.41			0.41			
84- CBAR	4232	108	7029	7033	1.0	.0	.0	1		ECB232
85- ECH232				0.41			0.41			
86- CBAR	4233	108	7033	7037	1.0	.0	.0	1		ECB233
87- ECH233				0.41			0.41			
88- CBAR	4234	108	7037	7041	1.0	.0	.0	1		ECB234
89- ECH234				0.41			0.41			
90- CBAR	4235	108	7041	7045	1.0	.0	.0	1		ECB235
91- ECH235				0.41			0.41			
92- CBAR	4236	108	7045	7001	1.0	.0	.0	1		ECB236
93- ECH236				-1.075			-1.075			
94- CBAR	4237	109	6907	6919	1.0	.0	.0	1		ECB237
95- ECH237				-1.075			-1.075			
96- CBAR	4238	109	6919	6931	1.0	.0	.0	1		ECB238
97- ECH238				-1.075			-1.075			
98- CBAR	4239	109	6931	6943	1.0	.0	.0	1		ECB239
99- ECH239										
100- CHEXA1	1001	1000	7002	7050	7054	7006	7001	7049		CHX1001



PHASE I PART I II  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO											
CARD	1	2	3	4	5	6	7	8	9	10	
101-CHEXA1	1001	7053	7005								
102-CHEXA1	1002	1000	7003	7051	7055	7007	7002	7050		CHX1002	
103-CHEXA1		7054	7006								
104-CHEXA1	1003	1000	7004	7052	7056	7008	7003	7051		CHX1003	
105-CHEXA1		7055	7007								
106-CHEXA1	1004	1000	7006	7054	7058	7010	7005	7053		CHX1004	
107-CHEXA1		7057	7009								
108-CHEXA1	1005	1000	7007	7055	7059	7011	7006	7054		CHX1005	
109-CHEXA1		7058	7010								
110-CHEXA1	1006	1000	7008	7056	7060	7012	7007	7055		CHX1006	
111-CHEXA1		7059	7011								
112-CHEXA1	1007	1000	7010	7058	7062	7014	7009	7057		CHX1007	
113-CHEXA1		7061	7013								
114-CHEXA1	1008	1000	7011	7059	7063	7015	7010	7058		CHX1008	
115-CHEXA1		7062	7014								
116-CHEXA1	1009	1000	7012	7060	7064	7016	7011	7059		CHX1009	
117-CHEXA1		7063	7015								
118-CHEXA1	1010	1000	7014	7062	7066	7018	7013	7061		CHX1010	
119-CHEXA1		7065	7017								
120-CHEXA1	1011	1000	7015	7063	7067	7019	7014	7062		CHX1011	
121-CHEXA1		7066	7018								
122-CHEXA1	1012	1000	7016	7064	7068	7020	7015	7063		CHX1012	
123-CHEXA1		7067	7019								
124-CHEXA1	1013	1000	7018	7066	7070	7022	7017	7065		CHX1013	
125-CHEXA1		7069	7021								
126-CHEXA1	1014	1000	7019	7067	7071	7023	7018	7066		CHX1014	
127-CHEXA1		7070	7022								
128-CHEXA1	1015	1000	7020	7068	7072	7024	7019	7067		CHX1015	
129-CHEXA1		7071	7023								
130-CHEXA1	1016	1000	7022	7070	7074	7026	7021	7069		CHX1016	
131-CHEXA1		7073	7025								
132-CHEXA1	1017	1000	7023	7071	7075	7027	7022	7070		CHX1017	
133-CHEXA1		7074	7026								
134-CHEXA1	1018	1000	7024	7072	7076	7028	7023	7071		CHX1018	
135-CHEXA1		7075	7027								
136-CHEXA1	1019	1000	7026	7074	7078	7030	7025	7073		CHX1019	
137-CHEXA1		7077	7029								
138-CHEXA1	1020	1000	7027	7075	7079	7031	7026	7074		CHX1020	
139-CHEXA1		7078	7030								
140-CHEXA1	1021	1000	7028	7076	7080	7032	7027	7075		CHX1021	
141-CHEXA1		7079	7031								
142-CHEXA1	1022	1000	7030	7078	7082	7034	7029	7077		CHX1022	
143-CHEXA1		7081	7033								
144-CHEXA1	1023	1000	7031	7079	7083	7035	7030	7078		CHX1023	
145-CHEXA1		7082	7034								
146-CHEXA1	1024	1000	7032	7080	7084	7036	7031	7079		CHX1024	
147-CHEXA1		7083	7035								
148-CHEXA1	1025	1000	7034	7082	7086	7038	7033	7081		CHX1025	
149-CHEXA1		7085	7037								
150-CHEXA1	1026	1000	7035	7083	7087	7039	7034	7082		CHX1026	

PHASE I PART I D  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
151-CHX1026		7086	7038							
152-CHEXA1	1027	1000	7036	7084	7088	7040	7035	7083	CHX1027	
153-CHX1027		7087	7039							
154-CHEXA1	1028	1000	7038	7086	7090	7042	7027	7085	CHX1028	
155-CHX1028		7089	7041							
156-CHEXA1	1029	1000	7039	7087	7091	7043	7038	7086	CHX1029	
157-CHX1029		7090	7042							
158-CHEXA1	1030	1000	7040	7088	7092	7044	7039	7087	CHX1030	
159-CHX1030		7091	7043							
160-CHEXA1	1031	1000	7042	7090	7094	7046	7041	7089	CHX1031	
161-CHX1031		7093	7045							
162-CHEXA1	1032	1000	7043	7091	7095	7047	7042	7090	CHX1032	
163-CHX1032		7094	7046							
164-CHEXA1	1033	1000	7044	7092	7096	7048	7043	7091	CHX1033	
165-CHX1033		7095	7047							
166-CHEXA1	1034	1000	7046	7094	7050	7002	7045	7093	CHX1034	
167-CHX1034		7049	7001							
168-CHEXA1	1035	1000	7047	7095	7051	7003	7046	7094	CHX1035	
169-CHX1035		7050	7002							
170-CHEXA1	1036	1000	7048	7096	7052	7004	7047	7095	CHX1036	
171-CHX1036		7051	7003							
172-CHEXA1	1037	1000	7050	7098	7102	7054	7049	7097	CHX1037	
173-CHX1037		7101	7054							
174-CHEXA1	1038	1000	7051	7099	7103	7055	7050	7098	CHX1038	
175-CHX1038		7102	7054							
176-CHEXA1	1039	1000	7052	7100	7104	7056	7051	7099	CHX1039	
177-CHX1039		7103	7055							
178-CHEXA1	1040	1000	7054	7102	7106	7058	7053	7101	CHX1040	
179-CHX1040		7105	7057							
180-CHEXA1	1041	1000	7055	7103	7107	7059	7054	7102	CHX1041	
181-CHX1041		7106	7058							
182-CHEXA1	1042	1000	7056	7104	7108	7060	7055	7103	CHX1042	
183-CHX1042		7107	7059							
184-CHEXA1	1043	1000	7058	7106	7110	7062	7057	7105	CHX1043	
185-CHX1043		7109	7061							
186-CHEXA1	1044	1000	7059	7107	7111	7063	7058	7106	CHX1044	
187-CHX1044		7110	7062							
188-CHEXA1	1045	1000	7060	7108	7112	7064	7059	7107	CHX1045	
189-CHX1045		7111	7063							
190-CHEXA1	1046	1000	7062	7110	7114	7066	7061	7109	CHX1046	
191-CHX1046		7113	7065							
192-CHEXA1	1047	1000	7063	7111	7115	7067	7062	7110	CHX1047	
193-CHX1047		7114	7066							
194-CHEXA1	1048	1000	7064	7112	7116	7068	7063	7111	CHX1048	
195-CHX1048		7115	7067							
196-CHEXA1	1049	1000	7066	7114	7118	7070	7065	7113	CHX1049	
197-CHX1049		7117	7069							
198-CHEXA1	1050	1000	7067	7115	7119	7071	7066	7114	CHX1050	
199-CHX1050		7118	7070							
200-CHEXA1	1051	1000	7068	7116	7120	7072	7067	7115	CHX1051	

PHASE 1 XPAK 1 H  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO											
CAN	1	2	3	4	5	6	7	8	9	10	
201-CHEXA1	1051	7119	1000	7071							
202-CHEXA1	1052	1000	7070	7118	7122	7074	7069	7117	6HX1052		
203-CHEXA1	1053	7121	1000	7071	7119	7123	7075	7070	7118	6HX1053	
204-CHEXA1	1053	7122	1000	7074	7122	7126	7078	7073	7121	6HX1054	
205-CHEXA1	1054	7123	1000	7072	7120	7124	7076	7071	7119	6HX1055	
206-CHEXA1	1054	7125	1000	7074	7122	7126	7078	7073	7121	6HX1056	
207-CHEXA1	1055	7126	1000	7075	7123	7127	7079	7074	7122	6HX1057	
208-CHEXA1	1055	7127	1000	7076	7124	7128	7080	7075	7123	6HX1058	
209-CHEXA1	1055	7129	1000	7077	7125	7129	7082	7077	7125	6HX1059	
210-CHEXA1	1056	7130	1000	7079	7127	7131	7083	7078	7126	6HX1060	
211-CHEXA1	1056	7131	1000	7080	7128	7132	7084	7079	7127	6HX1061	
212-CHEXA1	1057	7133	1000	7081	7130	7134	7086	7081	7129	6HX1062	
213-CHEXA1	1057	7134	1000	7082	7131	7135	7087	7082	7130	6HX1063	
214-CHEXA1	1058	7135	1000	7083	7132	7136	7088	7083	7131	6HX1064	
215-CHEXA1	1058	7137	1000	7084	7134	7138	7090	7085	7133	6HX1065	
216-CHEXA1	1059	7138	1000	7085	7135	7139	7091	7086	7134	6HX1066	
217-CHEXA1	1059	7139	1000	7087	7137	7141	7093	7088	7136	6HX1067	
218-CHEXA1	1060	7140	1000	7088	7138	7142	7094	7089	7137	6HX1068	
219-CHEXA1	1060	7141	1000	7089	7139	7143	7095	7090	7138	6HX1069	
220-CHEXA1	1061	7142	1000	7090	7140	7144	7096	7091	7139	6HX1070	
221-CHEXA1	1061	7143	1000	7091	7141	7145	7097	7092	7140	6HX1071	
222-CHEXA1	1062	7144	1000	7092	7142	7146	7098	7093	7141	6HX1072	
223-CHEXA1	1062	7145	1000	7093	7143	7147	7099	7094	7142	6HX1073	
224-CHEXA1	1063	7146	1000	7094	7144	7148	7100	7095	7143	6HX1074	
225-CHEXA1	1063	7147	1000	7095	7145	7149	7101	7096	7144	6HX1075	
226-CHEXA1	1064	7148	1000	7096	7146	7150	7102	7097	7145	6HX1076	
227-CHEXA1	1064	7149	1000	7097	7147	7151	7103	7098	7146		
228-CHEXA1	1065	7150	1000	7098	7148	7152	7104	7099	7147		
229-CHEXA1	1065	7151	1000	7099	7149	7153	7105	7100	7148		
230-CHEXA1	1066	7152	1000	7100	7150	7154	7106	7101	7149		
231-CHEXA1	1066	7153	1000	7101	7151						
232-CHEXA1	1067	7154	1000	7102	7152						
233-CHEXA1	1067	7155	1000	7103	7153						
234-CHEXA1	1068	7156	1000	7104	7154						
235-CHEXA1	1068	7157	1000	7105	7155						
236-CHEXA1	1069	7158	1000	7106	7156						
237-CHEXA1	1069	7159	1000	7107	7157						
238-CHEXA1	1070	7160	1000	7108	7158						
239-CHEXA1	1070	7161	1000	7109	7159						
240-CHEXA1	1071	7162	1000	7110	7160						
241-CHEXA1	1071	7163	1000	7111	7161						
242-CHEXA1	1072	7164	1000	7112	7162						
243-CHEXA1	1072	7165	1000	7113	7163						
244-CHEXA1	1073	7166	1000	7114	7164						
245-CHEXA1	1073	7167	1000	7115	7165						
246-CHEXA1	1074	7168	1000	7116	7166						
247-CHEXA1	1074	7169	1000	7117	7167						
248-CHEXA1	1075	7170	1000	7118	7168						
249-CHEXA1	1075	7171	1000	7119	7169						
250-CHEXA1	1076	7172	1000	7120	7170						

PHASE I PART I H  
SRM 6 PROPELLANT FWD HALF

SORTED BULK DATA LIST

CARD	1	2	3	4	5	6	7	8	9	10
251-CHEXA1	1076	7153	7105							
252-CHEXA1	1077	1000	7103	7151	7155	7107	7102	7150		CHX1077
253-CHEXA1	1077	7154	7106							
254-CHEXA1	1078	1000	7104	7152	7156	7108	7105	7151		CHX1078
255-CHEXA1	1078	7155	7107							
256-CHEXA1	1079	1000	7106	7154	7158	7110	7105	7153		CHX1079
257-CHEXA1	1079	7157	7109							
258-CHEXA1	1080	1000	7107	7155	7159	7111	7106	7154		CHX1080
259-CHEXA1	1080	7158	7110							
260-CHEXA1	1081	1000	7108	7156	7160	7112	7167	7155		CHX1081
261-CHEXA1	1081	7159	7111							
262-CHEXA1	1082	1000	7110	7158	7162	7114	7109	7157		CHX1082
263-CHEXA1	1082	7161	7113							
264-CHEXA1	1083	1000	7111	7159	7163	7115	7110	7158		CHX1083
265-CHEXA1	1083	7162	7114							
266-CHEXA1	1084	1000	7112	7160	7164	7116	7111	7159		CHX1084
267-CHEXA1	1084	7163	7115							
268-CHEXA1	1085	1000	7114	7162	7166	7118	7113	7161		CHX1085
269-CHEXA1	1085	7165	7117							
270-CHEXA1	1086	1000	7115	7163	7167	7119	7114	7162		CHX1086
271-CHEXA1	1086	7166	7118							
272-CHEXA1	1087	1000	7116	7164	7168	7120	7115	7163		CHX1087
273-CHEXA1	1087	7167	7119							
274-CHEXA1	1088	1000	7118	7166	7170	7122	7117	7165		CHX1088
275-CHEXA1	1088	7169	7121							
276-CHEXA1	1089	1000	7119	7167	7171	7123	7118	7166		CHX1089
277-CHEXA1	1089	7170	7122							
278-CHEXA1	1090	1000	7120	7168	7172	7124	7119	7167		CHX1090
279-CHEXA1	1090	7171	7123							
280-CHEXA1	1091	1000	7122	7170	7174	7126	7121	7169		CHX1091
281-CHEXA1	1091	7173	7125							
282-CHEXA1	1092	1000	7123	7171	7175	7127	7122	7170		CHX1092
283-CHEXA1	1092	7174	7126							
284-CHEXA1	1093	1000	7124	7172	7176	7128	7123	7171		CHX1093
285-CHEXA1	1093	7175	7127							
286-CHEXA1	1094	1000	7126	7174	7178	7130	7125	7173		CHX1094
287-CHEXA1	1094	7177	7129							
288-CHEXA1	1095	1000	7127	7175	7179	7131	7126	7174		CHX1095
289-CHEXA1	1095	7178	7130							
290-CHEXA1	1096	1000	7128	7176	7180	7132	7127	7175		CHX1096
291-CHEXA1	1096	7179	7131							
292-CHEXA1	1097	1000	7130	7178	7182	7134	7129	7177		CHX1097
293-CHEXA1	1097	7181	7133							
294-CHEXA1	1098	1000	7131	7179	7183	7135	7130	7178		CHX1098
295-CHEXA1	1098	7182	7134							
296-CHEXA1	1099	1000	7132	7180	7184	7136	7131	7179		CHX1099
297-CHEXA1	1099	7183	7135							
298-CHEXA1	1100	1000	7134	7182	7186	7138	7133	7181		CHX1100
299-CHEXA1	1100	7185	7137							
300-CHEXA1	1101	1000	7135	7183	7187	7139	7134	7182		CHX1101

PHASE I PART I II  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA CHECK

CARD

COUNT	1	2	3	4	5	6	7	8	9	10
301-CHEXAI	1101	7186	7138							
302-CHEXAI	1102	1000	7136	7184	7188	7140	7135	7193		CHX1102
303-CHX1102		7187	7139							
304-CHEXAI	1103	1000	7138	7186	7190	7142	7137	7185		CHX1103
305-CHX1103		7189	7141							
306-CHEXAI	1104	1000	7139	7187	7191	7143	7138	7186		CHX1104
307-CHX1104		7190	7142							
308-CHEXAI	1105	1000	7140	7188	7192	7144	7139	7187		CHX1105
309-CHX1105		7191	7143							
310-CHEXAI	1106	1000	7142	7190	7146	7098	7141	7189		CHX1106
311-CHX1106		7195	7097							
312-CHEXAI	1107	1000	7143	7191	7147	7099	7142	7190		CHX1107
313-CHX1107		7146	7098							
314-CHEXAI	1108	1000	7144	7192	7148	7100	7143	7191		CHX1108
315-CHX1108		7147	7099							
316-CHEXAI	1109	1000	7146	7194	7196	7150	7145	7193		CHX1109
317-CHX1109		7197	7149							
318-CHEXAI	1110	1000	7147	7195	7199	7151	7146	7194		CHX1110
319-CHX1110		7198	7150							
320-CHEXAI	1111	1000	7148	7196	7200	7152	7147	7195		CHX1111
321-CHX1111		7199	7151							
322-CHEXAI	1112	1000	7150	7198	7202	7154	7149	7157		CHX1112
323-CHX1112		7201	7153							
324-CHEXAI	1113	1000	7151	7199	7203	7155	7150	7198		CHX1113
325-CHX1113		7202	7154							
326-CHEXAI	1114	1000	7152	7200	7204	7156	7151	7199		CHX1114
327-CHX1114		7203	7155							
328-CHEXAI	1115	1000	7154	7202	7206	7158	7153	7201		CHX1115
329-CHX1115		7205	7157							
330-CHEXAI	1116	1000	7155	7203	7207	7159	7154	7202		CHX1116
331-CHX1116		7206	7158							
332-CHEXAI	1117	1000	7156	7204	7208	7160	7155	7203		CHX1117
333-CHX1117		7207	7159							
334-CHEXAI	1118	1000	7158	7206	7210	7162	7157	7205		CHX1118
335-CHX1118		7209	7161							
336-CHEXAI	1119	1000	7159	7207	7211	7163	7158	7206		CHX1119
337-CHX1119		7210	7162							
338-CHEXAI	1120	1000	7160	7208	7212	7164	7159	7207		CHX1120
339-CHX1120		7211	7163							
340-CHEXAI	1121	1000	7162	7210	7214	7166	7161	7209		CHX1121
341-CHX1121		7213	7165							
342-CHEXAI	1122	1000	7163	7211	7215	7167	7162	7210		CHX1122
343-CHX1122		7214	7166							
344-CHEXAI	1123	1000	7164	7212	7216	7168	7164	7211		CHX1123
345-CHX1123		7215	7167							
346-CHEXAI	1124	1000	7166	7214	7218	7170	7165	7213		CHX1124
347-CHX1124		7217	7169							
348-CHEXAI	1125	1000	7167	7215	7219	7171	7166	7214		CHX1125
349-CHX1125		7218	7170							
350-CHEXAI	1126	1000	7168	7216	7220	7172	7167	7215		CHX1126

PHASE I PART I II  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA LCHD

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
351-CHEXA1	7219	7171									
352-CHEXA1	1127	1000	7170	7218	7222	7174	7169	7217		6HX1127	
353-CHEXA1	7221	7173									
354-CHEXA1	1128	1000	7171	7219	7223	7175	7170	7218		6HX1128	
355-CHEXA1	7222	7174									
356-CHEXA1	1129	1000	7172	7220	7224	7176	7171	7219		6HX1129	
357-CHEXA1	7223	7175									
358-CHEXA1	1130	1000	7174	7222	7226	7178	7173	7221		6HX1130	
359-CHEXA1	7225	7177									
360-CHEXA1	1131	1000	7175	7223	7227	7179	7174	7222		6HX1131	
361-CHEXA1	7226	7178									
362-CHEXA1	1132	1000	7176	7224	7228	7180	7175	7223		6HX1132	
363-CHEXA1	7227	7179									
364-CHEXA1	1133	1000	7178	7226	7230	7182	7177	7225		6HX1133	
365-CHEXA1	7229	7181									
366-CHEXA1	1134	1000	7179	7227	7231	7183	7178	7226		6HX1134	
367-CHEXA1	7230	7182									
368-CHEXA1	1135	1000	7180	7228	7232	7184	7179	7227		6HX1135	
369-CHEXA1	7231	7183									
370-CHEXA1	1136	1000	7182	7230	7234	7186	7181	7229		6HX1136	
371-CHEXA1	7233	7185									
372-CHEXA1	1137	1000	7183	7231	7235	7187	7182	7230		6HX1137	
373-CHEXA1	7234	7186									
374-CHEXA1	1138	1000	7184	7232	7236	7188	7183	7231		6HX1138	
375-CHEXA1	7235	7187									
376-CHEXA1	1139	1000	7186	7234	7238	7190	7185	7233		6HX1139	
377-CHEXA1	7237	7189									
378-CHEXA1	1140	1000	7187	7235	7239	7191	7186	7234		6HX1140	
379-CHEXA1	7238	7190									
380-CHEXA1	1141	1000	7188	7236	7240	7192	7187	7235		6HX1141	
381-CHEXA1	7239	7191									
382-CHEXA1	1142	1000	7190	7238	7194	7190	7185	7237		6HX1142	
383-CHEXA1	7193	7195									
384-CHEXA1	1143	1000	7191	7239	7195	7197	7190	7238		6HX1143	
385-CHEXA1	7194	7196									
386-CHEXA1	1144	1000	7192	7240	7196	7198	7191	7239		6HX1144	
387-CHEXA1	7195	7197									
388-CHEXA1	1145	1000	7194	7242	7246	7198	7193	7241		6HX1145	
389-CHEXA1	7245	7197									
390-CHEXA1	1146	1000	7195	7243	7247	7199	7194	7242		6HX1146	
391-CHEXA1	7246	7198									
392-CHEXA1	1147	1000	7196	7244	7248	7200	7195	7243		6HX1147	
393-CHEXA1	7247	7199									
394-CHEXA1	1148	1000	7198	7246	7250	7202	7197	7245		6HX1148	
395-CHEXA1	7249	7201									
396-CHEXA1	1149	1000	7199	7247	7251	7203	7198	7246		6HX1149	
397-CHEXA1	7250	7202									
398-CHEXA1	1150	1000	7200	7248	7252	7204	7199	7247		6HX1150	
399-CHEXA1	7251	7203									
400-CHEXA1	1151	1000	7202	7250	7254	7206	7201	7249		6HX1151	

SORTED BULK DATA ECHO

CASE	1	2	3	4	5	6	7	8	9	10
401-CHEXAI	1151	7253	7205							
402-CHEXAI	1152	1000	7203	7251	7255	7207	7202	7250	6HX1152	
403-CHEXAI	1152	7254	7206							
404-CHEXAI	1153	1000	7204	7252	7256	7208	7203	7251	6HX1153	
405-CHEXAI	1153	7255	7207							
406-CHEXAI	1154	1000	7206	7254	7258	7210	7205	7253	6HX1154	
407-CHEXAI	1154	7257	7209							
408-CHEXAI	1155	1000	7207	7255	7259	7211	7206	7259	6HX1155	
409-CHEXAI	1155	7258	7210							
410-CHEXAI	1156	1000	7208	7256	7260	7212	7207	7255	6HX1156	
411-CHEXAI	1156	7259	7211							
412-CHEXAI	1157	1000	7210	7258	7262	7214	7209	7257	6HX1157	
413-CHEXAI	1157	7261	7213							
414-CHEXAI	1158	1000	7211	7259	7263	7215	7210	7258	6HX1158	
415-CHEXAI	1158	7262	7214							
416-CHEXAI	1159	1000	7212	7260	7264	7216	7211	7254	6HX1159	
417-CHEXAI	1159	7263	7215							
418-CHEXAI	1160	1000	7214	7262	7266	7218	7215	7261	6HX1160	
419-CHEXAI	1160	7265	7217							
420-CHEXAI	1161	1000	7215	7263	7267	7219	7214	7262	6HX1161	
421-CHEXAI	1161	7266	7218							
422-CHEXAI	1162	1000	7216	7264	7268	7220	7215	7263	6HX1162	
423-CHEXAI	1162	7267	7219							
424-CHEXAI	1163	1000	7218	7266	7270	7222	7217	7265	6HX1163	
425-CHEXAI	1163	7269	7221							
426-CHEXAI	1164	1000	7219	7267	7271	7223	7218	7266	6HX1164	
427-CHEXAI	1164	7270	7222							
428-CHEXAI	1165	1000	7220	7268	7272	7224	7215	7267	6HX1165	
429-CHEXAI	1165	7271	7223							
430-CHEXAI	1166	1000	7222	7270	7274	7226	7221	7269	6HX1166	
431-CHEXAI	1166	7273	7225							
432-CHEXAI	1167	1000	7223	7271	7275	7227	7222	7270	6HX1167	
433-CHEXAI	1167	7274	7226							
434-CHEXAI	1168	1000	7224	7272	7276	7228	7223	7271	6HX1168	
435-CHEXAI	1168	7275	7227							
436-CHEXAI	1169	1000	7226	7274	7278	7230	7225	7273	6HX1169	
437-CHEXAI	1169	7277	7229							
438-CHEXAI	1170	1000	7227	7275	7279	7231	7226	7274	6HX1170	
439-CHEXAI	1170	7278	7230							
440-CHEXAI	1171	1000	7228	7276	7280	7232	7227	7275	6HX1171	
441-CHEXAI	1171	7279	7231							
442-CHEXAI	1172	1000	7230	7278	7282	7234	7229	7277	6HX1172	
443-CHEXAI	1172	7281	7233							
444-CHEXAI	1173	1000	7231	7279	7283	7235	7230	7278	6HX1173	
445-CHEXAI	1173	7282	7234							
446-CHEXAI	1174	1000	7232	7280	7284	7236	7231	7279	6HX1174	
447-CHEXAI	1174	7283	7235							
448-CHEXAI	1175	1000	7234	7282	7286	7238	7233	7281	6HX1175	
449-CHEXAI	1175	7285	7237							
450-CHEXAI	1176	1000	7235	7283	7287	7239	7234	7282	6HX1176	

PHASE I PART II  
SRM 6 PROPELLANT FWD HALF

S O R T E D B U L K D A T A L C H U										
CARD	1	2	3	4	5	6	7	8	9	10
COUNT	1	2	3	4	5	6	7	8	9	10
451- BHX1176		7286	7238							
452- CHEXA1	1177	1000	7236	7284	7288	7240	7235	7283		BHX1177
453- BHX1177		7287	7239							
454- CHEXA1	1178	1000	7238	7286	7242	7194	7237	7285		BHX1178
455- BHX1178		7241	7194							
456- CHEXA1	1179	1000	7239	7287	7243	7195	7236	7286		BHX1179
457- BHX1179		7242	7194							
458- CHEXA1	1180	1000	7240	7288	7244	7196	7239	7287		BHX1180
459- BHX1180		7243	7195							
460- CHEXA1	1181	1000	7242	7290	7294	7246	7241	7289		BHX1181
461- BHX1181		7293	7245							
462- CHEXA1	1182	1000	7243	7291	7295	7247	7242	7290		BHX1182
463- BHX1182		7294	7246							
464- CHEXA1	1183	1000	7244	7292	7296	7248	7243	7291		BHX1183
465- BHX1183		7295	7247							
466- CHEXA1	1184	1000	7246	7294	7298	7250	7245	7293		BHX1184
467- BHX1184		7297	7249							
468- CHEXA1	1185	1000	7247	7295	7299	7251	7246	7294		BHX1185
469- BHX1185		7298	7250							
470- CHEXA1	1186	1000	7248	7296	7300	7252	7247	7295		BHX1186
471- BHX1186		7299	7251							
472- CHEXA1	1187	1000	7250	7298	7302	7254	7249	7297		BHX1187
473- BHX1187		7301	7253							
474- CHEXA1	1188	1000	7251	7299	7303	7255	7250	7298		BHX1188
475- BHX1188		7302	7254							
476- CHEXA1	1189	1000	7252	7300	7304	7256	7251	7299		BHX1189
477- BHX1189		7303	7255							
478- CHEXA1	1190	1000	7254	7302	7306	7258	7253	7301		BHX1190
479- BHX1190		7305	7257							
480- CHEXA1	1191	1000	7255	7303	7307	7259	7254	7302		BHX1191
481- BHX1191		7306	7258							
482- CHEXA1	1192	1000	7256	7304	7308	7260	7255	7303		BHX1192
483- BHX1192		7307	7259							
484- CHEXA1	1193	1000	7258	7306	7310	7262	7257	7305		BHX1193
485- BHX1193		7309	7261							
486- CHEXA1	1194	1000	7259	7307	7311	7263	7258	7306		BHX1194
487- BHX1194		7310	7262							
488- CHEXA1	1195	1000	7260	7308	7312	7264	7259	7307		BHX1195
489- BHX1195		7311	7263							
490- CHEXA1	1196	1000	7262	7310	7314	7266	7261	7309		BHX1196
491- BHX1196		7313	7265							
492- CHEXA1	1197	1000	7263	7311	7315	7267	7262	7310		BHX1197
493- BHX1197		7314	7266							
494- CHEXA1	1198	1000	7264	7312	7316	7268	7263	7311		BHX1198
495- BHX1198		7315	7267							
496- CHEXA1	1199	1000	7266	7314	7318	7270	7265	7313		BHX1199
497- BHX1199		7317	7269							
498- CHEXA1	1200	1000	7267	7315	7319	7271	7266	7314		BHX1200
499- BHX1200		7318	7270							
500- CHEXA1	1201	1000	7268	7316	7320	7272	7267	7315		BHX1201



PHASE 1 PART 1.1  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA FCHD

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
501-CHEXA1	1201	7319	7271								
502-CHEXA1	1202	1000	7270	7318	7322	7274	7269	7317		6HX1202	
503-CHEXA1	1203	7321	7273	7271	7319	7323	7275	7270	7318	6HX1203	
504-CHEXA1	1204	1000	7272	7320	7324	7276	7271	7319		6HX1204	
505-CHEXA1	1205	7322	7274								
506-CHEXA1	1206	1000	7274	7322	7326	7278	7273	7321		6HX1206	
507-CHEXA1	1207	7323	7275								
508-CHEXA1	1208	1000	7275	7323	7327	7279	7274	7322		6HX1208	
509-CHEXA1	1209	7324	7276	7324	7328	7280	7275	7323		6HX1209	
510-CHEXA1	1210	1000	7276	7324	7328	7280	7275	7323		6HX1210	
511-CHEXA1	1211	7327	7279								
512-CHEXA1	1212	1000	7278	7326	7330	7282	7277	7325		6HX1212	
513-CHEXA1	1213	7329	7281								
514-CHEXA1	1214	1000	7279	7327	7331	7283	7278	7326		6HX1214	
515-CHEXA1	1215	7330	7282								
516-CHEXA1	1216	1000	7280	7328	7332	7284	7279	7327		6HX1216	
517-CHEXA1	1217	7331	7283								
518-CHEXA1	1218	1000	7282	7330	7334	7286	7281	7329		6HX1218	
519-CHEXA1	1219	7333	7285								
520-CHEXA1	1220	1000	7283	7331	7335	7287	7282	7330		6HX1220	
521-CHEXA1	1221	7334	7286								
522-CHEXA1	1222	1000	7284	7332	7336	7288	7283	7331		6HX1222	
523-CHEXA1	1223	7335	7287								
524-CHEXA1	1224	1000	7286	7334	7290	7242	7285	7333		6HX1224	
525-CHEXA1	1225	7289	7241								
526-CHEXA1	1226	1000	7287	7335	7291	7243	7286	7334		6HX1226	
527-CHEXA1	1227	7290	7242								
528-CHEXA1	1228	1000	7288	7336	7292	7244	7287	7335		6HX1228	
529-CHEXA1	1229	7291	7243								
532-CURD2C	100	696	74.738	-30.494	6.138	200.0	-30.494	6.138		6C5SRM	
533-6C5SRM	74.738	0.0	0.0								
534-CURD2R	101	696	74.738	-30.494	6.138	74.738	-28.27015	6.0963		6M5SRM	
535-6M5SRM	200	-30.494	6.138								
536-CURD2R	696	0	-81.5683.0		35.5985	-80.2278.0		57.5136		6R5TANK	
537-6R5TANK	68.23	0.0	48.432								
538-CQUAD2	1	100	7001	7049	7053	7005	.0				
539-CQUAD2	2	100	7005	7053	7057	7009	.0				
540-CQUAD2	3	100	7009	7057	7061	7013	.0				
541-CQUAD2	4	100	7013	7061	7065	7017	.0				
542-CQUAD2	5	100	7017	7065	7069	7021	.0				
543-CQUAD2	6	100	7021	7069	7073	7025	.0				
544-CQUAD2	7	100	7025	7073	7077	7029	.0				
545-CQUAD2	8	100	7029	7077	7081	7033	.0				
546-CQUAD2	9	100	7033	7081	7085	7037	.0				
547-CQUAD2	10	100	7037	7085	7089	7041	.0				
548-CQUAD2	11	100	7041	7089	7093	7045	.0				
549-CQUAD2	12	100	7045	7093	7049	7001	.0				
550-CQUAD2	13	100	7049	7097	7101	7053	.0				

PHASE I PART I II  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
551-CQUAD2	14	100	7053	7101	7105	7057	.0				
552-CQUAD2	15	100	7057	7105	7109	7061	.0				
553-CQUAD2	16	100	7061	7109	7113	7065	.0				
554-CQUAD2	17	100	7065	7113	7117	7069	.0				
555-CQUAD2	18	100	7069	7117	7121	7073	.0				
556-CQUAD2	19	100	7073	7121	7125	7077	.0				
557-CQUAD2	20	100	7077	7125	7129	7081	.0				
558-CQUAD2	21	100	7081	7129	7133	7085	.0				
559-CQUAD2	22	100	7085	7133	7137	7089	.0				
560-CQUAD2	23	100	7089	7137	7141	7093	.0				
561-CQUAD2	24	100	7093	7141	7097	7099	.0				
562-CQUAD2	25	100	7097	7145	7149	7101	.0				
563-CQUAD2	26	100	7101	7149	7153	7105	.0				
564-CQUAD2	27	100	7105	7153	7157	7109	.0				
565-CQUAD2	28	100	7109	7157	7161	7113	.0				
566-CQUAD2	29	100	7113	7161	7165	7117	.0				
567-CQUAD2	30	100	7117	7165	7169	7121	.0				
568-CQUAD2	31	100	7121	7169	7173	7125	.0				
569-CQUAD2	32	100	7125	7173	7177	7129	.0				
570-CQUAD2	33	100	7129	7177	7181	7133	.0				
571-CQUAD2	34	100	7133	7181	7185	7137	.0				
572-CQUAD2	35	100	7137	7185	7189	7141	.0				
573-CQUAD2	36	100	7141	7189	7193	7097	.0				
574-CQUAD2	37	100	7145	7193	7197	7149	.0				
575-CQUAD2	38	100	7149	7197	7201	7153	.0				
576-CQUAD2	39	100	7153	7201	7205	7157	.0				
577-CQUAD2	40	100	7157	7205	7209	7161	.0				
578-CQUAD2	41	100	7161	7209	7213	7165	.0				
579-CQUAD2	42	100	7165	7213	7217	7169	.0				
580-CQUAD2	43	100	7169	7217	7221	7173	.0				
581-CQUAD2	44	100	7173	7221	7225	7177	.0				
582-CQUAD2	45	100	7177	7225	7229	7181	.0				
583-CQUAD2	46	100	7181	7229	7233	7185	.0				
584-CQUAD2	47	100	7185	7233	7237	7189	.0				
585-CQUAD2	48	100	7189	7237	7241	7193	.0				
586-CQUAD2	49	100	7193	7241	7245	7197	.0				
587-CQUAD2	50	100	7197	7245	7249	7201	.0				
588-CQUAD2	51	100	7201	7249	7253	7205	.0				
589-CQUAD2	52	100	7205	7253	7257	7209	.0				
590-CQUAD2	53	100	7209	7257	7261	7213	.0				
591-CQUAD2	54	100	7213	7261	7265	7217	.0				
592-CQUAD2	55	100	7217	7265	7269	7221	.0				
593-CQUAD2	56	100	7221	7269	7273	7225	.0				
594-CQUAD2	57	100	7225	7273	7277	7229	.0				
595-CQUAD2	58	100	7229	7277	7281	7233	.0				
596-CQUAD2	59	100	7233	7281	7285	7237	.0				
597-CQUAD2	60	100	7237	7285	7241	7193	.0				
598-CQUAD2	61	100	7241	7289	7293	7245	.0				
599-CQUAD2	62	100	7245	7293	7297	7249	.0				
600-CQUAD2	63	100	7249	7297	7301	7253	.0				

PHASE 1 XPART 1 H  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECH 1

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
601-CQUAD2	64	100	7253	7301	7305	7257	.0				
602-CQUAD2	65	100	7257	7305	7309	7261	.0				
603-CQUAD2	66	100	7261	7309	7313	7265	.0				
604-CQUAD2	67	100	7265	7313	7317	7269	.0				
605-CQUAD2	68	100	7269	7317	7321	7273	.0				
606-CQUAD2	69	100	7273	7321	7325	7277	.0				
607-CQUAD2	70	100	7277	7325	7329	7281	.0				
608-CQUAD2	71	100	7281	7329	7333	7285	.0				
609-CQUAD2	72	100	7285	7333	7289	7241	.0				
610-CQUAD2	401	400	6901	6913	6914	6902	.0				
611-CQUAD2	402	400	6902	6914	6915	6903	.0				
612-CQUAD2	403	400	6903	6915	6916	6904	.0				
613-CQUAD2	404	400	6904	6916	6917	6905	.0				
614-CQUAD2	405	400	6905	6917	6918	6906	.0				
615-CQUAD2	406	403	6906	6918	6919	6907	.0				
616-CQUAD2	407	403	6907	6919	6920	6908	.0				
617-CQUAD2	408	400	6908	6920	6921	6909	.0				
618-CQUAD2	409	400	6909	6921	6922	6910	.0				
619-CQUAD2	410	400	6910	6922	6923	6911	.0				
620-CQUAD2	411	400	6911	6923	6924	6912	.0				
621-CQUAD2	412	400	6912	6924	6913	6901	.0				
622-CQUAD2	413	400	6913	6925	6926	6914	.0				
623-CQUAD2	414	400	6914	6926	6927	6915	.0				
624-CQUAD2	415	400	6915	6927	6928	6916	.0				
625-CQUAD2	416	400	6916	6928	6929	6917	.0				
626-CQUAD2	417	401	6917	6929	6930	6918	.0				
627-CQUAD2	418	404	6918	6930	6931	6919	.0				
628-CQUAD2	419	404	6919	6931	6932	6920	.0				
629-CQUAD2	420	401	6920	6932	6933	6921	.0				
630-CQUAD2	421	400	6921	6933	6934	6922	.0				
631-CQUAD2	422	400	6922	6934	6935	6923	.0				
632-CQUAD2	423	400	6923	6935	6936	6924	.0				
633-CQUAD2	424	400	6924	6936	6925	6913	.0				
634-CQUAD2	425	400	6925	6937	6938	6926	.0				
635-CQUAD2	426	400	6926	6938	6927	.0					
636-CQUAD2	427	400	6927	6939	6940	6928	.0				
637-CQUAD2	428	400	6928	6940	6941	6929	.0				
638-CQUAD2	429	402	6929	6941	6942	6930	.0				
639-CQUAD2	430	405	6930	6942	6943	6931	.0				
640-CQUAD2	431	405	6931	6943	6944	6932	.0				
641-CQUAD2	432	402	6932	6944	6945	6933	.0				
642-CQUAD2	433	400	6933	6945	6946	6934	.0				
643-CQUAD2	434	400	6934	6946	6947	6935	.0				
644-CQUAD2	435	400	6935	6947	6948	6936	.0				
645-CQUAD2	436	400	6936	6948	6937	6925	.0				
646-CQUAD2	437	400	6937	7001	7005	6938	.0				
647-CQUAD2	438	400	6938	7005	7009	6939	.0				
648-CQUAD2	439	400	6939	7009	7013	6940	.0				
649-CQUAD2	440	400	6940	7013	7017	6941	.0				
650-CQUAD2	441	400	6941	7017	7021	6942	.0				

PHASE I PART I H  
SRM & PROPELLANT FWD HALF

SORTED JULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
651-CQUAD2	442	400	6942	7021	7025	6943				
652-CQUAD2	443	400	6943	7025	7029	6944				
653-CQUAD2	444	400	6944	7029	7033	6945				
654-CQUAD2	445	400	6945	7033	7037	6946				
655-CQUAD2	446	400	6946	7037	7041	6947				
656-CQUAD2	447	400	6947	7041	7045	6948				
657-CQUAD2	448	400	6948	7045	7001	6937				
658-DMI	BFAC	0	2	1	2		1	1		
659-DMI	BFAC	1	1	1.0						
660-DMI	CPAJC	0	2	1	1		1	1		
661-DMI	CPAJL	1	1	1.0						
662-DMI	EQR	0	2	1	2		6	6		
663-DMI	EQR	1	1	.012047	-.980338	.196959	33.0854	-21.56976	01	
664-EE01		-109.382								
665-DMI	EQR	2	1	.05985	.197328	.978504	-26.0164	-107.1606	02	
666-BL02		23.2010								
667-DMI	LWR	3	1	-.012047	.980338	-.196959	-13.021921	.5697	EE03	
668-EE03		108.1918								
669-DMI	EQR	4	1	-.012047	.980338	-.196959	-28.91483	.23439	EE04	
670-EE04		17.8664								
671-DMI	EQR	5	1	.05985	.197328	.978504	-25.5831	-16.06876	EE05	
672-EE05		4.80504								
673-DMI	LWR	6	1	.99813	3		-.06105	1.18502	34.4593	EE06
674-EE06		19.3744								
675-DMI	GFAC	0	2	1	2		1	1		
676-DMI	GFAC	1	1	1.0						
677-DMI	KFAC	0	2	1	2		1	1		
678-DMI	KFAC	1	1	1.0						
679-GRIDSET		100					100			
680-GRID	6901		9.750	180.000	25.242					
681-GRID	6902		9.750	150.000	25.242					
682-GRID	6903		9.750	120.000	25.242					
683-GRID	6904		9.750	90.000	25.242					
684-GRID	6905		9.750	60.000	25.242					
685-GRID	6906		9.750	30.000	25.242					
686-GRID	6907		9.750	0.000	25.242					
687-GRID	6908		9.750	-30.000	25.242					
688-GRID	6909		9.750	-60.000	25.242					
689-GRID	6910		9.750	-90.000	25.242					
690-GRID	6911		9.750	-120.000	25.242					
691-GRID	6912		9.750	-150.000	25.242					
692-GRID	6913		9.750	180.000	30.242					
693-GRID	6914		9.750	150.000	30.242					
694-GRID	6915		9.750	120.000	30.242					
695-GRID	6916		9.750	90.000	30.242					
696-GRID	6917		9.750	60.000	30.242					
697-GRID	6918		9.750	30.000	30.242					
698-GRID	6919		9.750	0.000	30.242					
699-GRID	6920		9.750	-30.000	30.242					
700-GRID	6921		9.750	-60.000	30.242					

PHASE I XPAWT I II  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
701- GRID	6922			9.750	-90.000	30.242				
702- GRID	6923			9.750	-120.000	30.242				
703- GRID	6924			9.750	-150.000	30.242				
704- GRID	6925			9.750	180.000	35.242				
705- GRID	6926			9.750	150.000	35.242				
706- GRID	6927			9.750	120.000	35.242				
707- GRID	6928			9.750	90.000	35.242				
708- GRID	6929			9.750	60.000	35.242				
709- GRID	6930			9.750	30.000	35.242				
710- GRID	6931			9.750	0.000	35.242				
711- GRID	6932			9.750	-30.000	35.242				
712- GRID	6933			9.750	-60.000	35.242				
713- GRID	6934			9.750	-90.000	35.242				
714- GRID	6935			9.750	-120.000	35.242				
715- GRID	6936			9.750	-150.000	35.242				
716- GRID	6937			9.750	180.000	40.242				
717- GRID	6938			9.750	150.000	40.242				
718- GRID	6939			9.750	120.000	40.242				
719- GRID	6940			9.750	90.000	40.242				
720- GRID	6941			9.750	60.000	40.242				
721- GRID	6942			9.750	30.000	40.242				
722- GRID	6943			9.750	0.000	40.242				
723- GRID	6944			9.750	-30.000	40.242				
724- GRID	6945			9.750	-60.000	40.242				
725- GRID	6946			9.750	-90.000	40.242				
726- GRID	6947			9.750	-120.000	40.242				
727- GRID	6948			9.750	-150.000	40.242				
728- GRID	7001			9.750	180.000	44.500				
729- GRID	7002			7.560	180.000	44.500				
730- GRID	7003			5.370	180.000	44.500				
731- GRID	7004			3.180	180.000	44.500				
732- GRID	7005			9.750	150.000	44.500				
733- GRID	7006			7.560	150.000	44.500				
734- GRID	7007			5.370	150.000	44.500				
735- GRID	7008			3.180	150.000	44.500				
736- GRID	7009			9.750	120.000	44.500				
737- GRID	7010			7.560	120.000	44.500				
738- GRID	7011			5.370	120.000	44.500				
739- GRID	7012			3.180	120.000	44.500				
740- GRID	7013			9.750	90.000	44.500				
741- GRID	7014			7.560	90.000	44.500				
742- GRID	7015			5.370	90.000	44.500				
743- GRID	7016			3.180	90.000	44.500				
744- GRID	7017			9.750	60.000	44.500				
745- GRID	7018			7.560	60.000	44.500				
746- GRID	7019			5.370	60.000	44.500				
747- GRID	7020			3.180	60.000	44.500				
748- GRID	7021			9.750	30.000	44.500				
749- GRID	7022			7.560	30.000	44.500				
750- GRID	7023			5.370	30.000	44.500				

PHASE I XPART I II  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHU															
CARD	1	2	3	4	5	6	7	8	9	10					
751- GRID	7024			3.180	30.000	44.500									
752- GRID	7025			9.750	0.0	44.500									
753- GRID	7026			7.560	0.0	44.500									
754- GRID	7027			5.370	0.0	44.500									
755- GRID	7028			3.180	0.0	44.500									
756- GRID	7029			9.750	-30.000	44.500									
757- GRID	7030			7.560	-30.000	44.500									
758- GRID	7031			5.370	-30.000	44.500									
759- GRID	7032			3.180	-30.000	44.500									
760- GRID	7033			9.750	-60.000	44.500									
761- GRID	7034			7.560	-60.000	44.500									
762- GRID	7035			5.370	-60.000	44.500									
763- GRID	7036			3.180	-60.000	44.500									
764- GRID	7037			9.750	-90.000	44.500									
765- GRID	7038			7.560	-90.000	44.500									
766- GRID	7039			5.370	-90.000	44.500									
767- GRID	7040			3.180	-90.000	44.500									
768- GRID	7041			9.750	-120.000	44.500									
769- GRID	7042			7.560	-120.000	44.500									
770- GRID	7043			5.370	-120.000	44.500									
771- GRID	7044			3.180	-120.000	44.500									
772- GRID	7045			9.750	-150.000	44.500									
773- GRID	7046			7.560	-150.000	44.500									
774- GRID	7047			5.370	-150.000	44.500									
775- GRID	7048			3.180	-150.000	44.500									
776- GRID	7049			9.750	180.000	56.777									
777- GRID	7050			7.560	180.000	56.777									
778- GRID	7051			5.370	180.000	56.777									
779- GRID	7052			3.180	180.000	56.777									
780- GRID	7053			9.750	150.000	56.777									
781- GRID	7054			7.560	150.000	56.777									
782- GRID	7055			5.370	150.000	56.777									
783- GRID	7056			3.180	150.000	56.777									
784- GRID	7057			9.750	120.000	56.777									
785- GRID	7058			7.560	120.000	56.777									
786- GRID	7059			5.370	120.000	56.777									
787- GRID	7060			3.180	120.000	56.777									
788- GRID	7061			9.750	90.000	56.777									
789- GRID	7062			7.560	90.000	56.777									
790- GRID	7063			5.370	90.000	56.777									
791- GRID	7064			3.180	90.000	56.777									
792- GRID	7065			9.750	60.000	56.777									
793- GRID	7066			7.560	60.000	56.777									
794- GRID	7067			5.370	60.000	56.777									
795- GRID	7068			3.180	60.000	56.777									
796- GRID	7069			9.750	30.000	56.777									
797- GRID	7070			7.560	30.000	56.777									
798- GRID	7071			5.370	30.000	56.777									
799- GRID	7072			3.180	30.000	56.777									
800- GRID	7073			9.750	0.0	56.777									

PHASE 1 PART 1 D  
SRM 6 PROPELLANT FWD HALF

SORTED BULK DATA LIST

CARD	1	2	3	4	5	6	7	8	9	10
801-GRID	7074		7.560	0.0		56.777				
802-GRID	7075		5.370	0.0		56.777				
803-GRID	7076		3.180	0.0		56.777				
804-GRID	7077		9.750	-30.000		56.777				
805-GRID	7078		7.560	-30.000		56.777				
806-GRID	7079		5.370	-30.000		56.777				
807-GRID	7080		3.180	-30.000		56.777				
808-GRID	7081		9.750	-60.000		56.777				
809-GRID	7082		7.560	-60.000		56.777				
810-GRID	7083		5.370	-60.000		56.777				
811-GRID	7084		3.180	-60.000		56.777				
812-GRID	7085		9.750	-90.000		56.777				
813-GRID	7086		7.560	-90.000		56.777				
814-GRID	7087		5.370	-90.000		56.777				
815-GRID	7088		3.180	-90.000		56.777				
816-GRID	7089		9.750	-120.000		56.777				
817-GRID	7090		7.560	-120.000		56.777				
818-GRID	7091		5.370	-120.000		56.777				
819-GRID	7092		3.180	-120.000		56.777				
820-GRID	7093		9.750	-150.000		56.777				
821-GRID	7094		7.560	-150.000		56.777				
822-GRID	7095		5.370	-150.000		56.777				
823-GRID	7096		3.180	-150.000		56.777				
824-GRID	7097		9.750	180.000		69.053				
825-GRID	7098		7.560	180.000		69.053				
826-GRID	7099		5.370	180.000		69.053				
827-GRID	7100		3.180	180.000		69.053				
828-GRID	7101		9.750	150.000		69.053				
829-GRID	7102		7.560	150.000		69.053				
830-GRID	7103		5.370	150.000		69.053				
831-GRID	7104		3.180	150.000		69.053				
832-GRID	7105		9.750	120.000		69.053				
833-GRID	7106		7.560	120.000		69.053				
834-GRID	7107		5.370	120.000		69.053				
835-GRID	7108		3.180	120.000		69.053				
836-GRID	7109		9.750	90.000		69.053				
837-GRID	7110		7.560	90.000		69.053				
838-GRID	7111		5.370	90.000		69.053				
839-GRID	7112		3.180	90.000		69.053				
840-GRID	7113		9.750	60.000		69.053				
841-GRID	7114		7.560	60.000		69.053				
842-GRID	7115		5.370	60.000		69.053				
843-GRID	7116		3.180	60.000		69.053				
844-GRID	7117		9.750	30.000		69.053				
845-GRID	7118		7.560	30.000		69.053				
846-GRID	7119		5.370	30.000		69.053				
847-GRID	7120		3.180	30.000		69.053				
848-GRID	7121		9.750	0.0		69.053				
849-GRID	7122		7.560	0.0		69.053				
850-GRID	7123		5.370	0.0		69.053				

PHASE 1 XPART 1 #  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
851- GRID	7124		3.180	0.0	69.053					
852- GRID	7125		9.750	-30.000	69.053					
853- GRID	7126		7.560	-30.000	69.053					
854- GRID	7127		5.370	-30.000	69.053					
855- GRID	7128		3.180	-30.000	69.053					
856- GRID	7129		9.750	-60.000	69.053					
857- GRID	7130		7.560	-60.000	69.053					
858- GRID	7131		5.370	-60.000	69.053					
859- GRID	7132		3.180	-60.000	69.053					
860- GRID	7133		9.750	-90.000	69.053					
861- GRID	7134		7.560	-90.000	69.053					
862- GRID	7135		5.370	-90.000	69.053					
863- GRID	7136		3.180	-90.000	69.053					
864- GRID	7137		9.750	-120.000	69.053					
865- GRID	7138		7.560	-120.000	69.053					
866- GRID	7139		5.370	-120.000	69.053					
867- GRID	7140		3.180	-120.000	69.053					
868- GRID	7141		9.750	-150.000	69.053					
869- GRID	7142		7.560	-150.000	69.053					
870- GRID	7143		5.370	-150.000	69.053					
871- GRID	7144		3.180	-150.000	69.053					
872- GRID	7145		9.750	180.000	81.330					
873- GRID	7146		7.560	180.000	81.330					
874- GRID	7147		5.370	180.000	81.330					
875- GRID	7148		3.180	180.000	81.330					
876- GRID	7149		9.750	150.000	81.330					
877- GRID	7150		7.560	150.000	81.330					
878- GRID	7151		5.370	150.000	81.330					
879- GRID	7152		3.180	150.000	81.330					
880- GRID	7153		9.750	120.000	81.330					
881- GRID	7154		7.560	120.000	81.330					
882- GRID	7155		5.370	120.000	81.330					
883- GRID	7156		3.180	120.000	81.330					
884- GRID	7157		9.750	90.000	81.330					
885- GRID	7158		7.560	90.000	81.330					
886- GRID	7159		5.370	90.000	81.330					
887- GRID	7160		3.180	90.000	81.330					
888- GRID	7161		9.750	60.000	81.330					
889- GRID	7162		7.560	60.000	81.330					
890- GRID	7163		5.370	60.000	81.330					
891- GRID	7164		3.180	60.000	81.330					
892- GRID	7165		9.750	30.000	81.330					
893- GRID	7166		7.560	30.000	81.330					
894- GRID	7167		5.370	30.000	81.330					
895- GRID	7168		3.180	30.000	81.330					
896- GRID	7169		9.750	0.0	81.330					
897- GRID	7170		7.560	0.0	81.330					
898- GRID	7171		5.370	0.0	81.330					
899- GRID	7172		3.180	0.0	81.330					
900- GRID	7173		9.750	-30.000	81.330					



PHASE 1 PART 1 A  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
901-GRID	7174			7.560	-30.000	81.330				
902-GRID	7175			5.370	-30.000	81.330				
903-GRID	7176			3.180	-30.000	81.330				
904-GRID	7177			9.750	-60.000	81.330				
905-GRID	7178			7.560	-60.000	81.330				
906-GRID	7179			5.370	-60.000	81.330				
907-GRID	7180			3.180	-60.000	81.330				
908-GRID	7181			9.750	-90.000	81.330				
909-GRID	7182			7.560	-90.000	81.330				
910-GRID	7183			5.370	-90.000	81.330				
911-GRID	7184			3.180	-120.000	81.330				
912-GRID	7185			9.750	-120.000	81.330				
913-GRID	7186			7.560	-120.000	81.330				
914-GRID	7187			5.370	-120.000	81.330				
915-GRID	7188			3.180	-120.000	81.330				
916-GRID	7189			9.750	-150.000	81.330				
917-GRID	7190			7.560	-150.000	81.330				
918-GRID	7191			5.370	-150.000	81.330				
919-GRID	7192			3.180	-150.000	81.330				
920-GRID	7193			9.750	180.000	93.607				
921-GRID	7194			7.560	180.000	93.607				
922-GRID	7195			5.370	180.000	93.607				
923-GRID	7196			3.180	180.000	93.607				
924-GRID	7197			9.750	150.000	93.607				
925-GRID	7198			7.560	150.000	93.607				
926-GRID	7199			5.370	150.000	93.607				
927-GRID	7200			3.180	150.000	93.607				
928-GRID	7201			9.750	120.000	93.607				
929-GRID	7202			7.560	120.000	93.607				
930-GRID	7203			5.370	120.000	93.607				
931-GRID	7204			3.180	120.000	93.607				
932-GRID	7205			9.750	90.000	93.607				
933-GRID	7206			7.560	90.000	93.607				
934-GRID	7207			5.370	90.000	93.607				
935-GRID	7208			3.180	90.000	93.607				
936-GRID	7209			9.750	60.000	93.607				
937-GRID	7210			7.560	60.000	93.607				
938-GRID	7211			5.370	60.000	93.607				
939-GRID	7212			3.180	60.000	93.607				
940-GRID	7213			9.750	30.000	93.607				
941-GRID	7214			7.560	30.000	93.607				
942-GRID	7215			5.370	30.000	93.607				
943-GRID	7216			3.180	30.000	93.607				
944-GRID	7217			9.750	0.0	93.607				
945-GRID	7218			7.560	0.0	93.607				
946-GRID	7219			5.370	0.0	93.607				
947-GRID	7220			3.180	0.0	93.607				
948-GRID	7221			9.750	-30.000	93.607				
949-GRID	7222			7.560	-30.000	93.607				
950-GRID	7223			5.370	-30.000	93.607				

PHASE I PART I II  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
951- GRID	7224			3.180	-30.000	93.607					
952- GRID	7225			9.750	-60.000	93.607					
953- GRID	7226			7.560	-60.000	93.607					
954- GRID	7227			5.370	-60.000	93.607					
955- GRID	7228			3.180	-60.000	93.607					
956- GRID	7229			9.750	-90.000	93.607					
957- GRID	7230			7.560	-90.000	93.607					
958- GRID	7231			5.370	-90.000	93.607					
959- GRID	7232			3.180	-90.000	93.607					
960- GRID	7233			9.750	-120.000	93.607					
961- GRID	7234			7.560	-120.000	93.607					
962- GRID	7235			5.370	-120.000	93.607					
963- GRID	7236			3.180	-120.000	93.607					
964- GRID	7237			9.750	-150.000	93.607					
965- GRID	7238			7.560	-150.000	93.607					
966- GRID	7239			5.370	-150.000	93.607					
967- GRID	7240			3.180	-150.000	93.607					
968- GRID	7241			9.750	180.000	105.883					
969- GRID	7242			7.560	180.000	105.883					
970- GRID	7243			5.370	180.000	105.883					
971- GRID	7244			3.180	180.000	105.883					
972- GRID	7245			9.750	150.000	105.883					
973- GRID	7246			7.560	150.000	105.883					
974- GRID	7247			5.370	150.000	105.883					
975- GRID	7248			3.180	150.000	105.883					
976- GRID	7249			9.750	120.000	105.883					
977- GRID	7250			7.560	120.000	105.883					
978- GRID	7251			5.370	120.000	105.883					
979- GRID	7252			3.180	120.000	105.883					
980- GRID	7253			9.750	90.000	105.883					
981- GRID	7254			7.560	90.000	105.883					
982- GRID	7255			5.370	90.000	105.883					
983- GRID	7256			3.180	90.000	105.883					
984- GRID	7257			9.750	60.000	105.883					
985- GRID	7258			7.560	60.000	105.883					
986- GRID	7259			5.370	60.000	105.883					
987- GRID	7260			3.180	60.000	105.883					
988- GRID	7261			9.750	30.000	105.883					
989- GRID	7262			7.560	30.000	105.883					
990- GRID	7263			5.370	30.000	105.883					
991- GRID	7264			3.180	30.000	105.883					
992- GRID	7265			9.750	0.0	105.883					
993- GRID	7266			7.560	0.0	105.883					
994- GRID	7267			5.370	0.0	105.883					
995- GRID	7268			3.180	0.0	105.883					
996- GRID	7269			9.750	-30.000	105.883					
997- GRID	7270			7.560	-30.000	105.883					
998- GRID	7271			5.370	-30.000	105.883					
999- GRID	7272			3.180	-30.000	105.883					
1000- GRID	7273			9.750	-60.000	105.883					

SORTED BULK DATA LIST

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
1001-GRID	7274				7.560	-60.000	105.883				
1002-GRID	7275				5.370	-60.000	105.883				
1003-GRID	7276				3.180	-60.000	105.883				
1004-GRID	7277				9.750	-90.000	105.883				
1005-GRID	7278				7.560	-90.000	105.883				
1006-GRID	7279				5.370	-90.000	105.883				
1007-GRID	7280				3.180	-90.000	105.883				
1008-GRID	7281				9.750	-120.000	105.883				
1009-GRID	7282				7.560	-120.000	105.883				
1010-GRID	7283				5.370	-120.000	105.883				
1011-GRID	7284				3.180	-120.000	105.883				
1012-GRID	7285				9.750	-150.000	105.883				
1013-GRID	7286				7.560	-150.000	105.883				
1014-GRID	7287				5.370	-150.000	105.883				
1015-GRID	7288				3.180	-150.000	105.883				
1016-GRID	7289				9.750	-180.000	118.160				
1017-GRID	7290				7.560	-180.000	118.160				
1018-GRID	7291				5.370	-180.000	118.160				
1019-GRID	7292				3.180	-180.000	118.160				
1020-GRID	7293				9.750	-150.000	118.160				
1021-GRID	7294				7.560	-150.000	118.160				
1022-GRID	7295				5.370	-150.000	118.160				
1023-GRID	7296				3.180	-150.000	118.160				
1024-GRID	7297				9.750	-120.000	118.160				
1025-GRID	7298				7.560	-120.000	118.160				
1026-GRID	7299				5.370	-120.000	118.160				
1027-GRID	7300				3.180	-120.000	118.160				
1028-GRID	7301				9.750	-90.000	118.160				
1029-GRID	7302				7.560	-90.000	118.160				
1030-GRID	7303				5.370	-90.000	118.160				
1031-GRID	7304				3.180	-90.000	118.160				
1032-GRID	7305				9.750	-60.000	118.160				
1033-GRID	7306				7.560	-60.000	118.160				
1034-GRID	7307				5.370	-60.000	118.160				
1035-GRID	7308				3.180	-60.000	118.160				
1036-GRID	7309				9.750	-30.000	118.160				
1037-GRID	7310				7.560	-30.000	118.160				
1038-GRID	7311				5.370	-30.000	118.160				
1039-GRID	7312				3.180	-30.000	118.160				
1040-GRID	7313				9.750	0.0	118.160				
1041-GRID	7314				7.560	0.0	118.160				
1042-GRID	7315				5.370	0.0	118.160				
1043-GRID	7316				3.180	0.0	118.160				
1044-GRID	7317				9.750	-30.000	118.160				
1045-GRID	7318				7.560	-30.000	118.160				
1046-GRID	7319				5.370	-30.000	118.160				
1047-GRID	7320				3.180	-30.000	118.160				
1048-GRID	7321				9.750	-60.000	118.160				
1049-GRID	7322				7.560	-60.000	118.160				
1050-GRID	7323				5.370	-60.000	118.160				

SORTED BULK DATA ECHO

CARD

COUNT	1	2	3	4	5	6	7	8	9	10
1051-GRID	7324			3.180	-90.000	118.160				
1052-GRID	7325			9.750	-90.000	118.160				
1053-GRID	7326			7.560	-90.000	118.160				
1054-GRID	7327			5.370	-90.000	118.160				
1055-GRID	7328			3.180	-90.000	118.160				
1056-GRID	7329			9.750	-120.000	118.160				
1057-GRID	7330			7.560	-120.000	118.160				
1058-GRID	7331			5.370	-120.000	118.160				
1059-GRID	7332			3.180	-120.000	118.160				
1060-GRID	7333			9.750	-150.000	118.160				
1061-GRID	7334			7.560	-150.000	118.160				
1062-GRID	7335			5.370	-150.000	118.160				
1063-GRID	7336			3.180	-150.000	118.160				
1064-GRID	8139	696		99.98	-19.41073	9071	100		456	
1065-MAT1	100	1.0567			.4	.1				
1066-MAT1	1000	25.063			.49	.0015			.52	
1067-MPC	2	6907	1		1.0	8134	1		-1.0	
1068-MPC	2	6907	5		1.0	6907	3		-.642834	EM6907M1
1069-EM6907M1		8134	3			.642834				
1070-MPC	2	6907	6		1.0	6907	2		-.642834	EM6907M2
1071-EM6907M2		8134	2			-.642834				
1072-PARAM	GRDPCT	0								
1073-PARAM	IPLOPY	1								
1074-PARAM	IPHAME	SRMPT								
1075-PARAM	WTMASS	.002580								
1076-PBAR	100	100		.127	.071					
1077-PBAR	101	100		.254	.142					
1078-PBAR	102	100		1.068	.074					
1079-PBAR	103	100		.230	.15					
1080-PQUAD2	100	100		.1875						
1081-PQUAD2	400	100		.040						
1082-PQUAD2	401	100		.054						
1083-PQUAD2	402	100		.058						
1084-PQUAD2	403	100		.230						
1085-PQUAD2	404	100		.135						
1086-PQUAD2	405	100		.096						
1087-SPC1	1	456	7002	7003	7004	7006	7007	7008		
1088-SPC1	1	456	7010	7011	7012	7014	7015	7016		
1089-SPC1	1	456	7018	7019	7020	7022	7023	7024		
1090-SPC1	1	456	7026	7027	7028	7030	7031	7032		
1091-SPC1	1	456	7034	7035	7036	7038	7039	7040		
1092-SPC1	1	456	7042	7043	7044	7046	7047	7048		
1093-SPC1	1	456	7050	7051	7052	7054	7055	7056		
1094-SPC1	1	456	7058	7059	7060	7062	7063	7064		
1095-SPC1	1	456	7066	7067	7068	7070	7071	7072		
1096-SPC1	1	456	7074	7075	7076	7078	7079	7080		
1097-SPC1	1	456	7082	7083	7084	7086	7087	7088		
1098-SPC1	1	456	7090	7091	7092	7094	7095	7096		
1099-SPC1	1	456	7098	7099	7100	7102	7103	7104		
1100-SPC1	1	456	7106	7107	7108	7110	7111	7112		

PHASE 1 PART 1 II  
SRM & PROPELLANT FWD HALF

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
1101- SPC1	1	456	7114	7115	7116	7118	7119	7120		
1102- SPC1	1	456	7122	7123	7124	7126	7127	7128		
1103- SPC1	1	456	7130	7131	7132	7134	7135	7136		
1104- SPC1	1	456	7138	7139	7140	7142	7143	7144		
1105- SPC1	1	456	7146	7147	7148	7150	7151	7152		
1106- SPC1	1	456	7154	7155	7156	7158	7159	7160		
1107- SPC1	1	456	7162	7163	7164	7166	7167	7168		
1108- SPC1	1	456	7170	7171	7172	7174	7175	7176		
1109- SPC1	1	456	7178	7179	7180	7182	7183	7184		
1110- SPC1	1	456	7186	7187	7188	7190	7191	7192		
1111- SPC1	1	456	7194	7195	7196	7198	7199	7200		
1112- SPC1	1	456	7202	7203	7204	7206	7207	7208		
1113- SPC1	1	456	7210	7211	7212	7214	7215	7216		
1114- SPC1	1	456	7218	7219	7220	7222	7223	7224		
1115- SPC1	1	456	7226	7227	7228	7230	7231	7232		
1116- SPC1	1	456	7234	7235	7236	7238	7239	7240		
1117- SPC1	1	456	7242	7243	7244	7246	7247	7248		
1118- SPC1	1	456	7250	7251	7252	7254	7255	7256		
1119- SPC1	1	456	7258	7259	7260	7262	7263	7264		
1120- SPC1	1	456	7266	7267	7268	7270	7271	7272		
1121- SPC1	1	456	7274	7275	7276	7278	7279	7280		
1122- SPC1	1	456	7282	7283	7284	7286	7287	7288		
1123- SPC1	1	456	7290	7291	7292	7294	7295	7296		
1124- SPC1	1	456	7298	7299	7300	7302	7303	7304		
1125- SPC1	1	456	7306	7307	7308	7310	7311	7312		
1126- SPC1	1	456	7314	7315	7316	7318	7319	7320		
1127- SPC1	1	456	7322	7323	7324	7326	7327	7328		
1128- SPC1	1	456	7330	7331	7332	7334	7335	7336		
1129- SUPPRT	0149	123	7301	2	7314	2	7325	2		
ENDDATA										

SOLID ROCKET BOOSTER COPY RUN Z701232

NASTRAN EXECUTIVE CONTROL DECK ECHO

ID TAPE COPYSRM

APP DMAP

DIAG 14

TIME 4

BEGIN \$ DMAP TO CHECK AND CONSOLIDATE SUBSTRUCTURE PHASE 1 SRM TAPES  
(SEE NASTRAN SOURCE PROGRAM COMPILATION FOR LISTING OF DMAP SEQUENCE)

END

CEND

TAPE COPY SRM

CASE CONTROL DECK ECHO

CARD  
COUNT

1 TITLE = TAPE COPY SRM  
2 BEGIN BULK

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

TAPE COPY SRM

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
COUNT.	1	2	3	4	5	6	7	8	9	10
1 DMI	CPSRMA	0	2	1	2	666	1			
2 DMI	CPSRMA	1	168	.0	169	1.0	1.0	1.0	1.0	ESRMA1
3 ESRMA1	172	1.0	1.0	1.0	175	1.0	1.0	1.0	1.0	ESRMA2
4 ESRMA2	181	1.0	1.0	1.0	187	1.0	1.0	1.0	1.0	ESRMA3
5 ESRMA3	193	1.0	1.0	1.0	196	1.0	1.0	1.0	1.0	ESRMA4
6 ESRMA4	199	1.0	1.0	1.0	205	1.0	1.0	1.0	1.0	ESRMA5
7 ESRMA5	211	1.0	1.0	1.0	217	1.0	1.0	1.0	1.0	ESRMA6
8 ESRMA6	220	1.0	1.0	1.0	223	1.0	1.0	1.0	1.0	ESRMA7
9 ESRMA7	229	1.0	1.0	1.0	235	1.0	1.0	1.0	1.0	ESRMA8
10 ESRMA8	241	1.0	1.0	1.0	244	1.0	1.0	1.0	1.0	ESRMA9
11 ESRMA9	247	1.0	1.0	1.0	253	1.0	1.0	1.0	1.0	ESRMA10
12 ESRMA10	259	1.0	1.0	1.0	265	1.0	1.0	1.0	1.0	ESRMA11
13 ESRMA11	268	1.0	1.0	1.0	271	1.0	1.0	1.0	1.0	ESRMA12
14 ESRMA12	277	1.0	1.0	1.0	283	1.0	1.0	1.0	1.0	ESRMA13
15 ESRMA13	289	1.0	1.0	1.0	292	1.0	1.0	1.0	1.0	ESRMA14
16 ESRMA14	295	1.0	1.0	1.0	301	1.0	1.0	1.0	1.0	ESRMA15
17 ESRMA15	307	1.0	1.0	1.0	313	1.0	1.0	1.0	1.0	ESRMA16
18 ESRMA16	316	1.0	1.0	1.0	319	1.0	1.0	1.0	1.0	ESRMA17
19 ESRMA17	325	1.0	1.0	1.0	331	1.0	1.0	1.0	1.0	ESRMA18
20 ESRMA18	337	1.0	1.0	1.0	340	1.0	1.0	1.0	1.0	ESRMA19
21 ESRMA19	343	1.0	1.0	1.0	349	1.0	1.0	1.0	1.0	ESRMA20
22 ESRMA20	355	1.0	1.0	1.0	361	1.0	1.0	1.0	1.0	ESRMA21
23 ESRMA21	364	1.0	1.0	1.0	367	1.0	1.0	1.0	1.0	ESRMA22
24 ESRMA22	373	1.0	1.0	1.0	379	1.0	1.0	1.0	1.0	ESRMA23
25 ESRMA23	385	1.0	1.0	1.0	388	1.0	1.0	1.0	1.0	ESRMA24
26 ESRMA24	391	1.0	1.0	1.0	397	1.0	1.0	1.0	1.0	ESRMA25
27 ESRMA25	403	1.0	1.0	1.0	409	1.0	1.0	1.0	1.0	ESRMA26
28 ESRMA26	412	1.0	1.0	1.0	415	1.0	1.0	1.0	1.0	ESRMA27
29 ESRMA27	421	1.0	1.0	1.0	427	1.0	1.0	1.0	1.0	ESRMA28
30 ESRMA28	433	1.0	1.0	1.0	436	1.0	1.0	1.0	1.0	ESRMA29
31 ESRMA29	439	1.0	1.0	1.0	445	1.0	1.0	1.0	1.0	ESRMA30
32 ESRMA30	451	1.0	1.0	1.0	457	1.0	1.0	1.0	1.0	ESRMA31
33 ESRMA31	463	1.0	1.0	1.0	469	1.0	1.0	1.0	1.0	ESRMA32
34 ESRMA32	475	1.0	1.0	1.0	481	1.0	1.0	1.0	1.0	ESRMA33
35 ESRMA33	487	1.0	1.0	1.0	493	1.0	1.0	1.0	1.0	ESRMA34
36 ESRMA34	499	1.0	1.0	1.0	505	1.0	1.0	1.0	1.0	ESRMA35
37 ESRMA35	511	1.0	1.0	1.0	517	1.0	1.0	1.0	1.0	ESRMA36
38 ESRMA36	523	1.0	1.0	1.0	529	1.0	1.0	1.0	1.0	ESRMA37
39 ESRMA37	535	1.0	1.0	1.0	541	1.0	1.0	1.0	1.0	ESRMA38
40 ESRMA38	547	1.0	1.0	1.0	553	1.0	1.0	1.0	1.0	ESRMA39
41 ESRMA39	559	1.0	1.0	1.0	565	1.0	1.0	1.0	1.0	ESRMA40
42 ESRMA40	571	1.0	1.0	1.0	577	1.0	1.0	1.0	1.0	ESRMA41
43 ESRMA41	583	1.0	1.0	1.0	589	1.0	1.0	1.0	1.0	ESRMA42
44 ESRMA42	595	1.0	1.0	1.0	601	1.0	1.0	1.0	1.0	ESRMA43
45 ESRMA43	607	1.0	1.0	1.0	613	1.0	1.0	1.0	1.0	ESRMA44
46 ESRMA44	619	1.0	1.0	1.0	625	1.0	1.0	1.0	1.0	ESRMA45
47 ESRMA45	631	1.0	1.0	1.0	637	1.0	1.0	1.0	1.0	ESRMA46
48 ESRMA46	643	1.0	1.0	1.0	655	1.0	1.0	1.0	1.0	ESRMA47
49 ESRMA47	661	1.0	1.0	1.0						
50 DMI	CPSRMA	0	2	1	2	666	1			



TAPE COPY SRM

SORTED BULK DATA ECHO

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
51	DMI										ESRMF1
52	ESRMF1	7	1.0	1.0	1.0	1.0	13	0.0	1.0	1.0	ESRMF2
53	ESRMF2	19	1.0	1.0	1.0	1.0	25	1.0	1.0	1.0	ESRMF3
54	ESRMF3	31	1.0	1.0	1.0	1.0	37	1.0	1.0	1.0	ESRMF4
55	ESRMF4	43	1.0	1.0	1.0	1.0	49	1.0	1.0	1.0	ESRMF5
56	ESRMF5	55	1.0	1.0	1.0	1.0	61	1.0	1.0	1.0	ESRMF6
57	ESRMF6	67	1.0	1.0	1.0	1.0	73	1.0	1.0	1.0	ESRMF7
58	ESRMF7	79	1.0	1.0	1.0	1.0	85	1.0	1.0	1.0	ESRMF8
59	ESRMF8	91	1.0	1.0	1.0	1.0	97	1.0	1.0	1.0	ESRMF9
60	ESRMF9	103	1.0	1.0	1.0	1.0	109	1.0	1.0	1.0	ESRMF10
61	ESRMF10	115	1.0	1.0	1.0	1.0	121	1.0	1.0	1.0	ESRMF11
62	ESRMF11	127	1.0	1.0	1.0	1.0	133	1.0	1.0	1.0	ESRMF12
63	ESRMF12	139	1.0	1.0	1.0	1.0	145	1.0	1.0	1.0	ESRMF13
64	ESRMF13	151	1.0	1.0	1.0	1.0	157	1.0	1.0	1.0	ESRMF14
65	ESRMF14	163	1.0	1.0	1.0	1.0	169	1.0	1.0	1.0	ESRMF15
66	ESRMF15	172	1.0	1.0	1.0	1.0	175	1.0	1.0	1.0	ESRMF16
67	ESRMF16	181	1.0	1.0	1.0	1.0	187	1.0	1.0	1.0	ESRMF17
68	ESRMF17	193	1.0	1.0	1.0	1.0	196	1.0	1.0	1.0	ESRMF18
69	ESRMF18	199	1.0	1.0	1.0	1.0	205	1.0	1.0	1.0	ESRMF19
70	ESRMF19	211	1.0	1.0	1.0	1.0	217	1.0	1.0	1.0	ESRMF20
71	ESRMF20	220	1.0	1.0	1.0	1.0	223	1.0	1.0	1.0	ESRMF21
72	ESRMF21	229	1.0	1.0	1.0	1.0	235	1.0	1.0	1.0	ESRMF22
73	ESRMF22	241	1.0	1.0	1.0	1.0	244	1.0	1.0	1.0	ESRMF23
74	ESRMF23	247	1.0	1.0	1.0	1.0	253	1.0	1.0	1.0	ESRMF24
75	ESRMF24	259	1.0	1.0	1.0	1.0	265	1.0	1.0	1.0	ESRMF25
76	ESRMF25	268	1.0	1.0	1.0	1.0	271	1.0	1.0	1.0	ESRMF26
77	ESRMF26	277	1.0	1.0	1.0	1.0	283	1.0	1.0	1.0	ESRMF27
78	ESRMF27	289	1.0	1.0	1.0	1.0	292	1.0	1.0	1.0	ESRMF28
79	ESRMF28	295	1.0	1.0	1.0	1.0	301	1.0	1.0	1.0	ESRMF29
80	ESRMF29	307	1.0	1.0	1.0	1.0	313	1.0	1.0	1.0	ESRMF30
81	ESRMF30	316	1.0	1.0	1.0	1.0	319	1.0	1.0	1.0	ESRMF31
82	ESRMF31	325	1.0	1.0	1.0	1.0	331	1.0	1.0	1.0	ESRMF32
83	ESRMF32	337	1.0	1.0	1.0	1.0	340	1.0	1.0	1.0	ESRMF33
84	ESRMF33	343	1.0	1.0	1.0	1.0	349	1.0	1.0	1.0	ESRMF34
85	ESRMF34	355	1.0	1.0	1.0	1.0	361	1.0	1.0	1.0	ESRMF35
86	ESRMF35	364	1.0	1.0	1.0	1.0	367	1.0	1.0	1.0	ESRMF36
87	ESRMF36	373	1.0	1.0	1.0	1.0	379	1.0	1.0	1.0	ESRMF37
88	ESRMF37	385	1.0	1.0	1.0	1.0	388	1.0	1.0	1.0	ESRMF38
89	ESRMF38	391	1.0	1.0	1.0	1.0	397	1.0	1.0	1.0	ESRMF39
90	ESRMF39	403	1.0	1.0	1.0	1.0	409	1.0	1.0	1.0	ESRMF40
91	ESRMF40	412	1.0	1.0	1.0	1.0	415	1.0	1.0	1.0	ESRMF41
92	ESRMF41	421	1.0	1.0	1.0	1.0	427	1.0	1.0	1.0	ESRMF42
93	ESRMF42	433	1.0	1.0	1.0	1.0	436	1.0	1.0	1.0	ESRMF43
94	ESRMF43	439	1.0	1.0	1.0	1.0	445	1.0	1.0	1.0	ESRMF44
95	ESRMF44	451	1.0	1.0	1.0	1.0	649	1.0	1.0	1.0	
	ENDDATA										

TAPE COPY SRM

NASTRAN SOURCE PROGRAM COMPILATION  
DMAP DMAP INSTRUCTION  
NO.

1 BEGIN \$ DMAP TO CHECK AND CONSOLIDATE SUBSTRUCTURE PHASE 1 SRM TAPES

2 INPUT1 /GMF,GDF,KFSF,,/C,N,3/C,N,1/C,N,SRMP1F

3 INPUT1 /KSRMF,MSRMF,K4SRMF,,/C,N,0/C,N,1/C,N,SRMP1F

4 OUTPUT1 CPSRMF,KSRMF,MSRMF,K4SRMF, //C,N,-1/C,N,6/C,N,SRMP1

5 INPUT1 /GDA,KFSA,,/C,N,-3/C,N,2/C,N,SRMP1A

6 INPUT1 /KSRMA,MSRMA,K4SRMA,,/C,N,0/C,N,2/C,N,SRMP1A

7 OUTPUT1 CPSRMA,KSRMA,MSRMA,K4SRMA, //C,N,0 /C,N,6/C,N,SRMP1

8 MATPRN CPSRMF,CPSRMA,,// \$

9 END

\*\*NO ERRORS FOUND EXECUTE NASTRAN PROGRAM\*\*

SOLID ROCKET BOOSTER COMBINED MODEL PHASE II PT. 1

212 DEGREES OF FREEDOM Z700234

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 PHASE2 SRMR1
APP DISP
CHKPNT YES
TIME 15
SQL 7.0
DIAG 7,8,13,14,19,21,22
ALTER 2,28 PARAMETER DEFAULTS
PARAM //C,N,NOP/V,Y,NOSUB=0
PARAM //C,N,NOP/V,Y,TPCOPY=-1
PARAM //C,N,NOP/V,Y,SURGK=-1
PARAM //C,N,NOP/V,Y,SUBK4=-1
PARAM //C,N,NOP/V,Y,SUBB=-1
PARAM //C,N,NOP/V,N,TRUE=-1
ALTER 25,27
CHKPNT EST,GE1,ECPT,GPCT
PARAM //C,N,SUB/V,N,COUPLE/V,Y,NOSUB/C,N,1
PARAM //C,N,NOP/V,N,NOK4GG#=-1
PURGE KGGX,K4GG,GPST,OGPST/NOSIMP
CHKPNT KGGX,K4GG,GPST,OGPST
COND L30,NOSIMP
COND L25A,GENEL
COND L25B,COUPLE
LABEL L25A
PURGE OGPST/TRUE
CHKPNT OGPST
LABEL L25B
ALTER 30,31
CHKPNT KGGX,K4GG,GPST
LABEL L30
ALTER 34,35
PARAM //C,N,AND/V,N,NOBG/V,N,NOBGG/V,Y,SUBB
PARAM //C,N,AND/V,N,NORK4/V,Y,SUBGK/V,Y,SUBK4
PARAM //C,N,AND/V,N,NOK4/V,N,NORK4/V,N,NOK4GG
COND L34A,NOMGG
JUMP L34B
LABEL L34A
COND ERROR3,COUPLE
LABEL L34B
PURGE BNN,BFF,BAA,BGGY/NUHG
PURGE K4GGY,K4NN,K4FF,K4AA/NOK4
CHKPNT BGGY,K4GGY,K4NN,K4FF,K4AA,MGG,BGG,BNN,BFF,BAA
ALTER 37,37
COND LBL1,NOMGG
ALTER 42,42 $ IF COUPLING RUN,CUMBINES SUBSTRUCTURES.
PURGE CPG1,K1,M1,KGG1,MGG1,KGGS,MGGS,KGT,MGT/COUPLL
PURGE K4GGS,K4GG1,K4GT,G1K1,K411,K41/COUPLE
PURGE B1,BGGS,BGGT,HGT,CFAC,KFAC,BFAC/COUPLE
CHKPNT KGGS,MGGS,K4GGS,BGGS
PARAM //C,N,NOP/V,N,CHECK=0
    
```

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   F C H 0

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COND    LPC9,COUPLE $ SKIP,NOT A COUPLING RUN
INPUTT1 /.../C,N,-3/C,N,9/V,Y,TPNAME9 $ LIST TAPE & REWIND
PARAM   //C,N,NOP/V,N,PASS=1 $ INITIAL LOOP PASS PARAMETER
PURGE   K4GG5,K4GGI,K4GT,GIKI,K4II,K4I,GFAC,KFAC/NOK4
PURGE   GIKI,GFAC/SUBGK/K4I,KFAC/SUBK4/BGG5,BGGI,BGT,EFAC/SUB5
CHKPNT   K4GG5,BGG5
JUMP    LOOPC
LABEL    LOOPC $ TOP OF LOOP
PARAM   //C,N,SUB/V,N,PASS1/V,N,PASS/C,N,2
INPUTT1 /CPGI,KI,MI.../C,N,0/C,N,9 $
COND    LPC1,PASS1
JUMP    LPC3
LABEL    LPC1
MERGE   ...KI,CPGI,/KGG5/C,N,-1/C,N,2/C,N,6
MERGE   ...MI,CPGI,/MGG5/C,N,-1/C,N,2/C,N,6
COND    LPC2,NOK4
MERGE   ...CPGI,/K4GG5/C,N,-1/C,N,2/C,N,6
LABEL    LPC2
COND    LPC3,SUBB
MERGE   ...CPGI,/BGG5 /C,N,-1/C,N,2/C,N,6
LABEL    LPC3
COND    LPC4,PASS1
MERGE   ...KI,CPGI,/KGGI/C,N,-1/C,N,2/C,N,6
MERGE   ...MI,CPGI,/MGGI/C,N,-1/C,N,2/C,N,6
ADD    KGG5,KGGI/KGT $
EQUIV   KGT,KGG5/TRUE
ADD    MGG5,MGGI/MGT $
EQUIV   MGT,MGG5/TRUE
COND    LPC4A,CHECK
JUMP    LPC4
LABEL    LPC4A
CHKPNT   KGG5,MGG5
LABEL    LPC4
COND    LPC7,NOK4
COND    LPC5,SUBGK
PARAML   GFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,GIR $
PARAMR   //C,N,E0/C,N,0.0/C,N,0.0/V,N,GIR/V,N,OUTC/V,N,INC1/V,N,INC2/
          V,N,NOGI $
PURGE   GIKI/NOGI
COND    LPC5,NOGI
PARAMR   //C,N,COMPLEX/C,N,0.0/V,N,GIR/C,N,0.0/V,N,GI $
ADD    KI,/GIKI/V,N,GI $
LABEL    LPC5
COND    LPC6,SUBK4
PARAML   KFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,K4R $
PARAMR   //C,N,E0/C,N,0.0/C,N,0.0/V,N,K4R/V,N,OUTC/V,N,INC1/V,N,INC2/
          V,N,NOK4I $
PURGE   K4I/NOK4I
COND    LPC6,NOK4I
INPUTT1 /K4I.../C,N,0/C,N,9 $

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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 I C K    E C H O

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LABEL   LPC6
ADD     GIK1,K41/K411
MERGE,  .,K411,CPG1,/K4GG1/C,N,-1/C,N,2/C,N,6
ADD     K4GGS,K4GG1/K4GT
EQUIV   K4GT,K4GGS/TRUE
COND    LPC7A,CHECK
JUMP    LPC7
LABEL   LPC7A
CHKPNT  K4GGS
LABEL   LPC7
COND    LPC8,SUBB
PARAML  BFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,HIR $
PARAMR  //C,N,E0/C,N,0.0/C,N,0.0/V,N,BIR/V,N,OUTC/V,N,INC1/V,N,INC2/
        V,N,NOP1 $
COND    LPC8A,NOB1
INPUT1  /BI,.../C,N,0/C,N,5 $
MERGE,  .,BI,CPG1/BGG1/C,N,-1/C,N,2/C,N,6
ADD     BGG5,BGG1/BGT $
EQUIV   BGT,BGG5/TRUE
LABEL   LPC8A
COND    LPC8B,CHECK
JUMP    LPC8
LABEL   LPC8B
CHKPNT  BGG5
LABEL   LPC8
PARAM    //C,N,ADD/V,N,PASS/V,N,PASS/C,N,1
PARAM    //C,N,SUB/V,N,SKIP2/V,N,NOSUB/V,N,PASS
PARAM    //C,N,SUB/V,N,CHECK/V,N,SKIP2/C,N,1
COND    LPC9,SKIP2
REPT    LOOPC,20
LABEL   LPC9
ADD     KGGX,KGGS/KGGY $
CHKPNT  KGGY
ADD     MGG,MGGS/MGGY $
CHKPNT  MGGY
COND    LPC11,NOK4
ADD     K4GG,K4GGS/K4GGY
CHKPNT  K4GGY
LABEL   LPC11
COND    LPC12,NLBC
ADD     HGG,HGGS/HGGY
CHKPNT  HGGY
LABEL   LPC12
EQUIV   KGGY,KGG/NOGENL $
ALTER  45,45
SMA3    GE1,KGGY/KGG/V,N,LUSIT/V,N,NOGENL/V,N,NOSIM#1 $
ALTER  51,53
PURGE   GM/MPCF1/GO/OMIT/KFS/SINGLE
EQUIV   KGG,KNN/MPCF1/MGGY,MNN/MPCF1/HGGY,BNN/MPCF1/K4GGY,K4NN/MPCF1
CHKPNT  GM,RG,GO,KFS,USF1,KNN,MNN,BNN,K4NN
    
```

NASTRAN EXECUTIVE CONTROL DECK F000

```

COND L53A,NOMGG
ADD MGG,/WGG/C,Y,ALPHA#X386,4,0,00 $
MATGPR GPL,USET,SIL,WGG//C,N,6
LABEL L53A
COND L53B,COUPLE
JUMP LBL4
LABEL L53B
ALTER 63,63
MCE2 USET,GM,KGG,MGGY,HGGY,K4GGY/KNN,MNN,BNN,KANN
ALTER 74,74
COND L87,OMIT
ALTER 77,77
ALTER 80,81
COND L87B,NOBG
ALTER 85,85
COND L87,NUK4
ALTER 87
LABEL L87
PURGE CPARL,CPFOA,CPNSF,CPGMN,EQR,EOL,EOA,EQO,EOF,EON,EOM,EOG/REACT
PURGE FX,EXT,EQMT,EQNT,EOGT,EOGTC,MGGG,MGGY/REACT
PURGE KLL,KLR,KRR,LLL,ULL,DM,X,EQNT,DMT,GOT,GMT/REACT
COND LCPS,REACT $ R-SET MUST BE DEFINED TO GENERATE FOG
RBMG1 USET,CAA,/KLL,KLR,KRR,... $
RBMG2 KLL/LLL,ULL
RBMG3 LLL,ULL,KLR,KRR/DM
CHKPNT KLL,KLR,KRR,DM
TRNSP EQR/EOF
MATGPR GPL,USET,SIL,EQNT//C,N,R
MPYAD KLR,DM,KRR/X/C,N,1 $
MATGPR GPL,USET,SIL,X//C,N,R
MPYAD EQR,X,/EX/C,N,0/C,N,1/C,N,0 $
TRNSP FX/EXT
MATGPR GPL,USET,SIL,FX//C,N,R
PURGE CPFOA/OMIT/CPNSF/SINGLE/CPGMN/MPCF1
PURGE EQO/OMIT/EOG/MPCF1
PURGE GOT/OMIT/GMT,EQMT/MPCF1
VEC USET/CPARL/C,N,A/C,N,R/C,N,L $
TRNSP DM/DMT
MPYAD EQR,DMT,/FOL/C,N,0/C,N,1/C,N,0
MERGE EQR,EOA,CPARL,/FOA/C,N,1/C,N,2/C,N,2
EQUIV EOA,EOF/OMIT
COND LCP1,OMIT
VEC USET/CPFOA/C,N,F/C,N,0/C,N,A $
TRNSP GO/GOT
MPYAD EOA,GOT,/EQO/C,N,0/C,N,1/C,N,0
MERGE EQO,EOA,CPFOA,/EOF/C,N,1/C,N,2/C,N,2
LABEL LCP1
EQUIV EOF,EON/SINGLE
COND LCP2,SINGLE
VEC USET/CPNSF/C,N,N/C,N,S/C,N,F $

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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 L C K    P C H O

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MERGE . , , EOF . , CPNSF . / EQN / C . N . 1 / C . N . 2 / C . N . 2
LABEL LCP2
TRNSP EQN / EQNT
MATGPR GPL , USET , SIL , EQNT // C . N . N
EQUIV EQN , EQG / MPCF1
COND LCP3 , MPCF1
VEC USET / CPGMN / C . N . G / C . N . M / C . N . N $
TRNSP GM / GMT
MPYAD EQN , GMT . / EQM / C . N . 0 / C . N . 1 / C . N . 0
MERGE EQM . , EQN . , CPGMN . / EQG / C . N . 1 / C . N . 2 / C . N . 2
TRNSP EQM / EQMT
MATGPR GPL , USET , SIL , EQMT // C . N . M
LABEL LCP3
CHKPNT C P F D A , C P N S E , C P G M N , C P A R L
CHKPNT FOG
TRNSP FOG / FOG1
ADD LOG1 . / LOGTC / C . Y . ALPHA = ( 386 . 4 , 0 . 0 ) †
$ ASSUME CONVERSION OF MASS TO LBS = 386.4
PURGE MOGG / NDMGG / MOGGY / COUPLE
COND LCP4 , NDMGG
SMPYAD EQG , MGG , EQGTC . . . / MOGG / C . N . 3 / C . N . 1 / C . N . 0 $
LABEL LCP4
COND LCP5 , COUPLE
SMPYAD EQG , MGGY , EQGTC . . . / MOGGY / C . N . 3 / C . N . 1 / C . N . 0 $
LABEL LCP5
MATPRN MOGG , MOGGY . . . // †
COND LCP8 , TPCOPY
SEEMAT KAA . . . . // C . N . PRINT
SEEMAT MAA . . . . // C . N . PRINT
OUTPUT1 GM , GO , KFS , KAA . . . // C . N . - 1 / C . N . 0 / V . Y . TPNAME
OUTPUT1 MAA . . . . // †
COND LCP7 , NOK4
SEEMAT K4AA . . . . // C . N . PRINT
OUTPUT1 K4AA . . . . // †
LABEL LCP7
COND LCP8 , NOBG
SEEMAT BAA . . . . // C . N . PRINT
OUTPUT1 BAA . . . . // †
LABEL LCP8
ALTER 89.162
ALTER 164.167
ENDALTER
CEND

```





PHASE 2 (PART 1)  
SRM COUPLING RUN

CASE CONTROL DECK ECHO

CARD  
COUNT  
1 TITLE = PHASE 2 (PART 1)  
2 SUBTITLE = SRM COUPLING RUN  
3 MAXLINS # 60000  
4 ECHO = BOTH  
5 MPC = 6050  
6 OUTPUT(PLOT)  
7 SET 1 # ALL  
8 PLOTTER CALCOMP 765.105  
9 AXES = MY,X,Z  
10 VIEW # 30.0,45.0,0.0  
11 FIND SCALE,ORIGIN 1,SET 1  
12 PLOT  
13 BEGIN BULK

PHASE 2 PART 10  
SRM COUPLING RUN

INPUT BULK DATA DECK ECHO

	1	2	3	4	5	6	7	8	9	10
CORD2R	696	0	-81.5683	0.0	35.5985	-80.2278	0.0	57.5136	ERSTANK	
ERSTANK	68.25	0.0	48.432							
CORD2C	100	696	74.738	-30.494	6.138	200.0	-30.494	6.138	ECSSRM	
ECSSRM	74.738	0.0	0.0							
CORD2K	101	696	74.738	-30.494	6.138	74.738	-28.5701	15.6963	ERSSRM	
ERSSRM	200.	-30.494	6.138							
GRID	6901	100	9.750	180.000	25.242	100	456			
GRID	6904	100	9.750	90.000	25.242	100	456			
GRID	6907	100	9.750	0.000	25.242	100	456			
GRID	6910	100	9.750	-90.000	25.242	100	456			
GRID	7001	100	9.750	180.000	44.500	100	456			
GRID	7004	100	3.180	180.000	44.500	100	456			
GRID	7013	100	9.750	90.000	44.500	100	456			
GRID	7016	100	3.180	90.000	44.500	100	456			
GRID	7025	100	9.750	0.0	44.500	100	456			
GRID	7028	100	3.180	0.0	44.500	100	456			
GRID	7037	100	9.750	-90.000	44.500	100	456			
GRID	7040	100	3.180	-90.000	44.500	100	456			
GRID	7097	100	9.750	180.000	69.053	100	456			
GRID	7100	100	3.180	180.000	69.053	100	456			
GRID	7109	100	9.750	90.000	69.053	100	456			
GRID	7112	100	3.180	90.000	69.053	100	456			
GRID	7121	100	9.750	0.0	69.053	100	456			
GRID	7124	100	3.180	0.0	69.053	100	456			
GRID	7133	100	9.750	-90.000	69.053	100	456			
GRID	7136	100	3.180	-90.000	69.053	100	456			
GRID	7193	100	9.750	180.000	93.607	100	456			
GRID	7196	100	3.180	180.000	93.607	100	456			
GRID	7205	100	9.750	90.000	93.607	100	456			
GRID	7208	100	3.180	90.000	93.607	100	456			
GRID	7217	100	9.750	0.0	93.607	100	456			
GRID	7220	100	3.180	0.0	93.607	100	456			
GRID	7229	100	9.750	-90.000	93.607	100	456			
GRID	7232	100	3.180	-90.000	93.607	100	456			
GRID	7289	100	9.750	180.000	118.160	100	0			
GRID	7290	100	7.560	180.000	118.160	100	456			
GRID	7291	100	5.370	180.000	118.160	100	456			
GRID	7292	100	3.180	180.000	118.160	100	456			
GRID	7293	100	9.750	150.000	118.160	100	0			
GRID	7294	100	7.560	150.000	118.160	100	456			
GRID	7295	100	5.370	150.000	118.160	100	456			
GRID	7296	100	3.180	150.000	118.160	100	456			
GRID	7297	100	9.750	120.000	118.160	100	0			
GRID	7298	100	7.560	120.000	118.160	100	456			
GRID	7299	100	5.370	120.000	118.160	100	456			
GRID	7300	100	3.180	120.000	118.160	100	456			
GRID	7301	100	9.750	90.000	118.160	100	0			
GRID	7302	100	7.560	90.000	118.160	100	456			
GRID	7303	100	5.370	90.000	118.160	100	456			
GRID	7304	100	3.180	90.000	118.160	100	456			

PHASE 2 XPART III  
SRM COUPLING RUN

INPUT BULK DATA DECK FCHD

	1	2	3	4	5	6	7	8	9	10
GRID	7305	100		9.750	60.000	118.160	100	0		
GRID	7306	100		7.560	60.000	118.160	100	456		
GRID	7307	100		5.370	60.000	118.160	100	456		
GRID	7308	100		3.180	60.000	118.160	100	456		
GRID	7309	100		9.750	30.000	118.160	100	0		
GRID	7310	100		7.560	30.000	118.160	100	456		
GRID	7311	100		5.370	30.000	118.160	100	456		
GRID	7312	100		3.180	30.000	118.160	100	456		
GRID	7313	100		9.750	0.0	118.160	100	0		
GRID	7314	100		7.560	0.0	118.160	100	456		
GRID	7315	100		5.370	0.0	118.160	100	456		
GRID	7316	100		3.180	0.0	118.160	100	456		
GRID	7317	100		9.750	-30.000	118.160	100	0		
GRID	7318	100		7.560	-30.000	118.160	100	456		
GRID	7319	100		5.370	-30.000	118.160	100	456		
GRID	7320	100		3.180	-30.000	118.160	100	456		
GRID	7321	100		9.750	-60.000	118.160	100	0		
GRID	7322	100		7.560	-60.000	118.160	100	456		
GRID	7323	100		5.370	-60.000	118.160	100	456		
GRID	7324	100		3.180	-60.000	118.160	100	456		
GRID	7325	100		9.750	-90.000	118.160	100	0		
GRID	7326	100		7.560	-90.000	118.160	100	456		
GRID	7327	100		5.370	-90.000	118.160	100	456		
GRID	7328	100		3.180	-90.000	118.160	100	456		
GRID	7329	100		9.750	-120.000	118.160	100	0		
GRID	7330	100		7.560	-120.000	118.160	100	456		
GRID	7331	100		5.370	-120.000	118.160	100	456		
GRID	7332	100		3.180	-120.000	118.160	100	456		
GRID	7333	100		9.750	-150.000	118.160	100	0		
GRID	7334	100		7.560	-150.000	118.160	100	456		
GRID	7335	100		5.370	-150.000	118.160	100	456		
GRID	7336	100		3.180	-150.000	118.160	100	456		
GRID	7385	100		9.750	180.000	142.713	100	456		
GRID	7388	100		3.180	180.000	142.713	100	456		
GRID	7397	100		9.750	90.000	142.713	100	456		
GRID	7400	100		3.180	90.000	142.713	100	456		
GRID	7409	100		9.750	0.0	142.713	100	456		
GRID	7412	100		3.180	0.0	142.713	100	456		
GRID	7421	100		9.750	-90.000	142.713	100	456		
GRID	7424	100		3.180	-90.000	142.713	100	456		
GRID	7481	100		9.750	180.000	167.267	100	456		
GRID	7484	100		3.180	180.000	167.267	100	456		
GRID	7493	100		9.750	90.000	167.267	100	456		
GRID	7496	100		3.180	90.000	167.267	100	456		
GRID	7505	100		9.750	0.0	167.267	100	456		
GRID	7508	100		3.180	0.0	167.267	100	456		
GRID	7517	100		9.750	-90.000	167.267	100	456		
GRID	7520	100		3.180	-90.000	167.267	100	456		
GRID	7801	100		9.75	180.0	196.25	100	456		
GRID	7803	100		9.43657	131.383196.25		100	456		

PHASE 2 (PART 1)  
SRM COUPLING RUN

INPUT BULK DATA DECK ECHO

	1	2	3	4	5	6	7	8	9	10
GRID	7805	100	9.75	90.0	196.25	100	456			
GRID	7806	100	9.43657	71.3832	196.25	100	456			
GRID	7809	100	9.75	0.0	196.25	100	456			
GRID	7811	100	9.43657	-48.6172	196.25	100	456			
GRID	7813	100	9.75	-90.0	196.25	100	456			
GRID	7814	100	9.43657	-108.6172	196.25	100	456			
GRID	7865	100	15.25	180.0	217.94	100	456			
GRID	7867	100	14.75977	131.3832	217.94	100	456			
GRID	7869	100	15.25	90.0	217.94	100	456			
GRID	7870	100	14.75977	71.3832	217.94	100	456			
GRID	7873	100	15.25	0.0	217.94	100	456			
GRID	7875	100	14.75977	-48.6172	217.94	100	456			
GRID	7877	100	15.25	-90.0	217.94	100	456			
GRID	7878	100	14.75977	-108.6172	217.94	100	456			
GRID	8134	696	99.98	-19.4107	3.9071	100	456			
GRID	8352	101	196.25	13.87258	9.75	101	456			
GRID	8355	101	196.25	13.87258	-9.75	101	456			
PLOTTEL	6001	6901	7001		6011	6904	7013			
PLOTTEL	6002	7001	7097		6012	7013	7109			
PLOTTEL	6003	7097	7193		6013	7109	7205			
PLOTTEL	6004	7193	7289		6014	7205	7301			
PLOTTEL	6005	7289	7385		6015	7301	7397			
PLOTTEL	6006	7385	7481		6016	7397	7493			
PLOTTEL	6007	7481	7801		6017	7493	7805			
PLOTTEL	6008	7801	7865		6018	7805	7869			
PLOTTEL	6021	6907	7025		6031	6910	7037			
PLOTTEL	6022	7025	7121		6032	7037	7133			
PLOTTEL	6023	7121	7217		6033	7133	7229			
PLOTTEL	6024	7217	7313		6034	7229	7325			
PLOTTEL	6025	7313	7409		6035	7325	7421			
PLOTTEL	6026	7409	7505		6036	7421	7517			
PLOTTEL	6027	7505	7609		6037	7517	7813			
PLOTTEL	6028	7809	7873		6038	7813	7877			
PLOTTEL	6009	7803	7867		6019	7811	7875			
PLOTTEL	6029	7806	7870		6039	7814	7878			
PLOTTEL	6041	6901	6904		6051	7097	7109			
PLOTTEL	6042	6904	6907		6052	7109	7121			
PLOTTEL	6043	6907	6910		6053	7121	7133			
PLOTTEL	6044	6910	6901		6054	7133	7097			
PLOTTEL	6045	7001	7013		6055	7193	7205			
PLOTTEL	6046	7013	7025		6056	7205	7217			
PLOTTEL	6047	7025	7037		6057	7217	7229			
PLOTTEL	6048	7037	7001		6058	7229	7193			
PLOTTEL	6061	7289	7301		6065	7385	7397			
PLOTTEL	6062	7301	7313		6066	7397	7409			
PLOTTEL	6063	7313	7325		6067	7409	7421			
PLOTTEL	6064	7325	7289		6068	7421	7397			
PLOTTEL	6071	7481	7493		6081	7801	7803			
PLOTTEL	6072	7493	7505		6082	7803	7805			
PLOTTEL	6073	7505	7517		6083	7805	7806			

PHASE 2 (PART 1)  
SRM COUPLING RUN

INPUT BULK DATA DECK FCHD

	1	2	3	4	5	6	7	8	9	10
PLOTEL	6074	7517	7481			6084	7806	7809		
PLOTEL	6091	7865	7867			6085	7809	7811		
PLOTEL	6092	7867	7869			6086	7811	7813		
PLOTEL	6093	7869	7870			6087	7813	7814		
PLOTEL	6094	7870	7873			6088	7814	7801		
PLOTEL	6095	7873	7875			6075	6907	8134		
PLOTEL	6096	7875	7877			6076	7805	8352		
PLOTEL	6097	7877	7878			6077	7809	8355		
PLOTEL	6098	7878	7865			6078	7813	8355		
PLOTEL	6101	7004	7016			6111	7196	7208		
PLOTEL	6102	7016	7028			6112	7208	7220		
PLOTEL	6103	7028	7040			6113	7220	7232		
PLOTEL	6104	7040	7004			6114	7232	7196		
PLOTEL	6105	7100	7112			6115	7292	7304		
PLOTEL	6106	7112	7124			6116	7304	7316		
PLOTEL	6107	7124	7136			6117	7316	7328		
PLOTEL	6108	7136	7100			6118	7328	7292		
PLOTEL	6121	7388	7400							
PLOTEL	6122	7400	7412							
PLOTEL	6123	7412	7424							
PLOTEL	6124	7424	7388							
PLOTEL	6125	7484	7496							
PLOTEL	6126	7496	7508							
PLOTEL	6127	7508	7520							
PLOTEL	6128	7520	7484							
PLOTEL	6131	7001	7004			6141	7013	7016		
PLOTEL	6132	7097	7100			6142	7109	7112		
PLOTEL	6133	7193	7196			6143	7205	7208		
PLOTEL	6134	7289	7292			6144	7301	7304		
PLOTEL	6135	7385	7388			6145	7397	7400		
PLOTEL	6136	7481	7484			6146	7493	7496		
PLOTEL	6151	7025	7028			6161	7037	7040		
PLOTEL	6152	7121	7124			6162	7133	7136		
PLOTEL	6153	7217	7220			6163	7229	7232		
PLOTEL	6154	7313	7316			6164	7325	7328		
PLOTEL	6155	7409	7412			6165	7421	7424		
PLOTEL	6156	7505	7508			6166	7517	7520		
OMIT1	123	7290	7291	7294	7295	7296	7298	7299		
OMIT1	123	7300	7302	7303	7306	7307	7308	7310		
OMIT1	123	7311	7312	7314	7315	7318	7319	7320		
OMIT1	123	7322	7323	7324	7326	7327	7330	7331		
OMIT1	123	7332	7334	7335	7336					
OMIT1	456	7289	7301	7313	7325					
OMIT1	123456	7293	7297	7305	7309	7317	7321	7329		
OMIT1	123456	7333								
PARAM	TPNAME	SRMP2								
PARAM	TPCOPY	1								
PARAM	NOSUB	2								
PARAM	TPNAME9	SRMP1								
PARAM	SUBK4	1								

PHASE 2 (PART 1)  
SRM COUPLING RUN

INPUT BULK DATA DECK FCHD

	1	2	3	4	5	6	7	8	9	10
DMI	GFAC	0	2	1	2			1	1	
DMI	GFAC	1	1	1.0						
DMI	BFAC	0	2	1	2			1	1	
DMI	BFAC	1	1	1.0						
DMI	KFAC	0	2	1	2			2	1	
DMI	KFAC	1	1	1.0	1.0					
CONRUD	1	7001	7097	1	.0000001					
MAT1	1	10.566			.3					
MPC	6050	6907	1	1.0	8134	1	-1.0			
SUPPORT	8134	123	8352	123	8355	123				
DMI	EOR	0	2	1	2			6	9	
DMI	EOR	1	1	-.012047	.980338	-.196959	-28.9148	3.234398	01	
EQ1	17.8664									
DMI	EOR	2	1	.05985	.197328	.978504	-25.5831	-16.0687	02	
EQ2	4.80504									
DMI	EOR	3	1	.99813	3	-.06105	1.18502	34.4593	03	
EQ3	19.3744									
DMI	EOR	4	1	.99813	3	-.06105	.913934	43.5110	04	
EQ4	14.9423									
DMI	EOR	5	1	-.012047	.980338	-.196959	-28.4118	36.9790	05	
EQ5	185.7937									
DMI	EOR	6	1	.05985	.197328	.978504	-20.9608	-183.7146	06	
EQ6	38.3298									
DMI	EOR	7	1	.99813	3	-.06105	1.14885	24.3945	07	
EQ7	18.7829									
DMI	EOR	8	1	-.012047	.980338	-.196959	-8.94825	36.979	EQ8	
EQ8	184.6032									
DMI	EOR	9	1	.05985	.197328	.978504	-20.9608	-183.7146	EQ9	
EQ9	38.3298									
ENDDATA										

TOTAL COUNT= 230

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

PHASE 2 (PART 1)  
SRM COUPLING RUN

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
1-CONROD	1		7001	7097	1	.0000001				
2-CORD2C	100		696	74.738	-30.494	6.138	200.0	-30.494	6.138	ECSSRM
3-ECSSRM	74.738		0.0	0.0						
4-CORD2R	101		696	74.738	-30.494	6.138	74.738	-28.570115	6.6963	ERSSRM
5-ERSSRM	200.		-30.494	6.138						
6-CORD2R	696		0	-81.5683	0	35.5985	-80.2278	0	57.5136	ERSTANK
7-ERSTANK	68.25		0.0	48.432						
8-DMI	BFAC	0		2	1	2		1	1	
9-DMI	BFAC	1		1	1.0					
10-DMI	EOR	0		2	1	2		6	9	
11-DMI	EOR	1		1						
12-EO1	17.8664				-0.012047	980338		-0.196959	-28.91483	23439
13-DMI	EOR	2		1	.05985	.197328	.978504	-25.5831	-16.0687	EO2
14-EO2	4.80504									
15-DMI	EOR	3		1	.99813	3		-0.06105	1.18502	34.4593
16-EO3	19.3744									
17-DMI	EOR	4		1	.99813	3		-0.06105	.913934	43.5110
18-EO4	14.9423									
19-DMI	EOR	5		1	-0.012047	980338		-0.196959	-28.411836	9790
20-EO5	185.7937									
21-DMI	EOR	6		1	.05985	.197328	.978504	-20.9608	-183.7146	EO6
22-EO6	38.3298									
23-DMI	EOR	7		1	.99813	3		-0.06105	1.14885	24.3945
24-EO7	18.7829									
25-DMI	EOR	8		1	-0.012047	980338		-0.196959	-8.9482536	979
26-EO8	184.6032									
27-DMI	EOR	9		1	.05985	.197328	.978504	-20.9608	-183.7146	EO9
28-EO9	38.3298									
29-DMI	GFAC	0		2	1	2		1	1	
30-DMI	GFAC	1		1	1.0					
31-DMI	KFAC	0		2	1	2		2	1	
32-DMI	KFAC	1		1	1.0	1.0				
33-GRID	6901	100		9.750	180.000	25.242	100	456		
34-GRID	6904	100		9.750	90.000	25.242	100	456		
35-GRID	6907	100		9.750	0.000	25.242	100	456		
36-GRID	6910	100		9.750	-90.000	25.242	100	456		
37-GRID	7001	100		9.750	180.000	44.500	100	456		
38-GRID	7004	100		3.180	180.000	44.500	100	456		
39-GRID	7013	100		9.750	90.000	44.500	100	456		
40-GRID	7016	100		3.180	90.000	44.500	100	456		
41-GRID	7025	100		9.750	0.0	44.500	100	456		
42-GRID	7028	100		3.180	0.0	44.500	100	456		
43-GRID	7037	100		9.750	-90.000	44.500	100	456		
44-GRID	7040	100		3.180	-90.000	44.500	100	456		
45-GRID	7097	100		9.750	180.000	69.053	100	456		
46-GRID	7100	100		3.180	180.000	69.053	100	456		
47-GRID	7109	100		9.750	90.000	69.053	100	456		
48-GRID	7112	100		3.180	90.000	69.053	100	456		
49-GRID	7121	100		9.750	0.0	69.053	100	456		
50-GRID	7124	100		3.180	0.0	69.053	100	456		

PHASE 2 (PART 1)  
SRM COUPLING RUN

SORTED BULK DATA FCHD

CARD	1	2	3	4	5	6	7	8	9	10
51-GRID	7133	100	9.750	-90.000	69.053	100	456			
52-GRID	7136	100	3.180	-90.000	69.053	100	456			
53-GRID	7193	100	9.750	180.000	93.607	100	456			
54-GRID	7196	100	3.180	180.000	93.607	100	456			
55-GRID	7205	100	9.750	90.000	93.607	100	456			
56-GRID	7208	100	3.180	90.000	93.607	100	456			
57-GRID	7217	100	9.750	0.0	93.607	100	456			
58-GRID	7220	100	3.180	0.0	93.607	100	456			
59-GRID	7229	100	9.750	-90.000	93.607	100	456			
60-GRID	7232	100	3.180	-90.000	93.607	100	456			
61-GRID	7289	100	9.750	180.000	118.160	100	0			
62-GRID	7290	100	7.560	180.000	118.160	100	456			
63-GRID	7291	100	5.370	180.000	118.160	100	456			
64-GRID	7292	100	3.180	180.000	118.160	100	456			
65-GRID	7293	100	9.750	150.000	118.160	100	0			
66-GRID	7294	100	7.560	150.000	118.160	100	456			
67-GRID	7295	100	5.370	150.000	118.160	100	456			
68-GRID	7296	100	3.180	150.000	118.160	100	456			
69-GRID	7297	100	9.750	120.000	118.160	100	0			
70-GRID	7298	100	7.560	120.000	118.160	100	456			
71-GRID	7299	100	5.370	120.000	118.160	100	456			
72-GRID	7300	100	3.180	120.000	118.160	100	456			
73-GRID	7301	100	9.750	90.000	118.160	100	0			
74-GRID	7302	100	7.560	90.000	118.160	100	456			
75-GRID	7303	100	5.370	90.000	118.160	100	456			
76-GRID	7304	100	3.180	90.000	118.160	100	456			
77-GRID	7305	100	9.750	60.000	118.160	100	0			
78-GRID	7306	100	7.560	60.000	118.160	100	456			
79-GRID	7307	100	5.370	60.000	118.160	100	456			
80-GRID	7308	100	3.180	60.000	118.160	100	456			
81-GRID	7309	100	9.750	30.000	118.160	100	0			
82-GRID	7310	100	7.560	30.000	118.160	100	456			
83-GRID	7311	100	5.370	30.000	118.160	100	456			
84-GRID	7312	100	3.180	30.000	118.160	100	456			
85-GRID	7313	100	9.750	0.0	118.160	100	0			
86-GRID	7314	100	7.560	0.0	118.160	100	456			
87-GRID	7315	100	5.370	0.0	118.160	100	456			
88-GRID	7316	100	3.180	0.0	118.160	100	456			
89-GRID	7317	100	9.750	-30.000	118.160	100	0			
90-GRID	7318	100	7.560	-30.000	118.160	100	456			
91-GRID	7319	100	5.370	-30.000	118.160	100	456			
92-GRID	7320	100	3.180	-30.000	118.160	100	456			
93-GRID	7321	100	9.750	-60.000	118.160	100	0			
94-GRID	7322	100	7.560	-60.000	118.160	100	456			
95-GRID	7323	100	5.370	-60.000	118.160	100	456			
96-GRID	7324	100	3.180	-60.000	118.160	100	456			
97-GRID	7325	100	9.750	-90.000	118.160	100	0			
98-GRID	7326	100	7.560	-90.000	118.160	100	456			
99-GRID	7327	100	5.370	-90.000	118.160	100	456			
100-GRID	7328	100	3.180	-90.000	118.160	100	456			



PHASE 2 XPART 1B  
SRM COUPLING RUN

SORTED HULK DATA ECHO

CARD	COUNT	1	2	3	4	5	6	7	8	9
101-GRID	7329	100	9.750	-120.000	118.160	100	0			
102-GRID	7330	100	7.560	-120.000	118.160	100	456			
103-GRID	7331	100	5.370	-120.000	118.160	100	456			
104-GRID	7332	100	3.180	-120.000	118.160	100	456			
105-GRID	7333	100	9.750	-150.000	118.160	100	0			
106-GRID	7334	100	7.560	-150.000	118.160	100	456			
107-GRID	7335	100	5.370	-150.000	118.160	100	456			
108-GRID	7336	100	3.180	-150.000	118.160	100	456			
109-GRID	7385	100	9.750	180.000	142.713	100	456			
110-GRID	7388	100	3.180	180.000	142.713	100	456			
111-GRID	7397	100	9.750	90.000	142.713	100	456			
112-GRID	7400	100	3.180	90.000	142.713	100	456			
113-GRID	7409	100	9.750	0.0	142.713	100	456			
114-GRID	7412	100	3.180	0.0	142.713	100	456			
115-GRID	7421	100	9.750	-90.000	142.713	100	456			
116-GRID	7424	100	3.180	-90.000	142.713	100	456			
117-GRID	7481	100	9.750	180.000	167.267	100	456			
118-GRID	7484	100	3.180	180.000	167.267	100	456			
119-GRID	7493	100	9.750	90.000	167.267	100	456			
120-GRID	7496	100	3.180	90.000	167.267	100	456			
121-GRID	7505	100	9.750	0.0	167.267	100	456			
122-GRID	7508	100	3.180	0.0	167.267	100	456			
123-GRID	7517	100	9.750	-90.000	167.267	100	456			
124-GRID	7520	100	3.180	-90.000	167.267	100	456			
125-GRID	7801	100	9.75	180.0	196.25	100	456			
126-GRID	7803	100	9.43657	131.383	196.25	100	456			
127-GRID	7805	100	9.75	90.0	196.25	100	456			
128-GRID	7806	100	9.43657	71.383	196.25	100	456			
129-GRID	7809	100	9.75	0.0	196.25	100	456			
130-GRID	7811	100	9.43657	-48.617	196.25	100	456			
131-GRID	7813	100	9.75	-90.0	196.25	100	456			
132-GRID	7814	100	9.43657	-108.617	196.25	100	456			
133-GRID	7865	100	15.25	180.0	217.94	100	456			
134-GRID	7867	100	14.75977	131.383	217.94	100	456			
135-GRID	7869	100	15.25	90.0	217.94	100	456			
136-GRID	7870	100	14.75977	71.383	217.94	100	456			
137-GRID	7873	100	15.25	0.0	217.94	100	456			
138-GRID	7875	100	14.75977	-48.617	217.94	100	456			
139-GRID	7877	100	15.25	-90.0	217.94	100	456			
140-GRID	7878	100	14.75977	-108.617	217.94	100	456			
141-GRID	8134	696	99.98	-19.41073	-9071	100	456			
142-GRID	8352	101	196.25	13.87258	-9.75	101	456			
143-GRID	8355	101	196.25	13.87258	-9.75	101	456			
144-MAT1	1	10.586		.3						
145-MFC	6050	6907	1	1.0	8134	1	-1.0			
146-OMIT1	123	7290	7291	7294	7295	7296	7298	7299		
147-OMIT1	123	7300	7302	7303	7306	7307	7308	7310		
148-OMIT1	123	7311	7312	7314	7315	7318	7319	7320		
149-OMIT1	123	7322	7323	7324	7326	7327	7330	7331		
150-OMIT1	123	7332	7334	7335	7336					

PHASE 2 (PART 1)  
SRM COUPLING RUN

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
151-OMIT1	456	7289	7301	7313	7325					
152-OMIT1	123456	7293	7297	7305	7309	7317	7321	7329		
153-OMIT1	123456	7333								
154-PARAM	NOSUB	2								
155-PARAM	SUBK4	1								
156-PARAM	TPCOPY	1								
157-PARAM	TPNAME	SRMP2								
158-PARAM	TPNAME9	SRMP1								
159-PLOTTEL	6001	6901	7001		6011	6904	7013			
160-PLOTTEL	6002	7001	7097		6012	7013	7109			
161-PLOTTEL	6003	7097	7193		6013	7109	7205			
162-PLOTTEL	6004	7193	7289		6014	7205	7301			
163-PLOTTEL	6005	7289	7385		6015	7301	7397			
164-PLOTTEL	6006	7385	7481		6016	7397	7493			
165-PLOTTEL	6007	7481	7801		6017	7493	7805			
166-PLOTTEL	6008	7801	7865		6018	7805	7869			
167-PLOTTEL	6009	7803	7867		6019	7811	7875			
168-PLOTTEL	6021	6907	7025		6031	6910	7037			
169-PLOTTEL	6022	7025	7121		6032	7037	7133			
170-PLOTTEL	6023	7121	7217		6033	7133	7229			
171-PLOTTEL	6024	7217	7313		6034	7229	7325			
172-PLOTTEL	6025	7313	7409		6035	7325	7421			
173-PLOTTEL	6026	7409	7505		6036	7421	7517			
174-PLOTTEL	6027	7505	7809		6037	7517	7813			
175-PLOTTEL	6028	7809	7873		6038	7813	7877			
176-PLOTTEL	6029	7806	7870		6039	7814	7878			
177-PLOTTEL	6041	6901	6904		6051	7097	7109			
178-PLOTTEL	6042	6904	6907		6052	7109	7121			
179-PLOTTEL	6043	6907	6910		6053	7121	7133			
180-PLOTTEL	6044	6910	6901		6054	7133	7097			
181-PLOTTEL	6045	7001	7013		6055	7193	7205			
182-PLOTTEL	6046	7013	7025		6056	7205	7217			
183-PLOTTEL	6047	7025	7037		6057	7217	7229			
184-PLOTTEL	6048	7037	7001		6058	7229	7193			
185-PLOTTEL	6061	7289	7301		6065	7385	7397			
186-PLOTTEL	6062	7301	7313		6066	7397	7409			
187-PLOTTEL	6063	7313	7325		6067	7409	7421			
188-PLOTTEL	6064	7325	7289		6068	7421	7385			
189-PLOTTEL	6071	7481	7493		6081	7801	7803			
190-PLOTTEL	6072	7493	7505		6062	7803	7805			
191-PLOTTEL	6073	7505	7517		6083	7805	7806			
192-PLOTTEL	6074	7517	7481		6084	7806	7809			
193-PLOTTEL	6091	7865	7867		6085	7809	7811			
194-PLOTTEL	6092	7867	7869		6086	7811	7813			
195-PLOTTEL	6093	7869	7870		6087	7813	7814			
196-PLOTTEL	6094	7870	7873		6088	7814	7801			
197-PLOTTEL	6095	7873	7875		6075	6907	8134			
198-PLOTTEL	6096	7875	7877		6076	7805	8352			
199-PLOTTEL	6097	7877	7878		6077	7809	8355			
200-PLOTTEL	6098	7878	7865		6078	7813	8355			

PHASE 2 (PART 1)  
SRM COUPLING RUN

SORTED BULK DATA LCHU

CARD	1	2	3	4	5	6	7	8	9	10
201- PLOTEL	6101	7004	7016			6111	7196	7208		
202- PLOTEL	6102	7016	7028			6112	7208	7220		
203- PLOTEL	6103	7028	7040			6113	7220	7232		
204- PLOTEL	6104	7040	7004			6114	7232	7196		
205- PLOTEL	6105	7100	7112			6115	7202	7304		
206- PLOTEL	6106	7112	7124			6116	7304	7316		
207- PLOTEL	6107	7124	7136			6117	7316	7328		
208- PLOTEL	6108	7136	7100			6118	7328	7292		
209- PLOTEL	6121	7388	7400							
210- PLOTEL	6122	7400	7412							
211- PLOTEL	6123	7412	7424							
212- PLOTEL	6124	7424	7388							
213- PLOTEL	6125	7484	7496							
214- PLOTEL	6126	7496	7508							
215- PLOTEL	6127	7508	7520							
216- PLOTEL	6128	7520	7484							
217- PLOTEL	6131	7001	7004			6141	7013	7016		
218- PLOTEL	6132	7097	7100			6142	7109	7112		
219- PLOTEL	6133	7193	7196			6143	7205	7208		
220- PLOTEL	6134	7289	7292			6144	7301	7304		
221- PLOTEL	6135	7385	7388			6145	7397	7400		
222- PLOTEL	6136	7481	7484			6146	7493	7496		
223- PLOTEL	6151	7025	7028			6161	7037	7040		
224- PLOTEL	6152	7121	7124			6162	7133	7136		
225- PLOTEL	6153	7217	7220			6163	7229	7232		
226- PLOTEL	6154	7313	7316			6164	7325	7328		
227- PLOTEL	6155	7409	7412			6165	7421	7424		
228- PLOTEL	6156	7505	7508			6166	7517	7520		
229- SUPORT	8134	123	8352	123	8355	123				
ENDDATA										

( SOLID ROCKET BOOSTER COMBINED MODEL PHASE II PT. 1

116 DEGREES OF FREEDOM Z702239

NASTRAN EXECUTIVE CONTROL DECK ECHO

```
ID PHASE2 SRMR1
APP DISP
CHKPNT YES
TIME 15
SOL 7.0
DIAG 7,8,13,14,19,21,22
ALTER 2,2$ PARAMETER DEFAULTS
PARAM //C,N,NOP/V,Y,NOSUB=0
PARAM //C,N,NUP/V,Y,TPCOPY=-1
PARAM //C,N,NUP/V,Y,SUBGK=-1
PARAM //C,N,NUP/V,Y,SUBK4=-1
PARAM //C,N,NOP/V,Y,SUBR=-1
PARAM //C,N,NOP/V,N,TRUE=-1
ALTER 25,27
CHKPNT EST,GET,LCPT,GPCI
PARAM //C,N,SUB/V,N,COUPLE/V,Y,NDSUH/C,N,I
PARAM //C,N,NUP/V,N,NUK4GG=-1
PURGE KGGX,K4GG,GPST,OGPST/NOSIMP
CHKPNT KGGX,K4GG,GPST,OGPST
COND L30,NOSIMP
COND L25A,GENL
COND L25B,COUPLE
LABEL L25A
PURGE OGPST/TRUE
CHKPNT OGPST
LABEL L25B
ALTER 30,31
CHKPNT KGGX,K4GG,GPST
LABEL L30
ALTER 34,35
PARAM //C,N,AND/V,N,NUBG/V,N,NOBGG/V,Y,SUBB
PARAM //C,N,AND/V,N,NORK4/V,Y,SUBGK/V,Y,SUBK4
PARAM //C,N,AND/V,N,NOK4/V,N,NURK4/V,N,NOK4GG
COND L34A,NUMGG
JUMP L34B
LABEL L34A
COND ERROR3,COUPLE
LABEL L34B
PURGE HNN,BFF,BAA,BGGY/NOB
PURGE K4GGY,K4NN,K4FF,K4AA/NUK4
CHKPNT BGGY,K4GGY,K4NN,K4FF,K4AA,MGG,BGG,HNN,BFF,BAA
ALTER 37,37
COND LBL1,NUMGG
ALTER 42,42 $ IF COUPLING RUN, COMBINES SUBSTRUCTURES.
PURGE CPGI,KT,MI,KGGI,MGGI,KGGS,MGGS,KGT,MGT/COUPLE
PURGE K4GGS,K4GGI,K4GI,GKI,K4II,K4I/COUPLE
PURGE BI,BGGS,BGGI,BGT,GFAC,KFAC,BFAC/COUPLE
CHKPNT KGGS,MGGS,K4GGS,BGGS
PARAM //C,N,NOP/V,N,CHECK=0
```

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   P C H O

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COND      LPC9,COUPLE $ SKIP,NOT A COUPLING RUN
INPUTT1  /...../C,N,-3/C,N,9/V,Y,TPNAME9 $ LIST TAPE & REWIND
PARAM    //C,N,NUP/V,N,PASS=1 $ INITIAL LOOP PASS PARAMETER
PURGE    K4GG5,K4GG1,K4GT,GIK1,K411,K41,GFAC,KFAC/NURK4
PURGE    GIK1,GFAC/SUBGK/K41,KFAC/SUBK4/BGG5,BGG1,BGT,KFAC/SUBB
CHKPNT   K4GG5,BGG5
JUMP     LUOPC
LABEL    LUOPC $ TOP OF LOOP
PARAM    //C,N,SUB/V,N,PASS1/V,N,PASS/C,N,2
INPUTT1  /CPGI,K1,MI../C,N,6/C,N,9 $
COND     LPC1,PASS1
JUMP     LPC3
LABEL    LPC1
MERGE.,  ...K1,CPGI,/KGG5/C,N,-1/C,N,2/C,N,6
MERGE.,  ...MI,CPGI,/MGG5/C,N,-1/C,N,2/C,N,6
COND     LPC2,NURK4
MERGE.,  ...CPGI,/K4GG5/C,N,-1/C,N,2/C,N,6
LABEL    LPC2
COND     LPC3,SUBB
MERGE.,  ...CPGI,/BGG5 /C,N,-1/C,N,2/C,N,6
LABEL    LPC3
COND     LPC4,PASS1
MERGE.,  ...K1,CPGI,/KGG1/C,N,-1/C,N,2/C,N,6
MERGE.,  ...MI,CPGI,/MGG1/C,N,-1/C,N,2/C,N,6
ADD      KGG5,KGG1/KGT $
EQUIV    KGT,KGG5/TRUE
ADD      MGG5,MGG1/MGT $
EQUIV    MGT,MGG5/TRUE
COND     LPC4A,CHECK
JUMP     LPC4
LABEL    LPC4A
CHKPNT   KGG5,MGG5
LABEL    LPC4
COND     LPC7,NURK4
COND     LPC5,SUBGK
PARAML   GFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,GIR $
PARAMR   //C,N,EG/C,N,0.0/C,N,0.0/V,N,GIR/V,N,OUTC/V,N,INC1/V,N,INC2/
          V,N,NUG1 $
PURGE    GIK1/NDG1
COND     LPC5,NDG1
PARAMR   //C,N,COMPLEX/C,N,0.0/V,N,GIR/C,N,0.0/V,N,G1 $
ADD      K1,/GIK1/V,N,G1 $
LABEL    LPC5
COND     LPC6,SUBK4
PARAML   KFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,K4R $
PARAMR   //C,N,EG/C,N,0.0/C,N,0.0/V,N,K4R/V,N,OUTC/V,N,INC1/V,N,INC2/
          V,N,NURK4 $
PURGE    K41/NURK4
COND     LPC6,NURK4
INPUTT1  /K41...../C,N,0/C,N,9 $

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NASTRAN EXECUTIVE CONTROL DECK FCHD

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LABEL    LPC6
ADD      GKI,K41/K411
MERGE    ...K411,CPGI,/K4GG1/C,N,-1/C,N,2/C,N,6
ADD      K4GS,K4GG1/K4GT
EQUIV    K4GT,K4GS/TRUE
COND     LPC7A,CHECK
JUMP     LPC7
LABEL    LPC7A
CHKPNT   K4GS
LABEL    LPC7
COND     LPC8,SUBB
PARAML   BFAC//C,N,DMI/C,N,1/V,N,PASS/V,N,BIR $
PARAMR   //C,N,EQ/C,N,0.0/C,N,0.0/V,N,BTR/V,N,OUTC/V,N,INCL/V,N,INC2/
          V,N,NOBI $
COND     LPC8A,NOBI
INPUTT1  /BI,.../C,N,0/C,N,9 $
MERGE    ...BI,CPGI,/BGG1/C,N,-1/C,N,2/C,N,6
ADD      BGS,BGG1/BGT $
EQUIV    BGT,BGS/TRUE
LABEL    LPC8A
COND     LPC8B,CHLCK
JUMP     LPC8
LABEL    LPC8B
CHKPNT   BGS
LABEL    LPC8
PARAM    //C,N,ADD/V,N,PASS/V,N,PASS/C,N,1
PARAM    //C,N,SUB/V,N,SKIP2/V,N,NOSUB/V,N,PASS
PARAM    //C,N,SUB/V,N,CHECK/V,N,SKIP2/C,N,1
COND     LPC9,SKIP2
REPT     LOOPC,20
LABEL    LPC9
ADD      KGGX,KGS/KGGY $
CHKPNT   KGGY
ADD      MGG,MGG5/MGGY $
CHKPNT   MGGY
COND     LPC11,NUK4
ADD      K4GG,K4GG5/K4GGY
CHKPNT   K4GGY
LABEL    LPC11
COND     LPC12,NOBG
ADD      HGG,HGG5/HGGY
CHKPNT   HGGY
LABEL    LPC12
EQUIV    KGGY,KGG/NOGENL $
ALTER   45,45
SMA3    GF1,KGGY/KGG/V,N,LUST/V,N,NOGENL/V,N,NOSIM=1 $
ALTER   51,53
PURGE   GM/MPCF1/GU/UMIT/KFS/SINGLE
EQUIV   KGG,KNN/MPCF1/MGGY,MNN/MPCF1/BGGY,BNN/MPCF1/K4GGY,KANN/MPCF1
CHKPNT  GM,RG,G1,KFS,USF,KNN,MNN,BNN,KANN
    
```

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   F C H U

```

COND      L53A,NOMGG
ADD       MGG,/WGG/C,Y,ALPHA=X386.4,0.0D $
MATGPR   GPL,USET,SIL,WGG//C,N,6
LABEL    L53A
COND     L53B,CIOUPL
JUMP     LBL4
LABEL    L53B
ALTER    63,63
MCE2     USET,GM,KGG,MGGY,BGGY,K4GGY/KNN,MNN,HNN,K4NN
ALTER    74,74
COND     L87,DMIT
ALTER    77,77
ALTER    80,81
COND     LBLB,NOMG
ALTER    85,85
COND     L87,NUK4
ALTER    87

LABEL     L87
PURGE    CPARL,CPFUA,CPNSF,CPGMN,EOR,EOL,FOA,FOO,EOF,FON,EOM,EOG/REACT
PURGE    EX,EXT,EOMT,EGNT,EGT,EGGTC,MGG,MGGY/REACT
PURGE    KLL,KLR,KRR,LLL,ULL,DM,X,EOR,DMT,GIT,GMT/REACT
COND     LCP5,REACT $ R-SET MUST BE DEFINED TO GENERATE EGG
RBMG1    USET,KAA,/KLL,KLR,KRR,.. $
RBMG2    KLL/LLL,ULL
RBMG3    LLL,ULL,KLR,KRR/DM
CHKPNT   KLL,KLR,KRR,DM
TRNSP    EQR/EORT
MATGPR   GPL,USET,SIL,EORT//C,N,R
MPYAD    KLR,DM,KRR/X/C,N,1 $
MATGPR   GPL,USET,SIL,X//C,N,R
MPYAD    EOR,X,/EX/C,N,0/C,N,1/C,N,0 $
TRNSP    EX/EXT
MATGPR   GPL,USET,SIL,EXT//C,N,R
PURGE    CPFUA/DMIT/CPNSF/SINGLE/CPGMN/MPCF1
PURGE    EOR/DMIT/EGM/MPCF1
PURGE    GOT/DMIT/GMT,EOMT/MPCF1
VEC      USET/CPARL/C,N,A/C,N,R/C,N,L $
TRNSP    DM/DMT
MPYAD    EOR,DMT,/EOL/C,N,0/C,N,1/C,N,0
MERGE    EOR,EOL,CPARL,/FOA/C,N,1/C,N,2/C,N,2
EQUIV    EOA,EOF/DMIT
COND     LCP1,DMIT
VEC      USET/CPFUA/C,N,F/C,N,0/C,N,A $
TRNSP    GO/GOT
MPYAD    EOA,GOT,/EOR/C,N,0/C,N,1/C,N,0
MERGE    EOR,EOA,CPFUA,/EOR/C,N,1/C,N,2/C,N,2
LABEL    LCP1
EQUIV    EOR,EON/SINGLE
COND     LCP2,SINGLE
VEC      USET/CPNSF/C,N,N/C,N,S/C,N,F $

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NASTRAN EXECUTIVE CONTROL DECK ECHO

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MERGE  ..EQF..CPNSF./EQN/C.N.1/C.N.2/C.N.2
LABEL  LCP2
TRNSP  EQN/EQNT
MATGPR GPL,USET,SIL,EQNT//C.N,N
EQUIV  EQN,EQG/MPCF1
COND   LCP3,MPCF1
VEC    USET/CPGMN/C.N.G/C.N.M/C.N.N $
TRNSP  GM/GMT
MPYAD  EQN,GMT./EQM/C.N.0/C.N.1/C.N.0
MERGE  EQM..EQN..CPGMN./EQG/C.N.1/C.N.2/C.N.2
TRNSP  EQM/EQMT
MATGPR GPL,USET,SIL,EQMT//C.N,M
LABEL  LCP3
CHKPNT CPFDA,CPNSF,CPGMN,CPARL
CHKPNT EQG
TRNSP  EQG/LOGT
ADD    EQGT./EQGTC/C.Y.ALPHA/(386.4,0.0) $
$ ASSUME CONVERSION OF MASS TO LBS # 386.4
PURGE  MDGG/NOMGG/MOGGY/COUPLE
COND   LCP4,NOMGG
SMPYAD EQG,MGG,EQGTC.../MOGG/C.N.3/C.N.1/C.N.0 $
LABEL  LCP4
COND   LCP5,COUPLE
SMPYAD EQG,MGGY,EQGTC.../MOGGY/C.N.3/C.N.1/C.N.0 $
LABEL  LCP5
MATPRN MDGG,MGGY...// $
COND   LCP8,TPCOPY
SEEMAT KAA...//C.N.PRINT
SEEMAT MAA...//C.N.PRINT
OUTPUT1 GM,GO,KFS,KAA...//C.N.-1/C.N.0/V,Y,TPNAME
OUTPUT1 MAA...// $
COND   LCP7,NOK4
SEEMAT K4AA...//C.N.PRINT
OUTPUT1 K4AA...// $
LABEL  LCP7
COND   LCP8,NDBG
SEEMAT BAA...//C.N.PRINT
OUTPUT1 BAA...// $
LABEL  LCP8
ALTER  89.162
ALTER  164.167
ENDALTER
CEND

```



NASTRAN EXECUTIVE CONTROL DECK ECHO

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

RESTART PHASE2 .SRM01 . 8/28/73. 17786.



PHASE 2 (PART 1)  
SRM COUPLING RUN

INPUT BULK DATA DECK ECHO

1	2	3	4	5	6	7	8	9	10
CORD2R	696	0	-81.5683	0.0	35.5985-80.2278	0.0		57.5136	CRSTANK
CRSTANK	68.25	0.0	48.432						
CORD2C	100	696	74.738	-30.494	6.138	200.0	-30.494	6.138	ECSSRM
ECSSRM	74.738	0.0	0.0						
CORD2H	101	696	74.738	-30.494	6.138	74.738	-28.5701	15.6963	CRSSRM
CRSSRM	200.	-30.494	6.138						
GRID	6901	100	9.750	180.000	25.242	100	456		
GRID	6904	100	9.750	90.000	25.242	100	456		
GRID	6907	100	9.750	0.000	25.242	100	456		
GRID	6910	100	9.750	-90.000	25.242	100	456		
GRID	7001	100	9.750	180.000	44.500	100	456		
GRID	7004	100	3.180	180.000	44.500	100	456		
GRID	7013	100	9.750	90.000	44.500	100	456		
GRID	7016	100	3.180	90.000	44.500	100	456		
GRID	7025	100	9.750	0.0	44.500	100	456		
GRID	7028	100	3.180	0.0	44.500	100	456		
GRID	7037	100	9.750	-90.000	44.500	100	456		
GRID	7040	100	3.180	-90.000	44.500	100	456		
GRID	7097	100	9.750	180.000	69.053	100	456		
GRID	7100	100	3.180	180.000	69.053	100	456		
GRID	7109	100	9.750	90.000	69.053	100	456		
GRID	7112	100	3.180	90.000	69.053	100	456		
GRID	7121	100	9.750	0.0	69.053	100	456		
GRID	7124	100	3.180	0.0	69.053	100	456		
GRID	7133	100	9.750	-90.000	69.053	100	456		
GRID	7136	100	3.180	-90.000	69.053	100	456		
GRID	7193	100	9.750	180.000	93.607	100	456		
GRID	7196	100	3.180	180.000	93.607	100	456		
GRID	7205	100	9.750	90.000	93.607	100	456		
GRID	7208	100	3.180	90.000	93.607	100	456		
GRID	7217	100	9.750	0.0	93.607	100	456		
GRID	7220	100	3.180	0.0	93.607	100	456		
GRID	7229	100	9.750	-90.000	93.607	100	456		
GRID	7232	100	3.180	-90.000	93.607	100	456		
GRID	7289	100	9.750	180.000	118.160	100	0		
GRID	7290	100	7.560	180.000	118.160	100	456		
GRID	7291	100	5.370	180.000	118.160	100	456		
GRID	7292	100	3.180	180.000	118.160	100	456		
GRID	7293	100	9.750	150.000	118.160	100	0		
GRID	7294	100	7.560	150.000	118.160	100	456		
GRID	7295	100	5.370	150.000	118.160	100	456		
GRID	7296	100	3.180	150.000	118.160	100	456		
GRID	7297	100	9.750	120.000	118.160	100	0		
GRID	7298	100	7.560	120.000	118.160	100	456		
GRID	7299	100	5.370	120.000	118.160	100	456		
GRID	7300	100	3.180	120.000	118.160	100	456		
GRID	7301	100	9.750	90.000	118.160	100	0		
GRID	7302	100	7.560	90.000	118.160	100	456		
GRID	7303	100	5.370	90.000	118.160	100	456		
GRID	7304	100	3.180	90.000	118.160	100	456		

PHASE 2 (PART 1)  
SRM COUPLING RUN

INPUT BULK DATA DECK ECHO

1	2	3	4	5	6	7	8	9	10
GRID	7305	100	9.750	60.000	118.160	100	0		
GRID	7306	100	7.560	60.000	118.160	100	456		
GRID	7307	100	5.370	60.000	118.160	100	456		
GRID	7308	100	3.180	60.000	118.160	100	456		
GRID	7309	100	9.750	30.000	118.160	100	0		
GRID	7310	100	7.560	30.000	118.160	100	456		
GRID	7311	100	5.370	30.000	118.160	100	456		
GRID	7312	100	3.180	30.000	118.160	100	456		
GRID	7313	100	9.750	0.0	118.160	100	0		
GRID	7314	100	7.560	0.0	118.160	100	456		
GRID	7315	100	5.370	0.0	118.160	100	456		
GRID	7316	100	3.180	0.0	118.160	100	456		
GRID	7317	100	9.750	-30.000	118.160	100	0		
GRID	7318	100	7.560	-30.000	118.160	100	456		
GRID	7319	100	5.370	-30.000	118.160	100	456		
GRID	7320	100	3.180	-30.000	118.160	100	456		
GRID	7321	100	9.750	-60.000	118.160	100	0		
GRID	7322	100	7.560	-60.000	118.160	100	456		
GRID	7323	100	5.370	-60.000	118.160	100	456		
GRID	7324	100	3.180	-60.000	118.160	100	456		
GRID	7325	100	9.750	-90.000	118.160	100	0		
GRID	7326	100	7.560	-90.000	118.160	100	456		
GRID	7327	100	5.370	-90.000	118.160	100	456		
GRID	7328	100	3.180	-90.000	118.160	100	456		
GRID	7329	100	9.750	-120.000	118.160	100	0		
GRID	7330	100	7.560	-120.000	118.160	100	456		
GRID	7331	100	5.370	-120.000	118.160	100	456		
GRID	7332	100	3.180	-120.000	118.160	100	456		
GRID	7333	100	9.750	-150.000	118.160	100	0		
GRID	7334	100	7.560	-150.000	118.160	100	456		
GRID	7335	100	5.370	-150.000	118.160	100	456		
GRID	7336	100	3.180	-150.000	118.160	100	456		
GRID	7385	100	9.750	180.000	142.713	100	456		
GRID	7388	100	3.180	180.000	142.713	100	456		
GRID	7397	100	9.750	90.000	142.713	100	456		
GRID	7400	100	3.180	90.000	142.713	100	456		
GRID	7409	100	9.750	0.0	142.713	100	456		
GRID	7412	100	3.180	0.0	142.713	100	456		
GRID	7421	100	9.750	-90.000	142.713	100	456		
GRID	7424	100	3.180	-90.000	142.713	100	456		
GRID	7481	100	9.750	180.000	167.267	100	456		
GRID	7484	100	3.180	180.000	167.267	100	456		
GRID	7493	100	9.750	90.000	167.267	100	456		
GRID	7496	100	3.180	90.000	167.267	100	456		
GRID	7505	100	9.750	0.0	167.267	100	456		
GRID	7508	100	3.180	0.0	167.267	100	456		
GRID	7517	100	9.750	-90.000	167.267	100	456		
GRID	7520	100	3.180	-90.000	167.267	100	456		
GRID	7801	100	9.75	180.0	196.25	100	456		
GRID	7803	100	9.43657	131.383	196.25	100	456		

PHASE 2 (PART 1)  
SRM COUPLING RUN

INPUT BULK DATA DLCK ECHO

	1	2	3	4	5	6	7	8	9	10
GRID	7805	100	9.75	90.0	196.25	100	456			
GRID	7806	100	9.43657	71.3831	196.25	100	456			
GRID	7809	100	9.75	0.0	196.25	100	456			
GRID	7811	100	9.43657	-48.6171	196.25	100	456			
GRID	7813	100	9.75	-90.0	196.25	100	456			
GRID	7814	100	9.43657	-108.6171	196.25	100	456			
GRID	7865	100	15.25	180.0	217.94	100	456			
GRID	7867	100	14.75977	131.3832	217.94	100	456			
GRID	7869	100	15.25	90.0	217.94	100	456			
GRID	7870	100	14.75977	71.3832	217.94	100	456			
GRID	7873	100	15.25	0.0	217.94	100	456			
GRID	7875	100	14.75977	-48.6172	217.94	100	456			
GRID	7877	100	15.25	-90.0	217.94	100	456			
GRID	7878	100	14.75977	-108.6172	217.94	100	456			
GRID	8134	696	99.98	-19.4107	3.9071	100	456			
GRID	8352	101	196.25	13.87258	9.75	101	456			
GRID	8355	101	196.25	13.87258	-9.75	101	456			
PLOTTEL	6001	6901	7001		6011	6904	7013			
PLOTTEL	6002	7001	7097		6012	7013	7109			
PLOTTEL	6003	7097	7193		6013	7109	7205			
PLUTEL	6004	7193	7289		6014	7205	7301			
PLUTEL	6005	7289	7385		6015	7301	7397			
PLUTEL	6006	7385	7481		6016	7397	7493			
PLUTEL	6007	7481	7801		6017	7493	7805			
PLOTTEL	6008	7801	7865		6018	7805	7869			
PLOTTEL	6021	6907	7025		6031	6910	7037			
PLUTEL	6022	7025	7121		6032	7037	7133			
PLUTEL	6023	7121	7217		6033	7133	7229			
PLUTEL	6024	7217	7313		6034	7229	7325			
PLOTTEL	6025	7313	7409		6035	7325	7421			
PLOTTEL	6026	7409	7505		6036	7421	7517			
PLOTTEL	6027	7505	7809		6037	7517	7813			
PLOTTEL	6028	7809	7873		6038	7813	7877			
PLOTTEL	6009	7803	7867		6019	7811	7875			
PLUTEL	6029	7806	7870		6039	7814	7878			
PLOTTEL	6041	6901	6904		6051	7097	7109			
PLOTTEL	6042	6904	6907		6052	7109	7121			
PLOTTEL	6043	6907	6910		6053	7121	7133			
PLOTTEL	6044	6910	6901		6054	7133	7097			
PLOTTEL	6045	7001	7013		6055	7193	7205			
PLOTTEL	6046	7013	7025		6056	7205	7217			
PLUTEL	6047	7025	7037		6057	7217	7229			
PLOTTEL	6048	7037	7001		6058	7229	7193			
PLUTEL	6061	7289	7301		6065	7385	7397			
PLUTEL	6062	7301	7313		6066	7397	7409			
PLUTEL	6063	7313	7325		6067	7409	7421			
PLUTEL	6064	7325	7289		6068	7421	7385			
PLUTEL	6071	7481	7493		6081	7801	7803			
PLOTTEL	6072	7493	7505		6082	7803	7805			
PLOTTEL	6073	7505	7517		6083	7805	7806			

PHASE 2 (PART 1)  
SRM COUPLING RUN

INPUT BULK DATA DECK ECHO

	1	2	3	4	5	6	7	8	9	10
PLOTTEL	6074	7517	7481			6084	7806	7809		
PLOTTEL	6091	7865	7867			6085	7809	7811		
PLOTTEL	6092	7867	7869			6086	7811	7813		
PLOTTEL	6093	7869	7870			6087	7813	7814		
PLOTTEL	6094	7870	7873			6088	7814	7801		
PLOTTEL	6095	7873	7875			6075	6907	8134		
PLOTTEL	6096	7875	7877			6076	7805	8352		
PLOTTEL	6097	7877	7878			6077	7809	8355		
PLOTTEL	6098	7878	7865			6078	7813	8355		
PLOTTEL	6101	7004	7016			6111	7196	7208		
PLOTTEL	6102	7016	7028			6112	7208	7220		
PLOTTEL	6103	7028	7040			6113	7220	7232		
PLOTTEL	6104	7040	7004			6114	7232	7196		
PLOTTEL	6105	7100	7112			6115	7292	7304		
PLOTTEL	6106	7112	7124			6116	7304	7316		
PLOTTEL	6107	7124	7136			6117	7316	7328		
PLOTTEL	6108	7136	7100			6118	7328	7292		
PLOTTEL	6121	7388	7400							
PLOTTEL	6122	7400	7412							
PLOTTEL	6123	7412	7424							
PLOTTEL	6124	7424	7388							
PLOTTEL	6125	7484	7496							
PLOTTEL	6126	7496	7508							
PLOTTEL	6127	7508	7520							
PLOTTEL	6129	7520	7484							
PLOTTEL	6131	7001	7004			6141	7013	7016		
PLOTTEL	6132	7097	7100			6142	7109	7112		
PLOTTEL	6133	7193	7196			6143	7205	7208		
PLOTTEL	6134	7289	7292			6144	7301	7304		
PLOTTEL	6135	7385	7388			6145	7397	7400		
PLOTTEL	6136	7481	7484			6146	7493	7496		
PLOTTEL	6151	7025	7028			6161	7037	7040		
PLOTTEL	6152	7121	7124			6162	7133	7136		
PLOTTEL	6153	7217	7220			6163	7229	7232		
PLOTTEL	6154	7313	7316			6164	7325	7328		
PLOTTEL	6155	7409	7412			6165	7421	7424		
PLOTTEL	6156	7505	7508			6166	7517	7520		
OMITI	123	7290	7291	7294		7295	7296	7298	7299	
OMITI	123	7300	7302	7303		7306	7307	7308	7310	
OMITI	123	7311	7312	7314		7315	7318	7319	7320	
OMITI	123	7322	7323	7324		7326	7327	7330	7331	
OMITI	123	7332	7334	7335		7336				
OMITI	456	7289	7301	7313		7325				
OMITI	123456	7293	7297	7305	7309	7317	7321	7329		
OMITI	123456	7333								
PARAM	TPNAME	SRMP2								
PARAM	TPCOPY	1								
PARAM	NOSUB	2								
PARAM	TPNAME9	SRMP1								
PARAM	SUBK4	1								

PHASE 2 SPART 1B  
SRM COUPLING RUN

INPUT BULK DATA DECK ECHO

	1	2	3	4	5	6	7	8	9	10
DMI	GFAC	0	2	1	2			1	1	
DMI	GFAC	1	1	1.0						
DMI	BFAC	0	2	1	2			1	1	
DMI	BFAC	1	1	1.0						
DMI	KFAC	0	2	1	2			2	1	
DMI	KFAC	1	1	1.0	1.0					
CONROD	1	7001	7097	1	.0000001					
MAT1	1	10.566		.3						
MPC	6050	6907	1	1.0	8134	1	-1.0			
SUPPORT	8134	123	8352	123	8355	123				
DMI	EOR	0	2	1	2			6	9	
DE01	EOR	1	1	-.012047	.980338	-.196959	-28.9148	3.234396	E01	
DE01	17.8664									
DMI	EOR	2	1	.05985	.197328	.978504	-25.5831	-16.0687	E02	
DE02	4.80504									
DMI	EOR	3	1	.99813	3	-.06105	1.18502	34.4543	E03	
DE03	19.3744									
DMI	EOR	4	1	.99813	3	-.06105	.913934	43.5110	E04	
DE04	14.9423									
DMI	EOR	5	1	-.012047	.980338	-.196959	-28.4118	36.9790	E05	
DE05	185.7937									
DMI	EOR	6	1	.05985	.197328	.978504	-20.9608	-183.7146	E06	
DE06	38.3298									
DMI	EOR	7	1	.99813	3	-.06105	1.14885	24.3945	E07	
DE07	18.7829									
DMI	EOR	8	1	-.012047	.980338	-.196959	-8.94825	36.979	E08	
DE08	184.6032									
DMI	EOR	9	1	.05985	.197328	.978504	-20.9608	-183.7146	E09	
DE09	38.3298									
OMIT1	1	7004	7016	7028	7040					
OMIT1	23	7097	7109	7121	7133					
OMIT1	123	7100	7112	7124	7136					
OMIT1	23	7193	7205	7217	7229					
OMIT1	123	7196	7208	7220	7232					
OMIT1	1	7292	7304	7316	7328					
OMIT1	23	7385	7397	7409	7421					
OMIT1	123	7388	7400	7412	7424					
OMIT1	1	7484	7496	7508	7520					
OMIT1	123	7803	7806	7811	7814					
OMIT1	123	7867	7870	7875	7878					
ENDDATA										

TOTAL COUNT= 241

\*\*\* USER INFORMATION MESSAGE 207: BULK DATA NOT SORTED, ASSET WILL BE ORDER DECK.

PHASE 2 (PART 1)  
SRM COUPLING RUN

SORTED BULK DATA FCHD

CARD	1	2	3	4	5	6	7	8	9	10
1-CONROD	1	7001	7097	1	.0000001					
2-CORD2C	100	696	74.738	-30.494	6.138	200.0	-30.494	6.138	ECSSRM	
3-ECSSRM	74.738	0.0	0.0							
4-CORD2R	101	696	74.738	-30.494	6.138	74.738	-28.570115	6.6963	CRSSRM	
5-CRSSRM	200.	-30.494	6.138							
6-CORD2R	696	0	-81.5683	0	35.5985	-80.2278	0	57.5136	CRSTANK	
7-CRSTANK	68.25	0.0	48.432							
8-DMI	BFAC	0	2	1	2		1	1		
9-DMI	BFAC	1	1	1.0						
10-DMI	LGR	0	2	1	2		6	9		
11-DMI	FOR	1	1	-.012047	.980338	-.196959	-28.91483	23439	CEQ1	
12-CEQ1	17.8664									
13-DMI	EQR	2	1	.05985	.197328	.978504	-25.5831	-16.0687	CEQ2	
14-CEQ2	4.80504									
15-DMI	LGR	3	1	.99813	3		-.06105	1.18502	34.4593	CEQ3
16-CEQ3	19.3744									
17-DMI	EQR	4	1	.99813	3		-.06105	.913934	43.5110	CEQ4
18-CEQ4	14.9423									
19-DMI	LGR	5	1	-.012047	.980338	-.196959	-28.411836	.9790	CEQ5	
20-CEQ5	185.7937									
21-DMI	EQR	6	1	.05985	.197328	.978504	-20.9608	-183.7146	CEQ6	
22-CEQ6	38.3298									
23-DMI	LGR	7	1	.99813	3		-.06105	1.14885	24.3945	CEQ7
24-CEQ7	18.7829									
25-DMI	FOR	8	1	-.012047	.980338	-.196959	-8.9482536	.979	CEQ8	
26-CEQ8	184.6032									
27-DMI	LGR	9	1	.05985	.197328	.978504	-20.9608	-183.7146	CEQ9	
28-CEQ9	38.3298									
29-DMI	GFAC	0	2	1	2		1	1		
30-DMI	GFAC	1	1	1.0						
31-DMI	KFAC	0	2	1	2		2	1		
32-DMI	KFAC	1	1	1.0	1.0					
33-GRID	6901	100	9.750	180.000	25.242	100	456			
34-GRID	6904	100	9.750	90.000	25.242	100	456			
35-GRID	6907	100	9.750	0.000	25.242	100	456			
36-GRID	6910	100	9.750	-90.000	25.242	100	456			
37-GRID	7001	100	9.750	180.000	44.500	100	456			
38-GRID	7004	100	3.180	180.000	44.500	100	456			
39-GRID	7013	100	9.750	90.000	44.500	100	456			
40-GRID	7016	100	3.180	90.000	44.500	100	456			
41-GRID	7025	100	9.750	0.0	44.500	100	456			
42-GRID	7028	100	3.180	0.0	44.500	100	456			
43-GRID	7037	100	9.750	-90.000	44.500	100	456			
44-GRID	7040	100	3.180	-90.000	44.500	100	456			
45-GRID	7097	100	9.750	180.000	69.053	100	456			
46-GRID	7100	100	3.180	180.000	69.053	100	456			
47-GRID	7109	100	9.750	90.000	69.053	100	456			
48-GRID	7112	100	3.180	90.000	69.053	100	456			
49-GRID	7121	100	9.750	0.0	69.053	100	456			
50-GRID	7124	100	3.180	0.0	69.053	100	456			



PHASE 2 XPART II  
SRM COUPLING RUN

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
51-GRID	7133	100	9.750	-90.000	69.053	100	456			
52-GRID	7136	100	3.180	-90.000	69.053	100	456			
53-GRID	7193	100	9.750	180.000	93.607	100	456			
54-GRID	7196	100	3.180	180.000	93.607	100	456			
55-GRID	7205	100	9.750	90.000	93.607	100	456			
56-GRID	7208	100	3.180	90.000	93.607	100	456			
57-GRID	7217	100	9.750	0.0	93.607	100	456			
58-GRID	7220	100	3.180	0.0	93.607	100	456			
59-GRID	7229	100	9.750	-90.000	93.607	100	456			
60-GRID	7232	100	3.180	-90.000	93.607	100	456			
61-GRID	7289	100	9.750	180.000	118.160	100	0			
62-GRID	7290	100	7.560	180.000	118.160	100	456			
63-GRID	7291	100	5.370	180.000	118.160	100	456			
64-GRID	7292	100	3.180	180.000	118.160	100	456			
65-GRID	7293	100	9.750	150.000	118.160	100	0			
66-GRID	7294	100	7.560	150.000	118.160	100	456			
67-GRID	7295	100	5.370	150.000	118.160	100	456			
68-GRID	7296	100	3.180	150.000	118.160	100	456			
69-GRID	7297	100	9.750	120.000	118.160	100	0			
70-GRID	7298	100	7.560	120.000	118.160	100	456			
71-GRID	7299	100	5.370	120.000	118.160	100	456			
72-GRID	7300	100	3.180	120.000	118.160	100	456			
73-GRID	7301	100	9.750	90.000	118.160	100	0			
74-GRID	7302	100	7.560	90.000	118.160	100	456			
75-GRID	7303	100	5.370	90.000	118.160	100	456			
76-GRID	7304	100	3.180	90.000	118.160	100	456			
77-GRID	7305	100	9.750	60.000	118.160	100	0			
78-GRID	7306	100	7.560	60.000	118.160	100	456			
79-GRID	7307	100	5.370	60.000	118.160	100	456			
80-GRID	7308	100	3.180	60.000	118.160	100	456			
81-GRID	7309	100	9.750	30.000	118.160	100	0			
82-GRID	7310	100	7.560	30.000	118.160	100	456			
83-GRID	7311	100	5.370	30.000	118.160	100	456			
84-GRID	7312	100	3.180	30.000	118.160	100	456			
85-GRID	7313	100	9.750	0.0	118.160	100	0			
86-GRID	7314	100	7.560	0.0	118.160	100	456			
87-GRID	7315	100	5.370	0.0	118.160	100	456			
88-GRID	7316	100	3.180	0.0	118.160	100	456			
89-GRID	7317	100	9.750	-30.000	118.160	100	0			
90-GRID	7318	100	7.560	-30.000	118.160	100	456			
91-GRID	7319	100	5.370	-30.000	118.160	100	456			
92-GRID	7320	100	3.180	-30.000	118.160	100	456			
93-GRID	7321	100	9.750	-60.000	118.160	100	0			
94-GRID	7322	100	7.560	-60.000	118.160	100	456			
95-GRID	7323	100	5.370	-60.000	118.160	100	456			
96-GRID	7324	100	3.180	-60.000	118.160	100	456			
97-GRID	7325	100	9.750	-90.000	118.160	100	0			
98-GRID	7326	100	7.560	-90.000	118.160	100	456			
99-GRID	7327	100	5.370	-90.000	118.160	100	456			
100-GRID	7328	100	3.180	-90.000	118.160	100	456			

PHASE 2 (PART 1)  
SRM COUPLING RUN

SORTED BULK DATA FILE

CARD	1	2	3	4	5	6	7	8	9	10
101-GRID	7329	100	9.750	-120.000	118.160	100	0			
102-GRID	7330	100	7.560	-120.000	118.160	100	456			
103-GRID	7331	100	5.370	-120.000	118.160	100	456			
104-GRID	7332	100	3.180	-120.000	118.160	100	456			
105-GRID	7333	100	9.750	-150.000	118.160	100	0			
106-GRID	7334	100	7.560	-150.000	118.160	100	456			
107-GRID	7335	100	5.370	-150.000	118.160	100	456			
108-GRID	7336	100	3.180	-150.000	118.160	100	456			
109-GRID	7385	100	9.750	180.000	142.713	100	456			
110-GRID	7388	100	3.180	180.000	142.713	100	456			
111-GRID	7397	100	9.750	90.000	142.713	100	456			
112-GRID	7400	100	3.180	90.000	142.713	100	456			
113-GRID	7409	100	9.750	0.0	142.713	100	456			
114-GRID	7412	100	3.180	0.0	142.713	100	456			
115-GRID	7421	100	9.750	-90.000	142.713	100	456			
116-GRID	7424	100	3.180	-90.000	142.713	100	456			
117-GRID	7481	100	9.750	180.000	167.267	100	456			
118-GRID	7484	100	3.180	180.000	167.267	100	456			
119-GRID	7493	100	9.750	90.000	167.267	100	456			
120-GRID	7496	100	3.180	90.000	167.267	100	456			
121-GRID	7505	100	9.750	0.0	167.267	100	456			
122-GRID	7508	100	3.180	0.0	167.267	100	456			
123-GRID	7517	100	9.750	-90.000	167.267	100	456			
124-GRID	7520	100	3.180	-90.000	167.267	100	456			
125-GRID	7801	100	9.75	180.0	196.25	100	456			
126-GRID	7803	100	9.43657	131.383	196.25	100	456			
127-GRID	7805	100	9.75	90.0	196.25	100	456			
128-GRID	7806	100	9.43657	71.383	196.25	100	456			
129-GRID	7809	100	9.75	0.0	196.25	100	456			
130-GRID	7811	100	9.43657	-48.617	196.25	100	456			
131-GRID	7813	100	9.75	-90.0	196.25	100	456			
132-GRID	7814	100	9.43657	-108.617	196.25	100	456			
133-GRID	7865	100	15.25	180.0	217.94	100	456			
134-GRID	7867	100	14.75977	131.383	217.94	100	456			
135-GRID	7869	100	15.25	90.0	217.94	100	456			
136-GRID	7870	100	14.75977	71.383	217.94	100	456			
137-GRID	7873	100	15.25	0.0	217.94	100	456			
138-GRID	7875	100	14.75977	-48.617	217.94	100	456			
139-GRID	7877	100	15.25	-90.0	217.94	100	456			
140-GRID	7878	100	14.75977	-108.617	217.94	100	456			
141-GRID	8134	696	99.98	-14.41073	9071	100	456			
142-GRID	8352	101	196.25	13.87258	9.75	101	456			
143-GRID	8355	101	196.25	13.87258	-9.75	101	456			
144-MAT1	1	10.566		.3						
145-MPC	6050	6907	1	1.0	8134	1	-1.0			
146-OMIT1	1	7004	7016	7028	7040					
147-OMIT1	1	7242	7304	7316	7328					
148-OMIT1	1	7484	7496	7508	7520					
149-OMIT1	23	7047	7109	7121	7133					
150-OMIT1	23	7193	7205	7217	7229					

PHASE 2 XPART III  
SRM COUPLING RUN

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
151-OMIT1	23	7385	7397	7409	7421					
152-OMIT1	123	7100	7112	7124	7136					
153-OMIT1	123	7196	7208	7220	7232					
154-OMIT1	123	7290	7291	7294	7295	7296	7298	7299		
155-OMIT1	123	7300	7302	7303	7306	7307	7308	7310		
156-OMIT1	123	7311	7312	7314	7315	7318	7319	7320		
157-OMIT1	123	7322	7323	7324	7326	7327	7330	7331		
158-OMIT1	123	7332	7334	7335	7336					
159-OMIT1	123	7388	7400	7412	7424					
160-OMIT1	123	7803	7806	7811	7814					
161-OMIT1	123	7867	7870	7875	7878					
162-OMIT1	456	7289	7301	7313	7325					
163-OMIT1	123456	7293	7297	7305	7309	7317	7321	7325		
164-OMIT1	123456	7333								
165-PARAM	NUSUP	2								
166-PARAM	SURK4	1								
167-PARAM	TPCOPY	1								
168-PARAM	TPNAME	SRMP2								
169-PARAM	TPNAME9	SRMP1								
170-PLOTEL	6001	6901	7001		6011	6904	7013			
171-PLOTEL	6002	7001	7097		6012	7013	7109			
172-PLOTEL	6003	7097	7193		6013	7109	7205			
173-PLOTEL	6004	7193	7289		6014	7205	7301			
174-PLOTEL	6005	7289	7385		6015	7301	7397			
175-PLOTEL	6006	7385	7481		6016	7397	7493			
176-PLOTEL	6007	7481	7801		6017	7493	7805			
177-PLOTEL	6008	7801	7865		6018	7805	7869			
178-PLOTEL	6009	7865	7867		6019	7811	7875			
179-PLOTEL	6021	6907	7025		6031	6910	7037			
180-PLOTEL	6022	7025	7121		6032	7037	7133			
181-PLOTEL	6023	7121	7217		6033	7133	7229			
182-PLOTEL	6024	7217	7313		6034	7229	7325			
183-PLOTEL	6025	7313	7409		6035	7325	7421			
184-PLOTEL	6026	7409	7505		6036	7421	7517			
185-PLOTEL	6027	7505	7809		6037	7517	7813			
186-PLOTEL	6028	7809	7873		6038	7813	7877			
187-PLOTEL	6029	7806	7870		6039	7814	7878			
188-PLOTEL	6041	6901	6904		6051	7097	7109			
189-PLOTEL	6042	6904	6907		6052	7109	7121			
190-PLOTEL	6043	6907	6910		6053	7121	7133			
191-PLOTEL	6044	6910	6901		6054	7133	7097			
192-PLOTEL	6045	7001	7013		6055	7193	7205			
193-PLOTEL	6046	7013	7025		6056	7205	7217			
194-PLOTEL	6047	7025	7037		6057	7217	7229			
195-PLOTEL	6048	7037	7001		6058	7229	7193			
196-PLOTEL	6061	7289	7301		6065	7385	7397			
197-PLOTEL	6062	7301	7313		6066	7397	7409			
198-PLOTEL	6063	7313	7325		6067	7409	7421			
199-PLOTEL	6064	7325	7289		6068	7421	7385			
200-PLOTEL	6071	7481	7493		6081	7801	7803			

PHASE 2 (PART 1)  
SRM COUPLING RUN

SORTED BULK DATA FILE

CAHL	1	2	3	4	5	6	7	8	9	10
201- PLOTEL	6072	7493	7505			6082	7803	7805		
202- PLOTEL	6073	7505	7517			6083	7805	7806		
203- PLOTEL	6074	7517	7481			6084	7806	7809		
204- PLOTEL	6091	7865	7867			6085	7809	7811		
205- PLOTEL	6092	7867	7869			6086	7811	7813		
206- PLOTEL	6093	7869	7870			6087	7813	7814		
207- PLOTEL	6094	7870	7873			6088	7814	7801		
208- PLOTEL	6095	7873	7875			6075	6907	8134		
209- PLOTEL	6096	7875	7877			6076	7805	8352		
210- PLOTEL	6097	7877	7878			6077	7809	8355		
211- PLOTEL	6098	7878	7865			6078	7813	8355		
212- PLOTEL	6101	7004	7016			6111	7196	7208		
213- PLOTEL	6102	7016	7028			6112	7208	7220		
214- PLOTEL	6103	7028	7040			6113	7220	7232		
215- PLOTEL	6104	7040	7004			6114	7232	7196		
216- PLOTEL	6105	7100	7112			6115	7292	7304		
217- PLOTEL	6106	7112	7124			6116	7304	7316		
218- PLOTEL	6107	7124	7136			6117	7316	7328		
219- PLOTEL	6108	7136	7100			6118	7328	7292		
220- PLOTEL	6121	7388	7400							
221- PLOTEL	6122	7400	7412							
222- PLOTEL	6123	7412	7424							
223- PLOTEL	6124	7424	7388							
224- PLOTEL	6125	7484	7496							
225- PLOTEL	6126	7496	7508							
226- PLOTEL	6127	7508	7520							
227- PLOTEL	6128	7520	7484							
228- PLOTEL	6131	7001	7004			6141	7013	7016		
229- PLOTEL	6132	7097	7100			6142	7109	7112		
230- PLOTEL	6133	7193	7196			6143	7205	7208		
231- PLOTEL	6134	7289	7292			6144	7301	7304		
232- PLOTEL	6135	7385	7388			6145	7397	7400		
233- PLOTEL	6136	7481	7484			6146	7493	7496		
234- PLOTEL	6151	7025	7028			6161	7037	7040		
235- PLOTEL	6152	7121	7124			6162	7133	7136		
236- PLOTEL	6153	7217	7220			6163	7229	7232		
237- PLOTEL	6154	7313	7316			6164	7325	7328		
238- PLOTEL	6155	7409	7412			6165	7421	7424		
239- PLOTEL	6156	7505	7508			6166	7517	7520		
240- SUPPORT	8134	123	8352	123		8295	123			
INDDATA										

**SOLID ROCKET BOOSTER COMBINED MODEL PHASE II PT. 2**  
**116 DEGREES OF FREEDOM Z704247**

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

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ID PHASE2 SRMP2
TIME      60
APP      CISP
SCL      7.0
DIAG  2,7,8,13,14,19,21,22
ALTER  2.2
FILE    CCC=SAVE/CMC=SAVE
PARAM  //C,N,NCP/V,N,TRUE=-1
PARAM  //C,N,NCP/V,Y,NOK4=-1
PARAM  //C,N,NCP/V,Y,NDBG=-1
PARAM  //C,N,NCP/V,Y,TPCCPY=-1
ALTER  17.17
SAVE    JUMFFLCT,PLTFLG,PFILF
ALTER  25.47
CHKENT  EST,ECPT,GPCT,GEI
ALTER  52.87
INPUTT1 /....//C,N,-2/C,N,9/V,Y,TPNAME$
PURGE   K4AA/NCK4/EAA/NDBG
CCND    LT11,MPCF1
INPUTT1 /CM....//C,N,0/C,N,9 $
LABEL  LT11
CCND    LT12,CMIT
INPUTT1 /CC....//C,N,0/C,N,9 $
LABEL  LT12
CCND    LT13,SINGLE
INPUTT1 /KFS....//C,N,0/C,N,9 $
LABEL  LT13
INPUTT1 /KAA,MAA....//C,N,0/C,N,9 $
CCND    LT14,NCK4
INPUTT1 /K4AA....//C,N,0/C,N,9 $
LABEL  LT14
CCND    LT15,NDBG
INPUTT1 /EAA....//C,N,0/C,N,9 $
LABEL  LT15
CHKENT  CM,CNC,RG,CC,COD,KFS,QPC,USER,KAA,MAA,K4AA,HAA
ALTER  103
CCND    L103,TPCCPY
OUTPUT1 . ....//C,N,-1/C,N,0/V,Y,TPNAME
LABEL  L103
ALTER  128,128E
CCND    L128A,NCP1
PARAM  //C,N,NCP/V,N,TRUE=-1
JUMP    L128E
LABEL  L128A
PARAM  //C,N,NCP/V,N,KDEK2=-1
LABEL  L128E
ALTER  133,133
GKAC    USFTC,GM,GC,KAA,BAA,MAA,K4AA,K2PP,M2PP,H2PP/KDD,BDD,MDD,GND,
        CCC,K2DD,42CC,B2DD/C,N,CMPLEV/C,N,DISP/C,N,DIRECT/C,Y,G=0.0/

```

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 C

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C,N,0.0/C,N,C.0/V,N,NCK2PP/V,N,NOM2PP/V,N,NCH2FP/V,N,MPCF1/
V,N,SINGLE/V,N,OMIT/V,N,NOUE/V,Y,NOK4/V,Y,NCBG/V,N,KDEK2/C,N,-1$
ALTER 135,135
EQUIV E2CC,ECDD/NCCE/M2DD,MDL/NDGPDCT/K2DD,KDD/KDEK2
ALTER 155
PURGE CFFIG,CPGE,RFHIG,CPHIN,CGMN,CPHIM,PHIG,CNSF,CPHIS,CPHIF/JUMFPLOT
PURGE CFOA,CPHIO,CPHIA,PHIN/JUMFPLOT
CCND L155,JUMFPLOT
PURGE CPGE/NOUE
EQUIV CFFIF,CPHIG/NOUE
CCND L155A,NOUE
VEC USET/CPGE/C,N,P/C,N,C/C,N,E
PARTN CFFIF,,CPGE/CPHIG,,/C,N,1/C,N,2/C,N,2 $
EQUIV CFFIG,RFHIG/TRUE
PURGE CPHIN,CGMN,CPHIM,PHIG,CNSF,CPHIS,CPHIF/TRLE
PURGE CFC,CPHIO,CPHIA,PHIN/TRLE
JUMP L155C
LABEL L155A
PURGE CGMN,CPHIN,PHIG/MPCF1
EQUIV CFFIG,CPHIN/MPCF1
CCND L155E,MPCF1
VEC USET/CGMN/C,N,G/C,N,M/C,N,N
PARTN CFFIG,,CGMN/CPHIM,CPHIN,,/C,N,1/C,N,2/C,N,2/C,N,2 $
MERGE CPHIN,CPHIN,,CGMN/PHIG/C,N,1/C,N,2/C,N,2 $
EQUIV FFIG,RFHIG/TRUE
PURGE CNSF,CPHIS,CFFIF/TRUE
PURGE CFC,CPHIG,CPHIA,PHIN/TRLE
JUMP L155C
LABEL L155E
PURGE CNSF,CPHIS,PHIN/SINGLE
EQUIV CPHIN,CFFIF/SINGLE
CCND L155C,SINGLE
VEC USET/CNSF/C,N,N/C,N,S/C,N,F
PARTN CPHIN,,CNSF/CPHIS,CPHIF,,/C,N,1/C,N,2/C,N,2/C,N,2 $
MERGE CPHIS,CPHIF,,CNSF/PHIN/C,N,1/C,N,2/C,N,2 $
EQUIV PHIN,RFHIG/TRUE
PURGE CFC,CPHIG,CPHIA/TRLE
JUMP L155C
LABEL L155C
PURGE CFC,CPHIG,CPHIA,RFHIG/CMIT
CCND L155,CMIT
VEC USET/CFOA/C,N,F/C,N,U/C,N,A
PARTN CPHIF,,CFOA/CPHIO,CPHIA,,/C,N,1/C,N,2/C,N,2/C,N,2 $
MERGE CFFIG,CPHIA,,CFOA/RFHIG/C,N,1/C,N,2/C,N,2 $
LABEL L155C
CHKPNT RFHIG
PARAM //C,N,SUB/V,N,SCALAR/V,N,NSIL/V,N,LUSET
EQUIV SIL,SIP/SCALAR/EGPDT,EGDP/SCALAR
CCND L155E,SCALAR
PLTTRAN EGPCT,SIL/BCDF,SIP/V,N,LUSET/V,N,LUSEP $

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SEPTEMBER

NASTRAN EXECUTIVE CONTROL DECK ECHO

```
SAVE      LU5EF
LABEL     L155E
CHKPNT    EGPDP,SIP
SCR2      CASEXX,CSTM,..EQEXIN,SIL,..BGPDP,..RPHIG,..,..CPHIG,..PPHIG/
          C,N,STATICS $
CFP       CFFIG,..../V,N,CARDNC
SAVE      CARDNC $
FLCT      FLTPAR,GPSETS,ELSETS,CASEXX,BGPDT,EQEXIN,SIF,PPHIG,/PLOTX2/V,N,
          NSIL/V,N,LJSET/V,N,JUMPPLCT/V,N,PLTFLG/V,N,PFILE $
SAVE      FFILE
FFMSG     FLCTX2// $
LABEL     L155
CCNC      L155F,TPCOPY
OUTPUT1   CFFIP,RPHIG,..// $
LABEL     L155F
ALTER     168,169
ENDALTER
CEND
```





PHASE 1 (PART 2 )  
SRM & FCFELLANT

REAL PART OF COMPLEX EIGENVECTORS

	1	2	3	4	5	6	7	8	9	10
CUNFOD	1	7001	7057	1	.0000001					
MAT1	1	10.E66		.3						
CORD2R	656	0	-21.5683	0.0	35.5985	-90.2278	0.0	57.5136	ERSTANK	
ERSTANK	68.25	0.0	48.432							
COFC2C	100	656	74.738	-30.494	6.138	200.0	-30.494	6.138	ECSSRM	
ECSSRM	74.738	0.0	0.0							
CORD2R	101	656	74.738	-30.494	6.138	74.738	-28.5701	15.6436	ECSSRM	
ECSSRM	200.	-30.454	6.138							
GRID	6901	100	5.750	180.000	25.242	100	456			
GRID	6904	100	5.750	90.000	25.242	100	456			
GRID	6907	100	5.750	0.000	25.242	100	456			
GRID	6910	100	5.750	-90.000	25.242	100	456			
GRID	7001	100	5.750	180.000	44.500	100	456			
GRID	7004	100	3.180	180.000	44.500	100	456			
GRID	7013	100	5.750	90.000	44.500	100	456			
GRID	7016	100	3.180	90.000	44.500	100	456			
GRID	7025	100	5.750	0.0	44.500	100	456			
GRID	7028	100	3.180	0.0	44.500	100	456			
GRID	7037	100	5.750	-90.000	44.500	100	456			
GRID	7040	100	3.180	-90.000	44.500	100	456			
GRID	7057	100	5.750	180.000	69.053	100	456			
GRID	7100	100	3.180	180.000	69.053	100	456			
GRID	7109	100	5.750	90.000	69.053	100	456			
GRID	7112	100	3.180	90.000	69.053	100	456			
GRID	7121	100	5.750	0.0	69.053	100	456			
GRID	7124	100	3.180	0.0	69.053	100	456			
GRID	7133	100	5.750	-90.000	69.053	100	456			
GRID	7136	100	3.180	-90.000	69.053	100	456			
GRID	7193	100	5.750	180.000	93.607	100	456			
GRID	7196	100	3.180	180.000	93.607	100	456			
GRID	7205	100	5.750	90.000	93.607	100	456			
GRID	7208	100	3.180	90.000	93.607	100	456			
GRID	7217	100	5.750	0.0	93.607	100	456			
GRID	7220	100	3.180	0.0	93.607	100	456			
GRID	7229	100	5.750	-90.000	93.607	100	456			
GRID	7232	100	3.180	-90.000	93.607	100	456			
GRID	7289	100	5.750	180.000	118.160	100	0			
GRID	7290	100	7.560	180.000	118.160	100	456			
GRID	7291	100	5.370	180.000	118.160	100	456			
GRID	7292	100	3.180	180.000	118.160	100	456			
GRID	7293	100	5.750	150.000	118.160	100	0			
GRID	7294	100	7.560	150.000	118.160	100	456			
GRID	7295	100	5.370	150.000	118.160	100	456			
GRID	7296	100	3.180	150.000	118.160	100	456			
GRID	7297	100	5.750	120.000	118.160	100	0			
GRID	7298	100	7.560	120.000	118.160	100	456			
GRID	7299	100	5.370	120.000	118.160	100	456			
GRID	7300	100	3.180	120.000	118.160	100	456			
GRID	7301	100	5.750	90.000	118.160	100	0			
GRID	7302	100	7.560	90.000	118.160	100	456			

PHASE 1 (PART 2 )  
SRM 6 FRECELLANT

REAL PART OF COMPLEX EIGENVECTORS

INPUT BULK DATA DECK FCHD

1	2	3	4	5	6	7	8	9	10
GRID	7303	100	5.370	90.000	118.160	100	456		
GRID	7304	100	3.180	90.000	118.160	100	456		
GRID	7305	100	5.750	60.000	118.160	100	0		
GRID	7306	100	7.560	60.000	118.160	100	456		
GRID	7307	100	5.370	60.000	118.160	100	456		
GRID	7308	100	3.180	60.000	118.160	100	456		
GRID	7309	100	5.750	30.000	118.160	100	0		
GRID	7310	100	7.560	30.000	118.160	100	456		
GRID	7311	100	5.370	30.000	118.160	100	456		
GRID	7312	100	3.180	30.000	118.160	100	456		
GRID	7313	100	5.750	0.0	118.160	100	0		
GRID	7314	100	7.560	0.0	118.160	100	456		
GRID	7315	100	5.370	0.0	118.160	100	456		
GRID	7316	100	3.180	0.0	118.160	100	456		
GRID	7317	100	5.750	-30.000	118.160	100	0		
GRID	7318	100	7.560	-30.000	118.160	100	456		
GRID	7319	100	5.370	-30.000	118.160	100	456		
GRID	7320	100	3.180	-30.000	118.160	100	456		
GRID	7321	100	5.750	-60.000	118.160	100	0		
GRID	7322	100	7.560	-60.000	118.160	100	456		
GRID	7323	100	5.370	-60.000	118.160	100	456		
GRID	7324	100	3.180	-60.000	118.160	100	456		
GRID	7325	100	5.750	-90.000	118.160	100	0		
GRID	7326	100	7.560	-90.000	118.160	100	456		
GRID	7327	100	5.370	-90.000	118.160	100	456		
GRID	7328	100	3.180	-90.000	118.160	100	456		
GRID	7329	100	5.750	-120.000	118.160	100	0		
GRID	7330	100	7.560	-120.000	118.160	100	456		
GRID	7331	100	5.370	-120.000	118.160	100	456		
GRID	7332	100	3.180	-120.000	118.160	100	456		
GRID	7333	100	5.750	-150.000	118.160	100	0		
GRID	7334	100	7.560	-150.000	118.160	100	456		
GRID	7335	100	5.370	-150.000	118.160	100	456		
GRID	7336	100	3.180	-150.000	118.160	100	456		
GRID	7365	100	5.750	180.000	142.713	100	456		
GRID	7368	100	3.180	180.000	142.713	100	456		
GRID	7397	100	5.750	90.000	142.713	100	456		
GRID	7400	100	3.180	90.000	142.713	100	456		
GRID	7409	100	5.750	0.0	142.713	100	456		
GRID	7412	100	3.180	0.0	142.713	100	456		
GRID	7421	100	5.750	-90.000	142.713	100	456		
GRID	7424	100	3.180	-90.000	142.713	100	456		
GRID	7481	100	5.750	180.000	167.267	100	456		
GRID	7484	100	3.180	180.000	167.267	100	456		
GRID	7483	100	5.750	90.000	167.267	100	456		
GRID	7486	100	3.180	90.000	167.267	100	456		
GRID	7505	100	5.750	0.0	167.267	100	456		
GRID	7508	100	3.180	0.0	167.267	100	456		
GRID	7517	100	5.750	-90.000	167.267	100	456		
GRID	7520	100	3.180	-90.000	167.267	100	456		

PHASE 1 (PART 2 )  
SRM 6 FRECELLANT

REAL PART OF COMPLEX EIGENVECTORS

INPUT BULK DATA CHECK FCHK

	1	2	3	4	5	6	7	8	9	10
GRID	78C1	100	9.75	180.0	196.25	100	456			
GRID	78C3	100	9.43E57	131.383	196.25	100	456			
GRID	78C5	100	9.75	90.0	196.25	100	456			
GRID	78C6	100	9.43E57	71.383	196.25	100	456			
GRID	78C9	100	9.75	0.0	196.25	100	456			
GRID	7811	100	9.43E57	-48.617	196.25	100	456			
GRID	7813	100	9.75	-90.0	196.25	100	456			
GRID	7814	100	9.43E57	-108.617	196.25	100	456			
GRID	7865	100	15.25	180.0	217.94	100	456			
GRID	7867	100	14.75E77	131.383	217.94	100	456			
GRID	7869	100	15.25	90.0	217.94	100	456			
GRID	7870	100	14.75E77	71.383	217.94	100	456			
GRID	7873	100	15.25	0.0	217.94	100	456			
GRID	7875	100	14.75E77	-48.617	217.94	100	456			
GRID	7877	100	15.25	-90.0	217.94	100	456			
GRID	7878	100	14.75E77	-108.617	217.94	100	456			
GRID	8134	696	99.98	-19.4107	3.9071	100	456			
GRID	E3E2	101	196.25	13.87258	9.75	101	456			
GRID	E3E5	101	196.25	13.87258	-9.75	101	456			
PLOTTEL	E0C1	69C1	70C1			6011	6904	7013		
PLOTTEL	E0C2	70C1	70C7			6012	7013	7109		
PLOTTEL	E0C3	70C7	71C3			6013	7109	7205		
PLOTTEL	E0C4	71C3	72C9			6014	7205	7301		
PLOTTEL	E0C5	72C9	73C5			6015	7301	7397		
PLOTTEL	E0C6	73C5	74C1			6016	7397	7493		
PLOTTEL	E007	74C1	75C5			6017	7493	7605		
PLOTTEL	E0C8	75C5	76C5			6018	7605	7865		
PLOTTEL	E021	69C7	70C5			6031	6910	7037		
PLOTTEL	E022	70C5	71C1			6032	7037	7133		
PLOTTEL	E023	71C1	72C7			6033	7133	7229		
PLOTTEL	E024	72C7	73C3			6034	7229	7325		
PLOTTEL	E025	73C3	74C9			6035	7325	7421		
PLOTTEL	E026	74C9	75C5			6036	7421	7517		
PLOTTEL	E027	75C5	76C9			6037	7517	7813		
PLOTTEL	E028	76C9	78C3			6038	7813	7877		
PLOTTEL	E0C9	78C3	78C7			6019	7811	7875		
PLOTTEL	E029	78C6	78C0			6039	7814	7878		
PLOTTEL	E041	69C1	69C4			6051	7097	7109		
PLOTTEL	E042	69C4	69C7			6052	7109	7121		
PLOTTEL	E043	69C7	69C0			6053	7121	7133		
PLOTTEL	E044	69C0	69C1			6054	7133	70C7		
PLOTTEL	E045	70C1	7013			6055	7193	7205		
PLOTTEL	E046	7013	70C5			6056	7205	7217		
PLOTTEL	E047	70C5	7037			6057	7217	7229		
PLOTTEL	E048	7037	70C1			6058	7229	7193		
PLOTTEL	E061	72C9	73C1			6065	7385	7397		
PLOTTEL	E062	73C1	7313			6066	7397	7409		
PLOTTEL	E063	7313	73C5			6067	7409	7421		
PLOTTEL	E064	73C5	72C9			6068	7421	7385		
PLOTTEL	E071	74C1	74C3			6081	7801	7803		

PHASE 1 (PART 2 )  
SRM & FRECELLANT

REAL PART OF COMPLEX EIGENVECTORS

	INPUT BULK DATA DECK FCFD									
	1	2	3	4	5	6	7	8	9	10
PLOTEL	6072	7493	7505			6082	7803	7805		
FLOTEL	6073	7505	7517			6083	7805	7806		
PLOTEL	6074	7517	7481			6084	7806	7809		
PLOTEL	6091	7885	7867			6085	7809	7811		
PLOTEL	6092	7867	7869			6086	7811	7813		
PLOTEL	6093	7869	7870			6087	7813	7814		
PLOTEL	6094	7870	7873			6088	7814	7801		
PLOTEL	6095	7873	7875			6075	6907	8134		
PLOTEL	6096	7875	7877			6076	7805	8352		
PLOTEL	6097	7877	7878			6077	7809	8355		
PLOTEL	6098	7878	7885			6078	7813	8355		
PLOTEL	6101	7004	7016			6111	7196	7208		
PLOTEL	6102	7016	7028			6112	7208	7220		
PLOTEL	6103	7028	7040			6113	7220	7232		
PLOTEL	6104	7040	7004			6114	7232	7196		
PLOTEL	6105	7100	7112			6115	7292	7304		
PLOTEL	6106	7112	7124			6116	7304	7316		
FLOTEL	6107	7124	7136			6117	7316	7328		
PLOTEL	6108	7136	7100			6118	7328	7292		
PLOTEL	6121	7388	7400							
PLOTEL	6122	7400	7412							
PLOTEL	6123	7412	7424							
PLOTEL	6124	7424	7388							
PLOTEL	6125	7484	7456							
PLOTEL	6126	7496	7508							
PLOTEL	6127	7508	7520							
PLOTEL	6128	7520	7484							
PLOTEL	6131	7001	7004			6141	7013	7016		
FLOTEL	6132	7057	7100			6142	7109	7112		
PLOTEL	6133	7193	7196			6143	7205	7208		
PLOTEL	6134	7289	7292			6144	7301	7304		
PLOTEL	6135	7385	7388			6145	7397	7400		
PLOTEL	6136	7481	7484			6146	7493	7496		
PLOTEL	6151	7025	7028			6161	7037	7040		
FLOTEL	6152	7121	7124			6162	7133	7136		
PLOTEL	6153	7217	7220			6163	7229	7232		
PLOTEL	6154	7313	7316			6164	7325	7328		
PLOTEL	6155	7409	7412			6165	7421	7424		
PLOTEL	6156	7505	7508			6166	7517	7520		
OMIT 1	123	7290	7291		7294	7295	7296	7298		7299
OMIT 1	123	7300	7302		7303	7306	7307	7308		7310
OMIT 1	123	7311	7312		7314	7315	7318	7319		7320
OMIT 1	123	7322	7323		7324	7326	7327	7330		7331
OMIT 1	123	7332	7334		7335	7336				
OMIT 1	456	7289	7301		7313	7325				
OMIT 1	123456	7293	7297		7305	7309	7317	7321		7329
OMIT 1	123456	7333								
MPC	6050	6907	1		1.0	8134	1	-1.0		
OMIT 1	1	7004	7016		7028	7040				
OMIT 1	23	7057	7109		7121	7133				

PHASE 1 (PART 2)  
SRM & FCCPELLANT

REAL PART OF COMPLEX EIGENVECTORS

INPUT BULK DATA DECK FCHP

	1	2	3	4	5	6	7	8	9	10
OMIT1	122	7100	7112	7124	7136					
OMIT1	23	7153	7205	7217	7229					
OMIT1	123	7156	7208	7220	7232					
OMIT1	1	7292	7304	7316	7328					
OMIT1	23	7385	7397	7409	7421					
OMIT1	123	7388	7400	7412	7424					
OMIT1	1	7464	7496	7508	7520					
OMIT1	123	7603	7606	7811	7814					
OMIT1	123	7667	7670	7875	7878					
EIGC	1	INV	MAX							
EIGC1	C.C	300.	0.0	2000.	150.	7				EIGC1
PARAM	NOK4	1								
PARAM	TPNAMES	SRMP2								
ENCDATA										

TOTAL COUNT= 214

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

PHASE 1 (PART 2)  
SRM & PFCPELLANT

REAL PART OF COMPLEX EIGENVECTORS

SORTED BULK DATA ETC

CASE	1	2	3	4	5	6	7	8	9	10
1-CORFCD	1	7001	7057	1	.0000001					
2-CORD2C	100	696	74.738	-30.494	6.138	200.0	-30.494	6.138	60SSRM	
3-6CSSRM	74.738	C.C	C.0							
4-CORF2R	101	696	74.738	-30.494	6.138	74.738	-28.570115.6563	60SSRM		
5-6RSSRM	200.	-30.494	6.138							
6-CORF2R	696	0	-81.5683.0		35.5985	-80.2278.0		67.5136	6RSTANK	
7-6RSTANK	68.25	C.C	48.432							
8-EIGC	1	INV	MAX						6EIGC1	
9-6EIGC1	C.C	300.	0.0	2000.	150.	7				
10-GRID	6901	100	5.750	180.000	25.242	100	456			
11-GRID	6904	100	5.750	90.000	25.242	100	456			
12-GRID	6907	100	5.750	0.000	25.242	100	456			
13-GRID	6910	100	5.750	-90.000	25.242	100	456			
14-GRID	7001	100	5.750	180.000	44.500	100	456			
15-GRID	7004	100	3.180	180.000	44.500	100	456			
16-GRID	7013	100	5.750	90.000	44.500	100	456			
17-GRID	7016	100	3.180	90.000	44.500	100	456			
18-GRID	7025	100	5.750	0.0	44.500	100	456			
19-GRID	7028	100	3.180	0.0	44.500	100	456			
20-GRID	7037	100	5.750	-90.000	44.500	100	456			
21-GRID	7040	100	3.180	-90.000	44.500	100	456			
22-GRID	7057	100	5.750	180.000	69.053	100	456			
23-GRID	7100	100	3.180	180.000	69.053	100	456			
24-GRID	7109	100	5.750	90.000	69.053	100	456			
25-GRID	7112	100	3.180	90.000	69.053	100	456			
26-GRID	7121	100	5.750	0.0	69.053	100	456			
27-GRID	7124	100	3.180	0.0	69.053	100	456			
28-GRID	7133	100	5.750	-90.000	69.053	100	456			
29-GRID	7136	100	3.180	-90.000	69.053	100	456			
30-GRID	7153	100	5.750	180.000	93.607	100	456			
31-GRID	7156	100	3.180	180.000	93.607	100	456			
32-GRID	7205	100	5.750	90.000	93.607	100	456			
33-GRID	7208	100	3.180	90.000	93.607	100	456			
34-GRID	7217	100	5.750	0.0	93.607	100	456			
35-GRID	7220	100	3.180	0.0	93.607	100	456			
36-GRID	7229	100	5.750	-90.000	93.607	100	456			
37-GRID	7232	100	3.180	-90.000	93.607	100	456			
38-GRID	7289	100	5.750	180.000	118.160	100	0			
39-GRID	7290	100	7.560	180.000	118.160	100	456			
40-GRID	7291	100	5.370	180.000	118.160	100	456			
41-GRID	7292	100	3.180	180.000	118.160	100	456			
42-GRID	7293	100	5.750	150.000	118.160	100	0			
43-GRID	7294	100	7.560	150.000	118.160	100	456			
44-GRID	7295	100	5.370	150.000	118.160	100	456			
45-GRID	7296	100	3.180	150.000	118.160	100	456			
46-GRID	7297	100	5.750	120.000	118.160	100	0			
47-GRID	7298	100	7.560	120.000	118.160	100	456			
48-GRID	7299	100	5.370	120.000	118.160	100	456			
49-GRID	7300	100	3.180	120.000	118.160	100	456			
50-GRID	7301	100	5.750	90.000	118.160	100	0			

PHASE 1 (PART 2)  
SRM & FOCPELLANT

REAL PART OF COMPLEX EIGENVECTORS

SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
51-GRID	7302	100	7.560	90.000	118.160	100	456			
52-GRID	7303	100	5.370	50.000	118.160	100	456			
53-GRID	7304	100	3.180	50.000	118.160	100	456			
54-GRID	7305	100	5.750	60.000	118.160	100	0			
55-GRID	7306	100	7.560	60.000	118.160	100	456			
56-GRID	7307	100	5.370	60.000	118.160	100	456			
57-GRID	7308	100	3.180	60.000	118.160	100	456			
58-GRID	7309	100	5.750	30.000	118.160	100	0			
59-GRID	7310	100	7.560	30.000	118.160	100	456			
60-GRID	7311	100	5.370	30.000	118.160	100	456			
61-GRID	7312	100	3.180	30.000	118.160	100	456			
62-GRID	7313	100	5.750	0.0	118.160	100	0			
63-GRID	7314	100	7.560	0.0	118.160	100	456			
64-GRID	7315	100	5.370	0.0	118.160	100	456			
65-GRID	7316	100	3.180	0.0	118.160	100	456			
66-GRID	7317	100	5.750	-30.000	118.160	100	0			
67-GRID	7318	100	7.560	-30.000	118.160	100	456			
68-GRID	7319	100	5.370	-30.000	118.160	100	456			
69-GRID	7320	100	3.180	-30.000	118.160	100	456			
70-GRID	7321	100	5.750	-60.000	118.160	100	0			
71-GRID	7322	100	7.560	-60.000	118.160	100	456			
72-GRID	7323	100	5.370	-60.000	118.160	100	456			
73-GRID	7324	100	3.180	-60.000	118.160	100	456			
74-GRID	7325	100	5.750	-90.000	118.160	100	0			
75-GRID	7326	100	7.560	-90.000	118.160	100	456			
76-GRID	7327	100	5.370	-90.000	118.160	100	456			
77-GRID	7328	100	3.180	-90.000	118.160	100	456			
78-GRID	7329	100	5.750	-120.000	118.160	100	0			
79-GRID	7330	100	7.560	-120.000	118.160	100	456			
80-GRID	7331	100	5.370	-120.000	118.160	100	456			
81-GRID	7332	100	3.180	-120.000	118.160	100	456			
82-GRID	7333	100	5.750	-150.000	118.160	100	0			
83-GRID	7334	100	7.560	-150.000	118.160	100	456			
84-GRID	7335	100	5.370	-150.000	118.160	100	456			
85-GRID	7336	100	3.180	-150.000	118.160	100	456			
86-GRID	7337	100	5.750	180.000	142.713	100	456			
87-GRID	7338	100	3.180	180.000	142.713	100	456			
88-GRID	7339	100	5.750	90.000	142.713	100	456			
89-GRID	7400	100	3.180	90.000	142.713	100	456			
90-GRID	7409	100	5.750	0.0	142.713	100	456			
91-GRID	7412	100	3.180	0.0	142.713	100	456			
92-GRID	7421	100	5.750	-90.000	142.713	100	456			
93-GRID	7424	100	3.180	-90.000	142.713	100	456			
94-GRID	7421	100	5.750	180.000	167.267	100	456			
95-GRID	7424	100	3.180	180.000	167.267	100	456			
96-GRID	7493	100	5.750	90.000	167.267	100	456			
97-GRID	7496	100	3.180	90.000	167.267	100	456			
98-GRID	7505	100	5.750	0.0	167.267	100	456			
99-GRID	7508	100	3.180	0.0	167.267	100	456			
100-GRID	7517	100	5.750	-90.000	167.267	100	456			

PHASE 1 (PART 2)  
SRM & FUELLEANT

REAL PART OF COMPLEX EIGENVECTORS

S O R T E D B U L K D A T A E C T O										
C/RC	1	2	3	4	5	6	7	8	9	10
101-GRID	7520	100	3.180	-90.000	167.267	100	456			
102-GRID	7801	100	5.75	180.0	196.25	100	456			
103-GRID	7803	100	5.43E57	131.383	196.25	100	456			
104-GRID	7805	100	5.75	90.0	196.25	100	456			
105-GRID	7806	100	5.43E57	71.383	196.25	100	456			
106-GRID	7809	100	5.75	0.0	196.25	100	456			
107-GRID	7811	100	5.43E57	-48.617	196.25	100	456			
108-GRID	7813	100	5.75	-90.0	196.25	100	456			
109-GRID	7814	100	5.43E57	-108.617	196.25	100	456			
110-GRID	7865	100	15.25	180.0	217.94	100	456			
111-GRID	7867	100	14.75577	131.383	217.94	100	456			
112-GRID	7869	100	15.25	90.0	217.94	100	456			
113-GRID	7870	100	14.75577	71.383	217.94	100	456			
114-GRID	7873	100	15.25	0.0	217.94	100	456			
115-GRID	7875	100	14.75577	-48.617	217.94	100	456			
116-GRID	7877	100	15.25	-90.0	217.94	100	456			
117-GRID	7878	100	14.75577	-108.617	217.94	100	456			
119-GRID	8134	696	59.98	-19.41073	9071	100	456			
119-GRID	8352	101	156.25	13.87258	9.75	101	456			
120-GRID	8355	101	156.25	13.87258	-9.75	101	456			
121-MAT1	1	10.56E		.3						
122-MPC	6050	6907	1	1.0	8134	1	-1.0			
123-OMIT1	1	7004	7016	7028	7040					
124-OMIT1	1	7292	7304	7316	7328					
125-OMIT1	1	7484	7496	7508	7520					
126-OMIT1	23	7097	7109	7121	7133					
127-OMIT1	23	7192	7205	7217	7229					
128-OMIT1	23	7385	7397	7409	7421					
129-OMIT1	123	7100	7112	7124	7136					
130-OMIT1	123	7156	7208	7220	7232					
131-OMIT1	123	7290	7291	7294	7295	7296	7298	7299		
132-OMIT1	123	7300	7302	7303	7306	7307	7308	7310		
133-OMIT1	123	7311	7312	7314	7315	7318	7319	7320		
134-OMIT1	123	7322	7323	7324	7326	7327	7330	7331		
135-OMIT1	123	7332	7334	7335	7336					
136-OMIT1	123	7388	7400	7412	7424					
137-OMIT1	123	7803	7806	7811	7814					
138-OMIT1	123	7867	7870	7875	7878					
139-OMIT1	456	7285	7301	7313	7325					
140-OMIT1	123456	7293	7297	7305	7309	7317	7321	7329		
141-OMIT1	123456	7333								
142-PARAM	NOK4	1								
143-PARAM	1PNAME9	SRMP2								
144-FLOTEL	6001	6901	7001		6011	6904	7013			
145-FLOTEL	6002	7001	7057		6012	7013	7109			
146-FLOTEL	6003	7057	7193		6013	7109	7205			
147-FLOTEL	6004	7153	7229		6014	7205	7301			
148-FLOTEL	6005	7285	7385		6015	7301	7397			
149-FLOTEL	6006	7385	7481		6016	7397	7493			
150-FLOTEL	6007	7481	7801		6017	7493	7805			



PHASE 1 (PART 2)  
SRM & FUELANT

REAL PART OF COMPLEX EIGENVECTORS

SORTED BULK DATA ECHC

CRG	CCUNT	1	2	3	4	5	6	7	8	9	10
151-PLOTEL	6008	7801	7865	6018	7805	7869					
152-PLOTEL	6009	7803	7867	6019	7811	7875					
153-PLOTEL	6021	6907	7025	6031	6910	7037					
154-PLOTEL	6022	7025	7121	6032	7037	7133					
155-PLOTEL	6023	7121	7217	6033	7133	7229					
156-PLOTEL	6024	7217	7313	6034	7229	7325					
157-PLOTEL	6025	7313	7409	6035	7325	7421					
158-PLOTEL	6026	7409	7505	6036	7421	7517					
159-PLOTEL	6027	7505	7601	6037	7517	7613					
160-PLOTEL	6028	7601	7697	6038	7613	7677					
161-PLOTEL	6029	7697	7793	6039	7719	7778					
162-PLOTEL	6041	6901	6904	6051	7097	7109					
163-PLOTEL	6042	6904	6907	6052	7109	7121					
164-PLOTEL	6043	6907	6910	6053	7121	7133					
165-PLOTEL	6044	6910	6913	6054	7133	7097					
166-PLOTEL	6045	7001	7013	6055	7193	7205					
167-PLOTEL	6046	7013	7025	6056	7205	7217					
168-PLOTEL	6047	7025	7037	6057	7217	7229					
169-PLOTEL	6048	7037	7001	6058	7229	7193					
170-PLOTEL	6061	7289	7301	6065	7385	7397					
171-PLOTEL	6062	7301	7313	6066	7397	7409					
172-PLOTEL	6063	7313	7325	6067	7409	7421					
173-PLOTEL	6064	7325	7289	6068	7421	7385					
174-PLOTEL	6071	7481	7493	6081	7801	7803					
175-PLOTEL	6072	7493	7505	6082	7803	7805					
176-PLOTEL	6073	7505	7517	6083	7805	7806					
177-PLOTEL	6074	7517	7481	6084	7806	7809					
178-PLOTEL	6051	7865	7667	6085	7809	7811					
179-PLOTEL	6052	7867	7669	6086	7811	7813					
180-PLOTEL	6053	7869	7670	6087	7813	7814					
181-PLOTEL	6054	7870	7673	6088	7814	7801					
182-PLOTEL	6055	7873	7675	6075	6907	8134					
183-PLOTEL	6056	7875	7677	6076	7805	8352					
184-PLOTEL	6057	7877	7678	6077	7809	8355					
185-PLOTEL	6058	7878	7665	6078	7813	8355					
186-PLOTEL	6101	7004	7016	6111	7196	7208					
187-PLOTEL	6102	7016	7028	6112	7208	7220					
188-PLOTEL	6103	7028	7040	6113	7220	7232					
189-PLOTEL	6104	7040	7004	6114	7232	7196					
190-PLOTEL	6105	7100	7112	6115	7292	7304					
191-PLOTEL	6106	7112	7124	6116	7304	7316					
192-PLOTEL	6107	7124	7136	6117	7316	7328					
193-PLOTEL	6108	7136	7100	6118	7328	7292					
194-PLOTEL	6121	7388	7400								
195-PLOTEL	6122	7400	7412								
196-PLOTEL	6123	7412	7424								
197-PLOTEL	6124	7424	7368								
198-PLOTEL	6125	7484	7496								
199-PLOTEL	6126	7496	7508								
200-PLOTEL	6127	7508	7520								

PHASE 1 (PART 2)  
SRM & REPELLANT

REAL PART OF COMPLEX EIGENVECTORS

CARD		SORTED BULK DATA ETC									
CCUNT	1	2	3	4	5	6	7	8	9	10	
201- PLOTEL	6128	7520	7484								
202- PLOTEL	6131	7001	7004		6141	7013	7016				
203- PLOTEL	6132	7097	7100		6142	7109	7112				
204- PLOTEL	6133	7153	7156		6143	7205	7208				
205- PLOTEL	6134	7289	7292		6144	7301	7304				
206- PLOTEL	6135	7389	7388		6145	7397	7400				
207- PLOTEL	6136	7481	7484		6146	7493	7496				
208- PLOTEL	6151	7029	7028		6161	7037	7040				
209- PLOTEL	6152	7121	7124		6162	7133	7136				
210- PLOTEL	6153	7217	7220		6163	7229	7232				
211- PLOTEL	6154	7313	7316		6164	7325	7328				
212- PLOTEL	6155	7409	7412		6165	7421	7424				
213- PLOTEL	6156	7505	7508		6166	7517	7520				

ENCCATA

PHASE 1 (PART 2)  
SRM & FREQUENT

REAL PART OF COMPLEX EIGENVECTORS

C O M P L E X E I G E N V A L U E S U M M A R Y

ROOT NO.	EXTRACTION ORDER	EIGENVALUE		FREQUENCY (CYCLES)	DAMPING COEFFICIENT
		(REAL)	(IMAG)		
1	2	-4.941204E C0	3.527739E 02	5.614571E 01	2.801717E-C2
2	1	-4.941204E C0	3.528157E 02	5.615236E 01	2.801012E-C2
3	4	-2.426610E C1	8.586082E 02	1.366517E 02	5.652427E-C2
4	3	-2.426610E C1	8.587512E 02	1.366745E 02	5.663848E-C2
5	5	-7.174017E C1	1.057418E 03	1.682933E 02	1.356693E-C1
6	6	-3.236357E C1	1.225925E 03	1.951121E 02	5.279860E-02
7	7	-4.653512E C1	1.409203E 03	2.242816E 02	6.661224E-C2
8	8	-4.708255E C1	1.410094E 03	2.244235E 02	6.673670E-C2
9	9	-4.235466E C0	1.543464E 03	2.456532E 02	5.489180E-C3
10	10	-4.450632E C0	1.692409E 03	2.693552E 02	5.307026E-C3
11	11	-1.174003E C2	2.016089E 03	3.208704E 02	1.164634E-C1
12	12	-1.177475E C2	2.018257E 03	3.212153E 02	1.166824E-C1

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