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Flight Dynamics Analysis and Simulation of Heavy Lift Airships

Volume IV: User's Guide - Appendices

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Mark B. Tischler
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Flight Dynamics Analysis and Simulation of Heavy Lift Airships

Volume IV: User's Guide - Appendices

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Prepared for
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NASA
National Aeronautics and
Space Administration

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FOREWORD

This document is the fourth in a five volume report which describes a comprehensive digital computer simulation of the dynamics of heavy lift airships and generically similar vehicles.

The work was performed by Systems Technology, Inc., Hawthorne, California for the Aeronautical Systems Branch in the Helicopter and Powered Lift Division of the National Aeronautics and Space Administration, Ames Research Center, Moffett Field, California. The simulation development was carried on between September 1979 and January 1982 and is currently installed on the Ames Research Center CDC 7600 computer. The contract technical monitors for NASA were Dr. Mark Ardema, Mr. Alan Faye, and Mr. Peter Talbot. STI's Program Manager was Mr. Irving Ashkenas.

The authors wish to acknowledge the technical contributions of Mr. Robert Heffley, Mr. Thomas Myers, and Mr. Samuel Craig and the further contributions of Mr. Allyn Hall, Ms. Natalie Hokama and Ms. Leslie Hokama in simulation software development. Special thanks are due to Ms. Kay Wade, Ms. Linda Huffman, Mr. Charles Reaber, and STI's production department for the preparation of the five volumes of this report.

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APPENDIX A

INPUT VARIABLES

This table contains all of the input variables to the three programs. The variables are arranged according to the namelist groups in which they appear in the data files. The program name, subroutine name, definition and, where appropriate, a default input value and any restrictions are listed with each variable.

The default input values are user supplied, not generated by the computer. These values remove a specific effect from the calculations, as explained in the table. The phrase "not used" indicates that a variable is not used in the calculations and are for identification purposes only.

The engineering symbol, where it exists, is listed to assist the user in correlating these inputs with the discussion in the Technical Manual (Volume II).

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NHULL			
HULTH	a) HLASIM HLAMOR HLAPAY b) HGEOM	Hull overall length	0.0 No hull length effect for ground contact calculation	ℓ_h	
HULDIA	a) HLASIM HLAMOR HLAPAY b) HGEOM	Hull maximum diameter		d_h	$d_h > 0$
HULVOL	a) HLASIM HLAMOR HLAPAY b) HGEOM	Total displaced volume of external hull envelope	0. No hull buoyancy forces	V	
HULARA	a) HLASIM HLAMOR HLAPAY b) HGEOM	Hull side projected area	Not used		
HULID	a) HLASIM HLAMOR HLAPAY b) HGEOM	Hull configuration identifier	Not used		

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NTAIL			
NUMFIN	a) HLASIM HLAMOR HLAPAY b) HGEOM	Number of fins in tail ensemble	Not used		
RTALOC	a) HLASIM HLAMOR HLAPAY b) HGEOM	Vector locating the tail reference center with respect to the hull center of volume reference axes		$\underline{R}^{ht}_{hcv}$	
TALARA	a) HLASIM HLAMOR HLAPAY b) HGEOM	Tail ensemble reference area	Not used		
TSPAN	a) HLASIM HLAMOR HLAPAY b) HGEOM	Tail ensemble reference span	$b_t = 0$; Eliminate tail contributions which are dependent on roll rate	b_t	
TALID	a) HLASIM HLAMOR HLAPAY b) HGEOM	Tail ensemble configuration identifier	Not used		

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NRATCH			
RATCH1 RATCH2 RATCH3 RATCH4	a) HLASIM HLAMOR HLAPAY b) HGEOM	Four vectors locating the attach point of the LPU on the hull, with respect to the hull center of volume reference axes		$\underline{R}^{hi}_{hcv}$	
		Namelist NLPU			
NUMLPU	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Number of lift prop units (LPUs)	Not used		
LPUID	a) HLASIM HLAMOR HLAPAY b) LPGEOM	LPU configuration identifies	Not used		
		Namelist NRROTR			
RROTR1 RROTR2 RROTR3 RROTR4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Four vectors locating each rotor hub with respect to coordinates in the LPU fuselage reference axes	0., 0., 0. Rotor hub is coincident with fuselage reference center	$\underline{R}^{ir}_{ifc}$	

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NRGEOM					
NRBLD1 NRBLD2 NRBLD3 NRBLD4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Number of rotor blades per rotor disk		b_r	b > 0
RADRT1 RADRT2 RADRT3 RADTR4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Rotor radius		R_r	R > 0
CORDR1 CORDR2 CORDR3 CORDR4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Effective rotor blade chord measured at the three-quarters radius station		c_r	c > 0
Namelist NRPROP					
RPROP1 RPROP2 RPROP3 RPROP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Four vectors locating the propeller hub of each LPU with respect to coordinates in the LPU fuselage reference axes	0., 0., 0. Propeller hub is coincident with fuselage reference center	$\underline{R}^{ip}_{ifc}$	
Namelist NPGEOM					
NPBLD1 NPBLD2 NPBLD3 NPBLD4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Number of propeller blades per propeller disk		b_p	b > 0
RADP1 RADP2 RADP3 RADP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Propeller radius		R_p	R > 0
CORDP1 CORDP2 CORDP3 CORDP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Effective propeller blade chord measured at the three-quarters radius station		c_p	c > 0

Data File GMDTA

VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NPRPRIG			
A1SP1 A1SP2 A1SP3 A1SP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Propeller shaft lateral Euler angle orientation with respect to the LPU c.g. axes; a positive deflection is in a positive sense about the positive x-axis	0. This orientation angle is zero	A_{1s_p}	
B1SP1 B1SP2 B1SP3 B1SP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Propeller shaft longitudinal Euler angle orientation with respect to the LPU c.g axes; a positive deflection is taken in a negative sense about the positive y-LPU c.g. reference axis	0. This orientation angle is zero	B_{1s_p}	
		Namelist NRLTCH			
RLTCH1 RLTCH2 RLTCH3 RLTCH4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Four vectors locating each attach point on the LPU with respect to the LPU fuselage references axes	0., 0., 0. Hull attach point on LPU is coincident with LPU fuselage reference center	$\underline{R}_{ifc}^{ih}$	
		Namelist NGBANG			
GBANG1 GBANG2 GBANG3 GBANG4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Four vectors each containing the LPU Euler angles, with respect to the hull reference axes: ϕ_i, θ_i, ψ_i	0., 0., 0. LPU body axes are aligned parallel to hull body axes	$\underline{\eta}_h^i$	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NMAST			
MASTLC	a) HLASIM HLAMOR HLAPAY b) INMOOR	Vector locating the attach point on the mooring mast with respect to the inertial reference axes in coordinates of the inertial reference axes		$\underline{R}_I^{Ih}$	$\underline{R}_I^{Ih}(3) < 0$
RMORPT	a) HLASIM HLAMOR HLAPAY b) INMOOR	Vector locating the attach point of the mooring mast on the vehicle relative to the hull center of volume in coordinates of the hull c.g. reference axis		$\underline{R}_h^{hm}$	
		Namelist NRATHG			
RATHG1 RATHG2 RATHG3 RATHG4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Vectors locating the gear attach point on the hull structural frame with respect to hull center of volume in coordinates of the hull c.g. reference axis		$\underline{R}_{hcv}^{ht}$	
		Namelist NLANDGL			
LGRLH1 LGRLH2 LGRLH3 LGRLH4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Unstretched (relaxed) landing gear length, these values must all be positive		ℓ_{og}	$\ell_{og} > 0$
		Namelist NGEARK			
GEARK1 GEARK2 GEARK3 GEARK4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Spring constants of the landing gears	0. This landing gear is disabled	K_g	$K_g \geq 0$

Data File CMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NGFRAMK			
GFRMK1 GFRMK2 GFRMK3 GFRMK4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Spring constants for the hull frame which supports the landing gear attach point	0. No structural spring stiffness in this landing gear frame	K_f	$K_f \geq 0$
		Namelist NGEARC			
GEARC1 GEARC2 GEARC3 GEARC4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Damping constants of the landing gear	0. No viscous damping in this landing gear	C_g	$C_g \geq 0$
		Namelist NMUKG			
MUKG1 MUKG2 MUKG3 MUKG4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Rolling friction constants for the landing gear tires; these values should always be positive	0. No kinetic (sliding, rolling) friction in this landing gear	μ_k	$\mu_k \geq 0$
		Namelist NRHULCG			
RHULCG	a) HLASIM HLAMOR HLAPAY b) INMASS	Location of hull center of gravity with respect to hull center of volume reference axes	0., 0., 0. Hull center of gravity is coincident with hull center of volume	$\underline{R}^h_{hcv}$	

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NMASHUL			
MASHUL	a) HLASIM HLAMOR HLAPAY b) INMASS	Mass of the hull component includes envelope, fins, support structures, and internal gases		m_h	$m_h > 0$
IHULXX	a) HLASIM HLAMOR HLAPAY b) INMASS	Hull moment of inertia about the hull c.g. x-axes		I_{xx_h}	$I_{xx_h} > 0$
IHULYY	a) HLASIM HLAMOR HLAPAY b) INMASS	Hull moment of inertia about the hull c.g. y-axes		I_{yy_h}	$I_{yy_h} > 0$
IHULZZ	a) HLASIM HLAMOR HLAPAY b) INMASS	Hull moment of inertia about the hull c.g. z-axes		I_{zz_h}	$I_{zz_h} > 0$
IHULXZ	a) HLASIM HLAMOR HLAPAY b) INMASS	Hull product of inertia with respect to the hull c.g. xz-axes	0. Hull body axes are coincident with hull principal axes	I_{xz_h}	
		Namelist NRCGLPU			
RCGLP1 RCGLP2 RCGLP3 RCGLP4	a) HLASIM HLAMOR HLAPAY b) INMASS	Four vectors locating each LPU c.g. with respect to the LPU fuselage reference axes	0., 0., 0. LPU center of gravity is coincident with fuselage reference center	$\underline{R}^i_{fc}$	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NMASLP1 Namelist NMASLP2 Namelist NMASLP3 Namelist NMASLP4			
MASLP1 MASLP2 MASLP3 MASLP4	a) HLASIM HLAMOR HLAPAY b) INMASS	Masses of the four LPUs		m_i	$m_i > 0$
ILP1XX ILP2XX ILP3XX ILP4XX	a) HLASIM HLAMOR HLAPAY b) INMASS	LPU moment of inertia about the LPU c.g. x-axes		I_{xx_i}	$I_{xx_i} > 0$
ILP1YY ILP2YY ILP3YY ILP4YY	a) HLASIM HLAMOR HLAPAY b) INMASS	LPU moment of inertia about the LPU c.g. y-axes		I_{yy_i}	$I_{yy_i} > 0$
ILP1ZZ ILP2ZZ ILP3ZZ ILP4ZZ	a) HLASIM HLAMOR HLAPAY b) INMASS	LPU moment of inertia about the LPU c.g. z-axes		I_{zz_i}	$I_{zz_i} > 0$
ILP1XZ ILP2XZ ILP3XZ ILP4XZ	a) HLASIM HLAMOR HLAPAY b) INMASS	LPU products of inertia about the LPU c.g. xz-axes	0. LPU body axes are coincident with LPU principal axes	I_{xz_i}	$I_{xz_i} > 0$

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NLOCKNR			
LOCNR1 LOCNR2 LOCNR3 LOCNR4	a) HLASIM HLAMOR HLAPAY b) INMASS	Rotor blade lock number		γ	$\gamma > 0$
		Namelist NJETHST			
JETHS1 JETHS2 JETHS3 JETHS4	a) HLASIM HLAMOR HLAPAY b) INEXST	Jet exhaust magnitudes	0. No jet exhaust thrust	T_e	
REXLC1 REXLC2 REXLC3 REXLC4	a) HLASIM HLAMOR HLAPAY b) INEXST	Four vectors locating the position of the jet exhaust nozzles with respect to the fuselage reference axis	0., 0., 0. Jet exhaust nozzle is coincident with fuselage reference center	$\underline{R}^{ie}_{ifc}$	
		Namelist NJETHSA			
A1SE1 A1SE2 A1SE3 A1SE4	a) HLASIM HLAMOR HLAPAY b) INEXST	Jet exhaust lateral Euler angle orientation with respect to c.g. axis; a positive jet exhaust angle is in a positive sense about the positive x-axis	0. This orientation angle is zero	A_{1s_e}	
B1SE1 B1SE2 B1SE3 B1SE4	a) HLASIM HLAMOR HLAPAY b) INEXST	Jet exhaust longitudinal Euler angle orientation with respect to the LPU c.g. axis; a positive jet exhaust longitudinal Euler angle is taken in a negative sense about the positive y-LPU c.g. reference axis	0. This orientation angle is zero	B_{1s_e}	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
	Namelist NRACLP				
RACLP1 RACLP2 RACLP3 RACLP4	a) HLASIM HLAMOR HLAPAY b) INLARO	Four vectors locating the LPU aerodynamic center of each LPU, with respect to the LPU fuselage reference axes	0., 0, 0. Fuselage aerodynamic center is coincident with fuselage reference center	$\underline{R}^{if}_{ifc}$	
Namelist NAROCN					
LCRS1 LCSR2 LCSR3 LCSR4	a) HLASIM HLAMOR HLAPAY b) INLARO	Rotor blade lift curve slope	0. Eliminates rotor thrust for this LPU	a_{o_r}	$a_{o_r} \geq 0$
DLTR1A DLTR2A DLTR3A DLTR4A	a) HLASIM HLAMOR HLAPAY b) INLARO	Constant term in quadratic equation for rotor profile drag coefficient	0. Eliminates term in rotor drag quadratic equation	δ_{a_r}	
DLTR1B DLTR2B DLTR3B DLTR4B	a) HLASIM HLAMOR HLAPAY b) INLARO	Linear term in quadratic function for rotor blade profile drag coefficient	0. Eliminates term in rotor drag quadratic equation	δ_{b_r}	
DLTR1C DLTR2C DLTR3C DLTR4C	a) HLASIM HLAMOR HLAPAY b) INLARO	Quadratic term in quadratic function for rotor blade drag coefficient	0. Eliminates term in rotor drag quadratic equation	δ_{c_r}	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NPAROCN			
LCSP1 LCSP2 LCSP3 LCSP4	a) HLASIM HLAMOR HLAPAY b) INLARO	Propeller blade lift curve slope	0. Eliminates propeller thrust for this LPU	a_{o_p}	$a_{o_p} \geq 0$
DLTP1A DLTP2A DLTP3A DLTP4A	a) HLASIM HLAMOR HLAPAY b) INLARO	Constant term in quadratic function for propeller blade profile drag coefficient	0. Eliminates term in propeller drag quadratic equation	δ_{a_p}	
DLTP1B DLTP2B DLTP3B DLTP4B	a) HLASIM HLAMOR HLAPAY b) INLARO	Linear term in quadratic function for propeller blade profile drag coefficient	0. Eliminates term in propeller drag quadratic equation	δ_{b_p}	
DLTP1C DLTP2C DLTP3C DLTP4C	a) HLASIM HLAMOR HLAPAY b) INLARO	Quadratic term in quadratic function for propeller blade profile drag coefficient	0. Eliminates term in propeller drag quadratic equation	δ_{c_p}	
		Namelist NFAROCN			
XUUAF1 XUUAF2 XUUAF3 XUUAF4	a) HLASIM HLAMOR HLAPAY b) INLARO	LPU fuselage X-force derivative with respect to U*ABS(U)	0. Eliminates this fuselage aero-dynamic term	$X_{u\|u\|f}$	
YVVAF1 YVVAF2 YVVAF3 YVVAF4	a) HLASIM HLAMOR HLAPAY b) INLARO	LPU fuselage Y-force derivative with respect to V*ABS(V)	0. Eliminates this fuselage aero-dynamic term	$Y_{v\|v\|f}$	
ZWWAF1 ZWWAF2 ZWWAF3 ZWWAF4	a) HLASIM HLAMOR HLAPAY b) INLARO	LPU fuselage Z-force derivative with respect to W*ABS(W)	0. Eliminatesthis fuselage aero-dynamic term	$Z_{w\|w\|f}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NHDTDRV			
XUDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull x-force derivative with respect to longitudinal acceleration	0. Eliminates this hull aerodynamic term	$X_{\dot{u}_h}$	
YVDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to lateral acceleration	0. Eliminates this hull aerodynamic term	$Y_{\dot{v}_h}$	
ZWDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to normal acceleration	0. Eliminates this hull aerodynamic term	$Z_{\dot{w}_h}$	
LPDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to rolling acceleration	0. Eliminates this hull aerodynamic term	$L_{\dot{p}_h}$	
MQDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to pitching acceleration	0. Eliminates this hull aerodynamic term	$M_{\dot{q}_h}$	
NRDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing moment derivative with respect to yaw acceleration	0. Eliminates this hull aerodynamic term	$N_{\dot{r}_h}$	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTDTDRV					
YVDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to lateral acceleration	0. Eliminates this tail aerodynamic term	$Y_{\dot{v}_t}$	
ZWDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail z-force derivative with respect to normal acceleration	0. Eliminates this tail aerodynamic term	$Z_{\dot{w}_t}$	
LVDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to lateral acceleration	0. Eliminates this tail aerodynamic term	$L_{\dot{v}_t}$	
LPDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to rolling acceleration	0. Eliminates this tail aerodyn - mic term	$L_{\dot{p}_t}$	
MQDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail pitching moment derivative with respect to pitching acceleration	0. Eliminates this tail aerodynamic term	$M_{\dot{q}_t}$	
NRDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail yawing moment derivative with respect to yawing acceleration	0. Eliminates this tail aerodynamic term	$N_{\dot{r}_t}$	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHDRVS					
XUUABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull x-force derivative with respect to U*ABS(U)	0. Eliminates this hull aerodynamic term	$X_{u\|u\|h}$	
XQWH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull x-force derivative with respect to Q*W	0. Eliminates this hull aerodynamic term	X_{qw_h}	
XRVH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull x-force derivative with respect to R*V	0. Eliminates this hull aerodynamic term	X_{rv_h}	
YVVABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to V*ABS(V)	0. Eliminates this hull aerodynamic term	$Y_{v\|v\|h}$	
YRRABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to R*ABS(R)	0. Eliminates this hull aerodynamic term	$Y_{r\|r\|h}$	
YPWH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to P*W	0. Eliminates this hull aerodynamic term	Y_{pw_h}	
YRUH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to R*U	0. Eliminates this hull aerodynamic term	Y_{ru_h}	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NHDRVS (Continued)			
NRVABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to R*ABS(V)	0. Eliminates this hull aerodynamic term	$Y_{r\|v\|h}$	
ZWWABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to W*ABS(W)	0. Eliminates this hull aerodynamic term	$Z_{w\|w\|h}$	
ZQQABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to Q*ABS(Q)	0. Eliminates this hull aerodynamic term	$Z_{q\|q\|h}$	
ZPVH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to P*V	0. Eliminates this hull aerodynamic term	Z_{pv_h}	
ZQUH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to Q*U	0. Eliminates this hull aerodynamic term	Z_{qu_h}	
ZQWABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to Q*ABS(W)	0. Eliminates this hull aerodynamic term	$Z_{q\|w\|h}$	
LPPABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to P*ABS(P)	0. Eliminates this hull aerodynamic term	$L_{p\|p\|h}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NHDRVS (Continued)			
LPUABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to P*ABS(U)	0. Eliminates this hull aerodynamic term	$L_{p\|u\|h}$	
LVWH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to V*W	0. Eliminates this hull aerodynamic term	L_{vw_h}	
LQBRH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to QB*R	0. Eliminates this hull aerodynamic term	$L_{\bar{q}r_h}$	
LRBQH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to RB*Q	0. Eliminates this hull aerodynamic term	$L_{\bar{r}q_h}$	
MQQABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to Q*ABS(Q)	0. Eliminates this hull aerodynamic term	$M_{q\|q\|h}$	
MUWH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to U*W	0. Eliminates this hull aerodynamic term	M_{uw_h}	
MRBPH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to RB*P	0. Eliminates this hull aerodynamic term	$L_{\bar{r}p_h}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHDRVS (Concluded)					
MPBRH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to PB*R	0. Eliminates this hull aerodynamic term	$M_{\bar{p}r_h}$	
MQWABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to Q*ABS(W)	0. Eliminates this hull aerodynamic term	$M_{q\|w\|_h}$	
NRRABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing derivative with respect to R*ABS(R)	0. Eliminates this hull aerodynamic term	$N_{r\|r\|_h}$	
NUVH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing moment derivative with respect to U*V	0. Eliminates this hull aerodynamic term	N_{uv_h}	
NPBQH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing derivative with respect to PB*Q	0. Eliminates this hull aerodynamic term	$N_{\bar{p}q_h}$	
NQBPH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing derivative with respect to QB*P	0. Eliminates this hull aerodynamic term	$N_{\bar{q}p_h}$	
NRVABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing moment derivative with respect to R*ABS(R)	0. Eliminates this hull aerodynamic term	$N_{r\|v\|_h}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTDRVS					
XUUABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail x-force derivative with respect to U*ABS(U)	0. Eliminates this tail aerodynamic term	$X_{u\|u\|_t}$	
YVVABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to V*ABS(V)	0. Eliminates this tail aerodynamic term	$Y_{v\|v\|_t}$	
YPPABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to P*ABS(P)	0. Eliminates this tail aerodynamic term	$Y_{p\|p\|_t}$	
YAPVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to ALPHA-P * (VPT**2.))	0. Eliminates this tail aerodynamic term	$Y_{\alpha_p V_t^2}$	
YBVSQT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to (BETA * (VXYT**2.))	0. Eliminates this tail aerodynamic term	$Y_{\beta V_t^2}$	
YBSVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to (BETA*2. (VXYT**2.))	0. Eliminates this tail aerodynamic term	$Y_{\beta^2 V_t^2}$	
YAPSVS	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to ALPHA-P*ABS(ALPHA-P) * (VPT**2)	0. Eliminates this tail aerodynamic term	$Y_{\alpha_p^2 V_t^2}$	
ZWWABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail z-force derivative with respect to W*ABS(W)	0. Eliminates this tail aerodynamic term	$Z_{w\|w\|_t}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NTDRVS (Concluded)			
ZAVSQT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to ALPHA * (VXZT**2))	0. Eliminates this tail aerodynamic term	$Z_{\alpha V_t^2}$	
ZASVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail z-force derivative with respect to (ALPHA**2 (VXZT**2))	0. Eliminates this tail aerodynamic term	$Z_{\alpha^2 V_t^2}$	
LVVABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail roll moment derivative with respect to V*ABS(V)	0. Eliminates this tail aerodynamic trm	$L_{v\|v\|_t}$	
LPPABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to P*ABS(P)	0. Eliminates this tail aerodynamic term	$L_{p\|p\|_t}$	
LAPVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to ALPHA-P * (VPT**2.))	0. Eliminates this tail aerodynamic term	$L_{\alpha_p V_t^2}$	
LBVSQT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to (BETA*(VXYT**2.))	0. Eliminates this tail aerodynamic term	$L_{\beta V_t^2}$	
LBAVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to BET*ALPHA*(VXY**1)	0. Eliminates this tail aerodynamic term	$L_{\beta\alpha V_t^2}$	
LAPSVS	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to ALPHA-P * ABS(ALPHA-P) * (VPT**2)	0. Eliminates this tail aerodynamic term	$L_{\alpha_p^2 V_t^2}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
			Namelist NTPARAH		
LAMTXQ	a) HLASIM HLAMOR HLAPAY b) INHARO	x-Tail arm scale factor for transferring pitching moments	1. Tail aerodynamic moment arm equals tail geometric moment arm for this axis	λ_{xqt}	
LAMTXR	a) HLASIM HLAMOR HLAPAY b) INHARO	x-tail arm scale factor for transferring yawing moment	1. Tail aerodynamic moment arm equals tail geometric moment arm for this axis	λ_{xr_t}	
LAMTZQ	a) HLASIM HLAMOR HLAPAY b) INHARO	z-tail arm scaling factor for transferring pitching moments	1. Tail aerodynamic moment arm equals tail geometric moment arm for this axis	λ_{zq_t}	
AL1T	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail stall angle of attack - 1 (start of stall transition regime)	0. -- always transition or post-stall regime 1.56 - always linear regime	α_1	$0 \leq \alpha_1 < \alpha_2$
AL2T	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail stall angle of attack - 2 (end of tail transition regime)	0.001 - always post-stall regime 1.57 - always linear or transition regime	α_2	$1.571 \geq \alpha_2 > \alpha_2$
BETA1T	a) HLASIM HLAMOR HLAPAY b) INHARO	Lateral tail stall angle of slideslip - 1 (start of sideslip stall transition regime)	0. - always transition or post-stall regime 1.56 - always linear regime	β_1	$0 \leq \beta_1 < \beta_2$
BETA2T	a) HLASIM HLAMOR HLAPAY b) INHARO	Stall angle of sideslip - 2 (end of sideslip stall transition regime)	0.001 - Always transition or post-stall regime 1.57 - always linear regime	β_2	$1.571 \geq \beta_2 > \beta_1$

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NTPARAH (Concluded)			
ALP1T	a) HLASIM HLAMOR HLAPAY b) INHARO	The rolling stall angle of attack - 1 (start of stall transition regime)	0. - always transition or post-stall regime 1.56 - always linear regime	α_{p1}	$0 \leq \alpha_{p1} < \alpha_{p2}$
ALP2T	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling stall angle of attack - 2 (end of stall regime)	0.001 - always post-stall regime 1.57 - always linear or transition regime	α_{p2}	$1.571 \geq \alpha_{p2} > \alpha_{p1}$
		Namelist NTAUTS			
TAUA	a) HLASIM HLAMOR HLAPAY b) INHARO	Aileron surface deflection effectiveness constants	0. - this tail control is disabled 1 - 100 percent movable tail surface ("flying tail")	τ_a	
TAUE	a) HLASIM HLAMOR HLAPAY b) INHARO	Elevator surface deflection effectiveness constants	0. - this tail control is disabled 1 - 100 percent tail surface ("flying tail")	τ_e	
TAUR	a) HLASIM HLAMOR HLAPAY b) INHARO	Rudder surface deflection effectiveness constants	0. - this tail control is disabled 1 - 100 percent movable tail surface ("flying tail")	τ_r	

Data File TRMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NINSTAT			
VHUL	a) HLASIM HLAPAY b) INSTAT	Velocity of the hull c.g. reference axis in coordinates of the hull c.g. reference axis	0., 0., 0. Hover flight condition	$\underline{V}_h$	
HULPOS	a) HLASIM HLAPAY b) INSTAT	Hull c.g. reference axes inertial position in inertial coordinates	Large negative third component Eliminates all ground effects (e.g., 0., 0, -5000.)	$\underline{R}_I^h$	$\underline{R}_I^h(3) < 0$
HULELR	a) HLASIM HLAPAY b) INSTAT	Euler angle rates of the hull c.g. reference axes with respect to an inertial frame.	0., 0., 0. Rectilinear flight	$\dot{\underline{\eta}}_I^h$	
HULEUL	a) HLASIM HLAPAY b) INSTAT	Euler angles of the hull c.g. reference axes with respect to an inertial frame: PHI, THETA, PSI	0., 0., 0. Level flight	$\underline{\eta}_I^b$	$\eta_I^b(2) \neq \pm \pi/2$

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
			Namelist NATMOS		
AIRDEN	a) HLASIM HLAMOR HLAPAY b) INATMOS	Reference atmospheric density	0. Eliminates all rotor, propeller, and static buoyancy forces and moments	ρ	
DENRAT	a) HLASIM HLAMOR HLAPAY b) INATMOS	Atmospheric density ratio	0. Eliminates all hull (non-buoyancy), tail, LPU-fuselage, payload aerodynamic forces and moments	σ	
GRAV	a) HLASIM HLAMOR HLAPAY b) INATMOS	Earth's gravitational acceleration magnitude		g	$g \neq 0$
VWIND	a) HLASIM HLAMOR HLAPAY b) INATMOS	Vector of steady wind components in inertial frame coordinates	0., 0., 0 Calm atmosphere	$\underline{V}_I^w$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NSTABDV					
DERVFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Logical: true equals calculate stability derivatives; false equals do not calculate stability derivatives	F No stability derivative calculations		T or F
AMATFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	System A-matrix stability derivative calculation for flag; true equals calculate system matrix	F No A, A_{aux} stability derivative matrix calculations		T or F
BMATFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Individual (not linked) control stability derivative calculation flag; true equals calculate individual control derivative matrices	F No B, B_{aux} stability derivative matrix calculations		T or F
BPMTFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Linked control stability derivative calculation flag, true equals calculate linked stability matrices	F No B', B'_{aux} stability derivative matrix calculations		T or F
CMATFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Gust input stability derivative calculation flag; true equals calculate gust derivative matrices	F No C, C_{aux} stability derivative matrix calculations		T or F
CFMTFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Constraint force stability derivative matrix flag; true equals calculate linearized constraint force equations	F No constraint force (auxiliary) force matrix output		T or F

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NRTRMSD			
OMEGR1 OMEGR2 OMEGR3 OMEGR4	a) HLASIM HLAPAY b) INPROP	Rotor spin rate	None	Ω_r	$\Omega_r \neq 0$
		Namelist NPTRMSP			
OMEGP1 OMEGP2 OMEGP3 OMEGP4	a) HLASIM HLAPAY b) INPROP	Propeller spin rate	None	Ω_p	$\Omega_p \neq 0$
		Namelist NMECLIM			
THERMX	a) HLASIM HLAPAY b) INMCLC	Maximum rotor collective pitch angle	Large value (e.g., 1.5) This allows full control usage	$(\theta_{o_r})_{max}$	$(\theta_{o_r})_{max} > 0$
A1SRMX	a) HLASIM HLAPAY b) INMCLC	Maximum rotor lateral control axes (swash plate) deflection	Large value (e.g., 1.5) This allows full control usage	$(A_{1s_r})_{max}$	$(A_{1s_r})_{max} > 0$

Data File PLMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NMECLIM (Concluded)					
B1SRMX	a) HLASIM HLAPAY b) INMCLC	Maximum rotor longitudinal control axes (swash plate) deflection	Large value (e.g., 1.5) This allows full control usage	$(B_{1s_r})_{max}$	$(B_{1s_r})_{max} > 0$
THEPMX	a) HLASIM HLAPAY b) INMCLC	Maximum propeller collective pitch angle	Large value (e.g., 1.5) This allows full control usage	$(\theta_{o_p})_{max}$	$(\theta_{o_p})_{max} > 0$
DLALMX	a) HLASIM HLAPAY b) INMCLC	Maximum aileron deflection angle	Large value (e.g., 1.5) This allows full control usage	$(\delta_a)_{max}$	$(\delta_a)_{max} > 0$
DLELMX	a) HLASIM HLAPAY b) INMCLC	Maximum elevator deflection angle	Large value (e.g., 1.5) This allows full control usage	$(\delta_e)_{max}$	$(\delta_e)_{max} > 0$
DLRDMX	a) HLASIM HLAPAY b) INMCLC	Maximum rudder deflection angle	Large value (e.g., 1.5) This allows full control usage	$(\delta_r)_{max}$	$(\delta_r)_{max} > 0$

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NSHDRCN			
BWK1R1 BWK1R2 BWK1R3 BWK1R4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Beta-wake angle for start of shadow region for rotors		$\beta 1^r$	$0 \leq \beta 1^r < \beta 2^r$
BWK2R1 BWK2R2 BWK2R3 BWK2R4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Beta-wake angle for end of shadow region for rotors		$\beta 2^r$	$6.283 \geq \beta 2^r > \beta 1^r$
MXBDR1 MXBDR2 MXBDR3 MXBDR4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Maximum beta-wake defect for rotors	1. No β-wake velocity defect	$M_{max}(\beta^r)$	
LWK1R1 LWK1R2 LWK1R3 LWK1R4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Lambda-wake angle for start of shadow region for rotors		$\lambda 1^r$	$0 \leq \lambda 1^r < \lambda 2^r$
LWK2R1 LWK2R2 LWK2R3 LWK2R4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Lambda-wake angle for end of shadow region for rotors		$\lambda 2^r$	$6.283 \geq \lambda 2^r > \lambda 1^r$
MXLDR1 MXLDR2 MXLDR3 MXLDR4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Maximum lambda-wake defect for rotors	1. No λ-wake velocity defect	$M_{max}(\lambda^r)$	
		Namelist NKHR			
KHRA1 KHRA2 KHRA3 KHRA4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Hull on rotor interference constants - A	0. No hull wake turbulence interference on rotor	KHRA	
KHRB1 KHRB2 KHRB3 KHRB4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Hull on rotor interference constants - B	0. No hull wake turbulence interference on rotor	KHRB	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NKGR			
KGR1 KGR2 KGR3 KGR4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Ground on rotor interference constants	Large negative value (e.g., -99.0) No ground effects on rotor	KGR	KGR $\neq$ 0
		Namelist NSHDPCN			
BWK1P1 BWK1P2 BWK1P3 BWK1P4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Beta-wake angle for start of shadow region for propellers		$\beta 1^P$	$0 \leq \beta 1^P < \beta 2^P$
BWK2P1 BWK2P2 BWK2P3 BWK2P4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Beta-wake angle for end of shadow region for propellers		$\beta 2^P$	$6.283 \geq \beta 2^P > \beta 1^P$
MXBDP1 MXBDP2 MXBDP3 MXBDP4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Maximum beta-wake defect for propellers	1. No β-wake velocity defect on propeller	$M_{max}(\beta^P)$	
LWK1P1 LWK1P2 LWK1P3 LWK1P4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Lambda-wake angle for start of shadow region for propellers		$\lambda 1^P$	$0 \leq \lambda 1^P < \lambda 2^P$
LWK2P1 LWK2P2 LWK2P3 LWK2P4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Lambda-wake angle for end of shadow region for propellers		$\lambda 2^P$	$6.283 \geq \lambda 2^P > \lambda 1^P$
MXLDP1 MXLDP2 MXLDP3 MXLDP4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Maximum lambda-wake defect for propellers	1. No λ-wake velocity defect on propeller	$M_{max}(\lambda^P)$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
			Namelist NKHP		
KHPA1 KHPA2 KHPA3 KHPA4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Hull on propeller interference constants - A	0. No hull wake turbulence interference on propeller	KHPA	
KHPB1 KHPB2 KHPB3 KHPB4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Hull on propeller interference constants - B	0. No hull wake turbulence interference on propeller	KHPB	
			Namelist KNRP		
KRP1 KRP2 KRP3 KRP4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Rotor on propeller interference constants	0. No rotor on propeller velocity interference	KRP	
			Namelist KNGP		
KGP1 KGP2 KGP3 KGP4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Ground on propeller interference constants	Large negative value (e.g., -99.0) No ground effects on propeller	KGP	KGP $\neq$ 0

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NSHDFCN			
BWK1F1 BWK1F2 BWK1F3 BWK1F4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Beta-wake angle for start of shadow region for fuselages		$\beta 1^f$	$0 \leq \beta 1^f < \beta 2^f$
BWK2F1 BWK2F2 BWK2F3 BWK2F4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Beta-wake angle for end of shadow region for fuselages		$\beta 2^f$	$6.283 \geq \beta 2^f > \beta 1^f$
MXBDF1 MXBDF2 MXBDF3 MXBDF4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Maximum beta-wake defect for fuselages	1. No β-wake velocity defect on fuselage	$M_{max}(\beta^f)$	
LWK1F1 LWK1F2 LWK1F3 LWK1F4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Lambda-wake angle for start of shadow region for fuselages		$\lambda 1^f$	$0 \leq \lambda 1^f < \lambda 2^f$
LWK2F1 LWK2F2 LWK2F3 LWK2F4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Lambda-wake angle for end of shadow region for fuselages		$\lambda 2^f$	$6.283 \geq \sim 2^f > \lambda 1^f$
MXLDF1 MXLDF2 MXLDF3 MXLDF4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Maximum lambda-wake defect for fuselages	1. No λ-wake velocity defect on fuselage	$M_{max}(\lambda^f)$	
		Namelist NKRF			
KRF1 KRF2 KRF3 KRF4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Rotor on fuselage interference constants	0. No rotor on fuselage velocity interference	KRF	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NKPF					
KPF1 KPF2 KPF3 KPF4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Propeller on fuselage interference constants	0. No propeller on fuselage velocity interference	KPF	
Namelist NKGHCN					
KGHA	a) HLASIM HLAMOR HLAPAY b) INHIFC	Ground on hull interference constant - A	Large negative value (e.g., -99.0) No ground on hull velocity interference	KGHA	KGHA ≠ 0
KGHB	a) HLASIM HLAMOR HLAPAY b) INHIFC	Ground on gull interference constant - B	Large negative value (e.g., -99.0) No ground on hull crossflow interference	KGHB	KGHB ≠0
Namelist NKRH					
KRHA1 KRHA2 KRHA3 KRHA4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - A	0. Eliminates linear term in rotor on hull crossflow interference equation	KRHA	
KRHB1 KRHB2 KRHB3 KRHB4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - B	0. Eliminates quadratic term in rotor on hull crossflow interference equation	KRHB	
KRHC1 KRHC2 KRHC3 KRHC4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - C	0. Eliminates this rotor on hull velocity interference term	KRHC	
KRHD1 KRHD2 KRHD3 KRHD4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - D	0. Eliminates this rotor on hull velocity interference term	KRHD	
KRHE1 KRHE2 KRHE3 KRHE4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - E	0. Eliminates this rotor on hull velocity interference term	KRHE	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NKPH					
KPHA1 KPHA2 KPHA3 KPHA4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - A	0. Eliminates linear term in propeller on hull crossflow interference equation	KPHA	
KPHB1 KPHB2 KPHB3 KPHB4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - B	0. Eliminates quadratic term in propeller on hull crossflow interference equation	KPHB	
KPHC1 KPHC2 KPHC3 KPHC4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - C	0. Eliminates this propeller on hull velocity interference term	KPHC	
KPHD1 KPHD2 KPHD3 KPHD4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - D	0. Eliminates this propeller on hull velocity interference term	KPHD	
KPHE1 KPHE2 KPHE3 KPHE4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - E	0. Eliminates this propeller on hull velocity interference term	KPHE	
Namelist NKRT					
KRTA1 KRTA2 KRTA3 KRTA4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Rotor on tail interference constant - A	0. Eliminates this rotor on tail velocity interference term	KRTA	
KRTB1 KRTB2 KRTB3 KRTB4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Rotor on tail interference constant - B	0. Eliminates this rotor on tail velocity interference constant	KRTB	
KRTC1 KRTC2 KRTC3 KRTC4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Rotor on tail interference constant - C	0. Eliminates this rotor on tail velocity interference term	KRTC	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NKPT			
KPTA1 KPTA2 KPTA3 KPTA4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Propeller on tail interference constant - A	0. Eliminates this propeller on tail velocity interference term	KPTA	
KPTB1 KPTB2 KPTB3 KPTB4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Propeller on tail interference constant - B	0. Eliminates this propeller on tail velocity interference term	KPTB	
KPTC1 KPTC2 KPTC3 KPTC4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Propeller on tail interference constant - C	0. Eliminates this propeller on tail velocity interference term	KPTC	
		Namelist NKGT			
KGTA	a) HLASIM HLAMOR HLAPAY b) INTIFC	Ground on tail interference constant - A	Large negative value (e.g., -99.0) Eliminates this ground on tail interference effect	KGTA	
KGTB	a) HLASIM HLAMOR HLAPAY b) INTIFC	Ground on tail interference constant - B	Large positive value (e.g., 99.0) Eliminates this ground on tail interference effect	KGTB	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NFCSLIM					
UILM	a) HLASIM HLAPAY b) INFCSC	X-speed circuit integration limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	UILM	UILM $\geq$ 0
ULLM	a) HLASIM HLAPAY b) INFCSC	X-speed circuit loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0.0 - Eliminates circuit operation	ULLM	ULLM $\geq$ 0
VILM	a) HLASIM HLAPAY b) INFCSC	Y-speed integration limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	VILM	VILM $\geq$ 0
VLLM	a) HLASIM HLAPAY b) INFCSC	Y-speed loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0.0 - eliminates circuit operation	VLLM	VLLM $\geq$ 0
HDTILM	a) HLASIM HLAPAY b) INFCSC	Vertical velocity circuit integrator limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	HDTILM	HDTILM $\geq$ 0
HDTLLM	a) HLASIM HLAPAY b) INFCSC	Vertical veloctiy circuit loop limit	Large value (e.g., 1.5) allows full circuit usage without cutoff (limiting) 0.0 - Eliminates circuit operation	HDTLLM	HDTLLM $\geq$ 0

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NFCSLIM (Concluded)					
PHIILM	a) HLASIM HLAPAY b) INFCSC	Roll angle circuit integration limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	PHIILM	PHIILM $\geq$ 0
PHILLM	a) HLASIM HLAPAY b) INFCSC	Roll angle circuit loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0.0 - Eliminates circuit operation	PHILLM	PHILLM $\geq$ 0
THEILM	a) HLASIM HLAPAY b) INFCSC	Pitch angle circuit integration limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	THEILM	THEILM $\geq$ 0
THELLM	a) HLASIM HLAPAY b) INFCSC	Pitch angle circuit loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0.0 - Eliminates circuit operation	THELLM	THELLM $\geq$ 0
RILM	a) HLASIM HLAPAY b) INFCSC	Turn rate circuit integrator limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	RILM	RILM $\geq$ 0
RLLM	a) HLASIM HLAPAY b) INFCSC	Turn rate circuit loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0. - Eliminates circuit operation	RLLM	RLLM $\geq$ 0

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NCLOSLP			
ULPFLG	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating U loop is closed	F - This flight control system circuit is disconnected		T or F
VLPFLG	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating V loop is closed	F - This flight control system circuit is disconnected		T or F
HDTLPF	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating HDOT loop is closed	F - This flight control system circuit is disconnected		T or F
PLPFLG	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating P loop is closed	F - This flight control system circuit is disconnected		T or F
QLPFLG	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating Q loop is closed	F - This flight control system circuit is disconnected		T or F
TRTLPF	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating turn rate loop is closed	F - This flight control system circuit is disconnected		T or F

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NFDBKFL			
UFDBK	a) HLASIM HLAPAY b) INFCSC	Feedback flag: true equals hull body axis x-velocity feedback, false equals hull x-velocity sensor feedback	T - Hull c.g. body axis kinematic feedback quantity		T or F
VFDBK	a) HLASIM HLAPAY b) INFCSC	Feedback flag: true equals hull c.g. body axis y-velocity feedback, false equals hull y-velocity sensor feedback	T - Hull c.g. body axis kinematic feedback quantity		T or F
RFDBK	a) HLASIM HLAPAY b) INFCSC	Feedback flag: true equals hull c.g. body axis yaw rate feedback false equals hull c.g. axis Euler yaw rate (PSIDOT) feedback	T - Hull c.g. body axis kinematic feedback quantity		T or F
		Namelist NFCSGNS			
KUSPED	a) HLASIM HLAPAY b) INFCSC	Forward speed circuit proportional gain	0.0 Gain is eliminated	K_u	
KIU	a) HLASIM HLAPAY b) INFCSC	Forward speed circuit integrator gain	0.0 Gain is eliminated	K_{Iu}	
TAXAC	a) HLASIM HLAPAY b) INFCSC	x-accelerometer gain	0.0 Gain is eliminated	$T_{\dot{u}_{ac}}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NFCSGNS (Continued)			
KVSPED	a) HLASIM HLAPAY b) INFCSC	Lateral velocity circuit proportional gain	0.0 Gain is eliminated	K_v	
KIV	a) HLASIM HLAPAY b) INFCSC	Lateral velocity circuit integrator gain	0.0 Gain is eliminated	K_{Iv}	
TAYAC	a) HLASIM HLAPAY b) INFCSC	y-accelerometer gain	0.0 Gain is eliminated	$T_{\dot{v}ac}$	
KHDOT	a) HLASIM HLAPAY b) INFCSC	Vertical velocity circuit proportional gain	0.0 Gain is eliminated	$K_{\dot{h}}$	
KHIDOT	a) HLASIM HLAPAY b) INFCSC	Vertical velocity circuit integrator gain	0.0 Gain is eliminated	K_{Ih}	
TAZAC	a) HLASIM HLAPAY b) INFCSC	z-accelerometer gain	0.0 Gain is eliminated	$T_{\dot{w}ac}$	
KPHI	a) HLASIM HLAPAY b) INFCSC	Roll angle circuit proportion gain	0.0 Gain is eliminated	K_{ϕ}	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NFCSGNS (Concluded)			
KIPHI	a) HLASIM HLAPAY b) INFCSC	Roll angle circuit integrator gain	0.0 Gain is eliminated	$K_{I\phi}$	
TROLRT	a) HLASIM HLAPAY b) INFCSC	Roll rate gain	0.0 Gain is eliminated	T_p	
KTHETA	a) HLASIM HLAPAY b) INFCSC	Pitch angle circuit proportional gain	0.0 Gain is eliminated	K_θ	
KITHET	a) HLASIM HLAPAY b) INFCSC	Pitch angle circuit integrator gain	0.0 Gain is eliminated	$K_{I\theta}$	
TPTHRT	a) HLASIM HLAPAY b) INFCSC	Pitch rate gain	0.0 Gain is eliminated	T_q	
KTRAT	a) HLASIM HLAPAY b) INFCSC	Turn rate circuit proportional gain	0.0 Gain is eliminated	$K_{\dot\psi}$	
KIR	a) HLASIM HLAPAY b) INFCSC	Yaw rate circuit integrator gain	0.0 Gain is eliminated	$K_{I\dot\psi}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NPOSHCS			
POSHT1	a) HLASIM HLAPAY b) INFCSC	Hover position hold starting time	POSHT1 > TSIM Position Hold System is not activated		0 ≤ POSHT1 < POSHT2
POSHT2	a) HLASIM HLAPAY b) INFCSC	Hover position hold ending time	POSHT2 > TSIM Command issued at POSHT1 is held on for the duration of the time history		POSHT2 > POSHT1
KX	a) HLASIM HLAPAY b) INFCSC	Forward location hold circuit proportional gain	0. Gain is eliminated	K_x	
KY	a) HLASIM HLAPAY b) INFCSC	Lateral position hold circuit proportional gain	0. Gain is eliminated	K_y	
KH	a) HLASIM HLAPAY b) INFCSC	Vertical height hold circuit proportional gain	0. Gain is eliminated	K_h	
KPSI	a) HLASIM HLAPAY b) INFCSC	Heading angle hold proportional gain	0. Gain is eliminated	K_ψ	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NRSENSR			
RACELC	a) HLASIM HLAPAY b) INFCSC	Relative accelerometer location	0., 0., 0. Accelerometer axes are coincident with hull center of volume reference axes	$\underline{R}^{hac}_{hac}$	
RVSNLC	a) HLASIM HLAPAY b) INFCSC	Relative velocity sensor location	0., 0., 0. Airspeed sensor axes are coincident with hull center of volume reference axes	$\underline{R}^{hac}_{hac}$	
		Namelist NRSWASH			
RTCOM1	a) HLASIM HLAPAY b) INPROF	Starting time for rotor control commands	RTCOM $\geq$ TSIM No test command is issued	$t1_r$	$0 \leq t1_r < t2_r$
RTCOM2	a) HLASIM HLAPAY b) INPROF	Ending time for rotor control commands	RTCOM2 $\geq$ TSIM Test command issued at RTCOM is held on for the duration of the time history	$t2_r$	$t2_r > t1_r$
DTHER1 DTHER2 DTHER3 DTHER4	a) HLASIM HLAPAY b) INPROF	Commanded rotor collective pitch increment	0. No test command increment is applied	$\Delta\theta_{o_r}$	
DA1SR1 DA1SR2 DA1SR3 DA1SR4	a) HLASIM HLAPAY b) INPROF	Commanded rotor lateral cyclic deflection increment	0. No test command increment is applied	ΔA_{1s_r}	
DB1SR1 DB1SR2 DB1SR3 DB1SR4	a) HLASIM HLAPAY b) INPROF	Commanded rotor longitudinal cyclic deflection increment	0. No test command increment is applied	ΔB_{1s_r}	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NPFETHR			
PTCOM1	a) HLASIM HLAPAY b) INPROF	Starting time for propeller control commands	PTCOM1 $\geq$ TSIM No test command is issued	$t1_p$	$0 \leq t1_p < t2_p$
PTCOM2	a) HLASIM HLAPAY b) INPROF	Ending time for propeller control commands	PTCOM2 $\geq$ TSIM Test command issued at PTCOM1 is held on for the duration of the time history	$t2_p$	$t2_p > t1_p$
DTHEP1 DTHEP2 DTHEP3 DTHEP4	a) HLASIM HLAPAY b) INPROF	Commanded propeller collective pitch increment	0.0 No test command increment is applied	$\Delta\theta_{o_p}$	
		Namelist NLNKCOM			
LKTCM1	a) HLASIM HLAPAY b) INPROF	Starting time for linked control commands	LKTCM1 $\geq$ TSIM No test command is issued	$t1_{\ell c}$	$0 \leq t1_{\ell c} < t2_{\ell c}$
LKTCM2	a) HLASIM HLAPAY b) INPROF	Ending time for linked control commands	LKTCM2 $\geq$ TSIM Test command issued at LKTCM1 is held on for the duration of the time history	$t2_{\ell c}$	$t2_{\ell c} > t1_{\ell c}$
DUDCNL	a) HLASIM HLAPAY b) INPROF	Axial force control command increment	0.0 No test command increment is applied	Δa_c	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NLNKCOM (Concluded)					
DVDCNL	a) HLASIM HLAPAY b) INPROF	Side force control command increment	0.0 No test command increment is applied	$\Delta\dot{v}_c$	
DWDCNL	a) HLASIM HLAPAY b) INPROF	Vertical force control command increment, positive downward	0.0 No test command increment is applied	$\Delta\dot{w}_c$	
DPCNTL	a) HLASIM HLAPAY b) INPROF	Roll control command increment	0.0 No test command increment is applied	$\Delta\dot{p}_c$	
DQCNTL	a) HLASIM HLAPAY b) INPROF	Yaw control command increment	0.0 No test command increment is applied	$\Delta\dot{q}_c$	
DRCNTL	a) HLASIM HLAPAY b) INPROF	Yaw control command increment	0.0 No test command increment is applied	$\Delta\dot{r}_c$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NTDEFLC			
TTCOM1	a) HLASIM HLAPAY b) INPROF	Starting time for tail surface deflection commands	TTCOM1 $\geq$ TSIM No test command is issued	$t1_t$	$0 \leq t1_t < t2_t$
TTCOM2	a) HLASIM HLAPAY b) INPROF	Ending time for tail surface deflection commands	TTCOM2 $\geq$ TSIM Test command applied at TTCOM1 is held on for duration of time history	$t2_t$	$t2_t > t1_t$
DDLTAL	a) HLASIM HLAPAY b) INPROF	Aileron test command increment	0. No test command increment is applied	$\Delta\delta_a$	
DDLTEL	a) HLASIM HLAPAY b) INPROF	Elevator test command increment	0. No test command increment is applied	$\Delta\delta_e$	
DDLTRD	a) HLASIM HLAPAY b) INPROF	Rudder test command increment	0. No test command increment is applied	$\Delta\delta_r$	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NCOMMAND					
UCMD	a) HLASIM HLAPAY b) INPROF	Forward velocity command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	u_{com}	
VCMD	a) HLASIM HLAPAY b) INPROF	Side velocity (y-axis) command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	v_{com}	
HDTCMD	a) HLASIM HLAPAY b) INPROF	Vertical velocity command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	$\dot{h}_{com}$	
PHICMD	a) HLASIM HLAPAY b) INPROF	Roll angle command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	ϕ_{com}	
THECMD	a) HLASIM HLAPAY b) INPROF	Pitch angle command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	θ_{com}	
TRTCMD	a) HLASIM HLAPAY b) INPROF	Turn rate command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	$\dot{\psi}_{com}$	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHGCOM					
HT1GST	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for hull gust commands	HT1GST $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	0 $\leq$ HT1GST < HT2GST
HT2GST	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for hull gust commands		T2	HT2GST > HT1GST
UHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the hull center of volume in the x direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the hull center of volume in the y direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the hull center of volume in the z direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
PHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust rolling velocity, acting on the hull center of volume	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NHGCOM (Concluded)			
QHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust pitching velocity acting at the hull center of volume	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
RHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust yawing velocity, acting at the hull center of volume	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DUXHMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of axial hull-gust velocity, with respect to axial location	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DUYHMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of axial hull-gust velocity, with respect to lateral position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DVYHMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of lateral hull-gust velocity, with respect to lateral position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTGCOM					
TT1GST	a) HLASIM HLAMOR HLAPAY b) INGUST	The starting time for the gust acting at the tail centroid	TT1GST $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	$0 \leq$ TT1GST < TT2GST
TT2GST	a) HLASIM HLAMOR HLAPAY b) INGUST	The ending time for the gust acting at the tail centroid		T2	TT2GST > TT1GST
UTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the tail centroid in the x direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VTGMAY	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the tail centroid in the y direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the tail centroid in the z direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTGCOM (Continued)					
PTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust rolling velocity, acting at the tail centroid	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
QTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust pitching velocity, acting at the tail centroid	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
RTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust yawing velocity, acting at the tail centroid	0.0 No (1 - cosine) disturbance is applied for this gust variable	$-_{max}$	
DUXTMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of axial tail-gust velocity, with respect to axial position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DUYTMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of axial tail-gust velocity, with respect to lateral position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DVYTMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of lateral tail-gust velocity, with respect to lateral position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NLPGCOM			
L1T1GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for LPU-1 gust commands	L1T1GT ≥ TSIM No (1 - cosine) gust commands are issued for this element	T1	0 ≤ L1T1GT < L1T2GT
L1T2GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for LPU-1 gust commands		T2	L1T2GT > L1T1GT
U11GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-1 in the x-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VL1GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-1 in the y-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WL1GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-1 in the z-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NLPGCOM (Continued)			
L2T1GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for LPU-1 gust commands	L2T1GT $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	0 $\leq$ L2T1GT < L2T2GT
L2T2GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for LPU-2 gust commands		T2	L2T2GT > L2T1GT
UL2GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-2 in the x-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VL2GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-2 in the y-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WL2GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-2 in the z-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NLPGCOM (Continued)					
L3T1GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for LPU-3 gust commands	L3T1GT ≥ TSIM No (1 - cosine) gust commands are issued for this elements	T1	0 ≤ L3T1GT < L3T2GT
L3T2GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for LPU-3 gust commands		T2	L3T2GT > L3T1GT
UL3GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-3 in the x-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VL3GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-3 in the y-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WL3TMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-3 in the z-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

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VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NLPGCOM (Concluded)			
L4T1GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for LPU-4 gust commands	0.0 No (1 - cosine) disturbance is applied for this gust variable	T1	
L4T2GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for LPU-4 gust commands	0.0 No (1 - cosine) disturbance is applied for this gust variable	T2	
UL4GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-4 in the x-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VL4GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-4 in the y-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WL4GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-4 in the z-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

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VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NGSTRNG			
GSTFLG	a) HLASIM HLAMOR HLAPAY b) INGUST	Logical flag: true equals gust string inputs desired; false equals gust string inputs not desired	F No (vehicle) gust input string data is necessary		T or F
GSTSCF	a) HLASIM HLAMOR HLAPAY b) INGUST	Scale factor for gust string inputs	1. Vehicle gust input string data is used uncorrected in the simulation	M_h	
		Namelist NRSRCLC			
RFSRCX	a) HLASIM HLAMOR HLAPAY b) INGUST	Locates the forward gust input source location with respect to the hull center of volume reference axis		R_x^f	$R_x^f \neq R_x^a$
RASRCX	a) HLASIM HLAMOR HLAPAY b) INGUST	Locates the aft gust input source slip locations with respect to the hull center of volume reference axis		R_x^a	$R_x^a \neq R_x^f$
RSORCY	a) HLASIM HLAMOR HLAPAY b) INGUST	Locates the lateral (symmetric about the x-axis) position of the gust input sources; this value must be positive		R_y^ℓ	$R_y^\ell > 0$

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Data File HIJDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist MINSTEP					
TIMSTP	a) HLASIM HLAMOR HLAPAY b) INSTEP	Numerical integration maximum time step			TIMSTP > 0
MINSTP	a) HLASIM HLAMOR HLAPAY b) INSTEP	Minimum time step allowed for the program integrator to provide the user a means of controlling run time and cost			MINSTP > 0
TPRINT	a) HLASIM HLAMOR HLAPAY b) INSTEP	Output print interval			TPRINT > 0 (Recommend to be a multiple of TIMSTP)
TSIM	a) HLASIM HLAMOR HLAPAY b) INSTEP	Total six degree of freedom simulation time			TSIM > 0

Data File PAYDTA

VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NPAYLOD					
PAYLTH	a) HLAPAY b) INPGEO	Payload reference length	Not used		
PAYDTH	a) HLAPAY b) INPGEO	Payload depth	Not used		
PAYVOL	a) HLAPAY b) INPGEO	Payload volume	Not used		
PAYARA	a) HLAPAY b) INPGEO	Payload front projected area (reference area)	Not used		
PAYID	a) HLAPAY b) INPGEO	Payload configuration identifier	Not used		
Namelist NRPTCH					
RPTCH1 RPTCH2 RPTCH3 RPTCH4	a) HLAPAY b) INPGEO	Four vectors locating the cable attach points on the payload with respect to the payload reference center in coordinates of payload reference axis		$\underline{R}^{pk}_{ppc}$	
Namelist NRATHP					
RATHP1 RATHP2 RATHP3 RATHP4	a) HLAPAY b) INPGEO	Four vectors locating each cable attach point on the hull, with respect to the hull center of volume in coordinates of the hull center of volume reference axis		$\underline{R}^{hj}_{hcv}$	
Namelist NUSCLTH					
USLTH1 USLTH2 USLTH3 USLTH4	a) HLAPAY b) INPGEO	Cable unstretched lengths		$\ell_{o_{jk}}$	$\ell_{o_{jk}} > 0$

Data File PAYDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NRPAYCG					
RPAYCG	a) HLAPAY b) INPMAS	Vector locating the center of gravity with respect to the payload reference center in coordinates of the reference center axis	0. Payload center of gravity is coincident with payload aerodynamic reference center	$\underline{R}^{p}_{ppc}$	
Namelist NMASPAY					
MASPAY	a) HLAPAY b) INPMAS	Mass of the payload		m_p	$m_p > 0$
IPAYXX	a) HLAPAY b) INPMAS	Payload moment of inertia about the payload c.g. x-axis		I_{xx_p}	$I_{xx_p} > 0$
IPAYYY	a) HLAPAY b) INPMAS	Payload moment of inertia about the payload c.g. y-axis		I_{yy_p}	$I_{yy_p} > 0$
IPAYXZ	a) HLAPAY b) INPMAS	Payload product of inertia with respect to the payload c.g. xz-axis		I_{xz_p}	
Namelist NCABLK					
CABLK1 CABLK2 CABLK3 CABLK4	a) HLAPAY b) INCABL	Cable spring constants	0. This payload cable is disabled	K_c	$K_c \geq 0$
Namelist NCABLC					
CABLC1 CABLC2 CABLC3 CABLC4	a) HLAPAY b) INCABL	Cable damping constants	0. No viscous spring damping in this cable	C_c	$C_c \geq 0$

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Data File PAYDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NPDRUS			
XUUABP	a) HLAPAY b) INPARO	Payload x-force derivative with respect to U*ABS(U)	0. Eliminates this payload aerodynamic term	$X_{u\|u\|p}$	
YVVABP	a) HLAPAY b) INPARO	Payload y-force derivative with respect to V*ABS(V)	0. Eliminates this payload aerodynamic term	$Y_{v\|v\|p}$	
ZWWABP	a) HLAPAY b) INPARO	Payload z-force derivative with respect to W*ABS(W)	0. Eliminates this payload aerodynamic term	$Z_{w\|w\|p}$	
NUVP	a) HLAPAY b) INPARO	Payload rolling moment derivative with respect to U*ABS(W)	0. Eliminates this payload aerodynamic term	N_{uv_p}	
LPPABP	a) HLAPAY b) INPARO	Payload rolling moment with respect to P*ABS(P)	0. Eliminates this payload aerodynamic term	$L_{p\|p\|p}$	
MQQABP	a) HLAPAY b) INPARO	Payload pitching moment derivative with respect to Q*ABS(Q)	0. Eliminates this payload aerodynamic term	$M_{q\|q\|p}$	
NRRABP	a) HLAPAY b) INPARO	Payload yawing derivative with respect to R*ABS(R)	0. Eliminates this payload aerodynamic term	$N_{r\|r\|p}$	

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Data File PAYDTA

VARI-ABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NINDPST			
DVPYLD	a) HLAPAY b) INPYST	Payload velocity increments	0. No time history perturbation on this payload vector	$\Delta \underline{V}_p$	
DHRPYL	a) HLAPAY b) INPYST	Payload location increments	0. No time history perturbation on this payload vector	$\Delta \underline{R}_h^p$	
DPYELR	a) HLAPAY b) INPYST	Payload Euler rate increments	0. No time history perturbation on this payload vector	$\Delta \dot{\underline{\eta}}_k^p$	
DPYEUL	a) HLAPAY b) INPYST	Payload Euler angle increments	0. No time history perturbation on this payload vector	$\Delta \underline{\eta}_I^p$	
		Namelist NPYGCOM			
PYT1GT	a) HLAPAY b) INPGST	Starting time for payload (1 - cosine gust)	PYT1GT $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	0 $\leq$ PYT1GT < PYT2GT
PYT2GT	a) HLAPAY b) INPGST	Ending time for payload (1 - cosine gust)		T2	PYT2GT > PYT1GT
UPYGMX	a) HLAPAY b) INPGST	Maximum payload axial gust velocity (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VPYGMX	a) HLAPAY b) INPGST	Maximum value of payload side gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File PAYDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NPYGCOM (Concluded)			
WPYGMX	a) HLAPAY b) INPGST	Maximum payload downward gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
PPYGMX	a) HLAPAY b) INPGST	Maximum payload rolling gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
QPYGMX	a) HLAPAY b) INPGST	Payload maximum pitching gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
RPYGMX	a) HLAPAY b) INPGST	Maximum value of payload yawing gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
		Namelist NPGSTRN			
PGSTFL	a) HLAPAY b) INPGST	T/F, a flag indicating that random gusts are to be turned on	F No gust payload input string data is necessary		T or F
PVGSCF	a) HLAPAY b) INPGST	A scale factor to be applied to the random gust velocities on input	1. Payload (linear) gust input string data is used uncorrected	M_{v_p}	
POGSCF	a) HLAPAY b) INPGST	A scale factor to be applied to the random gust angular velocities on input	1. Payload (angular) gust input string data is used uncorrected	M_{w_p}	

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Data File MORDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NCALMHD			
PSIO	a) HLAMOR b) INMTRA	Heading angle with respect to the inertial frame of the moored vehicle with no inertial wind, or initial heading angle off of the steady wind for trim algorithm initialization. The latter option is to find trim states not aligned with the steady wind.	0. Moored heading aligned with ambient wind or due north (calm atmosphere)	ψ_o	$\lvert\psi_o\rvert < 6.28$
		Namelist NTSDEFL			
DELTAL	a) HLAMOR b) INMTRA	Aileron angle; positive aileron deflection will produce a negative tail rolling moment	0. No deflection for this tail control (mooring simulation)	δ_a	
DELTEL	a) HLAMOR b) INMTRA	Elevator angle; positive elevator deflection angle will produce a positive z-tail force	0. No deflection for this tail control (mooring simulation)	δ_e	
DELTRD	a) HLAMOR b) INMTRA	Rudder angle; positive rudder deflection angle will produce a positive y-tail force	0. No deflection for this tail control (mooring simulation)	δ_r	
		Namelist NINDMST			
DHLEUL	a) HLAMOR b) INMRST	Euler angle increments away from moored trim angles to excite the vehicle for time history simulation	0. No hull Euler angle disturbance for mooring time history	$\Delta \underline{\eta}_I^h$	

APPENDIX B

SAMPLE PROGRAM OUTPUT

This appendix contains the output listing from two program runs.

1) Program HLASIM

   This run models the vehicle only in flight. Flight control system commands are issued to create a climbing turn. The data files listed in Appendix C were used to make this run. This run with those data files can be used as a check solution by a user implementing the program on a different computer system.

   Data files PAYDTA, MORDTA, and RG1-RG6 (in Appendix C) are not used in this program run.

2) Program HLAPAY

   This run models the vehicle with a payload. This is to provide an example of the combined vehicle/payload so only the input data and trim solution is included here. The data file PAYDTA in Appendix C was used by this run, but the other data files are different. If the user wishes to match this run he must create the input files from the input variables listed in the run heading.

```
**************************************************************************
*                 HEAVY LIFT AIRSHIP FLIGHT SIMULATION                   *
**************************************************************************

     ------------------------------RUN DESCRIPTION------------------------------
           PROGRAM HLASIM          DATE -  81/12/16.       TIME -  15.23.22.
     TEST RUN15
     FLIGHT CONTROL SYSTEM COMMANDS
     CLIMBING TURN
     ---------------------------------------------------------------------------

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

```
                              ****INPUT DATA****

-----------------------------------------------------------GEOMETRY INPUTS-----------------------------------------

------BASIC HULL MEASUREMENTS
HULARA =  .1942E+05 FT.**2                                   SIDE PROJECTED AREA
HULDIA =  .1030E+03 FEET                                     MAXIMUM DIAMETER
HULID  =          1                                          CONFIGURATION ID #
HULTH  =  .2400E+03 FEET                                     LENGTH OF HULL
HULVOL =  .1500E+07 FT.**3                                   TOTAL DISPLACEMENT VOLUME

-----BASIC TAIL MEASUREMENTS
NUMFIN =          2                                          NUMBER OF FINS
RTALOC =  -87.50,      0.00,      0.00 FEET                  TAIL VECTOR FROM HULL CV
TALARA =  .2520E+04                FT.**2                    TAIL REFERENCE AREA
TSPAN  =  .1100E+03                FEET                      TAIL SPAN
TALID  =          1                                          TAIL CONFIGURATION ID #

-----BASIC LPU VALUES
NUMLPU =          4                                          NUMBER OF LPUS
LPUID  =          1                                          CONFIGURATION ID #

-----FOUR VECTORS FROM HULL CV REFERENCE AXES TO EACH LPU ATTACH POINT
RATCH1 =  .3800E+02 -.8150E+02  .5900E+02  FEET
RATCH2 =  .3300E+02  .8150E+02  .5900E+02  FEET
RATCH3 = -.3800E+02 -.8150E+02  .5900E+02  FEET
RATCH4 = -.3800E+02  .8150E+02  .5900E+02  FEET

-----FOUR VECTORS FROM EACH LPU FUSELAGE REFERENCE AXES TO ITS HULL ATTACH POINT
RLTCH1 = 0.          0.          .3000E+01  FEET
RLTCH2 = 0.          0.          .3000E+01  FEET
RLTCH3 = 0.          0.          .3000E+01  FEET
RLTCH4 = 0.          0.          .3000E+01  FEET

-----VECTORS TO THE POSITION OF EACH ROTOR HUB WITH RESPECT TO ITS LPU FUSELAGE REFERENCE AXES
RROTR1 = 0.          0.         -.7000E+01  FEET
RROTR2 = 0.          0.         -.7000E+01  FEET
RROTR3 = 0.          0.         -.7000E+01  FEET
RROTR4 = 0.          0.         -.7000E+01  FEET

-----ROTOR CONFIGURATION
NRBLD1 =          4                                          NUMBER OF BLADES ROTOR 1
NRBLD2 =          4                                          NUMBER OF BLADES ROTOR 2
NRBLD3 =          4                                          NUMBER OF BLADES ROTOR 3
NRBLD4 =          4                                          NUMBER OF BLADES ROTOR 4

RADRT1 =    28.0000 FEET                                     EFFECTIVE RADIUS ROTOR 1
RADRT2 =    28.0000 FEET                                     EFFECTIVE RADIUS ROTOR 2
RADRT3 =    28.0000 FEET                                     EFFECTIVE RADIUS ROTOR 3
RADRT4 =    28.0000 FEET                                     EFFECTIVE RADIUS ROTOR 4

CORDR1 =     1.3700 FEET                                     BLADE CHORD AT 3/4 RADIUS STATION ROTOR 1
CORDR2 =     1.3700 FEET                                     BLADE CHORD AT 3/4 RADIUS STATION ROTOR 2
CORDR3 =     1.3700 FEET                                     BLADE CHORD AT 3/4 RADIUS STATION ROTOR 3
CORDR4 =     1.3700 FEET                                     BLADE CHORD AT 3/4 RADIUS STATION ROTOR 4
```

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```
-----VECTORS TO THE POSITION OF EACH PROPELLER HUB WITH RESPECT TO ITS LPU FUSELAGE REFERENCE AXES
RPROP1 =  .1400E+02 0.          0.          FEET
RPROP2 =  .1400E+02 0.          0.          FEET
RPROP3 =  .1400E+02 0.          0.          FEET
RPROP4 =  .1400E+02 0.          0.          FEET

-----PROPELLER CONFIGURATION
NPBLD1 =          3                               NUMBER OF BLADES PROPELLER 1
NPBLD2 =          3                               NUMBER OF BLADES PROPELLER 2
NPBLD3 =          3                               NUMBER OF BLADES PROPELLER 3
NPBLD4 =          3                               NUMBER OF BLADES PROPELLER 4

RADP1  =     6.5500 FEET                          EFFECTIVE RADIUS PROPELLER 1
RADP2  =     6.5500 FEET                          EFFECTIVE RADIUS PROPELLER 2
RADP3  =     6.5500 FEET                          EFFECTIVE RADIUS PROPELLER 3
RADP4  =     6.5500 FEET                          EFFECTIVE RADIUS PROPELLER 4

CORDP1 =      .6550 FEET                          BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 1
CORDP2 =      .6550 FEET                          BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 2
CORDP3 =      .6550 FEET                          BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 3
CORDP4 =      .6550 FEET                          BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 4

-----LATERAL CONTROL AXIS DEFLECTION FOR:
A1SP1  =     0.0000 RADIANS                       PROPELLER-1
A1SP2  =     0.0000 RADIANS                       PROPELLER-2
A1SP3  =     0.0000 RADIANS                       PROPELLER-3
A1SP4  =     0.0000 RADIANS                       PROPELLER-4

-----LONGITUDINAL CONTROL AXIS DEFLECTION FOR:
B1SP1  =     1.6060 RADIANS                       PROPELLER-1
B1SP2  =     1.5360 RADIANS                       PROPELLER-2
B1SP3  =     1.6060 RADIANS                       PROPELLER-3
B1SP4  =     1.5360 RADIANS                       PROPELLER-4

-----LPU EULER ANGLES WITH RESPECT TO THE HULL CENTER OF VOLUME REFERENCE AXES
GBANG1 = 0.          .3500E-01 0.         RADIANS
GBANG2 = 0.         -.3500E-01 0.         RADIANS
GBANG3 = 0.          .3500E-01 0.         RADIANS
GBANG4 = 0.         -.3500E-01 0.         RADIANS
```

```
-----------------------------------------------------MOORING POINT GEOMETRY--------------------

-----MOORING POINT ON MAST IN INERTIAL COORDINATES
MASTLC = 0.          0.          -.6501E+02  FEET

-----MOORING POINT ON HULL RELATIVE TO THE HULL CENTER OF VOLUME
RMORPT =  .1200E+03 0.          0.          FEET

-----------------------------------------LANDING GEAR ATTACH POINTS AND SPRING CONSTANTS--------

-----LANDING GEAR ATTACH POINTS ON THE HULL
RATHG1 =  .3600E+02 -.4600E+02  .6200E+02  FEET
RATHG2 =  .3600E+02  .4600E+02  .6200E+02  FEET
RATHG3 = -.3600E+02 -.4600E+02  .6200E+02  FEET
RATHG4 = -.3600E+02  .4600E+02  .6200E+02  FEET

-----LANDING GEAR LENGTHS
LGRLN1 =  .3320E+01 FEET                            LANDING GEAR 1
LGRLN2 =  .3320E+01 FEET                            LANDING GEAR 2
LGRLN3 =  .3320E+01 FEET                            LANDING GEAR 3
LGRLN4 =  .3320E+01 FEET                            LANDING GEAR 4

-----LANDING GEAR SPRING CONSTANTS
GEARK1 =  .7770E+04 LB / FT
GEARK2 =  .7770E+04 LB / FT
GEARK3 =  .7770E+04 LB / FT
GEARK4 =  .7770E+04 LB / FT

-----LANDING GEAR FRAME STIFFNESS CONSTANTS
GFRMK1 =  .7770E+05 LB / FT
GFRMK2 =  .7770E+05 LB / FT
GFRMK3 =  .7770E+05 LB / FT
GFRMK4 =  .7770E+05 LB / FT

-----LANDING GEAR SPRING DAMPING CONSTANTS
GEARC1 =  .1554E+04 (LB * SEC) / FT
GEARC2 =  .1554E+04 (LB * SEC) / FT
GEARC3 =  .1554E+04 (LB * SEC) / FT
GEARC4 =  .1554E+04 (LB * SEC) / FT

-----LANDING GEAR FRICTION CONSTANTS
MUKG1  =  .8000E-01
MUKG2  =  .8000E-01
MUKG3  =  .8000E-01
MUKG4  =  .8000E-01
```

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-------------------------------------------------MASS AND MOMENT OF INERTIA INPUTS------------

-----HULL CENTER OF GRAVITY VECTOR WITH RESPECT TO HULL CENTER OF VOLUME REFERENCE AXES
RHULCG = 0.          0.          .1663E+02  FEET

-----MASS AND MOMENT OF INERTIA OF HULL
MASHUL =  .2762E+04 SLUGS                           COMPLETE MASS OF HULL STRUCTURE
IHULXX =  .6350E+07 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG X AXES
IHULYY =  .1348E+08 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Y AXES
IHULZZ =  .1329E+08 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Z AXES
IHULXZ = 0.         SLUG*(FT.**2)                   PRODUCT OF INERTIA WRT THE CG XZ AXES

-----FOUR VECTORS LOCATING EACH LPU'S CG WITH RESPECT TO ITS FUSELAGE REFERENCE AXES
RCGLP1 = 0.          0.          0.          FEET
RCGLP2 = 0.          0.          0.          FEET
RCGLP3 = 0.          0.          0.          FEET
RCGLP4 = 0.          0.          0.          FEET

-----MASS AND MOMENT OF INERTIA OF LPU-1
MASLP1 =  .2795E+03 SLUGS                           MASS OF LPU-1
ILP1XX =  .8570E+04 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG X AXES
ILP1YY =  .4006E+05 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Y AXES
ILP1ZZ =  .3940E+05 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Z AXES
ILP1XZ = 0.         SLUG*(FT.**2)                   PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-2
MASLP2 =  .2795E+03 SLUGS                           MASS OF LPU-2
ILP2XX =  .8570E+04 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG X AXES
ILP2YY =  .4006E+05 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Y AXES
ILP2ZZ =  .3940E+05 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Z AXES
ILP2XZ = 0.         SLUG*(FT.**2)                   PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-3
MASLP3 =  .2795E+03 SLUGS                           MASS OF LPU-3
ILP3XX =  .8570E+04 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG X AXES
ILP3YY =  .4006E+05 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Y AXES
ILP3ZZ      94CE+05 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Z AXES
ILP3XZ              SLUG*(FT.**2)                   PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-4
MASLP4 =  .2795E+03 SLUGS                           MASS OF LPU-4
ILP4XX =  .8570E+04 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG X AXES
ILP4YY =  .4006E+05 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Y AXES
ILP4ZZ =  .3940E+05 SLUG*(FT.**2)                   MOMENT OF INERTIA ABOUT CG Z AXES
ILP4XZ = 0.         SLUG*(FT.**2)                   PRODUCT OF INERTIA WRT THE CG XZ AXES

-----ROTOR LOCK NUMBER
LOCNR1 =    15.0000                                ROTOR 1
LOCNR2 =    15.0000                                ROTOR 2
LOCNR3 =    15.0000                                ROTOR 3
LOCNR4 =    15.0000                                ROTOR 4
```

```
---------------------------------------------------EXHAUST THRUST INPUTS------------------------------

-----EXHAUST JET FORCES
JETHS1 =  .1000E+03 LBS.                                LPU 1
JETHS2 =  .1000E+03 LBS.                                LPU 2
JETHS3 =  .1000E+03 LBS.                                LPU 3
JLTHS4 =  .1000E+03 LBS.                                LPU 4

-----LOCATION OF THE EXHAUST NOZZLES WITH RESPECT TO THE FUSELAGE REFERENCE CENTERS
REXLC1 = -.1000E+02 0.          -.3000E+01  FEET                            LPU 1
REXLC2 = -.1000E+02 0.          -.3000E+01  FEET                            LPU 2
REXLC3 = -.1000E+02 0.          -.3000E+01  FEET                            LPU 3
REXLC4 = -.1000E+02 0.          -.3000E+01  FEET                            LPU 4

-----ANGULAR ORIENTATIONS OF THE EXHAUST NOZZLES WITH RESPECT TO THE FUSELAGE REFERENCE CENTERS
AISE1  = 0.          RADIANS                            LPU 1
BISE1  =  .1400E+01  RADIANS                            LPU 1
AISE2  = 0.          RADIANS                            LPU 2
BISE2  =  .1400E+01  RADIANS                            LPU 2
AISE3  = 0.          RADIANS                            LPU 3
BISE3  =  .1400E+01  RADIANS                            LPU 3
AISE4  = 0.          RADIANS                            LPU 4
BISE4  =  .1400E+01  RADIANS                            LPU 4
```

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------------------------------------------LPU AERODYNAMIC PARAMETERS INPUT--------------------

-----FOUR VECTORS LOCATING FUSELAGE AERODYNAMIC CENTER WITH RESPECT TO LPU FUSELAGE REFERENCE AXES
RACLP1 = 0.          0.          0.          FEET
RACLP2 = 0.          0.          0.          FEET
RACLP3 = 0.          0.          0.          FEET
RACLP4 = 0.          0.          0.          FEET

-----ROTOR BLADE LIFT CURVE SLOPE AND DRAG COEFFICIENTS

LCSR1  =     5.7300 1/RAD.                          ROTOR 1
DLTR1A =      .0087 1/RAD.
DLTR1B =    -.0216 1/RAD.
DLTR1C =      .4000 1/RAD.

LCSR2  =     5.7300 1/RAD.                          ROTOR 2
DLTR2A =      .0087 1/RAD.
DLTR2B =    -.0216 1/RAD.
DLTR2C =      .4000 1/RAD.

LCSR3  =     5.7300 1/RAD.                          ROTOR 3
DLTR3A =      .0087 1/RAD.
DLTR3B =    -.0216 1/RAD.
DLTR3C =      .4000 1/RAD.

LCSR4  =     5.7300 1/RAD.                          ROTOR 4
DLTR4A =      .0087 1/RAD.
DLTR4B =    -.0216 1/RAD.
DLTR4C =      .4000 1/RAD.

-----PROPELLER BLADE LIFT CURVE SLOPE AND DRAG COEFFICIENTS

LCSP1  =     5.7300 1/RAD.                          PROPELLER 1
DLTP1A =      .0087 1/RAD.
DLTP1B =    -.0216 1/RAD.
DLTP1C =      .4000 1/RAD.

LCSP2  =     5.7300 1/RAD.                          PROPELLER 2
DLTP2A =      .0087 1/RAD.
DLTP2B =    -.0216 1/RAD.
DLTP2C =      .4000 1/RAD.

LCSP3  =     5.7300 1/RAD.                          PROPELLER 3
DLTP3A =      .0087 1/RAD.
DLTP3B =    -.0216 1/RAD.
DLTP3C =      .4000 1/RAD.

LCSP4  =     5.7300 1/RAD.                          PROPELLER 4
DLTP4A =      .0087 1/RAD.
DLTP4B =    -.0216 1/RAD.
DLTP4C =      .4000 1/RAD.
```

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-----LPU FUSELAGE AERODYNAMIC X-FORCE DERIVATIVES WITH RESPECT TO U * ABS(U)
XUUAF1 =      -.0220 LB*(S**2)/(FT**2)             FUSELAGE 1
XUUAF2 =      -.0220 LB*(S**2)/(FT**2)             FUSELAGE 2
XUUAF3 =      -.0220 LB*(S**2)/(FT**2)             FUSELAGE 3
XUUAF4 =      -.0220 LB*(S**2)/(FT**2)             FUSELAGE 4

-----LPU FUSELAGE AERODYNAMIC Y-FORCE DERIVATIVES WITH RESPECT TO V * ABS(V)
YVVAF1 =      -.2010 LB*(S**2)/(FT**2)             FUSELAGE 1
YVVAF2 =      -.2010 LB*(S**2)/(FT**2)             FUSELAGE 2
YVVAF3 =      -.2010 LB*(S**2)/(FT**2)             FUSELAGE 3
YVVAF4 =      -.2010 LB*(S**2)/(FT**2)             FUSELAGE 4

-----LPU FUSELAGE AERODYNAMIC Z-FORCE DERIVATIVES WITH RESPECT TO W * ABS(W)
ZWWAF1 =      -.6460 LB*(S**2)/(FT**2)             FUSELAGE 1
ZWWAF2 =      -.6460 LB*(S**2)/(FT**2)             FUSELAGE 2
ZWWAF3 =      -.6460 LB*(S**2)/(FT**2)             FUSELAGE 3
ZWWAF4 =      -.6460 LB*(S**2)/(FT**2)             FUSELAGE 4
```

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------------------------------------------HULL AERODYNAMIC PARAMETERS INPUT----------------------------------

-----HULL ACCELERATION DERIVATIVES
XUDOTH = -.6634E+03 LB*(S**2)/FT                 X FORCE DERIVATIVE WITH RESPECT TO LONGITUDINAL ACCELERATION
YVDOTH = -.2600E+04 LB*(S**2)/FT                 Y FORCE DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
ZWDOTH = -.2600E+04 LB*(S**2)/FT                 Z FORCE DERIVATIVE WITH RESPECT TO DOWNWARD ACCELERATION
LPDOTH = 0.         FT*LB*(S**2)/RAD             ROLLING MOMENT DERIVATIVE WITH RESPECT TO ROLLING ACCELERATION
MQDOTH = -.3610E+07 FT*LB*(S**2)/RAD             PITCHING MOMENT DERIVATIVE WITH RESPECT TO PITCHING ACCELERATION
NRDOTH = -.3610E+07 FT*LB*(S**2)/RAD             YAWING MOMENT DERIVATIVE WITH RESPECT TO YAW ACCELERATION

-----TAIL ACCELERATION DERIVATIVES
YVDOTT = -.4894E+03 LB*(S**2)/FT                 Y FORCE DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
ZWDOTT = -.6050E+03 LB*(S**2)/FT                 Z FORCE DERIVATIVE WITH RESPECT TO DOWNWARD ACCELERATION
LVDOTT = -.9787E+04 LB*(S**2)                    ROLLING MOMENT DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
LPDOTT = -.3866E+06 FT*LB*(S**2)/RAD             ROLLING MOMENT DERIVATIVE WITH RESPECT TO ROLLING ACCELERATION
MQDOTT = -.3891E+04 FT*LB*(S**2)/RAD             PITCHING MOMENT DERIVATIVE WITH RESPECT TO PITCHING ACCELERATION
NRDOTT = -.3891E+04 FT*LB*(S**2)/RAD             YAWING MOMENT DERIVATIVE WITH RESPECT TO YAW ACCELERATION

-----HULL X FORCE DERIVATIVES WITH RESPECT TO:
XUUABH = -.4136E+00 LB*(S**2)/(FT**2)            U * ABS(U)
XQWH   = -.2600E+04 LB*(S**2)/(RAD*FT)           Q * W
XRVH   =  .2600E+04 LB*(S**2)/(FT**2)            R * V

-----HULL Y FORCE DERIVATIVES WITH RESPECT TO:
YVVABH = -.2804E+02 LB*(S**2)/(FT**2)            V * ABS(V)
YRRABH = 0.         LB*(S**2)/(RAD*FT)           R * ABS(R)
YPWH   =  .2600E+04 LB*(S**2)/(RAD*FT)           P * W
YRUH   = -.6634E+03 LB*(S**2)/(RAD*FT)           R * U
YRVABH = 0.         LB*(S**2)/(RAD*FT)           R * ABS(V)

-----HULL Z FORCE DERIVATIVES WITH RESPECT TO:
ZWWABH = -.2804E+02 LB*(S**2)/(FT**2)            W * ABS(W)
ZQQABH = 0.         LB*(S**2)/(RAD**2)           Q * ABS(Q)
ZPVH   = -.2600E+04 LB*(S**2)/(RAD*FT)           P * V
ZQUH   =  .6634E+03 LB*(S**2)/(RAD*FT)           Q * U
ZQWABH = 0.         LB*(S**2)/(RAD*FT)           Q * ABS(W)

-----HULL ROLLING MOMENT DERIVATIVES WITH RESPECT TO:
LPPABH = -.1314E+05 FT*LB*(S**2)/(RAD**2)        P * ABS(P)
LPUABH = 0.         FT*LB*(S**2)/(RAD**2)        P * ABS(U)
LVWH   = 0.         LB*(S**2)/FT                 V * W
LQBRH  = -.3610E+07 FT*LB*(S**2)/(RAD**2)        QB * R
LRBQH  =  .3610E+07 FT*LB*(S**2)/(RAD**2)        RB * Q

-----HULL PITCHING MOMENT DERIVATIVES WITH RESPECT TO:
MQQABH = -.8220E+07 FT*LB*(S**2)/(RAD**2)        Q * ABS(Q)
MUWH   =  .1452E+04 LB*(S**2)/FT                 U * W
MRBPH  = 0.         FT*LB*(S**2)/(RAD**2)        RB * P
MPBRH  =  .3610E+07 FT*LB*(S**2)/(RAD**2)        PB * R
MQWABH = -.2017E+06 LB*(S**2)/RAD                Q * ABS(W)

-----HULL YAWING MOMENT DERIVATIVE WITH RESPECT TO:
NRRABH = -.8220E+07 FT*LB*(S**2)/(RAD**2)        R * ABS(R)
NUVH   = -.1452E+04 LB*(S**2)/FT                 U * V
NPBQH  = -.3610E+07 FT*LB*(S**2)/(RAD**2)        PB * Q
NQBPH  = 0.         FT*LB*(S**2)/(RAD**2)        QB * P
NRVABH = -.2017E+06 LB*(S**2)/RAD                R * ABS(V)
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-----TAIL X FORCE DERIVATIVES WITH RESPECT TO:
XUUABT = -.1379E+00 LB*(S**2)/(FT**2)               U * ABS(U)

-----TAIL Y FORCE DERIVATIVES WITH RESPECT TO:
YVVABT = -.2446E+01 LB*(S**2)/(FT**2)               V * ABS(V)
YPPABT = -.3233E+04 LB*(S**2)/(RAD**2)              P * ABS(P)
YAPVST = -.1467E+01 LB*(S**2)/(RAD*(FT**2))         ALPHA-P * (VPT**2)
YBVSUT = -.2670E+01 LB*(S**2)/(RAD*(FT**2))         BETA * (VXY**2)
YBSVST = -.1734E+01 LB*(S**2)/((RAD**2)*(FT**2))  BETA*ABS(BETA)*(VXYT**2)
YAPSVS = -.2939E+01 LB*(S**2)/((RAD**2)*(FT**2))  ALPHA:P*ABS(ALPHA:P)*(VPT**2)

-----TAIL Z FORCE DERIVATIVES WITH RESPECT TO:
ZWWABT = -.2446E+01 LB*(S**2)/(FT**2)               W * ABS(W)
ZAVSUT = -.4141E+01 LB*(S**2)/(RAD*(FT**2))         ALPHA * VXZ**2
ZASVST = -.4000E+00 LB*(S**2)/((RAD**2)*(FT**2))  ALPHA*ABS(ALPHA)*(VXZ**2)

-----TAIL ROLL MOMENT DERIVATIVES WITH RESPECT TO:
LVVABT = -.4890E+01 LB*(S**2)/FT                    V * ABS(V)
LPPABT = -.1707E+06 LB*(S**2)/(RAD*FT)              P * ABS(P)
LAPVST = -.7740E+02 LB*(S**2)/(RAD*FT)              ALPHA-P * VPT**2
LBVSUT = -.3030E+01 LB*(S**2)/(RAD*FT)              BETA * VXY**2
LBAVST = -.1520E+01 LB*(S**2)/((RAD**2)*FT)         BETA*ALPHA*(VXY**2)
LAPSVS = -.1551E+03 LB*(S**2)/((RAD**2)*FT)         ALPHA:P*ABS(ALPHA:P)*(VPT**2)

-----TAIL LOCATION SCALE FACTORS
LAMTXU =      .7000                                 X-AXIS CORRECTION FOR PITCHING MOMENTS
LAMTXR =      .7000                                 X-AXIS CORRECTION FOR YAWING MOMENTS
LAMTZU =     1.0000                                 Z-AXIS CORRECTION FOR PITCHING MOMENTS

-----STALL PARAMETERS
AL1T    =  .5236E+00 RADIANS                        LONGITUDINAL TAIL STALLING PARAMETERS
AL2T    =  .6981E+00 RADIANS
BETA1T  =  .5236E+00 RADIANS                        LATERAL TAIL STALL PARAMETERS
BETA2T  =  .6981E+00 RADIANS
ALP1T   =  .5236E+00 RADIANS                        TAIL ROLLING STALL PARAMETERS
ALP2T   =  .6981E+00 RADIANS

-----TAIL SURFACE EFFECTIVENESS PARAMETERS
TAUA    =  .5000E+00 (SEC**2) / (FT**2)             AILERON
TAUE    =  .5000E+00 (SEC**2) / (FT**2)             ELEVATOR
TAUR    =  .5000E+00 (SEC**2) / (FT**2)             RUDDER
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---------------------------------------------INTERFERENCE CONSTANTS ON ROTOR--------

-----SHADOW CONSTANTS ROTOR 1
BWK1R1 =  .1745E+01 RADIANS                       BETA WAKE ANGLE 1
BWK2R1 =  .2967E+01 RADIANS                       BETA WAKE ANGLE 2
MXBDR1 =  .8500E+00                               BETA WAKE MAXIMUM DEFECT
LWK1R1 =  .1310E+01 RADIANS                       LAMBDA WAKE ANGLE 1
LWK2R1 =  .2880E+01 RADIANS                       LAMBDA WAKE ANGLE 2
MXLDR1 =  .8500E+00                               LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 2
BWK1R2 =  .3316E+01 RADIANS                       BETA WAKE ANGLE 1
BWK2R2 =  .4538E+01 RADIANS                       BETA WAKE ANGLE 2
MXBDR2 =  .8500E+00                               BETA WAKE MAXIMUM DEFECT
LWK1R2 =  .3403E+01 RADIANS                       LAMBDA WAKE ANGLE 1
LWK2R2 =  .4974E+01 RADIANS                       LAMBDA WAKE ANGLE 2
MXLDR2 =  .8500E+00                               LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 3
BWK1R3 =  .1745E+00 RADIANS                       BETA WAKE ANGLE 1
BWK2R3 =  .1396E+01 RADIANS                       BETA WAKE ANGLE 2
MXBDR3 =  .8500E+00                               BETA WAKE MAXIMUM DEFECT
LWK1R3 =  .1310E+01 RADIANS                       LAMBDA WAKE ANGLE 1
LWK2R3 =  .2880E+01 RADIANS                       LAMBDA WAKE ANGLE 2
MXLDR3 =  .8500E+00                               LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 4
BWK1R4 =  .4887E+01 RADIANS                       BETA WAKE ANGLE 1
BWK2R4 =  .6109E+01 RADIANS                       BETA WAKE ANGLE 2
MXBDR4 =  .8500E+00                               BETA WAKE MAXIMUM DEFECT
LWK1R4 =  .3403E+01 RADIANS                       LAMBDA WAKE ANGLE 1
LWK2R4 =  .4974E+01 RADIANS                       LAMBDA WAKE ANGLE 2
MXLDR4 =  .8500E+00                               LAMBDA WAKE MAXIMUM DEFECT

-----HULL ON ROTOR CONSTANTS
KHRA1   =  .1200E+02 LB / (FT**2)                 ROTOR 1  A
KHRB1   =  .3330E-01                              ROTOR 1  B
KHRA2   =  .1200E+02 LB / (FT**2)                 ROTOR 2  A
KHRB2   =  .3330E-01                              ROTOR 2  B
KHRA3   =  .1200E+02 LB / (FT**2)                 ROTOR 3  A
KHRB3   =  .3330E-01                              ROTOR 3  B
KHRA4   =  .1200E+02 LB / (FT**2)                 ROTOR 4  A
KHRB4   =  .3330E-01                              ROTOR 4  B

-----GROUND ON ROTOR CONSTANTS
KGR1    = -.2000E+01
KGR2    = -.2000E+01
KGR3    = -.2000E+01
KGR4    = -.2000E+01
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---------------------------------------------INTERFERENCE CONSTANTS ON PROPELLER--------

-----SHADOW CONSTANTS PROPELLER 1
BWK1P1 =  .1745E+01 RADIANS                    BETA WAKE ANGLE 1
BWK2P1 =  .2967E+01 RADIANS                    BETA WAKE ANGLE 2
MXBDP1 =  .8500E+00                            BETA WAKE MAXIMUM DEFECT
LWK1P1 =  .1310E+01 RADIANS                    LAMBDA WAKE ANGLE 1
LWK2P1 =  .2880E+01 RADIANS                    LAMBDA WAKE ANGLE 2
MXLDP1 =  .8500E+00                            LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 2
BWK1P2 =  .3316E+01 RADIANS                    BETA WAKE ANGLE 1
BWK2P2 =  .4538E+01 RADIANS                    BETA WAKE ANGLE 2
MXBDP2 =  .8500E+00                            BETA WAKE MAXIMUM DEFECT
LWK1P2 =  .3403E+01 RADIANS                    LAMBDA WAKE ANGLE 1
LWK2P2 =  .4974E+01 RADIANS                    LAMBDA WAKE ANGLE 2
MXLDP2 =  .8500E+00                            LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 3
BWK1P3 =  .1745E+00 RADIANS                    BETA WAKE ANGLE 1
BWK2P3 =  .1396E+01 RADIANS                    BETA WAKE ANGLE 2
MXBDP3 =  .8500E+00                            BETA WAKE MAXIMUM DEFECT
LWK1P3 =  .1310E+01 RADIANS                    LAMBDA WAKE ANGLE 1
LWK2P3 =  .2880E+01 RADIANS                    LAMBDA WAKE ANGLE 2
MXLDP3 =  .8500E+00                            LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 4
BWK1P4 =  .4887E+01 RADIANS                    BETA WAKE ANGLE 1
BWK2P4 =  .6109E+01 RADIANS                    BETA WAKE ANGLE 2
MXBDP4 =  .8500E+00                            BETA WAKE MAXIMUM DEFECT
LWK1P4 =  .3403E+01 RADIANS                    LAMBDA WAKE ANGLE 1
LWK2P4 =  .4974E+01 RADIANS                    LAMBDA WAKE ANGLE 2
MXLDP4 =  .8500E+00                            LAMBDA WAKE MAXIMUM DEFECT

-----HULL ON PROPELLER CONSTANTS
KHPA1   =  .1200E+02 LB / (FT**2)              PROPELLER 1  A
KHPB1   =  .3330E-01                           PROPELLER 1  B
KHPA2   =  .1200E+02 LB / (FT**2)              PROPELLER 2  A
KHPB2   =  .3330E-01                           PROPELLER 2  B
KHPA3   =  .1200E+02 LB / (FT**2)              PROPELLER 3  A
KHPB3   =  .3330E-01                           PROPELLER 3  B
KHPA4   =  .1200E+02 LB / (FT**2)              PROPELLER 4  A
KHPB4   =  .3330E-01                           PROPELLER 4  B

-----ROTOR ON PROPELLER CONSTANTS
KRP1    =  .1600E+01                           LPU 1
KRP2    =  .1600E+01                           LPU 2
KRP3    =  .1600E+01                           LPU 3
KRP4    =  .1600E+01                           LPU 4

-----GROUND ON PROPELLER CONSTANTS
KGP1    = -.2000E+01                           LPU 1
KGP2    = -.2000E+01                           LPU 2
KGP3    = -.2000E+01                           LPU 3
KGP4    = -.2000E+01                           LPU 4
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----------------------------------------------INTERFERENCE CONSTANTS ON FUSELAGE----------

-----SHADOW CONSTANTS FUSELAGE 1
BWK1F1 =  .1745E+01 RADIANS                       BETA WAKE ANGLE 1
BWK2F1 =  .2967E+01 RADIANS                       BETA WAKE ANGLE 2
MXBDF1 =  .8500E+00                               BETA WAKE MAXIMUM DEFECT
LWK1F1 =  .1310E+01 RADIANS                       LAMBDA WAKE ANGLE 1
LWK2F1 =  .2880E+01 RADIANS                       LAMBDA WAKE ANGLE 2
MXLDF1 =  .8500E+00                               LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 2
BWK1F2 =  .3316E+01 RADIANS                       BETA WAKE ANGLE 1
BWK2F2 =  .4538E+01 RADIANS                       BETA WAKE ANGLE 2
MXBDF2 =  .8500E+00                               BETA WAKE MAXIMUM DEFECT
LWK1F2 =  .3403E+01 RADIANS                       LAMBDA WAKE ANGLE 1
LWK2F2 =  .4974E+01 RADIANS                       LAMBDA WAKE ANGLE 2
MXLDF2 =  .8500E+00                               LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 3
BWK1F3 =  .1745E+00 RADIANS                       BETA WAKE ANGLE 1
BWK2F  =  .1396E+01 RADIANS                       BETA WAKE ANGLE 2
MXBDF3 =  .8500E+00                               BETA WAKE MAXIMUM DEFECT
LWK1F3 =  .1310E+01 RADIANS                       LAMBDA WAKE ANGLE 1
LWK2F3 =  .2890E+01 RADIANS                       LAMBDA WAKE ANGLE 2
MXLDF3 =  .8500E+00                               LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 4
BWK1F4 =  .4887E+01 RADIANS                       BETA WAKE ANGLE 1
BWK2F4 =  .6109E+01 RADIANS                       BETA WAKE ANGLE 2
MXBDF4 =  .8500E+00                               BETA WAKE MAXIMUM DEFECT
LWK1F4 =  .3403E+01 RADIANS                       LAMBDA WAKE ANGLE 1
LWK2F4 =  .4974E+01 RADIANS                       LAMBDA WAKE ANGLE 2
MXLDF4 =  .8500E+00                               LAMBDA WAKE MAXIMUM DEFECT

-----ROTOR ON FUSELAGE CONSTANTS
KRF1   =  .1600E+01                               FUSELAGE 1
KRF2   =  .1600E+01                               FUSELAGE 2
KRF3   =  .1600E+01                               FUSELAGE 3
KRF4   =  .1600E+01                               FUSELAGE 4

-----PROPELLER ON FUSELAGE CONSTANTS
KPF1   =  .1600E+01
KPF2   =  .1600E+01
KPF3   =  .1600E+01
KPF4   =  .1600E+01
```

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----------------------------------------------------INTERFERENCE CONSTANTS ON HULL---------

-----GROUND ON HULL CONSTANTS
KGHA   = -.4100E+01                                A CONSTANT
KGHB   = -.4100E+01                                B CONSTANT

-----ROTOR 1 ON HULL
KRHA1  = 0.          SEC / FT
KRHB1  =  .1000E-03 (SEC**2) / (FT**2)
KRHC1  =  .2000E+00
KRHD1  = -.4300E-01
KRHE1  =  .3330E-01

-----ROTOR 2 ON HULL
KRHA2  = 0.          SEC / FT
KRHB2  =  .1000E-03 (SEC**2) / (FT**2)
KRHC2  =  .2000E+00
KRHD2  =  .4300E-01
KRHE2  =  .3330E-01

-----ROTOR 3 ON HULL
KRHA3  = 0.          SEC / FT
KRHB3  =  .1000E-03 (SEC**2) / (FT**2)
KRHC3  = -.2000E+00
KRHD3  = -.4300E-01
KRHE3  =  .3330E-01

-----ROTOR 4 ON HULL
KRHA4  = 0.          SEC / FT
KRHB4  =  .1000E-03 (SEC**2) / (FT**2)
KRHC4  = -.2000E+00
KRHD4  =  .4300E-01
KRHE4  =  .3330E-01

-----PROPELLER 1 ON HULL
KPHA1  = 0.          SEC / FT
KPHB1  =  .5390E-05 (SEC**2) / (FT**2)
KPHC1  =  .1090E-01
KPHD1  = -.2380E-02
KPHE1  =  .1830E-02

-----PROPELLER 2 ON HULL
KPHA2  = 0.          SEC / FT
KPHB2  =  .5390E-05 (SEC**2) / (FT**2)
KPHC2  =  .1090E-01
KPHD2  = -.2380E-02
KPHE2  =  .1830E-02

-----PROPELLER 3 ON HULL
KPHA3  = 0.          SEC / FT
KPHB3  =  .5390E-05 (SEC**2) / (FT**2)
KPHC3  = -.1090E-01
KPHD3  = -.2380E-02
KPHE3  =  .1830E-02

-----PROPELLER 4 ON HULL
KPHA4  = 0.          SEC / FT
KPHB4  =  .5390E-05 (SEC**2) / (FT**2)
KPHC4  = -.1090E-01
KPHD4  = -.2380E-02
KPHE4  =  .1830E-02
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--------------------------------------------------INTERFERENCE CONSTANTS ON TAIL----

-----ROTOR 1 ON TAIL CONSTANTS
KRTA1  =  .1400E-01
KRTB1  = -.5700E-02
KRTC1  =  .5100E-02

-----ROTOR 2 ON TAIL CONSTANTS
KRTA2  =  .1400E-01
KRTB2  =  .5700E-02
KRTC2  =  .5100E-02

-----ROTOR 3 ON TAIL CONSTANTS
KRTA3  =  .3040E-01
KRTB3  = -.1240E-01
KRTC3  =  .1100E-01

-----ROTOR 4 ON TAIL CONSTANTS
KRTA4  =  .3040E-01
KRTB4  =  .1240E-01
KRTC4  =  .1100E-01

-----PROPELLER 1 ON TAIL CONSTANTS
KPTA1  =  .7600E-03
KPTB1  = -.3070E-03
KPTC1  =  .2750E-03

-----PROPELLER 2 ON TAIL CONSTANTS
KPTA2  =  .7600E-03
KPTB2  =  .3070E-03
KPTC2  =  .2750E-03

-----PROPELLER 3 ON TAIL CONSTANTS
KPTA3  =  .1640E-02
KPTB3  = -.5580E-03
KPTC3  =  .5930E-03

-----PROPELLER 4 ON TAIL CONSTANTS
KPTA4  =  .1640E-02
KPTB4  =  .5580E-03
KPTC4  =  .5930E-03

-----GROUND ON TAIL CONSTANTS
KGTA   = -.3177E 02 (SEC**2) / (FT**2)
KGTB   =  .1600E+02 (SEC**2) / (FT**2)
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---ROTOR AND PROPELLER SPIN RATES ---------------------

OMEGR1 =	23.2500 RAD./SEC.	ROTOR 1 SPIN RATE
OMEGR2 =	23.2500 RAD./SEC.	ROTOR 2 SPIN RATE
OMEGR3 =	23.2500 RAD./SEC.	ROTOR 3 SPIN RATE
OMEGR4 =	23.2500 RAD./SEC.	ROTOR 4 SPIN RATE
OMEGP1 =	125.0000 RAD./SEC.	PROPELLER 1 SPIN RATE
OMEGP2 =	125.0000 RAD./SEC.	PROPELLER 2 SPIN RATE
OMEGP3 =	125.0000 RAD./SEC.	PROPELLER 3 SPIN RATE
OMEGP4 =	125.0000 RAD./SEC.	PROPELLER 4 SPIN RATE

--MECHANICAL FLIGHT CONTROL SYSTEM CONSTANTS-----------------

THEMAX =	.5000 RADIANS	MAXIMUM ROTOR COLLECTIVE PITCH ANGLE
A1SMAX =	.5000 RADIANS	MAXIMUM ROTOR LATERAL CYCLIC PITCH ANGLE
B1SMAX =	.5000 RADIANS	MAXIMUM ROTOR LONGITUDINAL CYCLIC PITCH ANGLE
THEPMX =	.5000 RADIANS	MAXIMUM PROPELLER COLLECTIVE PITCH ANGLE
DLAMAX =	.1000E+01 RADIANS	MAXIMUM TAIL AILERON DEFLECTION
DELEMX =	.1000E+01 RADIANS	MAXIMUM TAIL ELEVATOR DEFLECTION
DERUMX =	.1000E+01 RADIANS	MAXIMUM TAIL RUDDER DEFLECTION

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--------------------------------  ---------------INERTIAL VEHICLE STATE INPUTS--------------------------------------------

-----HULL CG REFERENCE AXES VELOCITY VECTOR WITH RESPECT TO INERTIAL SPACE
VHUL   =    14.00,     0.C0,     0.00 FT./SEC.

-----HULL CG REFERENCE AXES INERTIAL POSITION IN INERTIAL COORDINATES
HULPOS =     0.00,     0.C0, -1000.00 FEET

-----EULER ANGLE RATES OF HULL CG REFERENCE AXES WITH RESPECT TO AN INERTIAL FRAME:  PHIDOT, THEDOT PSIDOT
HULLER =     0.00,     0.C0,     0.00 RAD./SEC.

-----EULER ANGLES OF THE HULL CG REFERENCE AXES WITH RESPECT TO AN INERTIAL FRAME :  PHI, THETA, PSI
HULEUL =     0.00,     0.C0,     0.00 RADIANS

---------------------------------------------ATMOSPHERIC PARAMETER INPUTS---------------------------------------------

AIRDEN =  .2378E-02                         SLUG / (FT**3)      REFERENCE ATMOSPHERIC DENSITY
DENRAT =    1.0000                                              DENSITY RATIO
GRAV   =  .3217E+02                         FT./(SEC.**2)       EARTHS GRAVITATIONAL ACCELERATION
VWIND  =   -30.00,     0.00,      0.0.     FT./SEC.            STEADY WIND VECTOR IN INERTIAL FRAME COORDINATES

------------------------------------ -------------STABILITY DERIVATIVE FLAGS------------------------------------------ -

DERVFL = T                                    STABILITY DERIVATIVES TO BE CALCULATED
AMATFL = T                                    A MATRIX
BMATFL = T                                    B MATRIX
BPMTFL = T                                    B PRIME  MATRIX
CMATFL = T                                    C MATRIX
CPMTFL = T                                    ALL CONSTRAINT FORCE (AUXILIARY) MATRICES

  TRIM CASE NUMBER      1

  THIS TRIM CONVERGED SATISFACTORILY

  TRIM ALGORITHM CONTROL
  ITERATIONS =   20     RESTARTS =    0     CONV. CRIT. =   .896E-11
  UDCNTL =   .09948 VDCNTL =  -.00533 WDCNTL =  -.04279 PCONTL =  -.00323 GLONTL =  -.C0124 RCONTL =   .00241
  CONTROL LIMITS FLAGGED DURING TRIM
     TTHER                 TTHEP                 TAISR                 TAISL           SRCPTX    AILERON  ELEVATOR  [illegible]
 0   0   0   0         0   0   0   0         0   0   0   0         0   0   0   0
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SIMULATION TIME -- -.660

	U	V	W	P	Q	R	X	Y	Z	
NULL	14.000	0.	0.	0.	0.	0.	0.	0.	-1000.0	0.
	THETA	PSI	AXCGG	AYCGG	AZCGG	NDIHT	NDTHT	VHGUST:X	VHGUST:Y	VHGUST:Z
NULL	0.	0.	-.27680E-11	-.58973E-13	-.17832E-13	9.8702	9.2421	0.	0.	0.
	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DVGDYI	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	CHGUST:X
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	UDHGST:Y	UDHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	PGDIAC:X	PGDIAC:Y
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	M[illegible]HAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	UTGUST:X	CTGUST:Y	UTGUST:Z	DUGDXT	DU[illegible]DYT	DV[illegible]
NULL	[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
	VDRTGT:X	VDRTGT:Y	VDRTGT:Z	UDTGST:X	UDTGST:Y	UDTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	PGD[illegible]:X
NULL	0.	0.	0.	0.	0.	0.	0.	0	0.	[illegible]
	MGDTAC:Y	MGDTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	RC LCV:X	RCHLCV:Y	RCHLCV:Z	CA[illegible]H	L[illegible]H
NULL	0.	0.	44.133	.38120E-01	-.60422	0.	0.	0.	0.	3.[illegible]9
	ZETAH	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	P[illegible]
NULL	-3.0359	1.5705	43.539	.74702E-03	-.16723	0.	0.	0.	-.32195E-02	-.3[illegible]19[illegible]
	BETAT	PBETAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:X
NULL	-.11898E-02	-.11898E-02	0.	.10157E-02	.10157E-02	0.	-.13382	.26[illegible]19E-02	.65760	.3 254[illegible]
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	PCHLWC	PCHLWC
NULL	-.40782E-01	.31623E-01	.44055	.55155E-03	.15973	.20723E-01	-.12986E-02	.74947E-02	.6723[illegible]E-01	[illegible]12.[illegible]
	C[illegible]HLDAC	TIAC	TLCC	ZAVSOI	RHBFOR:X	RHBFOR:Y	RHBFOR:Z	STATBF:X	STATBF:Y	STATBF:Z
NULL	-30.017	1.0001	1.0000	-4.1410	0.	0.	-.11476E+06	0.	0.	-.11476E+[illegible]
	GAMGFO:X	GAMGFO:Y	GAMGFO:Z	GGMGFO:X	GGMGFO:Y	GGH FO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	RHOA[illegible]C
NULL	0.	0.	0.	0.	0.	0.	-805.60	-.77982	13.143	0.
	RHOAMO:Y	RHOAMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-43861.	-2443.6	0.	0.	0.	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHCGMO:X	RHC MO:Y	RHCGMO:Z
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
NULL	0.	.[illegible]39E-18	0.	0.	0.	0.	.52403E-07	-.82C0[illegible]E-01	.19917E-08	0.
	HCACMO:Y	HCACMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCA[illegible]:X	HCA[illegible]:Y
NULL	.20212E-05	-.20926E-05	-805.60	-.77982	13.148	0.	-43861.	-2443.6	-80.[illegible]	-.7[illegible]
	HOABF :Z	HOABMO:X	HOABMO:Y	HOABMO:Z	HCTAFO:X	HCTAFO:Y	HCTAFO:Z	HCTAMO:X	HCTAMO:Y	HCTAMO:Z
NULL	-.11475E+00	-13.301	-30404.	-2443.6	-805.60	-.79952	-.11475E+06	-13.301	-30[illegible]	-2443.
	TXFOR	TSYFOR	TDYFOR	TSZFOR	TSLMOM	TDLMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RTCAMO
NULL	-261.41	0.0053	0.	25.281	6.7599	-237.83	-261.41	6.0063	25.2[illegible]	-231.0[illegible]
	RTOAMO:Y	RTOAMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTC MO:X	RTCGMO:Y	RTCGMO:Z
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

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      TCALFO:X    TCALFO:Y    TCALFO:Z    TCALMO:X    TCALMO:Y    TCALMO:Z    RTOAF :X    RTCAF :Y    RTCAF :Z    RTOAM[illegible]
NULL  0.          .326094E-07 .299860E-07 .633160E-06 .217892E-08 -.311770E-08 -261.41    6.0063      25.28.      -23[illegible]

      RTOAMO:Y    RTOAMO:Z    TOAFOR:X    TOAFOR:Y    TOAFOR:Z    TOAMOM:X    TOAMOM:Y    TOAMOM:Z    TCTFOR:X    TCTFOR:Y
NULL  0.          0.          -261.41     6.0063      25.281      -131.14     5895.6      -367.89     -261.41     6.0063

      TOTAFO:Z    TOTAMO:X    TOTAMO:Y    TOTAMO:Z    HABFOR:X    HABFOR:Y    HABFOR:Z    HABMOM:X    HABMOM:Y    HABMOM:Z
NULL  25.281      -231.03     [illegible]7832E-03 -.311770E-08 -1067.0  5.2065   -.11473+06  -144.44     -24966.     -28.1[illegible]

      HBACFO:X    HBACFO:Y    HBACFO:Z    HBACMO:X    HBACMO:Y    HBACMO:Z    HTOTAF:X    HTOTAF:Y    HTOTAF:Z    HTOTAM:X
NULL  .329032E-07 .320732E-07 .314772E-07 .116650E-05 .37673E-05  -.577391E-05 -1067.0    5.2065      -.11473+06  -144.4[illegible]

      HTOTAM:Y    HTOTAM:Z    HCBLFO:X    HCBLFO:Y    HCBLFO:Z    HCBLMO:X    HCBLMO:Y    HCBLMO:Z    HGEXFO:X    HGEXFO:Y
NULL  -24966.     -281.63     0.          0.          0.          0.          0.          0.          0.          0.

      HGEXFO:Z    HGEXMO:X    HGEXMO:Y    HGEXMO:Z    MORLOD:X    MORLOD:Y    MORLOD:Z    NOZLOD:X    NOZLOD:Y    NOZLOD:Z
NULL  0.          0.          0.          0.          I           I           I           I           I

      UCOM        VCOM        WCOM        PHICOM      THECOM      TRATCM      PHREF:X     PHREF:Y     PHREF:Z     PHREF:[illegible]
NULL  I           I           I           I           I           I           I           I           I

      VHSENS:X    VHSENS:Y    VHSENS:Z    XSPEED      YSPEED      ZSPEED      AXACC       AYACC       AZACC       RELEPT
NULL  I           I           I           I           I           I           I           I           I

      PTCHRT      YORRRT      IACCLC:X    IACCLC:Y    IACCLC:Z    UERR        VERR        HDTERP      PHIERR      THE[illegible]
NULL  I           I           I           I           I           I           I           I           I

      TRATER      IERR:X      IERR:Y      IERR:Z      PSIERR      UINT        VINT        HDTINT      PHIINT      THEINT
NULL  I           I           I           I           I           C.          C.          C.          C.          C.

      TRTINT      UCONTL      VCONTL      WCONTL      PCONTL      QCONTL      RCONTL      SOLTAL      SOLTEL      SOLTRA
NULL  0.          I           I           I           I           I           I           I           I

      PULTAL      PULTEL      PULTRD      DELTAL      DELTEL      DELTRD
NULL  I           I           I           .323150E-02 .124310E-02 -.240590E-02
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LPU VARIABLES AT TIME -- [illegible]

	U	V	W	PHID	THTD	PSID	X	Y	Z	[illegible]
LPU1	13.991	0.	.49990	0.	0.	0.	37.895	-81.500	-96[illegible]	0.
LPU2	13.991	0.	-.49990	0.	0.	0.	38.105	81.500	-96[illegible]	0.
LPU3	13.991	0.	.49990	0.	0.	0.	-38.105	-81.500	-96[illegible]	0.
LPU4	13.991	0.	-.49990	0.	0.	0.	-37.897	81.500	-96[illegible]	0.

	THETA	PSI	NORMT	NOPMT	GERIL :X	GERIL :Y	GERIL :Z	IVSCP :X	IVSJP :Y	IVSLP :Z
LPU1	.35000E-01	0.	17.279	73.368	36.000	-46.000	-951.31	I	I	
LPU2	-.35000E-01	0.	17.279	73.293	36.000	46.000	-951.31	I	I	
LPU3	.35000E-01	0.	7.279	73.368	-36.000	-46.000	-951.31	I	I	
LPU4	-.35000E-01	0.	17.279	73.293	-36.000	46.000	-951.31	I	I	

	VSORC :X	VSORC :Y	VSORC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	R[illegible]
LPU1	I	I	I	0.	0.	0.	43.973	0.	1.1397	52.[illegible]
LPU2	I	I	I	0.	0.	0.	43.973	0.	-1.1397	5[illegible]77
LPU3	I	I	I	0.	0.	0.	43.973	0.	1.1397	5[illegible]7
LPU4	I	I	I	0.	0.	0.	43.973	0.	-1.1397	5[illegible]

	RVFUS :Y	RVFUS :Z	RVROT :X	RVROT :Y	RVROT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RPIV :X	[illegible]
LPU1	-.40207E-01	-5.7136	43.973	0.	1.5397	44.384	-.40207E-01	-5.9946	-.41140	.40207 -[illegible]
LPU2	-.40482E-01	-9.3332	43.973	0.	-1.5397	44.314	-.40482E-01	-9.1291	-.34119	.40482 -[illegible]
LPU3	-.43070E-01	-6.2506	43.973	0.	1.5397	44.414	-.43070E-01	-6.5311	-.44070	.43070E-[illegible]
LPU4	-.43323E-01	-9.0640	43.973	0.	-1.5397	44.338	-.43323E-01	-9.6617	-.34514	.43323 -[illegible]

	RPIV :Z	KFIV :X	KFIV :Y	KFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCSKE	DELTA K	[illegible] HS
LPU1	7.5342	-.41140	.40207E-01	7.5342	-7.4776	0.	-.28097	3.6938	.34114E-02	1.0000
LPU2	7.5894	-.34119	.40432E-01	7.5894	-5.5632	0.	.20410	3.6974	.341[illegible]E-02	1.0000
LPU3	8.0708	-.44070	.43070E-01	8.0708	-7.9630	0.	-.28046	3.7113	.34173E-02	1.0000
LPU4	8.1221	-.34514	.43323E-01	8.1221	-5.6272	0.	.20285	3.7150	.34284E-02	1.0000

	LCSPE	DELTA P	UEPP	STHER	SAISR	SASR	SCMGR	PTHCR	PAISP	PHISP
LPU1	3.7257	.65000E-02	1.0000	I	I	I	I	I	I	
LPU2	3.6481	.64605E-02	1.0000	I	I	I	I	I	I	
LPU3	3.7257	.65000E-02	1.0000	I	I	I	I	I	I	
LPU4	3.6473	.64604E-02	1.0000	I	I	I	I	I	I	

	THEOR	AISK	BISK	OMEGR	STHEP	SCMGP	PTHLP	THEOP	CP.GP	TR
LPU1	.50316E-01	-.53286E-02	.54550E-01	23.250	I	I	I	.10188	129.66	2449.7
LPU2	.44781E-01	-.53286E-02	.44926E-01	23.250	I	I	I	.97070E-01	129.66	2422.4
LPU3	.40604E-01	-.53255E-02	.54550E-01	23.250	I	I	I	.10188	129.66	26[illegible].7
LPU4	.47267E-01	-.53280E-02	.44926E-01	23.250	I	I	I	.97070E-01	129.66	26[illegible]

	QR	ROTFU :X	ROTFU :Y	ROTFU :Z	ROTMO :X	ROTMO :Y	ROTMO :Z	TP	CP	PR.FF :X
LPU1	5134.8	97.871	-1.0277	-2448.0	-292.75	-657.74	5127.0	158.99	20[illegible].43	15[illegible].84
LPU2	5430.0	74.108	-1.4330	-2401.6	-234.24	-4[illegible].62	5424.4	114.85	187.70	11[illegible].8[illegible]
LPU3	5214.6	102.54	-1.1547	-2624.9	-292.40	-711.02	5206.8	15[illegible].94	20[illegible].42	15[illegible].6[illegible]
LPU4	5532.5	79.993	-.77402	-2659.5	-253.89	-530.47	5527.0	114.39	167.5[illegible]	11[illegible].7

	PROPF :Y	PROPF :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFO :X	FUSFO :Y	FUSFC :Z	FUSMO :X	FUSMC :Y
LPU1	.76904E-02	7.0772	-203.30	-99.081	-7.1550	-60.320	.32494E-03	21.089	0.	0.
LPU2	.74519E-02	-2.6007	-137.59	36.410	6.0343	-55.391	.32940E-03	56.27[illegible]	0.	0.
LPU3	.84525E-02	7.5923	-200.29	-100.55	-7.1467	-60.355	.37287E-03	25.240	0.	0.
LPU4	.79760E-02	-2.4066	-137.42	34.515	6.0350	-55.364	.37720E-03	62.[illegible]	0.	0.

	FUSMO :Z	DETHS	JETFO :X	JETFO :Y	JETFO :Z	JETMO :X	JETMO :Y	JETMO :Z	LPAFO :X	LPAFO :Y
LPU1	0.	100.00	98.545	0.	-16.997	0.	-463.60	0.	29[illegible].9[illegible]	-1.[illegible]195
LPU2	0.	100.00	98.545	0.	-16.997	0.	-46[illegible]	0.	23[illegible].0[illegible]	-1.[illegible]753
LPU3	0.	100.00	98.545	0.	-16.997	0.	-46[illegible]	0.	30[illegible]	-1.146[illegible]
LPU4	0.	100.00	98.545	0.	-16.997	0.	-45[illegible]	0.	23[illegible]	-.7[illegible]

	LPAFO :Z	LPAFO :X	LPAMO :Y	LPAMO :Z	HCBLF :X	HCBLF :Y	HCBLF :Z	HCBLP :X	HCBLP :Y	HCBLP :Z
LP01	-2436.6	-499.05	-1222.4	5119.7	0.	0.	0.	0.	0.	0.
LP02	-2444.9	-442.83	-917.02	5431.1	0.	0.	0.	0.	0.	0.
LP03	-2039.5	-493.5[illegible]	-1277.2	5[illegible]9.7	0.	0.	0.	0.	0.	0.
LP04	-2310.1	-441.31	-901.20	5533.[illegible]	0.	0.	0.	0.	0.	0.

	GCPRS	GCFOR :X	GCFOR :Y	GCFOR :Z	FRIMG	GFFOR :X	GFFOR :Y	GFFOR :Z	GERFO :X	G[illegible]FC :
LP01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LP02	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LP03	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LP04	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFO :Z	HGRMO :X	HGRMO :Y	HGRMO :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM [illegible]
LP01	0.	0.	0.	0.	209.48	-1.8195	6547.0	-32[illegible].04	-11[illegible]3.2	51[illegible]
LP02	0.	0.	0.	0.	317.51	-1.4753	6557.3	-636.03	-2559.3	5412.[illegible]
LP03	0.	0.	0.	0.	211.06	-1.1460	6374.2	-319.86	-1240.8	52[illegible]
LP04	0.	0.	0.	0.	326.95	-.70560	6336.4	-636.97	-2617.9	5514.[illegible]

	AOR	AIR	BIR	CLAVR	ALAVR	VT	THINR	RCTIV :X	RCTIV :Y	RCTIV :Z
LP01	.507[illegible]E-01	.57005E-02	.45840E-02	.95049E-01	.25732E-01	14.461	4.7160	-.25712	.2[illegible]12[illegible]E-01	4.[illegible]089
LP02	.52020E-01	.63496E-02	.47370E-02	.96319E-01	.2605[illegible]E-01	14.557	4.7482	-.21325	.[illegible]01E-01	4.74[illegible]4
LP03	.54154E-01	.61390E-02	.45905E-02	.10192	.27462E-01	14.975	5.0516	-.27544	.2[illegible]919[illegible]-01	5.04[illegible]2
LP04	.56023E-01	.67284E-02	.50440E-02	.10322	.27780E-01	15.070	5.0815	-.22821	.27077E-01	5.07[illegible]3

	DSALR	POWER R	CLAVP	ALAVP	VTP	THINP	PPPIV :X	PPPIV :Y	PPPIV :Z	DSALP
LP01	.99459	217.06	.40008E-01	.22349E-01	15.749	4.9092	-4.9862	0.	-.1[illegible]560	1.1795
LP02	1.0079	229.54	.33235E-01	.91103E-02	13.385	3.0667	-3.5645	0.	.12756	.[illegible]21.
LP03	1.0065	220.44	.40005E-01	.12349E-01	15.746	4.9803	-4.[illegible]772	0.	-.17529	1.1795
LP04	1.0001	233.36	.33102E-01	.90757E-02	13.359	3.0442	-3.0420	0.	.12675	.8[illegible]7.

	POWER P	COUNT	GRAT
LP01	47.163	3.3200	0.
LP02	42.583	3.3200	0.
LP03	47.160	3.3200	0.
LP04	42.646	3.3200	0.

TAIL AERODYNAMIC REGIMES ANGLE OF ATTACK - 1 ANGLE OF SLIDESLIP - 1 ROLLING ANGLE OF ATTACK - 1

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STABILITY DERIVATIVES AND EIGENVALUES FOR TRIM CASE 1

EQUATION FORM

[ADOT] = [A] [DUDAR] + [UPRIM] [DULCAR] + [B] [DUCRAR] + [C] [A]

UDOT
VDOT
WDOT
PDOT
QDOT
RDOT
XDOT
YDOT
ZDOT
PHIDOT
THETADOT
PSIDOT

A MATRIX

-.232E-01	.244E-02	-.113E-01	.265E+00	.110E+01	.670E-01	0.	0.	-.524E-10	.552E-03	-.150E+01	-.145E+0[illegible]	[illegible]
.461E-04	-.201E-0[illegible]	.187E-03	-.644E+00	-.643E-01	.204E+01	0.	0.	.121E-12	.1[illegible]6E+01	.578E-02	.2[illegible]2E+0[illegible]	[illegible]
-.331E-02	.256E-0[illegible]	-.141E+00	-.705E-01	-.317E+01	-.845E-0[illegible]	0.	0.	.416E-09	.563E-03	-.326E+01	-.144E+0[illegible]	[illegible]
.339E-04	-.267E-02	-.301E-04	-.273E+00	.467E-02	.145E+00	0.	0.	-.565E-14	-.197E+00	-.376E-03	.145E+0[illegible]	[illegible]
-.102E-04	-.142E-04	.232E-02	.212E-02	-.142E+00	-.156E-01	0.	0.	.723E-11	-.760E-04	-.315E-01	.783E-0[illegible]	[illegible]
.444E-05	-.810E-03	-.575E-04	-.363E-01	.352E-03	-.639E-01	0.	0.	-.665E-15	-.765E-02	-.173E-02	-.720E-0[illegible]	[illegible]
.100E+01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	.100E+01	0.	0.	0.	0.	0.	0.	0.	0.	0.	.140E+0[illegible]	[illegible]
0.	0.	.100E+01	0.	0.	0.	0.	0.	0.	0.	-.140E+02	0.	[illegible]
0.	0.	0.	.100E+01	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	.100E+01	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	.100E+01	0.	0.	0.	0.	0.	0.	[illegible]

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B PRIME MATRIX

.693E+01	.674E-02	-.199E+01	-.167E+01	-.227E+01	.429E+00	DUDCNTL
-.272E-01	.152E+01	-.453E-01	-.315E+01	-.441E-02	.174E+01	DVDCNTL
.174E+01	.699E-02	.392E+02	-.127E+00	-.261E+01	-.104E+00	DWDCNTL
.823E-03	-.206E-01	-.311E-02	.133E+01	.637E-03	-.233E+00	DPCCNTL
.349E-01	-.853E-03	-.476E-01	-.111E-01	.432E+00	.245E-02	DQCCNTL
-.206E-02	.637E-03	.157E-01	.446E-01	.151E-02	.119E+00	DRCCNTL
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	

B MATRIX

-.475E+00	.156E-02	.540E+00	-.114E-02	.155E+01	.141E-02	DTHEOR1
-.765E+00	.384E+00	.117E+00	-.222E-02	.109E+00	.569E-04	DAISR1
-.106E+02	.143E-02	.104E+01	-.286E-01	-.636E-01	-.586E-04	DBISR1
.331E+00	-.476E-02	-.327E-01	.903E-03	.160E-02	.138E-0[illegible]	DOMEGR1
.116E+00	-.207E-03	-.914E-02	.315E-03	.820E-02	.747E-03	DTHEOP1
.723E-02	.339E-02	.591E-02	.321E-04	.168E-01	.171E-04	DCMEGP1
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	

.363E+00	.179E-02	.465E+00	.127E-02	.149E+01	.126E-02	DTHEOR2
.788E+00	.390E+00	-.116E+00	.219E-02	-.123E+00	-.103E-03	DAISR2
-.105E+02	.195E-02	.105E+01	-.317E-01	-.336E-01	-.292E-04	DBISR2
-.329E+00	-.476E-02	.325E-01	-.987E-03	-.124E-02	-.118E-05	DOMEGR2
.120E+00	-.223E-03	-.977E-02	.362E-03	.779E-02	.659E-05	DTHEOP2
-.148E-01	.350E-02	-.490E-02	-.371E-04	-.203E-01	-.172E-04	DCMEGP2
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	

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.638E+00	.166E-02	.468E+00	.205E-02	.151E+01	.137E-02	DTHEOR3
-.751E+00	.371E+00	.121E+00	-.240E-02	.107E+00	.977E-04	DAISR3
-.964E+01	.157E-02	.673E+00	-.262E-01	-.818E-01	-.571E-04	DBISR3
.332E+00	-.583E-02	-.327E-01	.907E-03	.163E-02	.141E-05	DOMEGR3
-.174E-01	-.212E-03	.222E-01	-.231E-03	.607E-02	.73[illegible]E-05	DTHEOP3
.684E-02	-.314E-02	.644E-02	.361E-04	.138E-01	.171E-04	DOMEGP3
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	

.146E+01	.1[illegible]6E-02	.391E+00	.496E-02	.145E+01	.122E-[illegible]	DTHEOR4
.066E+00	.377E+00	-.121E+00	.236E-02	-.121E+00	-.102E-03	DAISR4
-.899E+01	.204E-02	.691E+00	-.286E-01	-.333E-01	-.294E-04	DBISR4
-.331E+00	-.569E-02	.326E-01	-.105E-02	-.118E-02	-.114E-05	DOMEGR4
-.907E-01	-.221E-03	.118E-01	-.267E-03	.826E-02	.697E-05	DTHEOP4
-.157E-01	-.312E-02	-.528E-02	-.395E-04	-.204E-01	-.172E-04	DOMEGP4
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	

.122E-04	.619E-02	.526E-05	DDELTAL
.937E-02	.101E-04	-.331E+00	DDELTEL
.125E-04	-.491E+00	.541E-05	DDELTRD
-.434E-02	-.476E-05	-.168E-02	
-.106E-05	-.852E-02	-.724E-06	
-.215E-05	-.232E-06	.463E-02	
0.	0.	0.	
0.	0.	0.	
0.	0.	0.	
0.	0.	0.	
0.	0.	0.	
0.	0.	0.	

C MATRIX

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!  .600E-02 -.239E-05  .139E-01  .217E-03 -.607E-01 -.106E-04  .961E+00 -.147E-04  .135E-01 !   ! DSUFC  !
!  .111E-04  .159E-01 -.163E-03 -.230E-05 -.102E-04  .111E+01  .495E-05  .981E+00  .726E-05 !   ! DSVFC  !
! -.367E-04 -.153E-03  .243E-01  .142E-01 -.115E+01 -.192E-04  .305E-01 -.131E-04  .884E+00 !   ! DSWFC  !
!  .164E-06  .265E-03 -.245E-05  .107E-03  .471E-05  .665E-02 -.230E-05  .525E-02 -.105E-05 !   ! DSPFC  !
!  .491E-05  .379E-03 -.250E-02 -.299E-04  .637E-02  .257E-05 -.408E-02  .203E-05 -.188E-02 !   ! DSQFC  !
!  .183E-05  .218E-02 -.303E-06  .527E-07  .233E-06  .258E-02 -.114E-06  .154E-02 -.518E-07 !   ! DSRFC  !
! 0.        0.        0.        0.        0.        0.        0.        0.        0.         !   ! DSUEFC !
! 0.        0.        0.        0.        0.        0.        0.        0.        0.         !   ! DS LFC !
! 0.        0.        0.        0.        0.        0.        0.        0.        0.         !   ! DS LFC !
! 0.        0.        0.        0.        0.        0.        0.        0.        0.         !   ---   ---
! 0.        0.        0.        0.        0.        0.        0.        0.        0.         !
! 0.        0.        0.        0.        0.        0.        0.        0.        0.         !
---                                                                                        ---

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! 0.        -.106E+01 -.294E-04 -.177E+02  .574E-02 -.237E-06 !   !  DSPDHG   !
! 0.        -.177E-03  .727E+00 -.910E-04  .296E-07  .142E-01 !   !  DSQDHG   !
! 0.        -.109E+01 -.303E-04 -.566E+00  .182E-03 -.243E-06 !   !  DSRDHG   !
! 0.         .826E-04  .105E-01  .422E-04 -.137E-07  .844E-04 !   ! DSDUGDXH  !
! 0.         .146E+00  .405E-05  .749E-01 -.244E-04  .326E-07 !   ! DSDUGDYH  !
! 0.         .405E-05  .123E+00  .209E-05 -.679E-09  .246E-04 !   ! DSDVGDYH  !
! 0.        0.        0.        0.        0.        0.        !   ---       ---
! 0.        0.        0.        0.        0.        0.        !
! 0.        0.        0.        0.        0.        0.        !
! 0.        0.        0.        0.        0.        0.        !
! 0.        0.        0.        0.        0.        0.        !
! 0.        0.        0.        0.        0.        0.        !
---                                                         ---
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.273E-02	-.241E-03	-.284E-02	-.430E-04	.618E+00	-.100E-03	0.	-.243E-05	-.142E-01	DSUTG
-.376E-04	.152E-01	-.465E-06	.437E+00	.103E-03	.262E+01	0.	.601E-01	-.237E-05	DSVTC
.286E-04	-.249E-06	.225E-01	.144E-04	-.308E+01	-.107E-03	0.	-.250E-05	.709E-01	D[illegible]TC
.430E-06	.382E-04	.216E-06	.134E-01	-.479E-04	.378E-01	0.	.932E-03	.110E-05	DSPTC
-.120E-04	.333E-07	.392E-03	.661E-05	-.351E-01	.146E-04	0.	.335E-06	.195E-02	DSQTC
.339E-05	-.213E-03	.107E-07	-.591E-02	-.237E-05	-.567E-01	0.	-.130E-02	.544E-07	DSRTC
0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]TG
0.	0.	0.	0.	0.	0.	0.	0.	0.	DSV[illegible]TC
0.	0.	0.	0.	0.	0.	0.	0.	0.	DS[illegible]TC
0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	0.	0.	0.	

-.601E-04	-.114E-02	-.317E-07	0.	0.	-.182E-08	DSPITG
.160E+01	-.171E-06	.754E-03	0.	0.	.449E-04	DSQDTG
-.625E-04	-.117E-02	-.326E-07	0.	0.	-.187E-06	DSRDTG
.286E-01	.364E-07	.113E-04	0.	0.	.640E-0[illegible]	DSDUGDXT
.110E-04	.157E-03	.437E-03	0.	0.	.250E-09	DSDUGDYT
-.255E-01	.437E-08	.132E-03	0.	0.	-.973E-06	DSDVGDYT
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	

.347E-02	-.300E-01	.126E-02	.320E-02	.342E-01	-.930E-03	.289E-02	-.266E-01	-.141E-02	.2[illegible]3E-02	.282E-01	-.363E-0[illegible]	[illegible]
.214E-03	-.271E-02	.126E-02	-.353E-03	-.285E-02	-.135E-02	.212E-03	-.271E-02	.190E-02	-.3[illegible]5E-03	-.247E-02	-.190E-0[illegible]	DSV[illegible]
.153E-02	-.253E-01	.252E-01	.194E-02	.119E-01	.250E-01	.151E-02	-.230E-01	.215E-01	.186E-02	.123E-01	.219E-01	[illegible]
-.450E-04	.767E-03	-.786E-03	.533E-04	.349E-03	.798E-03	-.525E-04	.840E-03	-.751E-03	.661E-04	.424E-03	.804E-0[illegible]	DSUL[illegible]
-.934E-05	.205E-03	-.275E-03	-.147E-04	-.619E-04	-.292E-03	.230E-04	-.321E-03	.232E-03	.253E-04	.192E-03	.214E-0[illegible]	[illegible]VL[illegible]
.233E-04	-.269E-03	-.126E-04	-.297E-04	-.314E-03	.417E-04	.276E-04	-.274E-03	-.112E-04	-.283E-[illegible]4	-.303E-03	.439E-0[illegible]	DSV[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	DSV[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	DSS[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]SYL[illegible]
0.	.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]

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EQUATION FORM   [DFTCBAR] = [AAUX][DUDBAR] + [BAPRIM][DULCBAR] + [BAUX][DUCBAR] + [CAUX][[illegible]]
```

DFCX1
DFCY1
DFCZ1
DTCX1
DTCY1
DTCZ1
DFCX2
DFCY2
DFCZ2
DTCX2
DTCY2
DTCZ2
DFCX3
DFCY3
DFCZ3
DTCX3
DTCY3
DTCZ3
DFCX4
DFCY4
DFCZ4
DTCX4
DTCY4
DTCZ4

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[illegible] AUXILIARY MATRIX

-.602E+01	.167E+03	-.156E+02	.531E+03	.715E+03	.895E+04	0.	0.	-.648E-07	.175E+03	-.776E+04	-.831E+04
.116E+01	-.192E+02	.657E+00	-.201E+04	-.476E+02	-.240E+04	0.	0.	.795E-11	.635E+04	.201E+02	.179E+[illegible]
-.122E+02	.960E+02	-.101E+05	.712E+04	.908E+04	.114E+05	0.	0.	-.393E-07	-.449E+04	-.157E+04	-.551E+[illegible]
.357E+01	-.166E+03	.646E+01	-.633E+04	-.827E+03	-.120E+05	0.	0.	.114E-10	.208E+05	.192E+03	.923E+0[illegible]
.311E+02	-.304E+03	-.962E+02	.370E+04	.608E+04	-.237E+05	0.	0.	-.553E-07	-.992E+03	.238E+05	.236E+0[illegible]
-.321E+01	.633E+02	-.325E+02	.431E+04	.139E+04	.391E+04	0.	0.	.182E-09	-.157E+03	-.975E+03	-.1[illegible]5E+04
-.724E+01	-.163E+03	-.127E+02	-.808E+02	.361E+03	-.841E+04	0.	0.	-.649E-07	-.174E+03	-.758E+04	.806E+0[illegible]
.114E+01	-.133E+02	.747E+00	-.253E+04	-.516E+02	-.211E+04	0.	0.	.715E-10	.638E+04	.21[illegible]E+02	.146E+0[illegible]
-.712E+01	-.246E+02	-.102E+03	-.718E+04	.935E+04	-.731E+04	0.	0.	-.355E-07	.443E+04	-.472E+04	.156E+0[illegible]
.930E+01	.435E+02	.754E+01	-.541E+04	-.903E+03	-.462E+04	0.	0.	.227E-09	.205E+05	.2[illegible]E+03	-.[illegible]7E+0[illegible]
.213E+02	.477E+03	-.846E+02	-.172E+04	.453E+04	.259E+05	0.	0.	-.911E-07	.[illegible]25E+02	.245E+05	-.236E+0[illegible]
-.153E-01	.236E+02	-.135E+02	-.409E+03	.702E+03	.225E+04	0.	0.	-.728E-09	.757E+03	-.[illegible]04E+03	.733E+[illegible]
-.608E+01	.167E+03	-.157E+02	.534E+03	.632E+03	-.310E+04	0.	0.	-.648E-07	.175E+03	-.779E+04	-.834E+04
.130E+01	-.370E+02	-.435E+00	-.340E+04	-.690E+01	-.330E+04	0.	0.	.165E-09	.622E+04	-.1[illegible]9E+02	.1[illegible]7E+0[illegible]
-.133E+02	.114E+03	-.151E+03	.727E+04	-.476E+03	-.833E+04	0.	0.	-.193E-05	-.443E+04	-.342E+04	-.671E+04
.104E+02	-.163E+03	.373E+01	-.373E+04	-.414E+03	-.617E+04	0.	0.	.443E-09	.203E+0[illegible]	.110E+03	.806E+0[illegible]
.312E+02	-.303E+03	-.101E+03	.373E+04	.779E+03	.239E+05	0.	0.	-.115E-06	-.592E+03	.239E+05	.2[illegible]
-.374E+01	.704E+02	-.341E+02	.502E+04	-.132E+04	.520E+05	0.	0.	-.728E-09	-.140E+03	-.102E+04	-.194E+04
-.721E+01	-.162E+03	-.127E+02	-.933E+02	.121E+04	.800E+04	0.	0.	-.648E-07	-.174E+03	-.758E+04	.806E+0[illegible]
.128E+01	-.362E+02	-.381E+00	-.330E+04	-.755E+01	-.375E+04	0.	0.	.151E-09	.622E+04	-.123E+02	.128E+0[illegible]
-.316E+01	-.394E+02	-.152E+03	-.733E+04	-.385E+03	.272E+04	0.	0.	-.192E-06	.449E+04	-.345E+04	.740E+04
.101E+02	-.364E+02	.454E+01	-.770E+04	-.337E+03	-.170E+05	0.	0.	.387E-09	.203E+05	.146E+03	-.126E+04
.219E+02	.473E+03	-.788E+02	-.182E+04	-.704E+02	-.227E+05	0.	0.	-.751E-07	.523E+02	.243E+05	-.236E+0[illegible]
-.248E+00	.195E+02	-.152E+02	-.692E+03	-.550E+03	.256E+04	0.	0.	-.546E-09	.742E+03	-.455E+03	.866E+0[illegible]

[illegible] PRIME AUXILIARY MATRIX

.607E+04	-.655E+0[illegible]	.462E+02	.226E+03	-.350E+04	.883E+04
.254E+02	.179E+04	-.448E+03	.153E+05	.242E+03	-.458E+04
.331E+04	-.465E+03	.578E+05	-.392E+05	-.640E+05	.804E+04
-.216E+04	.227E+05	-.248E+04	.354E+05	.187E+04	-.258E+05
-.309E+05	-.513E+04	.360E+05	-.265E+05	-.357E+05	-.596E+05
.75[illegible]E+03	-.733E+03	-.313E+05	.259E+05	.306E+05	-.107E+04
.551E+04	.229E+02	-.315E+04	-.301E+04	.525E+03	-.816E+04
.245E+02	.162E+04	-.463E+03	.148E+05	.257E+03	-.456E+04
.349E+04	.464E+03	.572E+05	.382E+05	-.632E+05	-.821E+04
-.063E+04	.230E+05	-.742E+02	.341E+05	-.304E+03	.333E+04
-.226E+05	-.552E+04	.225E+05	.226E+05	-.294E+05	.526E+05
.213E+05	.762E+03	-.465E+05	-.386E+05	.398E+05	-.594E+04
.616E+04	-.603E+0[illegible]	.658E+02	.188E+03	-.477E+04	.923E+04
-.191E+02	.176E+04	-.136E+03	.163E+05	-.263E+03	-.206E+04
.257E+04	-.466E+03	.592E+05	-.393E+05	.658E+05	.803E+04
-.635E+04	.245E+05	-.179E+04	.387E+05	-.220E+04	-.185E+05
-.31[illegible]E+05	-.521E+04	.296E+05	-.261E+05	.258E+05	-.631E+05
.831E+03	-.846E+03	-.341E+05	.286E+05	-.335E+05	-.116E+04
.566E+04	.230E+02	-.313E+04	-.297E+04	-.468E+04	-.851E+04
-.200E+02	.201E+04	-.152E+03	.157E+05	-.[illegible]E+03	-.196E+04
.276E+04	.483E+03	.566E+05	.366E+05	.[illegible]E+05	-.835E+04
-.623E+04	.246E+05	.767E+03	.363E+05	.347E+03	.112E+05
-.234E+05	-.562E+04	.220E+05	.222E+05	.187E+05	.504E+05
.239E+05	.825E+03	-.433E+05	-.414E+05	-.428E+05	-.566E+04

LJDCNTL
DVDCNTL
[illegible]CNTL
DPCCNTL
DVCCNTL
LRCCNTL

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b AUXILIARY MATRIX

-.650E+03	-.752E+02	.207E+04	-.139E+01	.627E+04	.569E+01	DTHEOR1
.403E+04	.225E+04	-.470E+03	.947E+01	-.212E+03	-.193E+00	DAISR1
-.370E+03	-.111E+03	.377E+04	-.156E+03	.969E+02	.802E-01	DBISR1
.104E+05	.239E+05	-.642E+04	.659E+01	-.426E+04	-.559E+01	DOMEGR1
-.309E+05	-.471E+04	-.200E+05	-.821E+02	-.234E+05	-.211E+02	DTHEOP1
.296E+05	-.359E+03	.128E+04	.448E+03	-.719E+03	-.653E+00	DOMEGP1
-.970E+03	.791E+02	.642E+02	-.242E+01	-.952E+02	-.867E-01	
.376E+04	-.195E+03	-.455E+03	.102E+02	-.213E+03	-.194E+00	
-.334E+04	.105E+03	.357E+03	-.915E+01	.687E+02	.644E-01	
.649E+04	-.541E+03	-.108E+04	.229E+02	-.632E+03	-.575E+00	
-.130E+04	-.240E+03	.760E+02	-.441E+01	-.505E+02	-.461E-01	
.469E+03	-.159E+03	-.316E+03	.781E+00	-.761E+03	-.691E+00	
-.131E+04	-.754E+02	-.165E+03	-.388E+01	-.952E+03	-.865E+00	
.393E+04	-.123E+03	-.330E+03	.107E+02	.188E+03	.169E+00	
.927E+04	-.105E+03	-.933E+03	.253E+02	-.332E+02	-.316E-01	
.694E+04	-.332E+03	-.713E+03	.249E+02	.528E+03	.479E+00	
.252E+03	.223E+03	.623E+03	.166E+01	.252E+04	.229E+01	
-.165E+04	-.118E+03	-.163E+03	-.334E+01	-.762E+03	-.691E+00	
-.970E+03	.791E+02	.642E+02	-.242E+01	-.952E+02	-.867E-01	
.393E+04	-.123E+03	-.330E+03	.103E+02	.186E+03	.166E+00	
-.580E+04	.109E+03	.552E+03	-.159E+02	-.106E+03	-.942E-01	
.695E+04	-.325E+03	-.701E+03	.249E+02	.565E+03	.511E+00	
-.110E+04	-.240E+03	.356E+02	-.371E+01	-.322E+02	-.294E-01	
.465E+03	-.152E+03	-.303E+03	.353E+00	-.719E+03	-.653E+00	

-.109E+04	-.777E+02	.391E+02	-.3[illegible]E+01	-.387E+02	-.326E-01	DTHEOR2
-.[illegible]E+04	-.198E+03	.442E+03	-.1[illegible]E+02	.236E+03	.198E+00	DAISR2
-.328E+04	-.111E+03	.343E+03	-.968E+01	.638E+02	.511E-01	DBISR2
-.620E+04	-.557E+03	.105E+04	-.247E+02	.741E+03	.622E+00	DOMEGR2
-.190E+04	.230E+03	.100E+03	-.505E+01	-.189E+03	-.161E+00	DTHEOP2
.132E+04	-.112E+03	.112E+03	.369E+01	.777E+03	.657E+00	DOMEGP2
.235E+04	.824E+02	.176E+04	.955E+01	.597E+04	.504E+01	
-.342E+04	.229E+04	.419E+03	-.113E+02	.237E+03	.199E+00	
-.568E+05	.107E+03	.581E+04	-.171E+03	.267E+03	.223E+00	
-.870E+04	.243E+03	-.403E+04	-.691E+02	-.[illegible]E+04	-.407E+01	
-.245E+05	-.50[illegible]E+04	-.210E+05	-.804E+02	-.[illegible]E+05	-.123E+02	
.397E+05	.7[illegible]E+03	.532E+03	.470E+03	.[illegible]E+03	.6[illegible]E+00	
-.109E+04	-.777E+02	.691E+02	-.349E+01	-.[illegible]E+02	-.3[illegible]E-01	
-.400E+04	-.124E+03	.338E+03	-.119E+02	-.176E+03	-.167E+00	
-.583E+04	-.107E+03	.550E+03	-.175E+02	-.102E+03	-.869E-01	
-.914E+04	-.335E+03	.738E+03	-.270E+02	-.555E+03	-.471E+00	
-.217E+04	.231E+03	.182E+03	-.580E+01	-.207E+03	-.176E+00	
.130E+04	-.120E+03	.122E+03	.377E+01	.823E+03	.695E+00	
-.176E+04	.816E+02	-.134E+03	-.518E+01	-.766E+03	-.216E+00	
-.400E+04	-.124E+03	.338E+03	-.119E+02	-.195E+03	-.166E+00	
.917E+04	.170E+03	-.929E+03	.275E+02	-.450E+02	-.348E-01	
-.917E+04	-.322E+03	.728E+03	-.271E+02	-.595E+03	-.507E+00	
-.445E+03	-.247E+03	.691E+03	-.184E+01	.259E+04	.218E+01	
-.191E+03	-.15[illegible]E+03	.263E+03	-.848E+00	.779E+03	.658E+00	

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.743E+03	.733E+02	-.412E+03	.170E+01	-.340E+03	-.854E+00
.380E+04	-.133E+03	-.452E+03	.107E+02	-.212E+03	-.193E+00
.907E+04	-.131E+0[illegible]	-.662E+03	.264E+02	.140E+03	.126E+00
.854E+04	-.345E+03	-.111E+04	.244E+02	-.369E+03	-.609E+00
.203E+04	-.225E+03	.655E+03	.394E+0[illegible]	.251E+04	.228E+01
-.162E+04	.143E+03	-.170E+03	-.361E+01	-.721E+03	-.654E+00
.165E+04	-.695E+02	-.119E+03	.334E+01	[illegible]E+02	-.756E-0[illegible]
.360E+04	-.132E+03	-.463E+03	.107E+02	[illegible]E+03	-.154E+0[illegible]
-.600E+04	.125E+03	.530E+03	-.177E+02	.661E+02	.617E+0[illegible]
.655E+04	-.352E+03	-.110E+04	.245E+02	-.631E+03	-.575E+00
.241E+04	.204E+03	-.201E+03	.309E+01	-.325E+02	-.746E-01
.490E+03	.103E+03	-.338E+03	.707E+00	-.752E+03	-.692E+00
.136E+04	.736E+02	.202E+04	.444E+01	[illegible]E+04	.571E+01
.424E+04	.243E+04	-.330E+03	.109E+02	.139E+03	.170E+00
-.565E+05	-.122E+03	.580E+04	-.109E+03	-.833E+02	[illegible]E-01
.112E+05	.257E+05	-.815E+04	.994E+01	-.307E+04	[illegible]
-.282E+05	-.544E+04	-.219E+05	-.881E+02	-.235E+05	-.212E+02
.324E+05	-.733E+03	.132E+04	.457E+03	-.762E+03	-.692E+00
.105E+04	-.595E+02	-.119E+03	.334E+02	-.326E+02	-.750E-01
.395E+04	-.195E+03	-.320E+03	.117E+02	.187E+03	.169E+00
-.401E+04	.130E+03	.370E+03	-.117E+02	-.105E+03	-.936E-01
.892E+04	-.551E+03	-.637E+03	.268E+02	.558E+03	.514E+0[illegible]
.119E+04	.203E+03	-.174E+03	.246E+01	-.646E+02	-.565E-0[illegible]
.511E+03	.965E+02	-.323E+03	.843E+00	-.720E+03	-.654E+00

DTHEGA3
DAISP3
DBISR3
DOMEGA3
DTHEOP3
DOMEGP3

.947E+03	.730E+02	-.118E+03	.269E+01	-.312E+02	-.262E-01
-.370E+04	-.135E+03	.448E+03	-.118E+02	.237E+0[illegible]	.198E+00
-.599E+04	-.132E+03	.618E+03	-.190E+02	.700E+02	.581E-01
-.823E+04	-.352E+03	.107E+04	-.263E+02	.742E+03	.623E+00
.165E+03	-.224E+03	-.511E+02	.144E+01	-.230E+03	-.195E+00
.136E+04	.143E+03	.125E+03	.393E+01	.779E+03	.658E+00
.230E+03	-.691E+02	-.359E+03	.892E+00	-.960E+03	-.810E+00
-.370E+04	-.135E+03	.449E+03	-.118E+02	.238E+03	.199E+00
.909E+04	.127E+03	-.667E+03	.289E+02	.124E+03	.103E+00
-.826E+04	-.358E+03	.106E+04	-.264E+02	.702E+03	.569E+00
.199E+04	.203E+03	.695E+03	.561E+01	.253E+04	.214E+01
-.120E+03	.102E+03	.290E+03	-.817E+00	.826E+03	.697E+00
.947E+03	.736E+02	-.118E+03	.269E+01	-.312E+02	-.262E-01
-.404E+04	-.201E+03	.336E+03	-.127E+02	-.196E+03	-.167E+00
-.400E+04	-.128E+03	.358E+03	-.129E+02	-.105E+03	-.919E-01
-.923E+04	-.551E+03	.734E+03	-.238E+02	-.556E+03	-.473E+00
.357E+03	-.223E+03	-.773E+02	.209E+01	-.248E+03	-.210E+0[illegible]
.140E+04	.150E+03	.137E+03	.402E+01	.824E+03	.692E+00
.482E+04	-.652E+02	.171E+04	.166E+02	.578E+04	.504E+01
-.373E+04	.246E+04	.310E+03	-.134E+02	-.195E+03	-.166E+00
-.579E+05	.134E+03	.567E+04	-.184E+03	.105E+03	.865E-01
-.554E+04	.261E+05	-.509E+04	-.744E+02	-.590E+04	-.517E+01
-.216E+05	-.334E+04	-.230E+05	-.737E+02	-.148E+05	-.124E+02
.425E+05	.104E+04	.596E+03	.481E+03	.731E+03	.654E+00

DTHEGA4
DAISR4
DBISR4
DOMEGA4
DTHEOP4
DOMEGP4

C-2

.491E+01	.705E+02	-.105E+03
-.482E+02	-.521E-01	.228E+02
-.390E+02	.406E+02	-.427E+02
-.107E+03	-.115E+00	.794E+02
-.250E+02	.117E+03	.312E+03
.182E+02	.197E-01	-.293E+03
-.408E+01	.735E+02	.105E+03
-.461E+02	-.526E-01	.225E+02
.393E+02	.405E+02	.427E+02
-.107E+03	-.110E+00	.835E+02
.431E+01	.137E+03	-.321E+03
-.120E+01	-.130E-02	-.162E+03
.491E+01	.705E+02	-.105E+03
-.527E+02	-.570E-01	.121E+03
-.983E+02	.228E+03	-.427E+02
-.126E+03	-.130E+00	.374E+03
-.250E+02	.136E+03	.312E+03
.167E+02	.202E-01	-.193E+03
-.403E+01	.705E+02	.105E+03
-.527E+02	-.570E-01	.121E+03
.390E+02	.228E+03	.427E+02
-.121E+03	-.131E+00	.383E+03
.430E+01	.362E+02	-.321E+03
-.176E+01	-.190E-02	-.171E+03

DDELTAL
DDELTEL
DDELTRL

C AUXILIARY MATRIX

-.233E+01	-.497E+02	.233E+02	.267E+00	-.751E+02	-.569E+02	-.224E+03	-.351E+02	.167E+02
-.212E-01	-.253E+02	.225E-01	.118E-01	.522E-01	-.264E+03	-.254E-01	-.205E+03	-.116E-01
.650E-01	.471E+01	-.345E+02	-.426E+01	.411E+03	.151E+03	-.316E+02	.120E+03	-.267E+03
-.671E-01	-.506E+02	.690E-01	.262E-01	.118E+00	-.853E+03	-.564E-01	-.661E+03	-.257E-01
.660E+01	.149E+03	.305E+02	-.511E-01	-.668E+02	.192E+03	.628E+03	.110E+03	-.357E+01
-.719E-01	-.734E+02	.140E-01	-.446E-02	-.197E-01	-.811E+02	.961E-02	-.446E+02	.439E-02
-.225E+01	.497E+02	.233E+02	.269E+00	-.751E+02	.560E+02	-.224E+03	.351E+02	.167E+02
-.213E-01	-.254E+02	.225E-01	.118E-01	.522E-01	-.265E+03	-.254E-01	-.205E+03	-.116E-01
.566E-01	-.461E+01	-.346E+02	-.431E+01	.412E+03	-.151E+03	-.519E+02	-.120E+03	-.267E+03
-.633E-01	-.737E+02	.663E-01	.263E-01	.116E+00	-.843E+03	-.566E-01	-.652E+03	-.258E-01
.653E+01	-.146E+03	.373E+02	.642E+00	-.153E+03	-.161E+03	.635E+03	-.927E+02	.256E+02
-.766E-01	-.633E+02	.140E-01	.314E-03	.139E-02	-.122E+03	-.677E-03	-.765E+02	-.309E-02
-.233E+01	-.497E+02	.233E+02	.267E+00	-.751E+02	-.565E+02	-.224E+03	-.351E+02	.167E+02
.167E-01	.210E+02	.148E-01	.129E-01	.571E-01	-.215E+03	-.279E-01	-.172E+03	-.127E-01
-.363E-01	.476E+01	.207E+02	-.363E+01	.234E+03	.151E+03	.349E+02	.120E+03	-.227E+03
.526E-01	.569E+02	.659E-01	.273E-01	.131E+03	-.686E+03	-.536E-01	-.563E+03	-.290E-01
.679E+01	.149E+03	.303E+02	.156E-01	-.555E+02	.192E+03	.636E+03	.116E+03	.580E+02
-.751E-01	-.353E+02	.154E-01	-.455E-02	-.202E-01	-.669E+02	.967E-02	-.462E+02	.450E-02
-.225E+01	.497E+02	.233E+02	.269E+00	-.751E+02	.566E+02	-.224E+03	.351E+02	.167E+02
.165E-01	.209E+02	.143E-01	.129E-01	.571E-01	-.210E+03	-.278E-01	-.172E+03	-.127E-01
-.455E-01	-.402E+01	.206E+02	-.366E+01	.234E+03	-.151E+03	.347E+02	-.120E+03	-.227E+03
.564E-01	.632E+02	.651E-01	.295E-01	.131E+00	-.663E+03	-.638E-01	-.560E+03	-.291E-01
.655E+01	-.146E+03	.320E+02	.776E+00	-.135E+03	-.161E+03	.630E+03	-.927E+02	.483E+02
-.719E-01	-.834E+02	.132E-01	.432E-03	.191E-02	-.117E+03	-.950E-03	-.731E+02	-.424E-03

DSUHC
DSVHC
DSWHC
DSPHC
DSQHC
DSRHC
DSULHC
DSVLHC
DSWLHC

0.	-.131E+04	-.279E+04	.411E+04	-.134E+01	-.504E+00
0.	.709E+00	-.139E+04	.467E+00	-.152E-03	-.329E+01
0.	.155E+04	.239E+03	.951E+03	-.309E+00	.192E+01
0.	.201E+01	-.433E+04	.104E+01	-.337E-03	-.106E+02
0.	-.172E+04	.639E+04	-.152E+05	.475E+01	.189E+01
0.	-.343E+00	-.469E+04	-.177E+00	.575E-04	-.720E+00
0.	-.131E+04	.279E+04	.411E+04	-.134E+01	.504E+00
0.	.909E+00	-.139E+04	.467E+00	-.152E-03	-.329E+01
0.	.185E+04	-.239E+03	.954E+03	-.310E+00	-.192E+01
0.	.202E+01	-.413E+04	.104E+01	-.335E-03	-.105E+02
0.	-.211E+04	-.634E+04	-.154E+05	.502E+01	-.149E+01
0.	.242E-01	-.496E+04	.124E-01	-.405E-05	-.123E+01
0.	-.131E+04	-.279E+04	.411E+04	-.134E+01	-.504E+00
0.	.795E+00	.122E+04	.512E+00	-.166E-03	-.277E+01
0.	-.175E+04	.239E+03	-.641E+03	.298E+00	.192E+01
0.	.227E+01	.343E+04	.117E+01	-.350E-03	-.965E+01
0.	-.205E+04	.637E+04	-.154E+05	.501E+01	.159E+01
0.	-.352E+00	-.495E+04	-.161E+00	.590E-04	-.775E+00
0.	-.131E+04	.277E+04	.411E+04	-.134E+01	.504E+00
0.	.775E+00	.121E+04	.512E+00	-.166E-03	-.277E+01
0.	-.124E+04	-.239E+03	-.636E+03	.206E+00	-.192E+01
0.	.228E+01	.367E+04	.117E+01	-.332E-03	-.906E+01
0.	-.179E+04	-.634E+04	-.153E+05	.495E+01	-.149E+01
0.	.332E-01	-.466E+04	.171E-01	-.550E-05	-.117E+01

DSPDHG
DSQDHG
DSRDHG
DSDUDXH
DSDUDYH
DSDVDYH

ORIGINAL PAGE IS OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

-.636E+00	.464E+01	-.351E+01	.134E+03	.764E+03	.129E+04	0.	.297E+02	-.175E+02
.954E-02	-.105E+01	.239E-02	.874E+02	-.531E+00	.256E+03	0.	.656E+01	.122E-01
-.131E+00	.196E+01	-.215E+01	.304E+03	-.406E+02	.661E+03	0.	.192E+02	.923E+01
.243E-01	-.355E+01	.530E-02	.134E+03	-.118E+01	.592E+03	0.	.135E+02	.270E-01
.240E+01	-.143E+02	-.537E+01	-.371E+03	.111E+04	-.376E+04	0.	-.865E+02	-.256E+02
-.227E-01	.839E+01	-.504E-03	.209E+03	.201E+00	.216E+04	0.	.497E+02	-.461E-02
-.613E+00	-.454E+01	-.351E+01	-.135E+03	.763E+03	-.129E+04	0.	-.297E+02	-.175E+0[illegible]
.951E-02	-.103E+01	.239E-02	.878E+02	-.531E+00	.269E+03	0.	.663E+01	.172E-01
-.152E+00	-.196E+01	-.213E+01	-.304E+03	-.434E+02	-.661E+03	0.	-.196E+02	.598E+0[illegible]
.254E-01	-.407E+01	.532E-02	.142E+03	-.118E+01	.460E+03	0.	.110E+02	.271E-01
.230E+01	.147E+02	-.493E+01	.435E+03	.112E+04	.396E+04	0.	.910E+02	-.258E+0[illegible]
-.197E-01	.835E+01	.630E-04	.256E+03	-.141E-01	.230E+04	0.	.525E+02	.324E-0[illegible]
-.633E+00	.464E+01	-.351E+01	.134E+03	.764E+03	.129E+04	0.	.297E+02	-.175E+02
.210E-01	-.556E+01	.202E-02	-.330E+02	-.581E+00	-.914E+03	0.	-.211E+02	.133E-01
.130E+00	.196E+01	-.105E+02	.304E+03	.177E+04	.661E+03	0.	.196E+02	-.400E+02
.566E-01	-.172E+02	.598E-02	-.223E+03	-.133E+01	-.302E+04	0.	-.694E+02	.305E-01
.243E+01	-.143E+02	-.625E+01	-.372E+03	.130E+04	-.376E+04	0.	-.865E+02	-.300E+02
-.239E-01	.356E+01	-.927E-03	.222E+03	.206E+00	.229E+04	0.	.526E+02	-.473E-0[illegible]
-.613E+00	-.454E+01	-.351E+01	-.135E+03	.763E+03	-.129E+04	0.	-.297E+02	-.175E+0[illegible]
.210E-01	-.555E+01	.202E-02	-.377E+02	-.581E+00	-.916E+03	0.	-.210E+02	.133E-01
.116E+00	-.176E+01	-.105E+02	-.304E+03	.176E+04	-.801E+03	0.	-.198E+02	-.405E+02
.597E-01	-.176E+02	.600E-02	-.234E+03	-.133E+01	-.313E+04	0.	-.720E+02	.306E-01
.233E+01	.147E+02	-.405E+01	.435E+03	.934E+03	.396E+04	0.	.910E+02	-.214E+02
-.165E-01	.788E+01	.674E-04	.243E+03	-.194E-01	.216E+04	0.	.500E+02	.445E-0[illegible]

DSUTG
DSVTG
DSWTG
DSPTG
DSQTG
DSRTG
DSULTG
D VLTG
DS LTG

.581E+03	-.141E+01	-.301E+01	0.	0.	.222E-01
.256E+03	.979E-03	-.149E+01	0.	0.	.496E-02
.651E+03	.199E+01	.258E+00	0.	0.	.146E-01
.543E+03	.217E-02	-.472E+01	0.	0.	.102E-01
-.167E+04	-.166E+01	.965E+01	0.	0.	-.649E-01
.940E+03	-.376E-03	-.505E+01	0.	0.	.371E-01
-.581E+03	-.141E+01	.301E+01	0.	0.	-.222E-01
.257E+03	.979E-03	-.150E+01	0.	0.	.496E-02
-.651E+03	.200E+01	-.258E+00	0.	0.	-.146E-01
.497E+03	.218E-02	-.446E+01	0.	0.	.823E-02
.161E+04	-.226E+01	-.699E+01	0.	0.	.660E-01
.165E+04	.231E-04	-.534E+01	0.	0.	.395E-01
.581E+03	-.141E+01	-.301E+01	0.	0.	.222E-01
-.286E+03	.107E-02	.131E+01	0.	0.	-.156E-01
.651E+03	-.134E+01	.258E+00	0.	0.	.146E-01
-.160E+04	.245E-02	.509E+01	0.	0.	-.516E-01
-.167E+04	-.221E+01	.965E+01	0.	0.	-.649E-01
.100E+04	-.356E-03	-.535E+01	0.	0.	.393E-01
-.581E+03	-.141E+01	.301E+01	0.	0.	-.222E-01
-.285E+03	.107E-02	.130E+01	0.	0.	-.157E-01
-.651E+03	-.134E+01	-.258E+00	0.	0.	-.143E-01
-.113E+04	.246E-02	.396E+01	0.	0.	-.550E-01
.161E+04	-.172E+01	-.699E+01	0.	0.	.660E-01
.100E+04	.358E-04	-.505E+01	0.	0.	.374E-01

LSPDTG
LSQDTG
LSRDTG
LSUDGDXT
LSUDGDYT
LSDVGDYT

.131E+02	-.135E+03	.194E+01	-.791E-01	-.171E+01	.253E+01	-.169E+01	.178E+02	-.150E+01	-.776E+00	-.311E+01	-.240E+01
-.113E+01	.160E+02	-.952E+01	.103E+01	.797E+01	.855E+01	-.929E+00	.129E+02	-.512E+01	.113E+01	.367E+01	.891E+0[illegible]
.531E+01	-.140E+03	.137E+03	.540E+00	.33[illegible]E+01	.774E+01	-.137E+01	.224E+02	-.216E+02	.123E+01	.475E+01	.1[illegible]
-.970E+01	.110E+03	-.220E+02	.270E+01	.212E+02	.170E+02	-.236E+01	.316E+02	[illegible]	.284E+01	.227E+02	.156E+[illegible]
-.476E+02	.450E+03	.704E+00	.693E+00	.302E+01	.497E+01	.400E+01	-.302E+02	-.565E+01	.220E+00	.148E+01	-.723E-0[illegible]
.097E+00	-.104E+02	.372E+02	.995E+00	.112E+02	-.343E+01	-.932E+00	.852E+01	.225E+01	.923E+00	.103E+02	-.352E+01
-.245E+00	.103E+01	.239E+01	.122E+02	.128E+03	-.708E+01	-.432E+00	.535E+01	-.241E+01	-.166E+01	-.1[illegible]E+02	-.348E+00
-.053E+00	.122E+02	-.404E+01	.703E+00	.612E+01	.835E+01	-.931E+00	.129E+02	-.912E+01	.113E+01	.369E+01	.271E+01
.513E+00	-.822E+01	.794E+01	.107E+02	.604E+02	.138E+03	.102E+01	-.159E+02	.345E+02	-.17[illegible]E+01	-.111E+02	-.221E+02
-.214E+01	.273E+02	-.203E+02	-.301E+01	-.462E+02	.133E+02	-.231E+01	.312E+02	-.205E+02	.278E+01	.221E+02	.193E+02
.100E+01	-.129E+02	.362E+01	-.343E+02	-.373E+03	.530E+02	.265E+00	-.151E+01	-.357E+01	.414E+01	.441E+02	-.527E+[illegible]
-.121E+01	.127E+02	-.130E+01	.192E+01	.172E+02	.159E+02	-.124E+01	.150E+02	-.137E+01	.130E+01	.133E+0[illegible]	.752E-[illegible]
-.149E+01	.135E+02	.296E+01	-.791E-01	-.171E+01	.253E+01	.130E+02	-.131E+03	-.[illegible]2E+01	-.376E+00	-.311E+01	-.240E+0[illegible]
-.271E+00	.604E+01	-.971E+01	.429E+00	.133E+01	.974E+01	-.063E+00	.116E+02	-.553E+01	.5[illegible]E+00	.275E+01	.955E+[illegible]
-.137E+01	.224E+02	-.226E+02	.952E+00	.527E+01	.141E+02	.966E+01	-.153E+03	.13[illegible]E+03	.713E+00	.416E+01	.9[illegible]
-.449E+00	.127E+02	-.211E+02	.612E+00	.122E+01	.223E+02	-.659E+01	.160E+03	-.279E+02	.104E+01	.341E+01	.226E+[illegible]
.470E+01	-.470E+02	-.174E+03	.925E+00	.315E+01	.552E+01	-.463E+02	.465E+03	.144E+02	.167E+00	.205E+01	-.561E+[illegible]
-.998E+00	.900E+01	.232E+01	.103E+01	.113E+02	-.352E+01	.111E+01	-.231E+02	.359E+02	.960E+00	.112E+02	-.[illegible]
-.245E+00	.103E+02	.239E+01	-.143E+01	-.100E+02	.443E+01	-.432E+00	.535E+01	-.241E+01	.113E+02	.127E+03	-.11[illegible]
-.272E+00	.635E+01	-.930E+01	.431E+00	.131E+01	.774E+01	-.344E+00	.710E+01	-.936E+01	.101E+00	-.114E+01	.925E+[illegible]
.711E+00	-.120E+02	.138E+02	-.173E+01	-.105E+02	-.222E+02	.330E+00	-.909E+01	.955E+01	.117E+02	.742E+02	.141E+[illegible]
-.374E+00	.122E+02	-.211E+02	.733E+00	.594E+00	.224E+02	-.551E+00	.133E+02	-.213E+02	-.710E+01	-.674E+02	.152E+[illegible]
.104E+01	-.143E+02	.241E+01	.503E+01	.312E+02	.772E+00	.316E+00	-.223E+01	-.306E+01	-.3[illegible]E+02	-.142E+03	.[illegible]
-.115E+01	.122E+02	-.133E+01	.125E+01	.129E+02	.241E+00	-.112E+01	.124E+02	-.140E+01	.211E+01	.147E+02	.174E+[illegible]

BECAUSE OF STRONG NONLINEARITIES THE FOLLOWING ENTRIES IN THE ABOVE MATRICES ARE NOT VALID.
THE DERIVATIVES AT THE POSITIVE AND NEGATIVE INCREMENTS ARE PRINTED TO INDICATE THE NATURE OF THE NONLINEARITY.

MATRIX	ROW POSITION	COLUMN POSITION	POSITIVE INCREMENT DERIVATIVE	NEGATIVE INCREMENT DERIVATIVE
A MATRIX	1	1	-.2317E-01	-.2315E-01
A MATRIX	3	1	-.6731E-02	-.6720E-02
A MATRIX	5	[illegible]	-.1615E-04	-.1820E-04
A MATRIX	1	2	.1296E+00	-.1247E+00
A MATRIX	2	2	-.2031E-01	-.1960E-01
A MATRIX	3	2	.9657E-01	-.4851E-01
A MATRIX	4	2	-.3521E-02	-.1822E-02
A MATRIX	5	2	.2326E-03	-.7712E-03
A MATRIX	6	2	-.6016E-03	-.7379E-0[illegible]
A MATRIX	1	3	-.1130E-01	-.1130E-01
A MATRIX	3	3	-.1412E+00	-.141[illegible]E+00
A MATRIX	4	3	-.3010E-04	-.2001E-04
A MATRIX	6	3	-.5753E-04	-.5743E-04
A MATRIX	6	4	-.6437E+00	-.[illegible]E+00
A MATRIX	3	4	-.6947E-01	-.7160E-01
A MATRIX	4	4	-.2762E+03	-.2781E+0[illegible]
A MATRIX	6	4	-.3625E-01	-.3626E-01
A MATRIX	2	5	-.6624E-01	-.[illegible]31E-01
A MATRIX	3	5	-.3163E+01	-.3162E+01
A MATRIX	5	5	-.1421E+00	-.1421E+00
A MATRIX	1	6	.7329E+01	-.7194E+01
A MATRIX	3	6	.4107E+01	-.[illegible]270E+01
A MATRIX	4	6	.9678E-01	.1935E+00
A MATRIX	5	6	-.1247E-02	-.7967E-01
A MATRIX	6	6	-.6801E-01	-.[illegible]78E-01
A MATRIX	3	10	-.4426E-03	.1578E-02
A MATRIX	4	10	-.1964E+00	-.1964E+00
A MATRIX	5	10	-.7368E-04	-.7613E-04
A MATRIX	6	10	-.7647E-02	-.7647E-02
A MATRIX	1	11	-.1602E+01	-.1603E+01
A MATRIX	3	11	-.3261E+01	-.32[illegible]E+01
A MATRIX	4	11	-.9779E-03	-.[illegible]731E-03
A MATRIX	5	11	-.6154E-01	-.[illegible]153E-01
A MATRIX	6	11	-.1729E-02	-.1727E-02
A MATRIX	7	11	-.9600E-02	.[illegible]00E-02
A MATRIX	9	11	-.1400E+02	-.1400E+02
A MATRIX	1	12	.7123E+01	-.7413E+01
A MATRIX	3	12	.2757E+01	-.5633E+01
A MATRIX	4	12	.9647E-01	.1935E+00
A MATRIX	5	12	.1491E-01	-.1335E-01
A MATRIX	6	12	-.1131E-01	-.[illegible]090E-[illegible]
A MATRIX	7	12	-.9600E-02	.[illegible]03E-[illegible]
AUXILIARY MATRIX	1	1	-.6019E+01	-.[illegible]01E+[illegible]
AUXILIARY MATRIX	3	1	-.1219E+02	-.1223E+[illegible]
AUXILIARY MATRIX	7	1	-.72[illegible]E+01	-.7244E+01
AUXILIARY MATRIX	9	1	-.7161E+01	-.7147E+01
AUXILIARY MATRIX	13	1	-.8079E+01	-.8079E+01

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A AUXILIARY MATRIX	15	1	-.1329E+02	-.1333E+02
A AUXILIARY MATRIX	19	1	-.7214E+01	-.7212E+01
A AUXILIARY MATRIX	21	1	-.8140E+01	-.8188E+01
A AUXILIARY MATRIX	1	2	.2790E+03	.5429E+02
A AUXILIARY MATRIX	2	2	-.3070E+02	-.7744E+01
A AUXILIARY MATRIX	3	2	.2260E+03	-.7353E+02
A AUXILIARY MATRIX	4	2	-.2037E+03	-.1250E+02
A AUXILIARY MATRIX	5	2	-.4734E+03	-.1541E+03
A AUXILIARY MATRIX	6	2	.9746E+02	.2906E+02
A AUXILIARY MATRIX	7	2	-.5908E+02	-.2664E+03
A AUXILIARY MATRIX	8	2	-.2472E+02	-.1893E+03
A AUXILIARY MATRIX	9	2	.5427E+02	-.1030E+03
A AUXILIARY MATRIX	10	2	-.5002E+02	.1376E+03
A AUXILIARY MATRIX	11	2	.1038E+03	.7902E+03
A AUXILIARY MATRIX	13	2	.2802E+03	.4255E+02
A AUXILIARY MATRIX	14	2	-.5047E+02	-.2345E+02
A AUXILIARY MATRIX	15	2	.2341E+03	-.2593E+02
A AUXILIARY MATRIX	16	2	-.2705E+03	-.5922E+02
A AUXILIARY MATRIX	17	2	-.5729E+03	-.1532E+03
A AUXILIARY MATRIX	18	2	.1101E+03	.2073E+02
A AUXILIARY MATRIX	19	2	-.5912E+02	-.7658E+03
A AUXILIARY MATRIX	20	2	-.4350E+02	-.1669E+02
A AUXILIARY MATRIX	21	2	.4932E+02	-.1283E+03
A AUXILIARY MATRIX	22	2	-.1072E+03	.9986E+02
A AUXILIARY MATRIX	23	2	.1647E+03	.7919E+03
A AUXILIARY MATRIX	24	2	.2345E+02	.1551E+02
A AUXILIARY MATRIX	1	3	-.1956E+02	-.1957E+02
A AUXILIARY MATRIX	3	3	-.1009E+03	-.1006E+03
A AUXILIARY MATRIX	5	3	-.9617E+02	-.9617E+02
A AUXILIARY MATRIX	6	3	-.3281E+02	-.3217E+02
A AUXILIARY MATRIX	7	3	-.1269E+02	-.1269E+02
A AUXILIARY MATRIX	9	3	-.1018E+03	-.1015E+03
A AUXILIARY MATRIX	11	3	-.8455E+02	-.8461E+02
A AUXILIARY MATRIX	12	3	-.1380E+02	-.1312E+02
A AUXILIARY MATRIX	13	3	-.1966E+02	-.1967E+02
A AUXILIARY MATRIX	14	3	-.4330E+00	-.4361E+00
A AUXILIARY MATRIX	15	3	-.1514E+03	-.1512E+03
A AUXILIARY MATRIX	17	3	-.1009E+03	-.1009E+03
A AUXILIARY MATRIX	18	3	-.3444E+02	-.3374E+02
A AUXILIARY MATRIX	19	3	-.1271E+02	-.1272E+02
A AUXILIARY MATRIX	20	3	-.3776E+00	-.3831E+03
A AUXILIARY MATRIX	21	3	-.1522E+03	-.1521E+03
A AUXILIARY MATRIX	23	3	-.7881E+02	-.7987E+02
A AUXILIARY MATRIX	24	3	-.1551E+02	-.1483E+02
A AUXILIARY MATRIX	2	4	-.2644E+04	-.2582E+04
A AUXILIARY MATRIX	4	4	-.6014E+04	-.6245E+01
A AUXILIARY MATRIX	7	4	-.8777E+02	-.8589E+02
A AUXILIARY MATRIX	8	4	-.2499E+04	-.2562E+04
A AUXILIARY MATRIX	9	4	-.7167E+04	-.7193E+04
A AUXILIARY MATRIX	10	4	+.5318E+04	+.5567E+04
A AUXILIARY MATRIX	11	4	-.1912E+04	-.1924E+04
A AUXILIARY MATRIX	12	4	-.5000E+03	-.4301E+03
A AUXILIARY MATRIX	14	4	-.3462E+04	-.7368E+0[illegible]

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* AUXILIARY MATRIX	16	4	-.8066E+04	-.8646E+04
* AUXILIARY MATRIX	19	4	-.5425E+02	-.9237E+02
* AUXILIARY MATRIX	20	4	-.3269E+04	-.3371E+04
* AUXILIARY MATRIX	21	4	-.7313E+04	-.7337E+04
* AUXILIARY MATRIX	22	4	-.7606E+04	-.7796E+04
* AUXILIARY MATRIX	23	4	-.1815E+04	-.1832 +04
* AUXILIARY MATRIX	24	4	-.7311E+03	-.6531E+03
* AUXILIARY MATRIX	2	5	-.4723E+02	-.4792E+02
* AUXILIARY MATRIX	4	5	-.8237E+03	-.8711E+03
* AUXILIARY MATRIX	8	5	-.5127E+02	-.5203 +[illegible]
* AUXILIARY MATRIX	10	5	-.8984E+03	-.9077E+03
* AUXILIARY MATRIX	14	5	-.7152E+01	-.[illegible]57E+ 1
* AUXILIARY MATRIX	15	5	-.4078E+03	-.4[illegible]
* AUXILIARY MATRIX	16		-.4184E+03	-.4121E+03
* AUXILIARY MATRIX	18	[illegible]	-.1331E+04	-.1311E+04
* AUXILIARY MATRIX	20	5	-.7779E+01	-.7315 +01
* AUXILIARY MATRIX	21	5	-.3747E+03	-.[illegible]57E+03
* AUXILIARY MATRIX	22	5	-.3955E+03	-.3954E+0[illegible]
* AUXILIARY MATRIX	23	5	-.3293E+02	-.1076E+03
* AUXILIARY MATRIX	24	5	-.5502E+03	-.5417E+03
* AUXILIARY MATRIX	1	6	.1541E+05	.2486E+0[illegible]
* AUXILIARY MATRIX	2	6	-.3087E+04	-.1708E+04
* AUXILIARY MATRIX	3	6	.1879E+ 5	.3969E+0[illegible]
* AUXILIARY MATRIX	4	6	-.1757E+05	-.6796E+04
* AUXILIARY MATRIX	5	6	-.5228E+05	-.5151E+04
* AUXILIARY MATRIX	6	6	.5867E+04	.1948E+0[illegible]
* AUXILIARY MATRIX	7	6	-.2440E+04	-.1437E+05
* AUXILIARY MATRIX	8	6	-.2732E+04	-.149 E+04
* AUXILIARY MATRIX	9	6	-.2832E+04	-.1179E+05
* AUXILIARY MATRIX	10	6	-.5915E+04	.6798E+03
* AUXILIARY MATRIX	11	6	.7887E+04	.4390E+05
* AUXILIARY MATRIX	13	6	-.1086E+04	-.1451E+05
* AUXILIARY MATRIX	14	6	-.4108E+04	-.2498E+04
* AUXILIARY MATRIX	15	6	-.3065E+03	-.1635E+05
* AUXILIARY MATRIX	16	6	-.1226E+05	-.7518E+02
* AUXILIARY MATRIX	17	6	.5640E+04	.5218E+05
* AUXILIARY MATRIX	18	6	.2793E+04	-.1737E+04
* AUXILIARY MATRIX	19	6	.1306E+05	.7137E+0[illegible]
* AUXILIARY MATRIX	20	6	-.4463E+04	-.3016 +0[illegible]
* AUXILIARY MATRIX	21	6	.8024E+04	-.2196E+04
* AUXILIARY MATRIX	22	6	-.2277E+05	-.1117E+05
* AUXILIARY MATRIX	23	6	-.4047E+05	-.490[illegible]+04
* AUXILIARY MATRIX	3	10	-.4492E+04	-.448[illegible] +04
* AUXILIARY MATRIX	5	10	-.9928E+03	-.9915E+03
* AUXILIARY MATRIX	6	10	-.1566E+03	-.1[illegible]66E+03
* AUXILIARY MATRIX	7	10	-.1735E+03	-.1735 +03
* AUXILIARY MATRIX	15	10	-.4471E+04	-.4479E+04
* AUXILIARY MATRIX	17	10	-.9927E+03	-.9914E+[illegible]
* AUXILIARY MATRIX	18	10	-.1391E+03	-.1395E+03
* AUXILIARY MATRIX	19	10	-.1735E+03	-.1735E+03
* AUXILIARY MATRIX	1	11	-.7782E+04	-.7783E+04
* AUXILIARY MATRIX	3	11	-.4696E+04	-.4681E+04

A AUXILIARY MATRIX	6	11	-.9805E+03	[illegible]
A AUXILIARY MATRIX	7	11	-.7576E+04	-.7577E+04
A AUXILIARY MATRIX	9	11	-.4747E+04	-.4712E+04
A AUXILIARY MATRIX	12	11	-.4092E+03	-.3984E+03
A AUXILIARY MATRIX	13	11	-.7785E+04	-.7786E+04
A AUXILIARY MATRIX	14	11	-.1394E+02	-.1393E+02
A AUXILIARY MATRIX	15	11	-.3424E+04	-.3409E+04
A AUXILIARY MATRIX	16	11	-.1023E+06	-.1017E+06
A AUXILIARY MATRIX	19	11	-.7577E+04	-.7577E+04
A AUXILIARY MATRIX	20	11	-.1234E+02	-.1234E+02
A AUXILIARY MATRIX	21	11	-.3457E+04	-.3442E+03
A AUXILIARY MATRIX	24	11	-.4605E+03	-.4457E+03
A AUXILIARY MATRIX	1	12	-.1690E+04	-.1473E+05
A AUXILIARY MATRIX	2	12	.1134E+04	[illegible]
A AUXILIARY MATRIX	3	12	.1010E+04	-.1313E+05
A AUXILIARY MATRIX	4	12	.2765E+04	.1137E+05
A AUXILIARY MATRIX	5	12	.3192E+04	.1206E+05
A AUXILIARY MATRIX	6	12	.3036E+03	-.3601E+04
A AUXILIARY MATRIX	7	12	.1400E+05	.2114E+05
A AUXILIARY MATRIX	8	12	.6067E+03	.7111E+04
A AUXILIARY MATRIX	9	12	.6075E+04	-.2957E+04
A AUXILIARY MATRIX	10	12	-.5511E+04	.4830E+04
A AUXILIARY MATRIX	11	12	-.4147E+05	-.5664E+04
A AUXILIARY MATRIX	13	12	-.1808E+04	-.1480E+05
A AUXILIARY MATRIX	14	12	.8987E+03	.2444E+04
A AUXILIARY MATRIX	15	12	.1293E+04	-.1472E+05
A AUXILIARY MATRIX	16	12	.2058E+04	.1411E+05
A AUXILIARY MATRIX	17	12	.5147E+04	.5199E+05
A AUXILIARY MATRIX	18	12	.3206E+03	-.4203E+04
A AUXILIARY MATRIX	19	12	.1397E+05	.2155E+04
A AUXILIARY MATRIX	20	12	.5156E+03	.2047E+04
A AUXILIARY MATRIX	21	12	.7474E+04	-.2667E+04
A AUXILIARY MATRIX	22	12	-.7173E+04	.4653E+04
A AUXILIARY MATRIX	23	12	-.4155E+05	-.5705E+04
A AUXILIARY MATRIX	24	12	.1069E+04	.6318E+03
D MATRIX	1	1	-.4762E+00	-.4713E+00
D MATRIX	2	1	-.7646E+00	-.7658E+00
D MATRIX	3	1	-.1062E+02	-.1059E+02
D MATRIX	3	2	.2353E-02	.5150E-03
D MATRIX	4	2	-.4732E-02	-.4674E-02
D MATRIX	5	2	-.2162E-03	-.1962E-03
D MATRIX	4	3	-.3273E-01	-.3267E-01
D MATRIX	5	3	-.9164E-02	-.9094E-02
D MATRIX	1	4	-.1138E-02	-.1138E-02
D MATRIX	2	4	-.2215E-02	-.2215E-02
D MATRIX	3	4	-.2853E-01	-.7783E-01
D MATRIX	3	5	-.6389E-01	-.6326E-01
D MATRIX	3	6	-.5860E-04	-.5880E-04
D MATRIX	3	7	-.1055E+02	-.1052E+02
D MATRIX	4	7	-.3296E+00	-.3265E+00
D MATRIX	6	7	-.1478E-01	-.1480E-01
D MATRIX	3	8	.2761E-01	.1190E-01
D MATRIX	4	1	-.4737E-01	[illegible]

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MATRIX	5	6	-.2329E-03	-.2137E-03
AUXILIARY MATRIX	1	1	-.6631E+03	-.6378E+03
AUXILIARY MATRIX	3	1	-.5707E+05	-.5751E+05
AUXILIARY MATRIX	5	1	-.3679E+05	-.3095E+05
AUXILIARY MATRIX	7	1	-.9712E+03	-.9753E+03
AUXILIARY MATRIX	9	1	-.3346E+04	-.3338E+04
AUXILIARY MATRIX	11	1	-.1364E+04	-.1353E+04
AUXILIARY MATRIX	13	1	-.1307E+04	-.1304E+04
AUXILIARY MATRIX	16	1	-.1057E+04	-.1052E+04
AUXILIARY MATRIX	19	1	-.9762E+03	-.9754E+03
AUXILIARY MATRIX	21	1	-.5868E+04	-.5793E+04
AUXILIARY MATRIX	23	1	-.1106E+04	-.1109E+04
AUXILIARY MATRIX	1	2	-.7517E+02	-.7524E+02
AUXILIARY MATRIX	3	2	-.1056E+03	-.1154E+03
AUXILIARY MATRIX	5	2	-.4911E+04	-.4918E+04
AUXILIARY MATRIX	6	2	-.9719E+03	-.9451E+03
AUXILIARY MATRIX	8	2	-.1935E+03	-.1944E+03
AUXILIARY MATRIX	10	2	-.5417E+03	-.5403E+03
AUXILIARY MATRIX	11	2	-.2397E+03	-.2402E+03
AUXILIARY MATRIX	12	2	-.1591E+03	-.1591E+03
AUXILIARY MATRIX	13	2	-.7529E+02	-.7560E+02
AUXILIARY MATRIX	14	2	-.1232E+03	-.1229E+03
AUXILIARY MATRIX	15	2	-.1061E+03	-.1045E+03
AUXILIARY MATRIX	16	2	-.3324E+03	-.3301E+03
AUXILIARY MATRIX	18	2	-.1154E+03	-.1157E+03
AUXILIARY MATRIX	20	2	-.1234E+03	-.1227E+03
AUXILIARY MATRIX	22	2	-.3257E+03	-.3241E+03
AUXILIARY MATRIX	23	2	-.2402E+03	-.2402E+03
AUXILIARY MATRIX	24	2	-.1515E+03	-.1516E+03
AUXILIARY MATRIX	2	3	-.4747E+03	-.4771E+03
AUXILIARY MATRIX	4	3	-.6426E+04	-.6424E+04
AUXILIARY MATRIX	5	3	-.1960E+05	-.2031E+05
AUXILIARY MATRIX	8	3	-.4547E+03	-.4564E+03
AUXILIARY MATRIX	10	3	-.1075E+04	-.1081E+04
AUXILIARY MATRIX	12	3	-.3117E+03	-.3119E+03
AUXILIARY MATRIX	13	3	-.1602E+03	-.1903E+03
AUXILIARY MATRIX	14	3	-.3309E+03	-.3283E+03
AUXILIARY MATRIX	15	3	-.9333E+03	-.9372E+03
AUXILIARY MATRIX	16	3	-.7166E+03	-.7095E+03
AUXILIARY MATRIX	18	3	-.1587E+03	-.1671E+03
AUXILIARY MATRIX	20	3	-.3312E+03	-.3280E+03
AUXILIARY MATRIX	22	3	-.7051E+03	-.6978E+03
AUXILIARY MATRIX	24	3	-.2967E+03	[illegible]
AUXILIARY MATRIX	1	4	-.1306E+01	-.1360E+01
AUXILIARY MATRIX	3	4	-.1554E+03	-.1564E+03
AUXILIARY MATRIX	5	4	-.8711E+02	-.8910E+02
AUXILIARY MATRIX	7	4	-.2426E+01	-.2420E+01
AUXILIARY MATRIX	9	4	-.9153E+01	-.9153E+01
AUXILIARY MATRIX	11	4	-.4415E+01	-.4410E+01
AUXILIARY MATRIX	13	4	-.3963E+01	-.3963E+01
AUXILIARY MATRIX	19	4	-.2426E+01	-.2420E+01
AUXILIARY MATRIX	21	4	-.1585E+02	-.1585E+02

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C AUXILIARY MATRIX	23	4	-.3712E+01	-.3712E+01
C AUXILIARY MATRIX	2	5	-.2132E+03	-.2100E+03
C AUXILIARY MATRIX	4	5	-.4311E+04	-.4218E+04
C AUXILIARY MATRIX	5	5	-.2350E+05	-.2324E+05
C AUXILIARY MATRIX	6	5	-.7232E+03	-.7147E+03
C AUXILIARY MATRIX	7	5	-.9557E+02	-.9400E+02
C AUXILIARY MATRIX	8	5	-.2144E+03	-.2115E+03
C AUXILIARY MATRIX	10	5	-.6362E+03	-.6265E+03
C AUXILIARY MATRIX	11	5	-.5145E+02	-.4959E+02
C AUXILIARY MATRIX	12	5	-.7654E+03	-.7564E+03
C AUXILIARY MATRIX	13	5	-.9574E+03	-.9463E+03
C AUXILIARY MATRIX	15	5	-.3351E+02	-.3282E+02
C AUXILIARY MATRIX	16	5	-.7601E+03	-.7572E+03
C AUXILIARY MATRIX	19	5	-.9557E+02	-.9480E+02
C AUXILIARY MATRIX	21	5	-.1061E+03	-.1050E+03
C AUXILIARY MATRIX	23	5	-.3304E+02	-.3141E+02
C AUXILIARY MATRIX	24	5	-.7232E+03	-.7147E+03
C AUXILIARY MATRIX	2	6	-.1932E+00	-.1932E+00
C AUXILIARY MATRIX	4	6	-.5508E+01	[illegible]
C AUXILIARY MATRIX	5	6	-.2113E+02	-.2113E+02
C AUXILIARY MATRIX	8	6	-.1942E+00	-.1942E+00
C AUXILIARY MATRIX	13	6	-.8645E+00	-.8645E+00
C AUXILIARY MATRIX	1	7	-.1067E+04	-.1063E+04
C AUXILIARY MATRIX	2	7	-.3691E+04	-.3677E+04
C AUXILIARY MATRIX	3	7	-.3286E+04	-.3275E+04
C AUXILIARY MATRIX	4	7	-.8213E+04	-.8179E+04
C AUXILIARY MATRIX	5	7	-.1903E+04	-.1900E+04
C AUXILIARY MATRIX	8	7	-.3414E+04	-.3424E+04
C AUXILIARY MATRIX	9	7	-.5692E+05	-.5674E+05
C AUXILIARY MATRIX	10	7	-.8265E+04	-.8744E+04
C AUXILIARY MATRIX	11	7	-.2442E+05	-.2462E+05
C AUXILIARY MATRIX	13	7	-.1067E+04	-.1063E+04
C AUXILIARY MATRIX	14	7	-.4005E+04	-.3992E+04
C AUXILIARY MATRIX	15	7	-.5841E+04	-.5822E+04
C AUXILIARY MATRIX	16	7	-.9155E+04	-.9126E+04
C AUXILIARY MATRIX	17	7	-.2171E+04	-.2167E+04
C AUXILIARY MATRIX	19	7	-.1761E+04	-.1760E+04
C AUXILIARY MATRIX	20	7	-.4004E+04	-.3991E+04
C AUXILIARY MATRIX	22	7	-.9184E+04	-.9159E+04
C AUXILIARY MATRIX	23	7	-.5027E+03	-.4978E+03
C AUXILIARY MATRIX	24	7	-.1939E+03	-.1884E+03
C AUXILIARY MATRIX	1	8	-.7765E+02	-.7777E+02
C AUXILIARY MATRIX	2	8	-.1981E+03	-.1948E+03

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34 SOME OF THE INVALID STABILITY DERIVATIVES HAVE NOT BEEN FLAGGED BECAUSE THE ARRAY IS FULL.
SUBROUTINE MATIVE
LOCATN = 301

EIGENVALUES AND NORMALIZED EIGENVECTORS

EIGENVALUES

	0.0000	0.0000	0.0000	0.0000	-.1139	.4154	-.1139	-.4154	-.0331	.2721	-.0331	-.[illegible]

NORMALIZED EIGENVECTORS

EU	0.0000	0.0000	0.0000	0.0000	-.0272	-.0200	-.0272	.0200	.0052	.0247	.0052	-.[illegible]47
EV	0.0000	0.0000	0.0000	0.0000	-.1381	.5294	-.1381	-.5294	-.0014	-.0026	-.0014	[illegible]
EW	0.0000	0.0000	0.0000	0.0000	.0519	.0039	.0519	-.0039	.0513	.1264	.0513	-.[illegible]64
EP	0.0000	0.0000	0.0000	0.0000	.0374	-.0354	.0374	.0354	.0000	.0001	.0000	-.[illegible]
EQ	0.0000	0.0000	0.0000	0.0000	-.0003	-.0006	-.0003	.0006	.0026	.0020	.002[illegible]	-.[illegible]2
ER	0.0000	0.0000	0.0000	0.0000	.0034	.0008	.0034	-.0008	.0000	.0001	.0000	-.[illegible]
EX	1.0000	0.0000	0.0000	0.0000	-.0281	.0731	-.0281	-.0731	.0606	-.2469	.0606	[illegible]
EY	0.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	-.0180	-.0038	-.0180	[illegible]
EZ	0.0000	0.0000	0.0000	0.0000	-.0752	-.1591	-.0752	.1591	1.0000	0.0000	1.0000	0.
EPHI	0.0000	0.0000	0.0000	0.0000	-.1023	-.0620	-.1023	.0620	.0004	-.0001	.0004	[illegible]
ETHETA	0.0000	0.0000	0.0000	0.0000	-.0012	.0011	-.0012	-.0011	.0060	-.0104	.0060	.1[illegible]4
EPSI	0.0000	0.0000	0.0000	0.0000	-.0004	-.0081	-.0004	.0081	.0002	-.0002	.0002	.[illegible]2

EIGENVALUES

	-.2157	0.0000	-.0078	.1237	-.0078	-.1237	-.0210	0.0000	-.1226	0.0000	-.0000	0.[illegible]

NORMALIZED EIGENVECTORS

EU	-.1255	0.0000	.0102	.0022	.0102	-.0022	-.0210	0.0000	-.1226	0.0000	-.0000	0.[illegible]
EV	-.3074	0.0000	.0379	.0652	.0379	-.0652	-.0003	0.0000	-.2765	0.0000	-.0000	0.[illegible]
EW	-.3099	0.0000	.0118	-.0204	.0118	.0204	.0004	0.0000	-.2079	0.0000	.0000	0.[illegible]
EP	-.0002	0.0000	-.0003	-.0004	-.0003	.0004	.0000	0.0000	-.0017	0.0000	.0000	0.[illegible]
EQ	.0024	0.0000	.0001	.0001	.0001	-.0001	-.0000	0.0000	.070[illegible]	0.0000	-.0000	0.[illegible]
ER	-.0003	0.0000	-.0005	-.0004	-.0005	.0004	-.0000	0.0000	-.0617	0.0000	.0000	0.[illegible]
EX	.3620	0.0000	.0125	-.0830	.0125	.0830	1.0000	0.0000	1.0000	0.0000	1.0000	0.[illegible]
EY	-.3416	0.0000	1.0000	0.0000	1.0000	0.0000	.0069	0.0000	.6280	0.0000	.0307	0.[illegible]
EZ	1.0000	0.0000	-.0357	-.0521	-.0357	.0521	-.0146	0.0000	.8380	0.0000	.1291	0.[illegible]
EPHI	.0010	0.0000	-.0031	.0026	-.0031	-.0026	-.0000	0.0000	.0140	0.0000	-.0000	0.[illegible]
ETHETA	-.0110	0.0000	.0004	-.0010	.0004	.0010	.0000	0.0000	-.0075	0.0000	.0000	0.[illegible]
EPSI	.0012	0.0000	-.0033	.0042	-.0033	-.0042	.0000	0.0000	.0139	0.0000	-.0000	0.[illegible]

EASL SUBROUTINE EIGRP PERFORMANCE INDEX = 13.097

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***THE PERTURBATION INCREMENTS USED IN THE CALCULATION OF THESE STABILITY DERIVATIVES***

   U        V        W        P        Q        R        X        Y        Z        PHI      THETA    PSI
 .08000   .08000   .08000   .00140   .00140   .00140   .08000   .08000   .08000   .CC140   .00140   .00.4

 THETA R     AISR      DIS.     OMEGA R   THETA P   OMEGA P   AILERON   ELEVATOR  RUDDER
  .00140    .00525    .00525    .00140    .00140    .CC140    .00140    .0014C    .CC14(

           VHGUST                       LHGUST                      VDWHGT                        ?HGST
 .08000    .08000    .08000   .00140    .00140   .00140   .C8000    .08000   .08000    .00140    .CC140   .CC14.

 UGGDXH    UUGGYH    VVGGYH
 .08000    .08000    .08000

           VTGUST                       LTGUST                      V?TGT                         ?TGST
 .08000    .08000    .0800C   .00140    .00140   .00140   .C6000    .08000   .08000    .C014C    .0C140   .CC14.

 UGGDXT    UUGGYT    VVGGYT
 .08000    .08000    .08000

GUSTS  LPU1--U   V        W         LPU2--U   V        W         LPU3--U   V        W         LPU4--U   V        W
       .08000   .0800C   .08000    .08000    .08000   .C8000    .08000    .08CCC   .08000    .08000    .C8000   .[illegible]
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-------------------------------------------------FLIGHT CONTROL SYSTEM CONFIGURATION---------

-----FLIGHT CONTROL SYSTEM LIMITS
UILM   =   .3500E+00 RADIANS
ULLM   =   .4000E+00 RADIANS
VILM   =   .4000E+00 RADIANS
VLLM   =   .4500E+00 RADIANS
HDTILM =   .3500E+00 RADIANS
HDTLLM =   .4000E+00 RADIANS
PHIILM =   .3500E+00 RADIANS
PHILLM =   .4000E+00 RADIANS
THEILM =   .3500E+00 RADIANS
THELLM =   .4000E+00 RADIANS
RILM   =   .3500E+00 RADIANS
RLLM   =   .4000E+00 RADIANS

-----FEEDBACK CONTROL FLAGS
UFDBK  = T          T = BODY AXIS U FEEDBACK AND F = BODY AXIS U APPARENT FEEDBACK
VFDBK  = T          T = BODY AXIS V FEEDBACK AND F = BODY AXIS V APPARENT FEEDBACK
RFDBK  = T          T = BODY AXIS YAW RATE FEEDBACK AND F= EULER AXIS PSIDOT FEEDBACK

-----CLOSED LOOP FLAGS FOR EACH LINKED CONTROL
ULPFLG = T          T = U LOOP CLOSED; F = U LOOP OPEN
VLPFLG = T          T = V LOOP CLOSED; F = V LOOP OPEN
HDTLPF = T          T = HDOT LOOP CLOSED; F = HDOT LOOP OPEN
PLPFLG = T          T = P LOOP CLOSED; F = P LOOP OPEN
QLPFLG = T          T = Q LOOP CLOSED; F = Q LOOP OPEN
TRTLPF = T          T = TURN RATE LOOP CLOSED; F = TURN RATE LOOP OPEN

-----FLIGHT CONTROL SYSTEM GAINS
KUSPED =  .1590E+00 RAD / (FT / SEC)
KIU    =  .1000E-01 RAD / FT
IAXAC  = 0.         RAD / (FT / (SEC**2))
KVSPED =  .3000E+00 RAD / (FT / SEC)
KIV    =  .1000E-01 RAD / FT
IAYAC  = 0.         RAD / (FT / (SEC**2))
KHDOT  =  .2220E-01 RAD / (FT / SEC)
KIHDOT =  .5300E-01 RAD / FT
IAZAC  = 0.         RAD / (FT / (SEC**2))
KPHI   =  .2180E+00 RAD / RAD
KIPHI  =  .1400E+00 RAD / (RAD * SEC)
KRDOT  =  .1335E+01 RAD / (RAD / SEC)
KTHETA =  .4720E+00 RAD / RAD
KITHET =  .1000E+00 RAD / (RAD * SEC)
KPTHAT =  .2420E+01 RAD / (RAD / SEC)
KTRAT  =  .7060E+01 RAD / (RAD / SEC)
KIR    =  .1000E-01 RAD / RAD

-----TIMES AND CONTROL SYSTEM GAINS FOR HOVER CONTROL
FLSHT1 =  2000.0000 SECONDS                            STARTING TIME FOR HOVER
FLSHT2 =  2200.0000 SECONDS                            ENDING TIME FOR HOVER
KX     =     1.0000 (FT / SEC) / FT                    X DIRECTION GAIN
KY     =      .2000 (FT / SEC) / FT                    Y DIRECTION GAIN
KH     =     1.0000 (FT / SEC) / FT                    H DIRECTION GAIN
KPSI   =     1.0000 (RAD / SEC) / RAD                  YAW ANGLE GAIN

-----FEEDBACK SENSOR LOCATIONS
XACCLC = 0.          0.           .0030E+02 FEET
XVSNLC = 0.          0.          0.         FEET
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--------------------------------------------------TIME HISTORY PROFILE-----

* * * * * TEST COMMANDS * * * * *

-----COMMAND TIME FOR ROTORS
RTCOM1 =  2000.0000 SECONDS                              COMMAND START
RTCOM2 =  2200.0000 SECONDS                              COMMAND END

-----COMMANDED ROTOR COLLECTIVE DEFLECTION INCREMENT FOR:
DTHCR1 =      .2000 RADIANS                              LPU-1
DTHCR2 =      .2000 RADIANS                              LPU-2
DTHCR3 =      .2000 RADIANS                              LPU-3
DTHCR4 =      .2000 RADIANS                              LPU-4

-----COMMANDED ROTOR LATERAL DEFLECTION INCREMENT ON:
DA1SR1 =     0.0000 RADIANS                              LPU-1
DA1SR2 =     0.0000 RADIANS                              LPU-2
DA1SR3 =     0.0000 RADIANS                              LPU-3
DA1SR4 =     0.0000 RADIANS                              LPU-4

-----COMMANDED ROTOR LONGITUDINAL DEFLECTION  INCREMENT ON:
DB1SR1 =     0.0000 RADIANS                              LPU-1
DB1SR2 =     0.0000 RADIANS                              LPU-2
DB1SR3 =     0.0000 RADIANS                              LPU-3
 B1SR4 =     0.0000 RADIANS                              LPU-4

-----COMMAND TIME FOR PROPELLER
PTCOM1 =  2000.0000 SECONDS                              COMMAND START
PTCOM2 =  2200.0000 SECONDS                              COMMAND END

-----COMMANDED PROPELLER COLLECTIVE DEFLECTION INCREMENT FOR:
DTHCP1 =      .2000 RADIANS                              LPU-1
DTHCP2 =      .1000 RADIANS                              LPU-2
DTHCP3 =      .2000 RADIANS                              LPU-3
DTHCP4 =      .2000 RADIANS                              LPU-4

-----COMMAND TIME FOR LINKED CONTROL SYSTEM
LKTCM1 =  2000.0000 SECONDS                              COMMAND START
LKTCM2 =  2200.0000 SECONDS                              COMMAND END

-----COMMANDED LINKED CONTROL INCREMENTS FOR:
DXDCHL =     0.0000 RADIANS                              X DIRECTION
DYDCHL =     0.0000 RADIANS                              Y DIRECTION
DZDCHL =     0.0000 RADIANS                              Z DIRECTION
DPCHIL =     0.0000 RADIANS                              ROLL
DQCHIL =     0.0000 RADIANS                              PITCH
DRCHIL =     0.0000 RADIANS                              YAW

-----COMMAND TIMES AND COMMANDED DEFLECTIONS OF THE TAIL
TTCOM1 =  .2000E+04 SECONDS                              STARTING TIME
TTCOM2 =  .2200E+04 SECONDS                              ENDING TIME
DDLTAL = 0.         RADIANS                              AILERON DEFLECTION
DDLTEL = 0.         RADIANS                              ELEVATOR DEFLECTION
DDLTRD = 0.         RADIANS                              RUDDER DEFLECTION
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* * * * * FLIGHT CONTROL SYSTEM COMMANDS * * * * *

TIME          COMMAND       X - VELOCITY  FT./SEC.         (UCMD)
.1000E+01     .3000E+02

TIME          COMMAND       Y - VELOCITY  FT./SEC.         (VCMD)
.1000E+01    0.
.2000E+01     .6000E+01

TIME          COMMAND       H - VELOCITY  FT./SEC.         (HDTCMD)
.1000E+01     .3000E+01

TIME          COMMAND       ROLL ANGLE    RADIANS          (PHICMD)
.1000E+01    0.
.2000E+01     .2000E+00

TIME          COMMAND       PITCH ANGLE   RADIANS          (THECMD)
.1000E+01     .1000E+00

TIME          COMMAND       TURN RATE     RAD./SEC.        (TPTCMD)
.1000E+01    0.
.2000E+01     .3000E+00
```

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------------------------------------------------------GUST INPUTS------------------------------------------------------

-----HULL GUST COMMANDS WITH RESPECT TO THE HULL CENTER OF VOLUME.  GENERATED BY (1 - COSINE)
HT1GST =  2000.0000 SECONDS              START TIME FOR THE HULL GUST INTERVAL
HT2GST =  2200.0000 SECONDS              END TIME FOR THE HULL GUST INTERVAL
UHGMAX =     0.0000 FT./SEC.             MAXIMUM LINEAR GUST VELOCITY  X-DIRECTION
VHGMAX =     0.0000 FT./SEC.             MAXIMUM LINEAR GUST VELOCITY  Y-DIRECTION
WHGMAX =     0.0000 FT./SEC.             MAXIMUM LINEAR GUST VELOCITY  Z-DIRECTION
PHGMAX =     0.0000 RAD./SEC.            MAXIMUM ROLLING GUST VELOCITY ABOUT THE X-AXIS
QHGMAX =     0.0000 RAD./SEC.            MAXIMUM PITCHING GUST VELOCITY ABOUT THE Y-AXIS
RHGMAX =     0.0000 RAD./SEC.            MAXIMUM YAWING GUST VELOCITY ABOUT THE Z-AXIS
DUXHMX =     0.0000 FT./(SEC.**2)        MAXIMUM VALUE OF THE HULL X-DIRECTION VELOCITY DERIVATIVE ALONG THE HULL X-AXIS
DUYHMX =     0.0000 FT./(SEC.**2)        MAXIMUM VALUE OF THE HULL X-DIRECTION VELOCITY DERIVATIVE ALONG THE HULL Y-AXIS
DVYHMX =     0.0000 FT./(SEC.**2)        MAXIMUM VALUE OF THE HULL Y-DIRECTION VELOCITY DERIVATIVE ALONG THE HULL Y-AXIS

-----TAIL GUST COMMANDS WITH RESPECT TO THE TAIL CENTROID.  GENERATED BY (1 - COSINE)
TT1GST =  2000.0000 SECONDS              STARTING TIME FOR THE TAIL GUST INTERVAL
TT2GST =  2200.0000 SECONDS              ENDING TIME FOR THE TAIL GUST INTERVAL
UTGMAX =     0.0000 FT./SEC.             MAXIMUM LINEAR GUST VELOCITY  X-DIRECTION
VTGMAX =     0.0000 FT./SEC.             MAXIMUM LINEAR GUST VELOCITY  Y-DIRECTION
WTGMAX =     0.0000 FT./SEC.             MAXIMUM LINEAR GUST VELOCITY  Z-DIRECTION
PTGMAX =     0.0000 RAD./SEC.            MAXIMUM GUST ANGULAR ROLLING VELOCITY ABOUT THE X-AXIS
QTGMAX =     0.0000 RAD./SEC.            MAXIMUM GUST ANGULAR PITCHING VELOCITY ABOUT THE Y-AXIS
RTGMAX =     0.0000 RAD./SEC.            MAXIMUM GUST ANGULAR YAWING VELOCITY ABOUT THE Z-AXIS
DUXTMX =     0.0000 FT./(SEC.**2)        MAXIMUM VALUE OF THE TAIL X-DIRECTION VELOCITY DERIVATIVE ALONG THE TAIL X-AXIS
DUYTMX =     0.0000 FT./(SEC.**2)        MAXIMUM VALUE OF THE TAIL X-DIRECTION VELOCITY DERIVATIVE ALONG THE TAIL Y-AXIS
DVYTMX =     0.0000 FT./(SEC.**2)        MAXIMUM VALUE OF THE TAIL Y-DIRECTION VELOCITY DERIVATIVE ALONG THE TAIL Y-AXIS

-----TIMES AND MAXIMUM VELOCITIES FOR A GUST ACTING AT THE CENTER OF GRAVITY ON LPU-1.
     GENERATED BY (1 - COSINE)
L1T1GT =  2000.0000 SECONDS              STARTING TIME
L1T2GT =  2200.0000 SECONDS              ENDING TIME
UL1GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  X-DIRECTION
VL1GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  Y-DIRECTION
WL1GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  Z-DIRECTION

-----TIMES AND MAXIMUM VELOCITIES FOR A GUST ACTING AT THE CENTER OF GRAVITY ON LPU-2.
     GENERATED BY (1 - COSINE)
L2T1GT =  2000.0000 SECONDS              STARTING TIME
L2T2GT =  2200.0000 SECONDS              ENDING TIME
UL2GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  X-DIRECTION
VL2GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  Y-DIRECTION
WL2GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  Z-DIRECTION

-----TIMES AND MAXIMUM VELOCITIES FOR A GUST ACTING AT THE CENTER OF GRAVITY ON LPU-3.
     GENERATED BY (1 - COSINE)
L3T1GT =  2000.0000 SECONDS              STARTING TIME
L3T2GT =  2200.0000 SECONDS              ENDING TIME
UL3GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  X-DIRECTION
VL3GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  Y-DIRECTION
WL3GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  Z-DIRECTION

-----TIMES AND MAXIMUM VELOCITIES FOR A GUST ACTING AT THE CENTER OF GRAVITY ON LPU-4.
     GENERATED BY (1 - COSINE)
L4T1GT =  2000.0000 SECONDS              STARTING TIME
L4T2GT =  2200.0000 SECONDS              ENDING TIME
UL4GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  X-DIRECTION
VL4GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  Y-DIRECTION
WL4GMX =     0.0000 FT./SEC.             LINEAR GUST VELOCITY  Z-DIRECTION
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-----GUST STRING PARAMETERS
GSTFLG = F                                  T = GUST STRING WANTED;  F = GUST STRING NOT WANTED
GSTSCF =      1.0000                        GUST STRING SCALE FACTOR

-----POSITIONS OF THE FOUR GUST SOURCES
XFSRCX =    100.0000 FEET                   X DISTANCE TO FORWARD SOURCES
XASRCX =   -100.0000 FEET                   X DISTANCE TO AFT SOURCES
XSCRCY =    100.0000 FEET                   Y DISTANCE BOTH LEFT AND RIGHT
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----------------------------------------COMPUTER ALGORITHM TIME STEPS INPUT--------------

TIMSTP =  .50000E+00 SECONDS          NUMERICAL INTEGRATION TIME STEP
MINSTP =  .50000E-01 SECONDS          MINIMUM NUMERICAL TIME STEP ALLOWED
TPRINT =  .10000E+01 SECONDS          OUTPUT PRINT INTERVAL
TSIM   =  .50000E+01 SECONDS          TOTAL SIX DEGREE OF FREEDOM SIMULATION TIME
```

SIMULATION TIME -- 0.00

	U	V	W	P	Q	R	X	Y		PHI
HULL	14.000	0.	0.	0.	0.	0.	0.	0.	-1000.	0.
	THETA	PSI	AXCGG	AYCGG	AZCGG	NDHHT	NDTHT	VFGUST:X	VFGUST:Y	VFGUST:Z
HULL	0.	0.	-.27680E-11	-.56973E-13	-.17832E-13	9.3702	9.2421	0.	0.	0.
	DHGUST:X	DHGUST:Y	DHGUST:Z	DUGDXH	DUGDYH	DVGDYH	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	CTHGST.
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	DDHGST:Y	DDHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	MGDHAC:X	MGDHAC:Y
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	MGDHAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	CTGUST:X	CTGUST:Y	CTGUST:Z	DUGDXT	DUGDYT	DVGDYT
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VDRTGT:X	VDRTGT:Y	VDRTGT:Z	DDTGST:X	DDTGST:Y	DDTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	MGTTAC:X
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	MGDTAC:Y	MGDTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	ROHLCV:X	ROHLCV:Y	ROHLCV:Z	GAMMAH	LAMDAH
HULL	0.	0.	44.133	.38120E-01	-.65422	0.	0.	0.	0.	3.0059
	ZETAH	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	PALT
HULL	-3.0859	1.5708	43.539	.74702E-03	-.16723	0.	0.	0.	-.31196E-02	-.32196
	BETAT	PBETAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	PHIVEL:Z	PHIVEL:S
HULL	-.11858E-02	-.11858E-02	0.	.16157E-02	.16157E-02	0.	-.13382	.26619E-02	.65260	.34254
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	RTIVEL:Z	RCFLWS	RCFLWS
HULL	-.40732E-01	.31623E-01	.44055	.55156E-03	.15973	.20723E-01	-.12986E-02	.74947E-02	.87239E-01	.45012
	C FLOW C	TLAC	TLLC	ZAVSUT	RHBFOR:X	RHBFOR:Y	RHBFOR:Z	STATBF:X	STATBF:Y	STATFF:Z
HULL	-30.617	1.0001	1.0000	-4.1410	0.	0.	-.11476E+06	0.	0.	-.11476E+06
	GAHBFO:X	GAHBFO:Y	GAHBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	RHOWMO:X
HULL	0.	0.	0.	0.	0.	0.	-805.60	-.79982	13.148	0.
	RHOWMO:Y	RHOWMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
HULL	-43861.	-2443.0	0.	0.	0.	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHOGMO:X	RHOGMO:Y	RHOGMO:Z
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
HULL	0.	.11839E-18	0.	0.	0.	0.	.52903E-07	-.82006E-09	.14917E-06	0.
	HCACMO:Y	HCACMO:Z	RHUAF :X	RHUAF :Y	RHUAF :Z	RHUAMO:X	RHUAMO:Y	RHUAMO:Z	HCAEF :X	HCAEF :Y
HULL	.20212E-05	-.20926E-05	-805.60	-.79982	13.148	0.	-43361.	-2443.0	-805.60	-.79982
	HUAEF :Z	HUASMO:X	HUASMO:Y	HCA MO:Z	HOTAFO:X	HOTAFO:Y	HOTAFO:Z	HCTAMO:X	HCTAMO:Y	HCTAMO:Z
HULL	-.11475E+06	-13.301	-30464.	-2443.0	-805.60	-.79982	-.11475E+06	-13.301	-30464.	-2443.0
	TAFOR	TSYFOR	TOYFOR	TSZFOR	TSLMOM	TDLMOM	RTGWFO:X	RTGWFO:Y	RTGWFO:Z	RTGGMC:Y
HULL	-261.41	6.0053	0.	25.281	6.7999	-237.83	-261.41	6.0053	25.281	-237.83
	RTGGMO:Y	RTGGMC:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGMO:X	RTOGMO:Y	RTOGMO:Z
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

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	TCACFO:X	TCACFO:Y	TCACFO:Z	TCACMO:X	TCACMO:Y	TCACMO:Z	RTOAF :X	RTOAF :Y	RTOAF :Z	RT[illegible]
NULL	0.	.32894E-07	.29986E-07	.63316E-06	.21785E-06	-.31177E-08	-261.41	6.0063	25.281	-231.[illegible]
	RTOAMO:Y	RTOAMO:Z	TOAFOR:X	TOAFOR:Y	TOAFOR:Z	TOAMOM:X	TOAMOM:Y	TOAMOM:Z	TOTAFO:X	TO[illegible]
NULL	0.	0.	-261.41	6.0063	25.281	-131.14	5895.6	-367.89	-261.41	6.00[illegible]
	TOTAFO:Z	TOTAMO:X	TOTAMO:Y	TOTAMO:Z	HABFOR:X	HABFOR:Y	HABFOR:Z	HABMOM:X	HABMOM:Y	HABMOM:Z
NULL	25.281	-231.03	.21785E-06	-.31177E-08	-1067.0	5.2065	-.11473E+06	-144.44	-24959.	-28.1.
	HBACFU:X	HBACFU:Y	HBACFU:Z	HBACMO:X	HBACMO:Y	HBACMO:Z	HTOTAF:X	HTOTAF:Y	HTOTAF:Z	HTOTAM:X
NULL	.32903E-07	.32073E-07	.31477E-07	.11665E-05	.37673E-05	-.57739E-05	-1067.0	5.2065	-.11473E+06	-144.4[illegible]
	HTOTAM:Y	HTOTAM:Z	HCBLFU:X	HCBLFO:Y	HCBLFO:Z	HCBLMO:X	HCBLMO:Y	HCBLMO:Z	HGERFO:X	HGERFO:Y
NULL	-24968.	-2811.5	0.	0.	0.	0.	0.	0.	0.	0.
	HGERFO:Z	HGERMO:X	HGERMO:Y	HGERMO:Z	MORLOD:X	MORLOD:Y	MORLOD:Z	ACZLOD:X	ACZLOD:Y	ACZLOD:Z
NULL	0.	0.	0.	0.	I	I	I	I	I	I
	UCOM	VCOM	HDTCOM	PHICOM	THECOM	TRATCM	PHRF:X	PHRF:Y	PHRF:Z	PH[illegible]
NULL	14.000	0.	0.	0.	0.	0.	I	I	I	
	VHSENS:X	VHSENS:Y	VHSENS:Z	XSPEED	YSPEED	ZSPEED	AXACC	AYACC	AZACC	R LLRT
NULL	44.000	0.	0.	14.000	0.	0.	-.89059E-10	-.18331E-11	-.57372E-12	0.
	PTCHRT	TURNRT	IACELC:X	IACELC:Y	IACELC:Z	UERR	VERR	HDTERR	PHIERR	THEERR
NULL	0.	0.	I	I	I	0.	0.	0.	0.	0.
	TRATER	IERR:X	IERR:Y	IERR:Z	PSIERR	UINT	VINT	HDTINT	PHIINT	THEINT
NULL	0.	I	I	I	I	.99476E-01	-.53286E-02	.42793E-01	-.32315E-02	-.12431[illegible]
	TRIINT	UDCNTL	VDCNTL	WDCNTL	PCNTL	QCNTL	RCNTL	SOLTAL	SOLTEL	SOLTR[illegible]
NULL	.24059E-02	.99476E-01	-.53286E-02	-.42793E-01	-.32315E-02	-.12431E-02	.24059E-02	.32315E-02	.12431E-02	-.24059[illegible]
	POLTAL	POLTEL	POLTRU	DELTAL	DELTEL	DELTRU				
NULL	0.	0.	0.	.32315E-02	.12431E-02	-.24059E-02				

LPU VARIABLES AT TIME --   0.00

	U	V	W	PHID	THETD	PSID	X	Y	Z	[illegible]
LPU1	13.991	0.	.40990	0.	0.	0.	37.895	-81.500	-960.63	0.
LPU2	13.991	0.	-.40990	0.	0.	0.	38.105	81.500	-960.63	0.
LPU3	13.991	0.	.40990	0.	0.	0.	-38.105	-81.500	-960.63	0.
LPU4	13.991	0.	-.40990	0.	0.	0.	-37.895	81.500	-960.63	0.

	THETA	PSI	NDRHT	NDPHT	GERIL :X	GERIL :Y	GERIL :Z	IVSOR :X	IVSOR :Y	IVSOR :Z
LPU1	.35000E-01	0.	17.279	73.368	36.000	-46.000	-951.31	I	I	
LPU2	-.35000E-01	0.	17.279	73.293	36.000	46.000	-951.31	I	I	
LPU3	.35000E-01	0.	17.279	73.368	-36.000	-46.000	-951.31	I	I	
LPU4	-.35000E-01	0.	17.279	73.293	-36.000	46.000	-951.31	I	I	

	VSORC :X	VSORC :Y	VSORC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVFUS :X
LPU1	I	I	I	0.	0.	0.	43.973	0.	1.5397	52.
LPU2	I	I	I	0.	0.	0.	43.973	0.	-1.5397	50.177
LPU3	I	I	I	0.	0.	0.	43.973	0.	1.5397	52.377
LPU4	I	I	I	0.	0.	0.	43.973	0.	-1.5397	50.165

	RVFUS :Y	RVFUS :Z	RVROT :X	RVROT :Y	RVROT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RPIV :X	RPIV :Y
LPU1	-.40207E-01	-5.7135	43.973	0.	1.5397	44.384	-.40207E-01	-5.9946	-.41140	.40207E-
LPU2	-.40482E-01	-9.3332	43.973	0.	-1.5397	44.314	-.40482E-01	-9.1291	-.34119	.40482 -
LPU3	-.43070E-01	-6.2506	43.973	0.	1.5397	44.414	-.43070E-01	-6.5311	-.44070	.43070 -
LPU4	-.43323E-01	-9.6646	43.973	0.	-1.5397	44.338	-.43323E-01	-9.6617	-.35514	.43323 -

	RPIV :Z	RFIV :X	RFIV :Y	RFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCS F	DELTA F	CEFR
LPU1	7.5342	-.41140	.40207E-01	7.5342	-7.9776	0.	-.28097	3.6936	.84114E-02	1.0000
LPU2	7.5894	-.34119	.40482E-01	7.5894	-5.6632	0.	.20410	3.6974	.84158E-02	1.0000
LPU3	8.0703	-.44070	.43070E-01	8.0703	-7.9636	0.	-.28046	3.7113	.84173E-02	1.0000
LPU4	8.1221	-.35514	.43323E-01	8.1221	-5.6272	0.	.20285	3.7150	.84254E-02	1.0000

	LCSPE	DELTA P	CEFP	STHER	SAISR	SBISR	SCMGR	PTHR	PAISR	PBISR
LPU1	3.7257	.85000E-02	1.0000	.38318E-01	-.53286E-02	.54550E-01	23.250	0.	0.	0.
LPU2	3.6481	.84605E-02	1.0000	.44781E-01	-.53286E-02	.44926E-01	23.250	0.	0.	0.
LPU3	3.7257	.85000E-02	1.0000	.40804E-01	-.53286E-02	.54550E-01	23.250	0.	0.	0.
LPU4	3.6473	.84604E-02	1.0000	.47267E-01	-.53286E-02	.44926E-01	23.250	0.	0.	0.

	THEOR	AISR	BISR	OMEGR	STHEP	SCMGP	PTHEP	THEOP	CMEGP	TR
LPU1	.38318E-01	-.53285E-02	.54550E-01	23.250	.10188	125.66	0.	.10188	125.66	2449.7
LPU2	.44781E-01	-.53286E-02	.44926E-01	23.250	.97070E-01	125.66	0.	.97070E-01	125.66	2432.4
LPU3	.40804E-01	-.53285E-02	.54550E-01	23.250	.10188	125.66	0.	.10188	125.66	2626.7
LPU4	.47267E-01	-.53286E-02	.44926E-01	23.250	.97070E-01	125.66	0.	.97070E-01	125.66	2656.4

	QR	ROTFO :X	ROTFO :Y	ROTFO :Z	ROTMO :X	ROTMO :Y	ROTMO :Z	TP	CP	PRUPF :X
LPU1	5134.8	97.671	-1.6277	-2448.0	-292.75	-657.74	5127.0	158.99	205.43	158.84
LPU2	5430.0	74.106	-1.4830	-2481.6	-254.24	-489.82	5424.4	114.75	187.70	114.83
LPU3	5224.6	105.54	-1.1549	-2624.9	-292.40	-711.02	5206.8	158.98	205.42	158.83
LPU4	5532.6	79.993	-.77402	-2659.5	-253.89	-530.47	5527.0	114.39	187.53	114.37

	PRUPF :Y	PRUPF :Z	PRUPM :X	PRUPM :Y	PRUPM :Z	FUSFO :X	FUSFO :Y	FUSFO :Z	FUSMO :X	FUSMO :Y
LPU1	.76904E-02	7.0772	-206.30	-99.051	-7.1550	-60.320	.32494E-03	21.089	0.	0.
LPU2	.74519E-02	-2.0007	-187.59	36.410	6.0343	-55.391	.32940E-03	56.27	0.	0.
LPU3	.84925E-02	7.1823	-206.23	-100.55	-7.1467	- 355	.37287E-03	25.247	0.	0.
LPU4	.79760E-02	-2.4865	-187.42	34.415	6.0358	-55.364	.37726E-03	62.862	0.	0.

	FUSMO :Z	JETHS	JETFO :X	JETFO :Y	JETFO :Z	JETMO :X	JETMO :Y	JETMO :Z	LPAMO :X	LPAMO :Y
LPU1	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	294.94	-1.8195
LPU2	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	232.09	-1.4753
LPU3	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	302.56	-1.1460
LPU4	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	237.57	-.75586

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	LPAFO :Z	LPAFU :X	LPAMU :Y	LPAMO :Z	HCBLF :X	HCBLF :Y	HCBLF :Z	HCBLM :X	HCB M :Y	HCBLM :Z
LPU1	-2436.6	-499.05	-1222.4	5119.9	0.	0.	0.	0.	0.	0.
LPU2	-2444.9	-441.83	-919.02	5431.1	0.	0.	0.	0.	0.	0.
LPU3	-2609.5	-498.60	-1277.2	5199.7	0.	0.	0.	0.	0.	0.
LPU4	-2516.1	-441.31	-961.26	5533.6	0.	0.	0.	0.	0.	0.

	GCPKS	GCFUR :X	GCFUR :Y	GCFUR :Z	FRTMG	GFFUR :X	GFFUR :Y	GFFUR :Z	GERFO :X	GERFG :Y
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFO :Z	HGRMO :X	HGRMU :Y	HGRMU :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z
LPU1	0.	0.	0.	0.	209.46	-1.8195	6547.0	-325.04	-1153.2	5134.4
LPU2	0.	0.	0.	0.	317.51	-1.4753	6557.3	-636.03	-2559.3	5412.1
LPU3	0.	0.	0.	0.	211.06	-1.1460	6374.2	-319.86	-1240.8	5214.[illegible]
LPU4	0.	0.	0.	0.	325.95	-.76560	6396.4	-6[illegible].97	-2617.9	551[illegible]

	AOR	AIR	BIR	CLAVR	ALAVR	VTR	TWINR	RCTIV :X	RCTIV :Y	RCTIV :Z
LPU1	.50761E-01	.57605E-02	.45840E-02	.95049E-01	.25732E-01	14.461	4.7160	-.25712	.25[illegible]29E-01	4.7[illegible]89
LPU2	.52620E-01	.63496E-02	.47370E-02	.96319E-01	.20051E-01	14.557	4.7482	-.21325	.25[illegible]01E-01	4.74[illegible]
LPU3	.54154E-01	.61396E-02	.46905E-02	.10192	.27462E-01	14.975	5.0518	-.27544	.25[illegible]19E-01	5.04[illegible]2
LPU4	.56023E-01	.67284E-02	.50440E-02	.10322	.27786E-01	15.070	5.0815	-.22821	.27077E-01	5.[illegible]703

	DSKLR	PDALK R	CLAVP	ALAVP	VTP	TWINP	PRPIV :X	PRPIV :Y	PRPIV :Z	DSKLP
LPU1	.99459	217.06	.46008E-01	.12349E-01	15.749	4.9892	-4.9862	0.	-.17560	1.1796
LPU2	1.0079	229.54	.33235E-01	.91103E-02	13.385	3.6667	-3.6545	0.	.12756	.85212
LPU3	1.0065	220.44	.46005E-01	.12348E-01	15.746	4.9803	-4.9772	0.	-.17529	1.1795
LPU4	1.0001	235.86	.35102E-01	.96757E-02	13.359	3.6442	-3.6420	0.	.12678	.84[illegible]71

	PDALK P	LGLAT	GRAT
LPU1	47.163	3.3200	0.
LPU2	42.265	3.3200	0.
LPU3	47.160	3.3200	0.
LPU4	42.646	3.3200	0.

TAIL AERODYNAMIC REGIMES   ANGLE OF ATTACK - 1   ANGLE OF SLIDESLIP - 1   ROLLING ANGLE OF ATTACK - 1

ORIGINAL PAGE IS
OF POOR QUALITY

SIMULATION TIME -- 1.00

	U	V	W	P	Q	R	X	Y	Z	H
NULL	17.390	.54794E-02	-1.5973	-.48969E-03	.22615E-01	-.54393E-03	15.511	-.12406E-02	-1000.5	-.2.757.-
	THETA	PSI	AXCGG	AYCGG	AZCGG	NDHHT	NOTHT	VHGUST:X	VHGUST:Y	VHGUST:Z
NULL	.10071E-01	-.30711E-03	.12332	.24954E-03	-.95483E-01	9.8750	9.2386	0.	C.	C.
	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DVGDYH	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	CDHGST:
NULL	0.	0.	0.	0.	0.	0.	0.	C.	C.	C.
	ODHGST:Y	ODHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	PGD AC:X	PGDHAC:Y
NULL	0.	0.	.63374E-02	-.16169E-01	-.67843	0.	0.	C.	C.	C.
	HGDHAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	OTGUST:X	OTGUST:Y	OTGUST:Z	CUGDX:	CUGDYT	DVGDYT
NULL	0.	0.	0.	0.	0.	0.	0.	C.	C.	C.
	VDRTGT:X	VDRTGT:Y	VDRTGT:Z	ODTGST:X	ODTGST:Y	ODTGST:Z	VDTGST:X	VDTGST:Y	VDT ST:Z	PCDTAC:X
NULL	0.	0.	0.	C.	0.	C.	.63374E-02	-.16169E-01	-.67843	C.
	HGDTAC:Y	HGDTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	RCHLCV:X	ROHLCV:Y	RCHLCV:Z	GAMRAM	LAMDAM
NULL	0.	0.	45.575	.53647	-3.1350	-.48969E-03	.22615E-01	-.54393E-03	1.5943	2.9771
	ZETAM	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCT IL:X	ROTAIL:Y	ROTAIL:	ALT	PALT
NULL	-1.5773	1.5708	45.716	.55410E-01	.41364	-.48969E-03	.22615E-01	-.54393E-03	.10915E-02	.10915
	BETAT	PBETAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:
NULL	-.19271E-02	-.19271E-02	-.58914E-03	.92214E-03	.92214E-03	-.58914E-03	1.4570	.33478E-02	1.6262	-.194815-
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RC LWC	RCFLWC
NULL	-.55334	.45537	1.0244	.51426E-03	.37163	.27198	-.21611E-02	.98365E-01	.25596	.13476
	C FLOW C	TIAC	TLLC	ZAVSOT	RH FOR:X	RHBFOR:Y	RHBFOR:Z	STATBF:X	STATBF:Y	STATBF:Z
NULL	-36.999	1.0001	1.0000	-4.1410	1155.7	28.411	-.11476E+06	1155.7	28.411	-.11476 +06
	GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOWFC:X	RHOWFO:Y	RHOWFO:Z	RHOWMO:
NULL	0.	0.	0.	0.	0.	0.	-675.50	-46.106	964.02	.31512E-0
	RHOWMO:Y	RHOWMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-.22597E+06	-35029.	4.5358	-42.040	-1763.9	0.	0.	C.	C.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHO FO:Y	RHOGFO:Z	RHOGMO:X	RHOGMO:Y	RHOGMO:Z
NULL	0.	0.	C.	0.	4.5358	-42.040	-1763.9	0.	C.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
NULL	0.	.25198E-16	.72285E-20	0.	0.	0.	-2370.9	-36.784	70 .6	C.
	HCACMO:Y	HCACMO:Z	RHUAF :X	RHUAF :Y	RHUAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCAIF :X	HCAIF :Z
NULL	-92327.	733.75	-670.97	-88.147	-799.90	.31512E-02	-.22597E+06	-35029.	484.77	-59.73
	HCASF :Z	HOASFO:X	HOASMO:Y	HOASMO:Z	HOTAFO:X	HOTAFO:Y	HOTAFO:Z	HCTAFO:X	HCTAFO:Y	HCTAFO:Z
NULL	-.11556E+06	-993.41	-.23403E+06	-35029.	-1836.1	-96.520	-.10851E+06	-99 .41	-.37635E+06	-34246.
	TXFOR	TSYFOR	TOTFOR	TS FOR	TSLMOM	TCLMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RTOWMO:
NULL	-280.21	10.767	1.0084	-9.4484	12.210	-149.44	-283.21	12.575	-5.44 4	-137.
	RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
NULL	0.	0.	0.	-7.9132	-410.45	-15.25	0.	0.	C.	C.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGMO:X	RTOGMO:Y	RTOGMO:Z
NULL	0.	0.	0.	0.	0.	-7.9132	-410.45	-150.25	C.	C.

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	TCACFO:X	TCACFO:Y	TCACFO:Z	TCACMO:X	TCACMO:Y	TCACMO:Z	RTOAF :X	RTOAF :Y	RTOAF :Z	RTO[illegible]
NULL	0.	-13.912	200.24	-232.02	-99.513	.85016	-288.21	4.6622	-419.90	-29[illegible]
	RTOAMO:Y	RTOAMO:Z	TOAFOR:X	TOAFOR:Y	TCAFOR:Z	TCAMOM:X	TOAMOM:Y	TCAMOM:Z	TCTAFO:X	TCTAFO:Y
NULL	0.	0.	-200.21	4.6622	-419.90	-217.95	-31700.	-77.841	-288.21	-9.24[illegible]
	TOTAFO:Z	TOTAMO:X	TOTAMO:Y	TOTAMO:Z	HABFOR:X	HABFOR:Y	HABFOR:Z	HABMOM:X	HABMOM:Y	HABMOM:[illegible]
NULL	-133.65	-527.51	-99.513	.85016	196.57	-55.074	-.11598E+06	-1211.4	-.2[illegible]573E+06	-25107.
	HBACFO:X	HBACFO:Y	HBACFO:Z	HBACMO:X	HBACMO:Y	HBACMO:Z	HTOTAF:X	HTOTAF:Y	HTOTAF:Z	HTOT[illegible]:X
NULL	-2370.9	-30.696	7334.6	-1075.1	-27952.	2006.9	-2174.3	-105.77	-.10864E+06	-226[illegible]
	HTOTAM:Y	HTOTAM:Z	HCBLFO:X	HCBLFO:Y	HCBLFO:Z	HCBLMO:X	HCBLMO:Y	HCBLMO:Z	HGERFO:X	HGERFO:Y
NULL	-.29366E+06	-35100.	0.	0.	0.	0.	0.	0.	0.	0.
	HGERFO:Z	HGERMO:X	HGERMO:Y	HGERMO:Z	MORLOD:X	MORLOD:Y	MORLOD:Z	AGZLOD:X	AGZLOD:Y	AGZL[illegible]
NULL	0.	0.	0.	0.	I	I	I	I	I	
	UCOM	VCOM	HDTCD.	PHICOM	THECOM	TRATCM	PHRF:X	PHRF:Y	PHRF:Z	PHRF:P I
NULL	30.000	0.	5.0000	0.	.10000	0.	I	I	I	
	VHSENS:X	VHSENS:Y	VHSENS:Z	XSPEED	YSPEED	ZSPEED	AXACC	AYACC	AZ CC	ROLLRT
NULL	40.030	-.16683E-02	-1.0952	17.390	.54794E-02	1.5724	3.9677	.802[illegible]E-02	-3.1042	-.46969 -[illegible]
	PTCHRT	YAWRT	IACELC:X	IACELC:Y	IACELC:Z	UERR	VERR	HDTERR	PHIERR	T[illegible]
NULL	.22615E-01	-.54393E-03	I	I	I	12.610	-.54794E-02	3.4276	.24757E-03	.89929 -[illegible]
	TRATER	IERR:X	IERR:Y	IERR:Z	PSIERR	UINT	VINT	HDTINT	PHIINT	T[illegible]INT
NULL	.54393E-03	I	I	I	I	.10784	-.53302E-02	.45152E-01	-.32190E-02	-.19[illegible]
	TRTINT	UCCNTL	VCCNTL	HDCNTL	PCONTL	CCONTL	RCONTL	SOLTAL	SOLTEL	SOLTRD
NULL	.24270E-02	.90000	-.69740E-02	-.12125	-.30226E-02	.15913E-01	.62786E-02	.30226E-02	-.15913E-01	-.62785[illegible]
	PGLTAL	PGLTEL	PGLTRD	DELTAL	DELTEL	DELTRD				
NULL	0.	0.	0.	.30226E-02	-.15913E-01	-.62786E-02				

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LPU VARIABLES AT TIME -- 1.00

	U	V	W	PHID	THETD	PSID	X	Y	Z	[illegible]
LPU1	18.302	.41470E-02	-1.5749	0.	0.	0.	53.775	-81.503	-961.49	0.
LPU2	18.235	.40328E-02	-2.7383	0.	0.	0.	54.035	81.497	-961.53	0.
LPU3	18.292	.45488E-01	.14278	0.	0.	0.	-22.221	-81.460	-961.7	0.
LPU4	18.293	.45372E-01	-1.2211	0.	0.	0.	-21.961	81.520	-961.77	0.

	THETA	PSI	NDRHT	NOPHT	GERIL :X	GERIL :Y	GERIL :Z	IVSOR :X	IVSOR :Y	IVSOR :Z
LPU1	.35000E-01	0.	17.294	73.444	51.985	-46.000	-952.16	I	I	
LPU2	-.35000E-01	0.	17.295	73.373	52.013	46.000	-952.18	I	I	
LPU3	.35000E-01	0.	17.281	73.386	-20.011	-45.978	-951.44	I	I	
LPU4	-.35000E-01	0.	17.282	73.314	-19.983	46.022	-951.46	I	I	

	VSORC :X	VSORC :Y	VSORC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	[illegible]
LPU1	I	I	I	0.	0.	0.	48.272	.13266E-01	-.22326	144.4
LPU2	I	I	I	0.	0.	0.	48.224	.13172E-01	-3.6866	140.[illegible]
LPU3	I	I	I	0.	0.	0.	48.212	.54625E-01	1.4944	144.5
LPU4	I	I	I	0.	0.	0.	43.264	.54511E-01	-1.9689	140.7

	RVFUS :Y	RVFUS :Z	RVRUT :X	RVRUT :Y	RVRUT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RPIV :X	RPIV :Y
LPU1	-.14314	-16.927	48.114	.99940E-02	-.22326	53.004	-.15099	-22.464	-4.7317	.15642
LPU2	-.14355	-20.615	48.065	.90133E-02	-3.6866	52.410	-.15087	-26.075	-4.1863	.15667
LPU3	-.60977E-01	-11.440	48.023	.51332E-01	1.4944	51.709	-.68822E-01	-15.024	-3.4967	.11560
LPU4	-.61703E-01	-21.490	48.126	.50952E-01	-1.9689	51.389	-.69073E-01	-18.657	-3.1052	.11621

	RPIV :Z	RFIV :X	RFIV :Y	RFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCSRE	DELTA A	G FR
LPU1	21.924	-4.7317	.15642	21.924	-91.460	0.	-3.2211	4.2598	.11350E-01	1.0000
LPU2	22.072	-4.1863	.15667	22.072	-87.794	0.	3.0561	4.2611	.10499E-01	1.0000
LPU3	16.202	-3.4967	.11560	16.202	-92.799	0.	-3.2682	4.0504	.91573E-02	1.0000
LPU4	16.372	-3.1052	.11621	16.372	-89.313	0.	3.1090	4.0602	.91530E-02	1.0000

	LCSPE	DELTA P	GFP	STHSR	SALSR	SBLSR	SCMGR	PTHER	PALSR	PBLSR
LPU1	5.7300	.32691E-01	1.0000	.13414	-.69740E-02	.21256	23.250	0.	0.	0.
LPU2	5.7300	.30550E-01	1.0000	.14018	-.69740E-02	.18744	23.250	0.	0.	0.
LPU3	5.7300	.32738E-01	1.0000	.10231	-.69740E-02	.21256	23.250	0.	0.	0.
LPU4	5.7300	.30625E-01	1.0000	.10835	-.69740E-02	.18744	23.250	0.	0.	0.

	THLOR	ALSR	BLSR	CMGSR	STHEP	SCGP	PTHEP	THEOP	CPGP	TR
LPU1	.13414	-.69740E-02	.21256	23.250	.40628	125.66	0.	.40628	125.65	6692.8
LPU2	.14013	-.69740E-02	.18744	23.250	.39372	125.66	0.	.39372	125.66	8018.1
LPU3	.10231	-.69740E-02	.21256	23.250	.40628	125.66	0.	.40628	125.66	6166.0
LPU4	.10835	-.69740E-02	.18744	23.250	.39372	125.66	0.	.39372	125.65	6287.0

	QR	ROTFO :X	ROTFO :Y	ROTFO :Z	RCTMO :X	RCTMO :Y	RCTMO :Z	TP	CP	PROPF :X
LPU1	14408.	1640.8	64.254	-8539.5	-2589.7	-11385.	14084.	4108.3	4112.3	4103.9
LPU2	15456.	1441.9	66.165	-8702.5	-2416.9	-9965.6	15184.	3902.1	3870.0	3901.[illegible]
LPU3	9917.0	1150.9	22.625	-6071.7	-1933.7	-8266.8	9693.6	4109.9	4112.3	41[illegible].0
LPU4	10659.	1051.4	23.956	-6260.0	-1818.5	-7265.3	10472.	3908.8	3871.0	3907.[illegible]

	PROPF :Y	PROPF :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFO :X	FUSFO :Y	FUSFO :Z	FUSMO :X	FUSMO :Y
LPU1	.32526	198.95	-4119.7	-2757.3	-140.54	-459.14	.41181E-02	231.41	0.	0.
LPU2	.31080	-65.857	-3367.6	1202.0	138.99	-432.45	.41392E-02	53[illegible].36	0.	0.
LPU3	.14804	186.84	-4120.0	-2531.9	-143.03	-459.38	.74737E-03	84.539	0.	0.
LPU4	.14193	-107.36	-3665.7	1417.1	138.66	-435.54	.76526E-03	297.2[illegible]	0.	0.

	FUSMO :Z	JETHS	JETFO :X	JETFO :Y	JETFO :Z	JETMO :X	JETMO :Y	JETMO :Z	LPA D :X	LPARG :Y
LPU1	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	5384.1	64.[illegible]
LPU2	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	5019.5	6[illegible].479
LPU3	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	4736.1	22.773
LPU4	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	4622.0	24.099

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	LPAFO :Z	LPAMC :X	LPAMC :Y	LPAMD :Z	HCBLF :X	HCBLF :Y	HCBLF :Z	HCBLM :X	HCBLM :Y	HCBLM :Z
LPU1	-8128.1	-6709.4	-14008.	13943.	0.	0.	0.	0.	0.	0.
LPU2	-3209.0	-6264.5	-9249.2	15323.	0.	0.	0.	0.	0.	0.
LPU3	-5823.4	-6053.7	-11264.	9530.5	0.	0.	0.	0.	0.	0.
LPU4	-6021.1	-5867.2	-6331.8	10609.	0.	0.	0.	0.	0.	0.

	GCPKS	GCFOR :X	GCFOR :Y	GCFOR :Z	FRTMG	GFFOR :X	GFFOR :Y	GFFOR :Z	GERFD :X	GERFC :Y
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFD :Z	HGRAD :X	HGRAD :Y	HGRAD :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z
LPU1	0.	0.	0.	0.	3625.6	60.005	1819.0	-6035.2	-26312.	14172.
LPU2	0.	0.	0.	0.	3815.6	61.939	2055.0	-6629.4	-21929.	15109.
LPU3	0.	0.	0.	0.	3247.6	13.315	3594.8	-5673.5	-21548.	9734.4
LPU4	0.	0.	0.	0.	3328.7	14.681	3744.6	-6009.1	-17750.	10413.

	ADR	AIR	BIR	CLAVR	ALAVR	VTR	THIKR	RCTIV :X	RCTIV :Y	RCTIV :Z
LPU1	.15917	.19398E-01	.14400E-01	.33729	.79994E-01	27.241	14.019	-2.9573	.97764E-01	13.703
LPU2	.16196	.19806E-01	.14526E-01	.34215	.79920E-01	27.437	14.041	-2.6165	.97922E-01	13.79.
LPU3	.11974	.14547E-01	.10576E-01	.24002	.59256E-01	22.980	10.360	-2.1854	.77243E-01	10.176
LPU4	.12236	.15032E-01	.10837E-01	.24394	.60081E-01	23.167	10.415	-1.9408	.72634E-01	10.23.

	DSKLP	POWER K	CLAVP	ALAVP	VTP	THINP	PRPIV :X	PRPIV :Y	PRPIV :Z	CSKLP
LPU1	3.0323	659.03	1.1688	.20748	80.056	57.198	-57.163	0.	-2.0134	30.481
LPU2	3.0802	653.35	1.1292	.19706	78.021	54.905	-54.871	0.	1.9101	28.951
LPU3	2.5116	419.22	1.1393	.20755	80.071	58.035	-58.000	0.	-2.0426	30.593
LPU4	2.5526	450.58	1.1311	.19740	78.088	55.556	-55.821	0.	1.9431	29.004

	POWER P	LOCAT	GRAT
LPU1	941.63	3.3200	0.
LPU2	954.17	3.3200	0.
LPU3	941.90	3.3200	0.
LPU4	864.43	3.3200	0.

TAIL AERODYNAMIC REGIMES   ANGLE OF ATTACK - 1   ANGLE OF SLIDESLIP - 1   ROLLING ANGLE OF ATTACK - 1

ORIGINAL PAGE IS
OF POOR QUALITY

SIMULATION TIME -- 2.00

	U	V	W	P	Q	R	X	Y	Z	PHI
NULL	19.251	1.9087	-2.6264	-.13669E-01	.25555E-01	.50342E-01	33.727	1.0573	-1003.2	-.1.950.-[illegible]
	THETA	PSI	AXCG	AYCG	AZCG	NDHHT	NDTHT	VHGUST:X	VHGUST:Y	VHGUST:Z
NULL	.35449.-01	.24530E-01	.77236E-01	.74745E-01	-.27823E-01	9.7015	9.2432	0.	0.	0.
	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DWGDYH	VDRAGT:X	VDRAGT:Y	VDRAGT:Z	COMGST:[illegible]
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	UDHGST:Y	UDHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	GGRDAC:X	GGRDAC:Y	CGRDAC:Z	RCDHAC:X	[illegible]
NULL	0.	0.	.54773E-01	1.5265	-.75189	0.	0.	0.	0.	0.
	AGDHAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	UTGUST:X	GTGUST:Y	CTGUST:Z	DUGEXT	DUGDYT	[illegible]
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VORTGT:X	VORTGT:Y	VORTGT:Z	DUTGST:X	DUTGST:Y	CDTGST:Z	VCTGST:X	VCTGST:Y	VCTGST:Z	PCTAC:X
NULL	0.	0.	0.	0.	0.	0.	.64778E-01	1.5285	-.7.14[illegible]	0.
	MGUTAC:Y	MGUTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	RCHLCV:X	RCHLCV:Y	RCHLCV:Z	GAMMAH	LAM[illegible]H
NULL	0.	0.	47.721	1.2457	-3.5285	-.16669E-01	.25555E-01	.50342E-01	.43974	2.0072
	ZETAH	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	PALT
NULL	-2.3325	1.5703	47.677	-3.5272	.2747E-01	-.16657E-01	.25555E-01	.50342E-01	.5.6465E-03	.5[illegible]E56.-
	BETAT	PSLTAT	ALPTO	ALPT	PALPT	PALPTJ	PHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:[illegible]
NULL	-.26855	-.26855	-.21532E-01	-.46190E-01	-.46190E-01	-.21532E-01	1.2584	.63063E-01	1.3911	-.[illegible]IC[illegible]
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RCFLWC	PCFLWC
NULL	-.46392	.35974	.87573	-.17432E-02	.31772	.24320	-.31171E-01	.87955E-01	.11326	.97309.-[illegible]
	C FLOW C	TIAC	TCLC	ZAVSOT	RHBFOR:X	RHBFOR:Y	RHBFOR:Z	STATEF:X	STATEF:Y	STATEF:Z
NULL	-35.069	1.0001	1.0000	-4.1410	4067.5	1600.0	-.11458E+06	4067.5	1615.5	-.1146E+0[illegible]
	GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	PHOBMC:X
NULL	0.	0.	0.	0.	0.	0.	-544.39	-1565.9	1239.7	4.5796
	RHOWMO:Y	RHOWMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-.27376E+05	-.13540E+06	42.973	3974.1	-1954.9	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHOGMC:X	RHOGMO:Y	RHOGMO:Z
NULL	0.	0.	0.	0.	42.973	3974.1	-1954.9	0.	0.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:[illegible]
NULL	0.	.11573E-15	.19039E-17	0.	0.	0.	-1832.3	-5211.9	9[illegible]	0.
	HCACMO:Y	HCACMO:Z	RHUAF:X	RHUAF:Y	RHUAF:Z	RHUAPO:X	RHUAMC:Y	RHCAPC:Z	HCAIF:X	HCAIF:Y
NULL	23586.	-.[illegible]176E+06	-501.42	2358.2	-715.20	4.5796	-.27376E+06	-.13548E+06	3535.0	4274.6
	HUAUF:Z	HUAUMO:X	HGAJMO:Y	HOAJMO:Z	HOTAFO:X	HOTAFO:Y	HOTAFO:Z	HCTAPC:X	HCTAMO:Y	HCTAMO:Z
NULL	-.11535E+06	71094.	-.33307E+05	-.13594E+06	1733.6	-937.10	-.11444E+06	71094.	-.3[illegible]E+06	-.27724.[illegible]
	TXFOR	TXYFOX	TXYFOR	TSZFOR	TSLMOM	T.LMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RTOWMO:[illegible]
NULL	-313.49	1924.7	74.939	-5.1347	1600.5	9302.4	-313.49	19[illegible]	-5.1347	11[illegible]
	RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
NULL	0.	0.	0.	748.04	-454.89	14960.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGMO:X	RTOGMO:Y	RTOGMO:Z
NULL	0.	0.	0.	0.	0.	748.04	-454.89	14960.	0.	0.

	TCACFO:X	TCACFO:Y	TCACFO:Z	TCACMO:X	TCACMO:Y	TCACMO:Z	RTOAF :X	RTO F :Y	RTOAF :Z	RTOA[illegible]
HULL	0.	396.81	568.25	2012.4	25.422	-152.79	-313.49	2747.9	-46 .73	26122.
	RTOAMO:Y	RTOAMO:Z	TOAFOR:X	TOAFOR:Y	TCAFOR:Z	TCAMOM:X	TOAMOM:Y	TOAMOM:Z	TCTAFO:X	TCT[illegible]
HULL	0.	0.	-313.49	2747.9	-460.23	71819.	-34916.	-.19794E+06	-313.49	3144.7
	TOTAFO:Z	TOTAMO:X	TOTAMO:Y	TOTAMO:Z	HABFOR:X	HABFOR:Y	HABFOR:Z	HABMOM:X	HABMOM:Y	HAB CM[illegible]
HULL	106.02	26135.	25.422	-152.79	3252.5	7022.6	-.11585E+06	.14291E+06	-.35800E+06	-.3234 [illegible]
	HBACFO:X	HBACFO:Y	HBACFO:Z	HBACMO:X	HBACMO:Y	HBACMO:Z	HTOTAF:X	HTOTAF:Y	HTOTAF:Z	HTOT[illegible]:X
HULL	-1632.3	-4015.1	1523.9	-78062.	.10380E+06	-.17663E+06	1420.3	2207.6	-.11433E+06	64 51.
	HTOTAM:Y	HTOTAM:Z	HCBLFO:X	HCBLFO:Y	HCBLFO:Z	HCBLMO:X	HCBLMO:Y	HCBLMO:Z	HGERFO:X	HGE[illegible]:Y
HULL	-.26420E+06	-.50005E+06	0.	0.	0.	0.	0.	0.	0.	0.
	HGERFO:Z	HGERMO:X	HGERMO:Y	HGERMO:Z	HORLOD:X	HORLOD:Y	HORLOD:Z	NOZLOD:X	NOZLOD:Y	NOZL[illegible]
HULL	0.	0.	0.	0.	1	1	1	1	1	
	UCOM	VCOM	HDTCOM	PHICOM	THECOM	TR TCM	PHRF:X	PHRF:Y	PHRF:Z	PHRF:P[illegible]
HULL	30.000	6.0000	5.0000	.20000	.10000	.30000	1	1	1	
	VHSENS:X	VHSENS:Y	VHSENS:Z	XSPEED	YSPEED	ZSPEED	AXACC	AYACC	AZACC	ROLLRT
HULL	46.373	.53436	-1.7777	19.251	1.9087	3.3399	2.4849	2.4047	-.83491	-.13649 [illegible]
	PTCHRT	YOWRAT	IACELC:X	IACELC:Y	IACELC:Z	UERR	VERR	HDTERR	PHIERR	THETER
HULL	.25555E-01	.50342E-01	1	1	1	10.749	4.0713	1.4601	.21645	.04551 [illegible]
	TRATER	IERR:X	IERR:Y	IERR:Z	PSIERR	UINT	VINT	HDTINT	PHIINT	THEINT
HULL	.24966	1	1	1	1	.12295	.86670E-03	.47825E-01	.72259E-03	.52086E-0[illegible]
	TRTINT	UOCNTL	VOCNTL	HOCNTL	PCONTL	QCONTL	RCONTL	SOLTAL	SOLTEL	SOLTRD
HULL	.11277E-01	.40000	.45000	-.80237E-01	.53342E-01	.10793E-02	.40000	-.53342E-01	-.10793E-02	-.40000
	POLTAL	POLTEL	POLTRD	DELTAL	DELTEL	DELTRD				
HULL	0.	0.	0.	-.53342E-01	-.10793E-02	-.40000				

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LPU VARIABLES AT TIME -- 2.00

	U	V	W	PHID	THETD	PSID	X	Y	Z	P?I
LPU1	24.425	4.5514	-1.4215	0.	0.	0.	75.012	-78.795	-963.9	C.
LPU2	15.958	4.5020	-5.2657	0.	0.	0.	71.129	84.137	-96[illegible]	C.
LPU3	24.357	.72531	.51955	0.	0.	0.	-.91721	-80.659	-96[illegible]	C.
LPU4	16.026	.73596	-3.7445	0.	0.	C.	-4.3009	82.273	-963.84	C.

	THETA	PSI	NOANT	NOPAT	GERIL #X	GERIL #Y	GERIL #Z	IVSCR #X	IVSJR #Y	IVSLR #Z
LPU1	.35000E-01	0.	17.337	73.653	72.554	-43.196	-955.10			
LPU2	-.35000E-01	0.	17.385	73.735	70.243	48.762	-956.61			
LPU3	.35000E-01	0.	17.269	73.449	.02064	-44.952	-952.55			
LPU4	-.35000E-01	0.	17.337	73.580	-1.0895	46.997	-954.06			

	VSURC #X	VSURC #Y	VSURC #Z	VGUST #X	VGUST #Y	VGUST #Z	RVLPU #X	RVLPU #Y	RVLPU #Z	RVFUS #X
LPU1				0.	0.	0.	54.342	3.7980	.67737	164.61
LPU2				0.	0.	C.	45.949	3.6086	-5.1844	2.7664
LPU3				0.	0.	C.	54.274	-.28007E-01	2.5184	165.9[illegible]
LPU4				0.	0.	0.	46.017	-.17437E-01	-3.7434	-24.976

	RVFUS #Y	RVFUS #Z	RVROT #X	RVROT #Y	RVROT #Z	RVPRP #X	RVPRP #Y	RVPRP #Z	PPIV #X	RPIV #Y
LPU1	10.653	-6.6453	47.300	3.1919	.59154	54.536	11.236	-13.035	-7.2727	-7.3277
LPU2	13.206	-21.777	45.770	3.6903	-5.6844	36.622	13.920	-23.315	9.3272	-9.3976
LPU3	6.0701	-5.5503	54.095	-.17094	2.6184	60.922	7.3653	-9.9CP0	-6.5477	-6.695[illegible]
LPU4	5.6312	-11.929	45.836	-.13571	-3.9434	40.411	6.3447	-14.563	5.0052	-5.[illegible]4[illegible]7

	RPIV #Z	RFIV #X	RFIV #Y	RFIV #Z	PFIV #X	PFIV #Y	PFIV #Z	LCSKE	DELTA	GEFK
LPU1	13.313	-7.2727	-7.3277	13.313	-109.96	0.	-3.6727	4.0848	.97970E-02	1.0000
LPU2	17.073	9.3272	-9.3976	17.073	33.921	C.	-1.1908	3.6503	.84031E-02	1.0000
LPU3	12.169	-6.6477	-6.6931	12.169	-105.06	0.	-3.6999	4.0936	.97604E-02	1.0000
LPU4	10.262	5.0052	-5.6467	10.262	65.389	0.	-2.2762	3.5184	.84665E-02	1.0000

	LCSPE	DELTA P	GEFP	STHER	SALER	SBISR	SOMGR	PTHER	PALER	PFLER
LPU1	5.7300	.50343E-01	1.0000	.13466	.45000	1.0000	23.250	0.	0.	C.
LPU2	4.0900	.92800E-02	1.0000	.27977E-01	.45000	-.60000	23.250	0.	C.	C.
LPU3	5.7300	.45273E-01	1.0000	.13250	.45000	1.0000	23.250	0.	C.	C.
LPU4	3.9069	.87000E-02	1.0000	.25818E-01	.45000	-.60000	23.250	C.	C.	C.

	THEOR	ALSR	DISR	OMEGR	STHEP	SCMGP	PTHEP	THEOP	CPEOP	TR
LPU1	.13466	.45000	.50000	23.250	.80000	125.66	0.	.50000	125.66	6535.9
LPU2	.27977E-01	.45000	-.50000	23.250	0.	125.66	0.	C.	125.66	65[illegible]3
LPU3	.13250	.45000	.50000	23.250	.80000	125.66	0.	.50000	125.66	6606.7
LPU4	.25815E-01	.45000	-.50000	23.250	0.	125.66	C.	0.	125.66	4156.3

	QR	ROTFO #X	ROTFO #Y	ROTFC #Z	ROTMO #X	ROTMO #Y	ROTMO #Z	TP	QP	PTLPF #X
LPU1	14083.	2599[illegible].0	2916.8	-5191.0	14338.	-25019.	11129.	5476.4	6230.0	5471.4
LPU2	4563.2	-507.72	2022.26	-507.73	3945.7	169.21	3606.0	-417.21	103.92	-416.91
LPU3	13605.	2711.0	2470.6	-5244.5	14834.	-24982.	10909.	5349.6	6236.5	5345.0
LPU4	3041.4	-1822.7	1826.9	-3258.4	14101.	11436.	2403.3	-329.62	147.74	-329.39

	PROPF #Y	PROPF #Z	PROPM #X	PROPM #Y	PROPM #Z	FUSFO #X	FUSFO #Y	FUSFO #Z	FUSMO #X	FUSMO #Y
LPU1	-33.813	237.70	-6196.1	-3367.8	-691.59	-597.56	-22.810	50.560	0.	C.
LPU2	-.81353	15.601	-105.86	-221.21	-7.7741	-.10045	-35.056	30.35	C.	C.
LPU3	-22.668	223.34	-6202.6	-3154.7	-535.79	-606.07	-8.9424	22.11[illegible]	C.	C.
LPU4	-.34764	[illegible].87	-147.65	-170.62	.27285	13.726	-6.3737	91.93[illegible]	C.	C.

	FUSMO #Z	JETHS	JETFO #X	JETFO #Y	JETFO #Z	JETMO #X	JETMO #Y	JETMO #Z	LPA O #X	LPA O #Y
LPU1	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	7671.4	28[illegible]0.[illegible]
LPU2	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	-629.25	24[illegible].[illegible]9
LPU3	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	7959.5	2935.[illegible]
LPU4	0.	100.00	98.545	0.	-16.997	0.	-465.60	C.	-2039.9	1826.2

	LPAFO SZ	LPAMO SX	LPAMO SY	LPAMG SZ	MCBLF SX	MCBLF SY	MCBLF SZ	MCBLM SX	MCBLM SY	MCBLM SZ
LPU1	-4919.7	6141.5	-28612.	10137.	0.	0.	0.	0.	0.	0.
LPU2	-202.57	3841.9	-517.01	35[illegible]2	0.	0.	0.	0.	0.	0.
LPU3	-5014.1	6031.0	-28002.	10373.	0.	0.	0.	0.	0.	0.
LPU4	-3171.2	13954.	10000.	2403.0	0.	0.	0.	0.	0.	0.

	GCPRS	GCFUR SX	GCFUR SY	GCFUR SZ	FRTMG	GFFUR SX	GFFUR SY	GFFCP SZ	GER-O SX	GF--G SY
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFO SZ	MGR-O SX	MGRAD SY	MGRAD SZ	CF SX	CF SY	CF SZ	CM SX	CM SY	CM SZ
LPU1	0.	0.	0.	0.	5091.9	1891.0	4738.6	13864.	-45159.	82[illegible]4.7
LPU2	0.	0.	0.	0.	-613.50	-593.73	8226.9	1709.1	684.31	21[illegible]9.5
LPU3	0.	0.	0.	0.	5498.0	2793.0	4707.6	17058.	-44355.	22[illegible]
LPU4	0.	0.	0.	0.	-1107.0	1804.1	5329.4	19045.	16933.	15[illegible]

	AOA	AAX	SIA	CLAMR	ALAMR	VTR	TNMR	PCTIV SX	PCTIV SY	PCTIV SZ
LPU1	.13117	.14015E-01	.94030E-02	.22360	.62083E-01	23.621	10.529	-4.[illegible]4	-4.[illegible]79[illegible]	8.[illegible]2C3
LPU2	.32700E-01	.16744E-02	.40779E-02	.23485E-01	.60190E-02	7.4981	13.584	5.8295	-5.[illegible]736	10.[illegible]
LPU3	.13147	.17594E-01	.11037E-01	.23634	.62621E-01	23.749	9.3244	-4.1548	-4.1[illegible]63	7.[illegible]34
LPU4	.61701E-01	.26424E-02	.60069E-02	.10127	.49835E-01	16.836	8.1866	3.5039	-3.[illegible]304	6.[illegible]

	DSKCR	PLACK K	CLAVP	ALAVP	VTP	TNIVP	PRPIV SX	PRPIV SY	PRPIV SZ	CSALP
LPU1	2.0536	39[illegible].34	1.3047	.27657	92.429	66.770	-68.727	0.	-2.[illegible]205	40.[illegible]3.
LPU2	.20660	192.90	-.12073	-.23518E-01	-25.512	-21.214	21.201	0.	-.73901	-3.[illegible]954
LPU3	2.0324	303.09	1.3460	.27616	91.353	65.703	-65.660	0.	-2.3124	39.[illegible]91
LPU4	1.0675	126.57	-.95333E-01	-.24414E-01	-22.676	-40.893	40.868	0.	-1.4226	-2.4436

	PCLR F	COEAT	SAGE
LPU1	14[illegible]	3.3200	0.
LPU2	23.743	3.3200	0.
LPU3	141[illegible].0	3.3200	0.
LPU4	33.755	3.3200	0.

TAIL AERODYNAMIC REGIMES ANGLE OF ATTACK - 1 ANGLE OF SLID SLIP - 1 ROLLING ANGLE OF ATTACK - 1
VORTEX RING STATE--ROTOR LPU-2
VORTEX RING STATE--PROPELLER LPU-4
MAXIMUM MECHANICAL LIMIT B1SK-1
MAXIMUM MECHANICAL LIMIT THEOP-1
MAXIMUM MECHANICAL LIMIT B1SK-2
MAXIMUM MECHANICAL LIMIT B1SK-3
MAXIMUM MECHANICAL LIMIT THEOP-3
MAXIMUM MECHANICAL LIMIT B1SK-4

* *

59 IMSL DVERK WAS UNABLE TO REACH THE SPECIFIED ERROR CRITERIA WITHOUT GOING BELOW THE MINIMUM TIME ST .
SUBROUTINE TATOTA
ERROR TOL = .10000000E-03
EST. ERROR = .44274020E-09
TIME = .22316400E+01

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SIMULATION TIME -- 3.00

	U	V	W	P	Q	R	X	Y	Z	R..
NULL	21.684	3.2421	-3.1613	.35487E-02	.20169E-01	.85905E-01	53.862	4.7469	-1037.3	-.19700E-[illegible]
	THETA	PSI	ALCGG	AYCGG	AZCGG	NDHHT	NDTHT	VHGUST:X	VHGUST:Y	VHGUST:Z
NULL	.57600E-01	.95017E-01	.61?23E-01	.92096E-01	-.17400E-01	9.9406	9.2606	0.	0.	0.
	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DVGDYH	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	OMHGUST:X
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	OMHGUST:Y	OMHGUST:Z	VDHGUST:X	VDHGUST:Y	VDHGUST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	MGDHAC:X	MGDHAC:Y
NULL	0.	0.	.27711	2.5553	-.01139	0.	0.	0.	0.	0.
	MGDHAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	UTGUST:X	UTGUST:Y	UTGUST:Z	DUGDXT	DUGDYT	DVGDYT
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VDRTGT:X	VDRTGT:Y	VDRTGT:Z	ODTGST:X	ODTGST:Y	ODTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	MGDTAC:X
NULL	0.	0.	0.	0.	0.	0.	.27711	2.5553	-.01139	0.
	MGDTAC:Y	MGDTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	ROHLCV:X	ROHLCV:Y	ROHLCV:Z	GAMMAH	LAMDAH
NULL	0.	0.	51.621	1.0509	-2.6653	.35487E-02	.20169E-01	.85905E-01	.2306[illegible]	2.7665
	ZETAH	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	ROTAIL:X	ROTAIL:Y	ROTAIL:Z	ALT	PALT
NULL	-2.5354	1.5708	50.332	-6.9939	.25759E-01	.35487E-02	.20169E-01	.85905E-01	.20453E-02	.20453 -[illegible]
	BETAT	PBETAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:X
NULL	-.33290	-.33290	.36778E-02	-.23394E-01	-.23394E-01	.36778E-02	-.58781	-.75907E-01	.84439	.13250
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RCFLWC	PCFLWC
NULL	-.49492	.56377	.55702	-.86988E-02	.21279	.24031	-.27852E-01	.89082E-01	.12765	.95266 -[illegible]
	C FLOW C	TLAC	TLLC	ZAVSCT	RHBFOR:X	RHBFOR:Y	RHBFOR:Z	STATBF:X	STATBF:Y	STATBF:Z
NULL	-34.293	1.0001	1.0000	-4.1410	6836.6	2256.7	-.11454E+06	6836.6	2256.7	-.11454E+0[illegible]
	GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	PHOWFO:X
NULL	0.	0.	0.	0.	0.	0.	-727.63	-3069.6	895.10	-.16549
	RHOAMO:Y	RHOAMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-.22001E+06	-.16965E+06	183.83	6643.9	-1589.6	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHOGMO:X	RHOGMO:Y	RHOGMO:Z
NULL	0.	0.	0.	0.	183.83	6643.9	-1589.6	0.	0.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
NULL	0.	.68113E-16	.15420E-17	0.	0.	0.	-1617.9	-3672.7	341.41	0.
	HCACMO:Y	HCACMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCAIF :X	HCAIF :Y
NULL	22027.	-.1[illegible]099E+06	-543.80	3574.3	-694.53	-.16549	-.22001E+06	-.16965E+06	6272.8	5831.[illegible]
	HOAGF :Z	HOAGMO:X	HOAGMO:Y	HOAGMO:Z	HOTAFO:X	HOTAFO:Y	HOTAFO:Z	HCTAMC:X	HCTAMC:Y	HCTAMC:Z
NULL	-.11523E+06	96970.	-.32460E+06	-.16965E+06	4074.9	2158.3	-.11486E+06	96970.	-.31205E+06	-.2[illegible]
	TAFOR	TSYFOR	TGYFOR	TSZFOR	TSLMOM	TGLMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RTOWMO:X
NULL	-349.35	2791.6	-14.524	-27.757	2608.2	4602.2	-349.35	2777.0	-27.757	7410.4
	RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
NULL	0.	0.	0.	1250.6	-369.89	25010.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGMO:X	RTOGMO:Y	RTOGMO:Z
NULL	0.	0.	0.	0.	0.	1250.6	-369.89	25010.	0.	0.

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     TCALFU:X     TCALFU:Y     TCALFU:Z     TCACMO:X     TCACMO:Y     TCACMO:Z     RTOAF :X     RTOAF :Y     RTOAF :Z     RTOA [illegible]
NULL 0.           434.89       412.83       4934.7       24.386       -119.63      -349.35      4027.6       -397.65      32420.

     RTOAMO:Y     RTOAMO:Z     TOAFOR:X     TOAFOR:Y     TOAFOR:Z     TOAMOM:X     TOAMOM:Y     TCAMCM:Z     TCTAFO:X     TCTAFO:[illegible]
NULL 0.           0.           -349.35      4027.6       -397.65      99400.       -28256.      -.27952E+06  -349.35      [illegible]

     TOTAFO:Z     TOTAMO:X     TCTAMO:Y     TCTAMO:Z     HABFOR:X     HABFOR:Y     HABFOR:Z     HABMOM:X     HABMOM:Y     HAB CM:Z
NULL 15.227       37405.       24.388       -119.63      5943.4       9858.7       -.11563E+06  .19637E+06   -.35291E+06  -.44917[illegible]

     HBACFO:X     HBACFO:Y     HBACFO:Z     HBACMO:X     HBACMO:Y     HBACMO:Z     HTOTAF:X     HTOTAF:Y     HTOTAF:Z     HTOTAM:X
NULL -1617.9      -3237.9      702.31       -43651.      85083.       -.14916E+06  4325.6       6620.8       -.11487E+06  .1475[illegible]+06

     HTOTAM:Y     HTOTAM:Z     HCBLFO:X     HCBLFO:Y     HCBLFO:Z     HCBLMO:X     HCBLMO:Y     HCBLMO:Z     HGERFO:X     HGERFO:Y
NULL -.26723E+06  -.59833E+06  0.           0.           0.           0.           0.           0.           0.           0.

     HGERFO:Z     HGERMO:X     HGERMO:Y     HGERMO:Z     MORLOD:X     MORLOD:Y     MORLOD:Z     NOZLOD:X     NOZLOD:Y     NOZLOD:Z
NULL 0.           0.           0.           0.                      I            I            I            I            I

     UCOM         VCOM         HDTCOM       PHICOM       THECOM       TRTCM        PHRF:X       PHRF:Y       PHRF:Z       PHRF:PSI
NULL 30.000       0.0000       5.0000       .20000       .10000       .30000                  I            I            I

     VHSENS:X     VHSENS:Y     VHSENS:Z     XSPEED       YSPEED       ZSPEED       AXACC        AYACC        AZACC        ROLLRT
NULL 50.830       .53909       -1.4371      21.684       3.2421       4.5105       1.9923       2.9631       -.55984      .35487 -0[illegible]

     PTCHRT       TURNRT       IACELC:X     IACELC:Y     IACELC:Z     UERR         VERR         HDTERR       PHIERR       THEERR
NULL .20169E-01   .65905E-01              I            I            I 8.3163       2.7579       .48947       .21970       .40394 -0[illegible]

     TRATER       IERR:X       IERR:Y       IERR:Z       PSIERR       UINT         VINT         HDTINT       PHIINT       THEINT
NULL .21409                    I            I            I            I .13521       .11037E-01   .48957E-01   .77091E-02   .31470 -01

     THTINT       UCONTL       VCONTL       WCONTL       PCONTL       QCONTL       RCONTL       SDLTAL       SDLTEL       SDLTRD
NULL .27642E-01   .40000       .45000       -.59824E-01  .54571E-01   -.42667E-02  .40000       -.54571E-01  .42657E-02   -.40000

     POLTAL       POLTEL       POLTRD       DLLTAL       DLLTEL       DELTRD
NULL 0.           0.           0.           -.54571E-01  .42667E-02   -.40000
```

LPU VARIABLES AT TIME -- 3.00

	U	V	W	PHID	THETD	PSID	X	Y	Z	PHI
LPU1	29.605	6.3577	-3.1807	0.	0.	0.	101.45	-71.873	-968.66	0.
LPU2	15.340	6.3758	-4.1800	0.	0.	0.	86.334	90.393	-971.56	0.
LPU3	29.555	-.17107	-1.5480	0.	0.	0.	25.916	-78.919	-964.12	0.
LPU4	15.393	-.15303	-2.5481	0.	0.	0.	10.797	83.346	-967.33	0.

	THETA	PSI	NORMT	NDPHT	GERIL :X	GERIL :Y	GERIL :Z	IVSCR :X	IVSIR :Y	IVSCR :Z
LPU1	.35000E-01	0.	17.422	74.043	96.767	-36.478	-959.93	I	I	
LPU2	-.35000E-01	0.	17.480	74.214	68.116	55.096	-961.74	I	I	
LPU3	.35000E-01	0.	17.341	73.698	25.205	-43.154	-955.64	I	I	
LPU4	-.35000E-01	0.	17.399	73.869	16.554	48.421	-957.45	I	I	

	VSURC :X	VSURC :Y	VSURC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVFUS :X
LPU1	I	I	I	0.	0.	0.	59.347	3.5267	-.41420	165.60
LPU2	I	I	I	0.	0.	0.	45.199	3.5548	-3.5002	-25.654
LPU3	I	I	I	0.	0.	0.	59.294	-2.9921	1.1177	166.7-
LPU4	I	I	I	0.	0.	0.	45.253	-2.9740	-1.0683	-18.361

	RVFUS :Y	RVFUS :Z	RVRUT :X	RVRUT :Y	RVRUT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RPIV :X	RPIV :Y
LPU1	7.5961	-4.6011	50.596	3.0257	-.35398	54.987	8.6045	-8.9038	-4.5407	-4.5751
LPU2	6.7605	-7.0055	45.058	3.6006	-3.5002	41.997	7.9807	-9.6429	3.2015	-3.2257
LPU3	1.6706	-4.1018	59.152	-2.9883	1.1177	64.120	3.0743	-7.9989	-4.8262	-4.6627
LPU4	2.2302	-6.9507	41.714	-2.7076	-1.6201	34.227	3.4480	-11.002	4.9461	-4.9835

	RPIV :Z	RFIV :X	RFIV :Y	RFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCSRE	DELTA R	CLRK
LPU1	8.3117	-4.5407	-4.5751	8.3117	-109.73	0.	-3.8646	3.8667	.89568E-02	1.0000
LPU2	5.6603	3.2015	-3.2257	5.6603	67.651	0.	-2.3550	3.6864	.84477E-02	1.0000
LPU3	8.6342	-4.8262	-4.6627	8.6342	-102.64	0.	-3.6147	3.9587	.92204E-02	1.0000
LPU4	9.0537	4.9461	-4.9835	9.0537	55.309	0.	-1.9253	3.7704	.84090E-02	1.0000

	LCSPL	DELTA P	GCRP	STHLR	SAISR	SBLR	SOMGR	PTHLR	PAISR	PBISR
LPU1	5.7303	.50201E-01	1.0000	.11013	.45000	1.0000	23.250	0.	0.	0.
LPU2	3.9395	.67000E-02	1.0000	.93605E-03	.45000	-.60000	23.250	0.	0.	0.
LPU3	5.7300	.48731E-01	1.0000	.11966	.45000	1.0000	23.250	0.	0.	0.
LPU4	3.7742	.67000E-02	1.0000	.95194E-02	.45000	-.60000	23.250	0.	0.	0.

	THEOR	AISR	BISR	OMEGR	STHLP	SCMGP	PTHLP	THEOP	CPEGP	TR
LPU1	.11013	.45000	.50000	23.250	.80000	125.66	0.	.50000	125.66	4161.6
LPU2	.93605E-03	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	2389.4
LPU3	.11866	.45000	.50000	23.250	.80000	125.66	0.	.50000	125.66	5101.2
LPU4	.95194E-02	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	3300.1

	QR	ROTFO :X	ROTFO :Y	ROTFC :Z	RCTMO :X	RCTMO :Y	ROTMO :Z	TP	CP	PROPF :X
LPU1	10125.	1719.0	1840.7	-3314.5	3513.9	-10437.	8000.6	5456.6	6201.0	5452.1
LPU2	3523.2	-1046.6	1039.6	-1679.8	8798.4	5794.0	2784.1	-352.82	147.72	-352.59
LPU3	11455.	2069.5	2265.7	-4055.7	11055.	-19610.	9032.3	5284.6	6207.3	5286.2
LPU4	3069.1	-1438.0	1443.2	-2596.3	11427.	8730.7	2425.3	-235.83	147.72	-235.67

	PROPF :Y	PROPF :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFO :X	FUSFO :Y	FUSFO :Z	FUSMO :X	FUSMO :Y
LPU1	-25.972	224.73	-6197.2	-3146.3	-581.86	-598.96	-11.604	14.891	0.	0.
LPU2	-.43727	12.722	-147.63	-178.11	-.96267	14.478	-9.2410	31.705	0.	0.
LPU3	-9.5692	227.88	-6203.4	-3050.4	-352.44	-611.78	-.70334	10.869	0.	0.
LPU4	-.16892	6.7413	-147.63	-122.38	2.4941	7.4172	-.99974	51.754	0.	0.

	FUSMO :Z	JETHS	JETFO :X	JETFO :Y	JETFO :Z	JETMO :X	JETMO :Y	JETMO :Z	LPA-O :X	LPA-C :Y
LPU1	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	6670.6	1063.1
LPU2	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	-1276.2	1036.6
LPU3	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	6854.5	2275.5
LPU4	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	-1557.7	1442.0

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	LPAFC :Z	LPAHU :X	LPAHU :Y	LPAHJ :Z	HCBLF :X	HCBLF :Y	HCBLF :Z	HCBLM :X	HCBLM :Y	HCBLM :Z
LPU1	-3071.8	2316.7	-20048.	741P.3	0.	0.	0.	C.	C.	C.
LPU2	-1352.3	3050.5	5150.3	27 3.1	0.	0.	C.	C.	C.	C.
LPU3	-3844.0	4651.4	-23126.	8619.9	0.	0.	C.	C.	C.	C.
LPU4	-2552.8	11260.	6142.7	2427.8	0.	C.	C.	C.	C.	[illegible]

	GCPRS	GCFUR :X	GCFUR :Y	GCFUR :Z	FRTMG	GFFUR :X	GFFUR :Y	GFFUR :Z	GERFO :X	GERFC :Y
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	C.	C.
LPU2	0.	0.	0.	C.	0.	0.	0.	C.	C.	C.
LPU3	0.	0.	0.	0.	0.	0.	C.	C.	C.	C.
LPU4	0.	0.	0.	0.	0.	0.	0.	C.	C.	C.

	GERFO :Z	HGRMO :X	HGRMO :Y	HGRMO :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z
LPU1	0.	0.	0.	0.	4915.2	498.25	6225.5	3869.3	-33179.	[illegible]
LPU2	0.	0.	0.	0.	-1465.9	60.090	6687.3	8595.3	9111.6	15-7.1
LPU3	0.	0.	0.	0.	4909.2	1625.2	5607.0	9826.1	-37303.	7122.6
LPU4	0.	0.	0.	0.	-1358.1	1129.6	6117.1	14433.	13430.	174[illegible].9

	AOK	AXK	SAK	CLAYR	ALAYR	VTR	TWINR	RCTIV :X	RCTIV :Y	RCTIV :Z
LPU1	.92215E-01	.12661E-01	.45597E-02	.16146	.41762E-0[illegible]	16.849	6.5739	-2.8379	-2.3594	5.1[illegible]46
LPU2	.92119E-01	-.13263E-02	.26522E-02	.92712E-01	.25150E-01	14.232	4.6350	2.0009	-2.9161	3.[illegible]7
LPU3	.10753	.17107E-01	.62133E-02	.19793	.49996E-01	20.868	6.9872	-3.0164	-3.0392	5.5214
LPU4	.55564E-01	-.41339E-03	.33563E-02	.12805	.33961E-01	16.785	7.1603	3.0913	-3.1147	5.6566

	DSKLK	PUALK K	CLAYP	ALAYP	VTP	TWINP	PRPIV :X	PRPIV :Y	PRPIV :Z	CSKLP
LPU1	1.0897	427.49	1.5790	.27557	92.262	65.626	-68.584	0.	-2.4154	40.485
LPU2	.97013	140.94	-.10210	-.25914E-01	-23.461	-42.307	42.282	C.	-1.4713	-2.6177
LPU3	2.0711	404.25	1.5292	.26686	93.795	64.188	-64.149	C.	-2.2592	39.2C
LPU4	1.3399	129.74	-.66244E-01	-.16082E-01	-19.181	-34.589	34.566	C.	-1.2033	-1.7457

	PUALK P	COUNT	GRAT
LPU1	1415.5	3.5200	0.
LPU2	33.751	3.5200	0.
LPU3	1418.2	3.5200	0.
LPU4	33.749	3.5200	0.

TAIL AERODYNAMIC REGIMES   ANGLE OF ATTACK - 1   ANGLE OF SLIDESLIP - [illegible]   ROLLING ANGLE O ATTACK - 1
VORTEX RING STATE--PROPELLER LPU-2
VORTEX RING STATE--PROPELLER LPU-4
MAXIMUM MECHANICAL LIMIT EISK-1
MAXIMUM MECHANICAL LIMIT THEUP-1
MAXIMUM MECHANICAL LIMIT EISK-2
MAXIMUM MECHANICAL LIMIT EISK-3
MAXIMUM MECHANICAL LIMIT THEUP-3
MAXIMUM MECHANICAL LIMIT EISK-4

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SIMULATION TIME -- 4.00

NULL	U 23.886	V 4.1516	W -3.2630	P .19920E-01	Q .12935E-01	R .11440	X 75.631	Y 11.574	Z -1012.1	P-I -.3 597[illegible]
NULL	THETA .77377E-01	PSI .19352	AXCGG .47831E-01	AYCGG .11040	AZCGG -.39465E-02	NDHHT 9.9870	NDTHT 9.2900	VHGUST:X 0.	VHGUST:Y 0.	VHGUST:Z 0.
NULL	OHGUST:X 0.	OHGUST:Y 0.	OHGUST:Z 0.	DUGDXH 0.	DUGDYH 0.	DVGDYH 0.	VCRHGT:X 0.	VCRHGT:Y 0.	VCRHGT:Z 0.	C[illegible] GST:X 0.
NULL	ODHGST:Y 0.	ODHGST:Z 0.	VDHGST:X .68956	VDHGST:Y 3.3127	VDHGST:Z -.47461	GGRDAC:X 0.	GGRDAC:Y 0.	GGRDAC:Z 0.	PCDHAC:X 0.	PGDH[illegible] 0.
NULL	HGDHAC:Z 0.	VTGUST:X 0.	VTGUST:Y 0.	VTGUST:Z 0.	CTGUST:X 0.	CTGUST:Y 0.	CTGUST:Z 0.	DUGDXT 0.	DUGDYT 0.	DVGDYT 0.
NULL	VORTGT:X 0.	VORTGT:Y 0.	VORTGT:Z 0.	ODTGST:X 0.	ODTGST:Y 0.	ODTGST:Z 0.	VDTGST:X .68955	VDTGST:Y 3.3127	VDTGST:Z -.47461	PGDTAC:X 0.
NULL	HGDTAC:Y 0.	HGDTAC:Z 0.	RVHLCV:X 53.842	RVHLCV:Y -.90723	RVHLCV:Z -1.9438	RCHLCV:X .19920E-01	RCHLCV:Y .12935E-01	RCHLCV:Z .11440	GAMMAH .11253	LAMDAH -2.7647
NULL	ZETAH 2.6175	LAMDPH 1.5706	RVTAIL:X 52.290	RVTAIL:Y -11.304	RVTAIL:Z -.22936E-01	RCTAIL:X .19920E-01	RCTAIL:Y .12935E-01	RCTAIL: .11440	ALT .1034[illegible]	PALT .1C34[illegible]
NULL	BETAT -.40761	PBETAT -.40761	ALPT, .20950E-01	ALPT -.48134E-02	PALPT -.48184E-02	PALPT, .20950E-01	RHIVEL:X -.86885	RHIVEL:Y .11961	RHIVEL:Z .65677	PHIVEL:X .68d5[illegible]
NULL	PHIVEL:Y -.49969	PHIVEL:Z .35744	RTIVEL:X .46090	RTIVEL:Y .27724E-01	RTIVEL:Z .17430	PTIVEL:X .25128	PTIVEL:Y -.23431E-01	PTIVEL:Z .90879E-01	RCFLWC .10294	PCFLWC .94917[illegible]
NULL	CFLOWC -33.590	TIAC 1.0001	TCLC 1.0000	ZAVSQT -4.1410	RHBFOR:X 8871.3	RHBFOR:Y 45.308	RHBFOR:Z -.11442E+06	STATBF:X 8871.3	STATBF:Y 45.308	STATBF:Z -.11442E+06
NULL	GAHBFO:X 0.	GAHBFO:Y 0.	GAHBFO:Z 0.	GGHBFO:X 0.	GGHBFO:Y 0.	GGHBFO:Z 0.	RHOWFO:X -1403.5	RHOWFO:Y -4121.6	RHOWFO:Z 623.91	RHOWFG:X -5.2146
NULL	RHOWMO:Y -.15781E+06	RHOWMO:Z -54015.	HGAAMF:X 457.44	HGAAMF:Y 8613.1	HGAAMF:Z -1286.0	HGAAMM:X 0.	HGAAMM:Y 0.	HGAAMM:Z 0.	HGGAMF:X 0.	HGGAMF:Y 0.
NULL	HGGAMF:Z 0.	HGGAMM:X 0.	HGGAMM:Y 0.	HGGAMM:Z 0.	RHOGFO:X 457.44	RHOGFO:Y 8613.1	RHOGFO:Z -1256.0	RHOGMO:X 0.	RHOGMO:Y 0.	RHOGMO:Z 0.
NULL	GHCIFO:X 0.	GHCIFO:Y -.45651E-16	GHCIFO:Z -.18077E-19	GHCIMO:X 0.	GHCIMO:Y 0.	GHCIMO:Z 0.	HCACFO:X -1446.7	HCACFO:Y -2504.0	HCACFO:Z -251.1[illegible]	HCACMO:X 0.
NULL	HCACMO:Y 26990.	HCACMO:Z -95012.	RHOAF:X -940.08	RHOAF:Y 4471.5	RHOAF:Z -660.07	RHOAMO:X -5.2146	RHOAMO:Y -.15781E+06	RHOAMO:Z -54015.	HCAIF:X 7925.2	HCAIF:[illegible] 4536.6
NULL	HOAUF:Z -.11506E+06	HOABMO:X 75442.	HOABMO:Y -.26961E+06	HOABMO:Z -54015.	HOTAFO:X 6478.5	HOTAFO:Y 2032.5	HOTAFO:Z -.11534E+06	HOTAMO:X 75442.	HOTAMO:Y -.25262E+06	HOTAMO:Z -.14983[illegible]
NULL	TAFOR -377.05	TSIFOR 3939.5	TOTFOR -87.537	TSLFOR -21.555	TSLMOM 3536.2	TOLMOM 1030.0	RTOWFO:X -377.05	RTOWFO:Y 3851.9	RTOWFO:Z -21.555	RTOWMO:X 45[illegible]
NULL	RTOWMO:Y 0.	RTOWMO:Z 0.	TGAAMF:X 0.	TGAAMF:Y 1621.2	TGAAMF:Z -299.24	TGAAMM:X 32422.	TGAAMM:Y 0.	TGAAMM:Z 0.	TGGAMF:X 0.	TGGAMF:Y 0.
NULL	TGGAMF:Z 0.	TGGAMM:X 0.	TGGAMM:Y 0.	TGGAMM:Z 0.	RTOGFO:X 0.	RTOGFO:Y 1621.2	RTOGFO:Z -299.24	RTOGMO:X 32422.	RTOGMO:Y 0.	RTOGMO:Z 0.

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NULL	TCACFO:X 0.	TCACFO:Y 543.53	TCACFO:Z 333.73	TCACMO:X 8446.4	TCACMO:Y 29.091	TCACMO:Z -103.27	RTOAF:X -377.05	PTOAF:Y 5473.1	RTOAF:Z -320.79	RTOAMO:X 35591.
NULL	RTOAMO:Y 0.	RTOAMO:Z 0.	TOAFOR:X -377.05	TOAFOR:Y 5473.1	TOAFOR:Z -320.79	TOAMOM:X .12801E+06	TOAMOM:Y -21233.	TOAMOM:Z -.37779E+05	TOTAFO:X -377.05	TOTAFO:Y [illegible]
NULL	TOTAFO:Z 14.935	TOTAMO:X 45487.	TOTAMO:Y 29.091	TOTAMO:Z -103.27	HABFOP:X 7548.1	HABFOR:Y 10010.	HABFOR:Z -.11540E+06	HABMOM:X .20345E+06	HABMOM:Y -.31084E+06	HABMOM:Z -.4315 [illegible]
NULL	HBACFO:X -1446.7	HBACFO:Y -1980.4	HBACFO:Z 77.609	HBACMO:X -24106.	HBACMO:Y 30453.	HBACMO:Z -.14347E+06	HTOTAF:X 6101.5	HTOTAF:Y 8049.5	HTOTAF:Z -.11532E+06	HTOTAM:X .17934E [illegible]
NULL	HTOTAM:Y -.23039E+06	HTOTAM:Z -.37526E+06	HCBLFO:X 0.	HCBLFO:Y 0.	HCBLFO:Z 0.	HCBLMO:X 0.	HCBLMO:Y 0.	HCBLMO:Z C.	HGEAFO:X C.	HGEAFO:Y C.
NULL	HGEAFO:Z 0.	HGEAMO:X 0.	HGEAMO:Y 0.	HGEAMO:Z 0.	MORLOD:X I	MORLOD:Y I	MORLOD:Z I	NOZLOD:X I	NOZLOD:Y I	NOZLOD:Z I
NULL	UCOM 30.000	VCOM 0.0000	HDTCOM 5.0000	PHICOM .20000	THECOM .10000	THATC .30000	PHRF:X I	PHRF:Y I	PHRF:Z I	PHRF:[illegible]
NULL	VHSENS:X 52.807	VHSENS:Y -.49597	VHSENS:Z -.88960	XSPEED 23.885	YSPEED 4.1518	ZSPEED 5.0015	AXACC 1.5405	AYACC 3.5519	AZACC -.12697	ROLLAT .19920E-[illegible]
NULL	PTCHRT .12935E-01	YAWRT .11440	IACELC:X I	IACELC:Y I	IACELC:Z I	UERR 6.1145	VERR 1.8482	HDTERR -.15279E-02	PHIERR .21040	THEERR .26623
NULL	THATER .16560	IERR:X I	IERR:Y I	IERR:Z I	PSIERR I	UINT .14449	VINT .17862E-01	HDTINT .49206E-01	PHIINT .13676E-01	THEINT -.18517E-[illegible]
NULL	TRTINT .41763E-01	UCONTL .40000	VCONTL .45000	WCONTL -.49172E-01	PCONTL .51559E-01	QCONTL -.46857E-02	RCONTL .40000	SOLTAL -.51559E-01	SOLTFL .46857E-02	SOLTRL -.40000
NULL	POLTAL 0.	POLTFL 0.	POLTRJ 0.	DELTAL -.51559E-01	DELTEL .46857E-02	DELTRJ -.40000				

LPU VARIABLES AT TIME -- 4.00

	U	V	W	PHID	THETD	PSID	X	Y	Z	R-I
LPU1	33.683	7.7028	-4.0935	0.	0.	0.	131.37	-60.538	-975.7[illegible]	0.
LPU2	14.991	7.7269	-2.5585	0.	0.	0.	100.22	99.459	-975.[illegible]	0.
LPU3	33.546	-.99189	-3.2111	0.	0.	0.	57.009	-75.110	-969.8[illegible]	0.
LPU4	15.025	-.95757	-1.5761	0.	0.	0.	25.863	84.887	-969.9[illegible]	0.
	THETA	PSI	NORMT	NDPHT	GERIL :X	GERIL :Y	GERIL :Z	IVSCF :X	IVSDP :Y	IVSCR :Z
LPU1	.35000E-01	0.	17.548	74.603	123.39	-25.922	-966.30	I	I	
LPU2	-.35000E-01	0.	17.550	74.534	105.70	64.356	-967.34	I	I	
LPU3	.35000E-01	0.	17.443	74.154	52.947	-39.727	-966.74	I	I	
LPU4	-.35000E-01	0.	17.445	74.086	35.251	50.555	-963.77	I	I	
	VSURC :X	VSURC :Y	VSURC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVFUS :X
LPU1	I	I	I	0.	0.	0.	63.137	1.9325	-.74447	176.0[illegible]
LPU2	I	I	I	0.	0.	0.	44.404	1.9565	-1.1135	-25.18
LPU3	I	I	I	0.	0.	0.	63.103	-6.7622	.14904	167.3[illegible]
LPU4	I	I	I	0.	0.	0.	44.438	-6.7382	-.33116	-24.17[illegible]
	RVFUS :Y	RVFUS :Z	RVROT :X	RVROT :Y	RVROT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RFIV :X	RFIV :Y
LPU1	4.2975	-1.4368	59.373	1.1248	-.74611	57.560	5.5613	-5.3275	-2.4444	-2.4629
LPU2	4.9145	-4.3675	44.313	2.1239	-1.3136	41.468	6.5056	-6.8687	2.4359	-2.9561
LPU3	-3.2256	-2.0897	63.012	-6.6509	.16804	66.613	-1.6151	-6.4182	-3.0101	-3.5367
LPU4	-1.7339	-7.1622	44.187	-6.5470	-.32996	39.397	-.15821	-9.5835	4.4399	-4.4773
	RPIV :Z	RPIV :X	RFIV :Y	RFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCSRE	DELTA R	CPFR
LPU1	4.4745	-2.4444	-2.4629	4.4745	-107.67	0.	-3.7918	3.7099	.85027E-02	1.0000
LPU2	5.3741	2.4359	-2.9581	5.3741	66.651	0.	-2.3201	3.6608	.84894E-02	1.0000
LPU3	6.4252	-3.0101	-3.5367	6.4252	-100.73	0.	-3.5474	3.8461	.83572E-02	1.0000
LPU4	9.0424	4.4399	-4.4773	9.0424	63.490	0.	-2.2101	3.7898	.84107E-02	1.0000
	LCSPE	DELTA P	CPFP	STHSR	SALSR	SBLSR	SCMGR	PTHER	PAISR	PBISR
LPU1	5.7300	.49730E-01	1.0000	.96045E-01	.45000	1.0000	23.250	0.	0.	0.
LPU2	3.9251	.57300E-02	1.0000	-.70727E-02	.45000	-.60000	23.250	0.	0.	0.
LPU3	5.7300	.46315E-01	1.0000	.10542	.45000	1.0000	23.250	0.	0.	0.
LPU4	3.8602	.57000E-02	1.0000	.22986E-02	.45000	-.60000	23.250	0.	0.	0.
	THEGR	AISR	BISR	GMEGR	STHEP	SCMGP	PTHEP	THEGP	CMEGP	TR
LPU1	.96045E-01	.45000	.50000	23.250	.60000	125.66	0.	.50000	125.66	2533.0
LPU2	-.70727E-02	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	2136.9
LPU3	.10542	.45000	.50000	23.250	.60000	125.66	0.	.50000	125.66	3857.3
LPU4	.22986E-02	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	3451.4
	QR	ROTFO :X	ROTFO :Y	ROTFO :Z	ROTMO :X	ROTMO :Y	ROTMO :Z	TP	QP	PROPF :X
LPU1	7925.3	1031.4	1117.9	-2026.7	4404.0	-10667.	6262.7	5400.0	62[illegible]4.3	5355.9
LPU2	3436.8	-934.42	926.17	-1632.9	7981.7	5045.2	2717.4	-342.47	147.71	-342.25
LPU3	9553.0	1571.9	1742.4	-3103.2	8072.6	-15299.	7548.9	5235.0	6235.4	5230.8
LPU4	2399.4	-1317.8	1528.4	-2747.8	11734.	9580.8	1896.0	-310.76	147.71	-310.55
	PROPF :Y	PROPF :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFO :X	FUSFO :Y	FUSFO :Z	FUSMO :X	FUSMO :Y
LPU1	-16.953	222.46	-6200.4	-2974.5	-455.71	-636.16	-3.7121	1.1335	0.	0.
LPU2	-.35645	22.211	-147.62	-178.95	.14343	13.952	-4.6549	12.37[illegible]	0.	0.
LPU3	5.0764	221.74	-6202.9	-2904.3	-147.46	-616.05	2.0913	4.[illegible]736	0.	0.
LPU4	.60665E-02	11.259	-147.62	-157.62	5.2600	12.852	.60427	3[illegible].137	0.	0.
	FUSMO :Z	JETHS	JETFO :X	JETFO :Y	JETFO :Z	JETMO :X	JETMO :Y	JETMO :Z	LPAFO :X	LPAFO :Y
LPU1	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	58[illegible]	1097.[illegible]
LPU2	0.	100.00	98.545	0.	-16.997	0.	-455.60	0.	-1154.2	52[illegible].96
LPU3	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	630[illegible].2	1749.5
LPU4	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	-1716.[illegible]	1524.0

	LPARU :Z	LPARC :X	LPARO :Y	LPARO :Z	HCBLF :X	HCBLF :Y	HCBLF :Z	HCBLM :X	HCBLM :Y	HCBLP :Z
LPU1	-1829.9	-1796.4	-14107.	5807.0	0.	0.	0.	0.	0.	0.
LPU2	-1075.3	7834.1	4403.0	2717.5	0.	0.	0.	0.	0.	0.
LPU3	-2903.0	1009.0	-13729.	7431.5	0.	0.	0.	0.	0.	0.
LPU4	-2720.4	11327.	2937.0	1901.3	0.	0.	0.	0.	0.	0.

	GCPRS	GCFOR :X	GCFOR :Y	GCFOR :Z	FRTMG	GFFOR :X	GFFOR :Y	GFFOR :Z	GERFO :X	GFRFC :Y
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFO :Z	HORFO :X	HORFO :Y	HORFO :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z
LPU1	0.	0.	0.	0.	4295.2	-369.55	7156.2	-2834.9	-25374.	434?.
LPU2	0.	0.	0.	0.	-1433.5	68.961	6871.5	78?3.9	8358.3	1936.?
LPU3	0.	0.	0.	0.	4391.4	851.9?	5305.6	4547.0	-30?77.	6177.4
LPU4	0.	0.	0.	0.	-2230.9	1244.2	6015.0	15166.	153??.	139?.?

	AUR	ALR	BLR	CLAVR	ALAVR	VTR	THINR	RCTIV :X	RCTIV :Y	RCTIV :Z
LPU1	.63767E-01	.12206E-01	.14930E-02	.90282E-01	.20492E-01	14.705	3.5389	-1.5273	-1.539?	?.?965
LPU2	.30293E-01	-.24732E-02	.94440E-03	.82915E-01	.22650E-01	13.500	4.2505	1.8349	-1.442?	?.?8?
LPU3	.63?37E-01	.16057E-01	.51431E-02	.15122	.3?317E-01	18.240	5.0815	-2.1938	-2.?104	4.?1?7
LPU4	.60649E-01	-.10534E-02	.54272E-02	.13547	.35745E-01	17.264	7.1519	3.087?	-3.1104	5.?515

	DSKLR	POWER R	CLAVP	ALAVP	VTP	THINP	PRPIV :X	PRPIV :Y	PRPIV :Z	CS LP
LPU1	1.0264	335.03	1.5626	.27271	91.783	67.333	-67.292	0.	-2.3699	40.665
LPU2	.65762	143.37	-.99100E-01	-.25246E-01	-23.114	-41.682	41.657	0.	-1.?501	-2.?409
LPU3	1.3623	403.?3	1.5149	.20438	90.370	62.993	-62.954	0.	-2.?171	38.?41
LPU4	1.4175	101.43	-.69925E-01	-.23175E-01	-22.0?8	-39.705	39.661	0.	-1.9813	-2.3056

	POWER P	COLNT	GRAT
LPU1	1417.5	3.3200	0.
LPU2	33.74?	3.3200	0.
LPU3	14??.1	3.3200	0.
LPU4	33.747	3.3200	0.

TAIL AERODYNAMIC REGIMES ANGLE OF ATTACK - 1 ANGLE OF SIDESLIP - 1 ROLLING ANGLE OF ATTACK - 1
VORTEX RING STATE--PROPELLER LPU-2
VORTEX RING STATE--PROPELLER LPU-4
MAXIMUM MECHANICAL LIMIT B1SK-1
MAXIMUM MECHANICAL LIMIT THEOP-1
MAXIMUM MECHANICAL LIMIT B1SK-2
MAXIMUM MECHANICAL LIMIT B1SK-3
MAXIMUM MECHANICAL LIMIT THEOP-3
MAXIMUM MECHANICAL LIMIT B1SK-4

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SIMULATION TIME -- 5.00

	U	V	W	P	Q	R	X	Y	Z	PSI
HULL	25.777	4.6257	-3.0693	.27286E-01	.64731E-02	.13978	98.186	22.183	-1017.1	.34513
	THETA	PSI	AXCGG	AYCGG	AZCGG	NDHHT	NDTHT	VHGUST:X	VHGUST:Y	VHGUST:Z
HULL	.64710E-01	.32126	.31500E-01	.13240	.17961E-03	10.036	9.3300	0.	0.	0.
	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DVGDYH	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	CDHGST:X
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	UDHGST:Y	UDHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	PCDRAC:X	PCDRAC:Y
HULL	0.	0.	1.3295	3.8900	-.43967	0.	0.	0.	0.	0.
	HGDRAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	DTGUST:X	DTGUST:Y	DTGUST:Z	DUGDXT	DUGDYT	DVGDYT
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VDRTGT:X	VDRTGT:Y	VDRTGT:Z	UDTGST:X	UDTGST:Y	UDTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	PCDTAC:X
HULL	0.	0.	0.	0.	0.	0.	1.3295	3.8900	-.43967	0.
	HGDTAC:Y	HGDTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	ROHLCV:X	ROHLCV:Y	ROHLCV:Z	GAMMAH	LAMDAH
HULL	0.	0.	54.559	-3.9743	-1.3726	.27286E-01	.64731E-02	.13978	.4527?E-01	-1.5?73
	ZETAH	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RDTAIL:X	RDTAIL:Y	RDTAIL:Z	ALT	PALT
HULL	1.9496	1.5708	53.323	-16.386	-.26005E-01	.27286E-01	.64731E-02	.13978	-.83100E-04	-.83100E-04
	BETAT	PSLTAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:X
HULL	-.49285	-.49285	.26137E-01	.49357E-02	.49357E-02	.26137E-01	-.55670	.34745	.6???4	.?5388E-?
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	PC-LMC	PCFL..
HULL	-.47736	.37017	.45739	.74962E-01	.16942	.24155	-.23925E-01	.87361E-01	.97245E-01	.92797E-01
	C FLUX C	TIAC	TCLC	ZA/SGT	RHBFCR:X	RHBFCR:Y	RHBFCR:Z	STATRF:X	STATRF:Y	STATRF:Z
HULL	-33.371	1.0001	1.0000	-4.1410	9710.1	-3945.9	-.11429E+06	9710.1	-39?5.9	-.11429E+06
	GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHDBFO:X	RHDBFO:Y	RHDBFO:Z	RHDBMC:X
HULL	0.	0.	0.	0.	0.	0.	-2652.5	-4598.9	67?.0?	-9.7340
	RHGAMO:Y	RHGAMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
HULL	-.10755E+06	43393.	881.97	10114.	-1143.2	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHGGFO:X	RHGGFO:Y	RHGGFO:Z	RHGGMO:X	RHGGMO:Y	RHGGPC:Z
HULL	0.	0.	0.	0.	881.97	10114.	-1143.2	0.	0.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
HULL	0.	-.69264E-15	.23915E-15	0.	0.	0.	-1185.0	-1598.9	-1??.43	0.
	HCACMO:Y	HCACMO:Z	RHJAF :X	RHJAF :Y	RHJAF :Z	RHJAMO:X	RHJAMO:Y	RHJAMO:Z	HCABF :X	HCABF :Y
HULL	17001.	-90176.	-1770.5	5515.2	-465.07	-9.7340	-.10755E+06	43393.	79?9.?	15?9.?
	HOABF :Z	HOABMO:X	HOABMO:Y	HOABMO:Z	HCTAFO:X	HCTAFO:Y	HCTAFO:Z	HCTAMO:X	HCTAMO:Y	HCTAMO:Z
HULL	-.11479E+06	26086.	-.23959E+05	43393.	6754.5	-29.690	-.11486E+06	26086.	-.22259E+06	-4?782.
	TAFUX	TSYFU	TSYFUX	TSZFUX	TSLMOM	TSLMOX	RTUAFO:X	RTUAFO:Y	RTUAFO:Z	RTUAMO:X
HULL	-392.10	5405.8	-124.08	.97845	4546.8	-1097.8	-392.10	5281.7	.97?4?	35???.
	RTUAMO:Y	RTUAMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
HULL	0.	0.	0.	1903.6	-266.00	38072.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTUGFO:X	RTUGFO:Y	RTUGFO:Z	RTUGMO:X	RTUGMO:Y	RTUGMO:Z
HULL	0.	0.	0.	0.	0.	1903.6	-266.00	38072.	0.	0.

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NULL	TCALFO:X 0.	TCALFO:Y 744.08	TCALFO:Z 224.54	TCALMO:X 14400.	TCACMO:Y 18.324	TCACMO:Z -97.195	RTOAF :X -392.10	RTOAF :Y 7165.5	RTO.F :Z -265.02	RTO[illegible] 41.[illegible]
NULL	RTOAMO:Y 0.	RTOAMO:Z 0.	TOAFOR:X -392.10	TOAFOR:Y 7165.5	TCAFOR:Z -265.02	TCAMOM:X .16112E+06	TOAMOM:Y -16695.	TCAMOM:Z -.49008E+06	TCTAFO:X -392.10	TCT.FO:Y 7[illegible]9.
NULL	TOTAFO:Z -40.485	TOTAMO:X 55021.	TCT.MO:Y 18.324	TCT.MO:Z -97.195	HABFOR:X 7547.5	HAB.OR:Y 8754.7	HABFOR:Z -.11502E+06	HABMOM:X .18720E+06	HABMOM:Y -.25628E+06	HABMOM:Z -.44 69[illegible]
NULL	HBACFO:X -1165.0	HBACFO:Y -654.32	HBACFO:Z 116.11	HBACMO:X 184.16	HBACMO:Y 56573.	HBACMO:Z -.15538E+06	HTOTAF:X 6302.4	HTOTAF:Y 7899.9	HTOTAF:Z -.11490E+06	HTOTA.:X .18739E+[illegible]
NULL	HTOTAM:Y -.19791E+06	HTOTAM:Z -.66267E+06	HCBLFO:X 0.	HCBLFO:Y 0.	HCBLFO:Z 0.	HCBLMO:X 0.	HCBLMO:Y 0.	HCBLMO:Z 0.	HGERFO:X 0.	HGERFO:Y 0.
NULL	HGERFO:Z 0.	HGERMO:X 0.	HGERMO:Y 0.	HGERMO:Z 0.	MCRLOD:X I	MC LOD:Y I	MCRLOD:Z I	NC2LOD:X I	NC2LOD:Y I	NC2LOD:Z I
NULL	UCCM 30.000	VCCM 0.0000	HDTCOM 5.0000	PHICOM .20000	THECOM .10000	TRKTCM .30000	PHRF:X I	PHRF:Y I	PHRF:Z I	PHRF:PSI
NULL	VHSENS:X 53.924	VHSENS:Y -3.5505	VHSENS:Z -.33563	XSPEED 25.777	YSPEED 4.0267	ZSPEED 5.0716	AXACC 1.0135	AYACC 4.2599	AZACC .57223E-02	ROLLRT .27286E-01
NULL	PTCHRT .04731E-02	TURNRT .13978	IACCLC:X I	IACCLC:Y I	IACCLC:Z I	UERR 4.2232	VERR 1.1733	HDTERR -.71620E-01	PHIERR .16545	THTERR .15290E-[illegible]
NULL	TRATER .15022	IERR:X I	IERR:Y I	IERR:Z I	PSIERR I	UINT .15112	VINT .22350E-01	HDTIN .49131E-01	PHIINT .13284E-01	THEINT -.44590E-01
NULL	TRTINT .54001E-01	UOCNTL .40000	VOCNTL .37433	HOCNTL -.47542E-01	PCONTL .45419E-01	OCONTL -.80918E-03	RCONTL .40000	SDLTAL -.46419E-01	SD.TEL .83918E-03	SDLTRD -.40000
NULL	PDLTAL 0.	PDLTEL 0.	PDLTRD 0.	DELTAL -.46419E-01	DELTEL .80918E-03	DELTRD -.40000				

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LFU VARIABLES AT TIME -- 3.00

	U	V	W	PHID	THETD	PSID	X	Y		F
LFU1	37.593	9.0494	-4.2230	0.	0.	0.	103.10	-43.490	-981.9	0.
LFU2	14.592	9.0735	-1.2039	0.	0.	0.	112.30	111.29	-973.3	0.
LFU3	37.577	-.0573	-3.2349	0.	0.	0.	91.244	-67.404	-977.5	0.
LFU4	14.213	-.0446	-1.123	0.	0.	0.	40.451	87.380	-971.[illegible]	0.

	THETA	PSI	ALPHAT	ADPAT	GEKIL SX	GEKIL SY	GEKIL SZ	IVSUP SX	IVSUP SY	IVS R SZ
LFU1	.35000E-01	0.	17.094	75.233	151.05	-10.440	-973.29	I	I	
LFU2	-.35000E-0[illegible]	0.	17.593	74.737	12[illegible].27	75.374	-370.12	I	I	
LFU3	.35000E-0[illegible]	0.	17.583	74.747	52.175	-33.101	-967.19	I	I	
LFU4	-.35000E-0[illegible]	0.	17.451	74.245	54.196	54.224	-964.63	I	I	

	VSURC SX	VSURC SY	VSURC SZ	VGUST SX	VGUST SY	VGUST SZ	VVLPU SX	VVLPU SY	PVLPU SZ	VVFUS SX
LFU1	I	I	I	0.	0.	0.	65.344	-.2393	-.53093	16[illegible]
LFU2	I	I	I	0.	0.	0.	43.033	-.30602	.11575	-23.5[illegible]
LFU3	I	I	I	0.	0.	0.	65.27	-10.959	-.93193E-02	167.6
LFU4	I	I	I	0.	0.	0.	43.051	-10.924	.61742	-23.160

	VVFUS SY	VVFUS SZ	RVKUT SX	RVKUT SY	RVKUT SZ	VVPRP SX	RVP P SY	RVPPP SZ	PFIV SX	PFIV SY
LFU1	1.0046	-.9077E-01	55.799	-.17872	-.50098	65.275	2.9967	-3.7434	-1.7731	-1.4222
LFU2	3.3174	-5.7349	42.965	-.33893E-01	.11570	38.012	5.2597	-8.0451	4.4217	-3.0234
LFU3	-5.8847	-2.[illegible]499	65.732	-10.892	-.93193E-02	66.355	-6.9156	-4.7321	-2.[illegible]	-2.0740
LFU4	-5.2412	-7.3520	42.692	-10.[illegible]	.02284	37.357	-4.3723	-9.7355	5.[illegible]113	-4.0960

	PFIV SZ	PFIV SX	PFIV SY	PFIV SZ	PFIV SX	PFIV SY	PFIV SZ	LCS F	DELTA	GEMA
LFU1	3.1725	-1.7331	-1.4202	3.1725	-131.75	0.	-3.5827	3.6469	.5212E-02	1.0000
LFU2	8.0942	4.4219	-3.0234	8.0942	62.152	0.	-2.1635	3.7374	.8425E-02	1.0000
LFU3	4.0331	-2.0311	-2.0740	4.0331	-99.324	0.	-3.4980	3.7417	.6525E-02	1.0000
LFU4	10.271	5.[illegible]13	-4.0960	10.271	63.244	0.	-2.0971	3.0092	.8409E-02	1.0000

	LCMX	DELTA F	GEFP	STH R	SAISR	SEI R	SCM R	PTH R	PAISR	P[illegible]
LFU1	5.7303	.9559 E-01	1.0000	.93151E-01	.37433	1.0000	23.25[illegible]	0.	0.	0.
LFU2	3.0019	.87009E-02	1.0000	.31328E-03	.37433	-.00000	23.250	0.	0.	0.
LFU3	5.73[illegible]	.96031E-01	1.0000	.94770E-01	.37433	1.0000	23.250	0.	0.	0.
LFU4	3.0054	.87000E-02	1.0000	.19316E-02	.37433	-.00000	23.250	0.	0.	0.

	THCUR	AISR	BISR	UMCUR	STHCP	SCMCP	PTHCP	THECP	CPECP	TP
LFU1	.93151E-01	.37433	.50000	23.250	.50000	125.60	0.	.50000	125.60	1903.[illegible]
LFU2	.31325E-03	.37433	-.50000	23.250	0.	125.60	0.	0.	125.66	2944.[illegible]
LFU3	.94770E-01	.37433	.50000	23.250	.20000	125.60	0.	.50000	125.60	2827.[illegible]
LFU4	.19316E-02	.37433	-.50000	23.250	0.	125.60	0.	0.	125.60	3716.[illegible]

	JA	ROTRC SX	RCTRC SY	RCTRC SZ	ROTRC SX	RCTRD SY	RCT D SZ	TP	CP	PROFF SX
LFU1	7130.1	790.2	703.34	-1031.2	1792.3	-8159.7	5871.3	5756.6	6237.1	5237.7
LFU2	2924.[illegible]	-1324.7	1031.2	-2337.0	8873.6	8203.7	2309.1	-297.77	147.71	-297.60
LFU3	5095.2	1107.1	1007.0	-2334.6	3356.9	-11285.	6612.2	5202.0	623[illegible].9	519[illegible]
LFU4	2055.5	-1[illegible]	1374.7	-3024.7	10354.	10666.	1704.3	-279.79	147.71	-279.61

	PROFF SY	PROFF SZ	PROPM SX	PROPM SY	PROPM SZ	FUSFD SX	FUSFD SY	FUSFC SZ	FUSMD SX	FUSMD SY
LFU1	-9.3715	203.89	-6203.2	-2054.4	-349.67	-630.62	-.23654	.57230 -0	0.	0.
LFU2	-.20817	155.727	-147.62	-1560.12	1.1041	1 .191	-2.2120	21.49[illegible]	0.	0.
LFU3	21.341	203.61	-5202.[illegible]	-2873.0	87.342	-512.59	15.860	.8[illegible]0	0.	0.
LFU4	.23956	[illegible].175	-147.62	-142.74	8.927	11.800	7.3295	36.943	0.	0.

	FUSMD SZ	ALIMS	JETFD SX	JETFD SY	JETFD SZ	JETMD SX	JETMD SY	JETMD SZ	LPAFD SX	LPAFD SY
LFU1	0.	100.00	90.343	0.	-16.997	0.	-465.60	0.	551[illegible].8	69[illegible]
LFU2	0.	100.00	90.343	0.	-16.997	0.	-465.60	0.	-1511.3	1[illegible]7
LFU3	0.	100.00	90.343	0.	-16.997	0.	-465.60	0.	5[illegible]7.3	1164.7
LFU4	0.	100.00	90.343	0.	-16.997	0.	-465.60	0.	-1813.0	13[illegible]

	LPAFO :Z	LPAMO :X	LPAMO :Y	LPAMO :Z	HCBLF :X	HCBLF :Y	HCBLF :Z	HCBLM :X	HCBLM :Y	HCBLM :Z
LPU1	-1394.4	-4451.0	-11480.	5521.7	0.	0.	0.	0.	0.	0.
LPU2	-2351.5	8726.0	7367.9	2340.2	0.	0.	0.	0.	0.	0.
LPU3	-2145.1	-2345.2	-14629.	6699.6	0.	0.	0.	0.	0.	0.
LPU4	-2994.7	10406.	10279.	1712.3	0.	0.	0.	0.	0.	0.

	GCPKS	GCFOR :X	GCFOR :Y	GCFOR :Z	FRTMG	GFFOR :X	GFFOR :Y	GFFOR :Z	GFR O :X	GFFG :Y
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFO :Z	HGRMO :X	HGRMO :Y	HGRMO :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z
LPU1	0.	0.	0.	0.	4306.3	-893.25	7333.4	-6951.3	-22514.	4777.3
LPU2	0.	0.	0.	0.	-1668.1	409.12	6360.4	9859.7	12302.	1749.9
LPU3	0.	0.	0.	0.	3950.8	45.904	6741.7	-2016.9	-25567.	5742.1
LPU4	0.	0.	0.	0.	-2404.4	1247.5	5917.4	14086.	17193.	1319.8

	AOR	AIR	BIR	CLAVR	ALAVR	VTR	TXI R	ROTIV :X	ROTIV :Y	ROTIV :Z
LPU1	.52682E-01	.13835E-01	.11507E-03	.73848E-01	.20250E-01	12.747	2.4275	-1.0832	-.60761	1.9926
LPU2	.51010E-01	-.15833E-02	.23439E-02	.11424	.30567E-01	15.554	6.1934	2.7637	-2.2646	5.0559
LPU3	.63035E-01	.14937E-01	.24078E-02	.10972	.29323E-01	15.537	3.5451	-1.5819	-1.2963	2.8557
LPU4	.63484E-01	-.12252E-02	.44402E-02	.14418	.37851E-01	17.811	7.8593	3.5070	-2.0737	6.4196

	DSKLR	POWER R	CLAVP	ALAVP	VTP	TKINP	PRPIV :X	PRPIV :Y	PRPIV :Z	DSKLP
LPU1	.77274	303.86	1.5211	.26547	90.556	63.620	-63.580	0.	-2.2392	39.001
LPU2	1.1954	123.64	-.56172E-01	-.22314E-01	-21.553	-33.866	38.845	0.	-1.3522	-2.2094
LPU3	1.1481	342.21	1.5053	.25271	90.084	62.116	-62.078	0.	-2.1863	38.596
LPU4	1.5087	63.202	-.50965E-01	-.21104E-01	-20.892	-37.675	37.653	0.	-1.3107	-2.6759

	POWER P	COUNT	GRAI
LPU1	1423.1	3.3200	0.
LPU2	33.743	3.3200	0.
LPU3	1417.9	3.3200	0.
LPU4	33.749	3.3200	0.

TAIL AERODYNAMIC REGIMES ANGLE OF ATTACK - 1 ANGLE OF SLIDESLIP - 1 ROLLING ANGLE OF ATTACK - 1
VORTEX RING STATE--PROPELLER LPU-2
VORTEX RING STATE--PROPELLER LPU-4
MAXIMUM MECHANICAL LIMIT B1SK-1
MAXIMUM MECHANICAL LIMIT THEOP-1
MAXIMUM MECHANICAL LIMIT B1SK-2
MAXIMUM MECHANICAL LIMIT B1SK-3
MAXIMUM MECHANICAL LIMIT THEOP-3
MAXIMUM MECHANICAL LIMIT B1SK-4

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*******************************************************************************************
*                         HEAVY LIFT AIRSHIP FLIGHT SIMULATION                            *
*******************************************************************************************

     ------------------------------RUN DESCRIPTION------------------------------
          PROGRAM HLAPAY          DATE -  81/12/11.        TIME -  10.10.39.

     TEST RUN3
     BIFILAR CABLES, PAYLOAD DISTURBANCE
     CLOSED LOOP
     ---------------------------------------------------------------------------

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****INPUT DATA****

--------------------------------------------------GEOMETRY INPUTS--------------------------------------

------BASIC HULL MEASUREMENTS
HLLARA =  .1342E+05 FT.**2                          SIDE PROJECTED AREA
HLLDIA =  .1000E+03 FEET                            MAXIMUM DIAMETER
HLLIC  =          1                                 CONFIGURATION ID =
HLLTH  =  .240E+03 FEET                             LENGTH OF HULL
HLLVOL =  .150E+07 FT.**3                           TOTAL DISPLACEMENT VOLUME

-----BASIC TAIL MEASUREMENTS
NUMFIN =          2                                 NUMBER OF FINS
STALCC =  -87.5..     0.00.     0.00 FEET           TAIL VECTOR FROM HULL CV
TALARA =  .252.E+04           FT.**2                TAIL REFERENCE AREA
TSPAN  =  .1000E+03           FEET                  TAIL SPAN
TALIC  =          1                                 TAIL CONFIGURATION IC =

-----BASIC LPU VALUES
NLPLPL =          4                                 NUMBER OF LPUS
LPLIC  =          1                                 CONFIGURATION ID =

-----FOUR VECTORS FROM HULL CV REFERENCE AXES TO EACH LPU ATTACH POINT
HATCH1 =  .240E+02 -.615E+02  .590E+02  FEET
HATCH2 =  .240E+02  .615E+02  .590E+02  FEET
HATCH3 = -.340E+02 -.615E+02  .590E+02  FEET
HATCH4 = -.340E+02  .615E+02  .590E+02  FEET

-----FOUR VECTORS FROM EACH LPU FUSELAGE REFERENCE AXES TO ITS HULL ATTACH POINT
RLTCH1 = 0.          0.          .3000E+01  FEET
RLTCH2 = 0.          0.          .3000E+01  FEET
RLTCH3 = 0.          0.          .3000E+01  FEET
RLTCH4 = 0.          0.          .3000E+01  FEET

-----VECTORS TO THE POSITION OF EACH ROTOR HUB WITH RESPECT TO ITS LPU FUSELAGE REFERENCE AXES
RRCTR1 = 0.          0.         -.7100E+01  FEET
RRCTR2 = 0.          0.         -.7100E+01  FEET
RRCTR3 = 0.          0.         -.7100E+01  FEET
RRCTR4 = 0.          0.         -.7100E+01  FEET

-----ROTOR CONFIGURATION
NBELD1 =          4                                 NUMBER OF BLADES ROTOR 1
NBELD2 =          4                                 NUMBER OF BLADES ROTOR 2
NBELD3 =          4                                 NUMBER OF BLADES ROTOR 3
NBELD4 =          4                                 NUMBER OF BLADES ROTOR 4

RADRT1 =    20.0000 FEET                            EFFECTIVE RADIUS ROTOR 1
RADRT2 =    20.0000 FEET                            EFFECTIVE RADIUS ROTOR 2
RADRT3 =    20.0000 FEET                            EFFECTIVE RADIUS ROTOR 3
RADRT4 =    20.0000 FEET                            EFFECTIVE RADIUS ROTOR 4

CCRCR1 =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 1
CCRCR2 =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 2
CCRCR3 =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 3
CCRCR4 =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 4
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-----VECTORS TO THE POSITION OF EACH PROPELLER POD WITH RESPECT TO ITS LPU FUSELAGE REFERENCE AXES
RFRCF1 =  .1400E+02 0.          0.          FEET
RFRCF2 =  .1400E+02 0.          0.          FEET
RFRCF3 =  .1400E+02 0.          0.          FEET
RFRCF4 =  .1400E+02 0.          0.          FEET

-----PROPELLER CONFIGURATION
NPELC1 =          3                              NUMBER OF BLADES PROPELLER 1
NPELC2 =          3                              NUMBER OF BLADES PROPELLER 2
NPELC3 =          3                              NUMBER OF BLADES PROPELLER 3
NPELC4 =          3                              NUMBER OF BLADES PROPELLER 4

RACP1  =     6.5500 FEET                         EFFECTIVE RADIUS PROPELLER 1
RACP2  =     6.5500 FEET                         EFFECTIVE RADIUS PROPELLER 2
RACP3  =     6.5500 FEET                         EFFECTIVE RADIUS PROPELLER 3
RACP4  =     6.5500 FEET                         EFFECTIVE RADIUS PROPELLER 4

CCRCF1 =      .6550 FEET                         BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 1
CCRCF2 =      .6550 FEET                         BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 2
CCRCF3 =      .6550 FEET                         BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 3
CCRCF4 =      .6550 FEET                         BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 4

-----LATERAL CONTROL AXIS DEFLECTION FOR:
A1SP1  =     0.0000 RADIANS                      PROPELLER-1
A1SP2  =     0.0000 RADIANS                      PROPELLER-2
A1SP3  =     0.0000 RADIANS                      PROPELLER-3
A1SP4  =     0.0000 RADIANS                      PROPELLER-4

-----LONGITUDINAL CONTROL AXIS DEFLECTION FOR:
B1SP1  =     1.6060 RADIANS                      PROPELLER-1
B1SP2  =     1.5360 RADIANS                      PROPELLER-2
B1SP3  =     1.6060 RADIANS                      PROPELLER-3
B1SP4  =     1.5360 RADIANS                      PROPELLER-4

-----LPU EULER ANGLES WITH RESPECT TO THE HULL CENTER OF VOLUME REFERENCE AXES
CBANG1 = 0.           .3500E-01 0.          RADIANS
CBANG2 = 0.          -.3500E-01 0.          RADIANS
CBANG3 = 0.           .3500E-01 0.          RADIANS
CBANG4 = 0.          -.3500E-01 0.          RADIANS
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--------------------------------------------------PAYLOAD GEOMETRY INPUTS-----------

-----BASIC PAYLOAD MEASUREMENTS
PAYLTH =     80.0000 FEET                               PAYLOAD LENGTH
PAYDTH =     12.0000 FEET                               PAYLOAD DEPTH
PAYVOL = 11520.0000 FT.**3                              PAYLOAD DISPLACED VOLUME
PAYARA =    144.0000 FT.**2                             PAYLOAD FRONT PROJECTED AREA
PAYID  =          1                                     PAYLOAD CONFIGURATION ID #

-----FOUR ATTACH POINTS ON THE PAYLOAD WITH RESPECT TO THE PAYLOAD REFERENCE CENTER
RPTCH1 =    40.00      0.00    -6.00   FEET
RPTCH2 =    40.00      0.00    -6.00   FEET
RPTCH3 =   -40.00      0.00    -6.00   FEET
RPTCH4 =   -40.00      0.00    -6.00   FEET

-----FOUR ATTACH POINTS ON THE HULL WITH RESPECT TO THE HULL CENTER OF VOLUME
RATHF1 =    36.00      0.00    50.00   FEET
RATHF2 =    36.00      0.00    50.00   FEET
RATHF3 =   -36.00      0.00    50.00   FEET
RATHF4 =   -36.00      0.00    50.00   FEET

-----PAYLOAD CABLE LENGTHS
USLTH1 =     20.0000 FEET                               CABLE 1
USLTH2 =     20.0000 FEET                               CABLE 2
USLTH3 =     18.0000 FEET                               CABLE 3
USLTH4 =     18.0000 FEET                               CABLE 4
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----------------------------------------------------MOORING POINT GEOMETRY--------------------

-----MOORING POINT ON MAST IN INERTIAL COORDINATES
MASTLC = 0.          0.          -.6501E+03  FEET

-----MOORING POINT ON HULL RELATIVE TO THE HULL CENTER OF VOLUME
MPCHFT =  .1200E+03 0.          0.          FEET

----------------------------------------LANDING GEAR ATTACH POINTS AND SPRING CONSTANTS--------

-----LANDING GEAR ATTACH POINTS ON THE HULL
RATHG1 =  .3600E+02 -.4600E+02  .6200E+02  FEET
RATHG2 =  .3600E+02  .4600E+02  .6200E+02  FEET
RATHG3 = -.3600E+02 -.4600E+02  .6200E+02  FEET
RATHG4 = -.3600E+02  .4600E+02  .6200E+02  FEET

-----LANDING GEAR LENGTHS
LGRLN1 =  .3320E+01 FEET                          LANDING GEAR 1
LGRLN2 =  .3320E+01 FEET                          LANDING GEAR 2
LGRLN3 =  .3320E+01 FEET                          LANDING GEAR 3
LGRLN4 =  .3320E+01 FEET                          LANDING GEAR 4

-----LANDING GEAR SPRING CONSTANTS
GEARK1 =  .7770E+04 LB / FT
GEARK2 =  .7770E+04 LB / FT
GEARK3 =  .7770E+04 LB / FT
GEARK4 =  .7770E+04 LB / FT

-----LANDING GEAR FRAME STIFFNESS CONSTANTS
GFRMK1 =  .7770E+05 LB / FT
GFRMK2 =  .7770E+05 LB / FT
GFRMK3 =  .7770E+05 LB / FT
GFRMK4 =  .7770E+05 LB / FT

-----LANDING GEAR SPRING DAMPING CONSTANTS
GEARC1 =  .1554E+04 (LB * SEC) / FT
GEARC2 =  .1554E+04 (LB * SEC) / FT
GEARC3 =  .1554E+04 (LB * SEC) / FT
GEARC4 =  .1554E+04 (LB * SEC) / FT

-----LANDING GEAR FRICTION CONSTANTS
MUKG1  =  .8000E-01
MUKG2  =  .8000E-01
MUKG3  =  .8000E-01
MUKG4  =  .8000E-01
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------------------------------------------PAYLOAD MASS AND MOMENT OF INERTIA INPUTS-------------

-----PAYLOAD CENTER OF GRAVITY VECTOR WITH RESPECT TO THE PAYLOAD REFERENCE CENTER
RPAYCG =     0.0000    0.0000    0.0000 FEET

-----MASS AND MOMENT OF INERTIA OF THE PAYLOAD
MASPAY =  .1243E+04 SLUGS                      MASS OF THE PAYLOAD
IPAYXX =  .2964E+05 SLUGS                      MOMENT OF INERTIA ABOUT THE PAYLOAD X AXIS
IPAYYY =  .6788E+06 SLUGS                      MOMENT OF INERTIA ABOUT THE PAYLOAD Y AXIS
IPAYZZ =  .6788E+06 SLUGS                      MOMENT OF INERTIA ABOUT THE PAYLOAD Z AXIS
IPAYXZ = 0.         SLUGS                      PRODUCT OF INERTIA WITH RESPECT TO THE XZ AXIS

----------------------------------------------------PAYLOAD CABLE INPUTS-----------------------

-----CABLE SPRING CONSTANTS
CABLK1 =  .6200E+05 (SEC**2) / (FT**2)         CABLE 1
CABLK2 = 0.         (SEC**2) / (FT**2)         CABLE 2
CABLK3 =  .6200E+05 (SEC**2) / (FT**2)         CABLE 3
CABLK4 = 0.         (SEC**2) / (FT**2)         CABLE 4

-----CABLE DAMPING CONSTANTS
CABLC1 =  .2486E+04 (SEC**2) / (FT**2)         CABLE 1
CABLC2 = 0.         (SEC**2) / (FT**2)         CABLE 2
CABLC3 =  .2486E+04 (SEC**2) / (FT**2)         CABLE 3
CABLC4 = 0.         (SEC**2) / (FT**2)         CABLE 4
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---------------------------------------------MASS AND MOMENT OF INERTIA INPUTS-----------

-----HULL CENTER OF GRAVITY VECTOR WITH RESPECT TO HULL CENTER OF VOLUME REFERENCE AXES
RHULCG = 0.          0.          .1663E+02  FEET

-----MASS AND MOMENT OF INERTIA OF HULL
MASHLL =  .2762E+04 SLUGS                          COMPLETE MASS OF HULL STRUCTURE
IHULXX =  .6350E+07 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG X AXES
IHULYY =  .1344E+08 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Y AXES
IHULZZ =  .1329E+08 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Z AXES
IHULXZ = 0.         SLUG*(FT.**2)                  PRODUCT OF INERTIA WRT THE CG XZ AXES

-----FOUR VECTORS LOCATING EACH LPU'S CG WITH RESPECT TO ITS FUSELAGE REFERENCE AXES
RCGLP1 = 0.          0.          0.          FEET
RCGLP2 = 0.          0.          0.          FEET
RCGLP3 = 0.          0.          0.          FEET
RCGLP4 = 0.          0.          0.          FEET

-----MASS AND MOMENT OF INERTIA OF LPU-1
MASLP1 =  .2795E+03 SLUGS                          MASS OF LPU-1
ILP1XX =  .8570E+04 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG X AXES
ILP1YY =  .4066E+05 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Y AXES
ILP1ZZ =  .3940E+05 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Z AXES
ILP1XZ = 0.         SLUG*(FT.**2)                  PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-2
MASLP2 =  .2795E+03 SLUGS                          MASS OF LPU-2
ILP2XX =  .8570E+04 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG X AXES
ILP2YY =  .4066E+05 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Y AXES
ILP2ZZ =  .3940E+05 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Z AXES
ILP2XZ = 0.         SLUG*(FT.**2)                  PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-3
MASLP3 =  .2795E+03 SLUGS                          MASS OF LPU-3
ILP3XX =  .8570E+04 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG X AXES
ILP3YY =  .4066E+05 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Y AXES
ILP3ZZ =  .3940E+05 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Z AXES
ILP3XZ = 0.         SLUG*(FT.**2)                  PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-4
MASLP4 =  .2795E+03 SLUGS                          MASS OF LPU-4
ILP4XX =  .8570E+04 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG X AXES
ILP4YY =  .4066E+05 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Y AXES
ILP4ZZ =  .3940E+05 SLUG*(FT.**2)                  MOMENT OF INERTIA ABOUT CG Z AXES
ILP4XZ = 0.         SLUG*(FT.**2)                  PRODUCT OF INERTIA WRT THE CG XZ AXES

-----ROTOR LOCK NUMBER
LOCNR1 =    15.0000                                ROTOR 1
LOCNR2 =    15.0000                                ROTOR 2
LOCNR3 =    15.0000                                ROTOR 3
LOCNR4 =    15.0000                                ROTOR 4
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---------------------------------------------------EXHAUST THRUST INPUTS--------------------------

-----EXHAUST JET FORCES
JETHS1 =  .1000E+03 LBS.                           LPL 1
JETHS2 =  .1000E+03 LBS.                           LPL 2
JETHS3 =  .1000E+03 LBS.                           LPL 3
JETHS4 =  .1000E+03 LBS.                           LPL 4

-----LOCATION OF THE EXHAUST NOZZLES WITH RESPECT TO THE FUSELAGE REFERENCE CENTERS
REXLC1 = -.1000E+02 0.          -.3100E+01  FEET                LPL 1
REXLC2 = -.1000E+02 0.          -.3000E+01  FEET                LPU 2
REXLC3 = -.1000E+02 0.          -.3000E+01  FEET                LPU 3
REXLC4 = -.1000E+02 0.          -.3000E+01  FEET                LPL 4

-----ANGULAR ORIENTATIONS OF THE EXHAUST NOZZLES WITH RESPECT TO THE FUSELAGE REFERENCE CENTERS
A1SE1  = 0.           RADIANS                      LPU 1
B1SE1  =  .1400E+01 RADIANS                        LPU 1
A1SE2  = 0.           RADIANS                      LPU 2
B1SE2  =  .1400E+01 RADIANS                        LPU 2
A1SE3  = 0.           RADIANS                      LPL 3
B1SE3  =  .1400E+01 RADIANS                        LPU 3
A1SE4  = 0.           RADIANS                      LPU 4
B1SE4  =  .1400E+01 RADIANS                        LPL 4
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---------------------------------------------PAYLOAD AERODYNAMIC PARAMETERS INPUT-----

-----PAYLOAD X, Y AND Z FORCE DERIVATIVES WITH RESPECT TO:
XUUAEF = -.2854E+00 LB*(S**2)/(FT**2)            U * ABS(U)
YVVAEF = -.2854E+01 LB*(S**2)/(FT**2)            V * ABS(V)
ZWWAEF = -.2854E+01 LB*(S**2)/(FT**2)            W * ABS(W)

-----PAYLOAD YAWING MOMENT DERIVATIVE WITH RESPECT TO:
NUVF   = -.2000E+02 LB*(S**2)/FT                U * V

LPPAEF = 0.         FT*LB*(S**2)/(RAD**2)        P * ABS(P)
MQQAEF = -.1000E+05 FT*LB*(S**2)/(RAD**2)        Q * ABS(Q)
NRRAEF = -.1000E+05 FT*LB*(S**2)/(RAD**2)        R * ABS(R)
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-------------------------------------------------LPC AERODYNAMIC PARAMETERS INPUT----------------------

-----FOUR VECTORS LOCATING FUSELAGE AERODYNAMIC CENTER WITH RESPECT TO LPC FUSELAGE REFERENCE AXES
RACLF1 = 0.          0.          0.          FEET
RACLF2 = 0.          0.          0.          FEET
RACLF3 = 0.          0.          0.          FEET
RACLF4 = 0.          0.          0.          FEET

-----ROTOR BLADE LIFT CURVE SLOPE AND DRAG COEFFICIENTS

LCSR1  =      5.7300 1/RAD.                         ROTOR 1
CLTR1A =       .0087 1/RAD.
CLTR1B =      -.0216 1/RAD.
CLTR1C =       .4000 1/RAD.

LCSR2  =      5.7300 1/RAD.                         ROTOR 2
CLTR2A =       .0087 1/RAD.
CLTR2B =      -.0216 1/RAD.
CLTR2C =       .4000 1/RAD.

LCSR3  =      5.7300 1/RAD.                         ROTOR 3
CLTR3A =       .0087 1/RAD.
CLTR3B =      -.0216 1/RAD.
CLTR3C =       .4000 1/RAD.

LCSR4  =      5.7300 1/RAD.                         ROTOR 4
CLTR4A =       .0087 1/RAD.
CLTR4B =      -.0216 1/RAD.
CLTR4C =       .4000 1/RAD.

-----PROPELLER BLADE LIFT CURVE SLOPE AND DRAG COEFFICIENTS

LCSP1  =      5.7300 1/RAD.                         PROPELLER 1
CLTP1A =       .0087 1/RAD.
CLTP1B =      -.0216 1/RAD.
CLTP1C =       .4000 1/RAD.

LCSP2  =      5.7300 1/RAD.                         PROPELLER 2
CLTP2A =       .0087 1/RAD.
CLTP2B =      -.0216 1/RAD.
CLTP2C =       .4000 1/RAD.

LCSP3  =      5.7300 1/RAD.                         PROPELLER 3
CLTP3A =       .0087 1/RAD.
CLTP3B =      -.0216 1/RAD.
CLTP3C =       .4000 1/RAD.

LCSP4  =      5.7300 1/RAD.                         PROPELLER 4
CLTP4A =       .0087 1/RAD.
CLTP4B =      -.0216 1/RAD.
CLTP4C =       .4000 1/RAD.
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---------------------------------------------------HULL AERODYNAMIC PARAMETERS INPUT---------------------------------------

-----HULL ACCELERATION DERIVATIVES
XUDOTH = -.6634E+03 LB*(S**2)/FT                 X FORCE DERIVATIVE WITH RESPECT TO LONGITUDINAL ACCELERATION
YVDOTH = -.2600E+04 LB*(S**2)/FT                 Y FORCE DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
ZWDOTH = -.2600E+04 LB*(S**2)/FT                 Z FORCE DERIVATIVE WITH RESPECT TO DOWNWARD ACCELERATION
LPDOTH = 0.         FT*LB*(S**2)/RAD             ROLLING MOMENT DERIVATIVE WITH RESPECT TO ROLLING ACCELERATION
MQDOTH = -.3610E+07 FT*LB*(S**2)/RAD             PITCHING MOMENT DERIVATIVE WITH RESPECT TO PITCHING ACCELERATION
NRDOTH = -.3610E+07 FT*LB*(S**2)/RAD             YAWING MOMENT DERIVATIVE WITH RESPECT TO YAW ACCELERATION

-----TAIL ACCELERATION DERIVATIVES
YVDOTT = -.4394E+03 LB*(S**2)/FT                 Y FORCE DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
ZWDOTT = -.6052E+03 LB*(S**2)/FT                 Z FORCE DERIVATIVE WITH RESPECT TO DOWNWARD ACCELERATION
LVDOTT = -.9787E+04 LB*(S**2)                    ROLLING MOMENT DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
LPDOTT = -.3366E+06 FT*LB*(S**2)/RAD             ROLLING MOMENT DERIVATIVE WITH RESPECT TO ROLLING ACCELERATION
MQDOTT = -.3891E+04 FT*LB*(S**2)/RAD             PITCHING MOMENT DERIVATIVE WITH RESPECT TO PITCHING ACCELERATION
NRDOTT = -.3891E+04 FT*LB*(S**2)/RAD             YAWING MOMENT DERIVATIVE WITH RESPECT TO YAW ACCELERATION

-----HULL X FORCE DERIVATIVES WITH RESPECT TO:
XUUABH = -.4136E+02 LB*(S**2)/(FT**2)            U * ABS(U)
XQWH   = -.2600E+04 LB*(S**2)/(RAD*FT)           Q * W
XRVH   =  .2600E+04 LB*(S**2)/(F  *2)            R * V

-----HULL Y FORCE DERIVATIVES WITH RESPECT TO:
YVVABH = -.2604E+02 LB*(S**2)/(FT**2)            V * ABS(V)
YRRABH = 0.         LB*(S**2)/(RAD*FT)           R * ABS(R)
YPWH   =  .2600E+04 LB*(S**2)/(RAD*FT)           P * W
YRUH   = -.6634E+03 LB*(S**2)/(RAD*FT)           R * U
YRVABH = 0.         LB*(S**2)/(RAD*FT)           R * ABS(V)

-----HULL Z FORCE DERIVATIVES WITH RESPECT TO:
ZWWABH = -.2604E+02 LB*(S**2)/(FT**2)            W * ABS(W)
ZQQABH = 0.         LB*(S**2)/(RAD**2)           Q * ABS(Q)
ZPVH   = -.2600E+04 LB*(S**2)/(RAD*FT)           P * V
ZQUH   =  .6634E+03 LB*(S**2)/(RAD*FT)           Q * U
ZQWABH = 0.         LB*(S**2)/(RAD*FT)           Q * ABS(W)

-----HULL ROLLING MOMENT DERIVATIVES WITH RESPECT TO:
LPPABH = -.1314E+05 FT*LB*(S**2)/(RAD**2)        P * ABS(P)
LPLABH = 0.         FT*LB*(S**2)/(RAD**2)        P * ABS(L)
LVWH   = 0.         LB*(S**2)/FT                 V * W
LQRH   = -.3610E+07 FT*LB*(S**2)/(RAD**2)        QB * R
LRQH   =  .3610E+07 FT*LB*(S**2)/(RAD**2)        RB * Q

-----HULL PITCHING MOMENT DERIVATIVES WITH RESPECT TO:
MQQABH = -.9220E+07 FT*LB*(S**2)/(RAD**2)        Q * ABS(Q)
MUWH   =  .1452E+04 LB*(S**2)/FT                 U * W
MRPH   = 0.         FT*LB*(S**2)/(RAD**2)        RB * P
MPRH   =  .3610E+07 FT*LB*(S**2)/(RAD**2)        PB * R
MQWABH = -.2317E+06 LB*(S**2)/RAD                Q * ABS(W)

-----HULL YAWING MOMENT DERIVATIVE WITH RESPECT TO:
NRRABH = -.8220E+07 FT*LB*(S**2)/(RAD**2)        R * ABS(R)
NUVH   = -.1452E+04 LB*(S**2)/FT                 U * V
NPQH   = -.3610E+07 FT*LB*(S**2)/(RAD**2)        PB * Q
NQPH   = 0.         FT*LB*(S**2)/(RAD**2)        QB * P
NRVABH = -.2317E+06 LB*(S**2)/RAD                R * ABS(V)
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-----TAIL X FORCE DERIVATIVES WITH RESPECT TO:
XUUAET = -.1379E+00 LE*(S**2)/(FT**2)               U * ABS(U)

-----TAIL Y FORCE DERIVATIVES WITH RESPECT TO:
YVVAET = -.2446E+01 LE*(S**2)/(FT**2)               V * ABS(V)
YPPAET = -.3233E+04 LE*(S**2)/(RAD**2)              P * ABS(P)
YAPVST = -.1467E+01 LE*(S**2)/(RAD*(FT**2))         ALPHA-P * (VPT**2)
YBVSCT = -.2072E+01 LE*(S**2)/(RAD*(FT**2))         BETA * (VXY**2)
YBSVST = -.1734E+01 LE*(S**2)/((RAD**2)*(FT**2))    BETA*ABS(BETA)*(VXY)**2)
YAPSVS = -.2939E+01 LE*(S**2)/((RAD**2)*(FT**2))    ALPHA1P*ABS(ALPHA1P)*(VPT**2)

-----TAIL Z FORCE DERIVATIVES WITH RESPECT TO:
ZWWAET = -.2440E+01 LE*(S**2)/(FT**2)               W * ABS(W)
ZAVSCT = -.4141E+01 LE*(S**2)/(RAD*(FT**2))         ALPHA * VXZ**2
ZASVST = -.4000E+00 LE*(S**2)/((RAD**2)*(FT**2))    ALPHA*ABS(ALPHA)*(VXZ**2)

-----TAIL ROLL MOMENT DERIVATIVES WITH RESPECT TO:
LVVAET = -.4390E+01 LE*(S**2)/FT                    V * ABS(V)
LPPAET = -.1707E+06 LE*(S**2)/(RAD*FT)              P * ABS(P)
LAPVST = -.7742E+02 LE*(S**2)/(RAD*FT)              ALPHA-P * VPT**2
LBVSCT = -.3331E+01 LE*(S**2)/(RAD*FT)              BETA * VXY**2
LBAVST = -.1520E+01 LE*(S**2)/((RAD**2)*FT)         BETA*ALPHA*(VXY**2)
LAPSVS = -.1551E+03 LE*(S**2)/((RAD**2)*FT)         ALPHA1P*ABS(ALPHA1P)*(VPT**2)

-----TAIL LOCATION SCALE FACTORS
LAPTXC =       .7000                                X-AXIS CORRECTION FOR PITCHING MOMENTS
LAPTXY =       .7000                                X-AXIS CORRECTION FOR YAWING MOMENTS
LAPTZC =      1.0000                                Z-AXIS CORRECTION FOR PITCHING MOMENTS

-----STALL PARAMETERS
AL1T    =  .5236E+00 RADIANS                        LONGITUDINAL TAIL STALLING PARAMETERS
AL2T    =  .6981E+00 RADIANS
BETA1T  =  .5236E+00 RADIANS                        LATERAL TAIL STALL PARAMETERS
BETA2T  =  .6981E+00 RADIANS
ALF1T   =  .5236E+00 RADIANS                        TAIL ROLLING STALL PARAMETERS
ALF2T   =  .6981E+00 RADIANS

-----TAIL SURFACE EFFECTIVENESS PARAMETERS
TALA    =  .5000E+00 (SEC**2) / (FT**2)             AILERON
TALE    =  .5000E+00 (SEC**2) / (FT**2)             ELEVATOR
TALR    =  .5000E+00 (SEC**2) / (FT**2)             RUDDER
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-------------------------------------------------INTERFERENCE CONSTANTS ON ROTOR------

-----SHADOW CONSTANTS ROTOR 1
BWK1R1 =   .1745E+01 RADIANS                          BETA WAKE ANGLE 1
BWK2R1 =   .2967E+01 RADIANS                          BETA WAKE ANGLE 2
MXBDR1 =   .2500E+00                                  BETA WAKE MAXIMUM DEFECT
LWK1R1 =   .1222E+01 RADIANS                          LAMBDA WAKE ANGLE 1
LWK2R1 =   .2863E+01 RADIANS                          LAMBDA WAKE ANGLE 2
MXLDR1 =   .2500E+00                                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 2
BWK1R2 =   .3316E+01 RADIANS                          BETA WAKE ANGLE 1
BWK2R2 =   .4538E+01 RADIANS                          BETA WAKE ANGLE 2
MXBDR2 =   .2500E+00                                  BETA WAKE MAXIMUM DEFECT
LWK1R2 =   .3403E+01 RADIANS                          LAMBDA WAKE ANGLE 1
LWK2R2 =   .4974E+01 RADIANS                          LAMBDA WAKE ANGLE 2
MXLDR2 =   .2500E+00                                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 3
BWK1R3 =   .1745E+00 RADIANS                          BETA WAKE ANGLE 1
BWK2R3 =   .1396E+01 RADIANS                          BETA WAKE ANGLE 2
MXBDR3 =   .2500E+00                                  BETA WAKE MAXIMUM DEFECT
LWK1R3 =   .1310E+01 RADIANS                          LAMBDA WAKE ANGLE 1
LWK2R3 =   .2006E+01 RADIANS                          LAMBDA WAKE ANGLE 2
MXLDR3 =   .2500E+00                                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 4
BWK1R4 =   .4887E+01 RADIANS                          BETA WAKE ANGLE 1
BWK2R4 =   .6109E+01 RADIANS                          BETA WAKE ANGLE 2
MXBDR4 =   .2500E+00                                  BETA WAKE MAXIMUM DEFECT
LWK1R4 =   .3403E+01 RADIANS                          LAMBDA WAKE ANGLE 1
LWK2R4 =   .4974E+01 RADIANS                          LAMBDA WAKE ANGLE 2
MXLDR4 =   .2500E+00                                  LAMBDA WAKE MAXIMUM DEFECT

-----HULL ON ROTOR CONSTANTS
KHRA1  =   .1200E+02 LB / (FT**2)                     ROTOR 1  A
KHRB1  =   .3330E-01                                  ROTOR 1  B
KHRA2  =   .1200E+02 LB / (FT**2)                     ROTOR 2  A
KHRB2  =   .3330E-01                                  ROTOR 2  B
KHRA3  =   .1200E+02 LB / (FT**2)                     ROTOR 3  A
KHRB3  =   .3330E-01                                  ROTOR 3  B
KHRA4  =   .1200E+02 LB / (FT**2)                     ROTOR 4  A
KHRB4  =   .3330E-01                                  ROTOR 4  B

-----GROUND ON ROTOR CONSTANTS
KGR1    = -.2000E+01
KGR2    = -.2000E+01
KGR3    = -.2000E+01
KGR4    = -.2000E+01
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---------------------------------------------INTERFERENCE CONSTANTS ON PROPELLER----

-----SHADOW CONSTANTS PROPELLER 1
BWK1F1 =  .1745E+01 RADIANS                              BETA WAKE ANGLE 1
BWK2F1 =  .2967E+01 RADIANS                              BETA WAKE ANGLE 2
MXECF1 =  .8500E+00                                      BETA WAKE MAXIMUM DEFECT
LWK1F1 =  .1310E+01 RADIANS                              LAMBDA WAKE ANGLE 1
LWK2F1 =  .2880E+01 RADIANS                              LAMBDA WAKE ANGLE 2
MXLCF1 =  .8500E+00                                      LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 2
BWK1F2 =  .3316E+01 RADIANS                              BETA WAKE ANGLE 1
BWK2F2 =  .4538E+01 RADIANS                              BETA WAKE ANGLE 2
MXECF2 =  .8500E+00                                      BETA WAKE MAXIMUM DEFECT
LWK1F2 =  .3403E+01 RADIANS                              LAMBDA WAKE ANGLE 1
LWK2F2 =  .4974E+01 RADIANS                              LAMBDA WAKE ANGLE 2
MXLCF2 =  .8500E+00                                      LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 3
BWK1F3 =  .1745E+00 RADIANS                              BETA WAKE ANGLE 1
BWK2F3 =  .1396E+01 RADIANS                              BETA WAKE ANGLE 2
MXECF3 =  .8500E+00                                      BETA WAKE MAXIMUM DEFECT
LWK1F3 =  .1310E+01 RADIANS                              LAMBDA WAKE ANGLE 1
LWK2F3 =  .2880E+01 RADIANS                              LAMBDA WAKE ANGLE 2
MXLCF3 =  .8500E+00                                      LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 4
BWK1F4 =  .4887E+01 RADIANS                              BETA WAKE ANGLE 1
BWK2F4 =  .6109E+01 RADIANS                              BETA WAKE ANGLE 2
MXECF4 =  .8500E+00                                      BETA WAKE MAXIMUM DEFECT
LWK1F4 =  .3403E+01 RADIANS                              LAMBDA WAKE ANGLE 1
LWK2F4 =  .4974E+01 RADIANS                              LAMBDA WAKE ANGLE 2
MXLCF4 =  .8500E+00                                      LAMBDA WAKE MAXIMUM DEFECT

-----HULL ON PROPELLER CONSTANTS
KHFA1  =  .1200E+02 LB / (FT**2)                         PROPELLER 1  A
KHFB1  =  .3333E-01                                      PROPELLER 1  B
KHFA2  =  .1200E+02 LB / (FT**2)                         PROPELLER 2  A
KHFB2  =  .3333E-01                                      PROPELLER 2  B
KHFA3  =  .1200E+02 LB / (FT**2)                         PROPELLER 3  A
KHFB3  =  .3333E-01                                      PROPELLER 3  B
KHFA4  =  .1200E+02 LB / (FT**2)                         PROPELLER 4  A
KHFB4  =  .3333E-01                                      PROPELLER 4  B

-----ROTOR ON PROPELLER CONSTANTS
KRF1   =  .1600E+01                                      LPU 1
KRF2   =  .1600E+01                                      LPU 2
KRF3   =  .1600E+01                                      LPU 3
KRF4   =  .1600E+01                                      LPU 4

-----GROUND ON PROPELLER CONSTANTS
KGF1   = -.2000E+01                                      LPU 1
KGF2   = -.2000E+01                                      LPU 2
KGF3   = -.2000E+01                                      LPU 3
KGF4   = -.2000E+01                                      LPU 4
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---------------------------------------------INTERFERENCE CONSTANTS ON FUSELAGE-----

-----SHADOW CONSTANTS FUSELAGE 1
BWK1F1 =   .1745E+01 RADIANS                      BETA WAKE ANGLE 1
BWK2F1 =   .2967E+01 RADIANS                      BETA WAKE ANGLE 2
MXEDF1 =   .8500E+00                              BETA WAKE MAXIMUM DEFECT
LWK1F1 =   .1310E+01 RADIANS                      LAMBDA WAKE ANGLE 1
LWK2F1 =   .2880E+01 RADIANS                      LAMBDA WAKE ANGLE 2
MXLDF1 =   .8500E+00                              LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 2
BWK1F2 =   .3316E+01 RADIANS                      BETA WAKE ANGLE 1
BWK2F2 =   .4538E+01 RADIANS                      BETA WAKE ANGLE 2
MXEDF2 =   .8500E+00                              BETA WAKE MAXIMUM DEFECT
LWK1F2 =   .3403E+01 RADIANS                      LAMBDA WAKE ANGLE 1
LWK2F2 =   .4974E+01 RADIANS                      LAMBDA WAKE ANGLE 2
MXLDF2 =   .8500E+00                              LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 3
BWK1F3 =   .1745E+00 RADIANS                      BETA WAKE ANGLE 1
BWK2F3 =   .1396E+01 RADIANS                      BETA WAKE ANGLE 2
MXEDF3 =   .8500E+00                              BETA WAKE MAXIMUM DEFECT
LWK1F3 =   .1310E+01 RADIANS                      LAMBDA WAKE ANGLE 1
LWK2F3 =   .2880E+01 RADIANS                      LAMBDA WAKE ANGLE 2
MXLDF3 =   .8500E+00                              LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 4
BWK1F4 =   .4887E+01 RADIANS                      BETA WAKE ANGLE 1
BWK2F4 =   .6109E+01 RADIANS                      BETA WAKE ANGLE 2
MXEDF4 =   .8500E+00                              BETA WAKE MAXIMUM DEFECT
LWK1F4 =   .3403E+01 RADIANS                      LAMBDA WAKE ANGLE 1
LWK2F4 =   .4974E+01 RADIANS                      LAMBDA WAKE ANGLE 2
MXLDF4 =   .8500E+00                              LAMBDA WAKE MAXIMUM DEFECT

-----ROTOR ON FUSELAGE CONSTANTS
KRF1    =  .1600E+01                              FUSELAGE 1
KRF2    =  .1600E+01                              FUSELAGE 2
KRF3    =  .1600E+01                              FUSELAGE 3
KRF4    =  .1600E+01                              FUSELAGE 4

-----PROPELLER ON FUSELAGE CONSTANTS
KPF1    =  .1600E+01
KPF2    =  .1600E+01
KPF3    =  .1600E+01
KPF4    =  .1600E+01
```

```
----------------------------------------------INTERFERENCE CONSTANTS ON HULL-----

-----GROUND ON HULL CONSTANTS
KGHA    = -.4100E+01                                A CONSTANT
KGHB    = -.4100E+01                                B CONSTANT

-----ROTOR 1 ON HULL
KRHA1   = 0.            SEC / FT
KRHB1   =  .1000E-03 (SEC**2) / (FT**2)
KRHC1   =  .2000E+00
KRHC1   = -.4300E-01
KRHE1   =  .3330E-01

-----ROTOR 2 ON HULL
KRHA2   = 0.            SEC / FT
KRHB2   =  .1000E-03 (SEC**2) / (FT**2)
KRHC2   =  .2000E+00
KRHC2   =  .4300E-01
KRHE2   =  .3330E-01

-----ROTOR 3 ON HULL
KRHA3   = 0.            SEC / FT
KRHB3   =  .1000E-03 (SEC**2) / (FT**2)
KRHC3   = -.2000E+00
KRHC3   = -.4300E-01
KRHE3   =  .3330E-01

-----ROTOR 4 ON HULL
KRHA4   = 0.            SEC /. FT
KRHB4   =  .1000E-03 (SEC**2) / (FT**2)
KRHC4   = -.2000E+00
KRHC4   =  .4300E-01
KRHE4   =  .3330E-01

-----PROPELLER 1 ON HULL
KPHA1   = 0.            SEC / FT
KPHB1   =  .5390E-05 (SEC**2) / (FT**2)
KPHC1   =  .1090E-01
KPHC1   = -.2360E-02
KPHE1   =  .1330E-02

-----PROPELLER 2 ON HULL
KPHA2   = 0.            SEC / FT
KPHB2   =  .5390E-05 (SEC**2) / (FT**2)
KPHC2   =  .1090E-01
KPHC2   = -.2360E-02
KPHE2   =  .1330E-02

-----PROPELLER 3 ON HULL
KPHA3   = 0.            SEC / FT
KPHB3   =  .5390E-05 (SEC**2) / (FT**2)
KPHC3   = -.1090E-01
KPHC3   = -.2360E-02
KPHE3   =  .1330E-02

-----PROPELLER 4 ON HULL
KPHA4   = 0.            SEC / FT
KPHB4   =  .5390E-05 (SEC**2) /.(FT**2)
KPHC4   = -.1090E-01
KPHC4   = -.2360E-02
KPHE4   =  [illegible]
```

```
-----------------------------------------------INTERFERENCE CONSTANTS ON TAIL------

- ---ROTOR 1 ON TAIL CONSTANTS
KRTA1  =  .1400E-01
KRTB1  = -.5700E-02
KRTC1  =  .5100E-02

-----ROTOR 2 ON TAIL CONSTANTS
KRTA2  =  .1400E-01
KRTB2  =  .5700E-02
KRTC2  =  .5100E-02

-----ROTOR 3 ON TAIL CONSTANTS
KRTA3  =  .3040E-01
KRTB3  = -.1240E-01
KRTC3  =  .1100E-01

-----ROTOR 4 ON TAIL CONSTANTS
KRTA4  =  .3040E-01
KRTB4  =  .1240E-01
KRTC4  =  .1100E-01

-----PROPELLER 1 ON TAIL CONSTANTS
KPTA1  =  .7600E-03
KPTB1  = -.3370E-03
KPTC1  =  .2750E-03

-----PROPELLER 2 ON TAIL CONSTANTS
KPTA2  =  .7600E-03
KPTB2  =  .3370E-03
KPTC2  =  .2750E-03

-----PROPELLER 3 ON TAIL CONSTANTS
KPTA3  =  .1640E-02
KPTB3  = -.6680E-03
KPTC3  =  .5930E-03

-----PROPELLER 4 ON TAIL CONSTANTS
KPTA4  =  .1640E-02
KPTB4  =  .6680E-03
KPTC4  =  .5930E-03

-----GROUND ON TAIL CONSTANTS
KGTA   = -.5177E+02 (SEC**2) / (FT**2)
KGTB   =  .1600E+02 (SEC**2) / (FT**2)
```

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----------------------------------------------ROTOR AND PROPELLER SPIN RATES-----------------

OMEGR1 =    23.2500 RAD./SEC.                    ROTOR 1 SPIN RATE
OMEGR2 =    23.2500 RAD./SEC.                    ROTOR 2 SPIN RATE
OMEGR3 =    23.2500 RAD./SEC.                    ROTOR 3 SPIN RATE
OMEGR4 =    23.2500 RAD./SEC.                    ROTOR 4 SPIN RATE

OMEGP1 =   125.6600 RAD./SEC.                    PROPELLER 1 SPIN RATE
OMEGP2 =   125.6600 RAD./SEC.                    PROPELLER 2 SPIN RATE
OMEGP3 =   125.6600 RAD./SEC.                    PROPELLER 3 SPIN RATE
OMEGP4 =   125.6600 RAD./SEC.                    PROPELLER 4 SPIN RATE

-----------------------------------------MECHANICAL FLIGHT CONTROL SYSTEM CONSTANTS-----------

THEMRX =      .5000 RADIANS                      MAXIMUM ROTOR COLLECTIVE PITCH ANGLE
A1SRMX =      .5000 RADIANS                      MAXIMUM ROTOR LATERAL CYCLIC PITCH ANGLE
B1SRMX =      .5000 RADIANS                      MAXIMUM ROTOR LONGITUDINAL CYCLIC PITCH ANGLE
THEPMX =      .5000 RADIANS                      MAXIMUM PROPELLER COLLECTIVE PITCH ANGLE
DLALMX =  .1000E+01 RADIANS                      MAXIMUM TAIL AILERON DEFLECTION
DLELMX =  .1000E+01 RADIANS                      MAXIMUM TAIL ELEVATOR DEFLECTION
DLRDMX =  .1000E+01 RADIANS                      MAXIMUM TAIL RUDDER DEFLECTION
```

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--------------------------------------------------INERTIAL VEHICLE STATE INPUTS--------------------------------------------------

-----HULL CG REFERENCE AXES VELOCITY VECTOR WITH RESPECT TO INERTIAL SPACE
VHLL   =     44.00,    -5.00,     0.00 FT./SEC.

-----HULL CG REFERENCE AXES INERTIAL POSITION IN INERTIAL COORDINATES
HLLPOS =      0.00,     0.00, -1000.00 FEET

-----EULER ANGLE RATES OF HULL CG REFERENCE AXES WITH RESPECT TO AN INERTIAL FRAME:  PHIDOT, THEDOT PSIDOT
HLLELR =      0.00,     0.00,     .05 RAD./SEC.

-----EULER ANGLES OF THE HULL CG REFERENCE AXES WITH RESPECT TO AN INERTIAL FRAME:  PHI, THETA, PSI
HLLELL =      .10,      0.00,     0.00 RADIANS

--------------------------------------------------ATMOSPHERIC PARAMETER INPUTS--------------------------------------------------

AIRDEN =  .2378E-02                        SLUG / (FT**3)      REFERENCE ATMOSPHERIC DENSITY
DENRAT =    1.0000                                             DENSITY RATIO
GRAV   =  .3217E+02                        FT./(SEC.**2)       EARTHS GRAVITATIONAL ACCELERATION
WNIND  =      0.00,     0.00,     0.00     FT./SEC.            STEADY WIND VECTOR IN INERTIAL FRAME COORDINATES

--------------------------------------------------STABILITY DERIVATIVE FLAGS--------------------------------------------------

DERVFL = T                                        STABILITY DERVIATIVES TO BE CALCULATED
APATFL = T                                        A MATRIX
BPATFL = T                                        B MATRIX
BPPTFL = T                                        B PRIME MATRIX
CPATFL = T                                        C MATRIX
CPPTFL = T                                        ALL CONSTRAINT FORCE (AUXILIARY) MATRICES

  PAYLOAD TRIM CASE NUMBER     1

  THIS PAYLOAD TRIM CONVERGED SATISFACTORILY

  TRIM ALGORITHM CONTROL
  ITERATIONS =    39     RESTARTS =     0     CONV. CRIT. =  .5112E-09
  HRPYLC:X =   -.3632  HRPYLC:Y =    .8303  HRPYLC:Z =  58.2646  PAY PHI =    .0668  PAY THETA =   -.0267  PAY PSI =   -.0[illegible]
  POSITION LIMITS AND SINGULAR MATRICES FLAGGED DURING PAYLOAD TRIM.  HRPLFL =    1     PSNGMT =    0
```

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PAYLOAD VARIABLES AT TIME --    -1.00

            U           V           W           P           Q           R           X           Y           Z           PHI
PAYLOAD   44.222      -5.6066     -1.3431     .13334E-02  .33348E-02  .49871E-01 -.36324      .83032      58.265      .66770E-01

          THETA         PSI         PAXCGG      PAYCGG      PAZCGG      VPAYRL:X    VPAYRL:Y    VPAYRL:Z    PAYIPC:X    PAYIPO:Y
PAYLOAD -.26671E-01 -.21803E-03  .77350E-02  .68601E-01 -.47942E-02  .24953     -.18071E-01  .18132E-02 -.36324     -4.9986

          PAYIPO:Z      VPGUST:X    VPGUST:Y    VPGUST:Z    OPGUST:X    OPGUST:Y    OPGUST:Z    RVPAYC:X    RVPAYC:Y    RVPAYC:Z
PAYLOAD -941.94       0.          0.          0.          0.          0.          0.          44.222      -5.3806     -1.3431

          RCPAYC:X      RCPAYC:Y    RCPAYC:Z    STATPF:X    STATPF:Y    STATPF:Z    STATPM:X    STATPM:Y    STATPM:Z    DYNAPM:X
PAYLOAD   .13334E-02  .33348E-02  .49871E-01 -558.13      76.183      20.142      0.          0.          4493.0      0.

          DYNAPM:Y      DYNAPM:Z    RPWFOR:X    RPWFOR:Y    RPWFOR:Z    RPWMOM:X    RPWMOM:Y    RPWMOM:Z    PYAFOR:X    PYAFOR:Y
PAYLOAD -.11121       -24.471     -558.13      76.183      20.142      0.          -.11121     4466.1      -558.13      76.183

          PYAFOR:Z      PYAPCM:X    PYAMCM:Y    PYAMCM:Z    PCBLFO:X    PCBLFO:Y    PCBLFO:Z    PCBLMO:X    PCBLMO:Y    PCBLMO:Z
PAYLOAD   20.142      0.          -.11121     4466.1      -199.18     -.22113E-05 -40109.     -.13268E-04 -42.588     -4465.2

          CBLTH         CLRAT       CBLTN       PCBLF :X    PCBLF :Y    PCBLF :Z    PCBLM :X    PCBLM :Y    PCBLM :Z    *
CABLE 1   20.331      -.23137E-12  23506.      -4350.1     -55.816     -20039.     -334.85      .82765E+06 -2232.6                 I
CABLE 2   20.331      -.23137E-12  0.           0.          0.          0.          0.          0.          0.                     I
CABLE 3   18.331       .29485E-12  23495.       4150.9      55.816     -20070.      334.85     -.82770E+06 -2232.6                 I
CABLE 4   18.331       .29485E-12  0.           0.          0.          0.          0.          0.          0.                     I

          *            %
CABLE 1                I            I
CABLE 2                I            I
CABLE 3                I            I
CABLE 4                I            I


  TRIM CASE NUMBER      1

  THIS TRIM CONVERGED SATISFACTORILY

  TRIM ALGORITHM CONTROL
  ITERATIONS =    17      RESTARTS =     0     CONV. CRIT. =    .305E-09
  UCCNTL =    .12574 VCCNTL =   .07045 WCCNTL =  -.17257 PCCNTL =    .30461 QCCNTL =   .00867 RCCNTL =  -.00787
  CONTROL LIMITS FLAGGED DURING TRIM
      ITMER                    ITMER                    TA1SR                    TB1SR          SAGMTX    AILERON   ELEVATOR  RUDDER
  0   0   0   0         0   0   0   0         0    0   0   0         0   0   0   0          0          0          0          0
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SIMULATION TIME -- -1.00

	U	V	W	P	Q	R	X	Y	Z	PHI
HULL	44.000	-5.0000	0.	0.	.49917E-02	.49750E-01	0.	0.	-1000.0	.10000
	THETA	PSI	AXCGG	AYCGG	AZCGG	NDHHT	NDTHT	VHGUST:X	OHGUST:Y	OHGUST:Z
HULL	0.	0.	.77314E-02	.68037E-01	-.68264E-02	9.8694	9.2413	0.	0.	0.
	DUCDAH	DUCDYH	DVCDYH	VORFCT:X	VORFGT:Y	VCRHGT:Z	ODHGST:X	ODHGST:Y	ODHGST:Z	VDHGST:X
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VDHGST:Y	VDHGST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	HGDHAC:X	HGDHAC:Y	HGDHAC:Z	VTGUST:X	VTGUST:Y
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VTGUST:Z	CTGUST:X	CTGUST:Y	CTGUST:Z	CUGDXT	CUGDYT	CVGDYT	VORTGT:X	VORTGT:Y	VORTGT:Z
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	ODTGST:X	ODTGST:Y	ODTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	HGDTAC:X	HGDTAC:Y	HGDTAC:Z	RVHLCV:X
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	42.947
	RVHLCV:Y	RVHLCV:Z	RCHLCV:X	ROHLCV:Y	RCHLCV:Z	GAMMAH	LAMDAH	ZETAH	TRATCH	RVTAIL:X
HULL	-4.8312	-3.1831	0.	.49917E-02	.49750E-01	.10000	-2.1534	2.2534	I	41.835
	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	ROTAIL:Y	RCTAIL:Z	ALT	PALT	BETAT	PBETAT	DELTRO
HULL	-9.3469	-.31811	0.	.49917E-02	.49750E-01	-.11939E-01	-.11939E-01	-.21574	-.21574	.78675E-02
	ALFT	FALFT	FALFTD	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:X	PHIVEL:Y	PHIVEL:Z	RTIVEL:X
HULL	-.23082E-02	-.23082E-02	0.	.96844	-.83121E-01	3.1167	.15949E-02	-.85713E-01	.66464E-01	2.3381
	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RCFLWC	PCFLWC	C-FLOW-C	TIAC	TCLC
HULL	-.18356E-01	.73514	.42518E-01	.61346E-02	.15739E-01	.47456	.12918E-01	-41.712	1.0001	1.0000
	ZAVSCT	RHBFCR:X	RHBFCR:Y	RHBFCR:Z	STATBF:X	STATBF:Y	STATBF:Z	GAMBFC:X	GAMBFO:Y	GAMBFO:Z
HULL	-4.1410	0.	-11457.	-.11419E+06	0.	-11457.	-.11419E+06	0.	0.	0.
	CGHBFC:X	CGHBFC:Y	CGHBFC:Z	RHBFCR:X	RHBFCR:Y	RHBFOR:Z	RHOWFC:X	RHOWFC:Y	RHOWFO:Z	RHOWMO:X
HULL	0.	0.	0.	0.	-11457.	-.11419E+06	-1346.5	-251.51	658.64	0.
	RHOWMO:Y	RHOWMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
HULL	-.20513E+06	.23587E+06	0.	0.	0.	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFC:Y	RHOGFC:Z	RHOGMC:X	RHOGMO:Y	RHOGMO:Z
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	GHCIFC:X	GHCIFC:Y	GHCIFC:Z	GHCIMC:X	GHCIMC:Y	GHCIMC:Z	HCACFC:X	HCACFC:Y	HCACFO:Z	HCACMO:X
HULL	0.	-.22271E-14	.22345E-15	0.	0.	0.	-.16530E-05	-.43760E-05	-.66818E-06	0.
	HCACMC:Y	HCACMC:Z	RHOAF :X	RHOAF :Y	RHCAF :Z	RHOAMC:X	RHOAMC:Y	RHOAMC:Z	HOABF :X	HOABF :Y
HULL	-.41427E-04	-.38577E-05	-1346.5	-251.51	658.64	0.	-.20513E+06	.23587E+06	-1346.5	-11709.
	HOABF :Z	HOAEMC:X	HOAEMC:Y	HOAEMC:Z	HCTAFO:X	HCTAFO:Y	HOTAFC:Z	HCTAMC:X	HOTAMO:Y	HOTAMO:Z
HULL	-.11353E+06	-.19472E+06	-.18274E+06	.23587E+06	-1346.5	-11709.	-.11353E+06	-.19472E+06	-.18274E+06	.23587E+06
	TXFCR	TSYFCR	TCYFCR	TSZFCR	TSLACM	TDLACM	RTOWFC:X	RTOWFC:Y	RTOWFO:Z	RTOWMO:X
HULL	-241.35	1206.7	0.	86.631	1193.9	313.85	-241.35	1206.7	86.631	1587.8
	RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
HULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

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     TGGAFF:Z      TGGAFM:X      TGGAMM:Y      TGGAMM:Z      RTOGFC:X      RTOGFC:Y      RTOGFO:Z      RTOCMO:X      RTOGMO:Y      RTOGMO:Z
HULL 0.            0.            0.            0.            0.            0.            0.            0.            0.            0.

     TCACFC:X      TCACFC:Y      TCACFC:Z      TCACMO:X      TCACMO:Y      TCACMO:Z      RTOAF :X      RTOAF :Y      RTOAF :Z      RTOAMO:X
HULL 0.            -.94268E-06   -.76297E-06   -.22641E-04   -.44652E-07   -.41579E-08   -241.35       1206.7        86.631        1507.8

     RTOAMC:Y      RTOAMC:Z      TCAFCA:X      TOAFCA:Y      TCAFCA:Z      TCAMOM:X      TCAMOM:Y      TOAMOM:Z      HCACMO:X      HCACMO:Y
HULL 0.            0.            -241.35       1206.7        86.631        21576.        9319.8        -73913.       0.            -.41427E-04

     HCACMC:Z      TCTAMC:X      TCTAMC:Y      TOTAMO:Z      HABFOR:Y      HABFOR:Z      HABMOM:X      HABMOM:Y      HABMOM:Z      RHOGFO:X
HULL -.36577E-05   1507.8        -.44652E-07   -.41579E-08   -10502.       -.11345E+06   -.17314E+06   -.17342E+06   .16196E+06    0.

     HEACFC:X      HEACFC:Y      HEACFC:Z      HBACMO:X      HBACFC:Y      HEACMC:Z      HTOTAF:X      HTOTAF:Y      HTOTAF:Z      HTOTAM:X
HULL -.18533E-05   -.53181E-05   -.14311E-05   -.11045E-03   -.80742E-04   .78570E-04    -1587.8       -10502.       -.11345E+06   -.17314E+06

     HTOTAM:Y      HTOTAM:Z      HCBLFC:X      HCBLFC:Y      HCBLFC:Z      HCBLMC:X      HCBLMC:Y      HCBLMC:Z      HGERFO:X      HGERFO:Y
HULL -.17342E+06   .16196E+06    -668.96       1331.9        40078.        -44447.       -35681.       4697.5        0.            0.

     HGERFC:Z      HGERMC:X      HGERMC:Y      HGERMC:Z      MCRLCC:X      MCRLOC:Y      MCRLCC:Z      NOZLCC:X      NOZLCO:Y      NOZLCO:Z
HULL 0.            0.            0.            0.                      I             I             I             I             I             I

       UCCP          VCCP          HCTCCH        PHICCH        THECCH        TRATCH        PHRF:X        PHRF:Y        PHRF:Z        PHRF:PSI
HULL            I             I             I             I             I             I             I             I             I             I

     VHSENS:X      VHSENS:Y      VHSENS:Z      XSPEED        YSPEED        ZSPEED        AXACC         AYACC         AZACC         ROLLRT
HULL            I             I             I             I             I             I             I             I             I             I

      FTURNT        TURNRT       IACELC:X      IACELC:Y      IACELC:Z       UERR          VERR         HDTERR        PHIERR        THEERR
HULL            I             I             I             I             I             I             I             I             I             I

      TRATER        IERR:X        IERR:Y        IERR:Z        PSIERR         UINT          VINT         HDTINT        PHIINT        THEINT
HULL            I             I             I             I             I 0.            0.            0.            0.            0.

      TRTINT        UCCNTL        VCCNTL        HDCNTL        PCCNTL        CCONTL        RCONTL        SDLTAL        SDLTEL        SOLTRD
HULL 0.                         I             I             I             I             I             I             I             I             I

      FDLTAL        FDLTEL        FDLTRD        DELTAL        DELTEL        DELTRD
HULL            I             I             I -.46124E-02   -.86663E-02   .76675E-02
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LFL VARIABLES AT TIME -- -1.03

	U	V	W	PHIO	THETO	PSIO	X	Y	Z	PHI
LFL1	48.228	-3.1147	1.4994	0.	0.	0.	37.895	-85.023	-968.96	0.
LFL2	40.111	-3.1043	-1.5948	0.	0.	0.	38.105	77.162	-952.69	0.
LFL3	48.215	-6.8957	1.8785	0.	0.	0.	-38.105	-85.023	-968.96	0.
LFL4	40.124	-6.8853	-1.2156	0.	0.	0.	-37.895	77.162	-952.69	0.

	THETA	PSI	KCRPT	KOPHT	GERIL :X	GERIL :Y	GERIL :Z	IVSOR :X	IVSOR :Y	IVSOR :Z
LFL1	.35000E-01	0.	17.427	74.004	36.000	-50.631	-956.15			
LFL2	-.35000E-01	0.	17.137	72.687	36.000	40.909	-946.96			
LFL3	.35000E-01	0.	17.427	74.004	-36.000	-50.631	-956.15			
LFL4	-.35000E-01	0.	17.137	72.687	-36.000	40.909	-946.96			

	VSORC :X	VSORC :Y	VSORC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVFUS :X
LFL1				0.	0.	0.	48.228	-3.1147	1.4994	59.450
LFL2				0.	0.	0.	40.111	-3.1043	-1.5948	60.776
LFL3				0.	0.	0.	48.215	-6.8957	1.8785	59.449
LFL4				0.	0.	0.	40.124	-6.8853	-1.2156	61.084

	RVFUS :Y	RVFUS :Z	RVROT :X	RVROT :Y	RVROT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RPIV :X	RPIV :Y
LFL1	-.29572	-38.073	-48.193	-3.1265	1.4994	50.110	.40035	-38.471	-1.8822	-2.8198
LFL2	-.21051	-40.666	37.893	-2.9234	-1.5078	40.414	.48020	-40.040	-3.0317	-2.7246
LFL3	-4.3350	-34.332	46.183	-6.9079	1.8785	49.925	-3.6389	-34.437	-1.7058	-2.5608
LFL4	-4.2871	-36.285	33.861	-6.6625	-1.1784	41.528	-3.5499	-35.675	-2.7122	-2.4374

	RPIV :Z	RFIV :X	RFIV :Y	RFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCSRE	DELTA R	GEFR
LFL1	39.901	-1.8822	-2.8198	39.901	-9.3400	0.	-.32894	4.8416	.14126E-01	1.0000
LFL2	38.469	-3.0317	-2.7246	38.469	-19.814	0.	.66975	4.6455	.12896E-01	1.0000
LFL3	36.246	-1.7058	-2.5608	36.246	-9.5247	0.	-.33544	4.7137	.12965E-01	1.0000
LFL4	34.432	-2.7122	-2.4374	34.432	-19.396	0.	.67517	4.5241	.11889E-01	1.0000

	LCSFE	DELTA P	GEFF	STHER	SA1SR	SB1SR	SOMGR	PTHER	PA1SR	PB1SR
LFL1	3.6555	.98531E-02	1.0000							
LFL2	4.3292	.90740E-02	1.0000							
LFL3	3.8852	.86483E-02	1.0000							
LFL4	4.2911	.90465E-02	1.0000							

	THEGR	A1SR	B1SR	CMEGR	STHEP	SCMGP	PTHEP	THEOP	CMEGP	TR
LFL1	.16565	.76454E-01	.47138E-01	23.250				.11788	125.66	16027.
LFL2	.17662	.76454E-01	.78606E-01	23.250				.13361	125.66	13405.
LFL3	.16651	.76454E-01	.47138E-01	23.250				.11788	125.66	14305.
LFL4	.15528	.76454E-01	.78606E-01	23.250				.13361	125.66	11853.

	CR	ROTFC :X	ROTFC :Y	ROTFC :Z	ROTMO :X	ROTMO :Y	ROTMO :Z	TP	CP	PROPF :X
LFL1	24322.	258.44	-1555.7	-15963.	-9748.7	-3921.2	24234.	253.80	254.94	253.29
LFL2	22935.	750.63	1193.1	-13336.	6555.3	-6858.9	22807.	528.44	379.36	528.52
LFL3	23164.	251.45	1389.4	-14245.	8778.0	-3459.6	20091.	250.59	254.05	250.12
LFL4	18955.	656.87	1064.5	-11769.	5963.8	-6215.2	18889.	503.54	371.47	533.59

	PROPF :Y	PROPF :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFO :X	FUSFO :Y	FUSFO :Z	FUSMO :X	FUSMO :Y
LFL1	-.98505E-01	16.827	-254.76	-263.57	-10.353	-77.756	.17578E-01	936.39	0.	0.
LFL2	-.14258	-6.9270	-379.13	96.978	11.281	-81.263	.89469E-02	1069.4	0.	0.
LFL3	.09563	17.718	-253.65	-240.05	3.5972	-77.753	3.7772	746.16	0.	0.
LFL4	1.0566	-7.3466	-371.24	102.76	27.718	-81.872	3.6086	650.55	0.	0.

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	FUSMC #Z	JETFS	JETFO #X	JETFC #Y	JETFC #Z	JETMO #X	JETMC #Y	JETMC #Z	LPAFO #X	LPAFC #Y
LFL1	0.	100.00	98.545	0.	-16.597	0.	-465.60	0.	532.52	1555.6
LFL2	0.	100.00	98.545	0.	-16.597	0.	-465.60	0.	1296.4	1193.0
LFL3	0.	100.00	98.545	0.	-16.597	0.	-465.60	0.	562.36	1394.1
LFL4	0.	100.00	98.545	0.	-16.597	0.	-465.60	0.	1217.1	1069.2

	LFAFC #Z	LFAFC #X	LFAMO #Y	LFAMC #Z	MCBLF #X	MCBLF #Y	MCBLF #Z	MCBLM #X	MCBLM #Y	MCBLM #Z
LFL1	-15325.	3431.9	-4256.4	24224.	3814.8	731.21	20134.	-24401.	-.59754E+06	26324.
LFL2	-12290.	6176.1	-7237.6	22813.	0.	0.	0.	0.	0.	0.
LFL3	-13456.	8524.2	-4173.2	20395.	-4683.8	600.73	19943.	-20046.	.56166E+06	-21626.
LFL4	-10583.	5552.5	-6578.1	18917.	0.	0.	0.	0.	0.	0.

	CCPRS	GCFCR #X	GCFCR #Y	GCFCR #Z	FKTNG	GFFOR #X	GFFCR #Y	GFFCR #Z	GERFO #X	GERFO #Y
LFL1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LFL2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LFL3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LFL4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFC #Z	MGRMC #X	MGRMC #Y	MGRMC #Z	CF #X	CF #Y	CF #Z	CM #X	CM #Y	CM #Z
LFL1	0.	0.	0.	0.	-36.614	1782.4	-6019.3	15678.	-4775.2	23690.
LFL2	0.	0.	0.	0.	1682.8	1532.6	-3233.8	9968.9	-11941.	23181.
LFL3	0.	0.	0.	0.	-6.4018	1620.9	-4792.4	14082.	-4628.3	19614.
LFL4	0.	0.	0.	0.	1504.0	1408.8	-1010.0	9151.0	-10884.	19249.

	A0R	A1R	B1R	CLAVR	ALAVR	VTR	TWINR	ROTIV #X	ROTIV #Y	ROTIV #Z
LFL1	.25215	.33645E-01	.24652E-01	.62136	.12844	36.990	25.028	-1.1764	-1.7615	24.938
LFL2	.22302	.22107E-01	.16603E-01	.52010	.11196	33.828	24.193	-1.8948	-1.7029	24.055
LFL3	.23077	.28080E-01	.22749E-01	.55506	.11775	34.946	22.735	-1.0686	-1.6005	22.654
LFL4	.23225	.24706E-01	.15707E-01	.45991	.10166	31.810	21.640	-1.6951	-1.5234	21.520

	CSKLR	FCWIP R	CLAVP	ALAVP	VTP	TWINP	PRPIV #X	PRPIV #Y	PRPIV #Z	DSKLP
LFL1	6.5073	1028.1	.73443E-01	.18853E-01	19.898	5.8411	-5.8375	0.	-.20559	1.8830
LFL2	5.4423	969.51	.15292	.35322E-01	28.712	12.392	-12.384	0.	.43105	3.9207
LFL3	5.8051	952.37	.72514E-01	.18645E-01	19.772	5.9566	-5.9529	0.	-.23965	1.8592
LFL4	4.8125	802.96	.14571	.33957E-01	28.027	12.130	-12.122	0.	.42198	3.7368

	FCWIN P	LCLAT	GRAT
LFL1	58.247	3.3200	0.
LFL2	86.073	3.3200	0.
LFL3	58.643	3.3200	0.
LFL4	84.870	3.3200	0.

TAIL AERODYNAMIC REGIMES   ANGLE OF ATTACK - 1   ANGLE OF SLIDESLIP - 1   ROLLING ANGLE OF ATTACK - 1

* *

36 THE LINEARIZATION ANGULAR INCREMENTS ARE LARGE ENOUGH TO CAUSE SOME OF THE CABLES TO GO SLACK. THEY ARE BEING RESET
SUBROUTINE CFINC
NEW FY INC = .32140431E-03
OLD FY INC = .32500000E-03

* *

36 THE LINEARIZATION ANGULAR INCREMENTS ARE LARGE ENOUGH TO CAUSE SOME OF THE CABLES TO GO SLACK. THEY ARE BEING RESET
SUBROUTINE CFINC
NEW FL INC = .26483462E-03
OLD FL INC = .14000000E-02

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APPENDIX C

SAMPLE INPUT DATA FILES

This appendix contains an example of each data file necessary for the program. With the exception of PAYDTA, PYOUTL, MORDTA, and RG1-RG6, these files were used to create the first sample run listed in Appendix C.

File PAYDTA and PYOUTL were used by the second sample run in Appendix C but the other data files were not part of that run. MORDTA and RG1-RG6 were not necessary for either of those runs.

The files which use namelist format have either "1" or "0" in column one. The namelist facility on CDC NOS and SCOPE systems ignores the first column. All names must start in column two.

INTERACTIVE QUESTION RESPONSES (INPUT) DATA FILE

QUESTION	INTERACTIVE RESPONSE (INPUT)
Six degrees of freedom simulation ? T/F	T
How many trim flight condition ?	01
Generation of plotting files ? T/F	F
Do you want English units ? T/F	T
Full header ? T/F	T
Any comments ? (6 lines)	TEST RUN15
	FLIGHT CONTROL SYSTEM COMMANDS
	CLIMBING TURN

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Geometry-Mass (GMDTA) Data File

```
1$NHULL
OHULTH    = 240.0,
OHULDIA   = 103.0,
OHULVOL   = 1.5E+06,
OHULARA   = 19415.0,
OHULID    = 1,
O$END
1$NTAIL
ONUMFIN   = 2,
ORTALOC   = -87.5, 0.0, 0.0,
OTALARA   = 2520.0,
OTSPAN    = 110.0,
OTALID    = 1,
O$END
1$NRATCH
ORATCH1   = 38.0, -81.5, 59.0,
ORATCH2   = 38.0, 81.5, 59.0,
ORATCH3   = -38.0, -81.5, 59.0,
ORATCH4   = -38.0, 81.5, 59.0,
O$END
1$NLPU
ONUMLPU   = 4.
OLPUID    = 1,
O$END
1$NRROTR
ORROTR1   = 0., 0., -7.,
ORROTR2   = 0., 0., -7.,
ORROTR3   = 0., 0., -7.,
ORROTR4   = 0., 0., -7.,
O$END
1$NRGEOM
ONRBLD1   = 4,
ORADRT1   = 28.0,
OCORDR1   = 1.37,
ONRBLD2   = 4,
ORADRT2   = 28.0,
OCORDR2   = 1.37,
ONRBLD3   = 4,
ORADRT3   = 28.0,
OCORDR3   = 1.37,
ONRBLD4   = 4,
ORADRT4   = 28.0,
OCORDR4   = 1.37,
O$END
1$NRPROP
ORPROP1   = 14., 0., 0.,
ORPROP2   = 14., 0., 0.,
ORPROP3   = 14., 0., 0.,
ORPROP4   = 14., 0., 0.,
O$END
1$NPGEOM
ONPBLD1   = 3,
ORADP1    = 6.55,
OCORDP1   = 0.655,
ONPBLD2   = 3,
ORADP2    = 6.55,
OCORDP2   = 0.655,
ONPBLD3   = 3,
ORADP3    = 6.55,
OCORDP3   = 0.655,
```

GMDTA (Continued)

```
ONPBLD4  = 3.
ORADP4   = 6.55.
OCORDP4  = 0.455.
0$END
1$NPRPRIG
0A1SP1   = 0.0.
0A1SP2   = 0.0.
0A1SP3   = 0.0.
0A1SP4   = 0.0.
0B1SP1   = 1.606.
0B1SP2   = 1.535.
0B1SP3   = 1.606.
0B1SP4   = 1.536.
0$END
1$NRLTCH
ORLTCH1  = 0.0, 0.0, 3.0,
ORLTCH2  = 0.0, 0.0, 3.0,
ORLTCH3  = 0.0, 0.0, 3.0,
ORLTCH4  = 0.0, 0.0, 3.0,
0$END
1$NGBANG
OGBANG1  = 0.0, 0.035, 0.0,
OGBANG2  = 0.0, -0.035, 0.0,
OGBANG3  = 0.0, 0.035, 0.0,
OGBANG4  = 0.0, -0.035, 0.0,
0$END
1$NMAST
OMASTLC = 0.0, 0.0, -65.0136,
ORMORPT = 120.0, 0.0, 0.0,
0$END
1$NRATHG
ORATHG1 = 36.0, -46.0, 62.0,
ORATHG2 = 36.0, 46.0, 62.0,
ORATHG3 = -36.0, -46.0, 62.0,
ORATHG4 = -36.0, 46.0, 62.0,
0$END
1$NLANDGL
OLGRLN1 = 3.32,
OLGRLN2 = 3.32,
OLGRLN3 = 3.32,
OLGRLN4 = 3.32,
0$END
1$NGEARK
OGEARK1 = 7770.0,
OGEARK2 = 7770.0,
OGEARK3 = 7770.0,
OGEARK4 = 7770.0,
0$END
1$NGFRAMK
OGFRMK1 = 77700.0,
OGFRMK2 = 77700.0,
OGFRMK3 = 77700.0,
OGFRMK4 = 77700.0,
0$END
1$NGEARC
OGEARC1 = 1554.0,
OGEARC2 = 1554.0,
OGEARC3 = 1554.0,
OGEARC4 = 1554.0,
0$END
1$NMUKG
OMUKG1   = 0.08,
```

```
OMUKG2  = 0.08,
OMUKG3  = 0.08,
OMUKG4  = 0.08,
0$END
1$NRHULCG
ORHULCG  = 0.0, 0.0, 16.63,
0$END
1$NMASHUL
OMASHUL  = 2761.9,
OIHULXX  = 6.35E+06,
OIHULYY  = 1.3478E+07,
OIHULZZ  = 1.3292E+07,
OIHULXZ  = 0.0,
0$END
1$NRCGLPU
ORCGLP1  = 0.0,0.0, 0.0,
ORCGLP2  = 0.0,0.0, 0.0,
ORCGLP3  = 0.0,0.0, 0.0,
ORCGLP4  = 0.0,0.0, 0.0,
0$END
1$NMASLP1
OMASLP1  = 279.5,
OILP1XX  = 8570.0,
OILP1YY  = 4.006E+04,
OILP1ZZ  = 3.94E+04,
OILP1XZ  = 0.0,
0$END
1$NMASLP2
OMASLP2  = 279.5,
OILP2XX  = 8570.0,
OILP2YY  = 4.006E+04,
OILP2ZZ  = 3.94E+04,
OILP2XZ  = 0.0,
0$END
1$NMASLP3
OMASLP3  = 279.5,
OILP3XX  = 8570.0,
OILP3YY  = 4.006E+04,
OILP3ZZ  = 3.94E+04,
OILP3XZ  = 0.0,
0$END
1$NMASLP4
OMASLP4  = 279.5,
OILP4XX  = 8570.0,
OILP4YY  = 4.006E+04,
OILP4ZZ  = 3.94E+04,
OILP4XZ  = 0.0,
0$END
1$NLOCKNR
OLOCNR1  = 15.0,
OLOCNR2  = 15.0,
OLOCNR3  = 15.0,
OLOCNR4  = 15.0,
0$END
1$NJETHST
OJETHS1 = 100.0,
OREXLC1 = -10.0, 0.0, -3.0,
OJETHS2 = 100.0,
OREXLC2 = -10.0, 0.0, -3.0,
OJETHS3 = 100.0,
OREXLC3 = -10.0, 0.0, -3.0,
OJETHS4 = 100.0,
```

```
OREXLC4 = -10.0, 0.0, -3.0,
0$END
1$NJETHSA
0A1SE1  = 0.0,
0B1SE1  = 1.4,
0A1SE2  = 0.0,
0B1SE2  = 1.4,
0A1SE3  = 0.0,
0B1SE3  = 1.4,
0A1SE4  = 0.0,
0B1SE4  = 1.4,
0$END
```

Aerodynamic Variables (ARODTA) Data File

```
1$NRACLP
ORACLP1  = 0.0, 0.0, 0.0,
ORACLP2  = 0.0, 0.0, 0.0,
ORACLP3  = 0.0, 0.0, 0.0,
ORACLP4  = 0.0, 0.0, 0.0,
0$END
1$NRAROCN
OLCSR1   = 5.73,
ODLTR1A  = 0.0087,
ODLTR1B  = -0.0216,
ODLTR1C  = 0.4,
OLCSR2   = 5.73,
ODLTR2A  = 0.0087,
ODLTR2B  = -0.0216,
ODLTR2C  = 0.4,
OLCSR3   = 5.73,
ODLTR3A  = 0.0087,
ODLTR3B  = -0.0216,
ODLTR3C  = 0.4,
OLCSR4   = 5.73,
ODLTR4A  = 0.0087,
ODLTR4B  = -0.0216,
ODLTR4C  = 0.4,
0$END
1$NPAROCN
OLCSP1   = 5.73,
ODLTP1A  = 0.0087,
ODLTP1B  = -0.0216,
ODLTP1C  = 0.4,
OLCSP2   = 5.73,
ODLTP2A  = 0.0087,
ODLTP2B  = -0.0216,
ODLTP2C  = 0.4,
OLCSP3   = 5.73,
ODLTP3A  = 0.0087,
ODLTP3B  = -0.0216,
ODLTP3C  = 0.4,
OLCSP4   = 5.73,
ODLTP4A  = 0.0087,
ODLTP4B  = -0.0216,
ODLTP4C  = 0.4,
0$END
1$NFAROCN
OXUUAF1  = -0.022,
OYVVAF1  = -0.201,
OZWWAF1  = -0.646,
OXUUAF2  = -0.022,
OYVVAF2  = -0.201,
OZWWAF2  = -0.646,
OXUUAF3  = -0.022,
OYVVAF3  = -0.201,
OZWWAF3  = -0.646,
OXUUAF4  = -0.022,
OYVVAF4  = -0.201,
OZWWAF4  = -0.646,
0$END
1$NHDTDRV
OXUDOTH  = -663.38,
OYVDOTH  = -2600.02,
OZWDOTH  = -2600.02,
```

```
OLPDOTH  = 0.0,
OMQDOTH  = -3.61E06,
ONRDOTH  = -3.61E06,
O$END
1$NTDTDRV
OYVDOTT  = -489.4,
OZWDOTT  = -605.,
OLVDOTT  = -9787.2,
OLPDOTT  = -3.866E05,
OMQDOTT  = -3891.0,
ONRDOTT  = -3891.0,
O$END
1$NHDRVS
OXUUABH  = -0.4136,
OXQWH    = -2600.02,
OXRVH    = 2600.02,
OYVVABH  = -28.042,
OYRRABH  = 0.0,
OYPWH    = 2600.02,
OYRUH    = -663.38,
OYRVABH  = 0.0,
OZWWABH  = -28.042,
OZQQABH  = 0.0,
OZPVH    = -2600.02,
OZQUH    = 663.38,
OZQWABH  = 0.0,
OLPPABH  = -1.3141E04,
OLPUABH  = 0.0,
OLVWH    = 0.0,
OLQBRH   = -3.61E6,
OLRBQH   = 3.61E6,
OMQQABH  = -8.22E06,
OMUWH    = 1452.48,
OMRBPH   = 0.0,
OMPBRH   = 3.61E06,
OMQWABH  = -2.017E05,
ONRRABH  = -8.22E06,
ONUVH    = -1452.48,
ONPBQH   = -3.61E6,
ONQBPH   = 0.0,
ONRVABH  = -2.017E05,
O$END
1$NTDRVS
OXUUABT  = -0.1379,
OYVVABT  = -2.4458,
OYPPABT  = -3233.1,
OYAPVST  = -1.467,
OYBVSQT  = -2.67,
OYBSVST  = -1.7343,
OYAPSVS  = -2.939,
OZWWABT  = -2.4458,
OZAVSQT  = -4.141,
OZASVST  = -0.400,
OLVVABT  = -4.89,
OLPPABT  = -1.707E05,
OLAPVST  = -77.4,
OLBVSQT  = -3.03,
OLBAVST  = -1.52,
OLAPSVS  = -155.1,
O$END
1$NTPARAM
OLAMTXQ  = 0.7,
```

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ARODTA (Concluded)

```
OLAMTXR  = 0.7,
OLAMTZQ  = 1.0,
OAL1T    = 0.5236,
OAL2T    = 0.6981,
OBETA1T  = 0.5236,
OBETA2T  = 0.6981,
OALP1T   = 0.5236,
OALP2T   = 0.6981,
O$END
1$NTAUTS
OTAUA   = 0.5,
OTAUE   = 0.5,
OTAUR   = 0.5,
O$END
```

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Propeller-Rotor Limits (PLMDTA) Data File

```
1$NRTRMSD
OOMEGR1  = 23.25,
OOMEGR2  = 23.25,
OOMEGR3  = 23.25,
OOMEGR4  = 23.25,
O$END
1$NPTRMSD
OOMEGP1  = 125.66,
OOMEGP2  = 125.66,
OOMEGP3  = 125.66,
OOMEGP4  = 125.66,
O$END
1$NMECLIM
OTHERMX  = 0.5,
OA1SRMX  = 0.5,
OB1SRMX  = 0.5,
OTHEPMX  = 0.5,
ODLALMX = 1.0,
ODLELMX = 1.0,
ODLRDMX = 1.0,
O$END
```

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Interference Constants (IFCDTA) Data File

```
1$NSHDRCN
OBWK1R1 =   1.745,
OBWK2R1 =   2.9671,
OMXBDR1 =   0.85,
OLWK1R1 =   1.31,
OLWK2R1 =   2.8798,
OMXLDR1 =   0.85,
OBWK1R2 =   3.3161,
OBWK2R2 =   4.5379,
OMXBDR2 =   0.85,
OLWK1R2 =   3.4034,
OLWK2R2 =   4.9742,
OMXLDR2 =   0.85,
OBWK1R3 =   0.1745,
OBWK2R3 =   1.3963,
OMXBDR3 =   0.85,
OLWK1R3 =   1.31,
OLWK2R3 =   2.8798,
OMXLDR3 =   0.85,
OBWK1R4 =   4.8869,
OBWK2R4 =   6.1087,
OMXBDR4 =   0.85,
OLWK1R4 =   3.4034,
OLWK2R4 =   4.9742,
OMXLDR4 =   0.85,
O$END
1$NKHR
OKHRA1  =   12.0,
OKHRB1  =   0.0333,
OKHRA2  =   12.0,
OKHRB2  =   0.0333,
OKHRA3  =   12.0,
OKHRB3  =   0.0333,
OKHRA4  =   12.0,
OKHRB4  =   0.0333,
O$END
1$NKGR
OKGR1   =   -2.0,
OKGR2   =   -2.0,
OKGR3   =   -2.0,
OKGR4   =   -2.0,
O$END
1$NSHDPCN
OBWK1P1 =   1.745,
OBWK2P1 =   2.9671,
OMXBDP1 =   0.85,
OLWK1P1 =   1.31,
OLWK2P1 =   2.8798,
OMXLDP1 =   0.85,
OBWK1P2 =   3.3161,
OBWK2P2 =   4.5379,
OMXBDP2 =   0.85,
OLWK1P2 =   3.4034,
OLWK2P2 =   4.9742,
OMXLDP2 =   0.85,
OBWK1P3 =   0.1745,
OBWK2P3 =   1.3963,
OMXBDP3 =   0.85,
OLWK1P3 =   1.31,
OLWK2P3 =   2.8798,
```

IFCDTA (Continued)

```
OMXLDP3 =   0.85,
OBWK1P4 =   4.8869,
OBWK2P4 =   6.1087,
OMXBDP4 =   0.85,
OLWK1P4 =   3.4034,
OLWK2P4 =   4.9742,
OMXLDP4 =   0.85,
O$END
1$NKHP
OKHPA1  =   12.0,
OKHPB1  =   0.0333,
OKHPA2  =   12.0,
OKHPB2  =   0.0333,
OKHPA3  =   12.0,
OKHPB3  =   0.0333,
OKHPA4  =   12.0,
OKHPB4  =   0.0333,
O$END
1$NKRP
OKRP1   =   1.6,
OKRP2   =   1.6,
OKRP3   =   1.6,
OKRP4   =   1.6,
O$END
1$NKGP
OKGP1   =   -2.0,
OKGP2   =   -2.0,
OKGP3   =   -2.0,
OKGP4   =   -2.0,
O$END
1$NSHDFCN
OBWK1F1 =   1.745,
OBWK2F1 =   2.9671,
OMXBDF1 =   0.85,
OLWK1F1 =   1.31,
OLWK2F1 =   2.8798,
OMXLDF1 =   0.85,
OBWK1F2 =   3.3161,
OBWK2F2 =   4.5379,
OMXBDF2 =   0.85,
OLWK1F2 =   3.4034,
OLWK2F2 =   4.9742,
OMXLDF2 =   0.85,
OBWK1F3 =   0.1745,
OBWK2F3 =   1.3963,
OMXBDF3 =   0.85,
OLWK1F3 =   1.31,
OLWK2F3 =   2.8798,
OMXLDF3 =   0.85,
OBWK1F4 =   4.8869,
OBWK2F4 =   6.1087,
OMXBDF4 =   0.85,
OLWK1F4 =   3.4034,
OLWK2F4 =   4.9742,
OMXLDF4 =   0.85,
O$END
1$NKRF
OKRF1   =   1.6,
OKRF2   =   1.6,
OKRF3   =   1.6,
OKRF4   =   1.6,
O$END
```

IFCDTA (Continued)

```
0$NKPF
OKPF1    =    1.6,
OKPF2    =    1.6,
OKPF3    =    1.6,
OKPF4    =    1.6,
0$END
1$NKGHCN
OKGHA    =    -4.10,
OKGHB    =    -4.10,
0$END
1$NKRH
OKRHA1   =    0.0,
OKRHB1   =    1.0E-4,
OKRHC1   =    0.2,
OKRHD1   =    -0.043,
OKRHE1   =    0.0333,
OKRHA2   =    0.0,
OKRHB2   =    1.0E-4,
OKRHC2   =    0.2,
OKRHD2   =    0.043,
OKRHE2   =    0.0333,
OKRHA3   =    0.0,
OKRHB3   =    1.0E-4,
OKRHC3   =    -0.2,
OKRHD3   =    -0.043,
OKRHE3   =    0.0333,
OKRHA4   =    0.0,
OKRHB4   =    1.0E-4,
OKRHC4   =    -0.2,
OKRHD4   =    0.043,
OKRHE4   =    0.0333,
0$END
1$NKPH
OKPHA1   =    0.0,
OKPHB1   =    5.39E-6,
OKPHC1   =    0.0109,
OKPHD1   =    -0.00236,
OKPHE1   =    0.00183,
OKPHA2   =    0.0,
OKPHB2   =    5.39E-6,
OKPHC2   =    0.0109,
OKPHD2   =    -0.00236,
OKPHE2   =    0.00183,
OKPHA3   =    0.0,
OKPHB3   =    5.39E-6,
OKPHC3   =    -0.0109,
OKPHD3   =    -0.00236,
OKPHE3   =    0.00183,
OKPHA4   =    0.0,
OKPHB4   =    5.39E-6,
OKPHC4   =    -0.0109,
OKPHD4   =    -0.00236,
OKPHE4   =    0.00183,
0$END
1$NKRT
OKRTA1   =    1.4E-2,
OKRTB1   =    -5.7E-3,
OKRTC1   =    5.1E-3,
OKRTA2   =    1.4E-2,
OKRTB2   =    5.7E-3,
OKRTC2   =    5.1E-3,
OKRTA3   =    3.04E-2,
```

IFCDTA (Concluded)

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```
OKRTB3  =   -1.24E-2,
OKRTC3  =   1.1E-2,
OKRTA4  =   3.04E-2,
OKRTB4  =   1.24E-2,
OKRTC4  =   1.1E-2,
O$END
1$NKPT
OKPTA1  =   7.6E-4,
OKPTB1  =   -3.07E-4,
OKPTC1  =   2.75E-4,
OKPTA2  =   7.6E-4,
OKPTB2  =   3.07E-4,
OKPTC2  =   2.75E-4,
OKPTA3  =   1.64E-3,
OKPTB3  =   -6.68E-4,
OKPTC3  =   5.93E-4,
OKPTA4  =   1.64E-3,
OKPTB4  =   6.68E-4,
OKPTC4  =   5.93E-4,
O$END
1$NKGT
OKGTA    = -51.77,
OKGTB    = 16.0,
O$END
```

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Trim Conditions (TRMDTA) Data File

```
SUBROUTINE INSTAT
1$NINSTAT
OVHUL     = 14.0, 0.0, 0.0,
OHULPOS   = 0.0 ,0.0, -1000.0,
OHULELR   = 0.0, 0.0, 0.0,
OHULEUL   = 0.0, 0.0, 0.0,
0$END
SUBROUTINE INATMOS
1$NATMOS
OAIRDEN   = 0.002378,
ODENRAT   = 1.0,
OGRAV     = 32.174,
OVWIND    = -30.0, 0.0, 0.0,
0$END
1$NSTABDV
ODERVFL   = T,
OAMATFL   = T,
OBMATFL   = T,
OBPMTFL   = T,
OCMATFL   = T,
OCFMTFL   = T,
0$END
```

Time History Parameter (HISDTA) Data File


```
1$NFCSLIM
OUILM    = 0.35,
OULLM    = 0.4,
OVILM    = 0.4,
OVLLM    = 0.45,
OHDTILM  = 0.35,
OHDTLLM  = 0.4,
OPHIILM  = 0.35,
OPHILLM  = 0.4,
OTHEILM  = 0.35,
OTHELLM  = 0.4,
ORILM    = 0.35,
ORLLM    = 0.4,
O$END
1$NCLOSLP
OULPFLG  = T,
OVLPFLG  = T,
OHDTLPF  = T,
OPLPFLG  = T,
OQLPFLG  = T,
OTRTLPF  = T,
O$END
1$NFDBKFL
OUFDBK   = T,
OVFDBK   = T,
ORFDBK   = T,
O$END
1$NFCSGNS
OKUSPED  = 0.129,
OKIU     = 0.01,
OTAXAC   = 0.0,
OKVSPED  = 0.30,
OKIV     = 0.01,
OTAYAC   = 0.,
OKHDOT   = 0.0222,
OKIHDOT  = 0.053,
OTAZAC   = 0.,
OKPHI    = 0.218,
OKIPHI   = 0.14,
OTROLRT  = 1.335,
OKTHETA  = 0.476,
OKITHET  = 0.1,
OTPTHRT  = 2.48,
OKTRAT   = 7.08,
OKIR     = 0.01,
O$END
1$NPOSHCS
OPOSHT1 = 2000.0,
OPOSHT2 = 2200.0,
OKX      = 1.0,
OKY      = 0.2,
OKH      = 1.0,
OKPSI    = 1.0,
O$END
1$NRSENSR
ORACELC  = 0.0, 0.0, 16.63,
ORVSNLC  = 0.0, 0.0, 0.0,
O$END
1$NRSWASH
OPTCOM1  = 2000.0,
```

```
ORTCOM2  = 2200.0,
ODTHER1  = 0.1,
ODA1SR1  = 0.0,
ODB1SR1  = 0.0,
ODTHER2  = 0.1,
ODA1SR2  = 0.0,
ODB1SR2  = 0.0,
ODTHER3  = 0.1,
ODA1SR3  = 0.0,
ODB1SR3  = 0.0,
ODTHER4  = 0.1,
ODA1SR4  = 0.0,
ODB1SR4  = 0.0,
0$END
1$NPFETHR
OPTCOM1  = 2000.0,
OPTCOM2  = 2200.0,
ODTHEP1  = 0.1,
ODTHEP2  = 0.1,
ODTHEP3  = 0.1,
ODTHEP4  = 0.1,
0$END
1$NLNKCOM
OLKTCM1  = 2000.0,
OLKTCM2  = 2200.0,
ODUDCNL  = 0.0,
ODVDCNL  = 0.0,
ODWDCNL  = 0.0,
ODPCNTL  = 0.0,
ODQCNTL  = 0.0,
ODRCNTL  = 0.0,
0$END
1$NTDEFLC
OTTCOM1 = 2000.0,
OTTCOM2 = 2200.0,
ODDLTAL = 0.0,
ODDLTEL = 0.0,
ODDLTRD = 0.0,
0$END
1$NCOMAND
 UCMD   = 1.0, 30.0,
 VCMD   = 1.0, 0.0,
          2.0, 6.0,
 HDTCMD = 1.0, 5.0,
 PHICMD = 1.0, 0.0,
          2.0, 0.2,
 THECMD = 1.0, 0.1,
 TRTCMD = 1.0, 0.0,
          2.0, 0.3,
0$END
SUBROUTINE INGUST
1$NHGCOM
OHT1GST  = 2000.0,
OHT2GST  = 2200.0,
OUHGMAX  = 0.0,
OVHGMAX  = 0.0,
OWHGMAX  = 0.0,
OPHGMAX  = 0.0,
OQHGMAX  = 0.0,
ORHGMAX  = 0.0,
ODUXHMX  = 0.0,
ODUYHMX  = 0.0,
```

HISDTA (Concluded)

```
ODVYHMX  = 0.0,
0$END
1$NTGCOM
OTT1GST  = 2000.0,
OTT2GST  = 2200.0,
OUTGMAX  = 0.0,
OVTGMAX  = 0.0,
OWTGMAX  = 0.0,
OPTGMAX  = 0.0,
OQTGMAX  = 0.0,
ORTGMAX  = 0.0,
ODUXTMX  = 0.0,
ODUYTMX  = 0.0,
ODVYTMX  = 0.0,
0$END
1$NLPGCOM
OL1T1GT  = 2000.,
OL1T2GT  = 2200.,
OUL1GMX  = 0.0,
OVL1GMX  = 0.0,
OWL1GMX  = 0.0,
OL2T1GT  = 2000.0,
OL2T2GT  = 2200.0,
OUL2GMX  = 0.0,
OVL2GMX  = 0.0,
OWL2GMX  = 0.0,
OL3T1GT  = 2000.,
OL3T2GT  = 2200.,
OUL3GMX  = 0.0,
OVL3GMX  = 0.0,
OWL3GMX  = 0.0,
OL4T1GT  = 2000.0,
OL4T2GT  = 2200.0,
OUL4GMX  = 0.0,
OVL4GMX  = 0.0,
OWL4GMX  = 0.0,
0$END
1$NGSTRNG
OGSTFLG = F,
OGSTSCF = 1.0,
0$END
1$NRFSRCLC
ORFSRCX = 100.0,
ORASRCX = -100.0,
ORSORCY = 100.0,
0$END
SUBROUTINE INSTEP
1$NINSTEP
OTIMSTP  = 0.5,
OMINSTP  = 0.05,
OTPRINT  = 1.0,
OTSIM    = 5.0,
0$END
```

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Payload (PAYDTA) Data File

```
1$NPAYLOD
OPAYLTH = 80.0,
OPAYDTH = 12.0,
OPAYVOL = 11520.0,
OPAYARA = 144.0,
OPAYID  = 1,
O$END
1$NRPTCH
ORPTCH1 = 40.0, 0.0, -6.0,
ORPTCH2 = 40.0, 0.0, -6.0,
ORPTCH3 = -40.0, 0.0, -6.0,
ORPTCH4 = -40.0, 0.0, -6.0,
O$END
1$NRATHP
ORATHP1 =  36.0, 0.0, 50.0,
ORATHP2 =  36.0,  0.0, 50.0,
ORATHP3 = -36.0, 0.0, 50.0,
ORATHP4 = -36.0,  0.0, 50.0,
O$END
1$NUSCLTH
OUSLTH1 = 20.0,
OUSLTH2 = 20.0,
OUSLTH3 = 18.0,
OUSLTH4 = 18.0,
O$END
1$NRPAYCG
ORPAYCG = 0.0, 0.0, 0.0,
O$END
1$NMASPAY
OMASPAY = 1243.24,
OIPAYXX = 29837.8,
OIPAYYY = 677980.2,
OIPAYZZ = 677980.2,
OIPAYXZ = 0.0,
O$END
1$NCABLK
OCABLK1 = 62000.0,
OCABLK2 = 0.0,
OCABLK3 = 62000.0,
OCABLK4 = 0.0,
O$END
1$NCABLC
OCABLC1 = 2486.0,
OCABLC2 = 0.0,
OCABLC3 = 2486.
OCABLC4 = 0.0,
O$END
1$NPDRVS
OXUUABP = -0.2854,
OYVVABP = -2.854,
OZWWABP = -2.854,
ONUVP   = -20.0,
OLPPABP = 0.0,
OMQQABP = -1.0E04,
ONRRABP = -1.0E04,
O$END
1$NINDPST
ODVPYLD = 0.1, 0.2, 0.3,
ODHRPYL = 0.4, 0.5, 0.6,
ODPYELR = 0.01, 0.02, 0.03,
```

PAYDTA (Concluded)

```
ODPYEUL = 0.04, 0.05, 0.06,
O$END
1$NPYGCOM
OPYT1GT = 40.0,
OPYT2GT = 50.0,
OUPYGMX = 0.0,
OVPYGMX = 0.0,
OWPYGMX = 0.0,
OPPYGMX = 0.0,
OQPYGMX = 0.5,
ORPYGMX = 0.0,
O$END
1$NPGSTRN
OPGSTFL = T,
OPGVSCF = 0.1,
OPGOSCF = 0.1,
O$END
```

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Mooring (MORDTA) Data File

```
1$NCALMHD
OPSIO   = 0.0,
0$END
1$NTSDEFL
ODELTAL = 0.0,
ODELTEL = 0.0,
ODELTRD = 0.0,
0$END
1$NINDMST
ODHLEUL = 0.0, 0.0, 0.0,
0$END
```

Gust String (RG1 - RG6) Data File

0.0,	2.1,	-1.2,	0.0
0.5,	2.5,	0.0,	0.5
1.0,	2.4,	1.1.	1.0
1.5,	1.9,	1.5,	1.2
2.0,	0.3,	0.9,	0.4
2.5,	0.0	0.0,	0.0

Vehicle Output Variables Code Numbers (OUTLST) Data File

```
  1
  2
  3
  4
  5
  6
  7
  8
  9
 10
 11
 12
 13
 14
 15
240
241
115
116
117
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131
132
142
143
144
133
134
135
136
137
138
299
300
301
```

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OUTLST (Continued)

308
309
310
169
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239
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OUTLST (Continued)

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OF POOR QUALITY

OUTLST (Continued)

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OUTLST (Continued)

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OUTLST (Continued)

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268
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270
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129
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131
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123
124
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97
100
121

OUTLST (Continued)

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145
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140
141
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OUTLST (Concluded)

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137
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103
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109
110
 34
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128
146
000
```

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Payload Output Variables Code Numbers (PYOUTL) Data File


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25
```

PYOUTL (Concluded)

26
27
000
7
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APPENDIX D

OUTPUT VARIABLES

This table contains all the output listing variable names, their descriptions, and the corresponding engineering symbols used in the Technical Manual. These are tables listing variables pertaining to the hull assembly, the LPUs, the payload, and the payload suspension cables.

This appendix gives a listing of Output Code Numbers and the associated listing labels, description, and engineering symbols. Each set of tables is followed by an alphabetized listing with which the user can look up the appropriate code number then the code number can be used to identify the output variable with the description and engineering symbol given in the chart.

TABLE D-1. HULL ASSEMBLY VARIABLES

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
1 2 3	U V W		Velocity vector of the hull c.g.	$\underline{V}_h$
4 5 6	P Q R		Hull angular velocity vector	$\underline{\omega}_h$
7 8 9	X Y Z		Hull c.g. reference axes inertial position	$\underline{R}_I^h$
10 11 12	PHI THETA PSI		Euler angles of hull c.g.	$\underline{\eta}_I^h$
13 14 15	AXCGG AYCGG AZCGG		Hull c.g. inertial acceleration x Hull c.g. inertial acceleration y Hull c.g. inertial acceleration z	$1/g[\overset{o}{\underline{V}}_h + (\underline{\omega}_h \times \underline{V}_h)]$
16 17 18	RHBFOR:	X Y Z	Total hull buoyancy force vector at the center of volume including aerostatic, gust acceleration, and gust gradient effects	$\underline{F}B_h^{hcv}$
19 20 21	RHOAF:	X Y Z	Hull only aerodynamic force vector at the center of volume including all right hand side terms except buoyancy effects	$\underline{F}SFGD_h^{hcv}$
22 23 24	RHOAMO:	X Y Z	Hull only aerodynamic moment vector at the CV including all right hand side terms except buoyancy effects	$\underline{T}SFGD_h^{hcv}$
25 26 27	RTOAF:	X Y Z	Tail only aerodynamic force vector at the tail reference center, right hand side terms	$\underline{F}SFGD_h^{ht}$
28 29 30	RTOAMO:	X Y Z	Tail only aerodynamic moment vector at the tail reference center, right hand side terms	$\underline{T}SFGD_h^{ht}$
31 32 33	HOABF:	X Y Z	Hull only aero-buoyancy force vector at the hull c.g., all right hand side terms including buoyancy	$\underline{F}HAB_h$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
34	HOABMO:	X	Hull only aero-buoyancy moment vector	
35		Y	at the hull c.g., all right hand side	$\underline{T}_{HAB_h}$
36		Z	terms including buoyancy	
37	TOAMOM:	X	Tail only aerodynamic moment vector	
38		Y	about hull c.g., all right hand side	$\underline{T}_{TA_h}$
39		Z	terms	
40	TOAFOR:	X	Tail only aerodynamic force vector	
41		Y	at hull c.g., all right hand side	$\underline{F}_{TA_h}$
42		Z	terms	
43	HABFOR:	X	Hull aero-buoyancy force vector at	
44		Y	hull c.g., hull and tail right hand	$\underline{F}_{A_h} - \underline{F}_{HAD_h}$
45		Z	side terms	
46	HABMOM:	X	Hull aero-buoyancy moment vector at	
47		Y	hull c.g., hull and tail right hand	$\underline{T}_{A_h} - \underline{T}_{HAD_h}$
48		Z	side terms	
49	RHOGFO:	X	Hull only gust derivative force	
50		Y	vector at hull center of volume	$\underline{F}_{GD_h}^{hcv}$
51		Z		
52	RHOGMO:	X	Hull only gust derivative moment	
53		Y	vector at hull center of volume	$\underline{T}_{GD_h}^{hcv}$
54		Z		
55	RHOWFO:	X	Hull only steady flow forces acting	
56		Y	at hull center of volume	$\underline{F}_{SF_h}^{hcv}$
57		Z		
58	RHOWMO:	X	Hull only steady flow moments about	
59		Y	hull center of volume	$\underline{T}_{SF_h}^{hcv}$
60		Z		
61	RTOGFO:	X	Tail only gust derivative force	
62		Y	vector at tail centroid	$\underline{F}_{GD_h}^{ht}$
63		Z		
64	RTOGMO:	X	Tail only gust derivative moment	
65		Y	vector about tail centroid	$\underline{T}_{GD_h}^{ht}$
66		Z		
67	TXFOR		Tail X-Force	X_t
68	TSYFOR		Tail static Y-Force	Y_{t_s}
69	TDYFOR		Tail dynamic Y-Force	Y_{t_d}

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
70	TSZFOR		Tail static Z-Force	Z_t
71	TSLMOM		Tail static rolling moment	L_{t_s}
72	TDLMOM		Tail dynamic rolling moment	L_{t_d}
73	ALT		Tail angle of attack	α
74	BETAT		Tail angle of slideslip	β
75	ALPT		Tail rolling angle of attack	α_p
76	PALT		Supplementary tail angle of attack	α'
77	PBETAT		Supplementary tail angle of slideslip	β'
78	PALPT		Supplementary tail rolling angle of attack	α_p'
79 80 81	HBACFO:	X Y Z	Hull body axis acceleration force vector	$\underline{F}_{HAD_h}$
82 83 84	HBACMO:	X Y Z	Hull body axis acceleration moment vector	$\underline{T}_{HAD_h}$
85 86 87	HTOTAF:	X Y Z	Hull total aerodynamic force vector	$\underline{F}_{A_h}$
88 89 90	HTOTAM:	X Y Z	Hull total aerodynamic moment vector	$\underline{T}_{A_h}$
91 92 93	TCACFO:	X Y Z	Tail centroid acceleration force vector	$\underline{F}_{AD_h}^{ht}$
94 95 96	TCACMO:	X Y Z	Tail centroid acceleration force vector	$\underline{T}_{AD_h}^{ht}$
97 98 99	TOTAFO:	X Y Z	Tail only total aerodynamic force	$\underline{F}_{A_h}^{ht}$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
100	TOTAMO:	X	Tail only total aerodynamic moment vector	$\underline{T}A_h^{ht}$
101		Y		
102		Z		
103	HCACFO:	X	Hull only center of volume axis acceleration force vector	$\underline{F}AD_h^{hcv}$
104		Y		
105		Z		
106	HCACMO:	X	Hull only center of volume axis acceleration moment vector	$\underline{T}AD_h^{hcv}$
107		Y		
108		Z		
109	HOTAFO:	X	Hull only total aerodynamic force vector	$\underline{F}A_h^{hcv}$
110		Y		
111		Z		
112	HOTAMO:	X	Hull only total aerodynamic moment vector	$\underline{T}A_h^{hcv}$
113		Y		
114		Z		
115	VHGUST:	X	Hull CV linear gust velocity vector	$\underline{V}_h^{am\ cv}$
116		Y		
117		Z		
118	OHGUST:	X	Hull CV angular gust velocity vector	$\underline{\omega}_h^{am\ cv}$
119		Y		
120		Z		
121	VDRHGT:	X	Hull CV gust linear acceleration measured in hull c.g. reference axis	$\dot{\underline{V}}_h^{am\ cv}$
122		Y		
123		Z		
124	ODHGST:	X	Hull CV angular gust acceleration measured in hull c.g. axis	$\dot{\underline{\omega}}_h^{am\ cv}$
125		Y		
126		Z		
127	VTGUST:	X	Tail centroid linear gusts velocity vector	$\underline{V}_h^{am\ t}$
128		Y		
129		Z		
130	OTGUST:	X	Tail centroid angular gust velocity vector	$\underline{\omega}_h^{am\ t}$
131		Y		
132		Z		
133	VDRTGT:	X	Tail centroid linear acceleration measured in hull c.g. reference axis	$\dot{\underline{V}}_h^{am\ t}$
134		Y		
135		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
136	ODTGST:	X	Tail CV angular gust acceleration measured in hull c.g. axis	$\overset{o}{\underline{\omega}}{}_h^{am\ t}$
137		Y		
138		Z		
139	DUGDXH		Derivative of hull u-gust with hull x-location	$\partial u_h^{am\ cv}/\partial x$
140	DUGDYH		Derivative of hull u-gust with hull y-location	$\partial u_h^{am\ cv}/\partial y$
141	DVGDYH		Derivative of hull v-gust with hull y-location	$\partial v_h^{am\ cv}/\partial y$
142	DUGDXT		Derivative of tail u-gust with tail x-location	$\partial u_h^{am\ t}/\partial x$
143	DUGDYT		Derivative of tail u-gust with tail y-location	$\partial u_h^{am\ t}/\partial y$
144	DVGDYT		Derivative of tail v-gust with tail y-location	$\partial v_h^{am\ t}/\partial y$
145	GAHBFO:	X	Hull buoyancy force vector from gust accelerations	$\underline{F}_{GAB}{}_h^{hcv}$
146		Y		
147		Z		
148	GGHBFO:	X	Hull buoyancy force vector from gust gradients	$\underline{F}_{GGB}{}_h^{hcv}$
149		Y		
150		Z		
151	STATBF:	X	Hull aero-static buoyancy force vector	$\underline{F}_{SB}{}_h^{hcv}$
152		Y		
153		Z		
154	HGGAMF:	X	Hull gust-gradient force vector	$\underline{F}_{GG}{}_h^{hcv}$
155		Y		
156		Z		
157	HGGAMM:	X	Hull gust-gradient moment vector	$\underline{T}_{GG}{}_h^{hcv}$
158		Y		
159		Z		
160	TGGAMF:	X	Tail gust-gradient force vector	$\underline{F}_{GG}{}_h^{ht}$
161		Y		
162		Z		
163	TGGAMM:	X	Tail gust-gradient moment vector	$\underline{T}_{GG}{}_h^{ht}$
164		Y		
165		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
166	RVTAIL	X	Relative air mass linear velocity at	
167		Y	tail center	$\underline{V}_h^{a\ t}$
168		Z		
169	RVHLCV	X	Relative air mass linear velocity at	
170		Y	hull C.V.	$\underline{V}_h^{a\ cv}$
171		Z		
172	ROTAIL	X	Relative air mass angular velocity at	
173		Y	tail center	$\underline{\omega}_h^{a\ t}$
174		Z		
175	ROHLCV	X	Relative air mass angular velocity at	
176		Y	hull C.V.	$\underline{\omega}_h^{a\ cv}$
177		Z		
178	VHSENS	X	Sensor location air mass relative	
179		Y	velocity	$\underline{V}_h^{a\ as}$
180		Z		
181	XSPEED		Forward Speed (Flight control system)	u_f
182	YSPEED		Lateral Speed (Flight control system)	v_f
183	ZSPEED		Vertical velocity (positive along minus z-axis)	$\dot{h}_f$
184	AXACC	X	X accelerometer measurement	$\dot{u}_f$
185	AYACC	Y	Y accelerometer measurement	$\dot{v}_f$
186	AZACC	Z	Z accelerometer measurement	$\dot{w}_f$
187	ROLLRT		Roll rate (Flight control system)	p_f
188	PTCHRT		Pitch rate (Flight control system)	q_f
189	TURNRT		Turn rate (Flight control system)	$\dot{\psi}_f$
190	UCOM		Forward velocity command	u_c
191	VCOM		Lateral velocity command	v_c
192	HDTCOM		Vertical velocity command (positive = up)	$\dot{h}_c$
193	PHICOM		Roll angle command	ϕ_c
194	THECOM		Pitch angle command	θ_c
195	TRATCM		Turn rate command	$\dot{\psi}_c$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
196	UDCNTL		Longitudinal control output	$\dot{u}_c$
197	VDCNTL		Lateral control output	$\dot{v}_c$
198	WDCNTL		Vertical control output (positive - down)	$\dot{w}_c$
199	PCONTL		Roll control output	$\dot{p}_c$
200	QCONTL		Pitch control output	$\dot{q}_c$
201	RCONTL		Yaw control output	$\dot{r}_c$
202	UERR		Control system U-loop feedback error	u_e
203	VERR		Control system V-loop feedback error	v_e
204	HDTERR		Control system $\dot{H}$-loop feedback error	$\dot{h}_e$
205	PHIERR		Control system PHI-loop feedback error	ϕ_e
206	THEERR		Control system THETA-loop feedback error	θ_e
207	TRATER		Control system Turn Rate loop feedback error	$\dot{\psi}_e$
208	UINT		X-speed 'control system' integrator value	u_I
209	VINT		Y-speed 'control system' integrator value	v_I
210	HDTINT		Vertical velocity 'control system' integrator value	$\dot{h}_I$
211	PHIINT		Roll angle 'control system' integrator value	ϕ_I
212	THEINT		Pitch angle 'control system' integrator value	θ_I
213	TRTINT		Yaw rate 'control system' integrator value	$\dot{\psi}_I$
214	RTOWFO:	X	Tail only steady flow force at the tail centroid	$\underline{F}_{SF_h}^{ht}$
215		Y		
216		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
217 218 219	RTOWMO:	X Y Z	Tail only steady flow moment at the tail centroid	$\underline{T}_{SF_h}^{ht}$
220 221 222	IERR:	X Y Z	Hover control system position-loop feedback error	x_{I_e}, y_{I_e}, z_{I_e}
223	PSIERR		Heading angle error signal (Hover control)	ψ_e
224 225 226	PHRF:	X Y Z	Inertial accelerometer location at time POSHTI.	$\underline{R}_I^{h\ ac}\Big\vert_{POSHTI}$
227	PHRF:PSI		Inertial heading at time POSHTI	$\psi_h\vert_{POSHTI}$
228 229 230	IACELC	X Y Z	Accelerometer inertial location	$\underline{R}_I^{hac}$
231 232 233	HCBLFO	X Y Z	Total cable force acting on the hull	$\sum_{j=1}^{4} \underline{F}_{c_h}^{hj}$
234 235 236	HCBLMO	X Y Z	Total cable moment acting on the hull	$\sum_{j=1}^{4} \underline{R}_h^{hj} \times \underline{F}_{c_h}^{hj}$
237	GAMMAH		Angle (from vertical) of the relative angular velocity vector in the hull y-z plane	γ_h
238	LAMDAH		Angle (from vertical) of the relative linear velocity vector in the hull y-z plane	λ_h
239	ZETAH		GAMMAH-LAMDAH	ζ_h
240	NDHHT		Nondimensional hull height (ref. hull diameter)	$\hat{h}$
241	NDTHT		Nondimensional tail height (ref. tail span)	$\hat{h}_t$
242 243 244	RTIVEL	X Y Z	Rotor on tail interference velocity vector	$\sum_{i=1}^{4} \underline{V}_t^{int\ r\ i}$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
245 246 247	PTIVEL:	X Y Z	Propeller on tail interference velocity vector	$\sum_{1}^{4} \underline{V}_t^{int\ p\ i}$
248 249 250	RHIVEL:	X Y Z	Rotor on hull interference velocity vector	$\sum_{i=1}^{4} \underline{V}_h^{int\ r\ i}$
251	RCFLWC		Rotor on hull crossflow correction	(Eq. 8-176)
252 253 254	PHIVEL:	X Y Z	Propeller on hull interference velocity vector	$\sum_{i=1}^{4} \underline{V}_h^{int\ p\ i}$
255	PCFLWC		Propeller on hull crossflow correction	(Eq. 8-176)
256 257 258	GHCIFO:	X Y Z	Ground on hull crossflow interference force	$\begin{bmatrix} 0 \\ (\Delta Y_h)_{ge} \\ (\Delta Z_h)_{ge} \end{bmatrix}_h^{hcv}$
259 260 261	GHCIMO:	X Y Z	Ground on hull crossflow interference moment	0
262	C FLOW C		Crossflow drag parameter including rotor and propeller on hull interference	$(Y_{v\|v\|_h})'$
263	PDLTAL		Test command aileron deflection	$\Delta\delta_a$
264	PDLTEL		Test command elevator deflection	$\Delta\delta_e$
265	PDLTRD		Test command rudder deflection	$\Delta\delta_r$
266	SDLTAL		Flight control system command aileron deflection	δ_a
267	SDLTEL		Flight control system command elevator deflection	δ_e
268	SDLTRD		Flight control system command rudder deflection	δ_r
269	DELTAL		Aileron deflection angle	δ_a
270	DELTEL		Elevator deflection angle	δ_e
271	DELTRD		Rudder deflection angle	δ_r

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
272	ALPTØ*		Tail rolling angle of attack	α_{p_o}
273	PALPTØ*		Supplementary tail rolling angle of attack without aileron effects	α'_{p_o}
274	TIAC		Ground on tail induced angle of attack correction	TIAC
275	TCLC		Tail lift curve slope around effect	TCLC
276	ZAVSQT		Tail z-force derivative	
277	MORLOD:	X	Mooring load force vector on mast	$L_{Ih}\underline{F}C_h^{hm}$
278		Y		
279		Z		
280	HOZLOD:	X	Vehicle (mooring) nose load force vector MFC(25-27)	$\underline{F}C_h^{hm}$
281		Y		
282		Z		
283	HGERFO:	X	Total landing gear force vector acting on the hull	$\sum_{g=1}^{4} \underline{F}g_h^{hg}$
284		Y		
285		Z		
286	HGERHO:	X	Total landing gear moment vector acting on the hull	$\sum^{4} \underline{R}_h^{hg} \times \underline{F}g_h^{hg}$
287		Y		
288		Z		
289	HGAAMF:	X	Hull gust acceleration force vector	$\underline{F}GA_h^{hcv}$
290		Y		
291		Z		
292	HGAAMM:	X	Hull gust acceleration moment vector	$\underline{T}GA_h^{hcv}$
293		Y		
294		Z		
295	LAMDPH		Ground induced hull flow rotation angle	λ'
296	VDHGST:	X	Hull C.V. total gust acceleration vector	$\overset{o}{\underline{V}}{}_h^{am\ cv}$
297		Y		
298		Z		

*Ø is a zero, O is the letter 'O'

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
299	VDTGST:	X	Tail centroid total gust acceleration vector	$\dot{\underline{V}}_h^{am\ t}$
300		Y		
301		Z		
302	GGRDAC:	X	Hull inertial gust gradient acceleration vector	$\frac{\partial \underline{V}_h^{am\ cv}}{\partial \underline{R}} \underline{V}_h^{am\ cv}$
303		Y		
304		Z		
305	MGDHAC:	X	Negative hull gust gradient acceleration vector	$-\frac{\partial \underline{V}_h^{am\ cv}}{\partial \underline{R}} \underline{V}_h^{a\ cv}$
306		Y		
307		Z		
308	MGDTAC:	X	Negative tail gust gradient acceleration vector	$-\frac{\partial V_h^{am\ t}}{\partial R} \underline{V}_h^{a\ t}$
309		Y		
310		Z		
311	TGAAMF:	X	Tail gust acceleration force	$\underline{F}GA_h^{ht}$
312		Y		
313		Z		
314	TGAAMM:	X	Tail gust acceleration moment	$\underline{T}GA_h^{ht}$
315		Y		
316		Z		

ALPHABETICAL LISTING

CODE NUMBER	OUTPUT LABEL	
75	ALPT	
73	ALT	
272	ALPTØ*	
184	AXACC	X
185	AYACC	Y
186	AZACC	Z
13	AXCGG	
14	AYCGG	
15	AZCGG	
74	BETAT	
262	C FLOW C	
269	DELTAL	
270	DELTEL	
271	DELTRD	
139	DUGDXH	
140	DUGDYH	
142	DUGDXT	
143	DUGDYT	
141	DVGDYH	
144	DVGDYT	
145	GAHBFO:	X
146		Y
147		Z
237	GAMMAH	
148	GGHBFO:	X
149		Y
150		Z

CODE NUMBER	OUTPUT LABEL	
256	GHCIFO:	X
257		Y
258		Z
259	GHCIMO:	X
260		Y
261		Z
302	GGRDAC:	X
303		Y
304		Z
43	HABFOR:	X
44		Y
45		Z
46	HABMOM:	X
47		Y
48		Z
79	HBACFO:	X
80		Y
81		Z
82	HBACMO:	X
83		Y
84		Z
103	HCACFO:	X
104		Y
105		Z
106	HCACMO:	X
107		Y
108		Z
231	HCBLFO:	X
232		Y
233		Z
234	HCBLMO:	X
235		Y
236		Z
192	HDTCON	

*Ø is a zero, O is the letter 'O'

CODE NUMBER	OUTPUT LABEL	
204	HDTERR	
210	HDTINT	
289	HGAAMF:	X
290		Y
291		Z
292	HGAAMM:	X
293		Y
294		Z
283	HGERFO:	X
284		Y
285		Z
286	HGERHO:	X
287		Y
288		Z
154	HGGAMF:	X
155		Y
156		Z
157	HGGAMM:	X
158		Y
159		Z
31	HOABF:	X
32		Y
33		Z
34	HOABMO:	X
35		Y
36		Z
109	HOTAFO:	X
110		Y
111		Z
112	HOTAMO:	X
113		Y
114		Z
280	HOZLOD:	X
281		Y
282		Z

CODE NUMBER	OUTPUT LABEL	
85	HTOTAF:	X
86		Y
87		Z
88	HTOTAM:	X
89		Y
90		Z
228	IACELC:	X
229		Y
230		Z
220	IERR:	X
221		Y
222		Z
238	LAMDAH	
295	LAMDPH	
305	MGDHAC:	X
306		Y
307		Z
308	MGDTAC:	X
309		Y
310		Z
277	MORLOD:	X
278		Y
279		Z
240	NDHHT	
241	NDTHT	
124	ODHGST:	X
125		Y
126		Z
136	ODTGST:	X
137		Y
138		Z
118	OHGUST:	X
119		Y
120		Z

CODE NUMBER	OUTPUT LABEL	
130	OTGUST:	X
131		Y
132		Z
4	P	
78	PALPT	
273	PALPTØ*	
76	PALT	
77	PBETAT	
255	PCFLWC	
199	PCONTL	
263	PDLTAL	
264	PDLTEL	
265	PDLTRD	
10	PHI	
193	PHICOM	
205	PHIERR	
211	PHIINT	
252	PHIVEL:	X
253		Y
254		Z
224	PHRF:	X
225		Y
226		Z
227	PHRF:PSI	
12	PSI	
223	PSIERR	
188	PTCHRT	

CODE NUMBER	OUTPUT LABEL	
245	PTIVEL:	X
246		Y
247		Z
5	Q	
200	QCONTL	
6	R	
251	RCFLWC	
201	RCONTL	
16	RHBFOR:	X
17		Y
18		Z
248	RHIVEL:	X
249		Y
250		Z
19	RHOAF:	X
20		Y
21		Z
22	RHOAMO:	X
23		Y
24		Z
49	RHOGFO:	X
50		Y
51		Z
52	RHOGMO:	X
53		Y
54		Z
55	RHOWFO:	X
56		Y
57		Z
58	RHOWMO:	X
59		Y
60		Z
187	ROLLRT	

CODE NUMBER	OUTPUT LABEL	
172	ROTAIL:	X
173		Y
174		Z
175	ROHLCV:	X
176		Y
177		Z
242	RTLVEL:	X
243		Y
244		Z
25	RTOAF:	X
26		Y
27		Z
28	RTOAMO:	X
29		Y
30		Z
61	RTOGFO:	X
62		Y
63		Z
64	RTOGMO:	X
65		Y
66		Z
214	RTOWFO:	X
215		Y
216		Z
217	RTOWMO:	X
218		Y
219		Z
169	RVHLCV:	X
170		Y
171		Z
166	RVTAIL:	X
167		Y
168		Z
266	SDLTAL	
267	SDLTEL	
268	SDLTRD	

CODE NUMBER	OUTPUT LABEL	
151	STATBF:	X
152		Y
153		Z
91	TCACFO:	X
92		Y
93		Z
94	TCACMO:	X
95		Y
96		Z
275	TCLC	
72	TDLMGM	
69	TDYFOR	
311	TGAAMF:	X
312		Y
313		Z
314	TGAAMM:	X
315		Y
316		Z
160	TGGAMF:	X
161		Y
162		Z
163	TGGAMM:	X
164		Y
165		Z
194	THECOM	
206	THEERR	
212	THEINT	
11	THETA	
274	TIAC	
37	TOAMOM:	X
38		Y
39		Z

CODE NUMBER	OUTPUT LABEL	
40	TOAFOR:	X
41		Y
42		Z
97	TOTAFO:	X
98		Y
99		Z
100	TOTAMO:	X
101		Y
102		Z
195	TRATCM	
207	TRATER	
213	TRTINT	
71	TSLMOM	
68	TSYFOR	
70	TSZFOR	
189	TURNRT	
67	TXFOR	
1	U	
190	UCOM	
196	UDCNTL	
202	UERR	
208	UINT	
2	V	
191	VCOM	
197	VDCNTL	
296	VDHGST:	X
297		Y
298		Z

CODE NUMBER	OUTPUT LABEL	
121	VDRHGT:	X
122		Y
123		Z
133	VDRTGT:	X
134		Y
135		Z
299	VDTGST:	X
300		Y
301		Z
203	VERR	
115	VHGUST:	X
116		Y
117		Z
178	VHSENS:	X
179		Y
180		Z
209	VINT	
127	VTGUST:	X
128		Y
129		Z
3	W	
198	WDCNTL	
7	X	
181	XSPEED	
8	Y	
182	YSPEED	
9	Z	
276	ZAVSQT	
239	ZETAH	
183	ZSPEED	

TABLE D-2. LPU VARIABLES (CODE NUMBERS LISTED IN SECOND SECTION OF INPUT DATA FILE OUTLST)

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
1	U		Velocity vector of each LPU	
2	V			$\underline{V}_i$
3	W			
4	PHID		LPU gimbal Euler rates	
5	THETD			$\dot{\underline{D}}h^{i}$
6	PSID			
7	X		LPU inertial position vector	
8	Y			$\underline{R}_I^i$
9	Z			
10	PHI		LPU gimbal Euler angles	
11	THETA			$\underline{D}h^{i}$
12	PSI			
13	CF	X	Constraint force vector for each LPU	
14	CF	Y	attach point	$\underline{F}C_h^{hi}$
15	CF	Z		
16	CM	X	Constraint moment vector for each	
17	CM	Y	LPU attach point	$\underline{T}C_h^{hi}$
18	CM	Z		
19	THEØR		Rotor blade collective pitch	θ_{o_r}
20	A1SR		Rotor lateral control axis deflection	A_{1s_r}
21	B1SR		Rotor longitudinal cyclic pitch	B_{1s_r}
22	OMEGR		Rotor spin rate	Ω_r
23	TR		Rotor thrust	T_r
24	QR		Rotor torque	Q_r
25	DSKLR		Disk loading on the rotor	T_r/A_r
26	POWER R		Required rotor engine power	P_{req_r}
27	AØR		Rotor blade coning angle	a_{o_r}

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
28	A1R		Rotor blade longitudinal flapping angle	a_{1_r}
29	B1R		Rotor blade lateral flapping angle	b_{1_r}
30	THEØP		Propeller blade collective pitch	θ_{o_p}
31	OMEGP		Propeller spin rate	Ω_p
32	TP		Propeller thrust	T_p
33	QP		Propeller torque	Q_p
34	DSKLP		Disk loading on the propeller	T_p/A_p
35	POWER P		Required propeller engine power	P_{req_p}
36 37 38	VGUST:	X Y Z	Gust linear velocity (LPU reference axis)	$\underline{V}_i^{am\ i}$
39 40 41	RVFUS:	X Y Z	LPU fuselage wind relative linear velocity at the fuselage aerodynamic reference center	$\underline{V}_i^{a\ f}$
42 43 44	FUSFO:	X Y Z	Fuselage aerodynamic force vector at the center of gravity	$\underline{F}_{A_i}^{if}$
45 46 47	PROPF:	X Y Z	Propeller aerodynamic force vector at the center of gravity	$\underline{F}_{A_i}^{ip}$
48 49 50	ROTFO:	X Y Z	Rotor aerodynamic force vector at the center of gravity	$\underline{F}_{A_i}^{ir}$
51 52 53	LPAFO:	X Y Z	LPU aerodynamic force vector at the center of gravity	$\underline{F}_{A_i}$
54 55 56	FUSMO:	X Y Z	Fuselage aerodynamic moment vector about the center of gravity	$\underline{T}_{A_i}^{if}$
57 58 59	PROPM:	X Y Z	Propeller aerodynamic moment vector about the center of gravity	$\underline{T}_{A_i}^{ip}$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
60 61 62	ROTMO:	X Y Z	Rotor aerodynamic moment vector about the center of gravity	$\underline{T}_{A_i}^{ir}$
63 64 65	LPAMO:	X Y Z	LPU aerodynamic moment vector about the center of gravity	$\underline{T}_{A_i}$
66	CLAVR		Rotor blade mean lift coefficient	$\bar{C}_{L_r}$
67	ALAVR		Rotor blade mean angle of attack	$\bar{\alpha}_r$
68	CLAVP		Propeller blade mean lift coefficient	$\bar{C}_{L_p}$
69	ALAVP		Propeller blade mean angle of attack	$\bar{\alpha}_p$
70 71 72	RVLPU:	X Y Z	LPU relative wind linear velocity at the LPU center of gravity	$\underline{V}_i^a$
73	PTHEP		Propeller collective pitch increment test command	$\Delta\theta_{o_p}$
74	PTHER		Rotor collective pitch increment test command	$\Delta\theta_{o_r}$
75	PA1SR		Rotor lateral cyclic deflection increment test command	ΔA_{1s_r}
76	PB1SR		Rotor longitudinal cyclic deflection increment test command	ΔB_{1s_r}
77	STHEP		Propeller collective pitch flight control system command	θ_{o_p}
78	SOMGP		Propeller angular rate flight control system command	Ω_p
79	STHER		Rotor collective pitch flight control system command	θ_{o_r}
80	SOMGR		Rotor angular rate flight control system command	Ω_{o_r}
81	SA1SR		Rotor lateral cyclic deflection flight control system command	A_{1s_r}
82	SB1SR		Rotor longitudinal cyclic deflection flight control system command	B_{1s_r}

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
83	IVSOR:	X	Inertial gust linear velocity vector	
84		Y	at the gust source	$\underline{V}_I^s$
85		Z		
86	VSORC:	X	Gust linear velocity at the gust	
87		Y	source in hull reference axis	$\underline{V}_h^s$
88		Z		
89	HCBLF:	X	Total cable force vector at the hull	$\underline{F}_{c_h}$
90		Y	c.g. (hull reference axis)	
91		Z		
92	HCBLM	X	Total cable moment vector at the hull	$\underline{T}_{c_h}$
93		Y	c.g. (hull reference axis)	
94		Z		
95	NDRHT		Nondimensional rotor height (rotor diameter reference)	$\hat{h}_r$
96	NDPHT		Nondimensior^l propeller height (propeller ameter reference)	$\hat{h}_p$
97	GEFR		Ground on rotor interference correction	GEF_r
98	LCSRE		Rotor effective lift curve slope	a_r
99	GEFP		Ground on propeller interference correction	GEF_p
100	LCSPE		Propeller effective lift curve slope	a_p
101	VTR		Rotor thrust velocity	V_{t_r}
102	TWINR		Total rotor induced velocity	$(GEF_r)w_{in_r}$
103	VTP		Propeller thrust velocity	V_{t_p}
104	TWINP		Total propeller induced velocity	$(GEF_p)w_{in_p}$
105	ROTIV:	X	Rotor induced velocity vector (LPU	
106		Y	reference axis)	$\underline{V}_i^{in\ r}$
107		Z		
108	PRPIV:	X	Propeller induced velocity vector	
109		Y	(LPU reference axis)	$\underline{V}_i^{in\ p}$
110		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
111 112 113	RFIV:	X Y Z	Rotor on fuselage interference velocity vector	$(KRF)\underline{V}_i^{int\ r}$
114 115 116	PFIV:	X Y Z	Propeller on fuselage interference velocity vector	$(KPF)\underline{V}_i^{int\ p}$
117 118 119	RPIV:	X Y Z	Rotor on propeller interference velocity vector	$(KRP)\underline{V}_i^{int\ r}$
120	DELTA R		Rotor blade drag coefficient	δ_r
121	DELTA P		Propeller blade drag coefficient	δ_p
122 123 124	RVROT:	X Y Z	Rotor relative linear velocity vector	$\underline{V}_i^{a\ r}$
125 126 127	RVPRP:	X Y Z	Propeller relative linear velocity vector	$\underline{V}_i^{a\ p}$
128	LGLNT		Landing gear length	ℓ_g
129 130 131	GERIL:	X Y Z	Landing gear inertial location	$\underline{R}_I^{hg}$
132 133 134	GERFO:	X Y Z	Landing gear force vectors at the ground contact points	$\underline{F}_{g_h}^{hg}$
135 136 137	HGRMO:	X Y Z	Landing gear moment vectors about the hull c.g.	$(\underline{R}_h^{hg} \times \underline{F}_{g_h}^{hg})$
138	FRTMG		Rolling friction magnitude on landing gears	$\mu_k F_{g_I}^{hg}(3)$
139 140 141	GCFOR:	X Y Z	Landing gear compression force vector (third component of $\underline{F}_{g_h}^{hg}$)	$\underline{F}_{g_h}^{hg}$
142 143 144	GFFOR:	X Y Z	Landing gear friction force vector (first and second components of $\underline{F}_{g_h}^{hg}$)	$\underline{F}_{g_h}^{hg}$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
145	GCPRS		Landing gear compression force magnitude	$F_{g_h}^{h}(3)$
146	GRAT		Landing gear compression rate	$\dot{\ell}_g$
147	JETHS		Exhaust jet force magnitude	T_e
148	JETFO:	X	Exhaust jet force vector at LPU c.g.	
149		Y		$\underline{F}_{e_i}$
150		Z		
151	JETMO:	X	Exhaust jet moment vector about LPU c.g.	
152		Y		$\underline{T}_{e_i}^{ie}$
153		Z		

ALPHABETICAL LISTING

CODE NUMBER	OUTPUT LABEL		CODE NUMBER	OUTPUT LABEL	
69	ALAVP		99	GEFP	
67	ALAVR		97	GEFR	
27	AØR		132	GERFO:	X
			133		Y
20	A1R		134		Z
28	A1SR		129	GERIL:	X
			130		Y
29	B1R		131		Z
21	B1SR		142	GFFOR:	X
			143		Y
13	CF	X	144		Z
14	CF	Y			
15	CF	Z	146	GRAT	
68	CLAVP		89	HCBLF:	X
			90		Y
66	CLAVR		91		Z
16	CM	X	92	HCBLM:	X
17	CM	Y	93		Y
18	CM	Z	94		Z
121	DELTA P		135	HGRMO:	X
			136		Y
120	DELTA R		137		Z
34	DSKLP		83	IVSOR:	X
			84		Y
25	DSKLR		85		Z
138	FRTMG		148	JETFO:	X
			149		Y
42	FUSFO:	X	150		Z
43		Y			
44		Z	147	JETHS	
54	FUSMO:	X	151	JETMO:	X
55		Y	152		Y
56		Z	153		Z
139	GCFOR:	X	100	LCSPE	
140		Y			
141		Z	98	LCSRE	
145	GCPRS		128	LGLNT	

CODE NUMBER	OUTPUT LABEL	
51	LPAFO:	X
52		Y
53		Z
63	LPAMO:	X
64		Y
65		Z
96	NDPHT	
95	NDRHT	
31	OMEGP	
22	OMEGR	
75	PA1SR	
76	PB1SR	
114	PFIV:	X
115		Y
116		Z
10	PHI	
4	PHID	
35	POWER P	
26	POWER R	
45	PROPF:	X
46		Y
47		Z
57	PROPM:	X
58		Y
59		Z
108	PRPIV:	X
109		Y
110		Z
12	PSI	
6	PSID	
73	PTHEP	

CODE NUMBER	OUTPUT LABEL	
74	PTHER	
33	QP	
24	QR	
111	RFIV:	X
112		Y
113		Z
48	ROTFO:	X
[illegible]		Y
[illegible]		Z
105	ROTIV:	X
106		Y
107		Z
60	ROTMO:	X
61		Y
62		Z
117	RPIV:	X
118		Y
119		Z
39	RVFUS:	X
40		Y
41		Z
70	RVLPU:	X
71		Y
72		Z
125	RVPRP:	X
126		Y
127		Z
122	RVROT:	X
123		Y
124		Z
81	SA1SR	
82	SB1SR	
78	SOMGP	
80	SOMGR	

CODE NUMBER	OUTPUT LABEL		CODE NUMBER	OUTPUT LABEL	
77	STHEP		2	V	
79	STHER		36	VGUST:	X
			37		Y
11	THETA		38		Z
5	THETD		86	VSORC:	X
			87		Y
30	THEØP		88		Z
19	THEØR		103	VTP	
32	TP		101	VTR	
23	TR		3	W	
104	TWINP		7	X	
102	TWINR		8	Y	
1	U		9	Z	

TAPLE D-3. PAYLOAD VARIABLES

(Code numbers listed in first section of input data file PYOUTL)

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
1	PU		Payload linear velocity	
2	PV			$\underline{V}_p$
3	PW			
4	PP		Payload angular velocity	
5	PQ			$\underline{\omega}_p$
6	PR			
7	PX		Payload location relative to hull	
8	PY			$\underline{R}_h^p$
9	PZ			
10	PPHI		Payload Euler angle orientation	
11	PTHETA			$\underline{\eta}_I^p$
12	PPSI			
13	PAXCGG		Payload c.g. inertial X acceleration (g's)	
14	PAYCGG		Payload c.g. inertial Y accleration (g's)	$1/g[\dot{\underline{V}}_p +$
15	PAZCGG		Payload c.g. inertial Z acceleration (g's)	$(\underline{\omega}_p \times \underline{V}_p)]$
16	VPAYRL:	X	Hull relative payload velocity	
17		Y		$\underline{V}_h^p$
18		Z		
19	PAYIPO:	X	Payload c.g. inertial position	
20		Y		$\underline{R}_I^p$
21		Z		
22	PCBLFO:	X	Total cable force on payload	
23		Y		$\sum_{k=1}^{4} \underline{F}_{c_p}^{pk}$
24		Z		
25	PCBLMO:	X	Total cable moment about payload c.g.	
26		Y		$\sum_{k=1}^{4} (\underline{R}_p^{pk} \times \underline{F}_{c_p}^{pk})$
27		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
28	PYAFOR:	X	Payload aerodynamic force at the	
29		Y	center of gravity	$\underline{F}_{A_p}$
30		Z		
31	PYAMOM:	X	Payload aerodynamic moment at the	
32		Y	center of gravity	$\underline{T}_{A_p}$
33		Z		
34	STATPF:	X	Static aerodynamic payload force	
35		Y	at the aerodynamic reference center	$\underline{F}_{SA_p}^{pc}$
36		Z		
37	STATPM:	X	Static aerodynamic payload moment	
38		Y	at the aerodynamic reference center	$\underline{T}_{SA_p}^{pc}$
39		Z		
40	DYNAPM:	X	Dynamic payload moment at the aero-	
41		Y	dynamic reference center	$\underline{T}_{DA}^{pc}$
42		Z		
43	RPWFOR:	X	Payload aerodynamic force at the	
44		Y	aerodynamics reference center	$\underline{F}_{A_p}^{pc}$
45		Z		
46	RPWMOM:	X	Payload aerodynamic moment at the	
47		Y	aerodynamic reference center	$\underline{T}_{A_p}^{pc}$
48		Z		
49	RVPAYC:	X	Payload relative linear velocity	
50		Y		$\underline{V}_p^{a\ pc}$
51		Z		
52	ROPAYC:	X	Payload relative angular velocity	
53		Y		$\underline{\omega}_p^{a\ pc}$
54		Z		
55	VPGUST:	X	Payload linear gust velocity	
56		Y		$\underline{V}_p^{am\ pc}$
57		Z		
58	OPGUST:	X	Payload angular gust velocity	
59		Y		$\underline{\omega}_p^{am\ pc}$
60		Z		

ALPHABETICAL LISTING

CODE NUMBER	OUTPUT LABEL	
40	DYNAPM:	X
41		Y
42		Z
58	OPGUST:	X
59		Y
60		Z
13	PAXCGG	
14	PAYCGG	
19	PAYIPO:	X
20		Y
21		Z
15	PAZCGG	
22	PCBLFO:	X
23		Y
24		Z
25	PCBLMO:	X
26		Y
27		Z
4	PP	
10	PPHI	
12	PPSI	
5	PQ	
6	PR	
11	PTHETA	
1	PU	
2	PV	
3	PW	
7	PX	
8	PY	
28	PYAFOR:	X
29		Y
30		Z
31	PYAMOM:	X
32		Y
33		Z
9	PZ	
52	ROPAYC:	X
53		Y
54		Z
43	RPWFOR:	X
44		Y
45		Z
46	RPWMOM:	X
47		Y
48		Z
49	RVPAYC:	X
50		Y
51		Z
34	STATPF:	X
35		Y
36		Z
37	STATPM:	X
38		Y
39		Z
16	VPAYRL:	X
17		Y
18		Z
55	VPGUST:	X
56		Y
57		Z

TABLE D-4. CABLE VARIABLES

(Code numbers listed in second section of input data file PYOUTL)

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
1	PCBLF:	X	Cable force vectors at payload	
2		Y	c.g.	$\underline{F}_{c_p}^{pk}$
3		Z		
4	PCBLM:	X	Cable moment vectors at payload c.g.	
5		Y		$(\underline{k}_p^{pk} \times \underline{F}_{c_p}^{pk})$
6		Z		
7	CBLTH		Cable length	$\ell_{o_{jk}}$
8	CLRAT		Cable stretch rate	$\dot{\ell}_{jk}$
9	CBLTN		Cable tension	F_{jk}
10			Not used	
11			Not used	
12			Not used	
13	HCBLF:	X	Cable force vectors at hull attach	
14		Y	points	$\underline{F}_{c_h}^{hj}$
15		Z		

ALPHABETICAL LISTING

CODE NUMBER	OUTPUT LABEL	
10		
11		
12		
7	CBLTH	
9	CBLTN	
8	CLRAT	
13	HCBLF:	X
14		Y
15		Z
1	PCBLF:	X
2		Y
3		Z
4	PCBLM:	X
5		Y
6		Z

Code Numbers 10, 11, and 12 were not used.

APPENDIX E

The messages printed by this program fall into four general categories:

1) Messages which indicate incorrect inputs.

2) Messages which are defensive in nature. They should never be printed in the present program, but they might be triggered if the code is improperly altered in the future.

3) Messages which are printed to indicate program conditions of interest to the programmer or engineer. They may or may not cause the program to be terminated.

4) Messages which are printed indicating some kind of error condition has arisen in the program and the program is being terminated.

<u>MESSAGES:</u>

-

001
ABSOLUTE VALUE OF PANGLE IS GREATER THAN 1/2 PI.
Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

-

002
CONTROL COMMAND TIMES WERE NOT INPUT IN INCREASING ORDER.
Notes: Incorrect inputs; check data list.

-

003
CONVERGED SOLUTION OF CT AND WIN IS INCORRECT.
Notes: This message indicates an improper convergence in subroutine CALCCT. If this message apears during the trim run, it is an informative message only, because the trim will continue restarting until it gets values that are converged. If this message appears during a time history run, some of the values printed at that time frame will probably be incorrect.

-

004
CT AND WIN DID NOT CONVERGE.
Notes: This message is an informative message only when this condition occurs the values are returned to CALCCT which will restart its convergence calculations to arrive at correct values. The value function (FUNCT) would have been close to zero if the subroutine had converged.

-

005
TVC COLUMN NUMBER EXCEEDS 24.
Notes: Defensive message. Check for improper arguments being passed into subroutine IN1MOD.

006
TVC ROW NUMBER EXCEEDS 30.
Notes: Defensive message. Check for improper arguments being passed into subroutine IN1MOD.

007
SROWN WILL EXCEED 30.
Notes: Check subroutine RMASS for improper argument SROWN. If this argument is greater than 25 when the subroutine is called, it will cause an attempt to access a location in the inverted mass matrix greater than 30.

008
GUSTT1 IS GREATER-EQUAL TO GUSTT2.
Notes: These values were tested on input. They are being tested again here to insure that data has not been scrambled after the input.

009
LCS OR SIGMA IS LESS THAN ZERO.
Notes: Check the input values of LCSR1-4 or CORDR1-4 or LCSP1-4 or CORDP1-4 for a negative alue.

010
LENGTH OF VCTR IS NOT 6, 12, 24, or 42.
Notes: A defensive message. Check subroutines which call subroutine PTURB.

011
MORE THAN 20 CONTROL COMMANDS WERE INPUT.
Notes: Only 20 commands are allowed.

012
NO REAL POSITIVE ROOTS WERE FOUND BY THE IMSL ROUTINE.
Notes: With the present polynomial being calculated in subroutine inflow. This message should never appear.

013
CURRENT AERODYNAMIC ANGLES DO NOT SATISFY ANY OF THE POSSIBLE CONDITIONS
Notes: A defensive message. Check for improper calling arguments or incorrect stall parameters.

014
SQROOT IS NEAR ZERO. POSSIBLE DIVISION BY ZERO.
Notes: A defensive message. This value should never be zero in the present model, but any alterations to subroutine CALCCT or ITERCT may cause this to be printed.

015

STABILITY DERIVATIVES WILL NOT BE CALCULATED FOR THIS TRIM.

Notes: The trim routine sets a flag which will prevent the calculation of stability derivatives if the trim did not converge.

016

STALL REGION ANGLE 1 IS GREATER THAN STALL REGION ANGLE 2.

Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

017

SOME OF THE STALL REGION ANGLES WERE NEGATIVE.

Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

018

SOME OF THE AERODYNAMIC ANGLES OF THE TAIL ARE GREATER THAN PI.

Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

019

TIME IS GREATER THAN LAST COMMAND TIME WHICH SHOULD BE THE SAME AS THE FINAL SIMULATION TIME.

Notes: Defensive message. Subroutine SETCMD should have inserted in the last position of the command string the simulation time and a command equal to the last command which the user input.

020

TIME IS LESS THAN THE FIRST COMMAND TIME WHICH SHOULD BE ZERO.

Notes: Defensive message. If the user did not input a command at time zero, subroutine SETCMD will put the trim value with time zero in the first position.

021

T1COM IS GREATER-EQUAL TO T2COM.

Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

022

INCORRECT INPUTS

Notes: Check data list and restrictions on input values.

023
IMSL ROUTINE HAS RETURNED AN ERROR FLAG. ROUTINE NAME IS THE FIRST VARIABLE GIVEN BELOW.

Notes: The IMSL routine which returned the error flag is printed as the first variable name. IER is the IMSL error flag. Consult the IMSL manual for the meaning of the error.

024
CDFLAG IS NOT SET TO -1, 0, OR 1 ON RETURN FROM SUBR. ITERCT.

Notes: Defensive message check subroutine ITERCT and subroutine CALCCT.

025
LESS THAN 4 ZEROS WERE FOUND BY IMSL ZRPOLY

Notes: It is possible that IMSL-ZRPOLY may not find all four solutions to the 4th order equation. This may mean the program attempts to use the wrong solution.

026
REQUIRED TRIM CONTROL EXCEEDED AVAILABLE INTEGRATION LIMITS. IF LOOP CLOSED THE INTEGRATOR WILL BE SET TO LIMIT.

Notes: The trim values may be larger than the integrator limits which were input. In this case subroutine loop will use the integrator value if that loop is closed. This will have the same effect as having a command of the limit value at time 0.0 seconds.

027
THE TIME IS LESS THAN OLDTIM. THIS IS AN IMPOSSIBLE SITUATION.

Notes: Defensive message. This would probably only occur if the time were to decrease during the simulation of if PROFIL were to be called with a negative time.

028
THE TIME READ FROM THIS FILE IS LESS THAN ZERO. THE TIME AND GUST VELOCITY WILL BE IGNORED.

Notes: One of the gust string files (FILE31, FILE32, FILE33, or FILE34) contained negative time.

029
THE TIME IS GREATER-EQUAL TO 100000. Notes: Defensive message. The user has input a gust time greater than 100,000.

030
CONDITION FLAGS FROM IMSL ROUTINE DVERK.

Notes: Debug message, not used in present version of the program.

031
TIME INCREMENT IS LESS THAN ZERO.

Notes: TIMSTP must be greater than zero.

032
THE LENGTH OF THE VECTOR PASSED INTO PPTURB IS NOT 6 OR 12

Notes: Defensive message which will only appear if the payload stability derivatives are incorrectly altered.

033
THE VALUE OF VCTRFL IS NOT VALID

Notes: Defensive message which will appear if the linearization module is incorrectly altered. VCTRFL indicates which stability derivative matrice is being calculated.

034
SOME OF THE INVALID STABILITY DERIVATIVES HAVE NOT BEEN FLAGGED BECAUSE THE ARRAY IS FULL.

Notes: During the stability derivative calculations points which have strong nonlinearities will be flagged. The array holding these flagged values has a length of 300. This message is written when more than 300 are found.

035
THE LINEARIZATION LINEAR INCREMENTS ARE LARGE ENOUGH TO CAUSE SOME OF THE CABLES TO GO SLACK. THEY ARE BEING RESET.

Notes: During stability derivative calculations the perturbation increments must not cause any cables to go slack. If the values initialized in subroutine "Initial" may cause this to happen then they will be reduced based on the cable geometry.

036
THE LINEARIZATION ANGULAR INCREMENTS ARE LARGE ENOUGH TO CAUSE SOME OF THE CABLES TO GO SLACK. THEY ARE BEING RESET.

037
THE LENGTH OF THE SV VECTOR IS NOT CONSISTANT WITH THE SIZE OF THE BLANK BLOCKS FOR EXTRA INTEGRATOR STATES.

Notes: This is a defensive comment and will appear if future changes do not correctly change the length of the SV vector and the BLKSI2. If this message appears the declarations of SV, GVLNTH, BLKINT and BKDINT must be carefully checked wherever they appear. All time history data from that run will be useless.

038
THE TIMSTP OR MINSTP INPUT IS GREATER THAN THE APROX. CABLE FREQ/10 AND MAY CAUSE NUMERICAL INACCURACIES.

Notes: This is a warning message indicating that the timestep is too large to accurately calculate the effects of high cable frequencies. The program will give a recommended time step for these calculations.

039
IMSL DVERK WAS UNABLE TO REACH THE SPECIFIED 'RITERIA WITHOUT GOING BELOW THE MINIMUM TIME STEP.

Notes: This indicates that the IMSL DVERK tried to reduce its timestep below that allowed by MINSTP in an attempt to meet the error tolerance of 0.0001. At this point the program will force acceptance of the last attempt and continue execution. The value C(19) will give an indication of how close the calculation was to being within the error critera.

040
THE FLAG FOR THIS SUBROUTINE WAS NOT FOUND IN THE DATA FILE (TAPE20)

Notes: In order to have program HLASIM, HLAPAY AND HALMOR use the same data files, it is necessary to insert flags to allow that data which is not needed to be skipped. Check the data files, and User's Manual for the correct position of these flags.

041
WAKE ANGLE 1 MUST BE LESS THAN ANGLE 2, AND BOTH MUST BE BETWEEN 0 AND 2*PI

Notes: Invalid values for the wake angles were input.

042
THIS VALUE WILL CAUSE DIVISION BY ZERO

Notes: Can indicate invalid inputs or that the program has obtained a value very near zero with which it will have to divide.

043
MORE THAN MAX NUMBER OF OUTPUT VARIABLES WERE REQUESTED.

Notes: The maximum number of code numbers allowed in input files OUTLST and PYOUTL are:

Hull variables requested	-	500
LPU variables requested	-	250
Payload variables requested	-	100
Cable variables requested	-	100

044
AN INITIAL GUESS WITH LANDING GEAR IN GROUND CONTACT AND PITCH ANGLE LESS THAN 1.0 COULD NOT BE FOUND.

Note: The trimmer must find a legal initial guess — some compression in all active landing gears and the pitch angle less than 1.0 radians. This message probably indicates an error in the user defined geometry.

045

LINEARIZATION INCREMENT COULD LIFT ONE OF THE LANDING GEARS OFF THE GROUND. IT IS BEING RESET.

Note: If some of the stability derivative increments are large enough to lift a landing gear off the ground they will invalidate the linearization analysis. The program calculates an appropriate increment and uses it. This message is informative only and the program will continue.

045

ALL ROTOR LIFT CURVE SLOPES CANNOT BE ZERO.

Note: At least one rotor must have a nonzero lift curve slope (LCSR1-4).