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**LANGLEY WORKING PAPER**

SUBSONIC WIND-TUNNEL INVESTIGATION  
OF THE PROPOSED NORTHROP SPECIALIZED  
CLOSE AIR SUPPORT (A-X) AIRPLANE MODEL

By Linwood W. McKinney  
and Charles H. Fox, Jr.

Langley Research Center  
Langley Station, Hampton, Va.

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Prepared By

Linwood W. McKinney  
Linwood W. McKinney

Charles H. Fox, Jr.  
Charles H. Fox, Jr.

Approved by Mark R. Nichols  
Mark R. Nichols  
Full-Scale Research Division

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SUMMARY

A subsonic wind-tunnel investigation of an unpowered .1054-scale model of the proposed Northrop A-X airplane has been made in the Langley High-Speed 7-by 10-Foot Tunnel. The results indicate that the configuration should provide adequate longitudinal stability and control (except possibly in the high-lift configuration where a requirement for high control deflections may be indicated) for the range of condition tested. To accommodate the sting the ventral vertical tail was omitted from the model, therefore, an analysis of the experimental directional stability characteristics is not possible. However, the configuration was directionally stable at the near zero angle-of-attack test condition as a result of the 25° dihedral in the horizontal tail.

INTRODUCTION

At the request of the Department of the Air Force (AFSC), the National Aeronautics and Space Administration has conducted a series of wind-tunnel tests on unpowered scale models of airframe manufacturer proposed specialized close support aircraft (A-X). These tests were made in order to investigate critical aerodynamic problems, to provide information for use in verification of the contractor's estimated performance data, and to provide credibility to the A-X concept formulation studies.

The purpose of this paper is to present the results of tests of a .1054-scale model of the proposed Northrop A-X airplane. The tests were conducted in the Langley 7- by 10-Foot High-Speed Wind Tunnel at Mach numbers from 0.20 to 0.70 corresponding to a Reynolds number (per foot) range of  $1.35 \times 10^6$  to  $3.65 \times 10^6$ . The model represented a low wing single engine pusher type turbo-propeller powered aircraft with a "Y" type empennage arrangement.

SYMBOLS

The coefficients of forces and moments for the plotted data are referred to the stability axis system for the longitudinal characteristics and to the body axis system for the lateral and directional characteristics. In addition, a tabulation of the test results utilizing both axis systems is presented in Table IV. The moments are referenced to a center-of-gravity

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location at 30 percent of the mean aerodynamic chord. The symbols are defined as follows:

A	aspect ratio, $b^2/S$
b	wing span, 58.705 inches
c	chord
$\bar{c}$	wing mean aerodynamic chord, 10 inches
$C_A$	axial force coefficient, $\frac{\text{Axial force}}{qS}$
$C_D$	drag coefficient, $\frac{\text{Drag}}{qS}$
$C_{D_0}$	drag coefficient at zero lift
$C_L$	lift coefficient, $\frac{\text{Lift}}{qS}$
$C_{L_\alpha}$	lift-curve slope
$C_l$	rolling-moment coefficient, $\frac{\text{Rolling moment}}{qSb}$
$C_m$	pitching-moment coefficient, $\frac{\text{Pitching moment}}{qSc}$
$C_{mC_L}$	static margin
$C_{m\delta_e}$	elevator effectiveness parameter, $\partial C_m / \partial \delta_e$ at $C_L = 0$
$C_n$	yawing-moment coefficient, $\frac{\text{Yawing moment}}{qSb}$
$C_Y$	side force coefficient, $\frac{\text{Side force}}{qS}$
M	Mach number
q	free-stream dynamic pressure, pounds per square foot
R	Reynolds number
S	wing area, 4.0 sq ft
$\alpha$	angle of attack relative to fuselage reference line, degrees
$\beta$	angle of sideslip relative to plane of symmetry, degrees, positive, nose left
$\delta_a$	aileron deflection angle, degrees, positive, left trailing edge down

$\delta_e$	elevator angle, degrees, positive when trailing edge down
$\delta_f$	wing flap deflection angle, degrees, positive when trailing edge down
$\delta_H$	horizontal-tail plane incidence angle, degrees, positive when trailing edge down
$\delta_n$	leading-edge flap deflection angle, degrees, positive when leading edge down

#### Configuration Code

F	fuselage
W	wing
H	horizontal tail
D	engine ducts
G	gear pods
P	pylons
S	M-117 stores (not to scale)

#### MODEL AND APPARATUS

The model tested represents a low wing, single engine, pusher type turbo-propeller powered airplane with a "Y" type empennage. A three-view sketch of the model and flap and control surface details are presented in figure 1. Detailed geometric characteristics of the model are presented in Table I. Note that the ventrally located vertical stabilizer (shown dashed in figure 1) was omitted from the model to allow for entry of the support system. The horizontal tail of the model differed from the proposed Northrop A-X airplane as shown in Table II. Photographs of the model mounted in the 7- by 10-Foot High-Speed Wind Tunnel are shown in figure 2.

The Langley 7- by 10-Foot High-Speed Tunnel is an atmospheric, closed circuit wind tunnel with a solid wall test section. The average test conditions are listed in the following table:

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M	Average Stagnation Temperature	Dynamic Pressure, PSF	Average R/Ft
.201	75.3°	58.7	$1.35 \times 10^6$
.402	87.5°	215.5	$2.50 \times 10^6$
.604	97.8°	424.4	$3.35 \times 10^6$
.656	107.0°	482.2	$3.45 \times 10^6$
.708	105.5°	533.9	$3.65 \times 10^6$

#### MEASUREMENTS AND CORRECTIONS

Aerodynamic forces and moments were measured by means of a six-component, electrical strain-gage balance (731) housed within the model. In order to insure turbulent flow in the model boundary layer for the test, a 0.10 inch wide transition strip of No. 80 Carborundum grains was placed 1.00 inches behind the leading edge of all model components. (See reference 1.)

The angles of attack and sideslip measured in the tunnel vertical plane were obtained by an accelerometer mounted in the model. Angles in the tunnel lateral plane were corrected for sting and balance deflections under load.

Pressures were measured in the balance cavity and at the model sting aperture. The balance axial force, normal force and pitching moment were adjusted to a condition of free-stream static pressure in the balance cavity.

From a comparison of data obtained from upright and inverted model tests, it was determined that an insignificant flow misalignment angle existed in the region of the High-Speed 7- by 10-Foot Tunnel occupied by the model. No corrections were therefore applied to the angles of attack or sideslip for flow misalignment.

Jet boundary and blockage corrections calculated by the methods of references 2 and 3, respectively, have been applied to the data.

#### ACCURACY

The accuracy of the individual measured quantities, based on balance calibration and repeatability of data, is estimated to be within the following limits.

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$$\underline{M = .60}$$

$$\begin{array}{ll} C_A = \pm .0003 & C_N = \pm .010 \\ C_l = \pm .0003 & C_m = \pm .005 \\ C_n = \pm .0004 & C_Y = \pm .0014 \\ \alpha = \pm .05 & \beta = \pm .05 \\ M = \pm .001 & \end{array}$$

### PRESENTATION OF RESULTS

Table III presents a test log for the data obtained in the Langley  
7- by 10-Foot Wind Tunnel. The tabulated results are presented in Table IV.

The figure content is outlined in the following table:

#### Figure

##### Longitudinal Characteristics

Stability and control of basic configuration, stores off. . . . .	4
Stability and control of basic configuration with ten stores installed. . . . .	5
Effect of all moving horizontal tail on stability and control . . . . .	6
Effect of configuration components. . . . .	7
Characteristics of proposed high-lift system. . . . .	8-11
Summary characteristics . . . . .	12-18

##### Lateral-Directional Characteristics

Effect of aileron deflection. . . . .	19
Effect of asymmetric store loading. . . . .	20

### SUMMARY OF RESULTS

The data presented herein do not include power effects. Due to the critical timing of these tests in relation to the USAF evaluation schedule no extrapolation of these data to full-scale Reynolds numbers or surface condition has been included in this paper.

In order to expedite publication, the data are presented without detailed analysis. A few pertinent remarks concerning the aerodynamic characteristics are appropriate, however.

## Longitudinal Characteristics

The basic longitudinal data for the complete airplane configuration without stores (figure 4) indicate a linear moment variation over the linear lift range. At the lower Mach numbers where the angle-of-attack range was sufficiently high to encounter flow separation on the wing (or loss of lift), an accompanying stable break in the pitching-moment curve was obtained as is characteristic of straight wing airplanes.

The control power appears to be adequate to trim the configuration over the linear lift range with an incremental elevator deflection of less than  $5^{\circ}$ . The control effectiveness parameter  $Cm_{\delta_e}$  and static margin  $Cm_C$  is summarized with Mach number in figure 12 for the clean configuration and with ten stores installed. In general, only minor effects of either Mach number or store installation on  $Cm_{\delta_e}$  are indicated. The addition of the ten stores results in no appreciable change in the static margin over the Mach number range from  $M = .20$  to  $M = .50$ ; however, at Mach numbers above 0.5 a rearward shift in the aerodynamic center results from the store installation. This shift is approximately 13 percent of the reference chord at  $M = .70$ .

The effect of deflecting the wing leading- and trailing-edge flaps on the longitudinal aerodynamic characteristics of the configuration is shown in figures 8 to 11. Significant increments in lift coefficient are shown at zero and negative angles of attack with the flaps deflected. These data indicate that deflecting the wing leading- and trailing-edge flaps produces a large increment of nose down pitching moment near zero lift, which would require between  $15^{\circ}$  and  $20^{\circ}$  of elevator control angle for trim near the maximum lift coefficient.

The drag characteristics of the configuration are summarized in figure 13 as trimmed drag polars for the clean configuration and with ten stores installed. It should be noted that the stores tested on the model were 88 percent of the model scale; consequently, the measured store drag increments represent only about 76 percent of the correctly scaled store drag. This simple analysis, however, does not account for the effect of store size on the wing store interference. Incremental store drag (fig.13) is a function of lift coefficient with higher drag at lower lift (within the range of the data). The variation in the incremental drag coefficient with Mach number taken at  $L/D_{max}$  for ten stores is presented in figure 14. No effect of Mach number on the drag increments is indicated up to a Mach number of .60; however, at  $M = .70$  the incremental drag is increased by a factor of approximately 3. The drag results of store build-up test are presented in figure 15 over a range of lift coefficients near zero. These store drag increments are indicative of the store interference effects but it should be pointed out that these increments are not applicable over the lift range due to the offset in the drag polar that results from store installation.

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Estimations of the longitudinal aerodynamic characteristics of this configuration have been made, and are compared with experiment in figures 17 and 18. The computed lift-curve slope and  $\Delta C_{m_0}$  is that of the wing alone calculated by the method presented in reference 5. The planform used in the computation of static margin (reference 6) was assumed to be the combined planform of the wing and fuselage. The angle of attack for zero lift was calculated by the method presented in reference 5.

The estimated  $\alpha_0$  and  $C_{L\alpha}$  presented in figure 17 are seen to agree reasonably well with experiment. The calculated static margin is about .04 c low for the configuration with the horizontal tail on at  $M = 0.20$ . Also compared are computed and estimated values of  $\Delta C_{m_0}$  as a function of Mach number. The experimental  $\Delta C_{m_0}$  is obtained by subtracting the moment due to the fuselage from the moment of the wing fuselage (figure 7) at the angle of attack for zero lift of the wing fuselage. The calculation, of course, is simply the contribution due to the wing. Since this calculation was performed on the chord plane of the wing, a transfer of the experimental data to the vertical plane of the mean aerodynamic chord was performed. The experimental drag increment due to the wing was used to transfer the moment vertically by .08 c down to the location of the wing mean aerodynamic chord. The calculation over predicts the measured value of  $\Delta C_{m_0}$  by about -.03 at  $M = 0.20$  and about -.05 at  $M = .70$ .

The skin-friction drag was computed by equations given in reference 7, and the form factors which account for wing and body thickness were estimated by reference 8. No increment in drag due to interference of one component on another is accounted for in these estimates.

The Reynolds numbers based on an average leading-edge radius of 0.0126 feet for this configuration at test Mach numbers above .20 were greater than 20,000. As indicated by reference 9, leading-edge suction values of about 95 percent can be obtained at Reynolds numbers, based on leading-edge radius, of 20,000. In view of these results drag due to lift values corresponding to 95-percent suction were used to estimate the model drag variation with lift coefficient.

In general, the estimate of the drag coefficients for the configurations agree reasonably well with the experiment. The estimated skin-friction level is shown on figure 18 for reference.

#### Lateral-Directional Characteristics

The vertical tail, which is to be located on the underside of the airplane, was omitted from the model tested in order to accommodate the support sting. Therefore the lateral-directional tests of this configuration were made only to assess the effects of sideslip on roll control effectiveness and the effects of asymmetric store loading on the lateral-directional characteristics.

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In general, the aileron effectiveness (figures 19 and 20) was unaffected by sideslip for the configuration either with or without stores. Removing the stores from the left wing (figure 20) results in a slight positive increment in rolling moment and a slight positive increment in yawing moment, as would be expected from qualitative consideration of the lift and drag interference effects but does not suggest any significant control problems.

#### CONCLUDING REMARKS

A subsonic wind-tunnel investigation of an unpowered .1054-scale model of the proposed Northrop A-X airplane has been made in the Langley High-Speed 7-by 10-Foot Tunnel. The results indicate that the configuration should provide adequate longitudinal stability and control (except possibly in the high-lift configuration where a requirement for high control deflections may be indicated) for the range of conditions tested. Since the model was not provided with a vertical tail, an analysis of the directional stability characteristics is not possible. However, the configuration was directionally stable at the near zero angle-of-attack test condition as a result of the 25° dihedral in the horizontal tail. The effects of angle of attack on the horizontal-tail contribution to directional stability are not known. The addition of a ventral type vertical fin to the configuration, as proposed, would be expected to contribute a stabilizing yawing moment over the angle-of-attack range as well as a favorable rolling moment due to rudder deflection.

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TABLE I

MODEL GEOMETRY

<u>Component</u>	<u>Model Scale</u>
<u>Wing</u>	
Area, sq. ft.	
Reference	4.0
Wetted	8.202
Span, in.	58.705
Root chord, in.	12.247
Tip chord, in.	7.348
Aspect ratio	6.0
Mean geometric chord, in.	10.00
Leading edge sweepback angle, deg	3.8
Incidence, deg	1
Dihedral angle, deg	3
Airfoil section	64A115 with 250 mean camber line.
<u>Fuselage</u>	
Wetted area, sq. ft.	7.415
Length, in.	55.655
<u>Horizontal Tail (VEE-TAIL)</u>	
Area, sq. ft.	.937
Wetted area, sq. ft	1.888
Span, in.	23.28
Aspect ratio	4
Leading edge sweepback angle, deg	13.2°

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Root chord, in.	7.728
Tip chord, in.	3.680
Incidence, deg (can be varied)	
Dihedral angle, deg	25°
Airfoil section	64A012

Vertical Tail (VENTRAL TAIL)

Omitted to accommodate sting

Landing Gear Pod

Wetted area, sq. ft. (each)	.1951
Length, in.	10.64
Width, in.	1.660

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TABLE II - MODEL-AIRPLANE COMPARISON

<u>Horizontal Tail</u>	<u>Model</u> (Full Scale Dimensions)	<u>Proposed Airplane</u>
Aspect ratio	4.00	4.63
Sweep of .25 c line	8.5	6.0
Area	84.42 ft <sup>2</sup>	104.5 ft <sup>2</sup>
Tail volume coefficient	.42	.53
<u>M-117 Stores</u>	<u>Model</u>	<u>Actual</u>
Diameter	14.01	16.1 inches
Length	76.18	84.0 inches

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TABLE III - WIND-TUNNEL TEST PROGRAM  
FOR THE .1054-SCALE NORTHROP A-X MODEL  
IN THE LANGLEY HIGH-SPEED 7- BY 10-FOOT TUNNEL

SYMBOLS

W	wing
F	fuselage
H	horizontal tail
D	engine ducts
G	gear pods
P	pylons
S	stores
$\delta_a$	aileron deflection angle, degrees, positive, left trailing edge down
$\delta_e$	elevator angle, degrees, positive when trailing edge down
$\delta_f$	wing flap deflection angle, degrees, positive when trailing edge down
$\delta_H$	horizontal-tail plane incidence angle, degrees, positive when trailing edge down
$\delta_n$	leading-edge flap deflection angle, degrees, positive when leading edge down

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TABLE III - CONTINUED

TABLE III - CONTINUED

TABLE III - CONCLUDED

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HIGH SPEED TUNNEL TEST 788

RUN 6

BALANCE 731

09/14/67.

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.916	-.00	.05	.0655	.0217	.0187	-.0007	.0004	.0009	3.017
.201	58.626	-.00	-5.19	-.3893	.0342	.0590	-.0006	.0004	-.0002	-11.367
.202	59.218	-.00	-4.14	-.2931	.0293	.0495	-.0007	.0004	-.0004	-9.987
.202	59.216	-.00	-3.10	-.2054	.0258	.0420	-.0004	.0003	.0008	-7.956
.201	59.017	-.00	-2.06	-.1140	.0234	.0337	-.0002	.0003	.0011	-4.867
.202	59.115	-.00	-1.00	-.0254	.0221	.0257	-.0003	.0003	.0008	-1.147
.202	59.311	-.01	.05	.0673	.0219	.0183	-.0004	.0004	.0016	3.080
.202	59.310	-.01	1.10	.1592	.0225	.0104	-.0003	.0004	.0018	7.083
.201	58.913	-.01	2.18	.2517	.0241	.0032	-.0006	.0004	.0021	10.438
.201	58.813	-.01	3.26	.3438	.0269	-.0037	-.0010	.0004	.0023	12.795
.201	58.714	-.01	4.33	.4352	.0309	-.0114	-.0007	.0004	.0029	14.101
.202	59.207	-.01	5.42	.5273	.0357	-.0190	-.0006	.0004	.0030	14.782
.202	59.108	-.01	6.50	.6182	.0419	-.0271	-.0008	.0004	.0031	14.763
.201	58.812	-.01	7.58	.7017	.0490	-.0352	-.0013	.0003	.0035	14.331
.201	58.912	-.01	8.65	.7732	.0558	-.0435	-.0015	.0003	.0044	13.846
.199	57.431	-.01	9.69	.8527	.0649	-.0522	-.0013	.0003	.0043	13.130
.199	57.632	-.01	10.80	.9279	.0748	-.0629	-.0012	.0003	.0051	12.398
.199	57.838	-.01	11.82	.9816	.0848	-.0737	-.0011	.0003	.0050	11.570
.198	57.354	-.01	12.89	1.0364	.0972	-.0919	-.0012	.0003	.0061	10.659
.198	57.074	-.01	13.92	1.0899	.1133	-.1147	-.0009	.0003	.0064	9.620
.202	59.508	-.01	.10	.0671	.0216	.0188	-.0006	.0004	.0016	3.113

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.916	-.00	.05	.0655	.0216	.0187	-.0007	.0004	.0009
.201	58.626	-.00	-5.19	-.3907	-.0011	.0590	-.0005	.0005	-.0002
.202	59.218	-.00	-4.14	-.2944	.0081	.0495	-.0006	.0004	-.0004
.202	59.216	-.00	-3.10	-.2064	.0147	.0420	-.0004	.0004	.0008
.201	59.017	-.00	-2.06	-.1147	.0193	.0337	-.0002	.0003	.0011
.202	59.115	-.00	-1.00	-.0258	.0217	.0257	-.0003	.0003	.0008
.202	59.311	-.01	.05	.0673	.0218	.0183	-.0004	.0004	.0016
.202	59.310	-.01	1.10	.1596	.0194	.0104	-.0004	.0004	.0018
.201	58.913	-.01	2.18	.2524	.0145	.0032	-.0006	.0004	.0021
.201	58.813	-.01	3.26	.3447	.0073	-.0037	-.0010	.0004	.0023
.201	58.714	-.01	4.33	.4362	-.0021	-.0114	-.0007	.0004	.0029
.202	59.207	-.01	5.42	.5281	-.0142	-.0190	-.0006	.0004	.0030
.202	59.108	-.01	6.50	.6188	-.0284	-.0271	-.0009	.0003	.0031
.201	58.812	-.01	7.58	.7018	-.0441	-.0352	-.0014	.0001	.0035
.201	58.912	-.01	8.65	.7725	-.0610	-.0435	-.0015	.0001	.0044
.199	57.431	-.01	9.69	.8511	-.0794	-.0522	-.0013	.0001	.0043
.199	57.632	-.01	10.80	.9250	-.1002	-.0629	-.0013	.0001	.0051
.199	57.838	-.01	11.82	.9776	-.1179	-.0737	-.0012	.0001	.0050
.198	57.354	-.01	12.89	1.0313	-.1364	-.0919	-.0013	.0001	.0061
.198	57.074	-.01	13.92	1.0843	-.1521	-.1147	-.0010	.0001	.0064
.202	59.508	-.01	.10	.0671	.0214	.0188	-.0006	.0004	.0016

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\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 7

BALANCE 731

09/14/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.402	216.056	-.02	.18	.0795	.0202	.0187	-.0004	.0004	.0016	3.936
.402	215.905	-.01	-5.58	-.4349	.0355	.0621	-.0004	.0004	.0000	-12.248
.402	216.266	-.01	-4.47	-.3339	.0294	.0531	-.0004	.0004	.0004	-11.351
.402	216.445	-.01	-3.34	-.2314	.0251	.0442	-.0002	.0004	.0005	-9.228
.402	216.253	-.01	-2.20	-.1297	.0221	.0355	-.0000	.0004	.0011	-5.862
.402	216.618	-.02	-1.03	-.0252	.0204	.0267	-.0000	.0003	.0013	-1.236
.402	216.335	-.02	.13	.0775	.0202	.0188	-.0005	.0004	.0018	3.847
.403	216.795	-.02	1.31	.1805	.0212	.0105	-.0003	.0005	.0019	8.517
.402	216.138	-.02	2.53	.2909	.0236	.0019	-.0007	.0005	.0022	12.346
.401	215.391	-.02	3.79	.3992	.0277	-.0060	-.0009	.0005	.0022	14.421
.402	215.761	-.02	4.97	.5031	.0331	.0138	-.0006	.0005	.0019	15.218
.402	215.853	-.02	6.16	.6031	.0396	-.0218	-.0010	.0004	.0026	15.229
.402	215.854	-.02	7.36	.7036	.0478	-.0297	-.0011	.0004	.0031	14.722
.402	215.766	-.02	8.53	.7962	.0568	-.0383	-.0013	.0004	.0033	14.015
.401	215.685	-.02	9.70	.8828	.0672	-.0482	-.0015	.0004	.0036	13.141
.402	215.810	-.02	10.79	.9446	.0781	-.0605	-.0017	.0003	.0037	12.101
.402	215.969	-.03	11.86	.9895	.0914	-.0823	-.0015	.0003	.0041	10.822
.403	216.799	-.02	.29	.0888	.0202	.0183	-.0003	.0004	.0017	4.402

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.402	216.056	-.02	.18	.0795	.0200	.0187	-.0004	.0004	.0016
.402	215.905	-.01	-5.58	-.4362	-.0069	.0621	-.0004	.0004	.0000
.402	216.266	-.01	-4.47	-.3351	.0033	.0531	-.0003	.0004	.0004
.402	216.445	-.01	-3.34	-.2324	.0115	.0442	-.0002	.0004	.0005
.402	216.253	-.01	-2.20	-.1305	.0171	.0355	-.0000	.0004	.0011
.402	216.618	-.02	-1.03	-.0256	.0200	.0267	-.0000	.0003	.0013
.402	216.335	-.02	.13	.0776	.0200	.0188	-.0005	.0004	.0018
.403	216.795	-.02	1.31	.1809	.0171	.0105	-.0004	.0005	.0019
.402	216.138	-.02	2.53	.2916	.0107	.0019	-.0007	.0004	.0022
.401	215.391	-.02	3.79	.4001	.0012	-.0060	-.0009	.0004	.0022
.402	215.761	-.02	4.97	.5039	-.0107	.0138	-.0007	.0004	.0019
.402	215.853	-.02	6.16	.6037	-.0254	.0218	-.0011	.0003	.0026
.402	215.854	-.02	7.36	.7037	-.0427	.0297	-.0012	.0003	.0031
.402	215.766	-.02	8.53	.7955	-.0618	.0383	-.0014	.0002	.0033
.401	215.685	-.02	9.70	.8811	-.0824	-.0482	-.0015	.0001	.0036
.402	215.810	-.02	10.79	.9420	-.1000	-.0605	-.0018	-.0000	.0037
.402	215.969	-.03	11.86	.9865	-.1138	-.0823	-.0015	.0000	.0041
.403	216.799	-.02	.29	.0888	.0197	.0183	-.0003	.0004	.0017

\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 F T TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

UNCLASSIFIED

TEST 788

RUN 8

BALANCE 731

09/14/67.

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.605	426.466	-.03	.51	.1184	.0206	.0170	-.0003	.0004	.0013	5.733
.605	427.492	-.02	-5.04	-.4096	.0349	.0565	-.0005	.0001	.0008	-11.723
.606	428.038	-.02	-3.81	-.2941	.0283	.0474	-.0004	.0002	.0012	-10.380
.605	427.346	-.02	-2.46	-.1627	.0234	.0370	-.0006	.0002	.0013	-6.965
.605	427.488	-.03	-1.08	-.0301	.0208	.0274	-.0005	.0002	.0016	-1.443
.605	426.637	-.04	.36	.1036	.0206	.0185	-.0004	.0003	.0019	5.037
.605	426.784	-.04	1.89	.2523	.0227	.0086	-.0005	.0004	.0020	11.094
.603	425.272	-.04	3.35	.3909	.0275	.0002	-.0004	.0004	.0019	14.212
.604	426.346	-.04	4.75	.5204	.0343	-.0069	-.0007	.0004	.0021	15.174
.604	426.350	-.03	6.11	.6432	.0433	-.0134	-.0021	.0003	.0023	14.869
.605	426.526	-.03	7.52	.7810	.0556	-.0176	-.0021	.0003	.0025	14.037
.604	426.219	-.04	.59	.1280	.0208	.0171	-.0002	.0003	.0018	6.154

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.605	426.466	-.03	.51	.1185	.0196	.0170	-.0003	.0004	.0013
.605	427.492	-.02	-5.04	-.4110	-.0012	.0565	-.0005	.0002	.0008
.606	428.038	-.02	-3.81	-.2953	.0088	.0474	-.0004	.0002	.0012
.605	427.346	-.02	-2.46	-.1635	.0164	.0370	-.0006	.0002	.0013
.605	427.488	-.03	-1.08	-.0304	.0203	.0274	-.0004	.0002	.0016
.605	426.637	-.04	.36	.1037	.0199	.0185	-.0004	.0003	.0019
.605	426.784	-.04	1.89	.2529	.0144	.0086	-.0005	.0003	.0020
.603	425.272	-.04	3.35	.3918	.0046	.0002	-.0005	.0004	.0019
.604	426.346	-.04	4.75	.5213	-.0089	-.0069	-.0007	.0003	.0021
.605	426.350	-.03	6.11	.6440	-.0254	-.0134	-.0021	.0001	.0023
.605	426.526	-.03	7.52	.7813	-.0470	-.0176	-.0021	.0001	.0025
.604	426.219	-.04	.59	.1282	.0195	.0171	-.0002	.0003	.0018

\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 F T TUNNELS \*\*\* NASA CONFIDENTIAL \*\*\*

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\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 9

BALANCE 731

09/14/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.656	481.203	-.04	.71	.1438	.0213	.0169	-.0005	.0003	.0018	6.741
.658	483.317	-.03	-3.85	-.2987	.0313	.0449	-.0003	-.0004	.0035	-9.552
.657	482.271	-.03	-2.51	-.1701	.0250	.0355	-.0005	-.0002	.0027	-6.798
.657	482.393	-.03	-1.05	-.0272	.0219	.0260	-.0004	-.0000	.0025	-1.243
.657	482.116	-.04	.57	.1321	.0217	.0154	-.0006	.0000	.0026	6.091
.656	481.191	-.04	2.15	.2859	.0245	.0070	-.0007	-.0000	.0033	11.649
.656	481.751	-.04	2.89	.3591	.0270	.0036	-.0009	-.0000	.0034	13.275
.656	481.581	-.04	3.65	.4329	.0303	.0004	-.0011	-.0000	.0034	14.279
.656	481.417	-.04	4.42	.5096	.0348	-.0024	-.0014	.0000	.0034	14.654
.657	482.396	-.04	5.22	.5941	.0404	-.0060	-.0012	-.0000	.0035	14.702
.656	481.515	-.04	5.96	.6702	.0469	-.0083	-.0012	.0001	.0033	14.284
.656	481.781	-.04	.79	.1520	.0218	.0144	-.0005	-.0002	.0033	6.964

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.656	481.203	-.04	.71	.1440	.0196	.0169	-.0005	.0003	.0018
.658	483.317	-.03	-3.85	-.3001	.0111	.0449	-.0003	-.0004	.0035
.657	482.271	-.03	-2.51	-.1710	.0175	.0355	-.0005	-.0001	.0027
.657	482.393	-.03	-1.05	-.0276	.0214	.0260	-.0004	-.0000	.0025
.657	482.116	-.04	.57	.1323	.0204	.0154	-.0006	.0000	.0026
.656	481.191	-.04	2.15	.2866	.0138	.0070	-.0007	-.0001	.0033
.656	481.751	-.04	2.89	.3599	.0089	.0035	-.0009	-.0001	.0034
.656	481.581	-.04	3.65	.4339	.0027	.0004	-.0011	-.0001	.0034
.656	481.417	-.04	4.42	.5106	-.0046	-.0024	-.0014	-.0001	.0034
.657	482.396	-.04	5.22	.5951	-.0138	-.0060	-.0012	-.0001	.0035
.656	481.515	-.04	5.96	.6713	-.0229	-.0083	-.0012	-.0000	.0033
.656	481.781	-.04	.79	.1523	.0197	.0144	-.0005	-.0002	.0033

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA C

\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 10

BALANCE 731

09/14/67.

UNCLASSIFIED

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.709	536.499	-.04	.74	.1641	.0226	.0157	-.0007	.0001	.0022	7.258
.708	536.153	-.03	-3.22	-.2207	.0351	.0450	-.0005	-.0003	.0029	-6.282
.709	537.000	-.03	-2.58	-.1632	.0308	.0384	-.0005	-.0002	.0028	-5.298
.709	536.674	-.04	-1.86	-.0960	.0271	.0327	-.0004	-.0002	.0030	-3.542
.710	537.056	-.04	-1.09	-.0221	.0240	.0275	-.0006	.0001	.0024	-.921
.709	536.538	-.04	-.27	.0595	.0225	.0220	-.0006	.0001	.0023	2.646
.709	536.104	-.04	.66	.1532	.0223	.0165	-.0005	.0001	.0023	6.862
.708	535.533	-.04	1.52	.2427	.0237	.0122	-.0007	.0002	.0025	10.257
.709	536.235	-.04	2.39	.3375	.0270	.0080	-.0007	.0002	.0023	12.513
.709	536.601	-.04	3.22	.4250	.0328	.0026	-.0010	.0002	.0022	12.941
.709	536.223	-.04	3.92	.4838	.0392	-.0051	-.0011	.0005	.0011	12.353
.708	535.877	-.05	4.52	.5089	.0448	-.0163	-.0008	-.0000	.0035	11.348
.709	536.082	-.04	.88	.1749	.0221	.0115	-.0005	.0001	.0026	7.909

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.709	536.499	-.04	.74	.1643	.0205	.0157	-.0007	.0001	.0022
.708	536.153	-.03	-3.22	-.2222	.0227	.0450	-.0006	-.0002	.0029
.709	537.000	-.03	-2.58	-.1643	.0234	.0384	-.0005	-.0001	.0028
.709	536.674	-.04	-1.86	-.0968	.0240	.0327	-.0004	-.0002	.0030
.710	537.056	-.04	-1.09	-.0225	.0236	.0275	-.0006	.0001	.0024
.709	536.538	-.04	-.27	.0594	.0228	.0220	-.0006	.0001	.0023
.709	536.104	-.04	.66	.1534	.0206	.0165	-.0005	.0001	.0023
.708	535.533	-.04	1.52	.2432	.0172	.0122	-.0007	.0001	.0025
.709	536.235	-.04	2.39	.3383	.0129	.0080	-.0007	.0001	.0023
.709	536.601	-.04	3.22	.4261	.0089	.0026	-.0010	.0001	.0022
.709	536.223	-.04	3.92	.4852	.0060	-.0051	-.0011	.0004	.0011
.708	535.877	-.05	4.52	.5107	.0046	-.0163	-.0008	-.0001	.0035
.709	536.082	-.04	.88	.1752	.0194	.0115	-.0005	.0001	.0026

CONFIDENTIAL

\* 7 X 10 FT TUNNELS \*

NASA CONFIDENTIAL

\*\*\* NASA [REDACTED] \*\*\* 7X10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL TEST 788 RUN 11 BALANCE 731 09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.200	58.330	-.00	.03	-.0178	.0256	.1419	-.0000	.0000	.0013	-.698
.200	57.943	-.00	-5.21	-.4655	.0428	.1721	.0002	-.0003	.0024	-10.864
.200	58.436	-.00	-4.16	-.3806	.0376	.1670	.0003	-.0002	.0014	-10.130
.200	58.433	-.00	-3.13	-.2896	.0328	.1603	.0001	-.0000	.0004	-8.838
.200	58.234	-.00	-2.08	-.2027	.0295	.1536	.0000	.0001	.0016	-6.869
.200	58.431	-.00	-1.03	-.1133	.0271	.1491	.0002	.0001	.0007	-4.179
.201	58.527	-.00	.04	-.0178	.0253	.1422	-.0001	.0001	.0014	-.706
.201	58.625	-.00	1.10	.0720	.0249	.1378	.0003	.0001	.0019	2.894
.201	58.624	-.00	2.17	.1651	.0256	.1303	.0001	.0002	.0010	6.463
.201	58.523	-.00	3.24	.2508	.0269	.1236	-.0001	.0003	.0012	9.323
.200	58.028	-.00	4.33	.3450	.0300	.1179	-.0003	.0003	.0014	11.518
.200	58.423	-.00	5.38	.4308	.0337	.1115	-.0006	.0003	.0011	12.787
.200	58.324	-.00	6.48	.5218	.0385	.1044	-.0005	.0003	.0016	13.543
.200	58.423	-.00	7.54	.5998	.0441	.0986	-.0011	.0002	.0014	13.613
.200	58.424	-.00	8.61	.6811	.0509	.0912	-.0012	.0003	.0019	13.377
.201	58.623	-.00	9.68	.7591	.0584	.0836	-.0011	.0003	.0021	13.004
.201	58.922	-.00	10.81	.8398	.0674	.0742	-.0012	.0002	.0018	12.452
.200	58.334	-.00	11.82	.8959	.0758	.0620	-.0010	.0002	.0021	11.814
.201	58.540	-.00	12.91	.9570	.0871	.0431	-.0011	.0003	.0027	10.988
.200	58.456	-.00	13.93	1.0094	.1012	.0184	-.0012	.0004	.0024	9.977
.200	58.429	-.00	.03	-.0201	.0254	.1417	.0003	.0001	.0017	-.794

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.200	58.330	-.00	.03	-.0178	.0256	.1419	-.0000	.0000	.0013
.200	57.943	-.00	-5.21	-.4673	.0004	.1721	.0002	-.0003	.0024
.200	58.436	-.00	-4.16	-.3822	.0099	.1670	.0003	-.0002	.0014
.200	58.433	-.00	-3.13	-.2909	.0169	.1603	.0001	-.0000	.0004
.200	58.234	-.00	-2.08	-.2036	.0221	.1536	.0000	.0001	.0016
.200	58.431	-.00	-1.03	-.1137	.0251	.1491	.0002	.0001	.0007
.201	58.527	-.00	.04	-.0178	.0253	.1422	-.0001	.0001	.0014
.201	58.625	-.00	1.10	.0725	.0235	.1378	.0003	.0001	.0019
.201	58.624	-.00	2.17	.1660	.0193	.1303	.0001	.0002	.0010
.201	58.523	-.00	3.24	.2519	.0127	.1236	-.0001	.0003	.0012
.200	58.028	-.00	4.33	.3462	.0038	.1179	-.0003	.0003	.0014
.200	58.423	-.00	5.38	.4320	-.0068	.1115	-.0006	.0003	.0011
.200	58.324	-.00	6.48	.5227	-.0205	.1044	-.0006	.0002	.0016
.200	58.423	-.00	7.54	.6002	-.0350	.0986	-.0011	.0001	.0014
.200	58.424	-.00	8.61	.6808	-.0516	.0912	-.0012	.0001	.0019
.201	58.623	-.00	9.68	.7578	-.0701	.0836	-.0011	.0001	.0021
.201	58.922	-.00	10.81	.8372	-.0912	.0742	-.0012	.0000	.0018
.200	58.334	-.00	11.82	.8920	-.1091	.0620	-.0010	.0000	.0021
.201	58.540	-.00	12.91	.9518	-.1288	.0431	-.0011	.0000	.0027
.200	58.456	-.00	13.93	1.0034	-.1446	.0184	-.0012	.0001	.0024
.200	58.429	-.00	.03	-.0201	.0254	.1417	.0003	.0001	.0017

\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

**UNCLASSIFIED**  
HIGH SPEED TUNNEL

TEST 788

RUN 12

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.401	215.429	-.02	.18	-.0050	.0234	.1451	-.0002	.0001	.0024	-.212
.401	214.725	-.01	-5.56	-.5118	.0441	.1777	.0000	-.0002	.0027	-11.593
.402	215.830	-.01	-4.47	-.4155	.0375	.1711	.0001	-.0002	.0026	-11.084
.402	216.009	-.01	-3.34	-.3171	.0322	.1651	-.0000	-.0001	.0024	-9.845
.402	215.908	-.01	-2.19	-.2134	.0279	.1584	-.0001	-.0000	.0024	-7.648
.401	215.435	-.01	-1.02	-.1110	.0249	.1520	-.0000	.0000	.0024	-4.455
.401	215.429	-.02	.19	-.0040	.0234	.1452	-.0000	.0001	.0026	-.172
.401	215.516	-.02	1.33	.0943	.0233	.1387	-.0004	.0001	.0026	4.058
.401	215.510	-.02	2.55	.2015	.0244	.1320	-.0006	.0001	.0024	8.245
.401	215.505	-.02	3.80	.3106	.0271	.1251	-.0006	.0003	.0019	11.455
.401	214.665	-.01	4.97	.4110	.0312	.1183	-.0007	.0003	.0016	13.190
.401	215.036	-.01	6.17	.5115	.0366	.1117	-.0011	.0003	.0018	13.978
.400	214.386	-.01	7.36	.6080	.0434	.1049	-.0011	.0003	.0019	14.015
.401	215.131	-.01	8.52	.7043	.0512	.0982	-.0011	.0003	.0018	13.756
.402	215.697	-.01	9.72	.7935	.0603	.0894	-.0014	.0003	.0019	13.164
.401	215.534	-.01	10.82	.8623	.0700	.0776	-.0016	.0002	.0025	12.319
.401	215.496	-.01	11.88	.9082	.0819	.0655	-.0017	.0002	.0027	11.089
.401	214.871	-.02	.19	-.0038	.0236	.1454	-.0001	.0000	.0028	-.159

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.401	215.429	-.02	.18	-.0049	.0235	.1451	-.0002	.0001	.0024
.401	214.725	-.01	-5.56	-.5135	-.0056	.1777	.0000	-.0002	.0027
.402	215.830	-.01	-4.47	-.4171	.0050	.1711	.0001	-.0002	.0026
.402	216.009	-.01	-3.34	-.3183	.0137	.1651	-.0000	-.0001	.0024
.402	215.908	-.01	-2.19	-.2143	.0197	.1584	-.0001	-.0000	.0024
.401	215.435	-.01	-1.02	-.1115	.0230	.1520	-.0000	.0000	.0024
.401	215.429	-.02	.19	-.0040	.0234	.1452	-.0000	.0001	.0026
.401	215.516	-.02	1.33	.0948	.0211	.1387	-.0004	.0001	.0026
.401	215.510	-.02	2.55	.2023	.0155	.1320	-.0006	.0001	.0024
.401	215.505	-.02	3.80	.3117	.0065	.1251	-.0006	.0002	.0019
.401	214.665	-.01	4.97	.4121	-.0046	.1183	-.0008	.0003	.0016
.401	215.036	-.01	6.17	.5124	-.0185	.1117	-.0011	.0002	.0018
.400	214.386	-.01	7.36	.6084	-.0348	.1049	-.0011	.0001	.0019
.401	215.131	-.01	8.52	.7038	-.0537	.0982	-.0011	.0001	.0018
.402	215.697	-.01	9.72	.7920	-.0745	.0894	-.0014	.0000	.0019
.401	215.534	-.01	10.82	.8597	-.0930	.0776	-.0016	-.0001	.0025
.401	215.496	-.01	11.88	.9051	-.1068	.0555	-.0017	-.0002	.0027
.401	214.871	-.02	.19	-.0037	.0236	.1454	-.0001	.0000	.0028

**UNCLASSIFIED**

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL \*\*\*

\*\*\* NASA C

7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 13

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.604	425.686	-.03	.45	.0221	.0243	.1527	-.0002	.0000	.0026	.909
.604	425.583	-.02	-4.96	-.4866	.0451	.1785	.0002	-.0003	.0033	-10.790
.605	427.385	-.03	-3.72	-.3728	.0369	.1727	-.0002	-.0001	.0027	-10.092
.606	427.431	-.03	-2.38	-.2445	.0304	.1661	-.0003	-.0000	.0023	-8.040
.606	427.817	-.03	-1.02	-.1159	.0262	.1599	-.0002	.0000	.0025	-4.418
.605	426.792	-.04	.44	.0160	.0244	.1538	-.0002	.0001	.0028	.688
.605	426.938	-.03	1.99	.1636	.0250	.1464	-.0005	.0002	.0024	6.847
.604	425.678	-.03	3.38	.2948	.0278	.1406	-.0006	.0003	.0015	10.591
.604	426.000	-.03	4.85	.4303	.0334	.1345	-.0008	.0004	.0010	12.078
.605	427.085	-.02	6.22	.5558	.0410	.1295	-.0019	.0004	.0011	13.543
.605	427.009	-.02	7.62	.6909	.0515	.1267	-.0019	.0004	.0014	13.417
.605	426.462	-.04	.45	.0174	.0245	.1538	-.0001	.0002	.0026	.708

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.604	425.686	-.03	.45	.0223	.0241	.1527	-.0002	.0000	.0026
.604	425.583	-.02	-4.96	-.4885	.0029	.1785	.0002	-.0003	.0033
.605	427.385	-.03	-3.72	-.3743	.0126	.1727	-.0002	-.0001	.0027
.606	427.431	-.03	-2.38	-.2455	.0202	.1661	-.0003	.0000	.0023
.606	427.817	-.03	-1.02	-.1163	.0242	.1599	-.0002	.0000	.0025
.605	426.792	-.04	.44	.0162	.0243	.1538	-.0002	.0001	.0028
.605	426.938	-.03	1.99	.1643	.0193	.1464	-.0005	.0002	.0024
.604	425.678	-.03	3.38	.2959	.0104	.1406	-.0006	.0003	.0015
.604	426.000	-.03	4.85	.4315	-.0031	.1345	-.0008	.0003	.0010
.605	427.085	-.02	6.22	.5568	-.0194	.1295	-.0019	.0002	.0011
.605	427.009	-.02	7.62	.6914	-.0405	.1267	-.0020	.0001	.0014
.605	426.462	-.04	.45	.0176	.0244	.1538	-.0001	.0002	.0026

CON

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 14

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.656	480.985	-.04	.69	.0465	.0252	.1558	-.0004	.0002	.0024	1.848
.656	481.398	-.03	-3.75	-.3844	.0402	.1791	-.0003	.0000	.0023	.9.573
.655	480.616	-.03	-3.13	-.3224	.0356	.1739	-.0002	.0001	.0021	.9.048
.657	482.467	-.03	-2.43	-.2546	.0321	.1702	-.0004	.0001	.0018	.7.920
.658	483.096	-.03	-1.71	-.1842	.0294	.1669	-.0003	.0002	.0018	.6.266
.657	482.178	-.03	-.99	-.1134	.0274	.1630	-.0004	.0002	.0018	.4.136
.656	480.850	-.03	-.23	-.0410	.0260	.1594	-.0002	.0003	.0017	.1.579
.657	481.723	-.04	.69	.0471	.0253	.1558	-.0005	.0003	.0022	1.864
.656	481.058	-.04	1.37	.1131	.0254	.1530	-.0007	.0004	.0019	4.444
.656	481.049	-.04	2.21	.1930	.0265	.1508	-.0008	.0004	.0017	7.286
.656	481.527	-.04	2.95	.2649	.0281	.1485	-.0010	.0005	.0014	9.436
.655	480.371	-.04	3.71	.3381	.0304	.1458	-.0010	.0005	.0010	11.138
.656	481.153	-.04	.70	.0457	.0254	.1562	-.0004	.0004	.0020	1.798

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.656	480.985	-.04	.69	.0468	.0246	.1558	-.0004	.0002	.0024
.656	481.398	-.03	-3.75	-.3861	.0149	.1791	-.0003	.0001	.0023
.655	480.616	-.03	-3.13	-.3238	.0180	.1739	-.0002	.0001	.0021
.657	482.467	-.03	-2.43	-.2556	.0213	.1702	-.0004	.0002	.0018
.658	483.096	-.03	-1.71	-.1850	.0239	.1669	-.0003	.0002	.0018
.657	482.178	-.03	-.99	-.1139	.0255	.1630	-.0004	.0002	.0018
.656	480.850	-.03	-.23	-.0411	.0258	.1594	-.0002	.0003	.0017
.657	481.723	-.04	.69	.0474	.0247	.1558	-.0005	.0003	.0022
.656	481.058	-.04	1.37	.1136	.0227	.1530	-.0007	.0003	.0019
.656	481.049	-.04	2.21	.1938	.0190	.1508	-.0008	.0003	.0017
.656	481.527	-.04	2.95	.2660	.0144	.1485	-.0010	.0004	.0014
.655	480.371	-.04	3.71	.3393	.0084	.1458	-.0010	.0005	.0010
.656	481.153	-.04	.70	.0460	.0249	.1562	-.0004	.0004	.0020

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7 X 10 FT TUNNELS \*\*\* NASA

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\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 = DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL TEST 788 RUN 15 BALANCE 731 09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.709	537.235	-.04	-.07	-.0310	.0279	.1668	-.0010	.0004	.0016	-1.111
.707	535.538	-.05	-.82	-.1060	.0296	.1707	-.0008	.0003	.0021	-3.576
.706	534.508	-.05	-1.59	-.1795	.0330	.1758	-.0005	.0002	.0023	-5.446
.708	537.058	-.04	-2.31	-.2447	.0380	.1815	-.0001	.0002	.0024	-6.446
.705	533.456	-.04	-3.03	-.3082	.0432	.1867	-.0000	.0001	.0026	-7.128
.708	536.509	-.04	-.08	-.0345	.0277	.1662	-.0008	.0003	.0018	-1.248

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.709	537.235	-.04	-.07	-.0310	.0278	.1668	-.0010	.0004	.0016
.707	535.538	-.05	-.82	-.1064	.0281	.1707	-.0008	.0003	.0021
.706	534.508	-.05	-1.59	-.1803	.0280	.1758	-.0005	.0003	.0023
.708	537.058	-.04	-2.31	-.2460	.0281	.1815	-.0001	.0002	.0024
.705	533.456	-.04	-3.03	-.3100	.0269	.1867	-.0000	.0001	.0026
.708	536.509	-.04	-.08	-.0346	.0276	.1662	-.0008	.0003	.0018

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

**UNCLASSIFIED**

HIGH SPEED TUNNEL

TEST 788

RUN 16

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL.	CD	CPM	CRM	CYM	CSF	L/D
.201	58.515	-.01	.06	.0917	.0196	-.0174	-.0004	.0000	.0033	4.670
.201	58.718	-.01	-5.17	-.3068	.0274	-.0617	-.0001	-.0003	.0048	-11.204
.201	58.816	-.01	-4.12	-.2271	.0243	-.0530	.0001	-.0003	.0047	-9.337
.202	59.111	-.01	-3.09	-.1486	.0217	-.0446	-.0000	-.0002	.0042	-6.841
.201	58.813	-.01	-2.05	-.0681	.0202	-.0365	-.0001	-.0001	.0035	-3.368
.200	58.120	-.01	-1.00	.0110	.0195	-.0273	-.0001	-.0000	.0031	.563
.201	58.614	-.01	.07	.0916	.0197	-.0176	-.0003	.0000	.0033	4.657
.201	58.613	-.01	1.13	.1734	.0206	-.0082	-.0005	.0001	.0032	8.395
.201	58.612	-.01	2.18	.2495	.0221	.0015	-.0008	.0001	.0030	11.273
.200	58.414	-.01	3.28	.3338	.0248	.0113	-.0007	.0001	.0032	13.452
.200	58.414	-.01	4.32	.4115	.0279	.0209	-.0007	.0001	.0037	14.725
.200	58.314	-.01	5.40	.4896	.0320	.0320	-.0009	.0001	.0034	15.308
.201	58.809	-.01	6.50	.5716	.0372	.0434	-.0009	.0001	.0038	15.348
.201	58.909	-.01	7.56	.6373	.0428	.0539	-.0017	.0001	.0032	14.874
.201	58.812	-.01	8.63	.7056	.0492	.0651	-.0016	.0001	.0033	14.336
.201	58.814	-.01	9.68	.7716	.0562	.0765	-.0015	.0001	.0034	13.729
.201	58.520	-.01	10.76	.8278	.0632	.0877	-.0014	.0001	.0035	13.098
.201	58.527	-.01	11.82	.8868	.0725	.0972	-.0011	.0002	.0032	12.228
.201	58.536	-.01	12.90	.9274	.0817	.1052	-.0011	.0002	.0034	11.354
.201	58.550	-.01	13.91	.9616	.0929	.1087	-.0010	.0002	.0036	10.350
.201	58.713	-.01	.07	.0902	.0197	-.0180	-.0006	-.0000	.0033	4.579

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.515	-.01	.06	.0917	.0195	-.0174	-.0004	.0000	.0033
.201	58.718	-.01	-5.17	-.3080	-.0004	-.0617	-.0001	-.0003	.0048
.201	58.816	-.01	-4.12	-.2282	-.0079	-.0530	-.0001	-.0003	.0047
.202	59.111	-.01	-3.09	-.1495	.0137	-.0446	-.0000	-.0002	.0042
.201	58.813	-.01	-2.05	-.0687	.0178	-.0365	-.0001	-.0001	.0035
.200	58.120	-.01	-1.00	.0106	.0197	-.0273	-.0001	-.0000	.0031
.201	58.614	-.01	.07	.0916	.0196	-.0176	-.0003	.0000	.0033
.201	58.613	-.01	1.13	.1737	.0172	-.0082	-.0005	.0001	.0032
.201	58.612	-.01	2.18	.2501	.0126	.0015	-.0008	.0001	.0030
.200	58.414	-.01	3.28	.3346	.0057	.0113	-.0007	.0001	.0032
.200	58.414	-.01	4.32	.4123	-.0031	.0209	-.0007	.0001	.0037
.200	58.314	-.01	5.40	.4903	-.0143	.0320	-.0009	.0000	.0034
.201	58.809	-.01	6.50	.5720	-.0277	-.0434	-.0010	.0000	.0038
.201	58.909	-.01	7.56	.6373	-.0414	.0539	-.0017	-.0001	.0032
.201	58.812	-.01	8.63	.7048	-.0572	.0651	-.0016	-.0001	.0033
.201	58.814	-.01	9.68	.7698	-.0743	.0765	-.0015	-.0001	.0034
.201	58.520	-.01	10.76	.8247	-.0924	.0877	-.0014	-.0001	.0035
.201	58.527	-.01	11.82	.8824	-.1106	.0972	-.0011	-.0001	.0032
.201	58.536	-.01	12.90	.9217	-.1273	.1052	-.0011	-.0001	.0034
.201	58.550	-.01	13.91	.9551	-.1408	.1087	-.0010	-.0000	.0036
.201	58.713	-.01	.07	.0902	.0196	-.0180	-.0006	-.0000	.0033

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\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - UPGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL TEST 788 RUN 17 BALANCE 731 09/15/67  
 STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.402	216.213	-.02	.17	.1023	.0182	-.0171	-.0003	.0000	.0033	5.631
.401	214.665	-.02	-5.61	-.3517	.0290	-.0678	.0004	-.0003	.0044	-12.125
.403	216.606	-.02	-4.48	-.2632	.0244	-.0583	.0003	-.0003	.0043	-10.775
.401	215.298	-.02	-3.37	-.1762	.0212	-.0484	.0003	-.0002	.0042	-8.332
.402	216.222	-.02	-2.22	-.0839	.0191	-.0383	.0001	-.0001	.0038	-4.406
.402	216.309	-.02	-1.04	.0075	.0180	-.0280	-.0001	-.0000	.0035	.414
.402	215.840	-.02	.17	.1021	.0181	-.0173	-.0004	.0000	.0035	5.653
.402	215.930	-.02	1.38	.1971	.0194	-.0058	-.0005	.0001	.0033	10.183
.402	215.741	-.02	2.57	.2889	.0217	-.0055	-.0005	.0001	.0034	13.306
.402	215.646	-.02	3.82	.3849	.0252	-.0177	-.0008	.0001	.0033	15.246
.402	215.830	-.02	5.01	.4755	.0299	-.0297	-.0006	.0000	.0030	15.919
.402	216.018	-.02	6.20	.5617	.0355	-.0427	-.0012	.0001	.0029	15.822
.401	214.815	-.02	7.40	.6474	.0423	-.0562	-.0010	.0001	.0031	15.300
.402	215.844	-.02	8.58	.7309	.0501	-.0695	-.0012	.0001	.0031	14.587
.401	215.206	-.02	9.76	.8043	.0586	-.0828	-.0014	.0001	.0029	13.718
.402	215.793	-.02	10.85	.8577	.0677	-.0949	-.0015	.0001	.0030	12.673
.402	216.135	-.02	11.94	.8867	.0785	-.1023	-.0014	.0001	.0031	11.289
.402	216.027	-.02	.16	.1014	.0182	-.0173	-.0003	-.0000	.0035	5.572

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.402	216.213	-.02	.17	.1024	.0179	-.0171	-.0003	.0000	.0033
.401	214.665	-.02	-5.61	-.3528	-.0055	-.0678	.0003	-.0004	.0044
.403	216.606	-.02	-4.48	-.2643	.0038	-.0583	.0003	-.0003	.0043
.401	215.298	-.02	-3.37	-.1771	.0108	-.0484	.0003	-.0003	.0042
.402	216.222	-.02	-2.22	-.0846	.0158	-.0383	.0001	-.0001	.0038
.402	216.309	-.02	-1.04	.0071	.0181	-.0280	-.0001	-.0000	.0035
.402	215.840	-.02	.17	.1022	.0178	-.0173	-.0004	-.0000	.0035
.402	215.930	-.02	1.38	.1974	.0146	-.0058	-.0005	-.0000	.0033
.402	215.741	-.02	2.57	.2896	.0087	-.0055	-.0005	-.0001	.0034
.402	215.646	-.02	3.82	.3857	-.0004	-.0177	-.0008	-.0000	.0033
.402	215.830	-.02	5.01	.4762	-.0118	-.0297	-.0006	-.0000	.0030
.402	216.018	-.02	6.20	.5621	-.0253	-.0427	-.0012	-.0001	.0029
.401	214.815	-.02	7.40	.6472	-.0414	-.0562	-.0010	-.0000	.0031
.402	215.844	-.02	8.58	.7300	-.0595	-.0695	-.0012	-.0001	.0031
.401	215.206	-.02	9.76	.8023	-.0785	-.0828	-.0014	-.0001	.0029
.402	215.793	-.02	10.85	.8547	-.0949	-.0949	-.0015	-.0001	.0030
.402	216.135	-.02	11.94	.8833	-.1064	-.1023	-.0013	-.0002	.0031
.402	216.027	-.02	.16	.1015	.0179	-.0173	-.0003	-.0000	.0035

\*\*\* NASA AL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP UNCLASSIFIED MAINTAINED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 18

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.604	425.338	-.04	.46	.1295	.0186	-.0154	-.0004	.0001	.0031	6.945
.603	425.027	-.04	-5.15	-.3435	.0303	-.0711	.0002	-.0004	.0044	-11.320
.604	426.147	-.04	-3.90	-.2413	.0245	-.0588	-.0000	-.0003	.0041	-9.869
.603	425.198	-.04	-2.53	-.1247	.0202	-.0456	-.0004	-.0002	.0041	-6.175
.603	425.013	-.04	-1.15	-.0077	.0183	-.0320	-.0004	-.0001	.0035	-.422
.603	425.003	-.04	.46	.1307	.0186	-.0153	-.0005	.0000	.0031	7.013
.603	425.156	-.04	1.89	.2503	.0210	-.0002	-.0006	.0001	.0028	11.946
.603	424.565	-.04	3.35	.3748	.0252	.0165	-.0006	.0001	.0027	14.859
.604	425.227	-.03	4.80	.4962	.0315	.0349	-.0008	.0002	.0024	15.754
.603	424.326	-.03	6.18	.6027	.0393	.0537	-.0021	.0002	.0022	15.354
.603	425.179	-.03	7.61	.7259	.0501	.0756	-.0020	.0003	.0023	14.492
.605	426.500	-.04	.46	.1312	.0187	-.0152	-.0004	.0001	.0032	7.000

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.604	425.338	-.04	.46	.1296	.0176	-.0154	-.0004	.0000	.0031
.603	425.027	-.04	-5.15	-.3448	-.0006	-.0711	.0002	-.0004	.0044
.604	426.147	-.04	-3.90	-.2424	.0080	-.0588	-.0000	-.0003	.0041
.603	425.198	-.04	-2.53	-.1254	.0147	-.0456	-.0004	-.0002	.0041
.603	425.013	-.04	-1.15	-.0081	.0182	-.0320	-.0004	-.0001	.0035
.603	425.003	-.04	.46	.1308	.0176	-.0153	-.0005	.0000	.0031
.603	425.156	-.04	1.89	.2508	.0127	-.0002	-.0006	.0000	.0028
.603	424.565	-.04	3.35	.3755	.0033	.0165	-.0006	.0001	.0027
.604	425.227	-.03	4.80	.4970	-.0101	.0349	-.0008	.0001	.0024
.603	424.326	-.03	6.18	.6033	-.0258	.0537	-.0022	.0000	.0022
.603	425.179	-.03	7.61	.7259	-.0465	.0756	-.0021	.0000	.0023
.605	426.500	-.04	.46	.1314	.0177	-.0152	-.0004	.0001	.0032

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CO \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

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\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 19

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.708	535.985	-.05	.81	.1720	.0209	-.0119	-.0009	.0001	.0028	8.229
.708	535.841	-.06	-3.29	-.1746	.0318	-.0545	-.0006	-.0002	.0045	-5.491
.707	535.337	-.05	-2.67	-.1310	.0274	-.0492	-.0004	-.0002	.0040	-4.772
.708	535.882	-.05	-1.93	-.0723	.0241	-.0422	-.0006	-.0001	.0037	-3.005
.707	535.188	-.05	-1.15	-.0047	.0215	-.0341	-.0008	-.0000	.0033	-.219
.708	535.780	-.05	-.31	.0700	.0203	-.0249	-.0009	.0000	.0030	3.451
.707	535.357	-.05	.82	.1738	.0208	-.0115	-.0008	.0001	.0028	8.341
.707	535.107	-.04	1.57	.2430	.0222	-.0025	-.0009	.0001	.0027	10.943
.707	534.713	-.04	2.45	.3278	.0253	-.0076	-.0011	.0001	.0023	12.947
.706	534.515	-.04	3.28	.4117	.0304	.0163	-.0010	.0002	.0022	13.526
.707	534.612	-.04	4.03	.4723	.0369	.0241	-.0008	.0003	.0022	12.808
.707	534.981	-.04	4.68	.4949	.0425	.0321	-.0008	.0002	.0022	11.643
.707	535.436	-.05	.81	.1718	.0208	-.0116	-.0009	.0001	.0027	8.254

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.708	535.985	-.05	.81	.1722	.0185	-.0119	-.0009	.0001	.0028
.708	535.841	-.06	-3.29	-.1761	.0217	-.0545	-.0006	-.0002	.0045
.707	535.337	-.05	-2.67	-.1321	.0213	-.0492	-.0004	-.0001	.0040
.708	535.882	-.05	-1.93	-.0731	.0216	-.0422	-.0006	-.0001	.0037
.707	535.188	-.05	-1.15	-.0051	.0214	-.0341	-.0008	-.0000	.0033
.708	535.780	-.05	-.31	.0699	.0207	-.0249	-.0009	-.0000	.0030
.707	535.357	-.05	.82	.1741	.0184	-.0115	-.0008	.0001	.0028
.707	535.107	-.04	1.57	.2435	.0155	-.0025	-.0009	.0001	.0027
.707	534.713	-.04	2.45	.3285	.0113	.0076	-.0011	.0001	.0023
.706	534.515	-.04	3.28	.4127	.0068	.0163	-.0010	.0002	.0022
.707	534.612	-.04	4.03	.4736	.0036	.0241	-.0008	.0002	.0022
.707	534.981	-.04	4.68	.4966	.0020	.0321	-.0008	.0002	.0022
.707	535.436	-.05	.81	.1720	.0184	-.0116	-.0009	.0001	.0027

7 X 10 FT TUNNELS \*\*\* NASA

\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

**UNCLASSIFIED**

HIGH SPEED TUNNEL

TEST 788

RUN 20

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYH	CSF	L/D
.199	57.831	-.00	.11	.0101	.0237	.1117	-.0010	.0n10	-.0007	.425
.199	57.541	-.00	-5.14	-.4441	.0390	.1489	-.0008	.0n07	-.0009	-11.380
.199	57.540	-.00	-4.09	-.3526	.0338	.1413	-.0012	.0n09	-.0008	-10.444
.199	57.439	-.00	-3.06	-.2627	.0296	.1347	-.0010	.0n10	-.0009	-8.875
.199	57.537	-.00	-2.01	-.1768	.0267	.1276	-.0013	.0n10	-.0010	-6.612
.199	57.536	-.00	-.95	-.0797	.0246	.1193	-.0007	.0n10	-.0009	-3.243
.199	57.535	-.00	.10	.0113	.0237	.1118	-.0007	.0n10	-.0007	.477
.199	57.533	-.00	1.17	.1000	.0236	.1056	-.0011	.0n10	-.0009	4.232
.199	57.533	-.00	2.24	.1945	.0250	.0967	-.0009	.0n11	-.0011	7.792
.199	57.631	-.00	3.32	.2886	.0272	.0896	-.0011	.0n11	-.0006	10.606
.199	57.729	-.00	4.38	.3766	.0302	.0820	-.0010	.0n11	-.0012	12.464
.199	57.728	-.00	5.45	.4620	.0342	.0762	-.0011	.0n11	-.0009	13.516
.199	57.530	-.00	6.54	.5505	.0395	.0690	-.0014	.0n11	-.0000	13.928
.199	57.729	-.00	7.64	.6390	.0464	.0614	-.0018	.0n10	-.0006	13.760
.199	57.729	-.01	8.70	.7181	.0531	.0536	-.0020	.0n11	-.0009	13.528
.199	57.632	-.00	9.75	.7974	.0614	.0445	-.0019	.0n10	-.0007	12.987
.199	57.537	-.01	10.86	.8732	.0709	.0343	-.0019	.0n10	-.0016	12.324
.199	57.343	-.01	11.89	.9302	.0793	.0220	-.0015	.0n11	-.0008	11.725
.199	57.552	-.01	12.97	.9906	.0920	.0027	-.0013	.0n11	-.0015	10.768
.198	57.270	-.01	14.01	1.0401	.1064	-.0225	-.0012	.0n13	-.0016	9.776
.199	57.633	-.01	.10	.0043	.0234	.1124	-.0011	.0n10	-.0001	.186

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYH	CSF
.199	57.831	-.00	.11	.0101	.0237	.1117	-.0010	.0n10	-.0007
.199	57.541	-.00	-5.14	-.4457	-.0009	.1489	-.0007	.0n08	-.0009
.199	57.540	-.00	-4.09	-.3540	.0085	.1413	-.0011	.0n10	-.0008
.199	57.439	-.00	-3.06	-.2639	.0155	.1347	-.0010	.0n11	-.0009
.199	57.537	-.00	-2.01	-.1776	.0205	.1276	-.0013	.0n11	-.0010
.199	57.536	-.00	-.95	-.0800	.0232	.1193	-.0006	.0n10	-.0009
.199	57.535	-.00	.10	.0113	.0237	.1118	-.0007	.0n10	-.0007
.199	57.533	-.00	1.17	.1004	.0216	.1056	-.0012	.0n10	-.0009
.199	57.533	-.00	2.24	.1953	.0173	.0967	-.0009	.0n10	-.0011
.199	57.631	-.00	3.32	.2896	.0104	.0896	-.0012	.0n10	-.0006
.199	57.729	-.00	4.38	.3777	.0014	.0820	-.0010	.0n10	-.0012
.199	57.728	-.00	5.45	.4630	-.0098	.0762	-.0012	.0n10	-.0009
.199	57.530	-.00	6.54	.5513	-.0234	.0690	-.0015	.0n09	-.0000
.199	57.729	-.00	7.64	.6393	.0389	.0614	-.0019	.0n08	-.0006
.199	57.729	-.01	8.70	.7176	-.0561	.0536	-.0021	.0n08	-.0009
.199	57.632	-.00	9.75	.7959	-.0745	.0445	-.0020	.0n07	-.0007
.199	57.537	-.01	10.86	.8705	-.0948	.0343	-.0021	.0n07	-.0016
.199	57.343	-.01	11.89	.9262	-.1139	.0220	-.0016	.0n08	-.0008
.199	57.552	-.01	12.97	.9853	-.1326	.0027	-.0015	.0n08	-.0015
.198	57.270	-.01	14.01	1.0342	-.1484	-.0225	-.0015	.0n09	-.0016
.199	57.633	-.01	.10	.0044	.0234	.1124	-.0011	.0n10	-.0001

**UNCLASSIFIED**

**UNCLASSIFIED**

\*\*\* NASA

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 748

RUN 21

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.402	215.880	-.02	.25	.0217	.0220	.1134	-.0010	.0011	-.0012	.987
.401	214.702	-.01	-5.52	-.4946	.0405	.1534	-.0011	.0008	-.0009	-12.222
.402	216.462	-.01	-4.40	-.3915	.0340	.1453	-.0011	.0009	-.0009	-11.514
.402	216.454	-.02	-3.28	-.2936	.0290	.1383	-.0013	.0010	-.0011	-10.121
.403	216.634	-.02	-2.13	-.1904	.0253	.1301	-.0014	.0011	-.0010	-7.524
.402	216.071	-.02	-.98	-.0894	.0229	.1219	-.0016	.0011	-.0009	-3.895
.402	215.695	-.02	.19	.0165	.0220	.1138	-.0012	.0011	-.0010	.748
.402	216.248	-.02	1.38	.1237	.0224	.1054	-.0009	.0012	-.0011	5.533
.402	216.151	-.02	2.60	.2329	.0241	.0969	-.0008	.0012	-.0014	9.652
.402	215.775	-.02	3.89	.3447	.0276	.0889	-.0011	.0012	-.0014	12.510
.402	215.680	-.01	5.05	.4447	.0322	.0820	-.0015	.0012	-.0016	13.832
.402	216.144	-.01	6.24	.5452	.0380	.0753	-.0020	.0012	-.0014	14.338
.402	215.773	-.01	7.41	.6424	.0452	.0681	-.0019	.0012	-.0014	14.224
.402	215.591	-.01	8.62	.7398	.0538	.0603	-.0019	.0012	-.0012	13.756
.402	215.692	-.01	9.76	.8263	.0630	.0514	-.0018	.0012	-.0010	13.106
.402	215.718	-.01	10.85	.8929	.0732	.0387	-.0020	.0012	-.0010	12.197
.401	215.500	-.01	11.93	.9385	.0860	.0169	-.0021	.0012	-.0007	10.918
.402	216.438	-.02	.24	.0198	.0220	.1137	-.0010	.0011	-.0010	.901

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.402	215.880	-.02	.25	.0218	.0219	.1134	-.0010	.0011	-.0012
.401	214.702	-.01	-5.52	-.4960	-.0073	.1534	-.0010	.0009	-.0009
.402	216.462	-.01	-4.40	-.3929	.0039	.1453	-.0010	.0009	-.0009
.402	216.454	-.02	-3.28	-.2948	.0122	.1383	-.0012	.0011	-.0011
.403	216.634	-.02	-2.13	-.1912	.0182	.1301	-.0014	.0011	-.0010
.402	216.071	-.02	-.98	-.0897	.0214	.1219	-.0016	.0011	-.0009
.402	215.695	-.02	.19	.0165	.0219	.1138	-.0012	.0011	-.0010
.402	216.248	-.02	1.38	.1242	.0194	.1054	-.0009	.0011	-.0011
.402	216.151	-.02	2.60	.2338	.0136	.0969	-.0009	.0011	-.0014
.402	215.775	-.02	3.89	.3457	.0041	.0889	-.0011	.0011	-.0014
.402	215.680	-.01	5.05	.4458	-.0071	.0820	-.0016	.0011	-.0016
.402	216.144	-.01	6.24	.5459	-.0215	.0753	-.0021	.0010	-.0014
.402	215.773	-.01	7.41	.6426	-.0380	.0681	-.0020	.0010	-.0014
.402	215.591	-.01	8.62	.7393	-.0576	.0603	-.0021	.0009	-.0012
.402	215.692	-.01	9.76	.8247	-.0778	.0514	-.0020	.0009	-.0010
.402	215.718	-.01	10.85	.8903	-.0961	.0387	-.0022	.0009	-.0010
.401	215.500	-.01	11.93	.9355	-.1098	.0169	-.0023	.0008	-.0007
.402	216.438	-.02	.24	.0199	.0219	.1137	-.0010	.0011	-.0010

\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
G.R.O.U.P. 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 22

BALANCE 731

09/15/67

UNCLASSIFIED

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.603	425.268	-.03	.58	.0562	.0225	.1182	-.0015	.0n12	-.0014	2.495
.605	426.705	-.03	-4.91	-.4654	.0399	.1534	-.0007	.0n08	-.0004	-11.672
.604	426.174	-.03	-3.65	-.3437	.0322	.1460	-.0007	.0n09	-.0011	-10.660
.604	426.066	-.03	-2.32	-.2182	.0268	.1374	-.0014	.0n11	-.0011	-8.130
.605	426.454	-.03	-.95	-.0897	.0236	.1287	-.0018	.0n11	-.0012	-3.808
.603	425.187	-.03	.58	.0564	.0226	.1182	-.0014	.0n12	-.0015	2.499
.603	425.092	-.03	2.04	.1985	.0240	.1089	-.0013	.0n12	-.0016	8.277
.604	425.414	-.03	3.64	.3311	.0278	.1015	-.0017	.0n13	-.0017	11.919
.604	425.654	-.03	4.88	.4662	.0340	.0948	-.0017	.0n13	-.0018	13.705
.604	425.577	-.02	6.25	.5885	.0421	.0891	-.0030	.0n12	-.0014	13.985
.603	424.847	-.02	7.59	.7042	.0521	.0848	-.0031	.0n12	-.0014	13.513
.604	425.435	-.03	.58	.0559	.0226	.1182	-.0014	.0n12	-.0013	2.476

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.603	425.268	-.03	.58	.0565	.0220	.1182	-.0015	.0012	-.0014
.605	426.705	-.03	-4.91	-.4669	-.0001	.1534	-.0007	.0008	-.0004
.604	426.174	-.03	-3.65	-.3450	.0103	.1460	-.0007	.0010	-.0011
.604	426.066	-.03	-2.32	-.2190	.0180	.1374	-.0013	.0011	-.0011
.605	426.454	-.03	-.95	-.0901	.0221	.1287	-.0018	.0011	-.0012
.603	425.187	-.03	.58	.0566	.0220	.1182	-.0014	.0012	-.0015
.603	425.092	-.03	2.04	.1992	.0169	.1089	-.0014	.0012	-.0016
.604	425.414	-.03	3.64	.3321	.0078	.1015	-.0018	.0012	-.0017
.604	425.654	-.03	4.88	.4673	-.0057	.0948	-.0018	.0012	-.0018
.604	425.577	-.02	6.25	.5895	-.0222	.0891	-.0031	.0009	-.0014
.603	424.847	-.02	7.59	.7047	-.0413	.0848	-.0032	.0008	-.0014
.604	425.435	-.03	.58	.0561	.0220	.1182	-.0014	.0012	-.0013

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CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL \*\*\*

\*\*\* NASA

7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS. DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 23

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY4	CSF	L/D
.707	535.066	-.04	.99	.1089	.0248	.1208	-.0017	.0009	-.0006	4.401
.707	535.218	-.03	-2.95	-.2645	.0378	.1480	-.0007	.0005	.0004	-6.993
.708	535.758	-.04	-2.32	-.2113	.0335	.1419	-.0007	.0006	.0005	-6.313
.708	535.669	-.04	-1.59	-.1447	.0293	.1360	-.0011	.0006	.0007	4.934
.708	535.917	-.04	-.83	-.0763	.0266	.1316	-.0015	.0007	.0003	-2.864
.707	534.850	-.04	-.08	-.0019	.0251	.1270	-.0014	.0008	-.0002	-.074
.707	534.596	-.04	1.00	.1123	.0248	.1205	-.0015	.0010	-.0007	4.533
.708	535.451	-.04	1.77	.1947	.0259	.1169	-.0014	.0010	-.0008	7.511
.708	535.455	-.04	2.63	.2873	.0289	.1128	-.0018	.0011	-.0011	9.954
.708	535.346	-.03	3.48	.3762	.0344	.1077	-.0018	.0012	-.0015	10.948
.707	534.871	-.03	4.17	.4355	.0400	.1022	-.0016	.0012	-.0016	10.892
.707	534.760	-.03	4.79	.4644	.0455	.0945	-.0015	.0012	-.0015	10.206
.708	535.855	-.04	.97	.1098	.0249	.1205	-.0016	.0010	-.0009	4.405

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY4	CSF
.707	535.066	-.04	.99	.1093	.0229	.1208	-.0017	.0009	-.0006
.707	535.218	-.03	-2.95	-.2661	.0242	.1480	-.0007	.0006	.0004
.708	535.758	-.04	-2.32	-.2124	.0249	.1419	-.0007	.0006	.0005
.708	535.669	-.04	-1.59	-.1454	.0253	.1360	-.0010	.0007	.0007
.708	535.917	-.04	-.83	-.0767	.0255	.1316	-.0015	.0007	.0003
.707	534.850	-.04	-.08	-.0019	.0251	.1270	-.0014	.0008	-.0002
.707	534.596	-.04	1.00	.1127	.0228	.1205	-.0015	.0010	-.0007
.708	535.451	-.04	1.77	.1954	.0199	.1169	-.0014	.0010	-.0008
.708	535.455	-.04	2.63	.2882	.0157	.1128	-.0018	.0010	-.0011
.708	535.346	-.03	3.48	.3775	.0115	.1077	-.0019	.0011	-.0015
.707	534.871	-.03	4.17	.4372	.0082	.1022	-.0017	.0011	-.0016
.707	534.760	-.03	4.79	.4664	.0066	.0945	-.0016	.0011	-.0015
.708	535.855	-.04	.97	.1102	.0231	.1205	-.0016	.0010	-.0009

HIGH SPEED TEST 768  
**UNCLASSIFIED**

RUN 24

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.620	-.00	.05	.0424	.0224	.0495	-.0003	.0003	.0022	1.894
.200	58.032	-.00	-5.13	-.412	.0355	.0889	-.0004	.0002	.0014	-11.599
.200	58.426	-.00	-4.08	-.3171	.0305	.0807	-.0005	.0003	.0010	-10.401
.200	58.326	-.00	-3.04	-.2274	.0270	.0725	-.0005	.0003	.0016	-8.423
.201	58.523	-.00	-2.00	-.1323	.0242	.0638	-.0002	.0003	.0014	-5.460
.200	58.225	-.00	-.95	-.0439	.0229	.0566	-.0001	.0003	.0012	-1.919
.201	58.521	-.00	.04	.0413	.0223	.0491	-.0003	.0003	.0018	1.849
.201	58.619	-.00	1.18	.1407	.0229	.0408	-.0003	.0003	.0012	6.145
.200	58.321	-.00	2.25	.2324	.0244	.0331	-.0005	.0004	.0014	9.520
.200	58.320	-.00	3.33	.3257	.0272	.0262	-.0007	.0004	.0008	11.971
.200	58.319	-.00	4.40	.4156	.0306	.0195	-.0007	.0004	.0010	13.474
.200	58.220	-.00	5.47	.5022	.0351	.0124	-.0006	.0004	.0016	14.291
.200	58.120	-.00	6.56	.5937	.0410	.0054	-.0010	.0004	.0018	14.489
.200	58.220	-.00	7.65	.6777	.0479	-.0020	-.0018	.0004	.0017	14.149
.200	58.222	-.00	8.72	.7583	.0558	-.0110	-.0016	.0003	.0026	13.595
.200	58.026	-.00	9.78	.8373	.0643	-.0200	-.0015	.0004	.0026	13.032
.200	57.931	-.00	10.87	.9070	.0737	-.0302	-.0017	.0004	.0028	12.311
.199	57.738	-.00	11.91	.9682	.0835	-.0432	-.0012	.0005	.0020	11.593
.199	57.452	-.01	13.00	1.0287	.0967	-.0621	-.0010	.0006	.0024	10.642
.201	58.557	-.01	14.01	1.0815	.1121	-.0861	-.0009	.0006	.0023	9.647
.200	58.125	-.00	.05	.0416	.0222	-.0494	-.0001	.0003	.0011	1.872

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.620	-.00	.05	.0424	.0223	.0495	-.0003	.0003	.0022
.200	58.032	-.00	-5.13	-.4126	-.0015	.0889	-.0004	.0002	.0014
.200	58.426	-.00	-4.08	-.3184	.0078	.0807	-.0004	.0003	.0010
.200	58.326	-.00	-3.04	-.2285	.0149	.0725	-.0005	.0003	.0016
.201	58.523	-.00	-2.00	-.1330	.0196	.0638	-.0002	.0003	.0014
.200	58.225	-.00	-.95	-.0442	.0221	.0566	-.0001	.0003	.0012
.201	58.521	-.00	.04	.0413	.0223	.0491	-.0003	.0003	.0018
.201	58.619	-.00	1.18	.1411	.0200	.0408	-.0003	.0003	.0012
.200	58.321	-.00	2.25	.2331	.0153	.0331	-.0006	.0003	.0014
.200	58.320	-.00	3.33	.3267	.0082	.0262	-.0007	.0003	.0008
.200	58.319	-.00	4.40	.4167	-.0011	.0195	-.0007	.0003	.0010
.200	58.220	-.00	5.47	.5031	-.0129	.0124	-.0006	.0003	.0016
.200	58.120	-.00	6.56	.5944	-.0271	.0054	-.0010	.0002	.0018
.200	58.220	-.00	7.65	.6778	-.0427	-.0020	-.0018	.0001	.0017
.200	58.222	-.00	8.72	.7577	-.0597	-.0110	-.0016	.0001	.0026
.200	58.026	-.00	9.78	.8357	-.0789	-.0200	-.0015	.0002	.0026
.200	57.931	-.00	10.87	.9041	-.0986	-.0302	-.0017	.0001	.0028
.199	57.738	-.00	11.91	.9641	-.1179	-.0432	-.0013	.0002	.0020
.199	57.452	-.01	13.00	1.0234	-.1370	-.0621	-.0011	.0004	.0024
.201	58.557	-.01	14.01	1.0757	-.1529	-.0861	-.0010	.0004	.0023
.200	58.125	-.00	.05	.0416	.0222	-.0494	-.0001	.0003	.0011

**UNCLASSIFIED**

\*\*\* NASA

\*\*\* 7 X 10 FT TUNNELS

\*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 25

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.402	215.773	-.02	.14	.0498	.0206	.0505	-.0004	.0003	.0016	2.413
.402	215.801	-.01	-5.54	-.4564	.0364	.0919	-.0005	.0001	.0019	-12.527
.402	216.350	-.02	-4.43	-.3596	.0306	.0846	-.0006	.0002	.0021	-11.759
.402	216.251	-.02	-3.29	-.2568	.0260	.0756	-.0009	.0002	.0017	-9.883
.402	216.246	-.02	-2.16	-.1551	.0229	.0669	-.0008	.0002	.0017	-6.778
.402	215.870	-.02	-.99	-.0531	.0210	.0586	-.0009	.0002	.0017	-2.525
.402	215.867	-.01	.15	.0523	.0206	.0503	-.0001	.0003	.0016	2.537
.402	215.862	-.02	1.37	.1606	.0215	.0415	-.0002	.0003	.0015	7.477
.402	216.044	-.01	2.60	.2694	.0238	.0334	-.0005	.0004	.0012	11.300
.402	215.763	-.01	3.85	.3786	.0278	.0254	-.0011	.0004	.0011	13.635
.402	215.853	-.01	5.03	.4818	.0328	.0178	-.0010	.0004	.0011	14.700
.402	215.852	-.01	6.22	.5826	.0391	.0106	-.0014	.0004	.0014	14.889
.402	216.133	-.01	7.43	.6826	.0471	.0026	-.0014	.0004	.0016	14.480
.402	216.043	-.01	8.58	.7768	.0559	-.0053	-.0013	.0004	.0017	13.904
.402	215.775	-.01	9.76	.8645	.0659	-.0152	-.0017	.0005	.0016	13.109
.402	215.712	-.01	10.83	.9267	.0764	-.0272	-.0019	.0005	.0017	12.123
.402	215.869	-.01	11.91	.9718	.0896	-.0490	-.0019	.0005	.0016	10.845
.402	215.960	-.01	.14	.0510	.0206	.0503	-.0001	.0002	.0018	2.471

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.402	215.773	-.02	.14	.0499	.0205	.0505	-.0004	.0003	.0016
.402	215.801	-.01	-5.54	-.4577	-.0078	.0919	-.0005	.0001	.0019
.402	216.350	-.02	-4.43	-.3608	.0027	.0846	-.0006	.0002	.0021
.402	216.251	-.02	-3.29	-.2578	.0112	.0756	-.0009	.0003	.0017
.402	216.246	-.02	-2.16	-.1559	.0170	.0669	-.0008	.0003	.0017
.402	215.870	-.02	-.99	-.0534	.0201	.0586	-.0009	.0003	.0017
.402	215.867	-.01	.15	.0523	.0205	.0503	-.0001	.0003	.0016
.402	215.862	-.02	1.37	.1611	.0176	.0415	-.0002	.0003	.0015
.402	216.044	-.01	2.60	.2702	.0116	.0334	-.0006	.0004	.0012
.402	215.763	-.01	3.85	.3796	.0023	.0254	-.0011	.0003	.0011
.402	215.853	-.01	5.03	.4827	-.0096	.0178	-.0010	.0003	.0011
.402	215.852	-.01	6.22	.5833	-.0242	.0106	-.0014	.0002	.0014
.402	216.133	-.01	7.43	.6827	-.0415	.0026	-.0015	.0002	.0016
.402	216.043	-.01	8.58	.7762	-.0607	-.0053	-.0013	.0002	.0017
.402	215.775	-.01	9.76	.8628	-.0815	-.0152	-.0017	.0002	.0016
.402	215.712	-.01	10.83	.9240	-.0989	-.0272	-.0019	.0001	.0017
.402	215.869	-.01	11.91	.9688	-.1127	-.0490	-.0019	.0001	.0016
.402	215.960	-.01	.14	.0511	.0205	.0503	-.0001	.0002	.0018

\*\*\* NASA [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - UNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 26

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BFTA	ALPHA	CL	CD	CPK	CRM	CY <sub>M</sub>	CSF	L/D
.605	426.730	-.03	.34	.0742	.0211	.0520	-.0008	.0002	.0018	3.522
.604	426.329	-.02	-4.98	-.4320	.0364	.0896	.0001	-.0001	.0023	-11.878
.604	425.629	-.03	-3.73	-.3154	.0293	.0810	-.0003	.0000	.0020	-10.767
.605	426.686	-.03	-2.38	-.1854	.0242	.0708	-.0007	.0001	.0021	-7.659
.604	426.158	-.03	-1.04	-.0626	.0215	.0618	-.0009	.0002	.0022	-2.906
.604	425.732	-.03	.34	.0725	.0211	.0523	-.0007	.0002	.0019	3.441
.604	426.219	-.03	1.96	.2301	.0231	.0417	-.0009	.0003	.0014	9.947
.604	425.539	-.03	3.39	.3648	.0275	.0342	-.0012	.0004	.0011	13.279
.604	425.782	-.03	4.81	.4978	.0341	.0271	-.0013	.0004	.0010	14.598
.603	424.955	-.02	6.16	.6190	.0425	.0207	-.0026	.0004	.0014	14.560
.604	425.727	-.02	7.52	.7392	.0537	.0161	-.0027	.0004	.0013	13.777
.604	426.317	-.03	.34	.0734	.0211	.0521	-.0008	.0002	.0017	3.481

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.605	426.730	-.03	.34	.0743	.0206	.0520	-.0008	.0002	.0018
.604	426.329	-.02	-4.98	-.4334	-.0013	.0896	.0001	-.0001	.0023
.604	425.629	-.03	-3.73	-.3165	.0087	.0810	-.0003	.0001	.0020
.605	426.686	-.03	-2.38	-.1863	.0165	.0708	-.0007	.0001	.0021
.604	426.158	-.03	-1.04	-.0630	.0204	.0618	-.0009	.0002	.0022
.604	425.732	-.03	.34	.0726	.0206	.0523	-.0007	.0002	.0019
.604	426.219	-.03	1.96	.2307	.0152	.0417	-.0009	.0003	.0014
.604	425.539	-.03	3.39	.3657	.0059	.0342	-.0012	.0003	.0011
.604	425.782	-.03	4.81	.4988	-.0077	.0271	-.0014	.0003	.0010
.603	424.955	-.02	6.16	.6198	-.0241	.0207	-.0026	.0001	.0014
.604	425.727	-.02	7.52	.7396	-.0435	.0161	-.0028	.0001	.0013
.604	426.317	-.03	.34	.0735	.0206	.0521	-.0008	.0002	.0017

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA [REDACTED] CONFIDENTIAL

\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 27

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.708	535.325	-.03	.57	.1052	.0230	.0536	-.0012	.0003	.0014	4.569
.708	536.176	-.04	-3.04	-.2343	.0352	.0807	-.0003	-.0000	.0027	-6.651
.708	536.165	-.04	-2.43	-.1810	.0308	.0739	-.0003	.0001	.0024	-5.868
.708	535.924	-.04	-1.70	-.1171	.0272	.0683	-.0009	.0001	.0022	-4.312
.708	535.784	-.04	-.99	-.0527	.0249	.0639	-.0010	.0002	.0023	-2.117
.708	535.424	-.04	-.19	.0260	.0233	.0584	-.0010	.0002	.0017	1.120
.708	535.327	-.04	.56	.1055	.0231	.0535	-.0010	.0003	.0016	4.571
.708	535.463	-.03	1.64	.2183	.0246	.0477	-.0012	.0003	.0013	8.869
.707	535.227	-.03	2.46	.3056	.0275	.0442	-.0016	.0004	.0010	11.112
.707	535.030	-.03	3.33	.3996	.0330	.0389	-.0013	.0005	.0007	12.106
.708	535.683	-.03	4.05	.4622	.0395	.0322	-.0012	.0005	.0007	11.702
.708	535.555	-.03	4.66	.4933	.0448	.0251	-.0009	.0005	.0008	11.002
.708	535.728	-.04	.58	.1083	.0232	.0537	-.0010	.0003	.0017	4.667

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.708	535.325	-.03	.57	.1054	.0220	.0536	-.0012	.0003	.0014
.708	536.176	-.04	-3.04	-.2358	.0227	.0807	-.0003	.0000	.0027
.708	536.165	-.04	-2.43	-.1821	.0231	.0739	-.0003	.0001	.0024
.708	535.924	-.04	-1.70	-.1178	.0237	.0683	-.0009	.0002	.0022
.708	535.784	-.04	-.99	-.0531	.0240	.0639	-.0010	.0002	.0023
.708	535.424	-.04	-.19	.0260	.0233	.0584	-.0010	.0002	.0017
.708	535.327	-.04	.56	.1057	.0220	.0535	-.0011	.0003	.0016
.708	535.463	-.03	1.64	.2189	.0183	.0477	-.0012	.0003	.0013
.707	535.227	-.03	2.46	.3065	.0143	.0442	-.0016	.0003	.0010
.707	535.030	-.03	3.33	.4008	.0098	.0389	-.0013	.0004	.0007
.708	535.683	-.03	4.05	.4637	.0068	.0322	-.0012	.0004	.0007
.708	535.555	-.03	4.66	.4951	.0046	.0251	-.0009	.0004	.0008
.708	535.728	-.04	.58	.1085	.0221	.0537	-.0010	.0003	.0017

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GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 28

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.827	-.01	.02	.0135	.0274	.0447	-.0004	.0003	.0038	.491
.201	58.737	-.00	-5.22	-.4427	.0436	.0870	-.0005	.0002	.0030	-10.162
.201	58.538	-.01	-4.19	-.3525	.0384	.0782	-.0006	.0002	.0033	-9.176
.201	58.931	-.01	-3.15	-.2603	.0339	.0694	-.0006	.0003	.0039	-7.689
.201	58.732	-.01	-2.11	-.1699	.0308	.0610	-.0004	.0003	.0038	-5.516
.201	58.928	-.01	-1.06	-.0774	.0285	.0524	-.0002	.0003	.0043	-2.715
.201	58.827	-.01	.01	.0135	.0274	.0446	-.0001	.0003	.0041	.493
.202	59.024	-.01	1.07	.1052	.0273	.0367	-.0003	.0004	.0036	3.854
.202	59.121	-.01	2.14	.1989	.0284	.0287	-.0006	.0004	.0034	7.003
.201	58.824	-.01	3.23	.2933	.0306	.0217	-.0006	.0004	.0043	9.582
.201	58.822	-.01	4.29	.3800	.0336	.0141	-.0007	.0004	.0037	11.323
.201	58.722	-.01	5.36	.4684	.0375	.0084	-.0009	.0004	.0041	12.480
.201	58.722	-.01	6.45	.5608	.0432	-.0007	.0014	.0003	.0041	12.996
.201	58.822	-.01	7.53	.6409	.0493	-.0080	.0018	.0003	.0035	13.001
.201	58.822	-.01	8.60	.7246	.0566	-.0173	-.0016	.0004	.0043	12.806
.201	58.725	-.01	9.67	.8004	.0646	-.0265	-.0017	.0004	.0044	12.385
.201	58.532	-.01	10.76	.8748	.0743	-.0373	-.0016	.0005	.0036	11.778
.200	58.339	-.01	11.80	.9315	.0833	-.0508	-.0013	.0005	.0036	11.183
.200	58.351	-.01	12.89	.9857	.0958	-.0696	-.0013	.0006	.0043	10.291
.200	58.368	-.01	13.92	1.0391	.1110	-.0942	-.0011	.0006	.0039	9.357
.201	58.630	-.01	.03	.0124	.0274	.0449	-.0001	.0004	.0034	.452

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.827	-.01	.02	.0135	.0274	.0447	-.0004	.0003	.0038
.201	58.737	-.00	-5.22	-.4447	.0032	.0870	-.0004	.0002	.0030
.201	58.538	-.01	-4.19	-.3543	.0126	.0782	-.0006	.0003	.0033
.201	58.931	-.01	-3.15	-.2617	.0195	.0694	-.0006	.0003	.0039
.201	58.732	-.01	-2.11	-.1709	.0245	.0610	-.0004	.0003	.0038
.201	58.928	-.01	-1.06	-.0779	.0271	.0524	-.0002	.0003	.0043
.201	58.827	-.01	.01	.0135	.0274	.0446	-.0001	.0003	.0041
.202	59.024	-.01	1.07	.1057	.0253	.0367	-.0003	.0004	.0036
.202	59.121	-.01	2.14	.1998	.0210	.0287	-.0006	.0003	.0034
.201	58.824	-.01	3.23	.2945	.0141	.0217	-.0006	.0003	.0043
.201	58.822	-.01	4.29	.3813	.0051	.0141	-.0007	.0003	.0037
.201	58.722	-.01	5.36	.4697	-.0064	.0084	-.0009	.0003	.0041
.201	58.722	-.01	6.45	.5619	-.0201	-.0007	-.0014	.0002	.0041
.201	58.822	-.01	7.53	.6417	-.0350	-.0080	-.0018	.0001	.0035
.201	58.822	-.01	8.60	.7246	-.0524	-.0173	-.0017	.0001	.0043
.201	58.725	-.01	9.67	.7995	-.0706	-.0265	-.0017	.0001	.0044
.201	58.532	-.01	10.76	.8729	-.0903	-.0373	-.0017	.0002	.0036
.200	58.339	-.01	11.80	.9283	-.1088	-.0508	-.0013	.0003	.0036
.200	58.351	-.01	12.89	.9816	-.1264	-.0696	-.0014	.0003	.0043
.200	58.368	-.01	13.92	1.0346	-.1419	-.0942	-.0012	.0003	.0039
.201	58.630	-.01	.03	.0124	.0274	.0449	-.0001	.0004	.0034

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7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 29

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.402	215.818	-.03	.08	.0165	.0257	.0455	-.0002	.0003	.0040	.641
.401	214.837	-.03	-5.67	-.5047	.0462	.0922	-.0006	.0001	.0040	-10.913
.403	216.686	-.03	-4.58	-.4042	.0394	.0833	-.0007	.0001	.0043	-10.254
.403	216.678	-.03	-3.45	-.2999	.0340	.0736	-.0009	.0002	.0039	-8.819
.403	216.856	-.03	-2.31	-.1967	.0299	.0643	-.0006	.0002	.0040	-6.587
.403	216.754	-.03	-1.16	-.0954	.0271	.0553	-.0010	.0002	.0043	-3.525
.402	216.004	-.03	.07	.0177	.0257	.0458	-.0002	.0003	.0040	.689
.402	216.184	-.03	1.22	.1205	.0258	.0371	-.0004	.0003	.0039	.667
.402	216.363	-.03	2.42	.2262	.0272	.0287	-.0006	.0004	.0035	8.308
.402	216.172	-.03	3.69	.3374	.0303	.0206	-.0008	.0004	.0034	11.128
.402	215.887	-.02	4.87	.4408	.0345	.0130	-.0010	.0004	.0032	12.760
.402	215.888	-.02	6.06	.5390	.0404	.0057	-.0012	.0004	.0033	13.347
.402	215.888	-.02	7.27	.6392	.0476	.0024	-.0015	.0004	.0033	13.430
.402	215.705	-.02	8.44	.7360	.0560	.0108	-.0016	.0004	.0031	13.151
.402	215.809	-.02	9.59	.8192	.0653	.0206	-.0019	.0005	.0031	12.547
.401	215.467	-.02	10.67	.8792	.0752	.0331	-.0022	.0005	.0030	11.686
.401	215.440	-.02	11.75	.9263	.0887	-.0557	-.0021	.0005	.0031	10.447
.402	216.097	-.03	.05	.0149	.0257	.0458	-.0004	.0003	.0041	.581

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.402	215.818	-.03	.08	.0165	.0257	.0455	-.0002	.0003	.0040
.401	214.837	-.03	-5.67	-.5067	-.0038	.0922	-.0006	.0001	.0040
.403	216.686	-.03	-4.58	-.4060	.0070	.0833	-.0007	.0002	.0043
.403	216.678	-.03	-3.45	-.3013	.0159	.0736	-.0008	.0003	.0039
.403	216.856	-.03	-2.31	-.1977	.0219	.0643	-.0006	.0003	.0040
.403	216.754	-.03	-1.16	-.0959	.0251	.0553	-.0010	.0003	.0043
.402	216.004	-.03	.07	.0177	.0257	.0458	-.0002	.0003	.0040
.402	216.184	-.03	1.22	.1210	.0233	.0371	-.0005	.0003	.0039
.402	216.363	-.03	2.42	.2271	.0177	.0287	-.0006	.0003	.0035
.402	216.172	-.03	3.69	.3386	.0086	.0206	-.0008	.0003	.0034
.402	215.887	-.02	4.87	.4421	-.0030	.0130	-.0010	.0003	.0032
.402	215.888	-.02	6.06	.5401	-.0167	.0057	-.0013	.0003	.0033
.402	215.888	-.02	7.27	.6399	-.0337	-.0024	-.0015	.0002	.0033
.402	215.705	-.02	8.44	.7360	-.0527	-.0108	-.0016	.0002	.0031
.402	215.809	-.02	9.59	.8183	-.0720	-.0206	-.0019	.0001	.0031
.401	215.467	-.02	10.67	.8775	-.0887	-.0331	-.0022	.0001	.0030
.401	215.440	-.02	11.75	.9244	-.1017	-.0557	-.0022	.0001	.0031
.402	216.097	-.03	.05	.0149	.0257	.0458	-.0004	.0003	.0041

\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

UNCLASSIFIED  
HIGH SPEED TUNNEL

TEST 788

RUN 30

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.604	426.156	-.06	.17	.0307	.0290	.0478	-.0008	.0002	.0047	1.060
.603	424.944	-.02	-4.96	-.4005	.0568	.0966	.0012	-.0003	.0028	-7.045
.605	427.051	-.05	-3.78	-.3108	.0455	.0824	.0010	-.000	.0045	.6.834
.605	427.039	-.06	-2.55	-.2108	.0379	.0705	-.0003	.0001	.0053	.5.565
.605	427.208	-.07	-1.24	-.0978	.0321	.0589	-.0008	.0001	.0055	.3.051
.604	426.409	-.07	.17	.0307	.0290	.0480	-.0007	.0002	.0051	1.057
.605	426.701	-.06	1.64	.1686	.0285	.0377	-.0010	.0003	.0044	.5.905
.604	425.750	-.05	3.09	.3046	.0308	.0293	-.0013	.0003	.0036	.9.895
.604	425.646	-.05	4.57	.4465	.0362	.0218	-.0013	.0004	.0035	12.333
.605	426.894	-.04	5.91	.5607	.0432	.0159	-.0026	.0003	.0036	12.978
.604	425.833	-.04	7.25	.6726	.0526	.0110	-.0023	.0004	.0035	12.787
.604	426.328	-.07	.17	.0305	.0291	.0479	-.0007	.0001	.0053	1.051

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.604	426.156	-.06	.17	.0308	.0289	.0478	-.0008	.0002	.0047
.603	424.944	-.02	-4.96	-.4037	.0220	.0966	.0011	-.0004	.0028
.605	427.051	-.05	-3.78	-.3131	.0249	.0824	.0010	-.0001	.0045
.605	427.039	-.06	-2.55	-.2122	.0285	.0705	-.0003	.0001	.0053
.605	427.208	-.07	-1.24	-.0985	.0299	.0589	-.0008	.0001	.0055
.604	426.409	-.07	.17	.0308	.0289	.0480	-.0007	.0002	.0051
.605	426.701	-.06	1.64	.1693	.0237	.0377	-.0010	.0002	.0044
.604	425.750	-.05	3.09	.3058	.0143	.0293	-.0013	.0003	.0036
.604	425.646	-.05	4.57	.4479	.0005	.0218	-.0013	.0003	.0035
.605	426.894	-.04	5.91	.5620	-.0147	.0159	-.0027	.0001	.0036
.604	425.833	-.04	7.25	.6736	-.0326	.0110	-.0023	.0001	.0035
.604	426.328	-.07	.17	.0306	.0290	.0479	-.0007	.0001	.0053

UNCLASSIFIED

C \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA [REDACTED]

7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 31

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.708	536.310	-.08	.80	.1621	.0427	.0515	-.0004	.0003	.0046	3.796
.709	536.702	-.00	-1.95	-.0396	.0572	.0822	-.0006	.0005	-.0015	-.692
.708	536.231	-.05	-1.31	-.0023	.0520	.0730	-.0005	.0004	.0019	-.043
.708	535.873	-.07	-.65	.0453	.0480	.0652	-.0004	.0004	.0034	.944
.708	535.851	-.07	.12	.1066	.0450	.0579	-.0008	.0005	.0034	2.368
.708	536.162	-.08	.78	.1585	.0427	.0519	-.0004	.0003	.0047	3.707
.708	535.673	-.08	1.61	.2278	.0412	.0455	-.0006	.0002	.0047	5.527
.708	535.965	-.07	2.37	.3019	.0429	.0401	-.0010	.0003	.0040	7.042
.708	535.658	-.07	3.13	.3701	.0462	.0345	-.0010	.0003	.0035	8.004
.706	534.427	-.06	3.80	.4199	.0495	.0288	-.0008	.0004	.0033	8.485

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.708	536.310	-.08	.80	.1627	.0405	.0515	-.0004	.0003	.0046
.709	536.702	-.00	-1.95	-.0415	.0559	.0822	-.0006	.0005	-.0015
.708	536.231	-.05	-1.31	-.0034	.0519	.0730	-.0005	.0004	.0019
.708	535.873	-.07	-.65	.0447	.0485	.0652	-.0004	.0004	.0034
.708	535.851	-.07	.12	.1067	.0448	.0579	-.0008	.0005	.0034
.708	536.162	-.08	.78	.1590	.0406	.0519	-.0004	.0003	.0047
.708	535.673	-.08	1.61	.2288	.0348	.0455	-.0006	.0002	.0047
.708	535.965	-.07	2.37	.3033	.0303	.0401	-.0010	.0002	.0040
.708	535.658	-.07	3.13	.3719	.0260	.0345	-.0010	.0003	.0035
.706	534.427	-.06	3.80	.4221	.0216	.0288	-.0008	.0003	.0033

7 X 10 FT TUNNELS \*\*\* NASA

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L \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GRN UP 4 - DOWNGRADED AT 3-YR INTERVALS. DECLASSIFIED AFTER 12 YRS

~~CONFIDENTIAL~~  
~~CLASSIFIED~~

HIGH SPEED TUNNEL

TEST 788

RUN 32

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.200	58.431	-.01	.03	.0508	.0272	-.0104	-.0003	.0002	.0046	1.866
.201	58.736	-.01	-5.20	-.4098	.0411	.0334	-.0005	.0000	.0045	-9.927
.201	58.932	-.01	-4.17	-.3171	.0361	.0244	-.0003	.0001	.0044	-8.732
.202	59.227	-.01	-3.15	-.2269	.0323	.0152	.0000	.0002	.0042	-6.990
.202	59.126	-.01	-2.09	-.1340	.0295	.0070	.0001	.0002	.0048	-4.504
.202	59.322	-.01	-1.02	-.0401	.0277	-.0020	.0001	.0001	.0054	-1.447
.202	59.025	-.01	.02	.0458	.0272	-.0097	-.0002	.0002	.0053	1.687
.202	59.023	-.01	1.09	.1399	.0275	-.0183	-.0002	.0002	.0051	5.081
.202	59.022	-.01	2.16	.2374	.0292	-.0261	-.0000	.0002	.0056	8.139
.201	58.922	-.01	3.24	.3241	.0316	-.0334	-.0007	.0002	.0054	10.264
.201	58.921	-.01	4.30	.4175	.0353	-.0405	-.0004	.0002	.0052	11.841
.202	59.019	-.01	5.37	.5052	.0398	-.0481	-.0004	.0003	.0053	12.690
.201	58.821	-.01	6.47	.5934	.0453	-.0567	-.0014	.0002	.0064	13.086
.201	58.921	-.01	7.53	.6756	.0521	-.0651	-.0014	.0002	.0065	12.962
.201	58.922	-.01	8.64	.7580	.0601	-.0736	-.0014	.0003	.0044	12.612
.201	58.925	-.01	9.68	.8345	.0687	-.0842	-.0011	.0003	.0057	12.153
.201	58.829	-.01	10.77	.9072	.0783	-.0944	-.0014	.0003	.0058	11.590
.202	59.133	-.01	11.82	.9680	.0889	-.1062	-.0011	.0004	.0069	10.888
.201	58.849	-.01	12.90	1.0220	.1019	-.1258	-.0009	.0004	.0061	10.032
.202	59.065	-.01	13.93	1.0690	.1169	-.1494	-.0008	.0004	.0068	9.148
.201	58.926	-.01	.03	.0482	.0271	-.0097	-.0000	.0002	.0053	1.777

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.200	58.431	-.01	.03	.0508	.0272	-.0104	-.0003	.0002	.0046
.201	58.736	-.01	-5.20	-.4098	.0039	.0334	-.0005	.0001	.0045
.201	58.932	-.01	-4.17	-.3171	.0131	.0244	-.0003	.0001	.0044
.202	59.227	-.01	-3.15	-.2269	.0198	.0152	.0000	.0002	.0042
.202	59.126	-.01	-2.09	-.1340	.0247	.0070	.0001	.0002	.0048
.202	59.322	-.01	-1.02	-.0406	.0270	-.0020	.0001	.0001	.0054
.202	59.025	-.01	.02	.0458	.0272	-.0097	-.0002	.0002	.0053
.202	59.023	-.01	1.09	.1403	.0249	-.0183	-.0002	.0002	.0051
.202	59.022	-.01	2.16	.2383	.0202	-.0261	-.0000	.0002	.0056
.201	58.922	-.01	3.24	.3253	.0132	-.0334	-.0007	.0002	.0054
.201	58.921	-.01	4.30	.4188	.0038	-.0405	-.0005	.0002	.0052
.202	59.019	-.01	5.37	.5066	-.0076	-.0481	-.0004	.0003	.0053
.201	58.821	-.01	6.47	.5946	-.0218	-.0567	-.0014	.0000	.0064
.201	58.921	-.01	7.53	.6764	-.0369	-.0651	-.0015	.0000	.0065
.201	58.922	-.01	8.64	.7581	-.0564	-.0736	-.0014	.0001	.0044
.201	58.925	-.01	9.68	.8337	-.0725	-.0842	-.0011	.0001	.0057
.201	58.829	-.01	10.77	.9054	-.0925	-.0944	-.0014	.0000	.0058
.202	59.133	-.01	11.82	.9651	-.1111	-.1062	-.0011	.0002	.0069
.201	58.849	-.01	12.90	1.0182	-.1286	-.1258	-.0010	.0002	.0061
.202	59.065	-.01	13.93	1.0649	-.1438	-.1494	-.0009	.0002	.0068
.201	58.926	-.01	.03	.0482	.0271	-.0097	-.0000	.0002	.0053

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CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA C

\*\*\* NASA

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

TEST 788

RUN 33

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.402	216.004	-.03	.05	.0498	.0255	-.0109	-.0002	.0002	.0046	1.951
.402	215.951	-.03	-5.69	-.4703	.0437	.0381	-.0005	-.0000	.0050	-10.764
.402	216.406	-.03	-4.61	-.3724	.0376	.0284	-.0005	.0000	.0052	-9.918
.402	216.490	-.03	-3.47	-.2672	.0323	.0178	-.0006	.0001	.0047	-8.273
.402	216.575	-.03	-2.33	-.1643	.0286	.0081	-.0007	.0001	.0050	-5.739
.402	216.102	-.03	-1.16	-.0615	.0263	-.0010	-.0008	.0001	.0047	-2.338
.402	215.910	-.03	.05	.0501	.0255	-.0107	-.0001	.0002	.0050	1.969
.402	216.276	-.03	1.21	.1538	.0260	.0194	-.0001	.0002	.0048	5.917
.402	216.177	-.03	2.41	.2604	.0279	-.0278	-.0004	.0002	.0046	9.333
.402	215.892	-.03	3.67	.3703	.0314	-.0362	-.0006	.0003	.0042	11.783
.402	215.702	-.03	4.84	.4736	.0362	-.0438	-.0009	.0003	.0038	13.080
.402	216.446	-.03	6.06	.5754	.0427	-.0519	-.0012	.0003	.0039	13.474
.402	216.447	-.03	7.23	.6719	.0501	-.0607	-.0011	.0004	.0041	13.401
.402	215.894	-.03	8.41	.7654	.0589	-.0692	-.0013	.0004	.0041	12.999
.402	215.721	-.03	9.55	.8505	.0688	-.0792	-.0017	.0004	.0041	12.358
.401	215.568	-.02	10.64	.9122	.0796	-.0908	-.0021	.0004	.0039	11.460
.401	215.168	-.02	11.71	.9553	.0926	-.1132	-.0019	.0004	.0042	10.314
.402	215.910	-.03	.06	.0504	.0255	-.0106	-.0003	.0002	.0049	1.976

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.402	216.004	-.03	.05	.0498	.0255	-.0109	-.0002	.0002	.0046
.402	215.951	-.03	-5.69	-.4722	-.0032	.0381	-.0005	.0000	.0050
.402	216.406	-.03	-4.61	-.3742	.0075	.0284	-.0005	.0001	.0052
.402	216.490	-.03	-3.47	-.2686	.0161	.0178	-.0006	.0002	.0047
.402	216.575	-.03	-2.33	-.1653	.0219	.0081	-.0007	.0002	.0050
.402	216.102	-.03	-1.16	-.0620	.0250	-.0010	-.0008	.0002	.0047
.402	215.910	-.03	.05	.0502	.0254	-.0107	-.0001	.0002	.0050
.402	216.276	-.03	1.21	.1543	.0227	-.0194	-.0001	.0002	.0048
.402	216.177	-.03	2.41	.2612	.0169	-.0278	-.0004	.0002	.0046
.402	215.892	-.03	3.67	.3714	.0077	-.0362	-.0007	.0002	.0042
.402	215.702	-.03	4.84	.4749	-.0039	-.0438	-.0009	.0003	.0038
.402	216.446	-.03	6.06	.5765	-.0183	-.0519	-.0012	.0002	.0039
.402	216.447	-.03	7.23	.6727	-.0348	-.0607	-.0011	.0002	.0041
.402	215.894	-.03	8.41	.7655	-.0536	-.0692	-.0013	.0002	.0041
.402	215.721	-.03	9.55	.8497	-.0731	-.0792	-.0018	.0001	.0041
.401	215.568	-.02	10.64	.9107	-.0901	-.0908	-.0021	-.0000	.0039
.401	215.168	-.02	11.71	.9537	-.1031	-.1132	-.0019	-.0000	.0042
.402	215.910	-.03	.06	.0504	.0255	-.0106	-.0003	.0002	.0049

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
[REDACTED] UPGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

TEST 788

RUN 34

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.604	426.409	-.07	.14	.0643	.0287	-.0123	-.0006	.0001	.0055	2.245
.604	426.447	-.06	-3.81	-.2850	.0434	.0237	.0006	-.0001	.0054	-6.564
.604	425.773	-.08	-2.58	-.1828	.0361	.0110	-.0004	-.0000	.0066	-5.063
.604	426.208	-.07	-1.29	-.0686	.0312	-.0006	-.0006	.0000	.0060	-2.200
.604	425.993	-.07	.14	.0655	.0287	.0126	-.0002	.0001	.0059	2.286
.604	426.368	-.07	1.64	.2043	.0288	-.0225	-.0010	.0002	.0053	7.084
.604	426.169	-.06	3.05	.3381	.0317	-.0308	-.0011	.0002	.0045	10.657
.603	425.316	-.06	4.52	.4764	.0374	-.0386	-.0013	.0003	.0043	12.721
.603	425.316	-.05	5.82	.5890	.0448	-.0450	-.0024	.0003	.0046	13.145
.604	425.646	-.05	7.24	.7268	.0558	-.0500	-.0027	.0003	.0042	13.027
.604	426.492	-.07	.13	.0628	.0286	-.0120	-.0004	.0001	.0060	2.195

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.604	426.409	-.07	.14	.0644	.0285	-.0123	-.0006	.0001	.0055
.604	426.447	-.06	-3.81	-.2872	.0244	.0237	.0006	-.0002	.0054
.604	425.773	-.08	-2.58	-.1842	.0278	.0110	-.0004	-.0000	.0066
.604	426.208	-.07	-1.29	-.0693	.0296	-.0006	-.0006	.0000	.0060
.604	425.993	-.07	.14	.0656	.0285	.0126	-.0002	.0001	.0059
.604	426.368	-.07	1.64	.2050	.0230	-.0225	-.0010	.0001	.0053
.604	426.169	-.06	3.05	.3393	.0137	-.0308	-.0011	.0002	.0045
.603	425.316	-.06	4.52	.4778	-.0002	-.0386	-.0013	.0002	.0043
.603	425.316	-.05	5.82	.5903	-.0152	-.0450	-.0024	.0000	.0046
.604	425.646	-.05	7.24	.7278	-.0363	-.0500	-.0027	.0000	.0042
.604	426.492	-.07	.13	.0628	.0285	-.0120	-.0004	.0001	.0060

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 35

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.708	535.834	-.09	.69	.1854	.0427	-.0101	-.0005	.0002	.0051	4.347
.709	536.595	.01	-2.00	-.0117	.0558	.0207	-.0007	.0004	-.0024	.210
.709	536.685	-.05	-1.41	.0250	.0512	.0114	-.0008	.0003	.0023	.488
.709	537.125	-.08	-.70	.0768	.0475	.0035	-.0005	.0002	.0044	1.617
.708	536.546	-.08	.09	.1371	.0445	-.0045	-.0008	.0003	.0042	3.081
.708	535.958	-.09	.82	.1934	.0419	-.0111	-.0003	.0002	.0057	4.612
.708	536.210	-.09	1.53	.2559	.0416	-.0163	-.0005	.0001	.0057	6.156
.708	535.779	-.08	2.26	.3257	.0429	-.0217	-.0007	.0001	.0050	7.587
.708	535.636	-.08	3.05	.4010	.0467	-.0281	-.0008	.0002	.0047	8.581
.708	535.609	-.07	3.69	.4469	.0508	-.0341	-.0008	.0002	.0044	8.794

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.708	535.834	-.09	.69	.1859	.0404	-.0101	-.0005	.0002	.0051
.709	536.595	.01	-2.00	-.0136	.0554	.0207	-.0007	.0004	-.0024
.709	536.685	-.05	-1.41	.0237	.0518	.0114	-.0008	.0003	.0023
.709	537.125	-.08	-.70	.0762	.0485	.0035	-.0005	.0002	.0044
.708	536.546	-.08	.09	.1372	.0443	-.0045	-.0008	.0003	.0042
.708	535.958	-.09	.82	.1939	.0392	-.0111	-.0003	.0002	.0057
.708	536.210	-.09	1.53	.2569	.0347	-.0163	-.0005	.0001	.0057
.708	535.779	-.08	2.26	.3270	.0301	-.0217	-.0007	.0001	.0050
.708	535.636	-.08	3.05	.4028	.0253	-.0281	-.0008	.0002	.0047
.708	535.609	-.07	3.69	.4491	.0220	-.0341	-.0008	.0002	.0044

7 X 10 FT TUNNELS \*\*\* NASA

\*\*\* NASA [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 36

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.201	58.718	-.01	.05	.0828	.0224	-.0072	-.0002	.0003	.0021	3.693
.200	58.229	-.00	-5.17	-.3738	.0332	.0341	-.0003	.0001	.0018	-11.260
.200	58.228	-.00	-4.14	-.2836	.0290	.0253	-.0003	.0001	.0023	-9.773
.201	58.622	-.00	-3.09	-.1932	.0255	.0178	.0001	.0002	.0021	-7.583
.201	58.522	-.01	-2.05	-.1005	.0235	.0085	.0001	.0002	.0023	-4.267
.201	58.521	-.00	-.99	-.0087	.0222	.0019	-.0004	.0002	.0018	-.391
.200	58.421	-.01	.05	.0810	.0222	-.0068	-.0001	.0003	.0021	3.644
.201	58.519	-.01	1.14	.1760	.0233	-.0151	-.0001	.0003	.0029	7.552
.200	58.419	-.01	2.21	.2683	.0249	-.0224	-.0004	.0003	.0029	10.752
.201	58.517	-.01	3.28	.3597	.0281	-.0298	-.0007	.0003	.0029	12.780
.200	58.319	-.01	4.35	.4475	.0320	-.0367	-.0006	.0003	.0036	13.964
.200	58.021	-.01	5.42	.5398	.0371	-.0446	-.0006	.0004	.0034	14.554
.201	58.515	-.01	6.52	.6349	.0438	-.0537	-.0010	.0003	.0038	14.503
.200	58.319	-.01	7.60	.7143	.0510	-.0606	-.0017	.0003	.0042	14.005
.200	58.320	-.01	8.67	.7975	.0592	-.0703	-.0016	.0003	.0039	13.474
.200	58.421	-.01	9.74	.8746	.0682	-.0797	-.0015	.0004	.0033	12.825
.201	58.524	-.01	10.83	.9439	.0777	-.0889	-.0014	.0004	.0038	12.142
.200	58.333	-.01	11.89	1.0111	.0893	-.1014	-.0012	.0004	.0037	11.324
.200	58.346	-.01	12.99	1.0607	.1022	-.1192	-.0012	.0004	.0039	10.377
.200	58.263	-.01	13.99	1.1117	.1173	-.1427	-.0006	.0004	.0050	9.479
.201	58.520	-.01	.06	.0797	.0221	-.0064	-.0000	.0003	.0025	3.603

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.201	58.718	-.01	.05	.0828	.0223	-.0072	-.0002	.0003	.0021
.200	58.229	-.00	-5.17	-.3752	-.0006	.0341	-.0003	.0001	.0018
.200	58.228	-.00	-4.14	-.2849	.0085	.0253	-.0003	.0001	.0023
.201	58.622	-.00	-3.09	-.1942	.0150	.0178	.0002	.0002	.0021
.201	58.522	-.01	-2.05	-.1012	.0199	.0085	.0001	.0002	.0023
.201	58.521	-.00	-.99	-.0091	.0221	.0019	-.0004	.0003	.0018
.200	58.421	-.01	.05	.0810	.0221	-.0068	-.0001	.0003	.0021
.201	58.519	-.01	1.14	.1764	.0198	-.0151	-.0001	.0003	.0029
.200	58.419	-.01	2.21	.2690	.0146	-.0224	-.0004	.0003	.0029
.201	58.517	-.01	3.28	.3606	.0075	-.0298	-.0007	.0002	.0029
.200	58.319	-.01	4.35	.4485	-.0020	.0367	-.0006	.0002	.0036
.200	58.021	-.01	5.42	.5408	-.0141	-.0446	-.0006	.0003	.0034
.201	58.515	-.01	6.52	.6355	-.0285	-.0537	-.0010	.0002	.0038
.200	58.319	-.01	7.60	.7145	-.0438	-.0606	-.0017	.0001	.0042
.200	58.320	-.01	8.67	.7970	-.0617	-.0703	-.0016	.0000	.0039
.200	58.421	-.01	9.74	.8731	-.0806	-.0797	-.0015	.0001	.0033
.201	58.524	-.01	10.83	.9412	-.1008	-.0889	-.0014	.0001	.0038
.200	58.333	-.01	11.89	1.0072	-.1209	-.1014	-.0013	.0002	.0037
.200	58.346	-.01	12.99	1.0588	-.1386	-.1192	-.0013	.0001	.0039
.200	58.263	-.01	13.99	1.1063	-.1548	-.1427	-.0007	.0003	.0050
.201	58.520	-.01	.06	.0797	.0220	-.0064	-.0000	.0003	.0025

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\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 37

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYH	CSF	L/D
.402	216.239	-.02	.12	.0867	.0204	-.0072	-.0003	.0002	.0023	4.245
.402	216.268	-.02	-5.63	-.4288	.0346	.0377	-.0006	.0000	.0027	-12.410
.403	216.631	-.02	-4.52	-.3311	.0290	.0288	-.0005	.0001	.0027	-11.406
.402	216.531	-.02	-3.39	-.2284	.0247	.0192	-.0005	.0001	.0026	-9.231
.402	216.062	-.02	-2.23	-.1244	.0219	.0104	-.0007	.0002	.0025	-5.681
.402	215.964	-.02	-1.08	-.0213	.0205	.0017	-.0004	.0002	.0024	-1.039
.402	216.424	-.02	.13	.0888	.0204	-.0073	-.0001	.0002	.0026	4.357
.402	215.955	-.02	1.31	.1949	.0216	-.0162	-.0001	.0003	.0024	9.016
.402	215.765	-.02	2.54	.3038	.0244	-.0244	-.0004	.0003	.0028	12.454
.402	215.947	-.02	3.77	.4123	.0286	-.0325	-.0007	.0003	.0023	14.397
.402	215.758	-.02	4.96	.5152	.0341	-.0397	-.0006	.0004	.0024	15.128
.402	215.943	-.02	6.14	.6142	.0408	-.0479	-.0011	.0004	.0024	15.063
.402	216.039	-.02	7.34	.7135	.0491	-.0564	-.0013	.0003	.0025	14.521
.402	215.765	-.02	8.52	.8091	.0586	-.0652	-.0014	.0004	.0025	13.813
.402	215.871	-.02	9.66	.8933	.0689	-.0745	-.0016	.0004	.0026	12.968
.402	215.714	-.02	10.74	.9595	.0800	-.0859	-.0019	.0004	.0025	11.997
.402	215.871	-.01	11.82	1.0034	.0932	-.1071	-.0021	.0004	.0024	10.763
.402	216.331	-.02	.14	.0885	.0204	-.0074	-.0004	.0002	.0023	4.345

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYH	CSF
.402	216.239	-.02	.12	.0867	.0202	-.0072	-.0003	.0002	.0023
.402	216.268	-.02	-5.63	-.4300	-.0077	.0377	-.0006	.0001	.0027
.403	216.631	-.02	-4.52	-.3323	.0028	.0288	-.0005	.0001	.0027
.402	216.531	-.02	-3.39	-.2294	.0112	.0192	-.0005	.0002	.0026
.402	216.062	-.02	-2.23	-.1252	.0170	.0104	-.0007	.0002	.0025
.402	215.964	-.02	-1.08	-.0216	.0200	.0017	-.0004	.0002	.0024
.402	216.424	-.02	.13	.0888	.0202	-.0073	-.0001	.0002	.0026
.402	215.955	-.02	1.31	.1953	.0172	-.0162	-.0001	.0003	.0024
.402	215.765	-.02	2.54	.3045	.0109	-.0244	-.0004	.0003	.0025
.402	215.947	-.02	3.77	.4133	.0015	-.0325	-.0007	.0002	.0023
.402	215.758	-.02	4.96	.5161	-.0106	-.0397	-.0006	.0003	.0024
.402	215.943	-.02	6.14	.6148	-.0251	-.0479	-.0011	.0002	.0024
.402	216.039	-.02	7.34	.7137	-.0424	-.0564	-.0014	.0002	.0025
.402	215.765	-.02	8.52	.8086	-.0619	-.0652	-.0014	.0002	.0025
.402	215.871	-.02	9.66	.8918	-.0819	-.0745	-.0016	.0001	.0026
.402	215.714	-.02	10.74	.9571	-.1002	-.0859	-.0020	.0000	.0025
.402	215.871	-.01	11.82	1.0006	-.1141	-.1071	-.0021	-.0000	.0024
.402	216.331	-.02	.14	.0885	.0202	-.0074	-.0004	.0002	.0023

~~UNCLASSIFIED~~

\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

UNCL

HIGH SPEED TUNNEL

TEST 788

RUN 38

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.604	426.073	-.04	.32	.1130	.0207	-.0091	-.0004	.0002	.0024	5.458
.604	426.046	-.03	-3.81	-.2873	.0277	.0215	-.0005	-.0000	.0028	-10.376
.604	426.273	-.04	-2.52	.1603	.0232	.0114	-.0006	.0000	.0030	-6.923
.603	425.418	-.04	-1.16	-.0329	.0208	.0017	-.0007	.0001	.0026	-1.582
.604	426.319	-.04	.32	.1118	.0207	-.0090	-.0007	.0002	.0023	5.392
.604	426.136	-.03	1.83	.2564	.0231	-.0186	-.0009	.0003	.0021	11.079
.603	425.122	-.03	3.24	.3922	.0278	-.0266	-.0010	.0003	.0021	14.113
.604	426.029	-.03	4.68	.5283	.0349	-.0340	-.0011	.0004	.0020	15.144
.604	426.366	-.03	6.06	.6527	.0441	-.0411	-.0023	.0003	.0022	14.801
.604	425.870	-.03	7.43	.7836	.0559	-.0460	-.0026	.0004	.0023	14.023
.604	426.067	-.04	.31	.1110	.0207	-.0087	-.0005	.0002	.0025	5.360

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.604	426.073	-.04	.32	.1131	.0201	-.0091	-.0004	.0002	.0024
.604	426.046	-.03	-3.81	-.2884	.0085	.0215	-.0005	-.0000	.0028
.604	426.273	-.04	-2.52	.1612	.0161	.0114	-.0006	.0001	.0030
.603	425.418	-.04	-1.16	-.0334	.0202	.0017	-.0007	.0001	.0026
.604	426.319	-.04	.32	.1119	.0201	-.0090	-.0007	.0002	.0023
.604	426.136	-.03	1.83	.2570	.0150	-.0186	-.0009	.0002	.0021
.603	425.122	-.03	3.24	.3931	.0056	-.0266	-.0010	.0003	.0021
.604	426.029	-.03	4.68	.5292	-.0083	-.0340	-.0011	.0003	.0020
.604	426.366	-.03	6.06	.6536	-.0251	-.0411	-.0024	.0001	.0022
.604	425.870	-.03	7.43	.7839	-.0459	-.0460	-.0026	.0000	.0023
.604	426.067	-.04	.31	.1111	.0201	-.0087	-.0005	.0002	.0025

CON \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

\*\*\* NASA

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 39

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYH	CSF	L/D
.708	535.566	-.04	.48	.1377	.0227	-.0096	-.0010	.0002	.0023	6.061
.708	535.841	-.05	-2.57	-.1604	.0299	.0126	-.0005	-.0000	.0034	-5.371
.708	536.006	-.05	-1.89	-.0981	.0266	.0068	-.0006	.0000	.0033	-3.689
.708	535.777	-.05	-1.17	-.0323	.0241	.0015	-.0008	.0001	.0029	-1.338
.708	535.659	-.04	.36	.0494	.0227	-.0043	-.0010	.0001	.0025	2.176
.707	535.397	-.04	.57	.1459	.0228	-.0099	-.0010	.0002	.0023	6.401
.707	535.379	-.04	1.46	.2380	.0243	-.0146	-.0012	.0002	.0020	9.780
.708	535.678	-.04	2.34	.3340	.0275	-.0189	-.0013	.0003	.0019	12.146
.707	534.460	-.04	3.18	.4256	.0329	-.0243	-.0013	.0004	.0016	12.930
.708	535.498	-.04	3.89	.4913	.0398	-.0309	-.0013	.0004	.0015	12.341
.708	535.855	-.04	4.51	.5228	.0458	-.0387	-.0010	.0004	.0015	11.422
.708	536.106	-.04	.66	.1551	.0230	-.0105	-.0011	.0002	.0022	6.734

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYH	CSF
.708	535.566	-.04	.48	.1378	.0216	-.0096	-.0010	.0002	.0023
.708	535.841	-.05	-2.57	-.1616	.0227	.0126	-.0005	-.0000	.0034
.708	536.006	-.05	-1.89	-.0989	.0233	.0068	-.0006	.0000	.0033
.708	535.777	-.05	-1.17	-.0327	.0234	.0015	-.0008	.0001	.0029
.708	535.659	-.04	.36	.0493	.0230	-.0043	-.0010	.0001	.0025
.707	535.397	-.04	.57	.1461	.0213	-.0099	-.0010	.0002	.0023
.707	535.379	-.04	1.46	.2385	.0183	-.0146	-.0012	.0002	.0020
.708	535.678	-.04	2.34	.3347	.0138	-.0189	-.0013	.0002	.0019
.707	534.460	-.04	3.18	.4267	.0093	-.0243	-.0013	.0003	.0016
.708	535.498	-.04	3.89	.4928	.0064	-.0309	-.0013	.0003	.0015
.708	535.855	-.04	4.51	.5246	.0046	-.0387	-.0010	.0003	.0015
.708	536.106	-.04	.66	.1554	.0212	-.0105	-.0011	.0002	.0022

UNCLASSIFIED

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\* \* 7 X 10 FT TUNNELS \*\*\* NASA \*

\*\*\* NASA C \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

~~UNCLASSIFIED~~

TEST 788

RUN 40

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.200	58.233	-.01	.02	.0371	.0274	.0140	-.0003	.0004	.0017	1.355
.200	58.142	-.00	-5.21	-.4201	.0417	.0568	.0002	.0003	.0026	-10.069
.201	58.635	-.01	-4.20	-.3296	.0369	.0478	.0001	.0003	.0023	-8.922
.201	58.732	-.00	-3.15	-.2367	.0329	.0385	-.0001	.0004	.0018	-7.188
.200	58.335	-.00	-2.11	-.1477	.0301	.0303	-.0002	.0004	.0015	-4.902
.201	58.432	-.00	-1.07	-.0559	.0283	.0217	-.0003	.0004	.0015	-1.979
.200	58.332	-.01	.02	.0347	.0274	.0141	-.0000	.0004	.0028	1.266
.201	58.826	-.01	1.06	.1267	.0279	.0060	-.0001	.0005	.0026	4.547
.200	58.330	-.01	2.12	.2174	.0289	-.0015	-.0003	.0005	.0021	7.511
.200	58.329	-.01	3.20	.3094	.0314	-.0092	-.0005	.0005	.0022	9.842
.200	58.130	-.01	4.26	.3994	.0349	.0169	-.0005	.0005	.0020	11.458
.200	58.228	-.01	5.35	.4924	.0395	-.0243	-.0005	.0005	.0016	12.460
.201	58.624	-.01	6.45	.5799	.0451	-.0325	-.0010	.0005	.0016	12.848
.200	58.328	-.01	7.52	.6640	.0520	-.0407	-.0012	.0005	.0019	12.761
.201	58.824	-.01	8.61	.7472	.0597	-.0498	-.0012	.0005	.0016	12.508
.201	58.925	-.01	9.65	.8152	.0673	-.0587	-.0015	.0005	.0013	12.107
.201	58.533	-.00	10.74	.8855	.0767	-.0688	-.0015	.0005	.0013	11.551
.200	58.343	-.00	11.79	.9455	.0870	-.0808	-.0014	.0005	.0010	10.873
.201	58.651	-.01	12.88	1.0048	.1000	-.0998	-.0011	.0006	.0026	10.046
.199	57.776	-.01	13.87	1.0478	.1137	-.1221	-.0010	.0006	.0020	9.214
.201	58.827	-.00	.02	.0345	.0275	.0149	-.0000	.0004	.0013	1.254

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.200	58.233	-.01	.02	.0371	.0273	.0140	-.0003	.0004	.0017
.200	58.142	-.00	-5.21	-.4221	.0034	.0568	.0002	.0002	.0026
.201	58.635	-.01	-4.20	-.3314	.0127	.0478	.0001	.0003	.0023
.201	58.732	-.00	-3.15	-.2381	.0199	.0385	-.0001	.0004	.0018
.200	58.335	-.00	-2.11	-.1487	.0247	.0303	-.0002	.0004	.0015
.201	58.432	-.00	-1.07	-.0564	.0272	.0217	-.0002	.0004	.0015
.200	58.332	-.01	.02	.0347	.0274	.0141	-.0000	.0004	.0028
.201	58.826	-.01	1.06	.1272	.0255	.0060	-.0001	.0005	.0026
.200	58.330	-.01	2.12	.2183	.0209	-.0015	-.0004	.0004	.0021
.200	58.329	-.01	3.20	.3106	.0141	-.0092	-.0006	.0004	.0022
.200	58.130	-.01	4.26	.4008	.0051	-.0169	-.0005	.0004	.0020
.200	58.228	-.01	5.35	.4938	-.0066	-.0243	-.0005	.0005	.0016
.201	58.624	-.01	6.45	.5811	-.0203	-.0325	-.0011	.0004	.0016
.200	58.328	-.01	7.52	.6649	-.0353	-.0407	-.0013	.0003	.0019
.201	58.824	-.01	8.61	.7474	-.0528	-.0498	-.0012	.0003	.0016
.201	58.925	-.01	9.65	.8146	-.0702	-.0587	-.0016	.0002	.0013
.201	58.533	-.00	10.74	.8839	-.0896	-.0688	-.0015	.0002	.0013
.200	58.343	-.00	11.79	.9428	-.1080	-.0808	-.0014	.0003	.0010
.201	58.651	-.01	12.88	1.0012	-.1263	-.0998	-.0011	.0003	.0026
.199	57.776	-.01	13.87	1.0437	-.1406	-.1221	-.0012	.0004	.0020
.201	58.827	-.00	.02	.0345	.0275	.0149	-.0000	.0004	.0013

~~UNCLASSIFIED~~

\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 41

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYH	CSF	L/D
.402	215.707	-.03	.05	.0368	.0257	.0148	-.0004	.0003	.0034	1.434
.401	215.100	-.02	-5.68	-.4762	.0448	.0611	-.0001	.0003	.0028	-10.633
.402	215.275	-.02	-4.59	-.3779	.0383	.0514	-.0002	.0003	.0025	-9.856
.402	216.010	-.02	-3.48	-.2782	.0333	.0421	-.0001	.0004	.0028	-8.364
.402	215.721	-.02	-2.33	-.1745	.0292	.0325	-.0000	.0003	.0029	-5.975
.402	215.249	-.02	-1.18	-.0704	.0267	.0236	-.0002	.0003	.0031	-2.632
.401	215.148	-.03	.06	.0394	.0256	.0146	-.0002	.0003	.0038	1.538
.402	215.514	-.03	1.18	.1387	.0259	.0064	-.0005	.0004	.0033	5.347
.402	215.322	-.03	2.39	.2476	.0277	-.0024	-.0007	.0005	.0032	8.928
.402	215.595	-.03	3.65	.3580	.0310	-.0105	-.0009	.0005	.0032	11.540
.401	215.127	-.02	4.86	.4613	.0358	-.0184	-.0009	.0005	.0026	12.895
.401	214.848	-.02	6.03	.5587	.0418	-.0261	-.0011	.0005	.0024	13.358
.402	215.315	-.02	7.24	.6565	.0493	-.0347	-.0012	.0005	.0025	13.321
.402	215.318	-.02	8.40	.7505	.0576	-.0435	-.0014	.0005	.0023	13.020
.401	214.493	-.02	9.54	.8341	.0672	-.0534	-.0016	.0005	.0022	12.422
.402	215.549	-.02	10.63	.8936	.0776	-.0654	-.0019	.0005	.0023	11.521
.401	215.057	-.02	11.72	.9395	.0909	-.0872	-.0018	.0005	.0022	10.334
.402	215.242	-.03	.06	.0394	.0257	.0146	-.0003	.0003	.0036	1.532

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYH	CSF
.402	215.707	-.03	.05	.0368	.0256	.0148	-.0004	.0003	.0034
.401	215.100	-.02	-5.68	-.4782	-.0026	.0611	-.0001	.0003	.0028
.402	215.275	-.02	-4.59	-.3797	.0080	.0514	-.0001	.0003	.0025
.402	216.010	-.02	-3.48	-.2796	.0163	.0421	-.0001	.0004	.0028
.402	215.721	-.02	-2.33	-.1755	.0221	.0325	-.0000	.0003	.0029
.402	215.249	-.02	-1.18	-.0709	.0253	.0236	-.0002	.0003	.0031
.401	215.148	-.03	.06	.0394	.0256	.0146	-.0002	.0003	.0038
.402	215.514	-.03	1.18	.1392	.0231	.0064	-.0005	.0004	.0033
.402	215.322	-.03	2.39	.2485	.0174	-.0024	-.0007	.0004	.0032
.402	215.595	-.03	3.65	.3592	.0082	-.0105	-.0009	.0004	.0032
.401	215.127	-.02	4.86	.4626	-.0034	.0184	-.0009	.0004	.0026
.401	214.848	-.02	6.03	.5598	-.0171	.0261	-.0012	.0004	.0024
.402	215.315	-.02	7.24	.6572	-.0339	-.0347	-.0013	.0003	.0025
.402	215.318	-.02	8.40	.7506	-.0526	-.0435	-.0014	.0003	.0023
.401	214.493	-.02	9.54	.8333	-.0720	-.0534	-.0017	.0002	.0022
.402	215.549	-.02	10.63	.8921	-.0885	-.0654	-.0020	.0001	.0023
.401	215.057	-.02	11.72	.9378	-.1016	-.0872	-.0018	.0002	.0022
.402	215.242	-.03	.06	.0394	.0257	.0146	-.0003	.0003	.0036

UNCLASSIFIED

UNCLASSIFIED

\*\*\* NASA [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - UPGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 42

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.603	423.362	-.06	.18	.0566	.0286	.0141	-.0003	.0003	.0044	1.976
.604	424.665	-.04	-3.82	-.2944	.0445	.0491	.0009	-.0002	.0045	-6.611
.605	425.403	-.06	-2.58	-.1890	.0368	.0359	.0001	-.0001	.0057	-5.138
.604	424.414	-.06	-1.27	-.0738	.0314	.0248	.0000	-.0000	.0053	-2.350
.603	424.029	-.06	.20	.0587	.0288	.0140	-.0002	.0000	.0054	2.039
.603	423.983	-.06	1.64	.1932	.0286	.0041	-.0003	.0001	.0052	6.761
.603	423.207	-.06	3.05	.3267	.0315	-.0038	-.0004	.0002	.0048	10.387
.601	421.182	-.06	4.46	.4533	.0363	-.0113	-.0007	.0003	.0039	12.503
.605	425.715	-.05	5.82	.5750	.0443	-.0175	-.0023	.0002	.0038	12.984
.603	423.793	-.04	7.23	.7103	.0545	-.0221	-.0025	.0003	.0033	13.037
.605	425.723	-.07	.18	.0533	.0290	.0149	-.0003	.0001	.0059	1.841

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.603	423.362	-.06	.18	.0567	.0284	.0141	-.0003	.0003	.0044
.604	424.665	-.04	-3.82	-.2967	.0248	.0491	.0008	-.0003	.0045
.605	425.403	-.06	-2.58	-.1904	.0282	.0359	.0001	-.0001	.0057
.604	424.414	-.06	-1.27	-.0745	.0298	.0248	.0000	-.0000	.0053
.603	424.029	-.06	.20	.0588	.0286	.0140	-.0002	.0000	.0054
.603	423.983	-.06	1.64	.1939	.0230	.0041	-.0003	.0001	.0052
.603	423.207	-.06	3.05	.3278	.0140	-.0038	-.0004	.0002	.0048
.601	421.182	-.06	4.46	.4547	.0009	-.0113	-.0007	.0003	.0039
.605	425.715	-.05	5.82	.5764	-.0143	-.0175	-.0023	.0000	.0038
.603	423.793	-.04	7.23	.7112	-.0353	-.0221	-.0025	-.0000	.0033
.605	425.723	-.07	.18	.0534	.0288	.0149	-.0003	.0001	.0059

[REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA

7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3 YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 43

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.708	534.207	-.10	.82	.1839	.0423	.0165	.0002	.0001	.0059	6.350
.709	535.687	.02	-1.98	-.0228	.0566	.0480	-.0005	.0004	-.0026	-.403
.708	535.221	-.05	-1.39	.0137	.0516	.0387	-.0007	.0002	.0023	.265
.709	536.046	-.08	.70	.0637	.0479	.0312	-.0003	.0002	.0042	1.329
.709	535.471	-.08	.06	.1219	.0451	.0238	-.0004	.0004	.0039	2.704
.709	535.450	-.09	.83	.1838	.0428	.0167	-.0003	.0002	.0053	4.299
.708	535.290	-.09	1.55	.2452	.0418	.0113	-.0000	.0001	.0059	5.865
.708	535.186	-.09	2.27	.3134	.0434	.0064	-.0005	.0001	.0056	7.221
.709	535.432	-.08	3.03	.3820	.0468	.0002	-.0005	.0002	.0047	8.158
.709	535.753	-.07	3.68	.4247	.0514	-.0071	-.0006	.0003	.0041	8.257
.708	534.468	-.07	4.28	.4532	.0547	-.0139	-.0005	.0003	.0036	8.286
.708	535.127	-.09	.82	.1821	.0428	.0166	-.0000	.0002	.0053	4.259

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.708	534.207	-.10	.82	.1844	.0396	.0165	.0002	.0001	.0059
.709	535.687	.02	-1.98	-.0247	.0557	.0480	-.0005	.0004	-.0026
.708	535.221	-.05	-1.39	.0124	.0519	.0387	-.0007	.0003	.0023
.709	536.046	-.08	.70	.0631	.0487	.0312	-.0003	.0002	.0042
.709	535.471	-.08	.06	.1220	.0450	.0238	-.0004	.0004	.0039
.709	535.450	-.09	.83	.1843	.0401	.0167	-.0003	.0002	.0053
.708	535.290	-.09	1.55	.2462	.0352	.0113	-.0000	.0001	.0059
.708	535.186	-.09	2.27	.3148	.0309	.0064	-.0005	.0001	.0056
.709	535.432	-.08	3.03	.3838	.0266	.0002	-.0005	.0002	.0047
.709	535.753	-.07	3.68	.4270	.0241	-.0071	-.0006	.0002	.0041
.708	534.468	-.07	4.28	.4558	.0208	-.0139	-.0005	.0003	.0036
.708	535.127	-.09	.82	.1826	.0402	.0166	-.0000	.0002	.0053

UNCLASSIFIED

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7 X 10 FT TUNNELS \*\*\* NASA

HIGH SPEED TUNNEL TEST 788 UNCLASSIFIED

RUN 44

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.200	58.124	-.00	.05	.0637	.0223	.0182	-.0007	.0003	.0007	2.856
.200	57.932	-.00	-5.19	-.3958	.0343	.0591	-.0003	.0003	.0013	-11.530
.200	58.030	-.00	-4.16	-.3039	.0301	.0503	-.0004	.0003	.0005	-10.103
.200	58.029	-.00	-3.11	-.2151	.0267	.0425	-.0005	.0004	.0009	-8.047
.200	58.027	-.00	-2.07	-.1219	.0241	.0337	-.0005	.0004	.0004	-5.062
.200	58.125	-.00	-1.02	-.0309	.0228	.0254	-.0004	.0003	.0010	-1.358
.200	58.025	-.01	.05	.0626	.0222	.0180	-.0007	.0003	.0015	2.827
.200	57.925	-.01	1.10	.1543	.0230	.0105	-.0005	.0004	.0018	6.699
.200	58.023	-.01	2.17	.2454	.0244	.0025	-.0005	.0004	.0019	10.042
.200	57.923	-.01	3.25	.3385	.0274	-.0042	-.0010	.0004	.0019	12.347
.200	58.022	-.01	4.32	.4283	.0314	-.0115	-.0011	.0004	.0019	13.661
.200	57.823	-.01	5.39	.5177	.0359	-.0195	-.0008	.0005	.0024	14.416
.200	58.120	-.01	6.50	.6142	.0426	-.0270	-.0011	.0004	.0032	14.408
.200	57.923	-.01	7.57	.6928	.0495	-.0356	-.0018	.0003	.0030	14.006
.200	58.221	-.01	8.64	.7726	.0573	-.0441	-.0016	.0004	.0031	13.479
.200	58.025	-.01	9.70	.8519	.0659	-.0533	-.0015	.0004	.0030	12.926
.200	57.930	-.01	10.81	.9262	.0759	-.0634	-.0014	.0004	.0031	12.200
.200	58.035	-.01	11.83	.9834	.0859	-.0748	-.0014	.0004	.0029	11.447
.199	57.750	-.01	12.92	1.0447	.0993	-.0922	-.0013	.0005	.0032	10.516
.200	58.062	-.01	13.93	1.0959	.1143	-.1150	-.0011	.0005	.0027	9.585
.201	58.618	-.01	.04	.0598	.0221	.0183	-.0006	.0003	.0018	2.708

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.200	58.124	-.00	.05	.0637	.0223	.0182	-.0007	.0003	.0007
.200	57.932	-.00	-5.19	-.3972	-.0016	.0591	-.0003	.0003	.0013
.200	58.030	-.00	-4.16	-.3052	.0079	.0503	-.0004	.0004	.0005
.200	58.029	-.00	-3.11	-.2162	.0150	.0425	-.0005	.0004	.0009
.200	58.027	-.00	-2.07	-.1226	.0196	.0337	-.0005	.0004	.0004
.200	58.125	-.00	-1.02	-.0313	.0222	.0254	-.0004	.0003	.0010
.200	58.025	-.01	.05	.0627	.0221	.0180	-.0007	.0003	.0015
.200	57.925	-.01	1.10	.1546	.0201	.0105	-.0005	.0004	.0018
.200	58.023	-.01	2.17	.2461	.0151	.0025	-.0005	.0004	.0019
.200	57.923	-.01	3.25	.3395	.0082	-.0042	-.0010	.0004	.0019
.200	58.022	-.01	4.32	.4293	-.0010	-.0115	-.0011	.0004	.0019
.200	57.823	-.01	5.39	.5187	-.0129	-.0195	-.0008	.0004	.0024
.200	58.120	-.01	6.50	.6149	-.0271	-.0270	-.0012	.0003	.0032
.200	57.923	-.01	7.57	.6930	-.0422	-.0356	-.0018	.0001	.0030
.200	58.221	-.01	8.64	.7721	-.0594	-.0441	-.0016	.0001	.0031
.200	58.025	-.01	9.70	.8505	-.0785	-.0533	-.0015	.0001	.0030
.200	57.930	-.01	10.81	.9235	-.0990	-.0634	-.0014	.0002	.0031
.200	58.035	-.01	11.83	.9796	-.1174	-.0748	-.0015	.0001	.0029
.199	57.750	-.01	12.92	1.0398	-.1365	-.0922	-.0014	.0002	.0032
.200	58.062	-.01	13.93	1.0903	-.1526	-.1150	-.0011	.0003	.0027
.201	58.618	-.01	.04	.0598	.0220	.0183	-.0006	.0003	.0018

UNCLASSIFIED

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\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED LAT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 45

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.402	215.472	-.02	.16	.0762	.0205	.0180	-.0001	.0001	.0030	3.724
.402	215.596	-.01	-5.63	-.4401	.0357	.0614	-.0001	-.0000	.0026	-12.344
.402	215.773	-.02	-4.50	-.3391	.0297	.0529	-.0001	.0000	.0026	-11.416
.402	215.487	-.02	-3.37	-.2387	.0254	.0435	-.0001	.0001	.0026	-9.398
.401	214.924	-.02	-2.23	-.1348	.0224	.0345	-.0001	.0000	.0027	-6.019
.402	215.291	-.02	-1.07	-.0326	.0208	.0264	-.0000	-.0000	.0030	-1.568
.402	215.565	-.02	.17	.0768	.0205	.0180	-.0002	.0001	.0032	3.751
.402	215.839	-.02	1.32	.1801	.0215	.0096	-.0004	.0001	.0032	8.364
.402	215.648	-.02	2.52	.2853	.0238	.0017	-.0007	.0001	.0032	11.975
.402	215.274	-.02	3.77	.3958	.0280	-.0065	-.0006	.0002	.0029	14.127
.401	214.992	-.02	4.95	.4981	.0332	-.0139	-.0007	.0002	.0027	14.986
.402	215.270	-.02	6.14	.6002	.0399	-.0219	-.0014	.0002	.0030	15.050
.402	215.459	-.02	7.31	.6976	.0479	-.0303	-.0013	.0002	.0029	14.551
.402	215.370	-.02	8.48	.7906	.0569	-.0387	-.0012	.0002	.0031	13.906
.402	215.380	-.02	9.66	.8808	.0673	-.0489	-.0016	.0002	.0031	13.092
.402	215.597	-.02	10.73	.9409	.0777	-.0606	-.0018	.0002	.0031	12.103
.402	215.847	-.02	11.82	.9866	.0911	-.0813	-.0018	.0003	.0029	10.827
.402	215.565	-.02	.16	.0765	.0205	.0182	-.0002	.0000	.0035	3.732

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.402	215.472	-.02	.16	.0763	.0202	.0180	-.0001	.0001	.0030
.402	215.596	-.01	-5.63	-.4414	-.0077	.0614	-.0001	-.0000	.0026
.402	215.773	-.02	-4.50	-.3403	.0030	.0529	-.0001	.0000	.0026
.402	215.487	-.02	-3.37	-.2397	.0113	.0435	-.0001	.0001	.0026
.401	214.924	-.02	-2.23	-.1356	.0171	.0345	-.0001	.0000	.0027
.402	215.291	-.02	-1.07	-.0329	.0202	.0264	-.0000	-.0000	.0030
.402	215.565	-.02	.17	.0769	.0203	.0180	-.0002	.0001	.0032
.402	215.839	-.02	1.32	.1805	.0174	.0096	-.0004	.0001	.0032
.402	215.648	-.02	2.52	.2860	.0112	.0017	-.0007	.0001	.0029
.402	215.274	-.02	3.77	.3967	.0020	-.0065	-.0007	.0001	.0029
.401	214.992	-.02	4.95	.4990	-.0098	-.0139	-.0007	.0002	.0027
.402	215.270	-.02	6.14	.6008	-.0245	-.0219	-.0014	.0001	.0030
.402	215.459	-.02	7.31	.6978	-.0412	-.0303	-.0014	.0000	.0029
.402	215.370	-.02	8.48	.7900	-.0603	-.0387	-.0013	.0001	.0031
.402	215.380	-.02	9.66	.8792	-.0814	-.0489	-.0016	-.0000	.0031
.402	215.597	-.02	10.73	.9385	-.0986	-.0606	-.0018	-.0001	.0031
.402	215.847	-.02	11.82	.9838	-.1127	-.0813	-.0018	-.0000	.0029
.402	215.565	-.02	.16	.0766	.0203	.0182	-.0002	.0000	.0035

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GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 46

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.603	423.946	-.04	.43	.1047	.0209	.0177	-.0003	.0001	.0030	5.010
.603	424.092	-.03	-3.75	-.2922	.0283	.0464	-.0002	-.0002	.0031	-10.315
.604	424.563	-.03	-2.47	-.1670	.0236	.0364	.0001	-.0001	.0031	-7.065
.604	424.543	-.04	-1.11	-.0390	.0212	.0273	-.0002	-.0000	.0034	-1.845
.603	424.113	-.04	.42	.1043	.0209	.0179	-.0004	.0001	.0031	4.990
.603	423.765	-.04	1.83	.2401	.0230	.0085	-.0005	.0002	.0029	10.441
.603	423.583	-.04	3.24	.3737	.0274	.0006	-.0006	.0003	.0024	13.630
.604	424.326	-.03	4.69	.5128	.0345	-.0066	-.0008	.0004	.0019	14.876
.604	424.499	-.03	6.04	.6347	.0432	-.0133	-.0020	.0003	.0019	14.700
.604	424.164	-.03	7.46	.7752	.0552	-.0173	-.0021	.0004	.0019	14.044
.603	423.864	-.04	.42	.1041	.0211	.0179	-.0004	.0002	.0027	4.943

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.603	423.946	-.04	.43	.1048	.0201	.0177	-.0003	.0001	.0030
.603	424.092	-.03	-3.75	-.2934	.0092	.0464	-.0002	-.0001	.0031
.604	424.563	-.03	-2.47	-.1678	.0164	.0364	.0000	-.0001	.0031
.604	424.543	-.04	-1.11	-.0394	.0204	.0273	-.0002	-.0000	.0034
.603	424.113	-.04	.42	.1045	.0201	.0179	-.0004	.0001	.0031
.603	423.765	-.04	1.83	.2406	.0153	.0085	-.0005	.0002	.0029
.603	423.583	-.04	3.24	.3745	.0062	.0006	-.0007	.0002	.0024
.604	424.326	-.03	4.69	.5138	-.0076	-.0066	-.0008	.0003	.0019
.604	424.499	-.03	6.04	.6355	-.0238	-.0133	-.0020	.0001	.0019
.604	424.164	-.03	7.46	.7755	-.0459	-.0173	-.0021	.0001	.0019
.603	423.864	-.04	.42	.1042	.0203	.0179	-.0004	.0002	.0027

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 47

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.707	533.180	-.05	.73	.1450	.0230	.0173	-.0006	.0002	.0027	6.309
.709	535.215	-.05	-2.52	-.1694	.0306	.0389	-.0003	-.0001	.0035	-5.533
.709	535.295	-.05	-1.86	-.1074	.0272	.0336	-.0004	-.0001	.0035	-3.951
.708	534.355	-.05	-1.12	-.0392	.0244	.0287	-.0005	-.0000	.0035	-1.606
.707	533.366	-.05	-.33	.0369	.0230	.0239	-.0005	.0001	.0032	1.606
.707	533.494	-.05	.72	.1435	.0231	.0174	-.0006	.0002	.0028	6.224
.707	533.951	-.05	1.45	.2215	.0243	.0136	-.0007	.0002	.0027	9.100
.707	533.232	-.05	2.28	.3081	.0268	.0097	-.0009	.0003	.0023	11.481
.707	532.951	-.04	3.13	.4010	.0320	.0048	-.0011	.0004	.0018	12.550
.708	534.150	-.04	3.89	.4749	.0390	-.0021	-.0011	.0004	.0015	12.163
.709	535.237	-.04	4.51	.5016	.0454	-.0108	-.0011	.0004	.0016	11.049
.708	534.045	-.05	.73	.1442	.0231	.0173	-.0007	.0002	.0029	6.240

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.707	533.180	-.05	.73	.1452	.0211	.0173	-.0006	.0002	.0027
.709	535.215	-.05	-2.52	-.1706	.0231	.0389	-.0003	-.0001	.0035
.709	535.295	-.05	-1.86	-.1082	.0237	.0336	-.0004	-.0000	.0035
.708	534.355	-.05	-1.12	-.0396	.0236	.0287	-.0005	-.0000	.0035
.707	533.366	-.05	-.33	.0368	.0232	.0239	-.0005	.0001	.0032
.707	533.494	-.05	.72	.1438	.0213	.0174	-.0006	.0002	.0028
.707	533.951	-.05	1.45	.2220	.0187	.0136	-.0008	.0002	.0027
.707	533.232	-.05	2.28	.3088	.0145	.0097	-.0009	.0002	.0023
.707	532.951	-.04	3.13	.4021	.0100	.0048	-.0011	.0003	.0018
.708	534.150	-.04	3.89	.4763	.0067	-.0021	-.0011	.0003	.0015
.709	535.237	-.04	4.51	.5035	.0058	-.0108	-.0011	.0003	.0016
.708	534.045	-.05	.73	.1445	.0213	.0173	-.0007	.0002	.0029

UNCLASSIFIED

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CO

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\*\*\* NASA [REDACTED] 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

09/15/67

HIGH SPEED TUNNEL

TEST 788

RUN 48

BALANCE 731

~~CLASSIFIED~~

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.422	-.00	.04	.0585	.0230	.0193	-.0006	.0002	.0022	2.540
.201	58.329	-.00	-5.22	-.4009	.0358	.0599	-.0004	.0001	.0022	-11.212
.201	58.526	-.00	-4.19	-.3089	.0311	.0514	-.0003	.0001	.0021	-9.947
.201	58.525	-.00	-3.16	-.2218	.0279	.0428	-.0004	.0002	.0020	-7.950
.201	58.622	-.00	-2.12	-.1289	.0251	.0344	-.0005	.0002	.0022	-5.130
.201	58.621	-.01	-1.06	-.0341	.0236	.0263	-.0006	.0002	.0032	-1.448
.201	58.422	-.01	.04	.0585	.0231	.0193	-.0005	.0002	.0030	2.533
.201	58.520	-.01	1.07	.1499	.0237	.0112	-.0005	.0003	.0035	6.312
.201	58.420	-.01	2.13	.2372	.0251	.0041	-.0005	.0003	.0033	9.451
.200	58.320	-.01	3.21	.3306	.0278	-.0036	-.0008	.0003	.0031	11.896
.201	58.517	-.01	4.27	.4223	.0316	-.0105	-.0009	.0003	.0032	13.376
.200	58.319	-.01	5.36	.5120	.0363	-.0183	-.0009	.0003	.0030	14.089
.201	58.516	-.01	6.43	.6019	.0420	-.0261	-.0011	.0003	.0038	14.320
.200	58.319	-.01	7.52	.6856	.0494	-.0349	-.0016	.0001	.0039	13.890
.200	58.321	-.01	8.59	.7653	.0570	-.0436	-.0016	.0002	.0041	13.425
.200	58.224	-.01	9.66	.8430	.0658	-.0532	-.0015	.0002	.0039	12.803
.201	58.326	-.01	10.76	.9165	.0751	-.0635	-.0014	.0002	.0040	12.211
.200	58.135	-.01	11.79	.9762	.0857	-.0744	-.0014	.0002	.0042	11.392
.200	58.147	-.01	12.90	1.0334	.0987	-.0920	-.0013	.0003	.0040	10.474
.200	58.163	-.01	13.89	1.0842	.1136	-.1147	-.0011	.0003	.0040	9.542
.202	59.015	-.01	.04	.0557	.0229	.0194	-.0005	.0002	.0037	2.431

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.422	-.00	.04	.0585	.0230	.0193	-.0006	.0002	.0022
.201	58.329	-.00	-5.22	-.4024	-.0008	.0599	-.0004	.0001	.0022
.201	58.526	-.00	-4.19	-.3103	.0084	.0514	-.0003	.0001	.0021
.201	58.525	-.00	-3.16	-.2230	.0156	.0428	-.0004	.0002	.0020
.201	58.622	-.00	-2.12	-.1297	.0203	.0344	-.0005	.0002	.0022
.201	58.621	-.01	-1.06	-.0346	.0230	.0263	-.0006	.0002	.0032
.201	58.422	-.01	.04	.0585	.0230	.0193	-.0005	.0002	.0030
.201	58.520	-.01	1.07	.1503	.0209	.0112	-.0005	.0003	.0035
.201	58.420	-.01	2.13	.2379	.0163	.0041	-.0005	.0002	.0033
.200	58.320	-.01	3.21	.3316	.0092	-.0036	-.0008	.0002	.0031
.201	58.517	-.01	4.27	.4234	.0000	-.0105	-.0009	.0002	.0032
.200	58.319	-.01	5.36	.5130	-.0116	-.0183	-.0009	.0002	.0030
.201	58.516	-.01	6.43	.6027	-.0256	-.0261	-.0011	.0001	.0038
.200	58.319	-.01	7.52	.6859	-.0408	-.0349	-.0016	.0000	.0039
.200	58.321	-.01	8.59	.7650	-.0580	-.0436	-.0016	-.0001	.0041
.200	58.224	-.01	9.66	.8418	-.0764	-.0532	-.0015	-.0000	.0039
.201	58.326	-.01	10.76	.9140	-.0973	-.0635	-.0014	-.0000	.0040
.200	58.135	-.01	11.79	.9725	-.1154	-.0744	-.0014	-.0000	.0042
.200	58.147	-.01	12.90	1.0287	-.1344	-.0920	-.0013	-.0000	.0040
.200	58.163	-.01	13.89	1.0790	-.1498	-.1147	-.0011	-.0001	.0040
.202	59.015	-.01	.04	.0557	.0229	.0194	-.0005	.0002	.0037

\*\*\* NASA CONFIDENTIAL \*\*\* 7X10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

HUN 49

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYB	CSF	L/D
.401	215.015	-.02	.11	.0648	.0213	.0186	.0001	.0002	.0034	3.050
.402	215.112	-.02	-.99	-.0339	.0217	.0265	-.0001	.0001	.0037	-1.563
.401	214.830	-.02	-.51	.0096	.0213	.0229	-.0002	.0001	.0037	.449
.402	215.664	-.02	.12	.0649	.0213	.0184	-.0001	.0002	.0035	3.055
.401	214.640	-.03	.66	.1134	.0215	.0146	-.0002	.0002	.0036	5.267
.402	215.195	-.02	1.26	.1677	.0221	.0099	-.0003	.0002	.0033	7.585
.402	215.106	-.03	.11	.0651	.0213	.0183	.0000	.0002	.0037	3.061

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYB	CSF
.401	215.015	-.02	.11	.0649	.0211	.0186	.0001	.0002	.0034
.402	215.112	-.02	-.99	-.0343	.0211	.0265	-.0001	.0001	.0037
.401	214.830	-.02	-.51	.0096	.0214	.0229	-.0002	.0001	.0037
.402	215.664	-.02	.12	.0650	.0211	.0184	-.0001	.0002	.0035
.401	214.640	-.03	.66	.1137	.0202	.0146	-.0002	.0002	.0036
.402	215.195	-.02	1.26	.1681	.0184	.0099	-.0003	.0002	.0033
.402	215.106	-.03	.11	.0651	.0211	.0183	.0000	.0002	.0037

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7X10 FT TUNNELS \*\*\* NASA

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\*\*\* NASA CONFIDENTIAL \*\*\* 7X10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 50

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.604	424.597	-.05	.27	.0791	.0219	.0188	-.0007	.0n02	.0033	3.621
.603	424.020	-.05	-.71	-.0151	.0221	.0255	-.0007	.0n01	.0039	-.683
.604	424.846	-.05	.27	.0803	.0219	.0188	-.0008	.0n01	.0035	3.667
.604	424.590	-.04	.98	.1479	.0224	.0138	-.0010	.0n02	.0032	6.595
.603	423.997	-.04	1.74	.2204	.0237	.0090	-.0012	.0n02	.0030	9.310
.603	424.320	-.04	2.48	.2915	.0254	.0048	-.0012	.0n03	.0028	11.454
.603	424.510	-.05	.27	.0788	.0219	.0189	-.0010	.0n01	.0035	3.604

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.604	424.597	-.05	.27	.0792	.0215	.0188	-.0007	.0n01	.0033
.603	424.020	-.05	-.71	-.0153	.0219	.0255	-.0007	.0n01	.0039
.604	424.846	-.05	.27	.0804	.0215	.0188	-.0008	.0n01	.0035
.604	424.590	-.04	.98	.1483	.0199	.0138	-.0010	.0n02	.0032
.603	423.997	-.04	1.74	.2209	.0170	.0090	-.0012	.0n02	.0030
.603	424.320	-.04	2.48	.2923	.0128	.0048	-.0012	.0n02	.0028
.603	424.510	-.05	.27	.0789	.0215	.0189	-.0010	.0n01	.0035

\*\*\* 7X10 FT TUNNELS \*\*\* NASA

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GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 51

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.708	534.650	-.06	.59	.1305	.0255	.0181	-.0008	.0001	.0038	5.117
.708	534.746	-.07	-1.14	-.0435	.0283	.0306	-.0004	-.0000	.0048	-1.540
.708	535.011	-.07	-.33	.0386	.0262	.0243	-.0009	.0000	.0044	1.473
.708	535.358	-.06	.60	.1340	.0255	.0179	-.0008	.0001	.0038	5.254
.708	535.168	-.06	1.41	.2137	.0263	.0135	-.0011	.0001	.0034	8.116
.708	534.914	-.05	2.24	.3009	.0287	.0095	-.0012	.0002	.0030	10.495
.706	532.477	-.05	3.07	.3879	.0324	.0049	-.0013	.0003	.0027	11.976
.708	535.121	-.06	.59	.1308	.0255	.0179	-.0012	.0001	.0037	5.123

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.708	534.650	-.06	.59	.1308	.0242	.0181	-.0008	.0001	.0038
.708	534.746	-.07	-1.14	-.0441	.0274	.0306	-.0004	-.0000	.0048
.708	535.011	-.07	-.33	.0384	.0264	.0243	-.0009	.0000	.0044
.708	535.358	-.06	.60	.1342	.0241	.0179	-.0008	.0001	.0038
.708	535.168	-.06	1.41	.2143	.0211	.0135	-.0011	.0001	.0034
.708	534.914	-.05	2.24	.3018	.0169	.0095	-.0012	.0002	.0030
.706	532.477	-.05	3.07	.3890	.0116	.0049	-.0013	.0002	.0027
.708	535.121	-.06	.59	.1310	.0242	.0179	-.0012	.0001	.0037

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GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 52

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.200	58.128	-.01	.03	.0536	.0246	.0183	-.0006	.0004	.0022	2.179
.200	58.031	-.01	-2.10	-.1342	.0265	.0341	-.0007	.0004	.0019	-5.067
.201	58.327	-.01	-1.04	-.0399	.0250	.0259	-.0005	.0003	.0019	-1.600
.200	58.029	-.01	.50	.0091	.0243	.0217	-.0001	.0004	.0018	.375
.200	58.127	-.01	.03	.0525	.0242	.0186	-.0005	.0004	.0016	2.169
.200	58.225	-.01	.56	.0991	.0243	.0140	-.0006	.0004	.0025	4.077
.200	58.126	-.01	1.08	.1450	.0247	.0103	-.0007	.0004	.0021	5.858
.200	57.730	-.01	1.62	.1920	.0255	.0069	-.0008	.0004	.0021	7.537
.200	58.127	-.01	.03	.0536	.0243	.0177	-.0006	.0004	.0022	2.209

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.200	58.128	-.01	.03	.0536	.0246	.0183	..0006	.0004	.0022
.200	58.031	-.01	-2.10	-.1351	.0216	.0341	..0007	.0004	.0019
.201	58.327	-.01	-1.04	-.0404	.0242	.0259	..0005	.0003	.0019
.200	58.029	-.01	.50	.0089	.0244	.0217	..0001	.0004	.0018
.200	58.127	-.01	.03	.0525	.0242	.0186	..0005	.0004	.0018
.200	58.225	-.01	.56	.0993	.0233	.0140	..0006	.0004	.0018
.200	58.126	-.01	1.08	.1454	.0220	.0103	..0007	.0004	.0025
.200	57.730	-.01	1.62	.1926	.0200	.0069	..0008	.0004	.0021
.200	58.127	-.01	.03	.0536	.0242	.0177	..0006	.0004	.0022

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GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL TEST 788 RUN 53 BALANCE 731 09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.402	214.926	-.02	.10	.0581	.0224	.0183	-.0002	.0001	.0035	2.590
.401	214.838	-.02	-1.04	-.0467	.0230	.0271	-.0003	.0000	.0037	-2.029
.402	215.021	-.02	-.49	.0040	.0226	.0227	-.0003	.0000	.0036	.178
.402	215.019	-.02	.08	.0563	.0224	.0186	-.0001	.0000	.0036	2.509
.402	215.481	-.02	.69	.1107	.0227	.0140	-.0001	.0001	.0035	4.881
.402	215.014	-.02	1.29	.1647	.0232	.0093	-.0002	.0001	.0035	7.084
.402	215.112	-.02	.10	.0575	.0225	.0183	-.0001	.0001	.0035	2.558

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.402	214.926	-.02	.10	.0582	.0223	.0183	-.0002	.0001	.0035
.401	214.838	-.02	-1.04	-.0471	.0222	.0271	-.0003	.0000	.0037
.402	215.021	-.02	-.49	.0038	.0226	.0227	-.0003	.0000	.0036
.402	215.019	-.02	.08	.0563	.0223	.0186	-.0001	.0000	.0036
.402	215.481	-.02	.69	.1110	.0214	.0140	-.0001	.0001	.0035
.402	215.014	-.02	1.29	.1652	.0195	.0093	-.0002	.0001	.0035
.402	215.112	-.02	.10	.0575	.0224	.0183	-.0001	.0001	.0035

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA C

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GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 54

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.604	424.409	-.05	.28	.0771	.0237	.0186	-.0006	.0002	.0037	3.255
.604	424.430	-.05	-1.12	-.0584	.0248	.0283	-.0005	.0001	.0043	-2.357
.604	424.000	-.05	-.48	.0028	.0239	.0238	-.0007	.0001	.0042	.118
.604	424.906	-.05	.27	.0771	.0237	.0184	-.0007	.0001	.0039	3.259
.604	424.645	-.05	1.00	.1469	.0241	.0133	-.0009	.0002	.0036	6.110
.605	425.048	-.05	1.74	.2169	.0250	.0085	-.0009	.0002	.0033	8.662
.603	423.657	-.05	.29	.0789	.0238	.0183	-.0007	.0001	.0039	3.321

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.604	424.409	-.05	.28	.0772	.0233	.0186	-.0006	.0002	.0037
.604	424.430	-.05	-1.12	-.0588	.0236	.0283	-.0005	.0001	.0043
.604	424.000	-.05	-.48	.0026	.0240	.0238	-.0007	.0001	.0042
.604	424.906	-.05	.27	.0772	.0233	.0184	-.0008	.0001	.0039
.604	424.645	-.05	1.00	.1473	.0215	.0133	-.0009	.0002	.0036
.605	425.048	-.05	1.74	.2175	.0185	.0085	-.0009	.0002	.0033
.603	423.657	-.05	.29	.0790	.0234	.0183	-.0007	.0001	.0039

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\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS. DECLASSIFIED AFTER 12 YRS.

HIGH SPEED TUNNEL

TEST 788

RUN 55

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.707	533.399	-.08	.67	.1472	.0302	.0188	-.0003	.0001	.0054	4.874
.708	533.461	-.06	-.92	.0093	.0339	.0303	-.0006	.0003	.0028	.276
.708	533.645	-.03	-1.61	-.0466	.0376	.0361	-.0007	.0003	.0009	-1.241
.708	533.315	-.05	-1.04	-.0002	.0344	.0313	-.0008	.0003	.0023	-.007
.708	533.630	-.09	.68	.1487	.0303	.0187	-.0002	.0001	.0056	4.907
.708	534.378	-.07	1.58	.2385	.0311	.0133	-.0005	.0001	.0045	7.674

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.707	533.399	-.08	.67	.1475	.0285	.0188	-.0003	.0001	.0054
.708	533.461	-.06	-.92	.0088	.0340	.0303	-.0006	.0003	.0028
.708	533.645	-.03	-1.61	-.0476	.0362	.0361	-.0007	.0003	.0009
.708	533.315	-.05	-1.04	-.0009	.0344	.0313	-.0008	.0003	.0023
.708	533.630	-.09	.68	.1490	.0285	.0187	-.0002	.0001	.0056
.708	534.378	-.07	1.58	.2392	.0245	.0133	-.0005	.0001	.0045

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

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GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 56

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.201	58.426	-.01	.03	.0491	.0254	.0170	-.0003	.0002	.0044	1.929
.200	57.933	-.01	-1.05	-.0484	.0261	.0248	-.0002	.0002	.0047	-1.852
.200	58.229	-.01	-.72	-.0187	.0257	.0224	-.0001	.0002	.0050	-.726
.200	58.228	-.01	.04	.0481	.0254	.0168	-.0000	.0002	.0040	1.894
.201	58.327	-.01	.54	.0909	.0257	.0129	-.0002	.0002	.0046	3.541
.201	58.327	-.01	.02	.0446	.0254	.0175	-.0002	.0002	.0040	1.755

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.201	58.426	-.01	.03	.0491	.0254	.0170	-.0003	.0002	.0044
.200	57.933	-.01	-1.05	-.0489	.0252	.0248	-.0002	.0002	.0047
.200	58.229	-.01	-.72	-.0190	.0255	.0224	-.0001	.0002	.0050
.200	58.228	-.01	.04	.0481	.0254	.0168	-.0000	.0002	.0040
.201	58.327	-.01	.54	.0911	.0248	.0129	-.0002	.0002	.0046
.201	58.327	-.01	.02	.0446	.0254	.0175	-.0002	.0002	.0040

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA [REDACTED]

\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 57

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.402	215.680	-.03	.08	.0490	.0236	.0171	-.0000	.0002	.0042	2.074
.402	215.686	-.03	-1.08	-.0574	.0244	.0257	-.0000	.0001	.0041	-2.354
.402	215.683	-.03	-.48	-.0029	.0238	.0214	-.0002	.0002	.0041	-.124
.402	215.495	-.03	.09	.0497	.0236	.0171	-.0002	.0002	.0039	2.101
.402	215.306	-.03	.67	.1015	.0238	.0129	-.0000	.0002	.0038	4.270
.401	214.751	-.03	.06	.0468	.0236	.0174	-.0001	.0002	.0042	1.979

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.402	215.680	-.03	.08	.0491	.0236	.0171	-.0000	.0002	.0042
.402	215.686	-.03	-1.08	-.0578	.0233	.0257	-.0000	.0001	.0041
.402	215.683	-.03	-.48	-.0031	.0238	.0214	-.0002	.0002	.0041
.402	215.495	-.03	.09	.0497	.0236	.0171	-.0002	.0002	.0039
.402	215.306	-.03	.67	.1017	.0226	.0129	-.0000	.0002	.0038
.401	214.751	-.03	.06	.0468	.0236	.0174	-.0001	.0002	.0042

UNCLASSIFIED

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

\*\*\* NASA [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 58

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.604	424.030	-.06	.19	.0650	.0258	.0175	-.0005	.0001	.0047	2.517
.603	423.477	-.06	-1.14	-.0618	.0276	.0275	-.0004	.0001	.0051	-2.239
.604	424.212	-.06	-.50	-.0012	.0265	.0226	-.0006	.0001	.0051	-.045
.604	424.114	-.06	.20	.0642	.0260	.0177	-.0008	.0001	.0047	2.470
.604	425.014	-.06	1.00	.1403	.0260	.0121	-.0007	.0002	.0045	5.406
.604	424.945	-.06	.19	.0636	.0259	.0177	-.0006	.0002	.0048	2.458
.708	533.774	-.09	.69	.1625	.0353	.0186	.0001	.0001	.0058	4.601

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.604	424.030	-.06	.19	.0651	.0256	.0175	-.0005	.0001	.0047
.603	423.477	-.06	-1.14	-.0624	.0264	.0275	-.0004	.0001	.0051
.604	424.212	-.06	-.50	-.0014	.0265	.0226	-.0006	.0001	.0051
.604	424.114	-.06	.20	.0643	.0258	.0177	-.0008	.0001	.0047
.604	425.014	-.06	1.00	.1407	.0235	.0121	-.0007	.0002	.0045
.604	424.945	-.06	.19	.0637	.0257	.0177	-.0006	.0002	.0048
.708	533.774	-.09	.69	.1629	.0334	.0186	.0001	.0001	.0058

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA [REDACTED]

\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL TEST 788 RUN 59 BALANCE 731 09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.708	533.703	-.09	.69	.1654	.0356	.0186	.0000	.0002	.0055	4.644
.707	532.858	-.03	-1.47	-.0092	.0427	.0357	-.0001	.0002	.0014	-.216
.708	533.853	-.03	-1.32	.0007	.0418	.0344	.0000	.0002	.0014	.017
.708	534.248	-.09	.71	.1662	.0357	.0185	.0002	.0001	.0059	4.659
.708	533.482	-.09	1.53	.2390	.0354	.0134	.0001	.0000	.0062	6.748
.708	534.174	-.09	.68	.1637	.0357	.0187	.0001	.0001	.0059	4.591

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.708	533.703	-.09	.69	.1658	.0336	.0186	.0000	.0002	.0055
.707	532.858	-.03	-1.47	-.0103	.0424	.0357	-.0001	.0002	.0014
.708	533.853	-.03	-1.32	-.0003	.0418	.0344	.0000	.0002	.0014
.708	534.248	-.09	.71	.1666	.0336	.0185	.0002	.0001	.0059
.708	533.482	-.09	1.53	.2398	.0290	.0134	.0001	.0000	.0062
.708	534.174	-.09	.68	.1641	.0337	.0187	.0001	.0001	.0059

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\*\*\* NASA C [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 60

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.200	57.934	-.01	.03	.0430	.0265	.0163	-.0003	.0002	.0034	1.620
.200	57.935	-.01	-1.05	-.0519	.0272	.0235	-.0002	.0002	.0040	-1.911
.200	58.034	-.01	-.55	-.0073	.0269	.0189	-.0001	.0002	.0035	-.272
.200	57.835	-.01	.03	.0442	.0264	.0161	-.0002	.0002	.0034	1.675
.200	58.131	-.01	.54	.0872	.0265	.0121	-.0004	.0002	.0037	3.295
.201	58.725	-.01	.03	.0413	.0264	.0161	-.0002	.0001	.0037	1.563

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.200	57.934	-.01	.03	.0430	.0265	.0163	-.0003	.0002	.0034
.200	57.935	-.01	-1.05	-.0524	.0262	.0235	-.0002	.0002	.0040
.200	58.034	-.01	-.55	-.0076	.0269	.0189	-.0001	.0002	.0035
.200	57.835	-.01	.03	.0442	.0264	.0161	-.0002	.0002	.0034
.200	58.131	-.01	.54	.0875	.0257	.0121	-.0004	.0002	.0037
.201	58.725	-.01	.03	.0413	.0264	.0161	-.0002	.0001	.0037

C [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA [REDACTED] CONFIDENTIAL \*\*\*

\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 61

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.402	215.503	-.03	.08	.0423	.0247	.0162	-.0002	.0001	.0042	1.712
.402	215.415	-.03	-1.09	-.0637	.0255	.0254	-.0001	.0001	.0041	-2.495
.402	215.505	-.03	-.40	-.0021	.0249	.0199	-.0002	.0001	.0043	-.082
.402	215.223	-.03	.09	.0420	.0247	.0162	-.0002	.0001	.0042	1.701
.402	215.128	-.03	.65	.0936	.0248	.0120	-.0002	.0002	.0041	3.771
.402	215.410	-.03	.08	.0417	.0247	.0163	-.0002	.0001	.0042	1.688

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.402	215.503	-.03	.08	.0423	.0247	.0162	-.0002	.0001	.0042
.402	215.415	-.03	-1.09	-.0641	.0243	.0254	-.0001	.0001	.0041
.402	215.505	-.03	-.40	-.0022	.0249	.0199	-.0002	.0001	.0043
.402	215.223	-.03	.09	.0421	.0247	.0162	-.0002	.0001	.0042
.402	215.128	-.03	.65	.0938	.0237	.0120	-.0002	.0002	.0041
.402	215.410	-.03	.08	.0417	.0246	.0163	-.0002	.0001	.0042

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

UNCLASSIFIED

~~UNCLASSIFIED~~ \*\*\* NASA EFTENTIAL \*\*\* 7X10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 62

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.604	424.145	-.06	.20	.0574	.0276	.0166	-.0004	.0001	.0052	2.082
.604	424.354	-.07	-1.16	-.0685	.0300	.0273	-.0004	-.0000	.0059	-2.284
.604	423.913	-.06	-.42	-.0008	.0284	.0211	-.0006	.0000	.0055	-.029
.604	423.979	-.06	.20	.0574	.0276	.0167	-.0005	.0001	.0052	2.079
.604	424.458	-.06	.93	.1251	.0273	.0116	-.0007	.0001	.0050	4.580
.604	424.144	-.06	.20	.0571	.0275	.0168	-.0005	.0001	.0053	2.076

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.604	424.145	-.06	.20	.0575	.0274	.0166	-.0004	.0001	.0052
.604	424.354	-.07	-1.16	-.0691	.0286	.0273	-.0004	-.0000	.0059
.604	423.913	-.06	-.42	-.0010	.0284	.0211	-.0006	.0000	.0055
.604	423.979	-.06	.20	.0575	.0274	.0167	-.0005	.0001	.0052
.604	424.458	-.06	.93	.1255	.0253	.0116	-.0007	.0001	.0050
.604	424.144	-.06	.20	.0572	.0273	.0168	-.0005	.0001	.0053

C ~~UNCLASSIFIED~~ \*\*\* 7X10 FT TUNNELS \*\*\* NASA ~~UNCLASSIFIED~~

\*\*\* NASA C [REDACTED] TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 63

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.708	533.891	-.08	.79	.1789	.0396	.0185	-.0001	.0001	.0052	4.517
.708	533.925	-.03	-2.05	-.0384	.0522	.0452	-.0001	.0000	.0018	-.736
.708	533.405	-.05	-1.46	.0031	.0478	.0381	-.0001	.0001	.0033	.064
.708	533.902	-.07	.08	.1211	.0416	.0244	-.0005	.0003	.0041	2.909
.708	533.497	-.08	.81	.1790	.0396	.0187	-.0001	.0001	.0054	4.519

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.708	533.891	-.08	.79	.1794	.0371	.0185	-.0001	.0001	.0052
.708	533.925	-.03	-2.05	-.0402	.0508	.0452	-.0001	.0000	.0018
.708	533.405	-.05	-1.46	.0018	.0479	.0381	-.0001	.0001	.0033
.708	533.902	-.07	.08	.1211	.0414	.0244	-.0005	.0003	.0041
.708	533.497	-.08	.81	.1795	.0371	.0187	-.0001	.0001	.0054

UNCLASSIFIED

UNCLASSIFIED

C

\*\*\* TX 10 FT TUNNELS \*\*\* NASA

HIGH SPEED TUNNEL

TEST 788

RUN 64

BALANCE 731

09/15/67

~~UNCLASSIFIED~~

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.812	-.00	.05	.0677	.0203	.0189	-.0002	.0002	.0007	3.338
.201	58.519	-.00	-5.22	-.3915	.0311	.0576	-.0002	-.0000	.0015	-12.579
.201	58.716	-.00	-4.16	-.3012	.0269	.0500	-.0000	.0000	.0011	-11.192
.201	58.715	-.00	-3.12	-.2080	.0237	.0413	-.0005	.0001	.0012	-8.770
.201	58.714	-.00	-2.09	-.1182	.0217	.0338	-.0005	.0002	.0009	-5.457
.201	58.516	-.00	-1.04	-.0263	.0206	.0258	-.0001	.0001	.0008	-1.273
.201	58.317	-.00	.04	.0636	.0202	.0184	-.0003	.0002	.0011	3.144
.201	58.613	-.00	1.09	.1597	.0213	.0107	-.0003	.0002	.0010	7.491
.201	58.514	-.00	2.14	.2487	.0230	.0038	-.0004	.0003	.0009	10.818
.201	58.810	-.00	3.25	.3436	.0262	-.0040	-.0008	.0003	.0008	13.138
.201	58.512	-.00	4.30	.4329	.0299	-.0113	-.0003	.0003	.0017	14.461
.201	58.710	-.00	5.40	.5283	.0353	-.0189	-.0005	.0003	.0018	14.969
.201	58.413	-.00	6.49	.6194	.0414	-.0277	-.0010	.0002	.0023	14.953
.201	58.414	-.00	7.57	.7034	.0487	-.0356	-.0013	.0002	.0024	14.434
.200	58.218	-.00	8.66	.7891	.0574	-.0447	-.0014	.0002	.0022	13.749
.201	58.319	-.00	9.72	.8628	.0660	-.0534	-.0015	.0002	.0020	13.063
.201	58.422	-.00	10.81	.9379	.0761	-.0631	-.0015	.0003	.0025	12.319
.201	58.526	-.01	11.84	.9992	.0863	-.0746	-.0013	.0003	.0024	11.584
.200	58.241	-.01	12.92	1.0518	.0988	-.0919	-.0012	.0004	.0023	10.648
.201	58.554	-.01	13.93	1.1047	.1139	-.1141	-.0010	.0005	.0030	9.700
.201	58.416	-.00	.04	.0636	.0201	.0189	-.0003	.0002	.0008	3.169

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.812	-.00	.05	.0677	.0202	.0189	-.0002	.0002	.0007
.201	58.519	-.00	-5.22	-.3926	-.0046	.0576	-.0002	.0000	.0015
.201	58.716	-.00	-4.16	-.3023	.0050	.0500	-.0000	.0000	.0011
.201	58.715	-.00	-3.12	-.2089	.0123	.0413	-.0005	.0001	.0012
.201	58.714	-.00	-2.09	-.1189	.0173	.0338	-.0005	.0002	.0009
.201	58.516	-.00	-1.04	-.0266	.0202	.0258	-.0001	.0001	.0008
.201	58.317	-.00	.04	.0637	.0202	.0184	-.0003	.0002	.0011
.201	58.613	-.00	1.09	.1601	.0183	.0107	-.0003	.0002	.0010
.201	58.514	-.00	2.14	.2493	.0137	.0038	-.0004	.0002	.0008
.201	58.810	-.00	3.25	.3444	.0066	-.0040	-.0008	.0002	.0008
.201	58.512	-.00	4.30	.4339	-.0026	.0113	-.0004	.0003	.0017
.201	58.710	-.00	5.40	.5292	-.0145	.0189	-.0006	.0002	.0018
.201	58.413	-.00	6.49	.6199	-.0288	.0277	-.0010	.0001	.0023
.201	58.414	-.00	7.57	.7034	-.0444	.0356	-.0014	.0000	.0024
.200	58.218	-.00	8.66	.7884	-.0621	-.0447	-.0015	-.0000	.0022
.201	58.319	-.00	9.72	.8612	-.0805	-.0534	-.0015	-.0000	.0020
.201	58.422	-.00	10.81	.9351	-.1010	-.0631	-.0015	-.0000	.0025
.201	58.526	-.01	11.84	.9950	-.1204	-.0746	-.0014	.0000	.0024
.200	58.241	-.01	12.92	1.0466	-.1388	-.0919	-.0012	.0001	.0023
.201	58.554	-.01	13.93	1.0988	-.1551	-.1141	-.0011	.0002	.0030
.201	58.416	-.00	.04	.0636	.0200	.0189	-.0003	.0002	.0008

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7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL TEST 788

RUN 65

BALANCE 731

09/15/67

UNCLASSIFIED  
STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.402	215.454	-.01	.12	.0748	.0186	.0195	-.0001	.0002	.0015	.0022
.402	215.195	-.01	-5.63	-.4401	.0324	.0621	-.0002	-.0001	.0018	-13.569
.402	215.838	-.01	-4.54	-.3452	.0270	.0546	-.0003	-.0000	.0019	-12.774
.403	216.206	-.01	-3.40	-.2431	.0229	.0454	-.0004	.0001	.0017	-10.613
.402	215.645	-.01	-2.25	-.1396	.0200	.0365	-.0007	.0001	.0015	-6.965
.402	214.991	-.01	-1.07	-.0333	.0187	.0278	-.0001	.0001	.0014	-1.788
.402	215.082	-.01	.12	.0740	.0186	.0195	-.0001	.0002	.0014	3.977
.402	215.358	-.01	1.28	.1792	.0198	.0111	-.0003	.0002	.0016	9.028
.402	215.634	-.01	2.51	.2894	.0227	.0028	-.0003	.0002	.0016	12.769
.402	215.446	-.01	3.77	.3994	.0269	.0051	-.0007	.0003	.0014	14.820
.402	215.351	-.01	4.92	.4998	.0322	-.0124	-.0004	.0003	.0015	15.533
.402	215.351	-.01	6.13	.6053	.0393	-.0208	-.0011	.0003	.0015	15.420
.402	215.075	-.01	7.30	.7011	.0472	-.0288	-.0012	.0003	.0017	14.839
.402	215.266	-.01	8.49	.7985	.0567	-.0376	-.0013	.0003	.0017	14.086
.402	215.278	-.01	9.67	.8867	.0672	-.0471	-.0015	.0003	.0018	13.190
.402	215.119	-.01	10.72	.9519	.0779	-.0584	-.0017	.0003	.0017	12.224
.401	214.900	-.01	11.83	.9993	.0910	-.0781	-.0019	.0004	.0015	10.980
.402	215.360	-.01	.12	.0733	.0185	.0197	.0000	.0002	.0014	3.954

UNCLASSIFIED  
BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.402	215.454	-.01	.12	.0748	.0184	.0195	-.0001	.0002	.0015
.402	215.195	-.01	-5.63	-.4410	-.0109	.0621	-.0002	-.0001	.0018
.402	215.838	-.01	-4.54	-.3462	-.0004	.0546	-.0003	-.0000	.0019
.403	216.206	-.01	-3.40	-.2440	.0085	.0454	-.0003	.0001	.0017
.402	215.645	-.01	-2.25	-.1402	.0145	.0365	-.0007	.0001	.0015
.402	214.991	-.01	-1.07	-.0337	.0180	.0278	-.0001	.0001	.0015
.402	215.082	-.01	.12	.0740	.0184	.0195	-.0001	.0002	.0014
.402	215.358	-.01	1.28	.1795	.0158	.0111	-.0003	.0002	.0014
.402	215.634	-.01	2.51	.2901	.0100	.0028	-.0003	.0002	.0016
.402	215.446	-.01	3.77	.4002	.0006	-.0051	-.0007	.0002	.0014
.402	215.351	-.01	4.92	.5006	-.0108	-.0124	-.0004	.0003	.0015
.402	215.351	-.01	6.13	.6058	-.0256	-.0208	-.0011	.0002	.0015
.402	215.075	-.01	7.30	.7012	-.0421	-.0288	-.0012	.0001	.0017
.402	215.266	-.01	8.49	.7978	-.0618	-.0376	-.0013	.0001	.0017
.402	215.278	-.01	9.67	.8850	-.0826	-.0471	-.0015	.0001	.0018
.402	215.119	-.01	10.72	.9493	-.1005	-.0584	-.0017	.0000	.0017
.401	214.900	-.01	11.83	.9962	-.1157	-.0781	-.0020	.0000	.0015
.402	215.360	-.01	.12	.0733	.0184	.0197	.0000	.0002	.0014

UNCLASSIFIED

CLASSIFIED

C

7 X 10 FT TUNNELS \*\*\* NASA

\*\*\* NASA C [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

TEST 788

RUN 66

BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.604	424.387	-.03	.32	.0979	.0186	.0200	-.0005	.0001	.0018	5.249
.604	424.024	-.02	-5.10	-.4207	.0313	.0564	-.0001	-.0002	.0023	-13.443
.604	424.420	-.02	-3.86	-.3000	.0249	.0476	-.0001	-.0001	.0022	-12.036
.604	424.151	-.03	-2.52	-.1739	.0206	.0387	.0001	-.0000	.0025	-8.432
.604	424.639	-.03	-1.15	-.0423	.0185	.0295	-.0003	.0000	.0024	-2.286
.604	424.468	-.03	.34	.1009	.0187	.0197	-.0004	.0002	.0019	5.394
.604	424.296	-.03	1.83	.2432	.0213	.0104	-.0008	.0002	.0016	11.425
.604	424.121	-.03	3.23	.3770	.0261	.0027	-.0008	.0003	.0013	14.463
.603	423.031	-.03	4.67	.5150	.0331	-.0049	-.0009	.0003	.0013	15.546
.604	424.534	-.02	6.06	.6435	.0424	-.0118	-.0018	.0003	.0014	15.164
.604	424.299	-.02	7.42	.7680	.0538	-.0169	-.0023	.0003	.0017	14.268
.604	424.805	-.03	.34	.1003	.0188	.0200	-.0005	.0001	.0019	5.346

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.604	424.387	-.03	.32	.0980	.0181	.0200	-.0005	.0001	.0018
.604	424.024	-.02	-5.10	-.4217	-.0062	.0564	-.0002	-.0002	.0023
.604	424.420	-.02	-3.86	-.3010	.0047	.0476	-.0001	-.0001	.0022
.604	424.151	-.03	-2.52	-.1746	.0130	.0387	.0001	-.0000	.0025
.604	424.639	-.03	-1.15	-.0426	.0176	.0295	-.0003	.0000	.0024
.604	424.468	-.03	.34	.1010	.0181	.0197	-.0004	.0002	.0019
.604	424.296	-.03	1.83	.2438	.0135	.0104	-.0008	.0002	.0016
.604	424.121	-.03	3.23	.3778	.0048	.0027	-.0008	.0002	.0013
.603	423.031	-.03	4.67	.5159	-.0089	-.0049	-.0009	.0003	.0013
.604	424.534	-.02	6.06	.6442	-.0257	-.0118	-.0018	.0001	.0014
.604	424.299	-.02	7.42	.7683	-.0458	-.0169	-.0023	-.0000	.0017
.604	424.805	-.03	.34	.1004	.0182	.0200	-.0005	.0001	.0019

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA [REDACTED]

HIGH SPEED TUNNEL

TEST 788

RUN 67

BALANCE 731

09/15/67

UNCL  
STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.707	533.255	-.04	.54	.1283	.0198	.0204	-.0006	.0001	.0022	6.478
.708	533.919	-.04	-3.32	-.2539	.0260	.0439	-.0004	-.0001	.0029	-.9.759
.708	533.954	-.03	-2.68	-.1932	.0228	.0381	-.0001	-.0001	.0023	-.8.493
.708	534.240	-.03	-1.93	-.1192	.0206	.0334	-.0003	-.0001	.0023	-.5.779
.708	533.668	-.03	-1.14	-.0396	.0193	.0290	-.0004	-.0000	.0023	-.2.046
.707	533.179	-.04	-.33	.0406	.0191	.0249	-.0004	.0000	.0024	2.127
.707	533.336	-.04	.55	.1291	.0199	.0206	-.0005	.0001	.0022	6.485
.708	533.804	-.04	1.48	.2261	.0219	.0160	-.0008	.0002	.0019	10.322
.707	533.015	-.03	2.29	.3131	.0248	.0121	-.0008	.0002	.0017	12.603
.707	532.820	-.03	3.16	.4080	.0305	.0074	-.0012	.0003	.0011	13.396
.707	532.898	-.03	3.91	.4816	.0369	.0015	-.0011	.0004	.0009	13.042
.707	533.346	-.03	4.56	.5216	.0438	-.0067	-.0010	.0003	.0009	11.912
.707	532.628	-.04	.53	.1271	.0198	.0207	-.0005	.0001	.0023	6.413

UNCL  
BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CHM	CYM	CSF
.707	533.255	-.04	.54	.1285	.0186	.0204	-.0006	.0001	.0022
.708	533.919	-.04	-3.32	-.2549	.0113	.0439	-.0004	-.0001	.0029
.708	533.954	-.03	-2.68	-.1941	.0137	.0381	-.0001	-.0001	.0023
.708	534.240	-.03	-1.93	-.1198	.0166	.0334	-.0003	-.0001	.0023
.708	533.668	-.03	-1.14	-.0399	.0185	.0290	-.0004	-.0000	.0023
.707	533.179	-.04	-.33	.0405	.0193	.0249	-.0004	.0000	.0024
.707	533.336	-.04	.55	.1292	.0187	.0206	-.0005	.0001	.0022
.708	533.804	-.04	1.48	.2266	.0161	.0160	-.0008	.0001	.0019
.707	533.015	-.03	2.29	.3138	.0123	.0121	-.0008	.0002	.0017
.707	532.820	-.03	3.16	.4090	.0079	.0074	-.0012	.0003	.0011
.707	532.898	-.03	3.91	.4829	.0040	.0015	-.0011	.0003	.0009
.707	533.346	-.03	4.56	.5232	.0022	-.0067	-.0010	.0003	.0009
.707	532.628	-.04	.53	.1273	.0186	.0207	-.0005	.0001	.0023

HIGH SPEED TUNNEL

TEST 788

RUN 68

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.201	58.612	-.00	.06	.0837	.0196	.0219	-.0001	.0002	.0006	4.274
.201	58.418	-.00	-5.17	-.3758	.0291	.0606	.0000	-.0000	.0015	-12.902
.201	58.516	-.00	-4.16	-.2846	.0252	.0530	-.0003	.0000	.0010	-11.301
.201	58.713	-.00	-3.12	-.1947	.0223	.0451	-.0005	.0001	.0009	-8.729
.201	58.515	-.00	-2.08	-.1050	.0208	.0376	-.0003	.0001	.0010	-5.046
.201	58.712	-.00	-1.02	-.0090	.0197	.0291	-.0003	.0002	.0005	-4.458
.201	58.613	-.00	.04	.0837	.0198	.0224	-.0000	.0002	.0009	4.226
.202	58.909	-.00	1.11	.1756	.0209	.0143	-.0002	.0002	.0011	8.397
.201	58.612	-.00	2.17	.2681	.0231	.0072	-.0001	.0002	.0005	11.618
.201	58.808	-.00	3.26	.3632	.0263	.0001	-.0002	.0002	-.0001	13.797
.201	58.511	-.00	4.34	.4523	.0304	-.0072	-.0008	.0002	.0009	14.877
.201	58.610	-.00	5.41	.5455	.0358	-.0146	-.0004	.0003	.0005	15.219
.201	58.709	-.00	6.50	.6407	.0426	-.0228	-.0008	.0002	.0013	15.034
.201	58.512	-.00	7.59	.7291	.0506	-.0311	-.0018	.0002	.0013	14.398
.200	58.216	-.00	8.65	.8085	.0585	-.0398	-.0014	.0002	.0019	13.822
.201	58.614	-.00	9.74	.8883	.0678	-.0482	-.0012	.0002	.0017	13.109
.201	58.815	-.01	10.84	.9640	.0778	-.0582	-.0012	.0003	.0025	12.397
.201	58.623	-.00	11.86	1.0199	.0878	-.0691	-.0011	.0003	.0022	11.620
.201	58.337	-.00	12.95	1.0833	.1010	-.0857	-.0011	.0003	.0020	10.724
.200	58.254	-.01	13.97	1.1266	.1153	-.1081	-.0009	.0004	.0030	9.772
.202	59.304	-.00	.03	.0771	.0196	.0225	-.0002	.0002	.0010	3.944

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.201	58.612	-.00	.06	.0837	.0195	.0219	-.0001	.0002	.0006
.201	58.418	-.00	-5.17	-.3768	-.0048	.0606	.0000	-.0000	.0015
.201	58.516	-.00	-4.16	-.2857	.0045	.0530	-.0003	.0000	.0010
.201	58.713	-.00	-3.12	-.1956	.0117	.0451	-.0005	.0001	.0009
.201	58.515	-.00	-2.08	-.1057	.0170	.0376	-.0003	.0001	.0010
.201	58.712	-.00	-1.02	-.0094	.0196	.0291	-.0003	.0002	.0005
.201	58.613	-.00	.04	.0837	.0198	.0224	-.0000	.0002	.0009
.202	58.909	-.00	1.11	.1759	.0175	.0143	-.0002	.0002	.0011
.201	58.612	-.00	2.17	.2688	.0129	.0072	-.0001	.0002	.0005
.201	58.808	-.00	3.26	.3640	.0057	.0001	-.0003	.0002	-.0001
.201	58.511	-.00	4.34	.4533	-.0039	-.0072	-.0009	.0002	.0009
.201	58.610	-.00	5.41	.5463	-.0157	-.0146	-.0004	.0002	.0005
.201	58.709	-.00	6.50	.6412	-.0302	-.0228	-.0008	.0001	.0013
.201	58.512	-.00	7.59	.7291	-.0461	-.0311	-.0018	-.0001	.0013
.200	58.216	-.00	8.65	.8078	-.0637	-.0398	-.0014	.0000	.0019
.201	58.614	-.00	9.74	.8865	-.0834	-.0482	-.0012	.0000	.0017
.201	58.815	-.01	10.84	.9609	-.1048	-.0582	-.0013	.0001	.0025
.201	58.623	-.00	11.86	1.0155	-.1235	-.0691	-.0011	.0001	.0022
.201	58.337	-.00	12.95	1.0777	-.1442	-.0857	-.0011	.0001	.0020
.200	58.254	-.01	13.97	1.1203	-.1599	-.1081	-.0010	.0002	.0030
.202	59.304	-.00	.03	.0771	.0195	.0225	-.0002	.0002	.0010

HIGH SPEED TUNNEL

TEST 788

RUN 69

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.402	215.542	-.01	.13	.0912	.0180	.0225	-.0002	.0002	.0015	5.078
.401	214.349	-.01	-5.61	-.4240	.0301	.0636	-.0004	-.0001	.0018	-14.097
.402	215.925	-.01	-4.50	-.3264	.0251	.0564	-.0004	-.0000	.0019	-12.980
.402	215.828	-.01	-3.37	-.2235	.0213	.0474	-.0003	-.0000	.0019	-10.510
.402	215.639	-.01	-2.23	-.1216	.0188	.0389	-.0005	.0000	.0020	-6.456
.402	215.172	-.01	-1.04	-.0146	.0177	.0305	-.0000	.0001	.0017	-.826
.402	215.727	-.01	.15	.0923	.0179	.0223	-.0002	.0002	.0013	5.154
.402	215.818	-.01	1.34	.2006	.0196	.0137	-.0003	.0002	.0016	10.234
.402	215.444	-.01	2.59	.3105	.0226	.0056	-.0003	.0002	.0015	13.725
.402	215.349	-.01	3.80	.4194	.0272	-.0023	-.0005	.0003	.0013	15.421
.402	215.440	-.01	4.99	.5247	.0330	-.0096	-.0004	.0003	.0012	15.916
.402	215.254	-.01	6.17	.6264	.0401	-.0175	-.0011	.0003	.0014	15.637
.402	215.072	-.01	7.36	.7258	.0487	-.0259	-.0013	.0003	.0015	14.899
.402	215.260	-.01	8.52	.8218	.0580	-.0343	-.0012	.0003	.0015	14.164
.402	215.085	-.01	9.70	.9139	.0690	-.0434	-.0014	.0003	.0016	13.235
.401	214.923	-.01	10.79	.9816	.0798	-.0535	-.0017	.0003	.0015	12.297
.402	215.539	-.01	11.89	1.0269	.0928	-.0731	-.0017	.0004	.0013	11.071
.401	214.984	-.01	.13	.0908	.0179	.0224	-.0002	.0002	.0014	5.060

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.402	215.542	-.01	.13	.0912	.0177	.0225	-.0002	.0002	.0015
.401	214.349	-.01	-5.61	-.4248	-.0115	.0636	-.0004	-.0001	.0018
.402	215.925	-.01	-4.50	-.3273	.0006	.0564	-.0004	-.0000	.0019
.402	215.828	-.01	-3.37	-.2243	.0081	.0474	-.0003	-.0000	.0019
.402	215.639	-.01	-2.23	-.1222	.0141	.0389	-.0005	.0001	.0020
.402	215.172	-.01	-1.04	-.0149	.0174	.0305	-.0000	.0001	.0017
.402	215.727	-.01	.15	.0923	.0177	.0223	-.0002	.0002	.0013
.402	215.818	-.01	1.34	.2010	.0149	.0137	-.0003	.0002	.0016
.402	215.444	-.01	2.59	.3112	.0086	.0056	-.0003	.0002	.0015
.402	215.349	-.01	3.80	.4202	-.0007	-.0023	-.0005	.0002	.0013
.402	215.440	-.01	4.99	.5255	-.0128	-.0096	-.0004	.0003	.0012
.402	215.254	-.01	6.17	.6269	-.0275	-.0175	-.0012	.0002	.0014
.402	215.072	-.01	7.36	.7258	-.0447	-.0259	-.0013	.0001	.0015
.402	215.260	-.01	8.52	.8210	-.0644	-.0343	-.0012	.0001	.0015
.402	215.085	-.01	9.70	.9120	-.0859	-.0434	-.0015	.0000	.0016
.401	214.923	-.01	10.79	.9787	-.1052	-.0535	-.0017	-.0000	.0015
.402	215.539	-.01	11.89	1.0233	-.1207	-.0731	-.0017	.0001	.0013
.401	214.984	-.01	.13	.0908	.0177	.0224	-.0002	.0002	.0014

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7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 70

## BALANCE 731

09/15/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.604	424.129	-.03	.39	.1217	.0181	.0225	-.0008	.0001	.0018	6.741
.603	423.417	-.02	-5.03	-.3974	.0284	.0582	-.0001	-.0002	.0022	-14.003
.605	425.482	-.02	-3.79	-.2784	.0228	.0502	-.0001	-.0001	.0022	-12.235
.604	424.802	-.02	-2.45	-.1512	.0190	.0411	-.0002	-.0000	.0022	-7.972
.605	425.211	-.03	-1.09	-.0194	.0174	.0323	-.0005	.0000	.0021	-1.114
.604	424.378	-.03	.38	.1210	.0181	.0228	-.0006	.0001	.0019	6.696
.604	424.535	-.03	1.92	.2718	.0212	.0126	-.0008	.0002	.0017	12.813
.603	423.863	-.02	3.36	.4087	.0266	.0050	-.0010	.0002	.0013	15.346
.604	424.853	-.02	4.80	.5496	.0344	-.0023	-.0008	.0003	.0012	15.968
.604	424.360	-.02	6.15	.6732	.0439	-.0087	-.0020	.0003	.0013	15.330
.604	424.454	-.02	7.54	.8051	.0563	-.0136	-.0024	.0002	.0016	14.307
.604	424.962	-.03	.41	.1234	.0181	.0226	-.0006	.0001	.0019	6.805

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.604	424.129	-.03	.39	.1218	.0172	.0225	-.0008	.0001	.0018
.603	423.417	-.02	-5.03	-.3983	-.0066	.0582	-.0001	-.0002	.0022
.605	425.482	-.02	-3.79	-.2793	.0043	.0502	-.0001	-.0001	.0022
.604	424.802	-.02	-2.45	-.1518	.0125	.0411	-.0003	-.0000	.0022
.605	425.211	-.03	-1.09	-.0197	.0170	.0323	-.0005	.0001	.0021
.604	424.378	-.03	.38	.1211	.0173	.0228	-.0006	.0001	.0019
.604	424.535	-.03	1.92	.2723	.0121	.0126	-.0008	.0002	.0017
.603	423.863	-.02	3.36	.4095	.0027	.0050	-.0011	.0002	.0013
.604	424.853	-.02	4.80	.5504	-.0117	-.0023	-.0009	.0002	.0012
.604	424.360	-.02	6.15	.6739	-.0284	-.0087	-.0020	.0001	.0013
.604	424.454	-.02	7.54	.8052	-.0499	-.0136	-.0026	-.0001	.0016
.604	424.962	-.03	.41	.1235	.0173	.0226	-.0006	.0001	.0019

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\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

09/15/67

HIGH SPEED TUNNEL

TEST 788

RUN 71

BALANCE 731

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.708	533.714	-.03	.66	.1580	.0193	.0234	-.0009	.0001	.0020	8.186
.708	533.665	-.03	-3.27	-.2432	.0221	.0450	-.0002	-.0001	.0023	-11.025
.708	534.297	-.03	-2.58	-.1690	.0200	.0407	-.0003	-.0001	.0021	-8.438
.708	533.808	-.03	-1.81	-.0916	.0185	.0365	-.0005	-.0001	.0024	-4.944
.708	534.032	-.03	-1.03	-.0124	.0179	.0323	-.0006	-.0000	.0025	-.691
.708	533.627	-.04	-.13	.0775	.0182	.0279	-.0006	.0000	.0024	4.264
.708	533.951	-.04	.66	.1589	.0193	.0233	-.0008	.0001	.0022	8.213
.708	533.867	-.04	1.61	.2592	.0218	.0182	-.0008	.0001	.0019	11.874
.707	532.853	-.03	2.46	.3507	.0254	.0146	-.0010	.0002	.0016	13.795
.707	533.048	-.03	3.30	.4427	.0312	.0096	-.0013	.0003	.0011	14.170
.708	534.502	-.03	4.06	.5135	.0393	.0026	-.0012	.0003	.0009	13.065
.708	534.140	-.02	4.66	.5488	.0451	-.0045	-.0012	.0003	.0008	12.170
.708	533.636	-.04	.66	.1578	.0193	.0234	-.0007	.0001	.0022	8.170

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.708	533.714	-.03	.66	.1582	.0175	.0234	-.0009	.0001	.0020
.708	533.665	-.03	-3.27	-.2441	.0082	.0450	-.0002	-.0001	.0023
.708	534.297	-.03	-2.58	-.1697	.0124	.0407	-.0003	-.0001	.0021
.708	533.808	-.03	-1.81	-.0922	.0156	.0365	-.0005	-.0001	.0024
.708	534.032	-.03	-1.03	-.0127	.0177	.0323	-.0006	-.0000	.0025
.708	533.627	-.04	-.13	.0774	.0183	.0279	-.0006	.0000	.0024
.708	533.951	-.04	.66	.1591	.0175	.0233	-.0008	.0001	.0022
.708	533.867	-.04	1.61	.2596	.0146	.0182	-.0008	.0001	.0019
.707	532.853	-.03	2.46	.3514	.0103	.0146	-.0010	.0001	.0016
.707	533.048	-.03	3.30	.4437	.0057	.0096	-.0013	.0002	.0011
.708	534.502	-.03	4.06	.5149	.0028	.0026	-.0012	.0002	.0009
.708	534.140	-.02	4.66	.5505	.0004	-.0045	-.0012	.0002	.0008
.708	533.636	-.04	.66	.1579	.0175	.0234	-.0007	.0001	.0022

7 X 10 FT TUNNELS \*\*\* NASA

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 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

~~UNCLASSIFIED~~

HIGH SPEED TUNNEL

TEST 788

RUN 72

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.203	59.501	-.00	.08	.0918	.0194	.0339	-.0000	.0002	.0017	4.744
.202	59.307	-.00	-5.18	-.3698	.0286	.0735	-.0001	-.0000	.0011	-12.931
.203	59.504	-.00	-4.14	-.2804	.0248	.0655	-.0002	.0000	.0009	-11.327
.202	59.305	-.00	-3.10	-.1884	.0218	.0573	-.0000	.0001	.0014	-8.650
.202	59.404	-.00	-2.04	-.0932	.0199	.0495	-.0001	.0001	.0012	-4.674
.202	59.403	-.00	-.99	-.0018	.0192	.0420	-.0003	.0002	.0018	-.093
.202	59.304	-.00	.08	.0899	.0192	.0339	-.0001	.0002	.0017	4.671
.202	59.106	-.00	1.15	.1855	.0206	.0264	-.0001	.0002	.0012	8.991
.202	59.401	-.00	2.21	.2762	.0228	.0189	-.0001	.0002	.0021	12.131
.202	59.401	-.00	3.30	.3734	.0262	.0121	-.0004	.0002	.0012	14.236
.202	59.202	-.00	4.36	.4633	.0303	.0046	-.0005	.0002	.0018	15.274
.202	59.004	-.00	5.44	.5544	.0357	-.0029	-.0006	.0002	.0015	15.525
.202	59.004	-.00	6.53	.6476	.0426	-.0101	-.0008	.0002	.0012	15.206
.201	58.709	-.00	7.62	.7310	.0501	-.0183	-.0012	.0002	.0020	14.599
.202	59.304	-.00	8.69	.8145	.0589	-.0273	-.0013	.0002	.0024	13.823
.202	59.306	-.00	9.74	.8861	.0676	-.0354	-.0012	.0003	.0016	13.110
.203	59.508	-.00	10.86	.9593	.0779	-.0469	-.0013	.0003	.0018	12.313
.203	59.714	-.01	11.88	1.0152	.0888	-.0613	-.0010	.0003	.0028	11.437
.203	59.534	-.01	12.96	1.0528	.1025	-.0850	-.0009	.0003	.0029	10.268
.203	59.488	-.01	13.97	1.0495	.1293	-.0977	-.0018	-.0026	.0118	8.118
.202	59.403	-.00	.07	.0841	.0192	.0342	-.0002	.0002	.0006	4.379

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.203	59.501	-.00	.08	.0919	.0192	.0339	-.0000	.0002	.0017
.202	59.307	-.00	-5.18	-.3708	-.0049	.0735	-.0001	-.0000	.0011
.203	59.504	-.00	-4.14	-.2814	.0044	.0655	-.0002	.0000	.0009
.202	59.305	-.00	-3.10	-.1893	.0116	.0573	-.0000	.0001	.0014
.202	59.404	-.00	-2.04	-.0938	.0166	.0495	-.0001	.0001	.0012
.202	59.403	-.00	-.99	-.0021	.0192	.0420	-.0003	.0002	.0018
.202	59.304	-.00	.08	.0899	.0191	.0339	-.0001	.0002	.0017
.202	59.106	-.00	1.15	.1859	.0169	.0264	-.0001	.0002	.0012
.202	59.401	-.00	2.21	.2768	.0121	.0189	-.0001	.0001	.0021
.202	59.401	-.00	3.30	.3742	.0047	.0121	-.0005	.0002	.0012
.202	59.202	-.00	4.36	.4641	-.0050	.0046	-.0005	.0002	.0018
.202	59.004	-.00	5.44	.5552	-.0170	-.0029	-.0006	.0002	.0015
.202	59.004	-.00	6.53	.6481	-.0314	-.0101	-.0008	.0002	.0012
.201	58.709	-.00	7.62	.7310	-.0472	-.0183	-.0013	.0001	.0020
.202	59.304	-.00	8.69	.8137	-.0648	-.0273	-.0013	.0000	.0024
.202	59.306	-.00	9.74	.8843	-.0832	-.0354	-.0012	.0001	.0016
.203	59.508	-.00	10.86	.9563	-.1041	-.0469	-.0013	.0001	.0018
.203	59.714	-.01	11.88	1.0111	-.1220	-.0613	-.0010	.0001	.0028
.203	59.534	-.01	12.96	1.0483	-.1360	-.0850	-.0010	.0001	.0029
.203	59.488	-.01	13.97	1.0487	-.1277	-.0977	-.0024	-.0021	.0118
.202	59.403	-.00	.07	.0841	.0191	.0342	-.0002	.0002	.0006

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\*\*\* NASA PRELIMINARY \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 73

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.402	215.634	-.01	.19	.1023	.0176	.0350	-.0004	.0001	.0014	5.824
.401	214.812	-.01	-5.57	-.4173	.0292	.0769	-.0002	-.0001	.0018	-14.306
.402	215.737	-.01	-4.46	-.3162	.0241	.0685	-.0000	-.0001	.0017	-13.102
.402	215.641	-.01	-3.33	-.2161	.0206	.0603	-.0005	.0000	.0016	-10.473
.402	215.638	-.01	-2.18	-.1111	.0182	.0515	-.0008	.0001	.0015	-6.111
.402	215.821	-.01	-1.00	-.0040	.0172	.0430	-.0002	.0001	.0016	-.233
.402	215.261	-.01	.18	.1032	.0175	.0349	-.0001	.0001	.0014	5.889
.402	215.817	-.01	1.39	.2125	.0193	.0265	-.0004	.0002	.0015	11.007
.402	215.164	-.01	2.64	.3216	.0226	.0183	-.0006	.0002	.0014	14.248
.402	215.067	-.01	3.83	.4301	.0271	.0109	-.0005	.0002	.0016	15.892
.402	215.529	-.01	4.99	.5339	.0328	.0033	-.0005	.0002	.0017	16.260
.402	215.808	-.01	6.24	.6413	.0405	-.0050	-.0011	.0002	.0015	15.849
.402	215.627	-.01	7.39	.7351	.0469	-.0130	-.0011	.0003	.0013	15.023
.402	215.260	-.01	8.58	.8288	.0584	-.0217	-.0011	.0003	.0016	14.180
.402	215.554	-.01	9.73	.9125	.0692	-.0311	-.0014	.0003	.0014	13.186
.402	215.213	-.01	10.79	.9735	.0800	-.0436	-.0016	.0003	.0014	12.171
.402	215.490	-.01	11.86	1.0039	.0950	-.0714	-.0012	.0001	.0013	10.565
.402	215.075	-.01	.19	.1020	.0175	.0349	-.0002	.0001	.0016	5.826

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.402	215.634	-.01	.19	.1024	.0172	.0350	-.0004	.0001	.0014
.401	214.812	-.01	-5.57	-.4181	-.0115	.0769	-.0003	-.0001	.0018
.402	215.737	-.01	-4.46	-.3170	-.0005	.0685	-.0000	-.0001	.0017
.402	215.641	-.01	-3.33	-.2169	.0080	.0603	-.0005	.0000	.0016
.402	215.638	-.01	-2.18	-.1117	.0139	.0515	-.0008	.0001	.0015
.402	215.821	-.01	-1.00	-.0043	.0171	.0430	-.0002	.0001	.0016
.402	215.261	-.01	.18	.1032	.0172	.0349	-.0001	.0001	.0014
.402	215.817	-.01	1.39	.2128	.0142	.0265	-.0004	.0002	.0015
.402	215.164	-.01	2.64	.3222	.0078	.0183	-.0006	.0002	.0014
.402	215.067	-.01	3.83	.4308	-.0017	.0109	-.0006	.0002	.0016
.402	215.529	-.01	4.99	.5346	-.0137	.0033	-.0006	.0002	.0017
.402	215.808	-.01	6.24	.6417	-.0295	-.0050	-.0012	.0001	.0015
.402	215.627	-.01	7.39	.7350	-.0460	-.0130	-.0012	.0002	.0013
.402	215.260	-.01	8.58	.8279	-.0658	-.0217	-.0012	.0001	.0016
.402	215.554	-.01	9.73	.9107	-.0860	-.0311	-.0015	.0001	.0014
.402	215.213	-.01	10.79	.9707	-.1035	-.0436	-.0017	.0000	.0014
.402	215.490	-.01	11.86	1.0013	-.1132	-.0714	-.0012	-.0001	.0013
.402	215.075	-.01	.19	.1020	.0172	.0349	-.0002	.0001	.0016

UNCLASSIFIED

\*\*\* NASA C [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 74

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYH	CSF	L/D
.604	424.710	-.02	.54	.1451	.0179	.0366	-.0007	.0001	.0016	8.122
.603	423.581	-.02	-4.94	-.3834	.0271	.0727	-.0001	-.0002	.0024	-14.139
.604	424.901	-.02	-3.71	-.2637	.0218	.0646	-.0001	-.0001	.0021	-12.081
.604	425.139	-.02	-2.37	-.1336	.0183	.0554	-.0001	-.0000	.0021	-7.316
.604	425.211	-.03	-.98	-.0006	.0169	.0463	-.0006	-.0000	.0020	-.035
.604	424.793	-.02	.53	.1441	.0178	.0366	-.0006	.0001	.0017	8.076
.604	424.453	-.02	2.05	.2938	.0214	.0273	-.0009	.0001	.0015	13.720
.604	424.525	-.02	3.48	.4318	.0272	.0197	-.0009	.0002	.0015	15.850
.604	424.185	-.02	4.92	.5728	.0354	.0126	-.0008	.0002	.0015	16.195
.604	424.851	-.02	6.28	.7025	.0454	.0066	-.0022	.0002	.0016	15.460
.604	424.552	-.02	7.56	.8044	.0566	-.0001	-.0022	.0002	.0016	14.215
.604	424.792	-.02	.52	.1438	.0179	.0370	-.0006	.0001	.0017	8.043

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYH	CSF
.604	424.710	-.02	.54	.1452	.0165	.0366	-.0007	.0001	.0016
.603	423.581	-.02	-4.94	-.3843	-.0060	.0727	-.0001	-.0002	.0024
.604	424.901	-.02	-3.71	-.2645	.0047	.0646	-.0001	-.0001	.0021
.604	425.139	-.02	-2.37	-.1342	.0127	.0554	-.0001	-.0000	.0021
.604	425.211	-.03	-.98	-.0009	.0169	.0463	-.0006	-.0001	.0020
.604	424.793	-.02	.53	.1442	.0165	.0366	-.0006	.0001	.0017
.604	424.453	-.02	2.05	.2944	.0109	.0273	-.0009	.0001	.0015
.604	424.525	-.02	3.48	.4326	.0010	.0197	-.0009	.0001	.0015
.604	424.185	-.02	4.92	.5736	-.0139	.0126	-.0008	.0001	.0016
.604	424.851	-.02	6.28	.7030	-.0317	.0066	-.0022	-.0001	.0016
.604	424.552	-.02	7.56	.8046	-.0497	-.0001	-.0022	-.0001	.0016
.604	424.792	-.02	.52	.1439	.0166	.0370	-.0006	.0001	.0017

ALL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA CO [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 75

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.707	533.557	-.03	.81	.1888	.0195	.0396	-.0007	.0001	.0019	9.672
.707	533.192	-.02	-3.14	-.2195	.0209	.0608	-.0002	-.0001	.0020	-10.506
.708	534.292	-.02	-2.43	-.1426	.0191	.0564	-.0001	-.0000	.0017	-7.485
.708	534.121	-.03	-1.63	-.0605	.0178	.0521	-.0004	.0000	.0018	-3.400
.708	534.029	-.03	-.85	.0158	.0175	.0485	-.0005	.0001	.0020	.902
.707	533.634	-.03	.09	.1138	.0182	.0432	-.0006	.0001	.0019	6.255
.708	534.109	-.03	.80	.1876	.0196	.0399	-.0009	.0001	.0017	9.581
.708	533.715	-.03	1.83	.2991	.0229	.0344	-.0008	.0002	.0015	13.036
.707	533.036	-.03	2.69	.3907	.0278	.0294	-.0012	.0002	.0011	14.051
.708	533.658	-.02	3.47	.4737	.0347	.0233	-.0012	.0003	.0010	13.662
.708	534.255	-.02	4.13	.5243	.0418	.0151	-.0010	.0003	.0007	12.549
.708	534.159	-.03	4.70	.5471	.0479	.0037	-.0009	.0003	.0010	11.427

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.707	533.557	-.03	.81	.1890	.0168	.0396	-.0007	.0001	.0019
.707	533.192	-.02	-3.14	-.2203	.0088	.0608	-.0002	-.0001	.0020
.708	534.292	-.02	-2.43	-.1433	.0130	.0564	-.0001	-.0000	.0017
.708	534.121	-.03	-1.63	-.0610	.0161	.0521	-.0004	.0000	.0018
.708	534.029	-.03	-.85	.0155	.0177	.0485	-.0005	.0001	.0020
.707	533.634	-.03	.09	.1138	.0180	.0432	-.0006	.0001	.0019
.708	534.109	-.03	.80	.1878	.0169	.0399	-.0009	.0001	.0017
.708	533.715	-.03	1.83	.2997	.0134	.0344	-.0008	.0001	.0015
.707	533.036	-.03	2.69	.3915	.0095	.0294	-.0012	.0002	.0011
.708	533.658	-.02	3.47	.4748	.0060	.0233	-.0012	.0002	.0010
.708	534.255	-.02	4.13	.5258	.0039	.0151	-.0010	.0002	.0007
.708	534.159	-.03	4.70	.5490	.0029	.0037	-.0009	.0002	.0010

DECLASSIFIED

UNCLASSIFIED

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

HIGH SPEED TUNNEL

TEST 788

RUN 76

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.202	58.883	-.00	-.01	.0003	.0055	-.0089	.0002	.0002	.0008	.049
.201	58.785	-.00	-4.94	-.0045	.0060	-.0235	.0003	-.0002	.0025	-.743
.202	58.883	-.00	-3.96	-.0038	.0059	-.0202	.0002	-.0001	.0022	-.646
.202	58.883	-.00	-2.98	-.0020	.0057	-.0174	.0002	-.0000	.0015	-.342
.202	58.883	-.00	-1.99	-.0024	.0056	-.0147	.0002	-.0000	.0016	-.427
.202	58.882	-.00	-1.00	.0017	.0054	-.0119	.0003	.0001	.0012	.306
.202	58.882	-.00	-.01	.0014	.0053	-.0085	.0003	.0001	.0008	.270
.201	58.784	-.00	.99	.0011	.0054	-.0049	.0003	.0002	.0008	.210
.202	58.883	-.00	2.00	-.0014	.0054	-.0005	.0003	.0002	.0006	-.262
.202	58.883	-.00	3.02	.0005	.0054	.0026	.0001	.0002	.0006	.094
.201	58.784	-.00	4.00	-.0009	.0053	.0060	.0002	.0002	.0005	-.174
.201	58.784	-.00	5.02	-.0015	.0053	.0087	.0002	.0002	.0000	-.282
.202	58.883	-.00	6.03	.0002	.0055	.0121	.0001	.0002	.0010	.044
.202	59.081	-.00	7.04	.0008	.0055	.0152	.0002	.0002	.0006	.151
.202	59.179	-.00	8.05	-.0020	.0052	.0181	.0002	.0002	.0009	-.378
.202	59.180	-.00	9.06	.0009	.0056	.0214	.0002	.0001	.0004	.156
.202	59.081	-.00	10.09	.0001	.0055	.0244	.0001	.0001	.0006	.026
.202	58.983	-.00	11.10	.0027	.0060	.0265	.0002	.0000	.0011	.455
.202	58.885	-.00	12.13	.0031	.0062	.0299	.0002	.0000	.0017	.502
.201	58.686	-.00	13.13	.0014	.0056	.0325	.0002	-.0000	.0018	.243
.201	58.784	-.00	.00	.0003	.0054	-.0085	.0003	.0002	.0005	.046

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.202	58.883	-.00	-.01	.0003	.0055	-.0089	.0002	.0002	.0008
.201	58.785	-.00	-4.94	-.0050	.0056	-.0235	.0002	-.0002	.0025
.202	58.883	-.00	-3.96	-.0042	.0056	-.0202	.0001	-.0001	.0022
.202	58.883	-.00	-2.98	-.0022	.0056	-.0174	.0002	-.0000	.0015
.202	58.883	-.00	-1.99	-.0026	.0055	-.0147	.0002	-.0000	.0016
.202	58.882	-.00	-1.00	.0016	.0054	-.0119	.0003	-.0001	.0012
.202	58.882	-.00	-.01	.0014	.0053	-.0085	.0003	.0001	.0008
.201	58.784	-.00	.99	.0012	.0054	-.0049	.0003	.0002	.0008
.202	58.883	-.00	2.00	-.0012	.0054	-.0005	.0003	.0002	.0006
.202	58.883	-.00	3.02	.0008	.0054	.0026	.0001	.0002	.0006
.201	58.784	-.00	4.00	-.0005	.0053	.0060	.0001	.0002	.0005
.201	58.784	-.00	5.02	-.0010	.0054	.0087	.0002	.0002	.0000
.202	58.883	-.00	6.03	.0008	.0054	.0121	.0001	.0002	.0010
.202	59.081	-.00	7.04	.0015	.0053	.0152	.0001	.0002	.0006
.202	59.179	-.00	8.05	-.0012	.0054	.0181	.0002	.0002	.0009
.202	59.180	-.00	9.06	.0017	.0054	.0214	.0002	.0001	.0004
.202	59.081	-.00	10.09	.0011	.0054	.0244	.0001	.0001	.0006
.202	58.983	-.00	11.10	.0038	.0054	.0265	.0001	.0001	.0011
.202	58.885	-.00	12.13	.0044	.0054	.0299	.0002	.0001	.0017
.201	58.686	-.00	13.13	.0026	.0052	.0325	.0002	-.0000	.0018
.201	58.784	-.00	.00	.0003	.0054	-.0085	.0003	.0002	.0005

HIGH SPEED TUNNEL

TEST 788

RUN 77

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.401	214.979	-.01	-.02	-.0012	.0048	-.0099	.0001	.0002	.0014	-.256
.401	214.985	-.01	-4.95	-.0054	.0057	-.0244	.0001	-.0002	.0022	-.951
.402	215.169	-.01	-3.98	-.0039	.0054	-.0218	.0001	-.0002	.0024	-.732
.402	215.445	-.01	-3.00	-.0031	.0051	-.0192	.0002	-.0001	.0022	-.600
.402	215.908	-.01	-2.01	-.0026	.0050	-.0163	.0001	.0000	.0018	-.516
.402	215.165	-.01	-1.01	-.0021	.0049	-.0133	.0001	.0001	.0014	-.425
.402	215.350	-.01	-.00	-.0019	.0048	-.0099	.0001	.0002	.0013	-.386
.402	215.350	-.01	.98	-.0016	.0047	-.0065	.0001	.0002	.0014	-.442
.402	215.164	-.01	1.97	-.0021	.0047	-.0025	.0001	.0001	.0015	-.478
.402	215.350	-.01	3.03	-.0022	.0046	-.0012	.0001	.0000	.0015	-.309
.402	215.071	-.01	4.01	-.0014	.0046	-.0045	.0001	.0001	.0014	-.354
.402	215.443	-.01	5.03	-.0016	.0047	-.0075	.0000	.0002	.0014	-.262
.402	215.444	-.01	6.05	-.0012	.0047	-.0108	.0000	.0002	.0013	-.238
.402	215.073	-.01	7.04	-.0011	.0047	-.0137	.0001	.0002	.0013	-.082
.401	214.888	-.01	8.09	-.0004	.0048	-.0167	.0000	.0001	.0014	.010
.402	215.631	-.01	9.09	-.0000	.0048	-.0197	.0000	.0001	.0015	.089
.402	215.261	-.01	10.13	-.0004	.0049	-.0228	.0000	.0001	.0014	-.193
.402	215.350	-.01	-.00	-.0009	.0048	-.0100	.0001	.0002	.0014	

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.401	214.979	-.01	-.02	-.0012	.0048	-.0099	.0001	.0002	.0014
.401	214.985	-.01	-4.95	-.0059	.0052	-.0244	.0001	-.0002	.0022
.402	215.169	-.01	-3.98	-.0043	.0051	-.0218	.0001	-.0002	.0024
.402	215.445	-.01	-3.00	-.0034	.0050	-.0192	.0002	-.0001	.0022
.402	215.908	-.01	-2.01	-.0027	.0049	-.0163	.0001	.0000	.0018
.402	215.165	-.01	-1.01	-.0022	.0048	-.0133	.0001	.0001	.0014
.402	215.350	-.01	-.00	-.0019	.0048	-.0099	.0001	.0002	.0014
.402	215.350	-.01	.98	-.0016	.0048	-.0065	.0001	.0002	.0013
.402	215.164	-.01	1.97	-.0019	.0048	-.0025	.0001	.0001	.0014
.402	215.350	-.01	3.03	-.0020	.0048	-.0012	.0001	.0001	.0015
.402	215.071	-.01	4.01	-.0011	.0047	-.0045	.0001	.0000	.0015
.402	215.443	-.01	5.03	-.0012	.0048	-.0075	.0000	.0001	.0014
.402	215.444	-.01	6.05	-.0007	.0048	-.0108	.0000	.0002	.0014
.402	215.073	-.01	7.04	-.0005	.0048	-.0137	.0000	.0002	.0013
.401	214.888	-.01	8.09	-.0003	.0048	-.0167	.0000	.0001	.0014
.402	215.631	-.01	9.09	-.0008	.0047	-.0197	.0000	.0001	.0015
.402	215.261	-.01	10.13	-.0013	.0047	-.0228	.0000	.0001	.0015
.402	215.350	-.01	-.00	-.0009	.0048	-.0100	.0001	.0002	.0014

UNCLASSIFIED

IN CLASSIFIED

~~UNCLASSIFIED~~

\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - UPGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 78

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.604	424.383	-.03	-.03	-.0020	.0046	-.0103	.0000	.0002	.0014	-.428
.604	424.311	-.02	-4.04	-.0040	.0053	-.0227	.0001	-.0001	.0024	-.762
.604	424.471	-.02	-3.06	-.0033	.0051	-.0200	.0001	-.0000	.0022	-.645
.604	424.383	-.02	-2.06	-.0025	.0048	-.0168	.0001	.0000	.0020	-.517
.604	424.548	-.02	-1.06	-.0021	.0047	-.0138	.0001	.0001	.0016	-.441
.604	424.465	-.03	-.03	-.0018	.0046	-.0104	.0000	.0002	.0015	-.390
.604	424.549	-.03	.96	-.0019	.0046	-.0066	.0000	.0002	.0015	-.409
.604	424.715	-.02	1.99	-.0018	.0045	-.0024	.0000	.0001	.0016	-.392
.604	424.799	-.02	3.01	-.0017	.0045	-.0011	.0000	.0001	.0017	-.377
.604	424.715	-.02	4.01	-.0015	.0046	-.0044	.0000	.0000	.0018	-.326
.604	424.635	-.02	5.04	-.0013	.0046	-.0076	.0000	.0001	.0017	-.285
.604	424.216	-.02	-.02	-.0016	.0047	-.0103	.0000	.0002	.0014	-.354
.707	532.692	-.04	-.03	-.0015	.0046	-.0102	.0000	.0003	.0015	-.317

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.604	424.383	-.03	-.03	-.0020	.0046	-.0103	.0000	.0002	.0014
.604	424.311	-.02	-4.04	-.0044	.0050	-.0227	.0001	-.0001	.0024
.604	424.471	-.02	-3.06	-.0035	.0049	-.0200	.0001	-.0001	.0022
.604	424.383	-.02	-2.06	-.0027	.0048	-.0168	.0001	.0000	.0020
.604	424.548	-.02	-1.06	-.0022	.0047	-.0138	.0001	.0001	.0016
.604	424.465	-.03	-.03	-.0018	.0046	-.0104	.0000	.0002	.0015
.604	424.549	-.03	.96	-.0018	.0046	-.0066	.0000	.0002	.0015
.604	424.715	-.02	1.99	-.0016	.0046	-.0024	.0000	.0001	.0016
.604	424.799	-.02	3.01	-.0015	.0046	-.0011	.0000	.0001	.0017
.604	424.715	-.02	4.01	-.0012	.0047	-.0044	.0000	.0000	.0018
.604	424.635	-.02	5.04	-.0009	.0047	-.0076	.0000	.0001	.0017
.604	424.216	-.02	-.02	-.0016	.0047	-.0103	.0000	.0002	.0014
.707	532.692	-.04	-.03	-.0015	.0046	-.0102	.0000	.0003	.0015

~~UNCLASSIFIED~~

~~CONFIDENTIAL~~

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA C \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

TRON 79

BALANCE 731

09/15/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/D
.707	532.767	-.04	-.03	-.0016	.0046	-.0102	.0000	.0003	.0015	-.344
.707	533.086	-.03	-2.55	-.0026	.0049	-.0185	.0001	.0001	.0020	-.527
.707	533.084	-.04	-2.07	-.0024	.0049	-.0170	.0000	.0001	.0019	-.499
.707	533.003	-.04	-1.56	-.0019	.0048	-.0153	.0000	.0002	.0018	-.392
.708	533.941	-.04	-1.05	-.0018	.0047	-.0138	.0000	.0002	.0017	-.386
.707	532.608	-.04	-.55	-.0015	.0047	-.0120	.0000	.0003	.0015	-.311
.707	533.159	-.04	-.03	-.0015	.0046	-.0103	.0000	.0003	.0015	-.318
.707	533.315	-.04	.47	-.0014	.0046	-.0083	.0000	.0003	.0014	-.298
.707	532.919	-.04	.97	-.0015	.0046	-.0062	.0000	.0003	.0016	-.333
.708	533.706	-.04	1.48	-.0017	.0045	-.0039	.0000	.0002	.0017	-.365
.708	533.941	-.04	1.98	-.0018	.0045	-.0022	.0000	.0002	.0018	-.400
.707	533.083	-.04	2.50	-.0016	.0046	-.0002	.0000	.0002	.0018	-.353
.707	533.078	-.04	-.04	-.0014	.0047	-.0102	.0000	.0003	.0014	-.290

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.707	532.767	-.04	-.03	-.0016	.0046	-.0102	.0000	.0003	.0015
.707	533.086	-.03	-2.55	-.0028	.0048	-.0185	.0001	.0001	.0020
.707	533.084	-.04	-2.07	-.0026	.0048	-.0170	.0001	.0001	.0019
.707	533.003	-.04	-1.56	-.0020	.0047	-.0153	.0000	.0002	.0018
.708	533.941	-.04	-1.05	-.0019	.0047	-.0138	.0000	.0002	.0017
.707	532.608	-.04	-.55	-.0015	.0047	-.0120	.0000	.0003	.0015
.707	533.159	-.04	-.03	-.0015	.0046	-.0103	.0000	.0003	.0015
.707	533.315	-.04	.47	-.0013	.0046	-.0083	.0000	.0003	.0014
.707	532.919	-.04	.97	-.0014	.0046	-.0062	.0000	.0003	.0016
.708	533.706	-.04	1.48	-.0015	.0046	-.0039	.0000	.0002	.0017
.708	533.941	-.04	1.98	-.0017	.0046	-.0022	.0000	.0002	.0018
.707	533.083	-.04	2.50	-.0014	.0046	-.0002	.0000	.0002	.0018
.707	533.078	-.04	-.04	-.0014	.0047	-.0102	.0000	.0003	.0014

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL UNCLAS TEST 788

RUN 80

BALANCE 731

09/20/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/E
.201	58.219	.00	.05	.0666	.0210	.0190	-.0008	.0003	-.0026	3.168
.200	58.127	.00	-5.24	-.3953	.0338	.0602	-.0010	.0003	-.0029	-11.705
.201	58.224	.00	-4.16	-.3019	.0290	.0517	-.0006	.0003	-.0028	-10.401
.201	58.420	.00	-3.14	-.2140	.0255	.0441	-.0008	.0002	-.0027	-8.389
.201	58.320	.00	-2.07	-.1196	.0231	.0350	-.0004	.0002	-.0018	-5.184
.201	58.221	.00	-1.01	-.0249	.0218	.0270	-.0006	.0002	-.0024	-1.142
.201	58.219	.00	.05	.0666	.0213	.0196	-.0008	.0003	-.0026	3.129
.201	58.218	.00	1.13	.1609	.0218	.0118	-.0006	.0003	-.0021	7.366
.200	58.118	.00	2.16	.2489	.0234	.0043	-.0006	.0003	-.0019	10.625
.200	58.117	.00	3.22	.3401	.0261	-.0028	-.0006	.0003	-.0021	13.052
.200	57.917	.00	4.26	.4283	.0294	-.0095	-.0006	.0004	-.0023	14.570
.200	58.016	.00	5.33	.5158	.0341	-.0167	-.0005	.0004	-.0017	15.138
.200	58.015	.00	6.47	.6025	.0394	-.0242	-.0008	.0004	-.0012	15.278
.200	57.917	-.00	7.53	.6890	.0470	-.0330	-.0014	.0004	-.0004	14.657
.200	58.116	.00	8.60	.7724	.0548	-.0421	-.0013	.0005	-.0014	14.106
.200	58.020	.00	9.66	.8537	.0644	-.0511	-.0013	.0006	-.0017	13.261
.200	58.122	.00	10.74	.9280	.0738	-.0619	-.0013	.0006	-.0016	12.571
.201	58.219	.00	.05	.0655	.0214	.0200	-.0006	.0002	-.0015	3.063

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.219	.00	.05	.0666	.0210	.0190	-.0008	.0003	-.0026
.200	58.127	.00	-5.24	-.3967	-.0025	.0602	-.0010	.0004	-.0029
.201	58.224	.00	-4.16	-.3031	.0071	.0517	-.0006	.0003	-.0028
.201	58.420	.00	-3.14	-.2151	.0137	.0441	-.0008	.0003	-.0027
.201	58.320	.00	-2.07	-.1203	.0187	.0350	-.0004	.0002	-.0018
.201	58.221	.00	-1.01	-.0252	.0213	.0270	-.0006	.0003	-.0024
.201	58.219	.00	.05	.0666	.0212	.0196	-.0008	.0003	-.0026
.201	58.218	.00	1.13	.1613	.0187	.0118	-.0006	.0003	-.0021
.200	58.118	.00	2.16	.2495	.0140	.0043	-.0006	.0003	-.0019
.200	58.117	.00	3.22	.3409	.0069	-.0028	-.0006	.0003	-.0021
.200	57.917	.00	4.26	.4292	-.0025	-.0095	-.0006	.0003	-.0023
.200	58.016	.00	5.33	.5166	-.0140	-.0167	-.0005	.0004	-.0017
.200	58.015	.00	6.47	.6029	-.0287	-.0242	-.0009	.0003	-.0012
.200	57.917	-.00	7.53	.6890	-.0436	-.0330	-.0014	.0003	-.0004
.200	58.116	.00	8.60	.7716	-.0614	-.0421	-.0014	.0003	-.0014
.200	58.020	.00	9.66	.8521	-.0797	-.0511	-.0014	.0004	-.0017
.200	58.122	.00	10.74	.9251	-.1004	-.0619	-.0014	.0004	-.0016
.201	58.219	.00	.05	.0655	.0213	.0200	-.0006	.0002	-.0015

UNCLASSIFIED

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HIGH SPEED TUNNEL

TEST 789

RUN PI

BALANCE 731

09/20/67

STABILITY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CL	CD	CPH	CRM	CYM	CSF	L/D
.401	214.322	.01	.18	.0743	.0197	.0200	-.0007	.0003	-.0024	3.781
.401	213.522	.01	-5.76	-.4555	.0364	.0647	-.0010	.0003	-.0025	-12.525
.402	214.627	.01	-4.60	-.3560	.0302	.0562	-.0007	.0003	-.0026	-11.779
.402	215.084	.01	-3.45	-.2529	.0254	.0471	-.0005	.0003	-.0024	-9.955
.402	214.798	.01	-2.22	-.1401	.0219	.0374	-.0006	.0003	-.0023	-6.391
.402	214.979	.01	-1.02	-.0323	.0201	.0283	-.0007	.0003	-.0023	-1.604
.402	215.159	.01	.17	.0744	.0197	.0200	-.0006	.0004	-.0025	3.777
.402	214.504	.01	1.33	.1795	.0207	.0112	-.0006	.0004	-.0024	8.675
.401	214.219	.00	2.48	.2814	.0229	.0033	-.0006	.0004	-.0021	12.301
.401	214.219	.00	3.66	.3869	.0264	-.0041	-.0005	.0005	-.0021	14.657
.401	214.213	.00	4.80	.4849	.0310	-.0114	-.0005	.0005	-.0018	15.622
.401	214.209	.00	5.98	.5853	.0373	-.0195	-.0010	.0005	-.0016	15.672
.401	214.021	.00	7.16	.6827	.0450	-.0281	-.0012	.0006	-.0015	15.164
.401	214.023	.00	8.29	.7750	.0536	-.0362	-.0012	.0006	-.0017	14.453
.401	214.119	.00	9.44	.8603	.0633	-.0452	-.0016	.0007	-.0020	13.598
.401	213.942	.00	10.55	.9322	.0745	-.0570	-.0018	.0007	-.0019	12.509
.402	214.993	.00	11.64	.9794	.0875	-.0757	-.0021	.0007	-.0020	11.188
.401	213.927	.01	11.64	.9794	.0875	-.0757	-.0021	.0007	-.0018	3.655
.402	214.508	.00	.16	.0726	.0199	.0201	-.0008	.0003	-.0008	

BODY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.401	214.322	.01	.18	.0744	.0194	.0200	-.0007	.0003	-.0024
.401	213.522	.01	-5.76	-.4567	-.0095	.0647	-.0010	.0004	-.0025
.402	214.627	.01	-4.60	-.3572	.0016	.0562	-.0006	.0003	-.0026
.402	215.084	.01	-3.45	-.2540	.0101	.0471	-.0005	.0003	-.0024
.402	214.798	.01	-2.22	-.1408	.0165	.0374	-.0006	.0003	-.0023
.402	214.979	.01	-1.02	-.0326	.0195	.0283	-.0007	.0003	-.0023
.402	215.159	.01	.17	.0744	.0195	.0200	-.0006	.0003	-.0025
.402	214.219	.01	1.33	.1799	.0165	.0112	-.0006	.0004	-.0024
.401	214.219	.00	2.48	.2821	.0107	.0033	-.0006	.0004	-.0021
.401	214.213	.00	3.66	.3878	.0016	-.0041	-.0005	.0005	-.0018
.401	214.209	.00	4.80	.4857	-.0096	-.0114	-.0005	.0005	-.0016
.401	214.021	.00	5.98	.5859	-.0239	-.0195	-.0010	.0004	-.0015
.401	214.023	.00	7.16	.6828	-.0404	-.0281	-.0012	.0004	-.0017
.401	214.119	.00	8.29	.7743	-.0587	-.0362	-.0013	.0005	-.0020
.401	213.942	.00	9.44	.8587	-.0786	-.0452	-.0016	.0004	-.0019
.402	214.993	.00	10.55	.9296	-.0973	-.0570	-.0019	.0003	-.0020
.401	213.937	.01	11.64	.9763	-.1117	-.0757	-.0021	.0003	-.0018
.402	214.508	.00	.16	.0727	.0197	.0201	-.0008	.0003	-.0008

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\*\*\* NASA \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

TEST 788

RUN 82

BALANCE 731

09/26/67

## STABILITY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CL	CD	CPM	CRM	CYR	CSF	L/D
.602	421.453	.01	.43	.1082	.0202	.0183	-.0007	.0004	-.0025	5.365
.602	421.461	.01	-6.57	-.5484	.0467	.0683	-.0010	.0001	-.0012	-11.740
.603	422.407	.01	-5.36	-.4457	.0373	.0597	-.0008	.0001	-.0016	-11.550
.606	425.112	.01	-4.08	-.3307	.0298	.0513	-.0007	.0003	-.0019	-11.085
.605	424.004	.01	-2.63	-.1840	.0239	.0392	-.0010	.0004	-.0023	-7.687
.605	424.398	.01	-1.09	-.0362	.0208	.0288	-.0008	.0004	-.0025	-1.738
.603	422.463	.01	.43	.1095	.0203	.0187	-.0007	.0004	-.0023	5.393
.604	422.776	.01	1.77	.2378	.0221	.0097	-.0005	.0004	-.0021	10.759
.602	421.591	.01	3.11	.3657	.0259	.0021	-.0006	.0004	-.0017	14.125
.603	422.164	.00	4.46	.4922	.0319	-.0048	-.0007	.0005	-.0017	15.440
.603	422.581	.00	5.79	.6105	.0399	-.0115	-.0015	.0004	-.0010	15.286
.602	420.910	.00	7.18	.7464	.0508	-.0165	-.0022	.0004	-.0005	14.684
.603	422.712	.01	.43	.1083	.0204	.0189	-.0007	.0003	-.0018	5.320

## BODY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CNF	CAF	CPM	CRM	CYR	CSF
.602	421.453	.01	.43	.1083	.0194	.0183	-.0007	.0004	-.0025
.602	421.461	.01	-6.57	-.5499	-.0163	.0683	-.0009	.0002	-.0012
.603	422.407	.01	-5.36	-.4472	-.0045	.0597	-.0008	.0002	-.0016
.606	425.112	.01	-4.08	-.3319	.0063	.0513	-.0007	.0003	-.0019
.605	424.004	.01	-2.63	-.1848	.0155	.0392	-.0010	.0004	-.0023
.605	424.398	.01	-1.09	-.0366	.0202	.0288	-.0007	.0004	-.0025
.603	422.463	.01	.43	.1096	.0195	.0187	-.0007	.0004	-.0023
.604	422.776	.01	1.77	.2383	.0148	.0097	-.0005	.0003	-.0021
.602	421.591	.01	3.11	.3665	.0060	.0071	-.0006	.0004	-.0017
.603	422.164	.00	4.46	.4931	-.0065	-.0048	-.0007	.0004	-.0017
.603	422.581	.00	5.79	.6113	-.0218	-.0115	-.0015	.0002	-.0010
.602	420.910	.00	7.18	.7467	-.0428	-.0165	-.0022	.0001	-.0005
.603	422.712	.01	.43	.1084	.0195	.0189	-.0007	.0003	-.0018

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

HIGH SPEED TUNNEL

TEST 788

PUN 87

BALANCE 731

C9/26/67

STABILITY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.707	532.618	.01	.73	.1559	.0223	.0171	-.0012	.0002	-.0012	6.990
.707	532.291	.00	-.82	-.0019	.0232	.0264	-.0012	.0002	-.0010	-.080
.707	532.411	.01	-.08	.0730	.0222	.0216	-.0011	.0002	-.0012	3.285
.707	532.539	.01	.73	.1566	.0223	.0170	-.0011	.0002	-.0011	7.016
.707	532.673	.01	1.46	.2323	.0234	.0130	-.0012	.0002	-.0012	12.040
.707	532.585	.01	2.20	.3109	.0258	.0100	-.0011	.0002	-.0014	13.169
.707	532.047	.01	2.99	.3958	.0301	.0056	-.0012	.0003	-.0011	12.621
.707	532.529	.00	3.72	.4649	.0368	-.0007	-.0010	.0003	-.0011	12.621
.705	529.938	.00	.73	.1539	.0221	.0168	-.0012	.0002	-.0009	6.952

BODY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.707	532.618	.01	.73	.1562	.0203	.0171	-.0012	.0002	-.0012
.707	532.291	.00	-.82	-.0022	.0232	.0264	-.0012	.0002	-.0010
.707	532.411	.01	-.08	.0729	.0223	.0216	-.0011	.0002	-.0012
.707	532.539	.01	.73	.1568	.0203	.0170	-.0011	.0002	-.0011
.707	532.673	.01	1.46	.2328	.0175	.0130	-.0012	.0002	-.0012
.707	532.585	.01	2.20	.3116	.0139	.0100	-.0011	.0002	-.0014
.707	532.047	.01	2.99	.3968	.0094	.0056	-.0013	.0002	-.0011
.707	532.529	.00	3.72	.4662	.0066	-.0007	-.0011	.0003	-.0012
.705	529.938	.00	.73	.1542	.0202	.0168	-.0012	.0002	-.0009

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HIGH SPEED TUNNEL

TEST 788

RUN 84

BALANCE 731

09/20/67

~~CLASSIFIED~~  
STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/C
.201	58.106	.04	1.19	1.5204	.3098	-.2223	.0167	.0030	-.0352	4.908
.201	58.404	.04	1.19	1.5183	.3094	-.2222	.0171	.0031	-.0373	4.908
.202	58.861	.00	-8.44	.0653	.2002	.0373	.0028	-.0011	.0059	.226
.201	58.357	-.00	-7.83	.2083	.1995	-.0028	.0033	-.0009	.0061	1.044
.200	57.642	-.00	-6.35	.6783	.2150	-.1089	.0005	-.0003	.0049	3.154
.201	58.426	-.01	-5.15	.9430	.2351	-.1545	-.0012	-.0009	.0091	4.011
.202	58.614	-.01	-4.03	1.1116	.2504	-.1793	-.0005	-.0007	.0090	4.438
.202	58.701	-.01	-2.95	1.2546	.2648	-.1977	-.0004	-.0007	.0071	4.737
.202	58.890	-.01	-1.86	1.3970	.2823	-.2144	-.0002	-.0010	.0082	4.949
.203	58.674	-.01	-.79	1.5004	.2953	-.2211	-.0000	-.0008	.0071	5.081
.201	58.174	-.01	.25	1.5689	.3029	-.2230	.0007	-.0008	.0068	5.180
.201	58.205	.04	1.19	1.5110	.3077	-.2214	.0173	.0032	-.0374	4.910
.200	57.810	.05	2.23	1.5563	.3175	-.2221	.0242	.0038	-.0487	4.902
.199	57.429	.01	3.15	1.4817	.3125	-.2187	.0056	.0002	-.0051	4.742
.200	57.836	.00	4.18	1.5091	.3222	-.2181	.0048	.0001	-.0031	4.684
.201	58.042	.00	5.20	1.5398	.3315	-.2182	.0046	.0000	-.0017	4.644
.201	58.148	.00	6.23	1.5759	.3418	-.2196	.0038	.0001	-.0009	4.611
.201	58.159	-.00	7.24	1.6223	.3564	-.2255	.0031	.0000	.0010	4.552
.200	57.985	-.00	8.33	1.6801	.3815	-.2446	.0029	-.0003	.0023	4.404
.200	57.836	-.00	9.37	1.7134	.4146	-.2765	.0034	-.0004	.0020	4.133
.200	57.901	.04	1.20	1.5120	.3053	-.2207	.0173	.0029	-.0377	4.953

~~CLASSIFIED~~  
BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.106	.04	1.19	1.5233	.2781	-.2223	.0167	.0032	-.0252
.201	58.404	.04	1.19	1.5212	.2778	-.2222	.0170	.0033	-.0373
.202	58.861	.00	-8.44	.0351	.2076	.0373	.0026	-.0015	.0059
.201	58.357	-.00	-7.83	.1785	.2260	-.0028	.0031	-.0013	.0061
.200	57.642	-.00	-6.35	.6493	.2886	-.1089	-.0005	-.0003	.0049
.201	58.426	-.01	-5.15	.9166	.3187	-.1545	-.0012	-.0008	.0051
.202	58.614	-.01	-4.03	1.0893	.3278	-.1793	-.0005	-.0007	.0090
.202	58.701	-.01	-2.95	1.2371	.3288	-.1977	-.0005	-.0007	.0071
.202	58.890	-.01	-1.86	1.3844	.3275	-.2144	-.0001	-.0010	.0062
.203	58.674	-.01	-.79	1.4931	.3160	-.2211	-.0000	-.0008	.0071
.201	58.174	-.01	.25	1.5670	.2960	-.2230	.0007	-.0008	.0068
.201	58.205	.04	1.19	1.5138	.2763	-.2214	.0172	.0033	-.0374
.200	57.810	.05	2.23	1.5641	.2569	-.2221	.0240	.0045	-.0487
.199	57.429	.01	3.15	1.4934	.2307	-.2187	.0056	.0004	-.0021
.200	57.836	.00	4.18	1.5253	.2115	-.2181	.0048	.0004	-.0017
.201	58.042	.00	5.20	1.5600	.1910	-.2182	.0046	.0004	-.0009
.201	58.148	.00	6.23	1.6000	.1693	-.2196	.0038	.0004	-.0010
.201	58.159	-.00	7.24	1.6505	.1482	-.2255	.0031	.0004	.0023
.200	57.985	-.00	8.33	1.7133	.1346	-.2446	.0029	.0001	.0020
.200	57.836	-.00	9.37	1.7533	.1310	-.2765	.0034	.0002	.0020
.200	57.901	.04	1.20	1.5149	.2737	-.2207	.0173	.0031	-.0377

HIGH SPEED TUNNEL

TEST 788

RUN 85

BALANCE 731

09/20/67

STABILITY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.202	58.766	.04	1.23	1.5543	.3134	-.2248	.0186	.0033	-.0376	4.960
.201	58.364	-.01	-8.54	.0315	.2003	-.0588	.0052	-.0031	.0188	.157
.201	58.349	-.01	-7.66	.1574	.1943	-.0222	-.0007	-.0024	.0166	.810
.201	58.543	-.01	-7.11	.2671	.1946	-.0090	-.0023	-.0017	.0133	1.373
.200	57.825	-.01	-5.23	.8656	.2243	-.1344	.0002	-.0009	.0083	3.859
.202	58.616	-.01	-4.03	1.1106	.2514	-.1796	.0003	-.0011	.0085	4.418
.201	58.504	-.01	-2.91	1.2648	.2671	-.1987	.0010	-.0010	.0073	4.735
.201	58.201	-.01	-1.86	1.3853	.2842	-.2118	.0008	-.0009	.0075	4.875
.200	57.989	-.01	-0.77	1.5191	.3005	-.2230	.0006	-.0006	.0075	5.056
.200	57.873	-.01	.29	1.6186	.3107	-.2283	.0013	-.0008	.0069	5.210
.200	58.003	.04	1.24	1.5572	.3149	-.2251	.0187	.0033	-.0378	4.945
.201	58.104	.06	2.29	1.6068	.3253	-.2257	.0245	.0031	-.0492	4.935
.201	58.521	.01	3.20	1.5170	.3186	-.2202	.0055	.0002	-.0059	4.762
.202	58.630	.00	4.24	1.5375	.3271	-.2186	.0046	-.0000	-.0034	4.701
.201	58.239	.00	5.24	1.5717	.3370	-.2186	.0045	-.0001	-.0023	4.663
.201	58.445	-.00	6.27	1.6103	.3480	-.2190	.0041	-.0000	-.0001	4.628
.201	58.058	-.00	7.34	1.6540	.3624	-.2249	.0025	-.0000	.0003	4.564
.201	58.083	-.00	8.37	1.7106	.3867	-.2429	.0033	-.0004	.0014	4.424
.201	58.023	-.00	9.40	1.7578	.4227	-.2764	.0046	-.0008	.0015	4.159
.200	57.998	.04	1.25	1.5651	.3136	-.2254	.0173	.0027	-.0374	4.991

BODY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.202	58.756	.04	1.23	1.5573	.2800	-.2248	.0185	.0035	-.0376
.201	58.364	-.01	-8.54	.0013	.2027	-.0588	.0047	-.0038	.0188
.201	58.349	-.01	-7.66	.1299	.2135	-.0222	-.0010	-.0023	.0166
.201	58.543	-.01	-7.11	.2406	.2261	-.0090	-.0025	-.0013	.0123
.200	57.825	-.01	-5.23	.8402	.3021	-.1344	.0001	-.0009	.0083
.202	58.616	-.01	-4.03	1.0883	.3286	-.1796	.0002	-.0011	.0085
.201	58.524	-.01	-2.91	1.2473	.3309	-.1987	.0010	-.0011	.0073
.201	58.201	-.01	-1.86	1.3726	.3289	-.2118	.0007	-.0009	.0075
.200	57.989	-.01	.77	1.5118	.3208	-.2230	.0005	-.0006	.0075
.200	57.873	-.01	.29	1.6167	.3024	-.2283	.0013	-.0008	.0069
.200	58.003	.04	1.24	1.5602	.2812	-.2251	.0187	.0035	-.0378
.201	58.104	.06	2.29	1.6149	.2610	-.2257	.0244	.0038	-.0452
.201	58.521	.01	3.20	1.5291	.2334	-.2202	.0055	.0004	-.0059
.202	58.630	.00	4.24	1.5540	.2128	-.2186	.0046	.0002	-.0034
.201	58.239	.00	5.24	1.5923	.1923	-.2186	.0045	.0003	-.0023
.201	58.445	-.00	6.27	1.6349	.1704	-.2190	.0041	.0004	-.0011
.201	58.058	-.00	7.34	1.6826	.1487	-.2249	.0025	.0003	.0013
.201	58.083	-.00	8.37	1.7442	.1343	-.2429	.0033	.0001	.0014
.201	58.023	-.00	9.40	1.7582	.1306	-.2764	.0047	-.0001	.0015
.200	57.998	.04	1.25	1.5683	.2794	-.2254	.0172	.0029	-.0374

\*\*\* NASA

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3 YEAR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 86

BALANCE 731

09/26/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.202	58.607	-.03	1.24	1.5462	.3166	-.1518	.0152	.0026	-.0287	4.880
.201	58.484	-.01	-8.57	-.0053	.2112	.1297	.0050	-.0027	.0160	-.025
.201	58.273	-.01	-7.75	.1106	.2058	.0989	-.0005	-.0019	.0128	.538
.201	58.364	-.01	-7.18	.2310	.2039	.0644	-.0009	-.0011	.0081	1.133
.200	57.947	-.01	-5.30	.8134	.2309	-.0664	.0005	-.0011	.0090	3.523
.201	58.140	-.01	-4.10	1.0749	.2580	-.1166	.0006	-.0012	.0093	4.166
.201	58.527	-.01	-2.98	1.2221	.2727	-.1337	.0009	-.0011	.0082	4.481
.201	58.520	-.01	-1.91	1.3456	.2883	-.1441	.0003	-.0009	.0077	4.667
.201	58.109	-.01	-.82	1.4824	.3049	-.1548	.0003	-.0005	.0066	4.861
.201	58.194	-.01	.26	1.5727	.3141	-.1547	.0009	-.0005	.0054	5.007
.201	58.507	.03	1.25	1.5544	.3183	-.1527	.0137	.0023	-.0259	4.883
.201	58.417	.05	2.27	1.5681	.3258	-.1499	.0231	.0029	-.0452	4.812
.201	58.429	.03	3.25	1.5484	.3282	-.1445	.0161	.0018	-.0295	4.718
.202	59.940	.00	4.25	1.5088	.3276	-.1370	.0044	.0006	-.0050	4.605
.202	58.748	.00	5.25	1.5385	.3366	-.1354	.0040	.0005	-.0043	4.570
.202	58.755	-.00	6.31	1.5730	.3471	-.1349	.0037	.0006	-.0032	4.532
.202	58.865	-.00	7.36	1.6138	.3602	-.1390	.0022	.0006	-.0017	4.481
.201	58.389	-.00	8.41	1.6796	.3844	-.1573	.0021	.0004	-.0005	4.370
.201	58.533	-.00	9.45	1.7223	.4164	-.1920	.0050	-.0000	-.0012	4.136
.201	58.205	.03	1.27	1.5646	.3182	-.1535	.0131	.0018	-.0264	4.917

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.202	58.607	-.03	1.24	1.5493	.2834	-.1518	.0151	.0028	-.0287
.201	58.484	-.01	-8.57	-.0367	.2081	.1297	.0046	-.0034	.0160
.201	58.273	-.01	-7.75	.0817	.2188	.0989	-.0007	-.0018	.0128
.201	58.364	-.01	-7.18	.2034	.2311	.0644	-.0010	-.0009	.0081
.200	57.947	-.01	-5.30	.7872	.3049	-.0664	.0004	-.0011	.0090
.201	58.140	-.01	-4.10	1.0517	.3341	-.1166	.0005	-.0013	.0093
.201	58.527	-.01	-2.98	1.2039	.3358	-.1337	.0008	-.0011	.0082
.201	58.520	-.01	-1.91	1.3326	.3379	-.1441	.0002	-.0009	.0077
.201	58.109	-.01	-.82	1.4748	.3260	-.1548	.0003	-.0005	.0066
.201	58.194	-.01	.26	1.5706	.3071	-.1547	.0009	-.0005	.0054
.201	58.567	.03	1.25	1.5576	.2843	-.1527	.0136	.0025	-.0259
.201	58.417	.05	2.27	1.5762	.2637	-.1499	.0230	.0035	-.0452
.201	58.429	.03	3.25	1.5611	.2399	-.1445	.0160	.0025	-.0259
.202	58.940	.00	4.25	1.5255	.2152	-.1370	.0043	.0009	-.0050
.202	58.748	.00	5.25	1.5593	.1947	-.1354	.0040	.0008	-.0043
.202	58.755	-.00	6.31	1.5979	.1726	-.1349	.0036	.0009	-.0032
.202	58.865	-.00	7.36	1.6427	.1510	-.1390	.0022	.0009	-.0017
.201	58.389	-.00	8.41	1.7134	.1352	-.1573	.0021	.0007	-.0005
.201	58.533	-.00	9.45	1.7625	.1286	-.1920	.0049	.0007	-.0012
.201	58.205	.03	1.27	1.5678	.2836	-.1535	.0131	.0020	-.0264

HIGH SPEED TUNNEL

TEST 788

RUN 87

BALANCE 731

09/26/67

STABILITY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.202	58.770	.05	1.22	1.6539	.3196	-.4244	.0269	-.0002	-.0333	5.174
.202	58.736	-.01	-8.74	.1685	.1887	-.1859	.0025	-.0023	.0173	.893
.202	58.823	-.01	-7.71	.3071	.1867	-.2221	.0021	-.0014	.0124	1.644
.202	58.905	-.00	-6.55	.5853	.1927	-.2995	.0010	-.0003	.0041	3.037
.202	58.663	-.01	-5.22	1.0646	.2185	-.4097	.0000	-.0001	.0041	4.872
.202	58.851	-.00	-4.02	1.2963	.2460	-.4504	.0009	-.0001	.0037	5.269
.201	58.347	-.00	-2.91	1.4387	.2659	-.4622	.0012	-.0001	.0029	5.410
.201	58.444	-.00	-1.85	1.5640	.2874	-.4693	.0026	-.0001	.0019	5.442
.201	58.234	-.01	-.75	1.6842	.3050	-.4696	.0013	-.0002	.0035	5.521
.200	58.866	.04	.22	1.6350	.3104	-.4430	.0172	-.0001	-.0232	5.268
.201	58.272	.05	1.23	1.6465	.3175	-.4225	.0274	-.0002	-.0343	5.186
.201	58.385	.05	2.23	1.6526	.3253	-.4030	.0239	-.0017	-.0260	5.080
.202	58.708	.01	3.19	1.5681	.3221	-.3668	.0050	-.0009	-.0004	4.868
.202	58.818	.00	4.22	1.5955	.3324	-.3496	.0049	-.0010	.0018	4.799
.202	58.825	.00	5.24	1.6145	.3400	-.3290	.0051	-.0010	.0017	4.749
.201	58.338	-.00	6.28	1.6450	.3509	-.3130	.0039	-.0008	.0029	4.688
.202	58.652	-.00	7.36	1.6898	.3680	-.3020	.0023	-.0008	.0043	4.592
.202	58.662	-.00	8.41	1.7352	.3934	-.3007	.0040	-.0014	.0055	4.411
.201	58.241	-.00	9.44	1.7667	.4292	-.3076	.0057	-.0010	.0022	4.116
.201	58.369	.06	1.23	1.6527	.3175	-.4232	.0262	-.0008	-.0332	5.205

BODY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.202	58.770	.05	1.22	1.6568	.2843	-.4244	.0269	-.0001	-.0333
.202	58.736	-.01	-8.74	.1377	.2120	-.1859	.0021	-.0026	.0173
.202	58.823	-.01	-7.71	.2788	.2262	-.2221	.0022	-.0011	.0124
.202	58.905	-.00	-6.55	.5587	.2581	-.2995	.0010	-.0004	.0041
.202	58.663	-.01	-5.22	1.0387	.3142	-.4097	.0001	-.0001	.0041
.202	58.851	-.00	-4.02	1.2737	.3361	-.4504	.0009	-.0002	.0037
.201	58.347	-.00	-2.91	1.4207	.3386	-.4622	.0011	-.0002	.0029
.201	58.444	-.00	-1.85	1.5509	.3376	-.4693	.0026	-.0002	.0019
.201	58.234	-.01	-.75	1.6766	.3271	-.4696	.0013	-.0002	.0025
.200	58.866	.04	.22	1.6326	.3042	-.4430	.0172	-.0000	-.0232
.201	58.272	.05	1.23	1.6493	.2823	-.4225	.0274	-.0001	-.0343
.201	58.285	.05	2.23	1.6603	.2608	-.4030	.0239	-.0010	-.0260
.202	58.708	.01	3.19	1.5801	.2344	-.3668	.0050	-.0007	-.0014
.202	58.818	.00	4.22	1.6120	.2144	-.3496	.0049	-.0007	.0018
.202	58.825	.00	5.24	1.6351	.1913	-.3290	.0051	-.0006	.0017
.201	58.338	-.00	6.28	1.6696	.1692	-.3130	.0040	-.0005	.0029
.202	58.652	-.00	7.36	1.7188	.1491	-.3020	.0024	-.0005	.0043
.202	58.682	-.00	8.41	1.7655	.1361	-.3007	.0042	-.0008	.0055
.201	58.241	-.00	9.44	1.8080	.1344	-.3076	.0058	-.0002	.0022
.201	58.369	.06	1.23	1.6555	.2820	-.4232	.0262	-.0006	-.0332

CLASSIFIED

HIGH SPEED TUNNEL

TEST 788

RUN 88

BALANCE 731

09/20/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.206	-.00	-.01	.0162	.0667	-.0494	-.0003	.0005	.0013	.243
.200	57.929	-.00	-5.08	-.2423	.1377	.0782	-.0009	.0004	-.0018	-1.826
.201	58.400	-.00	-4.10	-.2041	.1187	.0535	-.0006	.0004	-.0003	-1.720
.201	58.474	-.00	-3.07	-.1549	.1048	.0293	-.0006	.0003	.0004	-1.479
.202	58.647	-.00	-2.08	-.1112	.0908	.0003	-.0003	.0004	.0007	-1.224
.202	58.721	-.00	-1.06	-.0549	.0773	-.0290	-.0003	.0004	.0011	-.711
.201	58.266	-.00	-.01	.0150	.0669	-.0498	-.0004	.0004	.0020	.225
.201	58.191	-.00	1.05	.1010	.0595	-.0617	-.0004	.0005	.0014	1.699
.201	58.277	-.00	2.09	.1882	.0543	-.0710	-.0004	.0005	.0015	3.469
.201	58.266	-.01	3.18	.2771	.0511	-.0786	-.0004	.0005	.0016	5.421
.201	58.256	-.01	4.25	.3605	.0491	-.0851	-.0007	.0006	.0011	7.342
.201	58.239	-.01	5.33	.4459	.0443	-.0890	-.0004	.0006	.0015	10.068
.201	58.223	-.00	6.42	.5434	.0420	-.0941	-.0001	.0005	.0012	12.951
.201	58.124	-.01	7.49	.6332	.0482	-.1008	-.0003	.0005	.0017	13.147
.201	58.024	-.01	8.59	.7225	.0551	-.1086	-.0001	.0004	.0021	13.117
.201	58.420	-.01	9.65	.8132	.0639	-.1162	-.0003	.0004	.0019	12.730
.201	58.126	-.00	10.76	.8971	.0735	-.1235	-.0004	.0004	.0011	12.198
.200	57.933	-.00	11.84	.9768	.0851	-.1304	-.0000	.0004	.0008	11.481
.201	58.262	-.01	12.91	1.0020	.1051	-.1437	-.0006	.0005	.0014	9.535
.201	58.377	-.00	13.91	1.0397	.1181	-.1479	-.0009	.0008	-.0005	8.805
.202	58.601	-.00	-.01	.0138	.0664	-.0491	-.0004	.0005	.0005	.207

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.206	-.00	-.01	.0162	.0667	-.0494	-.0003	.0005	.0013
.200	57.929	-.00	-5.08	-.2529	.1107	.0782	-.0009	.0004	-.0018
.201	58.400	-.00	-4.10	-.2119	.1038	.0535	-.0006	.0004	-.0003
.201	58.474	-.00	-3.07	-.1602	.0963	.0293	-.0006	.0004	.0004
.202	58.647	-.00	-2.08	-.1143	.0867	.0003	-.0003	.0004	.0007
.202	58.721	-.00	-1.06	-.0563	.0763	-.0290	-.0003	.0004	.0011
.201	58.206	-.00	-.01	.0150	.0669	-.0498	-.0004	.0004	.0020
.201	58.191	-.00	1.05	.1020	.0576	-.0617	-.0004	.0004	.0014
.201	58.277	-.00	2.09	.1900	.0474	-.0710	-.0004	.0005	.0015
.201	58.266	-.01	3.18	.2794	.0357	-.0786	-.0004	.0005	.0016
.201	58.256	-.01	4.25	.3630	.0223	-.0851	-.0007	.0006	.0011
.201	58.239	-.01	5.33	.4480	.0027	-.0890	-.0005	.0005	.0015
.201	58.223	-.00	6.42	.5445	.0191	-.0941	-.0001	.0005	.0012
.201	58.124	-.01	7.49	.6339	.0348	-.1008	-.0003	.0004	.0017
.201	58.024	-.01	8.59	.7223	.0534	-.1086	-.0002	.0003	.0021
.201	58.420	-.01	9.65	.8120	.0733	-.1162	-.0004	.0004	.0019
.201	58.126	-.00	10.76	.8946	.0952	-.1235	-.0005	.0003	.0011
.200	57.933	-.00	11.84	.9729	.1170	-.1304	-.0001	.0004	.0008
.201	58.262	-.01	12.91	.9995	.1213	-.1437	-.0007	.0003	.0014
.201	58.377	-.00	13.91	1.0368	.1352	-.1479	-.0011	.0006	-.0005
.202	58.601	-.00	-.01	.0138	.0664	-.0491	-.0004	.0004	.0005

\*\*\* NASA C...

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

09/26/67

HIGH SPEED TUNNEL

TEST 788

RUN 89

BALANCE 731

## STABILITY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.403	215.136	-.01	-.02	.0360	.0669	-.0485	-.0004	.0003	.0010	.537
.400	212.026	-.01	-5.25	-.2283	.1369	.0821	-.0028	-.0008	.0031	-1.667
.403	215.272	.00	-4.24	-.1803	.1210	.0555	-.0028	-.0003	.0003	1.491
.404	215.720	-.00	-3.19	-.1316	.1061	.0318	-.0028	-.0001	.0005	-1.240
.402	214.400	-.01	-2.16	-.0879	.0920	.0044	-.0005	.0002	.0015	-.955
.403	214.761	-.02	-1.11	-.0313	.0784	-.0242	-.0003	.0003	.0018	-.400
.402	214.110	-.01	-.03	.0371	.0668	-.0487	-.0002	.0003	.0011	.555
.402	214.410	-.01	1.10	.1224	.0586	-.0637	-.0000	.0003	.0015	2.090
.402	214.158	-.02	2.28	.2189	.0522	-.0746	-.0004	.0004	.0019	4.193
.402	214.109	-.02	3.52	.3185	.0492	-.0829	-.0005	.0006	.0018	6.477
.402	214.409	-.02	4.70	.4077	.0440	-.0878	-.0005	.0005	.0020	9.256
.402	214.149	-.04	5.87	.5073	.0403	-.0927	-.0006	.0012	.0018	12.597
.402	213.667	-.02	7.09	.6126	.0453	-.0997	-.0002	.0003	.0016	13.526
.402	214.040	-.02	8.25	.7096	.0532	-.1073	-.0005	.0003	.0022	13.337
.402	213.683	-.02	9.46	.8039	.0637	-.1166	-.0003	.0003	.0020	12.826
.401	213.558	-.01	10.54	.8643	.0775	-.1297	.0010	-.0005	.0027	11.156
.402	214.483	-.01	-.02	.0377	.0669	-.0484	-.0003	.0000	.0021	.563

## BODY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.403	215.136	-.01	-.02	.0359	.0669	-.0485	-.0004	.0003	.0010
.400	212.026	-.01	-5.25	-.2396	.1155	.0821	-.0029	-.0005	.0031
.403	215.272	.00	-4.24	-.1886	.1073	.0555	-.0028	-.0001	.0003
.404	215.720	-.00	-3.19	-.1372	.0986	.0318	-.0028	.0000	.0005
.402	214.400	-.01	-2.16	-.0912	.0886	.0044	-.0005	.0002	.0015
.403	214.761	-.02	-1.11	-.0328	.0778	-.0242	-.0003	.0003	.0018
.402	214.110	-.01	-.03	.0371	.0669	-.0487	-.0002	.0003	.0011
.402	214.410	-.01	1.10	.1234	.0562	-.0637	-.0000	.0003	.0015
.402	214.158	-.02	2.28	.2207	.0435	-.0746	-.0004	.0004	.0019
.402	214.109	-.02	3.52	.3208	.0295	-.0829	-.0006	.0006	.0018
.402	214.409	-.02	4.70	.4098	.0105	-.0878	-.0006	.0004	.0020
.402	214.149	-.04	5.87	.5086	-.0118	-.0927	-.0005	.0012	.0018
.402	213.667	-.02	7.09	.6133	-.0306	-.0997	-.0003	.0003	.0016
.402	214.040	-.02	8.25	.7057	-.0492	-.1073	-.0005	.0002	.0022
.402	213.683	-.02	9.46	.8031	-.0692	-.1166	-.0004	.0002	.0020
.401	213.558	-.01	10.54	.8634	-.0819	-.1297	.0011	-.0003	.0027
.402	214.483	-.01	-.02	.0376	.0669	-.0484	-.0003	.0000	.0021

UNCLASSIFIED

\*\*\* NASA C \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 90

## BALANCE 731

09/26/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.605	422.934	-.04	.10	.0788	.0814	-.0366	.0003	.0001	.0030	.968
.606	424.017	-.00	-3.06	-.0433	.1149	.0435	-.0018	-.0000	.0003	-.377
.606	423.751	-.03	-2.02	-.0031	.1014	.0150	-.0013	-.0000	.0021	-.031
.606	423.802	-.04	-.56	.0398	.0912	-.0100	-.0008	.0001	.0029	.436
.605	423.183	-.04	.12	.0814	.0814	-.0364	-.0002	.0001	.0031	1.000
.605	422.774	-.05	1.27	.1321	.0741	-.0618	.0001	.0002	.0033	1.184
.604	421.876	-.06	2.50	.2045	.0723	-.0796	.0012	.0004	.0032	2.829
.605	422.731	-.06	3.60	.2445	.0787	-.1003	.0015	.0006	.0025	3.107
.605	422.719	-.06	4.66	.2812	.0877	-.1236	.0017	.0004	.0035	3.206
.605	422.768	-.09	5.72	.3190	.1000	-.1498	.0036	.0006	.0041	3.189
.605	422.261	-.04	.12	.0828	.0812	-.0364	-.0002	.0001	.0031	1.019

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.605	422.934	-.04	.10	.0789	.0813	-.0366	-.0003	.0001	.0030
.606	424.017	-.00	-3.06	-.0494	.1124	.0435	-.0018	-.0000	.0003
.606	423.751	-.03	-2.02	-.0067	.1012	.0150	-.0013	.0000	.0021
.606	423.802	-.04	-.96	.0382	.0919	-.0100	-.0007	.0001	.0029
.605	423.183	-.04	.12	.0816	.0813	-.0364	-.0002	.0001	.0031
.605	422.774	-.05	1.27	.1337	.0711	-.0618	.0001	.0002	.0033
.604	421.876	-.06	2.50	.2073	.0633	-.0796	.0012	.0004	.0032
.605	422.731	-.06	3.60	.2489	.0632	-.1003	.0014	.0007	.0025
.605	422.719	-.06	4.66	.2872	.0646	-.1236	.0017	.0006	.0035
.605	422.768	-.09	5.72	.3272	.0677	-.1498	.0036	.0010	.0041
.605	422.261	-.04	.12	.0829	.0810	-.0364	-.0002	.0001	.0031

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA [REDACTED] AL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWN [REDACTED] AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

09/20/67

HIGH SPEED TUNNEL

TEST 788

RUN 91

BALANCE 731

STABILITY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CL	CD	CPM	CRM	CY <sub>M</sub>	CSF	L/C
.200	57.821	.00	.07	.0822	.0214	.0153	.0002	.0004	-.0014	3.838
.200	57.722	-.99	.07	.0830	.0212	.0146	.0015	-.0001	.0081	3.508
.200	57.624	-2.01	.07	.0838	.0211	.0133	.0028	-.0005	.0170	3.972
.200	57.624	-3.00	.07	.0833	.0205	.0109	.0040	-.0010	.0258	4.064
.200	57.625	-4.00	.07	.0861	.0200	.0104	.0051	-.0015	.0344	4.315
.200	57.725	-4.99	.07	.0866	.0190	.0087	.0062	-.0021	.0439	4.546
.200	57.722	.00	.07	.0858	.0213	.0150	.0001	.0004	-.0022	4.031
.200	57.624	1.02	.07	.0856	.0213	.0151	-.0013	.0009	-.0102	4.011
.200	57.525	2.01	.07	.0841	.0209	.0152	-.0024	.0013	-.0198	4.019
.200	57.624	3.04	.07	.0822	.0203	.0140	-.0038	.0017	-.0290	4.057
.200	57.427	4.03	.07	.0832	.0197	.0130	-.0051	.0022	-.0378	4.224
.200	57.527	5.04	.07	.0851	.0187	.0109	-.0062	.0028	-.0468	4.550
.199	57.327	-.01	.07	.0853	.0215	.0150	-.0002	.0003	-.0015	3.967

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CY <sub>M</sub>	CSF
.200	57.821	.00	.07	.0822	.0213	.0153	.0002	.0004	-.0014
.200	57.722	-.99	.07	.0830	.0211	.0146	.0015	-.0001	.0081
.200	57.624	-2.01	.07	.0838	.0210	.0133	.0028	-.0005	.0170
.200	57.624	-3.00	.07	.0833	.0204	.0109	.0040	-.0010	.0258
.200	57.625	-4.00	.07	.0861	.0198	.0104	.0051	-.0015	.0344
.200	57.725	-4.99	.07	.0866	.0189	.0087	.0062	-.0021	.0439
.200	57.722	.00	.07	.0858	.0212	.0150	.0001	.0004	-.0022
.200	57.624	1.02	.07	.0856	.0212	.0151	-.0013	.0009	-.01C2
.200	57.525	2.01	.07	.0842	.0208	.0152	-.0024	.0013	-.0158
.200	57.624	3.04	.07	.0823	.0202	.0140	-.0038	.0017	.0250
.200	57.427	4.03	.07	.0833	.0196	.0130	-.0051	.0022	-.0378
.200	57.527	5.04	.07	.0851	.0186	.0109	-.0062	.0028	-.0468
.199	57.327	-.01	.07	.0853	.0214	.0150	-.0002	.0003	-.0015

[REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 92

## BALANCE 731

09/20/67

## STABILITY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/C
.201	58.221	-.01	.12	.1528	.0237	.0044	-.0197	.0017	.0000	6.440
.201	58.221	-1.01	.13	.1527	.0236	.0038	-.0183	.0012	.0092	6.461
.200	58.123	-2.01	.13	.1529	.0235	.0020	-.0172	.0007	.0177	6.507
.200	58.025	-3.01	.12	.1521	.0230	.0006	-.0161	.0003	.0263	6.595
.201	58.224	-4.01	.13	.1549	.0228	-.0010	-.0149	-.0002	.0351	6.809
.200	58.126	-4.99	.13	.1572	.0217	-.0034	-.0138	-.0007	.0436	7.234
.201	58.320	-.00	.13	.1537	.0239	.0043	-.0196	.0017	.0000	6.443
.201	58.320	.99	.13	.1542	.0235	.0047	-.0211	.0022	-.0094	6.585
.201	58.321	2.01	.12	.1524	.0233	.0044	-.0223	.0026	-.0177	6.545
.201	58.321	3.02	.12	.1517	.0225	.0042	-.0236	.0031	-.0278	6.616
.201	58.322	4.02	.12	.1554	.0223	.0020	-.0250	.0037	-.0367	6.560
.201	58.422	5.04	.13	.1566	.0213	.0003	-.0264	.0043	-.0462	7.342
.201	58.419	.00	.13	.1557	.0236	.0040	-.0196	.0017	-.0003	6.593

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.221	-.01	.12	.1528	.0234	.0044	-.0197	.0016	.0000
.201	58.221	-1.01	.13	.1527	.0233	.0038	-.0183	.0012	.0092
.200	58.123	-2.01	.13	.1529	.0232	.0020	-.0172	.0007	.0177
.200	58.025	-3.01	.12	.1521	.0227	.0006	-.0161	.0002	.0263
.201	58.224	-4.01	.13	.1549	.0224	-.0010	-.0149	-.0002	.0351
.200	58.126	-4.99	.13	.1572	.0214	-.0034	-.0138	-.0007	.0436
.201	58.320	-.00	.13	.1537	.0235	.0043	-.0196	.0017	.0000
.201	58.320	.99	.13	.1542	.0231	.0047	-.0211	.0022	-.0094
.201	58.321	2.01	.12	.1524	.0230	.0044	-.0223	.0026	-.0177
.201	58.321	3.02	.12	.1517	.0226	.0042	-.0236	.0031	-.0278
.201	58.322	4.02	.13	.1554	.0220	.0020	-.0250	.0037	-.0367
.201	58.422	5.04	.13	.1566	.0210	.0003	-.0264	.0043	-.0462
.201	58.419	.00	.13	.1557	.0233	.0040	-.0196	.0017	-.0003

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA CONFIDENTIAL \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 93

BALANCE 731

09/20/67

STABILITY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/C
.201	58.623	-.01	.02	.0131	.0256	.0251	.0222	.0016	.0033	.513
.201	58.525	-1.02	.02	.0110	.0257	.0254	.0238	.0010	.0131	.429
.202	58.723	-2.02	.02	.0131	.0254	.0242	.0250	.0005	.0221	.517
.202	58.823	-3.03	.02	.0119	.0249	.0226	.0260	.0000	.0302	.419
.202	58.823	-4.02	.02	.0141	.0242	.0210	.0271	-.0005	.0393	.583
.202	58.726	-5.00	.02	.0162	.0235	.0189	.0282	-.0010	.0481	.690
.202	58.821	-.02	.02	.0109	.0257	.0253	.0223	.0015	.0040	.424
.202	58.821	.98	.02	.0115	.0255	.0255	.0211	.0020	.0051	.452
.202	58.821	1.99	.02	.0108	.0251	.0246	.0196	.0025	-.0147	.431
.202	58.822	3.01	.02	.0123	.0248	.0233	.0182	.0030	-.0240	.498
.202	58.922	4.02	.02	.0125	.0242	.0216	.0169	.0036	-.0338	.515
.202	58.922	5.02	.02	.0128	.0232	.0188	.0154	.0042	-.0433	.550
.202	58.920	-.02	.02	.0121	.0257	.0255	.0225	.0015	.0039	.469

BODY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.623	-.01	.02	.0131	.0256	.0251	.0222	.0016	.0033
.201	58.525	-1.02	.02	.0110	.0257	.0254	.0238	.0010	.0131
.202	58.723	-2.02	.02	.0131	.0254	.0242	.0250	.0005	.0221
.202	58.823	-3.03	.02	.0119	.0249	.0226	.0260	.0000	.0302
.202	58.823	-4.02	.02	.0141	.0242	.0210	.0271	-.0005	.0393
.202	58.726	-5.00	.02	.0162	.0234	.0189	.0282	-.0010	.0481
.202	58.821	-.02	.02	.0109	.0257	.0253	.0223	.0015	.0040
.202	58.821	.98	.02	.0115	.0255	.0255	.0211	.0020	-.0051
.202	58.821	1.99	.02	.0108	.0251	.0246	.0196	.0025	-.0147
.202	58.822	3.01	.02	.0123	.0248	.0233	.0182	.0030	-.0240
.202	58.922	4.02	.02	.0125	.0242	.0216	.0169	.0036	-.0338
.202	58.922	5.02	.02	.0128	.0232	.0188	.0154	.0042	-.0423
.202	58.920	-.02	.02	.0121	.0257	.0255	.0225	.0015	.0039

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

\*\*\* NASA

7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 94

BALANCE 731

09/20/67

## STABILITY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.437	-.07	-.01	-.0167	.0318	.0210	.0211	.0017	.0063	-.524
.201	58.536	-1.09	-.01	-.0154	.0315	.0207	.0223	.0011	.0203	-.489
.201	58.439	-2.10	-.01	-.0155	.0312	.0200	.0231	.0005	.0327	-.496
.201	58.242	-3.10	-.00	-.0145	.0307	.0179	.0244	.0001	.0461	-.472
.201	58.244	-4.09	-.00	-.0135	.0298	.0165	.0255	-.0005	.0585	-.453
.200	57.949	-5.08	-.01	-.0148	.0289	.0149	.0266	-.0009	.0712	-.513
.201	58.240	-.06	-.01	-.0179	.0318	.0209	.0212	.0017	.0082	-.562
.201	58.338	.94	-.01	-.0161	.0316	.0209	.0199	.0022	-.0057	.509
.201	58.338	1.94	-.01	-.0156	.0311	.0201	.0184	.0027	.0187	-.503
.201	58.339	2.98	-.01	-.0163	.0305	.0190	.0171	.0033	.0332	-.536
.201	58.241	3.98	-.01	-.0179	.0296	.0171	.0161	.0039	.0451	-.605
.201	58.243	5.00	-.01	-.0183	.0285	.0153	.0148	.0045	.0592	-.642
.201	58.339	-.08	-.01	-.0156	.0319	.0206	.0211	.0017	.0066	-.488

## BODY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.437	-.07	-.01	-.0167	.0318	.0210	.0211	.0017	.0063
.201	58.536	-1.09	-.01	-.0154	.0315	.0207	.0223	.0011	.0203
.201	58.439	-2.10	-.01	-.0155	.0312	.0200	.0231	.0005	.0327
.201	58.242	-3.10	-.00	-.0145	.0307	.0179	.0244	.0001	.0461
.201	58.244	-4.09	-.00	-.0135	.0298	.0165	.0255	-.0005	.0585
.200	57.949	-5.08	-.01	-.0148	.0289	.0149	.0266	-.0009	.0712
.201	58.240	-.06	-.01	-.0179	.0318	.0209	.0212	.0017	.0082
.201	58.338	.94	-.01	-.0161	.0316	.0209	.0199	.0022	-.0057
.201	58.338	1.94	-.01	-.0156	.0311	.0201	.0184	.0027	.0187
.201	58.339	2.98	-.01	-.0163	.0305	.0190	.0171	.0033	.0332
.201	58.241	3.98	-.01	-.0179	.0296	.0171	.0161	.0038	.0451
.201	58.243	5.00	-.01	-.0183	.0285	.0153	.0148	.0045	.0592
.201	58.339	-.08	-.01	-.0156	.0319	.0206	.0211	.0017	.0066

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\* \* NASA [REDACTED] TUNNELS \*\* \* NASA PRELIMINARY \*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED A.F.T.E.R 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 95

BALANCE 731

09/20/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYR	CSF	L/D
.201	58.429	-.05	.10	.1214	.0285	.0024	-.0188	.0014	-.0006	4.260
.201	58.331	-1.07	.10	.1206	.0284	.0015	-.0172	.0009	.0125	4.249
.201	58.331	-1.99	.10	.1206	.0281	.0003	-.0163	.0004	.0246	4.294
.201	58.135	-3.09	.10	.1232	.0276	-.0015	-.0153	-.0001	.0372	4.463
.201	58.136	-4.07	.10	.1208	.0269	-.0024	-.0141	-.0005	.0489	4.499
.200	58.039	-5.07	.10	.1243	.0259	-.0050	-.0130	-.0010	.0611	4.798
.201	58.429	-.06	.10	.1214	.0285	.0029	-.0184	.0014	-.0003	4.267
.201	58.528	.95	.10	.1206	.0283	.0030	-.0197	.0019	-.0121	4.257
.201	58.430	1.96	.10	.1202	.0280	.0030	-.0211	.0024	.0251	4.299
.201	58.431	3.00	.10	.1207	.0273	.0018	-.0224	.0030	-.0380	4.416
.201	58.432	3.99	.10	.1203	.0265	.0002	-.0239	.0036	-.0510	4.539
.201	58.533	5.01	.10	.1231	.0254	-.0019	-.0251	.0042	-.0646	4.856
.201	58.528	-.05	.10	.1201	.0284	.0024	-.0183	.0014	.0001	4.225

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYR	CSF
.201	58.429	-.05	.10	.1214	.0283	.0024	-.0188	.0014	-.0006
.201	58.331	-1.07	.10	.1206	.0282	.0015	-.0172	.0009	.0125
.201	58.331	-1.99	.10	.1206	.0279	.0003	-.0163	.0004	.0246
.201	58.135	-3.09	.10	.1232	.0274	-.0015	-.0153	-.0001	.0372
.201	58.136	-4.07	.10	.1208	.0266	-.0024	-.0141	-.0005	.0489
.200	58.039	-5.07	.10	.1243	.0257	-.0050	-.0130	-.0010	.0611
.201	58.429	-.06	.10	.1214	.0282	.0029	-.0184	.0014	-.0003
.201	58.528	.95	.10	.1206	.0281	.0030	-.0197	.0019	-.0121
.201	58.430	1.96	.10	.1202	.0278	.0030	-.0211	.0024	.0251
.201	58.431	3.00	.10	.1207	.0271	.0018	-.0224	.0030	-.0380
.201	58.432	3.99	.10	.1203	.0263	.0002	-.0239	.0036	-.0510
.201	58.533	5.01	.10	.1231	.0251	-.0019	-.0251	.0042	-.0646
.201	58.528	-.05	.10	.1201	.0282	.0024	-.0183	.0014	.0001

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA

\* \* \* 7 X 10 FT TUNNELS \* \* \* NASA PRELIMINARY \* \*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 96

BALANCE 731

09/20/67

## STABILITY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.525	-.05	.05	.0594	.0263	.0109	.0001	.0001	.0030	2.259
.201	58.229	-1.06	.05	.0587	.0264	.0110	.0012	-.0003	.0158	2.224
.201	58.230	-2.08	.05	.0587	.0261	.0094	.0024	-.0009	.0289	2.252
.201	58.231	-3.07	.05	.0574	.0254	.0075	.0033	-.0015	.0418	2.259
.201	58.529	-4.08	.05	.0582	.0247	.0067	.0047	-.0019	.0539	2.357
.201	58.135	-5.07	.05	.0597	.0235	.0045	.0058	-.0024	.0648	2.538
.200	58.130	-.06	.05	.0552	.0263	.0111	.0002	.0001	.0022	2.100
.200	58.130	.95	.05	.0592	.0262	.0108	-.0011	.0007	-.0097	2.259
.201	58.229	1.96	.05	.0562	.0258	.0111	-.0022	.0012	-.0227	2.181
.201	58.230	3.00	.05	.0555	.0252	.0092	-.0035	.0018	-.0360	2.202
.201	58.232	4.00	.05	.0563	.0245	.0083	-.0048	.0023	-.0487	2.300
.201	58.233	5.01	.05	.0571	.0233	.0064	.0059	.0029	-.0614	2.457
.200	58.130	-.05	.05	.0587	.0264	.0110	.0003	.0001	.0033	2.220

## BODY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.525	-.05	.05	.0594	.0262	.0109	.0001	.0001	.0030
.201	58.229	-1.06	.05	.0587	.0263	.0110	.0012	-.0003	.0158
.201	58.230	-2.08	.05	.0587	.0260	.0094	.0024	-.0009	.0289
.201	58.231	-3.07	.05	.0574	.0254	.0075	.0033	-.0014	.0418
.201	58.529	-4.08	.05	.0583	.0247	.0067	.0047	-.0019	.0539
.201	58.135	-5.07	.05	.0597	.0235	.0045	.0058	-.0024	.0648
.200	58.130	-.06	.05	.0552	.0262	.0111	.0002	.0001	.0022
.200	58.130	.95	.05	.0592	.0261	.0108	-.0011	.0007	-.0057
.201	58.229	1.96	.05	.0562	.0257	.0111	-.0022	.0012	-.0227
.201	58.230	3.00	.05	.0555	.0252	.0092	-.0035	.0018	-.0360
.201	58.232	4.00	.05	.0563	.0244	.0083	-.0048	.0023	-.0487
.201	58.233	5.01	.05	.0571	.0232	.0064	-.0059	.0029	-.0614
.200	58.130	-.05	.05	.0587	.0264	.0110	.0003	.0001	.0033

\* \* \* 7 X 10 FT TUNNELS \* \* \* NASA

\*\*\* NASA CON \*\*\* TX 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 97

BALANCE 731

09/20/67

STABILITY AXIS COEFFICIENTS

MACH	C	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.326	-.05	.05	.0598	.0256	.0117	.0006	.0004	.0023	2.337
.201	58.228	-1.06	.05	.0600	.0256	.0108	.0020	-.0002	.0154	2.342
.200	58.129	-2.07	.05	.0601	.0251	.0101	.0032	-.0007	.0284	2.397
.200	58.031	-3.07	.05	.0613	.0245	.0081	.0043	-.0012	.0401	2.502
.200	57.934	-4.07	.05	.0619	.0238	.0066	.0056	-.0017	.0525	2.602
.200	57.639	-5.07	.05	.0627	.0227	.0046	.0067	-.0022	.0643	2.756
.200	57.733	-.06	.05	.0604	.0257	.0114	.0009	.0003	.0023	2.352
.200	57.634	.94	.05	.0602	.0254	.0112	.0004	.0008	.0095	2.369
.201	58.228	1.96	.05	.0605	.0254	.0106	-.0017	.0014	-.0229	2.384
.201	58.328	2.99	.05	.0590	.0246	.0099	-.0028	.0020	-.0355	2.403
.201	58.231	4.00	.05	.0605	.0240	.0079	-.0041	.0025	-.0479	2.518
.201	58.331	5.01	.05	.0583	.0231	.0068	-.0055	.0031	-.0608	2.528
.201	58.227	-.06	.05	.0599	.0257	.0113	.0009	.0004	.0023	2.329

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.326	-.05	.05	.0598	.0255	.0117	.0006	.0004	.0023
.201	58.228	-1.06	.05	.0600	.0255	.0108	.0020	-.0002	.0154
.200	58.129	-2.07	.05	.0601	.0250	.0101	.0032	-.0007	.0284
.200	58.031	-3.07	.05	.0613	.0244	.0081	.0043	-.0012	.0401
.200	57.934	-4.07	.05	.0619	.0237	.0066	.0056	-.0017	.0525
.200	57.639	-5.07	.05	.0627	.0227	.0046	.0067	-.0022	.0643
.200	57.733	-.06	.05	.0604	.0256	.0114	.0009	.0003	.0023
.200	57.634	.94	.05	.0602	.0254	.0112	-.0004	.0008	-.0045
.201	58.228	1.96	.05	.0605	.0253	.0106	-.0017	.0014	-.0229
.201	58.328	2.99	.05	.0591	.0245	.0099	-.0028	.0020	-.0355
.201	58.231	4.00	.05	.0605	.0240	.0079	-.0041	.0025	-.0479
.201	58.331	5.01	.05	.0583	.0230	.0068	-.0055	.0031	-.0608
.201	58.227	-.06	.05	.0599	.0257	.0113	.0009	.0004	.0023

UNCLASSIFIED

\*\*\* TX 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

\*\*\* NASA

7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

TEST 788

RUN 98

BALANCE 731

09/20/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/C
.201	58.425	-.01	.05	.0621	.0258	.0116	.0015	.0006	.0017	2.405
.201	58.228	-1.06	.05	.0628	.0256	.0110	.0027	.0000	.0145	2.453
.200	58.031	-2.06	.06	.0657	.0254	.0091	.0041	-.0005	.0277	2.591
.201	58.229	-3.06	.06	.0668	.0247	.0078	.0053	-.0010	.0393	2.702
.200	58.033	-4.07	.06	.0647	.0240	.0061	.0066	.0015	.0501	2.691
.201	58.233	-5.07	.05	.0631	.0229	.0041	.0080	-.0020	.0630	2.753
.201	58.524	-.02	.05	.0631	.0256	.0114	.0016	.0005	.0021	2.464
.200	58.029	.95	.05	.0622	.0254	.0111	.0003	.0011	.0099	2.449
.201	58.227	1.96	.05	.0618	.0250	.0109	-.0009	.0015	-.0222	2.469
.201	58.228	2.98	.05	.0627	.0244	.0097	-.0023	.0021	-.0344	2.567
.201	58.230	3.99	.05	.0623	.0238	.0083	-.0035	.0026	-.0464	2.624
.201	58.132	5.01	.05	.0609	.0226	.0064	-.0047	.0032	-.0595	2.691
.201	58.128	-.01	.06	.0647	.0257	.0107	.0016	.0005	.0021	2.517

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYP	CSF
.201	58.425	-.01	.05	.0621	.0258	.0116	.0015	.0006	.0017
.201	58.228	-1.06	.05	.0628	.0255	.0110	.0027	.0000	.0145
.200	58.031	-2.06	.06	.0657	.0253	.0091	.0041	-.0005	.0277
.201	58.229	-3.06	.06	.0668	.0247	.0078	.0053	-.0010	.0393
.200	58.033	-4.07	.06	.0647	.0239	.0061	.0066	-.0015	.0501
.201	58.233	-5.07	.05	.0631	.0229	.0041	.0080	-.0020	.0630
.201	58.524	-.02	.05	.0631	.0256	.0114	.0016	.0005	.0021
.200	58.029	.95	.05	.0622	.0254	.0111	.0003	.0011	.0099
.201	58.227	1.96	.05	.0618	.0250	.0109	-.0009	.0015	-.0222
.201	58.228	2.98	.05	.0627	.0244	.0097	-.0023	.0021	-.0344
.201	58.230	3.99	.05	.0623	.0237	.0083	-.0035	.0026	-.0464
.201	58.132	5.01	.05	.0609	.0226	.0064	-.0047	.0032	-.0595
.201	58.128	-.01	.06	.0647	.0256	.0107	.0016	.0005	.0021

CENSUS BUREAU \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

HIGH SPEED TUNNEL

TEST 788

RUN 99

BALANCE 731

09/20/67

STABILITY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CL	CD	CPM	CRM	CY	CSF	L/D
.202	58.918	-.05	.06	.0617	.0248	.0124	.0022	.0007	.0028	2.482
.201	58.424	-1.06	.06	.0653	.0249	.0112	.0033	.0002	.0147	2.621
.201	58.227	-2.07	.06	.0651	.0245	.0099	.0047	-.0003	.0275	2.654
.201	58.623	-3.07	.06	.0655	.0239	.0087	.0061	-.0008	.0388	2.143
.201	58.624	-4.07	.06	.0677	.0231	.0065	.0071	-.0013	.0500	2.927
.201	58.330	-5.06	.06	.0702	.0222	.0046	.0086	-.0018	.0622	3.156
.201	58.523	-.06	.06	.0632	.0251	.0126	.0023	.0007	.0029	2.516
.202	58.720	.96	.06	.0635	.0248	.0120	.0009	.0012	-.0087	2.562
.202	58.721	1.96	.05	.0618	.0246	.0117	-.0002	.0018	-.0203	2.514
.202	58.722	3.00	.05	.0623	.0240	.0100	-.0016	.0023	-.0340	2.595
.202	58.723	4.01	.05	.0626	.0233	.0093	-.0029	.0029	-.0456	2.687
.202	58.922	5.01	.05	.0637	.0224	.0069	-.0041	.0035	-.0570	2.850
.202	58.819	-.05	.06	.0652	.0249	.0120	.0023	.0007	.0032	2.617

BODY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CNF	CAF	CPM	CRM	CY	CSF
.202	58.918	-.05	.06	.0617	.0248	.0124	.0022	.0007	.0028
.201	58.424	-1.06	.06	.0653	.0248	.0112	.0033	.0002	.0147
.201	58.227	-2.07	.06	.0651	.0245	.0099	.0047	-.0003	.0275
.201	58.623	-3.07	.06	.0655	.0238	.0087	.0061	-.0008	.0388
.201	58.624	-4.07	.06	.0677	.0231	.0065	.0071	-.0013	.0500
.201	58.330	-5.06	.06	.0702	.0222	.0046	.0086	-.0018	.0622
.201	58.523	-.06	.06	.0632	.0251	.0126	.0023	.0007	.0029
.202	58.720	.96	.06	.0635	.0247	.0120	.0009	.0012	-.0087
.202	58.720	1.96	.05	.0618	.0245	.0117	-.0002	.0018	-.0203
.202	58.722	3.00	.05	.0623	.0240	.0100	-.0016	.0023	-.0340
.202	58.723	4.01	.05	.0626	.0232	.0093	-.0029	.0029	-.0456
.202	58.922	5.01	.05	.0637	.0223	.0069	-.0041	.0034	-.0570
.202	58.819	-.05	.06	.0652	.0248	.0120	.0023	.0007	.0032

\*\*\* NASA

\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 100

BALANCE 731

09/20/67

STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.323	-.04	.06	.0647	.0244	.0121	.0028	.0009	.0019	2.654
.200	58.027	-1.05	.06	.0650	.0243	.0111	.0040	.0003	.0142	2.673
.201	58.324	-2.06	.06	.0681	.0240	.0103	.0051	-.0002	.0267	2.841
.201	58.226	-3.07	.06	.0682	.0235	.0081	.0066	-.0007	.0372	2.901
.201	58.228	-4.06	.06	.0681	.0278	.0066	.0079	-.0012	.0478	2.990
.201	58.131	-5.04	.06	.0692	.0218	.0046	.0091	-.0017	.0595	3.172
.201	58.323	-.04	.06	.0658	.0243	.0116	.0029	.0009	.0022	2.708
.201	58.323	.06	.06	.0636	.0240	.0117	.0016	.0013	.0090	2.634
.201	58.422	1.96	.06	.0648	.0237	.0107	.0001	.0019	.0200	2.730
.201	58.423	3.00	.05	.0615	.0231	.0100	-.0011	.0024	.0322	2.662
.201	58.424	3.99	.05	.0634	.0225	.0087	-.0023	.0029	.0432	2.822
.201	58.524	5.01	.05	.0641	.0212	.0068	-.0034	.0034	.0548	3.019
.201	58.125	-.04	.06	.0672	.0243	.0121	.0029	.0009	.0026	2.763

BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.323	-.04	.06	.0647	.0243	.0121	.0028	.0009	.0019
.200	58.027	-1.05	.06	.0651	.0243	.0111	.0040	.0003	.0142
.201	58.324	-2.06	.06	.0682	.0239	.0103	.0051	.0002	.0267
.201	58.226	-3.07	.06	.0682	.0234	.0081	.0066	-.0007	.0372
.201	58.228	-4.06	.06	.0681	.0227	.0066	.0079	-.0012	.0478
.201	58.131	-5.04	.06	.0692	.0217	.0046	.0091	-.0017	.0555
.201	58.323	-.04	.06	.0658	.0242	.0116	.0029	.0009	.0022
.201	58.323	.06	.06	.0636	.0239	.0117	.0016	.0013	.0050
.201	58.422	1.96	.06	.0648	.0237	.0107	.0001	.0019	.0200
.201	58.423	3.00	.05	.0615	.0230	.0100	-.0011	.0024	.0322
.201	58.424	3.99	.05	.0635	.0224	.0087	-.0023	.0029	.0432
.201	58.524	5.01	.05	.0641	.0212	.0068	-.0034	.0034	.0548
.201	58.125	-.04	.06	.0672	.0242	.0121	.0029	.0009	.0026

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AI \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA CONFIDENTIAL

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# \* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*  
GROUP 4 - DOWNGRACED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

## HIGH SPEED TUNNEL

## TEST 788

## RUN 101

## BALANCE 731

09/26/67

## STABILITY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.125	-.04	.06	.0706	.0242	.0127	.0028	.0010	.0002	2.912
.200	58.027	-1.05	.06	.0715	.0243	.0116	.0041	.0004	.0121	2.943
.200	57.830	-2.05	.07	.0748	.0241	.0101	.0054	-.0001	.0230	3.105
.200	57.831	-3.05	.06	.0744	.0236	.0087	.0066	-.0006	.0339	3.153
.200	57.634	-4.05	.07	.0757	.0230	.0068	.0078	-.0011	.0442	3.284
.200	57.635	-5.02	.07	.0778	.0220	.0052	.0089	-.0016	.0553	3.536
.200	57.730	-.04	.06	.0723	.0242	.0119	.0031	.0011	.0005	2.984
.200	57.927	.96	.06	.0703	.0240	.0121	.0016	.0015	-.0096	2.930
.200	57.829	1.98	.06	.0698	.0236	.0117	.0004	.0020	-.0205	2.983
.200	57.829	3.00	.06	.0691	.0229	.0108	-.0009	.0025	-.0221	3.025
.200	57.929	4.00	.06	.0675	.0220	.0091	-.0020	.0030	-.0421	3.066
.200	57.930	5.01	.06	.0683	.0209	.0064	-.0032	.0036	-.0542	3.271
.200	57.927	-.05	.06	.0720	.0241	.0119	.0030	.0010	.0013	2.982

## BODY AXIS COEFFICIENTS

MACH	O	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.125	-.04	.06	.0706	.0242	.0127	.0028	.0010	.0012
.200	58.027	-1.05	.06	.0716	.0242	.0116	.0041	-.0005	.0121
.200	57.830	-2.05	.07	.0748	.0240	.0101	.0054	-.0001	.0230
.200	57.831	-3.05	.06	.0744	.0235	.0087	.0066	-.0006	.0339
.200	57.634	-4.05	.07	.0757	.0230	.0068	.0078	-.0011	.0442
.200	57.635	-5.02	.07	.0778	.0219	.0052	.0089	-.0016	.0553
.200	57.730	-.04	.06	.0723	.0241	.0119	.0031	.0011	.0005
.200	57.927	.96	.06	.0703	.0239	.0121	.0016	.0015	-.0056
.200	57.829	1.98	.06	.0698	.0235	.0117	.0004	.0020	-.0265
.200	57.829	3.00	.06	.0692	.0228	.0108	-.0009	.0025	-.0321
.200	57.929	4.00	.06	.0675	.0219	.0091	-.0020	.0030	-.0421
.200	57.930	5.01	.06	.0683	.0208	.0064	-.0032	.0036	-.0542
.200	57.927	-.05	.06	.0720	.0241	.0119	.0030	.0010	.0013

\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA

UNCLASSIFIED

\*\*\* NASA C [REDACTED] \*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*  
 GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPFFD TUNNEL

TEST 788

RUN 102

BALANCE 731

09/20/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.200	57.652	-.01	1.44	1.7689	.3295	-.1704	.0009	-.0010	.0075	5.369
.201	58.167	-.01	-.67	1.6089	.3066	-.1651	.0006	-.0014	.0096	5.247
.200	57.856	-.01	.38	1.6956	.3169	-.1686	.0006	-.0014	.0090	5.351
.200	57.950	-.01	1.44	1.7769	.3316	-.1716	.0008	-.0010	.0070	5.359
.200	57.894	.06	2.37	1.6737	.3324	-.1674	.0226	.0026	-.0462	5.036
.201	58.214	.00	3.29	1.5876	.3268	-.1628	.0040	-.0000	-.0031	4.838
.201	58.126	-.00	4.33	1.5958	.3340	-.1605	.0021	-.0001	.0020	4.778
.201	58.231	-.00	5.32	1.6231	.3424	-.1597	.0021	-.0003	.0018	4.741
.200	58.038	-.01	6.36	1.6380	.3483	-.1581	.0012	-.0002	.0030	4.703
.201	58.140	-.01	7.42	1.6905	.3603	-.1614	.0024	-.0003	.0027	4.692
.200	58.045	-.01	8.48	1.7751	.3801	-.1717	.0030	-.0004	.0025	4.670
.200	57.856	-.01	9.51	1.8042	.3916	-.1755	.0062	-.0010	.0039	4.607
.201	58.280	-.01	10.52	1.8270	.4104	-.1863	.0021	-.0005	.0046	4.452
.201	58.1C1	-.01	11.37	1.5815	.4733	-.2069	-.0508	.0059	.0163	3.342
.200	57.653	-.01	1.44	1.7711	.3306	-.1711	.0007	-.0011	.0074	5.357

## BODY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.200	57.652	-.01	1.44	1.7726	.2851	-.1704	.0010	-.0010	.0075
.201	58.167	-.01	-.67	1.6018	.3254	-.1651	.0005	-.0014	.0056
.200	57.856	-.01	.38	1.6940	.3056	-.1686	.0006	-.0014	.0090
.200	57.950	-.01	1.44	1.7807	.2869	-.1716	.0009	-.0010	.0070
.200	57.894	.06	2.37	1.6822	.2630	-.1674	.0225	.0033	-.0462
.201	58.214	.00	3.29	1.6002	.2353	-.1628	.0040	.0002	-.0031
.201	58.126	-.00	4.33	1.6128	.2129	-.1605	.0021	-.0000	.0020
.201	58.231	-.00	5.32	1.6441	.1906	-.1597	.0021	-.0001	.0018
.200	58.038	-.01	6.36	1.6626	.1651	-.1581	.0012	-.0000	.0030
.201	58.140	-.01	7.42	1.7187	.1396	-.1614	.0024	.0000	.0027
.200	58.045	-.01	8.48	1.8072	.1147	-.1717	.0030	.0000	.0025
.200	57.856	-.01	9.51	1.8393	.0898	-.1755	.0043	-.0003	.0039
.201	58.280	-.01	10.52	1.8661	.0707	-.1863	.0022	-.0001	.0046
.201	58.1C1	-.01	11.37	1.6387	.1532	-.2069	-.0510	-.0036	.0163
.200	57.653	-.01	1.44	1.7748	.2862	-.1711	.0007	-.0011	.0074

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

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\*\*\* 7 X 10 FT TUNNELS \*\*\* NASA PRELIMINARY \*\*\*

GROUP 4 - DOWNGRADED AT 3-YR INTERVALS, DECLASSIFIED AFTER 12 YRS

HIGH SPEED TUNNEL

TEST 788

RUN 103

BALANCE 731

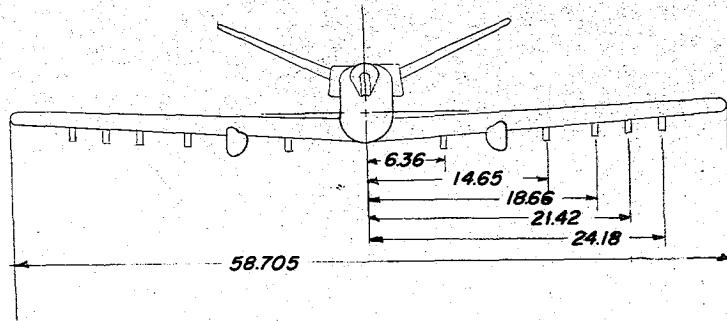
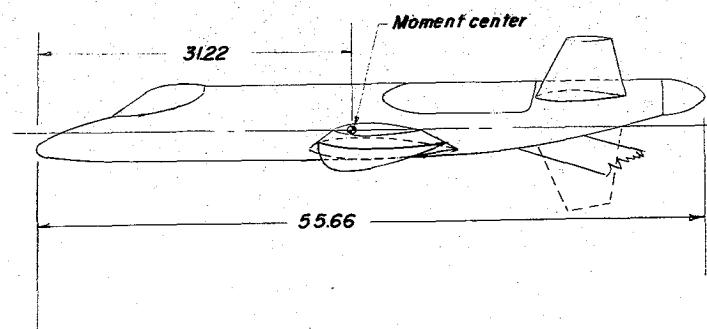
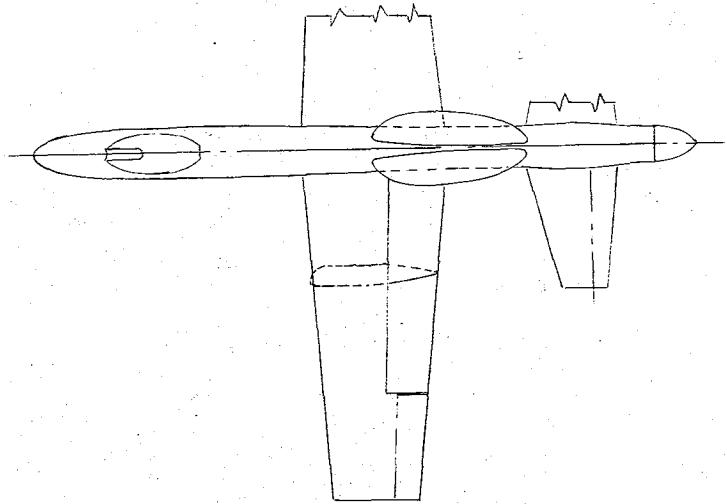
09/20/67

## STABILITY AXIS COEFFICIENTS

MACH	Q	BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF	L/D
.201	58.338	-.01	1.39	1.6395	.3501	.0560	.0013	-.0028	.0129	4.683
.202	58.684	-.01	-6.97	1.0435	.2780	-.0842	.0003	-.0011	.0069	3.754
.201	58.277	-.01	-4.91	1.2117	.2960	-.0754	.0004	-.0007	.0064	4.094
.201	58.266	-.01	-2.78	1.3669	.3147	-.0377	.0015	-.0034	.0173	4.343
.201	58.059	-.01	-.71	1.5038	.3346	.0124	.0004	-.0015	.0098	4.495
.200	57.940	-.01	1.41	1.6416	.3502	.0558	.0011	-.0029	.0138	4.687
.201	58.060	.04	2.38	1.5867	.3500	.0548	.0196	-.0009	.0253	4.533
.201	58.167	.06	3.39	1.5981	.3563	.0606	.0261	-.0004	-.0395	4.485
.201	58.175	-.00	4.34	1.4955	.3409	.0881	.0025	-.0002	-.0004	4.387
.201	58.082	-.00	5.33	1.5155	.3442	.0945	.0022	-.0002	-.0001	4.353
.201	58.186	-.00	6.35	1.5300	.3528	.1014	.0017	-.0003	.0013	4.336
.201	58.289	-.00	7.42	1.5631	.3607	.1046	.0029	-.0005	.0028	4.333
.201	58.393	-.01	8.48	1.6539	.3810	.1028	.0032	-.0007	.0031	4.341
.200	57.900	-.00	9.52	1.6835	.3894	.1072	.0048	-.0013	.0037	4.323
.200	57.909	-.01	10.53	1.6929	.3958	.1091	.0025	-.0008	.0046	4.277
.200	57.816	.01	11.36	1.5140	.4683	-.0560	.0519	.0009	-.0415	3.233
.201	58.239	-.01	1.41	1.6400	.3504	.0558	.0014	-.0028	.0148	4.681

## BODY AXIS COEFFICIENTS

MACH	Q	BFTA	ALPHA	CNF	CAF	CPM	CRM	CYM	CSF
.201	58.338	-.01	1.39	1.6436	.3101	.0560	.0013	-.0028	.0129
.202	58.684	-.01	-6.97	1.0000	.4022	-.0842	.0002	-.0011	.0069
.201	58.277	-.01	-4.91	1.1754	.3984	-.0754	-.0005	-.0007	.0064
.201	58.266	-.01	-2.78	1.3471	.3806	-.0377	.0013	-.0035	.0173
.201	58.059	-.01	-.71	1.4961	.3530	.0124	.0003	-.0015	.0098
.200	57.940	-.01	1.41	1.6457	.3099	.0558	.0012	-.0029	.0138
.201	58.060	.04	2.38	1.5961	.2840	.0548	.0196	-.0003	.0253
.201	58.167	.06	3.39	1.6125	.2615	.0606	.0261	-.0009	-.0395
.201	58.175	-.00	4.34	1.5136	.2269	.0881	.0025	-.0000	-.0064
.201	58.082	-.00	5.33	1.5377	.2061	.0945	.0022	-.0000	-.0061
.201	58.186	-.00	6.35	1.5559	.1818	.1014	.0017	-.0001	.0013
.201	58.289	-.00	7.42	1.5927	.1564	.1046	.0029	-.0002	.0028
.201	58.393	-.01	8.48	1.6878	.1334	.1028	.0032	-.0002	.0031
.200	57.900	-.00	9.52	1.7203	.1064	.1072	.0049	-.0006	.0027
.200	57.909	-.01	10.53	1.7322	.0807	.1091	.0026	-.0003	.0046
.200	57.816	.01	11.36	1.5717	.1619	-.0560	.0508	.0105	-.0415
.201	58.239	-.01	1.41	1.6442	.3100	.0558	.0015	-.0028	.0148



(a) Three-view sketch.

Figure 1.- Geometric characteristics of model configuration.

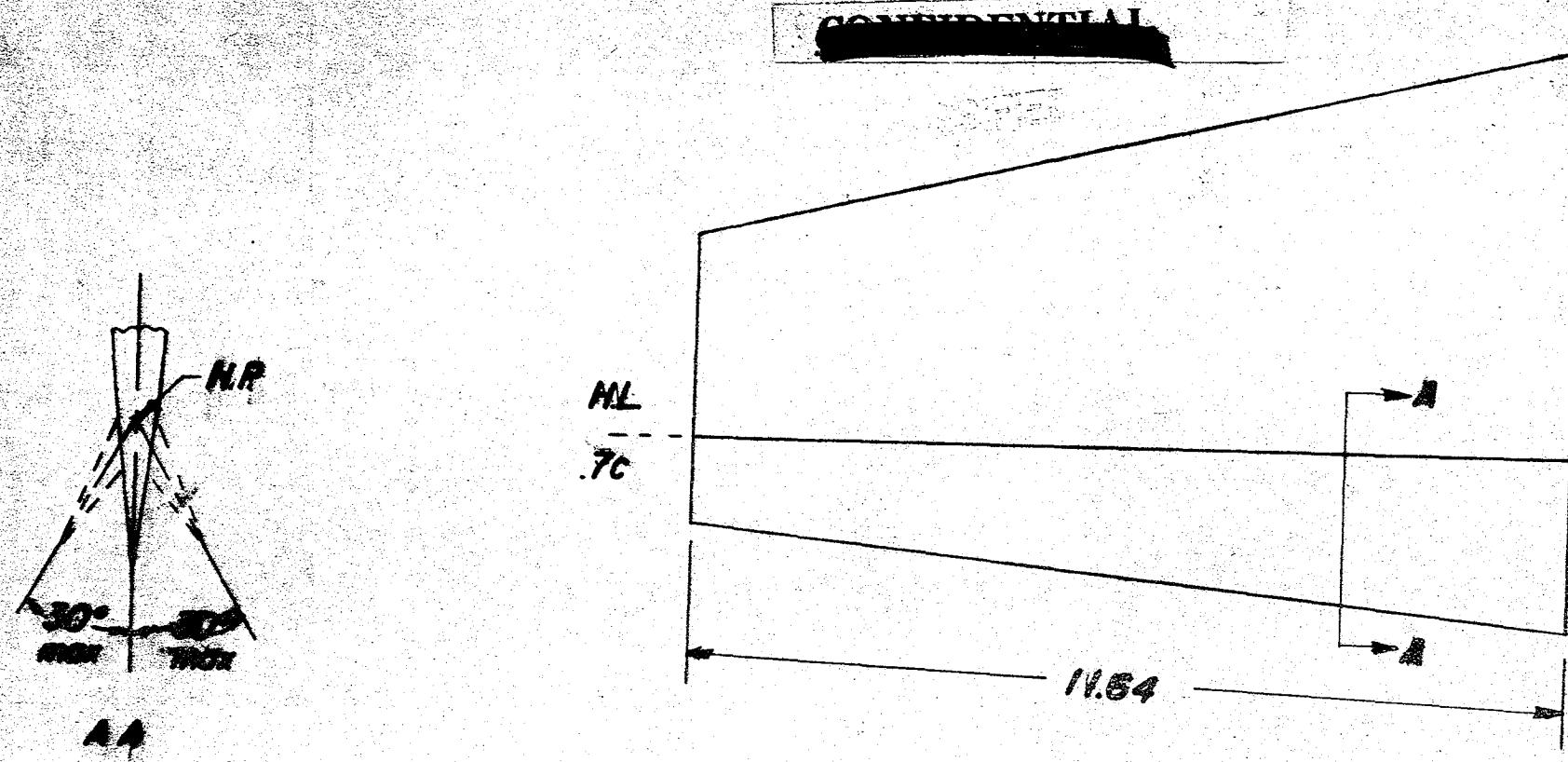
All dimensions are in inches unless specified otherwise.

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(b) Details of elevator control. H. L. means hinge line. H. P. means hinge point.

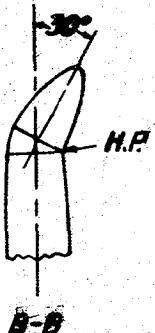
Figure 1.- Continued.

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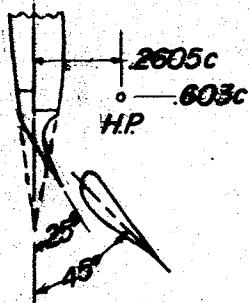
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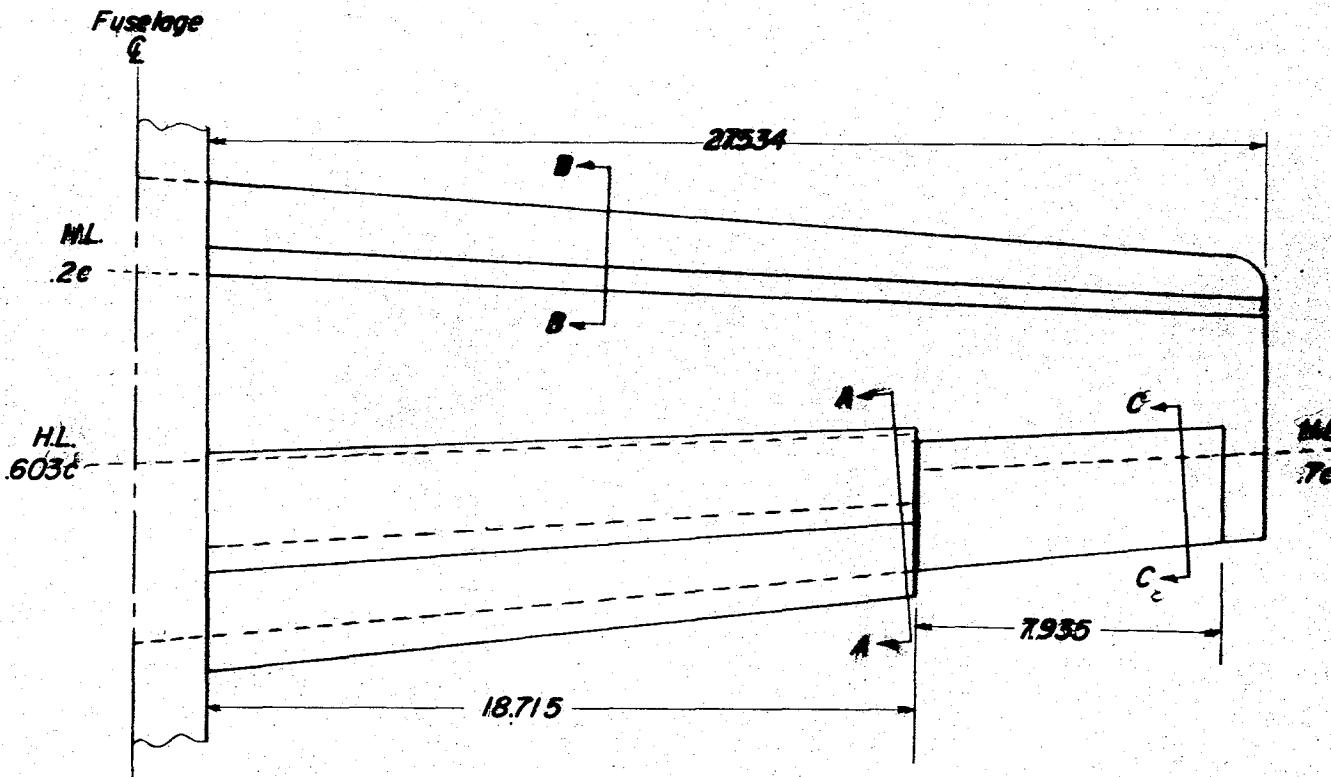
C-E



B-B



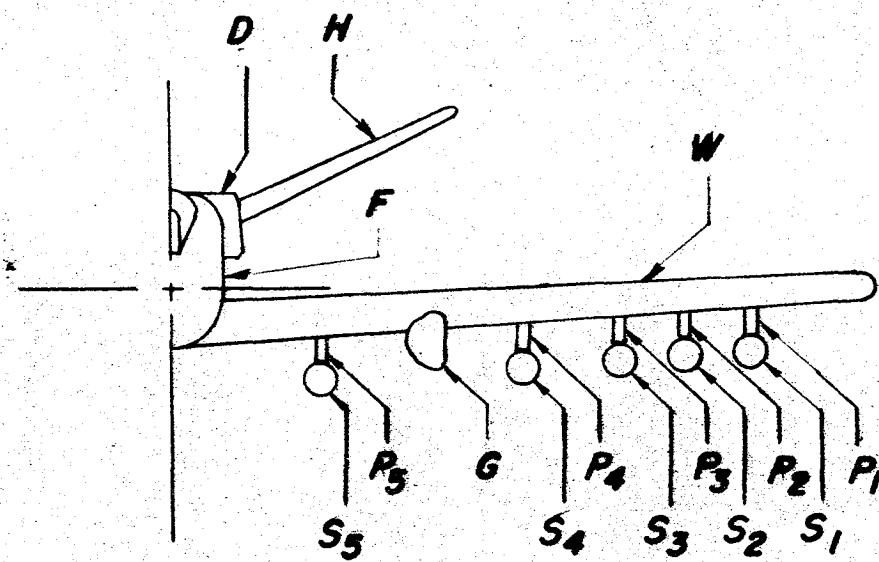
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(c) Details of wing flap system. H. L. means hinge line. H. P. means hinge point.

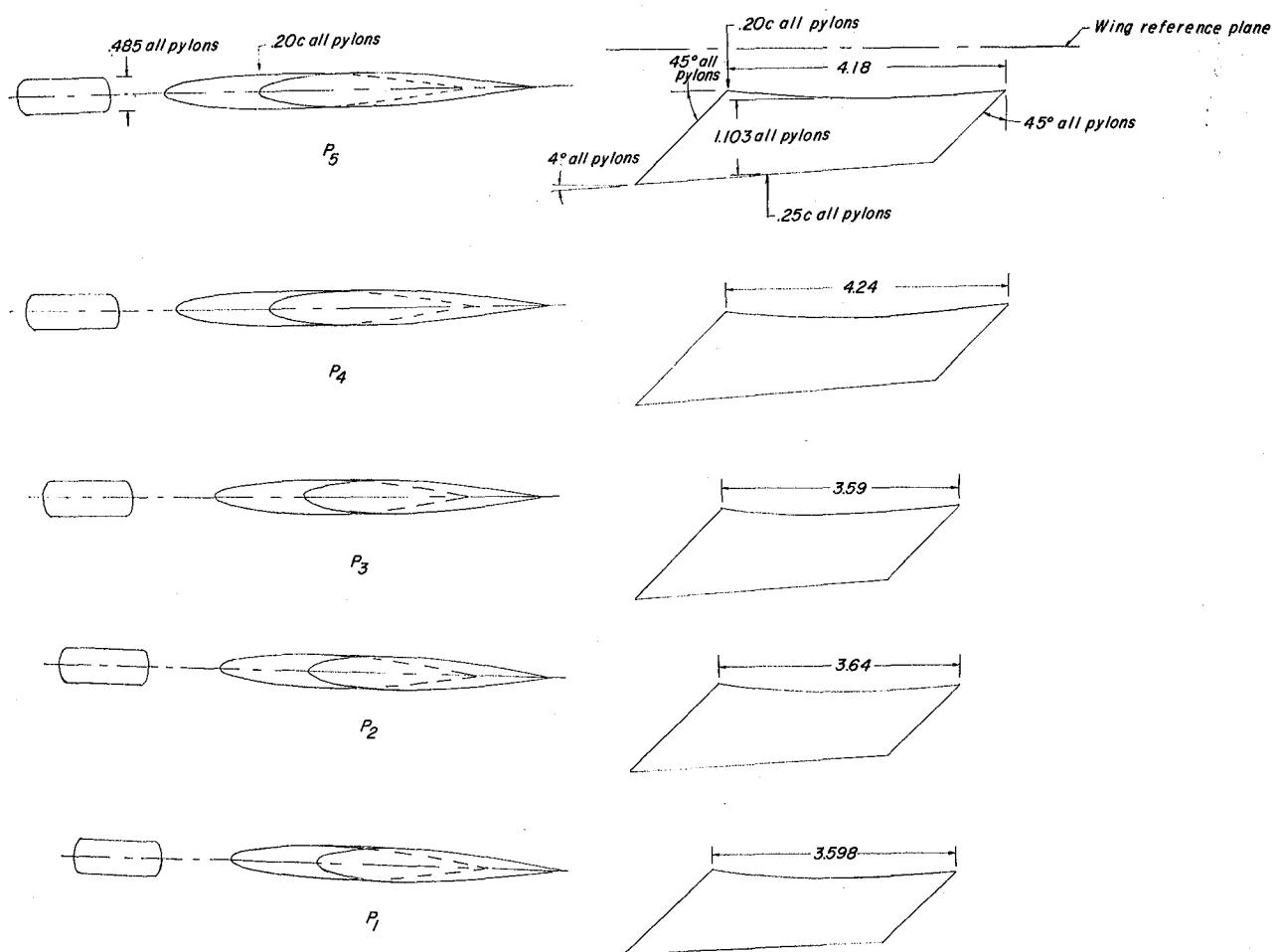
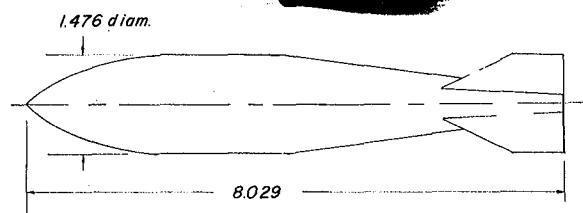
Figure 1.- Continued.



(d) Model component designations.

Figure 1.- Continued.

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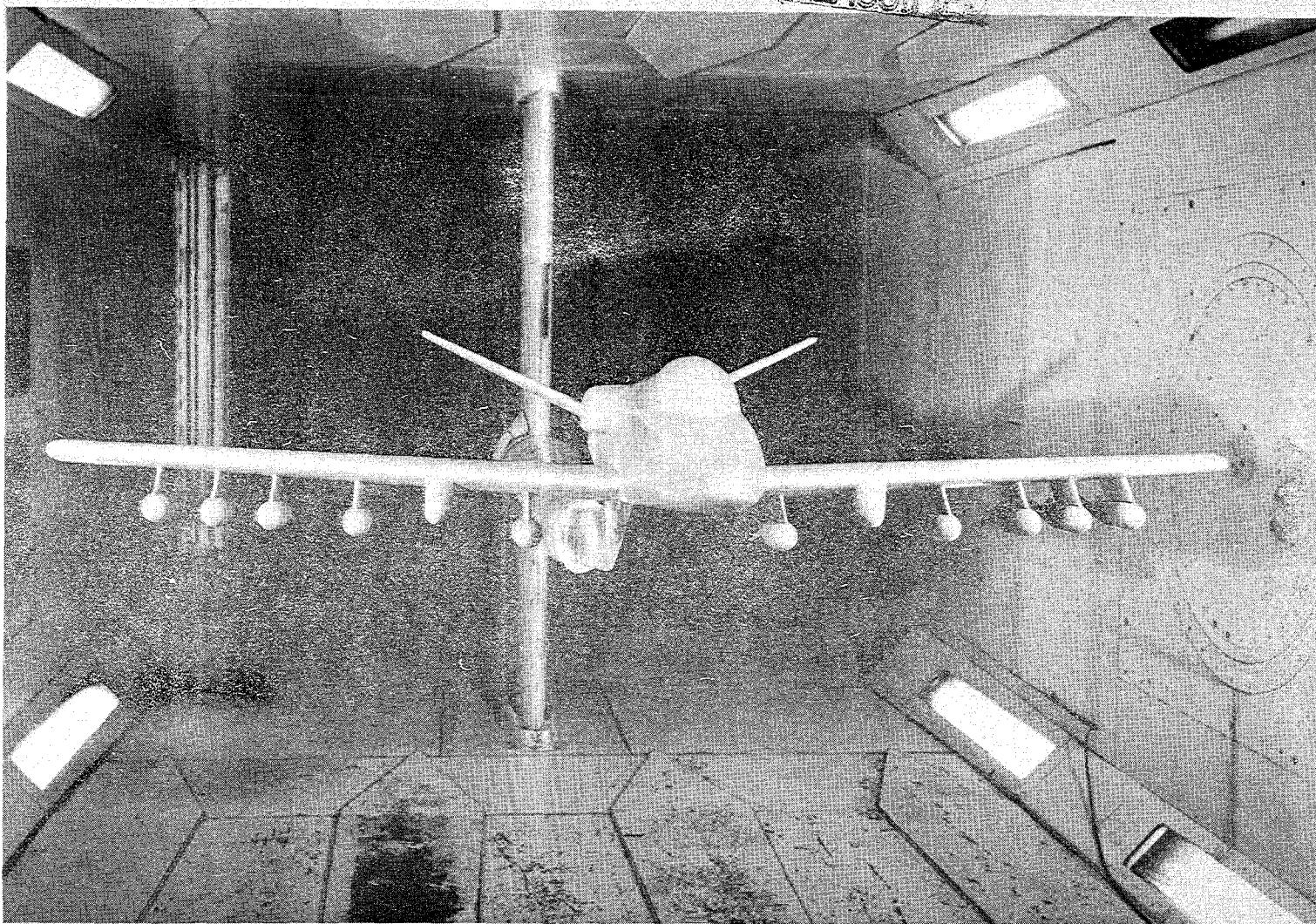
(e) Details of the pylons and the store.

Figure 1.- Concluded.

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NASA  
I-87-7567

GROUP 4  
Downgraded at 3 year intervals:  
declassified after 12 years



(a) Front view

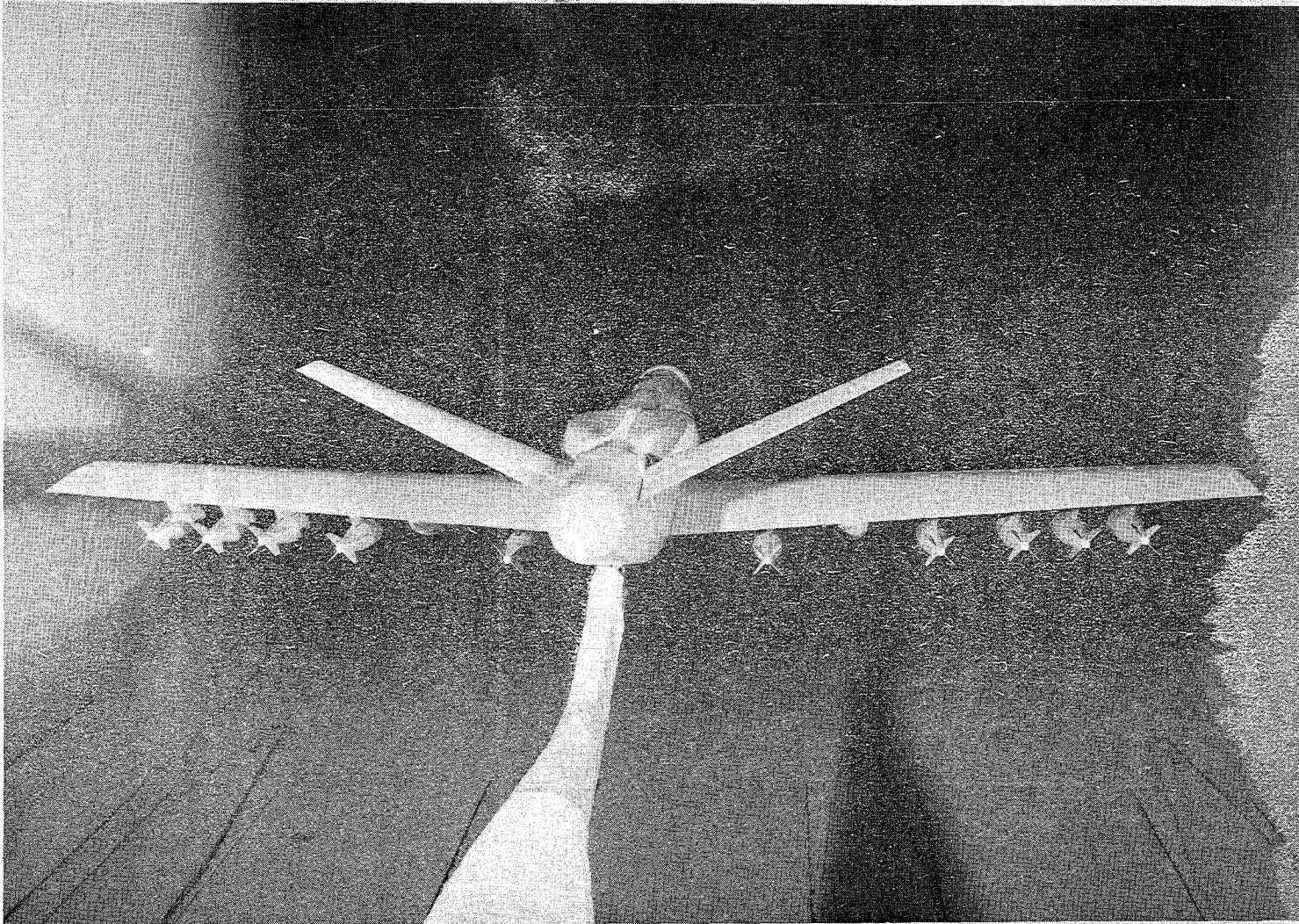
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Figure 2.- Photographs of model in the 7- [redacted] Foot High-Speed Wind Tunnel.

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L-67-7569

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GROUP 4  
Downgraded at 3 year intervals;  
declassified after 12 years



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(b) Rear view

Figure 2.- Concluded.

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$3.4 \times 10^6$

3.0

2.6

R 2.2

1.8

1.4

1.0

0 .1 .2 .3 .4 .5 .6 .7

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Figure 3.- Variation of test Reynolds number, based on mean aerodynamic chord, with Mach number for the temperature extremes.

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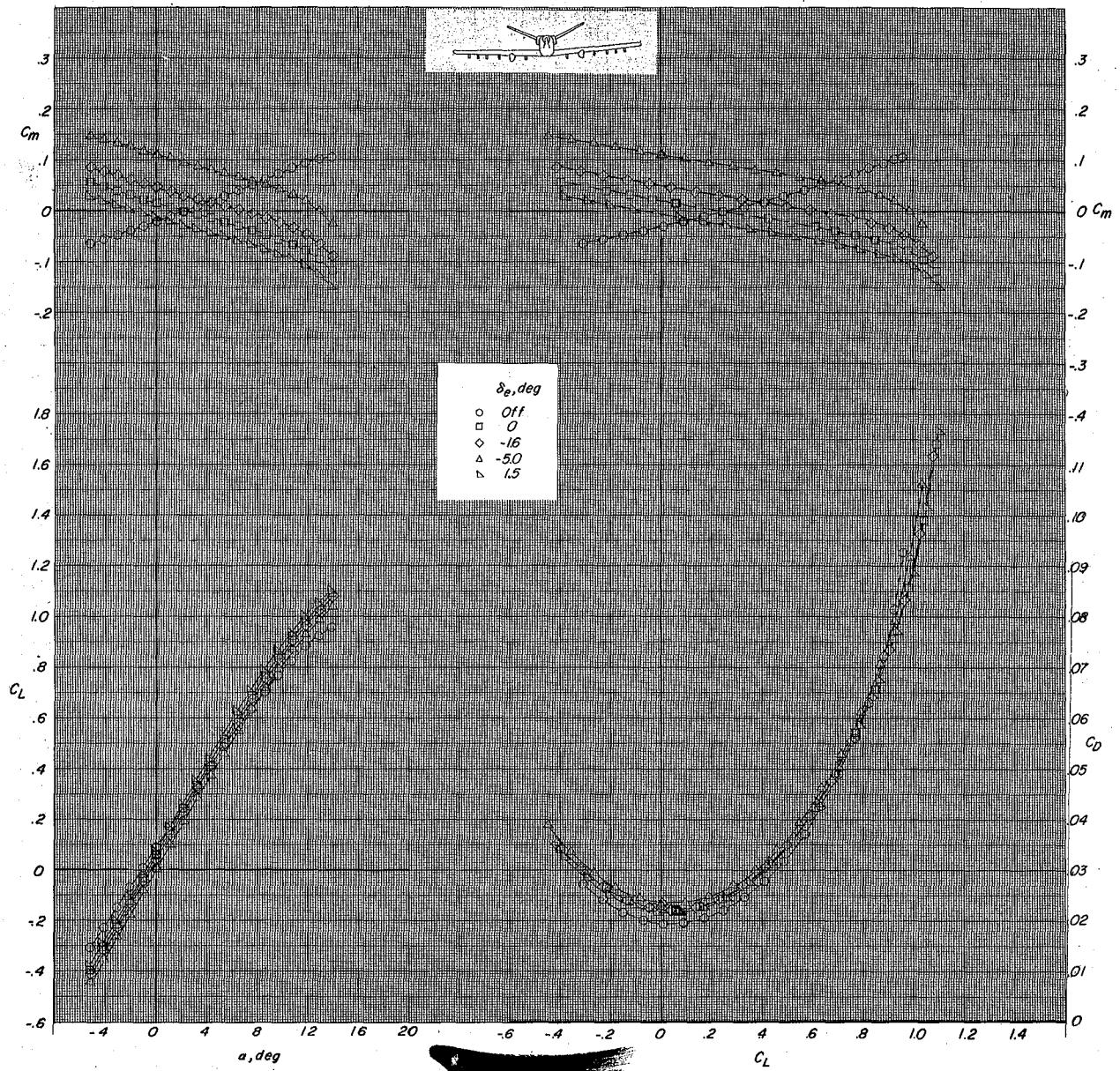
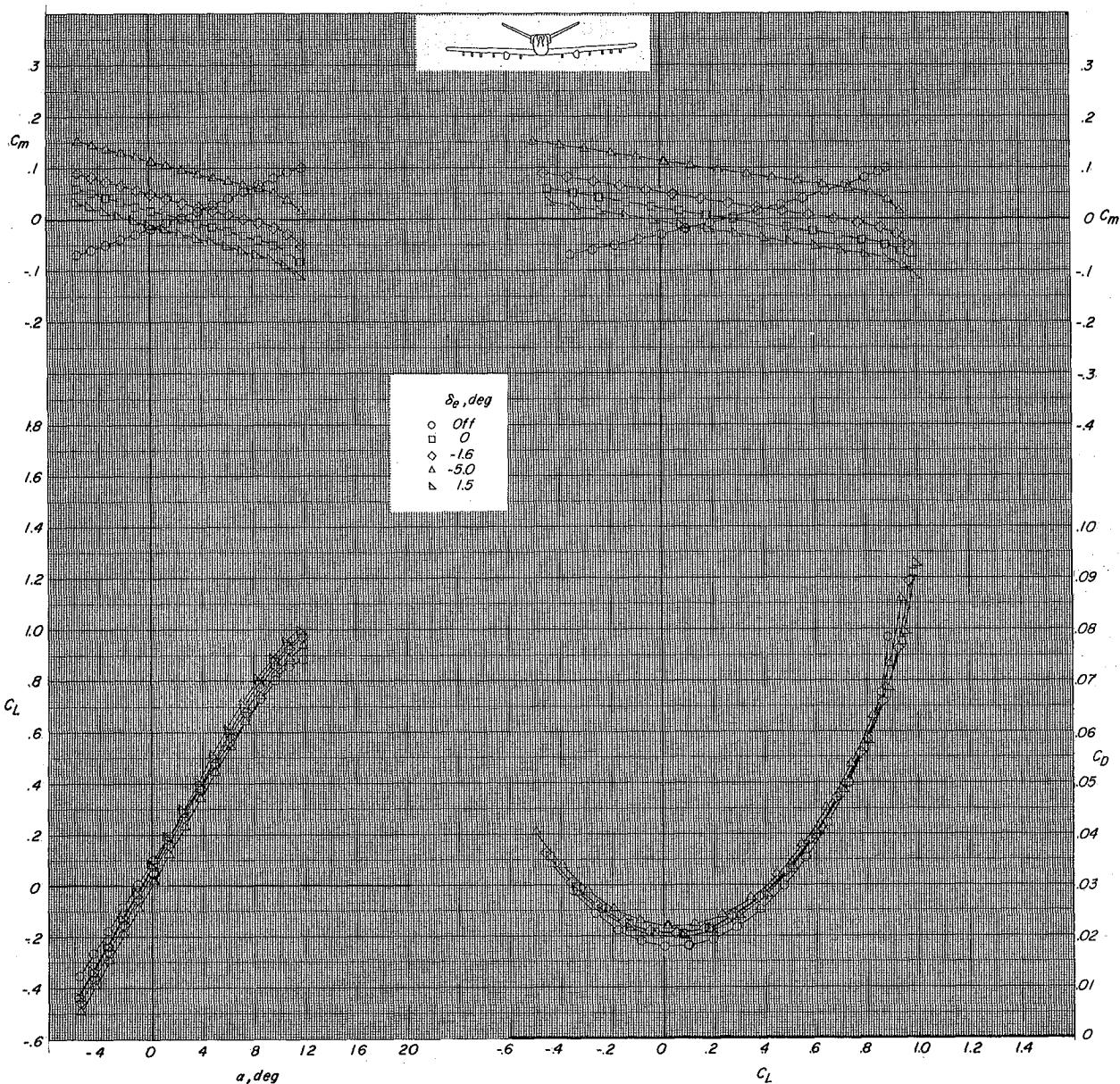


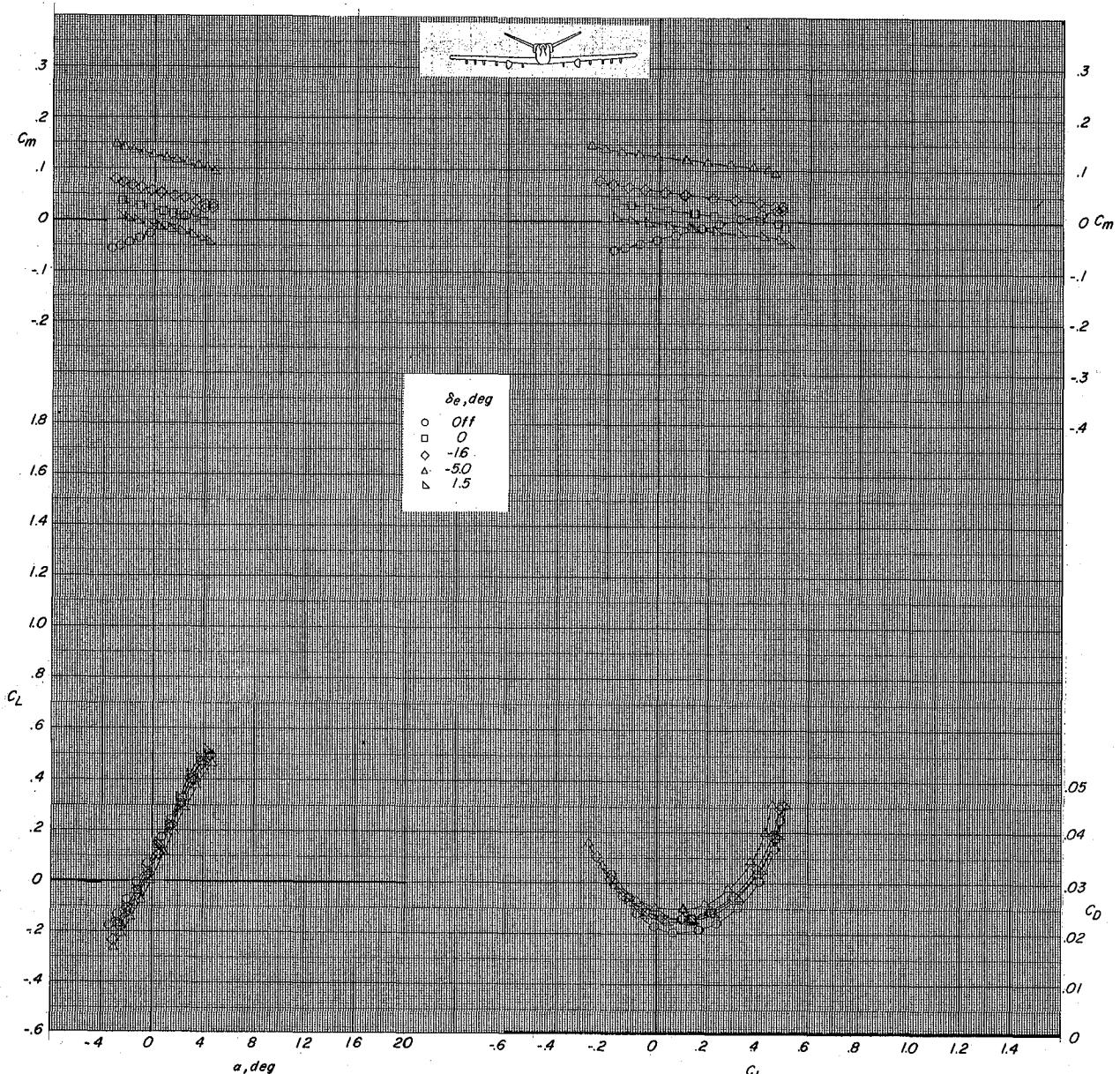
Figure 4.- Longitudinal stability and control characteristics of the basic configuration.  
Stores off;  $\delta_h = 0$ ,  $\delta_n = 0$ ,  $\delta_f = 0$ .

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(b)  $M = 0.40$   
Figure 4.- Continued.

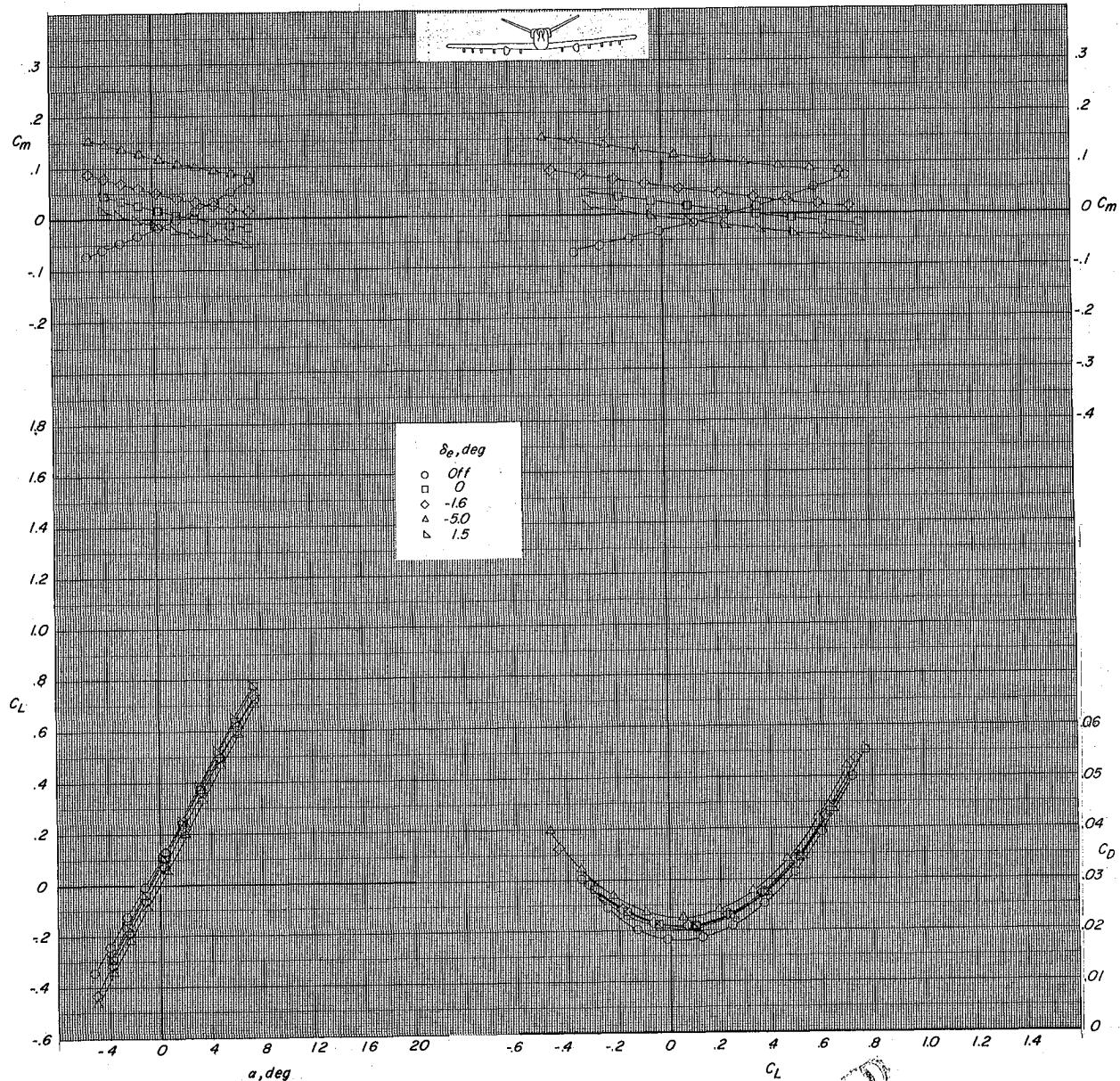
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(d)  $M = 0.70$   
Figure 4.- Concluded.

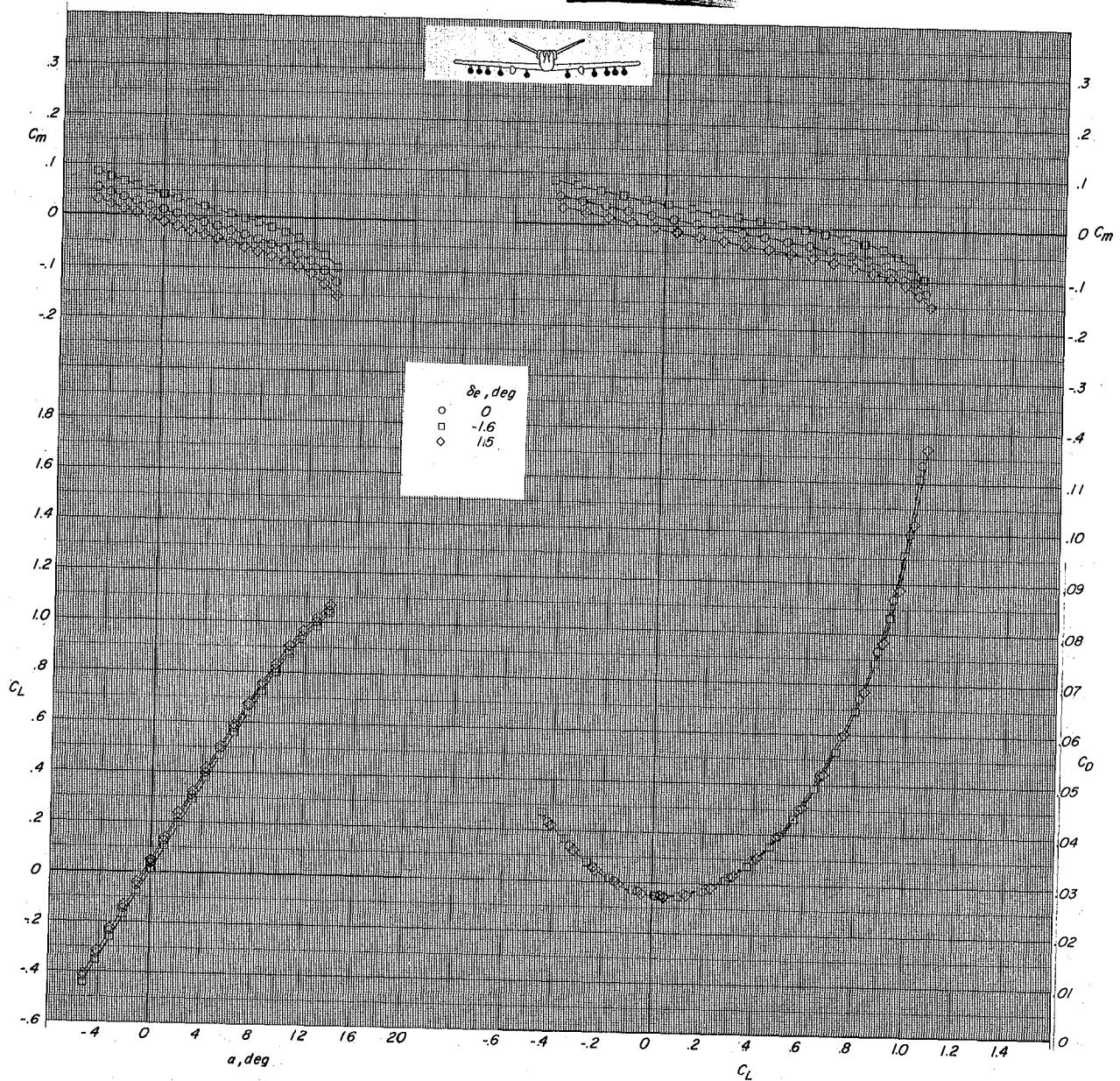
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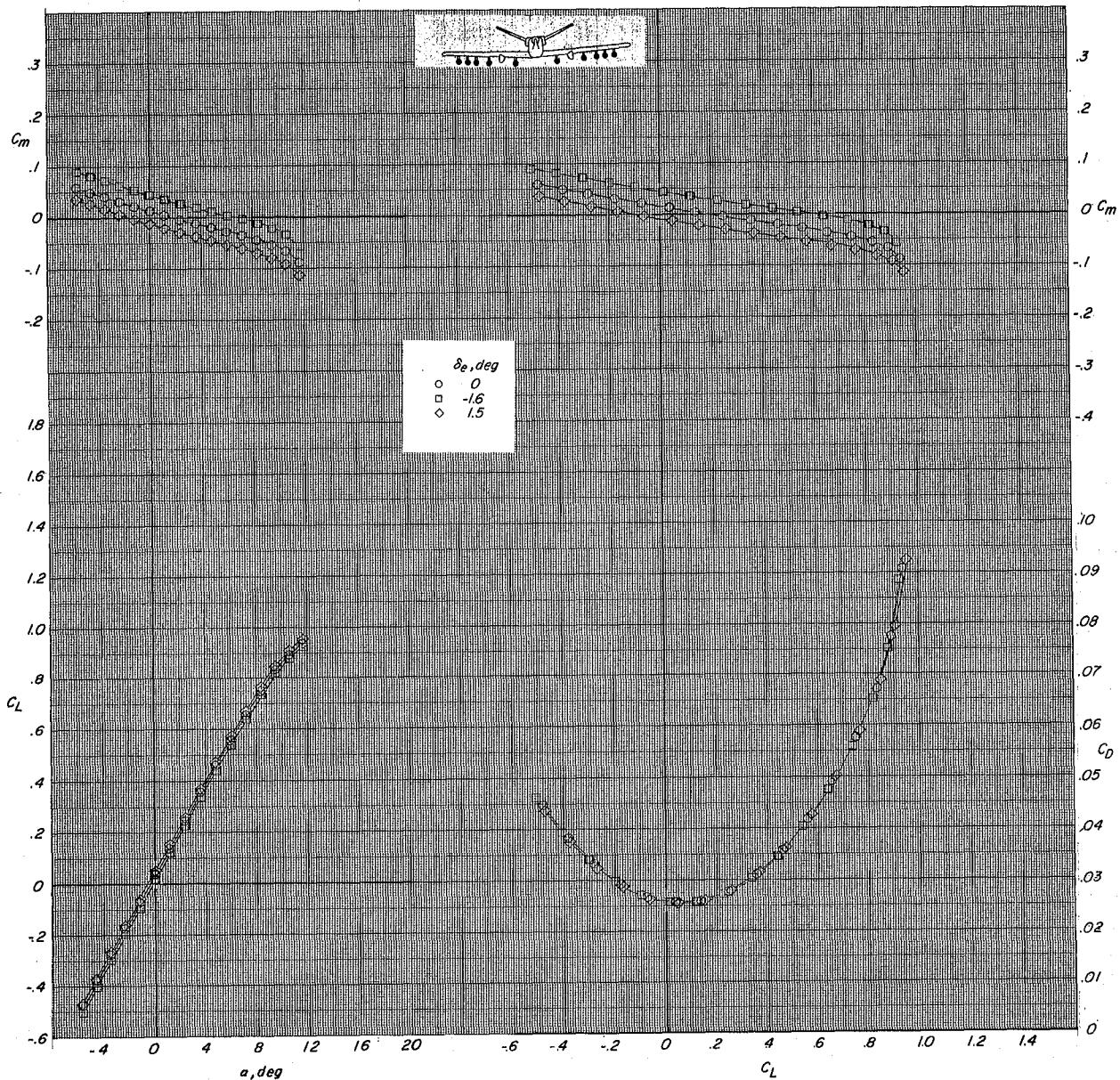
(c)  $M = 0.60$   
Figure 4.- Continued.  
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(a)  $M = 0.20$   
Figure 5.- Longitudinal stability and control characteristics of the basic configuration.  
Stores on;  $\delta_h = 0$ ,  $\delta_n = 0$ ,  $\delta_f = 0$ .

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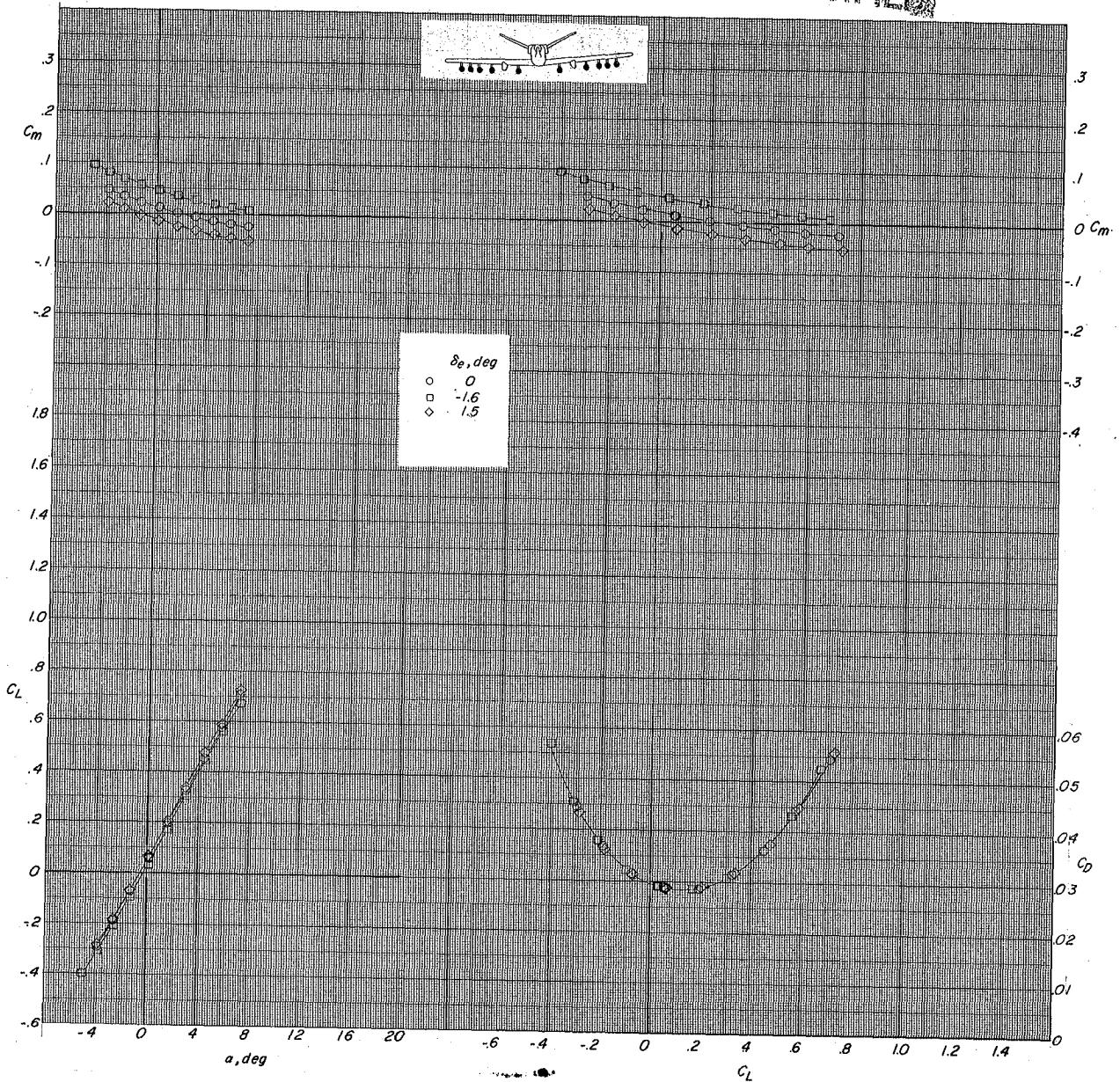


(b)  $M = 0.40$   
Figure 5.- Continued.

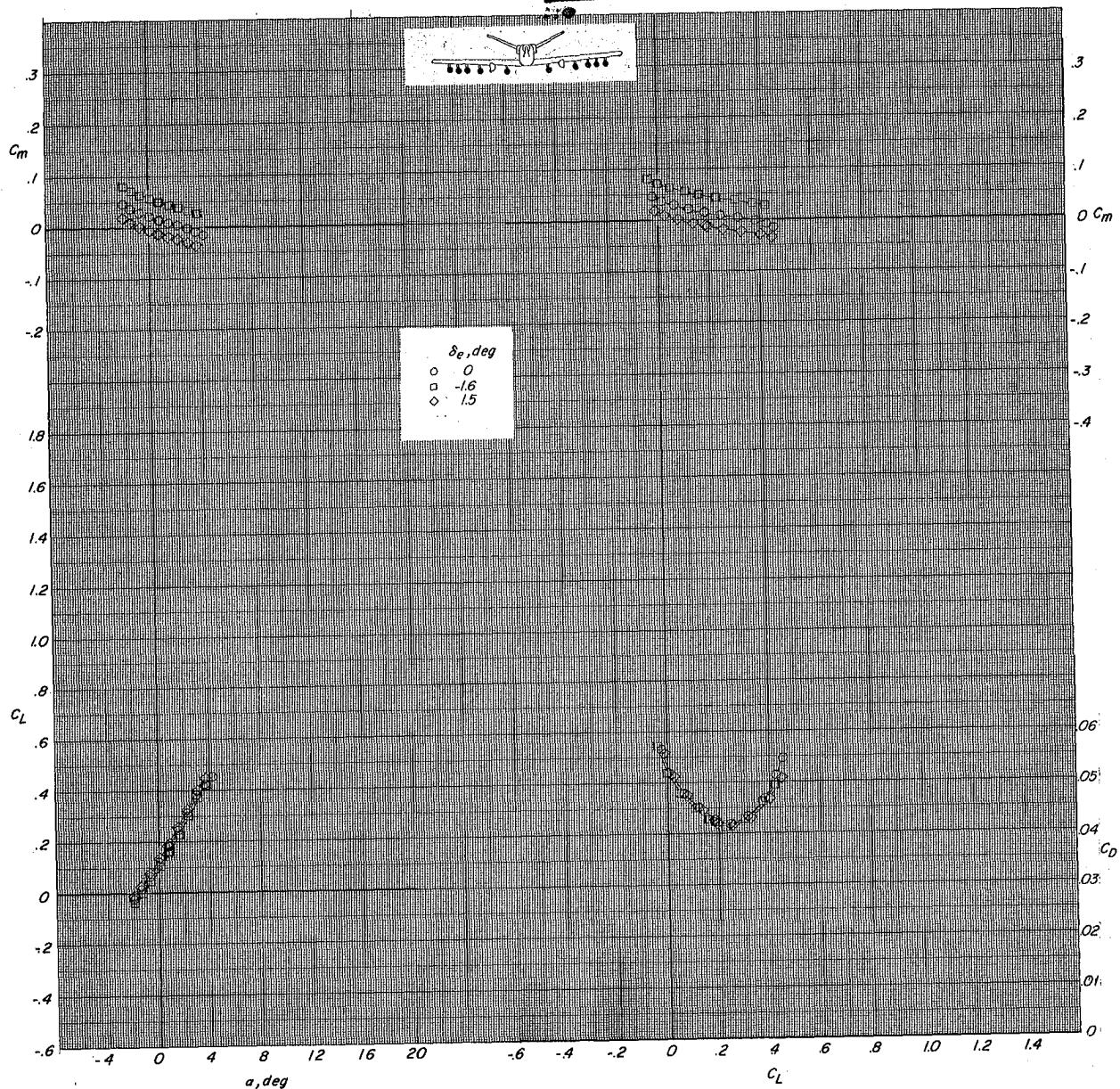
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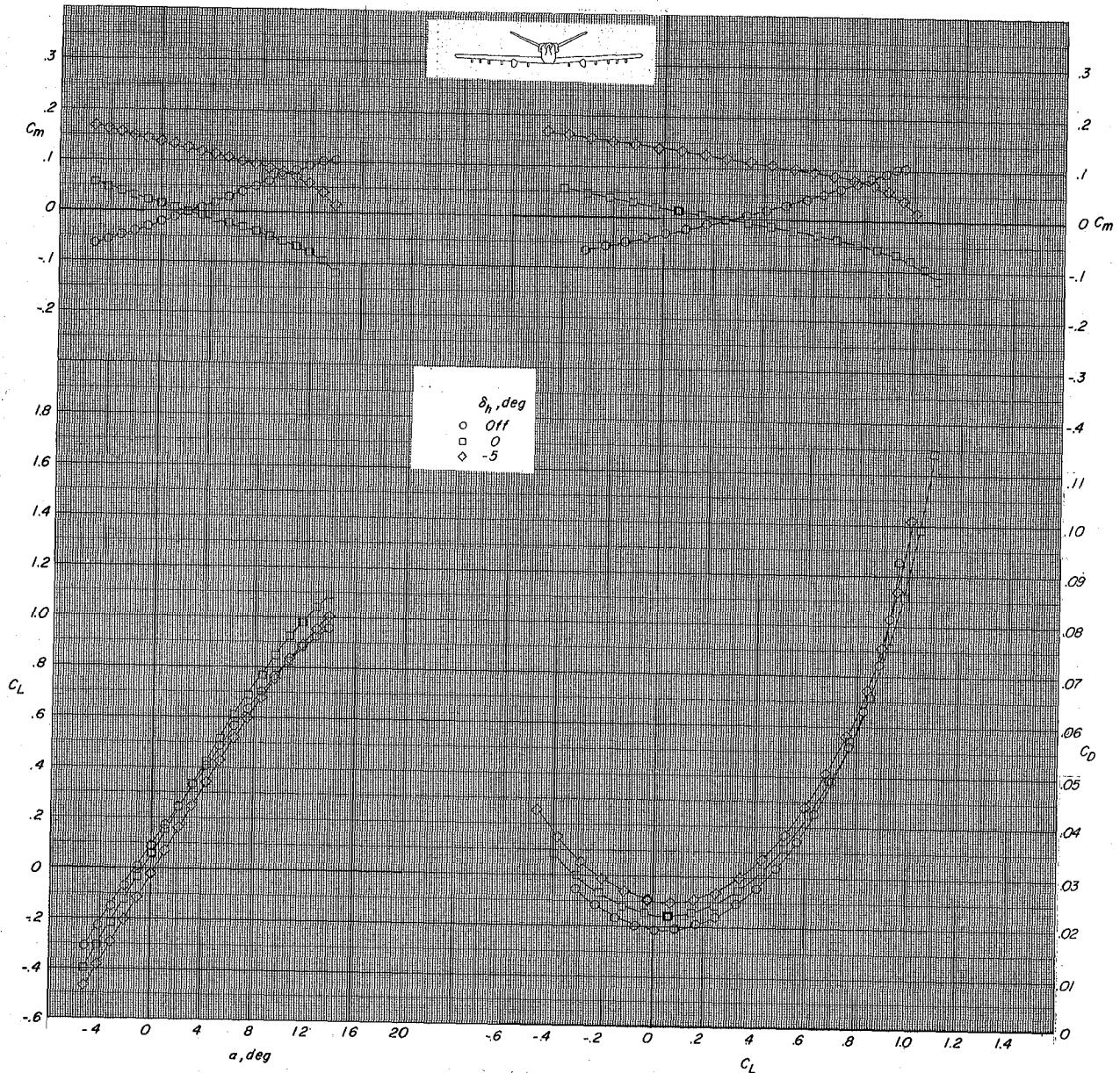
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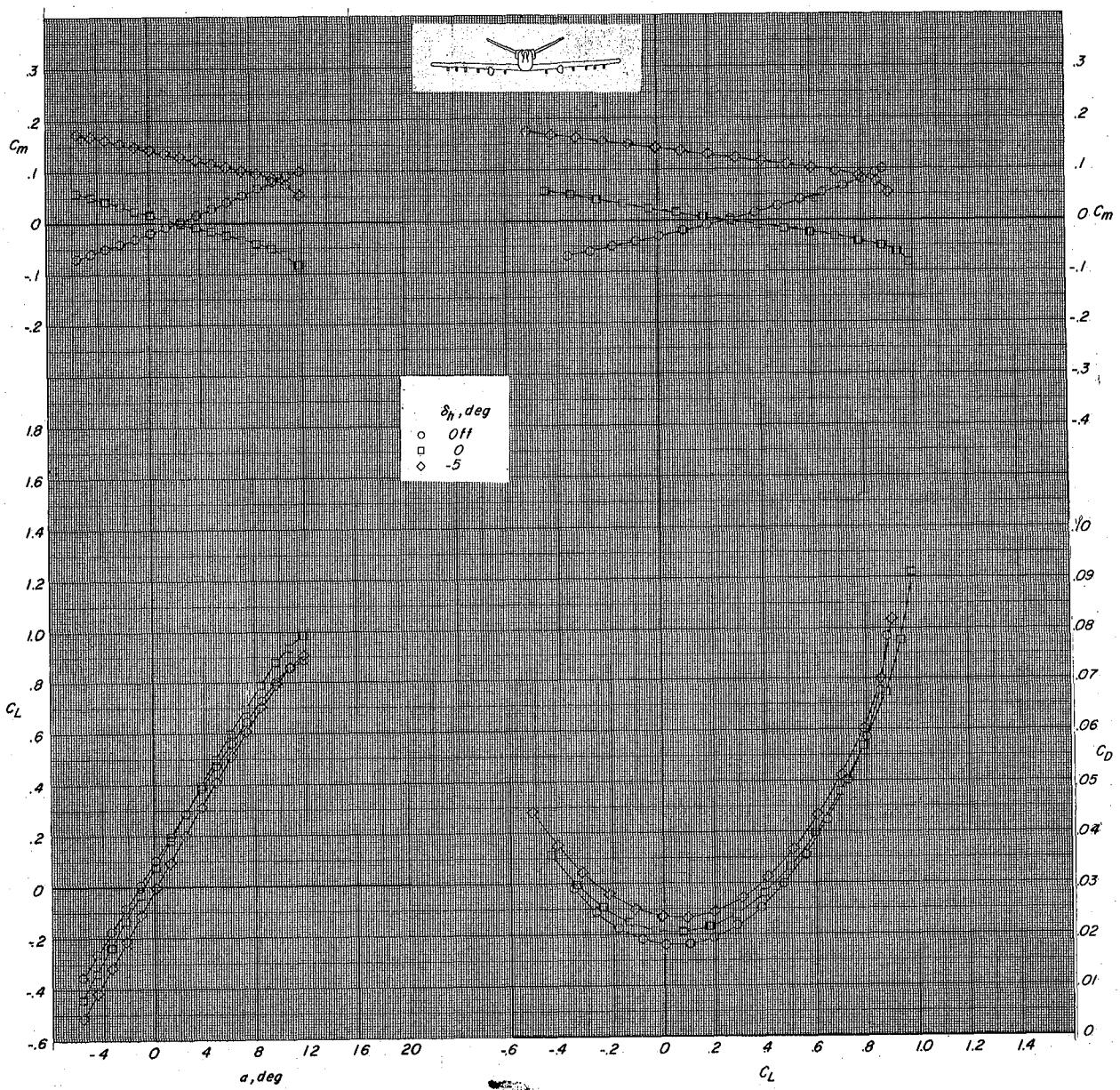
(c)  $M = 0.60$   
Figure 5.- Continued.



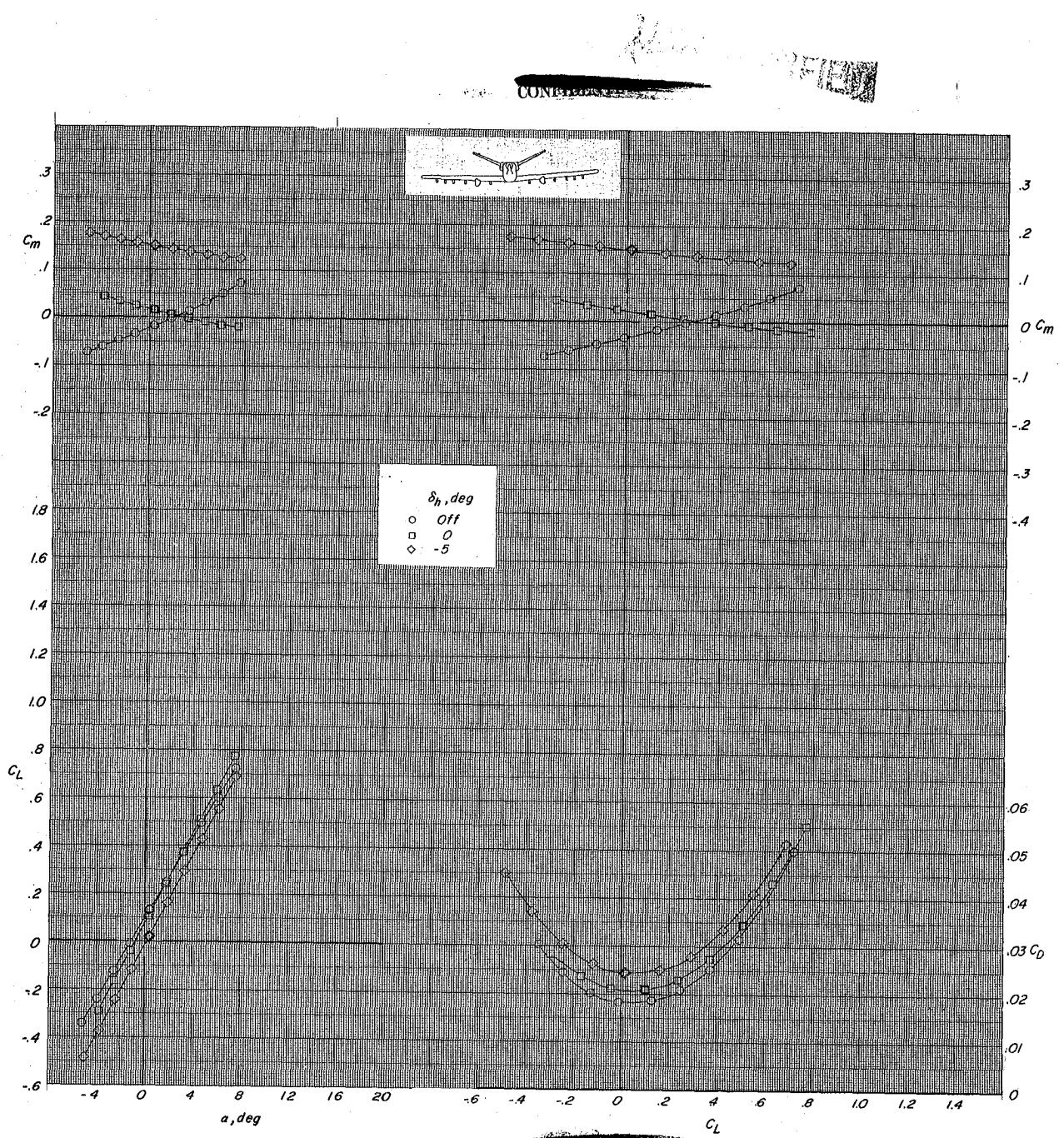
(d)  $M = 0.70$   
Figure 5.- Concluded.



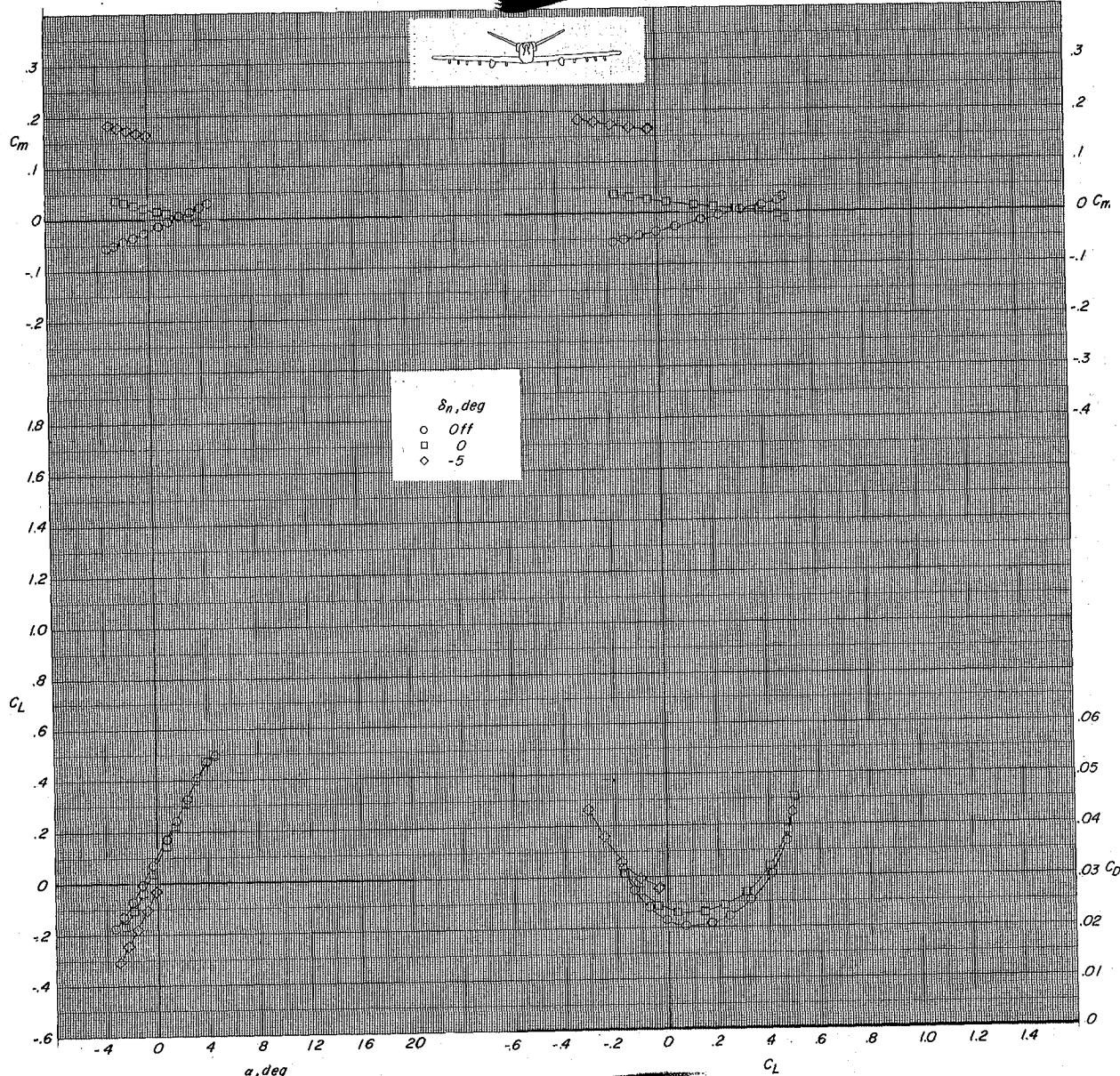
(a)  $M = 0.20$   
 Figure 6.- Effect of horizontal-tail incidence on longitudinal stability and control. Stores  
 'off';  $\delta_e = 0$ ,  $\delta_h = 0$ ,  $\delta_f = 0$ .



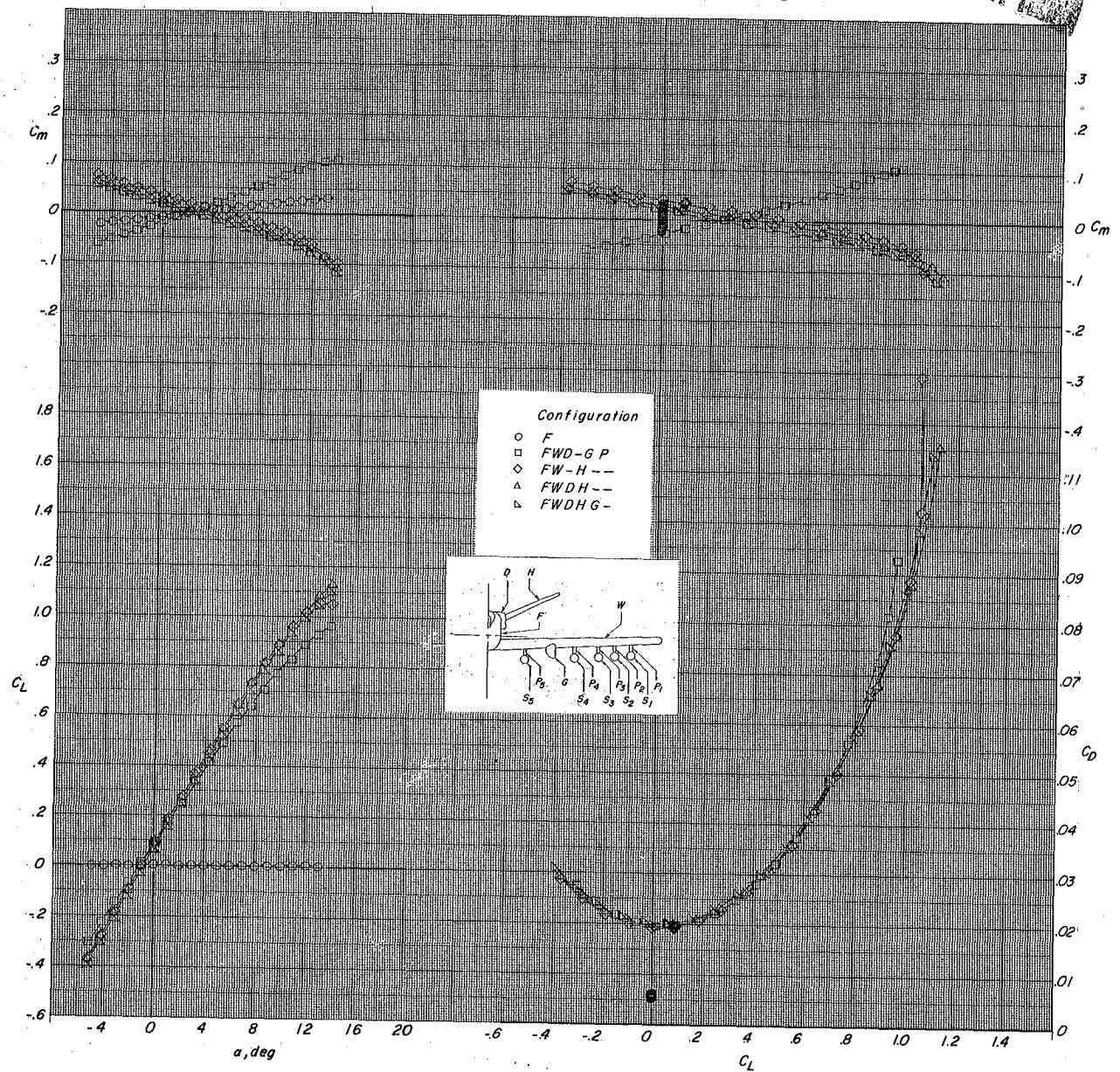
(b)  $M = 0.40$   
Figure 6.- Continued.



(c)  $M = 0.60$   
Figure 6. Continued.

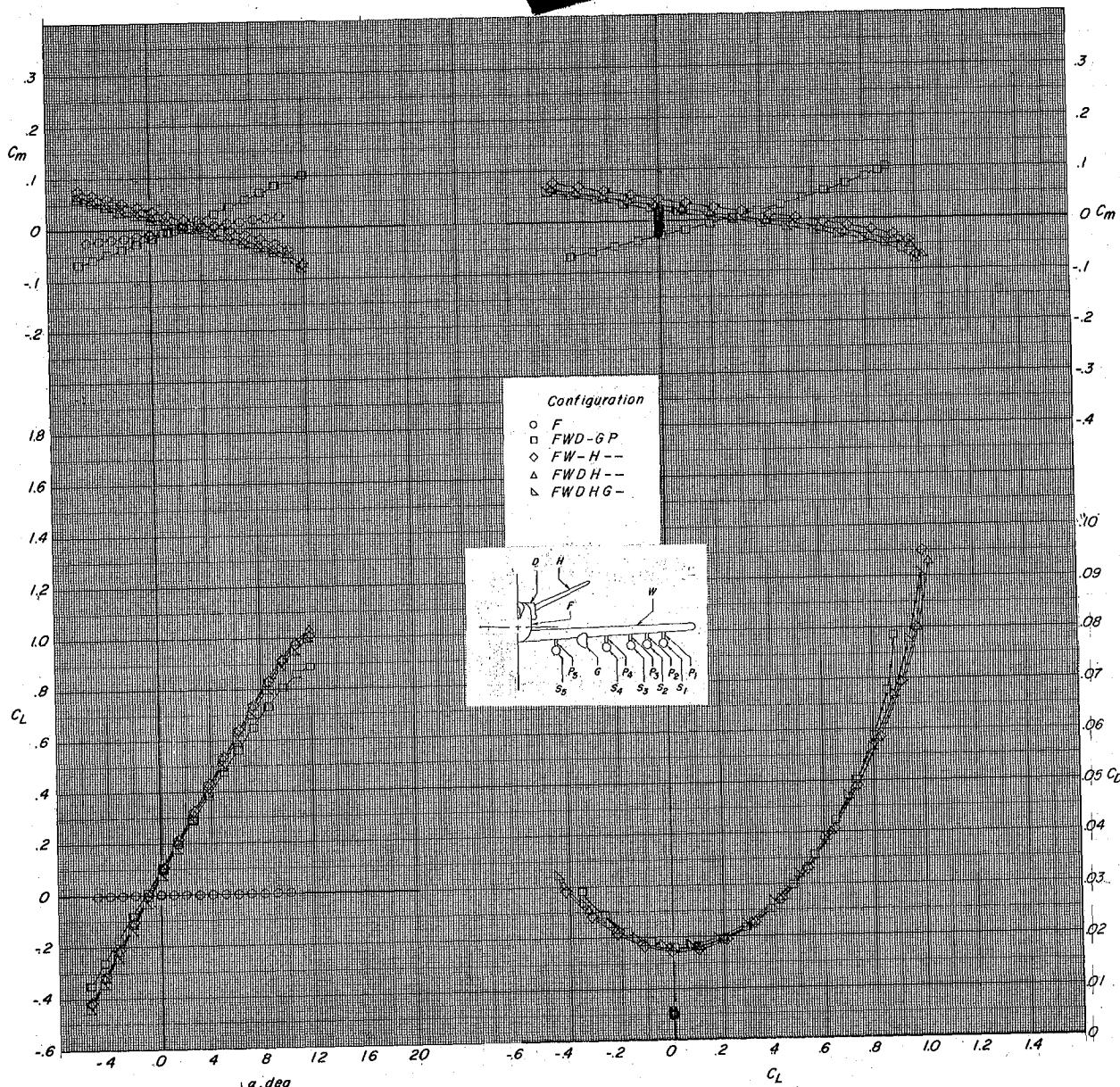


(d).  $M = 0.70$   
Figure 6.- Concluded.



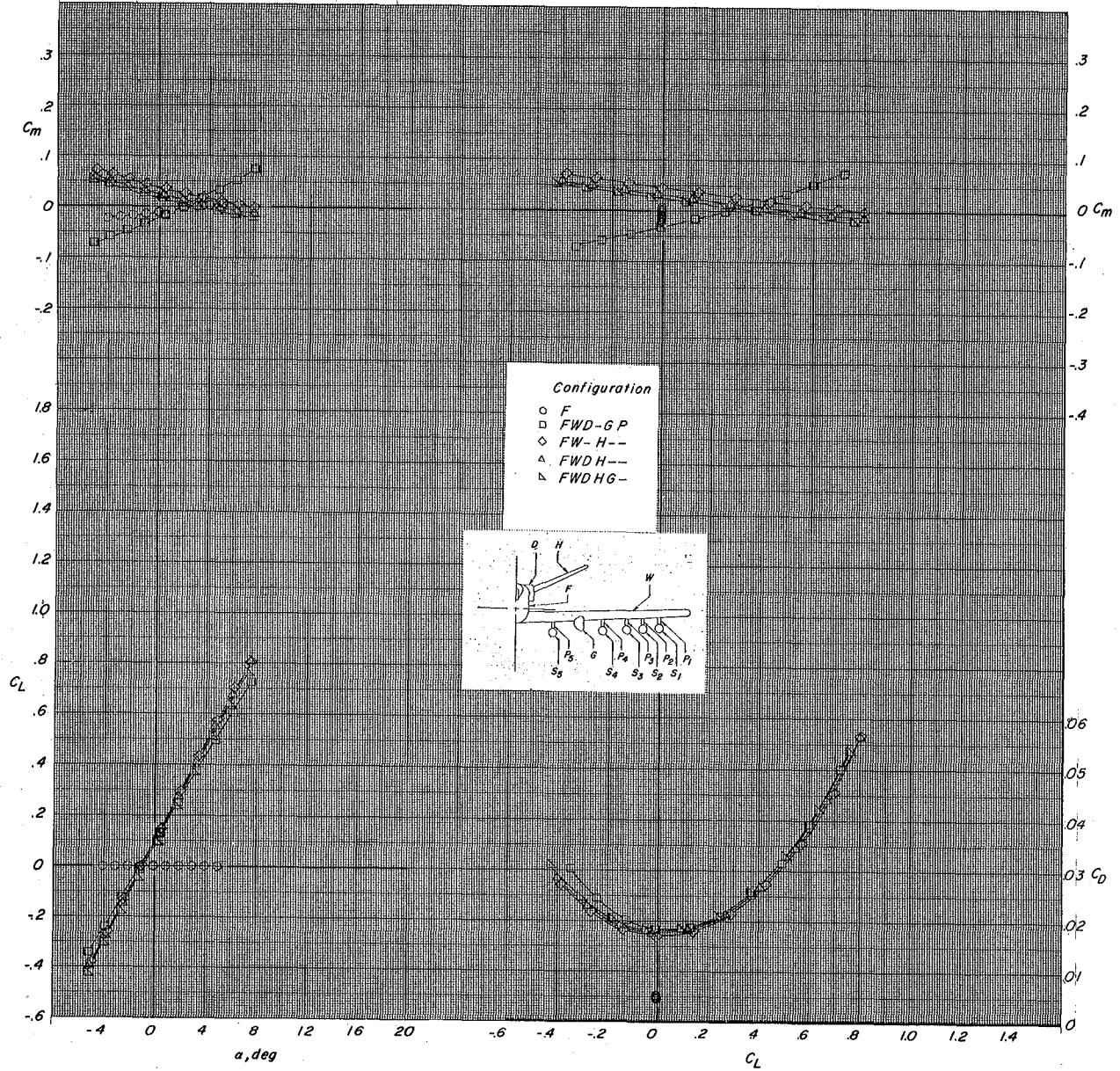
(a)  $M = 0.20$   
**Figure 7.** Effect of model components on longitudinal stability characteristics.

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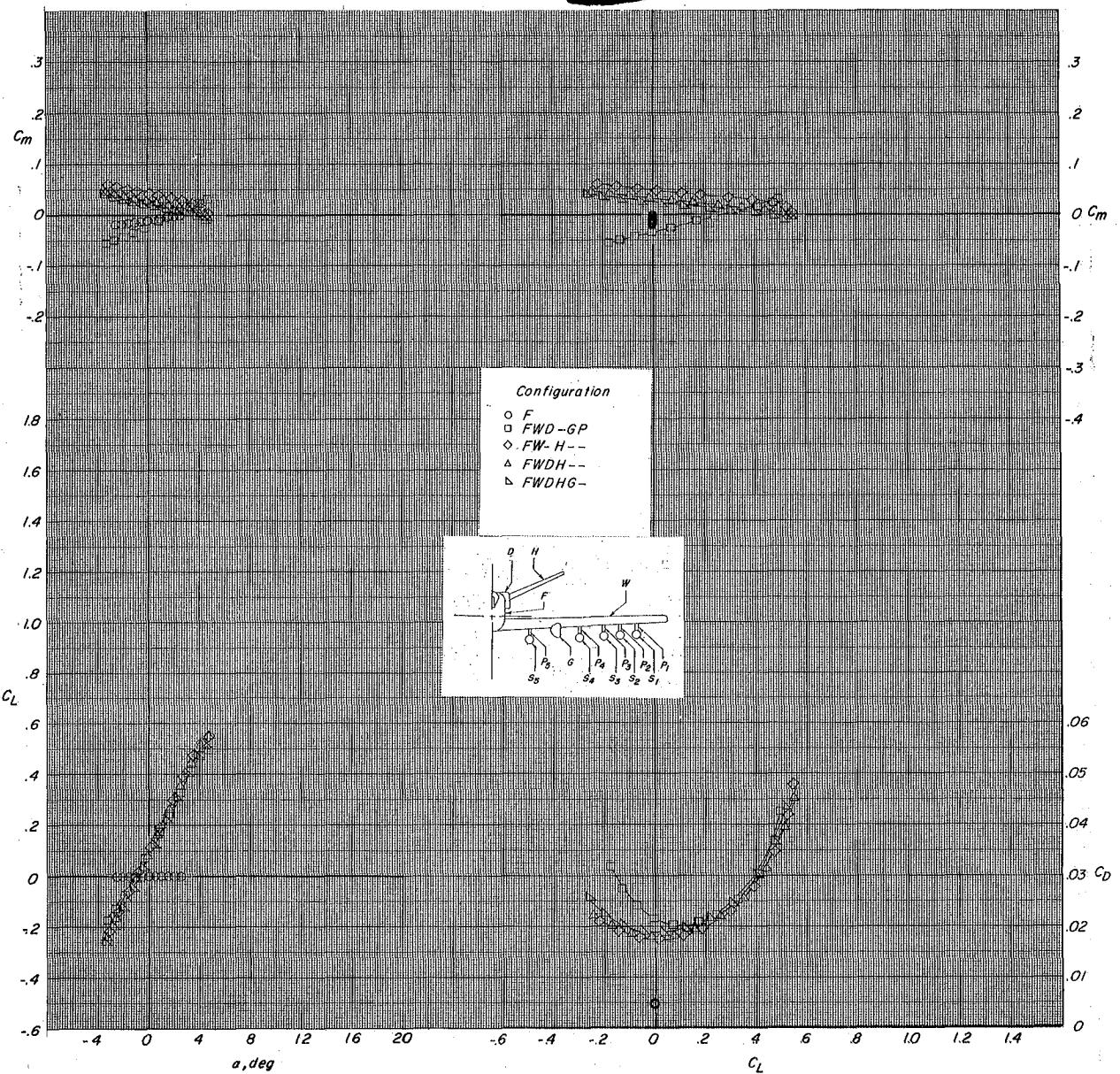


(b)  $M = 0.40$   
Figure 7 - Continued.

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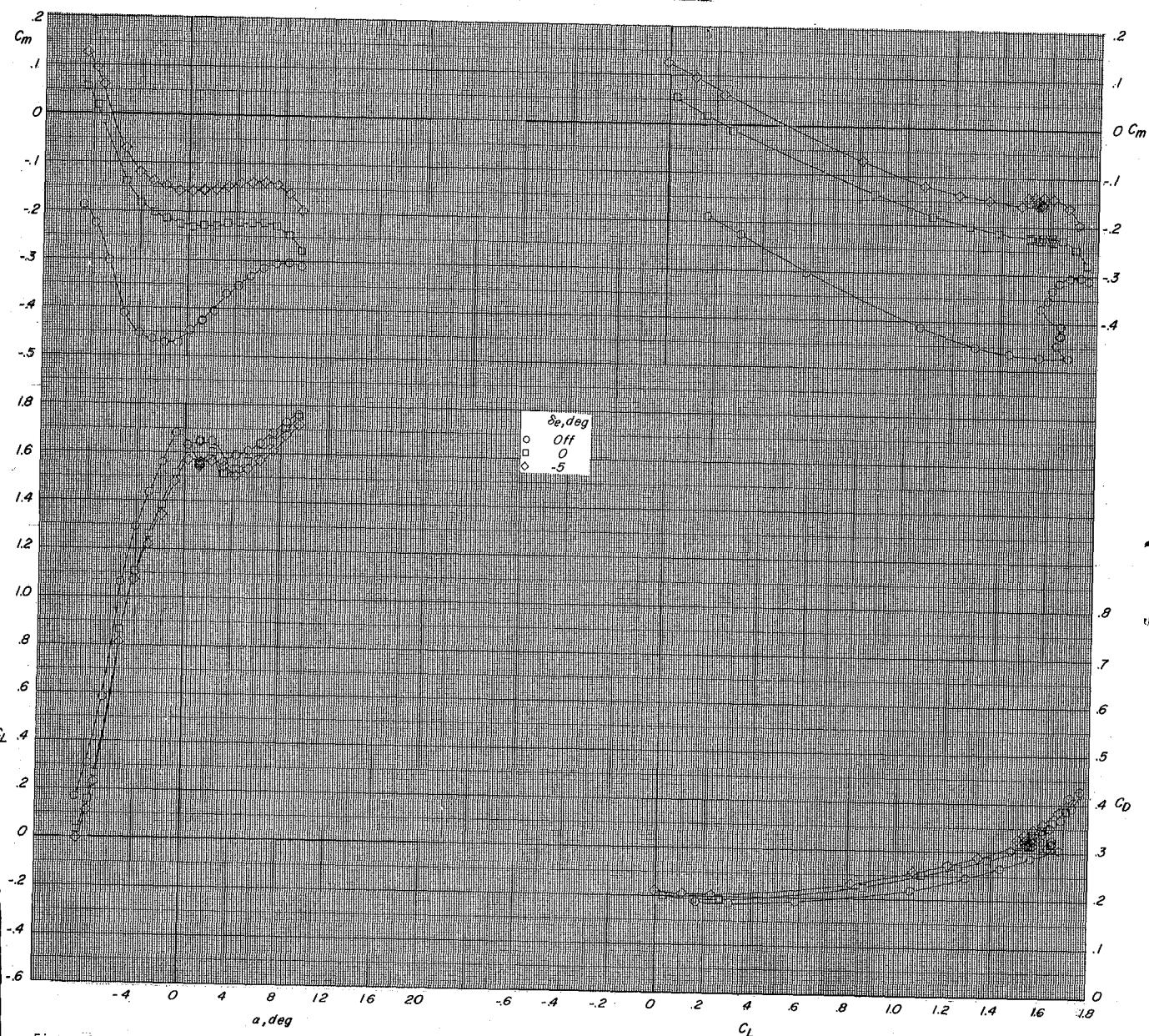


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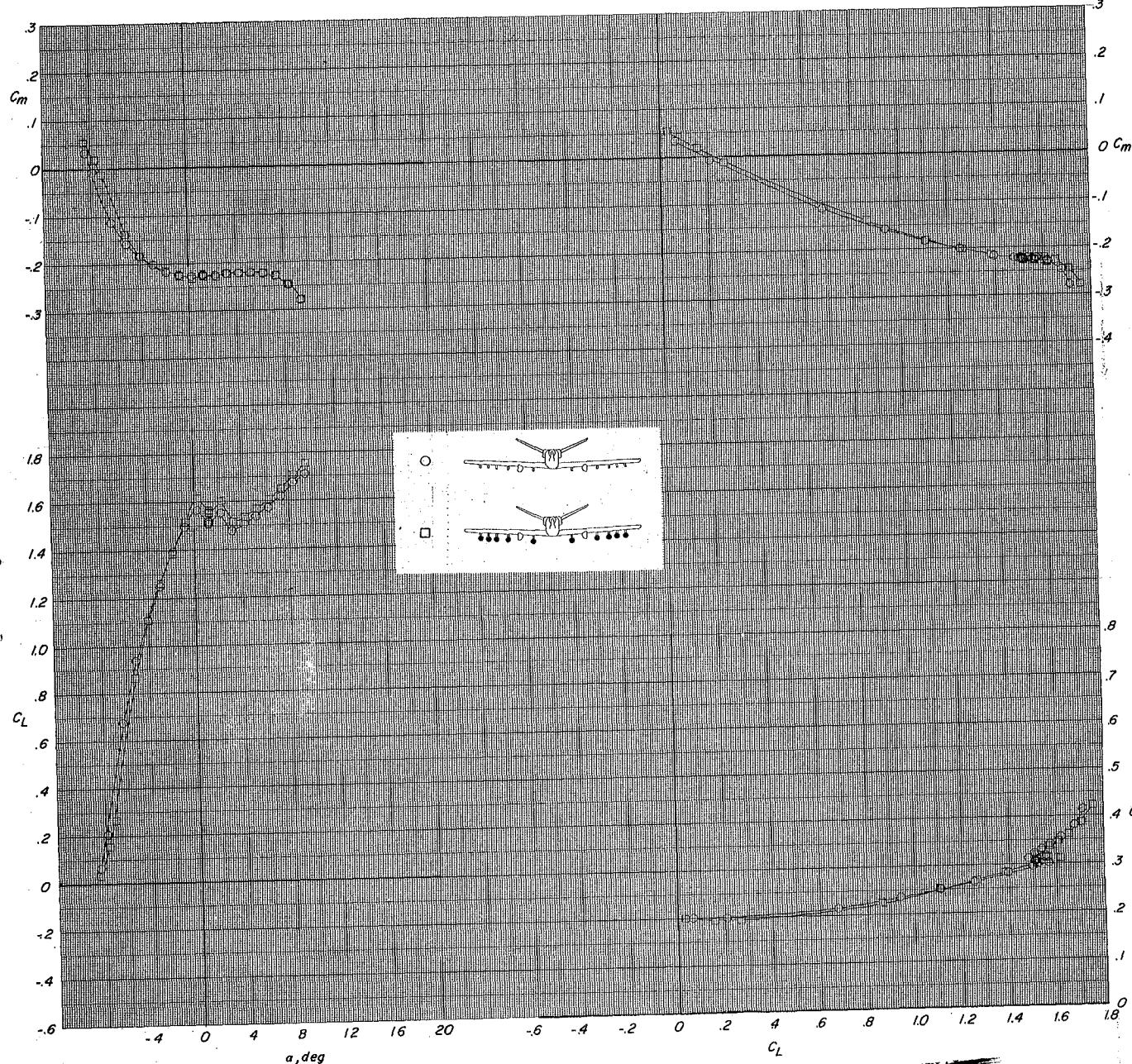


Figure 9.1.- Effect of stores on longitudinal stability characteristics of high-lift configuration.  $M = 0.20$ ,  $\delta_h = \delta_e = 0$ ,  $\delta_n = 30^\circ$ ,  $\delta_f = 45^\circ$ .

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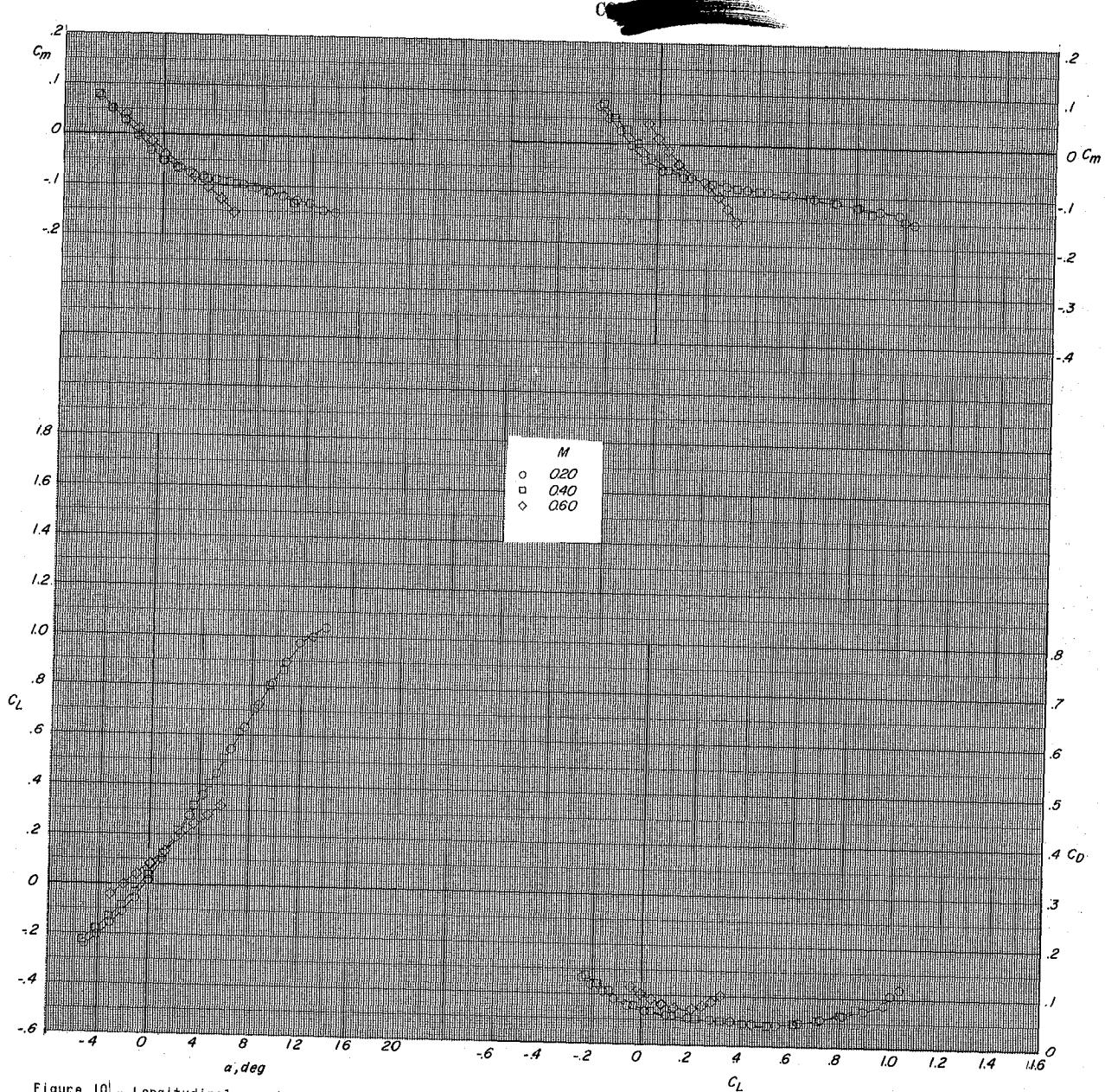


Figure 10. Longitudinal aerodynamic characteristics of deflected wing leading edge.  
Stores,  $\delta_e = 0$ ,  $\delta_n = 30^\circ$ ,  $\delta_f = 0$ .

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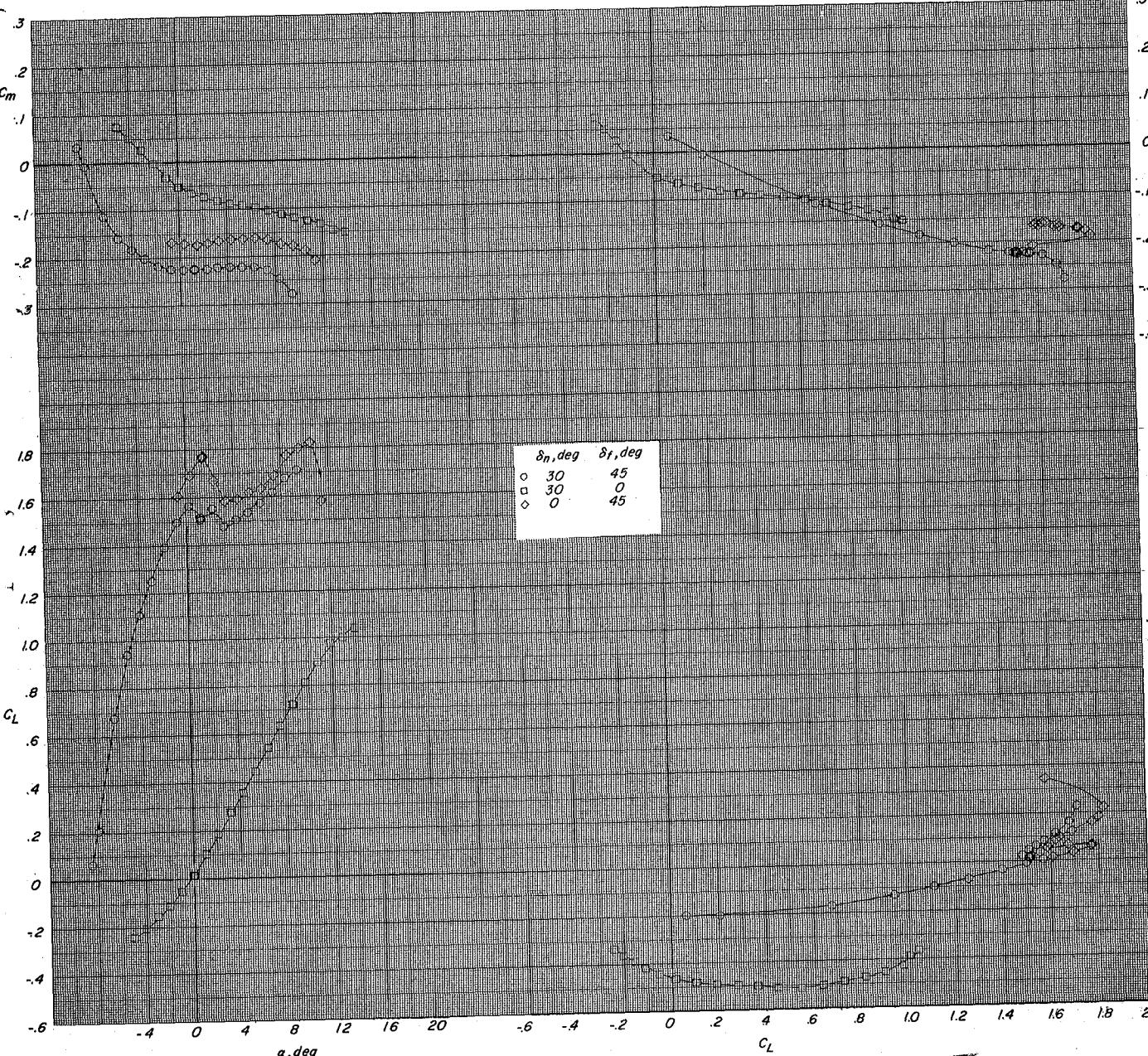
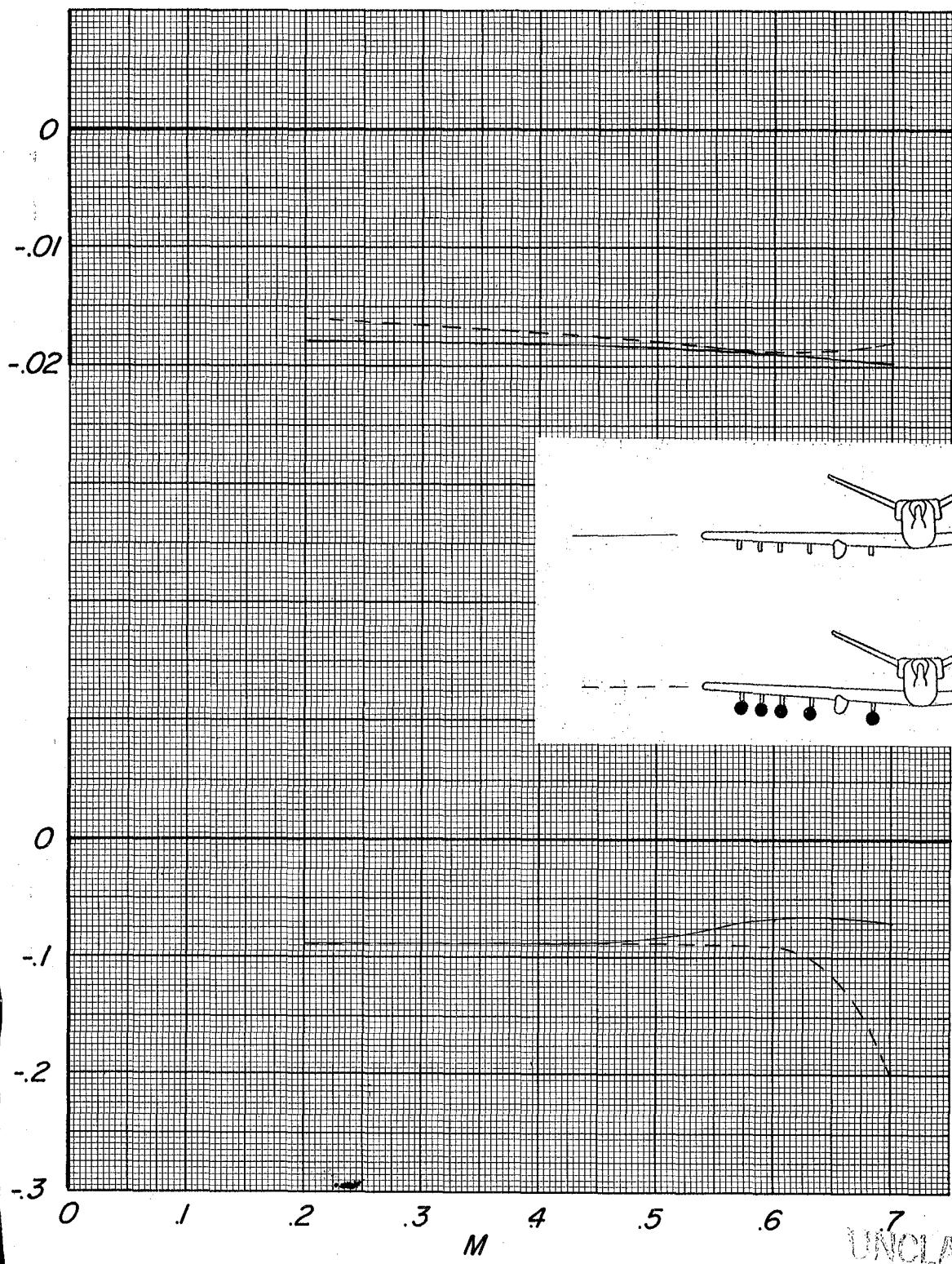


Figure 11.-- Longitudinal aerodynamic characteristics of high-lift system. Stores off;  
 $\delta_h = \delta_g = 0$ ,  $M = 0.20$ .

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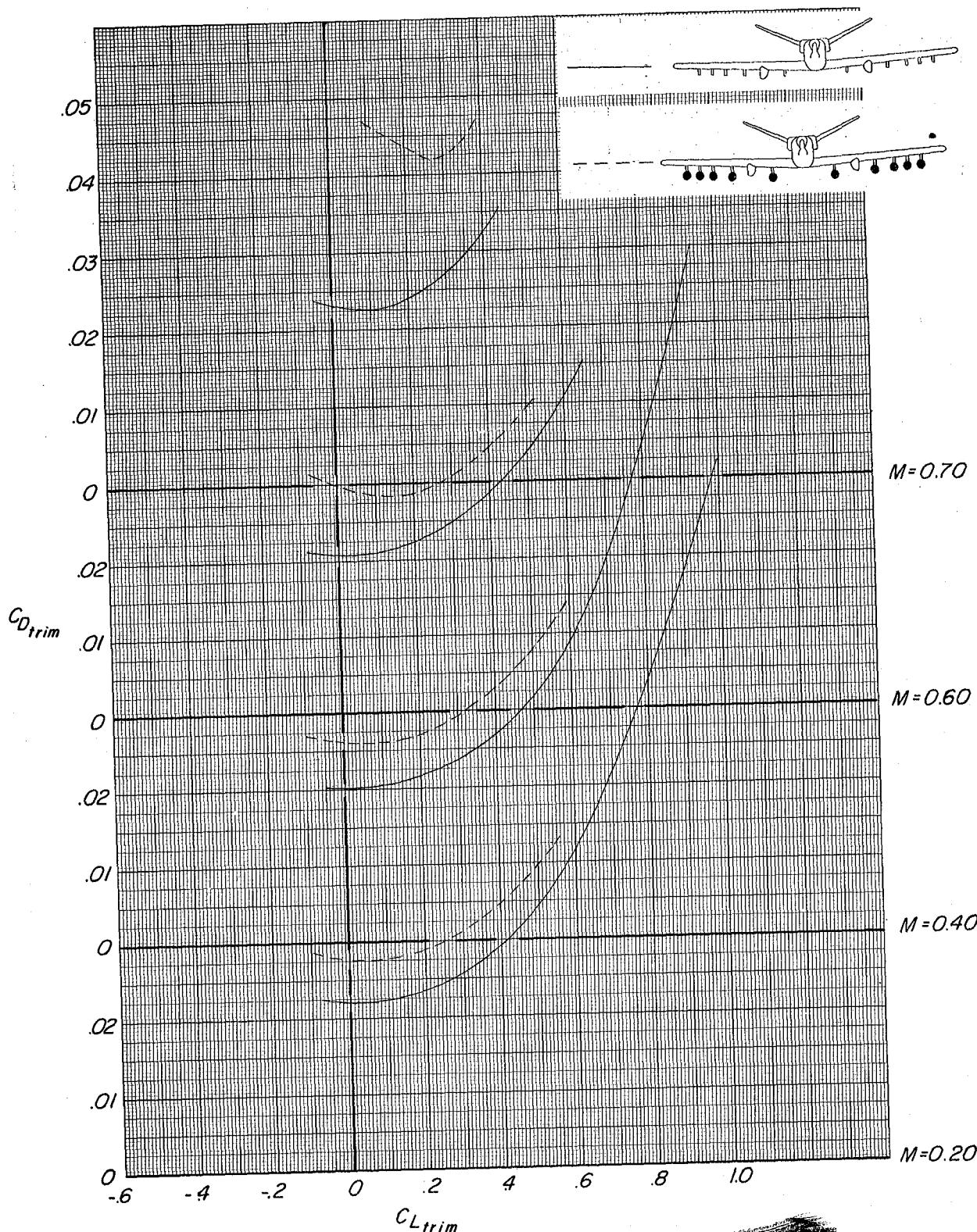


Figure 13.- Summary of trimmed lift-drag characteristics.

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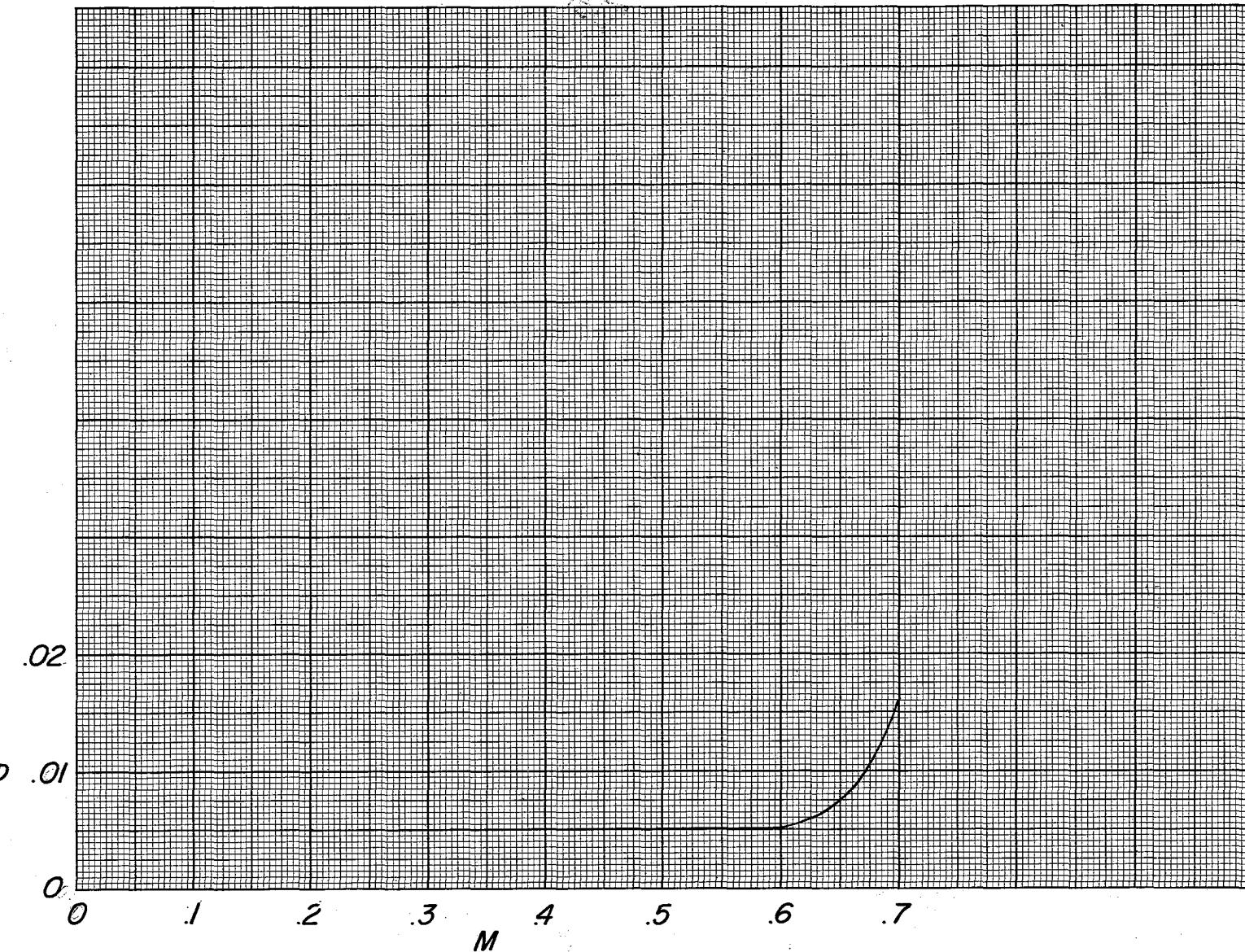


Figure 14.- Incremental drag coefficient at  $(L/D)_{\max}$  due to 10 stores as a function of Mach number.

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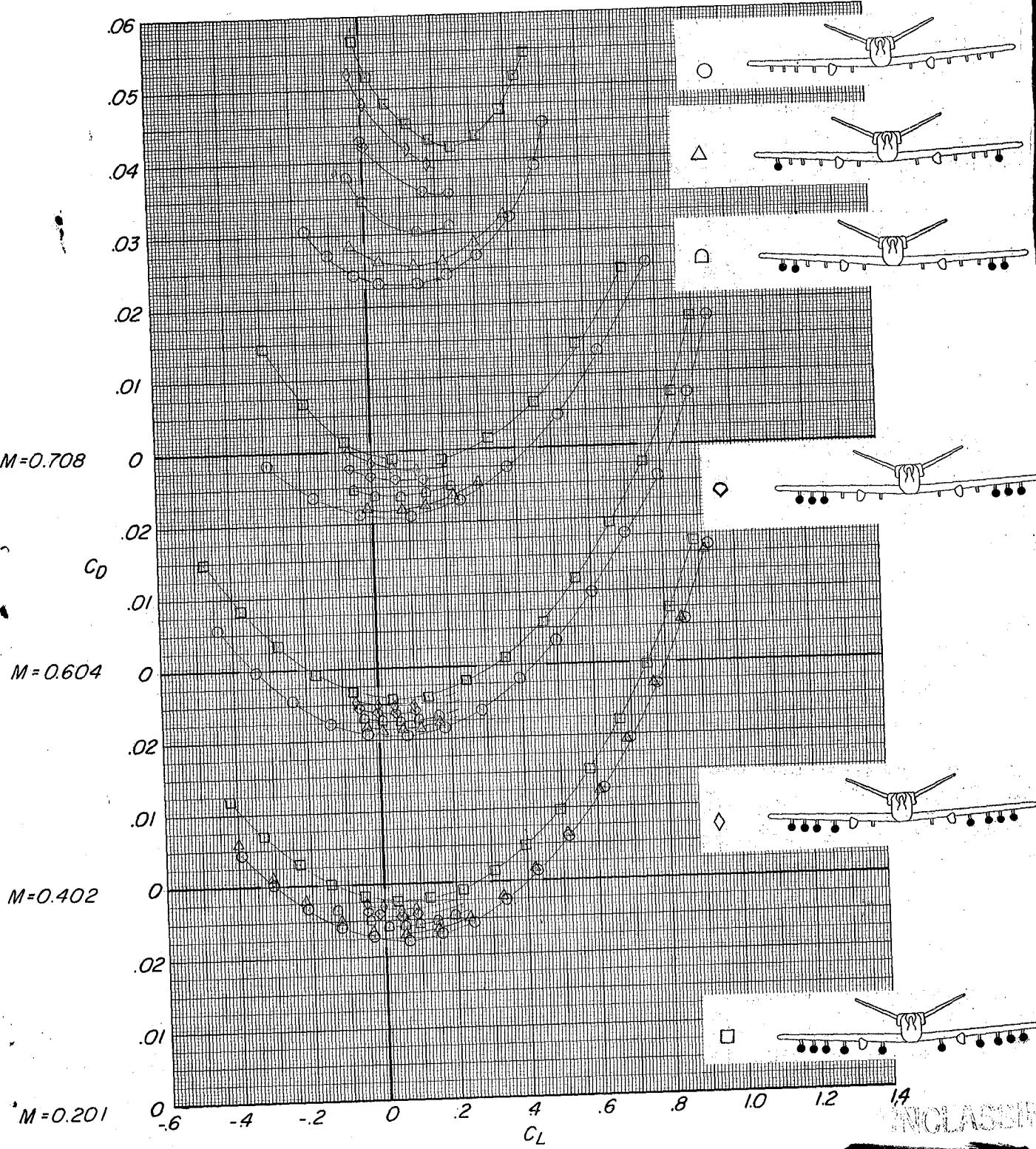


Figure 15.- Effect of store installation on the configuration drag characteristics.

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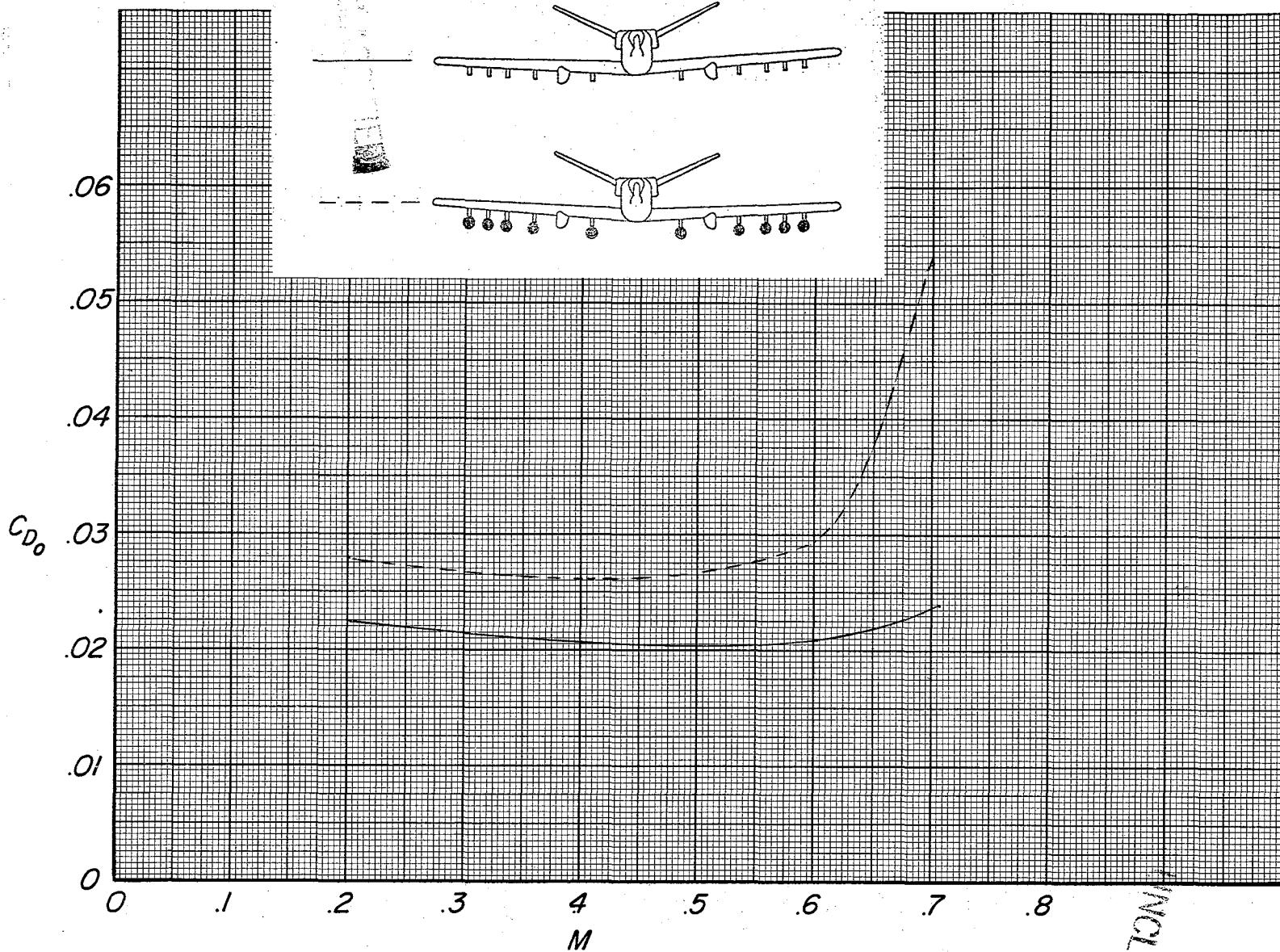


Figure 16.- Variation of drag at zero lift with Mach number.

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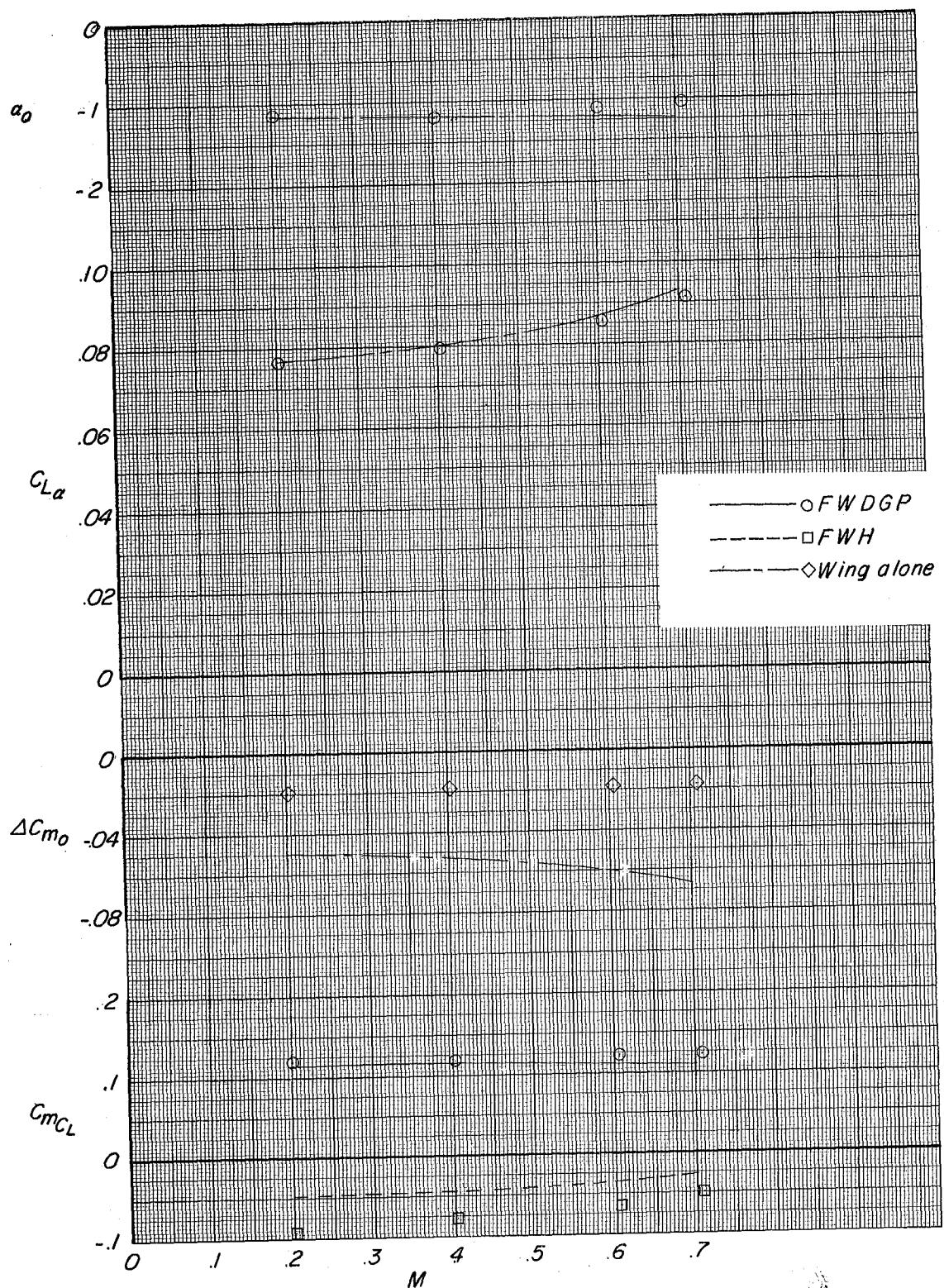
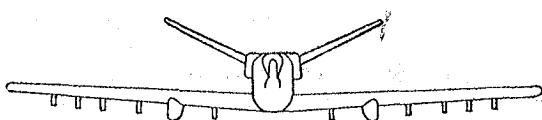


Figure 17.- Comparison of measured and calculated longitudinal aerodynamic characteristics.

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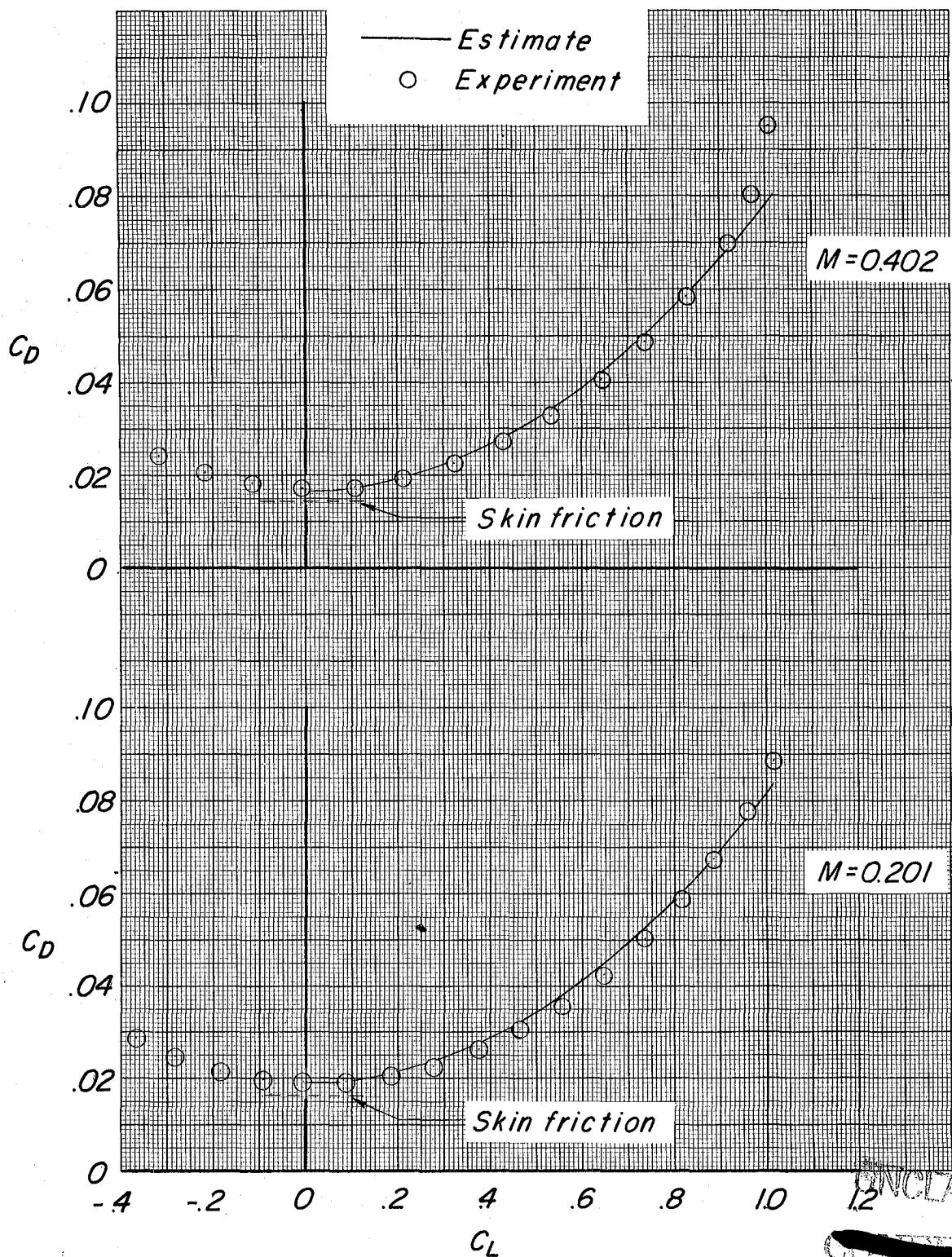


Figure 18.- Comparison of measured and calculated drag characteristics for the basic configuration.  
Stores off.

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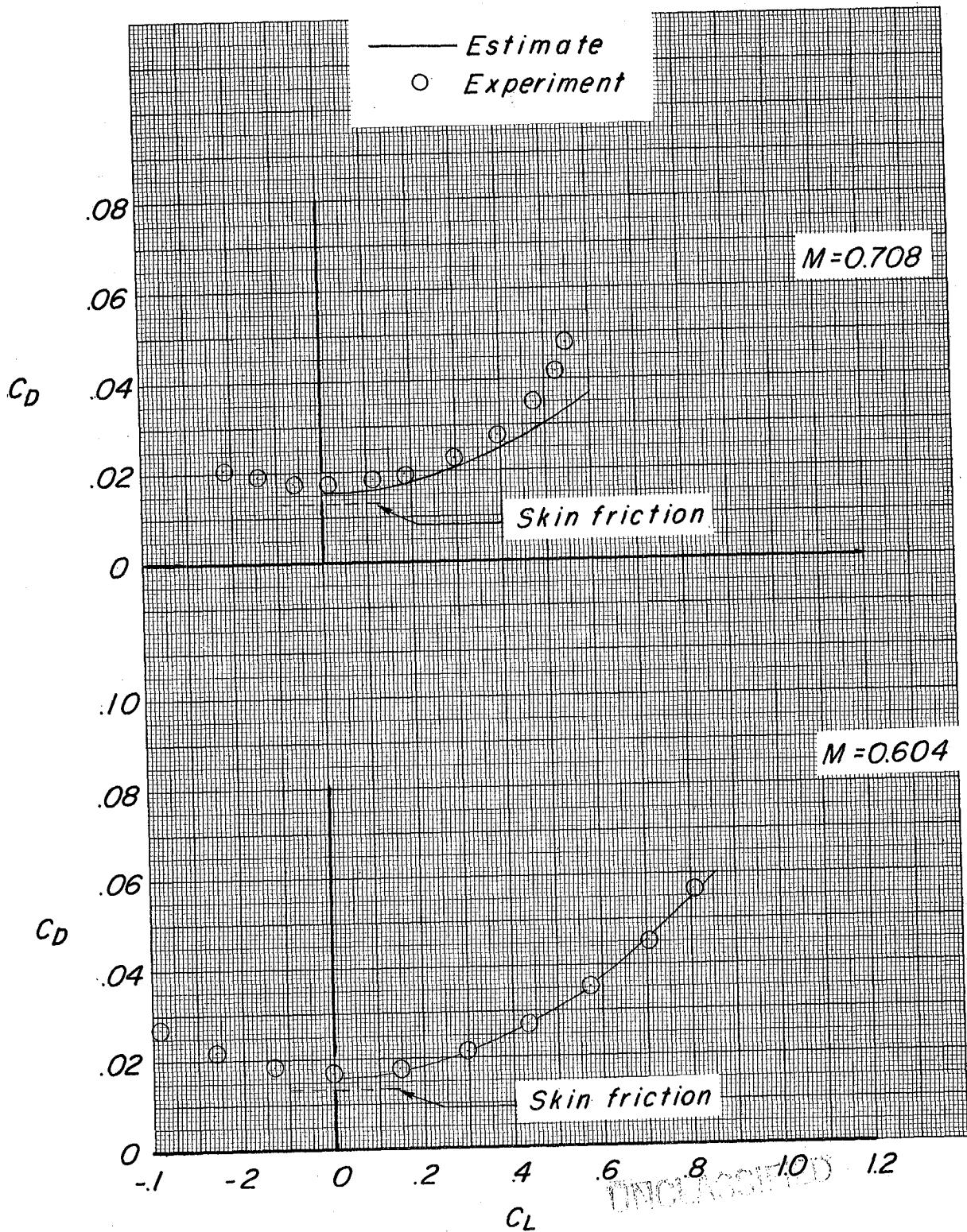
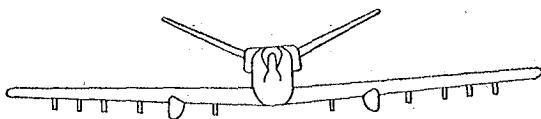
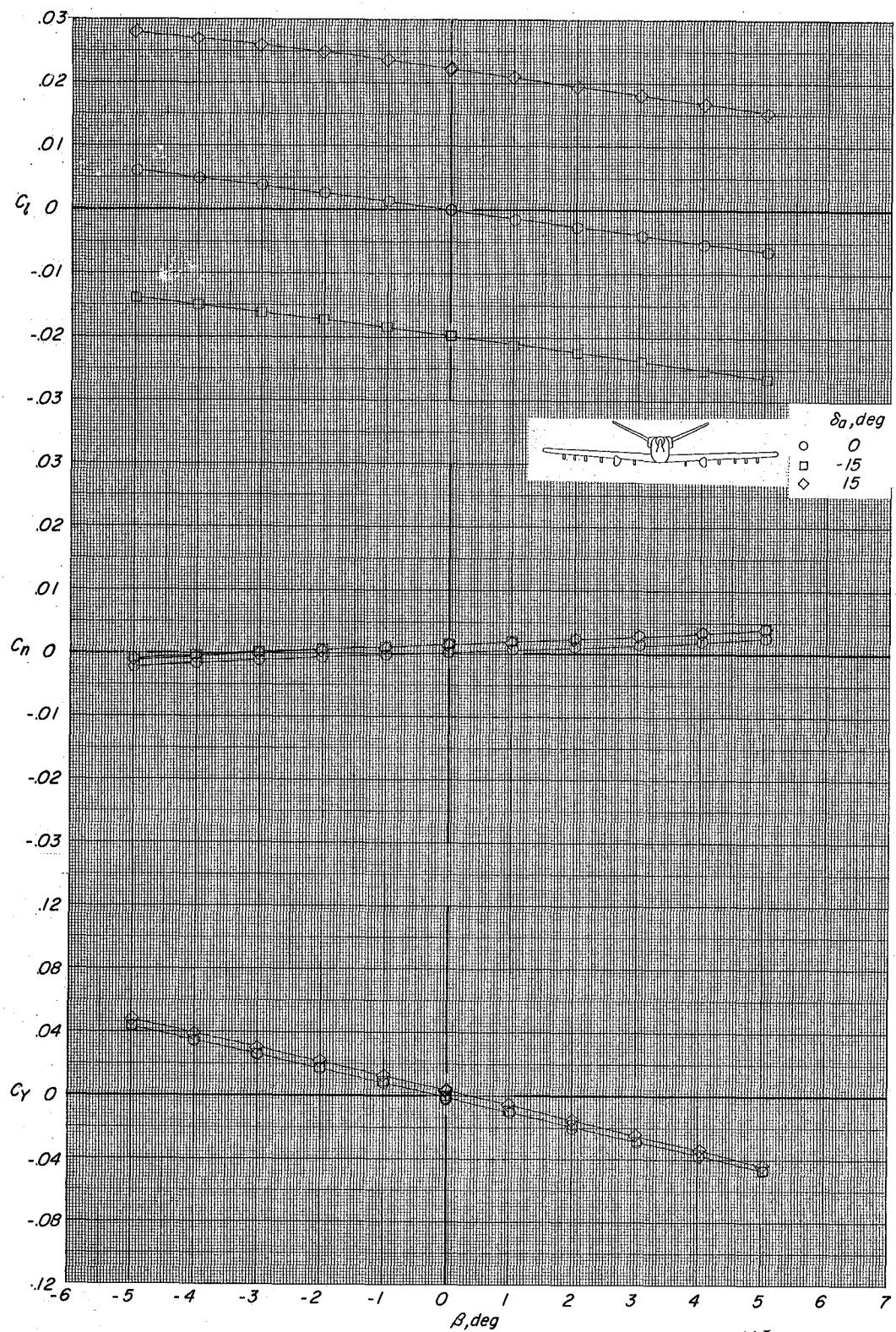


Figure 18.- Concluded.

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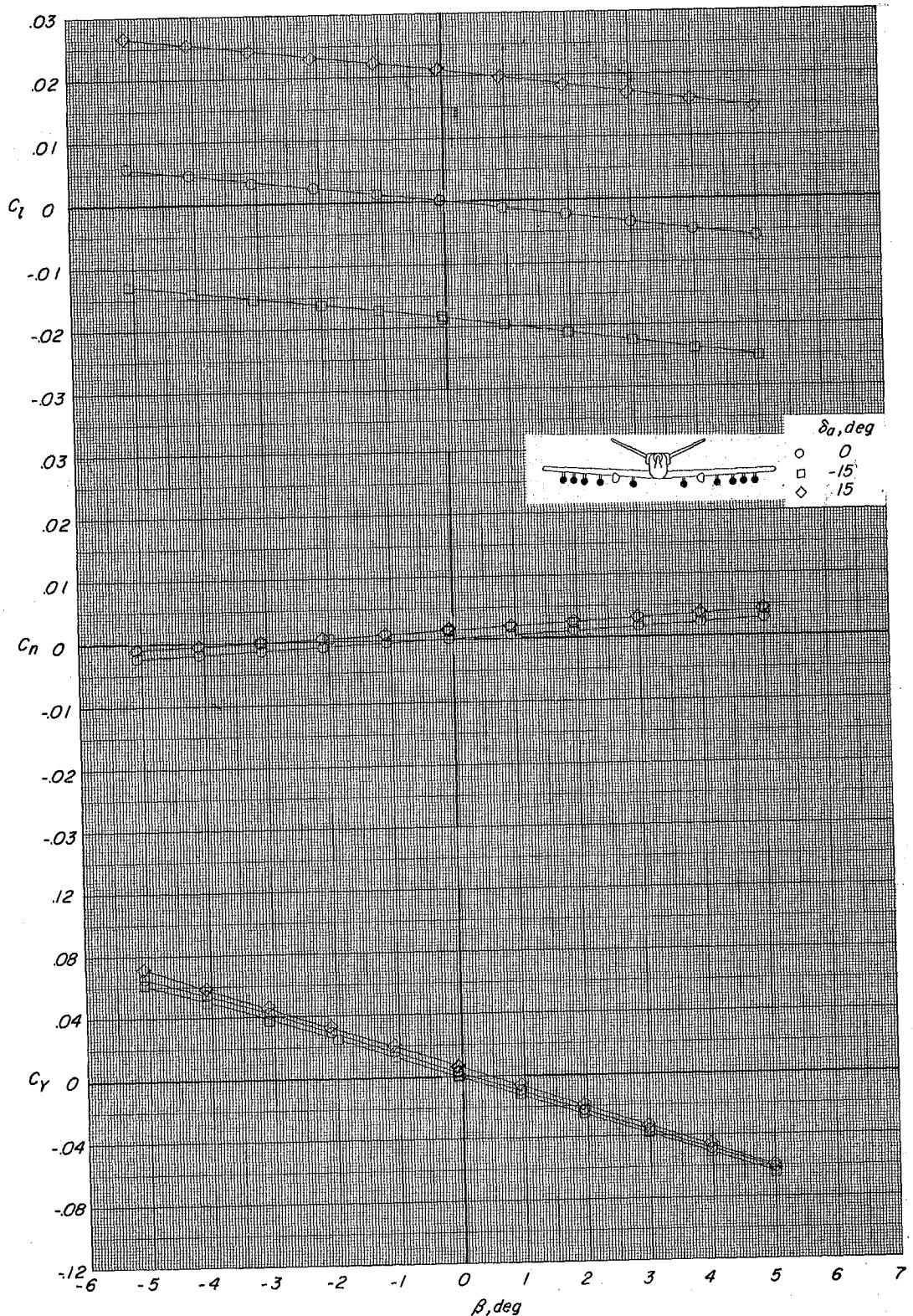


(a) Stores off

Figure 119.- Effect of aileron deflection on lateral directional characteristics.  $M = 0.20$ .  
 $\delta_e = 0^\circ, \delta_h = 0^\circ, \delta_n = 0^\circ, \delta_f = 0^\circ$ .

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(b) Stores on  
Figure 19.- Concluded.

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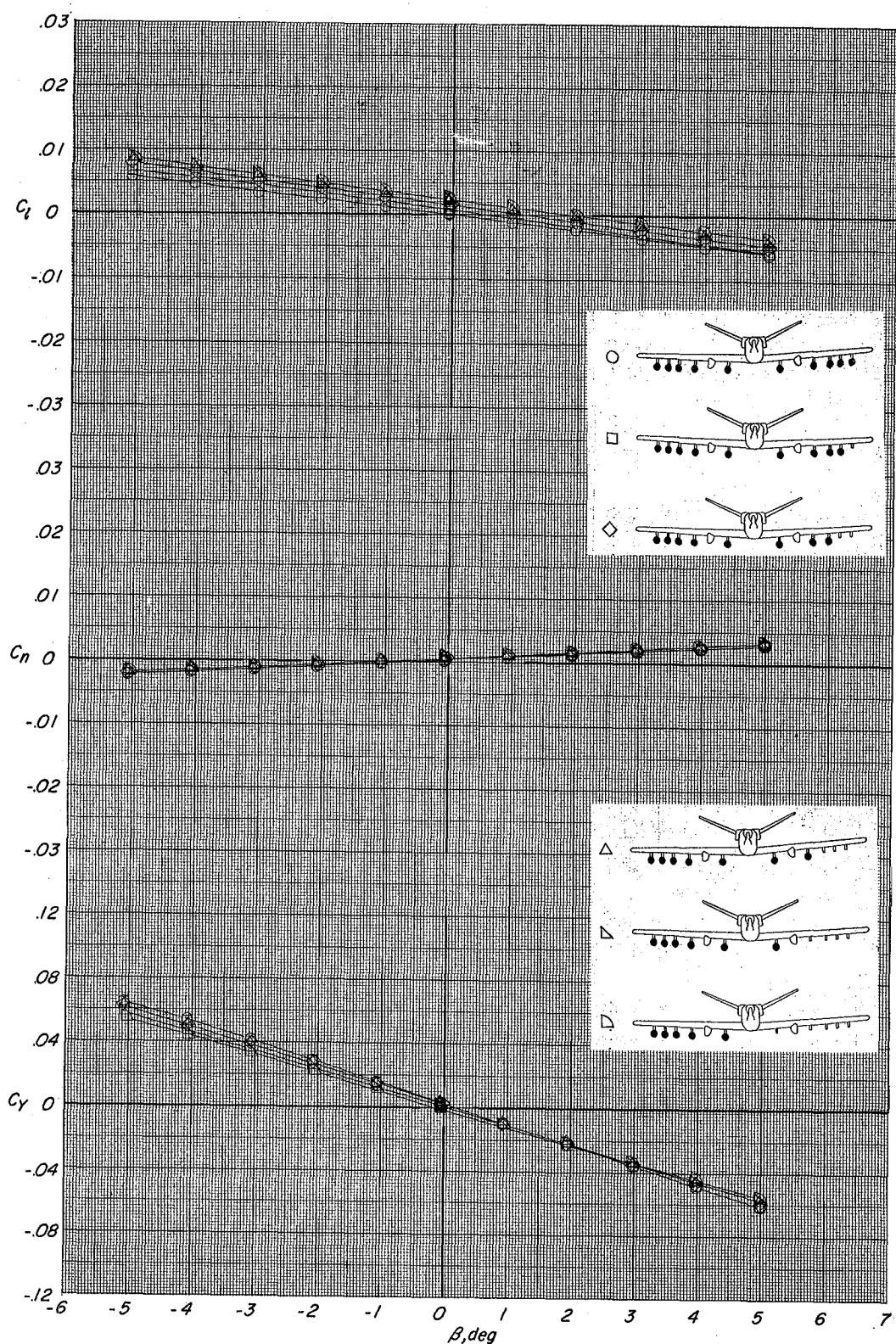


Figure 201.- Effect of stores on lateral directional characteristics.  $M = 0.20$ ,  $\delta_a = 0$ ,  
 $\delta_e = 0$ ,  $\delta_h = 0$ ,  $\delta_n = 0$ ,  $\delta_f = 0$ .

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