NASA Technical Memorandum 78767

WIND TUNNEL TESTS ON A TAIL-LESS SWEPT WING SPAN-DISTRIBUTED CARGO AIRCRAFT CONFIGURATION

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SEPTEMBER 1978

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The cruise parameter (product of Mach number and lift to drag ratio) was a maximum close to airfoil design point. The configuration was found to be postively stable with normal control effectiveness about all three axes in the lift coefficient and Mach number range of interest.

INTRODUCTION

The span-distributed load (Spanloader) concept recently has received considerable attention as a promising approach towards future large, all-cargo aircraft (refs. 1 - 4). In this concept, the payload is contained within a thick wing and uniformly distributed spanwise to largely balance the lift distribution and thus reduce bending stresses. The resulting improvement in structural efficiency allows higher payload fraction than possible with conventional wing-fuselage designs. Additionally, the use of an untapered, untwisted wing having uniform section enhances the commonality of parts and results in economical manufacture.

Crucial to the success of this approach are efficient, supercritical type airfoils of thickness ratio in the order of 0.2. Little research background or design experience exists in this area; also, the high-lift capability, stability, control and Mach number effects on the performance of tail-less thick wing configurations are relatively unknown.

Wind tunnel tests were carried out on a representative spanloader model in order to acquire a preliminary data base and to uncover any aerodynamic peculiarities of such configurations needing further study. Six-component balance measurements were performed at subsonic Mach numbers up to the buffet limit. Wing-pod filleting, airfoil modification, pod/wing interaction, trailing-edge deflection, tip-fin effectiveness and lateral-directional stability and control were also explored. This report presents the basic wind-tunnel data and briefly discusses the principal results.

SYMBOLS

The data are referred to the stability-axis system with the moments referenced to the point shown in Fig. 1A. The symbols are defined as follows:

b wing span (1.452 m)

C_D drag coefficient, Drag/q.S

C_L lift coefficient, Lift/q.S

C_l rolling-moment coefficient, Rolling moment/q.S.b

C_{l_β} rolling-moment due to sideslip, $\partial C_l/\partial\beta$ per degree

C_m pitching-moment coefficient, Pitching moment/q.S.c

C_n yawing-moment coefficient, Yawing moment/q.S.b

C_{n_β} yawing-moment due to sideslip, $\partial C_n/\partial\beta$ per degree

C_Y side-force coefficient, Side force/q.S

C_{Y_β} side force due to sideslip, $\partial C_Y/\partial\beta$ per degree

c chord (6.58 cm)

q free stream dynamic pressure

S reference area of wing (0.191 m^2)

L/D lift-to-drag ratio

M free-stream Mach number

R_c Reynolds number based on chord

α angle of attack, degrees

β angle of sideslip, degrees

δ deflection (of flap, elevon, vertical tail), degrees

Subscripts

A aileron

EI elevon, inboard

ET elevon, tip

F1 flap, inboard

F2 flap, outboard

VT vertical tail

DESCRIPTION OF MODEL

The model (Fig. 1A) represented on a 1/100 scale a conceptual tail-less configuration with 30° swept-back, untwisted, constant-chord wing. In addition to the center-body (sized to accommodate the balance) the wing carried two axi-symmetric pods (length to diameter ratio 8). The outboard pods close to the wing tips carried the vertical tails. Three different pairs of vertical tail were available (Fig. 1B). The entire trailing edge of the wing was occupied by flaps and elevons of 20 percent chord. The propulsion system was represented by a total of eight engine nacelles (through-flow type) mounted over the wing on swept-forward pylons.

The 20 percent thick (streamwise) cambered airfoil (Fig. 1C) was designed for a small positive zero-lift moment and also to be free of separation or wave drag at $M = 0.6$, $C_L = 0.4$, $R_c = 90 \times 10^6$ in two-dimensional flow (see page 18 for airfoil co-ordinates). The low-moment requirement distinguished the present airfoil from the well-known Whitcomb aft-loaded profiles which have a relatively high negative zero-lift moment and therefore not suited for use on tailless aircraft. It was also anticipated that the Spanloader would utilize active control technology; accordingly, the present design aimed for neutral stability about the center-of-gravity located 30.35 cm aft of the center-body nose, which is the aerodynamic center as calculated by vortex-lattice theory (ref. 6).

APPARATUS, TESTS AND CORRECTIONS

This investigation was carried out in the Langley 7- by 10-foot slotted-wall high speed wind tunnel with atmospheric stagnation

pressure. Forces and moments were measured by an internally mounted, six-component strain-gage balance.

Tests were done over a Mach no. range of 0.3 to 0.725 which corresponds to a Reynolds no. range of 1.1×10^6 to 2.04×10^6 based on wing chord. The angle of attack was varied from -2° to a maximum of $+18^\circ$, at sideslip angles of 0° and $\pm 4^\circ$. The angles of attack and sideslip have been corrected for balance and sting bending due to aerodynamic loads. The axial force measurement of the balance was adjusted to a condition of free-stream static pressure acting on the base of the model. Transition strips* 0.82 cm in width of # 100 carborundum grains were placed at 1.52 cm streamwise aft of the leading edge of wing and vertical tails, and also at an axial distance of 3.05 cm from the nose of the center-body and pods.

A photograph of the complete model configuration mounted in the tunnel test-section is shown in Fig. 2.

PRESENTATION OF RESULTS

The basic longitudinal characteristics are graphically presented in Figs. 3 through 19, followed by lateral-directional characteristics in Figs. 20 through 27. The tabulated data will be found following page 25. Analysis plots prepared from these basic data to illustrate principal features of the results (included in Discussion) are presented in Figures 28 through 41.

*See reference 7.

DISCUSSION OF RESULTS

Filleting

The wing-body and wing-pod junctions on the original model were not provided with fillets. The drag-reduction potential of fairing these junctions was briefly investigated. Body-putty was used to form the fillets to an arbitrary but reasonably smooth shape; no record of the fillet geometry is available.

As seen from the L/D data in Fig. 3 the result of the first trial (labelled "large" fillets) was negative. A second attempt with reduced-size fillets (labelled "small") however produced an 8 percent gain in $(L/D)_{max}$ at M = 0.3 (somewhat less at M = 0.5). The drag increment due to the two types of fillets is compared in Fig. 28. Note that the effectiveness of the "small" fillets is lift-dependent reaching a maximum at about $C_L = 0.4$, whereas the drag improvement at zero-lift is relatively small. Although the data are limited and probably Reynolds no. sensitive, they are illustrative of the drag-reduction potential of optimum fillets. A rational procedure for fillet design aimed at the cruise condition may significantly contribute towards the aerodynamic efficiency of multi-podded configurations.

Airfoil Modification

An oil-flow test at $\alpha = 2^{\circ}$ revealed a spanwise outflow on the wing upper surface over the rear 25 percent chord (Fig. 29A). This type of surface flow pattern on swept-back wings is well-known to be associated

with three-dimensional boundary layer separation. In an attempt to eliminate this low angle-of-attack separation a simple modification of the airfoil was tried: the concave portion on the upper surface was filled in to the trailing edge producing a flat tangent surface (see Fig. 1C). Subsequent oil-flow visualization showed a greatly reduced outflow (Fig. 29B), implying that this modification had successfully alleviated separation. As a consequence, a 15-count reduction in zero-lift drag and a 10 percent increase in $(L/D)_{max}$ were obtained (Figs. 5, 6).

A brief computational study using a two-dimensional airfoil analysis method (Korn-Garabedian including boundary layer) was performed to check the above experimental finding, and also to assess the profile modification at design condition and at full-scale Reynolds number. The calculated results are presented in the following Table:

M	C_L	$R_c = 1.6 \times 10^6$				$R_c = 90 \times 10^6$				
		Original		Modified		Original		Modified		
		C_D	$C_{m,c/4}$	C_D	$C_{m,c/4}$	C_D	$C_{m,c/4}$	C_D	$C_{m,c/4}$	
0.3	0	.0153	.0228	.0125	.0099	.0064	.0028	.0055	-.0147	
		[0.76]		[0.915]		[1.0]		[1.0]		
	0.4	.0157	.0162	.0139	.0113	.0064	.0063	.0059	-.004	
		[0.72]		[0.85]		[1.0]		[1.0]		
0.6	0	.014	.028	.0117	.0114	.0067	.0028	.0057	-.0146	
		[0.72]		[0.915]		[1.0]		[1.0]		
	0.4	.0128	.0237	.0122	.0128	.0064	.0086	.0064	-.0046	Design case
		[0.70]		[0.86]		[1.0]		[1.0]		

Note: [ ] denotes distance to upper surface separation point as a fraction of chord length.

Calculations at $R_c = 1.6 \times 10^6$ (the test Reynolds no.) predicted upper-surface separation close to the experimental position on the original airfoil, and also its observed movement towards the trailing edge on the altered profile. A corresponding drag reduction was also obtained in the calculation, although it should be noted that drag computation in presence of separation is questionable (see for example ref. 5). According to calculation at full-scale Reynolds no. (90×10^6), the original profile already was separation-free and yet the modification yielded significant drag reduction in all cases (with the sole exception of the design point, where the drag was unchanged). This improvement however was accompanied by a nose-down pitching moment, to be expected from a partial removal of the negative aft-end camber by the profile modification. In an attempt to counter this adverse effect the under-surface concavity also was filled in, and the resulting profile analyzed at the design point. This indicated a C_m improvement (Fig. 30) with no change in C_D. Subject to experimental validation, these calculations indicate some scope for simplification of the present airfoil geometry without materially affecting its cruise-point performance.

At the conclusion of the airfoil-modification tests, the fill-in was removed and the wing returned to its original section; all other results discussed in this report pertain to the unmodified airfoil.

Configuration Build-Up

Starting with the plain wing plus center-body, successive additions of pods, vertical tails and engine nacelles were tested. The most noteworthy change observed was that due to the addition of pods. As

seen in Fig. 31, a pod effect distinctly appears at about $\alpha = 7^{\circ}$ to the benefit of lift-curve slope, lift-dependent drag and, more significantly, pitch stability. The pitch-up typical of swept wings is reversed into a nose down moment. The pods presumably control wing flow separation particularly near the tips, possibly through forebody lee-side vortices which come into effect at a particular angle of attack. A more detailed study of the pod effect appears worth while with a view to its exploitation in tail-less configuration designs.

Vertical Tail Toe-In

The three vertical-tail designs (Fig. 1B) were tested at toe-in angles of 1°, 3° and 5° to observe the effect on configuration $(L/D)_{max}$. The results are shown in Fig. 32 and compared with tail-off $(L/D)_{max}$.

The vertical tails with symmetrical section (VT1 and VT2) show the most effect of toe-in; the optimum toe-in angle appears to be about 1.5 degrees. The vertical tail (VT3) having a cambered blunt leading-edge airfoil is relatively insensitive to toe-in, as might be expected. The $(L/D)_{max}$ of the configuration is about the same with all three vertical-tail designs, notwithstanding the 75% larger area of VT2 compared with the other tails.

Trailing Edge Controls

Lift and pitching-moment increments due to trailing-edge controls deflected in various combinations of flaps and elevons are presented in Fig. 33. These data indicate a trim point with 30° flaps and all elevons at -15° deflection. The trimmed lift coefficient at 30° flaps

is plotted against angle of attack in Fig. 34. The usable C_L with this flap deflection falls considerably short of required $C_L = 1.0$ estimated for zero-rotation take off and approach at 3^o glide-slope (assuming 130 knots speed and 55 p.s.f. wing loading). From the trends of ΔC_L and ΔC_m with flap deflection at $\delta_F = 30^o$, an increase in trimmed C_L of about 0.1 appears probable with 40^o flaps. Note that these indications are based on data without ground effect (an important consideration on the Spanloader) or Reynolds number influence. Both these effects need investigation for a more realistic assessment of the high-lift capability of the configuration.

A feature of the trailing-edge deflection data is the indicated $(L/D)_{max}$ gain over the zero-deflection case, noted in several instances (see Figs. 12 to 16). This effect is presumably related to favorable changes in spanwise lift distribution produced by certain combinations of flaps and elevon deflection, where the resulting decrease in induced-drag exceeds the profile-drag increment. Within the scope of the available data however, such favorable instances do not coincide with a trimmed condition. The effect nevertheless appears worth studying in greater detail with a larger number of trailing-edge segments and smaller deflections, and including the cruise Mach number.

Mach Number Effects

The variation of drag coefficient with Mach number at various list coefficients is shown in Fig. 35. The drag-rise Mach number (at $dC_D/dM = 0.1$) is indicated on each C_L = const. curve.

The maximum L/D as a function of Mach number is shown in Fig. 36. Applying the usual Reynolds number extrapolation to the skin-friction drag indicates that these $(L/D)_{max}$ values will be roughly doubled at full scale ($R_c = 90 \times 10^6$). The C_L at $(L/D)_{max}$ varies but little from 0.4 over the Mach number range. The maximum in cruise-efficiency parameter M.L/D, also shown in Fig. 36, occurs surprisingly close to the airfoil design point in spite of the large difference between the test and the design Reynolds numbers.

A Mach number effect on the longitudinal stability is discernable in Fig. 19. A distinct pitch-up is first observed in M = 0.5 data, and with further increase in Mach number the pitch-up onset occurs progressively earlier in C_L and also grows in severity.

A systematic rolling-moment variation with angle of attack was noted in the zero-yaw tests (Fig. 20). The rolling moment probably arises from a minor roll misalinement in the model mounting, such that one wing panel is effectively at a slightly higher angle of attack than the other. This ultimately leads to asymmetric stall and a sudden reversal in the rolling moment, providing a convenient means for identifying the onset of flow separation from balance data.

A summary of Mach number effects is presented in Fig. 37. The boundaries in this C_L versus Mach number plot are based on various limiting features deduced from balance data. At Mach numbers up to 0.5 the usable (untrimmed) lift coefficient is considered to be limited by low-speed stall onset as indicated by the rolling-moment break. For

$M > 0.5$, pitch-up instability limits the usable C_L (pitch-up at lower Mach numbers presumably occurs beyond the C_L range of the data). The drag rise Mach number boundary represents the cruise performance limit.

The location of target cruise point relative to constant M.L/D contours in Fig. 37 suggests that some increase in Mach number may perhaps be permissible without loss in cruise performance.

Lateral/Directional Stability

The lateral stability parameter C_{l_β} obtained from tests at ± 4 degrees sideslip is plotted versus C_L in Fig. 38 for Mach numbers 0.3 and 0.6. The effects of successively adding nacelles and vertical tails (VT3) to the podded wing are shown here. The changes in lateral stability characteristics produced by the addition of nacelles (and their support pylons) are relatively large and complex, and also quite different at the two Mach numbers. It may reasonably be expected that these changes are related to interference of forward-mounted pylons with the wing flow. Addition of vertical tails has a small favorable effect. The complete configuration is found to possess lateral stability throughout.

The directional stability parameter C_{n_β} is plotted versus C_L at the two Mach numbers in Fig. 39. The destabilizing effect of adding nacelles to the podded wing is noted. The further addition of vertical tails (VT3) restores directional stability to the configuration.

Lateral/Directional Control

A number of aileron-deflection combinations (sketched on top of Fig. 40) were tested at $M = 0.3$. The test cases included: tip ailerons

only, inboard ailerons only, both tip and inboard ailerons, right and left ailerons deflected in opposition as well as differentially together. The average rolling-moment increment for all the nine cases show a good correlation with the effective aileron deflection angle δA (as defined in the figure) giving $\delta C_l/\delta A = .0005$ per degree up to $\delta A = 40^\circ$. The ailerons remain fully effective up to the maximum lift coefficient (see Fig. 26).

The directional control due to all-moving vertical tails is shown in Fig. 41. The 75% larger area of VT2 produces a proportionately greater rudder power than VT1. Between vertical tails of identical planform and area, the one with cambered airfoil (VT3) generates about 38% higher control power. All three vertical tails produce essentially constant control effectiveness with lift coefficient at M = 0.3.

CONCLUSIONS

1. Proper filleting of the wing-body and wing-pod junctions significantly improved the configuration $(L/D)_{max}$.
2. Flattening of the concave upper-rear part of the airfoil largely controlled the flow separation observed in that region at small angles of attack and produced $(L/D)_{max}$ increment. Two-dimensional airfoil analysis indicated that the observed separation was a low Reynolds number effect. At full-scale Reynolds number (with no separation on the original airfoil) the predicted effect of this modification is to produce an undesirable nose-down moment; however, by flattening the concavity in the rear lower surface also, the theoretical drag and pitching-moment characteristics of the original airfoil at design-point are recovered.

3. Addition of pods improved the longitudinal characteristics of the plain wing above 8° angle of attack, and in particular eliminated the pitch-up instability.
4. Wing-tip vertical tails of cambered airfoil section required no toe-in for best $(L/D)_{max}$ of the configuration and also had better directional control effectiveness than tails of symmetrical section.
5. With 30° flap deflection (maximum tested) the trimmed lift coefficient (in absence of ground effect) was considerably short of the estimated requirement for zero-rotation take off.
6. The cruise parameter M.L/D reached a maximum close to the airfoil design point ($C_L = 0.4$; $M = 0.6$) with adequate margins before pitch-up and drag rise.
7. The configuration exhibited positive lateral and directional stability with normal roll and yaw control effectiveness in the Mach number and C_L range of interest.

ACKNOWLEDGEMENT

This work was supported by a NASA Research Grant (NSG-1315).

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UPPER SURFACE				LOWER SURFACE			
x/c	z/c	x/c	z/c	x/c	z/c	x/c	z/c
0.00000	0.00000	.21686	.10933	0.00000	0.00000	.22314	-.07518
.00021	.01561	.23739	.11184	.00379	-.01515	.24261	-.07644
.00626	.03330	.25804	.11392	.01374	-.03097	.26196	-.07756
.01057	.03979	.27875	.11556	.01943	-.03629	.28125	-.07853
.01512	.04417	.29963	.11681	.02488	-.03951	.30037	-.07945
.01971	.04823	.34145	.11793	.03029	-.04241	.33855	-.08104
.02434	.05205	.38248	.11762	.03566	-.04506	.37752	-.08232
.02906	.05539	.42328	.11607	.04094	-.04723	.41672	-.08309
.03386	.05837	.46397	.11334	.04614	-.04906	.45603	-.08332
.03872	.06116	.50421	.10935	.05128	-.05072	.49579	-.08267
.04364	.06380	.54441	.10401	.05636	-.05225	.53559	-.08103
.04861	.06629	.58431	.09698	.06139	-.05365	.57569	-.07787
.05361	.06863	.62396	.08812	.06639	-.05494	.61604	-.07297
.05865	.07085	.66353	.07781	.07135	-.05615	.65647	-.06655
.06372	.07296	.68313	.07213	.07628	-.05728	.67687	-.06278
.06882	.07496	.70277	.06623	.08118	-.05834	.69723	-.05869
.07393	.07687	.72247	.06034	.08607	-.05933	.71753	-.05455
.07904	.07868	.74211	.05452	.09096	-.06027	.73789	-.05040
.08414	.08041	.76165	.04848	.09586	-.06116	.75835	-.04587
.08923	.08208	.78128	.04313	.10077	-.06201	.77872	-.04183
.09431	.08368	.80085	.03761	.10569	-.06282	.79915	-.03737
.10446	.08668	.82047	.03265	.11554	-.06432	.81953	-.03315
.11460	.08950	.84022	.02803	.12540	-.06570	.83976	-.02897
.12474	.09213	.86007	.02353	.13526	-.06698	.85993	-.02467
.13490	.09458	.88000	.01961	.14510	-.06814	.88000	-.02079
.14509	.09693	.89998	.01592	.15491	-.06928	.90002	-.01708
.15531	.09910	.91996	.01277	.16469	-.07030	.92004	-.01383
.16554	.10109	.93994	.00956	.17446	-.07122	.94006	-.01044
.17577	.10304	.95995	.00690	.18423	-.07217	.96005	-.00750
.18603	.10481	.97997	.00435	.19397	-.07301	.98003	-.00465
.19632	.10641	.99998	.00220	.20368	-.07375	1.00002	-.00220

AIRFOIL COORDINATES

NASA LANGLEY 7 x 10 TUNNEL RUN SCHEDULE ("SPANLOADER" TEST # 996)

Run No.	M	δF_1	δF_2	δET_R	δEI_R	δET_L	δEI_L	Pods	Nac.	VT	δVT	Comments
1	0.3	0	0	0	0	0	0	On	On	VT1	0	No fillets
2	0.4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	(Runs 1, 2 and 3)
3	0.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
4	0.3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	Large fillets on
5	0.4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	through remainder
6	0.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	of runs
7	0.3	10	↓	↓	↓	↓	↓	↓	↓	↓	↓	
8	↓	20	↓	↓	↓	↓	↓	↓	↓	↓	↓	
9	↓	30	↓	↓	↓	↓	↓	↓	↓	↓	↓	
10	↓	30	30	↓	↓	↓	↓	↓	↓	↓	↓	
11	↓	20	20	↓	↓	↓	↓	↓	↓	↓	↓	
12	↓	10	10	↓	↓	↓	↓	↓	↓	↓	↓	
13	↓	30	30	-5	↓	-5	↓	↓	↓	↓	↓	
14	↓	- - -	- - -	- - -	- - -	- - -	- - -	↓	↓	↓	↓	Void
15	↓	↓	↓	-10	↓	-10	↓	↓	↓	↓	↓	
16	↓	↓	↓	-15	↓	-15	↓	↓	↓	↓	↓	
17	↓	↓	↓	-15	-15	-15	-15	↓	↓	↓	↓	
18	↓	↓	↓	-10	-10	-10	-10	↓	↓	↓	↓	
19	↓	↓	↓	-5	-5	-5	-5	↓	↓	↓	↓	
20	↓	↓	↓	0	-5	0	-5	↓	↓	↓	↓	
21	↓	0	0	0	0	0	0	↓	↓	↓	↓	Airfoil upper surface
22	0.4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	modified in runs 21,
23	0.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22 and 23 only.
24	↓	↓	↓	-5	0	-5	0	↓	↓	↓	↓	

TEST 996 CONTINUED

Run No.	M	δF_1	δF_2	δET_R	δEI_R	δET_L	δEI_L	Pods	Nac.	VT	δVT	Comments
25	0.3	0	0	-10	0	-10	0	On	On	VT1	0	
26				-10	0	-10	0					
27				-15	0	-15	0					
28				-15	-15	-15	-15					
29				-10	-10	-10	-10					
30				-5	-5	-5	-5					
31				0	-5	0	-5					
32				0	-10	0	-10					
33				0	-15	0	-15					
34				5	0	5	0					
35				5		5						Repeat of Run 34
36				10		10						
37				15		15						
38				15	15	15	15					
39												Void
40				10	10	10	10					
41				5	5	5	5					
42				0	5	0	5					
43					10	0	10					
44					15	0	15					
45					5	10	5					
46					0	10	10					
47				5	10	15	10					
48				5	5	15	15					

TEST 996 CONTINUED

Run No.	M	δF_1	δF_2	δET_R	δEI_R	δET_L	δEI_L	Pods	Nac.	VT	δVT	Comments
49	0.3	0	0	0	0	0	5	On	On	VT1		
50				0	0	5	5					
51				-15	0	15	0					
52				-10	0	10	0					
53				-10	-10	10	10					
54				0	0	0	0				1	Rudder control
55											3	effectiveness
56											5	tests
57											-5	
58											-3	
59											-1	
60											±1	Toe-in tests
61											±3	
62											±5	
63	0.2										0	
64	0.3									VT3	0	
65											5	
66											-5	
67											±5	
68											±3	
69											±1	
70										VT2	0	
71											1	
72											3	

Run No.	M	δF_1	δF_2	δET_R	δEI_R	δET_L	δEI_L	Pods	Nac.	VT	δVT	Comments
73	0.3	0	0	0	0	0	0	On	On	VT2	5	
74											-5	
75											+5	Toe-in.
76											+3	
77											+1	
78										Off	-	
79	0.4										-	
80	0.5										-	
81	0.3								Off		-	
82	0.4										-	Void
83	0.5										-	
84	0.3							Off			-	
85	0.4										-	
86	0.5										-	
87	0.3										-	
88	0.4										-	
89	0.5										-	

NASA LANGLEY 7 x 10 TUNNEL RUN SCHEDULE (SPANLOADER, TEST NO. 14)

Run No.	M	VT	Nac.	Pod	β	Comments
1	0.3	VT1	On	On	0	
2	0.4	↓	↓	↓	↓	
3	0.5					
4	0.6					
5	0.65					
6	0.675					
7	0.700					
8	0.725					
9	0.65					
10	0.675					
11	0.700	↓			↓	
12	0.3	VT3			3.63	
13	0.6	↓			↓	
14	0.65					
15	0.675					
16	0.625				↓	
17	0.3				-4.23	
18	0.6				↓	
19	0.625					
20	0.65					
21	0.675					
		↓	↓	↓	↓	

TEST 14 CONTINUED

Run No.	M	VT	Nac.	Pod	β	Comments
22	0.3	Off	On	On	-4.23	
23	0.6	↓	↓	↓	↓	
24	0.625					
25	0.65					
26	0.675					
27	0.3				3.576	
28	0.6				↓	
29	0.625					
30	0.65					
31	0.675		↓			
32	0.3		Off			
33	0.6		↓			
34	0.625					
35	0.65					
36	0.675				↓	
37	0.3				-4.1	
38	0.6				↓	
39	0.625					
40	0.65					
41	0.675	↓	↓	↓	↓	

TEST 14 (CONTINUED)

Run No.	M	VT	Nac.	Pod	β	Comments
42	0.3	Off	Off	On	0	
43	0.6	↓	↓	↓	↓	
44	0.625	↓	↓	↓	↓	
45	0.65	↓	↓	↓	↓	
46	0.675	↓	↓	↓	↓	
47	0.3	↓	On	↓	↓	
48	0.5	↓	↓	↓	↓	
49	0.6	↓	↓	↓	↓	
50	0.625	↓	↓	↓	↓	
51	0.65	↓	↓	↓	↓	
52	0.675	↓	↓	↓	↓	
53	0.3	VT3	↓	↓	↓	
54	0.5	↓	↓	↓	↓	
55	0.6	↓	↓	↓	↓	
56	0.625	↓	↓	↓	↓	
57	0.65	↓	↓	↓	↓	
58	0.675	↓	↓	↓	↓	

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 1

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.299	6018.6	.13	-.00	.09395	.02004	.01063	.00118	-.00034	.00486
.300	6052.6	-4.08	-.00	-.18777	.02359	.01078	.00106	-.00044	.00500
.302	6122.7	-1.94	-.00	-.04069	.01958	.00858	.00092	-.00036	.00482
.300	6050.0	.17	-.00	.09614	.02014	.01025	.00131	-.00035	.00488
.300	6046.8	2.26	-.00	.23635	.02446	.01028	.00131	-.00031	.00481
.300	6047.9	4.44	-.00	.38244	.03267	.01004	.00087	-.00037	.00509
.300	6037.1	6.63	-.00	.53125	.04484	.00779	.00081	-.00042	.00568
.299	6017.4	8.79	.00	.67460	.06075	.00574	.00143	-.00042	.00565
.299	6017.9	10.99	.00	.81206	.08145	.00514	.00141	-.00045	.00553
.299	6009.1	13.20	-.00	.93515	.10785	.00278	.00063	-.00018	.00585
.300	6061.9	15.43	-.00	1.04912	.14228	-.00739	.00070	-.00037	.00561
.300	6044.4	17.48	.02	1.11524	.19455	-.02195	-.00485	-.00615	.01715
.300	6046.9	.12	-.00	.09968	.02002	.01083	.00098	-.00040	.00471

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 2

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.401	10313.8	.24	-.00	.11215	.02023	.01114	.00115	-.00037	.00485
.400	10238.5	-4.26	-.01	-.19747	.02382	.01085	.00073	-.00047	.00514
.400	10263.4	-1.97	-.01	-.03637	.01922	.00887	.00078	-.00039	.00496
.401	10273.0	.28	-.00	.11063	.02014	.01149	.00108	-.00040	.00486
.400	10249.8	2.55	-.00	.26492	.02552	.01135	.00081	-.00035	.00479
.399	10207.4	4.87	-.00	.42776	.03533	.01073	.00045	-.00042	.00540
.399	10205.4	7.17	-.00	.58572	.04975	.00809	.00066	-.00044	.00544
.399	10208.8	9.48	.00	.73313	.06883	.00765	.00114	-.00053	.00569
.399	10188.5	11.79	-.00	.86542	.09410	.00829	.00082	-.00028	.00569
.399	10194.9	14.10	.00	.99076	.12777	-.00146	.00079	-.00041	.00490
.399	10191.6	15.62	.02	1.04438	.15760	-.00972	.00230	-.00052	.00332
.400	10265.6	.24	-.00	.11280	.02018	.01092	.00103	-.00039	.00509

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 3

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.501	15128.8	.42	-.01	.13223	.02114	.01140	.00095	-.00036	.00519
.500	15043.9	-4.48	-.01	-.21101	.02526	.00964	.00101	-.00052	.00550
.501	15091.9	-2.00	-.01	-.03028	.01960	.00725	.00098	-.00040	.00519
.501	15092.0	.45	-.01	.13224	.02109	.01156	.00127	-.00036	.00503
.500	15042.5	2.93	-.01	.30570	.02803	.01319	.00092	-.00037	.00525
.499	14999.6	5.43	-.01	.48379	.04055	.01131	.00080	-.00038	.00566
.499	14992.9	7.96	.00	.65029	.05861	.01394	.00139	-.00056	.00609
.499	14990.9	10.39	-.02	.78337	.08347	.01759	-.00071	-.00028	.00622
.498	14984.4	12.77	.00	.90770	.11952	.00595	.00124	-.00029	.00482
.500	15082.3	.39	-.01	.13497	.02101	.01141	.00125	-.00038	.00521

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 4

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6011.3	.09	-.00	.06537	.02050	.00773	.00087	-.00025	.00446
.299	5962.6	-4.10	-.00	-.21529	.02277	.00851	.00104	-.00024	.00459
.300	5987.9	-1.98	-.00	-.06846	.01968	.00609	.00121	-.00029	.00473
.300	5996.8	.14	-.00	.06936	.02054	.00795	.00113	-.00027	.00465
.301	6010.4	2.26	-.00	.21226	.02525	.00858	.00137	-.00023	.00466
.301	6011.5	4.41	-.00	.35845	.03386	.00853	.00185	-.00029	.00493
.299	5971.7	6.59	-.00	.50857	.04632	.00717	.00196	-.00039	.00547
.300	5976.9	8.78	.00	.65799	.06319	.00485	.00188	-.00047	.00561
.299	5958.3	10.97	.01	.79140	.08348	.00741	.00294	-.00062	.00572
.299	5942.0	13.18	-.00	.91884	.10931	.00431	.00142	-.00021	.00593
.299	5968.9	15.41	-.00	1.03397	.14265	-.00594	-.00021	-.00032	.00661
.301	6042.5	.10	-.00	.07274	.02065	.00826	.00094	-.00032	.00486

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 5

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.399	10121.0	.18	-.01	.07908	.02073	.00815	.00117	-.00027	.00499
.398	10040.8	-4.30	-.01	-.22915	.02341	.00819	.00110	-.00023	.00499
.400	10168.2	-2.02	-.01	-.06635	.01944	.00557	.00113	-.00030	.00497
.400	10141.4	.22	-.01	.07901	.02066	.00831	.00138	-.00028	.00486
.400	10154.9	2.48	-.01	.23277	.02640	.00991	.00159	-.00026	.00505
.400	10135.7	4.79	-.00	.39663	.03658	.00998	.00162	-.00034	.00555
.399	10102.7	7.12	-.00	.56085	.05164	.00713	.00181	-.00041	.00586
.398	10066.9	9.45	.00	.71711	.07149	.00725	.00212	-.00052	.00584
.399	10090.9	11.73	.00	.83775	.09561	.01459	.00167	-.00028	.00570
.398	10070.0	14.03	-.01	.96499	.12929	.00217	-.00098	-.00062	.00685
.399	10121.9	15.73	-.02	1.02052	.16354	-.00772	-.00405	-.00107	.00952
.400	10146.5	.18	-.01	.08106	.02077	.00843	.00154	-.00028	.00499

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 6

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.499	14888.4	.31	-.01	.09451	.02153	.00884	.00172	-.00026	.00497
.497	14780.8	-4.57	-.01	-.24894	.02549	.00662	.00123	-.00021	.00498
.503	15076.7	-2.09	-.01	-.06450	.01983	.00288	.00089	-.00026	.00496
.501	14957.8	.35	-.01	.09411	.02150	.00955	.00110	-.00026	.00495
.500	14918.3	2.84	-.01	.26817	.02891	.01141	.00181	-.00030	.00532
.499	14847.6	5.34	-.00	.44963	.04170	.01034	.00152	-.00037	.00572
.499	14881.4	7.87	.00	.62511	.06058	.01259	.00229	-.00043	.00606
.499	14863.8	10.29	-.01	.75133	.08477	.02371	.00109	-.00022	.00615
.499	14850.5	12.67	-.03	.86513	.12237	.01501	-.00227	-.00052	.00789
.501	14975.2	.33	-.01	.09718	.02158	.00938	.00146	-.00028	.00498

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 7

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6026.7	.27	-.00	.20948	.02440	.01103	.00067	-.00021	.00464
.299	5991.5	-3.76	-.00	-.06613	.02204	.00986	.00089	-.00024	.00492
.300	6000.8	-1.64	-.00	.07854	.02145	.00977	.00078	-.00024	.00487
.300	6008.2	.71	-.00	.24249	.02556	.01100	.00097	-.00020	.00505
.300	6009.5	2.45	-.00	.36502	.03164	.01129	.00130	-.00023	.00513
.299	5988.4	4.79	-.00	.53162	.04377	.01011	.00145	-.00036	.00561
.299	5974.3	6.92	-.00	.67680	.05883	.00785	.00173	-.00036	.00580
.299	5982.4	9.20	.00	.82333	.07883	.00757	.00291	-.00048	.00601
.299	5985.4	11.11	.00	.92961	.09853	.01124	.00254	-.00047	.00604
.300	5998.8	13.41	-.01	1.05644	.12910	.00522	.00030	-.00024	.00690
.300	6001.8	15.57	-.00	1.16007	.16490	-.00821	.00001	-.00062	.00621
.299	5992.1	16.56	.00	1.19098	.18377	-.01398	.00032	-.00089	.00578
.300	6016.2	.28	-.00	.21860	.02463	.01223	.00055	-.00024	.00533

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 8

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6012.3	.43	-.00	.34115	.03359	.01570	.00139	-.00023	.00522
.300	6007.1	-3.89	-.01	.03430	.02674	.01461	.00147	-.00024	.00516
.300	6010.0	-1.65	-.01	.19506	.02812	.01562	.00112	-.00022	.00517
.300	6011.4	.46	-.00	.34491	.03368	.01629	.00131	-.00022	.00510
.300	5997.5	2.57	-.00	.49554	.04286	.01572	.00162	-.00028	.00537
.300	6009.6	4.69	-.00	.64002	.05578	.01375	.00197	-.00036	.00580
.300	6007.2	7.03	-.00	.79376	.07401	.01190	.00169	-.00041	.00566
.300	5993.3	9.13	.00	.91805	.09318	.01238	.00191	-.00048	.00572
.299	5992.2	11.28	.00	1.03341	.11734	.01341	.00181	-.00032	.00594
.300	6019.5	13.46	-.00	1.14879	.14883	.00581	.00055	-.00026	.00609
.300	6021.6	15.74	.00	1.23817	.18895	-.00616	.00026	-.00089	.00573
.300	6020.2	.43	-.00	.34734	.03370	.01623	.00120	-.00026	.00520

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 9

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6001.6	.60	-.00	.47604	.04786	.02079	.00161	-.00020	.00508
.300	5999.0	-3.62	-.01	.17945	.03612	.02107	.00202	-.00023	.00499
.300	5999.8	-1.51	-.00	.32809	.03996	.02120	.00123	-.00022	.00491
.300	6004.0	.64	-.00	.47975	.04806	.02186	.00161	-.00018	.00492
.300	6024.3	2.77	-.00	.62428	.05940	.02063	.00223	-.00025	.00515
.300	6003.4	4.89	-.00	.75975	.07428	.01869	.00227	-.00034	.00556
.299	5973.3	7.05	.00	.89218	.09183	.01631	.00158	-.00045	.00547
.300	6021.8	9.24	.00	1.02081	.11336	.01719	.00229	-.00053	.00544
.299	5995.5	11.40	-.00	1.13339	.14014	.01670	.00089	-.00025	.00552
.300	6000.9	13.62	.00	1.23444	.17513	.00695	.00113	-.00039	.00535
.299	5975.0	15.73	.00	1.29539	.21183	-.00126	-.00025	-.00109	.00474
.300	6009.4	.61	-.00	.48147	.04811	.02149	.00150	-.00021	.00486

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 10

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6012.8	.71	-.00	.64575	.06060	-.06216	.00179	-.00033	.00571
.300	6010.1	-3.51	-.01	.34917	.04174	-.06267	.00184	-.00022	.00518
.300	6019.9	-1.38	-.00	.49945	.04916	-.06207	.00198	-.00028	.00534
.300	6010.8	.75	-.00	.64786	.06087	-.06212	.00203	-.00030	.00553
.299	5975.1	2.86	-.00	.78847	.07584	-.06167	.00227	-.00029	.00557
.299	5975.7	5.01	-.00	.92556	.09486	-.06140	.00228	-.00037	.00563
.300	6009.3	7.18	.00	1.05601	.11626	-.06291	.00167	-.00049	.00540
.300	5999.6	9.33	-.00	1.17790	.14073	-.06187	.00121	-.00025	.00508
.299	5985.2	11.50	-.00	1.28958	.17149	-.06434	.00112	-.00026	.00587
.300	5995.2	13.67	.01	1.37360	.20758	-.06756	.00174	-.00078	.00645
.300	6012.0	.72	-.00	.65151	.06054	-.06192	.00234	-.00030	.00562

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 11

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6014.3	.52	-.00	.47387	.04051	-.04615	.00193	-.00036	.00499
.300	6013.1	-3.70	-.00	.17164	.02806	-.04712	.00175	-.00031	.00469
.300	6022.1	-1.57	-.00	.32564	.03238	-.04682	.00152	-.00029	.00456
.300	6012.0	.56	-.00	.47499	.04076	-.04634	.00198	-.00035	.00513
.300	6018.6	2.71	-.00	.62489	.05267	-.04644	.00285	-.00039	.00533
.300	6015.9	4.85	.00	.76840	.06816	-.04675	.00271	-.00045	.00540
.300	6008.7	7.01	.00	.90706	.08732	-.04556	.00215	-.00048	.00503
.300	6015.9	9.17	.00	1.02888	.10915	-.04272	.00149	-.00036	.00484
.300	6003.2	11.36	-.00	1.15052	.13709	-.04524	.00060	-.00004	.00479
.300	6019.4	13.56	.00	1.26192	.17172	-.05160	.00068	-.00057	.00544
.300	6010.4	15.72	.01	1.33544	.21064	-.05594	.00119	-.00080	.00458
.300	6014.4	.52	-.00	.47725	.04073	-.04644	.00208	-.00034	.00532

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 12

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6008.5	.31	-.00	.27633	.02632	-.02064	.00036	-.00021	.00511
.299	5974.3	-3.90	-.00	-.01359	.02135	-.02127	.00109	-.00031	.00503
.301	6025.8	-1.77	-.00	.13484	.02184	-.02128	.00105	-.00022	.00504
.300	5996.2	.34	-.00	.27876	.02644	-.02097	.00085	-.00019	.00506
.300	5993.4	2.49	-.00	.42883	.03498	-.02039	.00113	-.00025	.00531
.300	5996.5	4.65	-.00	.58134	.04729	-.02067	.00236	-.00038	.00601
.300	6007.1	6.84	-.00	.73023	.06386	-.02207	.00162	-.00049	.00593
.300	6007.8	9.02	.00	.86890	.08375	-.02036	.00161	-.00051	.00620
.300	5993.3	11.20	.00	.99036	.10742	-.01707	.00164	-.00035	.00594
.300	6012.1	13.41	-.01	1.11497	.13870	-.02441	-.00048	-.00032	.00699
.299	5983.3	15.60	-.00	1.21277	.17612	-.03632	-.00009	-.00073	.00683
.301	6028.6	16.66	.01	1.24595	.19642	-.04054	.00088	-.00095	.00606
.300	6002.4	.34	-.00	.28185	.02667	-.02057	.00064	-.00021	.00512

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 15

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6021.2	.71	-.00	.62388	.06119	-.04466	.00207	-.00035	.00513
.299	5972.4	-3.51	-.01	.32752	.04431	-.04440	.00138	-.00019	.00466
.300	6004.1	-1.37	-.00	.47918	.05059	-.04394	.00179	-.00028	.00500
.300	6008.7	.75	-.00	.62824	.06138	-.04340	.00185	-.00032	.00508
.300	6003.7	2.86	-.00	.76928	.07565	-.04219	.00187	-.00034	.00517
.300	5994.1	5.01	-.00	.90213	.09400	-.04052	.00171	-.00043	.00516
.300	5998.6	7.19	.00	1.03661	.11455	-.04032	.00195	-.00060	.00530
.300	6014.3	9.34	.00	1.15632	.13802	-.03915	.00195	-.00057	.00528
.300	5994.6	11.51	.00	1.26631	.16721	-.03962	.00146	-.00044	.00614
.300	6007.2	13.67	.01	1.34827	.20191	-.03973	.00198	-.00087	.00673
.300	6005.6	.72	-.00	.63035	.06130	-.04379	.00226	-.00030	.00550

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 16

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6016.6	.71	-.00	.61741	.06287	-.03509	.00228	-.00042	.00462
.300	6005.2	-3.49	-.00	.32267	.04723	-.03559	.00162	-.00020	.00417
.300	5994.4	-1.36	-.00	.47103	.05289	-.03516	.00230	-.00035	.00448
.300	6004.3	.74	-.00	.61894	.06301	-.03540	.00238	-.00041	.00476
.300	6003.1	2.86	-.00	.76035	.07663	-.03366	.00201	-.00040	.00532
.300	6005.8	5.01	-.00	.89462	.09454	-.03138	.00199	-.00046	.00544
.300	5987.7	7.17	.00	1.02625	.11447	-.03011	.00235	-.00060	.00523
.299	5973.3	9.32	.00	1.14645	.13744	-.02791	.00268	-.00053	.00526
.300	5988.2	11.51	.00	1.25357	.16648	-.02756	.00181	-.00051	.00608
.300	6012.4	13.67	.01	1.33476	.20024	-.02621	.00185	-.00105	.00730
.300	6000.8	.71	-.00	.62028	.06281	-.03534	.00228	-.00045	.00473

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 17

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.299	5972.4	.70	-.00	.57987	.06958	.00513	.00316	-.00059	.00473
.300	6007.0	-3.50	-.00	.28274	.05681	.00672	.00076	-.00026	.00431
.300	6019.9	-1.38	-.00	.43391	.06162	.00349	.00172	-.00032	.00415
.300	6005.0	.74	-.00	.58134	.06982	.00498	.00308	-.00058	.00477
.300	6006.1	2.87	-.00	.71910	.08039	.00606	.00170	-.00029	.00464
.300	6012.4	5.00	-.00	.85762	.09528	.00606	.00169	-.00024	.00432
.300	6015.3	7.17	.00	.99021	.11348	.00398	.00238	-.00046	.00429
.300	6004.3	9.33	.00	1.11305	.13573	.00360	.00207	-.00050	.00452
.300	6015.7	11.51	.00	1.22214	.16328	.00217	.00137	-.00052	.00527
.300	6002.4	13.66	.01	1.30370	.19572	.00265	.00191	-.00091	.00631
.300	6021.3	.72	-.00	.58555	.07002	.00428	.00232	-.00047	.00477

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 18

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.299	5978.0	.70	-.00	.60140	.06439	-.01896	.00217	-.00042	.00462
.300	6030.2	-3.49	-.00	.31096	.05016	-.02119	.00136	-.00024	.00445
.300	6026.4	-1.38	-.00	.45986	.05593	-.02201	.00234	-.00041	.00467
.300	6021.5	.74	-.00	.60342	.06444	-.01918	.00208	-.00037	.00503
.299	6005.0	2.87	-.00	.74526	.07709	-.01871	.00229	-.00033	.00502
.300	6018.0	5.02	-.00	.87987	.09374	-.01736	.00193	-.00044	.00509
.300	6039.6	7.16	.00	1.01104	.11298	-.01790	.00200	-.00054	.00478
.300	6026.7	9.32	.00	1.13362	.13583	-.01805	.00201	-.00050	.00497
.300	6011.0	11.51	.00	1.24285	.16427	-.01812	.00100	-.00056	.00607
.300	6023.3	13.58	.01	1.32152	.19710	-.01848	.00157	-.00105	.00725
.300	6010.6	.71	-.00	.60432	.06439	-.01901	.00237	-.00036	.00475

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 19

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6028.9	.72	-.00	.62590	.06193	-.04121	.00145	-.00056	.00472
.300	6034.4	-3.50	-.00	.33813	.04602	-.04686	.00141	-.00048	.00428
.299	5981.7	-1.38	-.00	.47806	.05147	-.04193	.00161	-.00054	.00455
.300	6016.7	.76	-.00	.62659	.06219	-.04170	.00147	-.00055	.00486
.299	5994.4	2.88	-.00	.76861	.07555	-.03884	.00146	-.00055	.00506
.300	6018.9	5.03	.00	.90408	.09348	-.03865	.00118	-.00059	.00496
.300	6031.1	7.20	.00	1.03792	.11374	-.03958	.00144	-.00062	.00483
.301	6047.1	9.36	.00	1.15855	.13720	-.03973	.00161	-.00056	.00513
.300	6040.4	11.52	.00	1.26546	.16733	-.04082	.00107	-.00051	.00595
.300	6027.2	13.68	.01	1.34874	.20260	-.04209	.00157	-.00102	.00685
.300	6006.7	.73	-.00	.63134	.06174	-.04068	.00185	-.00053	.00481

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 20

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6026.7	.71	-.00	.63278	.06083	-.05046	.00109	-.00036	.00524
.301	6044.1	-3.48	-.00	.34444	.04392	-.05404	.00174	-.00037	.00474
.300	6016.8	-1.37	-.00	.48488	.05020	-.05069	.00107	-.00033	.00482
.300	6016.8	.75	-.00	.63377	.06114	-.05048	.00136	-.00034	.00526
.300	6022.2	2.89	-.00	.77771	.07512	-.04970	.00125	-.00040	.00557
.300	6016.2	5.02	-.00	.91324	.09338	-.05038	.00153	-.00044	.00569
.299	5989.3	7.17	.00	1.04389	.11420	-.05280	.00157	-.00059	.00583
.300	6033.3	9.35	.00	1.16733	.13877	-.05264	.00166	-.00058	.00611
.300	6009.9	11.51	.00	1.27575	.16896	-.05584	.00117	-.00055	.00712
.300	6008.7	13.66	.00	1.35905	.20478	-.05812	.00109	-.00115	.00845
.300	6032.8	.73	-.00	.63829	.06068	-.05048	.00146	-.00037	.00534

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 21

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6045.9	.11	-.00	.08940	.01993	.00006	-.00067	-.00021	.00418
.300	6016.0	-4.07	-.00	-.16766	.02178	-.00962	-.00063	-.00039	.00403
.300	6028.7	-1.86	-.00	-.02795	.01917	-.00582	-.00055	-.00029	.00416
.300	6033.0	.14	-.00	.09104	.01996	-.00011	-.00044	-.00022	.00413
.300	6024.9	2.27	-.00	.22635	.02420	.00364	-.00058	-.00024	.00401
.300	6020.1	4.41	-.00	.36195	.03187	.00414	.00052	-.00024	.00550
.300	6043.1	6.59	-.00	.50866	.04372	.00353	.00044	-.00035	.00646
.300	6015.2	8.78	-.00	.65461	.05993	.00148	.00043	-.00044	.00682
.300	6037.1	10.97	-.00	.79094	.07970	.00466	.00125	-.00051	.00704
.299	6000.4	13.18	-.01	.92136	.10540	.00112	-.00043	-.00026	.00745
.299	6005.0	15.42	-.01	1.04516	.13906	-.01024	-.00143	-.00044	.00843
.301	6060.2	17.46	-.00	1.13578	.17788	-.02427	-.00061	-.00090	.00794
.300	6026.2	.12	-.00	.09454	.02018	.00026	-.00043	-.00024	.00413

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 22

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.400	10216.9	.21	-.01	.09825	.02001	.00131	-.00025	-.00025	.00433
.400	10213.0	-4.24	-.00	-.17774	.02236	-.00973	-.00046	-.00044	.00442
.400	10216.2	-1.99	-.00	-.03457	.01897	-.00722	-.00049	-.00033	.00442
.400	10220.6	.24	-.01	.09800	.01997	.00141	-.00033	-.00026	.00424
.400	10207.8	2.51	-.01	.24467	.02507	.00575	-.00008	-.00026	.00461
.400	10197.1	4.77	-.01	.39322	.03419	.00523	.00054	-.00034	.00610
.399	10173.6	7.11	-.01	.55607	.04843	.00505	.00017	-.00042	.00684
.400	10203.4	9.45	-.00	.71248	.06779	.00437	.00076	-.00045	.00696
.400	10215.2	11.76	-.01	.84570	.09206	.00898	-.00012	-.00029	.00720
.400	10204.0	14.06	-.02	.98026	.12565	-.00393	-.00235	-.00029	.00752
.401	10228.7	.21	-.00	.10046	.01999	.00176	-.00057	-.00027	.00423

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 23

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.500	14999.6	.34	-.01	.10938	.02033	.00404	-.00055	-.00029	.00427
.499	14941.2	-4.47	-.00	-.19313	.02385	-.01158	-.00034	-.00050	.00454
.500	14998.8	-2.05	-.01	-.03534	.01913	-.00890	-.00043	-.00032	.00440
.499	14967.9	.37	-.01	.10853	.02035	.00399	-.00045	-.00029	.00444
.500	15020.1	2.81	-.01	.27046	.02656	.00806	-.00011	-.00032	.00505
.501	15036.9	5.32	-.01	.44645	.03844	.00785	.00054	-.00042	.00653
.501	15043.1	7.86	-.01	.62244	.05678	.00928	.00056	-.00044	.00682
.500	15016.5	10.33	-.02	.76602	.08164	.01647	-.00074	-.00027	.00682
.500	15018.2	.35	-.01	.11058	.02030	.00399	-.00023	-.00029	.00438

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 24

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6021.5	.11	-.00	.07047	.02034	.01988	.00032	-.00016	.00423
.300	6037.4	-4.11	-.00	-.21516	.02383	.02090	.00059	-.00035	.00388
.300	6032.0	-1.99	-.00	-.06719	.02005	.01816	.00015	-.00027	.00420
.300	6024.7	.11	-.00	.06998	.02031	.02005	.00030	-.00017	.00444
.300	6037.3	2.25	-.00	.21513	.02454	.02073	.00029	-.00014	.00458
.300	6020.2	4.41	-.00	.36329	.03249	.02223	.00111	-.00024	.00553
.300	6019.2	6.60	-.00	.50951	.04432	.02113	.00084	-.00038	.00669
.301	6041.9	8.78	-.00	.65486	.06025	.01899	.00138	-.00047	.00769
.300	6030.9	10.98	.00	.78633	.07998	.02311	.00210	-.00070	.00872
.300	6019.6	13.18	-.01	.91276	.10522	.02076	.00033	-.00050	.01000
.300	6020.6	15.41	-.01	1.02227	.13746	.01167	-.00068	-.00088	.01097
.300	6019.4	.11	-.00	.07322	.02043	.02020	.00007	-.00017	.00434

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 25

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6029.9	.12	-.00	.06273	.02129	.02913	.00029	-.00011	.00414
.300	6038.4	-4.10	-.00	-.22576	.02570	.03129	.00042	-.00035	.00415
.300	6030.1	-1.99	-.00	-.07815	.02150	.02826	.00027	-.00021	.00421
.300	6033.1	.14	-.00	.06272	.02123	.02972	.00001	-.00012	.00408
.300	6033.4	2.24	-.00	.20579	.02496	.03004	.00022	-.00010	.00437
.300	6028.8	4.43	-.00	.35453	.03271	.03103	.00062	-.00023	.00525
.300	6017.1	6.59	-.00	.49987	.04401	.03080	.00098	-.00034	.00645
.300	6024.0	8.79	-.00	.64504	.05956	.03015	.00108	-.00045	.00747
.300	6019.9	10.98	.00	.77447	.07877	.03456	.00206	-.00059	.00795
.301	6046.2	13.19	-.01	.90192	.10347	.03257	.00010	-.00037	.00881
.300	6019.5	15.43	-.01	1.01297	.13559	.02453	-.00156	-.00073	.00996
.300	6017.6	.10	-.00	.06306	.02138	.02958	-.00003	-.00013	.00424

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 26

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6039.6	.11	-.00	.06635	.02148	.02881	.00012	-.00010	.00381
.299	5994.7	-4.10	-.00	-.21844	.02611	.03115	.00040	-.00037	.00424
.301	6045.6	-1.98	-.00	-.06991	.02175	.02773	.00061	-.00024	.00415
.300	6027.7	.13	-.00	.06881	.02155	.02914	.00042	-.00010	.00401
.301	6040.0	2.28	-.00	.21512	.02529	.02955	.00044	-.00009	.00391
.300	6033.3	4.43	-.00	.35894	.03278	.03022	.00112	-.00015	.00459
.300	6013.5	6.62	-.00	.51045	.04433	.03048	.00067	-.00023	.00506
.300	6009.3	8.80	-.00	.65583	.06011	.02912	.00066	-.00030	.00514
.300	6037.3	10.99	.00	.78720	.07961	.03429	.00189	-.00037	.00522
.300	6014.8	13.20	-.01	.91374	.10458	.03278	-.00059	-.00005	.00544
.300	6021.3	15.42	-.01	1.02341	.13692	.02395	-.00228	-.00025	.00579
.301	6040.3	16.48	-.01	1.06780	.15534	.01613	-.00193	-.00050	.00537
.300	6021.0	17.49	-.00	1.10511	.17400	.01077	-.00121	-.00050	.00452
.300	6019.5	.11	-.00	.07071	.02185	.02914	.00027	-.00011	.00373

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 27

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6043.1	.12	-.00	.06245	.02354	.03807	.00100	-.00013	.00354
.300	6032.0	-4.10	-.00	-.22473	.02903	.04055	.00111	-.00036	.00409
.300	6040.0	-1.96	-.00	-.07703	.02421	.03715	.00075	-.00023	.00382
.300	6012.6	.14	-.00	.06180	.02349	.03802	.00103	-.00014	.00372
.300	6032.4	2.26	-.00	.20574	.02660	.03716	.00062	-.00018	.00367
.300	6021.6	4.44	-.00	.35358	.03351	.03858	.00094	-.00021	.00441
.300	6020.6	6.62	-.00	.50331	.04442	.03785	.00091	-.00027	.00479
.300	6017.3	8.80	-.00	.64761	.05998	.03859	.00089	-.00031	.00505
.300	6021.0	11.01	.00	.77752	.07878	.04478	.00179	-.00039	.00484
.300	6019.5	13.21	-.01	.90313	.10341	.04427	-.00053	-.00010	.00520
.300	6025.7	15.44	-.01	1.01189	.13544	.03636	-.00194	-.00038	.00579
.300	6025.4	17.50	-.00	1.09306	.17167	.02400	-.00091	-.00070	.00483
.300	6028.4	.12	-.00	.06544	.02363	.03831	.00068	-.00016	.00342

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 28

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6022.4	.10	-.00	.01392	.02600	.07517	.00028	-.00012	.00365
.300	6021.3	-4.10	-.00	-.27886	.03449	.08391	.00022	-.00038	.00439
.301	6043.0	-1.99	-.00	-.13036	.02822	.07823	.00020	-.00021	.00390
.301	6050.7	.13	-.00	.01502	.02595	.07480	.00037	-.00016	.00379
.300	6035.7	2.27	-.00	.16308	.02761	.07157	.00027	-.00013	.00363
.301	6042.9	4.42	-.00	.31098	.03320	.06973	.00045	-.00012	.00412
.300	6023.6	6.62	-.00	.46348	.04297	.06950	-.00004	-.00022	.00472
.300	6014.9	8.80	-.00	.60708	.05706	.07125	.00023	-.00022	.00463
.300	6020.9	10.98	-.00	.73761	.07503	.07595	.00060	-.00021	.00477
.300	6040.5	13.20	-.01	.86229	.09865	.07587	-.00113	-.00003	.00501
.300	6023.8	15.41	-.01	.96864	.12922	.06942	-.00212	-.00035	.00596
.300	6022.6	17.47	-.00	1.04661	.16503	.05862	-.00090	-.00066	.00442
.300	6030.5	.11	-.00	.01811	.02615	.07495	.00021	-.00017	.00367

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 29

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6015.8	.11	-.00	.04208	.02205	.04994	.00030	-.00015	.00384
.300	6023.4	-4.10	-.00	-.25035	.02871	.05776	-.00018	-.00042	.00436
.301	6046.3	-1.98	-.00	-.09923	.02329	.05205	-.00011	-.00029	.00407
.300	6034.5	.13	-.00	.04159	.02199	.04981	.00014	-.00019	.00351
.300	6039.9	2.27	-.00	.18980	.02494	.04889	.00027	-.00014	.00370
.300	6033.8	4.43	-.00	.33484	.03155	.04813	.00047	-.00019	.00382
.300	6021.5	6.61	-.00	.48283	.04228	.05087	.00014	-.00023	.00427
.300	6023.4	8.79	-.00	.62496	.05711	.05342	.00023	-.00030	.00433
.300	6020.8	10.98	.00	.75464	.07561	.05888	.00110	-.00023	.00421
.300	6011.6	13.19	-.01	.88190	.10005	.05661	-.00121	-.00004	.00444
.300	6025.8	15.43	-.01	.99041	.13199	.04816	-.00262	-.00032	.00574
.300	6016.2	17.47	-.00	1.06973	.16824	.03606	-.00114	-.00062	.00422
.301	6041.7	.11	-.00	.04623	.02230	.04992	.00022	-.00018	.00393

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 30

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6034.9	.10	-.00	.07007	.02039	.02639	-.00023	-.00018	.00376
.300	6009.8	-4.12	-.00	-.21822	.02474	.03018	-.00017	-.00034	.00403
.300	6028.0	-1.98	-.00	-.06723	.02050	.02531	-.00025	-.00031	.00410
.300	6026.0	.13	-.00	.07259	.02043	.02659	-.00019	-.00019	.00381
.301	6040.1	2.27	-.00	.21466	.02435	.02771	-.00027	-.00016	.00401
.300	6035.6	4.41	-.00	.35762	.03174	.02962	.00043	-.00020	.00435
.301	6051.7	6.61	-.00	.50862	.04335	.03052	.00024	-.00022	.00495
.300	6027.8	8.78	-.00	.65133	.05895	.03046	.00021	-.00025	.00540
.300	6009.7	10.98	-.00	.78069	.07843	.03521	.00092	-.00026	.00519
.301	6043.0	13.19	-.01	.90910	.10366	.03253	-.00173	.00003	.00548
.300	6027.2	15.42	-.02	1.01840	.13658	.02245	-.00322	-.00014	.00644
.300	6014.9	17.47	-.01	1.09918	.17411	.00831	-.00166	-.00050	.00536
.300	6021.1	.10	-.00	.07484	.02071	.02675	.00005	-.00021	.00423

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 31

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6018.2	.12	-.00	.07951	.01996	.01686	.00006	-.00020	.00385
.300	6010.0	-4.09	-.00	-.20693	.02346	.01894	.00039	-.00033	.00408
.300	6019.4	-1.95	-.00	-.05697	.01968	.01565	-.00020	-.00027	.00408
.300	6004.5	.15	-.00	.07961	.01993	.01653	.00009	-.00020	.00391
.300	6009.1	2.28	-.00	.22275	.02412	.01809	.00028	-.00015	.00408
.301	6051.1	4.44	-.00	.36805	.03202	.01958	.00063	-.00020	.00453
.300	6029.4	6.62	-.00	.51668	.04394	.01884	.00050	-.00025	.00486
.300	6032.8	8.80	-.00	.66140	.06007	.01822	.00064	-.00028	.00517
.300	6010.3	10.99	.00	.79029	.07993	.02173	.00140	-.00026	.00521
.300	6034.3	13.21	-.01	.92009	.10625	.01712	-.00075	.00007	.00551
.300	6021.3	15.44	-.01	1.03005	.13984	.00542	-.00265	-.00024	.00665
.300	6019.5	17.48	-.00	1.11093	.17760	-.00939	-.00110	-.00060	.00499
.300	6021.1	.12	-.00	.08164	.02009	.01707	.00009	-.00022	.00407

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 32

MACH	PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6014.6	.11	-.00	.05970	.02063	.03072	.00003	-.00019	.00402
.301	6054.6	-4.11	-.00	-.23079	.02544	.03500	.00034	-.00032	.00420
.300	6020.0	-1.97	-.00	-.07972	.02108	.03138	.00019	-.00020	.00393
.300	6019.2	.15	-.00	.06075	.02069	.03084	.00018	-.00018	.00421
.300	6017.0	2.28	-.00	.20694	.02432	.03002	.00033	-.00013	.00420
.300	6035.8	4.43	-.00	.35294	.03170	.02909	.00060	-.00014	.00468
.300	6026.7	6.62	-.00	.50294	.04323	.02965	.00027	-.00020	.00508
.300	6019.2	8.80	-.00	.64539	.05891	.03008	.00039	-.00023	.00547
.300	6012.4	11.00	-.00	.77484	.07855	.03429	.00103	-.00020	.00528
.300	6025.9	13.21	-.01	.90440	.10434	.02883	-.00113	.00001	.00593
.300	6024.7	15.43	-.01	1.01387	.13762	.01752	-.00242	-.00023	.00716
.300	6026.6	17.48	-.00	1.09321	.17535	.00374	-.00072	-.00055	.00554
.300	6025.0	.12	-.00	.06443	.02082	.03143	.00022	-.00018	.00436

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 33

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6025.5	.10	-.00	.04324	.02206	.04435	.00041	-.00023	.00423
.300	6021.9	-4.11	-.00	-.24686	.02778	.04993	.00037	-.00042	.00420
.300	6018.6	-1.98	-.00	-.09887	.02301	.04649	.00013	-.00025	.00393
.300	6008.4	.13	-.00	.04311	.02203	.04446	.00017	-.00024	.00421
.300	6018.7	2.27	-.00	.19242	.02494	.04228	.00034	-.00015	.00396
.300	6014.2	4.42	-.00	.33967	.03186	.04022	.00075	-.00015	.00435
.300	6027.5	6.61	-.00	.49266	.04306	.03806	.00056	-.00022	.00516
.300	6024.7	8.79	-.00	.63648	.05836	.03704	.00070	-.00023	.00522
.300	6025.7	10.99	-.00	.76815	.07782	.03953	.00080	-.00021	.00527
.300	6019.8	13.20	-.01	.89516	.10321	.03604	-.00096	.00004	.00590
.300	6022.7	15.42	-.01	1.00305	.13598	.02619	-.00261	-.00028	.00725
.300	6001.0	17.47	-.00	1.08190	.17352	.01271	-.00043	-.00060	.00551
.300	6013.6	.10	-.00	.04741	.02212	.04462	.00039	-.00023	.00455

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 34

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6049.1	.12	-.00	.09521	.02005	-.00239	.00025	-.00017	.00424
.300	6060.5	-4.09	-.00	-.18934	.02181	-.00308	.00052	-.00029	.00497
.300	6057.9	-1.96	-.00	-.04064	.01897	-.00405	.00044	-.00029	.00491
.300	6047.2	.14	-.00	.09613	.02006	-.00301	.00024	-.00020	.00450
.300	6063.1	2.27	-.00	.24383	.02524	-.00377	.00055	-.00017	.00403
.300	6064.0	4.44	-.00	.39417	.03432	-.00523	.00125	-.00022	.00458
.300	6066.7	6.64	-.00	.54822	.04798	-.00813	.00133	-.00032	.00462
.300	6046.7	8.82	.00	.69660	.06582	-.01176	.00127	-.00037	.00468
.299	6030.3	11.00	.01	.82900	.08739	-.01031	.00246	-.00056	.00496
.300	6063.9	13.22	-.00	.96059	.11476	-.01593	.00026	-.00003	.00539
.300	6046.3	15.46	-.01	1.07473	.14952	-.02810	-.00055	-.00011	.00596
.300	6063.9	.12	-.00	.10077	.02006	-.00258	.00028	-.00024	.00528

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 35

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6066.4	.12	-.00	.09938	.02009	-.00263	.00006	-.00022	.00528
.300	6053.6	-4.09	-.00	-.18265	.02156	-.00066	.00042	-.00034	.00568
.300	6036.0	-1.97	-.01	-.03873	.01880	-.00422	.00095	-.00033	.00591
.300	6058.1	.15	-.00	.09910	.02000	-.00234	.00043	-.00022	.00526
.300	6047.9	2.29	-.00	.24848	.02520	-.00316	.00047	-.00019	.00538
.300	6053.3	4.44	-.00	.39517	.03437	-.00584	.00127	-.00026	.00542
.300	6065.4	6.62	-.00	.54911	.04762	-.00744	.00152	-.00033	.00558
.300	6060.0	8.82	-.00	.69578	.06582	-.01196	.00085	-.00041	.00553
.300	6056.5	11.02	.01	.83065	.08730	-.00902	.00369	-.00048	.00585
.300	6045.6	13.23	-.01	.95803	.11496	-.01678	-.00028	-.00018	.00648
.300	6047.2	15.44	-.01	1.07510	.14958	-.02783	-.00012	-.00013	.00624
.300	6049.8	.12	-.00	.10255	.02004	-.00192	.00017	-.00020	.00547

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 36

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6092.2	.11	-.00	.10773	.02206	-.01879	.00061	-.00011	.00417
.300	6081.3	-4.08	-.00	-.17698	.02254	-.01556	.00071	-.00022	.00412
.300	6063.7	-1.96	-.00	-.03004	.02038	-.01776	.00044	-.00020	.00434
.300	6062.2	.15	-.00	.10822	.02212	-.01864	.00026	-.00011	.00402
.300	6076.0	2.27	-.00	.25585	.02773	-.02034	.00056	-.00010	.00398
.300	6068.6	4.43	-.00	.40476	.03754	-.02360	.00155	-.00017	.00461
.300	6067.9	6.62	-.00	.55865	.05155	-.02730	.00146	-.00026	.00454
.300	6074.2	8.82	.00	.70887	.07020	-.03248	.00133	-.00032	.00463
.300	6064.9	11.01	.01	.84332	.09262	-.03209	.00260	-.00048	.00482
.300	6055.6	13.22	-.00	.97221	.12032	-.03746	.00017	-.00004	.00545
.300	6050.3	15.45	-.01	1.08707	.15507	-.04987	-.00012	-.00003	.00554
.300	6049.0	17.49	.00	1.16930	.19364	-.06409	.00113	-.00032	.00390
.300	6058.0	.13	-.00	.11231	.02228	-.01809	.00029	-.00008	.00396

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 37

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6058.9	.12	-.00	.12122	.02453	-.03112	.00106	.00004	.00309
.300	6061.6	-4.07	-.01	-.16369	.02393	-.02785	.00124	-.00008	.00365
.300	6054.7	-1.97	-.00	-.01925	.02226	-.03073	.00116	-.00002	.00357
.300	6056.1	.15	-.00	.12175	.02454	-.03165	.00115	.00003	.00325
.300	6065.4	2.29	-.00	.27037	.03103	-.03436	.00146	-.00003	.00325
.300	6060.9	4.44	-.00	.41925	.04135	-.03743	.00215	-.00017	.00403
.300	6059.7	6.63	.00	.57392	.05614	-.04265	.00206	-.00035	.00406
.300	6058.3	8.81	.00	.72419	.07551	-.04961	.00213	-.00040	.00399
.300	6057.9	11.00	.01	.85820	.09854	-.04964	.00321	-.00053	.00435
.300	6066.3	13.20	-.00	.98541	.12652	-.05504	.00068	-.00018	.00524
.300	6068.9	15.45	-.00	1.10104	.16268	-.06793	.00035	-.00036	.00529
.300	6059.7	17.50	.01	1.18325	.20237	-.08328	.00183	-.00058	.00327
.300	6059.5	.12	-.00	.12397	.02459	-.03064	.00120	.00003	.00329

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 38

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6045.3	.13	-.00	.17937	.02880	-.07861	.00049	-.00030	.00404
.300	6059.8	-4.06	-.00	-.10830	.02497	-.07014	.00050	-.00029	.00377
.300	6074.0	-1.94	-.00	.03830	.02491	-.07435	.00040	-.00034	.00400
.301	6085.6	.17	-.00	.18154	.02897	-.07889	.00078	-.00031	.00416
.301	6080.6	2.31	-.00	.33223	.03719	-.08455	.00114	-.00029	.00401
.300	6069.4	4.46	-.00	.48150	.04941	-.08981	.00165	-.00038	.00444
.300	6070.1	6.65	.00	.63697	.06616	-.09590	.00167	-.00047	.00460
.300	6061.9	8.83	.00	.78718	.08714	-.10161	.00129	-.00050	.00488
.300	6067.9	11.04	.01	.92080	.11108	-.09946	.00287	-.00072	.00547
.300	6043.7	13.22	-.00	1.04457	.13970	-.10245	.00034	-.00024	.00602
.300	6058.2	15.48	-.00	1.15770	.17747	-.11502	.00009	-.00058	.00628
.300	6045.3	17.52	.01	1.23699	.21723	-.12941	.00184	-.00067	.00425
.300	6058.5	.15	-.00	.18447	.02909	-.07892	.00076	-.00033	.00422

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 40

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6070.1	.12	-.00	.14403	.02364	-.04835	.00025	-.00014	.00379
.301	6076.0	-4.08	-.00	-.14168	.02218	-.04326	.00009	-.00015	.00376
.300	6062.7	-1.95	-.00	.00381	.02096	-.04638	.00043	-.00018	.00421
.300	6061.3	.15	-.00	.14484	.02369	-.04883	.00037	-.00014	.00404
.300	6049.8	2.30	-.00	.29382	.03066	-.05257	.00076	-.00007	.00385
.300	6066.7	4.45	-.00	.44309	.04150	-.05623	.00171	-.00018	.00436
.300	6047.3	6.65	.00	.59792	.05672	-.06098	.00157	-.00036	.00465
.300	6058.7	8.83	.00	.74748	.07636	-.06537	.00125	-.00043	.00479
.300	6071.4	11.03	.01	.88117	.09954	-.06352	.00274	-.00071	.00509
.301	6079.3	13.24	-.00	1.00878	.12803	-.06858	.00020	-.00008	.00530
.300	6047.0	15.46	-.00	1.12005	.16344	-.07960	-.00024	-.00022	.00554
.300	6049.5	17.51	.00	1.20053	.20238	-.09347	.00124	-.00031	.00335
.300	6061.7	.13	-.00	.14856	.02379	-.04822	.00067	-.00014	.00438

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 41

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6038.6	.12	-.00	.10605	.02052	-.01616	.00018	-.00023	.00403
.299	6027.0	-4.08	-.00	-.17261	.02156	-.01546	.00073	-.00026	.00402
.300	6046.4	-1.97	-.00	-.03002	.01917	-.01568	.00054	-.00029	.00431
.300	6063.4	.14	-.00	.10960	.02061	-.01620	.00051	-.00024	.00409
.300	6053.1	2.29	-.00	.25694	.02618	-.01780	.00066	-.00020	.00421
.300	6050.6	4.43	-.00	.40333	.03548	-.02035	.00138	-.00027	.00481
.300	6053.7	6.63	-.00	.55727	.04923	-.02342	.00134	-.00040	.00528
.300	6051.3	8.81	.00	.70722	.06727	-.02678	.00141	-.00044	.00537
.300	6044.7	11.00	.01	.83872	.08895	-.02408	.00288	-.00068	.00567
.300	6044.1	13.22	-.00	.96805	.11633	-.02902	-.00002	-.00019	.00575
.300	6035.8	15.45	-.00	1.08156	.15093	-.04208	.00008	-.00015	.00588
.300	6037.3	17.49	.01	1.16381	.18925	-.05777	.00188	-.00036	.00375
.300	6052.1	.12	-.00	.11300	.02081	-.01563	.00054	-.00022	.00428

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 42

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6041.1	.12	-.00	.09886	.02017	-.00502	.00069	-.00018	.00435
.301	6068.4	-4.10	-.00	-.18489	.02183	-.00519	.00056	-.00026	.00402
.299	6016.8	-1.96	-.00	-.03912	.01908	-.00492	.00040	-.00022	.00407
.301	6068.5	.15	-.00	.09929	.02017	-.00495	.00040	-.00016	.00408
.300	6047.0	2.28	-.00	.24589	.02523	-.00539	.00053	-.00012	.00404
.300	6048.1	4.43	-.00	.39261	.03407	-.00709	.00108	-.00021	.00507
.300	6050.3	6.63	-.00	.54674	.04713	-.01027	.00108	-.00030	.00540
.300	6039.2	8.82	-.00	.69689	.06468	-.01262	.00137	-.00029	.00560
.300	6065.8	11.04	.00	.82936	.08591	-.00842	.00258	-.00054	.00590
.300	6058.5	13.23	-.01	.95513	.11212	-.01229	-.00017	.00002	.00601
.300	6042.1	15.44	-.01	1.06964	.14541	-.02387	-.00030	.00004	.00600
.300	6063.6	17.49	.00	1.15300	.18332	-.04048	.00118	-.00025	.00446
.300	6062.7	.12	-.00	.10194	.02027	-.00451	.00050	-.00017	.00414

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 43

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6053.6	.13	-.00	.12231	.02120	-.02173	.00099	-.00027	.00459
.300	6043.1	-4.09	-.00	-.16451	.02174	-.01978	.00087	-.00030	.00433
.300	6063.1	-1.96	-.00	-.01775	.01952	-.02171	.00129	-.00030	.00438
.300	6036.9	.16	-.00	.12321	.02122	-.02228	.00116	-.00027	.00449
.300	6045.3	2.28	-.00	.27045	.02693	-.02382	.00102	-.00029	.00450
.300	6052.0	4.44	-.00	.41783	.03651	-.02651	.00169	-.00041	.00534
.300	6066.1	6.63	-.00	.57209	.05024	-.02888	.00171	-.00044	.00552
.300	6053.6	8.86	.00	.72276	.06869	-.03027	.00153	-.00046	.00573
.301	6088.6	11.03	.01	.85179	.08997	-.02657	.00323	-.00074	.00570
.300	6049.8	13.23	-.00	.97779	.11656	-.02925	.00070	-.00009	.00579
.300	6047.0	15.45	-.00	1.09184	.15084	-.04096	.00043	-.00021	.00601
.300	6056.7	17.50	.00	1.17500	.18887	-.05675	.00136	-.00039	.00457
.300	6064.3	.13	-.00	.12558	.02126	-.02189	.00071	-.00031	.00440

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 44

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6066.8	.13	-.00	.14205	.02301	-.03952	.00011	-.00012	.00372
.301	6082.6	-4.09	-.00	-.14601	.02250	-.03553	.00025	-.00019	.00394
.300	6054.5	-1.94	-.00	.00299	.02079	-.03850	.00020	-.00020	.00373
.300	6047.1	.16	-.00	.14473	.02298	-.03909	.00015	-.00015	.00388
.300	6049.2	2.30	-.00	.29221	.02929	-.04198	.00061	-.00009	.00432
.300	6051.8	4.45	-.00	.43926	.03926	-.04360	.00107	-.00019	.00490
.300	6035.9	6.64	-.00	.59266	.05358	-.04504	.00096	-.00021	.00498
.300	6061.0	8.83	-.00	.74033	.07229	-.04688	.00089	-.00023	.00488
.300	6050.1	11.02	.01	.86996	.09381	-.04196	.00262	-.00048	.00516
.300	6048.0	13.23	-.01	.99633	.12070	-.04412	-.00013	.00013	.00509
.300	6048.2	15.46	-.01	1.11013	.15534	-.05523	-.00047	-.00007	.00569
.300	6040.6	17.51	.00	1.19139	.19379	-.07067	.00099	-.00020	.00391
.300	6061.6	.14	-.00	.14716	.02300	-.03938	.00010	-.00016	.00402

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 45

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6052.1	.11	-.00	.10976	.02120	-.01829	.00496	.00026	-.00017
.301	6079.6	-4.08	-.01	-.17207	.02195	-.01637	.00488	.00043	.00145
.300	6053.9	-1.96	-.01	-.02740	.01965	-.01720	.00484	.00032	.00089
.300	6028.8	.11	-.00	.11095	.02121	-.01803	.00511	.00024	.00007
.300	6048.8	2.29	.00	.26175	.02696	-.02021	.00572	.00014	-.00043
.300	6040.9	4.44	.01	.40826	.03645	-.02259	.00681	-.00011	-.00026
.300	6037.7	6.62	.01	.56135	.05029	-.02667	.00714	-.00043	-.00049
.300	6041.9	8.83	.02	.71278	.06881	-.03006	.00749	-.00079	-.00090
.300	6052.0	11.02	.04	.84508	.09063	-.02702	.00947	-.00154	-.00017
.300	6045.6	13.23	.03	.97247	.11780	-.03118	.00704	-.00141	.00014
.301	6069.3	15.46	.04	1.08793	.15251	-.04349	.00666	-.00182	.00057
.300	6035.6	17.50	.05	1.16744	.19057	-.05827	.00778	-.00236	-.00066
.300	6039.8	.12	-.00	.11576	.02139	-.01764	.00523	.00023	.00025

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 46

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6060.3	.12	.00	.11359	.02175	-.02027	.01165	-.00078	.00257
.300	6058.9	-4.08	-.01	-.16988	.02248	-.01698	.01089	-.00027	.00417
.301	6067.8	-1.96	-.01	-.02431	.02019	-.01970	.01119	-.00058	.00352
.300	6036.2	.16	.00	.11718	.02176	-.01968	.01123	-.00080	.00249
.300	6047.8	2.30	.01	.26253	.02741	-.02249	.01270	-.00108	.00189
.300	6044.1	4.44	.02	.40966	.03697	-.02449	.01347	-.00155	.00182
.300	6043.0	6.64	.04	.56415	.05080	-.02693	.01405	-.00203	.00128
.300	6027.4	8.81	.05	.71304	.06897	-.03032	.01467	-.00249	.00047
.300	6045.8	11.02	.07	.84685	.09111	-.02862	.01650	-.00309	-.00003
.300	6037.8	13.23	.07	.97512	.11829	-.03265	.01341	-.00303	-.00009
.300	6040.9	15.45	.08	1.08735	.15278	-.04464	.01299	-.00345	-.00014
.299	6019.8	17.51	.09	1.16762	.19092	-.05944	.01427	-.00391	-.00206
.300	6049.1	.13	.00	.11876	.02179	-.01970	.01158	-.00079	.00276

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 47

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6058.1	.13	.00	.14716	.02396	-.04848	.00723	-.00093	.00338
.300	6044.0	-4.07	-.01	-.13951	.02253	-.04269	.00654	-.00051	.00403
.300	6040.8	-1.94	-.00	.00769	.02128	-.04557	.00680	-.00070	.00340
.300	6050.5	.16	.00	.14955	.02401	-.04810	.00748	-.00094	.00344
.300	6045.8	2.30	.01	.29849	.03088	-.05167	.00779	-.00118	.00331
.299	6015.2	4.45	.02	.44633	.04142	-.05433	.00840	-.00149	.00338
.300	6027.8	6.65	.02	.60163	.05657	-.05892	.00874	-.00176	.00313
.300	6049.3	8.83	.03	.75185	.07590	-.06279	.00871	-.00206	.00279
.300	6046.3	11.05	.04	.88408	.09881	-.05927	.01048	-.00253	.00286
.300	6057.4	13.27	.04	1.01031	.12678	-.06243	.00758	-.00209	.00235
.300	6028.4	15.45	.04	1.11917	.16147	-.07384	.00693	-.00237	.00268
.300	6028.2	17.51	.06	1.20205	.20069	-.08864	.00861	-.00263	.00058
.300	6042.6	.13	.00	.15147	.02410	-.04757	.00764	-.00096	.00375

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 48

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
0.000	47.9	-4.06	-.33	-48.02422	33.77946	-96.62767	-2.56389	-.00987	35.26435
.300	6044.0	-.46	.01	.14169	.02813	.09545	.01273	-.00199	.00349
.300	6035.4	-4.64	-.01	-.14168	.03226	.10021	.01120	-.00122	.00475
.300	6038.8	-2.53	-.00	.00278	.02821	.09789	.01191	-.00165	.00444
.300	6037.7	-.42	.01	.14437	.02813	.09627	.01237	-.00199	.00358
.300	6037.2	1.71	.02	.29296	.03209	.09205	.01350	-.00236	.00277
.300	6057.1	3.87	.03	.44338	.04004	.08719	.01482	-.00284	.00236
.300	6029.5	6.05	.05	.59654	.05210	.08364	.01496	-.00331	.00148
.300	6045.2	8.24	.06	.74675	.06846	.07862	.01511	-.00374	.00052
.300	6035.2	10.43	.07	.87962	.08842	.08226	.01648	-.00425	.00013
.300	6045.2	12.65	.07	1.00694	.11394	.07850	.01356	-.00415	.00025
.300	6027.0	14.85	.09	1.12032	.14681	.06637	.01326	-.00457	-.00064
.301	6060.7	16.91	.10	1.20210	.18425	.05071	.01451	-.00490	-.00321
.301	6060.6	-.42	.01	.14708	.02811	.09556	.01277	-.00200	.00380

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 49

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6043.3	.11	-.00	.08812	.01996	.00325	.00239	.00008	.00239
.300	6052.1	-4.13	-.01	-.19565	.02485	.00265	.00274	.00013	.00323
.300	6052.4	-2.00	-.01	-.05047	.02049	.00120	.00256	.00003	.00316
.300	6042.2	.10	-.00	.08715	.02002	.00301	.00268	.00009	.00251
.300	6030.8	2.24	-.00	.23069	.02351	.00283	.00294	.00003	.00223
.300	6047.8	4.39	.00	.37840	.03079	.00180	.00387	-.00011	.00216
.300	6045.3	6.59	.01	.53197	.04222	-.00034	.00414	-.00029	.00218
.300	6035.7	8.76	.01	.68010	.05772	-.00349	.00430	-.00048	.00192
.300	6035.3	10.96	.02	.81460	.07756	-.00150	.00615	-.00076	.00194
.300	6036.0	13.18	.01	.94279	.10256	-.00579	.00383	-.00064	.00209
.300	6021.5	15.40	.02	1.05794	.13487	-.01721	.00349	-.00086	.00227
.300	6035.4	17.46	.03	1.14205	.17158	-.03313	.00497	-.00129	.00048
.300	6050.3	.08	-.00	.08959	.02018	.00346	.00265	.00008	.00266

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 50

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6048.7	.11	-.00	.09379	.02013	-.00320	.00504	-.00026	.00347
.300	6024.9	-4.13	-.01	-.18972	.02459	-.00321	.00519	-.00010	.00418
.300	6020.7	-2.00	-.01	-.04473	.02042	-.00421	.00494	-.00022	.00400
.300	6023.5	.12	-.00	.09347	.02010	-.00347	.00530	-.00027	.00342
.300	6047.7	2.25	.00	.24033	.02386	-.00402	.00609	-.00041	.00314
.300	6021.8	4.41	.01	.38755	.03135	-.00514	.00692	-.00065	.00331
.300	6036.0	6.60	.01	.54018	.04303	-.00825	.00705	-.00092	.00347
.300	6020.9	8.78	.02	.68922	.05900	-.01075	.00727	-.00113	.00332
.299	6012.1	10.97	.03	.82295	.07879	-.00856	.00894	-.00145	.00307
.300	6035.1	13.19	.03	.95083	.10405	-.01248	.00682	-.00120	.00256
.300	6026.3	15.41	.03	1.06558	.13637	-.02421	.00666	-.00150	.00248
.300	6023.0	17.46	.05	1.14974	.17294	-.04025	.00806	-.00196	.00077
.299	6006.3	.09	-.00	.09613	.02018	-.00316	.00543	-.00027	.00369

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 51

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6000.4	.11	-.01	.08593	.02409	.00373	.01405	.00140	-.00360
.301	6017.8	-4.10	-.03	-.19957	.02656	.00712	.01454	.00216	-.00018
.300	5988.0	-1.99	-.02	-.05368	.02338	.00347	.01338	.00175	-.00188
.300	5999.0	.12	-.01	.08463	.02411	.00352	.01413	.00137	-.00353
.300	5995.9	2.26	.01	.23238	.02889	.00174	.01467	.00092	-.00496
.301	6020.2	4.42	.02	.38038	.03754	-.00048	.01563	.00044	-.00584
.300	6006.6	6.60	.03	.53197	.05040	-.00356	.01658	-.00020	-.00699
.300	6011.6	8.79	.05	.68104	.06763	-.00623	.01746	-.00100	-.00753
.301	6025.4	10.98	.07	.81326	.08860	-.00336	.01934	-.00214	-.00759
.300	5997.0	13.18	.08	.93954	.11433	-.00621	.01832	-.00269	-.00721
.300	5979.1	15.41	.10	1.05262	.14740	-.01633	.01885	-.00371	-.00773
.300	5984.5	17.45	.13	1.13461	.18421	-.03102	.02053	-.00508	-.00905
.300	6006.4	.10	-.01	.08782	.02421	.00381	.01388	.00140	-.00345

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 52

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	5995.1	.11	-.01	.08238	.02149	.00511	.00911	.00077	-.00074
.300	5997.6	-4.10	-.02	-.20038	.02397	.00764	.00925	.00116	.00182
.300	5984.6	-1.97	-.01	-.05395	.02071	.00477	.00877	.00093	.00070
.300	6007.0	.14	-.01	.08513	.02148	.00549	.00909	.00075	-.00065
.300	5986.3	2.27	.00	.23037	.02623	.00449	.00979	.00050	-.00164
.300	6007.3	4.43	.01	.37737	.03480	.00276	.01100	.00016	-.00227
.300	5981.9	6.60	.02	.52863	.04738	.00057	.01178	-.00025	-.00300
.300	6001.1	8.78	.04	.67793	.06446	-.00231	.01252	-.00077	-.00366
.300	5987.4	10.98	.05	.81069	.08525	.00092	.01403	-.00161	-.00375
.300	5997.5	13.19	.06	.93826	.11127	-.00305	.01250	-.00185	-.00329
.300	5998.1	15.43	.07	1.05397	.14435	-.01339	.01271	-.00265	-.00352
.300	6012.2	17.47	.09	1.13508	.18127	-.02816	.01418	-.00363	-.00513
.300	6005.3	.11	-.01	.08578	.02153	.00511	.00932	.00076	-.00066

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 53

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	5996.7	.11	-.00	.08667	.02293	.00363	.02081	-.00031	.00261
.300	6008.0	-4.10	-.03	-.20391	.02552	.00990	.02117	.00081	.00533
.300	6014.0	-1.97	-.02	-.05481	.02214	.00560	.02055	.00018	.00410
.300	6003.0	.14	-.00	.08715	.02290	.00276	.02076	-.00034	.00267
.300	6012.4	2.27	.02	.23448	.02778	-.00030	.02130	-.00096	.00163
.300	6007.4	4.44	.03	.38391	.03646	-.00255	.02195	-.00163	.00077
.300	5992.2	6.61	.05	.53501	.04915	-.00425	.02274	-.00237	-.00032
.300	6005.8	8.79	.08	.68216	.06615	-.00549	.02411	-.00315	-.00136
.300	5991.9	10.99	.10	.81430	.08726	-.00275	.02619	-.00389	-.00287
.300	6000.2	13.20	.11	.94163	.11296	-.00579	.02376	-.00413	-.00363
.300	5998.6	15.43	.13	1.05448	.14597	-.01534	.02415	-.00500	-.00425
.300	5996.6	17.48	.16	1.13523	.18268	-.02820	.02596	-.00578	-.00722
.301	6036.1	.12	-.00	.09073	.02293	.00321	.02077	-.00032	.00286

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 54

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6004.6	.10	-.00	.07711	.01971	.00931	.00126	-.00042	.00477
.301	6021.8	-4.09	-.00	-.20291	.02246	.01020	.00164	-.00047	.00523
.300	6002.8	-1.97	-.00	-.05743	.01920	.00764	.00127	-.00048	.00535
.300	5996.6	.13	-.00	.07862	.01975	.00939	.00091	-.00041	.00478
.300	6005.2	2.26	-.00	.22364	.02428	.00939	.00152	-.00039	.00488
.300	6017.7	4.43	-.00	.37035	.03260	.00881	.00227	-.00047	.00553
.300	6013.1	6.62	.00	.52316	.04500	.00740	.00190	-.00063	.00597
.300	5998.6	8.81	.00	.67195	.06170	.00506	.00231	-.00071	.00618
.300	5999.6	11.02	.01	.80465	.08249	.00768	.00359	-.00088	.00640
.301	6025.5	13.20	.00	.93106	.10802	.00424	.00144	-.00048	.00660
.299	5978.8	15.41	.00	1.04537	.14074	-.00774	.00086	-.00051	.00674
.300	5986.4	17.47	.01	1.13030	.17795	-.02378	.00276	-.00085	.00465
.300	6007.4	.11	-.00	.08174	.01983	.00932	.00136	-.00040	.00501

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 55

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6006.5	.11	-.00	.07968	.01980	.00970	.00078	-.00084	.00723
.300	5999.2	-4.10	-.00	-.20381	.02244	.00921	.00148	-.00097	.00763
.300	6009.6	-1.97	-.00	-.05766	.01918	.00742	.00117	-.00093	.00761
.300	6003.8	.14	-.00	.08093	.01977	.00929	.00097	-.00084	.00729
.300	6006.3	2.26	-.00	.22419	.02430	.00936	.00160	-.00084	.00735
.300	5985.0	4.44	.00	.37130	.03267	.00899	.00217	-.00095	.00799
.300	6008.2	6.61	.00	.52319	.04497	.00732	.00215	-.00110	.00862
.300	5994.7	8.79	.00	.67049	.06164	.00507	.00241	-.00120	.00912
.300	6005.7	10.98	.01	.80346	.08216	.00809	.00348	-.00136	.00937
.300	6005.4	13.20	.00	.93016	.10797	.00437	.00134	-.00094	.00989
.300	6003.8	15.42	.00	1.04572	.14105	-.00699	.00113	-.00097	.01003
.300	6002.7	17.48	.01	1.12975	.17842	-.02338	.00281	-.00129	.00837
.300	6013.8	.11	-.00	.08287	.01973	.00936	.00125	-.00086	.00731

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 56

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6004.1	.11	-.00	.08120	.02003	.00921	.00118	-.00132	.00980
.300	5998.7	-4.10	-.00	-.20328	.02279	.00854	.00155	-.00151	.01044
.300	6011.3	-1.96	-.00	-.05585	.01945	.00703	.00129	-.00145	.01040
.300	5999.4	.14	-.00	.08222	.02002	.00943	.00100	-.00131	.00981
.300	6007.5	2.27	-.00	.22586	.02451	.00950	.00142	-.00128	.00953
.300	5991.8	4.42	.00	.37108	.03277	.00936	.00245	-.00134	.01032
.301	6022.2	6.62	.00	.52404	.04525	.00758	.00242	-.00148	.01061
.300	5998.3	8.78	.01	.67004	.06181	.00540	.00250	-.00160	.01106
.300	6009.9	10.99	.01	.80377	.08255	.00874	.00376	-.00176	.01136
.300	6001.1	13.21	.00	.93102	.10835	.00523	.00135	-.00137	.01181
.300	6003.1	15.42	.00	1.04405	.14118	-.00644	.00103	-.00146	.01210
.300	5997.5	17.47	.02	1.12698	.17807	-.02226	.00285	-.00170	.01022
.300	6014.5	.10	-.00	.08139	.01997	.00872	.00100	-.00135	.00983

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 57

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6029.2	.11	-.01	.08006	.01999	.00988	.00100	.00145	-.00197
.300	5988.8	-4.10	-.01	-.20562	.02263	.00974	.00167	.00118	-.00126
.300	6010.7	-1.98	-.01	-.05933	.01936	.00740	.00119	.00122	-.00148
.300	5997.2	.13	-.01	.07990	.01996	.00950	.00094	.00143	-.00200
.300	5985.9	2.26	-.01	.22333	.02452	.00942	.00113	.00156	-.00242
.300	6008.1	4.42	-.01	.37140	.03283	.00873	.00212	.00158	-.00226
.300	6004.3	6.60	-.01	.52293	.04529	.00648	.00209	.00158	-.00196
.300	6002.0	8.78	-.01	.67096	.06198	.00429	.00192	.00156	-.00195
.301	6018.2	10.98	-.00	.80298	.08253	.00672	.00338	.00129	-.00145
.301	6017.8	13.21	-.01	.93289	.10829	.00383	.00104	.00169	-.00090
.300	6009.3	15.42	-.01	1.04719	.14128	-.00845	.00065	.00164	-.00075
.300	5994.3	17.47	.00	1.13115	.17815	-.02465	.00239	.00120	-.00217
.300	6007.9	.10	-.01	.07941	.02005	.00985	.00092	.00143	-.00195

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 58

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6006.1	.11	-.01	.08039	.01971	.00990	.00113	.00073	.00046
.300	6006.3	-4.09	-.01	-.20319	.02229	.01032	.00181	.00061	.00083
.300	5988.0	-1.97	-.01	-.05751	.01907	.00792	.00107	.00061	.00099
.300	6000.1	.14	-.01	.08106	.01969	.00996	.00110	.00074	.00056
.300	6005.6	2.27	-.01	.22493	.02423	.00969	.00141	.00079	.00050
.300	5991.9	4.42	-.00	.37086	.03254	.00877	.00228	.00078	.00060
.300	5984.2	6.61	-.00	.52456	.04498	.00664	.00233	.00075	.00092
.300	6002.8	8.80	-.00	.67283	.06180	.00497	.00187	.00066	.00117
.300	5987.9	10.99	.00	.80393	.08206	.00776	.00332	.00042	.00139
.300	5989.2	13.20	-.01	.93288	.10815	.00338	.00113	.00089	.00174
.300	6004.2	15.43	-.01	1.04808	.14103	-.00817	.00073	.00084	.00198
.300	6004.7	17.47	.00	1.13160	.17809	-.02441	.00250	.00046	.00051
.300	5999.9	.11	-.01	.08261	.01970	.01000	.00125	.00073	.00059

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 59

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	5989.2	.11	-.00	.07957	.01961	.00966	.00122	.00014	.00295
.300	5982.7	-4.10	-.01	-.20386	.02228	.01004	.00150	.00005	.00323
.300	6002.0	-1.97	-.00	-.05726	.01901	.00797	.00139	.00002	.00328
.300	5983.4	.13	-.00	.07902	.01958	.00985	.00100	.00014	.00287
.300	5997.9	2.27	-.00	.22442	.02409	.00979	.00150	.00013	.00295
.300	6006.2	4.42	-.00	.37217	.03232	.00987	.00205	.00006	.00366
.300	5989.3	6.62	-.00	.52449	.04478	.00740	.00245	-.00001	.00350
.300	5982.9	8.80	.00	.67238	.06152	.00504	.00229	-.00011	.00371
.300	6015.2	11.00	.01	.80413	.08201	.00784	.00353	-.00030	.00394
.300	5992.8	13.21	-.00	.93189	.10798	.00374	.00110	.00009	.00438
.300	6006.7	15.44	-.00	1.04748	.14093	-.00723	.00110	.00011	.00422
.300	6006.0	17.48	.01	1.13027	.17819	-.02391	.00258	-.00021	.00287
.300	5997.2	.12	-.00	.08290	.01957	.01026	.00122	.00014	.00288

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 60

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	5990.8	.11	-.00	.07969	.01962	.01015	.00109	-.00012	.00362
.300	5997.3	-4.10	-.01	-.20452	.02227	.00968	.00184	-.00023	.00438
.300	5987.1	-1.97	-.00	-.05813	.01900	.00793	.00128	-.00023	.00421
.300	5995.0	.12	-.00	.08021	.01960	.00996	.00124	-.00012	.00373
.300	5994.7	2.26	-.00	.22440	.02409	.01004	.00157	-.00012	.00354
.300	5999.4	4.42	-.00	.36996	.03236	.00890	.00235	-.00023	.00396
.300	6000.5	6.61	.00	.52420	.04481	.00765	.00248	-.00034	.00393
.300	6005.3	8.79	.00	.67050	.06139	.00450	.00253	-.00043	.00394
.300	5984.5	10.99	.01	.80389	.08190	.00793	.00374	-.00065	.00421
.300	5996.1	13.20	.00	.93324	.10771	.00387	.00139	-.00021	.00418
.300	6005.6	15.43	.00	1.04630	.14071	-.00768	.00094	-.00029	.00420
.300	5994.2	17.47	.01	1.13046	.17781	-.02398	.00288	-.00059	.00229
.300	5996.7	.11	-.00	.08169	.01961	.00999	.00130	-.00012	.00362

NASA LANGLEY .7 X 10 HIGH SPEED TUNNEL

996 RUN 61

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	5983.0	.10	-.00	.07876	.01990	.00982	.00077	-.00029	.00407
.300	6005.2	-4.10	-.00	-.20381	.02256	.01053	.00159	-.00035	.00481
.300	6000.5	-1.97	-.00	-.05712	.01930	.00838	.00139	-.00038	.00473
.300	5987.0	.14	-.00	.08129	.01989	.01009	.00159	-.00030	.00438
.300	6004.9	2.27	-.00	.22532	.02444	.00956	.00177	-.00034	.00422
.300	5998.8	4.42	.00	.37111	.03275	.00897	.00224	-.00044	.00434
.300	5997.5	6.60	.00	.52371	.04515	.00691	.00241	-.00056	.00469
.300	6003.5	8.81	.00	.67338	.06207	.00448	.00232	-.00063	.00461
.300	6005.0	11.00	.01	.80567	.08239	.00774	.00350	-.00088	.00480
.300	5983.0	13.20	.00	.93267	.10806	.00344	.00129	-.00040	.00472
.301	6016.2	15.45	.00	1.04834	.14140	-.00839	.00092	-.00040	.00439
.300	6008.9	17.48	.01	1.13146	.17855	-.02487	.00266	-.00073	.00287
.299	5973.2	.11	-.00	.08042	.01991	.00991	.00113	-.00029	.00441

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 62

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6000.2	.11	-.00	.07963	.02046	.01006	.00090	-.00031	.00439
.300	6006.1	-4.07	-.00	-.20216	.02293	.01069	.00198	-.00034	.00460
.300	5990.7	-1.95	-.00	-.05496	.01974	.00907	.00108	-.00034	.00463
.300	5989.0	.14	-.00	.08041	.02043	.01029	.00134	-.00031	.00461
.300	5995.0	2.27	-.00	.22453	.02505	.00999	.00147	-.00029	.00426
.300	5990.8	4.43	-.00	.37208	.03347	.00936	.00192	-.00041	.00486
.300	6000.6	6.61	.00	.52541	.04606	.00718	.00255	-.00050	.00508
.300	5983.6	8.79	.00	.67282	.06271	.00453	.00221	-.00056	.00523
.300	5987.5	10.98	.01	.80490	.08302	.00750	.00332	-.00084	.00588
.300	5988.2	13.20	.00	.93398	.10891	.00261	.00111	-.00031	.00564
.300	6001.0	15.43	.00	1.05012	.14184	-.00885	.00107	-.00026	.00555
.300	5993.6	17.49	.01	1.13403	.17922	-.02556	.00238	-.00066	.00410
.300	5992.9	.12	-.00	.08218	.02042	.01040	.00121	-.00032	.00448

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 63

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.200	2769.5	.04	-.00	.08134	.02016	.01158	.00089	-.00017	.00389
.200	2778.9	-3.97	-.00	-.18640	.02308	.01134	.00145	-.00019	.00427
.200	2777.5	-1.95	-.00	-.04972	.01996	.01036	.00124	-.00023	.00447
.200	2779.0	.06	-.00	.08130	.02017	.01201	.00098	-.00015	.00414
.201	2783.0	2.10	-.00	.21819	.02404	.01086	.00117	-.00010	.00364
.200	2770.4	4.16	-.00	.35733	.03133	.01048	.00159	-.00017	.00404
.200	2765.4	6.24	.00	.49761	.04228	.00893	.00233	-.00029	.00472
.200	2770.4	8.33	.00	.64020	.05696	.00682	.00257	-.00033	.00465
.200	2767.3	10.45	.00	.77230	.07573	.00529	.00225	-.00038	.00493
.200	2758.9	12.57	.00	.89723	.09873	.00384	.00234	-.00041	.00483
.200	2758.5	14.73	.00	1.00992	.12721	.00091	.00171	-.00021	.00526
.200	2771.0	16.74	.00	1.10423	.15973	-.01305	.00264	-.00042	.00483
.200	2758.7	18.70	-.02	1.11860	.24781	-.02684	-.00833	-.00123	.01978
.200	2767.8	.05	-.00	.08163	.02046	.01176	.00083	-.00015	.00397

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 64

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6026.0	.11	-.00	.08243	.01996	.01119	.00119	-.00005	.00329
.300	6015.5	-4.10	-.01	-.20237	.02265	.01061	.00153	-.00013	.00372
.301	6031.5	-1.98	-.00	-.05533	.01937	.00922	.00095	-.00010	.00369
.300	6011.1	.14	-.00	.08264	.01996	.01094	.00127	-.00005	.00351
.300	6015.4	2.26	-.00	.22696	.02445	.01071	.00139	-.00006	.00329
.300	6010.5	4.42	-.00	.37410	.03267	.01040	.00240	-.00011	.00334
.300	6024.4	6.61	.00	.52657	.04518	.00782	.00235	-.00019	.00353
.300	6022.6	8.79	.00	.67645	.06187	.00531	.00268	-.00025	.00381
.300	6012.8	11.00	.01	.81023	.08258	.00796	.00351	-.00049	.00389
.300	6004.1	13.19	.00	.93809	.10835	.00394	.00150	-.00009	.00433
.300	5995.5	15.43	.00	1.05259	.14155	-.00821	.00126	-.00018	.00418
.301	6030.0	17.48	.01	1.13461	.17909	-.02457	.00258	-.00051	.00223
.300	6025.3	.11	-.00	.08566	.01997	.01146	.00093	-.00006	.00311

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 65

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6011.7	.11	.00	.08390	.01988	.01003	.00133	-.00151	.00956
.299	5992.3	-4.10	-.00	-.20000	.02252	.00942	.00159	-.00165	.01023
.300	6015.2	-2.52	.00	-.09080	.01968	.00708	.00127	-.00163	.00986
.300	6027.4	.13	.00	.08553	.01984	.01054	.00107	-.00150	.00958
.300	6025.7	2.26	.00	.22959	.02438	.01062	.00163	-.00149	.00941
.300	6010.8	4.42	.00	.37427	.03264	.01030	.00251	-.00155	.00979
.300	5998.8	6.62	.01	.52883	.04519	.00873	.00238	-.00163	.00979
.300	6007.4	8.78	.01	.67645	.06173	.00657	.00292	-.00169	.00984
.300	6012.9	10.98	.01	.80784	.08231	.00928	.00405	-.00183	.01013
.300	6009.1	13.20	.01	.93644	.10847	.00455	.00149	-.00148	.01047
.300	6021.2	15.42	.01	1.05136	.14157	-.00656	.00130	-.00159	.01034
.300	6025.3	17.47	.02	1.13321	.17923	-.02296	.00294	-.00185	.00885
.300	6017.6	.10	.00	.08561	.01985	.01021	.00125	-.00154	.00971

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 66

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6003.4	.11	-.01	.08276	.02062	.01073	.00116	.00181	-.00263
.300	6010.0	-4.08	-.01	-.20017	.02325	.01160	.00164	.00177	-.00290
.300	6008.5	-1.97	-.01	-.05471	.02001	.00933	.00090	.00174	-.00280
.300	6024.7	.14	-.01	.08385	.02057	.01072	.00105	.00180	-.00272
.301	6032.7	2.28	-.01	.23064	.02510	.01026	.00124	.00183	-.00275
.300	6019.8	4.43	-.01	.37760	.03341	.00955	.00248	.00183	-.00218
.300	6003.2	6.62	-.01	.52968	.04592	.00656	.00235	.00181	-.00187
.300	5992.3	8.80	-.01	.67807	.06268	.00427	.00194	.00174	-.00146
.300	6021.0	11.00	-.00	.81236	.08318	.00745	.00325	.00155	-.00120
.300	6019.6	13.22	-.01	.94148	.10939	.00187	.00102	.00199	-.00084
.300	6005.1	15.43	-.01	1.05511	.14242	-.00979	.00076	.00191	-.00052
.300	6016.6	17.48	-.01	1.13867	.17992	-.02618	.00193	.00160	-.00181
.300	6011.4	.11	-.01	.08605	.02057	.01098	.00105	.00180	-.00263

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 67

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6002.7	.12	-.00	.08214	.02135	.01090	.00137	-.00022	.00387
.300	6016.8	-4.09	-.00	-.20144	.02414	.01315	.00118	-.00023	.00427
.300	5998.3	-1.96	-.00	-.05452	.02077	.01000	.00099	-.00027	.00417
.300	6021.0	.14	-.00	.08402	.02131	.01086	.00137	-.00023	.00389
.301	6031.3	2.27	-.00	.22990	.02580	.01023	.00134	-.00023	.00377
.300	6017.8	4.43	.00	.37591	.03406	.00872	.00245	-.00030	.00392
.300	6005.2	6.61	.00	.52968	.04648	.00669	.00219	-.00035	.00392
.300	6019.2	8.80	.00	.67924	.06336	.00345	.00218	-.00044	.00398
.300	6001.4	11.00	.01	.81321	.08387	.00581	.00360	-.00067	.00428
.300	6024.6	13.20	.00	.94114	.10974	.00141	.00107	-.00022	.00421
.300	6022.6	15.44	.00	1.05572	.14302	-.01143	.00107	-.00024	.00402
.300	6013.8	17.48	.01	1.13936	.18057	-.02748	.00250	-.00059	.00255
.300	6012.7	.11	-.00	.08368	.02132	.01088	.00106	-.00024	.00404

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 68

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6012.5	.11	-.00	.08317	.02055	.01138	.00120	-.00026	.00405
.300	6019.7	-4.11	-.00	-.20203	.02339	.01117	.00165	-.00029	.00389
.300	6008.9	-1.97	-.00	-.05487	.02002	.00971	.00152	-.00032	.00437
.300	6008.8	.13	-.00	.08277	.02050	.01108	.00121	-.00028	.00398
.300	6016.9	2.27	-.00	.22904	.02504	.01053	.00149	-.00028	.00398
.300	6011.1	4.41	-.00	.37629	.03311	.00946	.00244	-.00034	.00483
.300	6000.9	6.60	.00	.52811	.04557	.00720	.00212	-.00041	.00493
.300	6014.1	8.79	.00	.67794	.06229	.00400	.00215	-.00049	.00530
.300	6021.4	11.00	.01	.81229	.08292	.00686	.00362	-.00066	.00554
.300	6010.3	13.18	-.00	.93824	.10872	.00178	.00102	-.00023	.00593
.300	6017.4	15.43	-.00	1.05515	.14209	-.01042	.00105	-.00024	.00577
.300	6011.9	17.47	.01	1.13682	.17945	-.02609	.00246	-.00055	.00420
.301	6031.7	.11	-.00	.08514	.02053	.01112	.00120	-.00026	.00415

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 69

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6023.6	.11	-.00	.08290	.02003	.01109	.00127	.00001	.00311
.300	5999.6	-4.10	-.01	-.20126	.02286	.01092	.00168	-.00005	.00353
.300	6009.4	-2.51	-.00	-.08951	.01998	.00935	.00123	-.00006	.00362
.300	6022.3	.14	-.00	.08367	.02004	.01101	.00128	.00003	.00344
.300	6028.2	2.27	-.00	.22899	.02455	.01093	.00187	.00001	.00336
.300	6009.1	4.42	-.00	.37586	.03274	.01041	.00253	-.00004	.00351
.300	6008.9	6.63	.00	.52854	.04523	.00782	.00242	-.00013	.00365
.300	6027.1	8.80	.00	.67610	.06198	.00532	.00229	-.00020	.00395
.300	6021.6	10.99	.01	.80955	.08238	.00768	.00367	-.00039	.00417
.300	5999.3	13.20	-.00	.93853	.10843	.00416	.00133	.00001	.00459
.300	6004.5	15.43	.00	1.05270	.14158	-.00874	.00144	-.00009	.00448
.300	5998.0	17.47	.01	1.13510	.17909	-.02448	.00262	-.00034	.00287
.300	6000.4	.10	-.00	.08292	.02004	.01107	.00135	.00000	.00332

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 70

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	5996.3	.12	-.00	.08511	.02001	.01108	.00118	-.00039	.00498
.300	6008.0	-4.10	-.00	-.19970	.02292	.01034	.00154	-.00056	.00561
.300	6012.2	-1.96	-.00	-.05375	.01953	.00862	.00118	-.00047	.00527
.300	6007.9	.14	-.00	.08591	.02006	.01067	.00123	-.00041	.00490
.300	6020.9	2.28	-.00	.23091	.02462	.01086	.00141	-.00044	.00496
.300	6000.7	4.43	.00	.37797	.03282	.01011	.00246	-.00055	.00554
.300	5992.7	6.62	.00	.53042	.04510	.00779	.00250	-.00067	.00589
.300	6002.9	8.81	.00	.67978	.06198	.00511	.00265	-.00081	.00638
.300	6002.8	11.00	.01	.81179	.08268	.00765	.00394	-.00108	.00690
.300	6014.3	13.22	.00	.93958	.10870	.00322	.00165	-.00059	.00665
.300	5989.1	15.43	.00	1.05357	.14176	-.00850	.00141	-.00063	.00654
.300	6009.0	17.49	.02	1.13505	.17956	-.02459	.00310	-.00091	.00469
.300	6006.9	.12	-.00	.08716	.02023	.01050	.00103	-.00042	.00488

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 71

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6019.1	.11	-.00	.08408	.02011	.01016	.00124	-.00087	.00702
.300	6009.7	-4.10	-.00	-.19936	.02292	.00984	.00185	-.00112	.00805
.300	6010.6	-1.98	-.00	-.05332	.01956	.00844	.00139	-.00100	.00759
.300	6015.0	.14	-.00	.08580	.02013	.01057	.00096	-.00085	.00670
.300	6015.2	2.28	.00	.23203	.02450	.00995	.00168	-.00097	.00706
.301	6039.2	4.43	.00	.37752	.03274	.00950	.00208	-.00111	.00781
.300	5993.4	6.61	.00	.53053	.04503	.00770	.00232	-.00124	.00825
.300	6024.8	8.80	.01	.67939	.06182	.00440	.00252	-.00139	.00863
.300	6019.4	11.01	.01	.81243	.08255	.00706	.00379	-.00163	.00911
.300	6010.8	13.22	.00	.93969	.10852	.00287	.00129	-.00115	.00884
.300	5991.8	15.43	.01	1.05268	.14139	-.00916	.00113	-.00120	.00886
.300	5992.8	17.48	.02	1.13482	.17902	-.02433	.00331	-.00145	.00699
.300	6007.0	.11	-.00	.08721	.02014	.01018	.00148	-.00088	.00691

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 72

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	5998.5	.11	.00	.08491	.02031	.00975	.00118	-.00172	.01108
.300	5993.8	-4.09	.00	-.19870	.02318	.00915	.00147	-.00209	.01225
.300	6004.0	-1.97	.00	-.05172	.01977	.00795	.00151	-.00191	.01170
.301	6023.0	.15	.00	.08698	.02032	.00973	.00100	-.00172	.01113
.300	6000.8	2.28	.00	.23111	.02482	.00991	.00155	-.00170	.01127
.300	6021.6	4.45	.00	.37976	.03302	.00974	.00229	-.00183	.01217
.300	6004.4	6.62	.01	.52803	.04525	.00729	.00223	-.00204	.01270
.300	5995.2	8.81	.01	.67756	.06195	.00515	.00252	-.00220	.01333
.300	5993.3	11.01	.01	.81109	.08272	.00770	.00359	-.00244	.01399
.300	5992.0	13.22	.01	.93884	.10878	.00305	.00154	-.00193	.01408
.300	5991.3	15.43	.01	1.05154	.14167	-.00838	.00139	-.00193	.01394
.300	6001.1	17.48	.02	1.13283	.17936	-.02407	.00337	-.00210	.01216
.300	6009.7	.13	.00	.08844	.02037	.00952	.00124	-.00174	.01116

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 73

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	5991.1	.11	.00	.08583	.02089	.00894	.00145	-.00289	.01633
.299	5975.4	-4.10	.00	-.19777	.02396	.00885	.00203	-.00341	.01875
.300	6012.8	-1.96	.00	-.05173	.02037	.00708	.00145	-.00314	.01759
.300	6007.0	.14	.00	.08517	.02091	.00889	.00131	-.00290	.01650
.300	6005.8	2.28	.00	.23127	.02531	.00968	.00177	-.00278	.01602
.300	6008.1	4.44	.01	.37776	.03346	.00945	.00250	-.00289	.01681
.300	5989.1	6.62	.01	.52910	.04570	.00765	.00261	-.00303	.01703
.300	5998.3	8.81	.01	.67744	.06239	.00498	.00250	-.00321	.01797
.300	6004.6	11.01	.02	.81021	.08307	.00832	.00364	-.00337	.01807
.300	5997.3	13.22	.01	.93773	.10923	.00330	.00185	-.00280	.01781
.300	6000.3	15.44	.01	1.05046	.14228	-.00725	.00135	-.00290	.01815
.300	6005.2	17.49	.03	1.13042	.17981	-.02289	.00370	-.00300	.01610
.300	6015.5	.12	.00	.08739	.02093	.00920	.00146	-.00290	.01678

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 74

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6013.7	.12	-.01	.08387	.02050	.01018	.00083	.00270	-.00645
.300	6000.2	-4.09	-.01	-.20024	.02328	.01104	.00103	.00227	-.00531
.300	6000.5	-1.97	-.01	-.05420	.01993	.00931	.00057	.00246	-.00580
.300	6008.7	.15	-.01	.08550	.02057	.01034	.00089	.00271	-.00627
.300	6013.5	2.28	-.01	.23213	.02504	.00979	.00087	.00290	-.00684
.301	6037.1	4.44	-.01	.37952	.03335	.00925	.00168	.00302	-.00683
.300	6005.9	6.62	-.01	.53142	.04577	.00690	.00223	.00310	-.00674
.300	6002.9	8.82	-.01	.68009	.06269	.00383	.00192	.00310	-.00666
.300	6013.4	11.01	-.01	.81303	.08324	.00614	.00341	.00270	-.00550
.300	6000.7	13.21	-.02	.94023	.10904	.00141	.00157	.00319	-.00601
.300	6003.1	15.44	-.02	1.05399	.14212	-.01060	.00076	.00309	-.00595
.300	5988.2	17.49	-.01	1.13683	.17966	-.02671	.00272	.00250	-.00635
.300	6009.0	.12	-.01	.08643	.02062	.01075	.00040	.00272	-.00633

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 75

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6011.1	.11	-.00	.08312	.02147	.01038	.00121	-.00073	.00549
.300	6006.3	-4.09	-.00	-.20065	.02408	.01124	.00187	-.00076	.00578
.301	6023.5	-1.98	-.00	-.05352	.02082	.00966	.00137	-.00076	.00585
.301	6021.5	.14	-.00	.08496	.02148	.01033	.00131	-.00073	.00556
.300	6011.1	2.28	.00	.23110	.02614	.01008	.00161	-.00088	.00595
.300	5999.3	4.45	.00	.37915	.03459	.00960	.00216	-.00102	.00653
.300	5998.7	6.62	.00	.53212	.04712	.00725	.00236	-.00112	.00691
.300	5990.5	8.81	.01	.68041	.06394	.00397	.00204	-.00112	.00679
.300	6001.6	11.01	.01	.81346	.08449	.00650	.00326	-.00155	.00777
.300	5996.2	13.21	.00	.94036	.11022	.00154	.00116	-.00081	.00650
.300	6007.9	15.43	.00	1.05645	.14321	-.01066	.00100	-.00072	.00628
.300	5992.8	17.48	.02	1.13871	.18053	-.02670	.00277	-.00121	.00572
.300	5997.8	.12	-.00	.08647	.02146	.01080	.00108	-.00075	.00570

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 76

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6031.1	.12	-.00	.08721	.02053	.01164	.00152	-.00062	.00561
.300	6028.8	-4.08	-.00	-.19797	.02332	.01249	.00190	-.00070	.00629
.300	6025.2	-1.97	-.00	-.05127	.02006	.01015	.00168	-.00072	.00620
.300	6043.3	.15	-.00	.08732	.02062	.01160	.00106	-.00062	.00539
.300	6037.1	2.29	.00	.23408	.02512	.01085	.00177	-.00084	.00599
.300	6019.9	4.43	.00	.38051	.03336	.00996	.00226	-.00101	.00633
.300	6037.5	6.63	.00	.53415	.04582	.00753	.00202	-.00110	.00639
.300	6025.1	8.82	.01	.68334	.06267	.00500	.00243	-.00119	.00632
.300	6025.4	11.00	.01	.81479	.08313	.00678	.00385	-.00143	.00653
.300	6018.8	13.23	.01	.94421	.10907	.00261	.00139	-.00084	.00606
.300	6022.5	15.44	.01	1.05838	.14196	-.01002	.00108	-.00088	.00556
.300	6020.3	17.49	.02	1.14150	.17962	-.02578	.00281	-.00122	.00380
.299	6002.0	.13	-.00	.08948	.02074	.01133	.00119	-.00066	.00554

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 77

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6026.5	.12	-.00	.08700	.02003	.01130	.00102	-.00044	.00480
.300	6020.8	-4.10	-.01	-.19950	.02273	.01106	.00176	-.00048	.00580
.300	6033.3	-1.97	-.00	-.04996	.01939	.00968	.00120	-.00050	.00536
.300	6028.0	.14	-.00	.08812	.01999	.01102	.00136	-.00045	.00498
.300	6025.0	2.28	-.00	.23489	.02446	.01071	.00157	-.00053	.00473
.300	6033.3	4.43	.00	.37968	.03261	.00964	.00241	-.00073	.00521
.300	6013.8	6.61	.00	.53283	.04487	.00740	.00244	-.00082	.00523
.300	6022.7	8.81	.01	.68256	.06161	.00501	.00212	-.00090	.00509
.300	6036.4	11.01	.01	.81554	.08239	.00697	.00386	-.00114	.00538
.300	6030.4	13.21	.01	.94316	.10823	.00249	.00166	-.00061	.00492
.300	6017.5	15.44	.01	1.05679	.14134	-.00976	.00118	-.00067	.00456
.300	6016.8	17.49	.02	1.13988	.17900	-.02526	.00290	-.00099	.00291
.300	6020.1	.13	-.00	.08934	.02001	.01078	.00137	-.00044	.00493

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 78

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6025.2	.12	-.00	.09139	.01892	.00747	.00120	.00019	.00247
.300	6030.9	-4.09	-.01	-.19418	.02155	.00816	.00133	.00025	.00268
.300	6019.0	-1.97	-.01	-.04775	.01829	.00583	.00119	.00018	.00278
.300	6029.2	.15	-.00	.09207	.01890	.00760	.00092	.00019	.00257
.300	6019.5	2.29	-.00	.23892	.02353	.00695	.00159	.00020	.00228
.300	6023.3	4.43	-.00	.38368	.03183	.00637	.00209	.00014	.00214
.300	6029.9	6.64	.00	.53878	.04450	.00418	.00219	.00009	.00217
.300	6012.7	8.81	.00	.68647	.06132	.00225	.00216	.00003	.00214
.300	6022.5	11.02	.01	.81764	.08199	.00501	.00361	.00009	.00095
.300	6028.7	13.21	-.00	.94472	.10793	.00090	.00130	.00030	.00179
.300	6015.8	15.43	.00	1.06038	.14134	-.01195	.00143	.00018	.00197
.300	6034.8	17.49	.01	1.14235	.17907	-.02719	.00247	-.00003	-.00009
.300	6022.3	.12	-.00	.09303	.01893	.00725	.00098	.00018	.00260

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 79

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.400	10227.9	.23	-.01	.10664	.01928	.00696	.00120	.00015	.00238
.400	10235.8	-4.27	-.01	-.20322	.02213	.00762	.00123	.00029	.00266
.400	10195.4	-1.98	-.01	-.04301	.01812	.00505	.00098	.00017	.00291
.400	10197.8	.26	-.01	.10671	.01928	.00701	.00101	.00015	.00257
.400	10202.2	2.54	-.00	.26443	.02498	.00742	.00177	.00013	.00228
.400	10213.9	4.84	-.00	.42654	.03506	.00670	.00181	.00007	.00256
.400	10206.5	7.20	-.00	.59214	.05048	.00431	.00181	.00002	.00253
.400	10199.4	9.50	.01	.74502	.07069	.00373	.00254	.00005	.00162
.400	10214.0	11.79	.00	.86825	.09548	.00920	.00181	.00024	.00171
.400	10212.7	14.11	.00	.99781	.12935	-.00463	.00094	.00009	.00174
.401	10244.2	.24	-.01	.11071	.01934	.00726	.00122	.00015	.00284

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 80

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.499	14975.1	.42	-.01	.13339	.02043	.00855	.00113	.00012	.00280
.500	14995.6	-4.51	-.02	-.21795	.02426	.00601	.00159	.00024	.00287
.501	15051.6	-2.00	-.01	-.03418	.01861	.00354	.00063	.00016	.00288
.500	15030.4	.45	-.01	.13126	.02041	.00829	.00100	.00011	.00281
.500	15040.8	2.93	-.01	.30619	.02783	.00927	.00160	.00008	.00257
.499	14987.1	5.43	-.00	.48524	.04064	.00781	.00176	.00004	.00287
.499	14984.2	7.95	.00	.65383	.05981	.01035	.00263	.00003	.00221
.500	15024.0	10.39	-.01	.78286	.08589	.02015	.00042	.00004	.00274
.500	15017.6	.42	-.01	.13309	.02044	.00848	.00117	.00011	.00286

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 81

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6037.7	.10	-.00	.08447	.01641	.00113	.00104	-.00000	.00073
.300	6027.6	-4.08	-.00	-.18142	.01928	.00429	.00179	.00007	.00108
.300	6035.5	-1.97	-.00	-.04509	.01623	.00163	.00145	.00001	.00113
.300	6041.6	.13	-.00	.08528	.01641	.00098	.00102	.00000	.00097
.300	6037.5	2.26	.00	.21485	.01971	.00174	.00142	-.00003	.00078
.300	6033.3	4.38	.00	.34580	.02602	.00016	.00232	-.00005	.00066
.300	6021.0	6.56	.00	.48626	.03557	-.00304	.00256	-.00012	.00089
.300	6033.1	8.73	.01	.62615	.04874	-.00708	.00322	-.00010	.00039
.300	6020.4	10.95	.00	.79052	.06871	-.02398	.00087	.00011	.00051
.300	6018.7	13.15	.00	.94973	.09536	-.04513	.00122	.00019	.00016
.300	6017.0	15.42	.00	1.09493	.12736	-.06220	.00126	.00015	.00004
.300	6024.8	.11	-.00	.08897	.01633	.00133	.00111	-.00002	.00090
.400	10225.0	.20	-.00	.09267	.01660	.00299	.00078	-.00006	.00092
.400	10207.0	-4.24	-.01	-.18674	.01973	.00314	.00182	.00011	.00109
.400	10223.3	-2.00	-.00	-.04319	.01593	.00152	.00114	-.00001	.00107
.400	10223.6	.23	-.00	.09261	.01654	.00345	.00072	-.00007	.00098
.400	10231.3	2.47	.00	.23147	.02082	.00523	.00132	-.00009	.00092
.400	10209.4	4.74	.00	.37674	.02844	.00081	.00216	-.00011	.00111

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 83

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.500	14993.8	.33	-.00	.10100	.01759	.00776	.00085	-.00011	.00113
.500	14993.0	-4.45	-.01	-.19357	.02152	-.00027	.00190	.00009	.00116
.501	15047.2	-2.03	-.00	-.04004	.01625	-.00026	.00095	-.00003	.00109
.501	15044.1	.35	-.00	.09975	.01753	.00839	.00045	-.00013	.00120
.500	15034.9	2.77	.00	.25444	.02312	.00803	.00197	-.00012	.00098
.500	14995.9	5.23	.01	.41942	.03259	.00309	.00217	-.00017	.00126
.499	14965.0	7.75	.01	.59237	.04796	-.00191	.00291	-.00016	.00062
.499	14968.1	.33	-.00	.10131	.01751	.00773	.00047	-.00014	.00115

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 84

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6021.4	.11	-.00	.07812	.01353	.00466	-.00074	-.00000	.00036
.300	6032.1	-4.06	-.00	-.15941	.01541	.00215	.00128	.00001	.00078
.301	6043.7	-1.95	-.00	-.03589	.01327	.00115	.00048	.00003	.00040
.300	6032.5	.13	-.00	.07885	.01357	.00449	-.00061	-.00000	.00036
.300	6040.3	2.24	-.00	.19163	.01650	.01095	-.00061	-.00003	.00044
.300	6037.3	4.36	-.00	.31294	.02181	.01012	.00001	-.00001	.00054
.300	6018.9	6.52	-.00	.44281	.02965	.00606	.00019	-.00005	.00084
.300	6024.2	8.68	.00	.57247	.04043	.00292	.00094	-.00003	.00056
.300	6042.2	10.87	.00	.69356	.05490	.00482	.00124	-.00005	.00007
.300	6041.4	13.07	.00	.80019	.07587	.01342	.00145	.00003	-.00023
.300	6028.8	15.30	.00	.90852	.10340	.02049	.00061	-.00005	.00016
.300	6029.9	17.38	-.00	1.00113	.13558	.02541	-.00062	-.00005	.00061
.300	6033.6	.12	-.00	.08163	.01366	.00524	-.00089	-.00001	.00064

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 85

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.400	10185.1	.20	-.00	.07793	.01409	.01238	-.00116	-.00008	.00065
.400	10190.2	-4.19	-.00	-.15918	.01532	-.00255	.00105	-.00000	.00052
.400	10221.6	-1.98	-.00	-.03351	.01312	.00040	.00000	-.00001	.00056
.400	10223.0	.21	-.00	.07640	.01405	.01259	-.00119	-.00008	.00072
.400	10190.8	2.43	-.00	.19893	.01763	.01818	-.00044	-.00006	.00060
.400	10209.9	4.67	-.00	.33147	.02369	.01581	-.00005	-.00007	.00077
.400	10200.5	6.95	.00	.47140	.03297	.01157	.00027	-.00010	.00087
.400	10185.2	9.23	.00	.61005	.04572	.01142	.00098	-.00012	.00051
.400	10194.7	11.52	.01	.72729	.06529	.01970	.00161	-.00001	-.00045
.400	10185.5	13.84	.01	.83988	.09213	.02953	.00088	-.00014	-.00013
.400	10211.3	16.17	-.00	.94006	.12687	.03615	-.00114	-.00032	.00090
.400	10197.0	18.28	-.01	.99770	.16396	.04128	-.00172	-.00039	.00148
.400	10213.9	.19	-.00	.07985	.01413	.01213	-.00136	-.00010	.00072

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 86

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.500	14981.4	.29	.00	.07451	.01530	.02293	-.00123	-.00012	.00065
.500	14995.1	-4.36	-.01	-.15622	.01572	-.01093	.00129	-.00001	.00065
.500	15002.2	-2.01	.00	-.02983	.01346	.00105	-.00118	-.00007	.00065
.501	15036.7	.30	.00	.07300	.01526	.02266	-.00137	-.00013	.00067
.500	15001.6	2.69	-.00	.21265	.01956	.02504	-.00100	-.00010	.00049
.500	14986.9	5.10	-.00	.35997	.02701	.02101	-.00071	-.00009	.00084
.500	15008.6	7.57	.00	.51376	.03857	.02108	.00047	-.00013	.00079
.501	15040.1	10.01	.01	.65294	.05663	.02849	.00144	-.00006	-.00032
.500	15011.8	12.43	.00	.77030	.08242	.03923	-.00004	-.00027	.00041
.501	15036.1	14.48	-.00	.84045	.11012	.04940	-.00015	.00012	-.00068
.500	15013.6	14.76	-.01	.84187	.11746	.05067	.00020	.00062	-.00189
.500	15019.9	.29	.00	.07624	.01527	.02352	-.00153	-.00014	.00067

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 87

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6023.0	.10	.00	.07496	.01361	.00600	-.00271	-.00011	.00047
.300	6005.7	-4.06	-.00	-.16215	.01551	.00293	.00067	-.00003	.00042
.300	6015.2	-1.97	.00	-.04190	.01329	.00289	-.00042	-.00002	.00028
.300	6031.7	.12	.00	.07465	.01355	.00600	-.00254	-.00009	.00046
.300	6019.5	2.22	-.00	.19113	.01649	.01019	-.00230	-.00011	.00081
.300	6023.0	4.34	-.00	.31136	.02180	.00966	-.00114	-.00009	.00074
.300	6007.6	6.51	-.00	.44006	.02964	.00729	-.00029	-.00010	.00097
.301	6042.3	8.67	.00	.56947	.04044	.00471	.00005	-.00011	.00078
.300	6027.7	10.86	.00	.69004	.05490	.00499	.00068	-.00006	.00022
.300	6004.3	13.05	.00	.79885	.07551	.01345	.00126	.00013	-.00084
.300	6021.8	15.28	.00	.90754	.10222	.02190	.00094	.00021	-.00100
.300	6014.8	17.38	-.00	1.00311	.13441	.02555	.00019	.00026	-.00092
.300	6023.9	.10	.00	.07717	.01359	.00609	-.00232	-.00009	.00052

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 88

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.400	10218.3	.17	.00	.07306	.01413	.01384	-.00257	-.00016	.00062
.400	10190.3	-4.21	-.00	-.16232	.01552	-.00115	.00070	-.00005	.00054
.400	10210.1	-2.00	.00	-.04014	.01324	.00245	-.00118	-.00006	.00050
.400	10183.3	.20	.00	.07127	.01411	.01321	-.00265	-.00016	.00063
.400	10217.5	2.43	-.00	.19647	.01769	.01767	-.00148	-.00012	.00062
.399	10158.2	4.64	-.00	.32640	.02367	.01644	-.00027	-.00011	.00076
.400	10192.8	6.94	.00	.46805	.03297	.01368	.00013	-.00012	.00082
.400	10212.3	9.24	.00	.60710	.04580	.01263	.00031	-.00013	.00070
.399	10167.7	11.51	.01	.72367	.06489	.02005	.00155	.00009	-.00070
.400	10202.1	13.84	.01	.83883	.09144	.02959	.00111	.00010	-.00081
.400	10181.5	16.16	-.00	.94232	.12555	.03620	.00001	.00007	-.00039
.400	10190.0	.17	.00	.07378	.01416	.01316	-.00230	-.00016	.00075

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

996 RUN 89

MACH	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.500	14996.3	.28	.00	.07023	.01547	.02490	-.00195	-.00018	.00063
.500	14970.8	-4.37	.00	-.15948	.01627	-.00894	.00035	-.00017	.00056
.500	15011.7	-2.02	.01	-.03871	.01404	.00389	-.00282	-.00027	.00058
.500	14999.4	.30	.00	.06747	.01581	.02404	-.00209	-.00033	.00060
.500	15004.7	2.67	.00	.20852	.01999	.02612	-.00077	-.00027	.00034
.500	14966.3	5.07	-.00	.35594	.02706	.02214	-.00074	-.00018	.00074
.500	14974.6	7.55	.00	.51020	.03851	.02204	.00021	-.00017	.00080
.500	14979.0	9.98	.01	.64834	.05624	.02836	.00122	-.00003	-.00042
.500	14971.2	12.43	.00	.76919	.08193	.04041	-.00020	-.00015	.00029
.500	14969.1	14.74	-.00	.84227	.11644	.05039	.00040	.00054	-.00193
.500	15004.1	.28	.00	.07091	.01562	.02546	-.00156	-.00023	.00052

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 1

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6075.5	.15	-.00	.10943	.01964	.01004	.00199	-.00043	.00388
.300	6063.3	-1.96	-.00	-.03436	.01945	.01006	.00193	-.00046	.00424
.301	6077.2	.24	-.00	.11615	.01965	.01052	.00231	-.00044	.00401
.300	6062.2	2.36	-.00	.26478	.02412	.00861	.00203	-.00045	.00371
.301	6074.9	4.58	.00	.41764	.03248	.00609	.00226	-.00054	.00376
.300	6063.4	6.74	.00	.55996	.04518	.00325	.00240	-.00055	.00407
.300	6056.2	8.96	.00	.70132	.06410	.00418	.00240	-.00057	.00394
.300	6049.5	11.16	.00	.83924	.08626	.00325	.00295	-.00061	.00333
.299	6025.4	13.33	.00	.96111	.11230	.00344	.00140	-.00031	.00330
.300	6056.2	15.52	.00	1.06870	.14594	-.00867	.00088	-.00075	.00356
.300	6034.2	17.09	.01	1.12118	.17911	-.02072	-.00303	-.00327	.00861
.301	6106.2	.17	-.00	.11397	.01955	.01009	.00203	-.00050	.00435

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 2

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.400	10270.7	.31	-.00	.12968	.01977	.01009	.00188	-.00047	.00441
.400	10230.6	-1.96	-.00	-.02301	.01926	.00919	.00176	-.00051	.00487
.400	10260.6	.37	-.00	.13401	.01983	.01097	.00179	-.00046	.00463
.401	10280.3	2.69	-.00	.29838	.02542	.00942	.00224	-.00044	.00431
.401	10280.9	5.05	-.00	.45888	.03553	.00652	.00243	-.00051	.00438
.400	10240.3	7.39	.00	.60815	.05199	.00606	.00212	-.00053	.00418
.400	10240.8	9.71	.00	.75508	.07376	.00747	.00319	-.00057	.00405
.400	10239.2	12.03	-.00	.88538	.10002	.00976	.00070	-.00036	.00374
.400	10235.4	14.33	-.00	.99975	.13429	-.00001	-.00138	-.00067	.00461
.399	10219.5	14.85	-.01	1.00522	.15206	-.00353	-.00579	-.00177	.01220
.401	10277.4	.33	-.00	.13412	.01985	.01072	.00200	-.00046	.00472

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 3

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.501	15102.7	.56	-.01	.16121	.02075	.01086	.00231	-.00044	.00449
.500	15048.1	-1.96	-.01	-.01331	.01967	.00710	.00152	-.00047	.00446
.500	15083.5	.62	-.01	.16459	.02078	.01168	.00225	-.00044	.00443
.501	15109.0	3.18	-.00	.34840	.02841	.01124	.00277	-.00045	.00419
.501	15109.2	3.18	-.00	.34788	.02843	.01125	.00244	-.00046	.00422
.500	15086.1	5.71	.00	.50990	.04156	.00683	.00258	-.00050	.00394
.500	15064.2	8.19	.00	.66580	.06256	.01381	.00349	-.00055	.00414
.500	15058.1	10.69	-.01	.79092	.09040	.02425	.00019	-.00028	.00376
.499	15043.8	12.07	-.01	.86328	.11083	.02014	-.00116	-.00040	.00425
.500	15092.8	.59	-.01	.16715	.02088	.01137	.00241	-.00044	.00452

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 4

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.601	20210.3	.96	-.01	.20611	.02363	.01285	.00224	-.00046	.00427
.601	20228.6	-1.92	-.01	.00621	.02132	.00460	.00149	-.00044	.00413
.601	20246.3	.98	-.01	.20464	.02370	.01341	.00221	-.00046	.00409
.601	20250.6	3.78	-.00	.40213	.03432	.01297	.00295	-.00050	.00421
.601	20240.2	5.15	.00	.47540	.04148	.00898	.00311	-.00051	.00424
.600	20191.7	6.58	.01	.56038	.05288	.01785	.00415	-.00056	.00395
.600	20171.7	7.87	.00	.62821	.06521	.02996	.00332	-.00048	.00392
.600	20202.3	9.19	.00	.68997	.08051	.03866	.00291	-.00039	.00360
.600	20197.8	.96	-.01	.20916	.02349	.01324	.00247	-.00045	.00424

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 5

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22801.6	1.17	-.01	.22210	.02629	.01687	.00344	-.00036	.00411
.651	22795.4	-1.84	-.01	.01569	.02279	.00424	.00182	-.00037	.00414
.651	22774.1	1.23	-.01	.22736	.02641	.01760	.00303	-.00036	.00409
.652	22812.0	2.77	-.01	.33625	.03240	.01690	.00371	-.00037	.00426
.652	22828.8	3.56	-.00	.38653	.03625	.01535	.00408	-.00039	.00431
.651	22762.4	3.85	-.00	.39653	.03716	.01311	.00401	-.00040	.00442
.651	22787.4	1.19	-.01	.22925	.02620	.01695	.00365	-.00035	.00447

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 6

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.676	24039.3	1.30	-.01	.23358	.02772	.01889	.00391	-.00031	.00435
.675	23992.2	1.33	-.01	.23434	.02780	.01818	.00342	-.00033	.00414
.676	24044.1	-1.79	-.01	.02603	.02389	.00402	.00163	-.00036	.00379
.676	24060.7	-.22	-.01	.12623	.02441	.01553	.00280	-.00039	.00417
.676	24055.4	1.38	-.01	.24089	.02820	.01899	.00401	-.00032	.00413
.675	24005.0	2.92	-.01	.34778	.03423	.01769	.00418	-.00034	.00416
.677	24070.3	3.26	-.01	.36660	.03595	.01652	.00426	-.00033	.00443
.676	24025.6	1.32	-.01	.24117	.02795	.01858	.00345	-.00033	.00440

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 7

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.701	25295.6	1.46	-.01	.25193	.03078	.01979	.00384	-.00029	.00424
.701	25262.9	-1.72	-.01	.03637	.02523	.00600	.00150	-.00037	.00381
.702	25316.3	-.13	-.01	.13680	.02628	.01819	.00274	-.00037	.00418
.702	25326.6	1.48	-.01	.24748	.03089	.01974	.00383	-.00029	.00418
.701	25268.3	2.98	-.01	.34318	.03723	.01799	.00459	-.00031	.00441
.701	25272.4	1.44	-.01	.24988	.03056	.01939	.00364	-.00029	.00436

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 8

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.726	26507.7	1.43	-.01	.23319	.03417	.02017	.00350	-.00023	.00384
.725	26459.2	-1.68	-.01	.04256	.02762	.00690	.00173	-.00038	.00363
.726	26504.2	-.12	-.01	.13315	.02939	.01873	.00216	-.00036	.00393
.726	26509.0	1.45	-.01	.22994	.03446	.01964	.00380	-.00023	.00392
.727	26541.7	2.89	-.01	.31203	.04051	.01964	.00407	-.00021	.00400
.725	26478.6	1.40	-.01	.23191	.03426	.01972	.00340	-.00022	.00397

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 9

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22783.7	6.91	.00	.57252	.05962	.02510	.00543	-.00046	.00460
.651	22760.1	4.19	-.00	.40690	.03802	.00967	.00437	-.00040	.00470
.651	22782.8	5.42	-.00	.48887	.04693	.01134	.00462	-.00044	.00485
.650	22738.8	6.97	.00	.57659	.06000	.02574	.00560	-.00046	.00461
.651	22753.7	8.41	.01	.65252	.07726	.03529	.00474	-.00053	.00470

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 10

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.675	23959.6	4.04	-.00	.38821	.03880	.01019	.00397	-.00038	.00433
.675	23980.5	5.70	.00	.49592	.05067	.01667	.00459	-.00042	.00443
.676	24028.1	7.37	.00	.60419	.06748	.02368	.00317	-.00055	.00437
.676	24030.4	7.99	-.00	.63999	.07790	.02653	.00255	-.00038	.00457

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 11

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.701	25272.7	4.98	-.00	.44282	.04761	.01509	.00468	-.00038	.00431
.701	25263.0	5.81	.00	.49756	.05470	.01743	.00404	-.00051	.00442
.701	25251.1	7.31	.00	.58814	.07493	.02132	.00132	-.00074	.00538
.700	25199.7	8.04	-.02	.62144	.08911	.02423	.00110	-.00009	.00463

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 12

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6069.1	.14	3.66	.09535	.01828	.01387	.00153	.00080	-.02741
.300	6049.5	-2.09	3.66	-.05105	.01826	.01394	.00255	.00085	-.02613
.301	6064.9	.18	3.66	.10028	.01826	.01467	.00090	.00080	-.02789
.300	6047.2	2.34	3.66	.24877	.02279	.01192	.00018	.00088	-.02909
.301	6062.7	4.57	3.66	.40225	.03162	.00897	-.00063	.00110	-.03106
.300	6039.0	6.73	3.64	.54099	.04424	.00619	-.00134	.00152	-.03318
.301	6071.1	8.98	3.62	.68359	.06319	.00709	-.00140	.00208	-.03474
.301	6061.2	11.21	3.60	.82207	.08570	.00565	-.00068	.00270	-.03703
.300	6046.8	13.40	3.57	.94163	.11248	.00518	.00139	.00337	-.03951
.300	6017.7	15.53	3.53	1.04532	.14555	-.00378	-.00347	.00404	-.03899
.300	6042.2	17.02	3.49	1.06885	.19384	-.01815	-.01544	.00070	-.01801
.300	6049.7	.14	3.66	.10052	.01829	.01404	.00153	.00081	-.02788

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 13

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.600	20127.2	.83	3.74	.17802	.02170	.01749	.00043	.00080	-.02934
.601	20174.6	-1.93	3.73	-.00765	.01969	.00754	.00037	.00093	-.02855
.600	20138.7	.90	3.74	.18215	.02188	.01722	.00059	.00078	-.02960
.602	20231.0	2.38	3.74	.29024	.02661	.01768	-.00020	.00092	-.03063
.601	20173.3	3.78	3.74	.38465	.03277	.01704	-.00007	.00113	-.03196
.601	20162.6	5.01	3.74	.44761	.03948	.01488	.00020	.00126	-.03365
.602	20207.0	6.45	3.74	.53547	.05068	.02033	.00197	.00148	-.03450
.601	20150.1	7.81	3.73	.61045	.06350	.03155	.00385	.00196	-.03597
.601	20150.7	9.08	3.72	.67246	.07867	.03774	.00456	.00214	-.03653
.601	20175.8	.88	3.74	.18760	.02192	.01706	.00060	.00079	-.02969

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 14

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22667.8	1.07	3.75	.20443	.02386	.01985	.00169	.00085	-.02971
.651	22625.3	-1.85	3.74	.00961	.02078	.00747	.00072	.00096	-.02860
.651	22640.0	-.40	3.75	.09761	.02122	.01716	.00188	.00074	-.02843
.651	22670.5	1.17	3.75	.21275	.02420	.01953	.00129	.00083	-.02976
.651	22657.6	2.74	3.75	.32616	.03022	.02107	.00067	.00104	-.03125
.651	22650.6	4.61	3.75	.42355	.03978	.01534	-.00038	.00135	-.03351
.651	22632.6	5.42	3.75	.47458	.04575	.01787	.00043	.00149	-.03439
.652	22685.7	6.89	3.75	.56102	.05922	.02831	.00346	.00146	-.03494
.651	22653.3	8.31	3.76	.63622	.07613	.03689	.00347	.00123	-.03467
.650	22609.8	1.14	3.75	.21632	.02412	.02042	.00145	.00081	-.02973

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 15

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.677	23940.6	1.27	3.76	.22702	.02602	.02291	.00238	.00086	-.02981
.675	23854.1	-1.83	3.75	.01696	.02199	.00712	.00121	.00093	-.02879
.676	23921.5	-.29	3.76	.10985	.02255	.01968	.00243	.00072	-.02884
.676	23913.1	1.35	3.76	.22988	.02634	.02309	.00235	.00084	-.03010
.676	23884.4	2.91	3.76	.33796	.03293	.02306	.00078	.00105	-.03155
.676	23884.7	4.35	3.76	.40309	.03983	.01620	-.00019	.00135	-.03372
.676	23902.9	5.55	3.76	.48075	.04889	.01866	.00115	.00143	-.03413
.676	23874.4	7.11	3.76	.57494	.06424	.02511	.00305	.00137	-.03520
.676	23910.3	7.86	3.77	.61270	.07572	.03008	.00262	.00119	-.03483
.677	23928.4	1.26	3.76	.22757	.02608	.02327	.00187	.00084	-.03002

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 16

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.626	21384.2	.98	3.75	.20275	.02281	.01798	.00114	.00077	-.02956
.626	21361.3	-1.93	3.74	.00109	.02023	.00610	.00059	.00089	-.02873
.626	21370.8	-.43	3.75	.09523	.02033	.01612	.00165	.00069	-.02888
.626	21366.8	1.03	3.75	.20215	.02298	.01856	.00088	.00078	-.02974
.627	21405.7	2.57	3.75	.31288	.02835	.01834	.00026	.00095	-.03107
.627	21385.1	3.79	3.75	.39012	.03397	.01773	-.00025	.00112	-.03241
.626	21361.3	4.15	3.75	.40234	.03553	.01570	-.00062	.00115	-.03301
.626	21339.5	5.15	3.74	.45999	.04177	.01652	.00038	.00134	-.03397
.625	21310.1	6.62	3.74	.54819	.05392	.02471	.00347	.00153	-.03493
.626	21345.7	7.98	3.75	.61713	.06793	.03669	.00555	.00174	-.03632
.626	21381.3	9.30	3.73	.68011	.08798	.04122	.00491	.00172	-.03524
.626	21343.6	.97	3.75	.20133	.02269	.01828	.00135	.00077	-.02947

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 17

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6054.7	.16	-4.26	.10954	.01851	.01282	.00285	-.00139	.03734
.300	6031.2	-1.97	-4.26	-.03163	.01850	.01138	.00048	-.00145	.03564
.301	6058.8	.19	-4.26	.11320	.01855	.01296	.00302	-.00138	.03753
.301	6051.0	2.37	-4.26	.26427	.02288	.01112	.00475	-.00146	.03943
.301	6052.5	4.66	-4.25	.42094	.03130	.00848	.00584	-.00172	.04126
.300	6035.3	6.75	-4.24	.55651	.04358	.00611	.00735	-.00225	.04346
.300	6022.1	8.94	-4.21	.69349	.06187	.00621	.00822	-.00295	.04515
.300	6031.5	11.27	-4.18	.83826	.08536	.00433	.00560	-.00375	.04713
.300	6021.5	13.31	-4.15	.95010	.11000	.00298	.00366	-.00425	.04958
.300	6038.4	15.49	-4.11	1.05170	.14306	-.00498	.00121	-.00556	.05189
.300	6016.3	16.51	-4.07	1.05527	.17854	-.00622	.01177	-.00445	.03583
.300	6018.0	.15	-4.26	.11391	.01861	.01277	.00350	-.00138	.03744

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 18

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.601	20132.1	.91	-4.36	.19770	.02201	.01565	.00388	-.00146	.03969
.601	20117.4	-1.89	-4.35	.00581	.01996	.00893	.00188	-.00156	.03761
.601	20149.9	-.51	-4.35	.09462	.01990	.01402	.00293	-.00150	.03845
.601	20123.2	.98	-4.36	.20137	.02223	.01572	.00395	-.00146	.03989
.602	20200.6	2.46	-4.36	.30800	.02696	.01582	.00524	-.00159	.04142
.601	20130.3	3.76	-4.35	.39145	.03257	.01576	.00680	-.00179	.04286
.601	20151.6	5.06	-4.34	.45870	.03932	.01448	.00762	-.00206	.04447
.602	20168.2	6.51	-4.33	.55221	.05095	.01902	.00672	-.00255	.04597
.601	20126.1	7.85	-4.32	.61871	.06410	.03108	.00355	-.00266	.04660
.601	20145.2	9.09	-4.33	.67871	.07974	.03689	.00083	-.00252	.04644
.602	20170.5	.96	-4.36	.20736	.02215	.01558	.00452	-.00147	.03983

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 19

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.627	21438.4	1.08	-4.37	.21982	.02324	.01678	.00435	-.00149	.03998
.626	21386.1	-1.86	-4.35	.01470	.02058	.00818	.00151	-.00161	.03770
.626	21387.6	-.38	-4.36	.10803	.02070	.01470	.00263	-.00151	.03884
.626	21396.1	1.09	-4.37	.21650	.02331	.01707	.00406	-.00151	.04013
.627	21472.5	2.64	-4.37	.32517	.02871	.01775	.00573	-.00168	.04182
.626	21410.8	3.42	-4.36	.37381	.03209	.01735	.00688	-.00179	.04268
.625	21380.6	4.29	-4.36	.41026	.03555	.01415	.00754	-.00195	.04396
.627	21447.7	5.23	-4.35	.47226	.04196	.01523	.00768	-.00222	.04501
.626	21404.2	6.79	-4.34	.56572	.05535	.02431	.00663	-.00257	.04629
.626	21430.1	8.05	-4.34	.62756	.06882	.03619	.00418	-.00244	.04621
.626	21388.5	9.33	-4.34	.68514	.08864	.04004	.00113	-.00193	.04509
.626	21424.6	1.08	-4.37	.21970	.02320	.01636	.00431	-.00150	.04006

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 20

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22677.3	1.23	-4.37	.23580	.02463	.01895	.00413	-.00153	.04018
.651	22653.0	-1.82	-4.36	.02115	.02141	.00747	.00159	-.00164	.03777
.652	22732.3	-.30	-4.37	.12156	.02171	.01639	.00276	-.00152	.03868
.651	22693.0	1.21	-4.38	.22891	.02469	.01764	.00421	-.00152	.04037
.651	22696.9	2.79	-4.37	.33789	.03061	.01932	.00662	-.00170	.04199
.651	22676.8	4.63	-4.36	.43096	.03923	.01567	.00839	-.00211	.04451
.651	22667.5	5.51	-4.35	.48731	.04586	.01754	.00825	-.00227	.04518
.652	22752.0	7.14	-4.34	.58435	.06109	.02926	.00690	-.00241	.04609
.650	22630.3	8.17	-4.35	.63888	.07419	.03519	.00660	-.00195	.04490
.651	22692.0	1.22	-4.38	.23621	.02451	.01816	.00460	-.00151	.04028

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 21

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.676	23953.2	1.39	-4.38	.25172	.02650	.02023	.00490	-.00154	.04044
.677	23961.3	-1.77	-4.37	.02772	.02249	.00767	.00165	-.00169	.03781
.674	23841.2	-.25	-4.38	.12655	.02273	.01737	.00201	-.00153	.03866
.677	23982.7	1.44	-4.38	.25105	.02686	.02040	.00472	-.00155	.04042
.676	23930.7	2.70	-4.38	.33616	.03178	.02063	.00678	-.00174	.04230
.676	23926.1	5.64	-4.36	.49165	.04910	.02028	.00758	-.00222	.04552
.676	23913.1	7.19	-4.36	.58453	.06639	.02713	.00485	-.00261	.04709
.676	23948.1	7.75	-4.37	.60818	.07558	.02990	.00378	-.00214	.04667
.676	23915.5	1.36	-4.38	.24698	.02634	.01972	.00487	-.00155	.04082

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 22

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6048.1	.15	-4.27	.09998	.01782	.00990	.00246	.00117	.02626
.300	6033.3	-1.96	-4.27	-.03635	.01756	.00861	.00035	.00120	.02458
.301	6055.3	.17	-4.27	.10428	.01776	.01004	.00270	.00119	.02660
.301	6066.6	2.35	-4.27	.25585	.02237	.00826	.00402	.00101	.02879
.300	6046.7	4.57	-4.26	.40785	.03066	.00521	.00535	.00065	.03131
.300	6039.2	6.73	-4.24	.54763	.04336	.00228	.00677	.00011	.03357
.299	6010.4	8.94	-4.22	.68565	.06172	.00238	.00738	-.00034	.03499
.300	6028.7	11.11	-4.19	.81977	.08377	.00099	.00537	-.00092	.03662
.300	6034.3	13.31	-4.17	.94213	.11014	-.00050	.00290	-.00137	.03924
.300	6040.8	15.53	-4.13	1.04820	.14269	-.00723	.00149	-.00248	.04196
.300	6018.1	16.53	-4.10	1.08943	.16076	-.01158	.00006	-.00352	.04339
.300	6032.7	17.15	-4.06	1.08229	.19108	-.01532	.01423	-.00183	.02206
.300	6039.0	.16	-4.27	.10749	.01776	.01088	.00241	.00115	.02671

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 23

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.601	20157.0	.87	-4.38	.18640	.02133	.01229	.00363	.00104	.02886
.600	20146.2	-1.93	-4.37	-.00375	.01914	.00359	.00163	.00104	.02601
.602	20217.9	-.50	-4.38	.08893	.01912	.01055	.00265	.00110	.02743
.601	20190.5	.93	-4.38	.19062	.02149	.01205	.00371	.00104	.02907
.601	20194.7	2.45	-4.38	.30169	.02654	.01227	.00490	.00082	.03106
.602	20213.4	3.80	-4.38	.39287	.03274	.01298	.00596	.00061	.03286
.601	20182.4	4.84	-4.37	.44072	.03762	.00898	.00639	.00042	.03418
.601	20165.7	5.25	-4.37	.46653	.04034	.00981	.00665	.00036	.03477
.600	20149.0	6.45	-4.36	.54352	.05008	.01400	.00622	-.00001	.03565
.601	20165.5	7.79	-4.35	.60976	.06288	.02641	.00386	-.00018	.03697
.601	20176.7	9.02	-4.36	.66688	.07762	.03440	.00047	-.00015	.03766
.600	20141.4	.88	-4.38	.19142	.02143	.01134	.00348	.00099	.02911

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 24

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.626	21441.4	1.02	-4.39	.20750	.02247	.01243	.00389	.00096	.02944
.626	21453.1	-1.93	-4.37	.00220	.01990	.00246	.00179	.00098	.02616
.626	21465.1	-.46	-4.38	.09481	.01990	.01066	.00271	.00104	.02763
.626	21467.2	1.04	-4.39	.20480	.02265	.01289	.00363	.00096	.02941
.626	21451.4	2.60	-4.39	.31699	.02822	.01351	.00512	.00075	.03130
.627	21509.5	3.65	-4.38	.38620	.03317	.01409	.00623	.00058	.03275
.626	21475.6	4.56	-4.38	.42179	.03693	.01003	.00659	.00044	.03422
.626	21458.8	5.18	-4.38	.46202	.04129	.01050	.00676	.00032	.03457
.625	21400.7	6.72	-4.36	.55682	.05429	.01803	.00649	-.00004	.03581
.625	21408.5	7.86	-4.36	.61074	.06571	.02966	.00446	-.00003	.03663
.626	21451.1	1.04	-4.39	.20961	.02256	.01285	.00370	.00094	.02950

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 25

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.652	22797.7	1.18	-4.40	.22295	.02399	.01407	.00383	.00090	.02983
.651	22731.0	-1.86	-4.38	.01187	.02064	.00288	.00142	.00092	.02636
.652	22768.0	-.36	-4.39	.10715	.02094	.01223	.00247	.00098	.02796
.651	22752.9	1.19	-4.40	.21937	.02405	.01422	.00415	.00091	.02970
.652	22768.9	2.78	-4.40	.33391	.03035	.01490	.00534	.00067	.03166
.652	22763.2	3.31	-4.39	.36711	.03299	.01582	.00645	.00062	.03221
.651	22726.5	4.25	-4.39	.40134	.03662	.01014	.00730	.00047	.03372
.651	22733.2	5.41	-4.38	.47776	.04496	.01117	.00781	.00025	.03449
.650	22702.4	6.92	-4.38	.56401	.05819	.02328	.00677	.00020	.03555
.651	22733.0	8.26	-4.38	.63978	.07531	.03204	.00663	.00058	.03528
.652	22775.0	1.14	-4.40	.22091	.02386	.01432	.00396	.00089	.02970

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 26

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.676	24013.5	1.28	-4.41	.23407	.02569	.01625	.00399	.00085	.03016
.676	23996.7	-1.81	-4.39	.02032	.02168	.00231	.00154	.00086	.02667
.676	23990.3	-.29	-4.40	.11566	.02210	.01322	.00257	.00090	.02810
.677	24076.1	1.34	-4.41	.23521	.02602	.01646	.00436	.00084	.02984
.678	24120.5	3.01	-4.40	.34992	.03332	.01709	.00665	.00064	.03189
.676	23985.5	4.25	-4.40	.39827	.03832	.00929	.00826	.00043	.03337
.676	23983.7	5.57	-4.39	.48131	.04825	.01436	.00647	.00026	.03467
.675	23950.0	7.18	-4.38	.57544	.06539	.02390	.00633	.00009	.03558
.675	23958.1	7.47	-4.38	.58959	.06953	.02447	.00542	.00005	.03584
.676	23977.8	1.31	-4.41	.23790	.02585	.01684	.00417	.00083	.02992

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 27

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6043.5	.14	3.61	.10046	.01710	.01005	.00119	-.00096	-.01964
.300	6034.1	-1.96	3.61	-.03870	.01669	.01038	.00211	-.00093	-.01902
.300	6040.5	.19	3.61	.10389	.01714	.01061	.00108	-.00096	-.01991
.300	6046.4	2.36	3.61	.25646	.02188	.00827	.00040	-.00081	-.02105
.300	6025.4	4.56	3.60	.40618	.03060	.00527	-.00037	-.00053	-.02298
.300	6039.0	6.72	3.59	.54728	.04350	.00263	-.00141	-.00021	-.02462
.300	6026.8	8.96	3.57	.68582	.06214	.00339	-.00103	.00032	-.02574
.300	6023.7	11.14	3.55	.81935	.08402	.00284	-.00029	.00090	-.02769
.300	6014.9	13.32	3.52	.93835	.11037	.00258	.00091	.00157	-.02966
.300	6032.6	15.52	3.48	1.04529	.14365	-.00640	-.00364	.00194	-.02683
.300	6032.5	16.55	3.46	1.08787	.16465	-.01565	-.00544	.00145	-.02368
.300	6023.4	17.07	3.44	1.07186	.19396	-.02004	-.01521	-.00104	-.00519
.300	6034.2	.15	3.61	.10319	.01705	.01045	.00095	-.00097	-.02005

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 28

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.601	20152.5	.83	3.69	.18122	.02069	.01158	.00047	-.00089	-.02149
.602	20188.4	-1.96	3.69	-.00787	.01837	.00236	.00022	-.00086	-.02054
.600	20122.6	-.57	3.69	.07947	.01828	.00959	.00099	-.00092	-.02076
.601	20175.4	.91	3.69	.18775	.02088	.01223	.00070	-.00089	-.02170
.602	20183.1	2.41	3.69	.29810	.02584	.01173	-.00038	-.00078	-.02257
.601	20164.5	3.78	3.69	.39138	.03218	.01231	-.00064	-.00064	-.02380
.601	20139.6	5.02	3.69	.45814	.03924	.01059	-.00064	-.00041	-.02558
.600	20117.0	6.42	3.68	.53846	.04998	.01510	.00110	.00000	-.02698
.601	20142.4	7.79	3.68	.61300	.06318	.02675	.00337	.00044	-.02863
.601	20139.5	9.08	3.67	.67237	.07898	.03477	.00419	.00040	-.02832
.601	20153.5	.87	3.69	.19024	.02084	.01171	.00066	-.00090	-.02177

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 29

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.626	21426.9	1.00	3.70	.20372	.02193	.01247	.00025	-.00088	-.02207
.625	21398.0	-1.92	3.69	.00104	.01895	.00180	.00006	-.00086	-.02078
.626	21447.4	-.50	3.70	.08984	.01921	.01004	.00109	-.00091	-.02109
.626	21450.1	1.01	3.70	.20049	.02202	.01227	.00097	-.00088	-.02201
.627	21456.7	2.58	3.70	.31528	.02760	.01324	-.00011	-.00075	-.02289
.626	21416.1	3.79	3.70	.39433	.03345	.01328	-.00082	-.00063	-.02405
.626	21437.1	4.66	3.70	.43452	.03826	.01101	-.00106	-.00053	-.02555
.626	21440.5	5.18	3.70	.46404	.04177	.01098	-.00083	-.00039	-.02577
.626	21418.5	6.67	3.69	.55319	.05422	.02003	.00245	.00010	-.02765
.625	21358.1	8.04	3.70	.62064	.06818	.03239	.00445	.00018	-.02859
.626	21455.4	9.17	3.69	.67329	.08508	.03781	.00415	-.00010	-.02740
.625	21396.4	.98	3.70	.20188	.02194	.01288	.00085	-.00088	-.02199

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 30

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22688.0	1.12	3.71	.21729	.02327	.01476	.00109	-.00084	-.02245
.651	22700.0	-1.89	3.70	.00986	.01970	.00171	.00049	-.00083	-.02109
.650	22662.2	-.42	3.71	.09937	.02011	.01127	.00141	-.00088	-.02164
.653	22793.1	1.15	3.71	.21382	.02352	.01465	.00096	-.00084	-.02250
.651	22706.8	2.74	3.71	.32949	.02965	.01500	-.00023	-.00073	-.02339
.651	22696.9	3.40	3.71	.37353	.03287	.01500	-.00071	-.00068	-.02393
.651	22701.0	4.75	3.71	.43578	.04018	.01141	-.00089	-.00045	-.02560
.651	22721.6	5.37	3.70	.47334	.04478	.01280	-.00044	-.00029	-.02608
.651	22700.9	6.90	3.71	.56581	.05824	.02242	.00256	-.00008	-.02776
.651	22722.1	8.28	3.71	.63736	.07554	.03355	.00256	-.00047	-.02725
.651	22680.5	1.12	3.71	.21731	.02328	.01461	.00100	-.00085	-.02248

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 31

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.677	24003.9	1.25	3.72	.22858	.02511	.01732	.00154	-.00078	-.02277
.675	23892.7	-1.84	3.71	.01801	.02068	.00164	.00082	-.00078	-.02122
.677	24005.6	-.34	3.71	.10738	.02147	.01413	.00214	-.00080	-.02201
.675	23919.5	1.27	3.72	.22537	.02520	.01733	.00139	-.00080	-.02286
.675	23926.0	2.90	3.72	.34158	.03210	.01752	.00008	-.00070	-.02373
.677	23993.1	3.36	3.72	.36850	.03448	.01679	-.00036	-.00065	-.02399
.676	23929.5	4.18	3.72	.39966	.03830	.01063	-.00100	-.00052	-.02527
.676	23959.8	5.58	3.71	.48659	.04837	.01306	.00056	-.00027	-.02629
.676	23970.0	7.18	3.71	.58666	.06461	.02036	.00184	-.00015	-.02751
.676	23971.8	7.77	3.72	.61623	.07379	.02437	.00148	-.00035	-.02750
.676	23951.5	1.21	3.72	.22417	.02499	.01718	.00118	-.00079	-.02274

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 32

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6029.6	.13	3.58	.09607	.01310	.00087	-.00101	-.00013	-.00580
.300	6017.7	-1.98	3.58	-.04024	.01349	.00664	.00048	-.00013	-.00588
.300	6033.1	.16	3.58	.09846	.01315	.00067	-.00066	-.00012	-.00585
.301	6066.5	2.36	3.58	.24598	.01636	-.00442	-.00164	.00006	-.00631
.301	6057.2	4.51	3.57	.38619	.02272	-.00995	-.00208	.00040	-.00742
.300	6038.6	6.69	3.56	.52426	.03274	-.01793	-.00275	.00070	-.00802
.300	6022.1	8.84	3.55	.63133	.04725	-.00984	.00165	.00095	-.00979
.300	6017.4	11.02	3.53	.77713	.06777	-.01886	.00213	.00151	-.01146
.300	6011.8	13.22	3.49	.93167	.09459	-.04120	-.00087	.00236	-.01210
.300	6019.1	15.45	3.46	1.06682	.12687	-.05639	-.00364	.00271	-.01251
.299	6001.6	16.49	3.44	1.12755	.14487	-.06426	-.00376	.00257	-.01322
.301	6048.6	.14	3.58	.10139	.01319	.00099	-.00039	-.00013	-.00566

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 33

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.602	20202.4	.68	3.60	.14393	.01650	.01262	.00021	.00012	-.00673
.600	20088.1	-2.01	3.60	-.01582	.01519	.00013	-.00149	.00000	-.00612
.601	20148.7	-.65	3.60	.05785	.01490	.01039	-.00061	.00000	-.00638
.602	20197.9	.70	3.60	.14518	.01653	.01274	.00065	.00012	-.00675
.602	20178.6	2.16	3.60	.24623	.01995	.01004	.00057	.00028	-.00730
.603	20231.0	3.54	3.60	.34182	.02472	.00622	.00048	.00044	-.00793
.601	20161.2	4.81	3.59	.41451	.02996	-.00095	-.00051	.00056	-.00915
.601	20143.6	6.15	3.58	.50198	.03779	-.00753	-.00178	.00076	-.00906
.600	20115.4	7.48	3.58	.57489	.04746	-.00062	.00206	.00106	-.01052
.601	20121.1	8.71	3.59	.62783	.05940	.00848	.00511	.00095	-.01175

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 34

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.626	21414.0	.74	3.60	.15166	.01750	.01523	.00101	.00016	-.00685
.627	21443.2	-1.98	3.60	-.01037	.01595	.00012	-.00127	.00002	-.00635
.626	21436.7	-.64	3.60	.05882	.01580	.01324	.00057	.00006	-.00639
.625	21382.0	.82	3.60	.15385	.01765	.01531	.00070	.00015	-.00693
.626	21410.3	2.26	3.60	.25344	.02130	.01268	.00118	.00031	-.00750
.626	21444.7	3.65	3.60	.35025	.02633	.00841	.00114	.00047	-.00821
.626	21405.9	4.88	3.60	.41658	.03153	.00032	-.00025	.00057	-.00951
.626	21439.7	6.34	3.58	.50991	.04030	-.00611	-.00189	.00081	-.00915
.626	21432.3	7.74	3.58	.59209	.05070	.00149	.00086	.00089	-.00997
.627	21462.2	8.99	3.60	.65194	.06615	.00482	.00081	-.00033	-.00799
.627	21446.2	.77	3.60	.15450	.01753	.01522	.00098	.00015	-.00683

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 35

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22691.3	.84	3.60	.15716	.01874	.01895	.00148	.00022	-.00714
.650	22628.0	-1.95	3.60	-.00569	.01670	.00284	-.00077	.00009	-.00640
.651	22677.1	-.61	3.60	.05852	.01680	.01731	.00152	.00013	-.00669
.651	22692.2	.85	3.61	.15499	.01881	.01949	.00187	.00023	-.00729
.652	22736.7	2.39	3.60	.26421	.02293	.01643	.00205	.00036	-.00785
.651	22711.4	3.78	3.60	.35701	.02812	.01074	.00133	.00048	-.00852
.650	22659.3	5.06	3.60	.42546	.03367	.00097	-.00121	.00059	-.00955
.651	22699.3	6.58	3.58	.53076	.04253	-.00964	-.00446	.00061	-.00830
.651	22683.7	8.00	3.58	.61735	.05492	-.00645	-.00399	.00016	-.00771
.650	22620.1	8.76	3.60	.64625	.06702	-.00167	-.00352	-.00068	-.00687
.651	22694.9	.82	3.61	.15563	.01868	.01911	.00218	.00023	-.00732

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 36

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.676	23920.3	.90	3.61	.15965	.02022	.02268	.00273	.00031	-.00763
.675	23911.0	-1.96	3.60	-.00671	.01802	.00626	.00021	.00019	-.00660
.677	24001.4	-.58	3.60	.05685	.01824	.02175	.00248	.00024	-.00702
.677	24008.7	.93	3.61	.15805	.02034	.02332	.00262	.00030	-.00765
.677	23989.7	2.54	3.61	.27461	.02515	.01863	.00274	.00042	-.00805
.676	23946.3	3.82	3.60	.35772	.03016	.01136	.00091	.00048	-.00859
.675	23918.7	5.20	3.60	.43049	.03540	-.00067	-.00235	.00045	-.00889
.676	23924.9	6.72	3.59	.52444	.04537	-.00589	-.00141	.00082	-.01003
.674	23855.5	8.65	3.59	.61431	.07720	-.00707	-.00061	.00077	-.01133
.677	23974.1	.90	3.61	.16082	.02024	.02254	.00284	.00031	-.00755

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 37

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6059.7	.14	-4.11	.09338	.01369	.00205	.00434	.00003	.00786
.301	6047.8	-1.99	-4.10	-.04688	.01446	.00425	.00208	.00008	.00729
.300	6027.6	.16	-4.11	.09334	.01372	.00209	.00405	.00002	.00789
.301	6048.4	2.38	-4.10	.23890	.01669	-.00299	.00511	-.00023	.00882
.301	6063.4	4.51	-4.09	.37979	.02211	-.00752	.00608	-.00063	.01025
.301	6047.7	6.67	-4.08	.51857	.03164	-.01675	.00721	-.00108	.01134
.300	6039.5	8.87	-4.05	.64031	.04685	-.01434	.00714	-.00127	.01114
.300	6027.9	11.06	-4.04	.78011	.06739	-.02535	.00211	-.00168	.01414
.300	6022.4	13.27	-4.00	.93719	.09470	-.04786	.00135	-.00284	.01699
.300	6041.2	15.48	-3.97	1.07727	.12750	-.06762	-.00143	-.00367	.02118
.300	6015.0	16.28	-3.93	1.03452	.15850	-.06609	.01476	-.00112	.00098
.300	6015.7	.12	-4.11	.09407	.01362	.00215	.00377	.00004	.00810

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 38

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.601	20141.6	.63	-4.13	.13359	.01727	.01330	.00220	-.00038	.00946
.604	20267.4	-2.00	-4.12	-.01932	.01652	.00188	.00135	-.00021	.00811
.603	20227.8	-.65	-4.13	.05047	.01604	.01205	.00083	-.00030	.00881
.602	20199.6	.70	-4.13	.13782	.01734	.01422	.00190	-.00039	.00965
.602	20200.7	2.23	-4.12	.24455	.02074	.01206	.00325	-.00060	.01080
.602	20171.6	3.53	-4.12	.33928	.02517	.00729	.00434	-.00082	.01185
.601	20157.5	4.23	-4.11	.38301	.02788	.00340	.00500	-.00095	.01248
.601	20155.9	4.77	-4.11	.40682	.02944	-.00110	.00567	-.00102	.01329
.601	20135.0	6.22	-4.09	.50104	.03762	-.00663	.00727	-.00133	.01353
.600	20091.2	7.58	-4.08	.58204	.04826	-.00372	.00917	-.00133	.01266
.601	20115.8	8.85	-4.08	.63977	.06027	.00757	.00707	-.00117	.01286
.601	20154.0	.68	-4.13	.14123	.01735	.01418	.00224	-.00040	.00980

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 39

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.626	21521.6	.70	-4.13	.13619	.01822	.01654	.00192	-.00044	.00980
.626	21544.7	-1.99	-4.12	-.01915	.01713	.00254	.00093	-.00027	.00824
.626	21538.8	-.64	-4.13	.04780	.01677	.01380	.00020	-.00038	.00889
.625	21493.8	.75	-4.13	.13800	.01828	.01579	.00164	-.00045	.00984
.626	21531.7	2.31	-4.13	.25043	.02212	.01474	.00279	-.00067	.01121
.626	21526.0	3.72	-4.12	.35172	.02741	.00876	.00388	-.00092	.01233
.626	21502.2	4.29	-4.12	.38869	.02960	.00549	.00453	-.00102	.01295
.626	21533.6	5.00	-4.11	.41737	.03195	-.00051	.00532	-.00114	.01384
.627	21560.0	6.38	-4.09	.50684	.04075	-.00623	.00717	-.00146	.01412
.626	21549.3	7.84	-4.08	.59425	.05282	-.00150	.01036	-.00116	.01245
.627	21566.7	9.15	-4.09	.65998	.06822	.00293	.00923	-.00011	.01116
.626	21534.9	.74	-4.13	.14279	.01840	.01645	.00195	-.00047	.01003

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 40

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22787.7	.83	-4.13	.14950	.01964	.02017	.00130	-.00055	.01045
.651	22789.1	-1.98	-4.12	-.01711	.01817	.00402	.00011	-.00040	.00863
.651	22818.0	-.62	-4.13	.04736	.01799	.01727	.00004	-.00049	.00935
.651	22810.4	.85	-4.13	.14578	.01971	.02008	.00114	-.00056	.01033
.652	22840.2	2.44	-4.13	.26088	.02405	.01697	.00269	-.00076	.01170
.651	22814.7	3.88	-4.12	.36201	.02957	.01119	.00390	-.00103	.01288
.652	22867.4	4.05	-4.12	.37267	.03026	.01035	.00460	-.00103	.01300
.651	22816.3	5.07	-4.11	.41437	.03359	.00098	.00570	-.00125	.01425
.651	22784.7	6.64	-4.09	.52978	.04329	-.00954	.00983	-.00123	.01334
.651	22818.1	8.04	-4.09	.60094	.05638	-.00007	.00981	-.00069	.01247
.651	22815.3	8.92	-4.10	.63540	.07121	.00064	.00771	-.00037	.01338
.651	22813.6	.82	-4.13	.14813	.01965	.01924	.00159	-.00057	.01048

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 41

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.677	24108.2	.91	-4.13	.15351	.02128	.02311	.00070	-.00066	.01073
.676	24079.4	-1.99	-4.12	-.01859	.01956	.00574	-.00129	-.00055	.00882
.676	24071.7	-.60	-4.13	.04698	.01933	.02106	-.00105	-.00061	.00965
.677	24101.3	.95	-4.13	.15423	.02135	.02369	.00115	-.00065	.01068
.676	24088.7	2.59	-4.13	.27392	.02619	.01944	.00216	-.00086	.01206
.677	24106.0	3.95	-4.12	.36114	.03155	.01288	.00395	-.00105	.01319
.676	24072.7	4.79	-4.12	.38691	.03366	.00495	.00492	-.00117	.01416
.676	24097.3	5.14	-4.11	.40648	.03534	.00319	.00550	-.00122	.01418
.676	24083.4	6.69	-4.10	.50990	.04635	-.00471	.00518	-.00157	.01565
.676	24057.3	8.10	-4.11	.58538	.06548	-.00411	.00482	-.00145	.01715
.676	24059.9	8.60	-4.09	.60277	.07619	-.00456	.00451	-.00198	.01844
.675	24036.0	.90	-4.13	.15443	.02113	.02302	.00140	-.00065	.01081

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 42

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6040.8	.13	-.00	.09776	.01419	.00101	.00157	-.00006	.00083
.300	6067.5	-1.98	-.00	-.04438	.01497	.00578	.00109	-.00001	.00050
.300	6068.8	-.89	-.00	.02676	.01410	.00309	.00173	-.00003	.00061
.301	6080.1	.18	-.00	.10040	.01422	.00043	.00141	-.00005	.00085
.300	6073.2	2.34	-.00	.24461	.01674	-.00497	.00160	-.00005	.00120
.301	6081.6	4.52	-.00	.39057	.02287	-.01034	.00172	-.00010	.00138
.300	6063.4	6.67	.00	.52787	.03281	-.01962	.00155	-.00018	.00181
.300	6049.6	8.88	.00	.64080	.04807	-.01093	.00401	-.00013	.00100
.300	6057.2	11.07	.00	.79132	.06955	-.02396	.00312	-.00003	.00114
.300	6059.2	13.29	-.00	.95603	.09731	-.04720	.00113	-.00014	.00258
.300	6051.8	15.48	-.00	1.09058	.12800	-.06112	-.00101	-.00024	.00399
.300	6075.1	16.55	-.01	1.14402	.14508	-.06809	-.00201	-.00029	.00438
.300	6054.7	.14	-.00	.10078	.01422	.00011	.00183	-.00003	.00094

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 43

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.602	20296.0	.70	-.00	.14885	.01760	.01104	.00134	-.00009	.00134
.601	20264.6	-1.99	-.00	-.01500	.01675	.00006	.00032	-.00006	.00064
.601	20271.9	-.63	-.00	.06092	.01617	.00862	.00097	-.00010	.00090
.601	20241.3	.75	-.00	.15135	.01767	.00998	.00125	-.00011	.00117
.601	20233.9	2.21	-.00	.25440	.02103	.00883	.00236	-.00011	.00151
.601	20244.2	3.56	-.00	.35013	.02538	.00369	.00200	-.00019	.00185
.601	20254.9	4.20	-.00	.39055	.02778	-.00007	.00222	-.00020	.00191
.600	20221.8	4.79	.00	.41826	.03019	-.00575	.00163	-.00025	.00194
.601	20261.1	6.19	.00	.50797	.03871	-.01110	.00203	-.00030	.00239
.600	20217.8	7.55	.01	.58661	.04918	-.00413	.00499	-.00020	.00124
.603	20380.8	8.88	.01	.65053	.06194	.00624	.00468	-.00021	.00127
.601	20272.1	.72	-.00	.15549	.01769	.01018	.00140	-.00011	.00131

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 44

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.627	21573.0	.81	-.00	.16157	.01868	.01347	.00115	-.00013	.00133
.625	21507.2	-1.95	-.00	-.00864	.01738	.00076	.00038	-.00009	.00069
.626	21527.3	-.61	-.00	.06274	.01704	.01093	.00103	-.00012	.00102
.627	21584.1	.84	-.00	.16043	.01879	.01274	.00189	-.00011	.00122
.626	21551.5	2.36	-.00	.26867	.02256	.01086	.00227	-.00015	.00174
.626	21526.4	3.73	-.00	.36195	.02723	.00473	.00202	-.00022	.00201
.626	21550.9	4.89	.00	.41730	.03185	-.00540	.00236	-.00027	.00211
.626	21555.8	6.38	.00	.51558	.04141	-.00959	.00229	-.00036	.00243
.627	21572.6	7.80	.01	.60061	.05229	-.00236	.00539	-.00023	.00114
.626	21534.3	9.08	.02	.65868	.06859	.00417	.00484	-.00061	.00188
.626	21553.5	.81	-.00	.16074	.01871	.01336	.00171	-.00012	.00135

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 45

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22798.1	.91	-.00	.16937	.01997	.01645	.00195	-.00012	.00140
.652	22860.3	-1.94	-.00	-.00576	.01838	.00213	.00000	-.00009	.00076
.651	22834.5	-.55	-.00	.06711	.01811	.01585	.00073	-.00013	.00107
.651	22840.4	.92	-.00	.16573	.02007	.01707	.00189	-.00012	.00136
.651	22819.8	2.50	-.00	.27953	.02436	.01289	.00236	-.00016	.00181
.651	22816.0	3.45	-.00	.34313	.02774	.00903	.00248	-.00019	.00202
.651	22821.1	4.81	.00	.40445	.03273	-.00252	.00222	-.00032	.00229
.651	22812.6	5.03	.00	.41939	.03406	-.00455	.00231	-.00034	.00246
.651	22798.2	6.55	.00	.52411	.04323	-.00936	.00294	-.00024	.00195
.651	22818.2	8.04	.01	.62160	.05479	-.00716	.00351	-.00021	.00167
.650	22794.3	8.56	.02	.64552	.06350	-.00506	.00236	-.00075	.00305
.651	22800.2	.90	-.00	.16875	.01992	.01671	.00171	-.00013	.00138

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 46

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.676	24108.1	.99	-.00	.17318	.02172	.01994	.00212	-.00013	.00135
.676	24074.9	-1.94	-.00	-.00521	.01958	.00460	-.00009	-.00011	.00084
.675	24052.7	-.55	-.00	.06298	.01953	.01858	.00124	-.00012	.00103
.676	24089.9	1.04	-.00	.17354	.02179	.02029	.00219	-.00012	.00133
.676	24084.0	2.60	-.00	.28520	.02645	.01523	.00271	-.00016	.00169
.676	24106.3	3.43	.00	.33656	.02958	.01086	.00248	-.00024	.00201
.676	24079.6	4.31	.00	.36582	.03169	.00005	.00220	-.00032	.00211
.676	24094.7	5.20	.00	.42884	.03595	-.00444	.00267	-.00027	.00207
.676	24080.7	6.76	.00	.53439	.04534	-.00998	.00182	-.00036	.00242
.677	24111.3	8.16	.02	.60659	.06606	-.00680	.00112	-.00099	.00398
.675	24045.9	8.44	.01	.61470	.07260	-.00755	.00160	-.00082	.00353
.676	24061.3	.98	-.00	.17317	.02166	.01954	.00222	-.00013	.00132
.016	19.2	.00	.00	1.06014	.06338	.00379	.03240	-.04148	.16811

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 47

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.300	6058.6	.17	-.00	.11520	.01843	.00846	.00180	.00010	.00236
.300	6047.6	-2.01	-.00	-.03096	.01851	.00768	.00274	.00014	.00210
.301	6088.8	.22	-.00	.11915	.01841	.00880	.00191	.00010	.00223
.300	6046.7	2.37	-.00	.26891	.02242	.00727	.00220	.00011	.00242
.301	6081.0	4.56	-.00	.42061	.03097	.00438	.00209	.00002	.00219
.300	6075.0	6.75	-.00	.56096	.04383	.00095	.00248	.00002	.00259
.300	6055.4	9.00	-.00	.70308	.06318	.00271	.00272	.00002	.00263
.300	6054.0	11.17	-.00	.83641	.08478	.00243	.00236	.00013	.00218
.300	6048.6	13.35	-.00	.95864	.11079	.00185	.00091	.00025	.00304
.301	6077.5	15.52	-.00	1.06151	.14392	-.01029	-.00074	-.00030	.00529
.300	6042.5	16.54	-.00	1.10374	.16191	-.01829	-.00113	-.00043	.00503
.300	6071.3	.16	-.00	.11450	.01844	.00831	.00191	.00011	.00242

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 48

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.500	15083.6	.55	-.01	.15988	.01975	.00893	.00198	.00006	.00222
.499	15033.0	-1.96	-.01	-.00990	.01875	.00493	.00123	.00006	.00175
.501	15148.9	.61	-.01	.16445	.01995	.00887	.00206	.00006	.00227
.502	15190.7	3.20	-.01	.35248	.02732	.00848	.00223	.00001	.00265
.501	15156.7	5.77	-.01	.52011	.04140	.00454	.00258	.00000	.00266
.500	15111.1	8.27	-.00	.67384	.06283	.01138	.00337	.00011	.00211
.500	15104.1	10.72	-.01	.78969	.08995	.02333	.00148	.00017	.00253
.501	15117.7	12.41	-.02	.87320	.12048	.01375	-.00121	.00005	.00480
.501	15123.3	.58	-.01	.16565	.01984	.00835	.00231	.00006	.00237

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 49

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.602	20288.1	.94	-.01	.20606	.02239	.01095	.00172	.00002	.00215
.601	20274.6	-1.90	-.01	.00850	.02008	.00152	.00126	.00006	.00177
.601	20255.5	-.48	-.01	.09878	.01999	.00766	.00155	.00003	.00185
.602	20309.8	.99	-.01	.20804	.02259	.01095	.00160	.00002	.00221
.601	20258.7	2.48	-.01	.31402	.02736	.01134	.00238	-.00001	.00239
.601	20265.9	3.83	-.01	.40631	.03308	.00997	.00246	-.00005	.00257
.602	20279.3	4.44	-.01	.43670	.03609	.00727	.00265	-.00007	.00259
.601	20266.3	5.10	-.01	.47552	.04038	.00564	.00273	-.00008	.00264
.602	20287.2	6.56	-.00	.56487	.05234	.01393	.00377	-.00002	.00228
.602	20320.4	7.92	-.00	.63784	.06580	.02693	.00370	.00004	.00211
.601	20241.6	9.20	-.01	.69294	.08052	.03546	.00252	.00004	.00263
.601	20269.2	.95	-.01	.20674	.02251	.01027	.00183	.00002	.00224

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 50

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.626	21541.9	1.08	-.01	.22177	.02360	.01140	.00205	.00003	.00242
.626	21555.3	-1.84	-.01	.01917	.02068	.00100	.00105	.00003	.00143
.626	21553.2	-.39	-.01	.11237	.02080	.00918	.00160	.00002	.00187
.626	21551.6	1.14	-.01	.22127	.02381	.01163	.00224	.00003	.00230
.627	21578.9	2.66	-.01	.33278	.02921	.01217	.00258	-.00002	.00242
.626	21519.5	3.60	-.01	.39514	.03320	.01142	.00283	-.00004	.00260
.626	21541.4	4.23	-.01	.42156	.03601	.00811	.00274	-.00008	.00248
.626	21550.1	5.32	-.01	.48932	.04359	.00669	.00302	-.00007	.00276
.626	21535.0	6.81	-.00	.57612	.05646	.01912	.00418	-.00003	.00215
.626	21551.4	8.17	.00	.64508	.07045	.03347	.00397	-.00001	.00215
.626	21561.2	9.44	-.00	.69487	.09146	.03990	.00238	-.00021	.00322
.627	21575.5	1.10	-.01	.22445	.02363	.01177	.00232	.00003	.00227

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 51

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.652	22842.2	1.26	-.01	.24125	.02511	.01390	.00223	.00002	.00236
.652	22847.4	-1.87	-.01	.02101	.02150	-.00044	.00125	.00005	.00165
.651	22809.8	-.31	-.01	.12218	.02169	.00984	.00172	.00001	.00178
.652	22859.5	1.25	-.01	.23501	.02520	.01330	.00222	.00001	.00223
.651	22829.5	2.83	-.01	.34815	.03130	.01382	.00295	.00000	.00253
.651	22820.0	3.41	-.01	.38253	.03374	.01202	.00270	-.00005	.00240
.649	22704.6	3.83	-.01	.39819	.03517	.00884	.00306	-.00006	.00237
.651	22811.1	4.03	-.00	.40386	.03627	.00788	.00339	-.00006	.00227
.652	22878.5	5.53	-.00	.50440	.04733	.01002	.00358	-.00005	.00247
.651	22824.0	7.07	.00	.59504	.06082	.02319	.00425	-.00000	.00205
.651	22825.5	8.16	.00	.65632	.07333	.02920	.00434	-.00017	.00267
.652	22872.0	1.23	-.01	.23894	.02518	.01388	.00239	.00002	.00229

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 52

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.676	24063.6	1.36	-.01	.24831	.02692	.01536	.00237	.00003	.00226
.677	24128.6	-1.76	-.01	.03501	.02251	.00097	.00115	.00003	.00147
.676	24053.9	-.23	-.01	.13042	.02303	.01152	.00188	.00002	.00198
.676	24097.2	1.42	-.01	.25069	.02718	.01523	.00274	.00003	.00222
.677	24124.0	2.99	-.01	.35730	.03382	.01398	.00303	-.00001	.00251
.675	24049.4	3.99	-.01	.39653	.03797	.00732	.00395	-.00000	.00230
.676	24100.0	4.15	-.01	.40558	.03907	.00675	.00340	-.00003	.00235
.677	24119.0	5.72	-.01	.50981	.05038	.01351	.00306	-.00007	.00278
.676	24079.5	7.32	-.00	.61157	.06683	.02263	.00343	-.00012	.00277
.675	24014.5	8.23	.00	.65541	.08337	.02665	.00317	-.00032	.00333
.676	24090.6	1.37	-.01	.25171	.02698	.01522	.00262	.00002	.00219

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 53

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.301	6080.7	.15	-.00	.10050	.01964	.01231	.00258	-.00035	.00364
.300	6058.2	-1.98	-.00	-.04247	.01975	.01261	.00187	-.00032	.00368
.300	6073.9	.21	-.00	.10634	.01963	.01285	.00188	-.00032	.00362
.301	6106.7	2.37	-.00	.25713	.02368	.01074	.00226	-.00033	.00387
.301	6090.1	4.55	-.00	.40647	.03204	.00761	.00226	-.00033	.00345
.300	6075.4	6.73	.00	.55023	.04476	.00512	.00237	-.00041	.00365
.300	6055.3	8.95	.00	.69051	.06373	.00623	.00258	-.00037	.00364
.300	6069.0	11.14	.00	.82538	.08575	.00572	.00260	-.00037	.00378
.301	6083.4	13.34	-.00	.95233	.11179	.00563	.00129	-.00007	.00399
.300	6052.7	15.52	-.00	1.05680	.14466	-.00480	-.00048	-.00032	.00518
.300	6050.4	16.55	-.00	1.09979	.16293	-.01414	-.00084	-.00048	.00434
.299	6030.7	17.58	-.00	1.13623	.18299	-.02106	-.00088	-.00059	.00488
.300	6048.4	.15	-.00	.10390	.01970	.01239	.00220	-.00035	.00372

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 54

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.500	14959.2	.46	-.00	.13165	.02093	.01270	.00197	-.00039	.00346
.500	14963.8	-2.00	-.00	-.03290	.02022	.00747	.00132	-.00036	.00307
.501	14994.2	.50	-.00	.13383	.02102	.01260	.00180	-.00038	.00344
.501	15002.4	3.09	-.00	.32469	.02821	.01268	.00204	-.00036	.00366
.500	14962.4	5.61	-.00	.49375	.04107	.01007	.00259	-.00038	.00348
.500	14972.9	6.87	.00	.57212	.05081	.01070	.00214	-.00041	.00362
.500	14947.2	8.10	-.00	.64838	.06203	.01292	.00274	-.00036	.00397
.500	14974.9	10.57	-.00	.76890	.08883	.02584	.00237	-.00007	.00302
.501	15000.3	11.80	-.01	.83226	.10620	.02283	-.00072	-.00015	.00377
.500	14946.3	12.60	-.03	.86572	.12614	.01555	-.00031	.00072	.00385
.501	15015.3	.48	-.00	.13982	.02106	.01325	.00190	-.00039	.00349

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 55

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.601	20061.2	.80	-.01	.17275	.02332	.01468	.00167	-.00032	.00326
.602	20105.9	-1.97	-.00	-.01447	.02158	.00520	.00128	-.00030	.00273
.601	20065.0	-.56	-.00	.07191	.02131	.01170	.00141	-.00035	.00301
.601	20076.5	.87	-.00	.17671	.02347	.01468	.00154	-.00034	.00316
.601	20085.6	2.38	-.00	.28956	.02825	.01660	.00197	-.00037	.00339
.602	20140.0	3.74	-.00	.38513	.03419	.01497	.00230	-.00039	.00369
.602	20114.3	4.40	-.00	.42379	.03722	.01385	.00226	-.00041	.00332
.601	20072.5	5.06	.00	.45815	.04096	.01117	.00266	-.00042	.00330
.601	20058.7	6.40	.00	.53835	.05172	.01518	.00318	-.00039	.00356
.602	20117.7	7.76	.00	.61004	.06505	.02760	.00350	-.00043	.00347
.602	20120.6	9.04	-.00	.66915	.07949	.03746	.00293	-.00017	.00343
.599	19993.7	.82	-.00	.17733	.02326	.01464	.00159	-.00035	.00325

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 56

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.625	21317.0	.94	-.00	.19029	.02431	.01573	.00205	-.00034	.00314
.626	21327.5	-1.95	-.00	-.00702	.02203	.00397	.00124	-.00031	.00271
.626	21357.3	-.50	-.01	.08297	.02187	.01212	.00182	-.00034	.00317
.627	21377.9	.96	-.00	.18854	.02438	.01571	.00187	-.00034	.00314
.626	21370.6	2.54	-.00	.30471	.02984	.01706	.00207	-.00038	.00366
.626	21337.9	3.90	-.00	.39764	.03596	.01551	.00295	-.00039	.00369
.626	21361.8	4.73	.00	.43512	.04004	.01138	.00312	-.00043	.00339
.626	21357.6	5.14	.00	.45993	.04283	.01086	.00325	-.00041	.00344
.626	21331.2	6.63	.01	.55003	.05555	.02006	.00411	-.00051	.00383
.627	21394.6	8.03	.01	.62324	.07002	.03354	.00363	-.00045	.00344
.626	21333.9	9.26	.01	.67394	.08617	.04137	.00327	-.00043	.00360
.627	21389.0	.94	-.01	.19101	.02436	.01565	.00215	-.00033	.00335
.651	22588.7	1.07	-.01	.20555	.02560	.01738	.00224	-.00031	.00319

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 57

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.651	22630.3	1.07	-.00	.20531	.02560	.01733	.00178	-.00034	.00322
.650	22544.5	-1.92	-.01	-.00016	.02273	.00346	.00099	-.00028	.00259
.651	22614.1	-.45	-.00	.08980	.02273	.01251	.00150	-.00034	.00293
.651	22618.4	1.09	-.00	.20175	.02564	.01733	.00196	-.00032	.00306
.651	22619.4	2.67	-.00	.31874	.03166	.01853	.00264	-.00037	.00365
.651	22616.8	3.75	-.00	.38579	.03646	.01630	.00258	-.00043	.00347
.651	22609.8	4.19	.00	.40134	.03816	.01307	.00292	-.00045	.00313
.648	22463.7	5.29	.00	.46816	.04568	.01151	.00317	-.00044	.00345
.650	22554.1	6.88	.01	.56146	.05988	.02406	.00422	-.00051	.00363
.650	22561.7	8.28	.01	.64187	.07520	.03316	.00463	-.00057	.00366
.650	22582.2	8.75	.01	.66475	.08312	.03560	.00384	-.00062	.00397
.651	22633.5	1.09	-.00	.20722	.02565	.01783	.00205	-.00035	.00314

NASA LANGLEY 7 X 10 HIGH SPEED TUNNEL

14 RUN 58

MACH NUMBER	Q PA	ALPHA DEG	BETA DEG	CL(SA)	CD(SA)	CPM(SA)	CRM(SA)	CYM(SA)	CSF(SA)
.677	23893.9	1.18	-.01	.21723	.02729	.01933	.00233	-.00032	.00328
.676	23856.1	-1.86	-.00	.00993	.02372	.00288	.00113	-.00027	.00243
.677	23920.4	-.33	-.00	.10316	.02402	.01560	.00186	-.00032	.00284
.677	23895.8	1.24	-.00	.21684	.02747	.01936	.00240	-.00034	.00320
.676	23857.9	2.84	-.00	.33150	.03406	.01997	.00330	-.00039	.00340
.677	23939.3	3.35	-.00	.36047	.03638	.01851	.00307	-.00041	.00346
.675	23837.5	3.95	.00	.37809	.03850	.01304	.00335	-.00044	.00339
.676	23863.4	5.50	.00	.47793	.04945	.01421	.00326	-.00042	.00370
.676	23880.9	7.06	.01	.57039	.06407	.02475	.00342	-.00054	.00384
.675	23829.0	8.50	.01	.64874	.08786	.02958	.00360	-.00057	.00404
.676	23841.8	1.20	-.01	.21924	.02724	.01973	.00229	-.00032	.00317

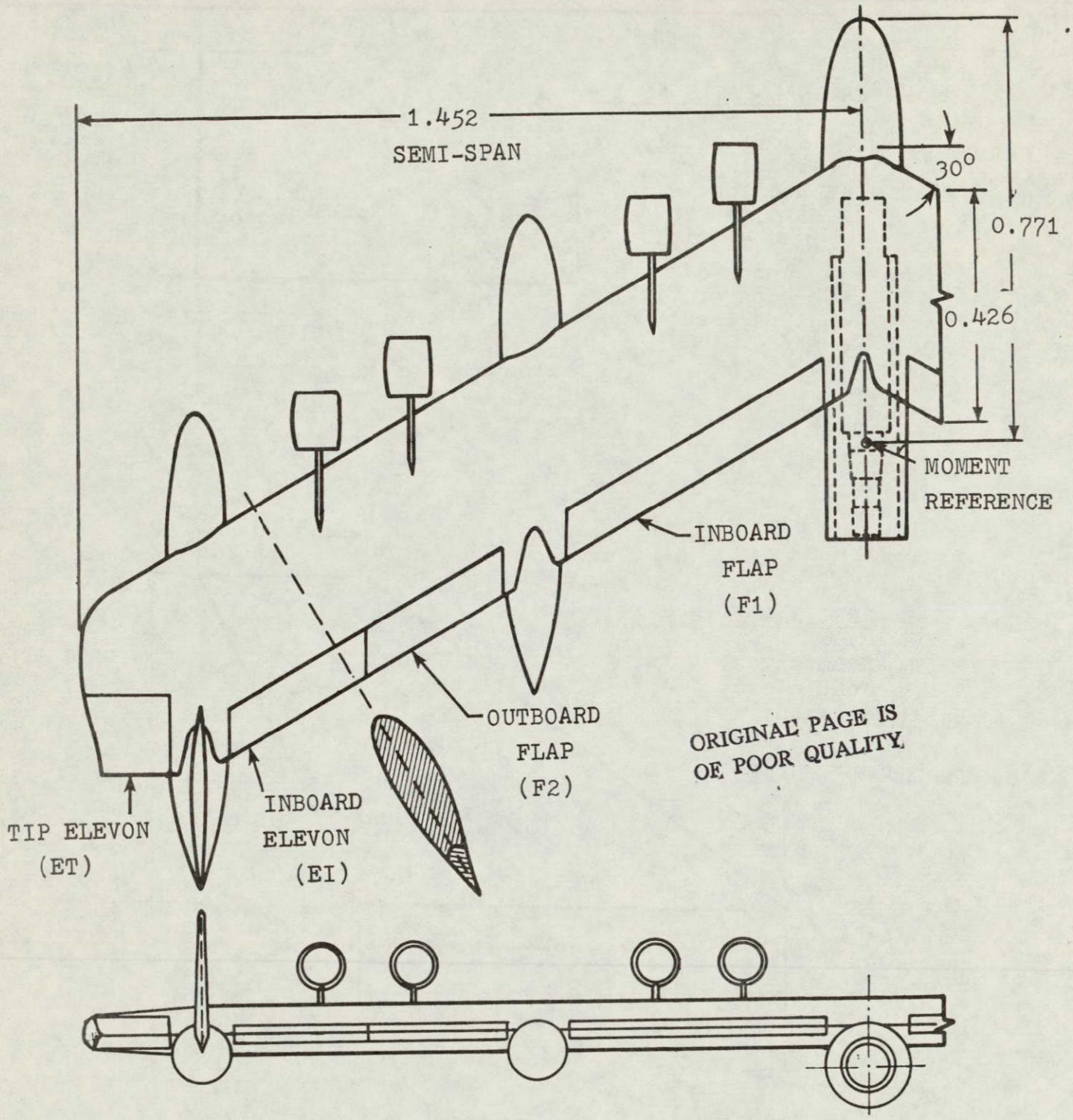


Fig. 1A - Model geometry and major dimensions (in meters)

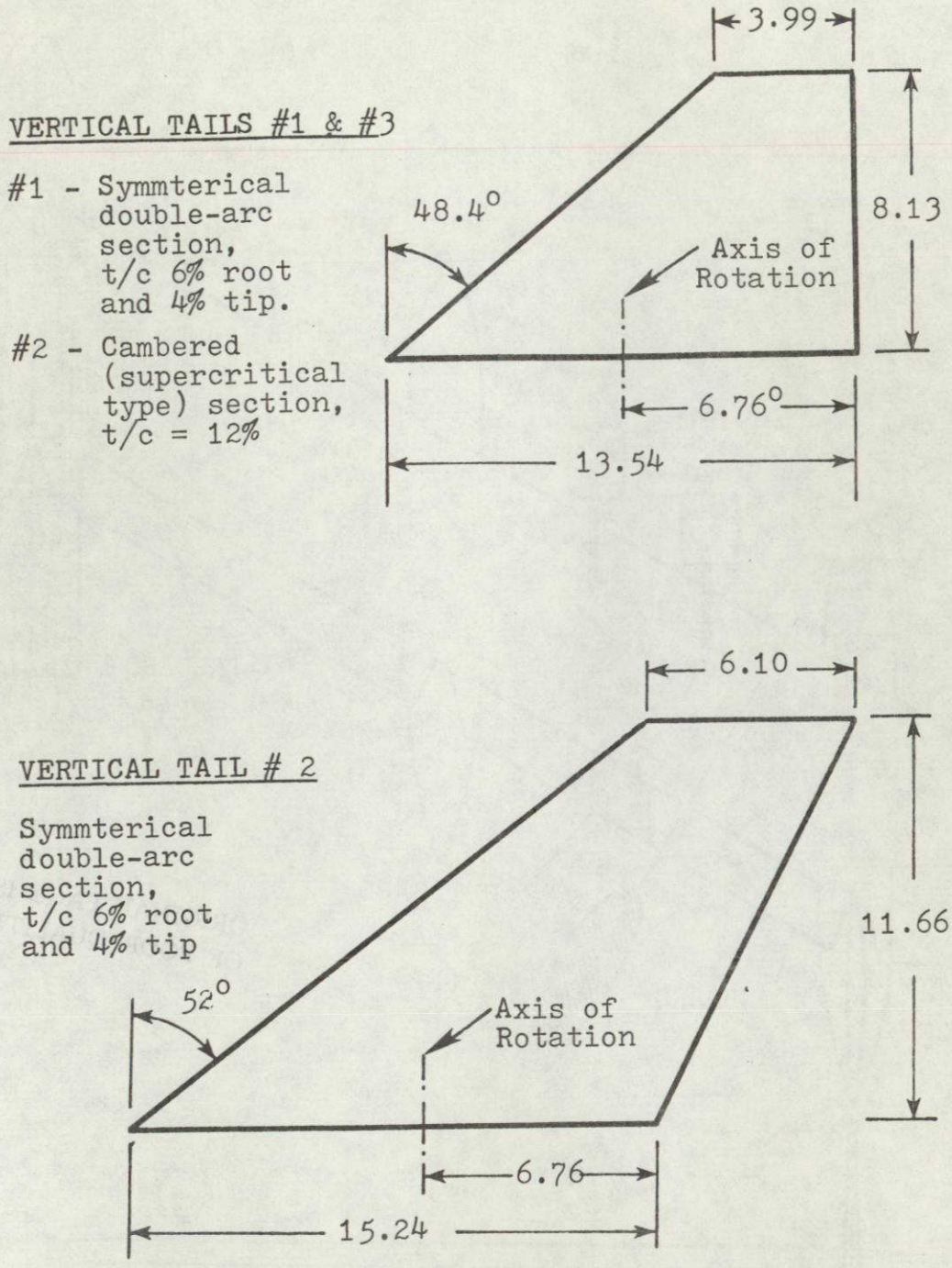


Fig. 1B - Vertical tail geometry and dimensions.

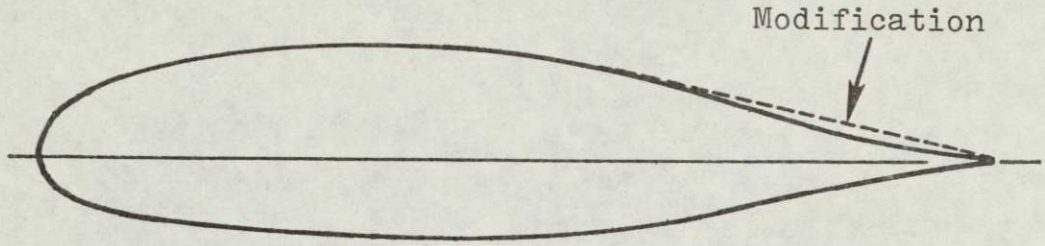


Fig. 1C - Airfoil geometry and modification.

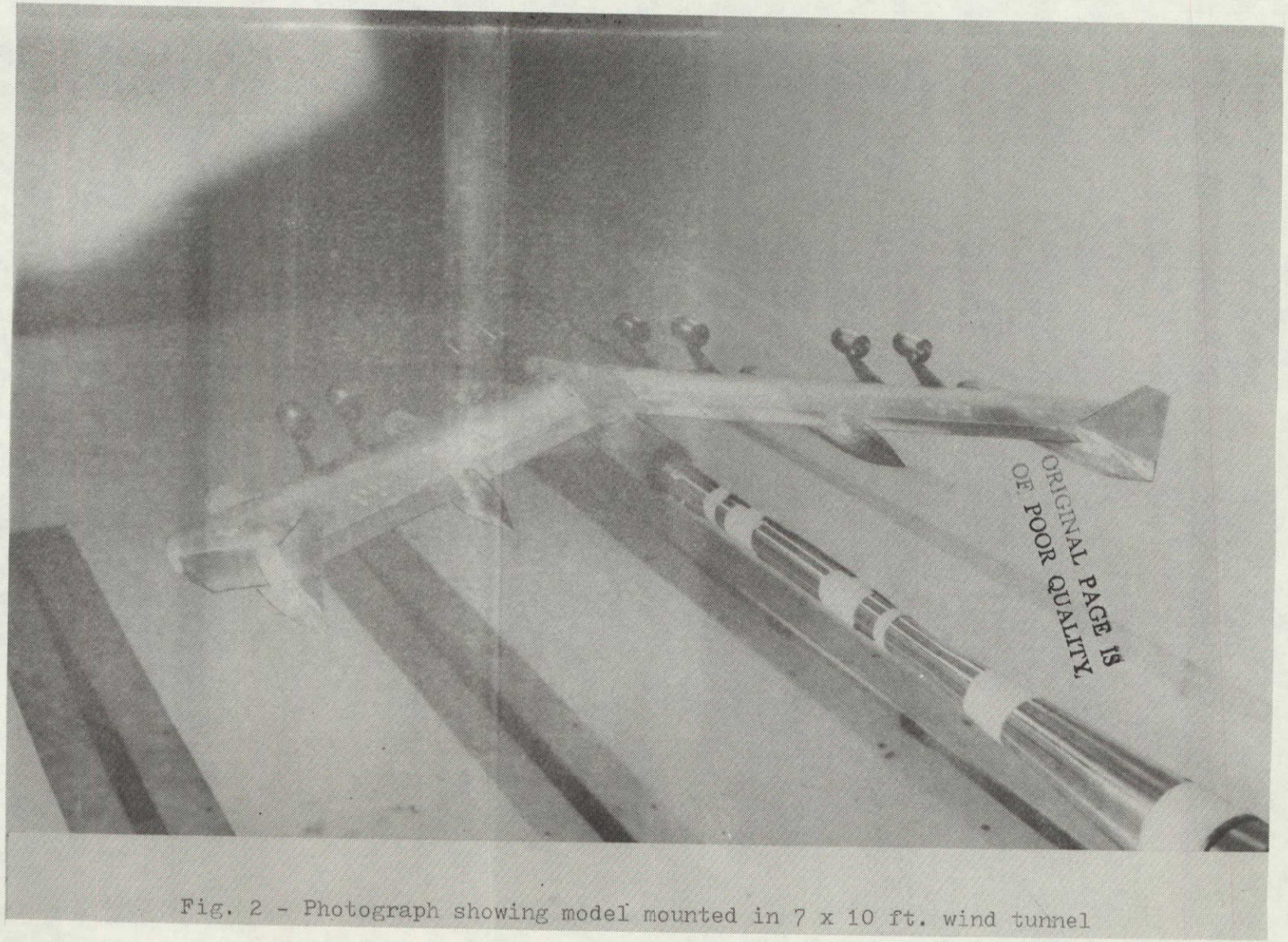


Fig. 2 - Photograph showing model mounted in 7 x 10 ft. wind tunnel

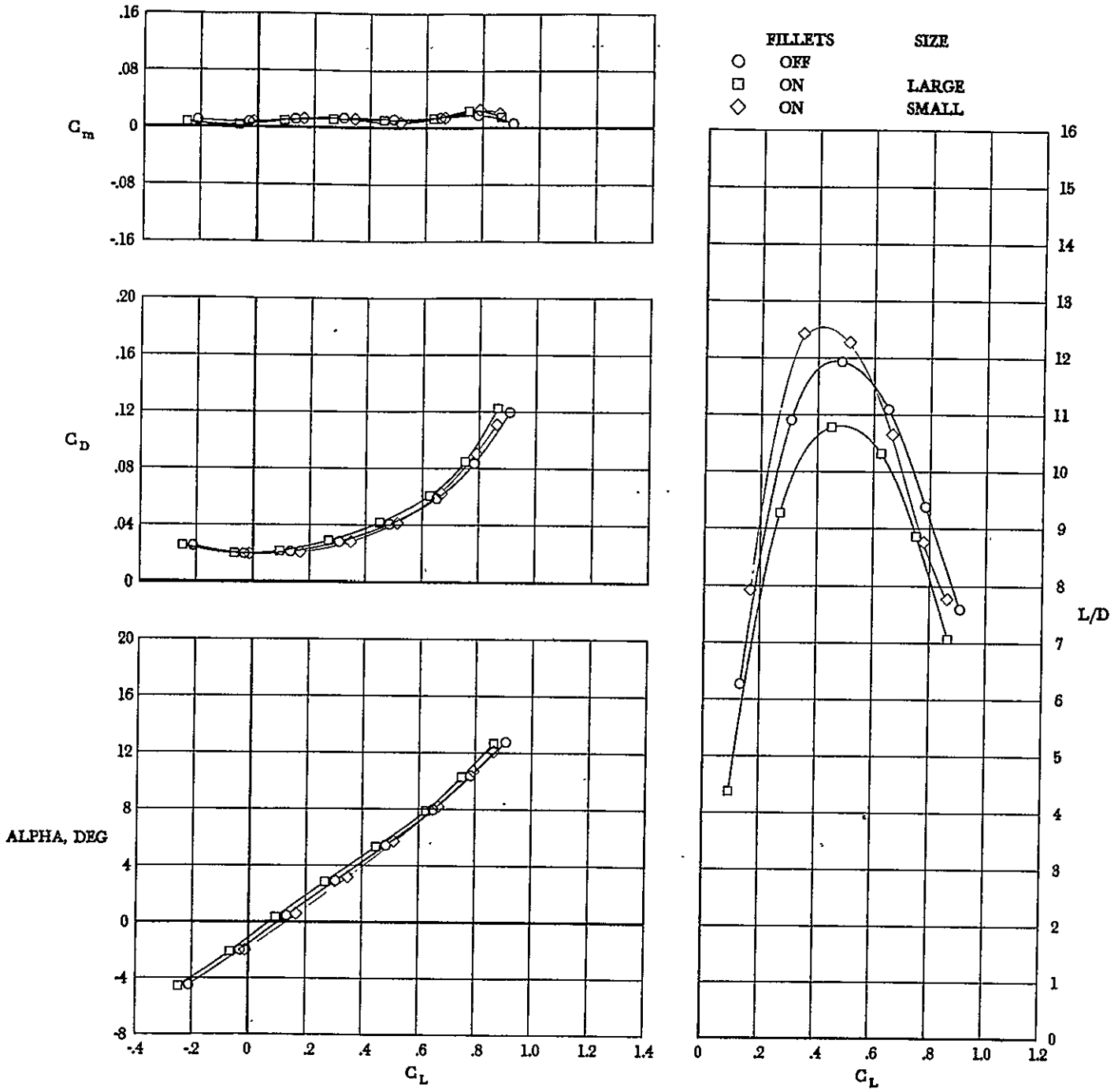


Fig. 4 - Effect of fillets on longitudinal characteristics at M = 0.5

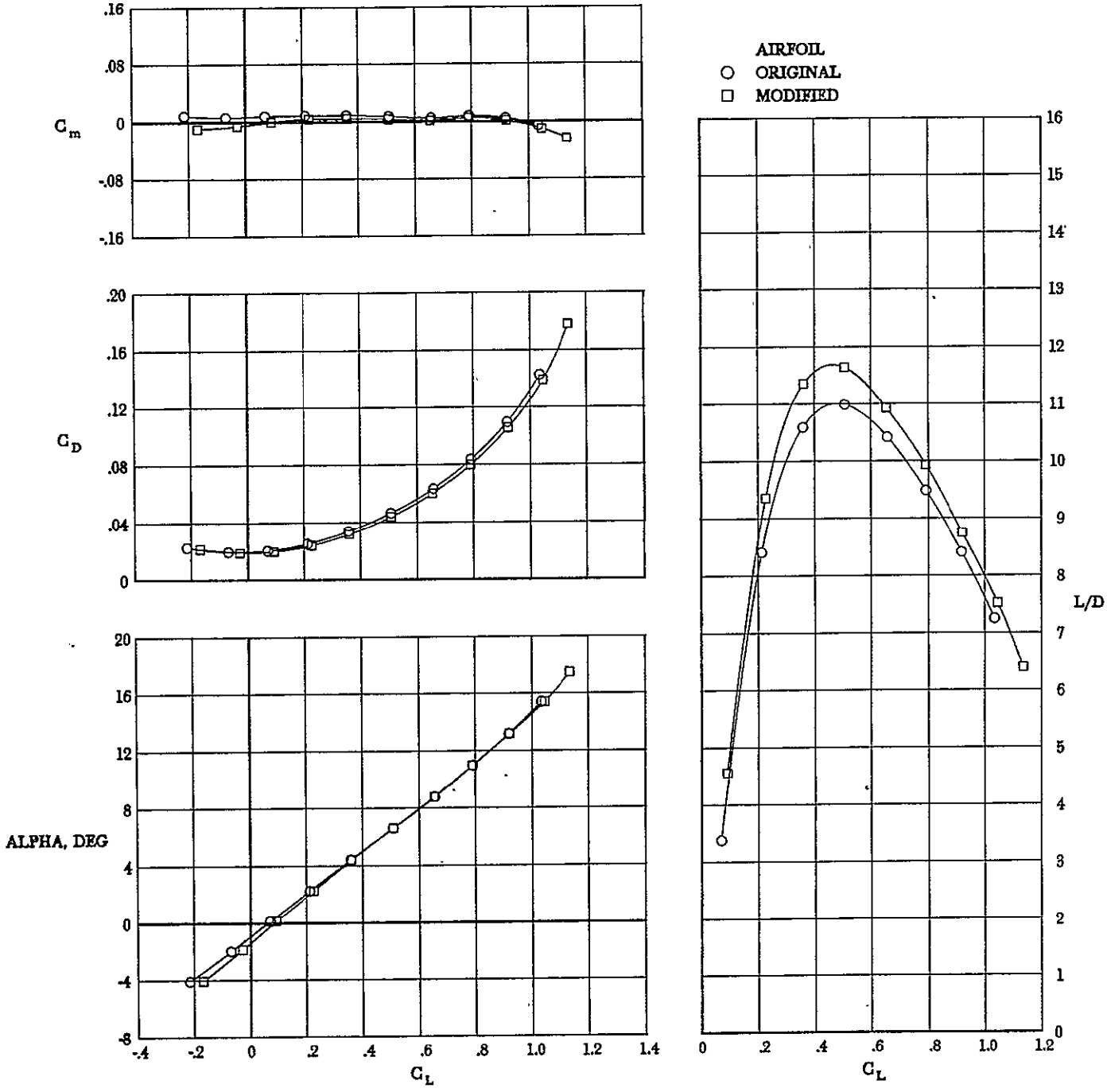


Fig. 5 - Effect of airfoil modification on longitudinal characteristics at M = 0.3

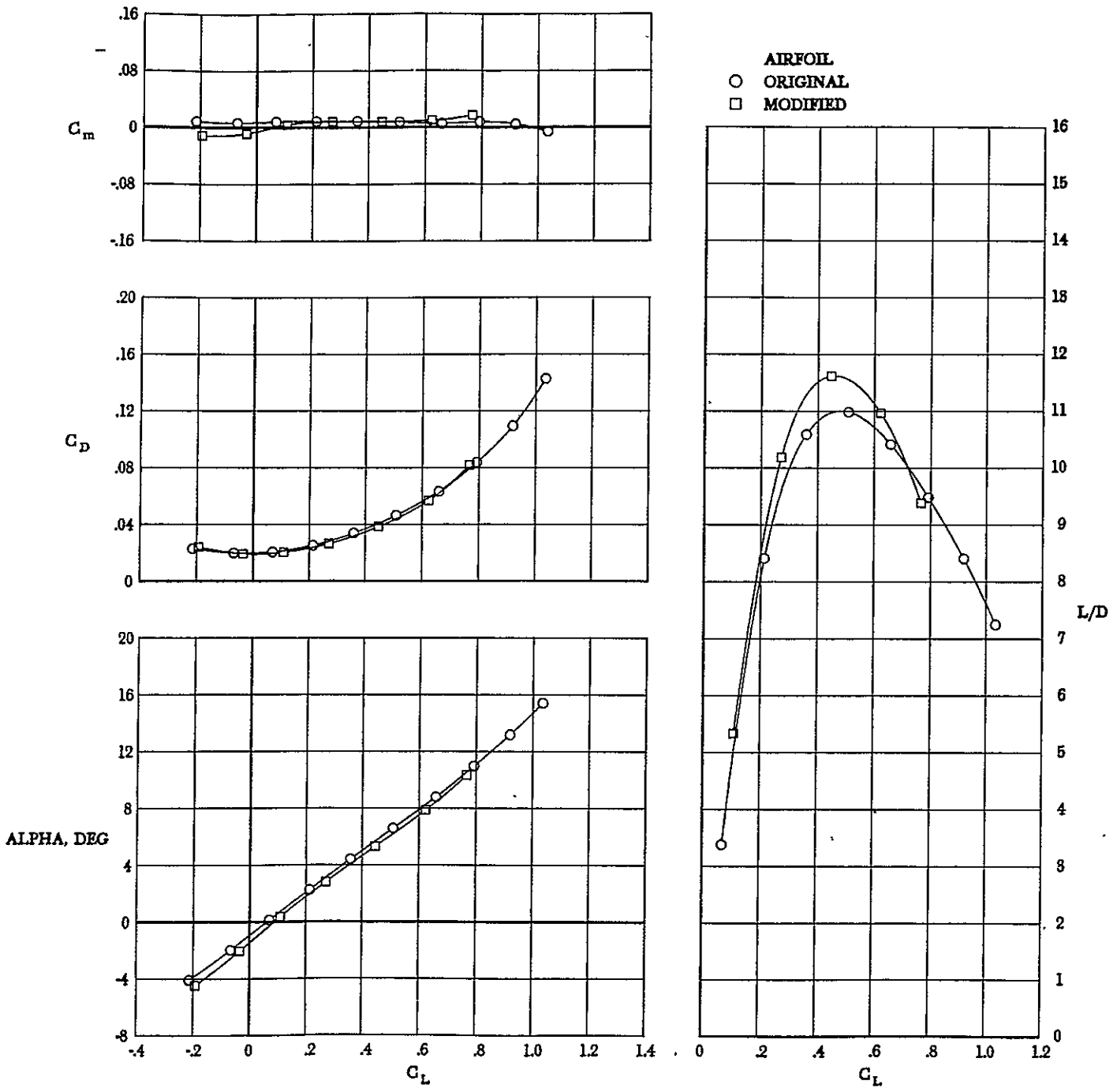


Fig. 6 - Effect of airfoil modification on longitudinal characteristics at M = 0.5

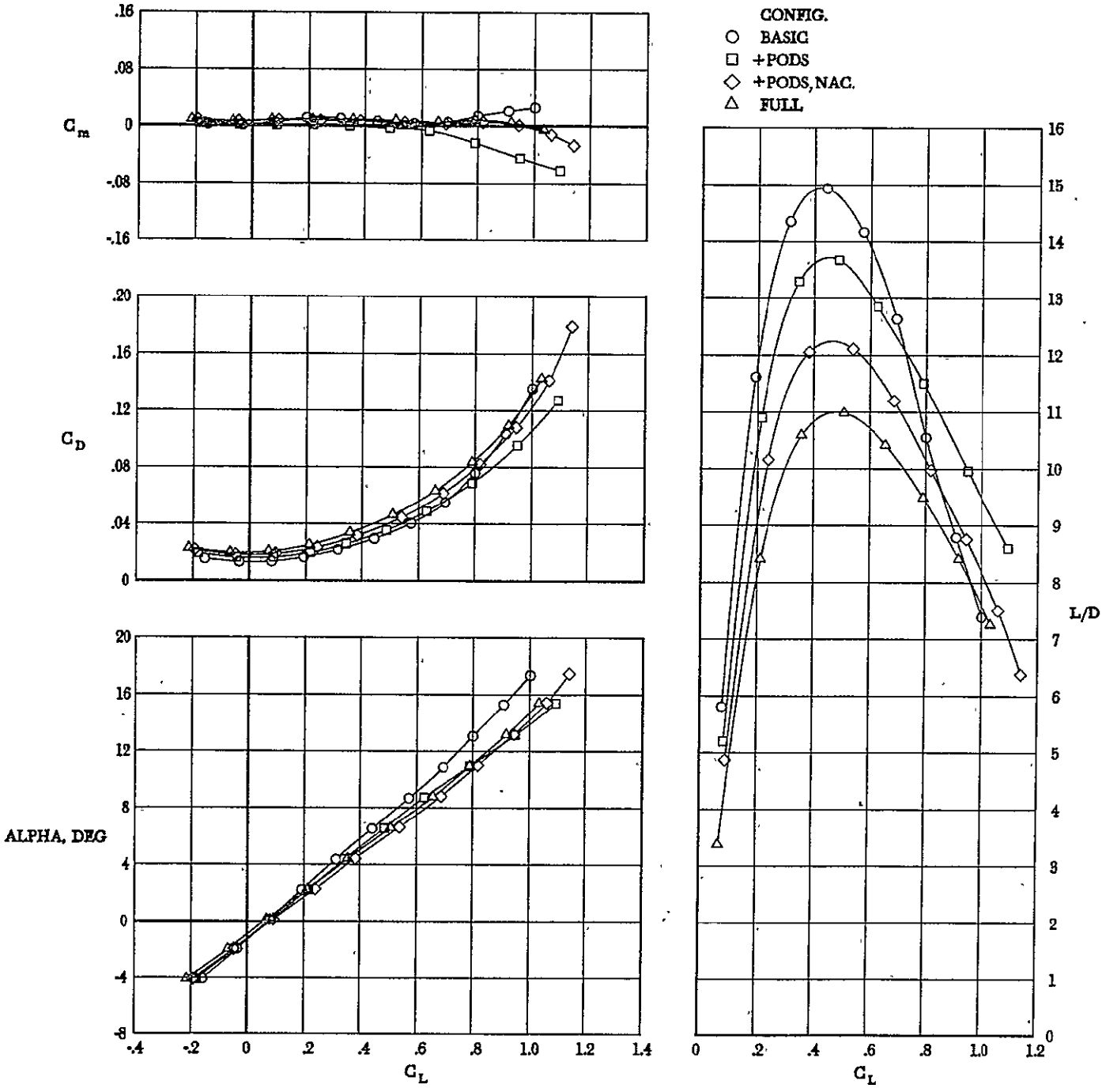


Fig. 7 - Configuration build-up effects on longitudinal characteristics at M = 0.3

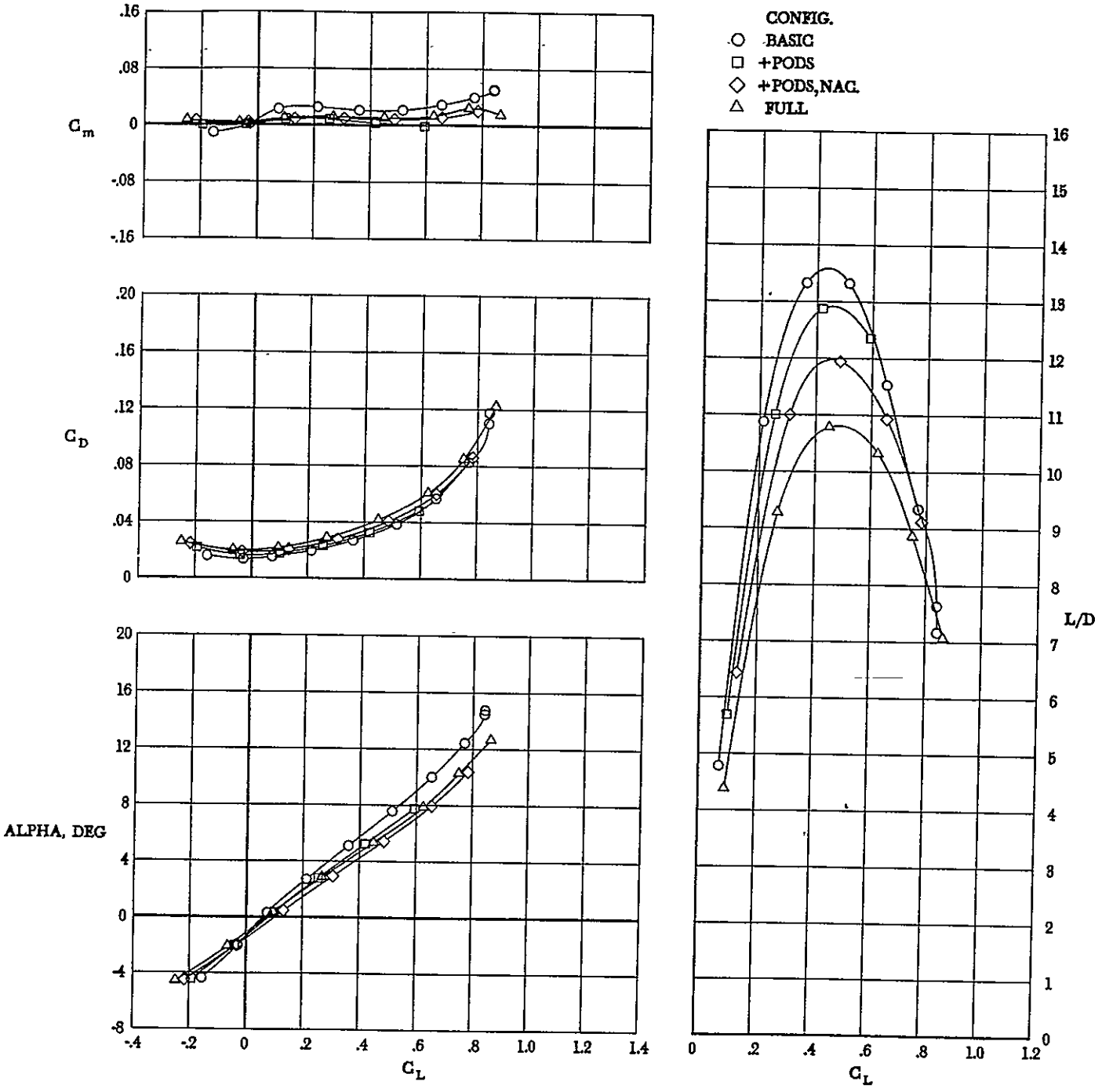


Fig. 8 - Configuration build-up effects on longitudinal characteristics at M = 0.5

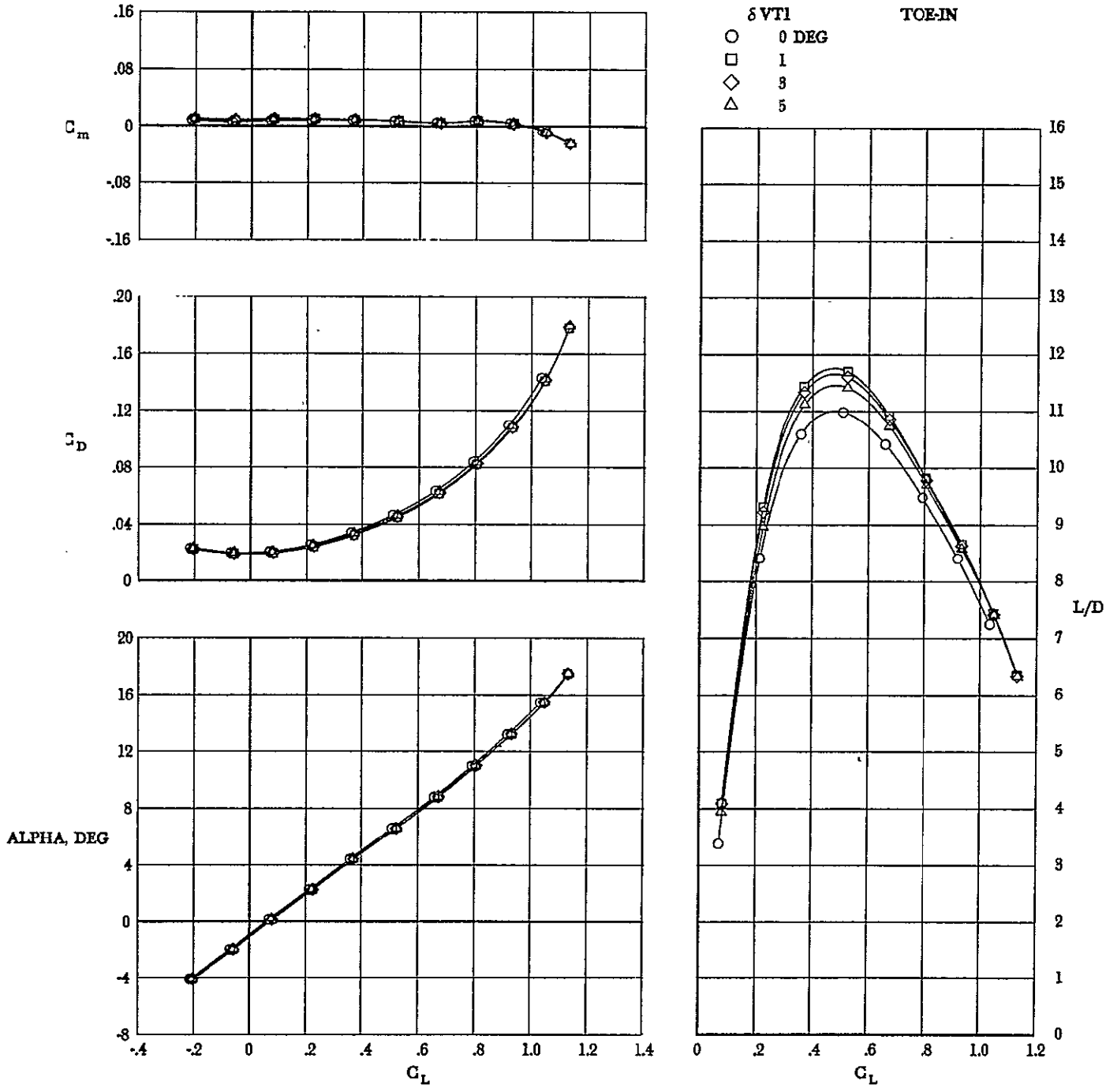


Fig. 9 - Effect of vertical tail (VT#1) toe-in on longitudinal characteristics at M = 0.3

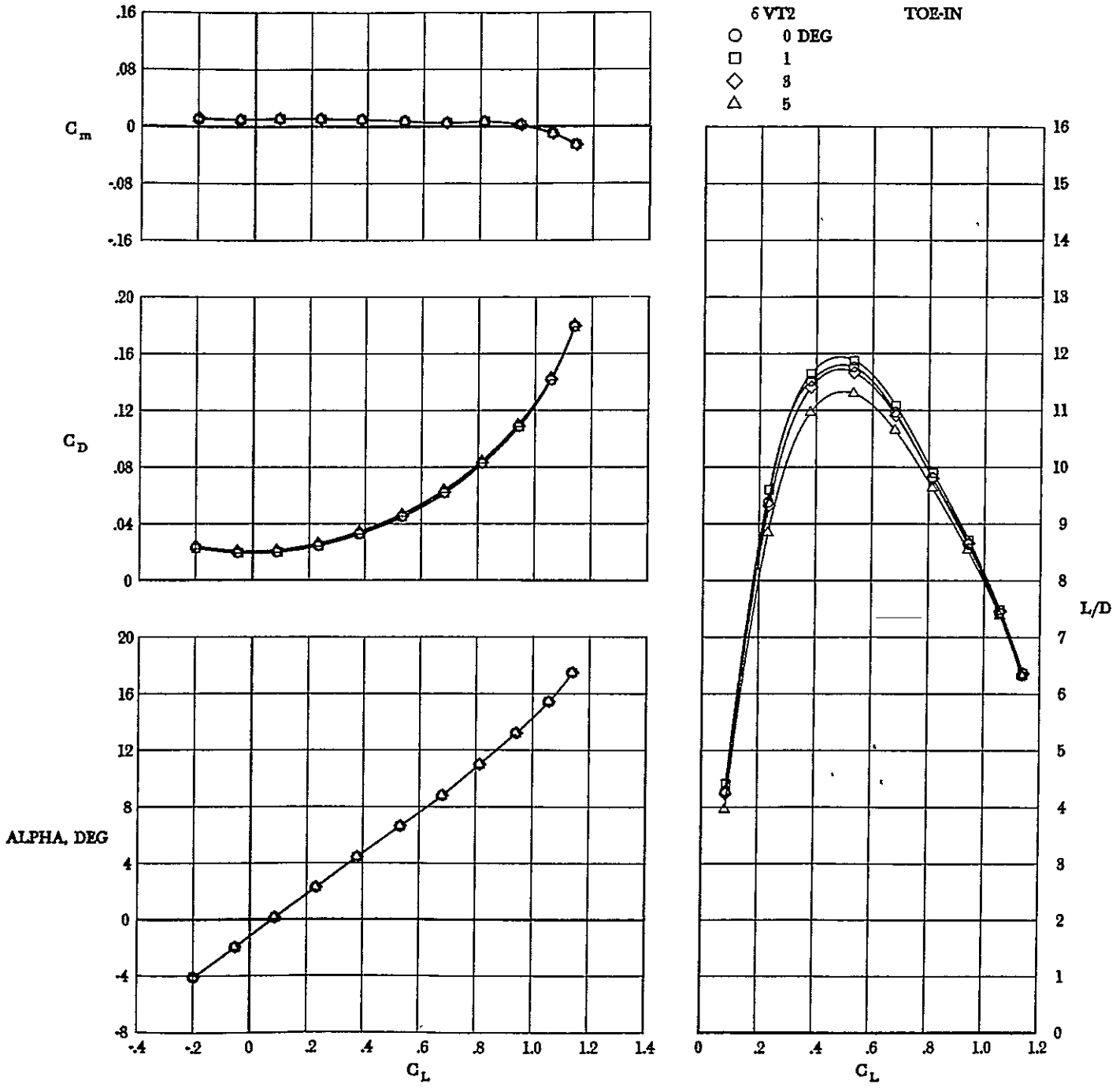


Fig. 10 - Effect of vertical tail (VT#2) toe-in on longitudinal characteristics at M = 0.3

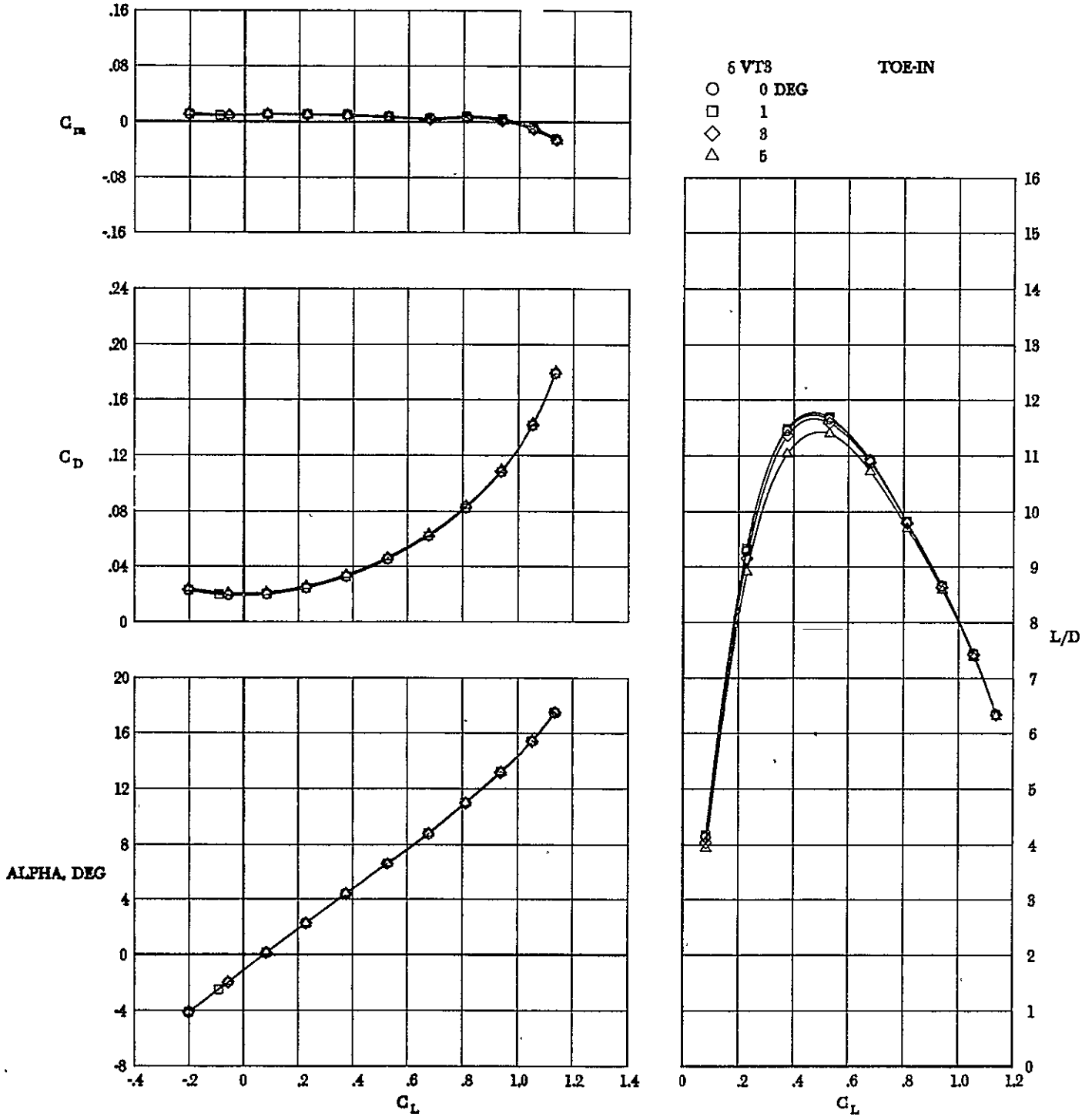


Fig. 11 - Effect of vertical tail (VT#3) toe-in on longitudinal characteristics at M = 0.3

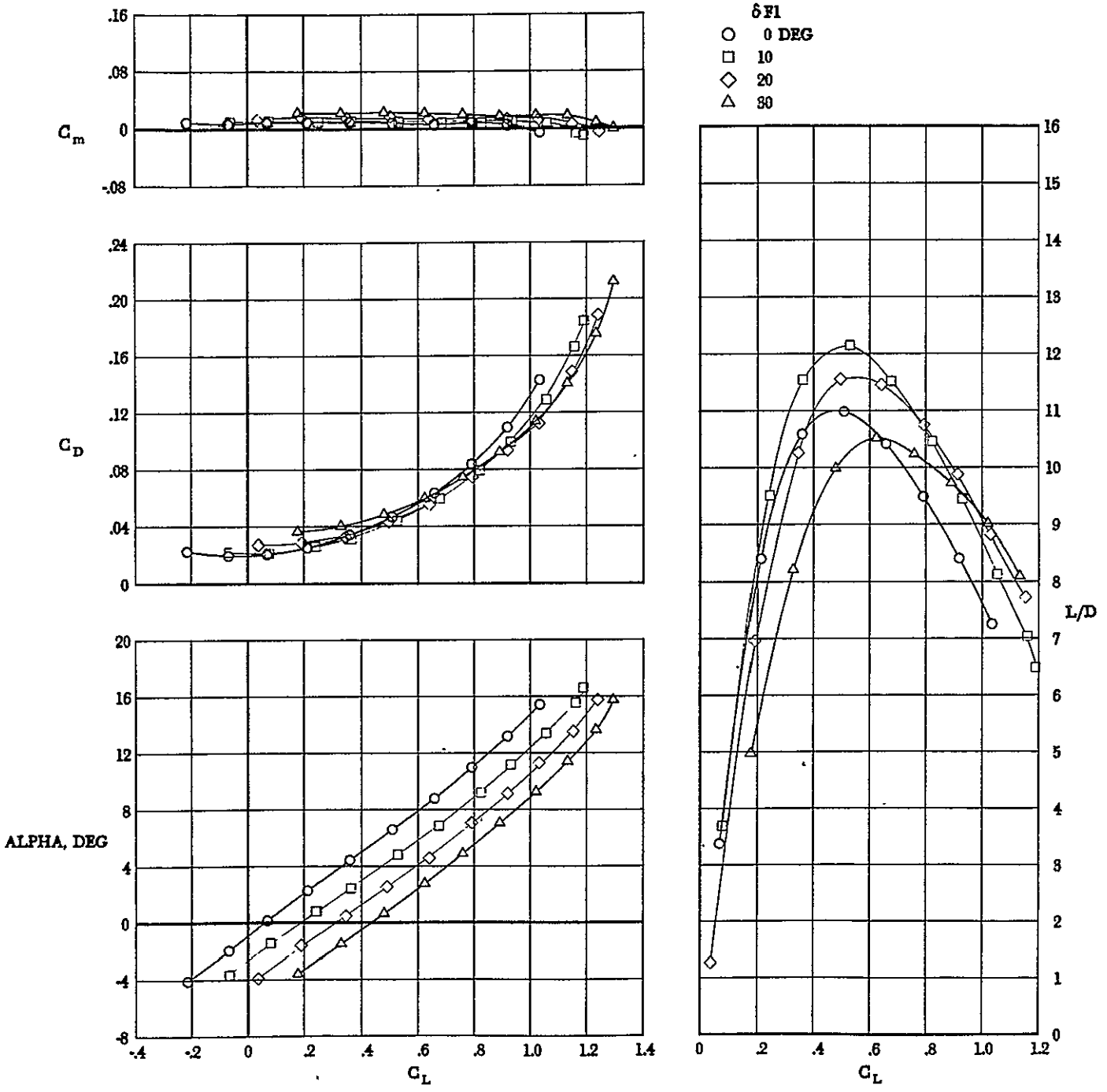


Fig. 12 - Effect of inboard flap deflection on longitudinal characteristics at M = 0.3

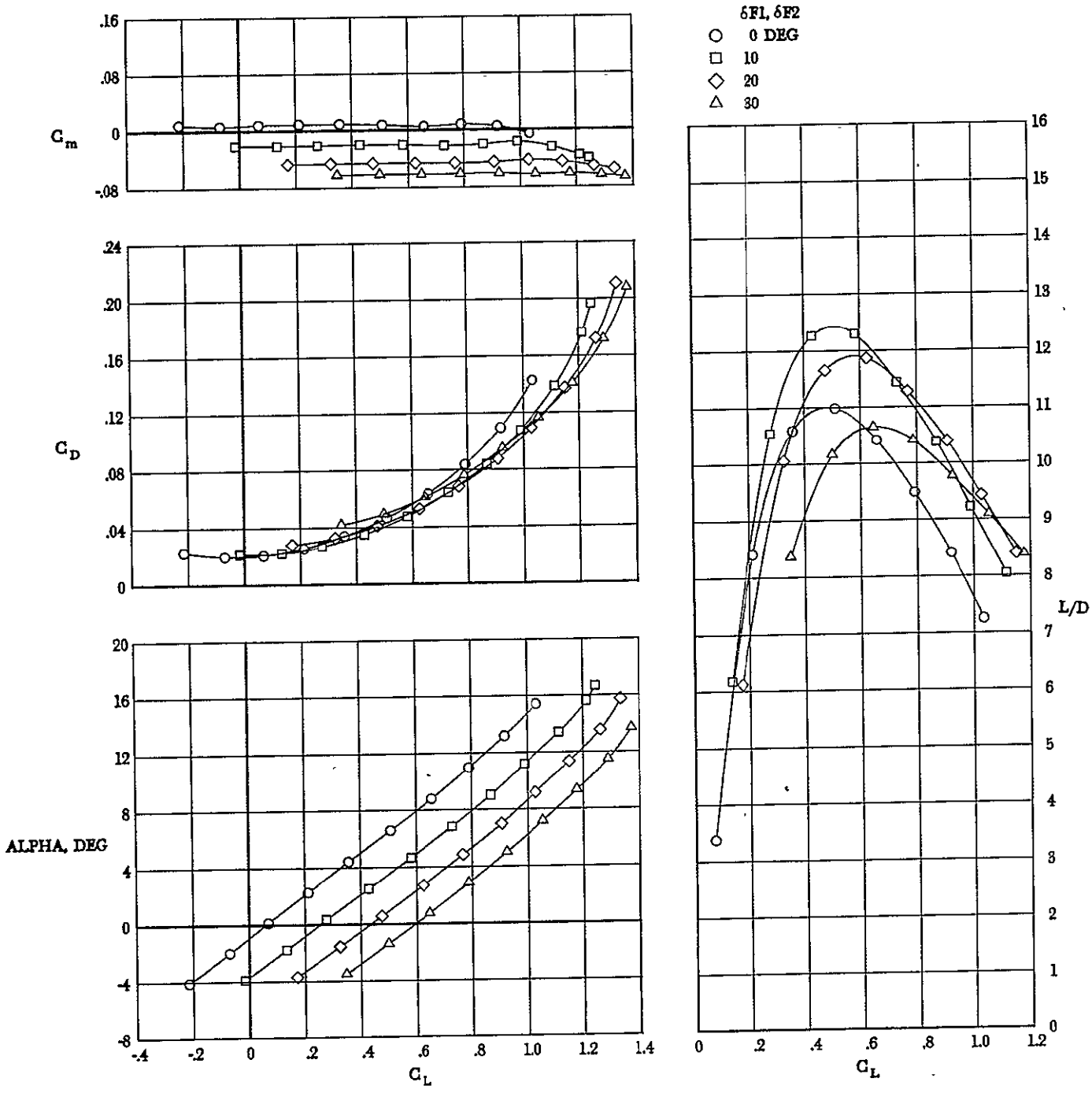


Fig. 13 - Effect of combined inboard and outboard flap deflection on longitudinal characteristics at M = 0.3

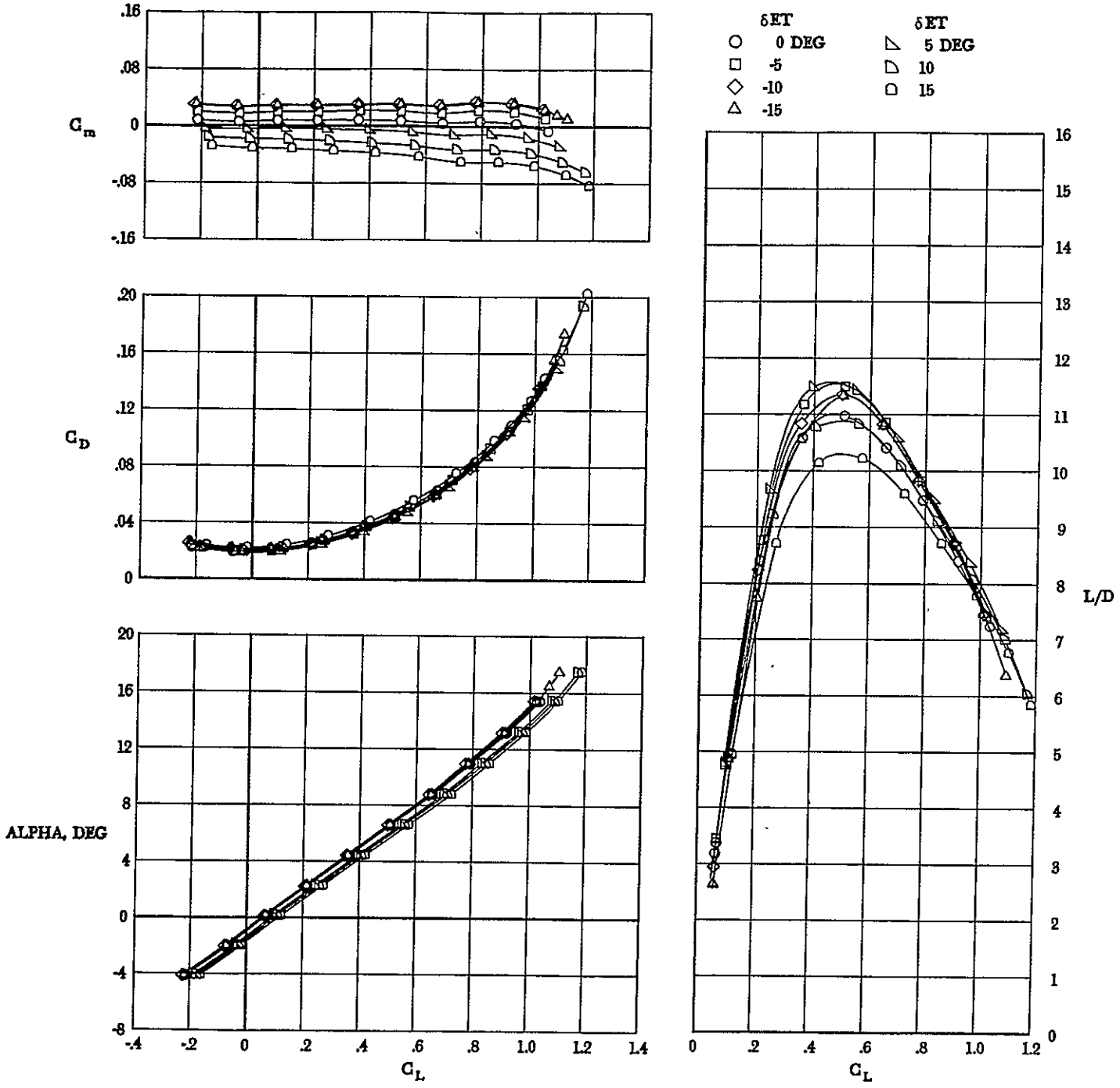
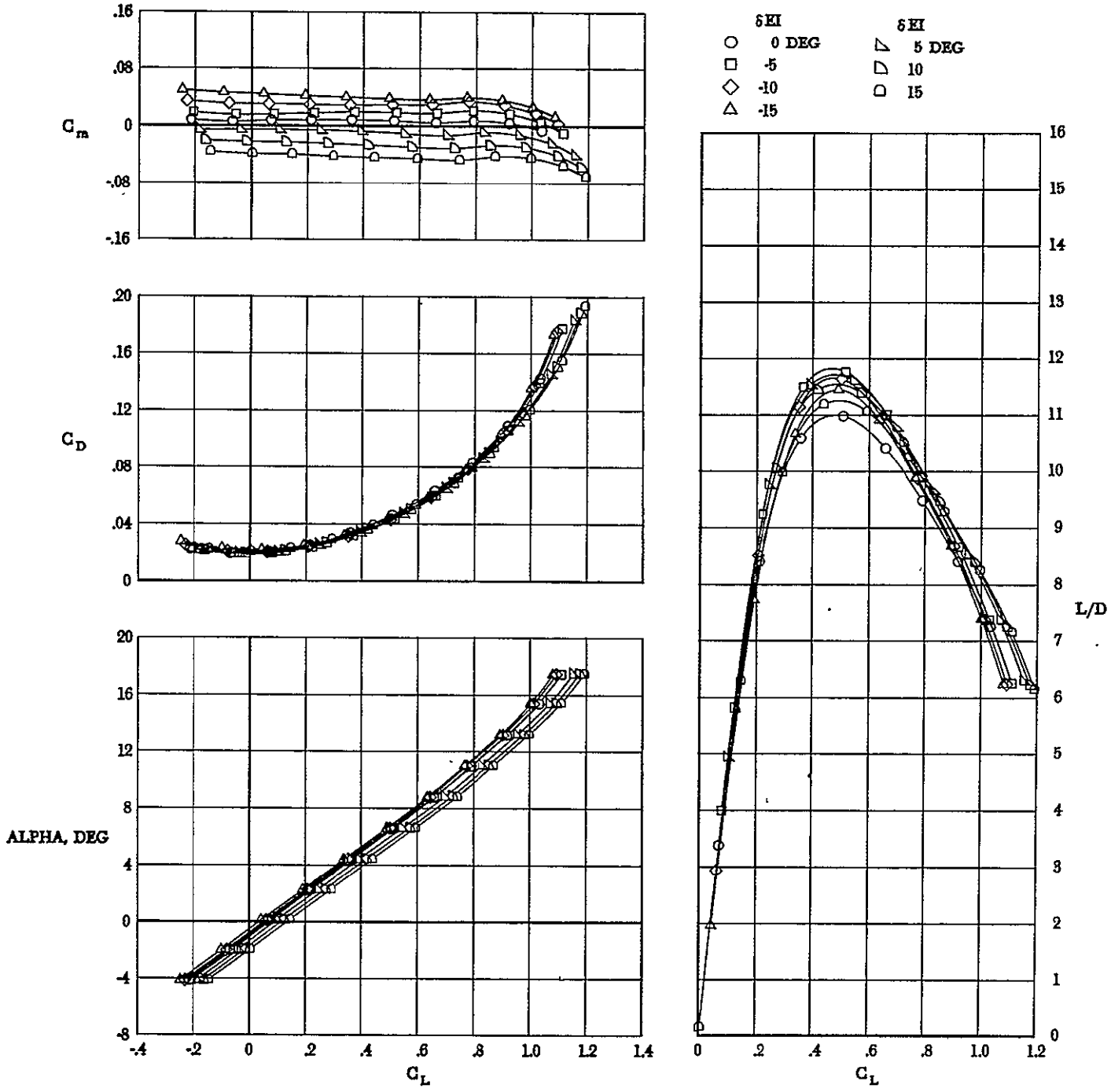


Fig. 14 - Effect of tip elevon deflection on longitudinal characteristics at M = 0.3



Fig, 15 - Effect of inboard elevon deflection on longitudinal characteristics at M = 0.3

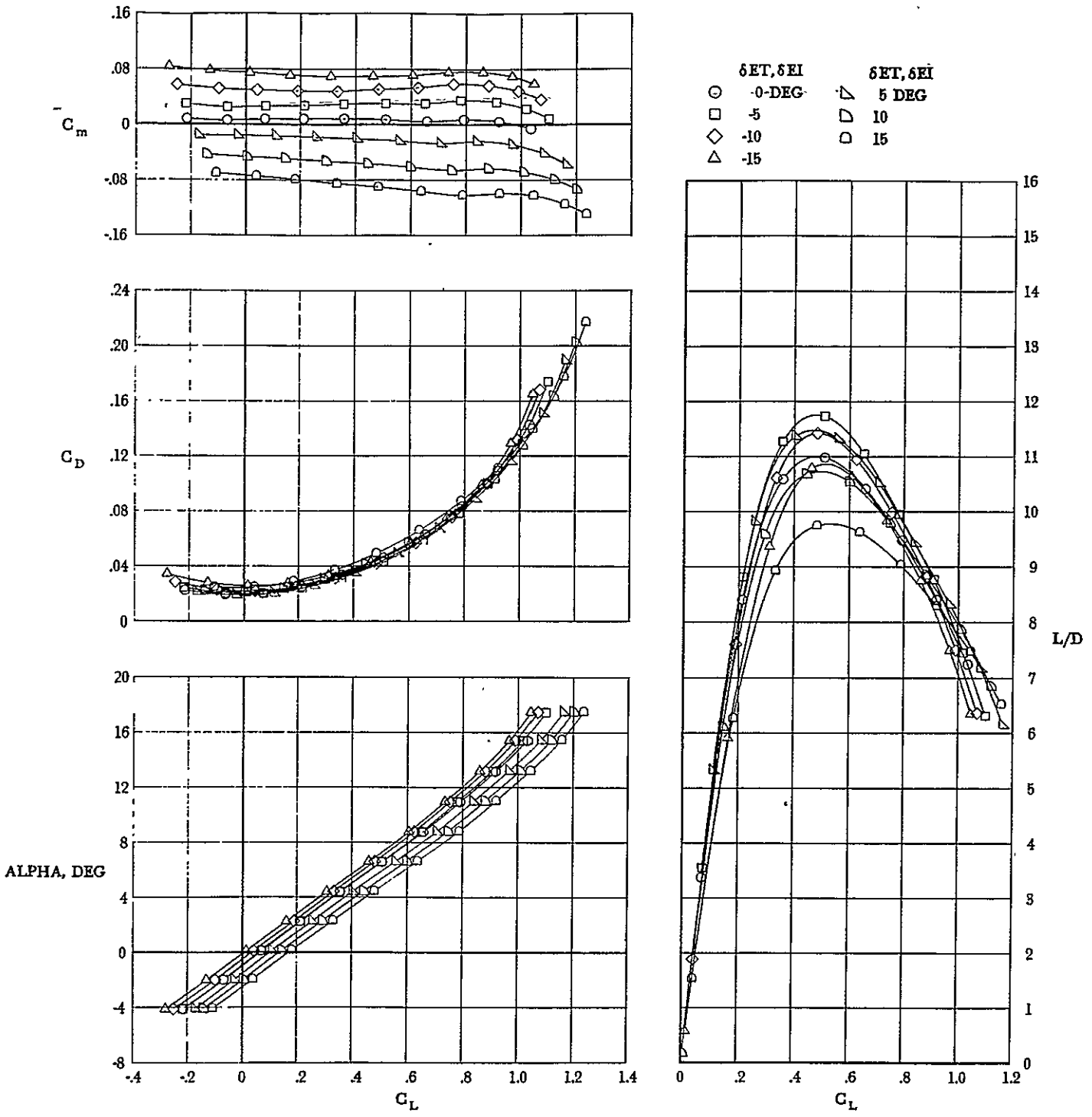


Fig. 16 - Effect of combined tip and inboard elevon deflection on longitudinal characteristics at M = 0.3

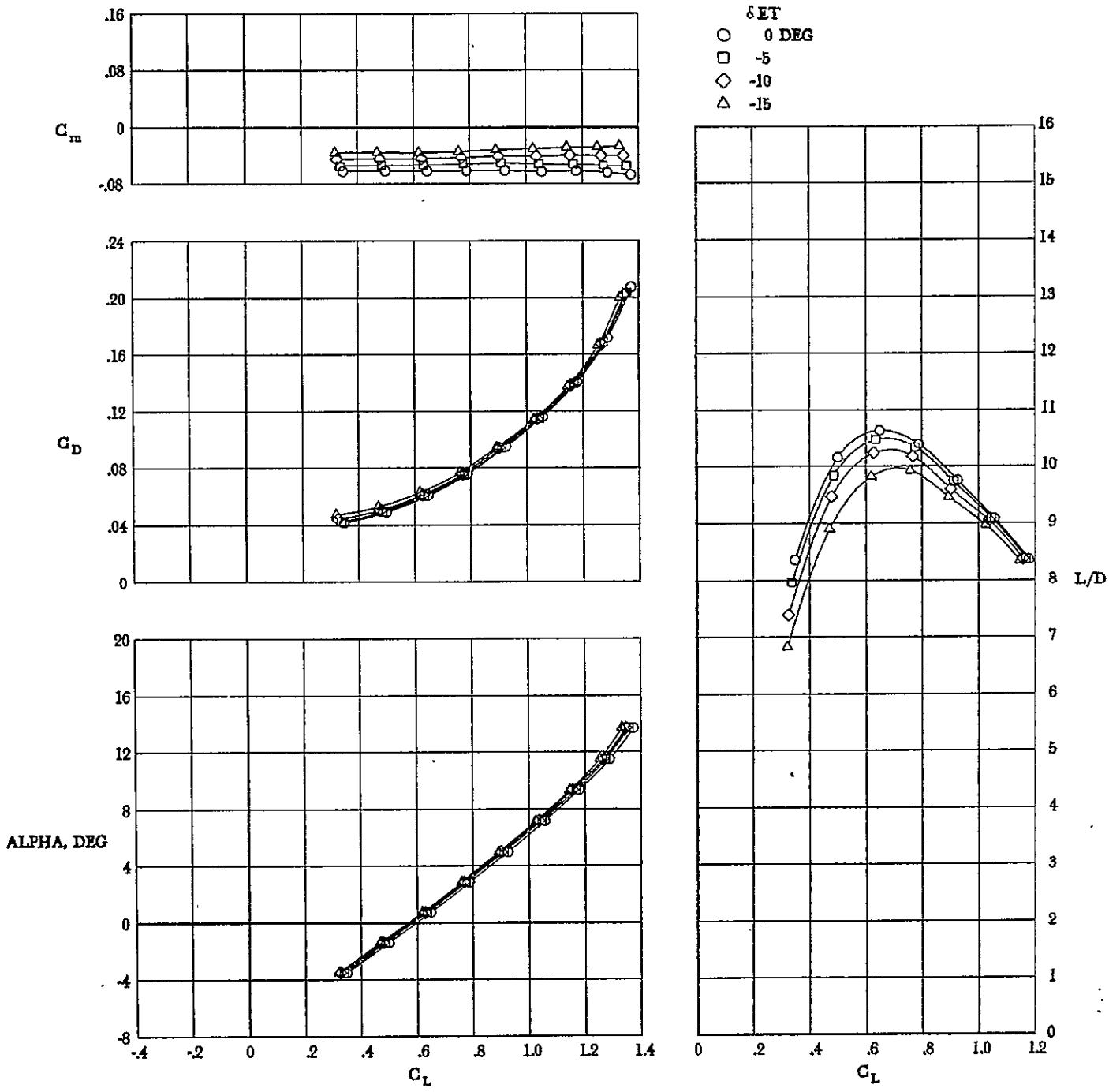


Fig. 17 - Effect of tip elevon deflection (with flaps at 30°) on longitudinal characteristics at M = 0.3

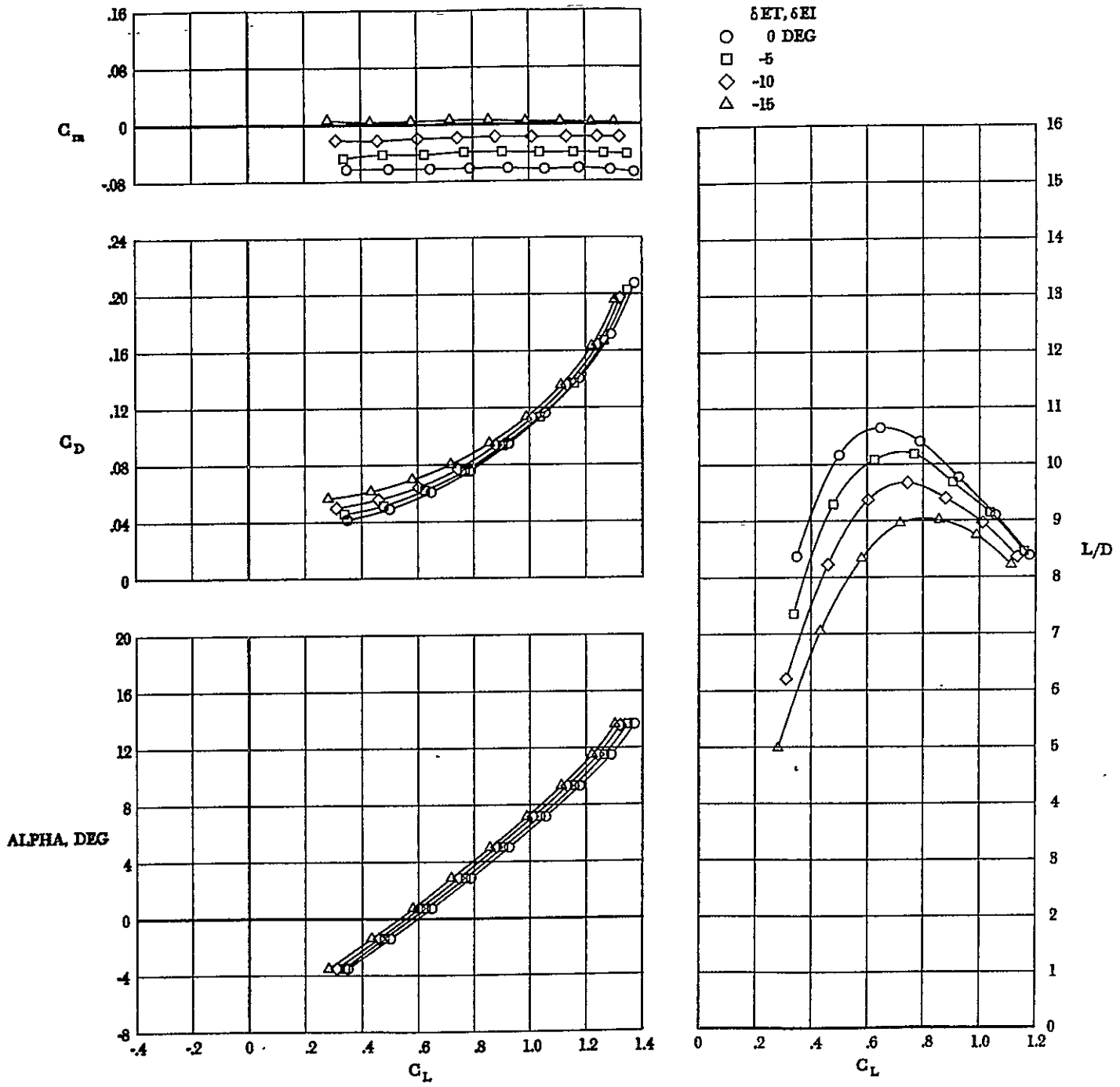


Fig. 18 - Effect of combined tip and inboard elevons deflection (with flaps at 30^{o}) on longitudinal characteristics at M = 0.3

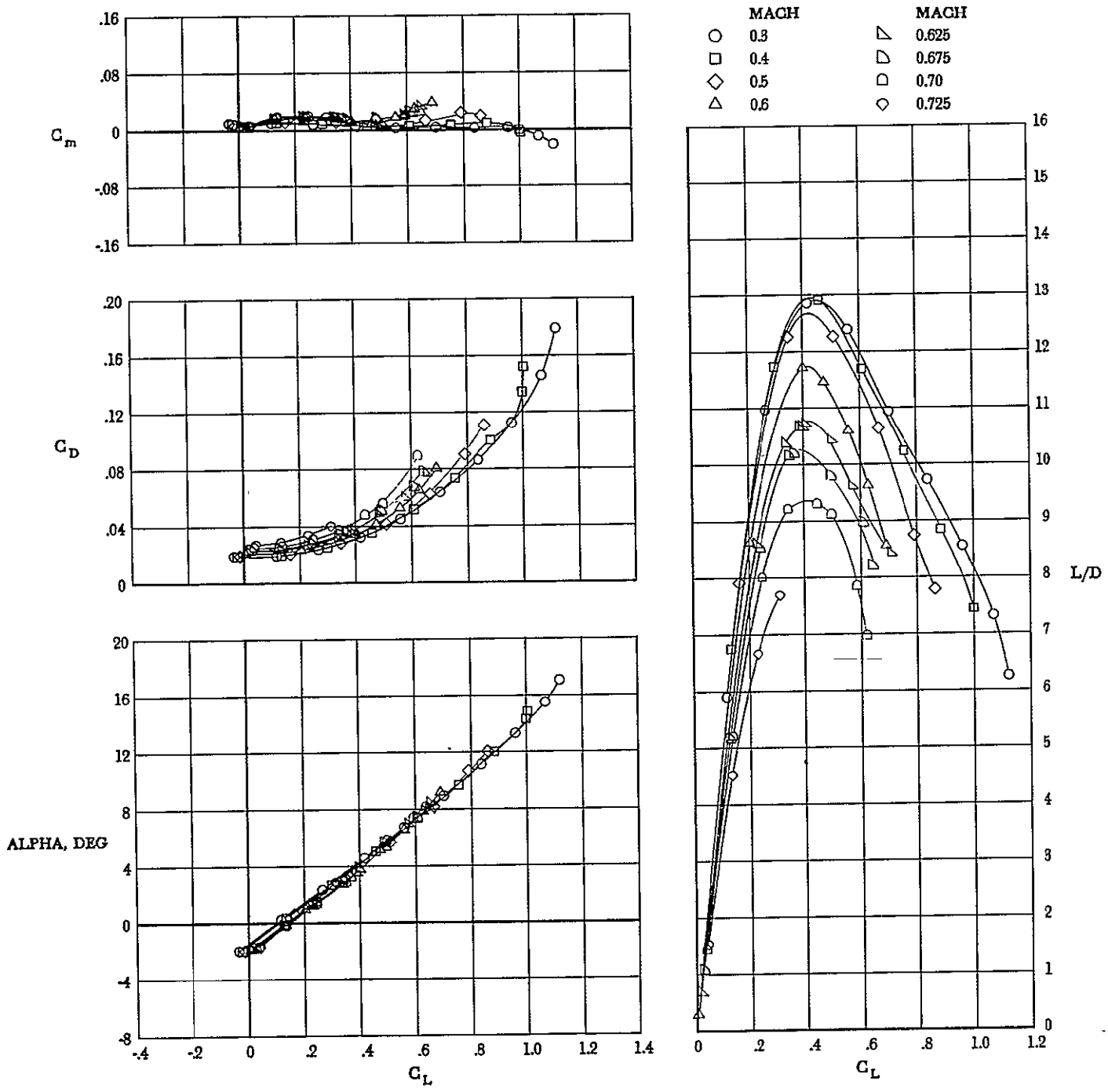


Fig. 19 - Mach number effect on longitudinal characteristics

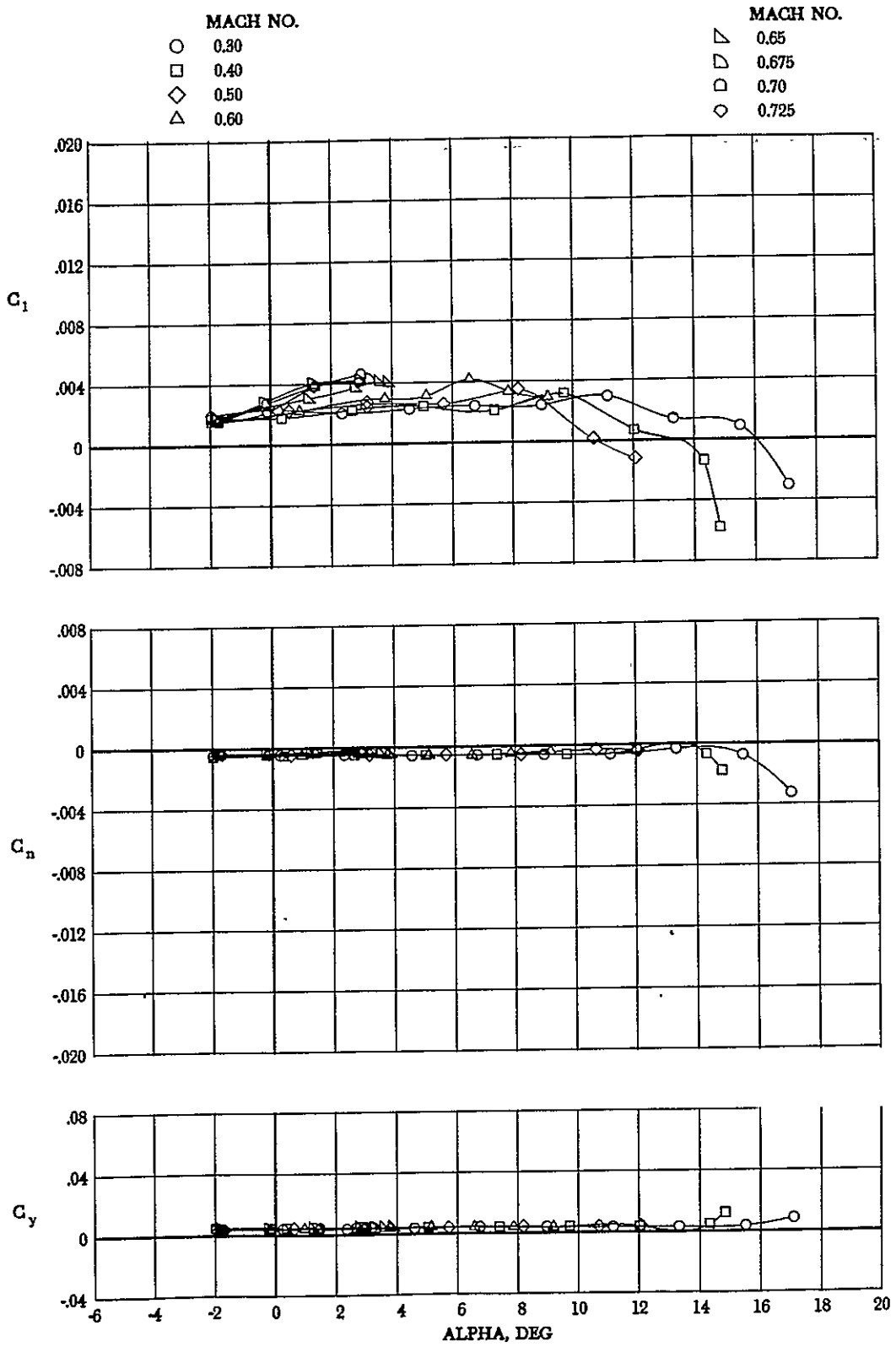


Fig. 20 - Mach number effect on lateral-directional characteristics at zero sideslip

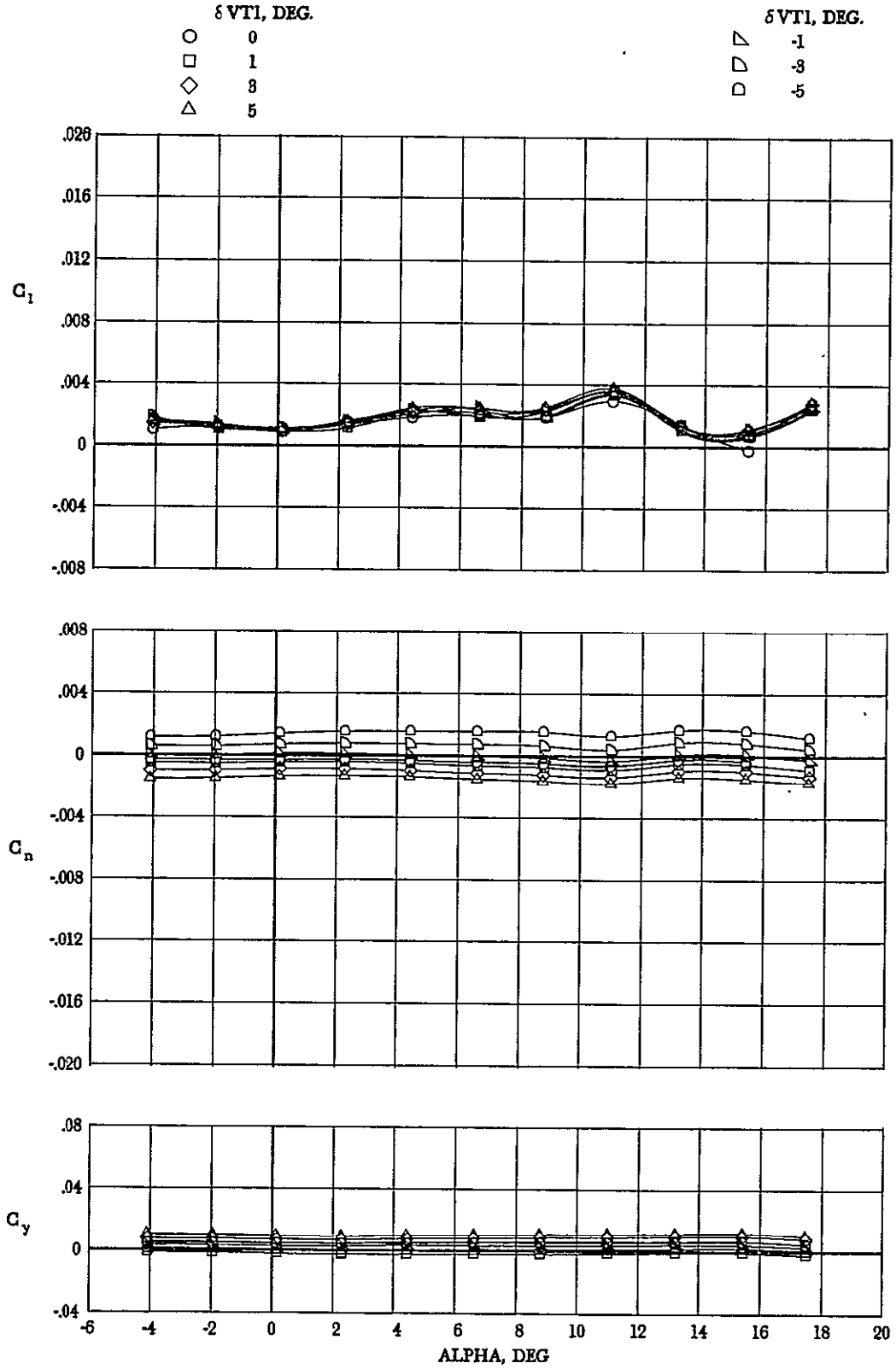


Fig. 21 - Effect of vertical tail (VT#1) deflection on lateral / directional characteristics at M = 0.3

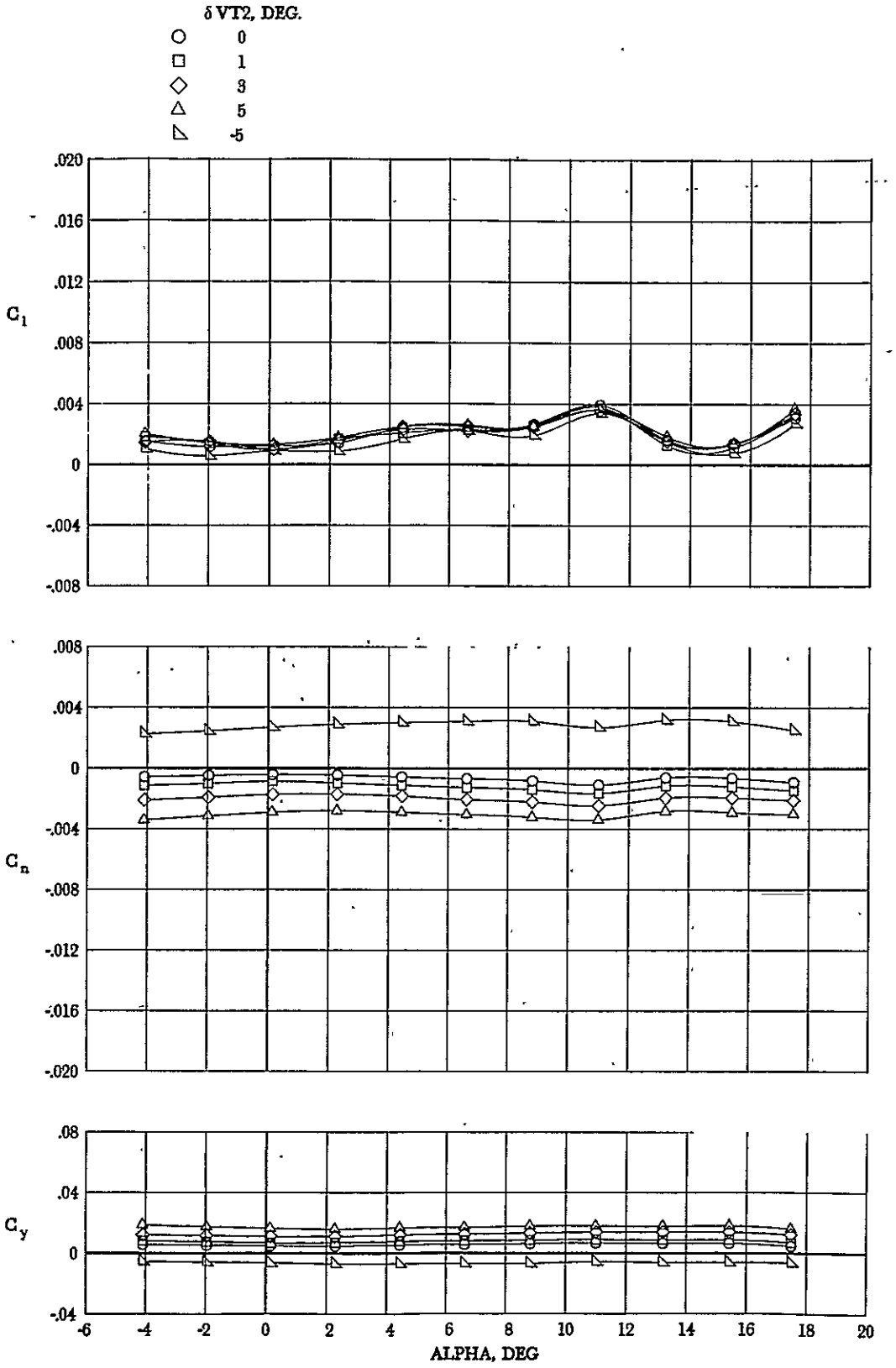


Fig. 22 - Effect of vertical tail (VT#2) deflection on lateral/directional characteristics at M = 0.3

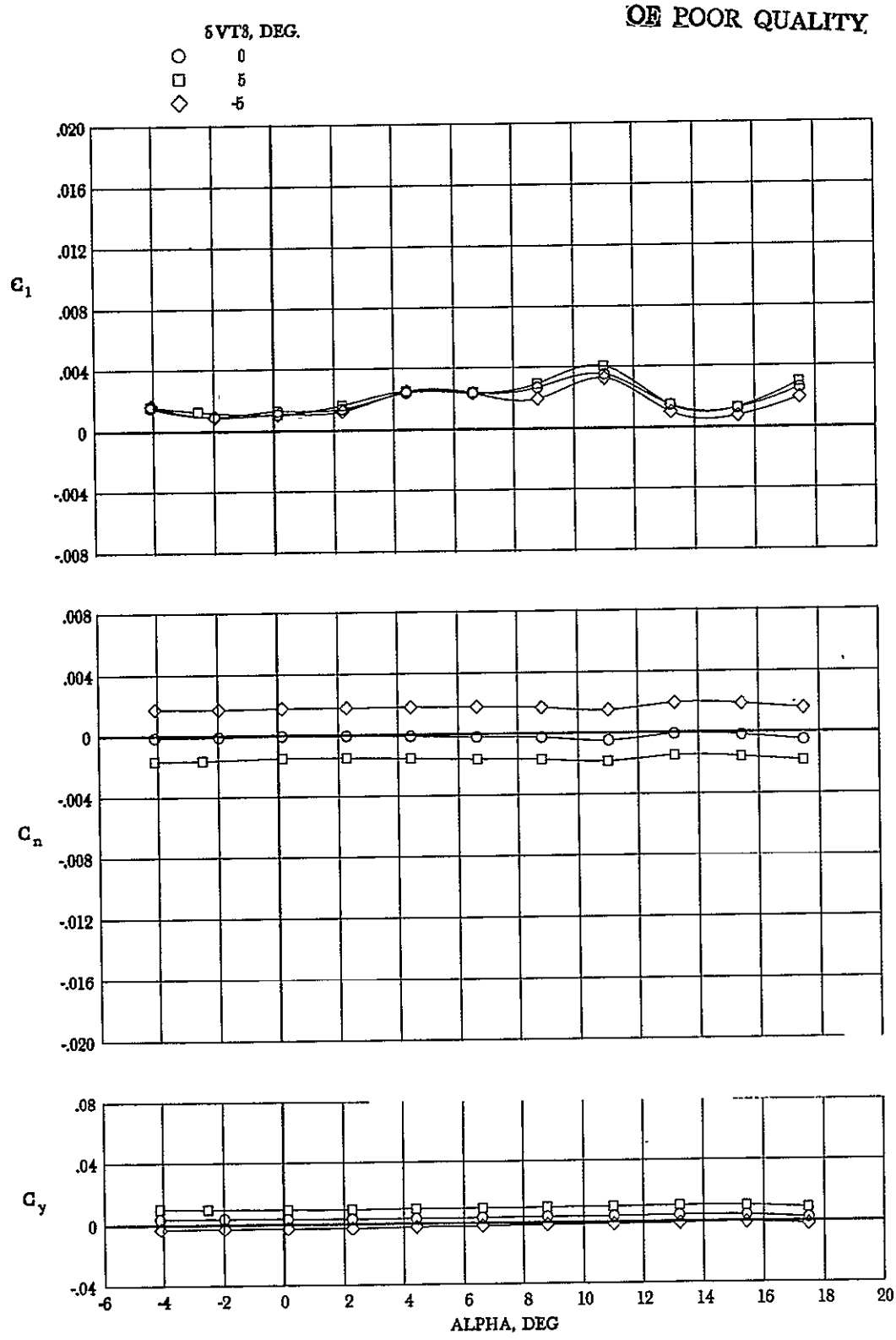


Fig. 23 - Effect of vertical tail (VT#3) deflection on lateral/directional characteristics at M = 0.3

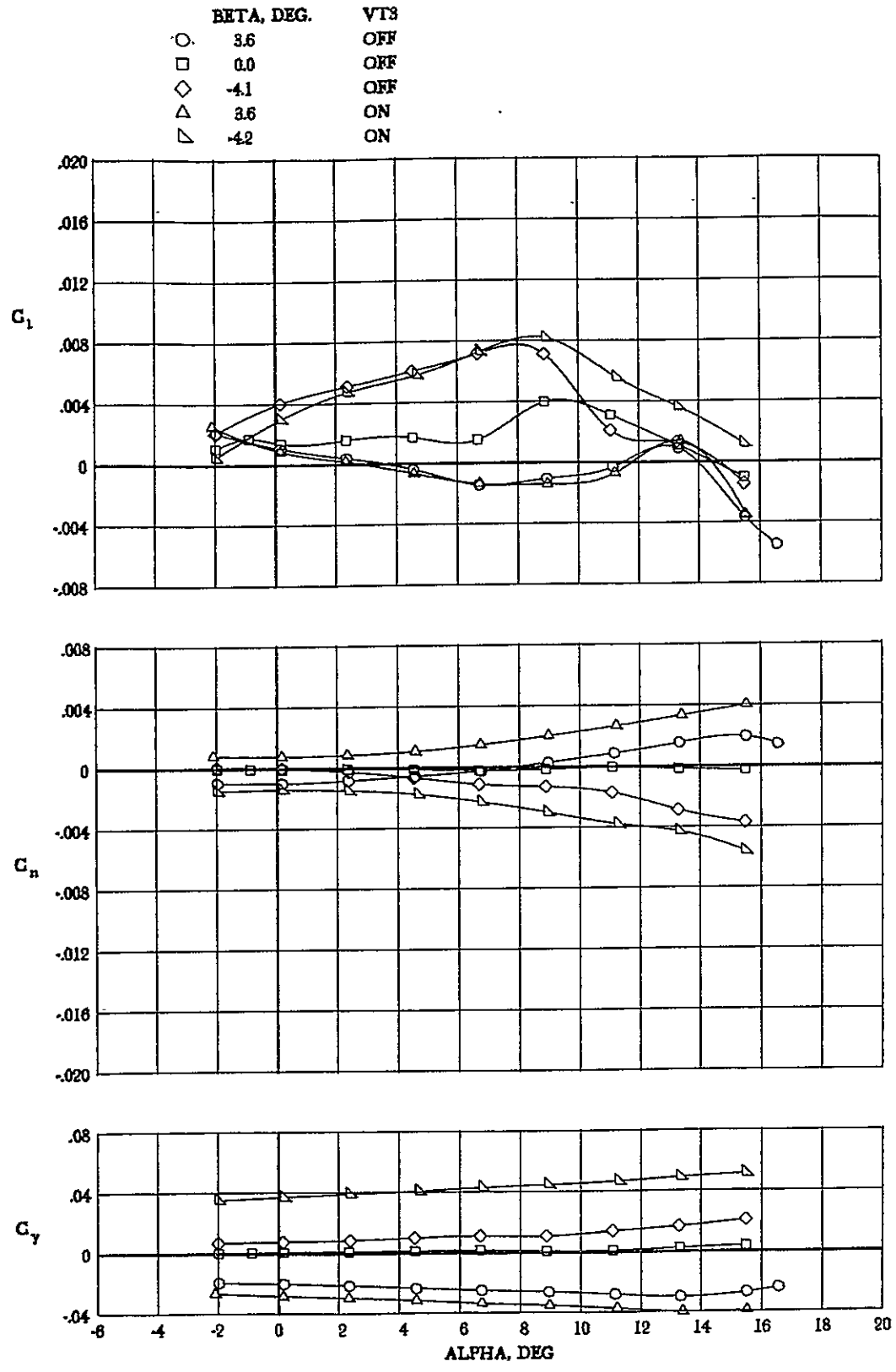


Fig. 24 - Effect of vertical tail (VT#3) on lateral/directional characteristics at sideslip. Nacelles off, M = 0.3

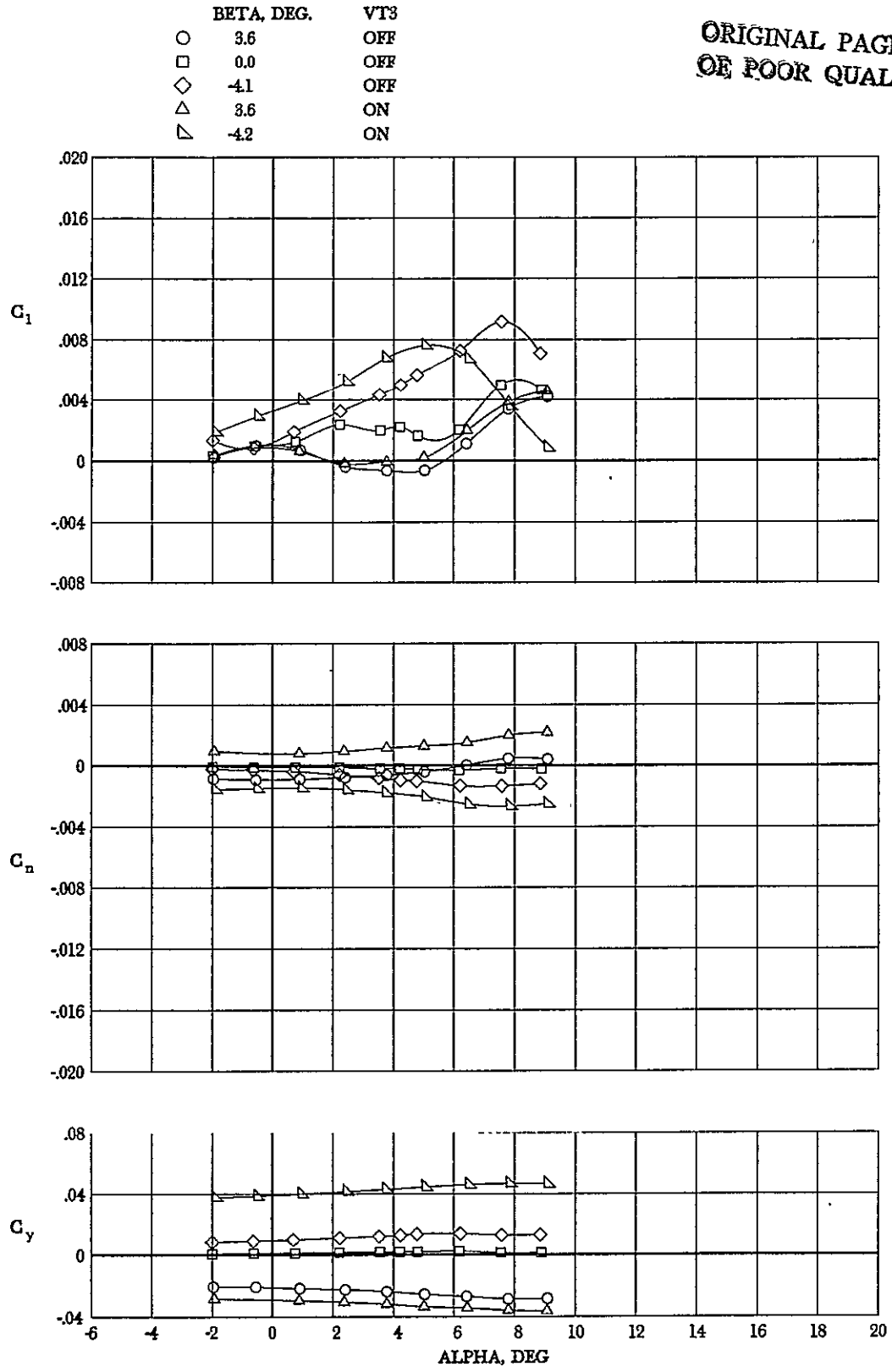


Fig. 25 - Effect of vertical tail (VT#3) on lateral/directional characteristics at sideslip. Nacelles off, M = 0.6

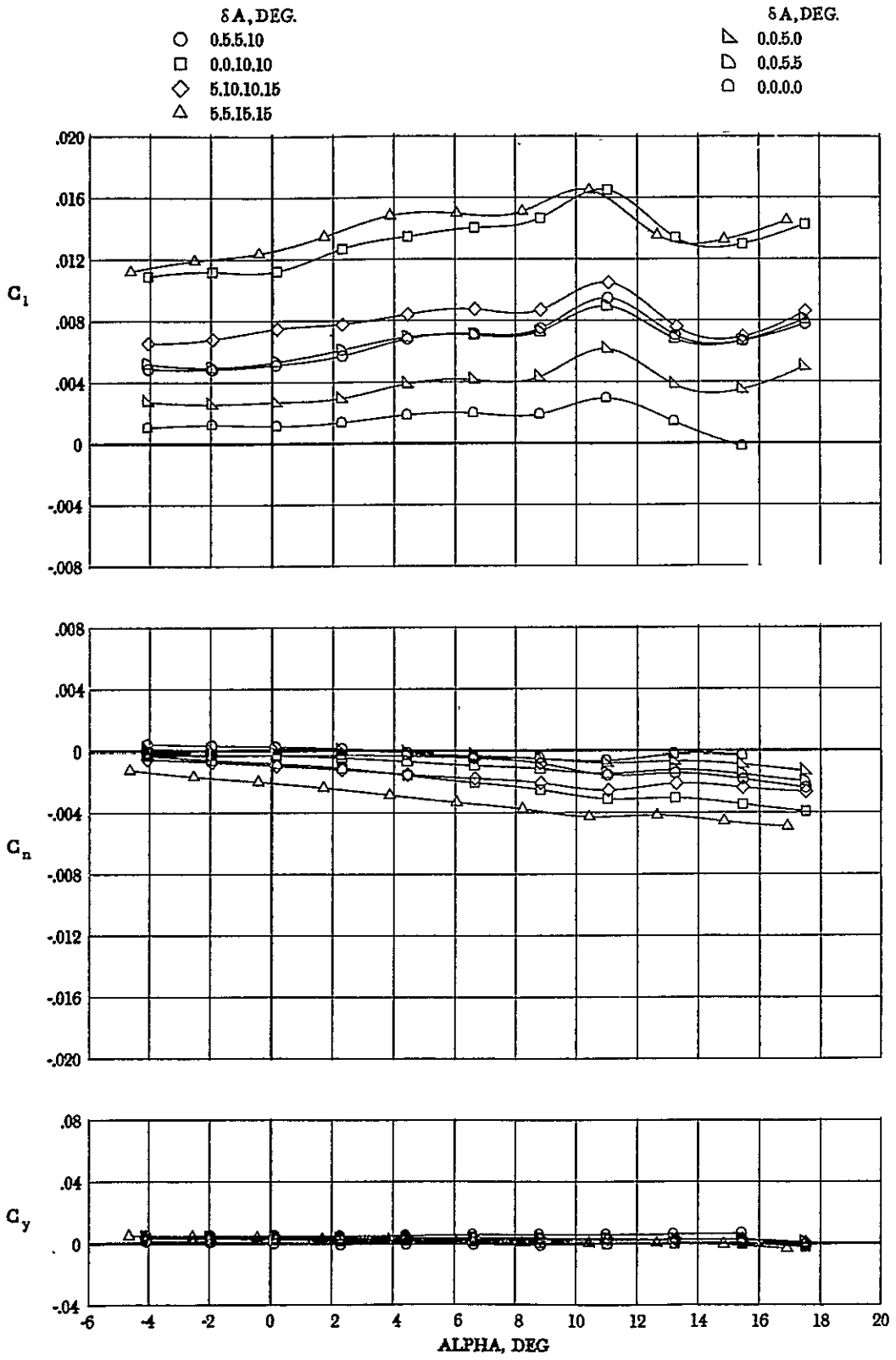


Fig. 26 - Effect of aileron deflection (unsymmetrical) on lateral/directional characteristics at M = 0.3

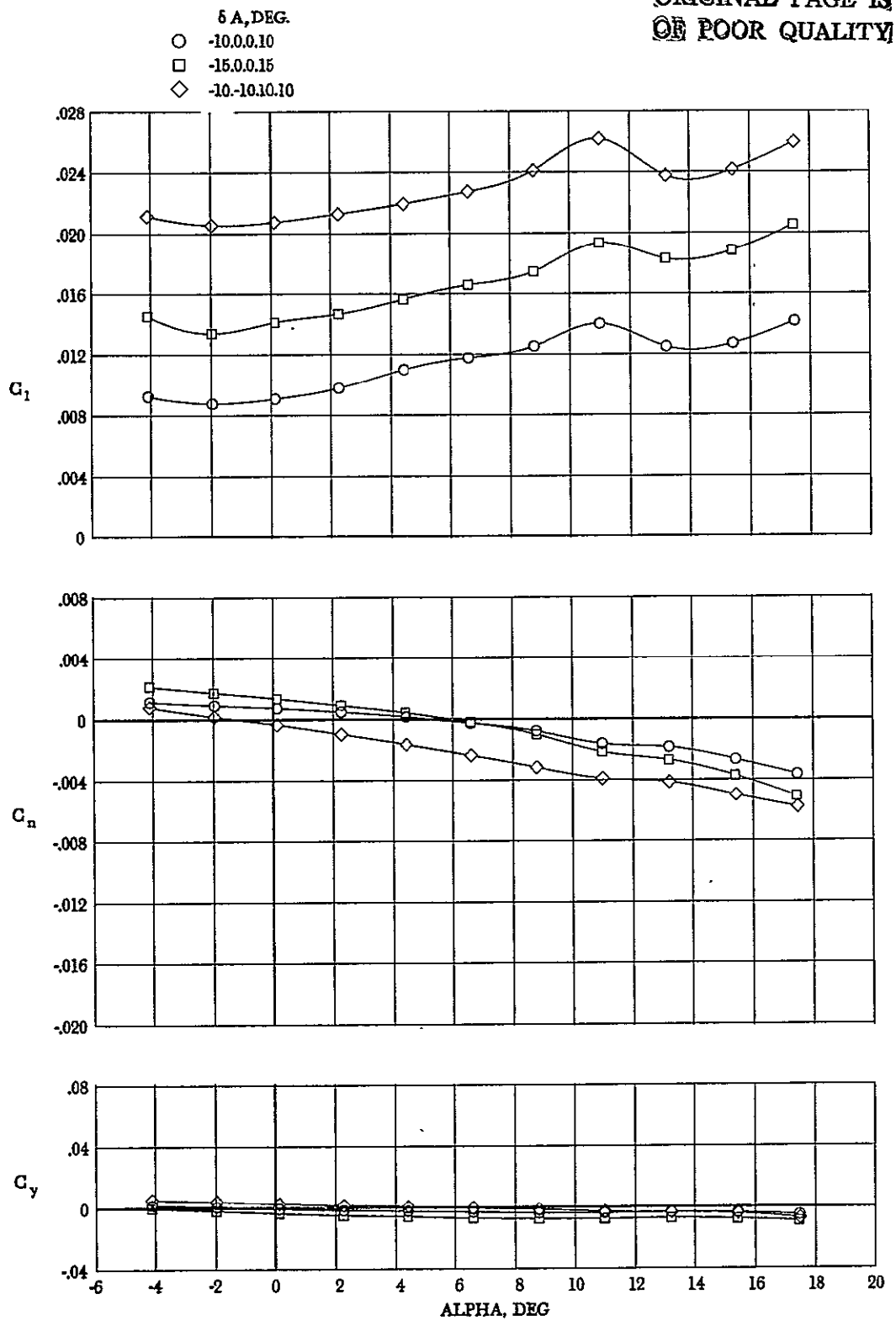


Fig. 27 - Effect of aileron deflection (symmetrical) on lateral/directional characteristics at M = 0.3

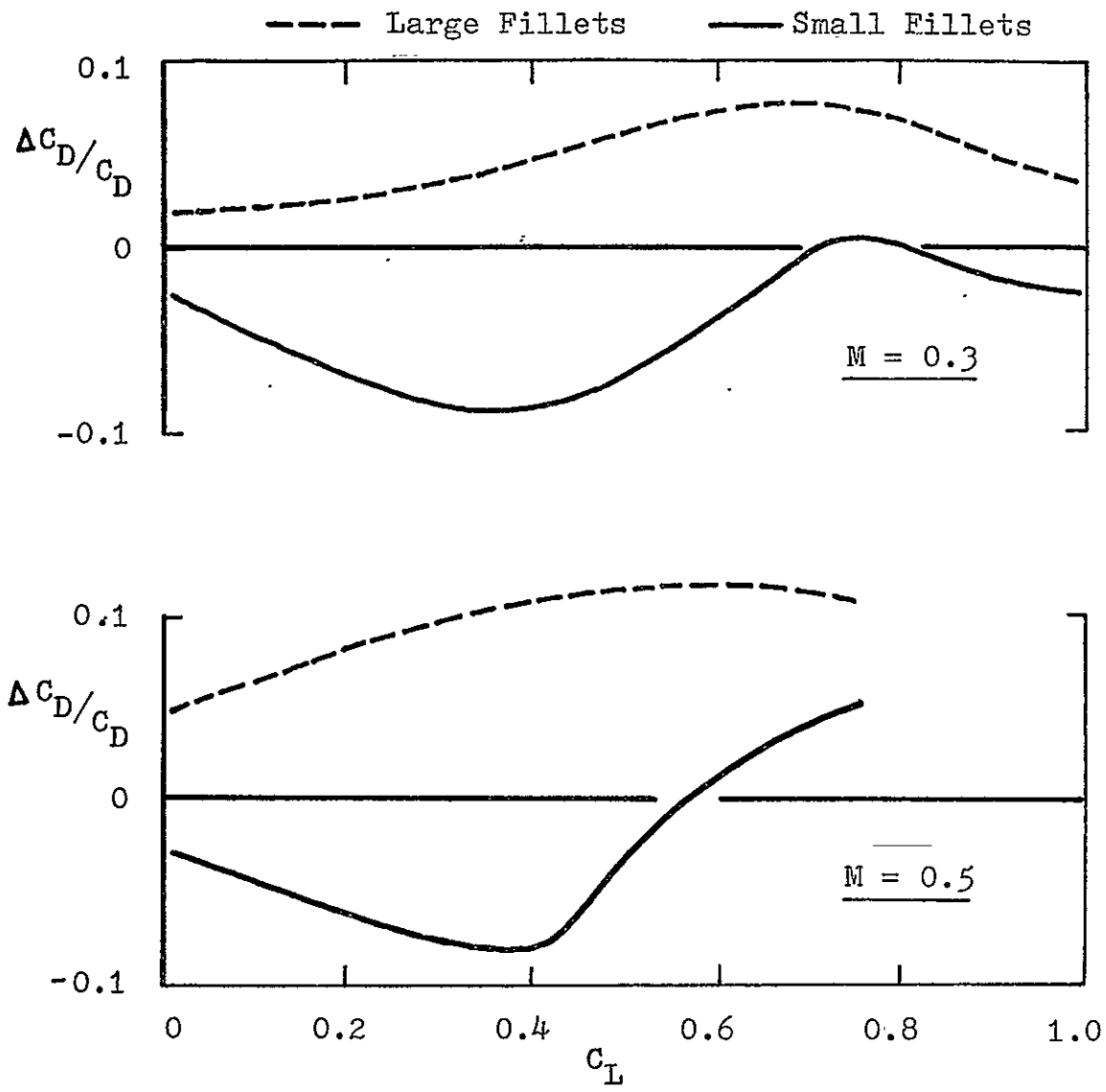


Fig. 28 - Drag improvement due to fillets.

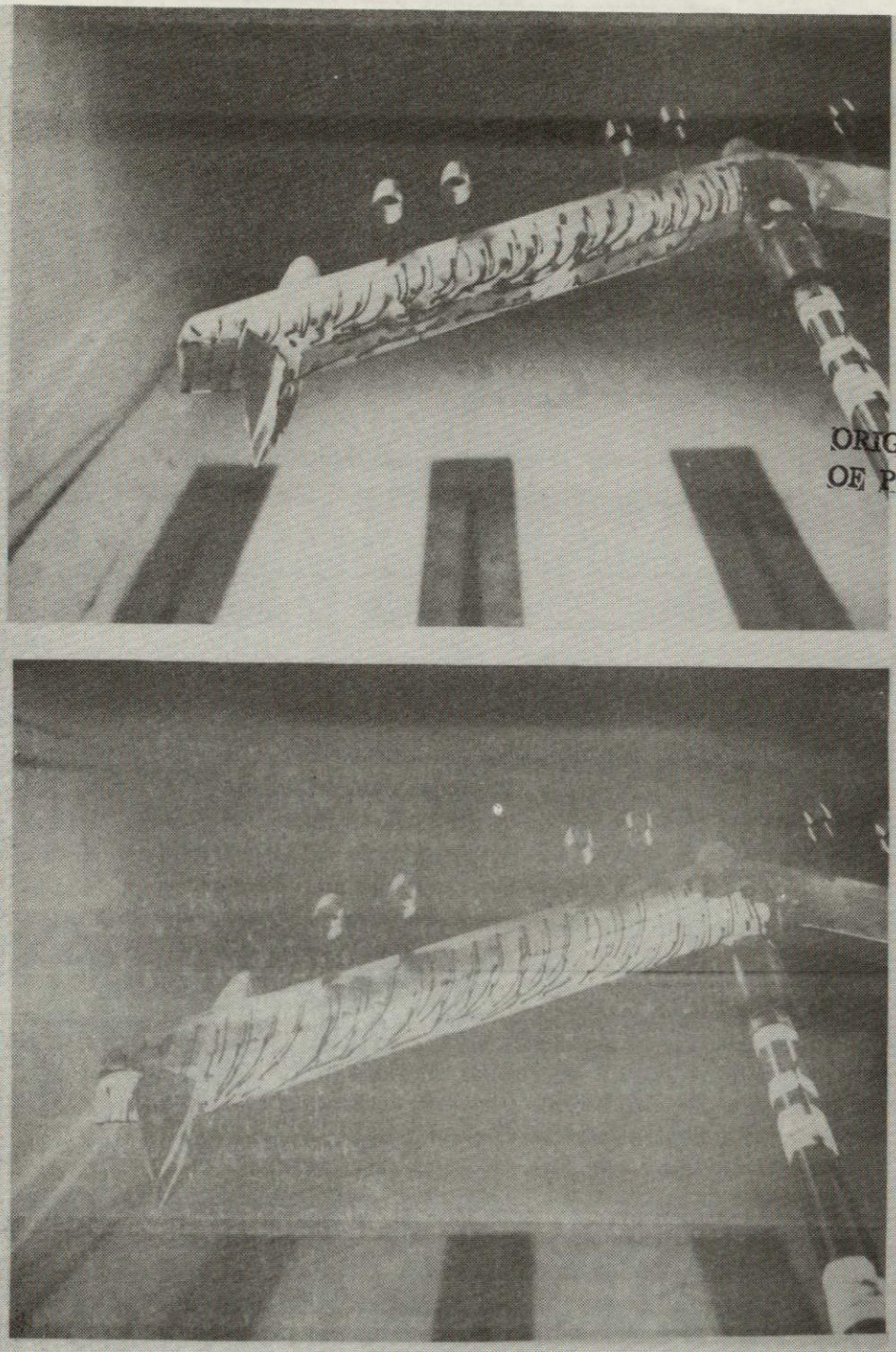


Fig. 29 - Oil flow visualization at low speed, α = 2 deg.
A (above)- Original wing,
B (below)- Upper surface modified.

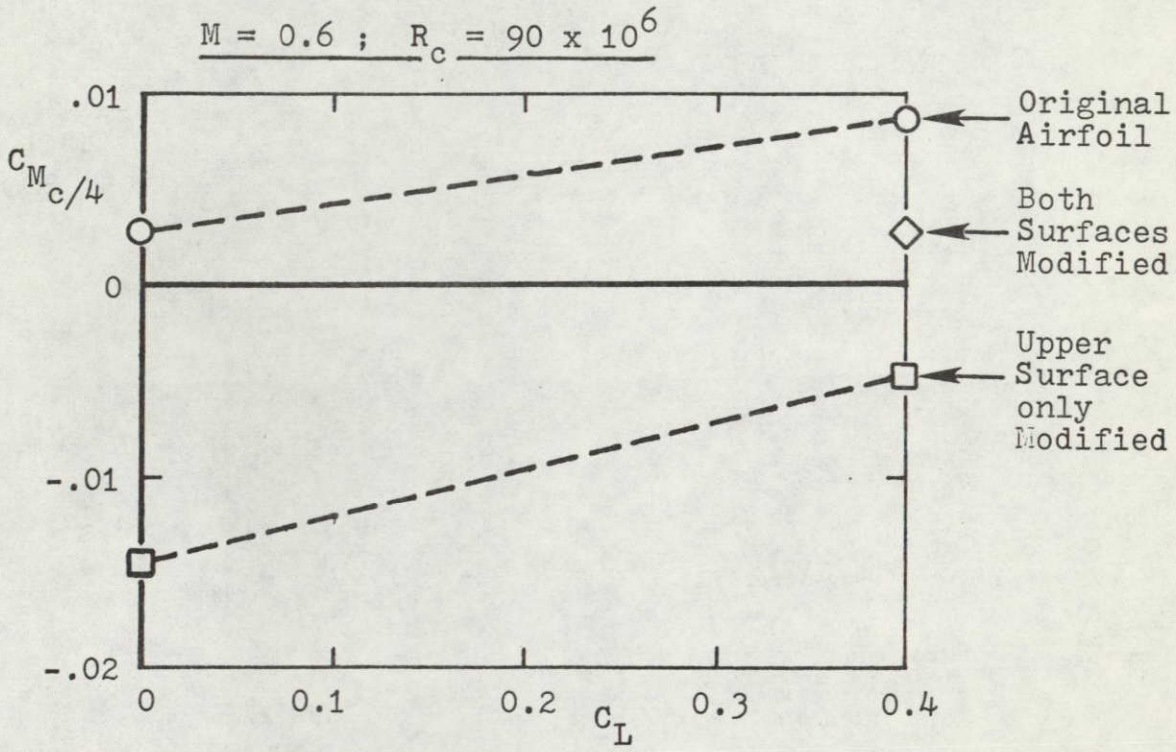


Fig. 30 - Calculated pitching-moment changes due to airfoil section modifications.

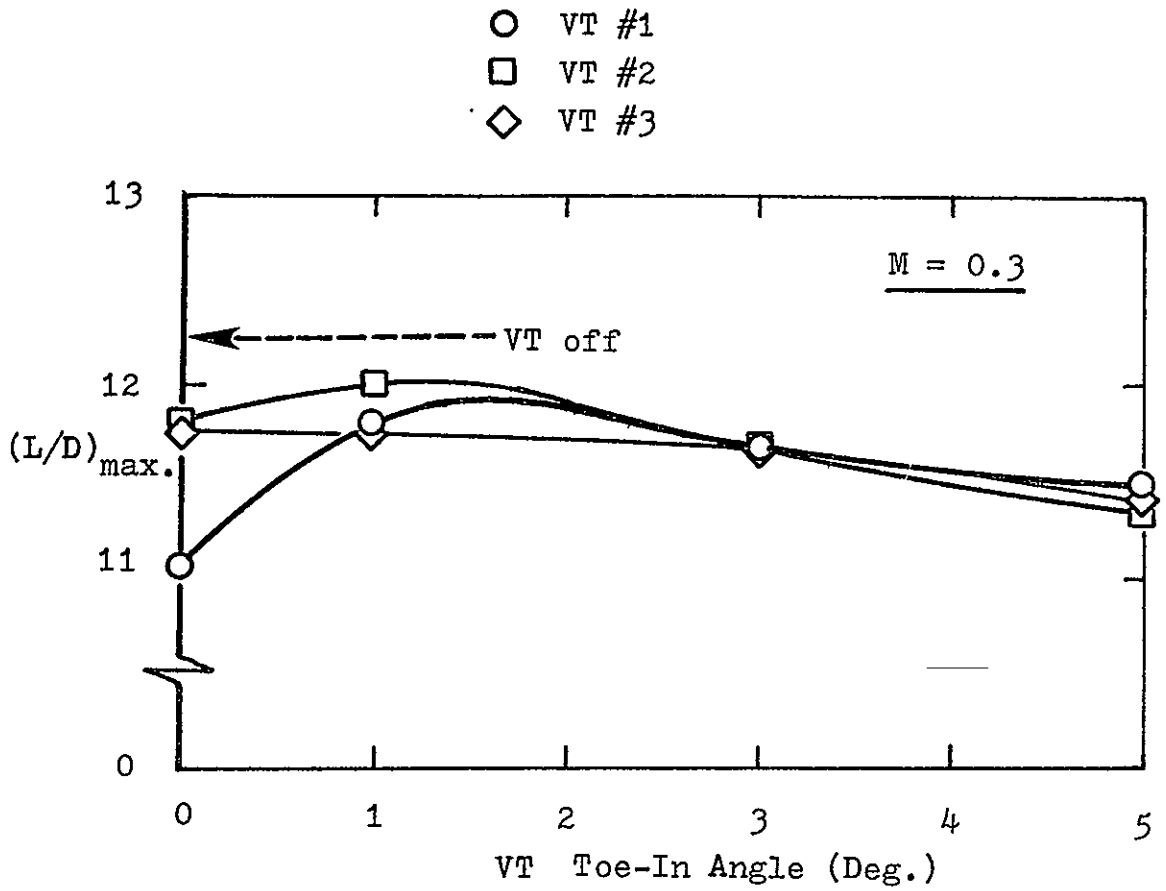


Fig. 32 - Vertical Tail toe-in effect on $(L/D)_{max.}$

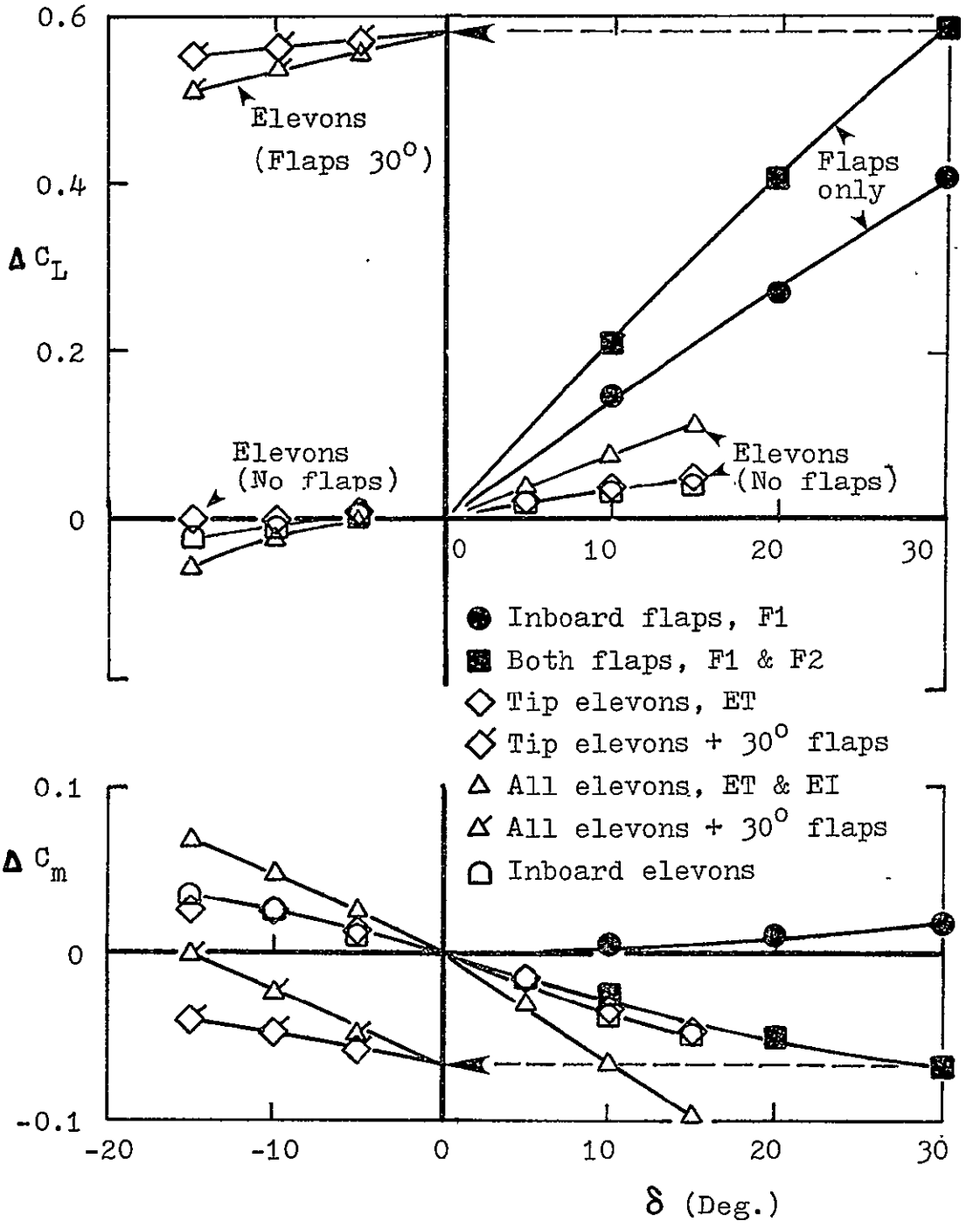


Fig. 33 - Lift and pitching-moment increments due to trailing-edge control deflection.

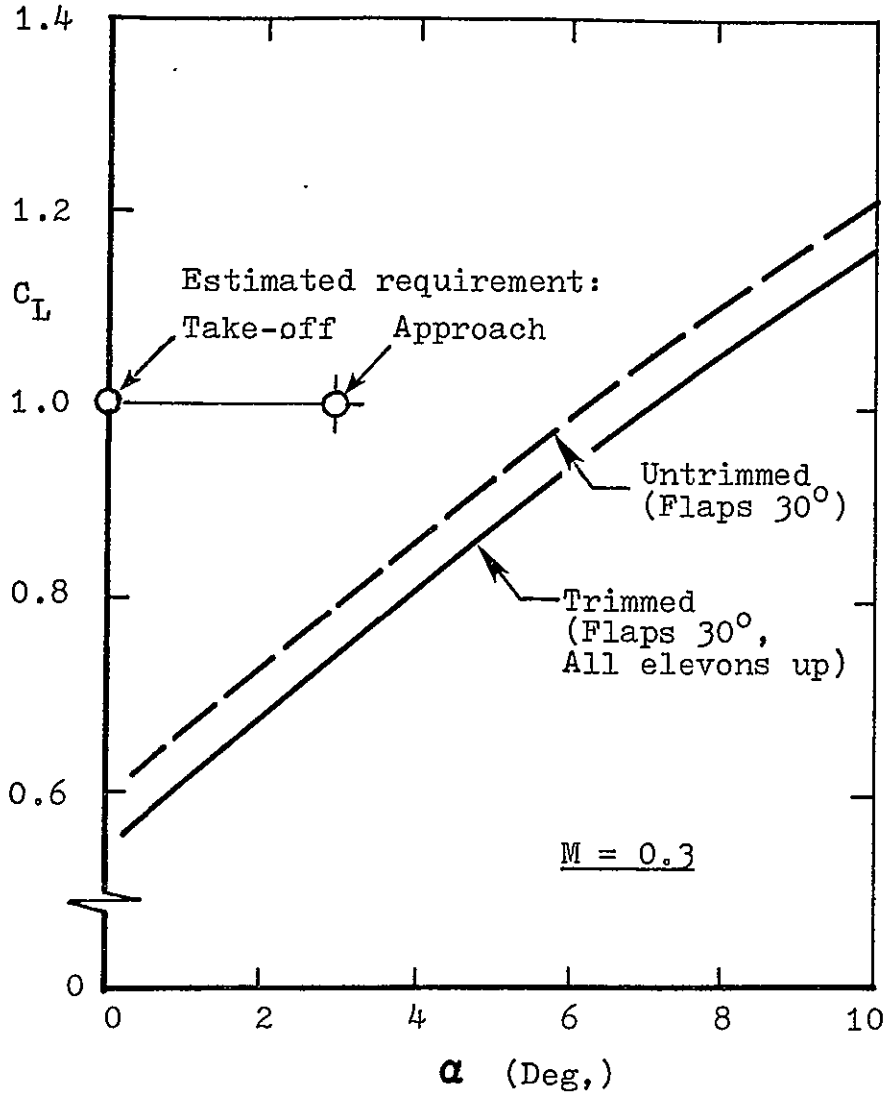


Fig. 34 - Trimmed lift curve with 30° flaps.

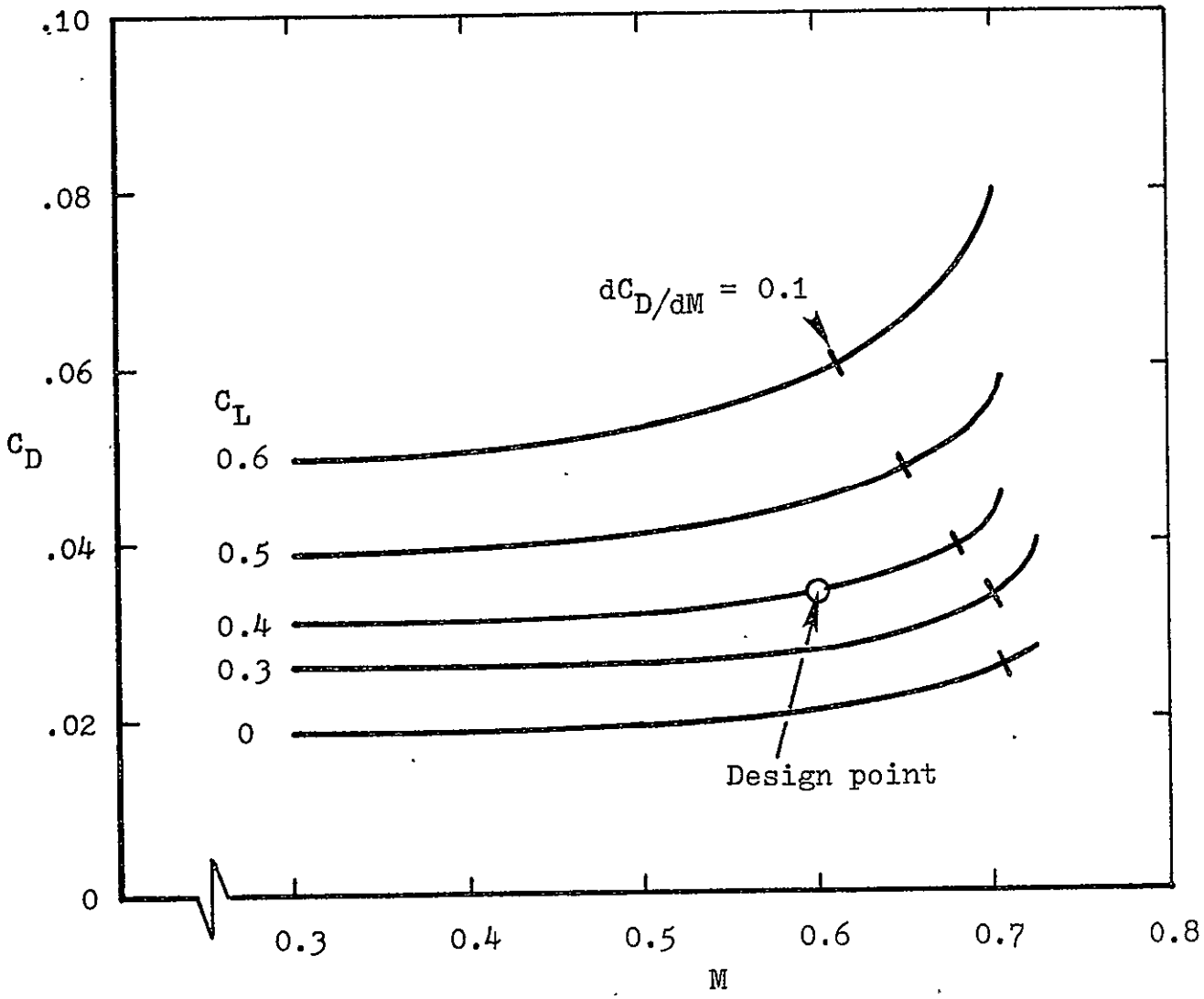


Fig. 35 - Drag rise with Mach number.

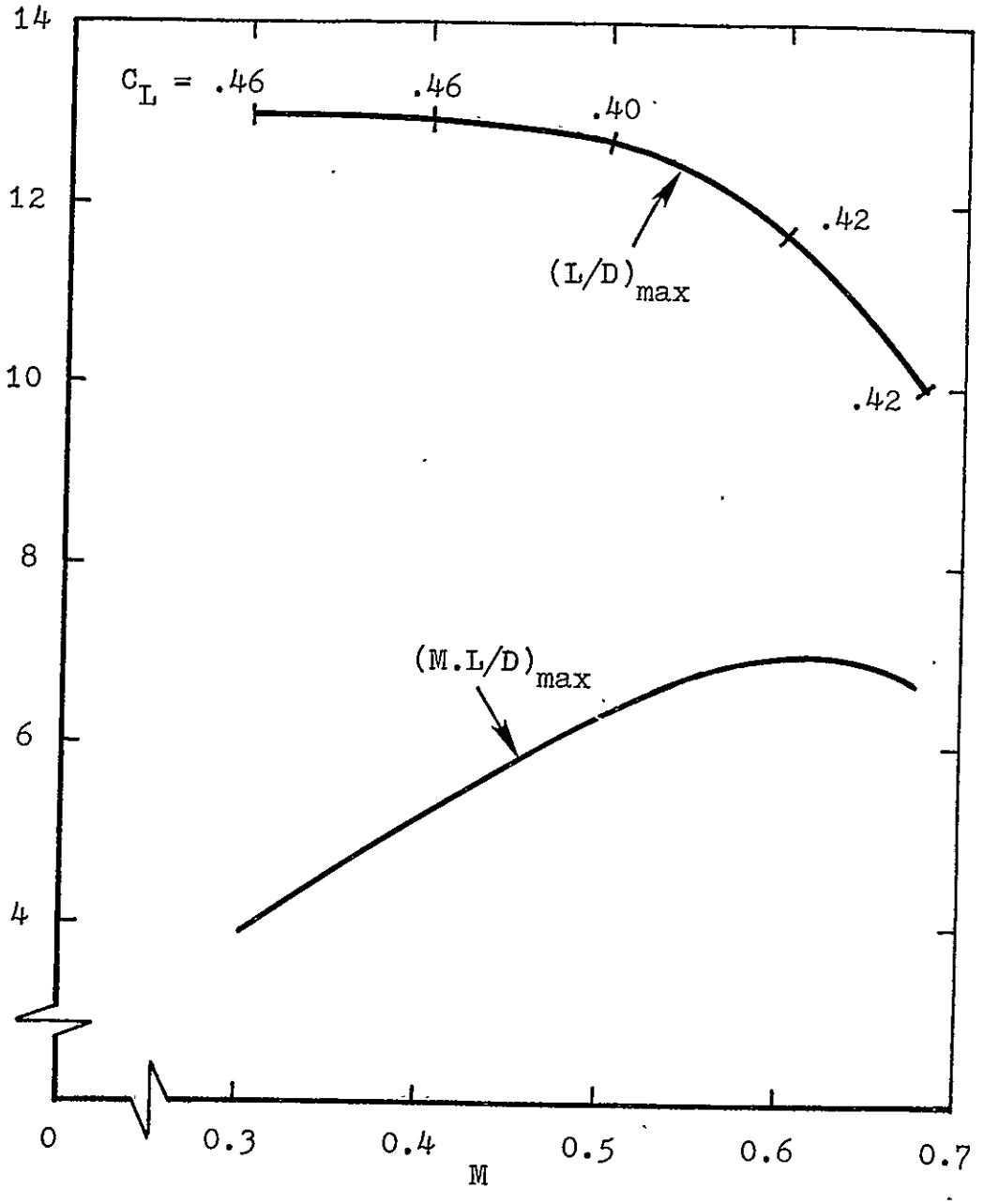


Fig. 36 - $(L/D)_{max}$ and $(M.L/D)_{max}$ variation with Mach number

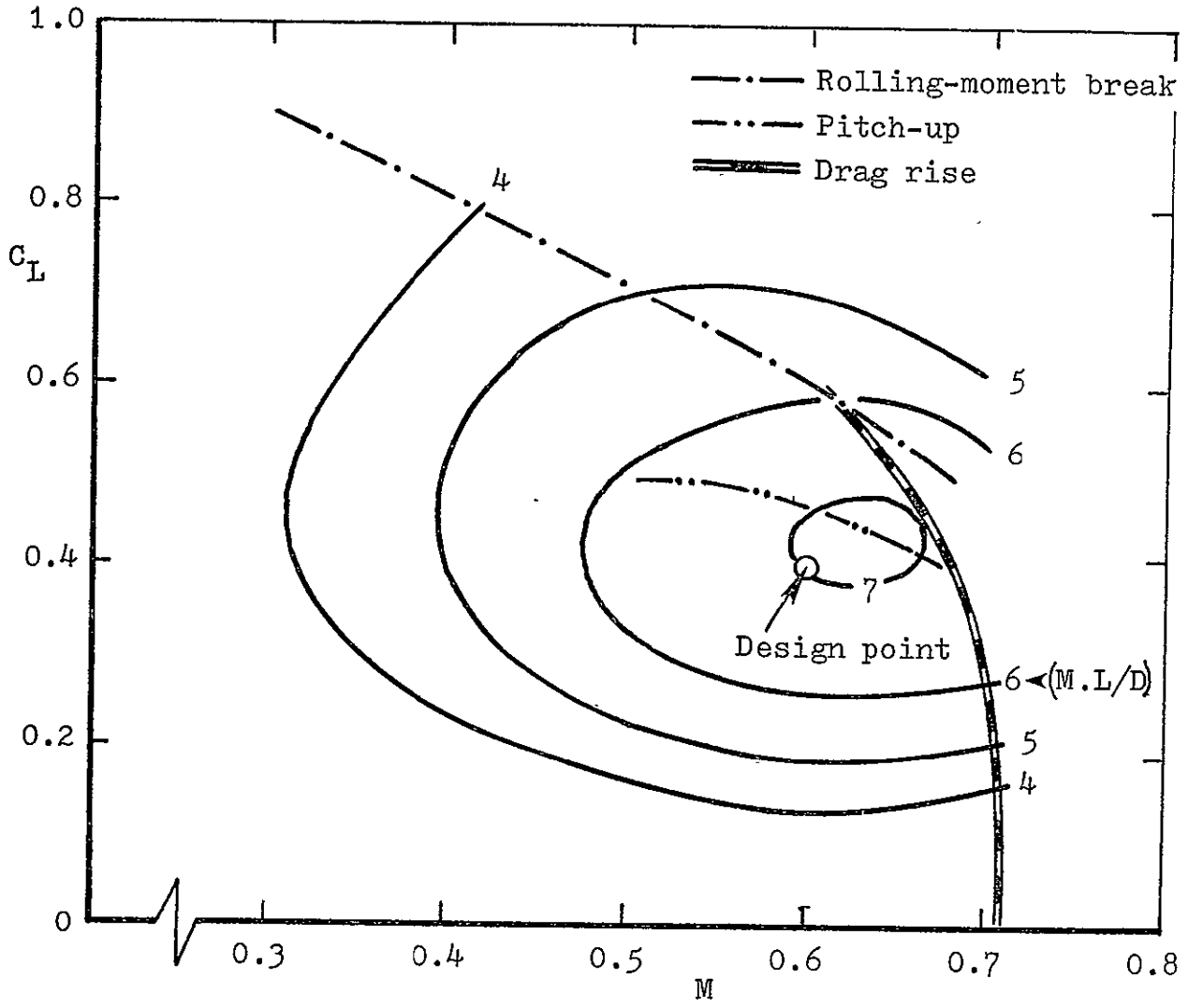


Fig. 37 - Summary of Mach number effects on aerodynamic boundaries.

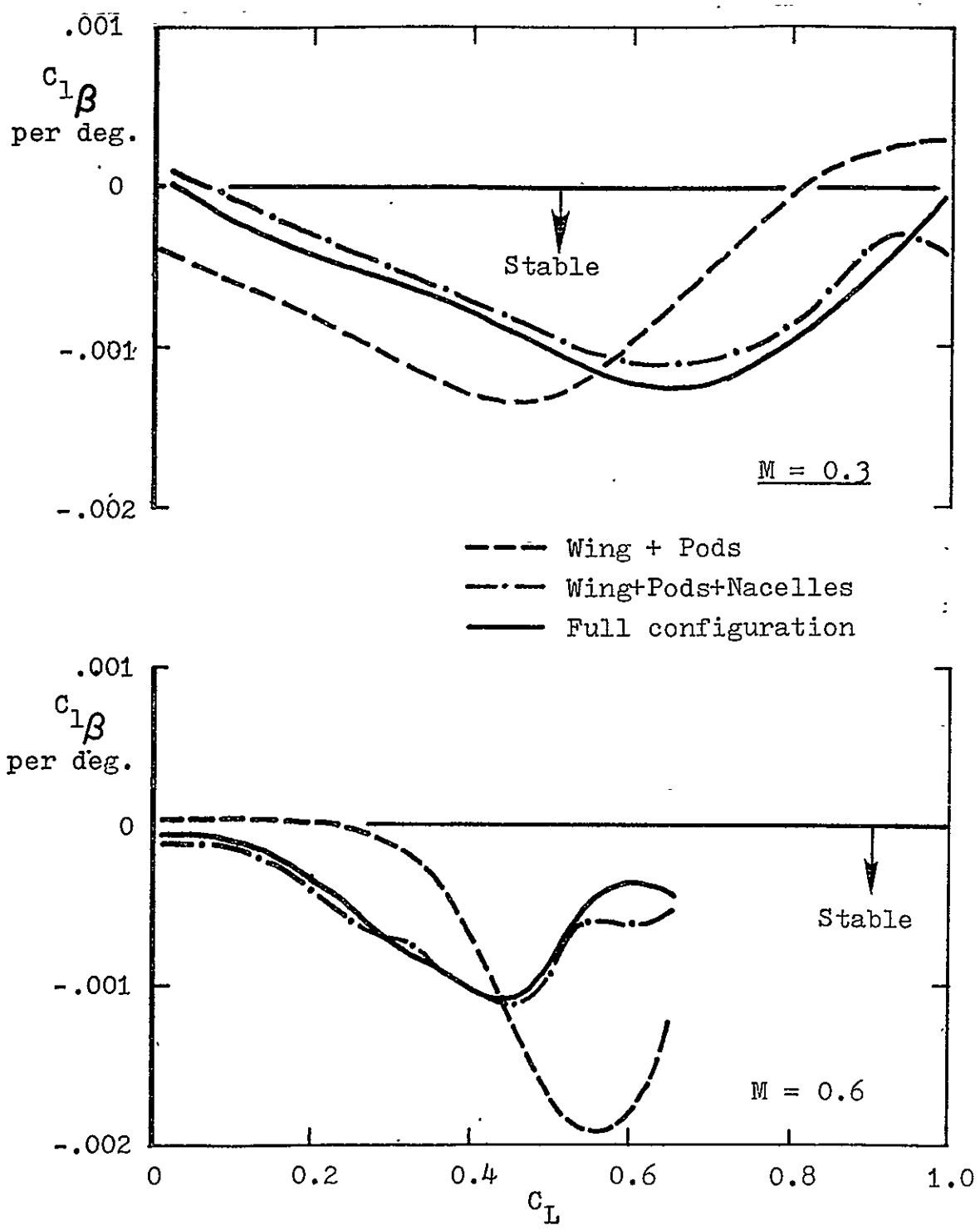


Fig. 38 - Configuration build-up effects on lateral stability.

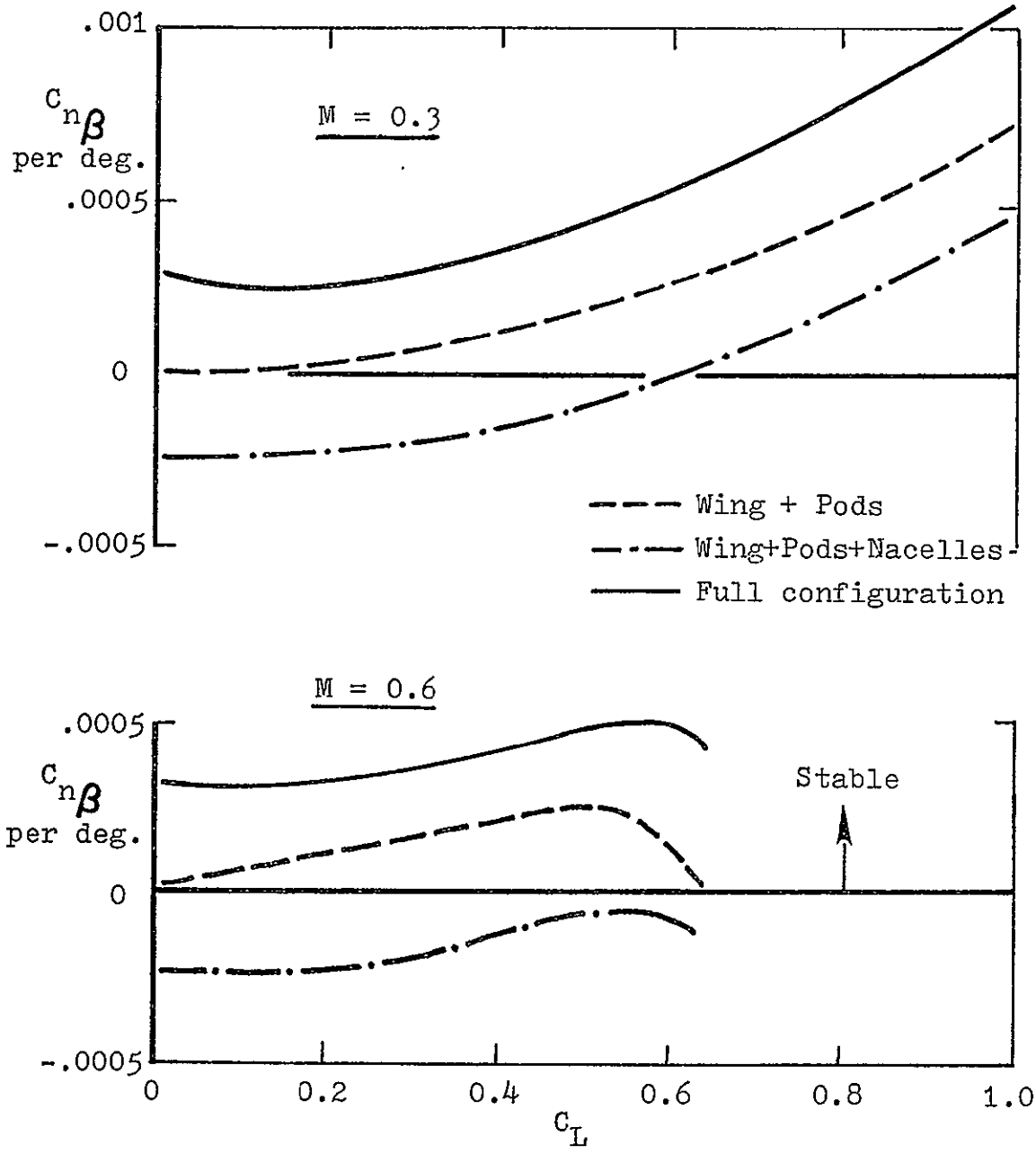


Fig. 39 - Configuration build-up effects on directional stability.

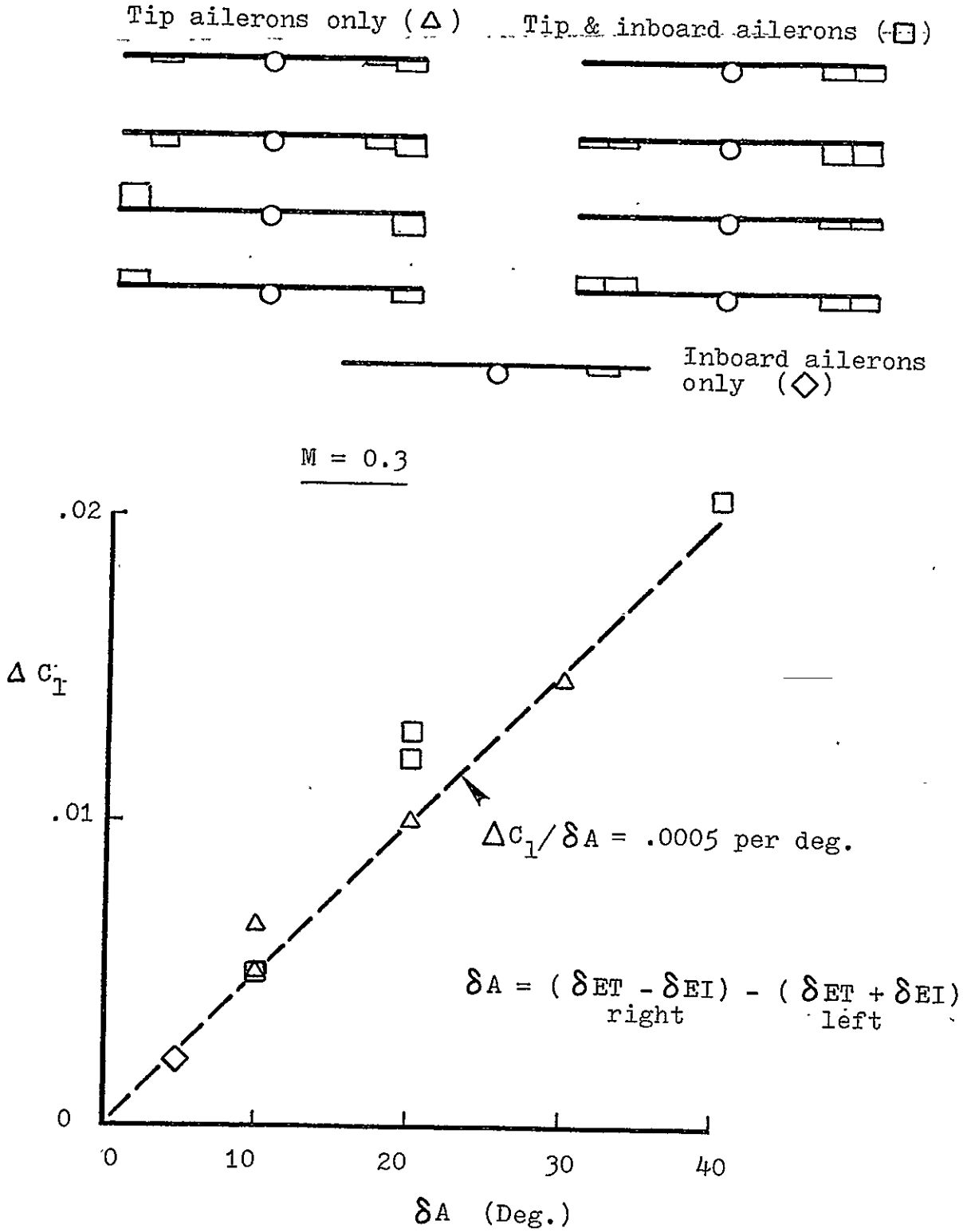


Fig. 40 - Roll control effectiveness.

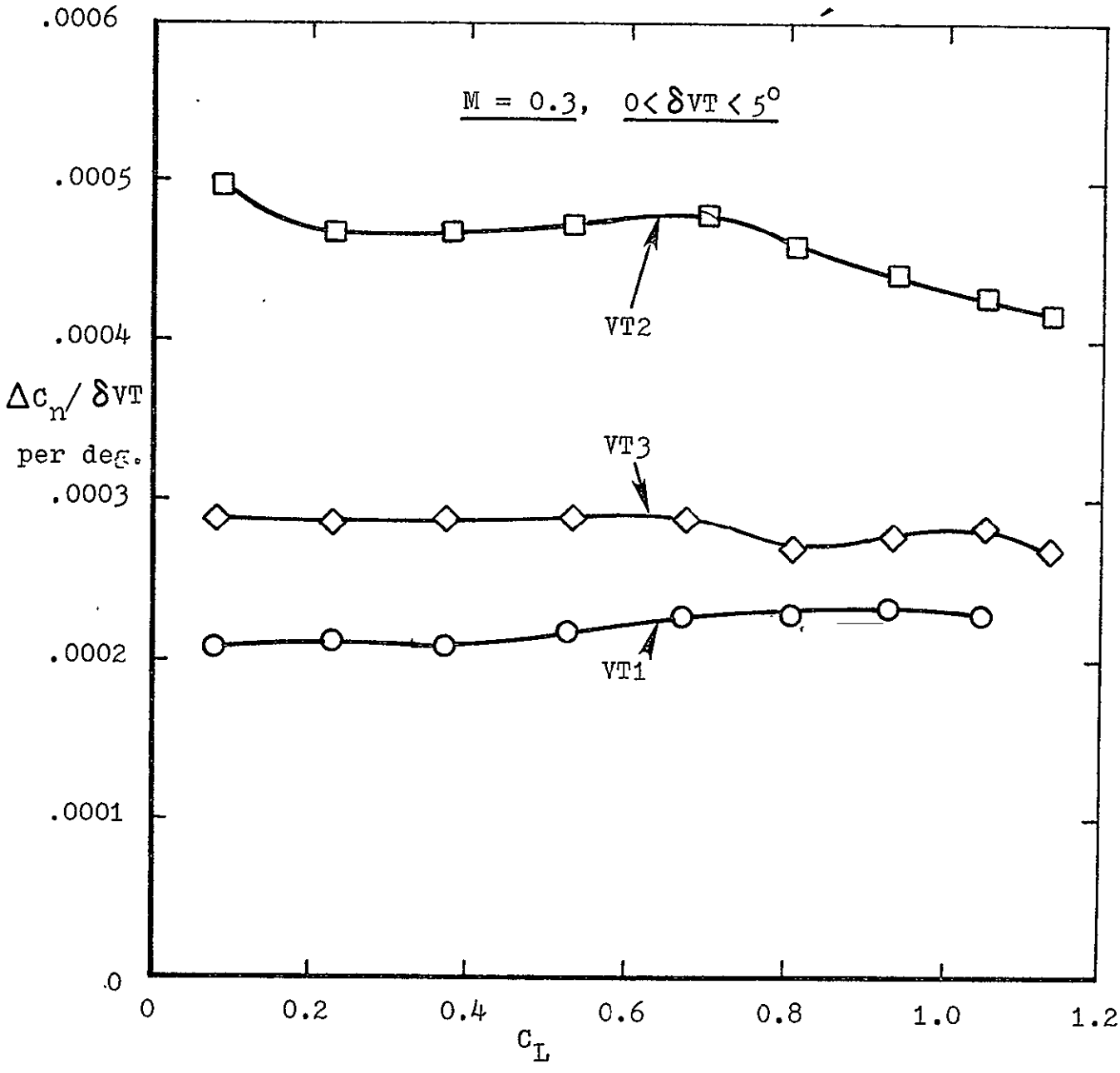


Fig. 41 - Directional control effectiveness of all-moving vertical tails

1. Report No	2. Government Accession No.	3. Recipient's Catalog No.
TM 78767		

4. Title and Subtitle	5 Report Date
WIND TUNNEL TESTS ON A TAIL-LESS SWEPT WING SPAN DISTRIBUTED CARGO AIRCRAFT CONFIGURATION	September 1978
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
Dhanvada M. Rao* and Jarrett K. Huffman	
	10. Work Unit No. 505-11-13-03
9. Performing Organization Name and Address	11. Contract or Grant No.
Hampton, Virginia 23665	
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	Technical Memorandum
National Aeronautics and Space Administration Washington, DC 20546	14. Sponsoring Agency Code

15. Supplementary Notes

*Old Dominion University Research Foundation

16. Abstract

A basic wind tunnel study was conducted on a 1/100-scale model of a tail-less, span-distributed advanced cargo aircraft (Spanloader) concept. The configuration consisted of a 30^{0} -swept, untapered, untwisted wing utilizing a low-moment cambered airfoil of 20 percent streamwise thickness designed for low wave drag at M = 0.6, C_L = 0.4. The tests covered a range of Mach numbers 0.3 to 0.725 and chord Reynolds no. 1.1×10^6 to 2.04×10^6, angles of attack up to model buffet and sideslip angles $\pm 4^{0}$. Configuration build-up, wing-pod filleting, airfoil modification and trailing-edge control deflection effects were briefly investigated. Three-wing-tip vertical tail designs were also tested.

Wing-body filleting and a simple airfoil modification both produced increments to maximum lift/drag ratio. Addition of pods eliminated pitch instability of the basic wing. While the magnitude of these benefits probably was Reynolds no. sensitive, they underline the potential for improving the aerodynamics of the present configuration. The cruise parameter (product of Mach number and lift/drag ratio) attained a maximum close to the airfoil design point. The configuration was found to be positively stable with normal control effectiveness about all three axes in the Mach no. and C_L range of interest.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Wind tunnel test Wing-body configurations Stability	Unclassified - Unlimited Star Category - 02

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	140	$7.25

*For sale by the National Technical Information Service, Springfield, Virginia 22151