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SUMMARY

Tests have been conducted in the Langley V/STOL tunnel to determine the effects of wing leading-edge deflection on the low-speed aerodynamic characteristics of a low-aspect-ratio highly swept arrow-wing configuration.

The results of the investigation showed that leading-edge deflection is effective in suppressing the formation of leading-edge vortices and promoting attached flow conditions. For the particular model tested, a uniform deflection of the entire leading edge was required to prevent the occurrence of local regions of vortex separation which otherwise originated at points where the leading edge was discontinuous. Based on analysis of the force and moment data and tuft grid measurements of the leading-edge upwash, a uniform deflection of 30° was selected for detailed study. The resulting improvements in low-speed performance and longitudinal stability, achieved with the uniform 30° deflection, were accompanied by marked improvements in the wing flow field.

INTRODUCTION

The National Aeronautics and Space Administration is currently investigating the aerodynamic characteristics of advanced aircraft concepts capable of cruising efficiently at supersonic speeds. In order to achieve the desired high levels of supersonic cruise efficiency, these conceptual designs typically incorporate a low-aspect-ratio highly swept arrow wing. (See, for example, ref. 1.) Unfortunately, such configurations have traditionally exhibited significant deficiencies in the areas of low-speed performance, stability, and control.

The present investigation is part of a broad research program intended to yield fundamental information necessary to provide such supersonic cruise concepts with acceptable low-speed characteristics. Previous low-speed studies with a model geometrically similar to the present model have been reported in references 2, 3, and 4, and a previous study with the model used in the present study was reported in reference 5. The specific intent of the present study was to provide a preliminary assessment of the leading-edge upwash characteristics and to explore possible beneficial effects provided by a revised leading-edge deflection.

The tests were conducted in the Langley V/STOL tunnel over an angle-of-attack range from about -10° to 17° for sideslip angles of 0° and $\pm 5^{\circ}$. The tests were conducted at a Reynolds number (based on the reference mean aerodynamic chord) of about 2.0×10^{6}.

SYMBOLS

The longitudinal data are referred to the stability system of axes, and the lateral-directional data are referred to the body system of axes as illustrated in figure 1. The moment reference center for the tests was located at 59.16 percent of the reference mean aerodynamic chord. The reference wing area and chord are based on the wing planform which results from extending the inboard (74°) leading-edge sweep angle and the outboard (41.457°) trailing-edge sweep angle to the model center line. (See fig. 2.)

The dimensional quantities herein are given in both the International System of Units (SI) and the U.S. Customary Units. Measurements were made in U.S. Customary Units.

A aspect ratio

b wing span, m (ft)

C_D drag coefficient, $\frac{\text{Drag}}{qS_{ref}}$

$C_{D,i}$ induced drag coefficient

$C_{D,sym}$ drag coefficient of equivalent symmetric configuration (without twist or camber) at zero lift

$C_{D,min}$ minimum drag coefficient

C_L lift coefficient, $\frac{\text{Lift}}{qS_{ref}}$

C_l rolling-moment coefficient, $\frac{\text{Rolling moment}}{qS_{ref}b}$

C_m pitching-moment coefficient, $\frac{\text{Pitching moment}}{qS_{ref}\bar{c}}$

C_n yawing-moment coefficient, $\frac{\text{Yawing moment}}{qS_{ref}b}$

C_Y side-force coefficient, $\frac{\text{Side force}}{qS_{ref}}$

$\bar{c}$ reference mean aerodynamic chord, m (ft)

q free-stream dynamic pressure, Pa (lbf/ft^2)

S leading-edge-suction parameter

S_{ref} reference wing area, m^2 (ft^2)

x,y,z body-axis coordinates

α angle of attack, deg

β angle of sideslip, deg

δ_f trailing-edge flap deflection normal to hinge line, positive when trailing edge is down, deg

δ_{le} leading-edge deflection normal to hinge line, positive when leading edge is down, deg

$\delta_{t,6L}$ deflection of left outboard aileron (segment t_{6L}) normal to hinge line, positive trailing edge down, deg

ϵ downwash angle, deg

σ sidewash angle, deg

Derivatives:

$$C_{L_\alpha} = \frac{\partial C_L}{\partial \alpha}$$

$$C_{L_{\delta_f}} = \frac{\partial C_L}{\partial \delta_f}$$

$$C_{l_\beta} = \frac{\partial C_l}{\partial \beta}$$

$$C_{n_\beta} = \frac{\partial C_n}{\partial \beta}$$

$$C_{Y_\beta} = \frac{\partial C_Y}{\partial \beta}$$

Model component designations:

H horizontal tail

L_1, L_2, L_3, L_4	wing leading-edge flap segments (see fig. 2(a))
N	flow-through engine nacelles
t_1, t_3, t_5, t_6	wing trailing-edge flap segments (see fig. 2(a))
$V_{1,2}$	outboard vertical fins
V_3	center-line vertical tail
WB	wing-body combination

Superscript:

K	Krueger flap

MODEL

The dimensional characteristics of the model used in the present study are listed in table 1 and shown in figure 2. The model, which was initially intended for dynamic tests and was of lightweight construction, was in conformance with the cruise shape geometry as defined in reference 6. A photograph of the model mounted for tests in the Langley V/STOL tunnel is presented in figure 3.

Previous tests with this model have been reported in reference 5. For the present tests the model was configured with flow-through nacelles and the revised full-span leading-edge flap system shown in figure 2. The revised leading-edge system was obtained by extending the existing hinge line to permit deflection of segments L_2 and L_3. (See fig. 2.) Discrete deflections of 0°, 30°, and 45° were provided for segments L_1, L_2, and L_3, whereas a continuous deflection capability was provided for segment L_4. In addition, segment L_4 could be replaced with a Krueger flap as shown in figure 2.

TESTS AND CORRECTIONS

Due to the lightweight construction of the model, static force tests were limited to dynamic pressures of about 335 Pa (7 lbf/ft^2). This value of dynamic pressure resulted in a Reynolds number (based on the reference mean aerodynamic chord) of 2.0×10^6, at a corresponding Mach number of 0.07. The angle of attack ranged from -10° to 17° and the angles of sideslip were 0° and $\pm 5^\circ$. The principal configuration variables were wing leading- and trailing-edge flap deflections. For purposes of the present study, the nacelles and outboard vertical fins were regarded as integral parts of the wing, and no attempt was made to isolate their effects. Limited tests were conducted to determine the influence of wing leading-edge deflection on horizontal- and vertical-tail effectiveness.

In addition to these tests, flow visualization studies were conducted to provide a qualitative assessment of the leading-edge upwash characteristics by

using the tuft mast arrangement shown schematically in figure 4. Limited smoke flow visualization tests were also conducted to aid in determining the effects of wing leading-edge deflection on the flow field over the wing surface.

The data presented have been corrected for jet-boundary effects by using the theory outlined in reference 7. The data have also been corrected for flow angularity by using the technique of reference 8. Blockage and buoyancy effects have been determined to be negligible by the methods of reference 8. Transition strips were placed on the wing and the horizontal and vertical tails in accordance with the method of reference 9.

PRESENTATION OF RESULTS

A data supplement containing a summary of the test program and a tabular listing of data is presented as an appendix. The results and discussion are presented in accordance with the following outline:

RESULTS AND DISCUSSION

Longitudinal Aerodynamic Characteristics

Leading-edge configuration studies.- Previous low-speed experimental studies (see, for example, refs. 3, 4, and 5) have shown that the basic wing—body—outboard-vertical-fin combination exhibits a marked longitudinal instability (referred to as pitch-up) and a degradation of performance at relatively low angles of attack. These previous investigations have indicated that this marked longitudinal instability and the degradation of performance are associated with separated flow effects, which result from high local angles of attack at the wing leading edge. Owing to the high leading-edge sweep of the present configuration, the separated flow forms the classical leading-edge vortex system. In an attempt to more closely approximate the design condition of attached flow, and thereby to alleviate the deficiencies mentioned, recent studies have considered conditions wherein limited portions of the leading edge (corresponding to segments L_1 and L_4 in the present notation) have been deflected.

Figure 5 presents the static longitudinal aerodynamic characteristics obtained during the present study for the wing—body—outboard-vertical-fin

combination configured with (1) undeflected leading edges and (2) deflected leading edges with $L_1 = 30^\circ$ and L_4 replaced with a 45° Krueger flap. (See fig. 2(b) for details of Krueger flap.) Also presented are the theoretical drag polars corresponding to the conditions of (1) minimum induced drag (100 percent leading-edge suction) and (2) full leading-edge separation with no subsequent flow reattachment (0 percent leading-edge suction). These conditions are defined herein as

$$C_D = C_{D,sym} + \frac{C_L^2}{\pi A} \tag{1}$$

and

$$C_D = C_{D,sym} + C_L \tan \frac{C_L}{C_{L_\alpha}} \tag{2}$$

where $C_{D,sym}$ represents the zero-lift drag coefficient for the equivalent symmetric (no twist or camber) configuration. The value of $C_{D,sym}$ has been estimated for the present model tests from the relationship

$$C_{D,sym} = C_{D,min} - \frac{C_L^2\Big|_{C_{D,min}}}{\pi A} \tag{3}$$

Evaluation of equation (3) yields $C_{D,sym} = 0.0158$. The value of C_{L_α} has been determined experimentally (for the linear region of C_L plotted against α) to be 0.036, which is in agreement with the results obtained by using a simple vortex-lattice theoretical model. (See ref. 10 for a description of the vortex-lattice program.) It should be noted that equations (1) and (2) are, of course, valid only for symmetric wings with no twist or camber and are presented herein solely to permit the aerodynamic performance (achieved by the various leading-edge treatments) to be quantified. This is accomplished by introducing the leading-edge-suction parameter S (see ref. 11 for a comprehensive discussion of leading-edge suction) defined herein as

$$S = \frac{C_D - \left(C_{D,sym} + C_L \tan \frac{C_L}{C_{L_\alpha}}\right)}{\frac{C_L^2}{\pi A} - C_L \tan \frac{C_L}{C_{L_\alpha}}} \tag{4}$$

It should be further noted that in equations (2) and (4), the quantity $C_L \tan (C_L/C_{L_\alpha})$ has been used in place of the more customary $C_L \tan \alpha$. (See ref. 11.) This present notation has been introduced to insure a common basis for comparison of leading-edge suction for the various leading-edge treatments.

From figure 5, it can be seen that the particular combination of deflections ($L_1 = 30^\circ$, $L_4 = 45^{\circ K}$) results in a reduction in vortex lift. (The superscript K indicates a Krueger flap as shown in fig. 2(b).) In addition, there is a beneficial reduction in pitch-up and a small reduction in drag for $C_L > 0.3$. Evaluation of the leading-edge suction, as discussed in a subsequent section, shows that with $\delta_{le} = 0^\circ$, the configuration achieves values of leading-edge suction of only about 55 percent and that leading-edge deflection with $L_1 = 30^\circ$ and $L_4 = 45^{\circ K}$ results in only modest increases. These relatively low values of S indicate that the flow is only partially attached along the leading edge.

Figure 6 presents results of tests conducted to determine the relative effect of increasing the deflection of leading-edge segment L_1. As can be seen, increasing the deflection from 30° to 45° had no beneficial effect on pitch-up and exhibited an adverse effect on drag.

In order to provide some insight into the flow characteristics along the wing leading edge, the tuft mast arrangement illustrated in figure 4 was used. Figure 7 presents photographs of the tufts, taken with the mast located at various leading-edge stations. Although the experimental accuracy of this technique for measuring upwash has not yet been determined, it is believed that the results are at least qualitatively indicative of relative flow angularity. Figure 8 shows a comparison of the upwash observed using the tuft mast arrangement and the theoretical upwash calculated using the linear vortex-lattice program described in reference 10. Both the observed and the theoretical results are presented for a location of $0.019\bar{c}$ forward of the wing leading edge with the model at $\alpha = 10^\circ$. As can be seen, the agreement between the observed and theoretical results is quite poor; however, the general trend of increasing upwash with increasing spanwise location is consistent.

Based on these data, it appeared that increasing the spanwise extent of the leading-edge deflection, beyond segment L_1, would be an appropriate means for improving the flow attachment along the wing leading edge and subsequently improving the performance of the configuration. Accordingly, the wing was modified to permit the deflection of the leading-edge segments subsequently denoted as L_2 and L_3. (See fig. 2.) In the interest of brevity, the leading-edge deflections are denoted as $\delta_{le} = L_1/L_2/L_3/L_4$. For example, a leading-edge deflection $\delta_{le} = 15^\circ/30^\circ/45^\circ/45^{\circ K}$ would correspond to a condition for which the segment deflections were $L_1 = 15^\circ$, $L_2 = 30^\circ$, $L_3 = 45^\circ$, and $L_4 = 45^\circ$.

During this phase of the investigation, smoke flow visualization tests were conducted to evaluate the effect of deflecting various combinations of L_1, L_2, and L_3. In all cases observed, when a discontinuity existed along the leading edge as a result of nonuniform deflections of segments L_1, L_2, and L_3, a distinct vortex core formed at the point of the discontinuity. This phe-

nomenon was found to persist, even through attempts to reduce the surface discontinuities by the introduction of fairings between adjacent segments. Therefore, to eliminate the vortex separation, a uniform deflection (i.e., $L_1 = L_2 = L_3$) was considered necessary. Based on the observed levels of upwash and the previously discussed adverse effects encountered when segment L_1 was overdeflected, a leading-edge deflection of 30° was selected. It is recognized, of course, that the high sweep of the leading-edge hinge line would, based on simple sweep theory, greatly increase the angular deflection required to align the leading edge with the upwash. However, smoke flow visualization tests indicated that the incoming flow was approximately perpendicular to the leading-edge hinge line. Based on this observation, the hinge-line sweep did not influence the selection of the leading-edge deflection. Figure 9 presents the results obtained for the configuration with $\delta_{le} = 30^\circ/30^\circ/30^\circ/0^\circ$. Also shown for purposes of comparison are previously discussed data for the configuration with $\delta_{le} = 0^\circ$ (undeflected leading edges) and $\delta_{le} = 30^\circ/0^\circ/0^\circ/0^\circ$. Comparison of the drag polars shows that substantial reductions in induced drag are achieved by deflecting the entire leading edge of the main wing structure. Smoke flow visualization studies showed that the measured reduction in induced drag was accompanied by marked improvements in the flow over the main wing structure, as might be anticipated.

It should be recalled that the 30° deflection of the leading edge evolved in order to preserve leading-edge surface continuity and to avoid overdeflecting the wing apex. Thus, the 30° deflection does not represent the optimum leading-edge configuration. In particular, the upwash measurements indicate that the inboard portion of the leading-edge flap is probably overdeflected. One approach, which could reduce the adverse effects of overdeflecting the wing apex, and which would permit a uniform leading-edge deflection, may be to simply increase the sweep of the leading-edge hinge line while moving the point of intersection of the hinge line and the side of the body forward. This modification could reduce the deflected area along the span of segment L_1, and perhaps increase the deflected area outboard of segment L_1.

In addition to deflecting the leading edge of the main wing panel, it would be expected that appropriate deflection of the leading edge of the outboard wing panel (segment L_4) could provide further improvements in the low-speed performance and longitudinal stability. Figures 10 and 11 show the results obtained for simple deflections of segment L_4 and also show the results obtained with a 45° Krueger flap. Examination of the data indicates that the performance benefit provided by simply deflecting segment L_4 either 20° or 30° is about equal and that both deflections resulted in slightly better performance than did the other deflections considered. The corresponding longitudinal stability characteristics are presented in figure 11. As can be seen, the 30° deflection resulted in a fairly linear variation of C_m with C_L; however, some nonlinearity is still apparent at higher angles of attack. Smoke flow observations showed that for the region over which C_m varied linearly with C_L, the flow over the outboard panel remained fairly well attached.

Figure 12 provides a direct comparison of the longitudinal aerodynamic characteristics of the model configured with (1) $\delta_{le} = 30^\circ/30^\circ/30^\circ/30^\circ$, (2) $\delta_{le} = 30^\circ/0^\circ/0^\circ/45^{\circ K}$ and (3) $\delta_{le} = 0^\circ$ (undeflected leading edges). Analysis of the data shows that whereas the wing—body—outboard-vertical-fin

combination with $\delta_{le} = 30^o/0^o/0^o/45^{oK}$ experienced a gradual pitch-up for $\alpha > 6^o$, the corresponding configuration with $\delta_{le} = 30^o/30^o/30^o/30^o$ postponed the occurrence of pitch-up to $\alpha = 11^o$. (It should be noted, however, that the pitch-up, although delayed, is more abrupt.) Furthermore, the leading-edge deflection $\delta_{le} = 30^o/30^o/30^o/30^o$ is seen to result in substantial reductions in induced drag, or equivalently improved performance, for $C_L > 0.2$. It should, of course, be noted that the reductions in vortex-induced pitch-up and vortex-induced drag are directly related to reductions in vortex lift.

Trailing-edge flap effectiveness.- The segmented trailing-edge flap system is shown in figure 2. The angular deflection of the individual segments is described normal to the respective flap hinge lines. A trailing-edge flap setting written $\delta_f = 40^o/30^o/20^o$ corresponds to a condition wherein the inboard trailing-edge flap segments t_1 are deflected 40^o, the midspan segments t_3 are deflected 30^o, and the outer flap segments t_5 are deflected 20^o.

Figure 13 presents the trailing-edge flap effectiveness for the wing—body—outboard-vertical-fin combination with various leading-edge deflections. Comparison of the data of figure 13(c) with the data of figures 13(a) and 13(b) shows that a slight improvement in trailing-edge flap effectiveness was achieved by deflecting the entire leading edge 30^o. For example, analysis of the data of figure 13 shows that at an assumed approach angle of attack of 8^o, with $\delta_{le} = 0^o$, the configuration exhibits an average value for $C_{L_{\delta_f}}$ of about 0.0067. However, with $\delta_{le} = 30^o/30^o/30^o/30^o$ the corresponding value of $C_{L_{\delta_f}}$ is increased to 0.0081. The latter value is considered to be in reasonable agreement with the theoretical result of $C_{L_{\delta_f}} = 0.0088$. This theoretical result was obtained by using the previously mentioned vortex-lattice representation of the configuration. The improvement in trailing-edge flap effectiveness is, of course, directly related to the improved flow conditions achieved by the leading-edge deflection and serves to emphasize that the development of an efficient trailing-edge flap system is strongly dependent on the development of an effective leading-edge system.

The data of figure 13 also show that deflecting the entire leading edge 30^o, with the trailing edge deflected, resulted in substantial reductions in induced drag (or equivalent increases in leading-edge suction), for the low-speed operational range of $0.3 < C_L < 0.7$. This result is summarized in figure 14, which shows the previously discussed leading-edge-suction parameter S plotted as a function of C_L. The results presented were obtained by constructing the envelope of the drag polars for the various trailing-edge flap deflections. As can be seen, the leading-edge deflection $\delta_{le} = 30^o/30^o/30^o/30^o$ results in substantial increases in leading-edge suction relative to both the undeflected condition, $\delta_{le} = 0^o$, and the condition with $\delta_{le} = 30^o/0^o/0^o/45^{oK}$. For example, relative to $\delta_{le} = 0^o$, $\delta_{le} = 30^o/30^o/30^o/30^o$ provides approximately a 31-percent increase in leading-edge suction at an assumed second-segment-climb lift coefficient of 0.35 and about a 22-percent increase at an assumed approach lift coefficient of 0.6. By contrast, the leading-edge deflection with $\delta_{le} = 30^o/0^o/0^o/45^{oK}$ provided only 6- and 11-percent increases at these respective lift coefficients.

The effect of Reynolds number on leading-edge suction has been discussed in reference 11. The results presented therein indicate that increasing the Reynolds number from the low values of the present tests to actual flight values will result in only modest increases in leading-edge suction for the separated flow condition (e.g., the conditions discussed herein with $\delta_{le} = 0^\circ$ or $\delta_{le} = 30^\circ/0^\circ/0^\circ/45^{\circ K}$). However, for fairly well attached flow conditions (as achieved with $\delta_{le} = 30^\circ/30^\circ/30^\circ/30^\circ$), increasing Reynolds number results in pronounced increases in leading-edge suction. (See fig. 8 of ref. 11.) Based on these results it would appear that the level of leading-edge suction achieved by the uniform 30° deflection is conservative. Furthermore, the favorable increment in leading-edge suction provided by the uniform 30° deflection (relative to the separated flow, $\delta_{le} = 0^\circ$ or $\delta_{le} = 30^\circ/0^\circ/0^\circ/45^{\circ K}$) is also conservative.

It should be noted that although the performance of the configuration was greatly improved by the present leading-edge treatment, the data of figure 13(c) show that progressively increasing the trailing-edge deflection leads to a progressive reduction in the angle of attack at which the onset of pitch-up occurs. This result is thought to be due to the increased circulation which accompanies trailing-edge deflection. The increased circulation apparently results in leading-edge separation and, possibly, a related reduction in trailing-edge flap effectiveness. Based on the results obtained with the trailing edge undeflected, it would appear that a suitable deflection schedule for the leading- and trailing-edge systems may be devised to alleviate the pitch-up characteristics for the high-lift configuration.

Horizontal-tail effectiveness.- Figure 15 presents the horizontal-tail effectiveness for the model with $\delta_f = 20^\circ/20^\circ/20^\circ$ and having the leading-edge geometries previously compared. Data are presented for a range of incidences of the all-movable horizontal tail from 10° to -20° (positive when leading edge is up).

As illustrated in references 4 and 5, the present study shows that while the horizontal tail provides only a small contribution to longitudinal stability, it is effective in providing longitudinal control. The relatively small stabilizing effect provided by the horizontal tail is, of course, directly related to relatively high values of the downwash factor (i.e., $\partial\varepsilon/\partial\alpha$) as measured in reference 2. Owing to the observed changes in the wing flow field when the entire leading edge is deflected, the present phase of the study was intended to determine whether the modified leading-edge geometry would impact the tail effectiveness by altering the downwash in the vicinity of the horizontal tail. As can be seen by comparison of figures 15(a) and 15(b), the horizontal-tail contribution to longitudinal stability and longitudinal control is virtually the same for both deflected-leading-edge geometries studied.

Lateral-Directional Characteristics

Effect of leading-edge deflection.- Previous studies of similar configurations (see, for example, ref. 5) have shown that deflecting all or part of the

wing leading edge may have a significant effect on lateral-directional stability. Figure 16 presents the values of the stability derivatives C_{n_β}, C_{l_β}, and C_{Y_β} as a function of angle of attack for the wing—body—outboard-vertical-fin combination with the various leading-edge deflections studied. As can be seen, the configuration with the undeflected leading edge exhibits stable values of the directional stability derivative C_{n_β} and the level of stability increases with increasing angle of attack. This result has been observed for other highly swept arrow-wing concepts (see, for example, ref. 12) and has been associated with the interaction of the wing-apex vortices on the forward portion of the configuration. The data of figure 16 also show that employing either of the deflected leading-edge geometries (i.e., either $\delta_{le} = 30^o/0^o/0^o/45^{oK}$ or $\delta_{le} = 30^o/30^o/30^o/30^o$) results in reduced values of C_{n_β}. This result is simply due to the combined effect of increased vertically projected area and vortex suppression, which results from the leading-edge deflection. It is interesting to note that while the leading-edge deflection $\delta_{le} = 30^o/30^o/30^o/30^o$ provided improvements in performance and longitudinal stability, relative to the configuration with $\delta_{le} = 30^o/0^o/0^o/45^{oK}$, it did so without any significant additional compromise of the lateral-directional characteristics.

The lateral-directional stability characteristics of the complete configuration are presented in figure 17. Analysis of the tail-on and tail-off data shows that the particular horizontal- and vertical-tail arrangement provides an incremental contribution to C_{n_β} of about 0.001. This result is in excellent agreement with results in reference 5 for the model configured with $\delta_{le} = 30^o/0^o/0^o/45^{oK}$, which indicates that deflecting the entire leading edge does not significantly affect the sidewash characteristics (i.e., $\partial\sigma/\partial\beta$) at the tail location. This result might be anticipated, based on the results of the previous section which indicated that the revised leading-edge treatment did not significantly affect the downwash characteristics in the vicinity of the horizontal tail.

Aileron effectiveness.- The data of the preceding section show that the configuration exhibits relatively high levels of the effective dihedral derivative C_{l_β}. (See figs. 16 and 17.) Previous analyses (see ref. 13) of this configuration have shown that such levels of effective dihedral, when coupled with relatively low levels of available lateral control, result in deficiencies in the lateral-directional handling qualities and also in the inability to meet current standard cross wind landing criteria.

The analysis of reference 5 has shown that one potential solution to the lateral control deficiency is to augment the roll control produced by the outboard aileron with that obtained from differential deflection of the trailing-edge flaps; however, such a scheme also results in an undesirable reduction in the low-speed operational lift coefficient. The more desirable approach

would, of course, be to provide the configuration with an increase in aileron effectiveness.

Inasmuch as the relative ineffectiveness of the outboard ailerons is considered to be directly related to the previously discussed separated flow over the outboard panels, leading-edge treatments which provide improved longitudinal stability would also be expected to yield improved aileron effectiveness. Figure 18 summarizes the rolling-moment data obtained by deflecting the left outboard aileron (segment t_{6L}) of the model. Results are presented for the model configured with the leading-edge deflection of $\delta_{le} = 30^{o}/30^{o}/30^{o}/30^{o}$ at an assumed approach angle of attack of 8^{o}. Also shown, for purposes of comparison, are comparable results obtained from the data of reference 5 for which the leading-edge deflection was $\delta_{le} = 30^{o}/0^{o}/0^{o}/45^{oK}$. Comparison of the initial slopes of the data shows that the configuration with $\delta_{le} = 30^{o}/30^{o}/30^{o}/30^{o}$ offers the potential for substantial increases in lateral control. This result would be expected because of the previously discussed improvements in flow over the outboard panel. It should be noted, however, that for higher deflections of segment t_{6L}, the aileron effectiveness with either of the leading-edge geometries is somewhat similar. In particular, for large upward (negative) deflections of t_{6L}, the curves coalesce as would be expected, and for large downward (positive) deflections of t_{6L}, the curves are about parallel. The data of figure 18 suggest partial flow separation as t_{6L} increases above 10^{o} deflection. This result is in agreement with the previously discussed results for the trailing-edge flap system from which it was concluded that the increased lift and circulation accompanying trailing-edge deflection results in an increase in upwash and, consequently, leading-edge separation. Therefore, it may be required to schedule the deflection of the leading-edge flaps with both ailerons and trailing-edge flaps to prevent flow separation on the outboard wing panels.

SUMMARY OF RESULTS

The results of low-speed wind-tunnel tests to determine the effects of wing leading-edge deflection on a low-aspect-ratio highly swept arrow-wing configuration may be summarized as follows:

Flow visualization studies and theoretical calculations of the wing leading-edge upwash characteristics both show that the upwash increases in the spanwise direction. Therefore, leading-edge deflection would appear to be of particular importance for the outboard portion of the wing.

Wing leading-edge deflection is effective in suppressing the formation of leading-edge vortices and promoting attached flow conditions. However, for the particular model tested, a continuous deflection of the entire leading edge was required to prevent the occurrence of local regions of vortex separation which otherwise originated at points of leading-edge discontinuity.

Deflecting the entire wing leading edge 30^{o} effectively postpones the pitch-up of the basic wing—body—outboard-vertical-fin configuration to about 11^{o}. However, trailing-edge flap deflection reduces the angle of attack at

which pitch-up occurs. This result is apparently due to the increased circulation, and hence increased upwash, associated with trailing-edge deflection.

The improvement in the wing flow field, achieved by deflecting the entire wing leading edge 30°, is accompanied by improvements in both trailing-edge flap effectiveness and leading-edge suction.

Comparison of data for the configuration with (1) the wing apex segment deflected through 30° and a 45° Krueger flap on the outboard wing panel and (2) the entire wing leading edge deflected through 30° shows that the latter leading-edge treatment results in significant improvements in longitudinal stability and performance and has no significant effect on either the horizontal- and vertical-tail effectiveness or the static lateral-directional stability characteristics.

The improvements in flow over the outboard wing panel, achieved by deflecting the entire wing leading edge through 30°, resulted in increased aileron effectiveness.

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TABLE 1.- DIMENSIONAL CHARACTERISTICS OF MODEL

Wing:		
Reference area, m^2 (ft^2)	1.875	(20.187)
Gross area, m^2 (ft^2)	2.067	(22.25)
Span, m (ft)	1.89	(6.20)
Root chord, m (ft)	2.515	(8.252)
Tip chord, m (ft)	0.242	(0.794)
Reference mean aerodynamic chord, m (ft)	1.320	(4.331)
Distance of leading edge of $\bar{c}$ aft of wing apex, m (ft)	1.063	(3.487)
Gross mean aerodynamic chord, m (ft)	1.557	(5.109)
Leading-edge sweep, deg		
At body station 0.574 m (1.883 ft)	74.0	
At body station 2.141 m (7.024 ft)	70.5	
At body station 2.827 m (9.277 ft)	60.0	
Vertical tail:		
Area, m^2 (ft^2)	0.0327	(0.352)
Span, m (ft)	0.171	(0.562)
Root chord, m (ft)	0.0732	(0.240)
Leading-edge sweep, deg	59.0	
Vertical fin (two):		
Area, m^2 (ft^2)	0.084	(0.906)
Span, m (ft)	0.147	(0.484)
Root chord, m (ft)	0.499	(1.637)
Tip chord, m (ft)	0.071	(0.233)
Leading-edge sweep, deg	73.4	
Horizontal tail:		
Area, m^2 (ft^2)	0.150	(1.613)
Span, m (ft)	0.457	(1.499)
Root chord, m (ft)	0.540	(1.772)
Tip chord, m (ft)	0.116	(0.380)
Mean aerodynamic chord, m (ft)	0.372	(1.221)
Horizontal-tail length, m (ft)	1.467	(4.811)
Leading-edge sweep, deg	43.0	
Dihedral, deg	-15.0	

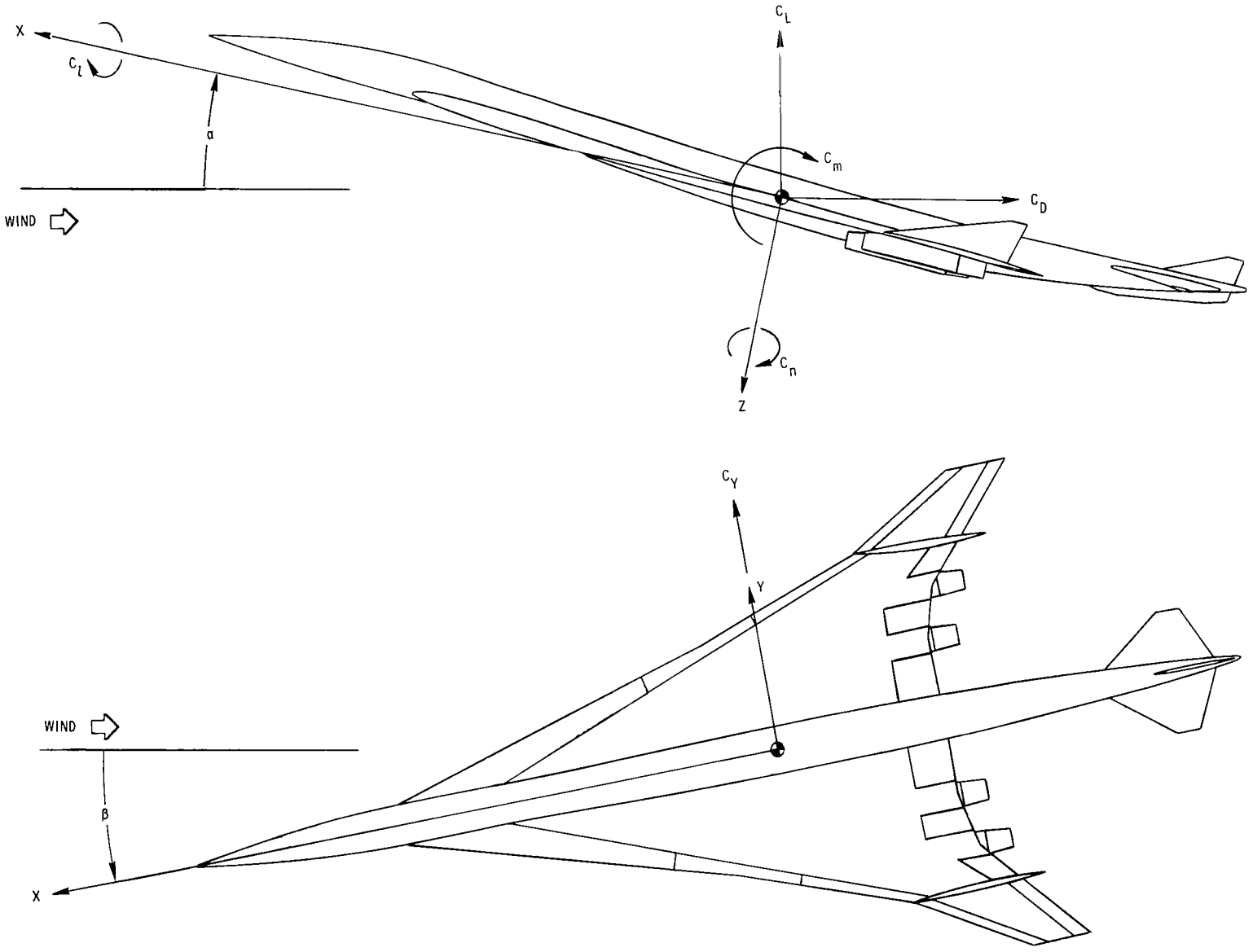
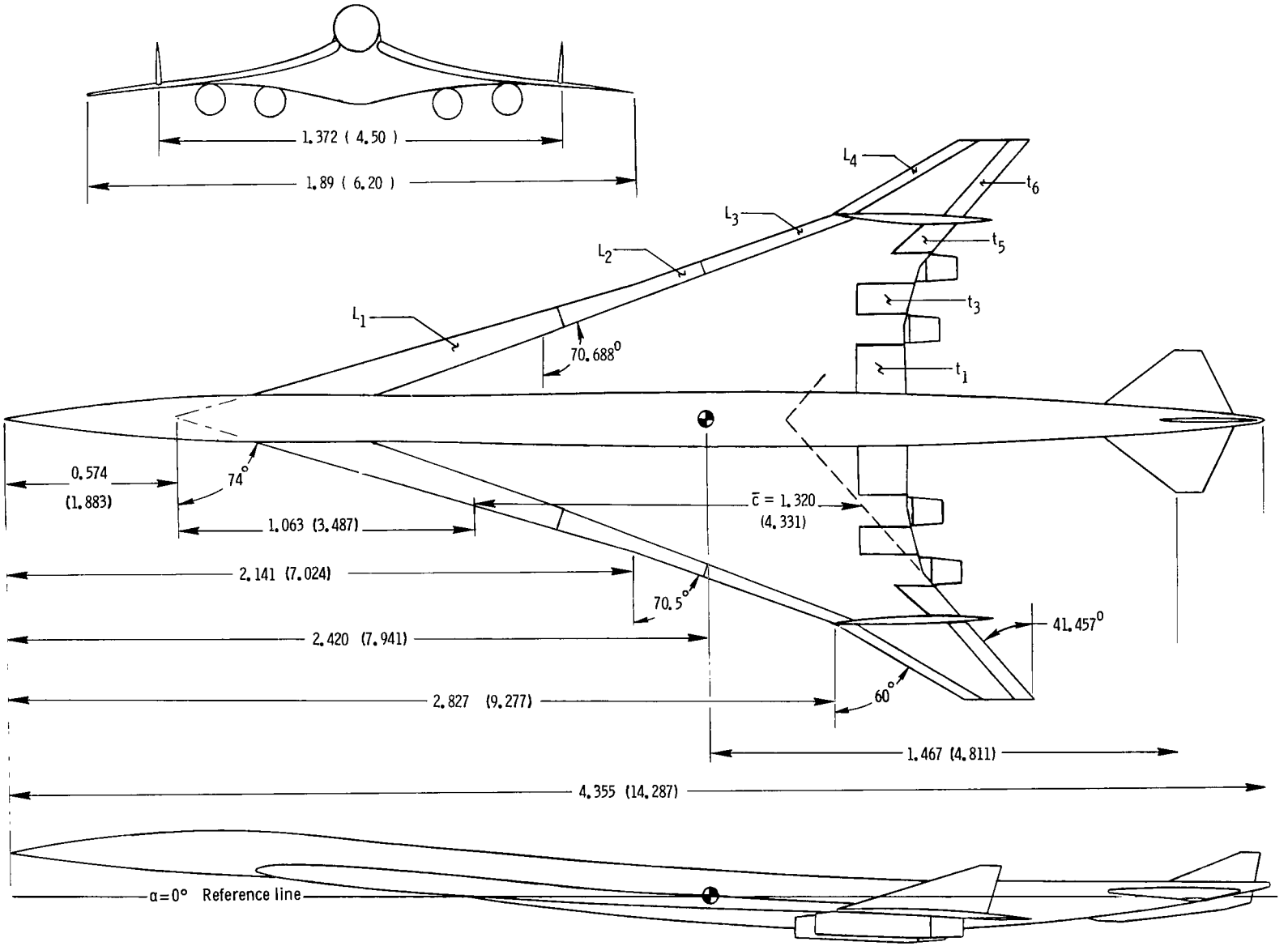
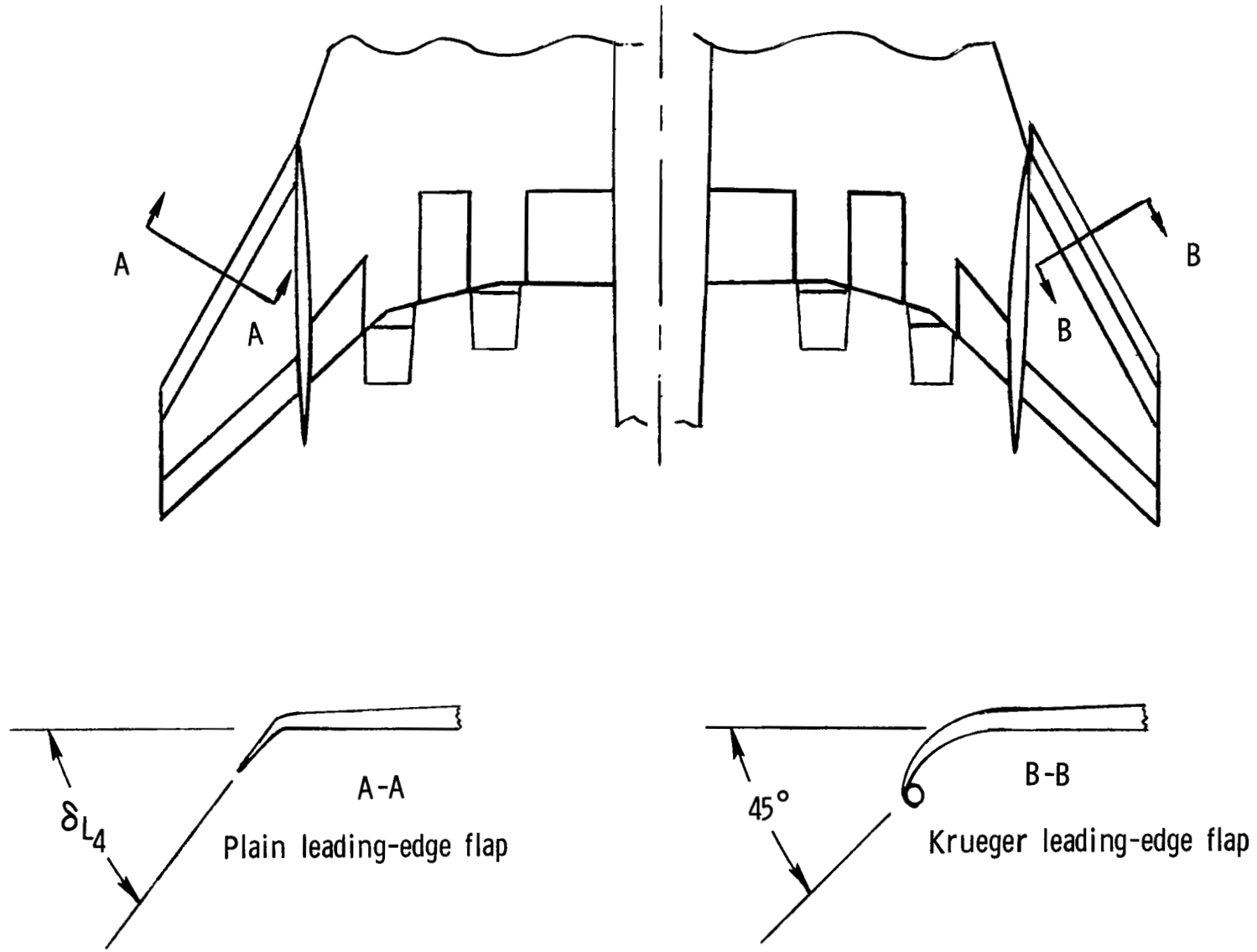


Figure 1.- System of axes.



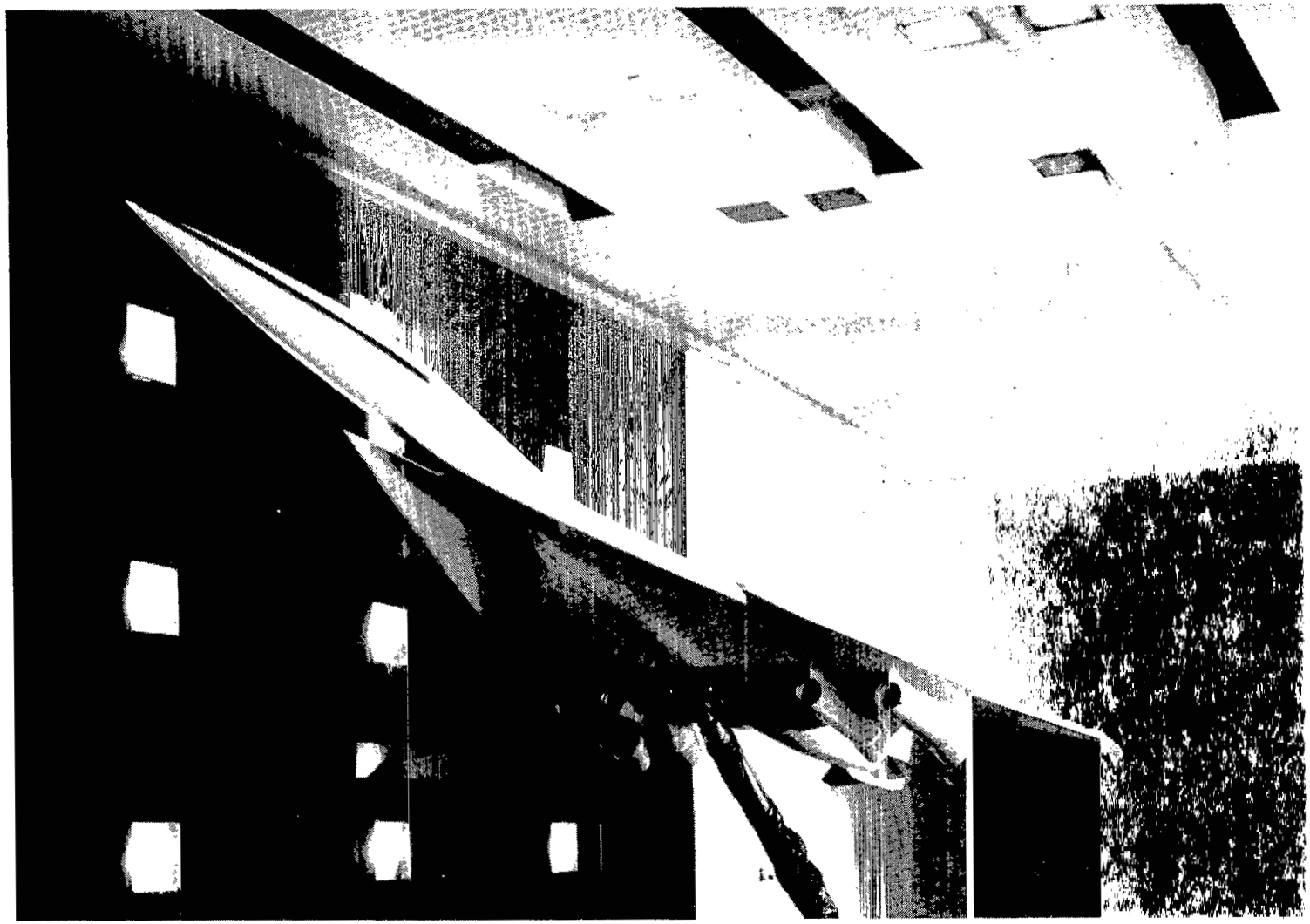
(a) Three-view sketch of model.

Figure 2.- Dimensional characteristics. Dimensions are given in meters and parenthetically in feet.



(b) Sketch of outboard wing-panel leading-edge flaps.

Figure 2.- Concluded.



L-76-6492

Figure 3.- Photograph of model mounted for tests in Langley V/STOL tunnel.

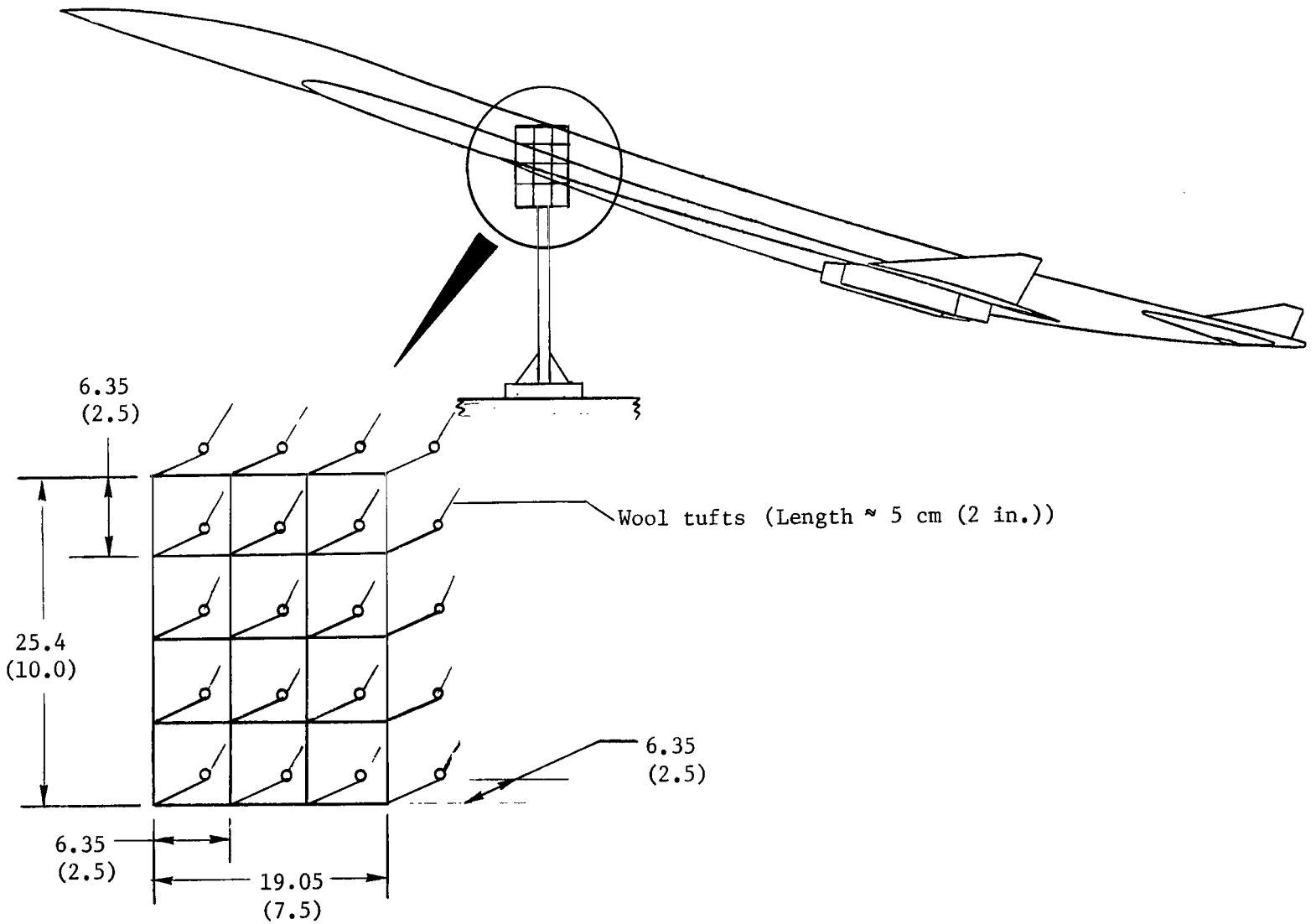


Figure 4.- Sketch of tuft mast and general arrangement for leading-edge upwash study. Dimensions are in centimeters and parenthetically in inches.

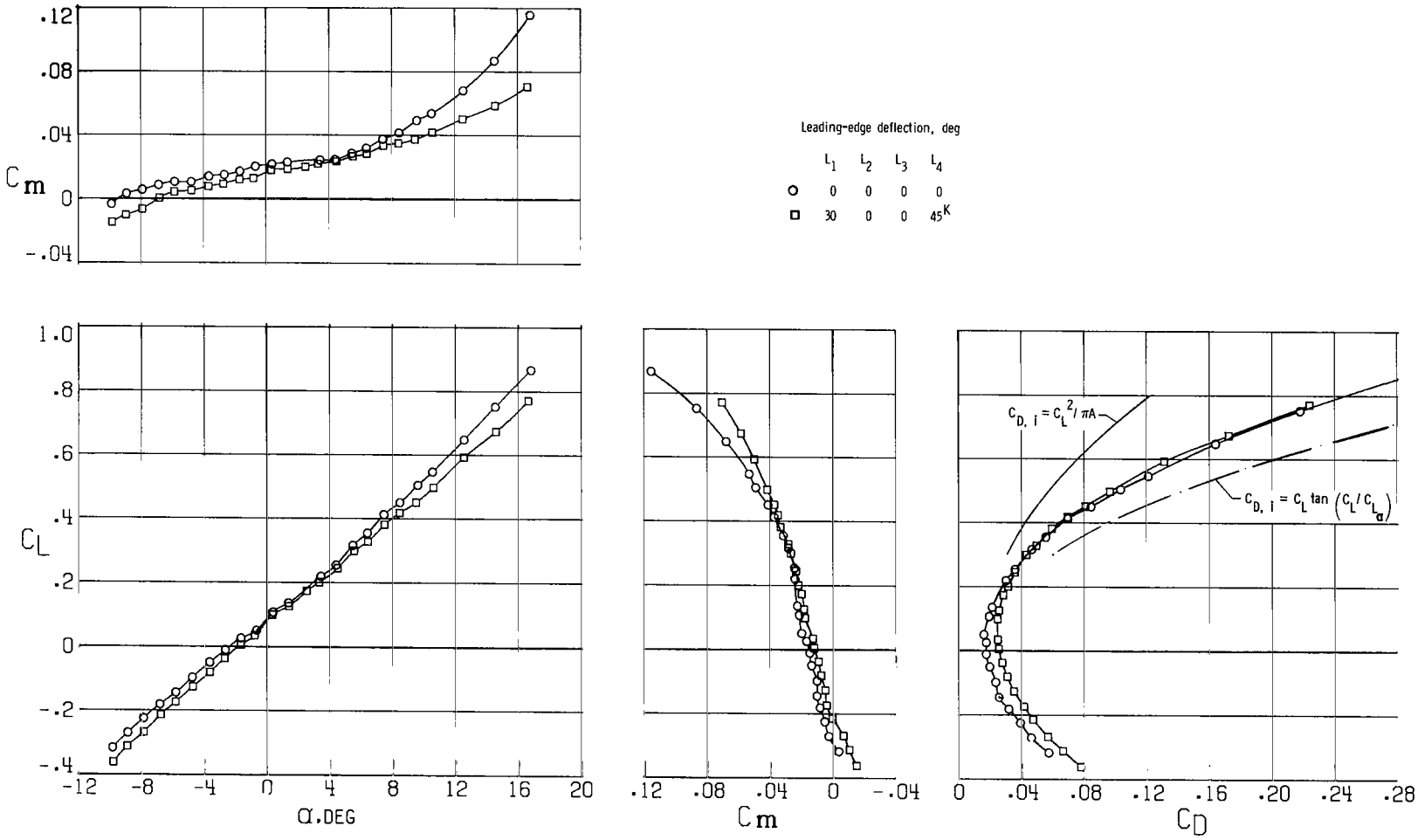


Figure 5.- Effect of deflecting wing apex and outboard wing panel leading edge. $WBV_{1,2N}$; $\delta_f = 0^o$.

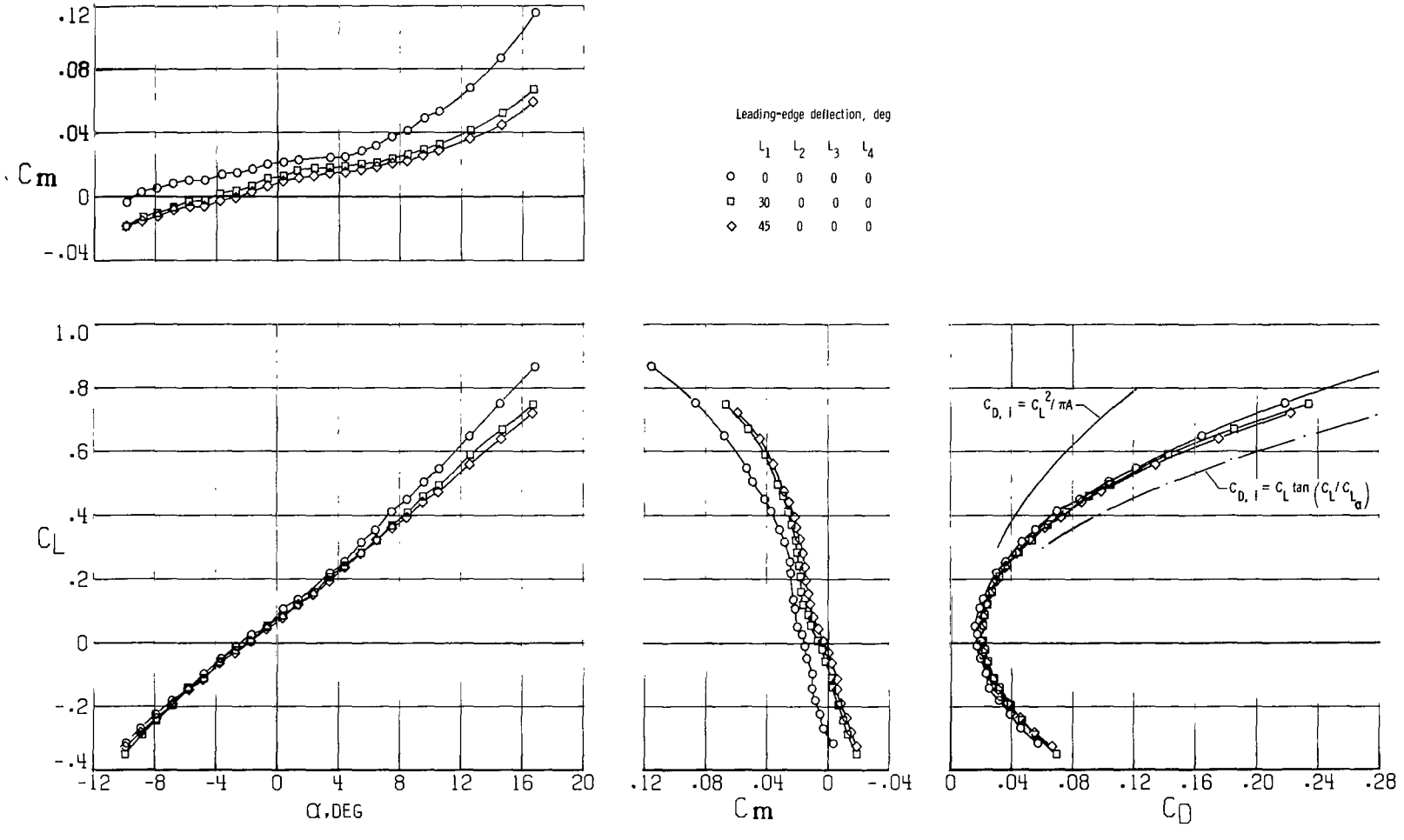
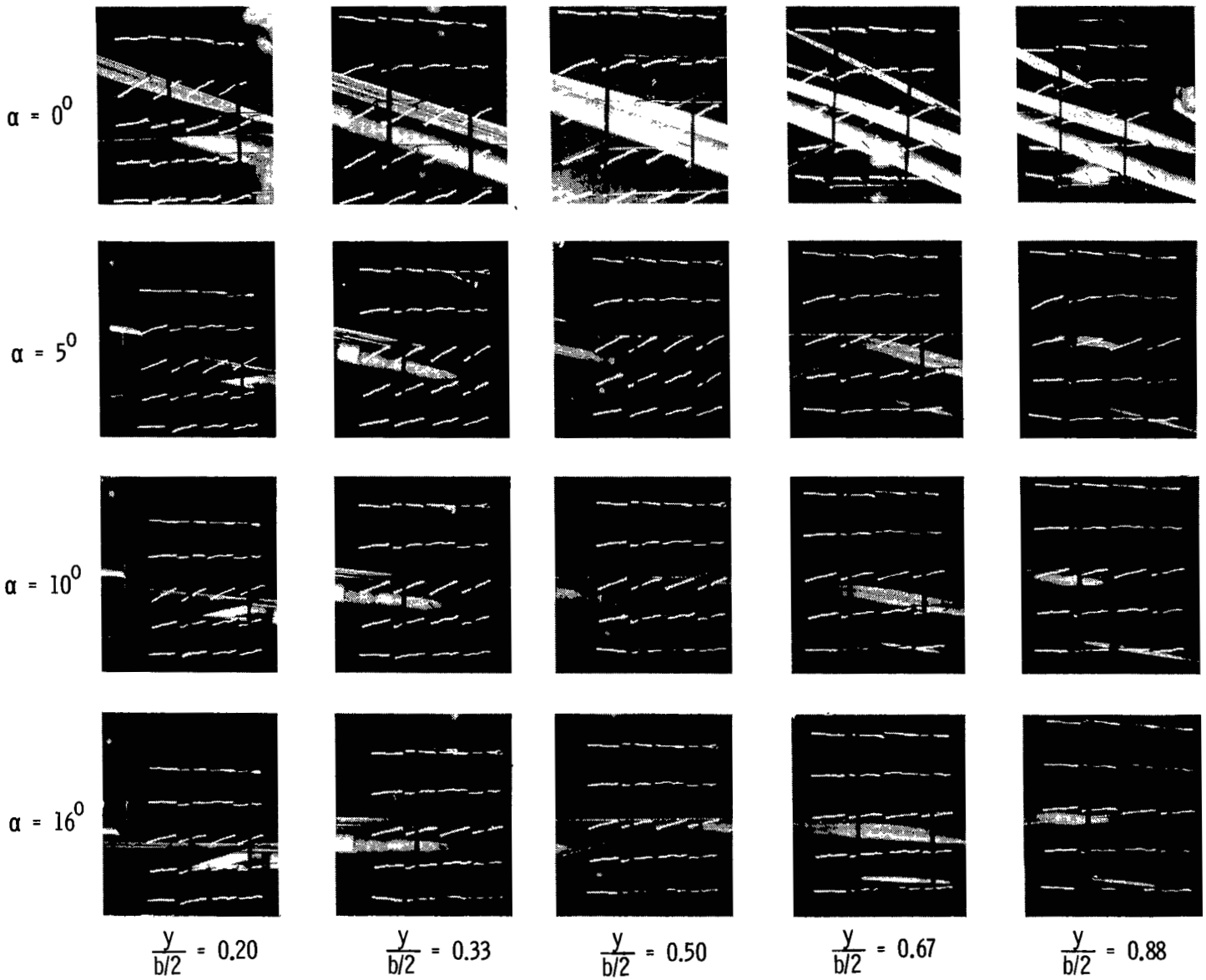


Figure 6.- Effect of increasing deflection of segment L_1. $WBV_{1,2}N$; $\delta_f = 0^o$.



L-79-184

Figure 7.- Photographs of tufts at various spanwise stations along wing leading edge.

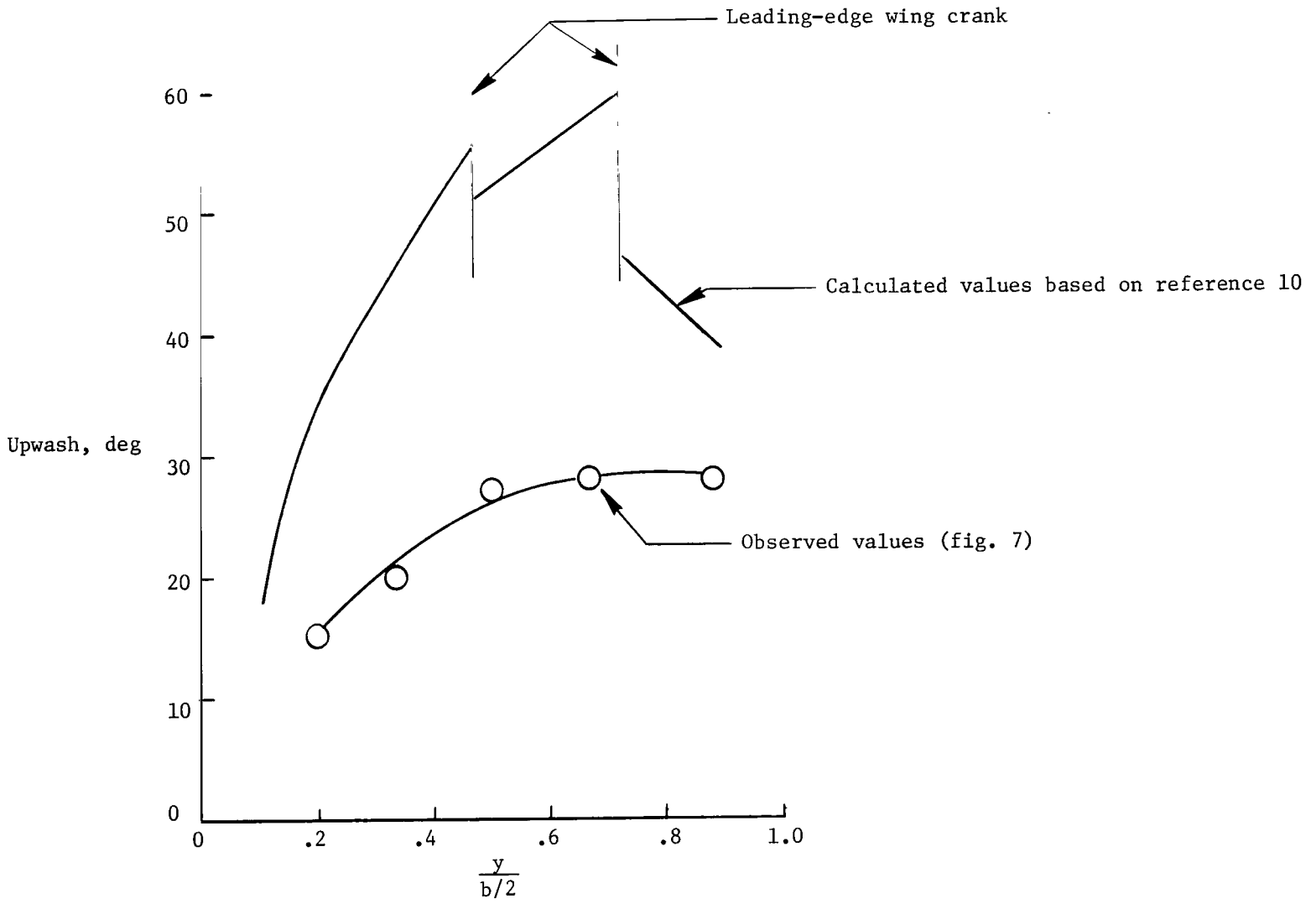


Figure 8.- Comparison of observed and calculated upwash at $x/\bar{c} = 0.019$ forward of wing leading edge. $\delta_f = 0^\circ$; $\alpha = 10^\circ$.

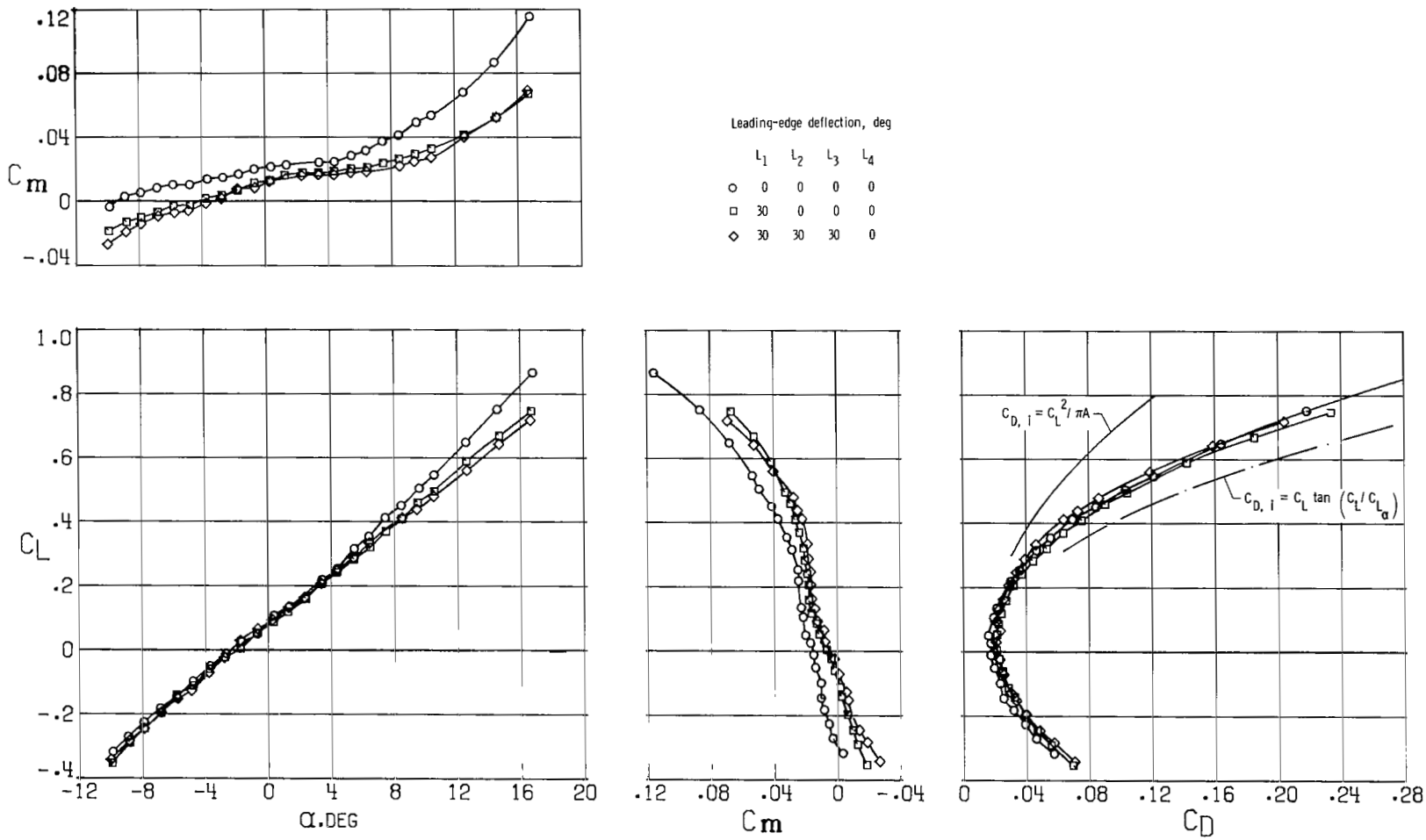
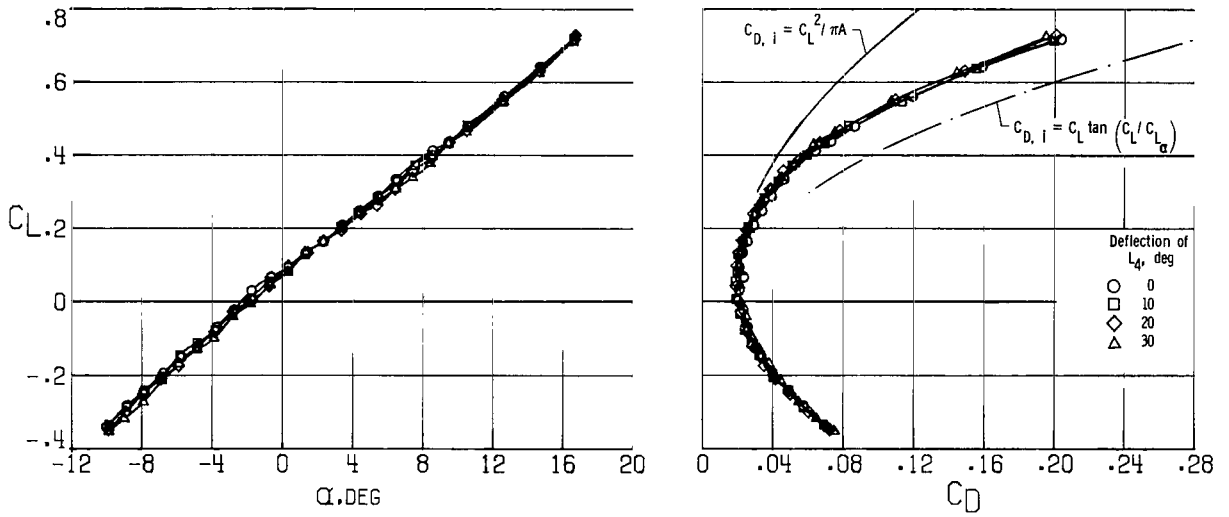
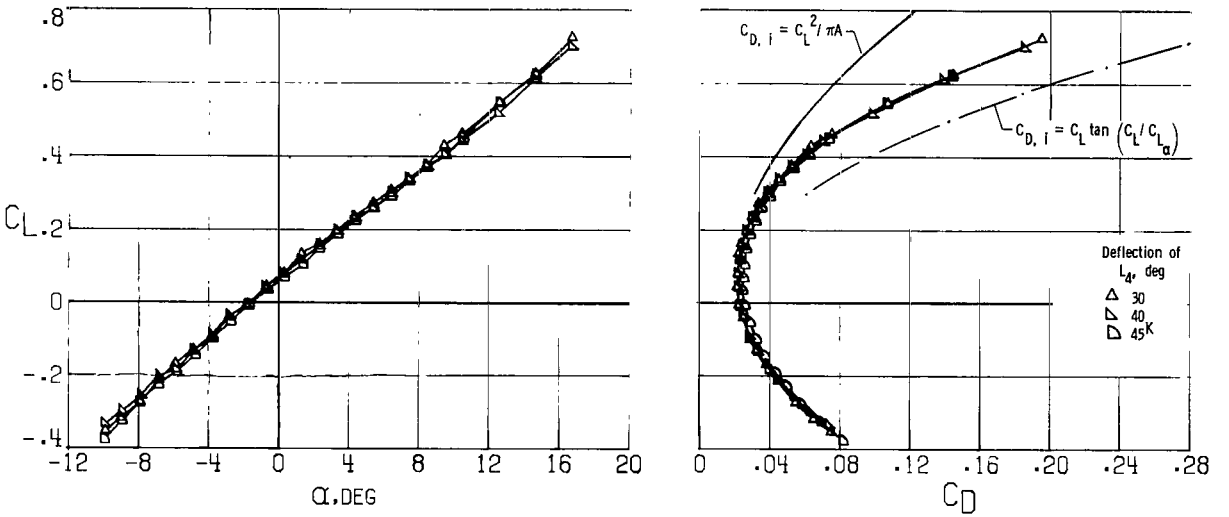


Figure 9.- Effect of deflecting main wing panel leading edge (segments L_1, L_2, and L_3). $WBV_{1,2}N$; $\delta_f = 0^o$.



(a) Deflection of $L_4 = 0^o$, 10^o, 20^o, and 30^o.



(b) Deflection of $L_4 = 30^o$, 40^o, and 45^{oK}.

Figure 10.- Effect on longitudinal performance of deflecting outboard wing panel leading edge (segment L_4). $WBV_{1,2N}$; $\delta_f = 0^o$; $L_1 = L_2 = L_3 = 30^o$.

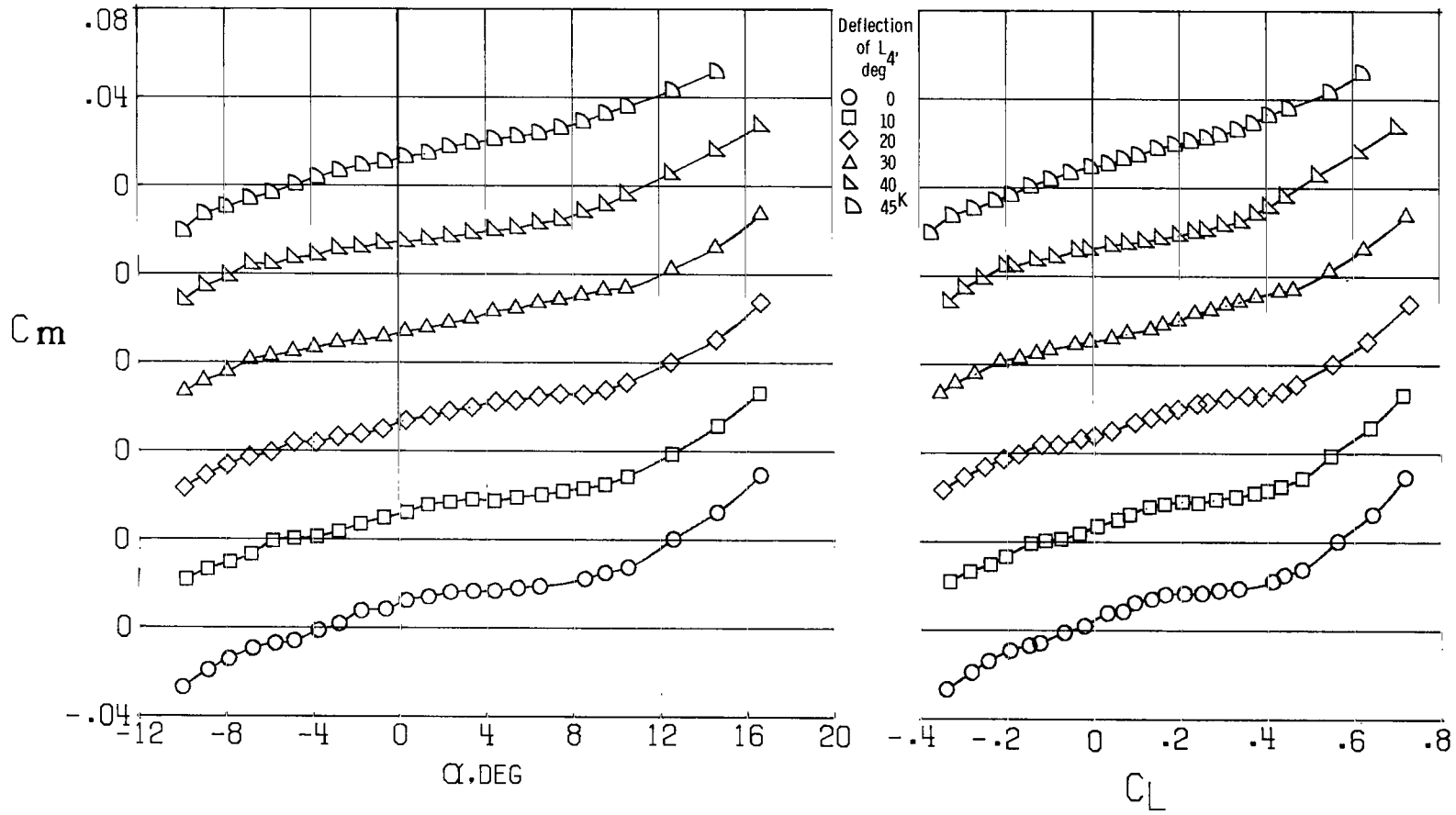


Figure 11.- Effect on longitudinal stability of deflecting outboard wing panel leading edge (segment L_4). $WBV_{1,2}N$; $\delta_f = 0^o$; $L_1 = L_2 = L_3 = 30^o$.

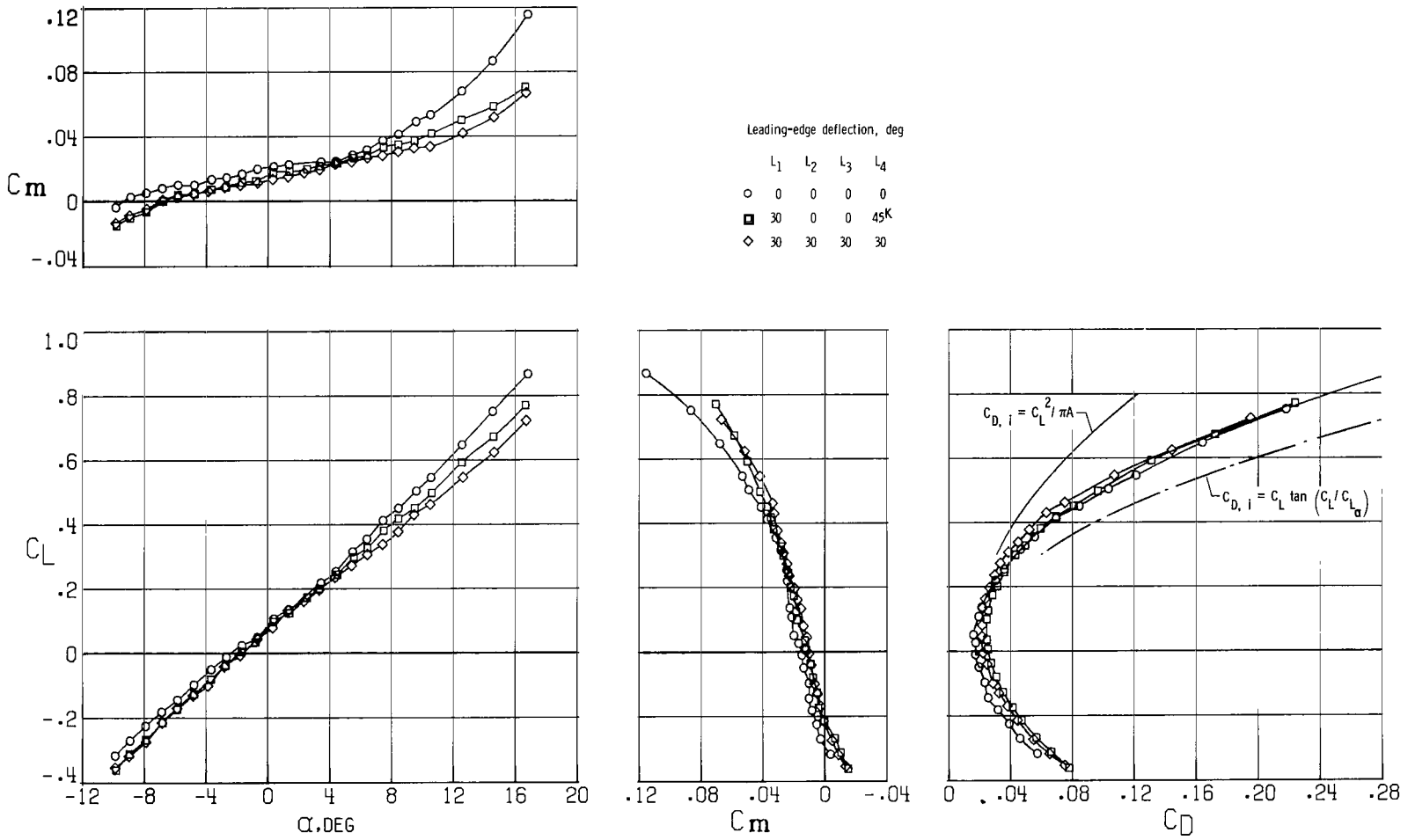
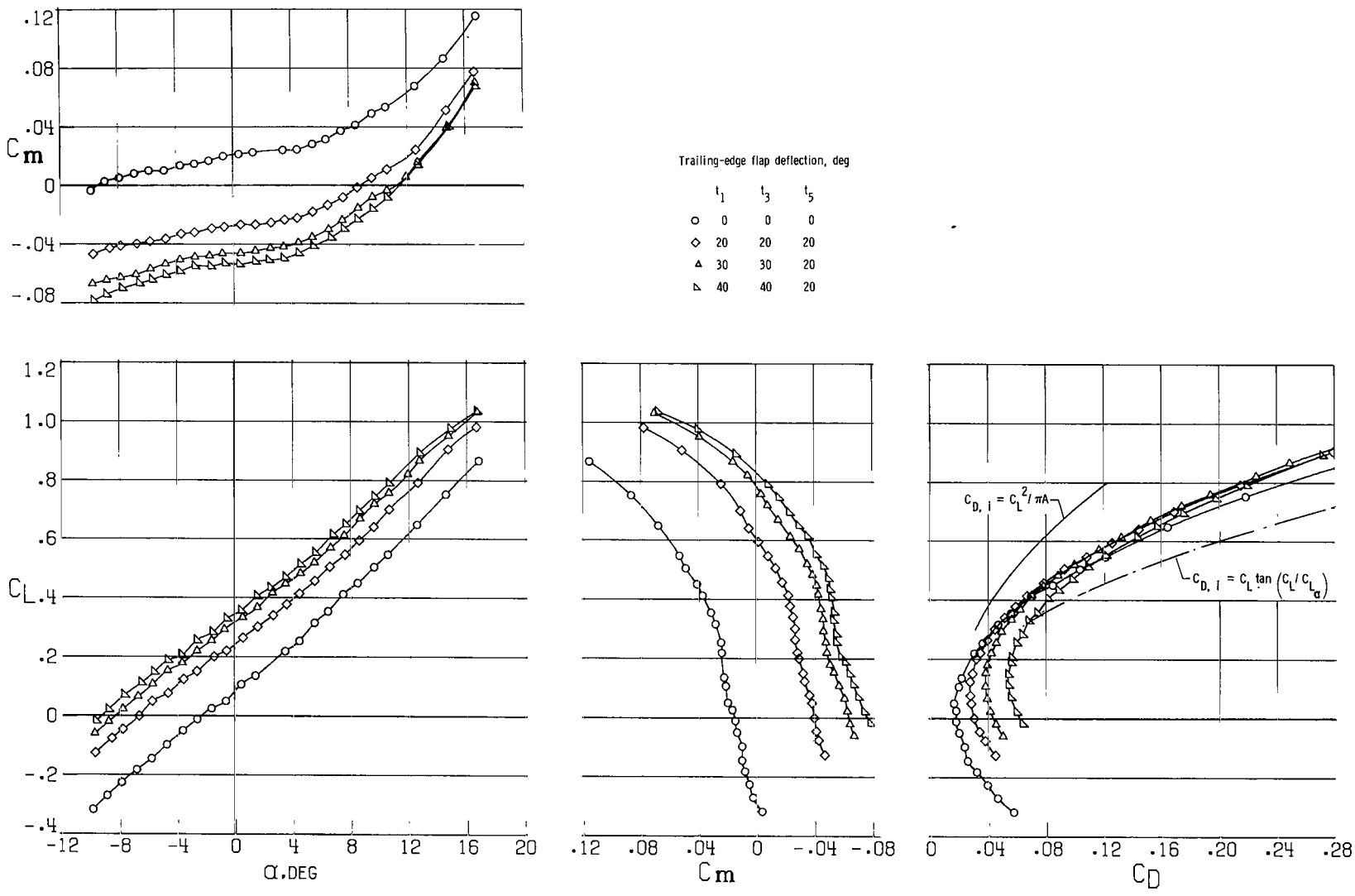
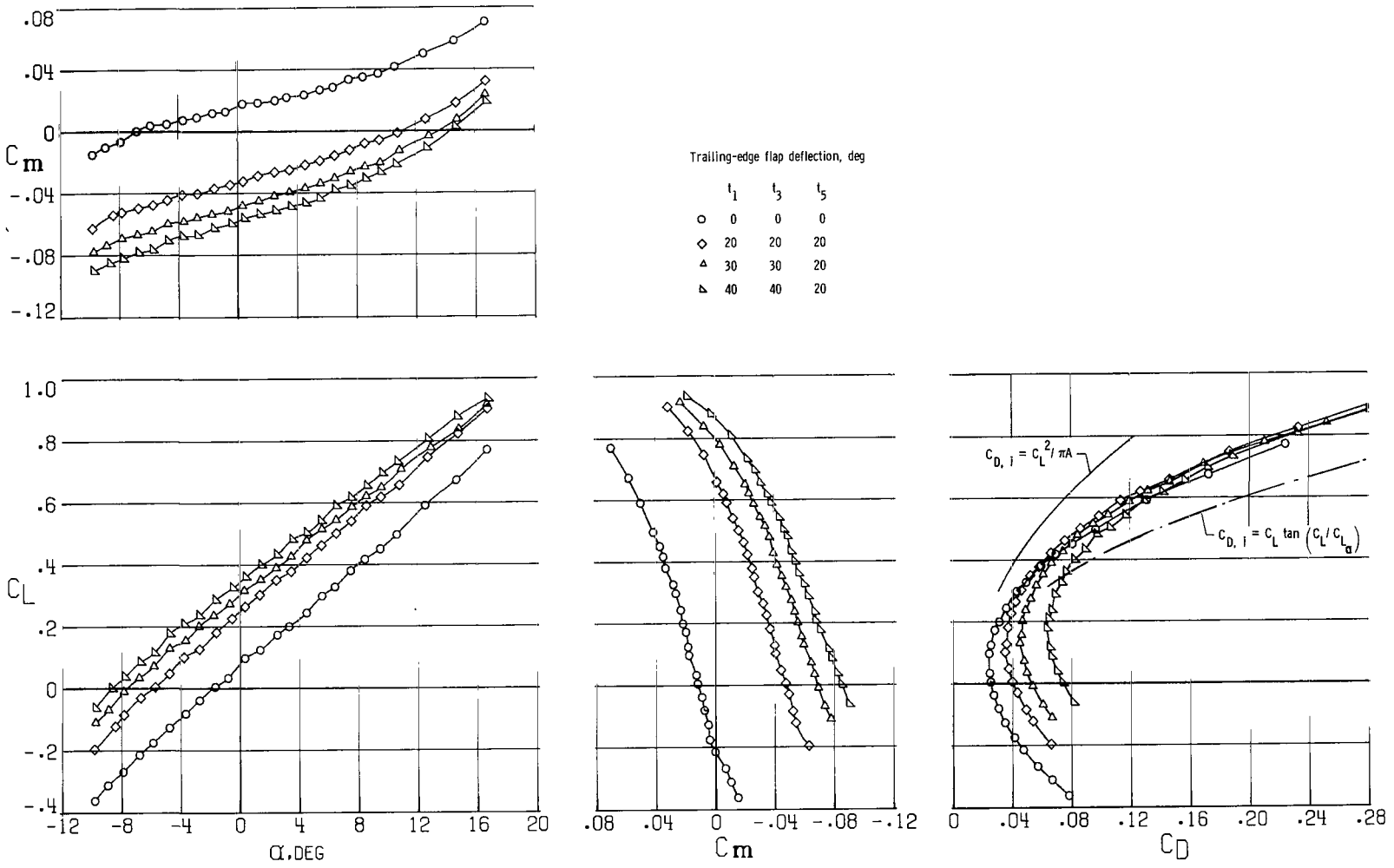


Figure 12.- Comparison of the effectiveness of leading-edge deflections studied. $WBV_{1,2}N$; $\delta_f = 0^o$.



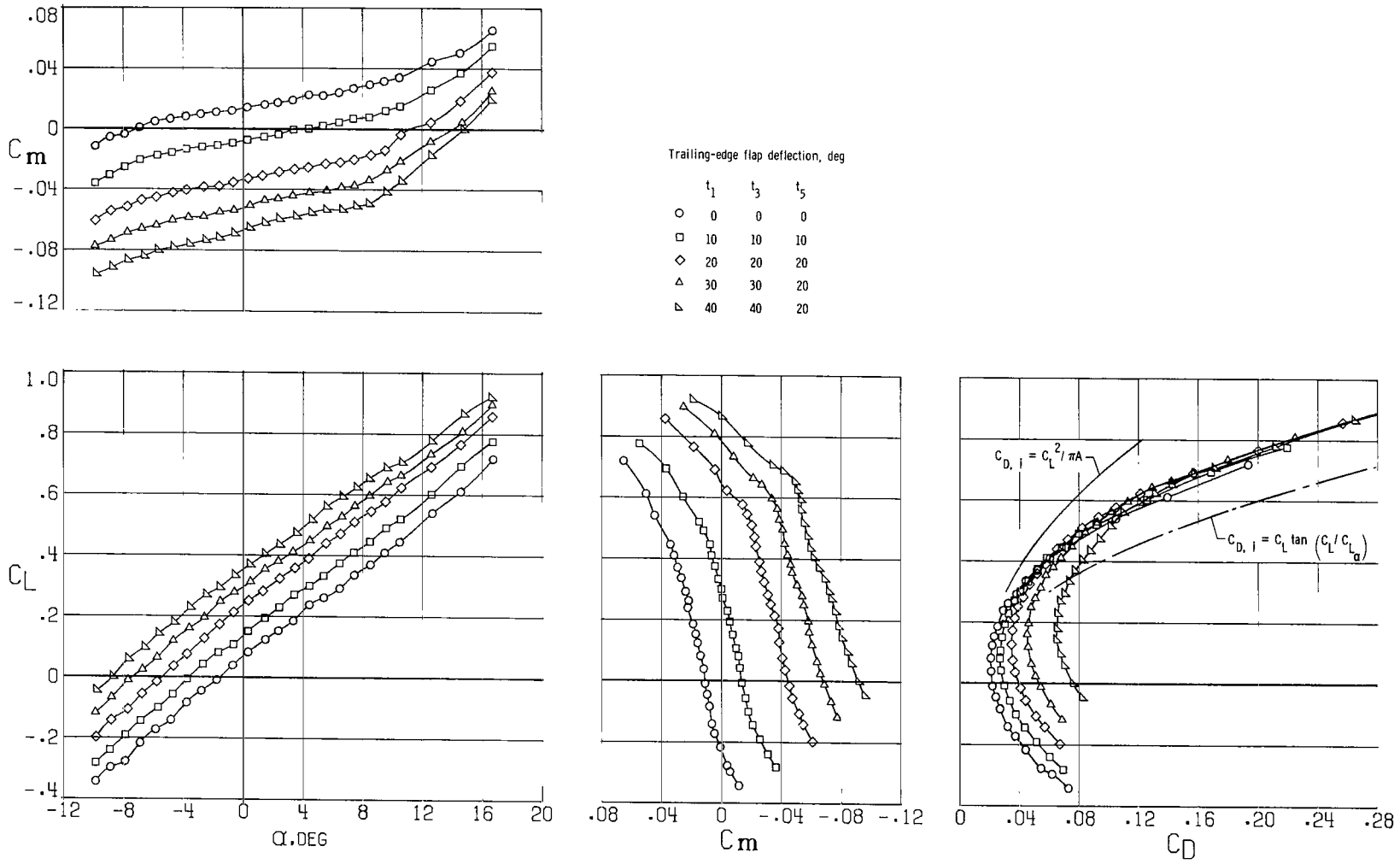
(a) Leading edge undeflected ($\delta_{le} = 0^o$).

Figure 13.- Trailing-edge flap effectiveness for model with various leading-edge deflections. $WBV_{1,2}N$.



(b) Deflected leading edge (δ_{le} = 30°/0°/0°/45°K).

Figure 13.- Continued.



(c) Deflected leading edge (δ_{le} = 30°/30°/30°/30°).

Figure 13.- Concluded.

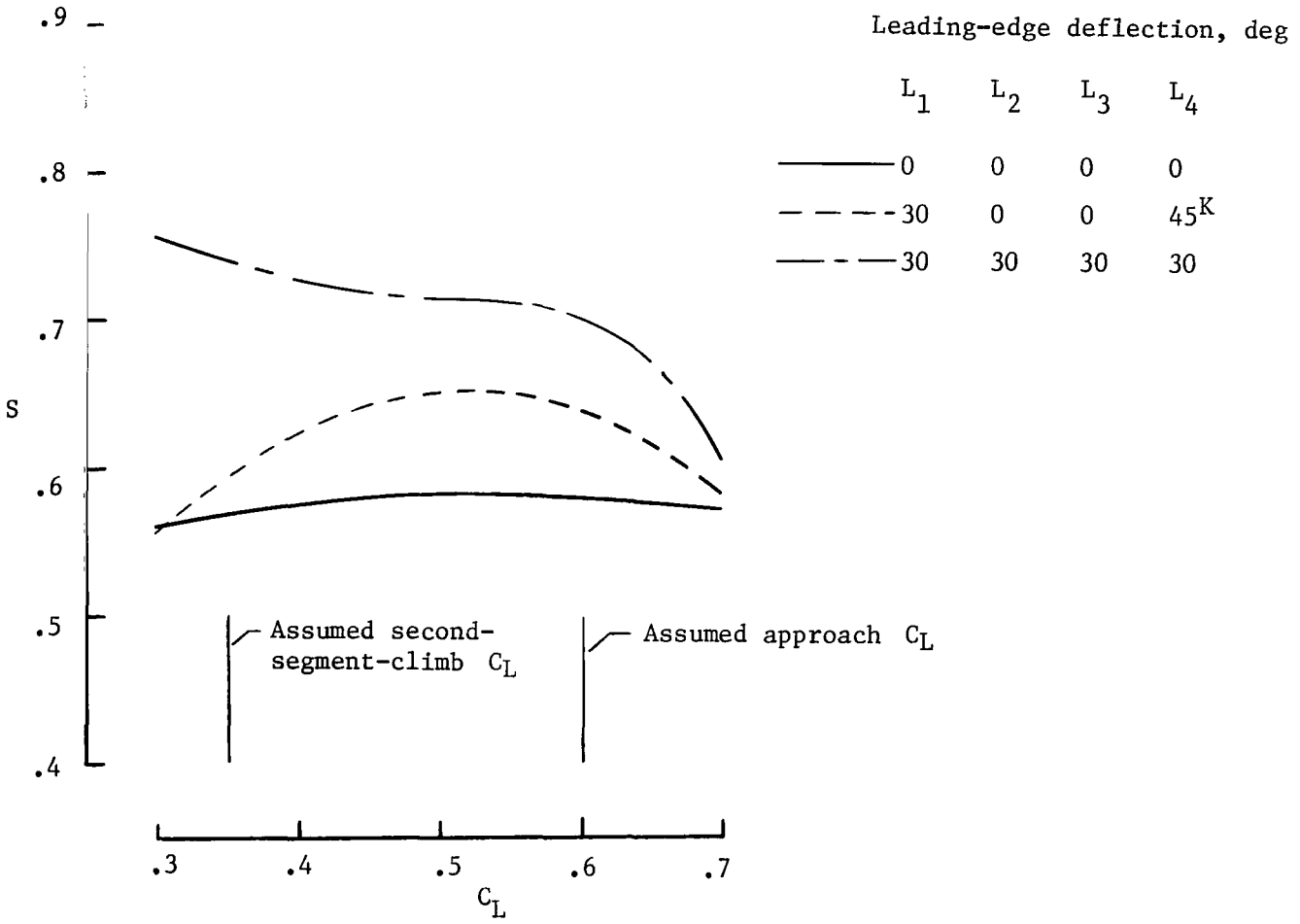
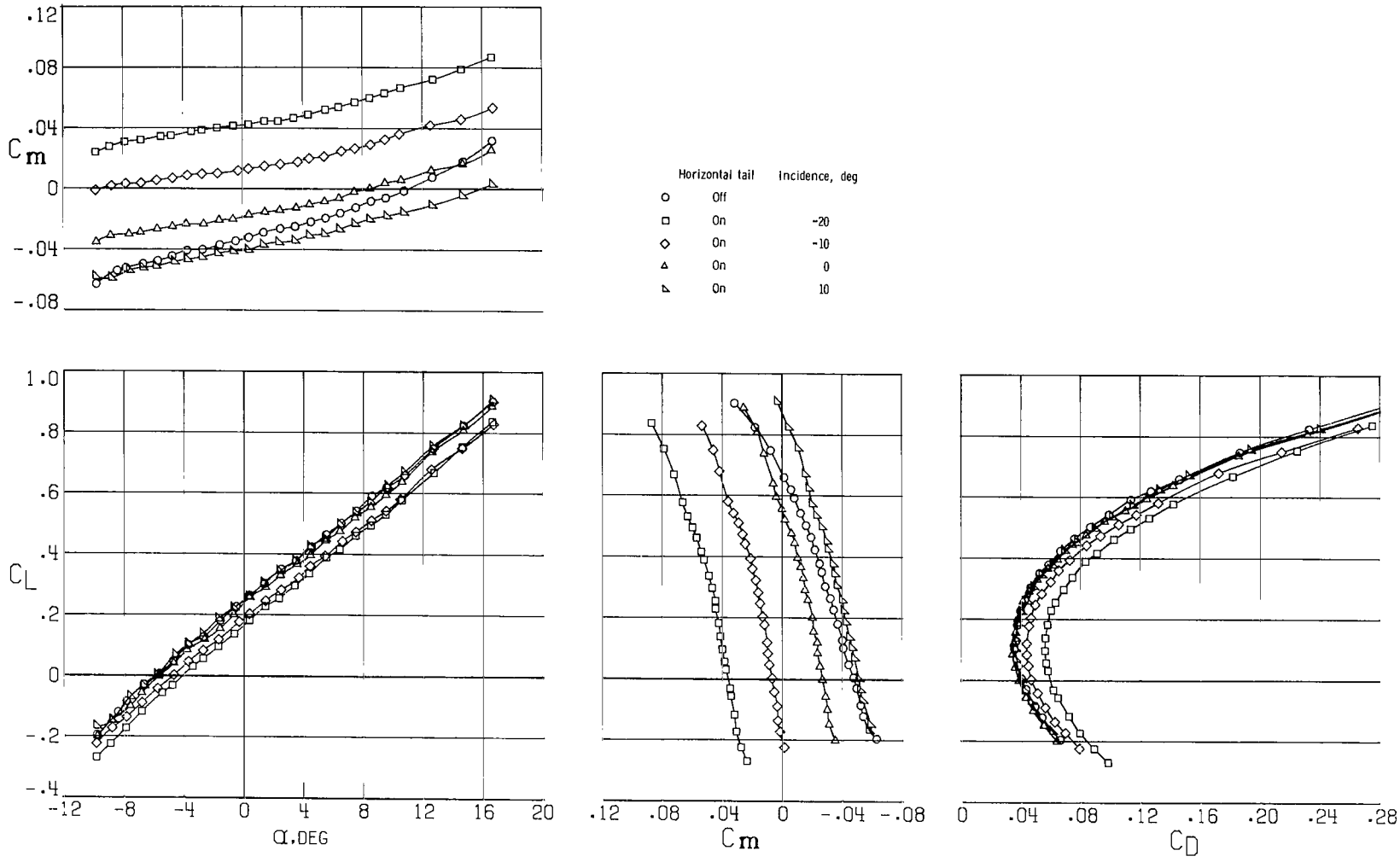
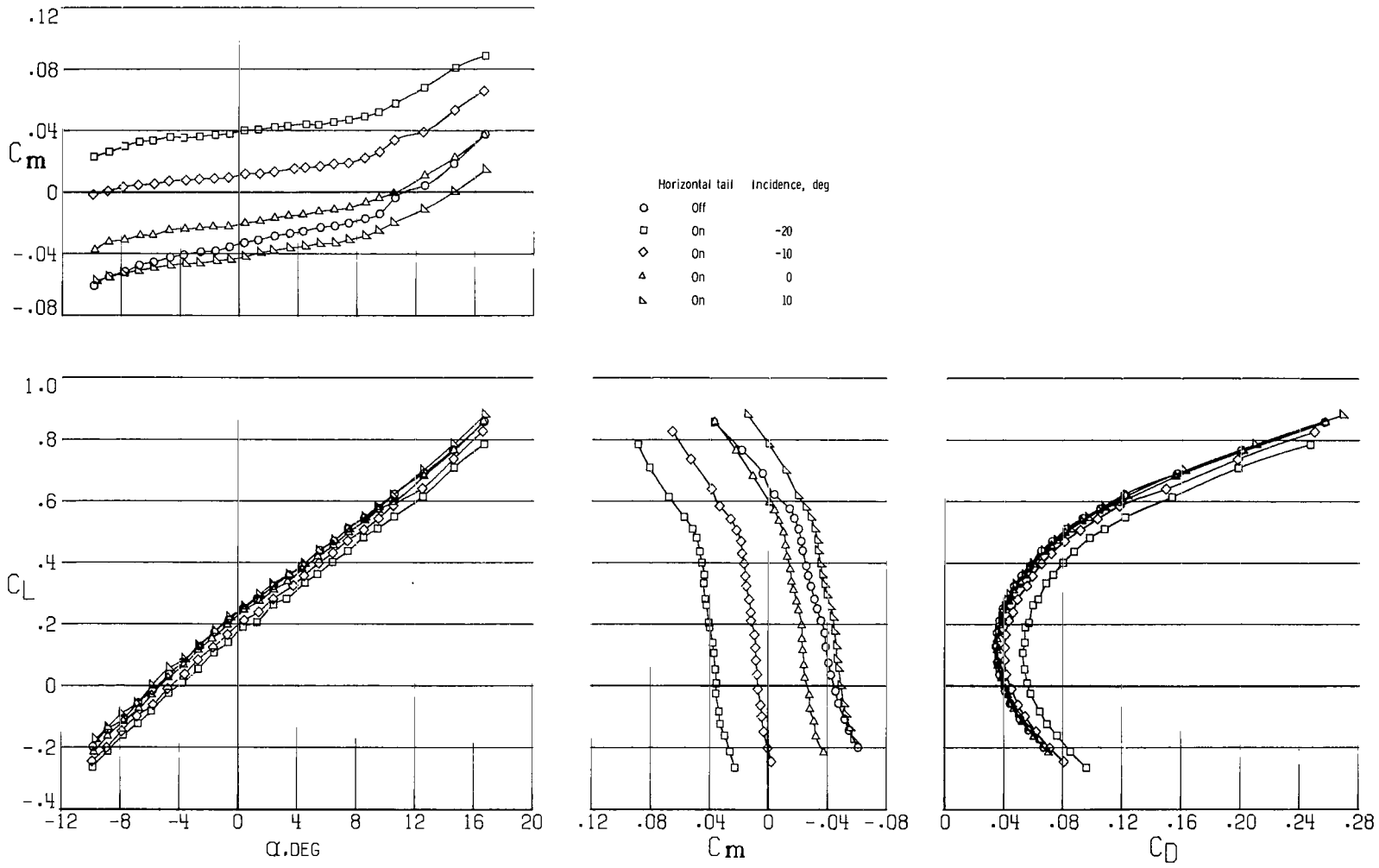


Figure 14.- Variation of leading-edge suction parameter with C_L based on drag polar envelope obtained by varying trailing-edge deflection.



(a) $\delta_{le} = 30^{o}/0^{o}/0^{o}/45^{oK}$.

Figure 15.- Horizontal-tail effectiveness for model with various leading-edge deflections. $\delta_f = 20^{o}/20^{o}/20^{o}$.



(b) $\delta_{le} = 30^{o}/30^{o}/30^{o}/30^{o}$.

Figure 15.- Concluded.

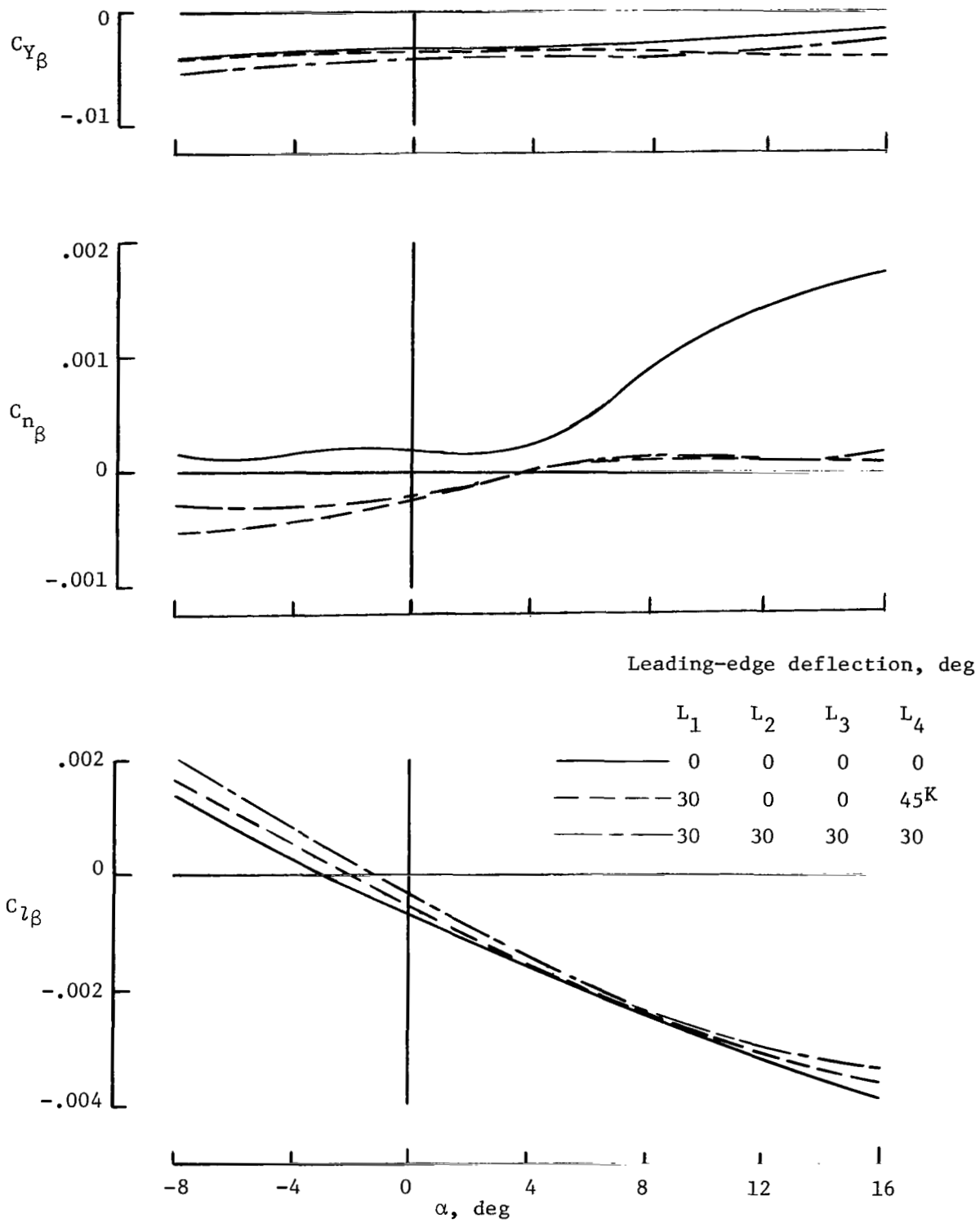


Figure 16.- Effect of wing leading-edge deflection on lateral-directional characteristics. $WBV_{1,2}N$; $\delta_f = 0^o$.

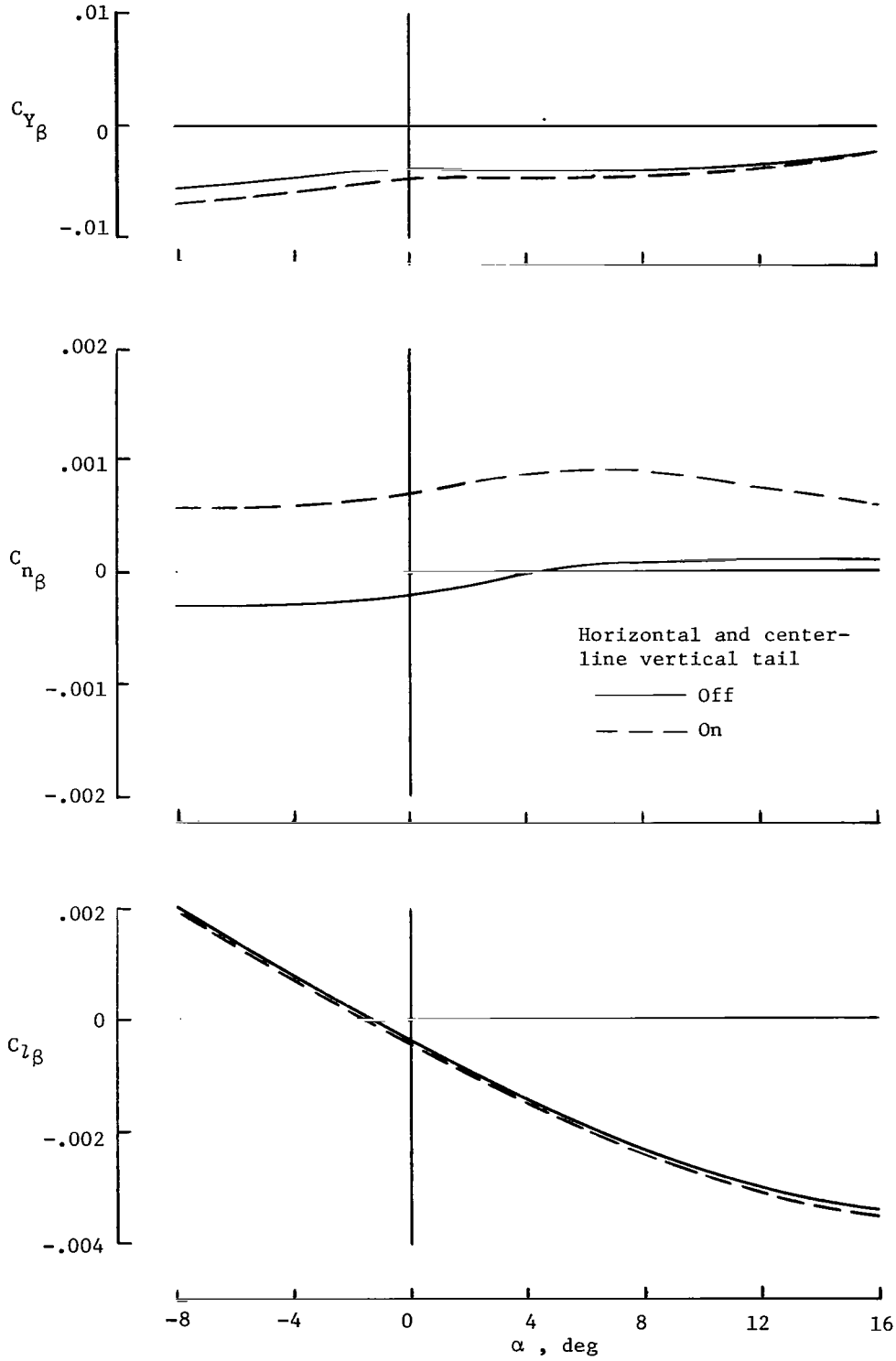


Figure 17.- Lateral-directional characteristics of configuration. $WBV_{1,2}N$; $\delta_{le} = 30^o/30^o/30^o/30^o$; $\delta_f = 0^o$.

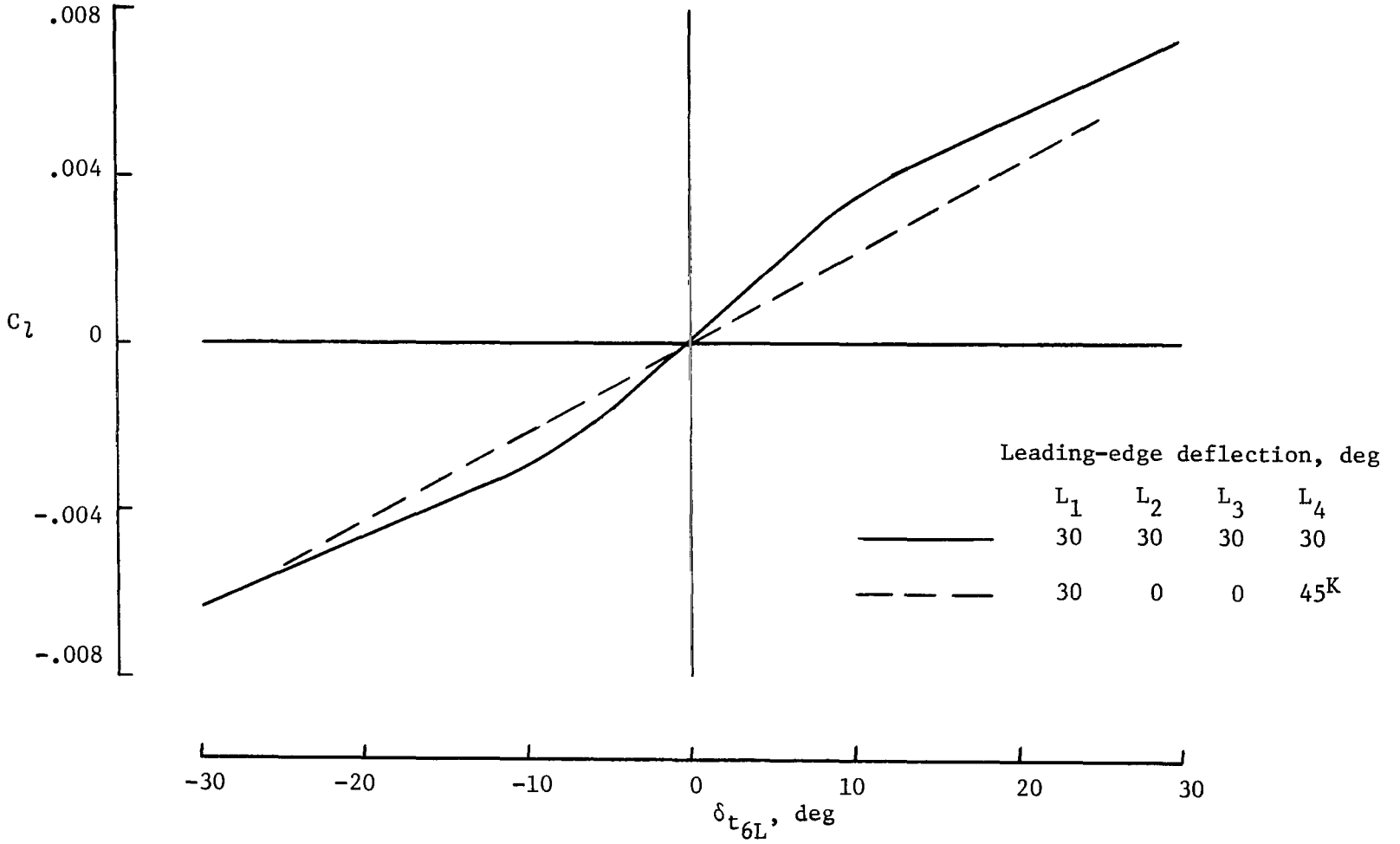


Figure 18.- Roll control provided by deflecting left outboard aileron (segment t_{6L}). $WBV_{1,2N}$; $\delta_f = 0^o$; $\alpha = 8^o$.

APPENDIX

DATA SUPPLEMENT

The tabulated data are presented in this appendix. A summary of the test program is given in table A1, and the data are given in table A2.

The symbols used in the data tabulation are defined as follows:

ALPHA	angle of attack, deg
BETA	angle of sideslip, deg
CD	drag-force coefficient, stability axis
CL	lift-force coefficient, stability axis
CPM	pitching-moment coefficient, stability axis
CRM	rolling-moment coefficient, body axis
CSF	side-force coefficient, body axis
CYM	yawing-moment coefficient, body axis

APPENDIX

TABLE A1.- TEST PROGRAM

Run	β, deg	Deflection, deg, of leading-edge segment -				Deflection, deg, of trailing-edge segment -					Center-line vertical tail	Horizontal tail
		L_1	L_2	L_3	L_4	t_1	t_3	t_5	t_6 Left	t_6 Right		
51	0	0	0	0	0	0	0	0	0	0	Off	Off
52	-5	0	0	0	0	0	0	0	0	0	Off	Off
53	5	0	0	0	0	0	0	0	0	0	Off	Off
56	0	0	0	0	0	20	20	20	0	0	Off	Off
57	0	0	0	0	0	30	30	20	0	0	Off	Off
58	0	0	0	0	0	40	40	20	0	0	Off	Off
59	0	30	0	0	45K	40	40	20	0	0	Off	Off
60	0	30	0	0	45K	30	30	20	0	0	Off	Off
61	0	30	0	0	45K	20	20	20	0	0	Off	Off
62	0	30	0	0	45K	20	20	20	0	0	On	0
63	0	30	0	0	45K	20	20	20	0	0	On	10
64	0	30	0	0	45K	20	20	20	0	0	On	-10
65	0	30	0	0	45K	20	20	20	0	0	On	-20
68	0	30	0	0	45K	0	0	0	0	0	On	On
69	0	30	0	0	45K	0	0	0	0	0	On	10
70	0	30	0	0	45K	0	0	0	0	0	On	-10
83	0	30	0	0	45K	0	0	0	0	0	On	-20
80	0	30	0	0	45K	0	0	0	0	0	Off	Off
81	-5	30	0	0	45K	0	0	0	0	0	Off	Off
82	5	30	0	0	45K	0	0	0	0	0	Off	Off
87	0	30	0	0	0	0	0	0	0	0	Off	Off
88	-5	30	0	0	0	0	0	0	0	0	Off	Off
89	5	30	0	0	0	0	0	0	0	0	Off	Off
90	0	45	0	0	0	0	0	0	0	0	Off	Off
91	-5	45	0	0	0	0	0	0	0	0	Off	Off
92	5	45	0	0	0	0	0	0	0	0	Off	Off
99	0	30	30	30	45K	0	0	0	0	0	Off	Off
100	5	30	30	30	45K	0	0	0	0	0	Off	Off
101	-5	30	30	30	45K	0	0	0	0	0	Off	Off
102	0	30	30	30	0	0	0	0	0	0	Off	Off
103	0	30	30	30	20	0	0	0	0	0	Off	Off
104	0	30	30	30	10	0	0	0	0	0	Off	Off
105	0	30	30	30	30	0	0	0	0	0	Off	Off
106	0	30	30	30	40	0	0	0	0	0	Off	Off
108	5	30	30	30	30	0	0	0	0	0	Off	Off
109	-5	30	30	30	30	0	0	0	0	0	Off	Off
110	0	30	30	30	30	0	0	0	10	0	Off	Off
111	0	30	30	30	30	0	0	0	20	0	Off	Off
112	0	30	30	30	30	0	0	0	30	0	Off	Off
113	0	30	30	30	30	0	0	0	0	-10	Off	Off
114	0	30	30	30	30	0	0	0	0	-20	Off	Off
115	0	30	30	30	30	0	0	0	0	-30	Off	Off
116	0	30	30	30	30	0	0	0	0	0	On	0
117	5	30	30	30	30	0	0	0	0	0	On	0
118	-5	30	30	30	30	0	0	0	0	0	On	0
119	0	30	30	30	30	10	10	10	0	0	Off	Off
120	0	30	30	30	30	30	30	20	0	0	Off	Off
121	0	30	30	30	30	40	40	20	0	0	Off	Off
122	0	30	30	30	30	20	20	20	0	0	Off	Off
123	0	30	30	30	30	20	20	20	0	0	On	0
124	0	30	30	30	30	20	20	20	0	0	On	10
125	0	30	30	30	30	20	20	20	0	0	On	-10
126	0	30	30	30	30	20	20	20	0	0	On	-20
127	0	30	30	30	30	40	40	20	0	0	On	-20
128	0	30	30	30	30	40	40	20	0	0	On	-10
129	0	30	30	30	30	40	40	20	0	0	On	10
130	0	30	30	30	30	40	40	20	0	0	On	0

APPENDIX

TABLE A2.- TABULATED DATA

RUN 51

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.88	-.3164	.0572	-.0035	.0015	.0003	-.0043
0.00	-8.91	-.2695	.0461	.0029	.0012	.0002	-.0044
0.00	-7.91	-.2248	.0391	.0054	.0023	.0005	-.0075
0.00	-6.87	-.1814	.0318	.0083	.0027	.0001	-.0038
0.00	-5.85	-.1446	.0254	.0103	.0021	-.0000	-.0006
0.00	-4.79	-.0974	.0233	.0103	.0018	.0004	-.0024
0.00	-3.67	-.0497	.0196	.0138	.0018	.0004	-.0034
0.00	-2.68	-.0106	.0174	.0150	.0022	.0002	.0016
0.00	-1.68	.0261	.0174	.0170	.0012	.0004	-.0031
0.00	-.69	.0507	.0159	.0201	.0009	.0002	-.0018
0.00	.38	.1073	.0193	.0216	.0016	.0005	-.0056
0.00	1.36	.1362	.0213	.0227	.0009	.0002	-.0011
0.00	2.43	.1917	.0246	.0245	.0013	-.0001	-.0017
0.00	3.42	.2192	.0301	.0244	.0015	.0002	-.0016
0.00	4.40	.2540	.0359	.0248	.0008	.0000	-.0027
0.00	5.46	.3159	.0467	.0286	.0010	-.0000	-.0018
0.00	6.39	.3544	.0557	.0318	.0011	.0004	-.0026
0.00	7.43	.4122	.0697	.0375	.0017	.0008	-.0022
0.00	8.45	.4504	.0846	.0414	.0011	.0009	-.0026
0.00	9.58	.5046	.1034	.0493	-.0000	.0007	.0045
0.00	10.52	.5470	.1212	.0536	.0003	.0016	.0002
0.00	12.53	.6486	.1640	.0680	-.0005	.0019	.0004
0.00	14.53	.7524	.2181	.0867	-.0023	.0016	.0033
0.00	16.80	.8671	.2901	.1156	-.0014	.0013	.0016

RUN 52

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
-5.00	-9.88	-.3191	.0535	-.0055	-.0085	-.0010	.0197
-5.00	-8.90	-.2635	.0451	-.0005	-.0068	-.0010	.0202
-5.00	-7.93	-.2255	.0351	.0040	-.0054	-.0015	.0261
-5.00	-6.90	-.1927	.0296	.0056	-.0041	-.0010	.0208
-5.00	-5.80	-.1319	.0241	.0089	-.0020	-.0004	.0168
-5.00	-4.80	-.1014	.0203	.0090	-.0008	-.0007	.0186
-5.00	-3.79	-.0482	.0184	.0105	.0005	-.0006	.0126
-5.00	-2.79	-.0167	.0154	.0125	.0014	-.0009	.0159
-5.00	-1.75	.0193	.0156	.0146	.0028	-.0009	.0142
-5.00	-.68	.0567	.0168	.0165	.0044	-.0006	.0127
-5.00	.39	.0968	.0170	.0196	.0060	-.0008	.0156
-5.00	1.38	.1244	.0210	.0198	.0059	-.0005	.0110
-5.00	2.39	.1550	.0232	.0213	.0062	-.0007	.0146
-5.00	3.40	.2039	.0272	.0227	.0082	-.0007	.0162
-5.00	4.43	.2469	.0345	.0249	.0092	-.0009	.0131
-5.00	5.36	.2884	.0444	.0265	.0105	-.0017	.0096
-5.00	6.45	.3336	.0526	.0295	.0108	-.0029	.0138
-5.00	7.44	.3736	.0632	.0330	.0115	-.0036	.0116
-5.00	8.53	.4331	.0805	.0399	.0125	-.0048	.0150
-5.00	9.46	.4760	.0978	.0455	.0134	-.0051	.0106
-5.00	10.46	.5200	.1152	.0532	.0130	-.0056	.0121
-5.00	12.67	.6257	.1613	.0698	.0171	-.0062	.0106
-5.00	14.58	.7338	.2169	.0869	.0186	-.0060	.0112
-5.00	16.74	.8259	.2767	.1132	.0198	-.0054	.0085

TABLE A2.- Continued

RUN 53

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
5.00	-9.86	-.2916	.0512	-.0009	.0109	.0010	-.0252
5.00	-8.93	-.2589	.0436	.0039	.0088	.0011	-.0276
5.00	-7.90	-.2296	.0358	.0051	.0069	.0006	-.0170
5.00	-6.91	-.1905	.0292	.0083	.0055	.0002	-.0151
5.00	-5.90	-.1506	.0260	.0095	.0050	.0005	-.0203
5.00	-4.82	-.0969	.0205	.0121	.0026	.0009	-.0200
5.00	-3.83	-.0562	.0174	.0139	.0022	.0012	-.0165
5.00	-2.75	-.0137	.0171	.0158	.0009	.0013	-.0194
5.00	-1.76	.0240	.0165	.0174	-.0008	.0011	-.0143
5.00	-.75	.0551	.0167	.0196	-.0018	.0010	-.0176
5.00	.30	.0877	.0173	.0214	-.0034	.0008	-.0147
5.00	1.31	.1291	.0180	.0240	-.0046	.0007	-.0148
5.00	2.35	.1701	.0227	.0239	-.0061	.0007	-.0165
5.00	3.31	.2069	.0287	.0248	-.0065	.0011	-.0196
5.00	4.37	.2584	.0364	.0279	-.0079	.0015	-.0205
5.00	5.42	.2931	.0439	.0287	-.0081	.0019	-.0193
5.00	6.43	.3478	.0537	.0352	-.0104	.0032	-.0147
5.00	7.48	.3882	.0665	.0399	-.0114	.0044	-.0158
5.00	8.50	.4368	.0823	.0443	-.0126	.0058	-.0167
5.00	9.53	.4775	.0983	.0477	-.0138	.0061	-.0100
5.00	10.46	.5293	.1160	.0573	-.0142	.0074	-.0135
5.00	12.70	.6408	.1646	.0762	-.0170	.0087	-.0094
5.00	14.62	.7313	.2144	.0960	-.0185	.0107	-.0115
5.00	16.64	.8270	.2726	.1175	-.0203	.0122	-.0076

RUN 56

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.71	-.1255	.0445	-.0467	.0008	.0003	-.0029
0.00	-8.59	-.0762	.0376	-.0426	.0012	.0002	-.0026
0.00	-7.81	-.0451	.0338	-.0411	.0004	.0002	-.0021
0.00	-6.71	-.0002	.0300	-.0396	.0014	.0002	-.0011
0.00	-5.79	.0495	.0280	-.0379	.0009	.0002	-.0011
0.00	-4.70	.0772	.0274	-.0362	.0006	.0003	-.0010
0.00	-3.63	.1239	.0271	-.0328	.0006	.0005	-.0025
0.00	-2.69	.1509	.0289	-.0319	.0007	.0006	-.0020
0.00	-1.50	.2005	.0315	-.0289	.0012	.0006	-.0025
0.00	-.63	.2211	.0343	-.0280	.0004	.0005	-.0013
0.00	.51	.2650	.0391	-.0264	.0004	.0004	-.0013
0.00	1.52	.3021	.0444	-.0263	.0014	.0006	-.0018
0.00	2.61	.3406	.0513	-.0250	.0010	.0007	-.0025
0.00	3.55	.3777	.0588	-.0230	.0009	.0005	-.0019
0.00	4.43	.4142	.0669	-.0218	.0003	.0005	-.0025
0.00	5.48	.4581	.0784	-.0176	-.0006	.0006	-.0034
0.00	6.52	.5061	.0928	-.0131	.0003	.0010	-.0023
0.00	7.58	.5468	.1082	-.0078	.0007	.0010	-.0010
0.00	8.55	.5950	.1258	-.0013	-.0004	.0009	-.0002
0.00	9.55	.6412	.1441	.0053	-.0002	.0014	.0001
0.00	10.62	.7010	.1687	.0113	-.0007	.0016	.0004
0.00	12.60	.7918	.2147	.0245	-.0009	.0020	.0022
0.00	14.70	.9057	.2790	.0513	-.0008	.0013	.0018
0.00	16.67	.9819	.3369	.0778	.0003	.0026	-.0001

TABLE A2.- Continued

RUN 57

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.75	-.0597	.0499	-.0670	.0019	.0002	-.0038
0.00	-8.79	-.0194	.0450	-.0643	.0026	.0000	-.0018
0.00	-7.82	.0228	.0413	-.0625	.0011	-.0000	-.0016
0.00	-6.77	.0658	.0390	-.0605	.0015	-.0000	-.0014
0.00	-5.76	.1081	.0379	-.0569	.0008	.0001	-.0018
0.00	-4.71	.1531	.0380	-.0534	.0007	-.0000	-.0013
0.00	-3.70	.1787	.0393	-.0506	.0009	.0001	-.0010
0.00	-2.67	.2206	.0420	-.0485	.0009	.0002	-.0014
0.00	-1.65	.2551	.0455	-.0478	.0002	.0003	-.0021
0.00	-.76	.2932	.0492	-.0461	.0007	.0004	-.0031
0.00	.50	.3336	.0563	-.0460	.0004	.0003	-.0022
0.00	1.52	.3669	.0623	-.0444	-.0001	.0003	-.0024
0.00	2.56	.4164	.0705	-.0425	.0002	.0003	-.0025
0.00	3.47	.4469	.0783	-.0415	.0006	.0004	-.0027
0.00	4.50	.4828	.0885	-.0387	-.0002	-.0000	-.0014
0.00	5.46	.5202	.0998	-.0350	-.0006	.0001	-.0030
0.00	6.59	.5704	.1167	-.0295	.0001	.0006	-.0019
0.00	7.53	.6119	.1323	-.0234	-.0005	.0004	.0001
0.00	8.63	.6701	.1525	-.0149	-.0000	.0008	-.0025
0.00	9.63	.7200	.1739	-.0076	-.0001	.0009	-.0002
0.00	10.62	.7583	.1938	-.0032	-.0003	.0013	-.0005
0.00	11.93	.8213	.2257	.0060	-.0010	.0015	.0016
0.00	12.75	.8669	.2488	.0161	-.0011	.0018	.0018
0.00	14.74	.9515	.3051	.0394	-.0006	.0014	-.0002
0.00	16.73	1.0325	.3681	.0704	.0021	.0030	-.0026

RUN 58

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
.01	-9.67	-.0177	.0636	-.0782	.0024	-.0003	-.0025
.01	-8.81	.0219	.0595	-.0740	.0025	-.0002	-.0026
.01	-7.72	.0705	.0554	-.0700	.0026	-.0001	-.0031
.01	-6.53	.1125	.0538	-.0665	.0022	-.0000	-.0025
.01	-5.65	.1484	.0537	-.0641	.0021	.0001	-.0023
.01	-4.69	.1884	.0556	-.0608	.0022	.0003	-.0035
.01	-3.72	.2058	.0562	-.0584	.0016	.0005	-.0023
.01	-2.68	.2560	.0596	-.0548	.0011	.0001	-.0023
0.00	-1.57	.2836	.0637	-.0549	.0017	.0003	-.0029
0.00	-.59	.3292	.0679	-.0530	.0023	.0005	-.0043
0.00	.40	.3566	.0739	-.0535	.0016	.0004	-.0039
0.00	1.50	.4051	.0815	-.0517	.0017	.0005	-.0040
0.00	2.45	.4338	.0887	-.0507	.0009	.0003	-.0030
0.00	3.48	.4704	.0984	-.0495	.0008	.0003	-.0037
0.00	4.50	.5138	.1092	-.0460	.0010	.0003	-.0029
0.00	5.53	.5523	.1214	-.0411	.0006	-.0000	-.0047
0.00	6.76	.6143	.1433	-.0353	.0018	.0005	-.0034
0.00	7.63	.6508	.1571	-.0293	.0019	.0005	-.0031
0.00	8.56	.6959	.1752	-.0227	.0018	.0007	-.0026
0.00	9.63	.7451	.1977	-.0155	.0012	.0009	-.0012
0.00	10.64	.7903	.2191	-.0079	.0012	.0013	-.0009
0.00	12.74	.8931	.2717	.0142	.0020	.0025	-.0022
0.00	14.89	.9766	.3312	.0403	.0024	.0028	-.0057
0.00	16.73	1.0368	.3852	.0678	.0037	.0033	-.0046

TABLE A2.- Continued

RUN 59

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
.01	-9.74	-.0612	.0813	-.0901	.0021	.0007	-.0017
.01	-8.63	.0019	.0742	-.0852	.0018	.0002	-.0009
.01	-7.74	.0399	.0702	-.0821	.0021	.0003	-.0018
.01	-6.69	.0871	.0668	-.0783	.0011	.0006	-.0011
.01	-5.76	.1174	.0655	-.0764	.0013	.0006	-.0010
.01	-4.71	.1780	.0635	-.0707	.0019	.0008	-.0032
.01	-3.71	.2098	.0649	-.0678	.0012	.0004	-.0038
.01	-2.71	.2377	.0669	-.0671	.0012	.0006	-.0029
.01	-1.61	.2879	.0691	-.0627	.0012	.0005	-.0027
.01	-.43	.3276	.0737	-.0598	.0014	.0005	-.0035
.01	.43	.3626	.0767	-.0563	.0017	.0007	-.0036
.01	1.49	.4003	.0824	-.0538	.0020	.0010	-.0043
.01	2.54	.4331	.0896	-.0513	.0004	.0005	-.0019
.01	3.58	.4826	.0977	-.0487	.0010	.0006	-.0045
.01	4.57	.5049	.1067	-.0465	.0014	.0005	-.0036
.01	5.54	.5433	.1172	-.0436	.0007	.0006	-.0028
0.00	6.55	.5915	.1297	-.0380	.0012	.0006	-.0029
0.00	7.55	.6186	.1420	-.0352	.0008	.0005	-.0020
0.00	8.61	.6566	.1566	-.0307	.0013	.0005	-.0024
0.00	9.62	.6971	.1719	-.0266	.0012	.0003	-.0019
0.00	10.64	.7331	.1886	-.0214	.0015	-.0001	.0003
0.00	12.72	.8080	.2324	-.0110	.0003	.0015	-.0015
0.00	14.67	.8788	.2807	.0027	-.0016	.0003	-.0005
0.00	16.72	.9354	.3281	.0190	-.0009	.0005	-.0019

RUN 60

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.73	-.1088	.0666	-.0780	.0007	.0013	-.0013
0.00	-8.86	-.0677	.0607	-.0737	.0008	.0011	-.0017
0.00	-7.81	-.0085	.0539	-.0694	.0007	.0007	-.0004
0.00	-6.78	.0356	.0500	-.0668	.0005	.0009	-.0015
0.00	-5.78	.0732	.0482	-.0646	.0003	.0010	-.0013
0.00	-4.71	.1309	.0453	-.0597	.0005	.0011	-.0029
0.00	-3.64	.1572	.0464	-.0582	.0014	.0011	-.0011
0.00	-2.74	.2017	.0470	-.0557	.0012	.0012	-.0031
0.00	-1.74	.2368	.0492	-.0536	.0006	.0010	-.0021
0.00	-.66	.2746	.0529	-.0515	.0008	.0012	-.0019
0.00	.33	.3173	.0566	-.0480	.0016	.0010	-.0026
0.00	1.44	.3530	.0613	-.0450	.0019	.0009	-.0032
0.00	2.48	.3898	.0669	-.0418	.0009	.0006	-.0025
0.00	3.50	.4274	.0746	-.0393	.0011	.0005	-.0020
0.00	4.55	.4795	.0846	-.0367	.0019	.0007	-.0040
0.00	5.58	.5162	.0952	-.0338	.0001	.0002	-.0021
0.00	6.54	.5451	.1054	-.0305	.0006	.0008	-.0030
-.01	7.60	.5882	.1195	-.0262	.0009	.0004	-.0017
-.01	8.57	.6219	.1320	-.0231	-.0003	.0003	-.0018
-.01	9.59	.6510	.1465	-.0206	.0006	.0006	-.0009
-.01	10.89	.7088	.1693	-.0127	.0019	.0005	-.0025
-.01	12.88	.7795	.2102	-.0033	-.0001	.0008	-.0017
-.01	14.78	.8392	.2521	.0075	-.0002	.0005	-.0007
-.01	16.67	.9172	.3030	.0235	.0005	.0011	-.0003

APPENDIX

TABLE A2.- Continued

RUN 61

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.81	-.1945	.0660	-.0629	.0014	.0012	-.0020
0.00	-8.43	-.1205	.0539	-.0540	.0017	.0009	-.0012
0.00	-7.85	-.0845	.0492	-.0522	.0007	.0009	-.0010
0.00	-6.70	-.0286	.0431	-.0495	.0006	.0009	-.0010
0.00	-5.72	.0061	.0400	-.0475	-.0001	.0012	-.0010
0.00	-4.74	.0485	.0378	-.0442	-.0004	.0010	-.0009
0.00	-3.76	.1028	.0352	-.0406	.0005	.0011	-.0015
0.00	-2.72	.1289	.0361	-.0401	.0000	.0009	-.0020
0.00	-1.58	.1815	.0372	-.0369	.0003	.0013	-.0028
0.00	-.51	.2275	.0394	-.0343	.0002	.0010	-.0025
0.00	.37	.2646	.0425	-.0321	-.0005	.0010	-.0032
0.00	1.36	.3032	.0464	-.0287	.0003	.0010	-.0014
0.00	2.48	.3508	.0523	-.0263	-.0001	.0007	-.0030
0.00	3.47	.3789	.0584	-.0249	.0009	.0014	-.0038
0.00	4.53	.4235	.0665	-.0218	.0004	.0008	-.0030
0.00	5.51	.4633	.0758	-.0192	.0009	.0009	-.0038
0.00	6.51	.5021	.0865	-.0159	.0001	.0011	-.0033
0.00	7.54	.5425	.0991	-.0122	.0002	.0010	-.0030
-.01	8.56	.5920	.1137	-.0080	.0001	.0010	-.0050
-.01	9.55	.6197	.1271	-.0058	-.0006	.0006	-.0035
-.01	10.77	.6594	.1462	-.0012	.0002	.0008	-.0033
-.01	12.67	.7477	.1864	.0078	-.0012	.0011	-.0017
-.01	14.70	.8243	.2328	.0181	-.0011	.0011	-.0012
-.01	16.68	.9031	.2849	.0320	-.0012	.0009	-.0020

RUN 62

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.78	-.2005	.0637	-.0353	.0009	.0008	-.0014
0.00	-8.84	-.1474	.0551	-.0312	.0014	.0006	-.0025
0.00	-7.59	-.0997	.0479	-.0301	.0011	.0008	-.0004
0.00	-6.83	-.0568	.0431	-.0289	.0007	.0005	-.0016
0.00	-5.72	-.0021	.0385	-.0267	.0005	.0007	-.0021
0.00	-4.70	.0410	.0358	-.0251	.0006	.0008	-.0018
0.00	-3.79	.0856	.0341	-.0234	.0017	.0006	-.0026
0.00	-2.62	.1198	.0350	-.0233	.0009	.0009	-.0012
0.00	-1.59	.1562	.0363	-.0208	.0002	.0007	-.0009
0.00	-.67	.2017	.0379	-.0201	.0002	.0007	-.0024
0.00	.39	.2579	.0413	-.0172	.0015	.0005	-.0022
0.00	1.48	.2912	.0454	-.0153	.0007	.0010	-.0040
0.00	2.47	.3305	.0509	-.0141	.0007	.0011	-.0051
0.00	3.57	.3659	.0582	-.0125	.0001	.0006	-.0028
0.00	4.46	.3961	.0645	-.0103	-.0005	.0001	-.0012
0.00	5.48	.4446	.0746	-.0083	-.0003	.0005	-.0041
0.00	6.44	.4749	.0838	-.0062	-.0003	.0004	-.0024
0.00	7.46	.5202	.0963	-.0019	-.0009	.0004	-.0026
0.00	8.52	.5556	.1101	.0002	-.0004	.0005	-.0014
0.00	9.52	.5951	.1244	.0039	-.0010	.0002	-.0031
-.01	10.60	.6380	.1420	.0059	-.0003	.0005	-.0019
-.01	12.61	.7366	.1857	.0122	-.0002	.0007	-.0018
-.01	14.71	.8075	.2319	.0164	-.0007	.0010	-.0035
-.01	16.63	.8868	.2834	.0256	-.0016	.0012	-.0017

TABLE A2.- Continued

RUN 63

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.83	-.1662	.0606	-.0580	.0008	.0008	.0007
0.00	-8.80	-.1466	.0555	-.0590	.0007	.0014	-.0020
0.00	-7.59	-.0686	.0462	-.0537	.0007	.0007	-.0007
0.00	-6.70	-.0332	.0426	-.0520	.0005	.0012	-.0007
0.00	-5.80	.0032	.0399	-.0510	.0002	.0011	-.0006
0.00	-4.60	.0693	.0364	-.0481	.0002	.0010	-.0010
0.00	-3.72	.1042	.0361	-.0465	.0004	.0010	-.0013
0.00	-2.76	.1385	.0361	-.0450	.0005	.0009	-.0010
0.00	-1.68	.1881	.0377	-.0425	.0006	.0013	-.0037
0.00	-.68	.2241	.0401	-.0410	.0000	.0010	-.0019
0.00	.35	.2594	.0442	-.0401	-.0001	.0009	-.0016
0.00	1.35	.3068	.0484	-.0367	-.0000	.0012	-.0041
0.00	2.39	.3458	.0538	-.0352	.0007	.0012	-.0039
0.00	3.47	.3775	.0613	-.0340	-.0011	.0005	-.0020
0.00	4.46	.4259	.0690	-.0307	.0010	.0007	-.0040
0.00	5.44	.4518	.0776	-.0298	-.0005	.0008	-.0022
0.00	6.46	.4983	.0897	-.0265	-.0000	.0013	-.0054
0.00	7.49	.5355	.1013	-.0229	-.0006	.0006	-.0027
0.00	8.49	.5733	.1150	-.0199	-.0007	.0009	-.0042
0.00	9.63	.6248	.1330	-.0177	-.0002	.0015	-.0041
0.00	10.75	.6702	.1525	-.0154	-.0003	.0006	-.0024
-.01	12.65	.7552	.1936	-.0107	-.0007	.0012	-.0022
-.01	14.69	.8242	.2401	-.0043	-.0017	.0008	-.0011
-.01	16.69	.9082	.2951	.0033	-.0018	.0015	-.0019

RUN 64

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
.01	-9.85	-.2236	.0787	-.0012	.0005	-.0000	.0029
.01	-8.80	-.1724	.0694	.0018	.0007	-.0003	.0037
.01	-7.85	-.1358	.0625	.0032	.0001	.0001	.0031
.01	-6.82	-.0887	.0560	.0035	.0008	.0000	.0041
.01	-5.79	-.0417	.0508	.0056	.0004	.0001	.0041
.01	-4.70	.0026	.0465	.0069	-.0001	.0000	.0041
.01	-3.72	.0467	.0446	.0087	-.0001	-.0001	.0050
.01	-2.75	.0841	.0435	.0099	.0001	.0003	.0036
.01	-1.70	.1200	.0436	.0103	-.0002	-.0002	.0051
.01	-.32	.1780	.0451	.0121	-.0001	.0001	.0042
.01	.37	.2038	.0463	.0132	-.0001	-.0000	.0047
.01	1.44	.2468	.0494	.0149	-.0002	-.0000	.0044
.01	2.49	.2827	.0537	.0162	-.0012	-.0003	.0060
.01	3.68	.3230	.0599	.0178	-.0002	-.0001	.0046
0.00	4.44	.3597	.0653	.0201	-.0008	-.0005	.0057
0.00	5.45	.3941	.0726	.0211	-.0004	-.0002	.0049
0.00	6.60	.4420	.0840	.0248	-.0006	-.0001	.0051
0.00	7.50	.4733	.0935	.0265	-.0007	-.0002	.0055
0.00	8.55	.5104	.1056	.0292	-.0009	-.0000	.0057
0.00	9.51	.5418	.1174	.0326	-.0007	-.0001	.0057
0.00	10.49	.5811	.1319	.0361	-.0015	.0000	.0056
0.00	12.55	.6791	.1721	.0419	.0001	.0006	.0035
0.00	14.61	.7488	.2142	.0461	-.0018	.0002	.0055
0.00	16.71	.8293	.2653	.0535	-.0023	.0007	.0065

TABLE A2.- Continued

RUN 65

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
.01	-9.84	-.2685	.0980	.0238	.0010	-.0002	.0006
.01	-8.91	-.2245	.0887	.0275	.0008	-.0004	.0023
.01	-7.91	-.1715	.0792	.0308	.0003	-.0008	.0027
.01	-6.82	-.1167	.0719	.0320	.0009	-.0005	.0022
.01	-5.47	-.0561	.0644	.0345	.0002	-.0004	.0013
.01	-4.80	-.0311	.0615	.0350	.0005	-.0002	.0019
.01	-3.45	.0309	.0579	.0378	.0004	-.0002	.0007
.01	-2.73	.0568	.0567	.0388	.0003	-.0001	.0009
.01	-1.72	.0968	.0559	.0403	.0001	-.0003	.0014
.01	-.64	.1391	.0563	.0415	.0002	-.0002	.0007
.01	.39	.1834	.0576	.0426	-.0005	-.0000	.0017
.01	1.45	.2289	.0599	.0447	.0004	-.0003	.0014
.01	2.37	.2554	.0631	.0448	-.0002	-.0002	.0005
.01	3.40	.2975	.0685	.0468	-.0004	-.0003	.0012
.01	4.38	.3369	.0744	.0491	-.0003	-.0001	.0006
0.00	5.53	.3886	.0832	.0522	-.0005	-.0005	.0003
0.00	6.41	.4160	.0909	.0540	-.0002	-.0002	.0003
0.00	7.50	.4610	.1025	.0573	-.0007	-.0001	-.0007
0.00	8.50	.4947	.1136	.0600	-.0008	-.0001	.0008
0.00	9.50	.5306	.1259	.0632	-.0008	.0001	.0005
0.00	10.56	.5777	.1422	.0666	-.0008	.0005	-.0005
0.00	12.72	.6679	.1817	.0721	-.0013	.0011	.0001
0.00	14.61	.7528	.2247	.0791	-.0014	.0010	-.0004
0.00	16.65	.8368	.2751	.0871	-.0022	.0034	.0004

RUN 68

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.93	-.3832	.0815	-.0022	.0023	.0010	-.0008
0.00	-8.80	-.3243	.0680	.0027	.0015	.0010	-.0012
0.00	-7.97	-.2829	.0595	.0032	.0010	.0008	-.0010
0.00	-6.68	-.2242	.0489	.0089	.0007	.0003	.0014
0.00	-5.85	-.1861	.0429	.0116	.0010	.0005	.0017
0.00	-4.72	-.1347	.0367	.0131	.0006	.0003	.0016
0.00	-3.82	-.0938	.0327	.0137	.0011	.0003	.0014
0.00	-2.87	-.0556	.0295	.0151	.0003	.0005	.0019
0.00	-1.80	-.0058	.0265	.0167	.0007	.0003	.0016
0.00	-.73	.0340	.0256	.0180	.0009	.0004	.0012
0.00	.25	.0718	.0257	.0194	.0009	.0004	.0025
0.00	1.26	.1149	.0265	.0211	.0008	.0004	.0016
0.00	2.32	.1669	.0288	.0241	.0014	.0004	.0014
0.00	3.32	.1926	.0317	.0252	.0000	.0001	.0028
0.00	4.32	.2403	.0358	.0268	.0002	.0003	.0025
0.00	5.35	.2802	.0421	.0295	.0006	-.0001	.0020
0.00	6.38	.3147	.0487	.0315	.0005	.0004	.0019
0.00	7.45	.3570	.0576	.0348	-.0005	-.0001	.0019
0.00	8.36	.4007	.0676	.0366	.0001	.0005	.0012
0.00	9.48	.4462	.0802	.0392	-.0007	-.0001	.0010
0.00	10.42	.4665	.0904	.0390	-.0014	.0003	.0036
0.00	12.49	.5589	.1249	.0441	-.0015	.0005	.0027
0.00	14.52	.6458	.1654	.0504	-.0008	.0008	.0025
-.01	16.72	.7353	.2159	.0574	-.0017	.0020	.0032

TABLE A2.- Continued

RUN 69

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.99	-.3603	.0798	-.0250	.0026	.0008	-.0014
0.00	-8.97	-.3072	.0678	-.0208	.0022	.0004	-.0008
0.00	-7.79	-.2427	.0560	-.0171	.0013	.0003	-.0008
0.00	-6.83	-.2112	.0498	-.0133	.0011	.0005	-.0003
0.00	-5.90	-.1711	.0432	-.0103	.0012	.0003	.0007
0.00	-4.61	-.1088	.0355	-.0087	.0009	.0005	.0007
0.00	-3.84	-.0663	.0313	-.0073	.0014	.0004	.0006
0.00	-2.83	-.0314	.0289	-.0074	.0008	.0005	.0011
0.00	-1.73	.0150	.0269	-.0051	.0013	.0004	.0009
0.00	-.78	.0516	.0267	-.0038	.0013	.0007	-.0003
0.00	.29	.0958	.0269	-.0019	.0009	.0005	.0010
0.00	1.34	.1371	.0292	-.0002	.0011	.0007	-.0011
0.00	2.34	.1760	.0318	.0018	.0008	.0008	-.0013
0.00	3.33	.2104	.0349	.0043	.0007	.0005	-.0012
0.00	4.49	.2577	.0406	.0054	.0005	.0003	-.0001
0.00	5.32	.2888	.0454	.0075	.0004	.0001	-.0011
0.00	6.38	.3403	.0539	.0086	.0007	.0005	-.0024
0.00	7.44	.3774	.0637	.0112	-.0004	.0003	-.0003
0.00	8.44	.4172	.0746	.0128	-.0007	.0003	-.0001
0.00	9.54	.4629	.0884	.0144	-.0011	.0003	.0026
0.00	10.46	.5126	.1026	.0163	-.0003	.0009	.0009
0.00	12.61	.6077	.1409	.0196	-.0007	.0014	-.0014
0.00	14.57	.6893	.1825	.0245	-.0011	.0007	.0012
-.01	16.76	.7891	.2380	.0320	-.0023	.0023	.0019

RUN 70

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.91	-.3879	.0870	.0347	.0028	.0006	-.0008
0.00	-8.95	-.3522	.0760	.0350	.0020	.0002	-.0005
0.00	-7.83	-.2922	.0635	.0376	.0013	-.0000	-.0016
0.00	-6.86	-.2541	.0553	.0407	.0012	-.0003	-.0004
0.00	-5.75	-.2089	.0472	.0434	.0015	-.0001	.0005
0.00	-4.89	-.1553	.0408	.0443	.0012	-.0003	.0002
0.00	-3.88	-.1206	.0356	.0444	.0015	.0001	-.0001
0.00	-2.82	-.0792	.0313	.0455	.0011	.0000	.0006
0.00	-1.82	-.0349	.0282	.0458	.0008	-.0000	.0006
0.00	-.78	.0062	.0275	.0472	.0010	.0001	.0003
0.00	.20	.0395	.0265	.0477	.0009	.0002	.0008
0.00	1.29	.0828	.0270	.0500	.0004	.0001	.0018
0.00	2.27	.1242	.0285	.0504	.0011	.0001	-.0001
0.00	3.40	.1715	.0313	.0528	.0018	.0002	-.0002
0.00	4.61	.2122	.0359	.0549	.0007	-.0001	.0005
0.00	5.44	.2525	.0411	.0565	.0005	-.0002	-.0003
0.00	6.40	.2885	.0474	.0581	.0006	.0002	-.0011
0.00	7.40	.3257	.0556	.0609	-.0002	-.0001	.0003
0.00	8.39	.3700	.0654	.0630	.0000	.0004	-.0004
0.00	9.41	.4049	.0762	.0647	-.0001	.0002	.0010
0.00	10.49	.4520	.0901	.0666	-.0002	.0006	.0011
0.00	12.54	.5337	.1215	.0703	-.0012	.0004	.0016
0.00	14.56	.6444	.1665	.0758	-.0006	.0014	-.0007
0.00	16.53	.7140	.2088	.0820	-.0022	.0025	.0014

TABLE A2.- Continued

RUN 80

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.82	-.3613	.0778	-.0149	.0030	.0009	-.0018
0.00	-8.93	-.3108	.0665	-.0101	.0017	.0007	-.0023
0.00	-7.90	-.2673	.0569	-.0064	.0009	.0008	-.0018
0.00	-6.80	-.2136	.0473	.0004	.0012	.0005	-.0007
0.00	-5.87	-.1745	.0414	.0041	.0010	.0006	-.0007
0.00	-4.75	-.1258	.0351	.0050	.0022	.0005	-.0013
0.00	-3.66	-.0797	.0308	.0076	.0015	.0005	-.0001
0.00	-2.73	-.0371	.0276	.0093	.0013	.0006	.0000
0.00	-1.67	.0060	.0255	.0121	.0011	.0005	-.0014
0.00	-.80	.0345	.0249	.0129	.0012	.0009	-.0006
0.00	.34	.0988	.0245	.0179	.0019	.0007	-.0017
0.00	1.37	.1255	.0257	.0185	.0010	.0007	-.0004
0.00	2.53	.1738	.0283	.0200	.0011	.0009	-.0024
0.00	3.32	.2006	.0313	.0221	.0005	.0005	.0003
0.00	4.50	.2449	.0360	.0235	.0007	.0006	-.0012
0.00	5.55	.2990	.0432	.0267	.0015	.0008	-.0026
0.00	6.42	.3283	.0495	.0283	.0010	.0008	-.0024
0.00	7.48	.3812	.0597	.0335	.0004	.0005	-.0005
0.00	8.44	.4176	.0697	.0350	.0005	.0009	-.0013
0.00	9.47	.4514	.0809	.0374	.0003	.0006	-.0005
0.00	10.59	.4980	.0967	.0417	-.0008	.0004	.0002
0.00	12.52	.5927	.1313	.0503	-.0008	.0008	-.0005
0.00	14.58	.6740	.1724	.0586	-.0005	.0010	-.0008
0.00	16.65	.7713	.2240	.0705	-.0021	.0027	.0018

RUN 81

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
-5.00	-9.89	-.3383	.0742	-.0178	-.0064	.0032	.0233
-5.00	-8.97	-.3079	.0652	-.0121	-.0070	.0033	.0214
-5.00	-7.91	-.2560	.0552	-.0059	-.0066	.0028	.0219
-5.00	-6.77	-.2073	.0458	-.0030	-.0046	.0031	.0210
-5.00	-5.73	-.1680	.0395	.0017	-.0038	.0029	.0197
-5.00	-4.88	-.1195	.0345	.0023	-.0016	.0028	.0177
-5.00	-3.66	-.0716	.0292	.0054	-.0008	.0026	.0166
-5.00	-2.63	-.0316	.0267	.0083	-.0001	.0023	.0176
-5.00	-1.72	.0059	.0241	.0108	.0010	.0022	.0176
-5.00	-.72	.0357	.0232	.0122	.0019	.0019	.0167
-5.00	.26	.0816	.0234	.0141	.0035	.0015	.0181
-5.00	1.32	.1149	.0249	.0159	.0046	.0010	.0180
-5.00	2.39	.1599	.0272	.0192	.0058	.0005	.0194
-5.00	3.45	.2020	.0306	.0217	.0071	.0003	.0189
-5.00	4.37	.2324	.0346	.0227	.0091	.0006	.0179
-5.00	5.43	.2779	.0411	.0251	.0100	.0002	.0176
-5.00	6.52	.3198	.0488	.0286	.0107	-.0002	.0176
-5.00	7.58	.3646	.0582	.0310	.0124	-.0000	.0169
-5.00	8.41	.4036	.0678	.0341	.0128	-.0002	.0179
-5.00	9.46	.4476	.0807	.0372	.0132	-.0006	.0191
-5.00	10.52	.4930	.0956	.0412	.0142	-.0001	.0179
-5.00	12.58	.5839	.1316	.0499	.0163	.0005	.0178
-5.00	14.57	.6707	.1730	.0596	.0170	.0002	.0193
-5.01	16.66	.7716	.2252	.0739	.0173	-.0006	.0198

APPENDIX

TABLE A2.- Continued

RUN 82

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
5.00	-9.90	-.3343	.0733	-.0146	.0109	-.0021	-.0229
5.00	-8.99	-.3029	.0639	-.0084	.0108	-.0022	-.0217
5.00	-7.90	-.2577	.0542	-.0035	.0094	-.0020	-.0215
5.00	-6.88	-.2168	.0464	-.0003	.0087	-.0020	-.0212
5.00	-5.83	-.1644	.0392	.0029	.0067	-.0018	-.0183
5.00	-4.88	-.1283	.0346	.0053	.0039	-.0019	-.0182
5.00	-3.82	-.0812	.0297	.0077	.0037	-.0016	-.0157
5.00	-2.92	-.0400	.0268	.0099	.0020	-.0015	-.0175
5.00	-1.81	-.0035	.0242	.0120	.0012	-.0010	-.0178
5.00	-.72	.0410	.0230	.0149	-.0003	-.0006	-.0185
5.00	.32	.0825	.0232	.0170	-.0021	-.0005	-.0178
5.00	1.34	.1260	.0241	.0190	-.0034	.0000	-.0199
5.00	2.44	.1697	.0267	.0211	-.0047	.0005	-.0201
5.00	3.38	.2040	.0296	.0226	-.0066	.0003	-.0193
5.00	4.39	.2431	.0341	.0260	-.0080	.0006	-.0195
5.00	5.40	.2852	.0399	.0287	-.0087	.0012	-.0197
5.00	6.39	.3277	.0475	.0321	-.0103	.0010	-.0204
5.00	7.46	.3702	.0570	.0339	-.0117	.0008	-.0202
5.00	8.52	.4004	.0666	.0355	-.0128	.0009	-.0193
5.00	9.51	.4578	.0807	.0422	-.0130	.0015	-.0219
5.00	10.56	.4870	.0936	.0428	-.0142	.0011	-.0214
5.00	12.54	.5710	.1269	.0495	-.0154	.0011	-.0206
5.00	14.54	.6595	.1674	.0592	-.0178	.0011	-.0203
5.00	16.65	.7592	.2210	.0753	-.0204	.0055	-.0175

RUN 83

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.91	-.4212	.1048	.0630	.0018	.0006	-.0002
0.00	-8.94	-.3707	.0920	.0661	.0020	.0002	-.0008
0.00	-7.87	-.3230	.0803	.0678	.0012	-.0001	.0005
0.00	-6.84	-.2764	.0706	.0736	.0015	-.0001	.0002
0.00	-5.90	-.2387	.0628	.0752	.0016	-.0001	.0009
0.00	-4.91	-.1903	.0557	.0755	.0018	-.0001	.0001
0.00	-3.71	-.1491	.0496	.0757	.0011	.0001	.0013
0.00	-2.79	-.0931	.0446	.0779	.0023	.0000	.0007
0.00	-1.60	-.0469	.0407	.0781	.0013	-.0002	.0015
0.00	-.60	-.0020	.0392	.0799	.0012	-.0003	.0016
0.00	.28	.0348	.0380	.0804	.0012	.0000	.0012
0.00	1.31	.0725	.0376	.0811	.0011	.0001	.0000
0.00	2.31	.1114	.0388	.0822	.0010	.0000	.0004
0.00	3.41	.1528	.0412	.0826	.0013	-.0000	-.0002
0.00	4.42	.1914	.0445	.0849	.0018	-.0001	.0002
0.00	5.46	.2363	.0503	.0866	.0011	-.0002	-.0000
0.00	6.59	.2874	.0582	.0883	.0010	.0002	-.0008
0.00	7.47	.3229	.0655	.0902	.0014	.0004	-.0004
0.00	8.43	.3466	.0731	.0915	.0002	-.0002	.0010
0.00	9.46	.3977	.0853	.0949	.0002	.0001	.0014
0.00	10.45	.4435	.0982	.0959	.0007	.0004	.0016
-.01	12.49	.5402	.1314	.1004	.0003	.0006	.0018
-.01	14.63	.6324	.1732	.1063	-.0008	.0010	.0018
-.01	16.75	.7326	.2244	.1128	-.0009	.0013	.0008

TABLE A2.- Continued

RUN 87

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.92	-.3524	.0694	-.0186	.0023	.0006	-.0011
0.00	-8.81	-.2892	.0555	-.0129	.0019	.0005	-.0016
0.00	-7.87	-.2442	.0468	-.0100	.0014	.0007	-.0010
0.00	-6.83	-.1965	.0393	-.0065	.0008	.0004	-.0004
0.00	-5.82	-.1400	.0324	-.0028	.0022	.0005	.0003
0.00	-4.77	-.1111	.0284	-.0020	.0011	.0006	.0004
0.00	-3.77	-.0586	.0248	.0019	.0003	.0004	.0008
0.00	-2.75	-.0215	.0228	.0038	.0009	.0006	.0011
0.00	-1.73	.0051	.0213	.0068	.0008	.0006	.0018
0.00	-.69	.0535	.0215	.0114	.0008	.0004	.0016
0.00	.37	.0874	.0224	.0130	.0009	.0006	.0022
0.00	1.25	.1191	.0241	.0161	.0002	.0004	.0020
0.00	2.40	.1596	.0273	.0177	.0001	.0002	.0016
0.00	3.41	.2074	.0321	.0180	.0008	.0004	.0007
0.00	4.39	.2418	.0374	.0188	.0006	.0003	.0023
0.00	5.45	.2830	.0447	.0204	.0028	-.0000	-.0011
0.00	6.48	.3215	.0533	.0212	-.0011	-.0000	.0027
0.00	7.48	.3697	.0638	.0239	-.0003	.0001	.0018
0.00	8.48	.4088	.0757	.0264	-.0003	.0003	.0018
0.00	9.50	.4592	.0905	.0293	.0006	.0003	.0012
0.00	10.54	.4945	.1046	.0329	-.0004	.0001	.0021
0.00	12.59	.5896	.1424	.0415	-.0008	.0005	.0031
0.00	14.65	.6694	.1851	.0524	-.0018	.0002	.0031
0.00	16.70	.7477	.2336	.0669	-.0015	.0011	.0031

RUN 88

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
-5.00	-9.90	-.3315	.0663	-.0199	-.0083	.0044	.0187
-5.00	-8.92	-.2832	.0557	-.0174	-.0054	.0044	.0172
-5.00	-7.87	-.2308	.0459	-.0120	-.0047	.0039	.0183
-5.00	-6.82	-.1840	.0381	-.0081	-.0036	.0038	.0185
-5.00	-5.79	-.1524	.0327	-.0058	-.0029	.0038	.0161
-5.00	-4.77	-.1029	.0278	-.0032	-.0011	.0038	.0154
-5.00	-3.74	-.0614	.0243	-.0001	-.0005	.0034	.0144
-5.00	-2.76	-.0248	.0222	.0028	.0003	.0030	.0149
-5.00	-1.72	.0053	.0208	.0057	.0014	.0029	.0154
-5.00	-.69	.0491	.0211	.0075	.0036	.0026	.0154
-5.00	.35	.0849	.0218	.0119	.0040	.0021	.0160
-5.00	1.38	.1177	.0233	.0132	.0049	.0016	.0160
-5.00	2.35	.1543	.0258	.0139	.0065	.0011	.0152
-5.00	3.37	.1955	.0299	.0159	.0068	.0006	.0165
-5.00	4.43	.2309	.0357	.0175	.0081	.0006	.0160
-5.00	5.42	.2695	.0421	.0192	.0091	.0001	.0159
-5.00	6.41	.3109	.0506	.0212	.0095	-.0004	.0169
-5.00	7.44	.3483	.0602	.0230	.0112	-.0002	.0157
-5.00	8.46	.3863	.0712	.0260	.0115	-.0004	.0169
-5.00	9.49	.4348	.0857	.0304	.0119	-.0007	.0179
-5.00	10.51	.4714	.1000	.0335	.0124	-.0004	.0170
-5.00	12.59	.5569	.1361	.0428	.0135	-.0003	.0176
-5.00	14.60	.6353	.1767	.0519	.0149	-.0001	.0174
-5.00	16.70	.7439	.2337	.0703	.0150	.0000	.0196

TABLE A2.- Continued

RUN 89

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
5.00	-9.89	-.3132	.0623	-.0178	.0102	-.0032	-.0195
5.00	-8.87	-.2753	.0528	-.0146	.0085	-.0036	-.0196
5.00	-7.86	-.2296	.0433	-.0107	.0070	-.0030	-.0195
5.00	-6.81	-.1872	.0361	-.0062	.0060	-.0028	-.0183
5.00	-5.82	-.1440	.0305	-.0033	.0046	-.0027	-.0175
5.00	-4.79	-.1040	.0252	-.0009	.0031	-.0028	-.0161
5.00	-3.75	-.0635	.0225	.0015	.0018	-.0025	-.0155
5.00	-2.73	-.0244	.0204	.0044	.0011	-.0022	-.0161
5.00	-1.71	.0112	.0189	.0074	-.0008	-.0017	-.0158
5.00	-.71	.0435	.0189	.0101	-.0014	-.0015	-.0161
5.00	.31	.0769	.0203	.0130	-.0030	-.0011	-.0157
5.00	1.33	.1217	.0224	.0153	-.0032	-.0006	-.0173
5.00	2.34	.1559	.0252	.0174	-.0052	-.0005	-.0175
5.00	3.34	.1894	.0289	.0181	-.0051	-.0004	-.0186
5.00	4.35	.2319	.0343	.0191	-.0067	-.0002	-.0191
5.00	5.37	.2676	.0406	.0205	-.0080	.0001	-.0186
5.00	6.42	.3141	.0495	.0238	-.0089	.0001	-.0173
5.00	7.45	.3527	.0591	.0248	-.0110	.0001	-.0185
5.00	8.47	.3947	.0705	.0281	-.0122	.0006	-.0194
5.00	9.50	.4230	.0823	.0300	-.0128	.0003	-.0183
5.00	10.52	.4678	.0973	.0344	-.0132	.0006	-.0195
5.00	12.54	.5521	.1322	.0422	-.0147	.0007	-.0191
5.00	14.61	.6317	.1731	.0509	-.0169	.0007	-.0189
5.00	16.64	.7037	.2191	.0678	-.0172	.0048	-.0187

RUN 90

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.91	-.3278	.0666	-.0185	.0009	-.0007	.0001
0.00	-8.89	-.2834	.0552	-.0155	.0013	-.0006	.0005
0.00	-7.87	-.2377	.0457	-.0122	.0006	-.0003	-.0001
0.00	-6.81	-.1920	.0377	-.0083	.0008	-.0004	-.0006
0.00	-5.76	-.1466	.0315	-.0061	.0009	-.0004	-.0005
0.00	-4.81	-.1151	.0275	-.0059	.0012	-.0002	.0001
0.00	-3.77	-.0643	.0239	-.0026	.0007	-.0003	-.0004
0.00	-2.75	-.0310	.0217	-.0005	.0005	-.0003	.0002
0.00	-1.72	.0052	.0199	.0031	.0003	-.0002	-.0002
0.00	-.70	.0426	.0201	.0065	.0007	-.0001	-.0003
0.00	.33	.0795	.0217	.0095	.0005	.0001	-.0004
0.00	1.36	.1200	.0235	.0116	.0007	.0002	-.0002
0.00	2.34	.1527	.0259	.0130	.0001	.0003	.0002
0.00	3.37	.1938	.0301	.0146	.0002	.0002	.0000
0.00	4.40	.2363	.0360	.0151	.0007	.0002	-.0011
0.00	5.44	.2800	.0432	.0167	-.0000	.0003	.0004
0.00	6.45	.3237	.0518	.0185	.0005	.0005	-.0011
0.00	7.47	.3611	.0619	.0209	-.0002	.0005	-.0008
0.00	8.45	.3935	.0723	.0221	-.0005	.0005	-.0008
0.00	9.48	.4406	.0859	.0257	.0000	.0008	.0000
0.00	10.51	.4742	.0989	.0288	-.0007	.0009	-.0000
0.00	12.55	.5593	.1340	.0361	.0001	.0009	-.0003
0.00	14.61	.6394	.1751	.0448	-.0016	.0013	.0010
0.00	16.64	.7198	.2222	.0592	-.0002	.0027	.0018

TABLE A2.- Continued

RUN 91

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
-5.00	-9.87	-.3303	.0658	-.0202	-.0071	.0050	.0204
-5.00	-8.84	-.2770	.0541	-.0163	-.0058	.0051	.0178
-5.00	-7.87	-.2425	.0466	-.0135	-.0046	.0049	.0176
-5.00	-6.83	-.1936	.0385	-.0107	-.0033	.0050	.0187
-5.00	-5.81	-.1529	.0324	-.0078	-.0026	.0049	.0166
-5.00	-4.79	-.1102	.0274	-.0057	-.0013	.0048	.0144
-5.00	-3.77	-.0783	.0242	-.0043	-.0008	.0047	.0147
-5.00	-2.75	-.0294	.0216	-.0007	.0003	.0042	.0148
-5.00	-1.74	.0072	.0197	.0029	.0013	.0038	.0139
-5.00	-.72	.0440	.0194	.0062	.0024	.0035	.0147
-5.00	.29	.0751	.0205	.0084	.0038	.0032	.0152
-5.00	1.32	.1181	.0230	.0109	.0049	.0026	.0154
-5.00	2.36	.1527	.0253	.0126	.0057	.0026	.0160
-5.00	3.38	.1960	.0301	.0136	.0071	.0023	.0159
-5.00	4.39	.2343	.0359	.0147	.0073	.0018	.0156
-5.00	5.42	.2748	.0424	.0167	.0085	.0013	.0154
-5.00	6.44	.3170	.0514	.0183	.0102	.0010	.0146
-5.00	7.45	.3551	.0613	.0202	.0109	.0007	.0153
-5.00	8.46	.3874	.0717	.0225	.0114	.0005	.0165
-5.00	9.50	.4326	.0851	.0266	.0116	.0001	.0163
-5.00	10.52	.4650	.0978	.0298	.0121	.0000	.0173
-5.00	12.54	.5483	.1322	.0351	.0138	.0004	.0188
-5.00	14.62	.6360	.1751	.0463	.0151	.0016	.0199
-5.00	16.67	.7113	.2210	.0586	.0149	.0030	.0239

RUN 92

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
5.02	-9.88	-.3285	.0650	-.0202	.0095	-.0063	-.0250
5.02	-8.89	-.2804	.0537	-.0168	.0074	-.0062	-.0236
5.02	-7.83	-.2330	.0445	-.0125	.0065	-.0059	-.0234
5.02	-6.80	-.1923	.0370	-.0104	.0056	-.0058	-.0223
5.02	-5.77	-.1484	.0310	-.0078	.0040	-.0053	-.0205
5.02	-4.78	-.1117	.0266	-.0054	.0032	-.0054	-.0198
5.02	-3.76	-.0741	.0226	-.0036	.0021	-.0052	-.0190
5.02	-2.73	-.0275	.0205	.0006	.0014	-.0049	-.0180
5.02	-1.71	.0103	.0192	.0029	-.0005	-.0043	-.0178
5.02	-.71	.0338	.0190	.0046	-.0010	-.0039	-.0172
5.02	.30	.0791	.0199	.0091	-.0027	-.0035	-.0184
5.02	1.31	.1109	.0216	.0109	-.0034	-.0029	-.0185
5.02	2.36	.1510	.0243	.0128	-.0043	-.0025	-.0186
5.02	3.36	.1885	.0287	.0138	-.0054	-.0024	-.0188
5.02	4.41	.2325	.0346	.0156	-.0067	-.0018	-.0195
5.02	5.42	.2690	.0416	.0170	-.0074	-.0011	-.0195
5.02	6.49	.3158	.0503	.0203	-.0090	-.0008	-.0194
5.02	7.46	.3474	.0590	.0214	-.0105	-.0006	-.0196
5.02	8.49	.3939	.0709	.0242	-.0111	.0000	-.0215
5.02	9.51	.4289	.0829	.0275	-.0116	.0002	-.0206
5.02	10.51	.4548	.0948	.0293	-.0125	-.0001	-.0212
5.02	12.57	.5449	.1305	.0380	-.0149	-.0000	-.0217
5.02	14.60	.6183	.1696	.0461	-.0154	.0005	-.0214
5.02	16.65	.7001	.2162	.0583	-.0179	.0034	-.0185

TABLE A2.- Continued

RUN 99

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.94	-.3766	.0816	-.0207	.0021	.0004	-.0016
0.00	-8.95	-.3253	.0690	-.0130	.0014	.0003	-.0001
0.00	-7.95	-.2759	.0579	-.0099	.0010	.0005	.0006
0.00	-6.87	-.2265	.0496	-.0062	.0012	.0006	-.0018
0.00	-5.85	-.1906	.0435	-.0035	.0003	.0006	-.0014
0.00	-4.77	-.1448	.0370	.0004	.0001	.0007	-.0008
0.00	-3.76	-.0992	.0324	.0035	.0010	.0005	.0011
0.00	-2.74	-.0529	.0287	.0065	.0004	.0004	.0005
0.00	-1.68	-.0056	.0256	.0091	.0007	.0004	.0000
0.00	-.63	.0347	.0244	.0105	.0011	.0006	.0000
0.00	.31	.0694	.0248	.0128	.0005	.0007	.0010
0.00	1.36	.1045	.0254	.0145	.0002	.0005	.0021
0.00	2.32	.1488	.0264	.0174	.0010	.0005	.0011
0.00	3.37	.1877	.0285	.0192	.0010	.0009	.0009
0.00	4.40	.2253	.0317	.0209	.0000	.0004	.0022
0.00	5.43	.2615	.0351	.0222	.0005	.0007	.0015
0.00	6.45	.2923	.0399	.0237	.0005	.0006	.0023
0.00	7.46	.3331	.0456	.0260	.0004	.0005	.0006
0.00	8.47	.3689	.0533	.0288	.0005	.0004	.0006
0.00	9.51	.4052	.0623	.0325	.0004	.0006	-.0005
0.00	10.54	.4504	.0734	.0357	.0006	.0005	-.0004
0.00	12.60	.5456	.1064	.0430	.0009	.0013	-.0054
0.00	14.65	.6216	.1436	.0517	.0011	.0000	-.0013

RUN 100

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
-5.00	-9.92	-.3655	.0799	-.0188	-.0122	.0014	.0314
-5.00	-8.93	-.3210	.0685	-.0119	-.0104	.0011	.0296
-5.00	-7.90	-.2805	.0584	-.0073	-.0086	.0008	.0308
-5.00	-6.89	-.2324	.0494	-.0039	-.0076	.0013	.0290
-5.00	-5.83	-.1854	.0422	-.0015	-.0065	.0013	.0284
-5.00	-4.79	-.1345	.0354	.0014	-.0038	.0018	.0237
-5.00	-3.79	-.0993	.0310	.0041	-.0028	.0019	.0239
-5.00	-2.77	-.0597	.0277	.0059	-.0024	.0016	.0232
-5.00	-1.73	-.0194	.0252	.0087	-.0019	.0016	.0225
-5.00	-.65	.0326	.0230	.0106	.0003	.0009	.0264
-5.00	.34	.0688	.0235	.0111	.0030	.0012	.0203
-5.00	1.39	.1090	.0240	.0146	.0045	.0007	.0203
-5.00	2.39	.1426	.0257	.0163	.0053	.0003	.0208
-5.00	4.41	.2172	.0306	.0204	.0077	.0000	.0198
-5.00	5.42	.2542	.0345	.0225	.0090	-.0001	.0207
-5.00	6.46	.2929	.0396	.0250	.0104	-.0005	.0199
-5.00	7.46	.3272	.0451	.0277	.0116	-.0006	.0187
-5.00	8.47	.3702	.0532	.0302	.0133	-.0004	.0189
-5.00	9.54	.4158	.0638	.0332	.0132	-.0002	.0185
-5.00	10.53	.4551	.0745	.0363	.0145	.0005	.0154
-5.00	12.56	.5330	.1024	.0430	.0157	.0020	.0123
-5.00	14.65	.6280	.1431	.0519	.0172	.0027	.0092

TABLE A2.- Continued

RUN 101

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
5.00	-9.94	-.3712	.0814	-.0180	.0137	-.0023	-.0303
5.00	-8.94	-.3321	.0704	-.0132	.0110	-.0018	-.0273
5.00	-7.89	-.2806	.0590	-.0080	.0092	-.0012	-.0277
5.00	-6.87	-.2350	.0499	-.0044	.0074	-.0014	-.0259
5.00	-5.86	-.1969	.0427	-.0035	.0068	-.0018	-.0233
5.00	-4.83	-.1480	.0369	.0005	.0053	-.0019	-.0211
5.00	-3.77	-.1040	.0318	.0024	.0055	-.0021	-.0203
5.00	-2.74	-.0547	.0279	.0069	.0030	-.0016	-.0186
5.00	-1.70	-.0132	.0257	.0081	.0023	-.0014	-.0173
5.00	-.64	.0380	.0237	.0112	-.0002	-.0013	-.0167
5.00	.31	.0676	.0237	.0125	-.0015	-.0008	-.0158
5.00	1.31	.1061	.0238	.0151	-.0030	-.0004	-.0162
5.00	2.36	.1476	.0251	.0175	-.0043	-.0000	-.0168
5.00	3.39	.1826	.0273	.0190	-.0049	.0004	-.0178
5.00	5.44	.2621	.0340	.0236	-.0081	.0007	-.0188
5.00	6.44	.2930	.0385	.0256	-.0090	.0007	-.0184
5.00	7.46	.3429	.0449	.0287	-.0115	.0005	-.0198
5.00	8.46	.3717	.0520	.0305	-.0119	.0005	-.0208
5.00	9.50	.4098	.0607	.0333	-.0129	-.0003	-.0186
5.00	10.52	.4521	.0729	.0371	-.0134	-.0007	-.0179
5.00	12.56	.5273	.1014	.0460	-.0137	-.0017	-.0165
5.00	14.69	.6266	.1473	.0583	-.0159	-.0010	-.0109

RUN 102

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-10.00	-.3407	.0705	-.0268	.0024	-.0006	-.0029
0.00	-8.83	-.2821	.0574	-.0190	.0025	-.0003	-.0006
0.00	-7.88	-.2435	.0485	-.0140	.0020	-.0004	-.0006
0.00	-6.79	-.1944	.0399	-.0093	.0020	-.0003	-.0013
0.00	-5.75	-.1509	.0336	-.0070	.0012	.0000	-.0006
0.00	-4.88	-.1259	.0300	-.0058	.0016	.0000	.0010
0.00	-3.76	-.0697	.0256	-.0011	.0013	-.0005	.0058
0.00	-2.79	-.0230	.0232	.0019	.0020	-.0004	.0023
0.00	-1.78	.0301	.0209	.0078	.0014	-.0001	.0032
0.00	-.66	.0662	.0234	.0084	.0017	-.0004	.0023
0.00	.29	.0935	.0209	.0124	.0011	-.0003	.0025
0.00	1.31	.1328	.0228	.0140	.0014	-.0001	.0026
0.00	2.32	.1640	.0255	.0161	.0003	-.0004	.0031
0.00	3.37	.2081	.0290	.0165	.0011	-.0005	.0021
0.00	4.35	.2482	.0338	.0167	.0006	-.0002	.0021
0.00	5.42	.2876	.0392	.0179	.0008	-.0007	.0031
0.00	6.43	.3337	.0462	.0187	.0004	-.0005	.0014
0.00	7.43	.3650	.0536	.0202	.0006	-.0002	.0033
0.00	8.51	.4117	.0641	.0221	.0003	-.0003	.0022
0.00	9.44	.4378	.0730	.0249	.0001	-.0006	.0038
0.00	10.51	.4787	.0864	.0274	-.0005	-.0005	.0036
0.00	12.68	.6999	.1813	.0242	-.0018	.0007	.0006
0.00	12.61	.5611	.1189	.0402	-.0001	.0004	.0027
0.00	14.64	.6426	.1588	.0524	.0006	-.0008	.0071
0.00	16.65	.7184	.2038	.0691	-.0010	.0004	.0154

TABLE A2.- Continued

RUN 103

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.90	-.3484	.0722	-.0168	.0031	.0001	-.0012
0.00	-8.92	-.2991	.0604	-.0110	.0036	-.0004	-.0028
0.00	-7.93	-.2508	.0500	-.0064	.0036	-.0001	-.0027
0.00	-6.90	-.2082	.0416	-.0027	.0031	-.0001	-.0028
0.00	-5.90	-.1731	.0350	-.0006	.0028	-.0000	-.0013
0.00	-4.83	-.1202	.0283	.0038	.0025	-.0002	-.0018
0.00	-3.84	-.0823	.0252	.0038	.0025	-.0003	-.0004
0.00	-2.82	-.0290	.0219	.0065	.0031	-.0004	-.0010
0.00	-1.76	.0023	.0196	.0078	.0020	-.0002	-.0017
0.00	-.77	.0422	.0188	.0101	.0014	.0002	.0006
0.00	.30	.0966	.0191	.0138	.0017	.0000	-.0023
0.00	1.42	.1328	.0203	.0158	.0019	.0005	-.0012
0.00	2.30	.1661	.0222	.0181	.0014	.0002	-.0022
0.00	3.34	.1953	.0248	.0198	.0006	.0001	-.0016
0.00	4.44	.2396	.0286	.0223	.0003	-.0003	-.0020
0.00	5.37	.2635	.0324	.0229	.0004	.0002	-.0005
0.00	6.41	.3069	.0382	.0247	.0008	-.0000	-.0022
0.00	7.39	.3572	.0455	.0258	-.0006	-.0001	-.0020
0.00	8.48	.3901	.0551	.0256	.0003	-.0000	-.0020
0.00	9.50	.4351	.0662	.0276	.0012	.0001	-.0028
0.00	10.48	.4678	.0776	.0309	.0005	.0003	-.0011
0.00	12.51	.5517	.1092	.0402	-.0012	.0002	-.0019
0.00	14.62	.6322	.1487	.0505	.0002	.0005	.0012
0.00	16.69	.7296	.2009	.0675	-.0007	.0013	.0120

RUN 104

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.85	-.3339	.0688	-.0182	.0044	.0003	-.0032
0.00	-8.87	-.2864	.0574	-.0135	.0038	.0003	-.0040
0.00	-7.82	-.2395	.0495	-.0103	.0037	.0004	-.0017
0.00	-6.85	-.2044	.0400	-.0066	.0033	.0005	-.0040
0.00	-5.85	-.1452	.0322	-.0008	.0036	.0004	-.0032
0.00	-4.87	-.1126	.0276	.0004	.0041	.0002	-.0029
0.00	-3.82	-.0768	.0239	.0013	.0034	.0003	-.0026
0.00	-2.81	-.0334	.0212	.0037	.0025	-.0001	-.0026
0.00	-1.80	.0072	.0190	.0070	.0020	-.0001	-.0019
0.00	-.73	.0553	.0185	.0098	.0019	-.0002	-.0019
0.00	.32	.0824	.0196	.0123	.0015	-.0001	-.0021
0.00	1.29	.1284	.0200	.0157	.0006	-.0003	-.0014
0.00	2.31	.1637	.0229	.0168	.0012	.0000	-.0018
0.00	3.32	.2040	.0257	.0182	.0017	-.0004	-.0028
0.00	4.35	.2408	.0303	.0175	.0019	-.0001	-.0027
0.00	5.38	.2818	.0352	.0191	.0013	-.0005	-.0026
0.00	6.53	.3275	.0427	.0202	.0018	-.0003	-.0029
0.00	7.51	.3707	.0509	.0219	.0007	-.0009	-.0027
0.00	8.46	.4002	.0592	.0232	.0009	-.0009	-.0028
0.00	9.45	.4318	.0692	.0250	.0009	-.0009	-.0025
0.00	10.48	.4807	.0827	.0286	.0007	-.0011	-.0014
0.00	12.55	.5469	.1130	.0388	.0001	-.0006	-.0015
0.00	14.68	.6381	.1551	.0515	-.0004	-.0008	.0024
0.00	16.60	.7144	.1996	.0664	-.0009	-.0003	.0115

TABLE A2.- Continued

RUN 105

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.85	-.3532	.0750	-.0134	.0023	-.0005	.0004
0.00	-8.98	-.3175	.0652	-.0086	.0020	-.0005	-.0016
0.00	-7.89	-.2731	.0549	-.0046	.0013	-.0003	-.0001
0.00	-6.85	-.2141	.0447	.0010	.0011	-.0005	-.0003
0.00	-5.89	-.1693	.0380	.0028	.0020	-.0004	-.0011
0.00	-4.85	-.1298	.0324	.0047	.0025	-.0004	-.0011
0.00	-3.88	-.0998	.0286	.0065	.0020	-.0003	.0010
0.00	-2.82	-.0410	.0249	.0088	.0016	-.0004	.0007
0.00	-1.80	-.0062	.0223	.0102	.0017	-.0001	.0017
0.00	-.69	.0447	.0213	.0116	.0011	-.0001	.0004
0.00	.31	.0802	.0217	.0139	.0014	-.0003	-.0003
0.00	1.31	.1339	.0219	.0155	.0009	-.0003	-.0016
0.00	2.31	.1619	.0236	.0178	.0012	.0002	.0006
0.00	3.31	.1972	.0265	.0197	.0007	-.0002	-.0003
0.00	4.34	.2360	.0296	.0230	.0007	-.0000	-.0010
0.00	5.41	.2728	.0334	.0244	.0008	.0004	-.0018
0.00	6.43	.3072	.0387	.0269	-.0002	-.0003	-.0003
0.00	7.40	.3380	.0450	.0283	.0007	.0002	-.0010
0.00	8.42	.3766	.0523	.0305	.0006	.0000	-.0004
0.00	9.44	.4299	.0632	.0328	.0001	-.0002	.0007
0.00	10.47	.4623	.0752	.0338	.0008	.0002	-.0022
0.00	12.59	.5466	.1072	.0422	-.0012	.0002	-.0006
0.00	14.63	.6251	.1445	.0521	-.0004	.0002	.0040
0.00	16.70	.7238	.1951	.0671	-.0009	.0007	.0125

RUN 106

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.90	-.3344	.0736	-.0121	.0037	-.0003	-.0008
0.00	-8.93	-.2986	.0632	-.0058	.0011	-.0003	.0012
0.00	-7.88	-.2567	.0535	-.0014	.0020	-.0007	.0021
0.00	-6.83	-.2046	.0441	.0042	.0013	-.0008	.0021
0.00	-5.88	-.1839	.0392	.0044	.0011	-.0006	.0026
0.00	-4.87	-.1336	.0326	.0070	.0007	-.0006	.0037
0.00	-3.83	-.0892	.0281	.0083	.0010	-.0006	.0034
0.00	-2.82	-.0369	.0245	.0113	.0021	-.0008	.0032
0.00	-1.79	-.0108	.0223	.0120	.0007	-.0003	.0048
0.00	-.76	.0412	.0216	.0137	.0010	-.0005	.0037
0.00	.25	.0783	.0215	.0146	.0008	-.0004	.0037
0.00	1.32	.1177	.0221	.0155	.0005	-.0003	.0040
0.00	2.33	.1551	.0236	.0168	.0007	-.0003	.0033
0.00	3.34	.1962	.0262	.0182	.0012	-.0004	.0036
0.00	4.36	.2323	.0294	.0197	.0014	.0001	.0022
0.00	5.38	.2588	.0332	.0206	.0011	.0001	.0030
0.00	6.40	.2997	.0383	.0229	.0009	-.0003	.0027
0.00	7.41	.3390	.0447	.0245	.0008	-.0001	.0023
0.00	8.46	.3740	.0521	.0280	.0007	-.0000	.0030
0.00	9.48	.4044	.0605	.0311	.0005	.0000	.0033
0.00	10.45	.4423	.0700	.0357	.0001	.0002	.0028
0.00	12.50	.5176	.0981	.0453	-.0012	.0002	.0024
0.00	14.59	.6114	.1384	.0558	-.0001	.0005	.0056
0.00	16.66	.7005	.1851	.0670	-.0006	.0004	.0132

TABLE A2.- Continued

RUN 108

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
5.00	-9.89	-.3432	.0725	-.0129	.0159	-.0014	-.0309
5.00	-8.90	-.3059	.0619	-.0072	.0139	-.0014	-.0302
5.00	-7.88	-.2583	.0515	-.0016	.0111	-.0012	-.0287
5.00	-6.87	-.2123	.0427	.0022	.0091	-.0015	-.0275
5.00	-5.83	-.1696	.0363	.0037	.0080	-.0018	-.0248
5.00	-4.85	-.1293	.0307	.0062	.0058	-.0017	-.0230
5.00	-3.83	-.0881	.0269	.0082	.0048	-.0016	-.0208
5.00	-2.70	-.0425	.0229	.0096	.0032	-.0014	-.0196
5.00	-1.71	-.0004	.0204	.0107	.0019	-.0010	-.0183
5.00	-.77	.0344	.0196	.0122	.0009	-.0012	-.0180
5.00	.29	.0787	.0194	.0136	-.0013	-.0009	-.0176
5.00	1.35	.1155	.0200	.0158	-.0025	-.0004	-.0179
5.00	2.45	.1599	.0216	.0181	-.0041	.0000	-.0192
5.00	3.30	.1833	.0241	.0197	-.0049	.0001	-.0196
5.00	4.37	.2220	.0272	.0219	-.0078	-.0002	-.0187
5.00	5.42	.2607	.0316	.0232	-.0079	.0009	-.0198
5.00	6.49	.2967	.0368	.0260	-.0096	.0012	-.0213
5.00	7.42	.3331	.0427	.0279	-.0108	.0011	-.0220
5.00	8.45	.3772	.0510	.0309	-.0118	.0006	-.0206
5.00	9.55	.4181	.0618	.0338	-.0117	.0001	-.0198
5.00	10.44	.4503	.0713	.0370	-.0125	-.0007	-.0168
5.00	12.54	.5231	.0999	.0448	-.0136	-.0019	-.0126
5.00	14.61	.6186	.1420	.0597	-.0147	.0004	-.0065
5.00	16.54	.7140	.1892	.0742	-.0180	.0026	.0016

RUN 109

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
-5.00	-9.94	-.3759	.0832	-.0173	-.0135	.0014	.0290
-5.00	-8.93	-.3282	.0711	-.0111	-.0112	.0014	.0298
-5.00	-7.89	-.2820	.0600	-.0046	-.0086	.0010	.0285
-5.00	-6.83	-.2403	.0505	-.0025	-.0065	.0011	.0283
-5.00	-5.85	-.1950	.0432	.0007	-.0051	.0014	.0270
-5.00	-4.68	-.1443	.0361	.0036	-.0036	.0022	.0224
-5.00	-3.81	-.1053	.0314	.0052	-.0019	.0019	.0236
-5.00	-2.73	-.0560	.0278	.0077	-.0010	.0017	.0223
-5.00	-1.66	-.0126	.0250	.0093	.0004	.0016	.0206
-5.00	-.79	.0243	.0238	.0104	.0015	.0015	.0217
-5.00	.29	.0642	.0240	.0121	.0022	.0011	.0211
-5.00	1.29	.1110	.0244	.0150	.0036	.0008	.0206
-5.00	2.31	.1435	.0258	.0164	.0051	.0006	.0204
-5.00	3.33	.1867	.0276	.0187	.0066	.0003	.0218
-5.00	4.41	.2255	.0314	.0209	.0087	.0001	.0217
-5.00	5.34	.2558	.0346	.0228	.0096	-.0003	.0229
-5.00	6.40	.2977	.0405	.0254	.0110	-.0008	.0226
-5.00	7.45	.3320	.0467	.0278	.0121	-.0006	.0228
-5.00	8.43	.3698	.0542	.0313	.0136	-.0004	.0224
-5.00	9.41	.4081	.0633	.0341	.0136	-.0008	.0224
-5.00	10.45	.4485	.0751	.0368	.0158	-.0006	.0206
-5.00	12.79	.5329	.1079	.0455	.0156	-.0011	.0201
-5.00	14.59	.6144	.1441	.0570	.0159	-.0009	.0191
-5.00	16.67	.7092	.1949	.0708	.0186	-.0027	.0239

TABLE A2.- Continued

RUN 110

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.92	-.3626	.0786	-.0167	.0045	.0008	-.0024
0.00	-8.83	-.3216	.0668	-.0107	.0043	.0008	-.0019
0.00	-7.94	-.2881	.0584	-.0075	.0040	.0008	-.0010
0.00	-6.88	-.2373	.0484	-.0026	.0036	.0010	-.0014
0.00	-5.87	-.1862	.0408	.0007	.0033	.0011	-.0013
0.00	-4.88	-.1421	.0347	.0027	.0046	.0009	-.0018
0.00	-3.86	-.1036	.0302	.0043	.0031	.0009	.0003
0.00	-2.70	-.0542	.0260	.0072	.0032	.0009	.0005
0.00	-1.68	-.0116	.0236	.0084	.0034	.0009	-.0004
0.00	-.71	.0311	.0226	.0093	.0035	.0008	.0003
0.00	.30	.0743	.0227	.0098	.0035	.0011	.0012
0.00	1.33	.1148	.0234	.0128	.0032	.0008	-.0005
0.00	2.34	.1505	.0249	.0138	.0035	.0011	-.0002
0.00	3.28	.1922	.0276	.0158	.0040	.0011	-.0016
0.00	4.36	.2310	.0312	.0179	.0034	.0011	-.0016
0.00	5.32	.2672	.0352	.0192	.0041	.0008	-.0019
0.00	6.38	.3013	.0404	.0214	.0031	.0007	.0003
0.00	7.39	.3389	.0463	.0244	.0027	.0008	-.0002
0.00	8.45	.3719	.0542	.0253	.0033	.0007	-.0006
0.00	9.51	.4235	.0649	.0292	.0036	-.0001	.0006
0.00	10.53	.4512	.0758	.0318	.0041	-.0004	.0020
0.00	12.49	.5323	.1054	.0418	.0032	-.0008	.0017
0.00	14.63	.6209	.1467	.0504	.0024	-.0008	.0077
0.00	16.92	.7288	.2041	.0709	.0024	.0004	.0173

RUN 111

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.90	-.3629	.0776	-.0230	.0060	.0002	-.0030
0.00	-8.91	-.3171	.0665	-.0160	.0060	.0001	-.0015
0.00	-7.95	-.2716	.0568	-.0102	.0062	.0001	-.0021
0.00	-6.86	-.2245	.0472	-.0063	.0057	.0001	-.0022
0.00	-5.84	-.1805	.0400	-.0026	.0053	.0002	-.0015
0.00	-4.83	-.1460	.0348	-.0002	.0050	.0001	-.0012
0.00	-3.72	-.0955	.0294	.0035	.0031	.0001	-.0001
0.00	-2.74	-.0595	.0262	.0056	.0030	-.0000	.0008
0.00	-1.76	-.0110	.0234	.0070	.0037	-.0001	.0002
0.00	-.77	.0222	.0229	.0089	.0035	-.0001	-.0006
0.00	-.82	.0280	.0234	.0060	.0065	.0011	-.0036
0.00	.20	.0689	.0235	.0076	.0059	.0013	-.0032
0.00	1.32	.1155	.0243	.0097	.0053	.0010	-.0035
0.00	2.34	.1624	.0258	.0112	.0055	.0014	-.0039
0.00	3.49	.1964	.0291	.0128	.0051	.0013	-.0027
0.00	4.35	.2344	.0320	.0145	.0048	.0012	-.0035
0.00	5.41	.2709	.0364	.0167	.0057	.0012	-.0039
0.00	6.43	.3062	.0417	.0191	.0053	.0014	-.0041
0.00	7.39	.3417	.0466	.0215	.0050	.0012	-.0047
0.00	8.45	.3876	.0564	.0238	.0052	.0002	-.0020
0.00	9.52	.4194	.0658	.0262	.0057	-.0001	-.0021
0.00	10.45	.4562	.0768	.0308	.0049	-.0007	-.0002
0.00	12.55	.5354	.1069	.0412	.0042	-.0007	-.0002
0.00	14.66	.6310	.1505	.0508	.0046	-.0010	.0057
0.00	16.63	.7217	.1985	.0697	.0032	-.0001	.0143

TABLE A2.- Continued

RUN 112

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.96	-.3554	.0778	-.0238	.0076	.0011	-.0035
0.00	-8.75	-.3096	.0654	-.0158	.0076	.0010	-.0040
0.00	-7.90	-.2732	.0571	-.0123	.0070	.0011	-.0020
0.00	-6.93	-.2270	.0479	-.0075	.0062	.0011	-.0040
0.00	-5.91	-.1881	.0410	-.0044	.0065	.0012	-.0027
0.00	-4.76	-.1408	.0349	-.0013	.0056	.0011	-.0021
0.00	-3.80	-.0864	.0303	.0003	.0064	.0007	-.0022
0.00	-2.73	-.0453	.0270	.0024	.0070	.0007	-.0013
0.00	-1.82	-.0126	.0251	.0032	.0060	.0004	.0001
0.00	-.75	.0394	.0238	.0039	.0060	.0003	.0004
0.00	.33	.0797	.0239	.0038	.0073	.0005	-.0008
0.00	1.31	.1214	.0253	.0060	.0068	.0004	.0001
0.00	2.42	.1657	.0275	.0081	.0066	.0002	-.0011
0.00	3.33	.1958	.0298	.0101	.0070	.0005	-.0017
0.00	4.38	.2331	.0336	.0125	.0067	.0004	-.0018
0.00	5.39	.2769	.0375	.0145	.0069	.0002	-.0030
0.00	6.44	.3060	.0432	.0160	.0062	.0002	-.0003
0.00	7.42	.3437	.0489	.0184	.0058	.0001	-.0009
0.00	8.47	.3819	.0574	.0210	.0065	-.0005	-.0006
0.00	9.54	.4161	.0667	.0229	.0068	-.0009	.0005
0.00	10.48	.4610	.0788	.0283	.0073	-.0013	.0007
0.00	12.53	.5429	.1099	.0379	.0056	-.0015	.0029
0.00	14.53	.6300	.1509	.0488	.0057	-.0019	.0074
0.00	16.62	.7160	.1976	.0668	.0051	-.0007	.0148

RUN 113

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.91	-.3746	.0799	-.0129	.0046	.0012	-.0033
0.00	-8.85	-.3241	.0670	-.0043	.0044	.0009	-.0021
0.00	-7.91	-.2852	.0579	-.0004	.0031	.0011	-.0021
0.00	-6.97	-.2371	.0488	.0040	.0043	.0010	-.0029
0.00	-5.93	-.2088	.0429	.0046	.0033	.0015	-.0017
0.00	-4.84	-.1495	.0353	.0097	.0040	.0011	-.0027
0.00	-3.93	-.1178	.0314	.0109	.0030	.0012	-.0022
0.00	-2.77	-.0703	.0270	.0126	.0039	.0015	-.0030
0.00	-1.84	-.0281	.0238	.0154	.0029	.0012	-.0015
0.00	-.79	.0143	.0225	.0167	.0036	.0013	-.0018
0.00	.26	.0608	.0227	.0190	.0032	.0015	-.0008
0.00	1.29	.1020	.0229	.0200	.0036	.0015	-.0019
0.00	2.30	.1418	.0241	.0222	.0033	.0013	-.0021
0.00	3.34	.1869	.0269	.0242	.0035	.0014	-.0032
0.00	4.37	.2185	.0299	.0252	.0026	.0011	-.0022
0.00	5.43	.2526	.0339	.0272	.0033	.0015	-.0021
0.00	6.37	.2830	.0384	.0288	.0040	.0015	-.0044
0.00	7.33	.3182	.0447	.0311	.0027	.0010	-.0017
0.00	8.28	.3581	.0513	.0329	.0028	.0007	-.0019
0.00	9.51	.3995	.0623	.0356	.0031	.0004	-.0002
0.00	10.37	.4230	.0707	.0381	.0035	.0000	.0007
0.00	12.47	.5082	.1008	.0471	.0037	-.0000	-.0003
0.00	14.55	.6136	.1449	.0597	.0038	-.0003	.0067
0.00	16.63	.6930	.1901	.0747	.0037	.0012	.0134

TABLE A2.- Continued

RUN 114

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.98	-.3755	.0807	-.0108	.0046	.0013	-.0015
0.00	-8.99	-.3346	.0689	-.0046	.0051	.0010	-.0020
0.00	-7.97	-.2912	.0585	.0005	.0042	.0011	-.0024
0.00	-6.85	-.2378	.0477	.0056	.0039	.0011	-.0028
0.00	-5.76	-.1943	.0405	.0081	.0038	.0014	-.0022
0.00	-4.92	-.1596	.0357	.0109	.0042	.0010	-.0023
0.00	-3.74	-.1048	.0295	.0131	.0039	.0013	-.0023
0.00	-2.69	-.0594	.0261	.0154	.0035	.0011	-.0014
0.00	-1.73	-.0286	.0237	.0165	.0040	.0015	-.0013
0.00	-.75	.0225	.0218	.0184	.0047	.0014	-.0019
0.00	.39	.0663	.0219	.0193	.0044	.0015	-.0018
0.00	1.23	.0941	.0223	.0212	.0039	.0018	-.0017
0.00	2.39	.1427	.0240	.0227	.0044	.0017	-.0026
0.00	3.34	.1760	.0264	.0255	.0040	.0015	-.0026
0.00	4.29	.2061	.0290	.0259	.0037	.0017	-.0028
0.00	5.31	.2425	.0333	.0278	.0040	.0015	-.0023
0.00	6.44	.2871	.0385	.0304	.0038	.0013	-.0015
0.00	7.24	.3178	.0434	.0323	.0033	.0014	-.0026
0.00	8.48	.3606	.0528	.0333	.0039	.0013	-.0010
0.00	9.65	.4085	.0636	.0370	.0047	.0005	-.0004
0.00	10.42	.4382	.0726	.0404	.0039	-.0003	.0005
0.00	12.45	.5166	.1024	.0493	.0044	-.0003	.0005
0.00	14.50	.6096	.1435	.0606	.0045	.0001	.0074
0.00	16.62	.7047	.1932	.0770	.0044	.0016	.0136
0.00	16.55	.7095	.1925	.0782	.0043	.0021	.0144

RUN 115

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.92	-.3831	.0817	-.0084	.0076	.0026	-.0051
0.00	-8.97	-.3357	.0698	-.0006	.0079	.0024	-.0051
0.00	-7.90	-.2994	.0594	.0045	.0068	.0024	-.0045
0.00	-6.84	-.2508	.0499	.0081	.0067	.0025	-.0050
0.00	-5.86	-.2031	.0423	.0116	.0069	.0025	-.0052
0.00	-4.75	-.1586	.0353	.0145	.0066	.0025	-.0030
0.00	-3.76	-.1168	.0308	.0167	.0065	.0026	-.0047
0.00	-2.71	-.0724	.0272	.0187	.0066	.0027	-.0039
0.00	-1.80	-.0317	.0248	.0209	.0071	.0027	-.0043
0.00	-.83	.0071	.0231	.0223	.0074	.0026	-.0052
0.00	.29	.0460	.0227	.0225	.0072	.0030	-.0042
0.00	1.35	.0853	.0232	.0245	.0066	.0032	-.0038
0.00	2.34	.1298	.0244	.0275	.0069	.0032	-.0052
0.00	3.36	.1649	.0271	.0280	.0064	.0031	-.0047
0.00	4.31	.2149	.0296	.0314	.0063	.0025	-.0052
0.00	5.35	.2506	.0334	.0317	.0061	.0027	-.0055
0.00	6.36	.2765	.0381	.0333	.0067	.0028	-.0059
0.00	7.35	.3198	.0440	.0372	.0074	.0025	-.0066
0.00	8.41	.3511	.0516	.0371	.0058	.0022	-.0047
0.00	9.43	.3955	.0610	.0402	.0068	.0015	-.0040
0.00	10.38	.4241	.0710	.0431	.0064	.0008	-.0017
0.00	12.49	.5098	.1014	.0524	.0058	.0005	.0000
0.00	14.45	.6036	.1419	.0645	.0070	.0008	.0059
0.00	16.60	.6954	.1910	.0820	.0064	.0023	.0123

TABLE A2.- Continued

RUN 116

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-10.00	-.3758	.0808	-.0019	.0027	.0001	-.0005
0.00	-8.92	-.3216	.0676	.0054	.0025	.0003	-.0014
0.00	-7.81	-.2862	.0574	.0076	.0018	.0001	-.0016
0.00	-6.93	-.2456	.0495	.0102	.0017	.0001	-.0013
0.00	-5.74	-.1903	.0407	.0125	.0024	.0003	-.0018
0.00	-4.75	-.1428	.0342	.0149	.0016	.0003	-.0008
0.00	-3.79	-.1027	.0301	.0169	.0012	.0002	.0000
0.00	-2.88	-.0711	.0272	.0168	.0018	.0001	-.0001
0.00	-1.79	-.0212	.0236	.0180	.0013	.0003	-.0011
0.00	-.81	.0256	.0223	.0186	.0007	-.0000	.0010
0.00	.29	.0779	.0219	.0199	.0014	.0004	-.0010
0.00	1.29	.1031	.0228	.0202	.0008	.0005	-.0001
0.00	2.26	.1400	.0242	.0222	.0012	.0005	-.0009
0.00	3.28	.1850	.0267	.0238	.0009	.0005	-.0017
0.00	4.34	.2230	.0300	.0255	.0007	.0001	-.0006
0.00	5.39	.2603	.0343	.0281	.0012	-.0001	-.0001
0.00	6.30	.2907	.0388	.0293	.0012	-.0002	-.0004
0.00	7.37	.3287	.0454	.0304	.0014	.0003	.0005
0.00	8.37	.3662	.0533	.0322	.0015	.0000	-.0006
0.00	9.55	.4151	.0647	.0344	.0030	-.0007	.0008
0.00	10.45	.4404	.0744	.0365	.0011	-.0015	.0026
0.00	12.48	.5392	.1083	.0440	.0024	-.0015	.0013
0.00	14.61	.6303	.1508	.0528	.0015	-.0009	.0096
0.00	16.77	.7109	.1983	.0649	.0006	.0002	.0162

RUN 117

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
5.02	-9.90	-.3561	.0772	-.0020	.0148	.0032	-.0353
5.02	-8.92	-.3163	.0666	.0026	.0126	.0033	-.0348
5.02	-7.90	-.2768	.0562	.0053	.0111	.0032	-.0335
5.02	-6.84	-.2309	.0471	.0084	.0089	.0032	-.0318
5.02	-5.82	-.1743	.0395	.0096	.0069	.0031	-.0300
5.02	-4.86	-.1435	.0346	.0107	.0059	.0026	-.0262
5.02	-3.78	-.0942	.0292	.0116	.0036	.0029	-.0262
5.02	-2.80	-.0570	.0260	.0131	.0032	.0031	-.0246
5.02	-1.81	-.0220	.0234	.0132	.0024	.0034	-.0248
5.02	-.75	.0322	.0216	.0160	.0001	.0037	-.0229
5.02	.23	.0630	.0213	.0165	-.0004	.0038	-.0233
5.02	1.40	.1160	.0223	.0175	-.0027	.0042	-.0231
5.02	2.29	.1421	.0236	.0187	-.0046	.0043	-.0230
5.02	3.42	.1885	.0261	.0214	-.0061	.0047	-.0246
5.02	4.43	.2222	.0294	.0220	-.0070	.0045	-.0245
5.02	5.33	.2525	.0334	.0234	-.0077	.0042	-.0240
5.01	6.29	.2836	.0378	.0271	-.0084	.0045	-.0252
5.01	7.44	.3321	.0457	.0289	-.0096	.0044	-.0262
5.01	8.37	.3611	.0529	.0294	-.0109	.0035	-.0225
5.00	9.42	.4147	.0646	.0341	-.0120	.0031	-.0209
5.00	10.36	.4493	.0765	.0381	-.0126	.0028	-.0193
5.00	12.44	.5303	.1070	.0474	-.0126	.0020	-.0103
5.00	14.49	.6301	.1504	.0576	-.0138	.0039	-.0050
5.00	16.59	.7247	.2021	.0687	-.0172	.0078	.0056

TABLE A2.- Continued

RUN 118

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
-5.10	-10.00	-.3771	.0806	-.0056	-.0124	-.0031	.0361
-5.10	-8.99	-.3182	.0672	.0013	-.0093	-.0031	.0345
-5.10	-7.80	-.2802	.0565	.0038	-.0079	-.0036	.0350
-5.10	-6.80	-.2260	.0462	.0044	-.0049	-.0034	.0338
-5.10	-5.77	-.1926	.0400	.0072	-.0050	-.0028	.0312
-5.10	-4.79	-.1394	.0330	.0090	-.0025	-.0027	.0278
-5.10	-3.68	-.0961	.0283	.0102	-.0020	-.0029	.0277
-5.10	-2.68	-.0542	.0252	.0114	-.0004	-.0028	.0253
-5.10	-.71	.0239	.0217	.0132	.0015	-.0032	.0241
-5.10	.19	.0659	.0214	.0149	.0025	-.0035	.0244
-5.10	1.37	.1107	.0220	.0161	.0050	-.0034	.0233
-5.10	2.30	.1405	.0234	.0188	.0054	-.0038	.0244
-5.10	3.30	.1830	.0259	.0193	.0071	-.0036	.0233
-5.10	4.39	.2222	.0295	.0218	.0089	-.0040	.0239
-5.10	5.48	.2562	.0338	.0239	.0103	-.0046	.0248
-5.10	6.46	.3009	.0391	.0266	.0121	-.0044	.0221
-5.10	7.37	.3271	.0446	.0287	.0128	-.0046	.0230
-5.10	9.40	.4039	.0618	.0352	.0148	-.0046	.0225
-5.10	10.53	.4501	.0754	.0373	.0160	-.0046	.0211
-5.10	12.51	.5308	.1055	.0419	.0162	-.0042	.0188
-5.10	14.47	.6151	.1442	.0508	.0174	-.0038	.0167
-5.10	16.53	.7069	.1940	.0616	.0179	-.0032	.0230

RUN 119

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.87	-.2817	.0691	-.0362	.0023	.0005	-.0021
0.00	-8.93	-.2389	.0605	-.0309	.0017	.0002	-.0003
0.00	-7.90	-.1912	.0514	-.0256	.0012	-.0001	-.0018
0.00	-6.89	-.1440	.0436	-.0209	.0017	.0001	-.0007
0.00	-5.72	-.1010	.0375	-.0178	.0006	.0004	-.0009
0.00	-4.73	-.0569	.0333	-.0161	.0013	.0002	-.0015
0.00	-3.78	-.0071	.0298	-.0137	.0013	.0003	-.0013
0.00	-2.71	.0424	.0275	-.0122	.0020	.0001	-.0009
0.00	-1.68	.0811	.0268	-.0113	.0015	.0002	-.0012
0.00	-.68	.1070	.0272	-.0096	.0017	.0003	.0002
0.00	.30	.1512	.0283	-.0074	.0011	.0000	.0004
0.00	1.42	.1935	.0301	-.0054	.0010	.0006	.0004
0.00	2.38	.2294	.0326	-.0038	.0005	.0004	.0002
0.00	3.38	.2712	.0365	-.0006	.0008	.0001	.0007
0.00	4.40	.3001	.0406	.0002	.0008	.0006	.0007
0.00	5.35	.3334	.0459	.0021	.0008	.0004	.0006
0.00	6.42	.3753	.0524	.0044	.0005	.0004	.0000
0.00	7.37	.4098	.0585	.0068	.0009	.0007	.0004
0.00	8.46	.4457	.0686	.0079	.0013	-.0001	.0009
0.00	9.55	.4911	.0800	.0119	.0011	-.0013	.0008
0.00	10.52	.5196	.0919	.0151	.0007	-.0011	.0039
0.00	12.61	.6017	.1258	.0259	-.0001	-.0011	.0035
0.00	14.57	.6941	.1687	.0369	.0004	-.0014	.0083
0.00	16.69	.7764	.2195	.0548	.0003	.0001	.0185

TABLE A2.- Continued

RUN 120

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.86	-.1184	.0686	-.0776	.0012	.0005	-.0028
0.00	-8.79	-.0691	.0612	-.0736	.0015	.0002	-.0029
0.00	-7.69	-.0116	.0545	-.0688	.0007	.0005	-.0016
0.00	-6.74	.0232	.0509	-.0662	.0009	.0005	-.0030
0.00	-5.77	.0632	.0481	-.0639	.0000	.0004	-.0017
0.00	-4.69	.1186	.0459	-.0605	.0006	.0006	-.0022
0.00	-3.62	.1599	.0453	-.0587	.0016	.0002	-.0020
0.00	-2.61	.1964	.0462	-.0581	.0013	.0005	-.0012
0.00	-1.53	.2486	.0480	-.0551	-.0002	.0002	-.0024
0.00	-.59	.2786	.0507	-.0540	-.0004	.0005	-.0025
0.00	.49	.3136	.0544	-.0507	.0004	.0009	-.0030
0.00	1.46	.3547	.0580	-.0473	.0001	.0009	-.0039
0.00	2.36	.3801	.0629	-.0462	-.0004	.0006	-.0024
0.00	3.34	.4113	.0682	-.0442	-.0004	.0007	-.0025
0.00	4.47	.4480	.0756	-.0422	.0001	.0006	-.0016
0.00	5.61	.4957	.0844	-.0408	-.0004	.0003	-.0016
0.00	6.60	.5270	.0926	-.0386	-.0004	-.0000	.0002
0.00	7.47	.5621	.1020	-.0374	.0010	-.0004	-.0026
0.00	8.46	.5966	.1132	-.0338	.0004	-.0009	-.0004
0.00	9.67	.6426	.1295	-.0272	-.0004	-.0012	-.0014
0.00	10.56	.6634	.1424	-.0214	-.0012	-.0023	.0034
0.00	12.59	.7331	.1800	-.0083	-.0007	-.0014	.0028
0.00	14.70	.8084	.2249	.0044	-.0007	-.0014	.0070
0.00	16.69	.8961	.2828	.0252	-.0008	-.0011	.0195

RUN 121

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.80	-.0463	.0821	-.0958	.0011	.0004	-.0028
0.00	-8.74	-.0010	.0760	-.0916	.0010	.0002	-.0016
0.00	-7.69	.0584	.0701	-.0868	.0006	.0004	-.0037
0.00	-6.62	.0968	.0674	-.0841	.0006	.0005	-.0018
0.00	-5.67	.1422	.0649	-.0804	.0009	.0005	-.0025
0.00	-4.63	.1792	.0653	-.0783	.0011	.0004	-.0031
0.00	-3.57	.2284	.0657	-.0762	.0003	.0004	-.0028
0.00	-2.50	.2694	.0675	-.0738	.0003	.0005	-.0027
0.00	-1.60	.2948	.0704	-.0720	.0004	.0009	-.0021
0.00	-.57	.3342	.0734	-.0690	-.0002	.0009	-.0024
0.00	.44	.3692	.0776	-.0652	-.0002	.0009	-.0025
0.00	1.46	.4038	.0828	-.0619	-.0001	.0007	-.0023
0.00	2.42	.4348	.0879	-.0595	-.0001	.0004	-.0013
0.00	3.55	.4731	.0942	-.0578	.0005	.0006	-.0024
0.00	4.59	.5165	.1016	-.0552	.0006	.0003	-.0041
0.00	5.57	.5605	.1103	-.0532	.0008	-.0003	-.0037
0.00	6.64	.5933	.1214	-.0533	.0008	-.0003	-.0029
0.00	7.59	.6231	.1315	-.0510	.0006	-.0011	-.0017
0.00	8.42	.6525	.1425	-.0493	.0003	-.0011	-.0008
0.00	9.61	.6876	.1576	-.0415	-.0005	-.0013	-.0020
0.00	10.63	.7067	.1713	-.0343	.0010	-.0020	.0012
0.00	12.62	.7774	.2115	-.0173	-.0001	-.0013	.0021
0.00	14.79	.8656	.2649	-.0000	-.0006	-.0029	.0135
0.00	16.63	.9210	.3098	.0192	-.0001	-.0021	.0210

TABLE A2.- Continued

RUN 122

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.84	-.1982	.0671	-.0607	.0017	.0005	-.0025
0.00	-8.83	-.1422	.0569	-.0547	.0017	-.0000	-.0028
0.00	-7.74	-.1069	.0510	-.0518	.0015	.0001	-.0019
0.00	-6.77	-.0560	.0443	-.0475	.0010	-.0000	-.0023
0.00	-5.81	-.0162	.0408	-.0455	.0007	.0003	-.0026
0.00	-4.69	.0362	.0370	-.0423	.0009	.0004	-.0019
0.00	-3.77	.0752	.0354	-.0407	.0011	.0003	-.0012
0.00	-2.62	.1273	.0346	-.0387	.0006	.0002	-.0007
0.00	-1.61	.1734	.0352	-.0381	.0004	.0002	-.0002
0.00	-.65	.2126	.0368	-.0354	.0007	.0004	-.0018
0.00	.35	.2511	.0391	-.0329	.0002	.0003	-.0017
0.00	1.29	.2824	.0425	-.0310	.0002	.0007	-.0006
0.00	2.41	.3242	.0468	-.0285	.0005	.0005	-.0020
0.00	3.45	.3589	.0517	-.0267	.0007	.0007	-.0019
0.00	4.36	.3904	.0576	-.0254	.0005	.0008	-.0029
0.00	5.53	.4395	.0651	-.0229	.0011	.0007	-.0024
0.00	6.50	.4708	.0726	-.0219	.0008	.0004	-.0024
0.00	7.44	.5103	.0822	-.0201	.0002	-.0005	-.0018
0.00	8.55	.5452	.0932	-.0172	.0005	-.0009	.0014
0.00	9.53	.5766	.1051	-.0140	-.0005	-.0012	.0002
0.00	10.59	.6231	.1214	-.0036	.0008	-.0017	.0023
0.00	12.58	.6909	.1570	.0044	.0000	-.0014	.0023
0.00	14.56	.7664	.2001	.0187	.0010	-.0017	.0099
0.00	16.68	.8582	.2569	.0377	.0014	-.0007	.0177

RUN 123

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.77	-.2156	.0704	-.0377	.0009	-.0004	-.0027
0.00	-8.83	-.1640	.0607	-.0324	.0015	-.0002	-.0009
0.00	-7.76	-.1160	.0528	-.0311	.0011	-.0001	-.0011
0.00	-6.71	-.0750	.0469	-.0282	.0008	.0000	-.0011
0.00	-5.85	-.0303	.0425	-.0279	.0010	-.0003	.0003
0.00	-4.73	.0248	.0384	-.0247	.0014	-.0004	-.0000
0.00	-3.67	.0660	.0361	-.0240	.0012	-.0001	-.0002
0.00	-2.67	.1150	.0354	-.0232	.0008	-.0003	-.0004
0.00	-1.76	.1521	.0355	-.0226	.0006	-.0003	.0008
0.00	-.72	.1975	.0370	-.0224	.0005	.0000	-.0008
0.00	.42	.2452	.0394	-.0202	.0002	.0003	-.0019
0.00	1.45	.2745	.0432	-.0189	.0004	.0006	-.0019
0.00	2.43	.3113	.0466	-.0168	.0004	.0002	-.0014
0.00	3.37	.3382	.0511	-.0154	.0005	.0002	-.0004
0.00	4.35	.3789	.0566	-.0146	.0000	.0001	-.0007
0.00	5.42	.4193	.0634	-.0126	.0002	.0002	-.0018
0.00	6.47	.4563	.0722	-.0115	-.0001	-.0003	.0001
0.00	7.51	.4984	.0815	-.0101	.0006	-.0009	.0004
0.00	8.62	.5356	.0929	-.0067	.0007	-.0014	.0010
0.00	9.51	.5703	.1042	-.0039	-.0000	-.0017	.0009
0.00	10.50	.5964	.1172	-.0006	-.0010	-.0024	.0026
0.00	12.60	.6809	.1560	.0108	-.0009	-.0015	.0039
0.00	14.62	.7641	.2019	.0223	.0006	-.0015	.0114
0.00	16.64	.8579	.2575	.0368	.0004	.0001	.0193

TABLE A2.- Continued

RUN 124

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.67	-.1738	.0638	-.0576	.0014	.0001	-.0014
0.00	-8.84	-.1357	.0567	-.0553	.0019	.0001	-.0021
0.00	-7.87	-.0910	.0498	-.0527	.0020	.0001	-.0011
0.00	-6.86	-.0571	.0451	-.0510	.0012	.0000	-.0006
0.00	-5.81	.0009	.0400	-.0491	.0014	-.0000	-.0000
0.00	-4.68	.0563	.0364	-.0475	.0024	.0004	-.0013
0.00	-3.63	.0852	.0357	-.0464	.0009	.0002	-.0003
0.00	-2.70	.1300	.0349	-.0460	.0011	.0000	-.0012
0.00	-1.56	.1773	.0363	-.0446	.0007	-.0002	.0001
0.00	-.58	.2223	.0383	-.0436	.0006	.0003	-.0019
0.00	.42	.2565	.0408	-.0419	.0003	.0002	.0001
0.00	1.45	.2950	.0439	-.0394	.0003	.0004	-.0017
0.00	2.32	.3297	.0481	-.0378	-.0002	.0002	-.0023
0.00	3.44	.3606	.0541	-.0363	.0005	.0004	-.0022
0.00	4.49	.3960	.0598	-.0352	.0001	.0004	-.0012
0.00	5.49	.4384	.0671	-.0336	.0005	.0003	-.0040
0.00	6.52	.4727	.0757	-.0331	.0003	.0002	-.0024
0.00	7.47	.5098	.0850	-.0311	.0004	-.0009	.0004
0.00	8.59	.5480	.0969	-.0285	.0009	-.0013	.0002
0.00	9.46	.5806	.1081	-.0250	-.0002	-.0015	.0009
0.00	10.48	.6185	.1232	-.0199	.0002	-.0016	-.0011
0.00	12.55	.7002	.1620	-.0112	-.0005	-.0017	.0024
0.00	14.61	.7853	.2100	.0003	.0012	-.0013	.0092
0.00	16.73	.8812	.2691	.0147	.0005	.0009	.0180

RUN 125

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.91	-.2446	.0806	-.0019	.0014	-.0006	-.0017
0.00	-8.91	-.2009	.0713	.0005	.0012	-.0005	-.0009
0.00	-7.88	-.1478	.0617	.0032	.0015	-.0001	-.0019
0.00	-6.86	-.0989	.0545	.0047	.0016	-.0004	-.0010
0.00	-5.75	-.0619	.0497	.0054	.0004	-.0003	-.0007
0.00	-4.77	-.0099	.0451	.0071	.0007	-.0004	-.0008
0.00	-3.63	.0373	.0415	.0078	.0011	-.0005	.0001
0.00	-2.71	.0828	.0404	.0085	.0013	-.0005	-.0004
0.00	-1.70	.1237	.0405	.0090	.0008	-.0010	-.0001
0.00	-.72	.1661	.0410	.0095	.0009	-.0002	-.0024
0.00	.40	.2119	.0433	.0120	.0002	-.0001	-.0017
0.00	1.39	.2395	.0460	.0122	.0002	-.0002	-.0021
0.00	2.37	.2812	.0489	.0133	.0006	-.0001	-.0018
0.00	3.75	.3251	.0554	.0154	-.0000	-.0003	-.0011
0.00	4.48	.3574	.0592	.0161	.0002	-.0004	-.0022
0.00	5.48	.3976	.0654	.0167	-.0004	-.0003	-.0006
0.00	6.42	.4314	.0721	.0184	-.0007	-.0009	.0001
0.00	7.41	.4701	.0810	.0190	.0008	-.0010	-.0013
0.00	8.53	.5062	.0916	.0222	.0009	-.0015	-.0002
0.00	9.52	.5427	.1032	.0262	.0002	-.0019	.0004
0.00	10.51	.5853	.1182	.0335	.0001	-.0027	.0018
0.00	12.47	.6408	.1497	.0391	-.0003	-.0020	.0031
0.00	14.61	.7372	.1978	.0533	.0007	-.0019	.0116
0.00	16.58	.8272	.2500	.0657	.0005	.0014	.0167

TABLE A2.- Continued

RUN 126

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.86	-.2643	.0960	.0231	.0013	-.0003	-.0010
0.00	-8.84	-.2120	.0852	.0263	.0014	-.0006	-.0007
0.00	-7.78	-.1601	.0761	.0298	.0010	-.0007	-.0007
0.00	-6.79	-.1225	.0695	.0328	.0009	-.0003	-.0000
0.00	-5.89	-.0821	.0645	.0337	.0006	-.0006	-.0009
0.00	-4.69	-.0244	.0582	.0358	.0011	-.0004	-.0006
0.00	-3.77	.0085	.0559	.0355	.0008	-.0003	.0005
0.00	-2.70	.0537	.0540	.0362	.0006	-.0006	.0014
0.00	-1.64	.1066	.0528	.0373	.0011	-.0006	-.0005
0.00	-.67	.1408	.0541	.0381	-.0003	-.0004	.0010
0.00	.34	.1911	.0545	.0402	.0011	.0003	-.0027
0.00	1.27	.2059	.0569	.0407	-.0003	-.0003	-.0008
0.00	2.39	.2632	.0595	.0423	.0004	.0001	-.0029
0.00	3.28	.2821	.0631	.0432	.0000	-.0002	-.0002
0.00	4.54	.3341	.0686	.0442	-.0006	-.0002	.0003
0.00	5.39	.3625	.0734	.0438	-.0001	-.0001	-.0005
0.00	6.41	.4015	.0799	.0457	-.0009	.0000	-.0019
0.00	7.45	.4367	.0875	.0471	.0001	-.0001	-.0010
0.00	8.51	.4811	.0980	.0491	.0011	-.0005	-.0001
0.00	9.46	.5099	.1080	.0519	.0004	-.0012	.0026
0.00	10.58	.5487	.1220	.0577	.0008	-.0009	.0001
0.00	12.52	.6154	.1536	.0680	-.0009	-.0013	.0013
0.00	14.64	.7092	.1981	.0810	-.0009	-.0008	.0048
0.00	16.68	.7853	.2472	.0887	.0001	-.0005	.0153

RUN 127

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.72	-.1233	.1120	-.0100	.0011	-.0002	-.0022
0.00	-8.79	-.0753	.1047	-.0064	.0010	-.0006	-.0021
0.00	-7.72	-.0229	.0981	-.0036	.0002	-.0006	-.0011
0.00	-6.84	.0207	.0931	-.0003	.0003	-.0006	-.0022
0.00	-5.70	.0643	.0901	.0012	.0006	-.0005	-.0020
0.00	-4.62	.1150	.0878	.0036	.0009	-.0009	-.0001
0.00	-3.66	.1470	.0874	.0039	.0009	-.0004	-.0002
0.00	-2.65	.1803	.0877	.0061	.0002	-.0004	.0004
0.00	-1.67	.2277	.0885	.0089	-.0001	-.0003	-.0018
0.00	-.69	.2554	.0906	.0101	-.0004	.0001	-.0018
0.00	.42	.3007	.0940	.0130	-.0009	-.0001	-.0020
0.00	1.48	.3384	.0969	.0155	-.0005	.0005	-.0033
0.00	2.44	.3751	.1015	.0175	-.0006	-.0001	-.0028
0.00	3.37	.4046	.1060	.0180	.0001	-.0002	-.0024
0.00	5.52	.4778	.1207	.0189	-.0001	-.0005	-.0007
0.00	6.72	.5223	.1306	.0192	-.0003	-.0010	-.0012
0.00	7.61	.5560	.1385	.0206	.0006	-.0016	.0000
0.00	8.50	.5909	.1494	.0230	-.0009	-.0023	.0016
0.00	9.66	.6156	.1633	.0287	-.0004	-.0022	.0008
0.00	10.58	.6446	.1757	.0392	.0005	-.0024	.0028
0.00	12.67	.7060	.2119	.0544	-.0002	-.0021	.0030
0.00	14.56	.7630	.2477	.0670	-.0020	-.0012	.0056
0.00	16.60	.8419	.2987	.0826	-.0008	-.0004	.0162

TABLE A2.- Continued

RUN 128

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.77	-.1102	.0975	-.0297	.0009	-.0002	-.0017
0.00	-8.74	-.0561	.0895	-.0264	.0005	-.0007	-.0012
0.00	-7.75	.0008	.0835	-.0238	.0006	-.0004	-.0023
0.00	-6.67	.0302	.0800	-.0228	-.0007	.0002	-.0003
0.00	-5.70	.0874	.0763	-.0187	-.0002	-.0003	-.0022
0.00	-4.70	.1259	.0754	-.0174	-.0002	-.0003	-.0005
0.00	-3.73	.1729	.0742	-.0171	-.0004	-.0004	-.0020
0.00	-2.65	.2045	.0758	-.0169	.0000	.0000	-.0010
0.00	-1.62	.2425	.0772	-.0158	-.0006	.0002	-.0016
0.00	-.58	.2797	.0798	-.0146	-.0016	.0004	-.0013
0.00	.46	.3305	.0828	-.0113	-.0010	.0003	-.0024
0.00	1.50	.3583	.0868	-.0099	-.0021	-.0002	-.0001
0.00	2.53	.4029	.0913	-.0076	-.0013	.0000	-.0013
0.00	3.47	.4250	.0967	-.0076	-.0009	.0001	-.0014
0.00	4.46	.4640	.1031	-.0070	-.0004	.0001	-.0026
0.00	5.55	.5038	.1113	-.0068	-.0014	-.0000	-.0016
0.00	6.54	.5371	.1193	-.0061	-.0007	-.0006	.0002
0.00	7.56	.5805	.1294	-.0051	.0004	-.0006	-.0015
0.00	8.58	.6153	.1418	-.0031	-.0004	-.0010	.0001
0.00	9.63	.6416	.1535	.0021	-.0003	-.0021	.0025
0.00	10.65	.6662	.1671	.0110	.0012	-.0017	.0018
0.00	12.67	.7316	.2042	.0245	-.0001	-.0009	.0008
0.00	14.76	.7925	.2443	.0377	-.0020	-.0002	.0035
0.00	16.74	.8745	.2948	.0487	-.0010	-.0002	.0095

RUN 129

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.79	-.0566	.0850	-.0956	.0003	.0007	-.0043
0.00	-8.84	-.0043	.0782	-.0905	.0005	.0003	-.0035
0.00	-7.80	.0452	.0733	-.0883	.0003	.0001	-.0026
0.00	-6.72	.0902	.0703	-.0845	-.0002	-.0000	-.0032
0.00	-5.63	.1371	.0680	-.0816	.0000	.0001	-.0035
0.00	-4.64	.1872	.0677	-.0797	.0000	.0003	-.0029
0.00	-3.61	.2243	.0688	-.0786	.0001	.0004	-.0027
0.00	-2.61	.2640	.0704	-.0764	.0000	.0003	-.0026
0.00	-1.60	.3069	.0725	-.0750	-.0003	.0006	-.0025
0.00	-.52	.3534	.0760	-.0722	-.0009	.0006	-.0031
0.00	.42	.3792	.0805	-.0707	-.0013	.0005	-.0016
0.00	1.64	.4268	.0869	-.0674	-.0006	.0006	-.0019
0.00	2.61	.4508	.0919	-.0654	-.0004	.0004	-.0012
0.00	3.51	.4881	.0972	-.0633	-.0003	.0006	-.0036
0.00	4.43	.5248	.1041	-.0631	-.0006	.0001	-.0028
0.00	5.48	.5598	.1141	-.0621	-.0011	.0001	-.0022
0.00	6.54	.6008	.1231	-.0601	.0002	-.0004	-.0028
0.00	7.69	.6236	.1328	-.0573	-.0003	-.0010	-.0005
0.00	8.56	.6516	.1438	-.0556	-.0002	-.0013	-.0012
0.00	9.55	.6781	.1565	-.0517	-.0002	-.0014	.0005
0.00	10.68	.7065	.1724	-.0421	.0007	-.0016	-.0007
0.00	12.77	.7764	.2138	-.0301	-.0004	-.0005	-.0023
0.00	14.61	.8298	.2507	-.0190	-.0026	-.0004	.0015
0.00	16.97	.9210	.3135	-.0022	-.0016	.0007	.0121

TABLE A2.- Concluded

RUN 130

BETA	ALPHA	CL	CD	CPM	CRM	CYM	CSF
0.00	-9.78	-.0793	.0882	-.0643	-.0009	-.0002	.0003
0.00	-8.77	-.0299	.0786	-.0592	.0008	.0003	-.0022
0.00	-7.78	.0169	.0737	-.0564	-.0001	-.0002	-.0005
0.00	-6.66	.0611	.0700	-.0551	-.0000	-.0001	-.0024
0.00	-5.65	.1101	.0671	-.0521	-.0004	.0002	-.0014
0.00	-4.65	.1594	.0665	-.0503	.0007	.0001	-.0022
0.00	-3.64	.1947	.0666	-.0502	-.0000	.0001	-.0011
0.00	-2.57	.2346	.0679	-.0484	-.0010	.0002	-.0003
0.00	-1.59	.2793	.0696	-.0465	-.0006	.0003	-.0019
0.00	-.50	.3185	.0735	-.0451	-.0013	.0007	-.0024
0.00	.44	.3498	.0766	-.0430	-.0011	.0004	-.0017
0.00	1.41	.3794	.0812	-.0413	-.0008	.0005	-.0012
0.00	2.42	.4212	.0858	-.0391	.0001	.0005	-.0038
0.00	3.57	.4498	.0932	-.0379	-.0011	.0002	-.0020
0.00	4.49	.4948	.1001	-.0379	-.0008	.0001	-.0022
0.00	5.65	.5372	.1092	-.0367	-.0008	-.0002	-.0027
0.00	6.69	.5720	.1186	-.0366	.0005	-.0001	-.0040
0.00	7.54	.6009	.1274	-.0349	.0004	-.0008	-.0021
0.00	8.56	.6340	.1401	-.0326	-.0000	-.0015	.0019
0.00	9.57	.6659	.1539	-.0290	-.0007	-.0012	-.0004
0.00	10.58	.6981	.1684	-.0197	.0005	-.0017	.0004
0.00	12.64	.7658	.2079	-.0066	-.0005	-.0004	-.0010
0.00	14.61	.8213	.2462	.0063	-.0024	-.0007	.0035
0.00	16.68	.9002	.2992	.0186	-.0014	.0001	.0107

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16. Abstract

An experimental investigation has been conducted to determine the effects of wing leading-edge deflection on the low-speed aerodynamic characteristics of a low-aspect-ratio highly swept arrow-wing configuration. Static force tests were conducted in the Langley V/STOL tunnel at a Reynolds number (based on the mean aerodynamic chord) of about 2.0×10^6 for an angle-of-attack range from about -10° to 17° and angles of sideslip of 0 and $\pm 5^\circ$. Limited flow visualization studies were also conducted in order to provide a qualitative assessment of leading-edge upwash characteristics.

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