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RESEARCH MEMORANDUM

EFFECTS OF WING SWEEP, HORIZONTAL-TAIL CONFIGURATION, AND A VENTRAL FIN ON STATIC STABILITY CHARACTERISTICS OF A MODEL WITH A WING OF ASPECT RATIO 3 AT MACH NUMBERS FROM 2.29 TO 4.65

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RESEARCH MEMORANDUM

EFFECTS OF WING SWEEP, HORIZONTAL-TAIL CONFIGURATION, AND A VENTRAL FIN ON STATIC STABILITY CHARACTERISTICS OF A MODEL WITH A WING OF ASPECT RATIO 3 AT MACH NUMBERS FROM 2.29 TO 4.65 *

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SUMMARY

An investigation was made in the high Mach number test section of the Langley Unitary Plan wind tunnel to determine the effects on the static longitudinal and lateral stability characteristics of a model with a wing of aspect ratio 3 of sweep from 28.8° to 45°, horizontal-tail height and dihedral, and a ventral fin. The tests were made over an angle-of-attack range of -4° to 20° at a Reynolds number of about 2.1×10^6 at Mach numbers of 2.29, 2.98, 3.96, and 4.65. The results of the investigation have indicated that configurations with the horizontal tail on the fuselage center line generally had more uniform variations of the pitching moment at zero lift and static longitudinal stability with Mach number than the T-tail configurations. Configurations with a T-tail had greater stability at high Mach numbers and experienced erratic changes in the variation with Mach number of the pitching moment at zero lift and in the static-longitudinal stability. Configurations employing the 45° swept wing had greater static longitudinal stability than those with a 28.8° swept wing. When sideslipped over a large range, at a given angle of attack, configurations with a T-tail had a tendency to pitch down and configurations with the horizontal tail on the fuselage center line had a tendency to pitch up. At the lower Mach numbers, T-tail configurations had slightly greater directional stability at low angles of attack than configurations with low tails whereas at the higher Mach numbers there was essentially no effect of tail changes or of a change in wing sweep from 28.8° to 45°. All complete models incorporating a ventral fin with a wedge airfoil section were directionally stable for the angle-of-attack range investigated at all Mach numbers. The directional stability decreased with increasing angle of attack at the lowest Mach number and at a given low angle of attack the directional stability decreased with an increase in Mach number. There were increases in directional stability at the high angles of attack at the highest Mach numbers due to the effects of the wing

*Title, Unclassified.

compression field on the ventral fin and a decrease in the unstable contribution of the wing-fuselage combination.

The experimental variation with Mach number of lift-curve and pitching-moment slope and the directional stability and effective dihedral parameter could generally be predicted with good accuracy at approximately zero angle of attack by theoretical methods.

INTRODUCTION

There is a general lack of information of a systematic nature in the high supersonic speed range (Mach numbers to about 5) concerning the effects of such design variables as wing sweep and horizontal-tail position on the static longitudinal and lateral stability of airplane configurations.

The Langley Unitary Plan wind tunnel (ref. 1) was designed to enable continuous testing of relatively large models, at a constant Reynolds number, over a Mach number range of 2.29 to 4.65 and is particularly well suited for systematic test programs.

The present investigation was made to determine, over an angle-of-attack range of -4° to 20°, the effects of various geometric model changes on the static longitudinal and lateral stability characteristics of a model with a wing of aspect ratio 3 at Mach numbers from 2.29 to 4.65. Investigated at a Reynolds number of about 2.1×10^{6}, based on the wing mean aerodynamic chord, were the effects of a change in wing sweep from 28.8° to 45°, a change in the horizontal-tail position from the fuselage center line to the top of the vertical tail, a change from 0° to -15° in the dihedral of the horizontal tail on the fuselage center line, and the addition of a ventral fin. The 28.8° swept wing was selected for the investigation since it had generally satisfactory static longitudinal stability characteristics at high subsonic speeds (ref. 2). In addition, some of the experimental data are compared with estimates made by use of various available methods.

SYMBOLS AND COEFFICIENTS

The data presented herein are referred to a moment center located at 0.26 mean aerodynamic chord of the wings, this point being located at 0.57 fuselage length from the nose and on the fuselage center line. The forces and moments are oriented as shown in figure 1. The symbols and coefficients are defined as follows:

A	aspect ratio, b^2/S
b	span, ft
c	chord parallel to plane of symmetry, ft
$\bar{c}$	mean aerodynamic chord, $\frac{2}{S}\int_0^{b/2} c^2 dy$, ft
l	effective tail length from moment center to center of pressure of tail, measured parallel to fuselage center line, ft
M	free-stream Mach number
p	free-stream static pressure, psf
q	free-stream dynamic pressure, $0.7pM^2$, psf
S	area, sq ft
y	spanwise distance measured from and perpendicular to the plane of symmetry, ft
z	effective tail height from fuselage center line, ft
α	angle of attack of fuselage center line, $\tan^{-1}\frac{\text{Velocity component along Z-axis}}{\text{Velocity component along X-axis}}$, deg
α_0	angle of attack for zero lift, deg
β	angle of sideslip, $\sin^{-1}\frac{\text{Velocity component along Y-axis}}{V}$, deg
V	free-stream velocity, fps
i_t	horizontal-tail incidence (-4° for all tests)
C_L	lift coefficient, $\frac{\text{Lift}}{qS_w}$
C_m	pitching-moment coefficient, $\frac{\text{Pitching moment}}{qS_w\bar{c}_w}$

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

C_l rolling-moment coefficient, $\frac{\text{Rolling moment}}{qS_w b_w}$

C_n yawing-moment coefficient, $\frac{\text{Yawing moment}}{qS_w b_w}$

$C_{L_{max}}$ maximum lift coefficient

C_{m_0} pitching moment at zero lift

$$C_{L_\alpha} = \left(\frac{\partial C_L}{\partial \alpha}\right)_{\alpha \approx 0}$$

$$C_{m_\alpha} = \left(\frac{\partial C_m}{\partial \alpha}\right)_{\alpha \approx 0}$$

$$C_{m_{C_L}} = \left(\frac{\partial C_m}{\partial C_L}\right)_{C_L \approx 0}$$

$C_{Y_\beta} = \frac{\text{Increment in } C_Y}{\text{Increment in } \beta}$, where the increment in β is approximately 5°

$C_{n_\beta} = \frac{\text{Increment in } C_n}{\text{Increment in } \beta}$, where the increment in β is approximately 5°

$C_{l_\beta} = \frac{\text{Increment in } C_l}{\text{Increment in } \beta}$, where the increment in β is approximately 5°

Subscripts:

h horizontal tail

w wing

V vertical tail

v ventral fin

The prefix Δ denotes the contribution of the tail assembly VH or VHv to a given coefficient or derivative.

Model component designations:

W^1	28.8° swept wing
W^2	45° swept wing
F	fuselage
V	vertical tail
H^1	horizontal tail at top vertical tail, no dihedral
H^2	horizontal tail on fuselage center line, no dihedral
H^3	horizontal tail on fuselage center line, -15° dihedral
v	ventral fin

APPARATUS AND MODEL

The present investigation was conducted in the high Mach number test section of the Langley Unitary Plan wind tunnel (ref. 1). This test section is 4 feet square and is approximately 7 feet in length. With the tunnel operating, the adjustment of an asymmetric nozzle and a second minimum section permits a variation of any desired increment in Mach number throughout the entire speed range of $M = 2.29$ to 4.65. Both stagnation temperature and stagnation pressure can be controlled independently.

The forces and moments on the model were measured by means of a six-component strain-gage balance enclosed within the model. For the present investigation, the model was oriented in the test section with the wings horizontal. The angles of attack and sideslip of the model were remotely controlled. A description of an angle-of-attack positioning apparatus similar to that used in the present investigation is given in reference 1.

Details of the model, including photographs of some configurations, are shown in figure 2. Additional details are given in table I. The fuselage was constructed around a hollow steel frame which had a square cross section with 1/4-inch walls. This frame extended from the fuselage base to the tangent point of the nose. The stainless-steel wing and tail panels and the duralumin ventral fin were attached to the steel

frame and fiber-glass-covered mahogany was used to finish the fuselage contour. The two interchangeable wings used with the model differed only in the angle of sweepback of the quarter-chord line, one wing having 28.8° sweepback and the other having 45° sweepback.

TESTS

Twelve model configurations were investigated to determine the effects of wing sweep, horizontal-tail configuration and a ventral fin on the stability characteristics of the model. These model configurations are indicated as follows:

Wing sweep, deg	Model configuration	Horizontal tail
28.8	$W^1FVH^1{}_v$	Tee
	$W^1FVH^2{}_v$	Low, 0° dihedral
	W^1FVH^2	Low, 0° dihedral
	$W^1FVH^3{}_v$	Low, -15° dihedral
	W^1F	Tail off
45	$W^2FVH^1{}_v$	Tee
	$W^2FVH^2{}_v$	Low, 0° dihedral
	$W^2FVH^3{}_v$	Low, -15° dihedral
	W^2F	Tail off
Wings off	$FVH^2{}_v$	Low, 0° dihedral
	FVH^2	Low, 0° dihedral
	F	Tail off

The various model configurations were tested through an angle-of-attack range of -4° to 20° at sideslip angles of 0° and 5° (for obtaining derivatives), and at angles of attack of 0°, 8°, and 16° through a sideslip range of about -4° to 20°. Measurements with respect to the body axes were made of the normal force, axial force, side force, yawing moment, pitching moment, rolling moment, and the pressure on the base. The data were reduced to coefficient form about the axes indicated in figure 1.

The test conditions were as follows:

Mach number	Stagnation conditions		Average dynamic pressure, lb/sq ft	Average Reynolds number (based on wing $\bar{c}$)
	Temperature, °F	Pressure, lb/sq in. abs		
2.29	150	16.2	696	2.1×10^6
2.98	150	23.3	587	2.1
3.96	175	41.5	453	2.1
4.65	175	60.5	375	2.2

The dewpoint was maintained below -30° F for all tests.

ACCURACY AND CORRECTIONS

Accuracy

The estimated accuracy of individual coefficients, angles, and derivatives is as follows:

C_L . . . . . ±0.004
C_m . . . . . ±0.002
C_l . . . . . ±0.001
C_n . . . . . ±0.001
C_Y . . . . . ±0.005
$\alpha - \alpha_0$, deg . . . . . ±0.1
β, deg . . . . . ±0.1
C_{Y_β} . . . . . ±0.0010
C_{n_β} . . . . . ±0.0002
C_{l_β} . . . . . ±0.0002

Corrections

A calibration of the flow in the test section has indicated that the longitudinal pressure gradients experienced by the model are negligible. The calibration also indicated that flow angularity is present in the test section. A correction for flow angularity, which is in the direction to increase the model angle of attack, has not been included

in the data presented herein and, consequently, the drag data have been deleted. The effects of flow misalinement will be discussed subsequently.

The maximum deviation of local Mach number in the part of the tunnel occupied by the model was ±0.015 for these tests. The angles of attack and sideslip have been corrected for the deflection of the support system under load.

Aeroelastic Considerations

A given wing may bend under load and thereby cause, effectively, a change in geometric dihedral and a corresponding change in the effective dihedral parameter C_{l_β}. In order to determine the significance of wing bending on C_{l_β} for the present wings, each wing was loaded statically at four spanwise locations to approximate the spanwise loading as determined from reference 3 for each Mach number. The deflection of each wing was measured at several spanwise stations and was converted to an equivalent dihedral angle. The method of reference 4 was then adapted to the supersonic case to determine the value of $\frac{\partial C_{l_\beta}}{\partial C_L}$ for the two test wings. It was found that the change in $\frac{\partial C_{l_\beta}}{\partial C_L}$ due to bending was well within the experimental accuracy of the data and therefore no corrections have been applied to the data.

RESULTS AND DISCUSSION

Inasmuch as there are a large number of model configurations, the discussion will be concerned primarily with the effects of Mach number, wing sweep, horizontal-tail configuration, and a ventral fin on the characteristics of the complete model with reference, where necessary, to tail and wing-fuselage combination contributions. The discussion has been divided into two parts, the first being concerned with the static longitudinal characteristics, and the second being concerned with the static lateral and directional characteristics.

Data concerned with the static longitudinal characteristics are presented in figures 3 to 22 and data dealing with the lateral-directional characteristics, are presented in figures 23 through 33. The basic pitch data are presented in figures 9 to 20. Data obtained in tests of the various model configurations through the sideslip range are tabulated in table II inasmuch as only plots of C_m and C_n against sideslip angle are presented in the figures. An index to the figures is presented as table III.

Static-Longitudinal Stability Characteristics

The data for the symmetrical model configurations W^1F (fig. 13) and W^2F (fig. 17) indicate that some misalinement exists in the angle of attack, especially at the two highest Mach numbers. The amount of misalinement is shown in the plots of α_0 against Mach number in figure 3. The known flow angularity is such that the application of a correction would further increase the already positive values of α_0. It is believed that the error in angle of attack may be the result of some malfunction in the angle-indicating system during these tests and/or that some interference on the lifting surfaces was caused by shock waves emanating from surface or juncture irregularities in the fiber-glass skin of the fuselage.

No corrections have been applied to account for the α_0 discrepancies. As a result of the discrepancies all drag data have been omitted from this paper. It is believed, however, that the usefulness of the stability data is not significantly altered by the discrepancy in α_0.

Lift.- As would be expected, for all complete model configurations (fig. 3), the values of C_{L_α} decrease with an increase in Mach number from 2.29 to 4.65. A similar trend has been shown in reference 5 for a slightly different model with a wing of aspect ratio 3.

There is, in general, little effect of changes in horizontal-tail dihedral or wing sweep on the lift characteristics of the model (fig. 3). The data of figures 9 to 20 indicate that, as would be expected, the maximum lift coefficient was not reached for any configuration tested for the angle-of-attack range (maximum $\alpha = 21^\circ$) of the investigation.

Static longitudinal stability.- For either wing sweep (fig. 3), an increase in Mach number causes a forward shift $\left(C_{m_{C_L}}\right.$ becomes less negative$\left.\right)$ in the aerodynamic-center position for configurations with the horizontal tail on the fuselage center line. T-tail configurations, however, have greater stability than low-tail configurations and experience a more erratic variation in aerodynamic-center position with Mach number, as indicated by the erratic variation of $C_{m_{C_L}}$ in figure 3. These data also indicate little effect of tail dihedral on the values of $C_{m_{C_L}}$. In general, the most negative values of $C_{m_{C_L}}$ occur for the 45° swept-wing configurations.

Also shown in figure 3 is the variation of C_{m_0} with Mach number. An error in C_{m_0}, possibly related to the error in α_0, exists at the

two highest Mach numbers since the expected value of zero was not measured for the symmetrical wing-fuselage combinations. The low-tail configurations experience a smaller, less erratic, variation of C_{m_0} with Mach number than the T-tail configurations. More positive values of C_{m_0} occur for the T-tail configurations than the low-tail configurations and may be attributed to vertical gradients in dynamic pressure at the horizontal-tail position (ref. 6), to a longer tail length (about $0.17\bar{c}_w$) for the T-tail configurations, and to the moment contributed by the drag of the horizontal tail. Similar variations in C_{m_0} due to changes in horizontal-tail position have been indicated at high subsonic speeds (ref. 2) and at Mach numbers of 1.41 and 2.01 (ref. 7). (All data herein were obtained at $i_t = -4^\circ$ and different variations in C_{m_0} and $C_{m_{C_L}}$ may occur for other values of i_t.)

The large variations of $C_{m_{C_L}}$ and C_{m_0} that occur with Mach number for the T-tail configuration may be attributed to the effects of the vertical dynamic-pressure gradient at the tail, wing-flow-field effects, and, at certain Mach numbers, to the interference of shock waves from the wing leading edge with the horizontal tail, as can be seen in figures 21 and 22, which present schlieren photographs of several model configurations. (Most of the photographs are for $\beta = 0^\circ$ but in some cases it was necessary to use those for $\beta \approx 5^\circ$ and this is noted.) Figures 21 and 22 indicate that shock waves from the inboard leading edge of the wing (at $M = 2.98$) pass below the horizontal tail of the T-tail at negative angles of attack and that, as the angle of attack is changed positively, the tail moves through the shock wave. Thus, an effective increase occurs in the angle of attack of the tail and in the dynamic pressure at the tail and these effects cause changes in stability. (See figs. 3 to 5, 9, and 14.) Because a smaller shock-wave angle exists at the higher Mach numbers, the interference occurs at higher angles of attack.

There is little effect of the wings on the tail contribution (for a low tail) to ΔC_m (fig. 5). Therefore, the wing, because the center of pressure is rearward of the moment center, contributes large negative increases in C_m at moderate and high angles of attack (fig. 4) when added to the fuselage-tail combination. Also shown in figure 4 are regions of neutral or approximately neutral stability that occur for the fuselage-tail configurations. The ventral fin (fig. 6) produced a negative increment in ΔC_m (as a result of the drag of the ventral fin) for all Mach numbers with or without the 28.8° swept wing.

Inasmuch as the previous discussion of longitudinal stability has been concerned with zero sideslip, figure 7 has been prepared to show

the effects of sideslip on the pitching-moment coefficient of the various model configurations at three nominal angles of attack. The corrected angles for a given configuration may be obtained from table II.

The data of figure 7 indicate that, when sideslipped, those configurations with a T-tail tend to pitch down and those with the horizontal tail on the center line of the fuselage tend to pitch up. These effects have also occurred at high subsonic speeds (ref. 8). These trends result from the different types of loadings induced on the horizontal tail by the vertical tail, a difference in effective sweep between advancing and retreating horizontal-tail panels, and the effect of the dynamic-pressure variation with sideslip on the tail loadings (ref. 9). The magnitude of the change of C_m with β varies somewhat with angle of attack. By using a horizontal-tail effectiveness at $\alpha = 0^\circ$ estimated, for each Mach number, from reference 10 it would appear that, for the T-tail with the 28.8° swept-wing model, the increment in C_m produced by sideslipping from 0° to 16° is equivalent to that produced by about 5° incidence of the horizontal tail at $M = 2.29$ and by about 11° incidence at $M = 4.65$. For the low horizontal tail without dihedral and corresponding conditions, tail incidences of about -1° and -2° would be required to trim out the increment in C_m due to 16° of sideslip. It would appear that somewhat similar conclusions could be drawn for the 45° swept-wing configurations. It is also of interest to note that the tail contribution to C_m for the T-tail configurations may be doubled when the sideslip angle is changed from 0° to 16° (see fig. 7(c)).

Comparison of experimental and estimated characteristics.- The method of reference 10 was used to estimate the variation of C_{L_α} and C_{m_α} ($\alpha = 0^\circ$) with Mach number for various model configurations. In this method it was necessary to obtain the lift-curve slope of the isolated wing and tail (exposed surfaces) and these were obtained from reference 11. The estimated values of C_{L_α} and C_{m_α} are compared with experimental values for various configurations in figure 8. The estimated variation of C_{L_α} and C_{m_α} with Mach number is about the same as the experimental variation although the estimated values at a given Mach number are generally lower than the experimental values. Slightly better agreement between estimated and experimental values of C_{L_α} and C_{m_α} is obtained for the 28.8° swept-wing configurations than for the 45° swept-wing configurations. This would be expected to some degree on the basis of some of the limitations (no trailing-edge sweep) of the method as indicated in reference 10.

Lateral Directional Stability Characteristics

In figures 23 through 25, the lateral stability derivatives obtained from data at 0° and 5° sideslip angles are indicated by lines and the slopes measured from data obtained through the sideslip range at three angles of attack are indicated by symbols.

Directional.- At $M = 2.29$ the directional stability for all complete model configurations decreases with an increase in angle of attack (figs. 23 and 24). As the Mach number is increased, the value of C_{n_β} at $\alpha = 0^{\circ}$ decreases and the rate of decrease of C_{n_β} with α becomes smaller until finally at some moderate angle of attack C_{n_β} increases with a further increase in angle of attack. At the highest test Mach number, C_{n_β} is about constant up to $\alpha = 8^{\circ}$, after which it increases to a value at $\alpha = 21^{\circ}$ that is almost double that at $\alpha = 0^{\circ}$ (figs. 23 and 24) but is still lower than the value of C_{n_β} at $\alpha = 0^{\circ}$ at $M = 2.29$. The increase in C_{n_β} at the moderate and high angles of attack is the result of an increase in the effectiveness of the ventral fin with increasing angle of attack (the ventral fin is immersed in the compression field of the wing where a higher dynamic pressure exists (ref. 12)) and a decrease in the unstable contribution of wing-fuselage combination (figs. 23 and 24).

With or without the 28.8° swept wing (figs. 23 and 25) the contribution of the ventral fin to C_{n_β} generally decreases at low angles of attack with an increase in Mach number. At the higher Mach numbers, however, there is a tendency for the effectiveness of the ventral fin to be increased with an increase in angle of attack and C_{n_β} increases accordingly. At Mach numbers higher than those of the present investigation it would be expected that greater effectiveness of the ventral fin in producing directional stability may be expected as a result of an increase in the lift effectiveness of the wedge airfoils with increasing Mach number (ref. 13).

Without the ventral fin (fig. 23) the directional stability of the model with the 28.8° swept wing decreases rapidly with an increase in angle of attack; thus, the model becomes unstable at relatively low angles of attack.

For either wing sweep, changes in horizontal-tail configuration have little effect on the directional stability of the complete model (figs. 23 and 24) or in the tail contribution to C_{n_β} (figs. 26 and 28). The T-tail configurations have slightly greater stability at low angles of attack than configurations with the low tails at the lower Mach

numbers. It is also shown in figures 26 to 28 that, at the two lower Mach numbers, the addition of either wing causes a decrease in ΔC_{n_β} at low angles of attack and an increase in ΔC_{n_β} at high angles of attack whereas at the two higher Mach numbers ΔC_{n_β} is increased by the addition of either wing for the entire positive angle-of-attack range. This, as previously noted, is the result of the effect of the wing on the ventral fin. All data were obtained with $i_t = -4^\circ$ and for other values of i_t the horizontal tail may cause different effects on directional stability. This was noted, at $M = 2.01$, in reference 14 where a given amount of tail incidence produced opposite effects on C_{n_β} for low and high horizontal-tail configurations. It would appear to be advisable, therefore, to investigate completely the effects of horizontal-tail incidence on the directional stability of a specific airplane model.

A comparison of the data of figure 23 with 24 and figure 26 with 28 indicates very little effect of a change in wing sweep from 28.8° to 45° on the directional stability of the complete model or on the tail contribution to directional stability.

Lateral.- The effective-dihedral parameter (figs. 23 and 24) is generally more negative at a given angle of attack for T-tail configurations than for configurations with the horizontal tail on the center line. This effect of the T-tail on C_{l_β} has also occurred at high subsonic speeds (ref. 8) and is related to the induced loadings previously discussed with the variation of C_m with β. The addition of -15° dihedral or a change in wing sweep have little effect on C_{l_β} (figs. 23 and 24) or ΔC_{l_β} (figs. 26 and 28). The addition of the ventral fin, as would be expected, makes C_{l_β} less negative with the wing on (fig. 23) or off (fig. 25).

Effective center of pressure.- The tail-increment data of figures 26 to 28 were used to determine the vertical (z/b_w) and longitudinal (l/b_w) locations of the effective center of pressure of the tail assembly and these data are presented in figures 29 to 31. As would be expected, there is little effect of horizontal-tail configuration on the vertical and longitudinal location of the effective center of pressure of the tail, although the T-tail configurations have a slightly higher and more rearward center of pressure for all Mach numbers. With the wing off or on and the ventral fin off, the location of the effective center of pressure at $\alpha = 0^\circ$ is lower and more rearward than the geometric center of pressure of the vertical tail alone at all Mach numbers (fig. 30) probably as a result of the end-plate effect of the fuselage.

Comparison of estimated and experimental characteristics.- In the estimation of the derivatives ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} $(\alpha = 0^\circ)$ of the tail assembly (including vertical tail, low horizontal tail without dihedral, and ventral fin), it was necessary to obtain the derivatives of the isolated tail with reference to the moment center of the model and to account for the interference of the fuselage on the tail. (For the case of fuselage-tail derivatives, it was also necessary to account for the interference of the tail on the fuselage.)

The derivatives of the exposed isolated vertical tail, with respect to the model moment center, were obtained from reference 15 and the effect of the wedge airfoil on the lift-curve slope of the ventral fin was determined from reference 13. The interference effects of the fuselage on the tail and the tail on the fuselage were obtained from reference 10. In order to determine the interference of the tail on the fuselage (for fuselage-tail derivatives), it was necessary to consider an equivalent wing, the aspect ratio of which was twice that of the vertical tail or ventral fin. An interference factor was then obtained from the charts of reference 10 and divided by two to reduce it to the appropriate value for the vertical tail or ventral fin. The isolated tail derivatives were then multiplied by the appropriate interference factor which, in the case of the fuselage-tail combination, represents

$$\frac{\text{Lift of tail in presence of fuselage + Lift of fuselage due to tail}}{\text{Lift of isolated tail}}$$

The estimated and experimental derivatives of the tail are compared in figure 33 for various configurations. Also, an indication of the magnitude of the interference of the fuselage on the tail is shown by a comparison of the estimated curves of figure 33(a) with those of figure 33(b).

There is fairly good agreement between the estimated and experimental variations of the tail increments with Mach number although the estimated values are lower than the experimental values at a given Mach number. The interference of the fuselage on the tail accounts for an increment in ΔC_{n_β} which is about equal to that produced by the ventral fin (fig. 33).

Presented in the following table is a comparison of the estimated and experimental fuselage-tail derivatives at $\alpha = 0^\circ$, with the estimated values including the interference of the tail on the fuselage as well as the interference of the fuselage on the tail:

Configuration	M	C_{n_β}		C_{Y_β}	
		Experimental	Estimated	Experimental	Estimated
FVH^2v	2.29	0.00751 (.00699 .00700)	0.00737	-0.02110 (-.02030 -.02010)	-0.01792
	2.98	0.00534 (.00500 .00520)	0.00538	-0.01800 (-.01800 -.01570)	-0.01495
	3.96	0.00363 (.00351 .00350)	0.00386	-0.01590 (-.01510 -.01440)	-0.01222
	4.65	0.00271 (.00279 .00300)	0.00326	-0.01457 (-.01470 -.01500)	-0.01121
FVH^2	2.29	0.00395 (.00360)	0.00425	-0.01520 (-.01400)	-0.01251
	2.98	0.00232 (.00208)	0.00257	-0.01320 (-.01340)	-0.01008
	3.96	0.00099 (.00130)	0.00134	-0.01130 (-.01240)	-0.00814
	4.65	0.00070 (.00060)	0.00082	-0.01130 (-.01080)	-0.00732

The values in parenthesis are wing on, the first value being for the 28.8° swept wing and, where two values are given, the second is for the 45° swept wing. The estimated values of C_{Y_β} and C_{n_β} for the fuselage alone were obtained from reference 10 and, since for the fuselage alone about the body axes $C_{l_\beta} = 0$, the values of the fuselage-tail derivatives C_{l_β} are equal to the tail-alone values ΔC_{l_β} presented in figure 33.

The agreement between estimated and experimental fuselage-tail derivatives is good, better agreement being obtained for C_{n_β} than for C_{Y_β}. The investigation of reference 16 may be used to study, in detail, the effects of vortex and shock-expansion fields and changes in airplane geometry on the directional stability of a given airplane.

CONCLUSIONS

An investigation, at Mach numbers from 2.29 to 4.65, of the effects of changes in Mach number, wing sweep, horizontal-tail configuration, and a ventral fin on the static stability characteristics of a model with a wing of aspect ratio 3 has indicated the following:

1. Configurations with the horizontal tail on the fuselage center line generally had more uniform variations of pitching moment at zero lift and static longitudinal stability with Mach number than configurations with a T-tail. Configurations with a T-tail had greater stability at high Mach numbers and experienced erratic changes in the variation with Mach number of the pitching moment at zero lift and in static longitudinal stability as a result of interference of shock waves from the wing leading edge with the horizontal tail. Configurations employing a 45° swept wing had greater static longitudinal stability than those with a 28.8° swept wing. When sideslipped over a large range at a given angle of attack, configurations with a T-tail had a tendency to pitch down and configurations with the horizontal tail on the fuselage center line had a tendency to pitch up. This trend has been noted previously at high subsonic speeds and at supersonic speeds lower than those of the present investigation. At the lower Mach numbers, T-tail configurations had slightly greater directional stability at low angles of attack than configurations with low tails whereas at the higher Mach numbers there was essentially no effect of tail changes or a change in wing sweep from 28.8° to 45° on directional stability.

2. All complete models incorporating a ventral fin with a wedge airfoil section were directionally stable at all Mach numbers for the angle-of-attack range investigated. The directional stability decreased with increasing angle of attack at the lowest Mach number investigated and at a given low angle of attack the directional stability decreased with an increase in Mach number. There were increases in directional stability at high angles of attack at the highest Mach number due to the effects of the wing compression field on the ventral fin and a decrease in the unstable contribution of the wing-fuselage combination.

3. The experimental variations with Mach number of lift-curve and pitching-moment slope, and the directional stability and effective dihedral parameters could generally be predicted with good accuracy at approximately zero angle of attack by theoretical methods.

Langley Aeronautical Laboratory,
National Advisory Committee for Aeronautics,
Langley Field, Va., April 12, 1958.

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TABLE I.- PERTINENT MODEL DETAILS

Wings:		
Sweepback at quarter-chord line, deg	28.8	45
Total area, including that in fuselage, sq in.	141.06	141.06
Span, in.	20.57	20.57
Root chord, in.	12.00	12.00
Tip chord, in.	1.72	1.72
Taper ratio	0.143	0.143
Aspect ratio	3.00	3.00
Mean aerodynamic chord, in.	8.15	8.15
Distance from apex to $0.26\bar{c}_w$	5.21	6.93
Airfoil section	NACA 65A004	NACA 65A004
Horizontal tail:		
Sweepback at leading edge, deg		45
Total area, sq in.		36.72
Span, in.		12.12
Root chord, in.		6.06
Taper ratio		0
Aspect ratio		4.00
Mean aerodynamic chord, in.		4.04
Distance from $0.26\bar{c}_w$ to $\frac{\bar{c}_h}{4}$, in.:		
Low tails		14.64
T-tail		16.02
Airfoil section		NACA 65A004
Vertical tail (exposed):		
Sweepback of quarter-chord line, deg		28.4
Area, sq in.		33.00
Span, in.		5.67
Root chord, in.		7.86
Tip chord, in.		3.78
Taper ratio		0.48
Aspect ratio		0.98
Mean aerodynamic chord, in.		6.05
Distance from $0.26\bar{c}_w$ to $\frac{\bar{c}_v}{4}$, in.		12.26
Airfoil section		NACA 65A006
Ventral fin (exposed):		
Sweepback of quarter-chord line, deg		28.4
Area, sq in.		16.50
Span, in.		2.35
Root chord, in.		7.86
Tip chord, in.		6.17
Taper ratio		0.79
Aspect ratio		0.34
Mean aerodynamic chord, in.		7.07
Distance from $0.26\bar{c}_w$ to $\frac{\bar{c}_v}{4}$, in.		11.51
Airfoil section		Wedge with 10° included angle
Fuselage:		
Length, in.		41.19
Fineness ratio		10.98
Nose fineness ratio		3.25
Center of moments, percent length		57

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^1FVH^1V	2.294	.08	-.0237	.0559	-3.97	.0059	-.0294	.0795
	2.294	.10	-.0247	.0554	-1.97	.0026	-.0139	.0382
	2.294	.07	-.0244	.0573	-.99	.0006	-.0066	.0182
	2.294	.07	-.0249	.0577	.00	-.0010	.0010	-.0001
	2.294	.06	-.0291	.0578	1.00	-.0030	.0086	-.0221
	2.294	.08	-.0289	.0571	1.97	-.0045	.0158	-.0413
	2.294	.08	-.0293	.0574	2.98	-.0064	.0239	-.0639
	2.294	.08	-.0276	.0562	3.98	-.0078	.0311	-.0844
	2.294	.09	-.0278	.0544	4.95	-.0095	.0385	-.1053
	2.294	.07	-.0258	.0535	6.05	-.0112	.0464	-.1305
	2.294	.05	-.0229	.0483	7.93	-.0143	.0606	-.1752
	2.294	.03	-.0191	.0406	9.97	-.0177	.0749	-.2300
	2.294	.00	-.0134	.0309	12.03	-.0208	.0877	-.2902
	2.294	-.01	-.0054	.0069	16.08	-.0270	.1105	-.4078
	2.294	.00	.0090	-.0293	20.00	-.0328	.1365	-.5276
	2.294	8.46	.3612	-.1309	20.05	-.0408	.1320	-.5417
	2.294	8.38	.3534	-.1073	16.15	-.0319	.1046	-.4180
	2.294	8.55	.3466	-.0758	12.06	-.0221	.0770	-.2993
	2.294	8.57	.3375	-.0600	10.05	-.0172	.0622	-.2360
	2.294	8.57	.3309	-.0435	8.03	-.0133	.0487	-.1831
	2.294	8.59	.3244	-.0301	6.03	-.0098	.0361	-.1327
	2.294	8.61	.3239	-.0261	4.98	-.0081	.0309	-.1092
	2.294	8.59	.3206	-.0214	3.99	-.0064	.0244	-.0851
	2.294	8.61	.3189	-.0181	2.97	-.0048	.0184	-.0641
	2.294	8.61	.3158	-.0157	1.99	-.0032	.0125	-.0431
	2.294	8.61	.3129	-.0151	1.00	-.0018	.0066	-.0228
	2.294	8.61	.3127	-.0151	.01	-.0004	.0010	-.0024
	2.294	8.63	.3139	-.0152	-1.02	.0011	-.0052	.0181
	2.294	8.63	.3153	-.0149	-2.01	.0024	-.0110	.0384
	2.294	8.58	.3104	-.0180	-4.03	.0054	-.0232	.0822
	2.294	17.42	.6624	-.1369	-4.09	.0122	-.0177	.0989
	2.294	17.35	.6677	-.1333	-2.04	.0063	-.0087	.0507
	2.294	17.41	.6817	-.1374	-1.02	.0035	-.0047	.0264
	2.294	17.42	.6805	-.1395	-.02	.0011	-.0005	.0051
	2.294	17.44	.6932	-.1433	1.03	-.0016	.0030	-.0198
	2.294	17.45	.6879	-.1419	2.04	-.0043	.0069	-.0433
	2.294	17.41	.6952	-.1431	3.03	-.0073	.0111	-.0653
	2.294	17.41	.6926	-.1447	4.03	-.0101	.0150	-.0878
	2.294	17.41	.7030	-.1529	5.06	-.0136	.0205	-.1153
	2.294	17.42	.7097	-.1635	6.11	-.0170	.0259	-.1425
	2.294	17.38	.7176	-.1782	8.12	-.0236	.0385	-.1992
	2.294	17.42	.7233	-.1854	10.11	-.0294	.0526	-.2552
	2.294	17.39	.7282	-.1949	12.18	-.0354	.0681	-.3218
	2.294	17.35	.7450	-.2195	16.21	-.0460	.0933	-.4356
	2.294	17.33	.7550	-.2462	20.15	-.0579	.1156	-.5503
	2.975	.04	-.0185	.0298	-4.02	.0039	-.0209	.0689
	2.975	.07	-.0191	.0300	-2.01	.0015	-.0100	.0339
	2.975	.04	-.0196	.0308	-1.00	.0004	-.0054	.0180
	2.975	.05	-.0219	.0311	.00	-.0009	.0000	.0016
	2.975	.05	-.0241	.0310	1.01	-.0020	.0052	-.0175
	2.975	.03	-.0227	.0307	1.97	-.0032	.0108	-.0337
	2.975	.00	-.0230	.0308	2.99	-.0045	.0161	-.0520
	2.975	.00	-.0215	.0293	3.99	-.0057	.0215	-.0700
	2.975	.00	-.0201	.0287	5.01	-.0070	.0268	-.0899
	2.975	.00	-.0204	.0279	6.01	-.0082	.0320	-.1100
	2.975	.01	-.0171	.0245	8.01	-.0108	.0429	-.1532
	2.975	.01	-.0150	.0181	10.06	-.0130	.0524	-.2028
	2.975	.00	-.0081	.0083	12.05	-.0155	.0624	-.2518
	2.975	.02	.0011	-.0121	16.12	-.0204	.0829	-.3583
	2.975	.02	.0168	-.0384	20.03	-.0256	.1067	-.4643
	2.975	8.42	.2911	-.0723	20.08	-.0246	.0969	-.4690
	2.975	8.37	.2800	-.0429	16.15	-.0171	.0741	-.3616
	2.975	8.44	.2740	-.0295	12.12	-.0102	.0541	-.2603
	2.975	8.44	.2705	-.0261	10.07	-.0084	.0450	-.2122
	2.975	8.44	.2687	-.0248	8.06	-.0064	.0353	-.1662
	2.975	8.43	.2654	-.0241	6.05	-.0046	.0258	-.1213
	2.975	8.41	.2636	-.0223	5.02	-.0039	.0213	-.0992
	2.975	8.42	.2622	-.0213	4.04	-.0033	.0171	-.0788
	2.975	8.41	.2622	-.0216	3.01	-.0024	.0124	-.0589
	2.975	8.41	.2590	-.0220	1.99	-.0016	.0082	-.0388
	2.975	8.41	.2595	-.0224	1.02	-.0009	.0041	-.0223
	2.975	8.43	.2580	-.0222	.01	-.0003	.0000	-.0032
	2.975	8.42	.2551	-.0216	-1.02	.0000	-.0035	.0160
	2.975	8.43	.2588	-.0217	-2.00	.0007	-.0074	.0329
	2.975	8.41	.2577	-.0207	-4.02	.0024	-.0161	.0715
	2.975	17.11	.5381	-.0828	-4.05	.0065	-.0151	.0887
	2.975	17.12	.5466	-.0878	-2.00	.0041	-.0066	.0442
	2.975	17.03	.5524	-.0869	-1.01	.0027	-.0038	.0236
	2.975	17.17	.5570	-.0895	.01	.0009	-.0005	.0024
	2.975	17.16	.5606	-.0905	1.03	-.0005	.0017	-.0196
	2.975	17.14	.5663	-.0940	2.04	-.0023	.0053	-.0410
	2.975	17.14	.5701	-.0971	3.03	-.0042	.0092	-.0635
	2.975	17.12	.5668	-.0965	4.06	-.0055	.0130	-.0850
	2.975	17.10	.5725	-.0972	5.05	-.0070	.0175	-.1089
	2.975	17.08	.5747	-.0987	6.06	-.0085	.0228	-.1347
	2.975	17.12	.5803	-.1042	8.09	-.0114	.0327	-.1850
	2.975	17.10	.5823	-.1131	10.12	-.0153	.0430	-.2339
	2.975	17.13	.5927	-.1253	12.18	-.0192	.0526	-.2853
	2.975	17.15	.6119	-.1541	16.19	-.0290	.0733	-.3879
	2.975	17.14	.6381	-.1841	20.11	-.0427	.0943	-.4962
	2.975	-.01	-.0088	.0006	10.02	.0000	-.0003	.0039

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
$W^1F_VH^1_V$	3.963	.02	-.0212	.0392	-1.97	.0007	-.0066	.0273
	3.963	.04	-.0201	.0395	-.98	-.0001	-.0027	.0123
	3.963	.04	-.0213	.0401	-.01	-.0007	.0005	-.0012
	3.963	.02	-.0223	.0403	1.02	-.0016	.0043	-.0171
	3.963	.03	-.0212	.0402	2.00	-.0023	.0081	-.0314
	3.963	.02	-.0223	.0401	3.03	-.0031	.0119	-.0474
	3.963	.01	-.0210	.0389	3.98	-.0039	.0153	-.0613
	3.963	.01	-.0198	.0383	4.98	-.0047	.0189	-.0784
	3.963	.01	-.0185	.0358	6.00	-.0056	.0228	-.0959
	3.963	.00	-.0158	.0287	8.01	-.0074	.0297	-.1320
	3.963	-.01	-.0106	.0182	10.05	-.0092	.0368	-.1702
	3.963	-.02	-.0055	.0057	12.08	-.0111	.0433	-.2097
	3.963	-.02	.0075	-.0204	16.11	-.0153	.0608	-.2974
	3.963	8.26	.2056	-.0229	-2.00	.0004	-.0055	.0310
	3.963	8.26	.2068	-.0234	-1.01	-.0001	-.0024	.0150
	3.963	8.26	.2050	-.0228	-.01	-.0004	.0006	-.0019
	3.963	8.26	.2064	-.0229	1.04	-.0008	.0037	-.0194
	3.963	8.24	.2084	-.0228	2.00	-.0012	.0066	-.0347
	3.963	8.25	.2097	-.0225	3.03	-.0017	.0098	-.0506
	3.963	8.23	.2081	-.0215	4.03	-.0023	.0136	-.0687
	3.963	8.21	.2126	-.0224	5.02	-.0029	.0171	-.0873
	3.963	8.21	.2133	-.0232	6.02	-.0037	.0203	-.1060
	3.963	8.21	.2169	-.0252	8.05	-.0049	.0266	-.1422
	3.963	8.22	.2192	-.0278	10.07	-.0065	.0335	-.1830
	3.963	8.23	.2227	-.0313	12.06	-.0080	.0396	-.2210
	3.963	8.23	.2368	-.0464	16.13	-.0125	.0551	-.3106
	3.963	16.91	.4488	-.0355	-2.00	.0007	-.0075	.0428
	3.963	16.87	.4503	-.0353	-1.01	.0002	-.0033	.0212
	3.963	16.86	.4544	-.0355	-.01	.0001	-.0003	.0018
	3.963	16.90	.4595	-.0356	1.00	-.0002	.0028	-.0191
	3.963	16.91	.4612	-.0354	2.01	-.0008	.0068	-.0406
	3.963	16.89	.4651	-.0363	3.05	-.0013	.0109	-.0630
	3.963	16.89	.4649	-.0367	4.00	-.0017	.0148	-.0835
	3.963	16.89	.4662	-.0376	4.99	-.0023	.0190	-.1042
	3.963	16.89	.4697	-.0388	6.09	-.0031	.0235	-.1285
	3.963	16.90	.4713	-.0409	8.02	-.0050	.0325	-.1714
	3.963	16.91	.4757	-.0445	10.09	-.0072	.0397	-.2164
	3.963	16.92	.4813	-.0479	12.10	-.0099	.0450	-.2581
	3.963	16.91	.4952	-.0675	16.20	-.0178	.0553	-.3436
	4.653	.02	-.0092	.0270	-1.99	.0002	-.0056	.0258
	4.653	.04	-.0109	.0273	-1.00	-.0004	-.0026	.0124
	4.653	.02	-.0098	.0267	.03	-.0008	.0008	-.0030
	4.653	.02	-.0114	.0269	1.03	-.0015	.0038	-.0174
	4.653	.02	-.0103	.0268	2.00	-.0020	.0067	-.0308
	4.653	.02	-.0091	.0267	2.98	-.0027	.0097	-.0453
	4.653	.03	-.0106	.0259	4.02	-.0033	.0124	-.0605
	4.653	.02	-.0095	.0249	4.99	-.0040	.0151	-.0748
	4.653	.03	-.0082	.0228	6.05	-.0047	.0179	-.0911
	4.653	.03	-.0028	.0170	8.03	-.0060	.0233	-.1246
	4.653	.03	-.0001	.0091	10.05	-.0076	.0289	-.1594
	4.653	.04	.0053	-.0005	12.06	-.0091	.0351	-.1955
	4.653	.03	.0196	-.0256	16.10	-.0131	.0539	-.2838
	4.653	8.23	.2003	-.0275	-1.99	.0003	-.0045	.0254
	4.653	8.21	.2014	-.0276	-1.00	-.0002	-.0018	.0109
	4.653	8.18	.2028	-.0272	.01	-.0006	.0011	-.0065
	4.653	8.21	.2035	-.0273	1.02	-.0009	.0036	-.0230
	4.653	8.21	.2045	-.0274	1.97	-.0014	.0061	-.0374
	4.653	8.22	.2065	-.0276	3.01	-.0019	.0092	-.0547
	4.653	8.22	.2101	-.0280	4.03	-.0024	.0124	-.0718
	4.653	8.20	.2118	-.0282	5.00	-.0029	.0152	-.0873
	4.653	8.20	.2101	-.0279	6.04	-.0035	.0183	-.1044
	4.653	8.20	.2153	-.0304	8.04	-.0045	.0232	-.1370
	4.653	8.22	.2207	-.0344	10.07	-.0058	.0293	-.1753
	4.653	8.22	.2259	-.0407	12.07	-.0072	.0360	-.2135
	4.653	8.24	.2405	-.0591	16.14	-.0114	.0509	-.2968
	4.653	16.80	.4304	-.0382	-1.99	.0005	-.0079	.0370
	4.653	16.80	.4309	-.0373	-1.00	.0001	-.0039	.0157
	4.653	16.75	.4324	-.0365	.01	-.0001	.0003	-.0065
	4.653	16.83	.4387	-.0373	1.04	-.0003	.0040	-.0258
	4.653	16.81	.4413	-.0381	1.99	-.0005	.0078	-.0463
	4.653	16.79	.4415	-.0391	2.99	-.0009	.0119	-.0654
	4.653	16.77	.4456	-.0410	4.03	-.0011	.0159	-.0866
	4.653	16.78	.4505	-.0435	5.00	-.0016	.0201	-.1070
	4.653	16.86	.4567	-.0458	6.06	-.0019	.0252	-.1301
	4.653	16.86	.4587	-.0474	8.07	-.0028	.0329	-.1711
	4.653	16.82	.4628	-.0498	10.07	-.0046	.0392	-.2118
	4.653	16.82	.4680	-.0571	12.10	-.0071	.0448	-.2535
	4.653	16.83	.4826	-.0744	16.14	-.0142	.0538	-.3303

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^1FVH^2V	2.294	.04	-.0091	.0273	-3.96	.0041	-.0279	.0799
	2.294	.04	-.0063	.0252	-1.96	.0017	-.0137	.0408
	2.294	.04	-.0077	.0272	-1.00	.0004	-.0069	.0217
	2.294	.04	-.0077	.0273	.00	-.0009	.0003	.0015
	2.294	.04	-.0094	.0268	1.02	-.0023	.0069	-.0173
	2.294	.03	-.0110	.0273	1.97	-.0032	.0137	-.0354
	2.294	.03	-.0112	.0281	2.97	-.0043	.0208	-.0563
	2.294	.04	-.0111	.0289	3.98	-.0055	.0272	-.0759
	2.294	.06	-.0111	.0297	4.96	-.0067	.0346	-.0970
	2.294	.06	-.0125	.0310	5.98	-.0080	.0419	-.1203
	2.294	.04	-.0137	.0335	7.96	-.0106	.0558	-.1651
	2.294	.05	-.0113	.0344	9.98	-.0131	.0691	-.2188
	2.294	.05	-.0098	.0345	12.00	-.0149	.0801	-.2739
	2.294	.04	-.0146	.0351	16.08	-.0187	.1027	-.3926
	2.294	.08	-.0166	.0390	20.04	-.0212	.1237	-.5088
	2.294	8.65	.3242	-.0107	20.09	-.0303	.1201	-.5276
	2.294	8.66	.3347	-.0234	16.14	-.0231	.0938	-.3983
	2.294	8.69	.3453	-.0355	12.09	-.0170	.0733	-.2959
	2.294	8.66	.3475	-.0448	10.06	-.0135	.0591	-.2340
	2.294	8.65	.3550	-.0559	8.04	-.0108	.0462	-.1807
	2.294	8.63	.3565	-.0663	6.05	-.0079	.0346	-.1300
	2.294	8.63	.3542	-.0692	5.00	-.0063	.0284	-.1046
	2.294	8.62	.3572	-.0742	3.98	-.0050	.0225	-.0842
	2.294	8.63	.3583	-.0773	3.02	-.0036	.0169	-.0634
	2.294	8.63	.3549	-.0784	2.00	-.0023	.0113	-.0416
	2.294	8.63	.3591	-.0819	1.03	-.0013	.0059	-.0215
	2.294	8.62	.3559	-.0820	-.01	-.0001	.0002	-.0011
	2.294	8.63	.3558	-.0815	-1.00	.0010	-.0054	.0201
	2.294	8.63	.3578	-.0806	-1.97	.0021	-.0107	.0380
	2.294	8.61	.3515	-.0733	-4.00	.0050	-.0233	.0819
	2.294	17.35	.6829	-.1554	-4.06	.0089	-.0176	.0970
	2.294	17.26	.6927	-.1638	-2.04	.0046	-.0089	.0523
	2.294	17.33	.7003	-.1664	-1.02	.0025	-.0045	.0258
	2.294	17.31	.7084	-.1689	.00	.0009	-.0011	.0058
	2.294	17.30	.7056	-.1676	1.05	-.0008	.0027	-.0179
	2.294	17.40	.7179	-.1688	2.02	-.0027	.0058	-.0403
	2.294	17.39	.7141	-.1664	3.06	-.0051	.0102	-.0654
	2.294	17.35	.7157	-.1641	4.01	-.0069	.0140	-.0868
	2.294	17.36	.7105	-.1580	5.05	-.0094	.0190	-.1120
	2.294	17.37	.7167	-.1548	6.10	-.0118	.0242	-.1414
	2.294	17.39	.7049	-.1397	8.11	-.0163	.0347	-.1906
	2.294	17.43	.7080	-.1274	10.15	-.0208	.0472	-.2523
	2.294	17.45	.7053	-.1168	12.17	-.0251	.0599	-.3095
	2.294	17.45	.7022	-.0999	16.27	-.0361	.0860	-.4306
	2.294	17.48	.6994	-.0866	20.17	-.0459	.1026	-.5299
	2.975	.03	.0012	.0194	-4.00	.0031	-.0201	.0660
	2.975	.05	.0004	.0186	-1.98	.0010	-.0093	.0302
	2.975	.03	.0015	.0191	-1.02	.0002	-.0052	.0160
	2.975	.03	.0011	.0189	.01	-.0007	-.0002	-.0025
	2.975	.05	.0006	.0191	1.02	-.0015	.0046	-.0194
	2.975	.05	-.0001	.0191	1.99	-.0024	.0097	-.0352
	2.975	.05	-.0006	.0192	2.99	-.0034	.0146	-.0519
	2.975	.07	.0013	.0190	3.02	-.0033	.0143	-.0532
	2.975	.07	.0009	.0194	4.02	-.0043	.0192	-.0707
	2.975	.05	.0006	.0205	5.00	-.0053	.0244	-.0897
	2.975	.05	.0003	.0214	6.02	-.0064	.0297	-.1088
	2.975	.04	.0001	.0232	8.00	-.0084	.0401	-.1524
	2.975	.04	.0005	.0242	10.05	-.0101	.0498	-.2037
	2.975	.06	.0005	.0241	12.08	-.0113	.0581	-.2498
	2.975	.06	.0012	.0261	16.15	-.0139	.0754	-.3496
	2.975	.07	.0000	.0303	20.06	-.0172	.0977	-.4571
	2.975	8.51	.2851	-.0152	20.10	-.0197	.0910	-.4635
	2.975	8.49	.2876	-.0198	16.18	-.0140	.0699	-.3588
	2.975	8.43	.2882	-.0277	12.12	-.0086	.0518	-.2589
	2.975	8.42	.2879	-.0314	10.09	-.0068	.0433	-.2117
	2.975	8.41	.2914	-.0388	8.06	-.0051	.0344	-.1663
	2.975	8.42	.2952	-.0459	6.03	-.0044	.0266	-.1251
	2.975	8.42	.2952	-.0490	5.05	-.0038	.0213	-.1037
	2.975	8.41	.2954	-.0522	4.02	-.0031	.0167	-.0831
	2.975	8.39	.2954	-.0543	3.02	-.0024	.0124	-.0614
	2.975	8.39	.2940	-.0570	2.01	-.0016	.0079	-.0434
	2.975	8.38	.2943	-.0591	1.05	-.0010	.0043	-.0256
	2.975	8.38	.2946	-.0595	.01	-.0005	.0002	-.0061
	2.975	8.38	.2916	-.0588	-1.00	.0001	-.0041	.0119
	2.975	8.38	.2903	-.0568	-1.99	.0007	-.0078	.0300
	2.975	8.40	.2895	-.0518	-4.01	.0020	-.0160	.0668
	2.975	17.03	.5853	-.1322	-4.04	.0049	-.0149	.0848
	2.975	16.91	.5904	-.1374	-2.03	.0030	-.0077	.0428
	2.975	17.01	.6009	-.1407	-.99	.0019	-.0041	.0195
	2.975	17.00	.5988	-.1405	-.03	.0008	-.0007	-.0003
	2.975	17.04	.6075	-.1414	1.03	.0000	.0017	-.0222
	2.975	17.04	.6037	-.1398	2.03	-.0012	.0052	-.0437
	2.975	17.03	.6097	-.1396	3.06	-.0024	.0090	-.0670
	2.975	17.02	.6062	-.1359	4.07	-.0036	.0130	-.0888
	2.975	17.02	.6106	-.1336	5.10	-.0049	.0178	-.1142
	2.975	17.01	.6111	-.1301	6.07	-.0062	.0231	-.1397
	2.975	17.03	.6081	-.1234	8.10	-.0087	.0333	-.1895
	2.975	17.03	.6029	-.1145	10.12	-.0121	.0435	-.2367
	2.975	17.04	.6019	-.1063	12.15	-.0158	.0535	-.2875
	2.975	17.08	.6034	-.0936	16.18	-.0235	.0709	-.3884
	2.975	17.11	.6037	-.0807	20.17	-.0335	.0865	-.4870

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^1FVH^2V	3.963	.01	-.0276	.0193	-4.01	.0022	-.0148	.0650
	3.963	-.01	-.0276	.0186	-2.02	.0008	-.0075	.0361
	3.963	-.01	-.0289	.0192	-1.01	.0002	-.0039	.0224
	3.963	.01	-.0301	.0194	.00	-.0004	-.0009	.0079
	3.963	-.01	-.0290	.0189	1.01	-.0011	.0029	-.0066
	3.963	-.01	-.0303	.0195	1.99	-.0017	.0063	-.0202
	3.963	.01	-.0289	.0197	2.97	-.0024	.0099	-.0354
	3.963	.01	-.0301	.0203	3.99	-.0031	.0133	-.0508
	3.963	.01	-.0311	.0217	5.00	-.0038	.0169	-.0670
	3.963	-.01	-.0321	.0230	6.02	-.0044	.0202	-.0832
	3.963	-.01	-.0314	.0243	8.02	-.0057	.0272	-.1204
	3.963	-.01	-.0329	.0249	10.07	-.0070	.0335	-.1578
	3.963	-.01	-.0321	.0249	12.07	-.0081	.0401	-.1975
	3.963	.00	-.0323	.0271	16.11	-.0108	.0555	-.2815
	3.963	.02	-.0319	.0291	20.01	-.0144	.0782	-.3781
	3.963	8.31	.2038	-.0051	20.05	-.0146	.0689	-.3899
	3.963	8.27	.2017	-.0071	16.16	-.0095	.0514	-.2970
	3.963	8.33	.2033	-.0073	16.16	-.0091	.0511	-.2969
	3.963	8.32	.2010	-.0101	12.10	-.0057	.0363	-.2103
	3.963	8.32	.1987	-.0118	10.07	-.0048	.0311	-.1721
	3.963	8.33	.1957	-.0143	8.03	-.0037	.0247	-.1332
	3.963	8.32	.1953	-.0175	6.04	-.0028	.0189	-.0984
	3.963	8.32	.1937	-.0194	5.03	-.0021	.0154	-.0790
	3.963	8.32	.1945	-.0211	4.01	-.0015	.0120	-.0604
	3.963	8.31	.1924	-.0221	2.99	-.0011	.0081	-.0425
	3.963	8.29	.1917	-.0228	1.98	-.0007	.0051	-.0266
	3.963	8.29	.1921	-.0237	1.00	-.0004	.0021	-.0094
	3.963	8.29	.1916	-.0237	.02	-.0002	-.0007	.0069
	3.963	8.31	.1897	-.0242	-1.01	.0000	-.0033	.0232
	3.963	8.31	.1892	-.0234	-2.02	.0003	-.0063	.0403
	3.963	8.32	.1867	-.0211	-4.05	.0010	-.0138	.0761
	3.963	16.73	.4415	-.0775	-4.04	.0017	-.0176	.0965
	3.963	16.69	.4438	-.0782	-4.06	.0017	-.0180	.0973
	3.963	16.66	.4513	-.0807	-2.01	.0007	-.0090	.0545
	3.963	16.60	.4530	-.0817	-1.00	.0004	-.0046	.0318
	3.963	16.61	.4565	-.0833	.00	.0001	-.0012	.0124
	3.963	16.61	.4564	-.0824	1.02	.0000	.0018	-.0088
	3.963	16.59	.4556	-.0815	2.00	-.0004	.0055	-.0299
	3.963	16.59	.4611	-.0822	3.01	-.0008	.0096	-.0502
	3.963	16.79	.4675	-.0842	3.01	-.0008	.0097	-.0508
	3.963	16.77	.4709	-.0843	4.02	-.0013	.0137	-.0736
	3.963	16.78	.4705	-.0841	5.02	-.0019	.0181	-.0934
	3.963	16.78	.4739	-.0850	6.05	-.0027	.0225	-.1180
	3.963	16.78	.4749	-.0835	8.05	-.0044	.0319	-.1630
	3.963	16.79	.4761	-.0791	10.08	-.0065	.0393	-.2080
	3.963	16.80	.4773	-.0727	12.11	-.0089	.0447	-.2489
	3.963	16.85	.4718	-.0564	16.19	-.0146	.0529	-.3309
	3.963	16.85	.4774	-.0470	20.11	-.0220	.0661	-.4257
	4.653	.03	-.0155	.0125	-4.04	.0012	-.0119	.0605
	4.653	.00	-.0159	.0121	-2.01	.0002	-.0063	.0321
	4.653	.00	-.0149	.0105	-1.01	-.0003	-.0032	.0186
	4.653	-.02	-.0167	.0108	.00	-.0008	-.0001	.0040
	4.653	.00	-.0156	.0102	1.01	-.0011	.0026	-.0106
	4.653	.00	-.0146	.0106	2.01	-.0016	.0056	-.0233
	4.653	.00	-.0134	.0109	3.00	-.0020	.0082	-.0378
	4.653	.00	-.0150	.0121	4.02	-.0026	.0111	-.0525
	4.653	.00	-.0164	.0133	5.00	-.0031	.0137	-.0682
	4.653	.00	-.0152	.0137	6.01	-.0037	.0163	-.0825
	4.653	.02	-.0123	.0148	8.03	-.0046	.0211	-.1157
	4.653	.02	-.0123	.0159	10.03	-.0059	.0264	-.1501
	4.653	.00	-.0120	.0159	12.08	-.0069	.0321	-.1861
	4.653	.01	-.0110	.0175	16.11	-.0100	.0490	-.2709
	4.653	.01	-.0066	.0167	19.99	-.0144	.0747	-.3691
	4.653	8.29	.2144	-.0136	20.02	-.0137	.0656	-.3784
	4.653	8.25	.2100	-.0143	16.10	-.0086	.0490	-.2880
	4.653	8.26	.2061	-.0145	12.09	-.0048	.0336	-.2065
	4.653	8.28	.2033	-.0142	10.07	-.0040	.0273	-.1685
	4.653	8.30	.2036	-.0162	8.06	-.0032	.0221	-.1344
	4.653	8.29	.2008	-.0183	6.02	-.0024	.0171	-.1003
	4.653	8.29	.2029	-.0200	5.04	-.0020	.0139	-.0839
	4.653	8.29	.2016	-.0209	4.01	-.0017	.0113	-.0673
	4.653	8.29	.2004	-.0212	3.01	-.0012	.0081	-.0510
	4.653	8.27	.1991	-.0216	1.99	-.0009	.0051	-.0343
	4.653	8.25	.2007	-.0218	1.04	-.0005	.0024	-.0187
	4.653	8.27	.2015	-.0234	.01	-.0005	.0002	-.0018
	4.653	8.27	.2009	-.0233	-1.00	-.0003	-.0025	.0139
	4.653	8.28	.1999	-.0222	-2.01	.0001	-.0051	.0295
	4.653	8.29	.2000	-.0218	-4.04	.0008	-.0115	.0628
	4.653	16.67	.4397	-.0776	-4.04	.0010	-.0173	.0840
	4.653	16.61	.4419	-.0772	-2.00	.0003	-.0091	.0419
	4.653	16.52	.4462	-.0758	-1.00	.0002	-.0043	.0204
	4.653	16.49	.4486	-.0771	-.03	.0000	-.0010	.0009
	4.653	16.68	.4561	-.0791	1.02	-.0001	.0031	-.0196
	4.653	16.67	.4614	-.0802	2.00	-.0003	.0073	-.0401
	4.653	16.65	.4618	-.0807	3.01	-.0006	.0111	-.0615
	4.653	16.65	.4642	-.0821	4.01	-.0008	.0155	-.0822
	4.653	16.65	.4681	-.0840	5.00	-.0012	.0195	-.1026
	4.653	16.63	.4697	-.0852	6.04	-.0015	.0240	-.1251
	4.653	16.66	.4734	-.0851	8.04	-.0024	.0330	-.1675
	4.653	16.66	.4777	-.0823	10.05	-.0038	.0394	-.2107
	4.653	16.65	.4783	-.0774	12.12	-.0058	.0440	-.2495
	4.653	16.70	.4760	-.0637	16.14	-.0113	.0522	-.3245
	4.653	16.74	.4819	-.0564	20.05	-.0182	.0665	-.4162

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^1FVH^2	2.294	.08	-.0119	.0404	-4.04	.0062	-.0140	.0574
	2.294	.08	-.0105	.0391	-2.00	.0028	-.0067	.0283
	2.294	.08	-.0104	.0408	-1.00	.0008	-.0035	.0150
	2.294	.08	-.0120	.0414	.01	-.0011	.0001	.0009
	2.294	.07	-.0150	.0410	1.00	-.0028	.0028	-.0122
	2.294	.07	-.0169	.0417	1.98	-.0043	.0061	-.0250
	2.294	.07	-.0168	.0419	2.98	-.0058	.0095	-.0393
	2.294	.07	-.0167	.0431	4.02	-.0076	.0133	-.0549
	2.294	.07	-.0167	.0440	5.01	-.0094	.0169	-.0694
	2.294	.07	-.0194	.0454	6.05	-.0113	.0207	-.0876
	2.294	.06	-.0189	.0479	8.04	-.0149	.0278	-.1225
	2.294	.07	-.0193	.0518	10.08	-.0186	.0355	-.1686
	2.294	.03	-.0217	.0552	12.14	-.0217	.0409	-.2176
	2.294	.11	-.0275	.0647	16.22	-.0274	.0504	-.3106
	2.294	.07	-.0351	.0770	20.22	-.0320	.0623	-.4220
	2.294	8.71	.2984	.0405	20.27	-.0409	.0551	-.4256
	2.294	8.67	.3128	.0173	16.29	-.0321	.0387	-.3163
	2.294	8.69	.3262	-.0049	12.24	-.0234	.0266	-.2199
	2.294	8.68	.3355	-.0174	10.19	-.0188	.0198	-.1716
	2.294	8.67	.3439	-.0324	8.12	-.0148	.0146	-.1267
	2.294	8.65	.3451	-.0438	6.09	-.0106	.0105	-.0884
	2.294	8.64	.3460	-.0488	5.07	-.0084	.0088	-.0723
	2.294	8.63	.3472	-.0540	4.02	-.0070	.0069	-.0575
	2.294	8.65	.3469	-.0572	3.03	-.0051	.0051	-.0429
	2.294	8.64	.3482	-.0596	2.02	-.0035	.0034	-.0287
	2.294	8.64	.3493	-.0616	1.03	-.0019	.0020	-.0145
	2.294	8.62	.3511	-.0627	-.01	-.0003	.0001	-.0004
	2.294	8.62	.3480	-.0617	-1.03	.0013	-.0018	.0138
	2.294	8.60	.3449	-.0596	-2.01	.0031	-.0037	.0289
	2.294	8.60	.3421	-.0531	-4.07	.0067	-.0080	.0575
	2.294	17.34	.6856	-.1376	-4.10	.0110	.0000	.0686
	2.294	17.31	.6921	-.1450	-2.04	.0056	.0005	.0354
	2.294	17.35	.6997	-.1482	-1.03	.0031	.0004	.0190
	2.294	17.36	.7080	-.1507	.00	.0010	.0000	.0034
	2.294	17.35	.7050	-.1477	1.04	-.0013	-.0006	-.0127
	2.294	17.35	.7111	-.1478	2.06	-.0039	-.0006	-.0295
	2.294	17.34	.7066	-.1454	3.06	-.0063	-.0007	-.0452
	2.294	17.37	.7156	-.1440	4.11	-.0096	-.0008	-.0636
	2.294	17.35	.7073	-.1375	5.09	-.0122	-.0004	-.0795
	2.294	17.46	.7094	-.1324	6.16	-.0151	-.0003	-.0980
	2.294	17.46	.7112	-.1192	8.20	-.0216	.0017	-.1392
	2.294	17.48	.6987	-.1014	10.26	-.0273	.0044	-.1801
	2.294	17.50	.6961	-.0845	12.32	-.0337	.0095	-.2283
	2.294	17.52	.6849	-.0595	16.41	-.0462	.0247	-.3309
	2.294	17.56	.6837	-.0378	20.37	-.0569	.0352	-.4275
	2.975	.04	-.0058	.0299	-4.00	.0048	-.0079	.0463
	2.975	.04	-.0048	.0291	-2.00	.0018	-.0038	.0211
	2.975	.06	-.0054	.0292	-1.00	.0006	-.0021	.0102
	2.975	.06	-.0041	.0290	.01	-.0008	-.0001	-.0026
	2.975	.09	-.0047	.0287	1.02	-.0021	.0015	-.0128
	2.975	.04	-.0069	.0294	2.07	-.0035	.0036	-.0255
	2.975	.02	-.0055	.0296	3.00	-.0049	.0058	-.0389
	2.975	.02	-.0077	.0306	4.04	-.0064	.0079	-.0520
	2.975	.02	-.0079	.0315	5.03	-.0080	.0101	-.0670
	2.975	.02	-.0078	.0326	6.16	-.0097	.0127	-.0847
	2.975	.03	-.0079	.0350	8.07	-.0124	.0173	-.1178
	2.975	.01	-.0075	.0377	10.09	-.0150	.0219	-.1562
	2.975	.07	-.0087	.0408	12.18	-.0174	.0258	-.1999
	2.975	.10	-.0112	.0483	16.22	-.0217	.0346	-.2861
	2.975	.09	-.0150	.0590	20.18	-.0269	.0465	-.3775
	2.975	8.53	.2686	.0233	20.24	-.0311	.0311	-.3713
	2.975	8.50	.2753	.0110	16.28	-.0233	.0195	-.2817
	2.975	8.49	.2774	-.0015	12.26	-.0173	.0103	-.1950
	2.975	8.50	.2850	-.0097	10.15	-.0135	.0072	-.1551
	2.975	8.49	.2863	-.0192	8.13	-.0107	.0037	-.1165
	2.975	8.46	.2895	-.0291	6.09	-.0077	.0008	-.0829
	2.975	8.47	.2912	-.0332	5.09	-.0065	.0000	-.0686
	2.975	8.50	.2911	-.0361	4.04	-.0050	-.0003	-.0534
	2.975	8.50	.2913	-.0390	3.01	-.0038	-.0006	-.0408
	2.975	8.51	.2897	-.0414	2.03	-.0025	-.0008	-.0283
	2.975	8.49	.2887	-.0436	.00	-.0004	-.0003	-.0050
	2.975	8.49	.2891	-.0428	-1.01	.0007	.0000	.0066
	2.975	8.47	.2859	-.0416	-2.03	.0020	.0001	.0181
	2.975	8.47	.2852	-.0364	-4.03	.0045	-.0002	.0420
	2.975	17.05	.5815	-.1099	-4.07	.0081	.0058	.0523
	2.975	17.02	.5937	-.1180	-2.02	.0045	.0043	.0236
	2.975	17.04	.5935	-.1176	-1.00	.0028	.0025	.0095
	2.975	17.08	.5985	-.1190	-.01	.0009	.0010	-.0031
	2.975	17.11	.6001	-.1184	1.06	-.0006	-.0015	-.0171
	2.975	17.09	.6003	-.1183	2.04	-.0025	-.0030	-.0298
	2.975	17.10	.6027	-.1142	4.09	-.0067	-.0054	-.0593
	2.975	17.07	.6007	-.1166	3.07	-.0045	-.0044	-.0449
	2.975	17.06	.6017	-.1108	5.09	-.0088	-.0055	-.0756
	2.975	17.05	.6023	-.1060	6.15	-.0110	-.0052	-.0932
	2.975	17.08	.5982	-.0956	8.18	-.0152	-.0042	-.1284
	2.975	17.08	.5942	-.0845	10.21	-.0199	-.0013	-.1664
	2.975	17.09	.5957	-.0735	12.27	-.0246	.0022	-.2083
	2.975	17.14	.5907	-.0533	16.34	-.0340	.0100	-.2915
	2.975	17.16	.5903	-.0343	20.28	-.0446	.0210	-.3828

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
$W^1F_{VH}^2$	3.963	.02	-.0253	.0280	-4.03	.0039	-.0049	.0461
	3.963	.02	-.0250	.0268	-1.98	.0015	-.0025	.0229
	3.963	.04	-.0240	.0267	-1.01	.0005	-.0011	.0134
	3.963	.05	-.0205	.0269	.02	-.0007	.0000	.0024
	3.963	.04	-.0238	.0273	1.02	-.0018	.0008	-.0088
	3.963	.04	-.0249	.0275	2.00	-.0029	.0019	-.0199
	3.963	.04	-.0236	.0278	3.01	-.0041	.0030	-.0310
	3.963	.03	-.0248	.0289	4.00	-.0052	.0042	-.0423
	3.963	.03	-.0256	.0302	5.00	-.0063	.0054	-.0549
	3.963	.01	-.0264	.0316	6.07	-.0074	.0073	-.0699
	3.963	.01	-.0279	.0344	8.10	-.0095	.0105	-.1004
	3.963	.01	-.0271	.0362	10.09	-.0114	.0134	-.1331
	3.963	.02	-.0236	.0374	12.10	-.0132	.0165	-.1673
	3.963	.04	-.0302	.0446	16.18	-.0175	.0242	-.2414
	3.963	.06	-.0340	.0531	20.08	-.0231	.0377	-.3230
	3.963	8.31	.2011	.0246	20.15	-.0256	.0159	-.3150
	3.963	8.29	.2037	.0176	16.23	-.0185	.0066	-.2328
	3.963	8.31	.2042	.0096	12.17	-.0130	.0014	-.1647
	3.963	8.30	.2024	.0063	10.11	-.0111	.0002	-.1310
	3.963	8.28	.2012	.0022	8.08	-.0090	-.0009	-.1004
	3.963	8.27	.2005	-.0023	6.08	-.0071	-.0018	-.0723
	3.963	8.27	.2042	-.0052	5.05	-.0059	-.0024	-.0580
	3.963	8.27	.2019	-.0075	4.02	-.0046	-.0026	-.0451
	3.963	8.27	.2027	-.0097	3.03	-.0035	-.0025	-.0331
	3.963	8.26	.2020	-.0109	2.02	-.0024	-.0022	-.0212
	3.963	8.28	.2021	-.0123	1.05	-.0014	-.0011	-.0116
	3.963	8.28	.2014	-.0122	-.01	-.0003	-.0002	-.0004
	3.963	8.28	.2016	-.0132	-1.01	.0006	.0007	.0100
	3.963	8.28	.2012	-.0124	-2.01	.0017	.0016	.0196
	3.963	8.28	.1980	-.0086	-4.05	.0037	.0020	.0426
	3.963	16.86	.4506	-.0561	-4.07	.0053	.0048	.0523
	3.963	16.82	.4580	-.0604	-2.04	.0027	.0035	.0270
	3.963	16.85	.4677	-.0640	-1.02	.0013	.0029	.0128
	3.963	16.81	.4676	-.0647	.02	.0002	.0009	-.0000
	3.963	16.85	.4735	-.0657	1.01	-.0008	-.0015	-.0120
	3.963	16.85	.4729	-.0647	2.03	-.0021	-.0028	-.0248
	3.963	16.86	.4769	-.0639	3.04	-.0035	-.0038	-.0383
	3.963	16.90	.4801	-.0626	4.04	-.0050	-.0047	-.0512
	3.963	16.90	.4779	-.0610	5.07	-.0064	-.0054	-.0662
	3.963	16.87	.4800	-.0599	6.08	-.0080	-.0055	-.0820
	3.963	16.87	.4793	-.0547	8.12	-.0114	-.0055	-.1121
	3.963	16.85	.4832	-.0496	10.16	-.0149	-.0051	-.1454
	3.963	16.91	.4824	-.0416	12.19	-.0182	-.0056	-.1772
	3.963	16.95	.4817	-.0248	16.28	-.0257	-.0047	-.2494
	3.963	16.98	.4839	-.0116	20.21	-.0347	.0015	-.3296
	4.653	.03	-.0270	.0235	-4.03	.0031	-.0029	.0472
	4.653	.02	-.0248	.0219	-2.00	.0013	-.0018	.0271
	4.653	.02	-.0264	.0222	-1.01	.0002	-.0012	.0165
	4.653	.00	-.0281	.0220	.00	-.0007	-.0007	.0069
	4.653	.00	-.0271	.0209	1.03	-.0015	.0000	-.0037
	4.653	.00	-.0259	.0213	2.00	-.0024	.0006	-.0143
	4.653	.00	-.0275	.0221	3.01	-.0033	.0009	-.0239
	4.653	.01	-.0291	.0233	4.01	-.0042	.0015	-.0345
	4.653	.01	-.0305	.0251	5.00	-.0053	.0023	-.0471
	4.653	.02	-.0291	.0259	6.06	-.0060	.0034	-.0608
	4.653	.02	-.0318	.0288	8.05	-.0078	.0054	-.0880
	4.653	.02	-.0316	.0309	10.08	-.0095	.0076	-.1179
	4.653	.00	-.0341	.0333	12.10	-.0112	.0102	-.1481
	4.653	.01	-.0352	.0390	16.15	-.0160	.0194	-.2210
	4.653	.03	-.0357	.0450	20.04	-.0228	.0352	-.3049
	4.653	8.26	.1803	.0210	20.09	-.0243	.0123	-.2891
	4.653	8.23	.1779	.0170	16.16	-.0176	.0026	-.2085
	4.653	8.24	.1759	.0119	12.13	-.0118	-.0020	-.1429
	4.653	8.25	.1731	.0101	10.11	-.0098	-.0033	-.1150
	4.653	8.23	.1705	.0069	8.10	-.0081	-.0034	-.0881
	4.653	8.23	.1700	.0029	6.07	-.0061	-.0029	-.0637
	4.653	8.20	.1690	.0010	5.04	-.0052	-.0030	-.0513
	4.653	8.20	.1702	-.0016	4.03	-.0041	-.0028	-.0387
	4.653	8.20	.1685	-.0025	3.02	-.0032	-.0028	-.0271
	4.653	8.18	.1698	-.0037	2.01	-.0021	-.0025	-.0156
	4.653	8.20	.1688	-.0046	1.02	-.0012	-.0019	-.0049
	4.653	8.20	.1671	-.0065	.02	-.0004	-.0004	.0047
	4.653	8.20	.1690	-.0058	-1.01	.0006	.0004	.0154
	4.653	8.21	.1651	-.0044	-2.03	.0017	.0012	.0259
	4.653	8.23	.1653	-.0022	-4.04	.0036	.0013	.0490
	4.653	16.77	.4055	-.0499	-4.05	.0050	.0026	.0590
	4.653	16.70	.4086	-.0521	-2.02	.0025	.0017	.0322
	4.653	16.70	.4138	-.0531	-1.04	.0016	.0012	.0198
	4.653	16.74	.4166	-.0548	-.02	.0005	-.0001	.0072
	4.653	16.74	.4182	-.0544	1.02	-.0007	-.0011	-.0062
	4.653	16.72	.4209	-.0542	1.99	-.0017	-.0024	-.0188
	4.653	16.73	.4214	-.0537	3.02	-.0030	-.0026	-.0322
	4.653	16.73	.4239	-.0534	4.03	-.0040	-.0031	-.0458
	4.653	16.73	.4243	-.0529	5.04	-.0051	-.0036	-.0582
	4.653	16.73	.4270	-.0531	6.06	-.0064	-.0039	-.0738
	4.653	16.74	.4302	-.0504	8.09	-.0090	-.0048	-.1006
	4.653	16.78	.4334	-.0467	10.12	-.0120	-.0058	-.1284
	4.653	16.75	.4333	-.0411	12.14	-.0153	-.0078	-.1566
	4.653	16.73	.4341	-.0265	16.22	-.0226	-.0080	-.2209
	4.653	16.80	.4343	-.0147	20.16	-.0315	-.0028	-.2948

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^1FVH^3V	2.294	.03	-.0156	.0227	-3.98	.0040	-.0273	.0805
	2.294	.01	-.0158	.0207	-1.96	.0019	-.0138	.0411
	2.294	.01	-.0175	.0225	-1.00	.0006	-.0065	.0224
	2.294	.02	-.0204	.0225	-.02	-.0008	.0002	.0031
	2.294	.02	-.0224	.0232	1.00	-.0020	.0074	-.0157
	2.294	.00	-.0254	.0242	1.97	-.0028	.0145	-.0355
	2.294	.00	-.0256	.0253	2.96	-.0039	.0215	-.0544
	2.294	.02	-.0289	.0275	3.96	-.0050	.0291	-.0764
	2.294	-.01	-.0286	.0289	4.95	-.0063	.0361	-.0963
	2.294	-.03	-.0301	.0309	5.98	-.0074	.0432	-.1181
	2.294	-.05	-.0355	.0364	7.96	-.0098	.0571	-.1666
	2.294	-.06	-.0379	.0406	9.98	-.0124	.0706	-.2213
	2.294	.05	-.0499	.0533	16.09	-.0180	.1033	-.3901
	2.294	.09	-.0545	.0586	20.02	-.0203	.1268	-.5084
	2.294	.12	-.0428	.0473	12.04	-.0137	.0811	-.2762
	2.294	.01	-.0426	.0469	12.02	-.0135	.0802	-.2705
	2.294	8.66	.2916	-.0005	20.07	-.0282	.1200	-.5286
	2.294	8.58	.3018	-.0147	16.16	-.0216	.0944	-.4045
	2.294	8.57	.3091	-.0284	12.09	-.0157	.0687	-.2817
	2.294	8.82	.3236	-.0420	10.06	-.0127	.0594	-.2349
	2.294	8.71	.3327	-.0541	8.03	-.0100	.0463	-.1800
	2.294	8.70	.3391	-.0669	6.03	-.0075	.0347	-.1310
	2.294	8.65	.3416	-.0729	4.98	-.0061	.0287	-.1068
	2.294	8.65	.3427	-.0768	3.98	-.0047	.0233	-.0848
	2.294	8.64	.3423	-.0804	3.00	-.0034	.0177	-.0626
	2.294	8.60	.3434	-.0832	1.97	-.0022	.0126	-.0429
	2.294	8.57	.3464	-.0865	1.01	-.0013	.0072	-.0236
	2.294	8.58	.3481	-.0884	.01	-.0001	.0014	-.0033
	2.294	8.58	.3511	-.0890	-1.00	.0012	-.0044	.0181
	2.294	8.59	.3496	-.0871	-1.99	.0022	-.0096	.0355
	2.294	8.59	.3482	-.0816	-4.01	.0049	-.0218	.0791
	2.294	17.30	.6797	-.1645	-4.06	.0081	-.0155	.0894
	2.294	17.25	.6913	-.1720	-2.02	.0041	-.0070	.0428
	2.294	17.19	.6984	-.1756	-1.00	.0023	-.0034	.0214
	2.294	17.15	.6927	-.1735	.01	.0008	-.0002	-.0023
	2.294	17.18	.6933	-.1724	1.04	-.0010	.0031	-.0256
	2.294	17.18	.6926	-.1703	2.03	-.0030	.0066	-.0466
	2.294	17.35	.7078	-.1713	3.04	-.0051	.0105	-.0693
	2.294	17.31	.7046	-.1670	4.06	-.0074	.0145	-.0938
	2.294	17.32	.7043	-.1618	5.09	-.0096	.0191	-.1203
	2.294	17.31	.6994	-.1557	6.11	-.0118	.0238	-.1464
	2.294	17.32	.6892	-.1415	8.13	-.0160	.0343	-.1983
	2.294	17.33	.6859	-.1291	10.16	-.0203	.0466	-.2566
	2.294	17.35	.6791	-.1161	12.17	-.0251	.0601	-.3169
	2.294	17.39	.6662	-.0971	16.25	-.0350	.0843	-.4310
	2.294	17.38	.6637	-.0821	20.18	-.0444	.1015	-.5383
	2.975	.05	.0009	.0156	-4.00	.0028	-.0199	.0680
	2.975	.04	-.0017	.0151	-1.99	.0010	-.0092	.0322
	2.975	.06	-.0025	.0152	-1.00	.0003	-.0049	.0179
	2.975	.05	-.0048	.0151	.01	-.0005	.0000	.0006
	2.975	.07	-.0054	.0156	1.01	-.0013	.0052	-.0161
	2.975	.07	-.0058	.0160	1.99	-.0022	.0105	-.0340
	2.975	.05	-.0100	.0175	2.99	-.0029	.0154	-.0502
	2.975	.00	-.0104	.0188	3.97	-.0039	.0205	-.0681
	2.975	-.01	-.0142	.0206	4.99	-.0048	.0254	-.0875
	2.975	-.02	-.0162	.0224	6.01	-.0058	.0308	-.1072
	2.975	-.04	-.0182	.0259	8.01	-.0076	.0405	-.1494
	2.975	-.04	-.0196	.0289	10.04	-.0093	.0508	-.2004
	2.975	-.02	-.0231	.0324	12.06	-.0107	.0594	-.2481
	2.975	.02	-.0291	.0391	16.11	-.0135	.0774	-.3459
	2.975	-.01	-.0303	.0430	20.05	-.0165	.1002	-.4546
	2.975	8.47	.2514	-.0016	20.09	-.0180	.0917	-.4627
	2.975	8.43	.2592	-.0105	16.18	-.0129	.0702	-.3583
	2.975	8.40	.2671	-.0207	12.12	-.0086	.0524	-.2572
	2.975	8.44	.2706	-.0256	10.07	-.0074	.0438	-.2116
	2.975	8.41	.2742	-.0319	8.04	-.0064	.0349	-.1653
	2.975	8.41	.2804	-.0431	6.05	-.0037	.0257	-.1196
	2.975	8.42	.2822	-.0484	5.05	-.0026	.0206	-.0999
	2.975	8.42	.2856	-.0519	4.02	-.0019	.0162	-.0774
	2.975	8.39	.2844	-.0552	3.01	-.0014	.0125	-.0599
	2.975	8.39	.2845	-.0581	2.01	-.0008	.0082	-.0406
	2.975	8.38	.2849	-.0606	1.02	-.0004	.0044	-.0231
	2.975	8.40	.2871	-.0622	.01	.0001	.0004	-.0057
	2.975	8.40	.2860	-.0618	-1.00	.0002	-.0034	.0112
	2.975	8.42	.2863	-.0606	-2.01	.0008	-.0076	.0305
	2.975	8.41	.2822	-.0550	-4.02	.0018	-.0153	.0654
	2.975	17.00	.5785	-.1385	-4.04	.0046	-.0133	.0800
	2.975	16.95	.5820	-.1435	-2.01	.0026	-.0058	.0361
	2.975	16.87	.5841	-.1436	-1.01	.0016	-.0027	.0157
	2.975	16.82	.5859	-.1432	.02	.0010	-.0004	-.0055
	2.975	16.82	.5857	-.1431	1.02	-.0002	.0027	-.0265
	2.975	16.80	.5843	-.1419	2.03	-.0011	.0058	-.0489
	2.975	16.77	.5847	-.1384	3.04	-.0023	.0095	-.0686
	2.975	16.75	.5836	-.1351	4.07	-.0035	.0135	-.0928
	2.975	16.74	.5785	-.1306	5.06	-.0047	.0179	-.1156
	2.975	17.00	.5915	-.1339	5.06	-.0049	.0183	-.1168
	2.975	17.00	.5901	-.1300	6.09	-.0061	.0232	-.1421
	2.975	17.02	.5872	-.1235	8.10	-.0087	.0327	-.1910
	2.975	17.04	.5846	-.1143	10.13	-.0122	.0426	-.2400
	2.975	17.05	.5797	-.1041	12.16	-.0156	.0522	-.2885
	2.975	17.04	.5747	-.0903	16.21	-.0229	.0691	-.3896
	2.975	17.05	.5736	-.0756	20.16	-.0326	.0839	-.4878

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
$W^1F_VH^3_V$	3.963	.05	-.0039	.0139	-4.01	.0019	-.0144	.0582
	3.963	.06	-.0062	.0131	-1.99	.0007	-.0072	.0288
	3.963	.03	-.0074	.0137	-1.00	-.0001	-.0031	.0144
	3.963	.01	-.0087	.0139	.01	-.0005	.0001	-.0000
	3.963	.01	-.0076	.0138	1.02	-.0010	.0035	-.0145
	3.963	.02	-.0109	.0146	2.00	-.0017	.0074	-.0304
	3.963	.01	-.0099	.0153	2.98	-.0024	.0112	-.0439
	3.963	.03	-.0108	.0162	4.02	-.0030	.0147	-.0607
	3.963	.03	-.0118	.0180	5.00	-.0036	.0181	-.0767
	3.963	.03	-.0103	.0187	6.03	-.0043	.0215	-.0946
	3.963	.03	-.0142	.0216	8.03	-.0055	.0288	-.1314
	3.963	.03	-.0157	.0239	10.03	-.0068	.0354	-.1688
	3.963	.01	-.0193	.0264	12.10	-.0081	.0423	-.2097
	3.963	.03	-.0217	.0292	16.17	-.0109	.0577	-.2920
	3.963	.05	-.0237	.0305	20.01	-.0147	.0820	-.3928
	3.963	8.37	.2086	.0037	20.06	-.0136	.0712	-.4060
	3.963	8.31	.2116	-.0026	16.15	-.0086	.0527	-.3095
	3.963	8.29	.2121	-.0083	12.15	-.0060	.0381	-.2239
	3.963	8.28	.2137	-.0129	10.10	-.0052	.0314	-.1845
	3.963	8.31	.2138	-.0161	8.04	-.0050	.0258	-.1462
	3.963	8.31	.2164	-.0218	6.07	-.0023	.0199	-.1102
	3.963	8.29	.2171	-.0239	4.98	-.0017	.0165	-.0902
	3.963	8.29	.2186	-.0265	4.02	-.0011	.0133	-.0737
	3.963	8.29	.2189	-.0270	3.03	-.0010	.0098	-.0557
	3.963	8.30	.2206	-.0288	2.01	-.0007	.0065	-.0381
	3.963	8.30	.2185	-.0301	1.04	-.0004	.0034	-.0219
	3.963	8.30	.2202	-.0308	.01	-.0002	.0006	-.0042
	3.963	8.32	.2183	-.0309	-1.00	.0000	-.0022	.0111
	3.963	8.32	.2195	-.0303	-2.00	.0002	-.0053	.0273
	3.963	8.29	.2201	-.0288	-4.02	.0007	-.0128	.0629
	3.963	16.78	.4764	-.0862	-4.02	.0013	-.0152	.0769
	3.963	16.71	.4777	-.0874	-2.00	.0005	-.0069	.0349
	3.963	16.65	.4810	-.0887	-1.00	.0003	-.0026	.0133
	3.963	16.58	.4826	-.0885	.03	.0002	.0004	-.0070
	3.963	16.56	.4800	-.0876	1.03	.0001	.0037	-.0264
	3.963	16.84	.4937	-.0906	2.01	-.0003	.0079	-.0479
	3.963	16.84	.4954	-.0904	3.02	-.0007	.0119	-.0704
	3.963	16.82	.4948	-.0903	4.05	-.0012	.0161	-.0920
	3.963	16.82	.4980	-.0908	5.03	-.0018	.0201	-.1140
	3.963	16.82	.4993	-.0902	6.06	-.0026	.0243	-.1361
	3.963	16.83	.4964	-.0865	8.07	-.0043	.0329	-.1820
	3.963	16.83	.4955	-.0811	10.10	-.0064	.0396	-.2251
	3.963	16.86	.4919	-.0741	12.13	-.0088	.0446	-.2649
	3.963	16.88	.4885	-.0558	16.19	-.0140	.0532	-.3493
	3.963	16.85	.4860	-.0426	20.11	-.0214	.0662	-.4415
	4.653	.02	.0102	.0085	-4.01	.0010	-.0117	.0541
	4.653	.04	.0097	.0076	-1.97	.0001	-.0059	.0247
	4.653	.03	.0078	.0069	-1.02	-.0003	-.0027	.0120
	4.653	.01	.0060	.0071	-.01	-.0005	.0003	-.0018
	4.653	.01	.0070	.0070	1.00	-.0010	.0034	-.0154
	4.653	.01	.0054	.0072	2.00	-.0015	.0065	-.0312
	4.653	.03	.0065	.0081	3.00	-.0019	.0094	-.0448
	4.653	.05	.0049	.0088	3.98	-.0024	.0120	-.0586
	4.653	.05	.0062	.0096	5.01	-.0028	.0148	-.0741
	4.653	.05	.0020	.0111	6.05	-.0033	.0173	-.0908
	4.653	.05	.0019	.0132	8.01	-.0045	.0227	-.1234
	4.653	.04	.0022	.0152	10.06	-.0055	.0278	-.1594
	4.653	.04	-.0003	.0171	12.08	-.0068	.0340	-.1964
	4.653	.06	.0007	.0200	16.12	-.0100	.0528	-.2803
	4.653	.06	.0024	.0175	19.99	-.0144	.0777	-.3798
	4.653	8.25	.2134	-.0042	20.02	-.0127	.0679	-.3918
	4.653	8.28	.2139	-.0094	16.11	-.0079	.0499	-.2980
	4.653	8.29	.2162	-.0142	12.09	-.0045	.0357	-.2160
	4.653	8.33	.2161	-.0157	10.05	-.0037	.0298	-.1787
	4.653	8.36	.2163	-.0182	8.05	-.0031	.0243	-.1432
	4.653	8.30	.2139	-.0208	6.04	-.0030	.0191	-.1085
	4.653	8.27	.2231	-.0230	5.02	-.0020	.0153	-.0918
	4.653	8.29	.2217	-.0243	4.02	-.0016	.0118	-.0743
	4.653	8.26	.2184	-.0244	3.01	-.0012	.0088	-.0581
	4.653	8.28	.2198	-.0241	2.01	-.0009	.0060	-.0412
	4.653	8.28	.2180	-.0244	1.02	-.0007	.0037	-.0254
	4.653	8.30	.2173	-.0258	.01	-.0005	.0011	-.0096
	4.653	8.30	.2188	-.0260	-1.00	-.0002	-.0019	.0072
	4.653	8.28	.2205	-.0257	-1.94	.0001	-.0050	.0229
	4.653	8.28	.2207	-.0253	-4.01	.0009	-.0108	.0553
	4.653	16.66	.4574	-.0823	-4.00	.0009	-.0150	.0706
	4.653	16.64	.4604	-.0821	-1.99	.0004	-.0071	.0304
	4.653	16.61	.4616	-.0823	-1.00	.0002	-.0032	.0118
	4.653	16.55	.4633	-.0801	.01	.0002	.0009	-.0109
	4.653	16.56	.4658	-.0809	1.01	.0002	.0047	-.0317
	4.653	16.65	.4709	-.0830	2.01	-.0001	.0089	-.0521
	4.653	16.71	.4760	-.0847	3.03	-.0004	.0130	-.0738
	4.653	16.68	.4762	-.0856	4.02	-.0005	.0169	-.0933
	4.653	16.66	.4787	-.0880	5.02	-.0009	.0212	-.1150
	4.653	16.66	.4788	-.0884	6.05	-.0012	.0262	-.1363
	4.653	16.66	.4801	-.0872	8.03	-.0020	.0339	-.1789
	4.653	16.66	.4776	-.0810	10.07	-.0035	.0394	-.2180
	4.653	16.67	.4768	-.0758	12.10	-.0055	.0433	-.2553
	4.653	16.70	.4706	-.0587	16.17	-.0106	.0520	-.3336
	4.653	16.71	.4687	-.0445	20.07	-.0171	.0667	-.4250

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^1F	2.294	.01	-.0041	.0014	-4.04	.0000	.0099	.0175
	2.294	.01	-.0058	.0017	-2.02	.0000	.0049	.0081
	2.294	.01	-.0048	.0029	-1.05	-.0006	.0023	.0040
	2.294	.01	-.0070	.0022	.01	-.0010	-.0010	-.0002
	2.294	.01	-.0063	.0022	1.06	-.0010	-.0037	-.0045
	2.294	.01	-.0071	.0020	2.07	-.0012	-.0061	-.0093
	2.294	.01	-.0049	.0023	3.06	-.0011	-.0089	-.0136
	2.294	.01	-.0072	.0024	4.06	-.0010	-.0113	-.0185
	2.294	.03	-.0079	.0025	5.02	-.0010	-.0138	-.0237
	2.294	.01	-.0069	.0024	6.14	-.0011	-.0171	-.0319
	2.294	.01	-.0078	.0018	8.15	-.0013	-.0223	-.0488
	2.294	-.01	-.0064	.0010	10.26	-.0012	-.0263	-.0764
	2.294	-.01	-.0071	.0004	12.41	-.0012	-.0320	-.1099
	2.294	-.02	-.0132	.0026	16.55	-.0011	-.0429	-.1803
	2.294	.02	-.0120	.0018	20.53	-.0002	-.0496	-.2558
	2.294	8.57	.3080	-.0255	-4.13	.0009	.0125	.0235
	2.294	8.54	.3157	-.0272	-2.03	.0004	.0061	.0110
	2.294	8.56	.3153	-.0275	-1.00	.0002	.0028	.0045
	2.294	8.54	.3164	-.0278	.05	-.0001	-.0005	-.0018
	2.294	8.52	.3158	-.0272	.99	-.0004	-.0043	-.0072
	2.294	8.52	.3125	-.0268	2.03	-.0006	-.0063	-.0139
	2.294	8.61	.3208	-.0259	3.10	-.0009	-.0104	-.0209
	2.294	8.59	.3232	-.0255	4.14	-.0011	-.0136	-.0281
	2.294	8.59	.3198	-.0244	5.15	-.0013	-.0167	-.0353
	2.294	8.59	.3197	-.0225	6.22	-.0016	-.0200	-.0443
	2.294	8.62	.3182	-.0157	8.27	-.0023	-.0262	-.0654
	2.294	8.62	.3104	-.0048	10.27	-.0032	-.0309	-.0925
	2.294	8.62	.3071	.0043	12.40	-.0041	-.0349	-.1281
	2.294	8.61	.2991	.0133	16.55	-.0062	-.0427	-.1984
	2.294	8.59	.2901	.0178	20.61	-.0086	-.0465	-.2726
	2.294	17.56	.6297	-.0298	-4.14	.0055	.0119	.0473
	2.294	17.51	.6344	-.0379	-2.01	.0031	.0047	.0233
	2.294	17.47	.6389	-.0399	-1.03	.0018	.0024	.0113
	2.294	17.44	.6435	-.0406	-.03	.0007	.0008	-.0018
	2.294	17.61	.6563	-.0410	1.09	-.0006	-.0017	-.0176
	2.294	17.61	.6579	-.0393	2.10	-.0017	-.0040	-.0298
	2.294	17.62	.6568	-.0362	3.11	-.0031	-.0074	-.0415
	2.294	17.61	.6574	-.0336	4.17	-.0045	-.0106	-.0532
	2.294	17.61	.6491	-.0290	5.14	-.0056	-.0139	-.0639
	2.294	17.62	.6530	-.0245	6.24	-.0072	-.0182	-.0782
	2.294	17.63	.6499	-.0153	8.31	-.0101	-.0269	-.1011
	2.294	17.62	.6413	-.0046	10.35	-.0127	-.0345	-.1250
	2.294	17.64	.6416	.0074	12.51	-.0156	-.0411	-.1568
	2.294	17.68	.6459	.0141	16.63	-.0212	-.0497	-.2230
	2.294	17.67	.6412	.0188	20.69	-.0271	-.0557	-.2946
	2.294	-.07	-.0083	.0007	.00	.0000	-.0002	.0028
	2.975	.04	.0046	-.0010	-4.09	-.0005	.0106	.0164
	2.975	.02	.0007	-.0007	-2.02	-.0004	.0050	.0060
	2.975	.00	-.0004	-.0006	-.99	-.0005	.0022	.0016
	2.975	-.02	-.0014	-.0004	.01	-.0005	-.0009	-.0023
	2.975	-.02	-.0007	-.0005	1.04	-.0005	-.0038	-.0068
	2.975	-.04	-.0018	-.0003	2.04	-.0006	-.0067	-.0113
	2.975	.02	.0008	-.0006	3.05	-.0006	-.0094	-.0170
	2.975	.02	.0016	-.0003	4.07	-.0006	-.0119	-.0227
	2.975	.04	.0008	-.0002	5.11	-.0006	-.0150	-.0299
	2.975	.04	.0017	-.0003	6.11	-.0006	-.0174	-.0373
	2.975	.02	.0006	-.0004	8.17	-.0007	-.0218	-.0598
	2.975	.02	.0017	-.0010	10.23	-.0007	-.0251	-.0878
	2.975	.02	-.0005	-.0013	12.28	-.0007	-.0294	-.1168
	2.975	.00	.0006	-.0003	16.43	-.0006	-.0362	-.1805
	2.975	.02	-.0003	.0002	20.40	-.0005	-.0421	-.2431
	2.975	8.46	.2508	.0185	20.40	-.0078	-.0422	-.2596
	2.975	8.39	.2559	.0136	16.46	-.0049	-.0363	-.1978
	2.975	8.35	.2593	.0073	12.32	-.0029	-.0299	-.1343
	2.975	8.46	.2633	.0043	10.26	-.0027	-.0270	-.1059
	2.975	8.47	.2652	-.0010	8.18	-.0021	-.0236	-.0770
	2.975	8.46	.2660	-.0077	6.14	-.0018	-.0198	-.0535
	2.975	8.46	.2664	-.0103	5.12	-.0015	-.0168	-.0433
	2.975	8.43	.2636	-.0113	4.06	-.0016	-.0140	-.0341
	2.975	8.43	.2641	-.0130	3.07	-.0012	-.0106	-.0253
	2.975	8.45	.2664	-.0144	2.05	-.0010	-.0074	-.0184
	2.975	8.45	.2654	-.0150	1.05	-.0007	-.0041	-.0115
	2.975	8.44	.2626	-.0151	.00	-.0004	-.0008	-.0051
	2.975	8.44	.2616	-.0147	-1.01	-.0002	.0028	.0019
	2.975	8.44	.2605	-.0144	-2.04	.0002	.0060	.0087
	2.975	8.43	.2587	-.0118	-4.08	.0007	.0122	.0225
	2.975	17.22	.5198	-.0233	-4.10	.0051	.0103	.0448
	2.975	17.17	.5283	-.0299	-2.04	.0029	.0055	.0207
	2.975	17.21	.5346	-.0306	-1.03	.0022	.0033	.0090
	2.975	17.20	.5380	-.0321	.01	.0009	.0007	-.0030
	2.975	17.18	.5434	-.0325	1.06	.0000	-.0024	-.0154
	2.975	17.15	.5415	-.0308	2.05	-.0013	-.0050	-.0268
	2.975	17.25	.5447	-.0293	3.09	-.0026	-.0071	-.0401
	2.975	17.24	.5447	-.0264	4.10	-.0039	-.0097	-.0522
	2.975	17.24	.5433	-.0227	5.15	-.0052	-.0123	-.0656
	2.975	17.24	.5502	-.0180	6.20	-.0063	-.0150	-.0796
	2.975	17.23	.5422	-.0075	8.22	-.0087	-.0200	-.1034
	2.975	17.24	.5392	.0008	10.29	-.0111	-.0265	-.1285
	2.975	17.24	.5395	.0043	12.36	-.0133	-.0313	-.1565
	2.975	17.28	.5420	.0109	16.48	-.0178	-.0387	-.2182
	2.975	17.28	.5446	.0199	20.47	-.0223	-.0471	-.2799

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^1F	3.963	.00	-.0215	.0037	-4.05	-.0003	.0091	.0248
	3.963	.03	-.0223	.0038	-2.01	-.0003	.0040	.0139
	3.963	.05	-.0217	.0038	-1.01	-.0003	.0016	.0098
	3.963	.05	-.0233	.0040	.02	-.0003	-.0011	.0048
	3.963	-.01	-.0248	.0042	1.04	-.0002	-.0041	.0005
	3.963	-.01	-.0265	.0045	2.00	-.0003	-.0069	-.0028
	3.963	-.01	-.0257	.0044	3.03	-.0003	-.0093	-.0086
	3.963	-.03	-.0273	.0046	4.02	-.0002	-.0119	-.0153
	3.963	-.03	-.0263	.0045	5.06	-.0002	-.0140	-.0226
	3.963	-.05	-.0277	.0047	6.11	-.0003	-.0159	-.0318
	3.963	-.05	-.0278	.0048	8.11	-.0003	-.0190	-.0524
	3.963	-.01	-.0276	.0049	10.15	-.0003	-.0218	-.0760
	3.963	-.01	-.0273	.0049	12.20	-.0003	-.0256	-.0998
	3.963	.01	-.0290	.0053	16.24	-.0003	-.0321	-.1506
	3.963	-.01	-.0302	.0055	20.24	-.0003	-.0364	-.2087
	3.963	8.29	.1766	.0282	20.27	-.0071	-.0399	-.2268
	3.963	8.26	.1767	.0238	16.30	-.0054	-.0334	-.1684
	3.963	8.26	.1752	.0197	12.22	-.0035	-.0270	-.1151
	3.963	8.25	.1755	.0173	10.17	-.0030	-.0235	-.0918
	3.963	8.25	.1727	.0151	8.11	-.0023	-.0199	-.0665
	3.963	8.22	.1703	.0137	6.13	-.0018	-.0166	-.0446
	3.963	8.24	.1690	.0130	5.07	-.0015	-.0143	-.0348
	3.963	8.22	.1678	.0119	4.04	-.0012	-.0125	-.0250
	3.963	8.25	.1684	.0089	3.04	-.0009	-.0098	-.0167
	3.963	8.23	.1695	.0075	2.02	-.0006	-.0072	-.0086
	3.963	8.23	.1691	.0068	1.01	-.0003	-.0044	-.0012
	3.963	8.25	.1680	.0065	.01	-.0001	-.0013	.0061
	3.963	8.25	.1670	.0062	-1.02	.0001	.0016	.0127
	3.963	8.27	.1682	.0064	-2.04	.0003	.0047	.0201
	3.963	8.26	.1641	.0100	-4.11	.0008	.0095	.0363
	3.963	16.82	.3980	.0045	-4.12	.0036	.0080	.0543
	3.963	16.88	.4078	-.0012	-2.03	.0019	.0038	.0312
	3.963	16.86	.4150	-.0038	-1.03	.0012	.0021	.0194
	3.963	16.86	.4164	-.0047	.02	.0004	.0001	.0074
	3.963	16.91	.4200	-.0047	1.01	-.0004	-.0029	-.0038
	3.963	16.89	.4194	-.0029	2.04	-.0013	-.0053	-.0158
	3.963	16.89	.4209	-.0018	3.04	-.0020	-.0070	-.0279
	3.963	16.89	.4165	.0014	4.04	-.0030	-.0091	-.0397
	3.963	16.90	.4180	.0037	5.06	-.0040	-.0111	-.0516
	3.963	16.90	.4213	.0068	6.12	-.0052	-.0131	-.0653
	3.963	16.87	.4193	.0131	8.14	-.0071	-.0169	-.0890
	3.963	16.90	.4235	.0166	10.19	-.0094	-.0216	-.1147
	3.963	16.89	.4222	.0209	12.24	-.0115	-.0266	-.1403
	3.963	16.92	.4232	.0305	16.34	-.0152	-.0362	-.1941
	3.963	16.97	.4259	.0384	20.28	-.0186	-.0451	-.2508
	4.653	.03	-.0314	.0042	-4.07	-.0005	.0086	.0300
	4.653	-.04	-.0299	.0041	-2.01	-.0006	.0038	.0190
	4.653	-.01	-.0320	.0034	-1.01	-.0004	.0011	.0138
	4.653	-.03	-.0314	.0028	.00	-.0004	-.0017	.0088
	4.653	.01	-.0306	.0028	1.00	-.0003	-.0046	.0037
	4.653	-.03	-.0298	.0032	2.01	-.0003	-.0073	-.0014
	4.653	-.03	-.0317	.0035	3.02	-.0003	-.0096	-.0074
	4.653	-.03	-.0309	.0034	4.03	-.0003	-.0118	-.0144
	4.653	-.04	-.0300	.0033	5.04	-.0003	-.0140	-.0224
	4.653	-.05	-.0318	.0036	6.08	-.0003	-.0160	-.0314
	4.653	-.04	-.0296	.0034	8.11	-.0004	-.0189	-.0524
	4.653	-.02	-.0273	.0032	10.12	-.0005	-.0225	-.0733
	4.653	-.01	-.0278	.0033	12.16	-.0005	-.0262	-.0965
	4.653	-.01	-.0282	.0044	16.22	-.0003	-.0311	-.1472
	4.653	.02	-.0257	.0047	20.17	-.0005	-.0333	-.2028
	4.653	8.23	.1694	.0268	20.19	-.0078	-.0367	-.2196
	4.653	8.23	.1689	.0242	16.26	-.0065	-.0312	-.1622
	4.653	8.24	.1689	.0201	12.16	-.0041	-.0250	-.1143
	4.653	8.26	.1662	.0184	10.12	-.0034	-.0220	-.0907
	4.653	8.25	.1642	.0176	8.10	-.0027	-.0184	-.0692
	4.653	8.25	.1643	.0165	6.09	-.0020	-.0146	-.0493
	4.653	8.23	.1631	.0146	5.07	-.0017	-.0125	-.0404
	4.653	8.23	.1648	.0124	4.04	-.0013	-.0105	-.0315
	4.653	8.23	.1640	.0116	3.03	-.0011	-.0088	-.0226
	4.653	8.21	.1653	.0108	2.02	-.0008	-.0066	-.0147
	4.653	8.23	.1647	.0099	1.03	-.0004	-.0040	-.0078
	4.653	8.23	.1663	.0087	-.01	-.0003	-.0010	.0003
	4.653	8.23	.1649	.0087	-1.01	.0000	.0014	.0082
	4.653	8.24	.1638	.0093	-2.03	.0002	.0040	.0161
	4.653	8.25	.1619	.0123	-4.05	.0009	.0089	.0318
	4.653	16.80	.3840	.0002	-4.05	.0031	.0063	.0467
	4.653	16.71	.3894	-.0032	-2.01	.0016	.0030	.0245
	4.653	16.81	.3985	-.0043	-1.03	.0011	.0014	.0119
	4.653	16.77	.4000	-.0049	.01	.0004	.0000	.0002
	4.653	16.78	.4039	-.0054	1.03	-.0003	-.0013	-.0114
	4.653	16.78	.4055	-.0055	2.02	-.0013	-.0032	-.0250
	4.653	16.78	.4067	-.0046	3.03	-.0020	-.0050	-.0356
	4.653	16.77	.4083	-.0037	4.05	-.0027	-.0065	-.0483
	4.653	16.77	.4096	-.0024	5.06	-.0035	-.0080	-.0599
	4.653	16.77	.4112	-.0010	6.09	-.0044	-.0093	-.0725
	4.653	16.80	.4117	.0045	8.09	-.0062	-.0133	-.0948
	4.653	16.82	.4158	.0077	10.15	-.0083	-.0174	-.1192
	4.653	16.83	.4175	.0104	12.19	-.0104	-.0219	-.1440
	4.653	16.84	.4162	.0212	16.28	-.0145	-.0327	-.1905
	4.653	16.82	.4227	.0309	20.20	-.0181	-.0399	-.2478

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
$W^2F_VH^1_V$	2.294	.04	-.0199	.0517	-3.99	.0063	-.0314	.0863
	2.294	.08	-.0196	.0518	-1.99	.0031	-.0163	.0453
	2.294	.06	-.0195	.0522	-1.01	.0015	-.0084	.0249
	2.294	.04	-.0236	.0554	.00	-.0009	-.0001	.0021
	2.294	.02	-.0236	.0555	1.05	-.0026	.0081	-.0184
	2.294	.02	-.0237	.0545	1.99	-.0042	.0154	-.0379
	2.294	.00	-.0239	.0543	3.01	-.0057	.0231	-.0566
	2.294	.00	-.0225	.0539	4.01	-.0076	.0314	-.0793
	2.294	.00	-.0219	.0508	5.02	-.0094	.0395	-.1057
	2.294	.00	-.0203	.0491	6.04	-.0112	.0476	-.1288
	2.294	.00	-.0185	.0441	8.05	-.0145	.0625	-.1776
	2.294	-.02	-.0135	.0358	10.09	-.0179	.0773	-.2341
	2.294	-.39	-.0180	.0299	12.15	-.0213	.0917	-.2965
	2.294	-.02	.0005	-.0001	16.27	-.0279	.1140	-.4161
	2.294	-.02	.0115	-.0290	20.23	-.0336	.1399	-.5442
	2.294	8.49	.3769	-.1594	20.28	-.0428	.1330	-.5526
	2.294	8.46	.3644	-.1222	16.30	-.0330	.1071	-.4280
	2.294	8.43	.3501	-.0884	12.19	-.0232	.0802	-.3038
	2.294	8.57	.3471	-.0747	10.17	-.0185	.0642	-.2426
	2.294	8.49	.3387	-.0601	8.10	-.0146	.0504	-.1854
	2.294	8.57	.3364	-.0502	6.08	-.0108	.0375	-.1351
	2.294	8.59	.3330	-.0443	5.06	-.0087	.0307	-.1103
	2.294	8.57	.3252	-.0403	4.05	-.0067	.0239	-.0847
	2.294	8.55	.3234	-.0383	3.04	-.0049	.0181	-.0627
	2.294	8.54	.3280	-.0371	2.03	-.0038	.0126	-.0440
	2.294	8.55	.3263	-.0354	1.03	-.0020	.0069	-.0242
	2.294	8.52	.3259	-.0354	.01	-.0002	.0004	-.0016
	2.294	8.54	.3241	-.0358	-.97	.0015	-.0058	.0207
	2.294	8.52	.3222	-.0354	-2.01	.0034	-.0125	.0436
	2.294	8.55	.3212	-.0389	-4.04	.0072	-.0262	.0893
	2.294	17.00	.6717	-.1768	-4.11	.0150	-.0179	.1054
	2.294	16.97	.6771	-.1728	-2.05	.0082	-.0086	.0575
	2.294	17.01	.6839	-.1772	-1.02	.0048	-.0043	.0327
	2.294	17.04	.6935	-.1819	.01	.0017	-.0002	.0077
	2.294	17.04	.6957	-.1834	1.03	-.0014	.0033	-.0158
	2.294	17.06	.6913	-.1823	2.05	-.0044	.0070	-.0373
	2.294	17.05	.6992	-.1836	3.05	-.0078	.0113	-.0632
	2.294	17.04	.6938	-.1855	4.07	-.0111	.0156	-.0873
	2.294	17.04	.7061	-.1930	5.12	-.0150	.0209	-.1150
	2.294	17.04	.7102	-.2009	6.16	-.0186	.0265	-.1441
	2.294	16.96	.7115	-.2115	8.20	-.0246	.0393	-.1998
	2.294	17.01	.7241	-.2242	10.23	-.0309	.0524	-.2604
	2.294	16.96	.7265	-.2401	12.33	-.0370	.0667	-.3214
	2.294	17.01	.7354	-.2663	16.41	-.0465	.0936	-.4363
	2.294	17.04	.7612	-.3058	20.38	-.0577	.1195	-.5582
	2.975	.05	-.0132	.0298	-3.98	.0041	-.0216	.0694
	2.975	.04	-.0120	.0295	-2.00	.0018	-.0106	.0332
	2.975	.04	-.0127	.0293	-.99	.0007	-.0051	.0187
	2.975	.04	-.0116	.0291	.00	-.0005	.0004	.0023
	2.975	.04	-.0119	.0290	1.02	-.0017	.0052	-.0154
	2.975	.04	-.0124	.0294	2.02	-.0027	.0100	-.0313
	2.975	.04	-.0127	.0292	3.04	-.0040	.0156	-.0502
	2.975	.04	-.0113	.0282	4.03	-.0053	.0210	-.0687
	2.975	.02	-.0129	.0284	4.20	-.0054	.0219	-.0711
	2.975	.03	-.0121	.0282	5.03	-.0062	.0262	-.0844
	2.975	.04	-.0101	.0266	6.07	-.0077	.0323	-.1082
	2.975	.05	-.0086	.0228	8.08	-.0101	.0426	-.1515
	2.975	.03	-.0050	.0151	10.14	-.0125	.0532	-.2017
	2.975	.03	.0001	.0057	12.19	-.0146	.0627	-.2489
	2.975	.01	.0113	-.0167	16.24	-.0196	.0830	-.3568
	2.975	.02	.0237	-.0417	20.21	-.0252	.1075	-.4656
	2.975	.03	-.0030	.0143	10.15	-.0127	.0537	-.2061
	2.975	8.37	.2678	-.0366	-4.05	.0034	-.0177	.0764
	2.975	8.39	.2709	-.0372	-1.97	.0014	-.0078	.0355
	2.975	8.37	.2705	-.0365	-1.01	.0006	-.0040	.0182
	2.975	8.37	.2685	-.0356	.03	-.0003	.0007	-.0016
	2.975	8.37	.2698	-.0360	1.06	-.0011	.0051	-.0201
	2.975	8.37	.2693	-.0359	2.03	-.0017	.0079	-.0350
	2.975	8.36	.2745	-.0377	3.03	-.0026	.0121	-.0541
	2.975	8.36	.2759	-.0381	4.05	-.0036	.0165	-.0725
	2.975	8.36	.2777	-.0395	5.07	-.0046	.0212	-.0953
	2.975	8.36	.2793	-.0419	6.08	-.0056	.0259	-.1163
	2.975	8.38	.2828	-.0459	8.10	-.0080	.0361	-.1631
	2.975	8.38	.2850	-.0488	10.17	-.0108	.0466	-.2128
	2.975	8.38	.2868	-.0551	12.21	-.0133	.0560	-.2609
	2.975	8.37	.2945	-.0712	16.28	-.0193	.0774	-.3672
	2.975	8.36	.3091	-.0944	20.23	-.0270	.0991	-.4721
	2.975	16.76	.6354	-.2215	20.28	-.0462	.0963	-.4994
	2.975	16.76	.6174	-.1867	16.32	-.0349	.0777	-.3962
	2.975	16.77	.5960	-.1517	12.26	-.0236	.0564	-.2921
	2.975	16.75	.5854	-.1376	10.21	-.0186	.0460	-.2388
	2.975	16.75	.5794	-.1295	8.17	-.0138	.0342	-.1869
	2.975	16.75	.5754	-.1258	6.14	-.0101	.0235	-.1368
	2.975	16.75	.5695	-.1233	5.08	-.0082	.0182	-.1098
	2.975	16.73	.5711	-.1233	4.08	-.0064	.0135	-.0855
	2.975	16.74	.5674	-.1226	3.06	-.0054	.0104	-.0626
	2.975	16.74	.5651	-.1200	2.03	-.0033	.0066	-.0421
	2.975	16.74	.5576	-.1158	1.05	-.0011	.0030	-.0177
	2.975	16.76	.5608	-.1182	.02	.0012	.0000	.0033
	2.975	16.75	.5587	-.1165	-1.02	.0034	-.0037	.0264
	2.975	16.78	.5529	-.1138	-2.01	.0050	-.0071	.0471
	2.975	16.78	.5495	-.1122	-4.08	.0085	-.0163	.0954
	2.975	16.76	.5719	-.1247	6.14	-.0103	.0230	-.1343
	2.975	16.76	.5888	-.1531	12.27	-.0241	.0565	-.2893

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^2FVH^1v	3.963	.04	-.0124	.0354	-4.00	.0028	-.0147	.0570
	3.963	.04	-.0100	.0356	-1.98	.0011	-.0072	.0288
	3.963	.04	-.0088	.0355	-1.00	.0003	-.0032	.0130
	3.963	.06	-.0099	.0351	.01	-.0005	.0010	-.0027
	3.963	.08	-.0088	.0348	1.04	-.0012	.0049	-.0177
	3.963	.08	-.0100	.0350	2.02	-.0020	.0088	-.0310
	3.963	.06	-.0109	.0347	3.03	-.0029	.0128	-.0484
	3.963	.06	-.0095	.0338	4.03	-.0038	.0166	-.0657
	3.963	.04	-.0085	.0325	5.04	-.0044	.0198	-.0791
	3.963	.04	-.0096	.0307	6.07	-.0052	.0233	-.0948
	3.963	.02	-.0043	.0231	8.06	-.0069	.0305	-.1346
	3.963	.00	.0030	.0120	10.10	-.0087	.0379	-.1738
	3.963	-.01	.0082	.0016	12.15	-.0103	.0433	-.2124
	3.963	.00	.0211	-.0247	16.19	-.0147	.0613	-.3001
	3.963	.01	.0302	-.0449	20.13	-.0196	.0857	-.4020
	3.963	8.24	.2582	-.0808	20.17	-.0210	.0756	-.4108
	3.963	8.17	.2481	-.0612	16.24	-.0139	.0571	-.3164
	3.963	8.16	.2378	-.0469	12.18	-.0090	.0412	-.2274
	3.963	8.15	.2316	-.0418	10.12	-.0071	.0339	-.1859
	3.963	8.15	.2269	-.0382	8.10	-.0055	.0273	-.1455
	3.963	8.15	.2243	-.0348	6.07	-.0041	.0209	-.1100
	3.963	8.15	.2200	-.0335	5.04	-.0033	.0176	-.0932
	3.963	8.15	.2180	-.0329	4.05	-.0025	.0136	-.0687
	3.963	8.18	.2199	-.0336	3.04	-.0021	.0101	-.0539
	3.963	8.18	.2185	-.0335	2.01	-.0015	.0068	-.0365
	3.963	8.18	.2169	-.0325	1.04	-.0009	.0034	-.0167
	3.963	8.18	.2157	-.0324	.01	-.0003	.0004	-.0025
	3.963	8.21	.2168	-.0334	-1.01	.0002	-.0023	.0127
	3.963	8.25	.2174	-.0335	-2.01	.0008	-.0059	.0326
	3.963	8.26	.2145	-.0324	-4.04	.0022	-.0136	.0707
	3.963	16.50	.4555	-.0620	-4.06	.0049	-.0168	.0918
	3.963	16.47	.4633	-.0617	-2.00	.0027	-.0088	.0494
	3.963	16.53	.4668	-.0621	-1.02	.0016	-.0050	.0306
	3.963	16.52	.4684	-.0618	.00	.0005	-.0015	.0094
	3.963	16.50	.4699	-.0600	1.02	-.0004	.0022	-.0111
	3.963	16.56	.4735	-.0612	2.03	-.0015	.0054	-.0291
	3.963	16.54	.4739	-.0623	3.02	-.0028	.0099	-.0532
	3.963	16.55	.4798	-.0662	4.06	-.0038	.0148	-.0802
	3.963	16.55	.4814	-.0671	5.05	-.0049	.0188	-.0990
	3.963	16.53	.4832	-.0688	6.10	-.0060	.0236	-.1217
	3.963	16.51	.4886	-.0726	8.11	-.0083	.0333	-.1680
	3.963	16.54	.4951	-.0760	10.14	-.0110	.0423	-.2206
	3.963	16.54	.4979	-.0774	12.18	-.0138	.0473	-.2604
	3.963	16.60	.5099	-.0333	16.28	-.0205	.0584	-.3500
	3.963	16.58	.5284	-.1781	20.20	-.0300	.0734	-.4445
	4.653	.01	-.0121	.0254	-4.02	.0020	-.0120	.0575
	4.653	.01	-.0127	.0265	-2.00	.0009	-.0066	.0325
	4.653	.01	-.0120	.0264	-.99	.0004	-.0039	.0229
	4.653	.03	-.0134	.0266	.00	-.0003	-.0005	.0066
	4.653	.03	-.0125	.0260	1.03	-.0009	.0023	-.0058
	4.653	.03	-.0139	.0263	2.02	-.0015	.0057	-.0232
	4.653	.06	-.0100	.0258	3.00	-.0022	.0085	-.0365
	4.653	-.01	-.0143	.0259	4.03	-.0027	.0115	-.0520
	4.653	-.01	-.0134	.0249	5.01	-.0033	.0138	-.0635
	4.653	-.01	-.0120	.0228	6.08	-.0039	.0166	-.0808
	4.653	-.03	-.0094	.0168	8.05	-.0053	.0220	-.1144
	4.653	-.02	-.0068	.0084	10.10	-.0066	.0278	-.1505
	4.653	-.02	-.0013	-.0022	12.11	-.0081	.0345	-.1877
	4.653	.01	.0099	-.0259	16.13	-.0121	.0540	-.2732
	4.653	-.02	.0223	-.0488	20.08	-.0174	.0795	-.3747
	4.653	8.15	.2359	-.0839	20.11	-.0185	.0691	-.3793
	4.653	8.17	.2271	-.0660	16.19	-.0122	.0521	-.2915
	4.653	8.20	.2210	-.0497	12.12	-.0075	.0363	-.2069
	4.653	8.18	.2184	-.0441	10.11	-.0060	.0296	-.1687
	4.653	8.18	.2127	-.0402	8.08	-.0047	.0237	-.1303
	4.653	8.18	.2047	-.0373	6.08	-.0036	.0183	-.0986
	4.653	8.21	.2033	-.0367	5.03	-.0029	.0153	-.0814
	4.653	8.23	.2043	-.0374	4.04	-.0021	.0117	-.0612
	4.653	8.21	.2031	-.0363	3.01	-.0016	.0085	-.0439
	4.653	8.21	.1992	-.0354	2.01	-.0011	.0056	-.0305
	4.653	8.19	.1978	-.0338	1.02	-.0006	.0029	-.0113
	4.653	8.20	.1967	-.0342	.00	-.0002	.0000	.0032
	4.653	8.19	.1956	-.0341	-1.01	.0003	-.0025	.0177
	4.653	8.20	.1943	-.0344	-1.99	.0008	-.0053	.0341
	4.653	8.16	.1912	-.0341	-4.04	.0020	-.0125	.0716
	4.653	16.33	.4142	-.0631	-4.04	.0034	-.0176	.0916
	4.653	16.37	.4225	-.0626	-2.01	.0020	-.0099	.0523
	4.653	16.36	.4231	-.0617	-1.02	.0012	-.0061	.0321
	4.653	16.45	.4276	-.0623	.00	.0006	-.0025	.0150
	4.653	16.40	.4291	-.0610	1.03	-.0001	.0013	-.0062
	4.653	16.39	.4309	-.0607	2.02	-.0008	.0052	-.0283
	4.653	16.40	.4326	-.0618	3.02	-.0017	.0090	-.0494
	4.653	16.41	.4357	-.0650	4.06	-.0023	.0137	-.0702
	4.653	16.41	.4383	-.0672	5.07	-.0032	.0177	-.0905
	4.653	16.39	.4426	-.0691	6.06	-.0040	.0219	-.1115
	4.653	16.41	.4506	-.0735	8.09	-.0054	.0318	-.1585
	4.653	16.45	.4540	-.0743	10.12	-.0076	.0402	-.2053
	4.653	16.46	.4596	-.0759	12.14	-.0097	.0458	-.2444
	4.653	16.44	.4666	-.0841	16.21	-.0162	.0567	-.3255
	4.653	16.40	.4891	-.1229	20.13	-.0243	.0716	-.4133

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^2FVH^2V	2.294	.03	.0007	.0204	-3.95	.0043	-.0289	.0856
	2.294	.03	.0019	.0182	-1.95	.0022	-.0155	.0472
	2.294	.05	.0018	.0175	-.96	.0011	-.0088	.0283
	2.294	.03	.0030	.0169	.07	-.0001	-.0013	.0084
	2.294	.01	.0029	.0172	1.06	-.0012	.0059	-.0120
	2.294	.02	.0043	.0173	2.05	-.0022	.0129	-.0315
	2.294	.02	.0040	.0184	3.06	-.0034	.0200	-.0500
	2.294	.04	.0042	.0190	4.07	-.0048	.0280	-.0734
	2.294	.04	.0024	.0208	5.05	-.0058	.0348	-.0923
	2.294	.06	.0040	.0217	6.10	-.0071	.0423	-.1147
	2.294	.06	.0016	.0251	8.09	-.0098	.0562	-.1640
	2.294	.04	.0024	.0275	10.15	-.0122	.0703	-.2166
	2.294	.02	-.0021	.0268	12.19	-.0154	.0830	-.2776
	2.294	.04	-.0026	.0282	16.33	-.0194	.1033	-.3905
	2.294	.07	-.0086	.0360	20.30	-.0222	.1244	-.5115
	2.294	8.56	.3412	-.0497	20.35	-.0324	.1198	-.5278
	2.294	8.54	.3440	-.0560	16.37	-.0253	.0964	-.4076
	2.294	8.57	.3483	-.0653	12.28	-.0190	.0735	-.2909
	2.294	8.55	.3512	-.0719	10.21	-.0155	.0594	-.2316
	2.294	8.54	.3559	-.0806	8.16	-.0129	.0464	-.1757
	2.294	8.52	.3578	-.0892	6.13	-.0095	.0346	-.1265
	2.294	8.51	.3587	-.0928	5.10	-.0077	.0286	-.1020
	2.294	8.51	.3595	-.0954	4.08	-.0059	.0226	-.0785
	2.294	8.53	.3625	-.0985	3.07	-.0049	.0174	-.0590
	2.294	8.53	.3624	-.1001	2.09	-.0035	.0118	-.0403
	2.294	8.54	.3622	-.1015	1.08	-.0018	.0060	-.0201
	2.294	8.54	.3607	-.1017	.06	-.0002	.0002	.0001
	2.294	8.54	.3603	-.1007	-.96	.0015	-.0062	.0230
	2.294	8.54	.3586	-.0989	-1.96	.0031	-.0120	.0443
	2.294	8.52	.3538	-.0937	-3.99	.0065	-.0246	.0871
	2.294	16.91	.6803	-.1847	-4.05	.0105	-.0178	.1069
	2.294	16.89	.6933	-.1924	-2.00	.0059	-.0086	.0579
	2.294	16.88	.6982	-.1948	-.99	.0038	-.0045	.0351
	2.294	16.84	.6993	-.1945	.06	.0014	-.0010	.0113
	2.294	16.81	.7030	-.1961	1.08	-.0008	.0030	-.0125
	2.294	16.80	.7038	-.1953	2.10	-.0030	.0066	-.0365
	2.294	16.78	.7047	-.1954	3.10	-.0053	.0106	-.0592
	2.294	16.78	.7057	-.1943	4.14	-.0076	.0150	-.0830
	2.294	16.78	.7037	-.1913	5.15	-.0100	.0197	-.1085
	2.294	16.79	.6982	-.1881	6.21	-.0124	.0241	-.1331
	2.294	16.80	.7038	-.1813	8.25	-.0169	.0351	-.1897
	2.294	16.83	.6986	-.1695	10.29	-.0217	.0466	-.2481
	2.294	16.84	.6974	-.1596	12.35	-.0262	.0591	-.3048
	2.294	16.84	.6975	-.1488	16.44	-.0371	.0890	-.4285
	2.294	16.88	.7037	-.1400	20.42	-.0470	.1112	-.5473
	2.975	.04	.0134	.0132	-3.97	.0029	-.0202	.0674
	2.975	.07	.0126	.0121	-1.92	.0010	-.0099	.0323
	2.975	.07	.0139	.0117	-.95	.0002	-.0048	.0150
	2.975	.09	.0150	.0113	.06	-.0007	.0003	-.0017
	2.975	.09	.0145	.0117	1.07	-.0016	.0056	-.0183
	2.975	.09	.0138	.0121	2.06	-.0023	.0106	-.0344
	2.975	.09	.0135	.0122	3.07	-.0034	.0161	-.0535
	2.975	.11	.0146	.0127	4.09	-.0042	.0211	-.0705
	2.975	.11	.0141	.0134	5.08	-.0050	.0260	-.0871
	2.975	.11	.0124	.0149	6.13	-.0062	.0320	-.1118
	2.975	.11	.0122	.0169	8.13	-.0080	.0420	-.1551
	2.975	.11	.0141	.0174	10.17	-.0097	.0522	-.2029
	2.975	.11	.0123	.0177	12.24	-.0110	.0596	-.2478
	2.975	.11	.0112	.0198	16.31	-.0137	.0772	-.3488
	2.975	.12	.0104	.0242	20.26	-.0172	.0989	-.4564
	2.975	8.43	.2984	-.0378	20.30	-.0227	.0940	-.4701
	2.975	8.41	.3008	-.0433	16.37	-.0167	.0738	-.3667
	2.975	8.40	.2998	-.0494	12.26	-.0119	.0549	-.2653
	2.975	8.40	.2997	-.0526	10.22	-.0099	.0466	-.2207
	2.975	8.39	.3022	-.0599	8.16	-.0072	.0364	-.1656
	2.975	8.37	.3023	-.0649	6.13	-.0050	.0263	-.1230
	2.975	8.37	.3021	-.0672	5.11	-.0040	.0210	-.0989
	2.975	8.36	.3024	-.0694	4.10	-.0032	.0165	-.0803
	2.975	8.36	.3042	-.0728	3.10	-.0029	.0129	-.0589
	2.975	8.36	.3063	-.0749	2.08	-.0020	.0087	-.0416
	2.975	8.36	.3029	-.0752	1.09	-.0011	.0046	-.0242
	2.975	8.37	.3035	-.0756	.07	-.0005	.0004	-.0058
	2.975	8.37	.3021	-.0745	-.95	.0004	-.0040	.0134
	2.975	8.38	.3021	-.0737	-1.94	.0012	-.0076	.0345
	2.975	8.38	.2977	-.0679	-3.97	.0029	-.0170	.0720
	2.975	16.68	.5909	-.1590	-4.01	.0073	-.0168	.0957
	2.975	16.68	.5963	-.1654	-1.96	.0042	-.0077	.0492
	2.975	16.70	.5997	-.1654	-.97	.0026	-.0038	.0278
	2.975	16.69	.6016	-.1655	.07	.0010	-.0001	.0064
	2.975	16.65	.6037	-.1654	1.08	-.0007	.0033	-.0150
	2.975	16.67	.6053	-.1670	2.11	-.0026	.0074	-.0376
	2.975	16.66	.6078	-.1675	3.12	-.0044	.0117	-.0633
	2.975	16.64	.6097	-.1670	4.13	-.0058	.0156	-.0841
	2.975	16.65	.6102	-.1645	5.13	-.0075	.0203	-.1093
	2.975	16.63	.6110	-.1626	6.17	-.0093	.0259	-.1364
	2.975	16.66	.6103	-.1564	8.20	-.0130	.0370	-.1904
	2.975	16.72	.6110	-.1500	10.27	-.0164	.0462	-.2414
	2.975	16.73	.6127	-.1445	12.31	-.0205	.0563	-.2882
	2.975	16.75	.6166	-.1355	16.39	-.0293	.0753	-.3968
	2.975	16.74	.6236	-.1265	20.35	-.0382	.0905	-.4960

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^2FVH^2V	3.963	-.04	-.0402	.0203	-4.07	.0025	-.0154	.0774
	3.963	-.04	-.0376	.0188	-2.02	.0011	-.0082	.0461
	3.963	-.04	-.0388	.0190	-1.04	.0004	-.0048	.0326
	3.963	-.04	-.0378	.0185	-.01	-.0002	-.0011	.0191
	3.963	-.03	-.0390	.0183	.98	-.0008	.0028	.0023
	3.963	-.01	-.0379	.0182	1.98	-.0014	.0066	-.0112
	3.963	-.01	-.0390	.0192	2.99	-.0021	.0102	-.0264
	3.963	.01	-.0375	.0194	4.00	-.0029	.0138	-.0430
	3.963	-.10	-.0412	.0207	5.02	-.0035	.0172	-.0568
	3.963	-.02	-.0394	.0221	6.04	-.0041	.0194	-.0751
	3.963	-.03	-.0412	.0236	8.03	-.0053	.0264	-.1104
	3.963	-.02	-.0404	.0244	10.08	-.0064	.0327	-.1483
	3.963	-.02	-.0397	.0240	12.09	-.0076	.0395	-.1881
	3.963	-.01	-.0420	.0260	16.16	-.0103	.0553	-.2729
	3.963	.01	-.0413	.0281	20.10	-.0140	.0771	-.3724
	3.963	8.21	.1970	-.0146	20.14	-.0166	.0693	-.3876
	3.963	8.25	.1959	-.0188	16.21	-.0109	.0526	-.2933
	3.963	8.23	.1932	-.0227	12.10	-.0070	.0379	.2057
	3.963	8.23	.1941	-.0253	10.10	-.0056	.0316	.1656
	3.963	8.22	.1918	-.0270	8.07	-.0044	.0255	-.1277
	3.963	8.23	.1889	-.0295	6.06	-.0033	.0191	-.0908
	3.963	8.23	.1896	-.0313	5.02	-.0026	.0157	-.0724
	3.963	8.23	.1883	-.0323	4.02	-.0020	.0124	-.0547
	3.963	8.23	.1882	-.0331	3.01	-.0015	.0083	-.0345
	3.963	8.21	.1875	-.0351	1.98	-.0011	.0050	-.0177
	3.963	8.21	.1862	-.0350	1.01	-.0006	.0020	-.0009
	3.963	8.21	.1865	-.0354	-.03	-.0002	-.0011	.0168
	3.963	8.21	.1859	-.0346	-1.04	.0003	-.0043	.0337
	3.963	8.21	.1839	-.0339	-2.04	.0008	-.0074	.0512
	3.963	8.21	.1844	-.0321	-4.06	.0017	-.0146	.0868
	3.963	16.44	.4482	-.1023	-4.07	.0048	-.0189	.1105
	3.963	16.49	.4578	-.1074	-2.03	.0029	-.0102	.0668
	3.963	16.47	.4594	-.1084	-1.07	.0018	-.0062	.0470
	3.963	16.44	.4636	-.1088	-.03	.0008	-.0025	.0231
	3.963	16.48	.4673	-.1100	1.01	-.0003	.0012	.0024
	3.963	16.48	.4689	-.1110	1.98	-.0012	.0050	-.0191
	3.963	16.45	.4691	-.1107	2.99	-.0024	.0094	-.0420
	3.963	16.45	.4748	-.1116	4.00	-.0034	.0137	-.0636
	3.963	16.43	.4767	-.1114	5.02	-.0046	.0182	-.0867
	3.963	16.53	.4804	-.1126	6.05	-.0058	.0229	-.1104
	3.963	16.53	.4839	-.1121	8.04	-.0082	.0323	-.1565
	3.963	16.54	.4875	-.1085	10.12	-.0108	.0412	-.2050
	3.963	16.57	.4850	-.1027	12.14	-.0134	.0471	-.2486
	3.963	16.51	.4858	-.0886	16.22	-.0195	.0577	-.3359
	3.963	16.55	.4936	-.0792	20.17	-.0262	.0702	-.4283
	4.653	.04	.0010	.0095	-4.05	.0015	-.0117	.0615
	4.653	.04	.0003	.0086	-2.02	.0005	-.0063	.0353
	4.653	.05	.0038	.0082	-1.03	.0001	-.0040	.0255
	4.653	.03	.0050	.0081	.00	-.0004	-.0008	.0100
	4.653	.02	.0004	.0068	1.01	-.0007	.0024	-.0047
	4.653	.02	-.0013	.0075	2.00	-.0011	.0053	-.0193
	4.653	.02	-.0001	.0078	3.00	-.0016	.0082	-.0340
	4.653	.02	-.0017	.0086	4.01	-.0022	.0108	-.0476
	4.653	.02	-.0003	.0094	5.00	-.0027	.0134	-.0632
	4.653	.02	-.0019	.0101	6.04	-.0032	.0158	-.0776
	4.653	.03	-.0018	.0116	8.05	-.0042	.0211	-.1121
	4.653	.04	-.0016	.0117	10.10	-.0053	.0264	-.1482
	4.653	.03	-.0016	.0122	12.09	-.0062	.0321	-.1834
	4.653	.01	.0022	.0129	16.14	-.0091	.0488	-.2665
	4.653	.01	.0036	.0134	20.04	-.0133	.0731	-.3616
	4.653	8.19	.1995	-.0315	-4.04	.0014	-.0121	.0707
	4.653	8.19	.2019	-.0331	-2.05	.0004	-.0061	.0395
	4.653	8.19	.2030	-.0333	-1.01	.0001	-.0036	.0248
	4.653	8.19	.2045	-.0339	.00	-.0003	-.0005	.0052
	4.653	8.19	.2028	-.0332	1.00	-.0005	.0022	-.0095
	4.653	8.21	.2036	-.0328	1.99	-.0009	.0051	-.0271
	4.653	8.21	.2049	-.0329	2.99	-.0013	.0079	-.0435
	4.653	8.21	.2065	-.0326	4.02	-.0017	.0109	-.0572
	4.653	8.22	.2072	-.0322	5.02	-.0022	.0137	-.0725
	4.653	8.17	.2088	-.0309	6.05	-.0027	.0168	-.0920
	4.653	8.18	.2091	-.0289	8.06	-.0035	.0221	-.1254
	4.653	8.17	.2116	-.0273	10.09	-.0044	.0279	-.1641
	4.653	8.17	.2144	-.0271	12.12	-.0054	.0342	-.2020
	4.653	8.16	.2176	-.0254	16.15	-.0088	.0468	-.2782
	4.653	8.22	.2258	-.0236	20.11	-.0148	.0648	-.3728
	4.653	8.22	.2231	-.0228	20.11	-.0149	.0653	-.3758
	4.653	16.35	.4547	-.1065	-4.06	.0032	-.0182	.0884
	4.653	16.33	.4583	-.1070	-2.01	.0020	-.0104	.0547
	4.653	16.35	.4598	-.1077	-1.02	.0013	-.0061	.0334
	4.653	16.38	.4642	-.1068	-.02	.0006	-.0015	.0091
	4.653	16.43	.4649	-.1073	1.00	.0001	.0021	-.0074
	4.653	16.42	.4671	-.1085	1.99	-.0008	.0068	-.0336
	4.653	16.38	.4713	-.1095	3.00	-.0015	.0106	-.0539
	4.653	16.42	.4726	-.1101	4.00	-.0022	.0148	-.0732
	4.653	16.46	.4725	-.1109	5.01	-.0029	.0186	-.0904
	4.653	16.42	.4759	-.1124	6.06	-.0038	.0236	-.1168
	4.653	16.46	.4809	-.1135	8.03	-.0052	.0331	-.1594
	4.653	16.32	.4834	-.1102	10.08	-.0070	.0404	-.2025
	4.653	16.40	.4812	-.1050	12.13	-.0091	.0465	-.2450
	4.653	16.41	.4847	-.0931	16.18	-.0148	.0569	-.3273
	4.653	16.42	.4890	-.0846	20.10	-.0210	.0704	-.4145

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^2FVH^3V	2.294	.05	-.0173	.0214	-3.98	.0043	-.0276	.0814
	2.294	.03	-.0172	.0215	-1.98	.0016	-.0132	.0422
	2.294	.01	-.0191	.0217	-1.00	.0007	-.0065	.0243
	2.294	.00	-.0203	.0215	.00	-.0010	.0011	.0026
	2.294	.02	-.0219	.0220	1.02	-.0020	.0084	-.0181
	2.294	.02	-.0221	.0220	1.97	-.0030	.0150	-.0366
	2.294	.00	-.0237	.0233	2.96	-.0042	.0224	-.0563
	2.294	.00	-.0253	.0254	3.97	-.0052	.0297	-.0769
	2.294	.02	-.0271	.0271	4.93	-.0065	.0375	-.0988
	2.294	.02	-.0284	.0287	5.96	-.0076	.0444	-.1217
	2.294	.00	-.0341	.0339	7.95	-.0099	.0584	-.1675
	2.294	.01	-.0350	.0378	9.97	-.0123	.0724	-.2180
	2.294	-.01	-.0422	.0439	12.02	-.0137	.0831	-.2730
	2.294	.01	-.0497	.0530	16.11	-.0170	.1028	-.3869
	2.294	.03	-.0528	.0572	20.04	-.0198	.1272	-.5097
	2.294	8.52	.2822	-.0287	20.10	-.0297	.1225	-.5292
	2.294	8.53	.2918	-.0375	16.16	-.0229	.0955	-.4079
	2.294	8.52	.3018	-.0505	12.06	-.0174	.0743	-.2917
	2.294	8.52	.3147	-.0620	10.03	-.0148	.0613	-.2353
	2.294	8.53	.3178	-.0706	8.02	-.0124	.0489	-.1797
	2.294	8.54	.3227	-.0810	6.02	-.0095	.0372	-.1323
	2.294	8.53	.3281	-.0868	4.99	-.0078	.0313	-.1086
	2.294	8.53	.3279	-.0909	3.98	-.0063	.0251	-.0877
	2.294	8.53	.3291	-.0932	2.99	-.0048	.0194	-.0672
	2.294	8.50	.3302	-.0957	2.01	-.0034	.0140	-.0467
	2.294	8.50	.3315	-.0975	1.01	-.0018	.0081	-.0262
	2.294	8.48	.3329	-.0988	-.01	-.0003	.0021	-.0053
	2.294	8.48	.3328	-.0986	-1.02	.0012	-.0038	.0162
	2.294	8.51	.3341	-.0981	-1.99	.0026	-.0094	.0357
	2.294	8.51	.3326	-.0938	-4.00	.0058	-.0217	.0769
	2.294	17.12	.6442	-.1814	-4.06	.0088	-.0140	.0861
	2.294	17.11	.6554	-.1889	-2.00	.0043	-.0058	.0401
	2.294	17.07	.6531	-.1890	-1.01	.0023	-.0023	.0178
	2.294	17.05	.6525	-.1886	.01	.0004	.0010	-.0047
	2.294	17.06	.6605	-.1896	1.03	-.0017	.0048	-.0279
	2.294	17.04	.6598	-.1878	2.04	-.0038	.0082	-.0495
	2.294	17.05	.6547	-.1848	3.04	-.0060	.0121	-.0714
	2.294	17.05	.6527	-.1820	4.05	-.0083	.0163	-.0943
	2.294	17.03	.6568	-.1798	5.07	-.0106	.0206	-.1211
	2.294	17.02	.6550	-.1763	6.10	-.0129	.0258	-.1473
	2.294	17.03	.6436	-.1646	8.12	-.0170	.0352	-.1978
	2.294	17.04	.6444	-.1529	10.17	-.0218	.0473	-.2553
	2.294	17.03	.6387	-.1430	12.17	-.0259	.0593	-.3112
	2.294	17.23	.6384	-.1337	16.26	-.0361	.0881	-.4340
	2.294	17.23	.6384	-.1247	20.20	-.0445	.1083	-.5466
	2.975	.06	-.0114	.0166	-3.98	.0029	-.0201	.0672
	2.975	.08	-.0124	.0158	-2.02	.0012	-.0105	.0344
	2.975	.08	-.0129	.0156	-1.00	.0003	-.0049	.0169
	2.975	.07	-.0152	.0156	-.01	-.0004	.0001	.0005
	2.975	.06	-.0158	.0157	1.01	-.0012	.0056	-.0171
	2.975	.06	-.0163	.0164	1.99	-.0020	.0108	-.0342
	2.975	.06	-.0167	.0171	2.99	-.0029	.0161	-.0511
	2.975	.04	-.0188	.0180	4.01	-.0038	.0213	-.0700
	2.975	.04	-.0210	.0198	4.96	-.0047	.0266	-.0871
	2.975	.04	-.0229	.0216	6.01	-.0056	.0318	-.1083
	2.975	.04	-.0229	.0244	8.01	-.0074	.0420	-.1521
	2.975	.06	-.0264	.0280	10.04	-.0088	.0515	-.1973
	2.975	.06	-.0278	.0307	12.05	-.0103	.0602	-.2456
	2.975	.06	-.0340	.0379	16.13	-.0132	.0797	-.3500
	2.975	.06	-.0339	.0377	16.11	-.0130	.0789	-.3466
	2.975	.08	-.0322	.0378	16.11	-.0131	.0788	-.3472
	2.975	.07	-.0346	.0416	20.06	-.0160	.1014	-.4559
	2.975	8.40	.2438	-.0176	20.11	-.0198	.0944	-.4690
	2.975	8.42	.2513	-.0257	16.20	-.0147	.0734	-.3653
	2.975	8.41	.2573	-.0355	12.12	-.0103	.0550	-.2643
	2.975	8.40	.2586	-.0412	10.09	-.0089	.0459	-.2146
	2.975	8.41	.2635	-.0484	8.08	-.0068	.0369	-.1704
	2.975	8.41	.2667	-.0554	6.05	-.0048	.0273	-.1233
	2.975	8.39	.2699	-.0595	5.02	-.0040	.0226	-.1029
	2.975	8.38	.2683	-.0616	4.02	-.0030	.0180	-.0809
	2.975	8.38	.2718	-.0652	3.01	-.0022	.0135	-.0608
	2.975	8.38	.2721	-.0677	2.01	-.0016	.0092	-.0425
	2.975	8.37	.2741	-.0697	1.02	-.0008	.0051	-.0257
	2.975	8.37	.2743	-.0704	.01	-.0001	.0009	-.0061
	2.975	8.39	.2732	-.0694	-.98	.0003	-.0033	.0117
	2.975	8.39	.2735	-.0688	-1.99	.0010	-.0072	.0301
	2.975	8.40	.2725	-.0648	-4.00	.0024	-.0154	.0680
	2.975	16.90	.5435	-.1521	-4.04	.0059	-.0139	.0811
	2.975	16.77	.5509	-.1558	-1.99	.0032	-.0061	.0367
	2.975	16.93	.5588	-.1583	-1.03	.0018	-.0026	.0149
	2.975	16.91	.5590	-.1583	.00	.0008	.0003	-.0058
	2.975	16.90	.5607	-.1590	1.03	-.0009	.0036	-.0286
	2.975	16.98	.5638	-.1596	2.03	-.0024	.0069	-.0490
	2.975	16.98	.5643	-.1584	3.03	-.0041	.0109	-.0700
	2.975	17.00	.5630	-.1560	4.05	-.0056	.0148	-.0936
	2.975	17.01	.5618	-.1518	5.04	-.0072	.0197	-.1171
	2.975	16.99	.5606	-.1482	6.09	-.0088	.0242	-.1419
	2.975	17.00	.5582	-.1422	8.10	-.0122	.0340	-.1919
	2.975	16.99	.5539	-.1345	10.13	-.0163	.0444	-.2413
	2.975	16.98	.5561	-.1283	12.14	-.0204	.0546	-.2900
	2.975	17.00	.5574	-.1186	16.22	-.0277	.0724	-.3922
	2.975	17.04	.5632	-.1084	20.18	-.0364	.0884	-.4983

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
$W^2F_{VH}^3{}_V$	3.963	.04	-.0089	.0139	-4.01	.0020	-.0137	.0598
	3.963	.04	-.0087	.0127	-1.99	.0008	-.0068	.0282
	3.963	.06	-.0100	.0133	-1.02	.0002	-.0029	.0153
	3.963	.08	-.0111	.0139	.01	-.0004	.0004	-.0009
	3.963	.08	-.0124	.0140	1.01	-.0009	.0040	-.0146
	3.963	.08	-.0112	.0143	2.01	-.0015	.0078	-.0300
	3.963	.07	-.0147	.0152	3.00	-.0021	.0112	-.0447
	3.963	.06	-.0159	.0158	3.98	-.0027	.0148	-.0590
	3.963	.04	-.0170	.0176	4.98	-.0033	.0183	-.0747
	3.963	.04	-.0155	.0186	6.00	-.0039	.0217	-.0922
	3.963	.02	-.0196	.0208	8.01	-.0051	.0292	-.1292
	3.963	.02	-.0211	.0231	10.05	-.0063	.0357	-.1676
	3.963	.02	-.0249	.0253	12.07	-.0076	.0429	-.2065
	3.963	.04	-.0272	.0294	16.10	-.0103	.0590	-.2941
	3.963	.02	-.0292	.0294	20.01	-.0141	.0821	-.3925
	3.963	8.32	.1939	-.0030	20.05	-.0153	.0724	-.4051
	3.963	8.30	.2024	-.0120	16.15	-.0100	.0546	-.3115
	3.963	8.30	.2048	-.0189	12.12	-.0063	.0392	-.2245
	3.963	8.29	.2038	-.0229	10.08	-.0051	.0331	-.1841
	3.963	8.29	.2060	-.0273	8.05	-.0038	.0269	-.1466
	3.963	8.27	.2069	-.0306	6.06	-.0026	.0209	-.1096
	3.963	8.26	.2075	-.0328	5.02	-.0020	.0172	-.0886
	3.963	8.24	.2070	-.0336	4.01	-.0019	.0143	-.0717
	3.963	8.25	.2125	-.0355	3.01	-.0015	.0103	-.0538
	3.963	8.24	.2111	-.0365	1.99	-.0010	.0068	-.0359
	3.963	8.24	.2100	-.0376	1.04	-.0006	.0038	-.0205
	3.963	8.26	.2087	-.0379	.01	-.0003	.0010	-.0034
	3.963	8.26	.2066	-.0380	-1.02	.0001	-.0018	.0128
	3.963	8.28	.2085	-.0375	-2.02	.0005	-.0049	.0292
	3.963	8.28	.2075	-.0358	-4.05	.0011	-.0126	.0649
	3.963	16.69	.4559	-.1030	-4.03	.0038	-.0152	.0801
	3.963	16.68	.4597	-.1048	-2.00	.0018	-.0070	.0381
	3.963	16.66	.4636	-.1065	-1.01	.0009	-.0029	.0165
	3.963	16.64	.4646	-.1067	.01	.0002	.0005	-.0045
	3.963	16.64	.4663	-.1069	1.03	-.0007	.0040	-.0255
	3.963	16.64	.4657	-.1067	2.01	-.0017	.0077	-.0456
	3.963	16.65	.4676	-.1065	3.00	-.0026	.0119	-.0674
	3.963	16.70	.4673	-.1063	4.02	-.0036	.0160	-.0888
	3.963	16.71	.4690	-.1060	4.99	-.0045	.0197	-.1105
	3.963	16.69	.4686	-.1047	6.06	-.0057	.0242	-.1329
	3.963	16.67	.4692	-.1020	8.08	-.0079	.0330	-.1777
	3.963	16.66	.4705	-.0976	10.09	-.0102	.0405	-.2211
	3.963	16.77	.4736	-.0927	12.10	-.0128	.0468	-.2661
	3.963	16.80	.4681	-.0759	16.18	-.0180	.0561	-.3501
	3.963	16.83	.4665	-.0641	20.10	-.0247	.0697	-.4433
	4.653	.04	-.0042	.0092	-4.04	.0013	-.0114	.0569
	4.653	.04	-.0018	.0080	-1.99	.0005	-.0057	.0274
	4.653	.06	-.0037	.0073	-1.00	.0001	-.0027	.0138
	4.653	.04	-.0054	.0070	.02	-.0002	.0006	-.0010
	4.653	.04	-.0072	.0072	1.03	-.0006	.0034	-.0147
	4.653	.02	-.0062	.0076	2.00	-.0011	.0065	-.0285
	4.653	.00	-.0077	.0083	3.02	-.0016	.0093	-.0431
	4.653	.00	-.0066	.0092	4.00	-.0019	.0120	-.0568
	4.653	.00	-.0082	.0104	5.00	-.0025	.0149	-.0714
	4.653	.00	-.0095	.0115	6.05	-.0030	.0175	-.0891
	4.653	.02	-.0125	.0134	8.03	-.0040	.0232	-.1217
	4.653	.00	-.0122	.0149	10.05	-.0048	.0279	-.1560
	4.653	.02	-.0148	.0173	12.08	-.0062	.0346	-.1944
	4.653	.06	-.0165	.0196	16.10	-.0092	.0518	-.2778
	4.653	.06	-.0149	.0172	20.00	-.0138	.0774	-.3762
	4.653	8.26	.1964	-.0075	20.04	-.0144	.0680	-.3882
	4.653	8.27	.1977	-.0156	16.12	-.0092	.0507	-.2963
	4.653	8.29	.1991	-.0209	12.11	-.0051	.0356	-.2142
	4.653	8.28	.1988	-.0233	10.07	-.0040	.0300	-.1761
	4.653	8.30	.1992	-.0259	8.02	-.0032	.0245	-.1392
	4.653	8.28	.1996	-.0288	6.04	-.0026	.0188	-.1057
	4.653	8.26	.2010	-.0310	5.02	-.0022	.0159	-.0890
	4.653	8.22	.1999	-.0309	4.01	-.0018	.0118	-.0725
	4.653	8.22	.2009	-.0310	3.01	-.0014	.0090	-.0559
	4.653	8.22	.1996	-.0313	2.01	-.0008	.0054	-.0393
	4.653	8.22	.1983	-.0307	1.02	-.0006	.0036	-.0235
	4.653	8.24	.2004	-.0310	.01	-.0003	.0009	-.0078
	4.653	8.24	.2019	-.0317	-1.00	.0000	-.0019	.0080
	4.653	8.26	.2008	-.0311	-1.99	.0002	-.0040	.0238
	4.653	8.28	.2037	-.0320	-4.00	.0011	-.0106	.0572
	4.653	16.62	.4299	-.0964	-4.00	.0025	-.0148	.0720
	4.653	16.56	.4357	-.0976	-1.97	.0013	-.0071	.0311
	4.653	16.66	.4428	-.0996	-1.04	.0008	-.0030	.0137
	4.653	16.61	.4447	-.0988	.03	.0001	.0010	-.0108
	4.653	16.59	.4461	-.0994	1.02	-.0004	.0047	-.0293
	4.653	16.59	.4478	-.1005	2.03	-.0011	.0086	-.0508
	4.653	16.59	.4493	-.1007	3.01	-.0017	.0129	-.0712
	4.653	16.59	.4498	-.1011	4.02	-.0023	.0164	-.0916
	4.653	16.58	.4522	-.1030	5.02	-.0029	.0205	-.1113
	4.653	16.58	.4537	-.1026	6.07	-.0036	.0245	-.1327
	4.653	16.58	.4526	-.1014	8.07	-.0050	.0336	-.1762
	4.653	16.58	.4531	-.0970	10.07	-.0067	.0397	-.2171
	4.653	16.59	.4519	-.0896	12.10	-.0086	.0446	-.2556
	4.653	16.60	.4484	-.0747	16.13	-.0141	.0546	-.3359
	4.653	16.73	.4514	-.0636	20.05	-.0202	.0696	-.4254

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^2P	2.294	-.01	-.0076	.0008	-4.03	.0000	.0105	.0221
	2.294	-.02	-.0092	.0005	-1.94	-.0001	.0047	.0129
	2.294	-.01	-.0086	.0007	-.97	.0000	.0024	.0091
	2.294	-.02	-.0105	.0019	.07	-.0011	-.0004	.0041
	2.294	.00	-.0098	.0018	1.06	-.0012	-.0032	.0003
	2.294	.00	-.0106	.0019	2.10	-.0010	-.0056	-.0047
	2.294	.00	-.0101	.0019	3.10	-.0011	-.0083	-.0085
	2.294	-.01	-.0093	.0021	4.10	-.0009	-.0109	-.0139
	2.294	-.03	-.0100	.0017	5.14	-.0010	-.0136	-.0198
	2.294	.01	-.0076	.0017	6.22	-.0011	-.0162	-.0287
	2.294	-.01	-.0071	.0014	8.21	-.0009	-.0215	-.0436
	2.294	-.03	-.0058	.0003	10.31	-.0011	-.0269	-.0704
	2.294	.02	-.0082	-.0006	12.38	-.0014	-.0319	-.1043
	2.294	-.04	-.0142	.0009	16.59	-.0014	-.0414	-.1748
	2.294	.00	-.0142	.0029	20.63	-.0007	-.0480	-.2520
	2.294	8.51	.2900	-.0063	20.67	-.0111	-.0469	-.2747
	2.294	8.58	.2995	-.0143	16.64	-.0091	-.0405	-.2012
	2.294	8.60	.3025	-.0178	12.46	-.0062	-.0337	-.1244
	2.294	8.58	.3060	-.0239	10.38	-.0051	-.0307	-.0906
	2.294	8.54	.3096	-.0336	8.22	-.0037	-.0252	-.0610
	2.294	8.53	.3110	-.0384	6.20	-.0027	-.0191	-.0403
	2.294	8.53	.3127	-.0399	5.17	-.0023	-.0161	-.0321
	2.294	8.53	.3101	-.0399	4.16	-.0017	-.0128	-.0245
	2.294	8.53	.3136	-.0412	3.12	-.0018	-.0093	-.0179
	2.294	8.53	.3126	-.0406	2.10	-.0013	-.0063	-.0116
	2.294	8.51	.3114	-.0408	1.11	-.0008	-.0030	-.0053
	2.294	8.51	.3103	-.0405	.06	-.0003	.0003	.0011
	2.294	8.51	.3092	-.0410	-.99	.0002	.0039	.0074
	2.294	8.51	.3082	-.0414	-1.99	.0008	.0070	.0142
	2.294	8.54	.3062	-.0405	-4.03	.0018	.0129	.0278
	2.294	17.05	.5960	-.0496	-4.08	.0065	.0124	.0564
	2.294	17.04	.6081	-.0581	-2.02	.0037	.0060	.0326
	2.294	17.03	.6197	-.0621	-1.00	.0025	.0037	.0195
	2.294	17.03	.6170	-.0628	.05	.0008	.0009	.0056
	2.294	17.06	.6202	-.0631	1.09	-.0007	-.0010	-.0087
	2.294	17.04	.6221	-.0617	2.08	-.0021	-.0037	-.0215
	2.294	17.05	.6227	-.0598	3.14	-.0035	-.0063	-.0348
	2.294	17.03	.6218	-.0559	4.17	-.0050	-.0098	-.0476
	2.294	17.15	.6251	-.0533	5.23	-.0068	-.0122	-.0618
	2.294	17.14	.6245	-.0497	6.27	-.0084	-.0158	-.0751
	2.294	17.13	.6229	-.0419	8.34	-.0114	-.0221	-.1029
	2.294	17.12	.6202	-.0337	10.45	-.0146	-.0313	-.1275
	2.294	17.13	.6192	-.0268	12.54	-.0177	-.0378	-.1578
	2.294	17.16	.6248	-.0272	16.70	-.0235	-.0448	-.2266
	2.294	17.21	.6353	-.0267	20.74	-.0290	-.0529	-.2977
	2.975	.00	.0044	-.0022	-4.07	-.0005	.0113	.0172
	2.975	.02	.0045	-.0019	-4.07	-.0005	.0114	.0173
	2.975	.02	.0045	-.0019	-4.03	-.0005	.0112	.0172
	2.975	.02	.0058	-.0023	-1.96	-.0005	.0057	.0075
	2.975	.04	.0048	-.0022	-1.00	-.0006	.0030	.0023
	2.975	.02	.0055	-.0022	.03	-.0005	.0001	-.0022
	2.975	-.01	.0044	-.0026	1.05	-.0006	-.0029	-.0061
	2.975	.00	.0033	-.0025	2.05	-.0005	-.0057	-.0101
	2.975	.00	.0041	-.0025	3.06	-.0006	-.0085	-.0159
	2.975	.00	.0031	-.0024	4.08	-.0006	-.0114	-.0218
	2.975	.00	.0040	-.0024	5.10	-.0006	-.0141	-.0281
	2.975	.00	.0031	-.0023	6.14	-.0005	-.0168	-.0355
	2.975	.02	.0038	-.0023	8.16	-.0006	-.0209	-.0580
	2.975	.02	.0047	-.0030	10.24	-.0006	-.0243	-.0844
	2.975	.02	.0043	-.0031	12.31	-.0007	-.0282	-.1157
	2.975	.00	.0037	-.0023	16.42	-.0006	-.0351	-.1809
	2.975	.02	.0046	-.0019	20.41	-.0005	-.0409	-.2449
	2.975	.04	.0018	-.0014	16.44	-.0005	-.0346	-.1814
	2.975	.02	.0049	-.0033	10.22	-.0007	-.0245	-.0863
	2.975	8.41	.2619	-.0244	-4.07	.0009	.0135	.0236
	2.975	8.41	.2638	-.0264	-2.01	.0002	.0076	.0103
	2.975	8.41	.2649	-.0267	-1.00	-.0001	.0043	.0033
	2.975	8.41	.2676	-.0273	.01	-.0004	.0008	-.0030
	2.975	8.41	.2650	-.0267	1.06	-.0003	-.0028	-.0096
	2.975	8.41	.2678	-.0263	2.06	-.0008	-.0064	-.0153
	2.975	8.42	.2672	-.0256	3.08	-.0012	-.0096	-.0222
	2.975	8.44	.2700	-.0246	4.08	-.0016	-.0125	-.0313
	2.975	8.44	.2677	-.0230	5.12	-.0020	-.0152	-.0393
	2.975	8.44	.2674	-.0217	6.17	-.0026	-.0180	-.0506
	2.975	8.44	.2669	-.0174	8.21	-.0037	-.0222	-.0746
	2.975	8.45	.2667	-.0132	10.27	-.0047	-.0255	-.1036
	2.975	8.45	.2666	-.0118	12.34	-.0058	-.0285	-.1337
	2.975	8.44	.2685	-.0060	16.47	-.0076	-.0348	-.2001
	2.975	8.47	.2655	.0020	20.46	-.0100	-.0408	-.2642
	2.975	8.46	.2684	-.0054	16.45	-.0074	-.0346	-.1995
	2.975	8.40	.2690	-.0130	10.28	-.0048	-.0256	-.1055
	2.975	16.76	.5214	-.0461	-4.04	.0064	.0110	.0503
	2.975	16.78	.5316	-.0526	-1.99	.0036	.0071	.0243
	2.975	16.78	.5351	-.0548	-.98	.0021	.0048	.0115
	2.975	16.79	.5363	-.0539	.07	.0007	.0021	.0018
	2.975	16.80	.5365	-.0539	1.09	-.0010	-.0007	-.0133
	2.975	16.75	.5402	-.0535	2.12	-.0025	-.0034	-.0256
	2.975	16.78	.5390	-.0528	3.15	-.0038	-.0063	-.0401
	2.975	16.76	.5423	-.0509	4.15	-.0053	-.0087	-.0511
	2.975	16.78	.5392	-.0473	5.20	-.0069	-.0106	-.0659
	2.975	16.81	.5410	-.0436	6.25	-.0085	-.0126	-.0787
	2.975	16.81	.5365	-.0337	8.29	-.0118	-.0167	-.1071
	2.975	16.82	.5351	-.0258	10.36	-.0149	-.0216	-.1347
	2.975	16.83	.5373	-.0236	12.43	-.0176	-.0271	-.1619
	2.975	16.82	.5452	-.0228	16.56	-.0228	-.0358	-.2219
	2.975	16.86	.5516	-.0144	20.54	-.0272	-.0442	-.2868
	2.975	16.82	.5334	-.0256	10.34	-.0147	-.0215	-.1342

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
W^2F	3.963	-.01	-.0319	.0057	-4.02	-.0001	.0097	.0316
	3.963	.01	-.0304	.0052	-1.99	-.0001	.0045	.0215
	3.963	.02	-.0297	.0052	-1.02	-.0002	.0019	.0165
	3.963	-.05	-.0313	.0050	.01	-.0002	-.0008	.0114
	3.963	-.05	-.0328	.0052	1.03	-.0001	-.0038	.0071
	3.963	-.05	-.0321	.0051	2.03	-.0001	-.0065	.0020
	3.963	-.03	-.0338	.0054	3.04	-.0001	-.0091	-.0030
	3.963	-.03	-.0327	.0057	4.05	-.0001	-.0115	-.0106
	3.963	-.05	-.0320	.0056	5.06	-.0002	-.0137	-.0181
	3.963	-.05	-.0310	.0056	6.10	-.0002	-.0156	-.0273
	3.963	-.03	-.0311	.0056	8.12	-.0001	-.0185	-.0482
	3.963	-.03	-.0314	.0061	10.16	-.0002	-.0218	-.0675
	3.963	-.01	-.0309	.0061	12.19	-.0002	-.0252	-.0958
	3.963	-.01	-.0323	.0065	16.30	-.0003	-.0320	-.1501
	3.963	-.01	-.0336	.0072	20.23	-.0003	-.0368	-.2084
	3.963	8.23	.1799	.0197	20.27	-.0090	-.0408	-.2269
	3.963	8.23	.1802	.0145	16.33	-.0068	-.0333	-.1709
	3.963	8.24	.1787	.0087	12.22	-.0047	-.0262	-.1165
	3.963	8.24	.1779	.0070	10.19	-.0038	-.0229	-.0902
	3.963	8.23	.1751	.0057	8.14	-.0030	-.0194	-.0646
	3.963	8.23	.1726	.0050	6.10	-.0023	-.0154	-.0432
	3.963	8.23	.1739	.0036	5.06	-.0020	-.0132	-.0357
	3.963	8.21	.1746	.0006	4.05	-.0015	-.0109	-.0233
	3.963	8.21	.1758	-.0012	3.05	-.0014	-.0091	-.0149
	3.963	8.20	.1741	-.0023	2.04	-.0010	-.0062	-.0067
	3.963	8.21	.1758	-.0030	1.04	-.0005	-.0031	.0015
	3.963	8.20	.1747	-.0033	.02	-.0001	-.0001	.0090
	3.963	8.22	.1737	-.0028	-1.01	.0003	.0029	.0155
	3.963	8.22	.1725	-.0019	-2.01	.0007	.0059	.0246
	3.963	8.22	.1697	.0014	-4.08	.0012	.0103	.0417
	3.963	16.50	.4151	-.0175	-4.09	.0062	.0092	.0609
	3.963	16.48	.4248	-.0245	-2.04	.0036	.0050	.0364
	3.963	16.47	.4264	-.0266	-1.04	.0023	.0027	.0254
	3.963	16.45	.4301	-.0277	-.01	.0010	.0005	.0151
	3.963	16.51	.4363	-.0288	1.04	-.0006	-.0017	.0001
	3.963	16.52	.4379	-.0285	2.05	-.0019	-.0037	-.0102
	3.963	16.52	.4416	-.0271	3.06	-.0036	-.0060	-.0262
	3.963	16.48	.4396	-.0248	4.07	-.0050	-.0078	-.0381
	3.963	16.56	.4412	-.0220	5.11	-.0063	-.0097	-.0517
	3.963	16.55	.4427	-.0197	6.13	-.0077	-.0113	-.0628
	3.963	16.55	.4420	-.0141	8.18	-.0105	-.0144	-.0924
	3.963	16.59	.4414	-.0085	10.19	-.0130	-.0190	-.1189
	3.963	16.54	.4404	-.0037	12.27	-.0155	-.0239	-.1462
	3.963	16.58	.4468	.0046	16.37	-.0197	-.0347	-.1994
	3.963	16.56	.4504	.0140	20.33	-.0228	-.0451	-.2574
	4.653	.01	-.0119	.0023	-4.03	-.0003	.0097	.0281
	4.653	.01	-.0104	.0022	-2.01	-.0003	.0047	.0171
	4.653	-.01	-.0097	.0021	-1.01	-.0004	.0020	.0121
	4.653	-.02	-.0089	.0021	.02	-.0003	-.0008	.0070
	4.653	-.02	-.0081	.0020	1.04	-.0003	-.0033	.0009
	4.653	-.02	-.0076	.0020	2.03	-.0003	-.0057	-.0021
	4.653	-.02	-.0067	.0019	3.02	-.0003	-.0086	-.0082
	4.653	-.02	-.0086	.0022	4.05	-.0004	-.0110	-.0152
	4.653	-.02	-.0076	.0021	5.06	-.0004	-.0130	-.0242
	4.653	-.02	-.0067	.0020	6.09	-.0004	-.0147	-.0332
	4.653	-.02	-.0048	.0018	8.10	-.0003	-.0176	-.0511
	4.653	.00	-.0052	.0019	10.12	-.0003	-.0211	-.0731
	4.653	.00	-.0057	.0016	12.16	-.0002	-.0249	-.0964
	4.653	.01	-.0063	.0022	16.23	-.0001	-.0302	-.1461
	4.653	.00	-.0034	.0030	20.16	-.0003	-.0333	-.2047
	4.653	8.20	.1897	.0176	20.21	-.0092	-.0370	-.2198
	4.653	8.11	.1864	.0134	16.27	-.0072	-.0299	-.1676
	4.653	8.10	.1864	.0088	12.18	-.0050	-.0236	-.1206
	4.653	8.10	.1832	.0071	10.16	-.0041	-.0201	-.0930
	4.653	8.10	.1835	.0060	8.12	-.0033	-.0163	-.0723
	4.653	8.10	.1812	.0052	6.09	-.0025	-.0126	-.0527
	4.653	8.09	.1799	.0034	5.05	-.0020	-.0110	-.0409
	4.653	8.11	.1814	.0012	4.06	-.0016	-.0091	-.0320
	4.653	8.08	.1856	-.0004	3.04	-.0014	-.0066	-.0220
	4.653	8.07	.1825	-.0015	2.02	-.0009	-.0043	-.0162
	4.653	8.07	.1813	-.0018	1.02	-.0006	-.0019	-.0063
	4.653	8.07	.1798	-.0018	.00	-.0002	.0008	.0005
	4.653	8.07	.1785	-.0017	-1.00	.0001	.0031	.0094
	4.653	8.07	.1829	-.0013	-2.02	.0005	.0054	.0183
	4.653	8.07	.1812	.0017	-4.05	.0010	.0096	.0341
	4.653	16.38	.4054	-.0239	-4.07	.0050	.0071	.0534
	4.653	16.34	.4083	-.0284	-2.01	.0030	.0037	.0304
	4.653	16.29	.4098	-.0300	-1.02	.0018	.0022	.0180
	4.653	16.43	.4189	-.0320	.00	.0008	.0007	.0046
	4.653	16.39	.4203	-.0321	1.02	-.0003	-.0010	-.0049
	4.653	16.32	.4225	-.0322	2.04	-.0016	-.0027	-.0203
	4.653	16.34	.4236	-.0313	3.05	-.0025	-.0039	-.0299
	4.653	16.34	.4251	-.0300	4.06	-.0037	-.0054	-.0424
	4.653	16.33	.4281	-.0287	5.06	-.0050	-.0068	-.0569
	4.653	16.31	.4287	-.0273	6.11	-.0062	-.0084	-.0702
	4.653	16.30	.4318	-.0236	8.11	-.0084	-.0113	-.0933
	4.653	16.47	.4376	-.0188	10.17	-.0110	-.0154	-.1191
	4.653	16.50	.4380	-.0147	12.22	-.0134	-.0196	-.1441
	4.653	16.51	.4402	-.0019	16.30	-.0180	-.0310	-.1924
	4.653	16.52	.4436	.0077	20.24	-.0213	-.0405	-.2450

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
FVH^2V	2.294	.04	-.0226	.0318	-1.98	.0022	-.0131	.0383
	2.294	.02	-.0226	.0316	-1.00	.0010	-.0060	.0185
	2.294	.02	-.0225	.0308	.00	-.0004	.0013	-.0015
	2.294	.02	-.0226	.0304	1.00	-.0016	.0089	-.0218
	2.294	.02	-.0227	.0304	1.99	-.0028	.0161	-.0417
	2.294	.02	-.0229	.0308	2.96	-.0040	.0233	-.0612
	2.294	.02	-.0229	.0313	3.96	-.0053	.0307	-.0820
	2.294	.00	-.0245	.0323	4.93	-.0067	.0384	-.1047
	2.294	-.05	-.0243	.0332	5.97	-.0080	.0460	-.1289
	2.294	-.05	-.0255	.0347	7.96	-.0105	.0601	-.1751
	2.294	-.09	-.0248	.0350	9.97	-.0128	.0741	-.2293
	2.294	-.01	-.0234	.0341	12.01	-.0147	.0850	-.2823
	2.294	.08	-.0222	.0336	16.08	-.0183	.1070	-.3995
	2.294	8.25	.1037	.0202	16.13	-.0192	.0947	-.3957
	2.294	8.21	.0932	.0157	12.09	-.0158	.0741	-.2827
	2.294	8.25	.0881	.0127	10.03	-.0136	.0635	-.2304
	2.294	8.19	.0805	.0087	7.98	-.0108	.0512	-.1767
	2.294	8.19	.0731	.0060	6.00	-.0085	.0394	-.1299
	2.294	8.20	.0693	.0058	4.96	-.0072	.0331	-.1047
	2.294	8.16	.0676	.0052	3.98	-.0059	.0263	-.0813
	2.294	8.13	.0662	.0040	3.00	-.0046	.0206	-.0642
	2.294	8.13	.0645	.0044	1.98	-.0031	.0138	-.0409
	2.294	8.11	.0633	.0045	1.01	-.0017	.0079	-.0245
	2.294	8.15	.0629	.0042	-.02	-.0002	.0013	-.0015
	2.294	8.13	.0629	.0044	-1.00	.0013	-.0056	.0187
	2.294	8.15	.0627	.0046	-1.97	.0028	-.0116	.0385
	2.294	16.79	.2052	.0028	-2.04	.0024	-.0049	.0416
	2.294	16.80	.2055	.0034	-1.04	.0012	-.0018	.0222
	2.294	16.75	.2074	.0051	.04	.0000	.0007	.0022
	2.294	16.83	.2103	.0045	1.04	-.0010	.0022	-.0147
	2.294	16.77	.2118	.0043	1.04	-.0009	.0024	-.0147
	2.294	16.77	.2132	.0032	2.02	-.0019	.0043	-.0310
	2.294	16.77	.2164	.0011	3.03	-.0031	.0073	-.0514
	2.294	16.76	.2211	-.0018	4.04	-.0045	.0119	-.0732
	2.294	16.78	.2257	-.0038	5.05	-.0057	.0167	-.0971
	2.294	16.81	.2291	-.0047	6.10	-.0070	.0223	-.1232
	2.294	16.80	.2356	-.0036	8.09	-.0091	.0340	-.1734
	2.294	16.82	.2437	-.0035	10.10	-.0110	.0453	-.2274
	2.294	16.89	.2522	-.0032	12.13	-.0132	.0579	-.2838
	2.294	16.89	.2670	-.0125	16.22	-.0162	.0813	-.3967
	2.975	.06	-.0216	.0230	-2.01	.0015	-.0103	.0361
	2.975	.04	-.0238	.0235	-.98	.0006	-.0048	.0177
	2.975	.02	-.0244	.0233	.02	-.0004	.0006	.0003
	2.975	.00	-.0248	.0229	1.01	-.0012	.0056	-.0164
	2.975	.02	-.0239	.0230	1.97	-.0022	.0113	-.0332
	2.975	.02	-.0241	.0234	2.99	-.0031	.0166	-.0525
	2.975	.02	-.0243	.0236	4.00	-.0040	.0219	-.0713
	2.975	.02	-.0249	.0248	4.98	-.0051	.0272	-.0893
	2.975	.00	-.0251	.0258	6.01	-.0061	.0330	-.1104
	2.975	.01	-.0253	.0278	8.03	-.0080	.0433	-.1540
	2.975	.01	-.0251	.0283	10.03	-.0096	.0535	-.2014
	2.975	.01	-.0250	.0289	12.06	-.0113	.0640	-.2534
	2.975	.03	-.0244	.0293	16.10	-.0141	.0824	-.3550
	2.975	8.21	.0923	.0192	16.13	-.0125	.0744	-.3512
	2.975	8.17	.0868	.0179	12.10	-.0099	.0548	-.2497
	2.975	8.25	.0833	.0168	10.06	-.0088	.0469	-.2035
	2.975	8.18	.0783	.0148	8.02	-.0074	.0382	-.1594
	2.975	8.17	.0732	.0123	6.03	-.0058	.0286	-.1160
	2.975	8.17	.0719	.0122	5.00	-.0050	.0240	-.0943
	2.975	8.16	.0683	.0125	4.00	-.0041	.0187	-.0733
	2.975	8.16	.0656	.0126	3.00	-.0032	.0142	-.0565
	2.975	8.16	.0619	.0138	1.98	-.0021	.0094	-.0367
	2.975	8.16	.0627	.0141	1.02	-.0012	.0050	-.0202
	2.975	8.16	.0608	.0144	-.01	-.0002	.0001	.0024
	2.975	8.14	.0612	.0140	-1.00	.0008	-.0047	.0176
	2.975	8.14	.0619	.0140	-2.01	.0018	-.0093	.0370
	2.975	16.70	.1964	-.0011	-2.03	.0016	-.0056	.0415
	2.975	16.67	.1974	-.0004	-1.04	.0008	-.0024	.0230
	2.975	16.69	.1994	-.0001	-.01	.0001	-.0005	.0042
	2.975	16.67	.1992	-.0004	1.03	-.0005	.0015	-.0145
	2.975	16.71	.2037	-.0007	2.02	-.0012	.0040	-.0328
	2.975	16.68	.2039	-.0021	3.03	-.0020	.0070	-.0517
	2.975	16.68	.2072	-.0034	4.04	-.0028	.0108	-.0721
	2.975	16.66	.2120	-.0047	5.06	-.0036	.0150	-.0944
	2.975	16.65	.2123	-.0049	6.09	-.0042	.0190	-.1163
	2.975	16.75	.2202	-.0057	8.10	-.0053	.0281	-.1634
	2.975	16.74	.2249	-.0066	10.11	-.0067	.0382	-.2096
	2.975	16.73	.2299	-.0086	12.14	-.0079	.0482	-.2574
	2.975	16.77	.2433	-.0174	16.19	-.0102	.0697	-.3645

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β, deg	C_l	C_n	C_Y
FVH^2V	3.963	.03	-.0104	.0192	-1.99	.0009	-.0062	.0245
	3.963	.03	-.0115	.0194	-.98	.0003	-.0028	.0092
	3.963	.05	-.0105	.0192	.03	-.0004	.0010	-.0042
	3.963	.05	-.0117	.0190	1.02	-.0010	.0043	-.0186
	3.963	.03	-.0106	.0193	1.98	-.0016	.0080	-.0329
	3.963	.03	-.0118	.0195	2.98	-.0022	.0117	-.0473
	3.963	.03	-.0105	.0198	3.98	-.0028	.0152	-.0643
	3.963	.01	-.0114	.0207	5.00	-.0035	.0189	-.0800
	3.963	.02	-.0101	.0214	6.05	-.0042	.0226	-.0979
	3.963	.00	-.0118	.0233	8.03	-.0054	.0303	-.1343
	3.963	.00	-.0109	.0237	10.05	-.0066	.0374	-.1745
	3.963	.00	-.0101	.0233	12.06	-.0078	.0444	-.2146
	3.963	.04	-.0103	.0242	16.11	-.0105	.0622	-.3019
	3.963	8.16	.0952	.0177	16.14	-.0083	.0578	-.3106
	3.963	8.15	.0892	.0192	12.12	-.0063	.0399	-.2210
	3.963	8.15	.0864	.0192	10.07	-.0056	.0328	-.1791
	3.963	8.13	.0836	.0191	8.07	-.0047	.0266	-.1421
	3.963	8.10	.0807	.0189	6.04	-.0040	.0206	-.1047
	3.963	8.17	.0770	.0194	5.00	-.0033	.0169	-.0867
	3.963	8.17	.0760	.0188	3.99	-.0027	.0134	-.0702
	3.963	8.15	.0743	.0192	3.01	-.0021	.0104	-.0524
	3.963	8.15	.0733	.0194	2.00	-.0015	.0071	-.0365
	3.963	8.15	.0721	.0199	1.02	-.0008	.0041	-.0214
	3.963	8.17	.0705	.0204	-.01	-.0003	.0009	-.0045
	3.963	8.17	.0718	.0199	-1.00	.0004	-.0021	.0107
	3.963	8.18	.0704	.0195	-2.00	.0010	-.0051	.0267
	3.963	16.62	.1878	.0146	-2.01	.0005	-.0039	.0337
	3.963	16.59	.1891	.0156	-1.01	.0001	-.0014	.0168
	3.963	16.61	.1905	.0163	.03	-.0002	.0003	-.0018
	3.963	16.63	.1924	.0158	1.03	-.0003	.0018	-.0181
	3.963	16.61	.1928	.0144	2.01	-.0006	.0038	-.0334
	3.963	16.61	.1943	.0135	3.04	-.0010	.0066	-.0527
	3.963	16.61	.1977	.0123	4.03	-.0013	.0094	-.0704
	3.963	16.61	.1998	.0117	5.04	-.0015	.0122	-.0893
	3.963	16.62	.2026	.0109	6.06	-.0017	.0158	-.1096
	3.963	16.66	.2081	.0091	8.07	-.0025	.0238	-.1509
	3.963	16.64	.2100	.0071	10.09	-.0030	.0316	-.1930
	3.963	16.67	.2172	.0042	12.12	-.0038	.0403	-.2386
	3.963	16.69	.2296	-.0022	16.16	-.0055	.0595	-.3388
	4.653	.01	-.0013	.0133	-1.99	.0007	-.0047	.0223
	4.653	.03	-.0031	.0135	-1.00	.0002	-.0019	.0086
	4.653	.07	-.0020	.0129	.01	-.0004	.0010	-.0060
	4.653	-.01	-.0037	.0126	1.02	-.0008	.0038	-.0196
	4.653	-.01	-.0026	.0130	2.02	-.0013	.0067	-.0333
	4.653	-.01	-.0044	.0132	3.00	-.0017	.0093	-.0459
	4.653	-.01	-.0032	.0136	3.99	-.0021	.0120	-.0607
	4.653	-.01	-.0048	.0143	5.01	-.0026	.0149	-.0752
	4.653	.01	-.0035	.0152	6.03	-.0032	.0179	-.0920
	4.653	.01	-.0035	.0162	8.03	-.0043	.0237	-.1252
	4.653	.01	-.0033	.0173	10.04	-.0052	.0294	-.1625
	4.653	.03	-.0031	.0182	12.07	-.0063	.0363	-.1995
	4.653	.05	-.0046	.0206	16.08	-.0092	.0554	-.2885
	4.653	8.17	.1014	.0116	16.09	-.0062	.0543	-.2957
	4.653	8.15	.0955	.0142	12.06	-.0044	.0355	-.2059
	4.653	8.12	.0904	.0154	10.06	-.0038	.0285	-.1693
	4.653	8.12	.0879	.0161	8.04	-.0034	.0226	-.1339
	4.653	8.10	.0827	.0167	6.04	-.0029	.0174	-.1004
	4.653	8.10	.0815	.0164	5.00	-.0025	.0145	-.0838
	4.653	8.11	.0802	.0170	3.99	-.0022	.0115	-.0669
	4.653	8.10	.0792	.0191	3.01	-.0016	.0081	-.0515
	4.653	8.12	.0809	.0193	2.01	-.0012	.0056	-.0368
	4.653	8.11	.0769	.0203	1.02	-.0008	.0035	-.0222
	4.653	8.12	.0783	.0205	-.01	-.0003	.0012	-.0075
	4.653	8.12	.0770	.0201	-.96	.0002	-.0014	.0072
	4.653	8.13	.0786	.0194	-1.98	.0006	-.0037	.0219
	4.653	16.55	.1858	.0099	-2.00	.0002	-.0043	.0291
	4.653	16.51	.1844	.0110	-1.00	-.0001	-.0019	.0123
	4.653	16.50	.1881	.0120	.01	-.0002	.0005	-.0045
	4.653	16.57	.1887	.0108	1.02	-.0003	.0025	-.0212
	4.653	16.56	.1930	.0094	2.01	-.0004	.0045	-.0371
	4.653	16.56	.1936	.0083	3.01	-.0005	.0070	-.0527
	4.653	16.54	.1950	.0072	4.02	-.0006	.0097	-.0705
	4.653	16.54	.1965	.0061	5.02	-.0006	.0126	-.0884
	4.653	16.56	.1998	.0041	6.05	-.0008	.0161	-.1068
	4.653	16.56	.2040	.0020	8.05	-.0012	.0231	-.1451
	4.653	16.56	.2104	-.0011	10.07	-.0015	.0305	-.1859
	4.653	16.57	.2156	-.0046	12.09	-.0021	.0390	-.2272
	4.653	16.55	.2289	-.0122	16.12	-.0037	.0583	-.3230

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β, deg	C_l	C_n	C_Y
FVH[2]	2.294	.05	-.0226	.0456	-2.01	.0030	-.0063	.0245
	2.294	.05	-.0229	.0461	-1.02	.0013	-.0025	.0105
	2.294	.06	-.0241	.0452	.01	-.0006	.0010	-.0042
	2.294	.01	-.0245	.0458	1.03	-.0021	.0046	-.0176
	2.294	.01	-.0242	.0452	2.02	-.0040	.0087	-.0331
	2.294	.01	-.0243	.0453	3.00	-.0057	.0125	-.0471
	2.294	.01	-.0245	.0466	4.02	-.0075	.0162	-.0618
	2.294	.01	-.0258	.0474	5.02	-.0094	.0206	-.0791
	2.294	.01	-.0256	.0477	6.03	-.0114	.0245	-.0953
	2.294	.01	-.0262	.0496	8.05	-.0149	.0319	-.1315
	2.294	.02	-.0265	.0523	10.10	-.0186	.0392	-.1773
	2.294	.05	-.0295	.0542	12.11	-.0217	.0442	-.2223
	2.294	.11	-.0328	.0614	16.24	-.0277	.0557	-.3265
	2.294	8.23	.0588	.0215	-2.04	.0038	-.0046	.0253
	2.294	8.21	.0590	.0209	-1.02	.0017	-.0019	.0113
	2.294	8.23	.0583	.0213	.03	-.0003	.0009	-.0034
	2.294	8.23	.0594	.0208	1.02	-.0022	.0036	-.0180
	2.294	8.21	.0612	.0212	2.01	-.0042	.0059	-.0307
	2.294	8.22	.0623	.0212	3.02	-.0060	.0081	-.0440
	2.294	8.20	.0640	.0221	4.03	-.0079	.0107	-.0592
	2.294	8.19	.0664	.0238	5.02	-.0100	.0137	-.0765
	2.294	8.18	.0693	.0248	6.07	-.0117	.0163	-.0941
	2.294	8.26	.0747	.0320	8.09	-.0155	.0214	-.1316
	2.294	8.31	.0820	.0386	10.12	-.0191	.0259	-.1733
	2.294	8.27	.0861	.0455	12.22	-.0227	.0308	-.2202
	2.294	8.37	.0919	.0595	16.32	-.0278	.0376	-.3103
	2.294	16.86	.2102	.0176	-2.03	.0034	.0034	.0255
	2.294	16.86	.2093	.0184	-1.01	.0016	.0029	.0117
	2.294	16.82	.2113	.0197	-.02	.0001	.0012	-.0002
	2.294	16.82	.2130	.0193	1.05	-.0015	-.0006	-.0131
	2.294	16.73	.2162	.0181	2.04	-.0029	-.0018	-.0260
	2.294	16.81	.2174	.0159	3.08	-.0046	-.0021	-.0385
	2.294	16.83	.2205	.0136	4.08	-.0064	-.0015	-.0537
	2.294	16.82	.2254	.0119	5.12	-.0083	-.0001	-.0724
	2.294	16.90	.2295	.0131	6.12	-.0102	.0018	-.0930
	2.294	16.96	.2356	.0158	8.18	-.0132	.0055	-.1316
	2.294	16.90	.2419	.0210	10.23	-.0165	.0104	-.1766
	2.294	16.94	.2426	.0257	12.30	-.0194	.0154	-.2190
	2.294	16.90	.2555	.0267	16.39	-.0249	.0251	-.3142
	2.975	.03	-.0171	.0336	-1.98	.0025	-.0042	.0211
	2.975	.05	-.0175	.0332	-1.02	.0011	-.0018	.0090
	2.975	.04	-.0180	.0328	.01	-.0003	.0004	-.0036
	2.975	.05	-.0167	.0329	1.02	-.0019	.0027	-.0163
	2.975	.03	-.0172	.0331	2.03	-.0033	.0049	-.0290
	2.975	.03	-.0176	.0330	3.01	-.0047	.0072	-.0408
	2.975	.03	-.0179	.0337	4.00	-.0062	.0096	-.0544
	2.975	.05	-.0181	.0348	5.01	-.0077	.0121	-.0695
	2.975	.05	-.0201	.0363	6.07	-.0093	.0148	-.0864
	2.975	.05	-.0201	.0387	8.06	-.0122	.0202	-.1212
	2.975	.05	-.0212	.0415	10.12	-.0150	.0258	-.1626
	2.975	-.02	-.0225	.0446	12.13	-.0175	.0304	-.2043
	2.975	-.01	-.0247	.0505	16.21	-.0222	.0397	-.2923
	2.975	8.20	.0666	.0269	-1.99	.0030	-.0027	.0236
	2.975	8.20	.0659	.0266	-1.01	.0013	-.0011	.0097
	2.975	8.20	.0657	.0270	.01	-.0002	.0004	-.0036
	2.975	8.22	.0657	.0270	1.03	-.0017	.0017	-.0163
	2.975	8.20	.0673	.0270	2.02	-.0033	.0030	-.0296
	2.975	8.21	.0705	.0261	3.03	-.0048	.0043	-.0427
	2.975	8.19	.0716	.0258	4.02	-.0063	.0059	-.0569
	2.975	8.20	.0751	.0258	5.03	-.0077	.0075	-.0726
	2.975	8.19	.0785	.0267	6.10	-.0091	.0093	-.0890
	2.975	8.20	.0820	.0308	8.08	-.0118	.0130	-.1237
	2.975	8.19	.0843	.0350	10.17	-.0144	.0157	-.1616
	2.975	8.22	.0886	.0396	12.19	-.0166	.0185	-.1997
	2.975	8.28	.0927	.0462	16.29	-.0213	.0266	-.2832
	2.975	16.74	.2000	.0180	-2.05	.0027	.0019	.0268
	2.975	16.70	.2001	.0187	-1.02	.0013	.0018	.0116
	2.975	16.63	.1999	.0191	-.01	.0003	.0006	-.0007
	2.975	16.57	.2017	.0187	1.03	-.0009	-.0005	-.0147
	2.975	16.73	.2046	.0181	2.03	-.0021	-.0011	-.0274
	2.975	16.71	.2094	.0167	3.07	-.0033	-.0012	-.0422
	2.975	16.75	.2112	.0157	4.05	-.0046	-.0009	-.0559
	2.975	16.76	.2129	.0152	5.06	-.0058	-.0003	-.0730
	2.975	16.78	.2146	.0154	6.10	-.0069	.0005	-.0895
	2.975	16.78	.2183	.0164	8.15	-.0091	.0031	-.1257
	2.975	16.79	.2217	.0186	10.19	-.0118	.0067	-.1635
	2.975	16.82	.2252	.0201	12.25	-.0140	.0097	-.2022
	2.975	16.84	.2371	.0186	16.28	-.0186	.0178	-.2868

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Continued

Configuration	M	α, deg	C_L	C_m	β deg	C_l	C_n	C_Y
FVH[2]	3.963	.01	-.0221	.0286	-2.00	.0019	-.0020	.0208
	3.963	.01	-.0208	.0285	-1.01	.0008	-.0008	.0097
	3.963	.05	-.0221	.0284	-.01	-.0002	.0002	.0003
	3.963	.04	-.0233	.0287	1.02	-.0013	.0013	-.0108
	3.963	.03	-.0221	.0285	2.00	-.0024	.0023	-.0209
	3.963	.04	-.0231	.0297	3.03	-.0035	.0036	-.0328
	3.963	.04	-.0242	.0298	4.02	-.0046	.0048	-.0438
	3.963	.01	-.0252	.0309	5.02	-.0056	.0064	-.0576
	3.963	.01	-.0236	.0322	6.05	-.0067	.0079	-.0717
	3.963	.01	-.0251	.0354	8.06	-.0087	.0112	-.1017
	3.963	.02	-.0264	.0373	10.09	-.0108	.0146	-.1353
	3.963	.02	-.0276	.0392	12.12	-.0127	.0181	-.1705
	3.963	.04	-.0295	.0448	16.15	-.0171	.0270	-.2439
	3.963	8.38	.0783	.0426	16.21	-.0162	.0156	-.2430
	3.963	8.14	.0712	.0394	12.15	-.0120	.0092	-.1681
	3.963	8.15	.0703	.0373	10.11	-.0102	.0072	-.1353
	3.963	8.16	.0675	.0361	8.10	-.0085	.0058	-.1062
	3.963	8.15	.0622	.0346	6.07	-.0067	.0048	-.0775
	3.963	8.17	.0606	.0334	5.04	-.0056	.0037	-.0631
	3.963	8.17	.0593	.0328	4.03	-.0045	.0026	-.0490
	3.963	8.15	.0602	.0326	3.02	-.0034	.0017	-.0355
	3.963	8.15	.0589	.0323	2.01	-.0023	.0010	-.0237
	3.963	8.13	.0572	.0322	1.00	-.0012	.0007	-.0118
	3.963	8.13	.0558	.0327	-.01	-.0001	.0001	.0008
	3.963	8.14	.0570	.0326	-1.01	.0010	-.0003	.0119
	3.963	8.14	.0560	.0328	-2.01	.0021	-.0008	.0230
	3.963	16.58	.1680	.0357	-2.02	.0019	.0020	.0273
	3.963	16.62	.1714	.0362	-1.02	.0009	.0018	.0145
	3.963	16.61	.1706	.0371	.00	.0001	.0006	.0025
	3.963	16.66	.1727	.0373	.00	.0001	.0005	.0017
	3.963	16.61	.1748	.0369	1.02	-.0006	-.0007	-.0096
	3.963	16.67	.1770	.0355	2.02	-.0014	-.0017	-.0215
	3.963	16.65	.1785	.0342	3.03	-.0023	-.0019	-.0350
	3.963	16.63	.1805	.0338	4.04	-.0031	-.0022	-.0488
	3.963	16.61	.1820	.0333	5.06	-.0039	-.0023	-.0623
	3.963	16.54	.1857	.0325	6.09	-.0048	-.0018	-.0775
	3.963	16.64	.1886	.0323	8.09	-.0067	-.0001	-.1094
	3.963	16.64	.1916	.0320	10.14	-.0085	.0013	-.1422
	3.963	16.63	.1969	.0315	12.18	-.0103	.0030	-.1758
	3.963	16.64	.2079	.0292	16.24	-.0147	.0089	-.2532
	4.653	.02	-.0209	.0241	-2.00	.0016	-.0010	.0206
	4.653	.08	-.0198	.0236	-1.02	.0006	-.0005	.0111
	4.653	.04	-.0216	.0224	-.03	-.0003	.0000	.0016
	4.653	.00	-.0232	.0222	1.02	-.0012	.0007	-.0099
	4.653	.04	-.0220	.0221	1.99	-.0021	.0010	-.0194
	4.653	-.02	-.0237	.0229	3.01	-.0029	.0017	-.0299
	4.653	.02	-.0224	.0238	4.03	-.0038	.0023	-.0414
	4.653	.02	-.0239	.0250	5.04	-.0048	.0031	-.0530
	4.653	.02	-.0253	.0262	6.05	-.0056	.0044	-.0664
	4.653	.02	-.0251	.0287	8.05	-.0073	.0066	-.0943
	4.653	.02	-.0276	.0311	10.08	-.0090	.0089	-.1249
	4.653	.03	-.0271	.0336	12.11	-.0110	.0119	-.1566
	4.653	.05	-.0311	.0407	16.13	-.0157	.0222	-.2294
	4.653	8.13	.0738	.0380	16.15	-.0142	.0121	-.2251
	4.653	8.14	.0699	.0357	12.14	-.0100	.0057	-.1555
	4.653	8.12	.0668	.0344	10.09	-.0084	.0041	-.1246
	4.653	8.13	.0643	.0338	8.09	-.0070	.0033	-.0981
	4.653	8.13	.0617	.0325	6.06	-.0055	.0027	-.0720
	4.653	8.11	.0630	.0318	5.03	-.0047	.0022	-.0584
	4.653	8.13	.0617	.0308	4.02	-.0037	.0015	-.0468
	4.653	8.13	.0604	.0324	3.02	-.0028	.0005	-.0344
	4.653	8.13	.0593	.0324	2.03	-.0020	.0003	-.0239
	4.653	8.13	.0580	.0330	1.02	-.0011	.0002	-.0124
	4.653	8.11	.0567	.0331	.01	-.0002	.0002	-.0009
	4.653	8.13	.0582	.0328	-1.01	.0007	.0002	.0096
	4.653	8.12	.0541	.0328	-2.00	.0017	.0000	.0210
	4.653	16.57	.1635	.0311	-2.01	.0016	.0016	.0250
	4.653	16.55	.1646	.0315	-1.03	.0007	.0011	.0125
	4.653	16.53	.1658	.0328	.02	.0000	.0006	-.0001
	4.653	16.57	.1669	.0322	1.02	-.0006	-.0007	-.0097
	4.653	16.57	.1687	.0309	2.01	-.0013	-.0012	-.0223
	4.653	16.55	.1698	.0301	3.04	-.0019	-.0015	-.0359
	4.653	16.53	.1708	.0295	4.03	-.0025	-.0021	-.0475
	4.653	16.52	.1753	.0282	5.02	-.0032	-.0021	-.0611
	4.653	16.48	.1763	.0275	6.09	-.0041	-.0018	-.0744
	4.653	16.60	.1816	.0256	8.08	-.0055	-.0009	-.1025
	4.653	16.58	.1872	.0241	10.11	-.0072	.0002	-.1343
	4.653	16.58	.1901	.0224	12.14	-.0088	.0017	-.1662
	4.653	16.61	.2035	.0179	16.19	-.0129	.0076	-.2386

TABLE II.- AERODYNAMIC CHARACTERISTICS IN SIDESLIP OF CONFIGURATIONS INVESTIGATED - Concluded

Configuration	M	α_i deg	C_L	C_m	β deg	C_l	C_n	C_Y
F	2.294	.05	-.0154	.0057	-4.09	.0000	.0114	.0235
	2.294	.02	-.0155	.0055	-2.02	.0001	.0051	.0151
	2.294	.00	-.0149	.0052	-1.05	.0000	.0024	.0113
	2.294	.02	-.0157	.0056	.03	.0001	-.0006	.0068
	2.294	.03	-.0151	.0055	1.00	.0001	-.0033	.0029
	2.294	.02	-.0159	.0054	2.04	.0000	-.0066	-.0004
	2.294	-.02	-.0153	.0054	3.08	.0000	-.0093	-.0048
	2.294	-.02	-.0161	.0055	4.06	.0001	-.0123	-.0093
	2.294	.00	-.0153	.0054	5.10	.0000	-.0151	-.0159
	2.294	-.02	-.0159	.0053	6.14	.0000	-.0177	-.0225
	2.294	-.04	-.0155	.0051	8.18	.0000	-.0231	-.0378
	2.294	.02	-.0142	.0050	10.28	.0000	-.0282	-.0640
	2.294	.00	-.0139	.0027	12.35	.0000	-.0341	-.0954
	2.294	-.02	-.0124	.0027	16.51	-.0001	-.0420	-.1716
	2.294	.02	-.0109	.0027	20.55	-.0001	-.0504	-.2473
	2.294	8.25	.0936	.0574	20.57	-.0001	-.0495	-.2586
	2.294	8.16	.0853	.0601	16.55	-.0001	-.0422	-.1874
	2.294	8.21	.0756	.0598	12.38	-.0001	-.0335	-.1226
	2.294	8.19	.0632	.0631	10.25	-.0001	-.0288	-.0895
	2.294	8.14	.0523	.0647	8.25	-.0001	-.0230	-.0620
	2.294	8.16	.0457	.0647	6.20	-.0001	-.0174	-.0429
	2.294	8.14	.0413	.0644	5.07	-.0001	-.0147	-.0298
	2.294	8.13	.0389	.0652	4.06	-.0001	-.0120	-.0227
	2.294	8.09	.0365	.0657	3.09	-.0001	-.0088	-.0162
	2.294	8.09	.0339	.0658	2.05	-.0001	-.0059	-.0074
	2.294	8.07	.0333	.0658	1.03	-.0001	-.0028	-.0030
	2.294	8.09	.0324	.0659	.02	.0000	.0000	.0036
	2.294	8.08	.0315	.0657	-1.03	.0000	.0032	.0097
	2.294	8.10	.0321	.0650	-2.00	.0000	.0058	.0163
	2.294	8.12	.0345	.0641	-4.07	.0000	.0112	.0317
	2.294	16.52	.1599	.1154	-4.09	.0000	.0123	.0531
	2.294	16.45	.1622	.1175	-2.10	.0000	.0069	.0350
	2.294	16.41	.1622	.1186	-1.02	.0000	.0041	.0235
	2.294	16.32	.1621	.1195	.00	.0000	.0014	.0109
	2.294	16.32	.1619	.1198	1.07	.0000	-.0021	.0010
	2.294	16.34	.1618	.1194	2.07	.0000	-.0050	-.0098
	2.294	16.35	.1660	.1202	3.08	.0000	-.0075	-.0214
	2.294	16.33	.1675	.1188	4.13	-.0001	-.0103	-.0357
	2.294	16.34	.1700	.1193	5.12	.0000	-.0133	-.0454
	2.294	16.34	.1729	.1190	6.20	.0000	-.0166	-.0585
	2.294	16.33	.1805	.1179	8.25	.0000	-.0223	-.0884
	2.294	16.33	.1863	.1154	10.35	-.0001	-.0270	-.1174
	2.294	16.36	.1920	.1150	12.41	.0000	-.0320	-.1460
	2.294	16.36	.2087	.1101	16.58	.0000	-.0396	-.2163
	2.294	16.40	.2227	.1067	20.63	-.0001	-.0459	-.2912
	2.975	-.01	-.0103	.0033	-4.06	.0000	.0114	.0225
	2.975	-.01	-.0088	.0032	-2.03	.0000	.0052	.0134
	2.975	-.03	-.0099	.0033	-1.00	.0000	.0025	.0076
	2.975	-.03	-.0092	.0033	-.01	.0000	-.0009	.0043
	2.975	-.03	-.0085	.0029	1.03	.0000	-.0038	.0004
	2.975	-.03	-.0095	.0031	2.04	-.0001	-.0067	-.0047
	2.975	-.03	-.0088	.0027	3.02	.0000	-.0094	-.0106
	2.975	-.03	-.0099	.0029	4.06	-.0001	-.0124	-.0144
	2.975	-.03	-.0090	.0028	5.08	-.0001	-.0152	-.0216
	2.975	-.03	-.0081	.0024	6.13	.0000	-.0178	-.0284
	2.975	-.01	-.0056	.0016	8.15	-.0001	-.0215	-.0529
	2.975	-.01	-.0045	.0012	10.22	-.0001	-.0254	-.0810
	2.975	-.02	-.0051	.0004	12.32	-.0001	-.0287	-.1096
	2.975	-.02	-.0040	.0017	16.45	-.0001	-.0363	-.1731
	2.975	.00	-.0011	.0015	20.42	-.0002	-.0415	-.2379
	2.975	8.22	.1047	.0469	20.45	-.0002	-.0413	-.2564
	2.975	8.21	.0979	.0490	16.45	-.0002	-.0349	-.1888
	2.975	8.22	.0885	.0500	12.35	-.0002	-.0278	-.1292
	2.975	8.19	.0808	.0522	10.26	-.0002	-.0237	-.1001
	2.975	8.18	.0741	.0532	8.18	-.0002	-.0190	-.0747
	2.975	8.16	.0686	.0542	6.16	-.0002	-.0147	-.0522
	2.975	8.15	.0653	.0541	5.10	-.0002	-.0123	-.0417
	2.975	8.13	.0611	.0553	4.09	-.0002	-.0100	-.0324
	2.975	8.13	.0601	.0554	3.07	-.0002	-.0076	-.0247
	2.975	8.12	.0571	.0563	2.05	-.0001	-.0050	-.0145
	2.975	8.14	.0564	.0567	1.05	-.0001	-.0024	-.0087
	2.975	8.14	.0554	.0568	.03	-.0001	.0001	-.0010
	2.975	8.14	.0539	.0562	-1.02	-.0001	.0027	.0085
	2.975	8.16	.0547	.0555	-2.01	-.0001	.0055	.0156
	2.975	8.18	.0580	.0541	-4.05	-.0001	.0103	.0316
	2.975	16.27	.1688	.0933	-4.08	-.0001	.0109	.0512
	2.975	16.31	.1717	.0938	-2.05	-.0001	.0061	.0299
	2.975	16.44	.1731	.0955	-1.00	-.0001	.0041	.0159
	2.975	16.40	.1737	.0962	.03	-.0001	.0017	.0051
	2.975	16.37	.1723	.0963	1.05	-.0001	-.0013	-.0064
	2.975	16.37	.1747	.0971	2.09	-.0001	-.0038	-.0180
	2.975	16.37	.1758	.0973	3.05	-.0001	-.0061	-.0270
	2.975	16.36	.1778	.0964	4.08	-.0001	-.0084	-.0401
	2.975	16.34	.1799	.0969	5.12	-.0001	-.0107	-.0506
	2.975	16.33	.1804	.0961	6.13	-.0001	-.0130	-.0668
	2.975	16.33	.1837	.0962	8.20	-.0001	-.0177	-.0896
	2.975	16.32	.1891	.0946	10.27	-.0001	-.0219	-.1188
	2.975	16.33	.1963	.0935	12.33	-.0001	-.0261	-.1488
	2.975	16.41	.2075	.0872	16.50	-.0001	-.0325	-.2118
	2.975	16.45	.2200	.0826	20.45	-.0001	-.0377	-.2775

M	α_i deg	C_L	C_m	β deg	C_l	C_n	C_Y
3.963	-.02	-.0099	.0054	-4.04	-.0001	.0102	.0230
3.963	-.02	-.0087	.0054	-2.00	.0000	.0047	.0155
3.963	.01	-.0079	.0053	-1.00	.0000	.0019	.0097
3.963	-.02	-.0095	.0051	.02	.0000	-.0007	.0047
3.963	-.01	-.0087	.0051	1.04	.0000	-.0035	-.0002
3.963	.01	-.0103	.0053	2.01	.0000	-.0059	-.0052
3.963	-.06	-.0095	.0044	3.05	.0000	-.0087	-.0110
3.963	.01	-.0087	.0048	4.06	.0000	-.0108	-.0176
3.963	-.01	-.0102	.0046	5.07	.0000	-.0131	-.0242
3.963	-.01	-.0092	.0041	6.07	.0000	-.0149	-.0341
3.963	-.02	-.0071	.0035	8.13	.0000	-.0179	-.0537
3.963	-.04	-.0069	.0035	10.14	.0000	-.0208	-.0783
3.963	-.04	-.0067	.0036	12.22	.0000	-.0242	-.1029
3.963	-.04	-.0080	.0039	16.29	-.0001	-.0305	-.1578
3.963	-.02	-.0093	.0046	20.24	-.0001	-.0355	-.2143
3.963	8.15	.0853	.0428	20.27	.0000	-.0373	-.2322
3.963	8.12	.0798	.0453	16.31	-.0001	-.0314	-.1725
3.963	8.15	.0722	.0473	12.24	-.0001	-.0251	-.1177
3.963	8.16	.0674	.0486	10.17	-.0001	-.0213	-.0931
3.963	8.14	.0628	.0493	8.15	-.0001	-.0173	-.0723
3.963	8.14	.0607	.0501	6.10	-.0001	-.0131	-.0496
3.963	8.15	.0574	.0509	5.08	-.0001	-.0110	-.0398
3.963	8.15	.0563	.0510	4.07	-.0001	-.0088	-.0316
3.963	8.15	.0552	.0515	3.03	-.0001	-.0066	-.0209
3.963	8.13	.0542	.0518	2.04	-.0001	-.0043	-.0135
3.963	8.11	.0510	.0525	1.04	-.0001	-.0023	-.0053
3.963	8.11	.0501	.0528	-.02	-.0001	-.0002	.0037
3.963	8.13	.0515	.0526	-1.00	-.0001	.0025	.0103
3.963	8.13	.0506	.0523	-2.02	-.0001	.0049	.0169
3.963	8.13	.0530	.0503	-4.05	-.0001	.0092	.0343
3.963	16.27	.1519	.0905	-4.07	-.0001	.0096	.0500
3.963	16.25	.1544	.0919	-2.00	.0000	.0051	.0294
3.963	16.25	.1550	.0923	-1.03	.0000	.0030	.0187
3.963	16.24	.1568	.0929	.01	.0000	.0009	.0081
3.963	16.35	.1580	.0939	1.06	-.0001	-.0012	-.0059
3.963	16.24	.1592	.0930	2.06	-.0001	-.0032	-.0157
3.963	16.28	.1603	.0933	3.04	.0000	-.0054	-.0264
3.963	16.28	.1614	.0932	4.07	-.0001	-.0077	-.0371
3.963	16.26	.1624	.0931	5.07	.0000	-.0098	-.0478
3.963	16.30	.1657	.0927	6.11	.0000	-.0120	-.0584
3.963	16.29	.1683	.0921	8.16	-.0001	-.0158	-.0846
3.963	16.29	.1750	.0905	10.21	.0000	-.0195	-.1100
3.963	16.30	.1799	.0892	12.24	-.0001	-.0237	-.1378
3.963	16.33	.1895	.0869	16.37	.0000	-.0310	-.1951
3.963	16.37	.1996	.0829	20.30	.0000	-.0366	-.2629
4.653	.01	.0025	.0044	-4.03	-.0001	.0098	.0242
4.653	.02	-.0015	.0050	-1.99	-.0001	.0047	.0120
4.653	.02	-.0007	.0054	-.99	-.0001	.0016	.0069
4.653	.02	.0000	.0034	.04	-.0001	-.0005	.0010
4.653	-.01	.0008	.0033	1.04	-.0001	-.0034	-.0040
4.653	-.02	-.0013	.0036	2.03	-.0001	-.0059	-.0091
4.653	-.03	-.0005	.0031	3.04	-.0001	-.0084	-.0152
4.653	-.01	.0003	.0035	4.03	-.0001	-.0108	-.0221
4.653	-.02	-.0016	.0033	5.04	-.0001	-.0129	-.0292
4.653	-.02	-.0007	.0032	6.10	-.0001	-.0144	-.0381
4.653	-.02	-.0013	.0028	8.09	-.0001	-.0172	-.0590
4.653	.00	.0010	.0026	10.15	-.0001	-.0211	-.0809
4.653	.00	.0007	.0027	12.19	-.0001	-.0243	-.1048
4.653	.02	.0002	.0034	16.27	-.0002	-.0297	-.1549
4.653	.02	.0028	.0032	20.19	-.0002	-.0330	-.2111
4.653	.03	.0087	.0062	.03	-.0001	-.0003	-.0020
4.653	8.11	.0947	.0385	20.20	-.0002	-.0332	-.2263
4.653	8.16	.0891	.0410	16.24	-.0002	-.0282	-.1656
4.653	8.13	.0817	.0437	12.19	-.0003	-.0223	-.1159
4.653	8.15	.0766	.0452	10.16	-.0002	-.0191	-.0930
4.653	8.15	.0743	.0454	8.14	-.0002	-.0155	-.0700
4.653	8.13	.0724	.0456	6.08	-.0003	-.0118	-.0520
4.653	8.12	.0687	.0461	5.07	-.0003	-.0098	-.0431
4.653	8.10	.0677	.0461	4.04	-.0002	-.0077	-.0351
4.653	8.10	.0666	.0472	3.03	-.0002	-.0060	-.0251
4.653	8.12	.0657	.0478	2.02	-.0002	-.0038	-.0171
4.653	8.12	.0648	.0478	1.03	-.0003	-.0016	-.0091
4.653	8.12	.0667	.0476	.04	-.0002	.0000	-.0011
4.653	8.14	.0658	.0477	-.99	-.0002	.0026	.0059
4.653	8.14	.0648	.0473	-1.99	-.0002	.0046	.0140
4.653	8.12	.0656	.0461	-4.03	-.0001	.0084	.0309
4.653	8.13	.0725	.0475	.03	-.0001	.0003	-.0021
4.653	16.23	.1572	.0760	-4.04	-.0001	.0082	.0412
4.653	16.23	.1595	.0777	-2.00	-.0001	.0045	.0202
4.653	16.23	.1610	.0778	-1.00	-.0001	.0024	.0102
4.653	16.24	.1629	.0798	1.05	-.0001	-.0013	-.0118
4.653	16.25	.1640	.0797	2.06	-.0002	-.0032	-.0218
4.653	16.26	.1650	.0796	3.05	-.0001	-.0049	-.0328
4.653	16.26	.1665	.0797	4.06	-.0002	-.0070	-.0428
4.653	16.26	.1671	.0794	5.10	-.0001	-.0088	-.0537
4.653	16.26	.1683	.0793	6.11	-.0001	-.0107	-.0647
4.653	16.28	.1730	.0778	8.13	-.0001	-.0139	-.0866
4.653	16.29	.1783	.0767	10.17	-.0001	-.0176	-.1115
4.653	16.27	.1834	.0762	12.19	-.0002	-.0206	-.1364
4.653	16.26	.1907	.0734	16.27	-.0002	-.0263	-.1931
4.653	16.29	.2037	.0708	20.22	-.0002	-.0313	-.2517
4.653	16.29	.1828	.0747	12.21	-.0002	-.0202	-.1353
4.653	16.26	.1697	.0767	5.08	-.0002	-.0083	-.0556
4.653	16.24	.1639	.0779	.02	-.0002	.0007	-.0008

TABLE III.- INDEX TO FIGURES

Figure	Data presented for variation of -	Configuration
3	$C_{m_{C_L}}$, C_{L_α}, C_{m_0}, and α_0 with M	All wing-on configurations
4	C_m with α	All wing-on and wing-off configurations
5	ΔC_m with α	All wing-on and wing-off configurations with ventral fin
6	ΔC_m with α	28.8° wing-on and wing-off configurations with and without ventral fin
7	C_m with β for $\alpha \approx 0°$, 8°, and 16°	All wing-on configurations and FVH^2v
8	Experimental and estimated C_{L_α} and C_{m_α} (at $\alpha = 0°$) with M	All configurations with H^2
9	C_m and α with C_L	W^1FVH^1v
10	C_m and α with C_L	W^1FVH^2v
11	C_m and α with C_L	W^1FVH^2
12	C_m and α with C_L	W^1FVH^3v
13	C_m and α with C_L	W^1F
14	C_m and α with C_L	W^2FVH^1v
15	C_m and α with C_L	W^2FVH^2v
16	C_m and α with C_L	W^2FVH^3v
17	C_m and α with C_L	W^2F
18	C_m and C_L with α	F
19	C_m and C_L with α	FVH^2
20	C_m and C_L with α	FVH^2v
21	α, β, and M (Schlieren photographs)	W^1FVH^1v W^2FVH^1v
22	α, β, and M (Schlieren photographs)	W^2FVH^1v W^2FVH^2v
23	C_{Y_β}, C_{n_β}, and C_{l_β} with α	All 28.8° wing configurations
24	C_{Y_β}, C_{n_β}, and C_{l_β} with α	All 45° wing configurations
25	C_{Y_β}, C_{n_β}, and C_{l_β} with α	All wing-off configurations
26	ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} with α	All 28.8° wing-on and wing-off configurations with ventral fin
27	ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} with α	28.8° wing-on and wing-off configurations with and without ventral fin
28	ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} with α	All 45° wing-on and wing-off configurations with ventral fin
29	z/b_w and l/b_w with α	All 28.8° wing-on and wing-off configurations with ventral fin
30	z/b_w and l/b_w with α	28.8° wing-on and wing-off with and without ventral fin
31	z/b_w and l/b_w with α	All 45° wing-on and wing-off configurations
32	C_n with β for $\alpha \approx 0°$, 8°, and 16°	All configurations
33	Experimental and estimated ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} with M for $\alpha = 0°$	All configurations with H^2

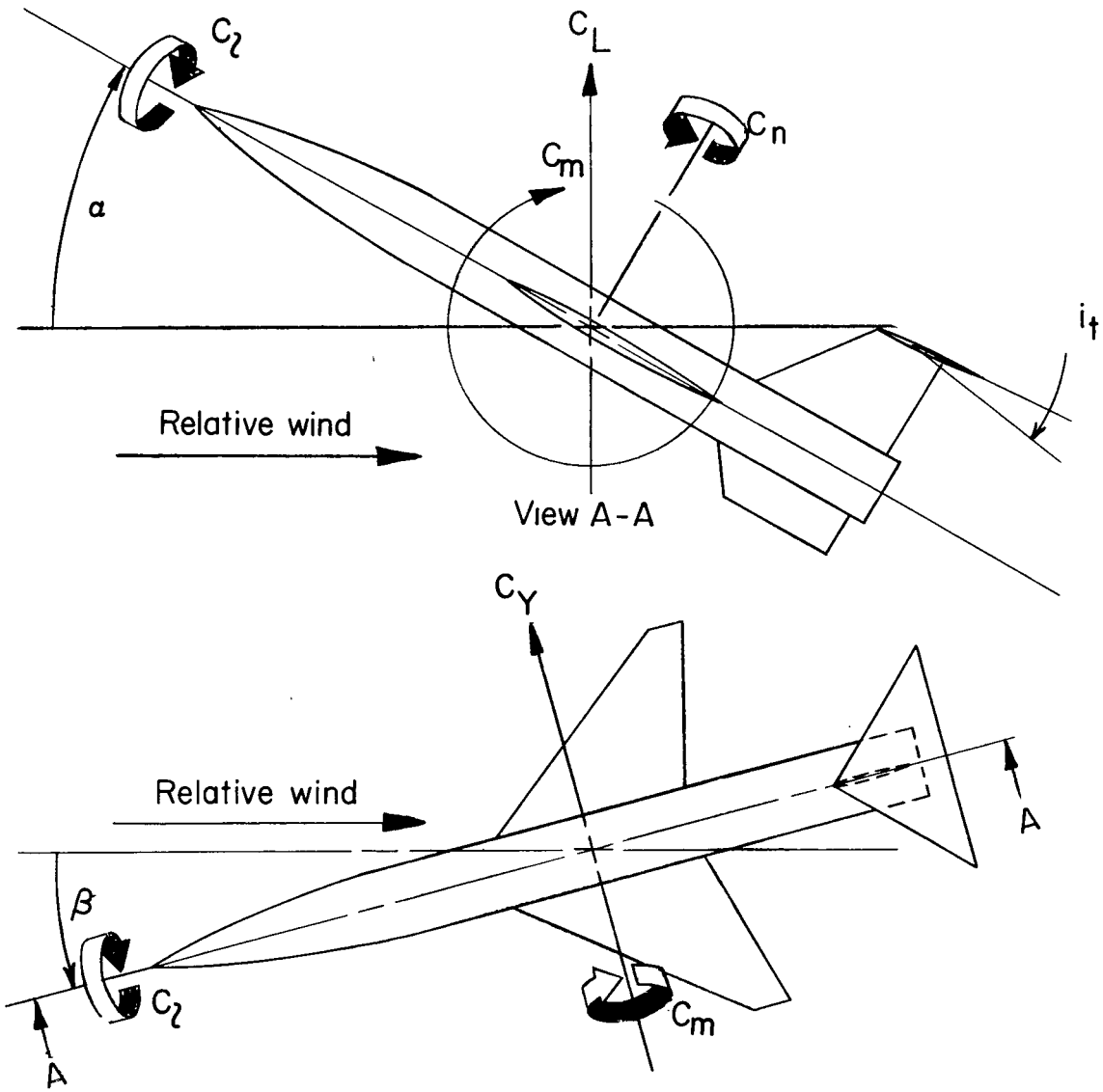
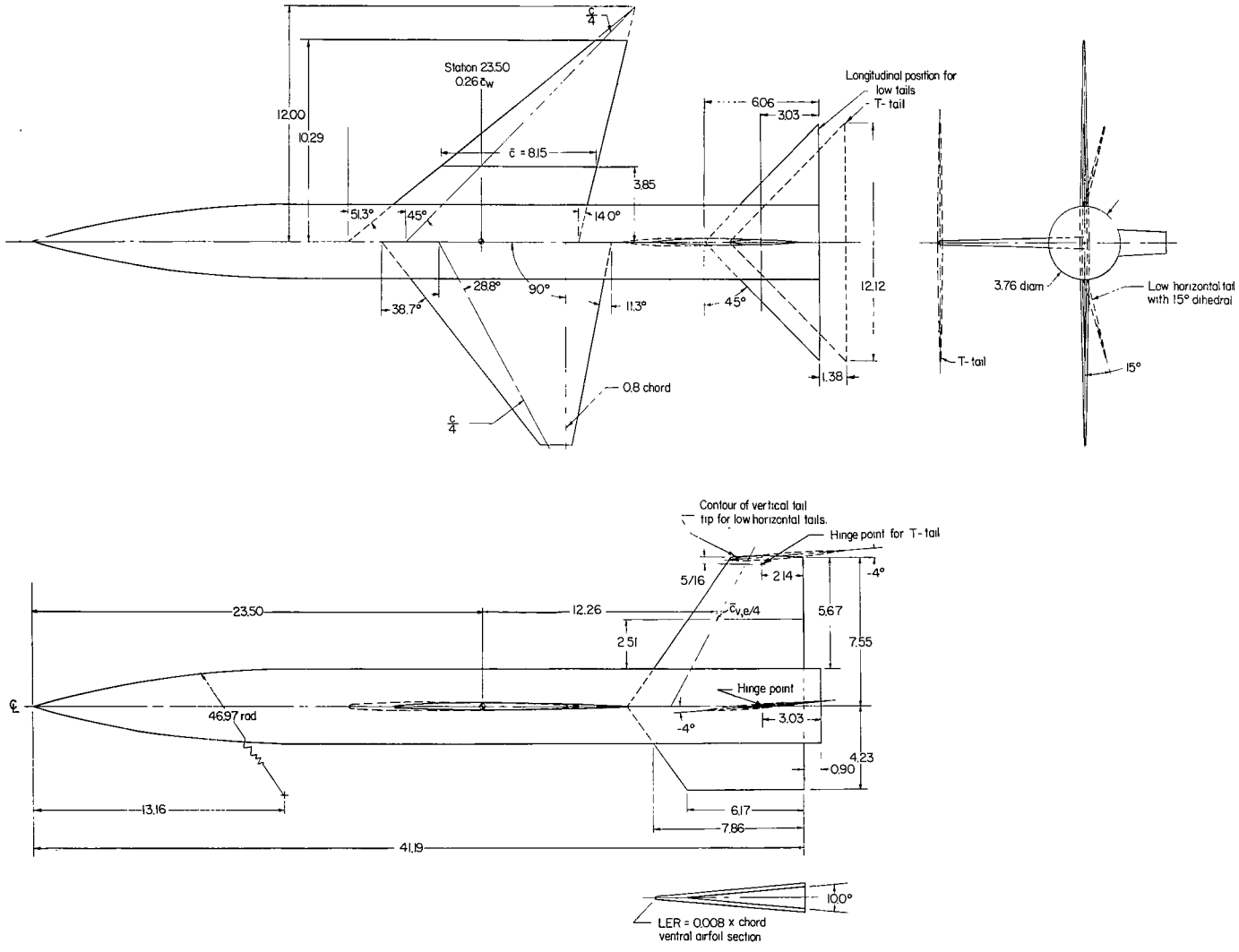
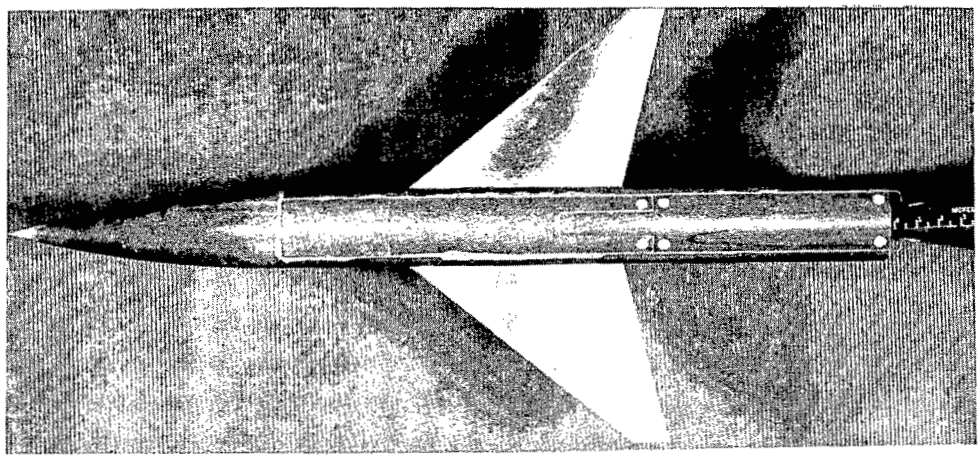


Figure 1.- System of axes. Arrows indicate positive values.

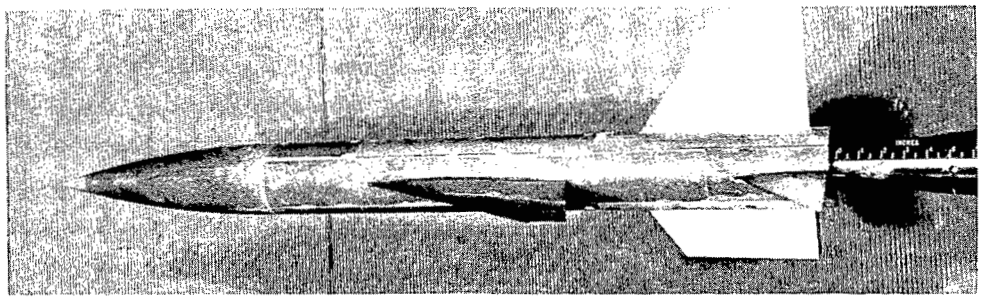


(a) Three-view drawing of model.

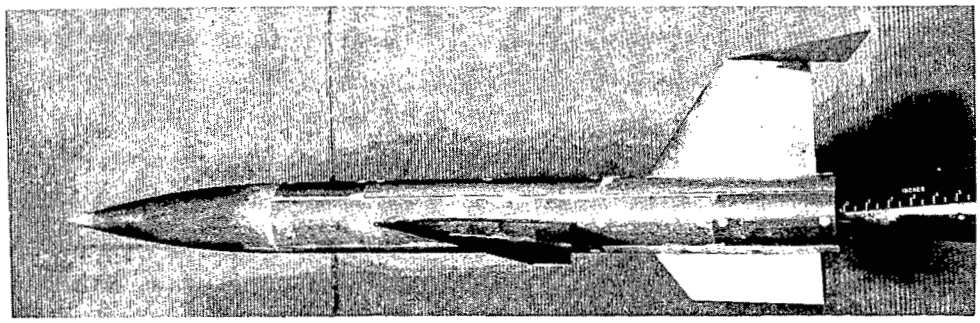
Figure 2.- Drawing and photographs of models.



Configuration W^2 F



Configuration W^2 FVH^3v

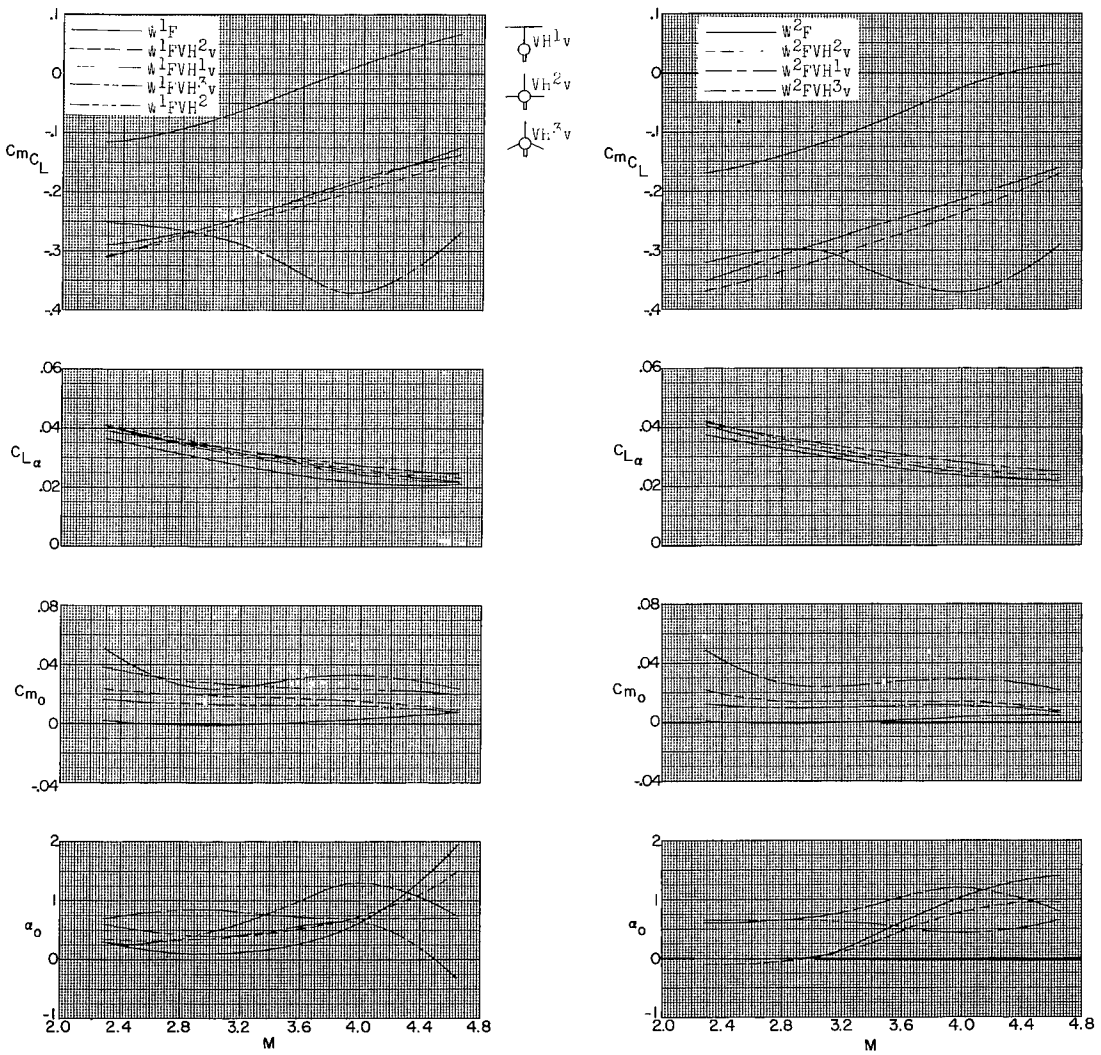


Configuration W^2 FVH'v

L-58-1615

(b) Photographs of some of the model configurations investigated.

Figure 2.- Concluded.



(a) 28.8° swept wing. (b) 45° swept wing.

Figure 3.- Summary of static-longitudinal characteristics for various model configurations $i_t = -4^\circ$; $\beta = 0^\circ$.

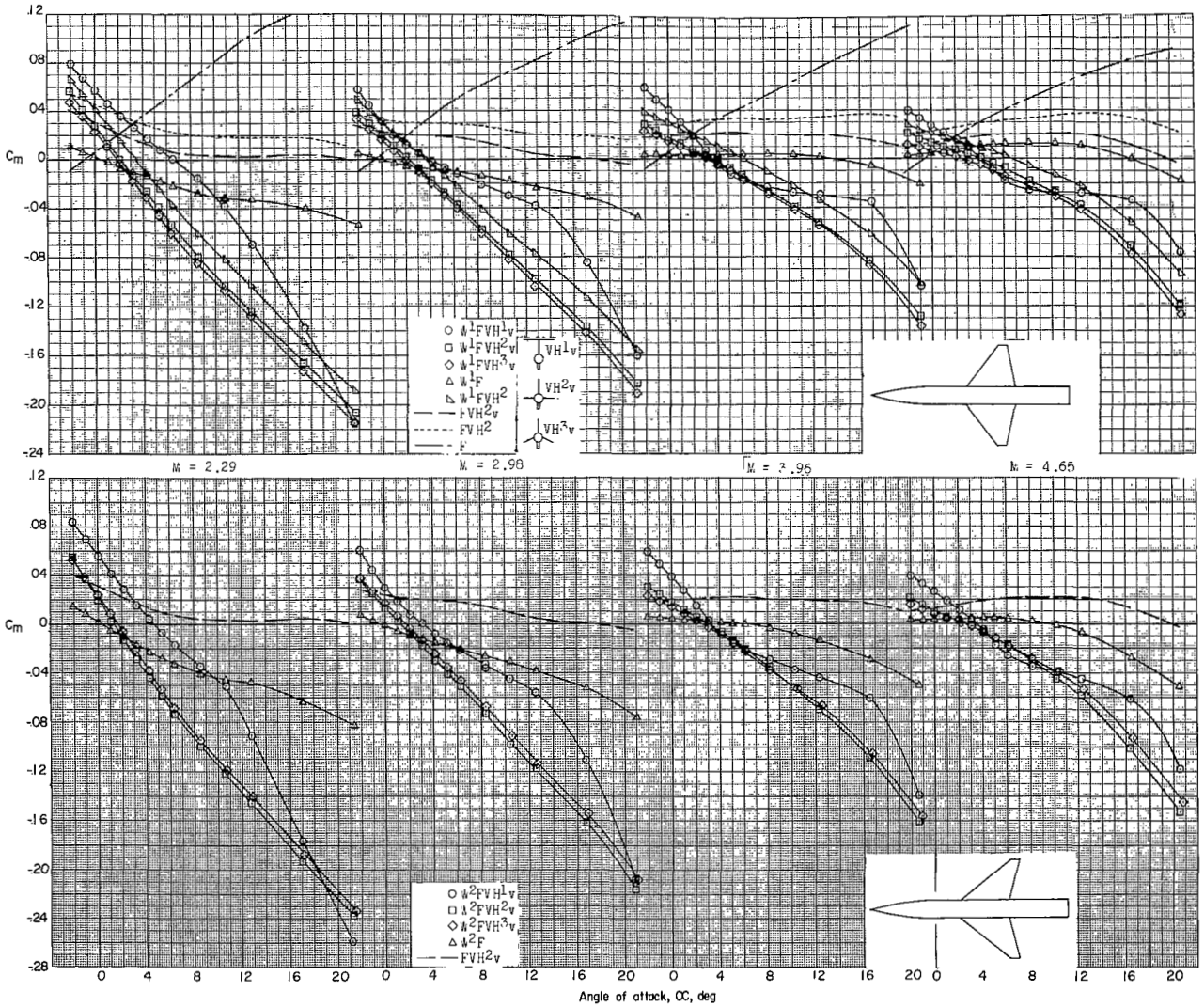
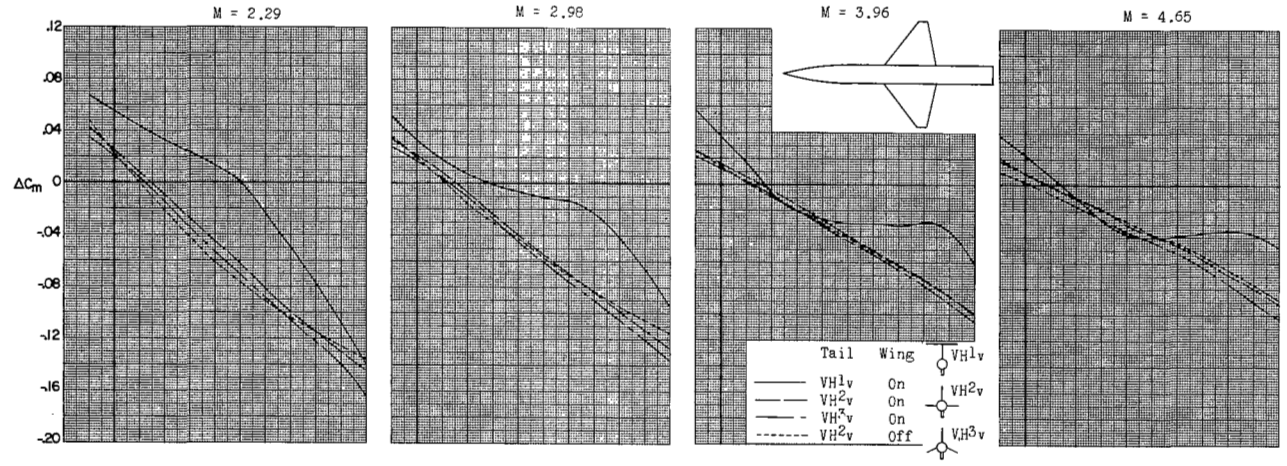
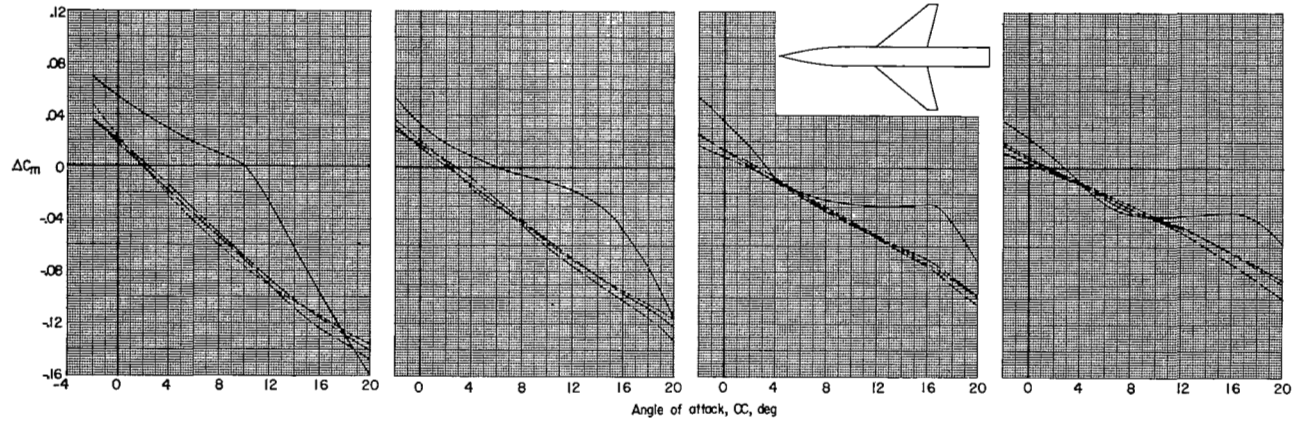


Figure 4.- Variation of C_m with α for various model configurations with and without the 28.8° and 45° swept wings.



(a) 28.8° swept wing.



(b) 45° swept wing.

Figure 5.- Variation of the tail increment ΔC_m with α for various model configurations with and without the wings.

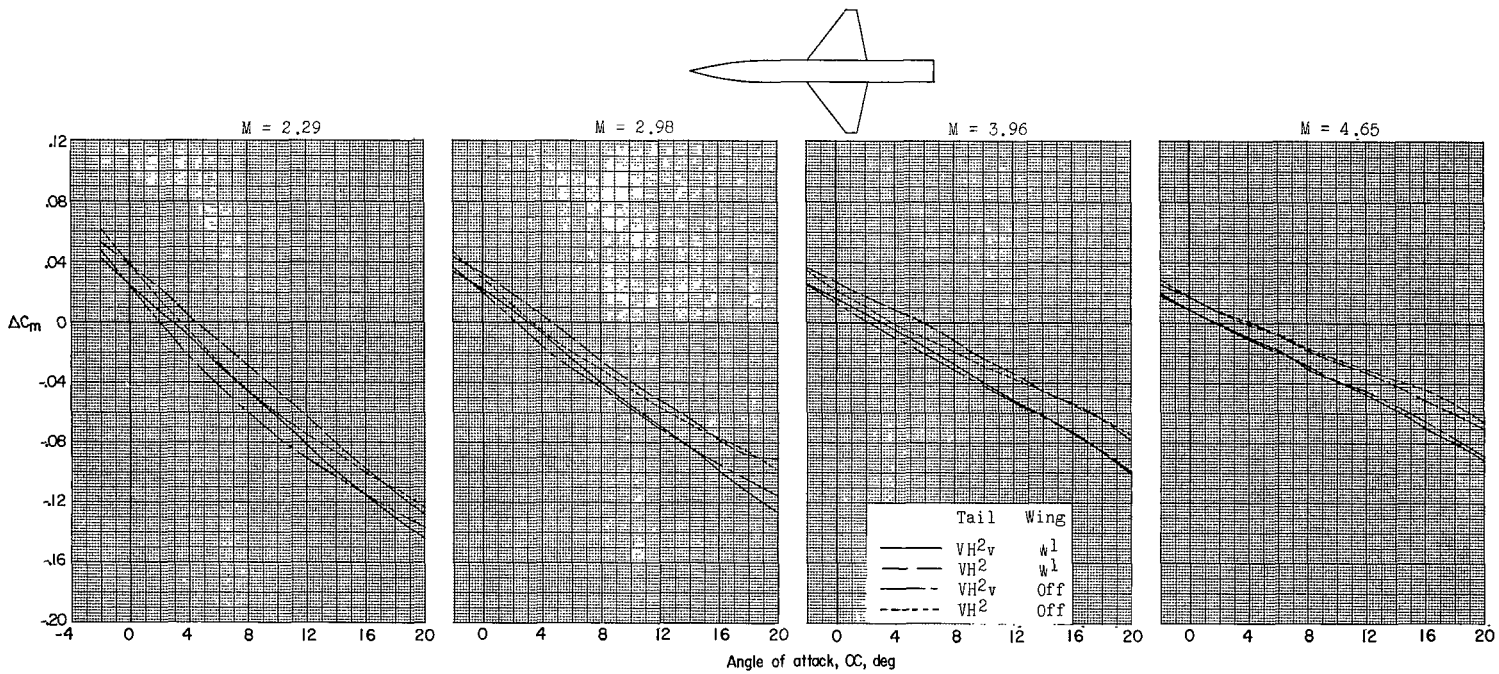
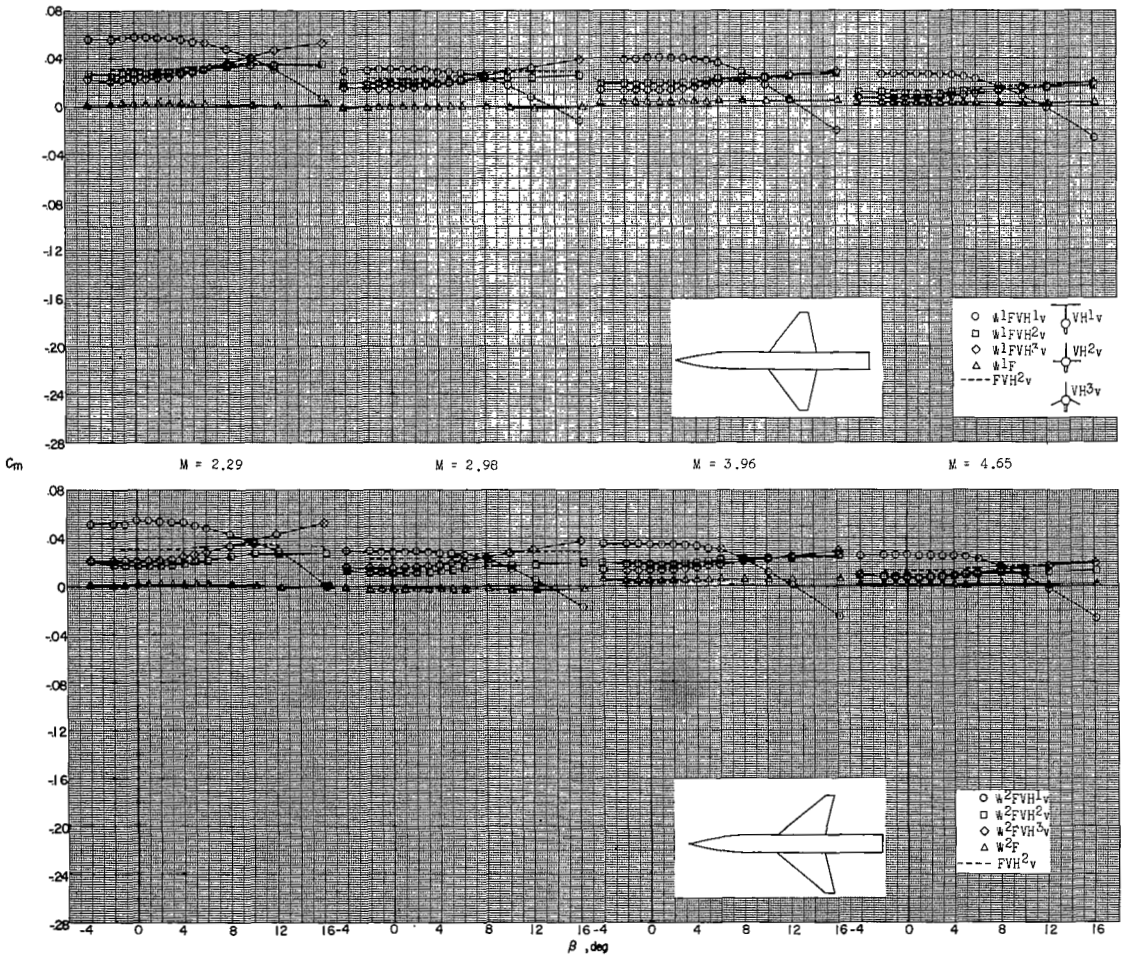
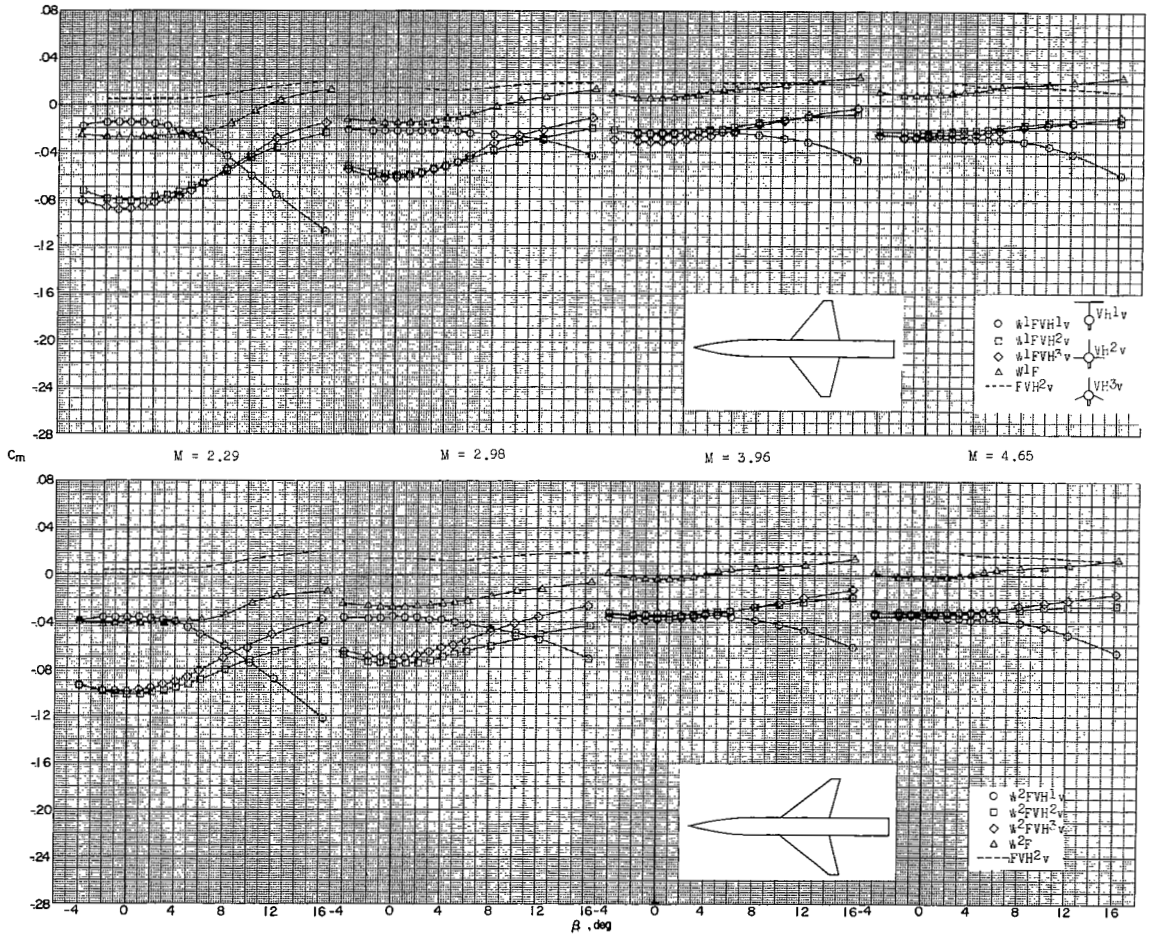


Figure 6.- Effect of ventral fin on the variation of the tail increment ΔC_m with α for the model with and without the 28.8° swept wing.



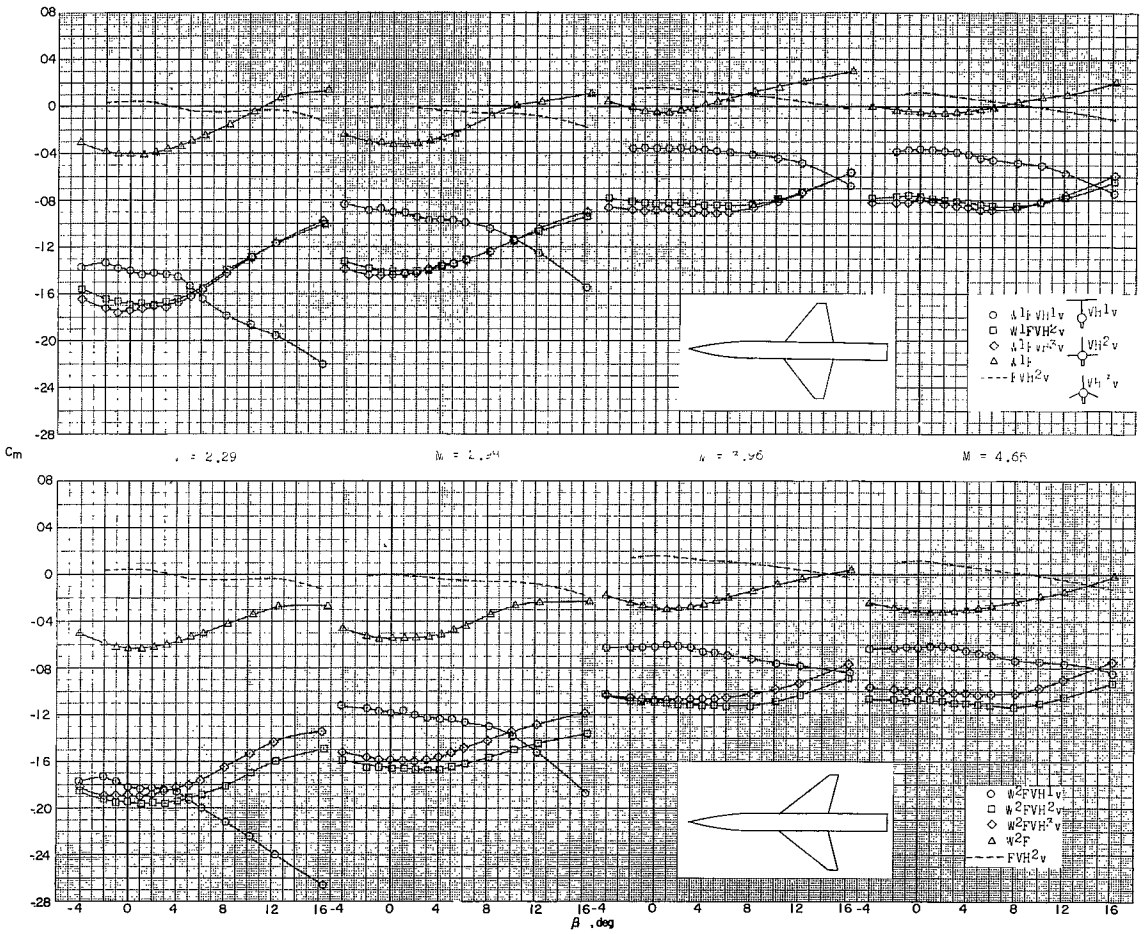
(a) Uncorrected angle of attack, 0°.

Figure 7.- Effect of horizontal-tail configuration, wing sweep, and Mach number on the variation of C_m with sideslip angle.



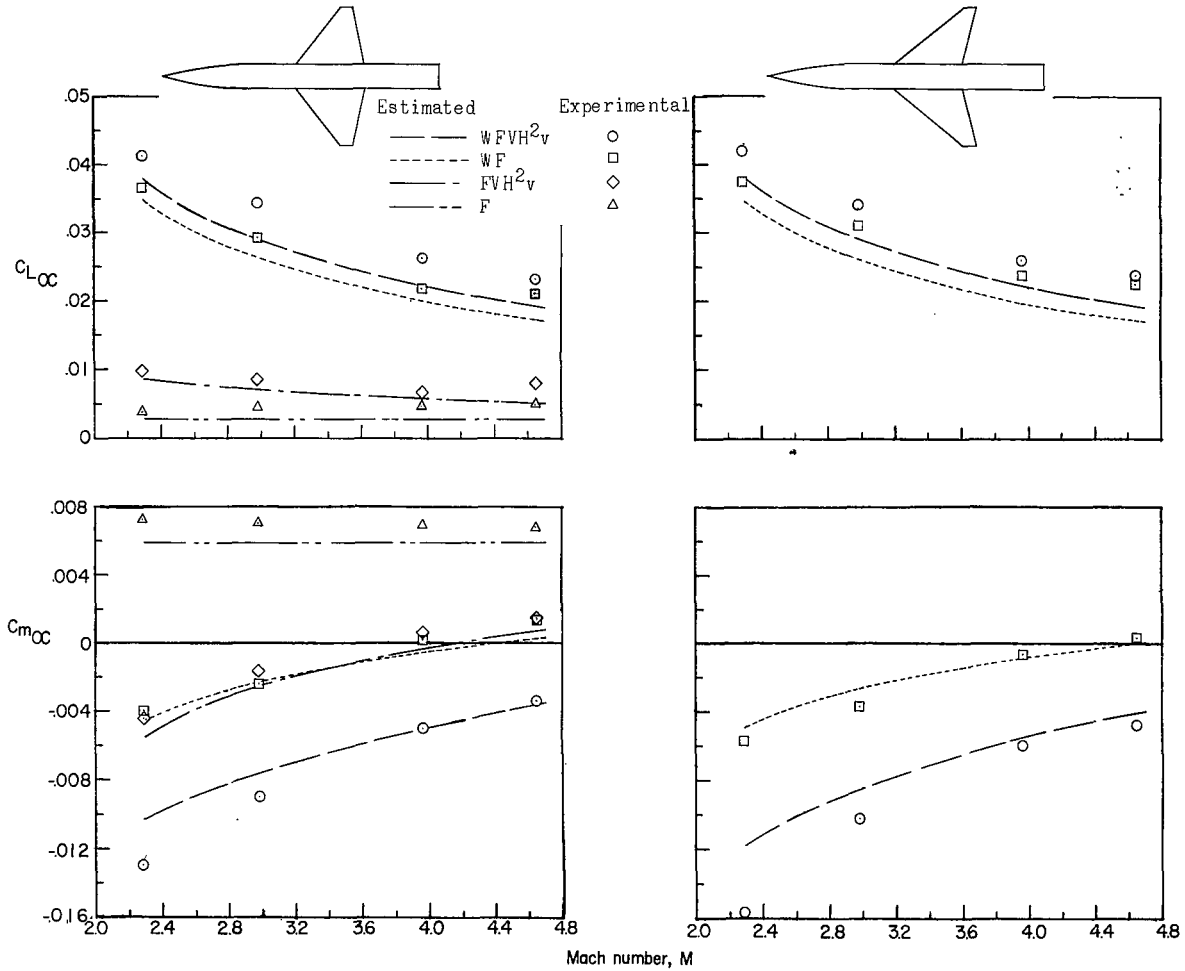
(b) Uncorrected angle of attack, 8°.

Figure 7.- Continued.



(c) Uncorrected angle of attack, 16°.

Figure 7.- Concluded.



(a) Wing with 28.8° sweep.

(b) Wing with 45° sweep.

Figure 8.- Comparison of experimental and estimated values of C_{L_α} and C_{m_α} for several model configurations. $i_t = -4^\circ$; $\alpha = 0^\circ$; $\beta = 0^\circ$.

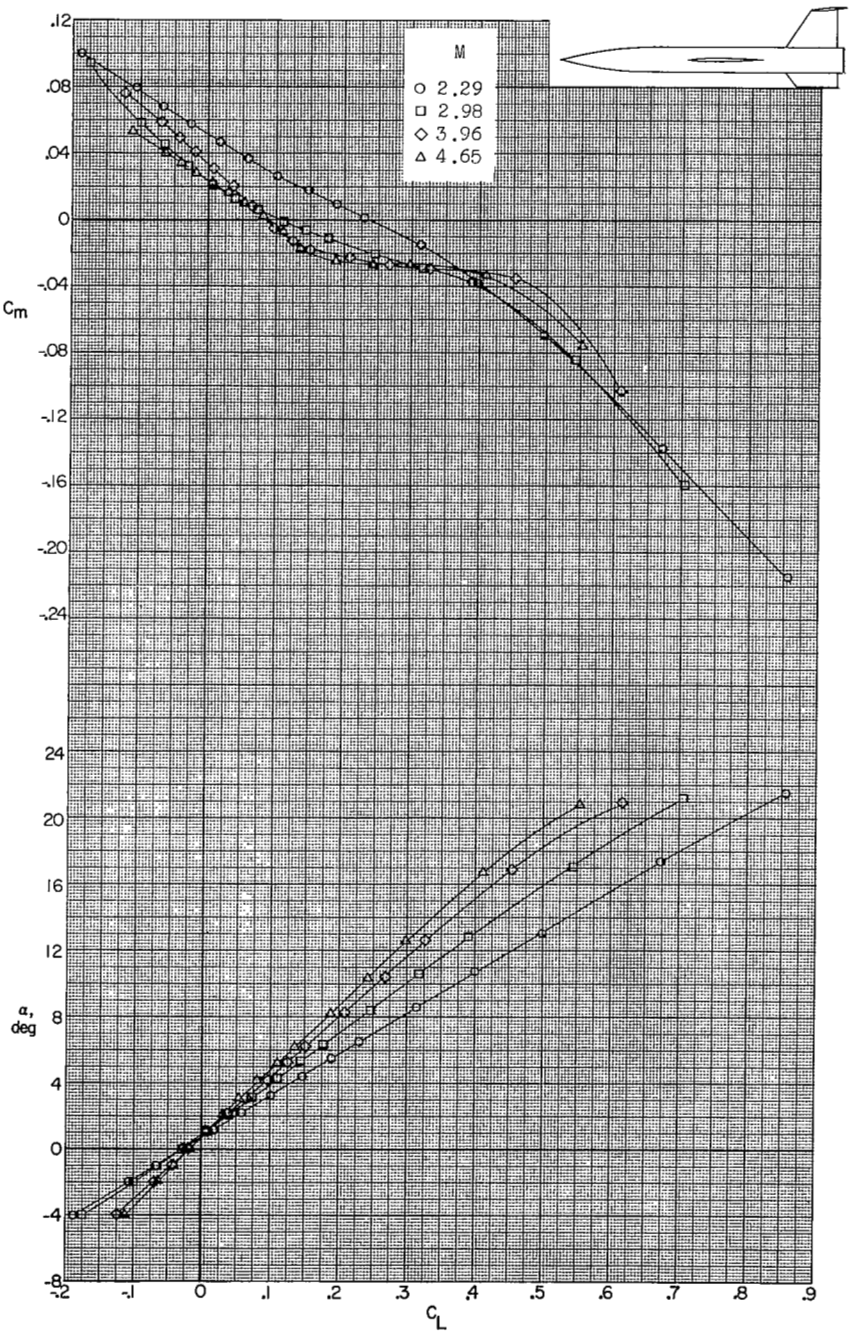


Figure 9.- Aerodynamic characteristics of the model with the 28.8° swept wing, high horizontal tail, vertical tail, and the ventral fin. $i_t = -4^\circ$; $\beta = 0^\circ$.

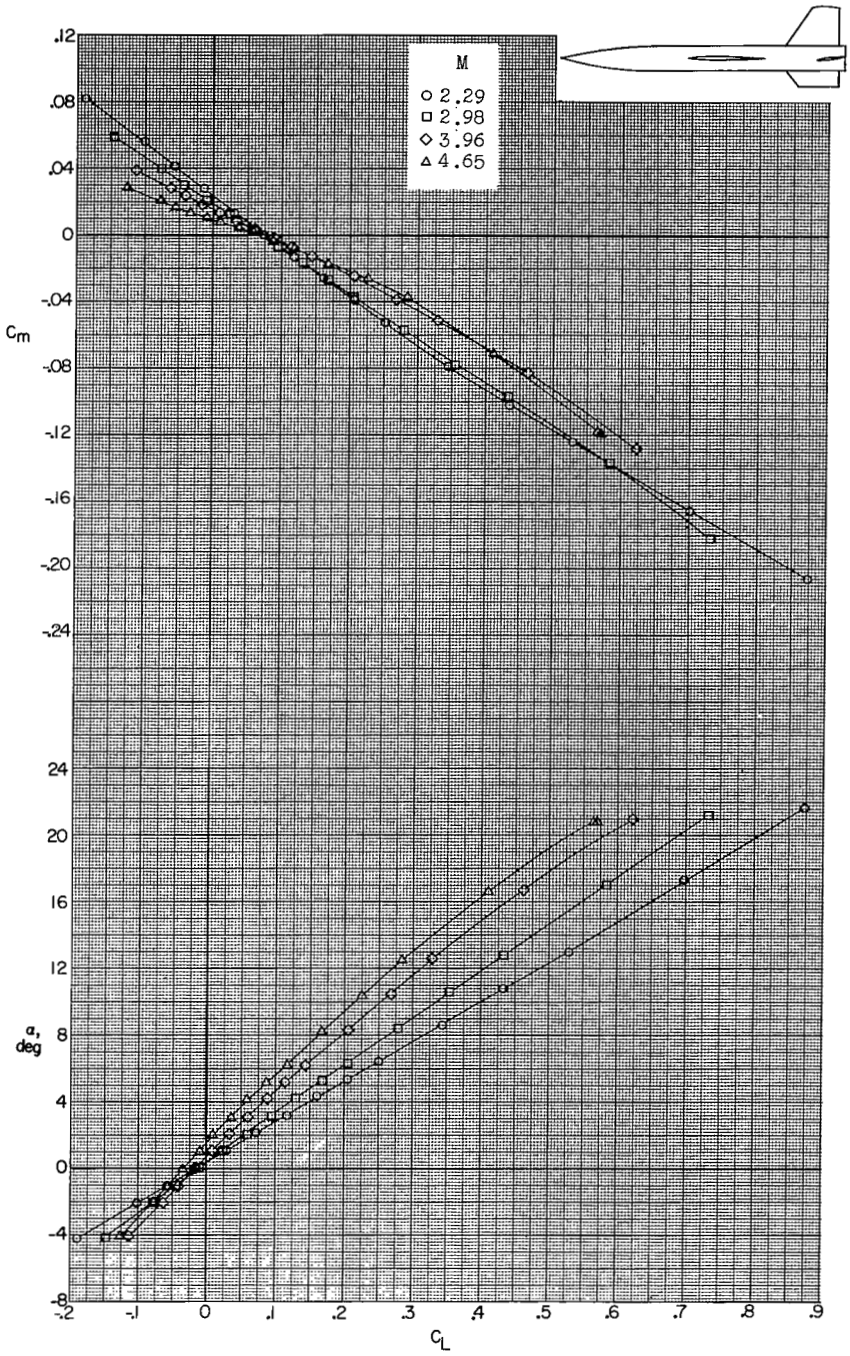


Figure 10.- Aerodynamic characteristics of the model with the 28.8° swept wing, low horizontal tail without dihedral, vertical tail, and the ventral fin. $i_t = -4^\circ$; $\beta = 0^\circ$.

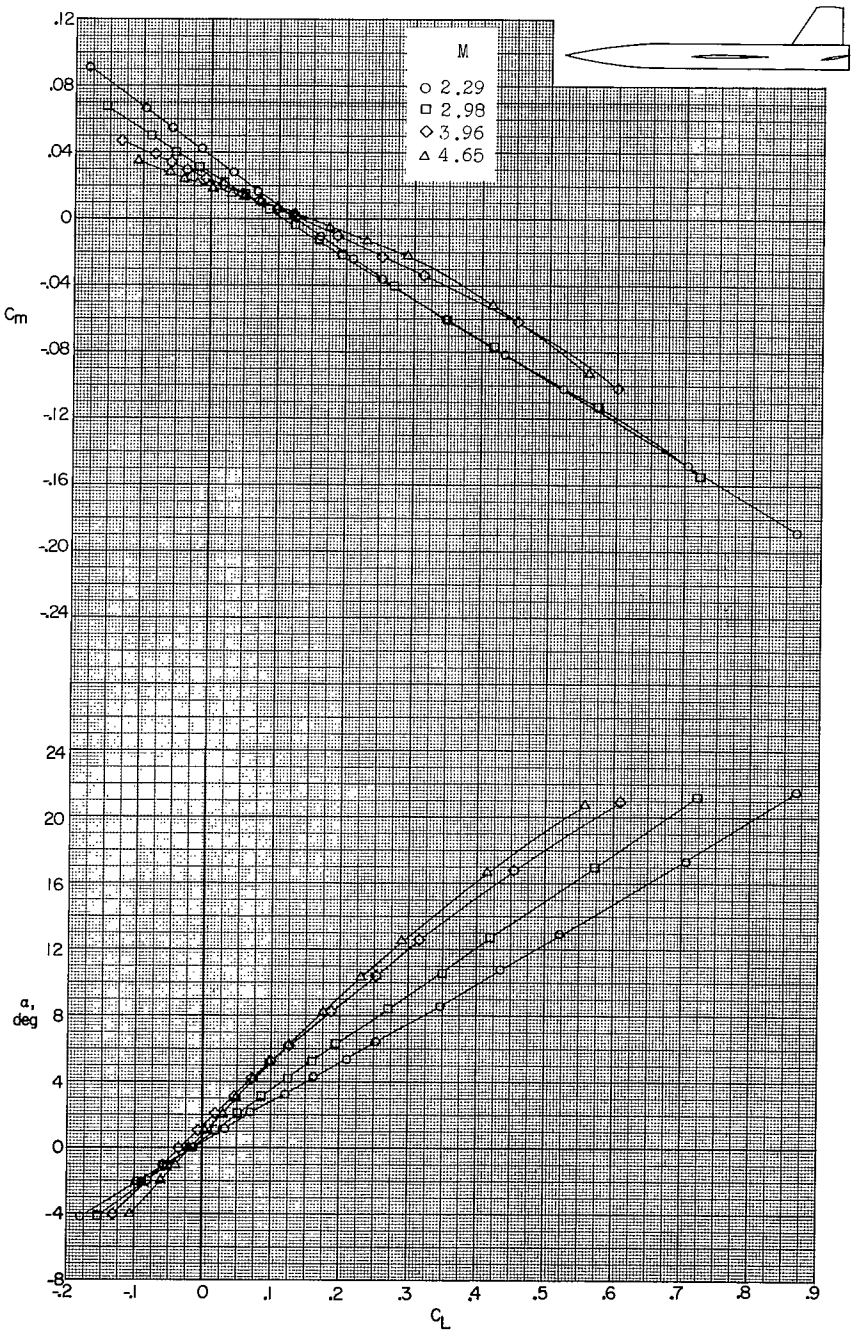


Figure 11.- Aerodynamic characteristics of the model with the 28.8° swept wing, low horizontal tail without dihedral, and the vertical tail. $i_t = -4^\circ$; $\beta = 0^\circ$.

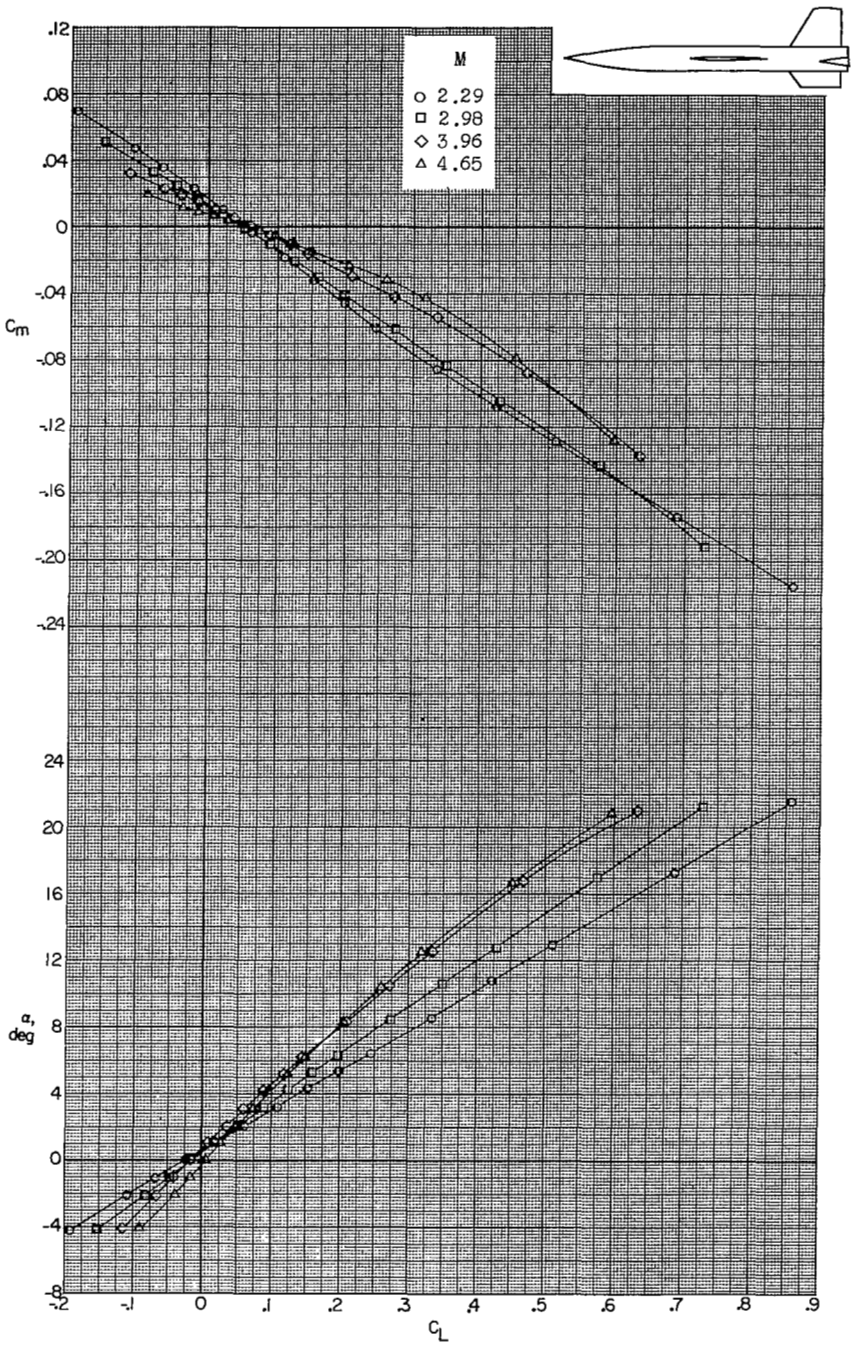


Figure 12.- Aerodynamic characteristics of the model with the 28.8° swept wing, low horizontal tail with -15° dihedral, vertical tail, and the ventral fin. $i_t = -4^\circ$; $\beta = 0^\circ$.

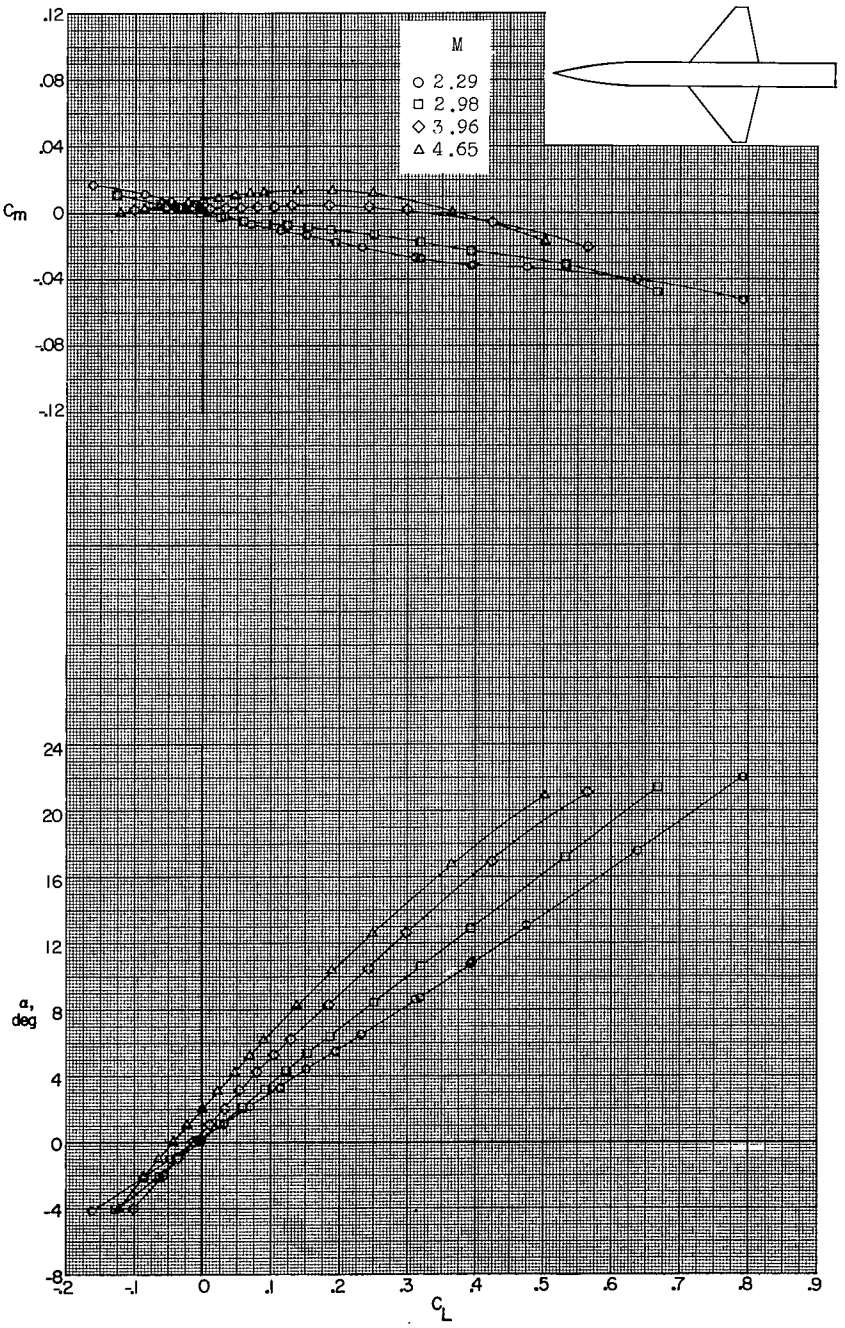


Figure 13.- Aerodynamic characteristics of the wing-fuselage combination with the 28.8° swept wing. $\beta = 0^{\circ}$.

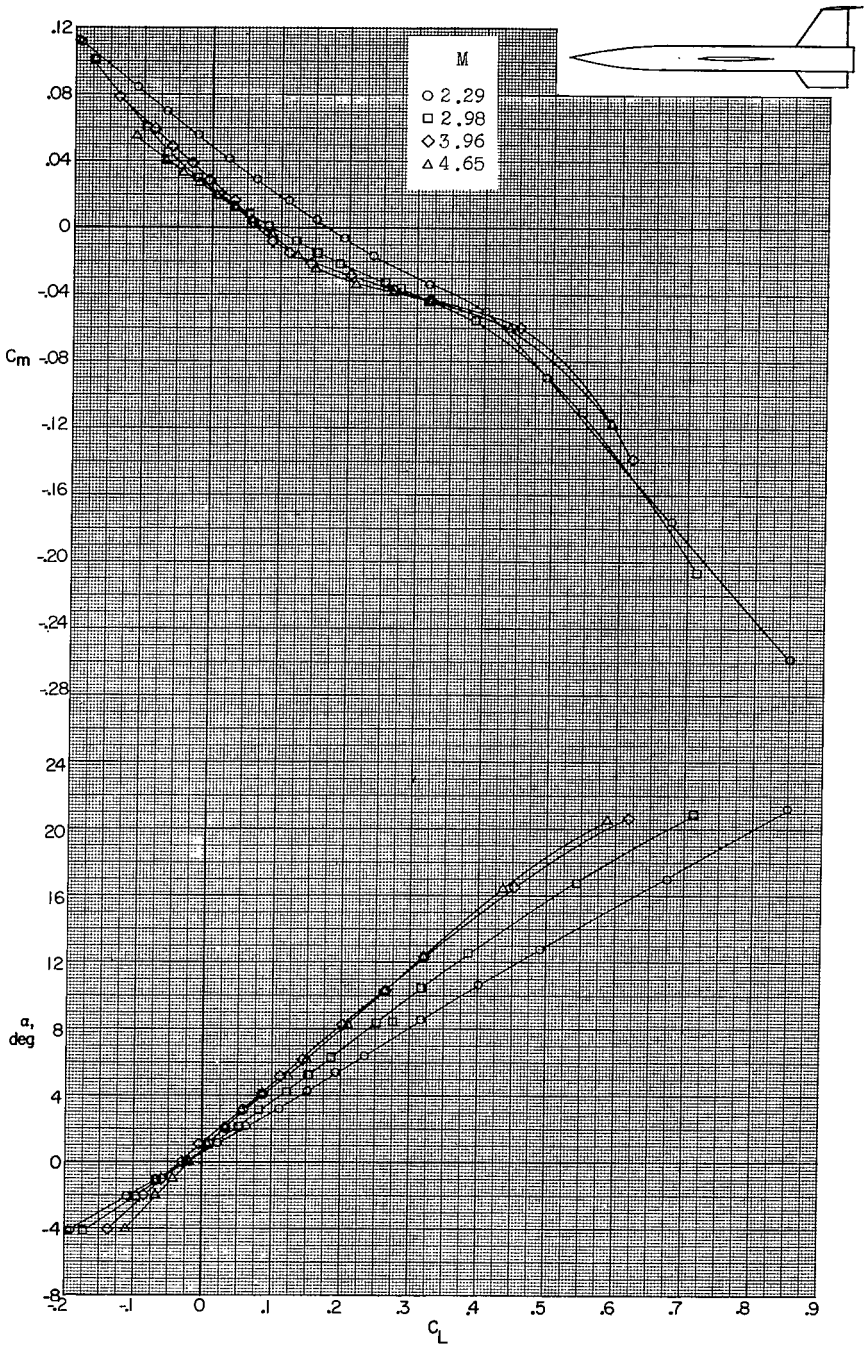


Figure 14.- Aerodynamic characteristics of the model with the 45° swept wing, high horizontal tail, vertical tail, and the ventral fin. $i_t = -4^\circ$; $\beta = 0^\circ$.

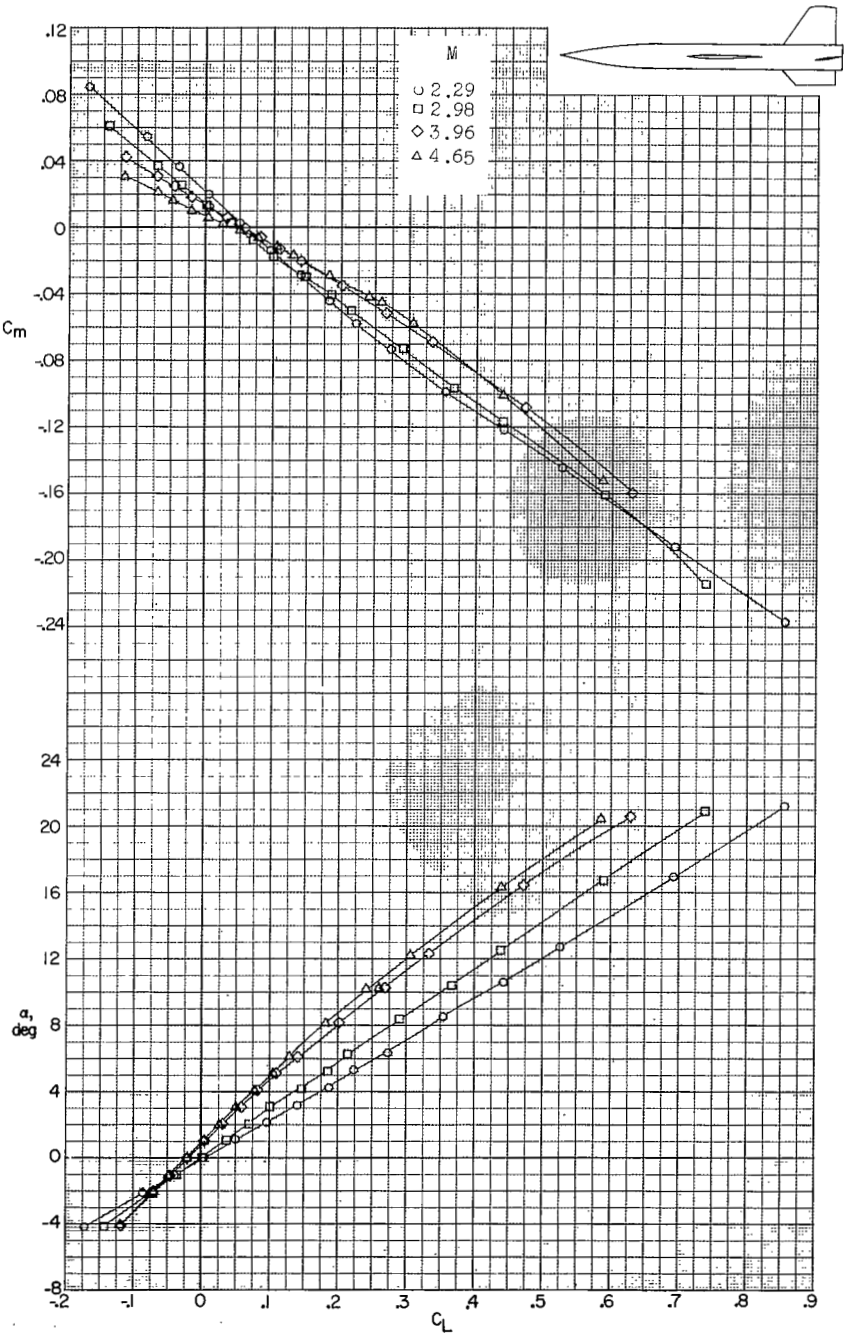


Figure 15.- Aerodynamic characteristics of the model with the 45° swept wing, low horizontal tail without dihedral, vertical tail, and the ventral fin. $i_t = -4^\circ$; $\beta = 0^\circ$.

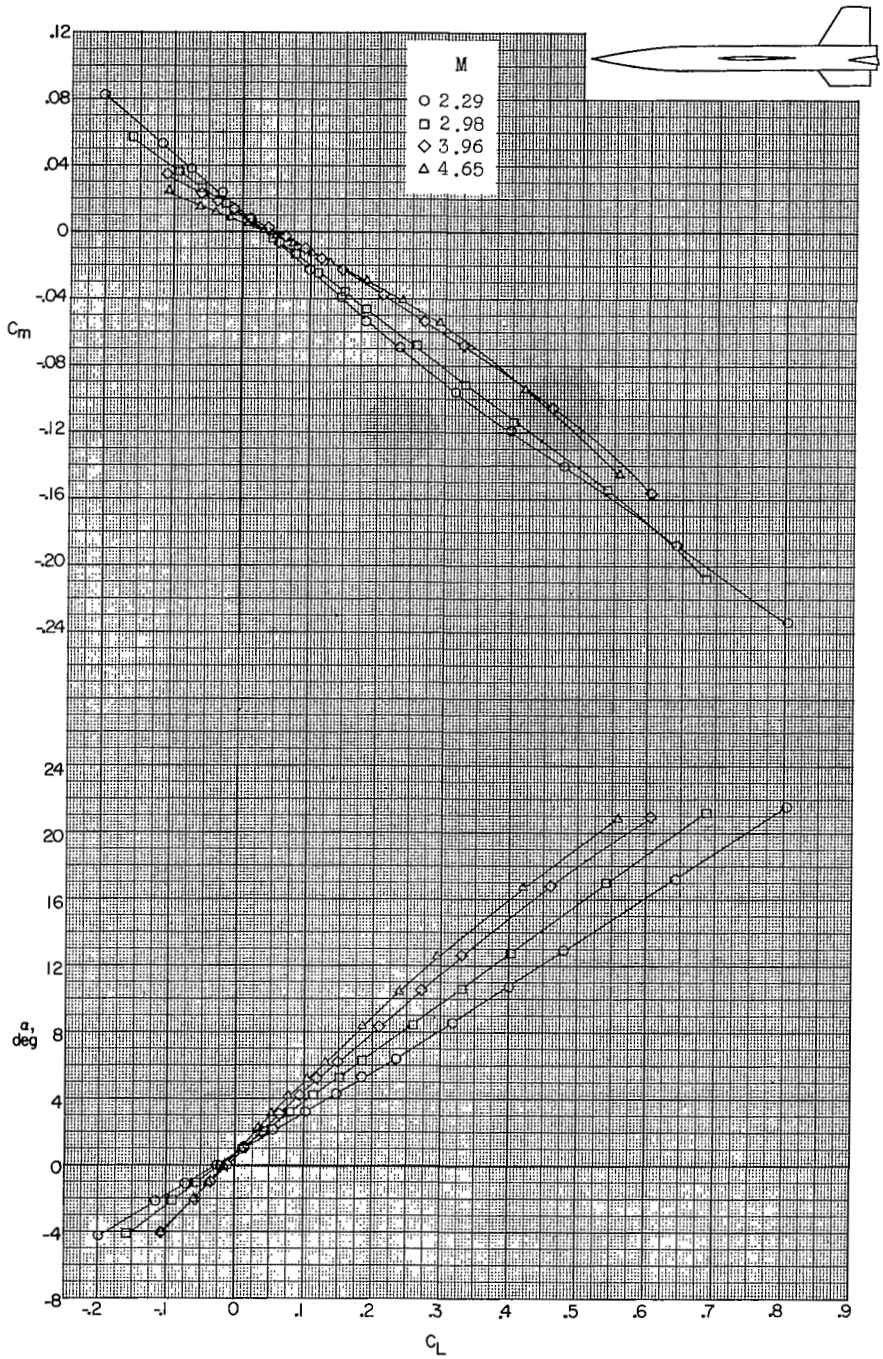


Figure 16.- Aerodynamic characteristics of the model with the 45° swept wing, low horizontal tail with -15° dihedral, vertical tail, and the ventral fin. $i_t = -4^\circ$; $\beta = 0^\circ$.

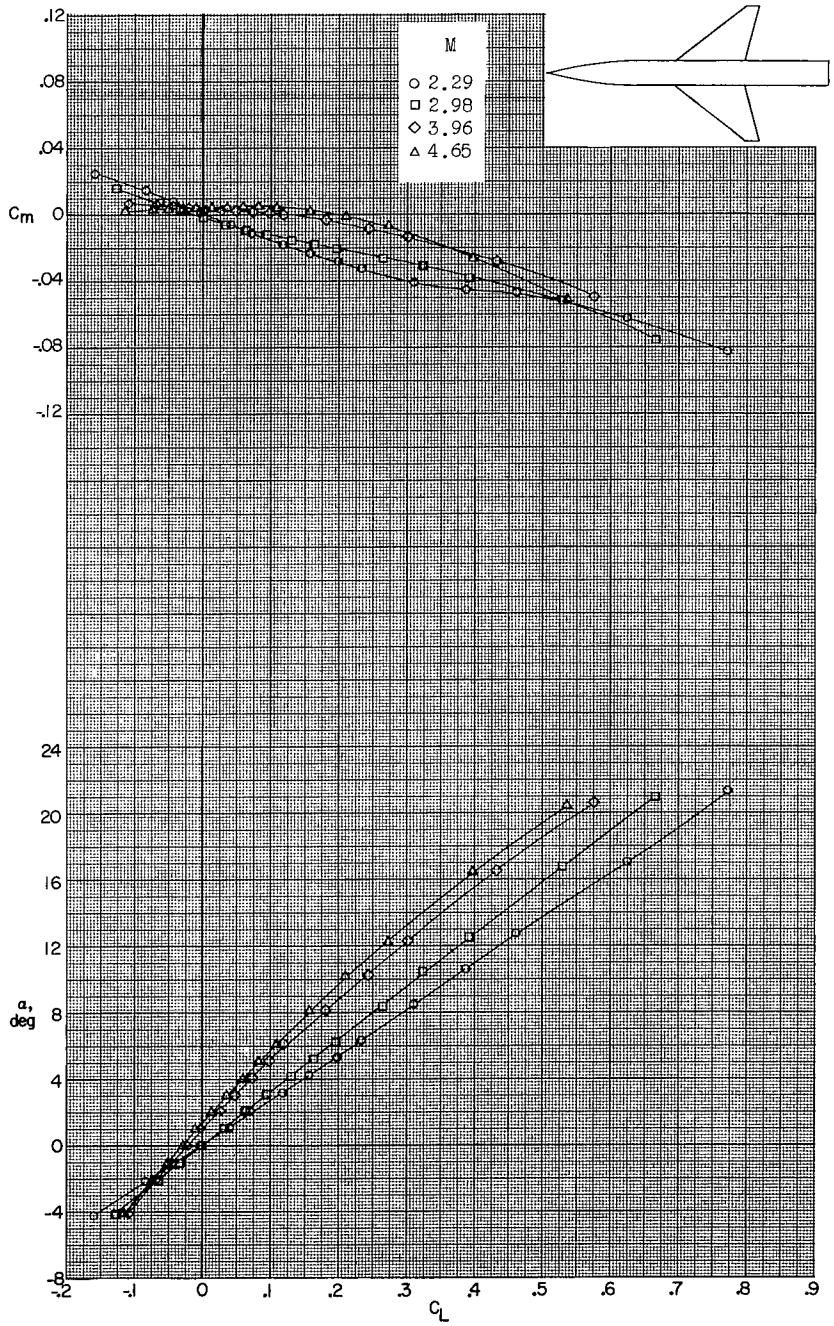


Figure 17.- Aerodynamic characteristics of the wing-fuselage combination with the 45° swept wing. $\beta = 0^{\circ}$.

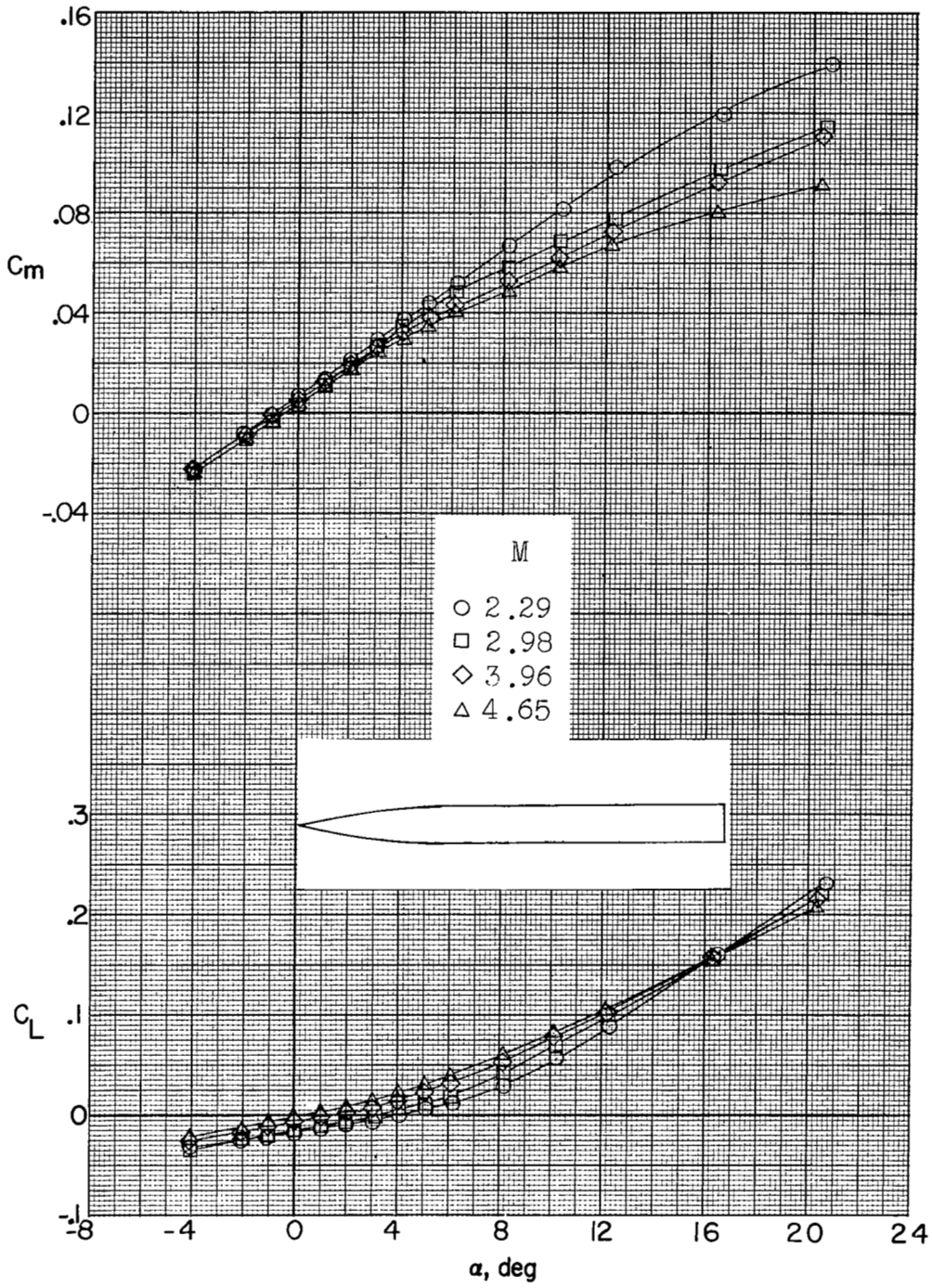


Figure 18.- Aerodynamic characteristics of the fuselage.

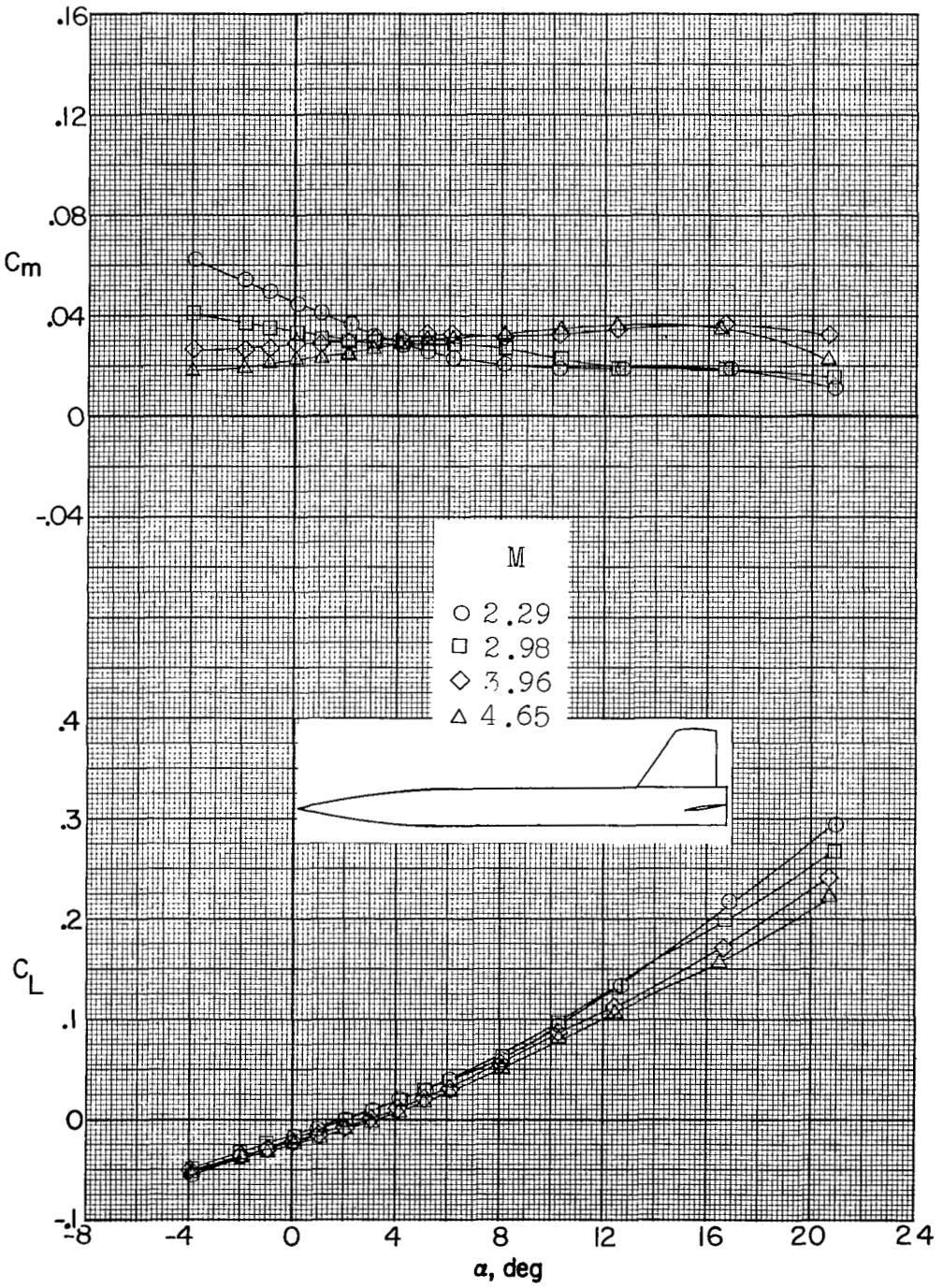


Figure 19.- Aerodynamic characteristics of the model without a wing and with the low horizontal tail without dihedral and the vertical tail. $i_t = -4^{\circ}$; $\beta = 0^{\circ}$.

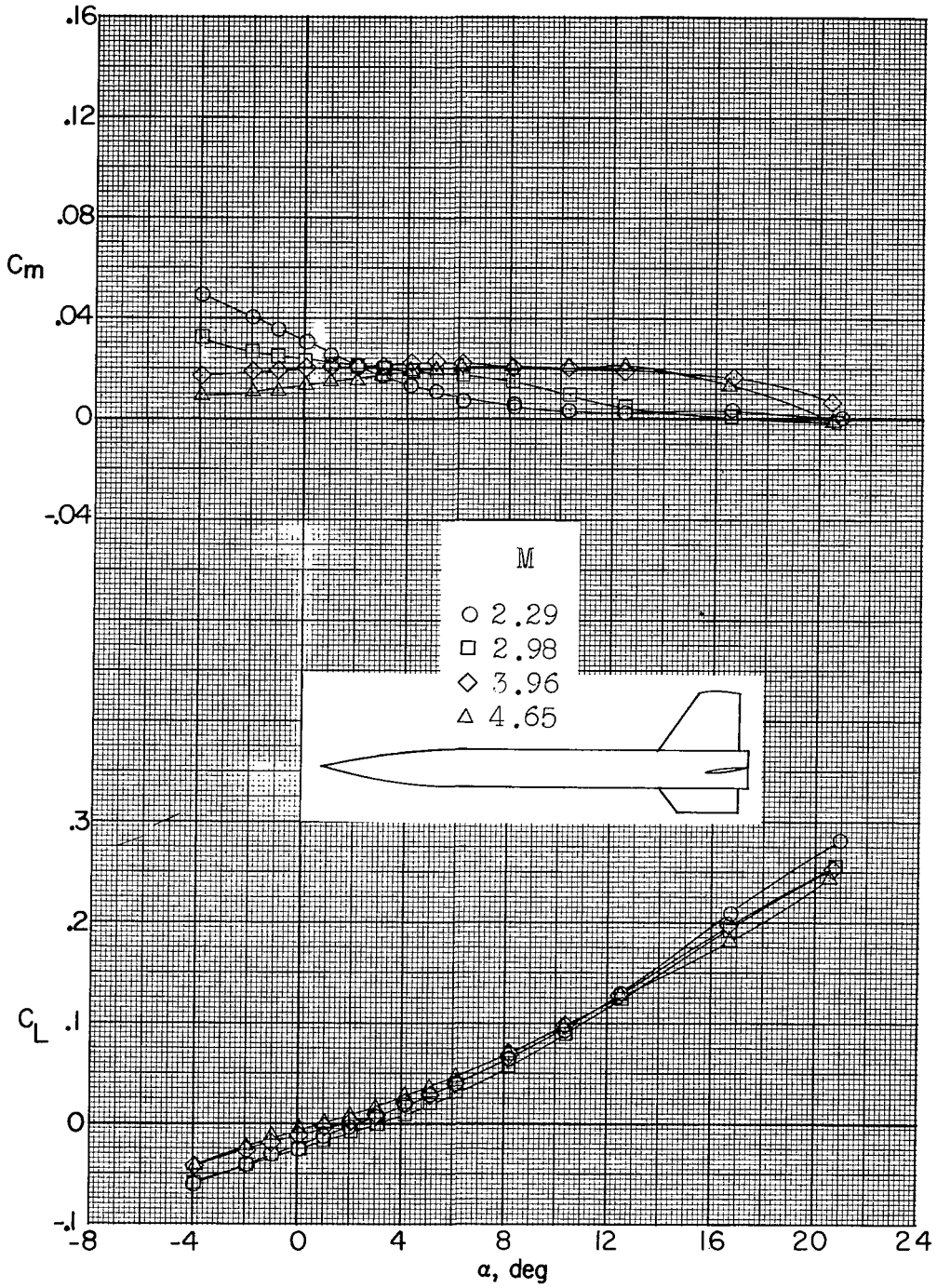
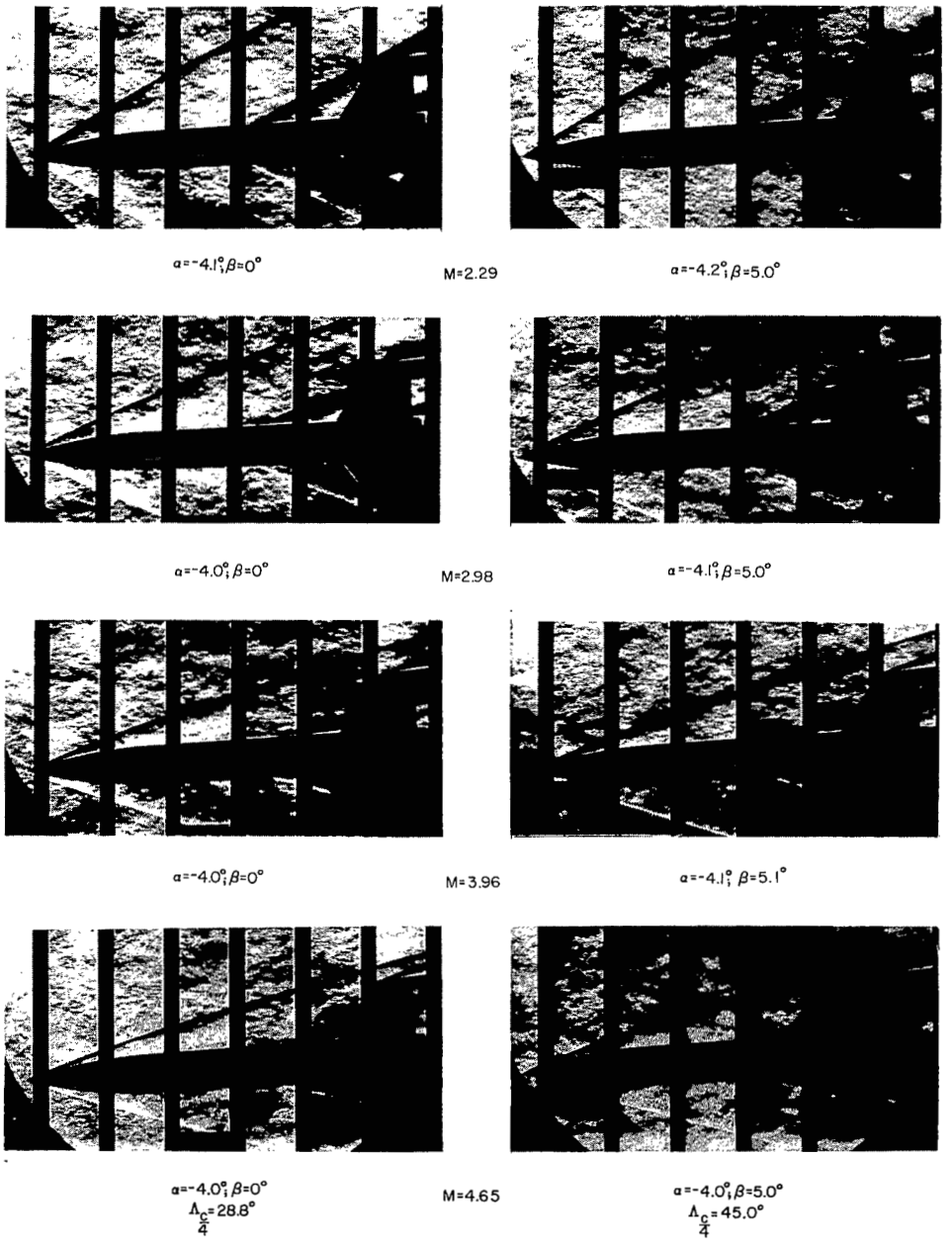


Figure 20.- Aerodynamic characteristics of the model without a wing and with the low horizontal tail without dihedral, the vertical tail, and the ventral fin. $i_t = -4^{\circ}$; $\beta = 0^{\circ}$.



L-58-1616

Figure 21.- Schlieren photographs of the complete test model in the Langley Unitary Plan wind tunnel. T-tail and ventral fin on.

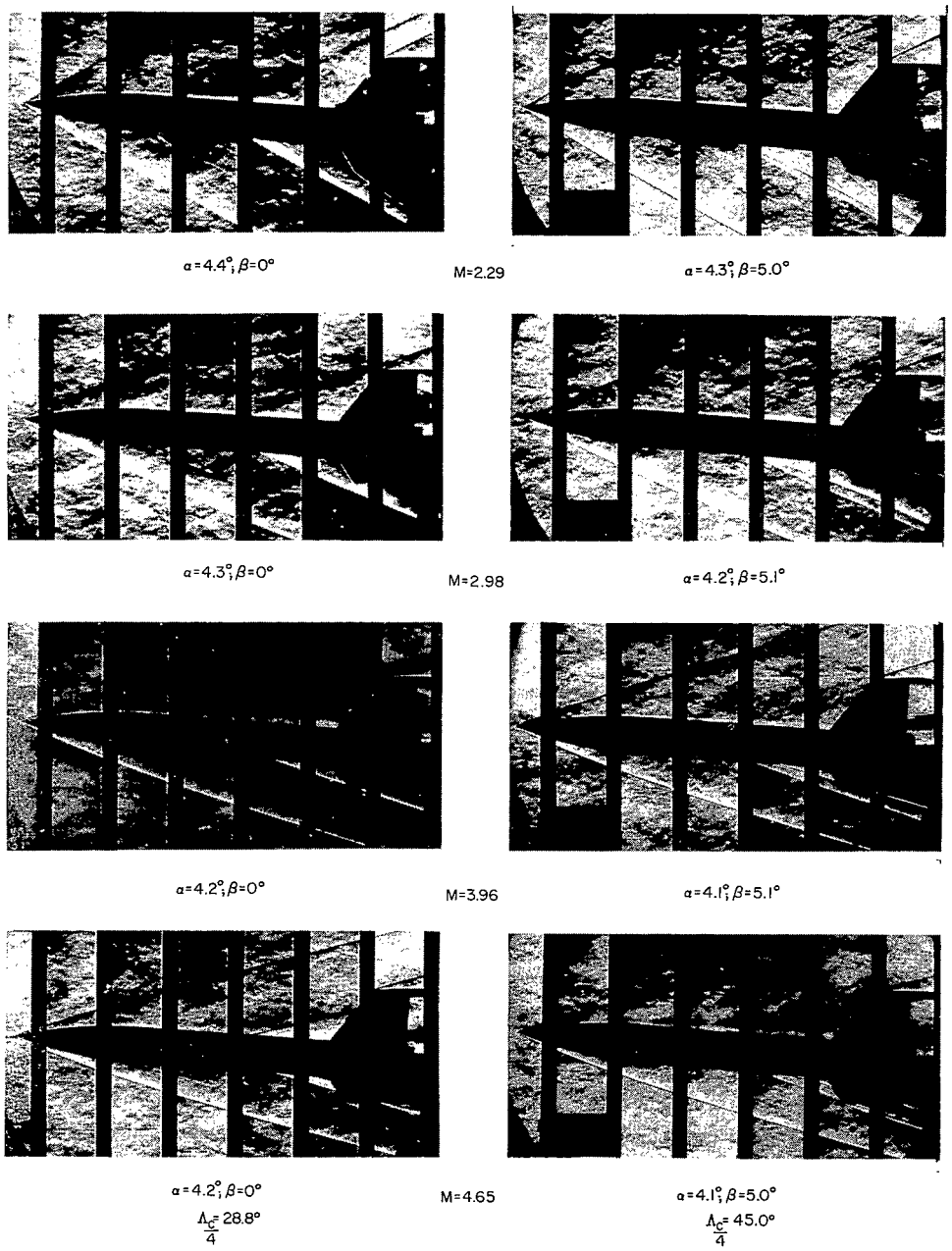
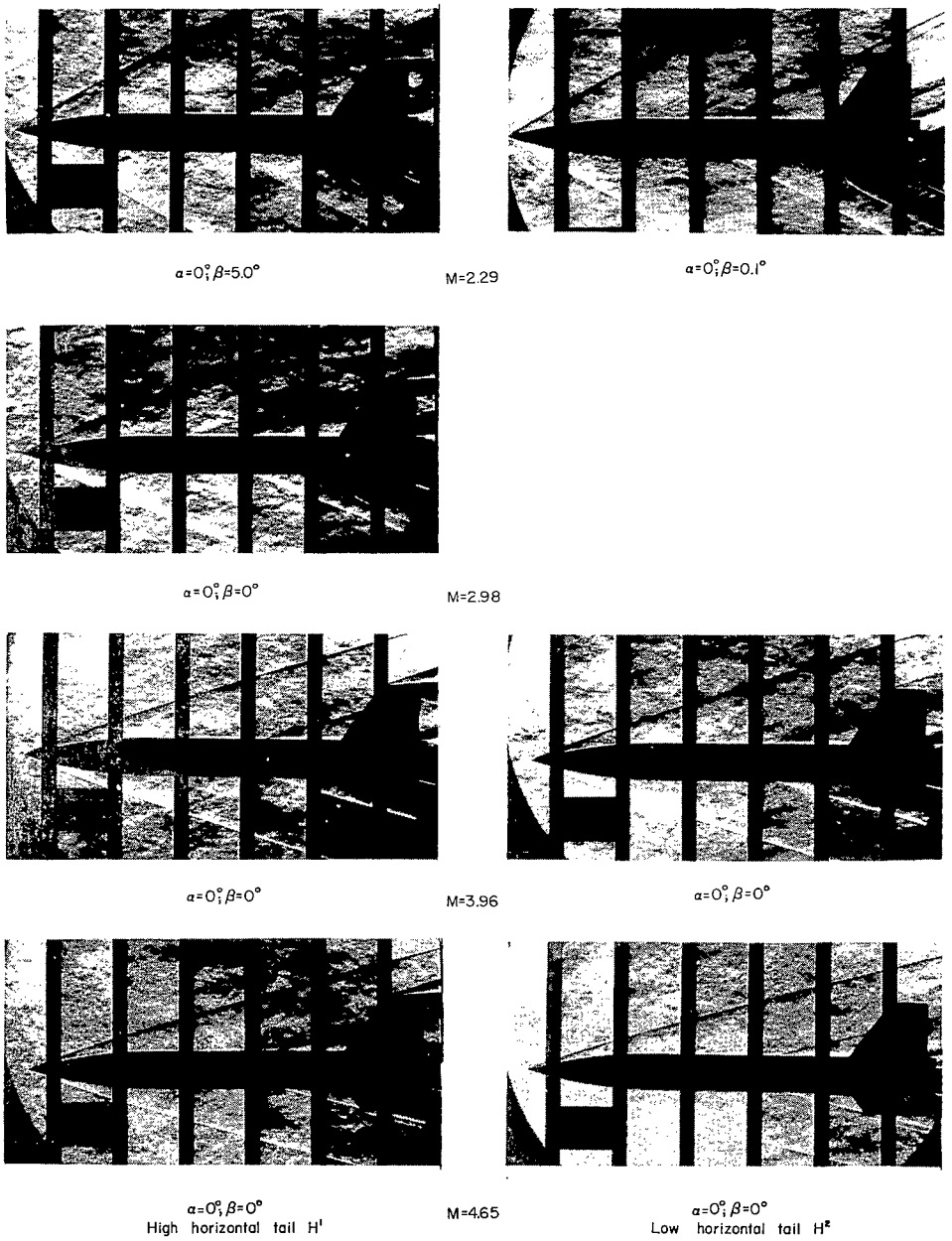


Figure 21.- Concluded. L-58-1617



L-58-1618

Figure 22.- Schlieren photographs of the complete test model with the 45° swept wing in the Langley Unitary Plan wind tunnel.

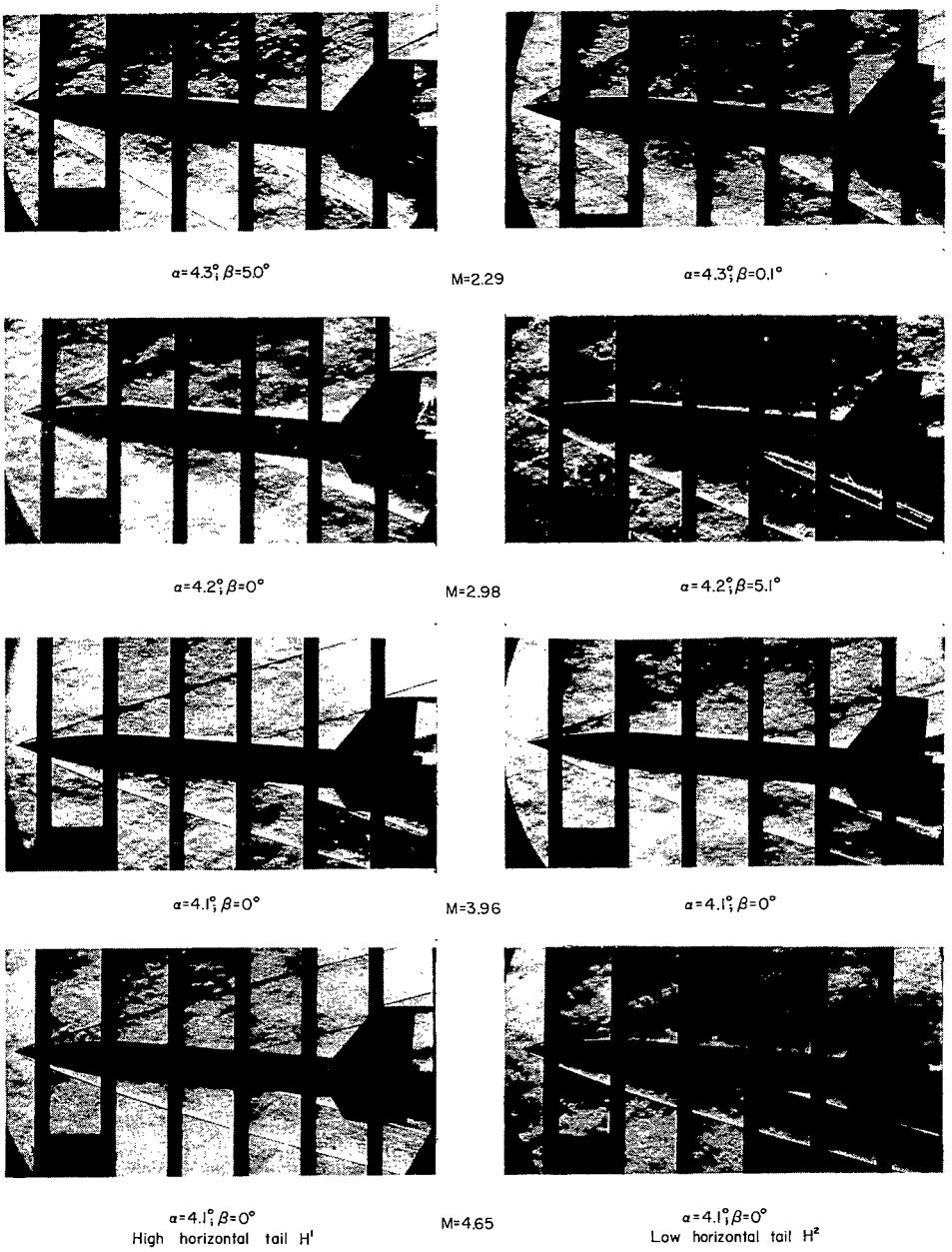
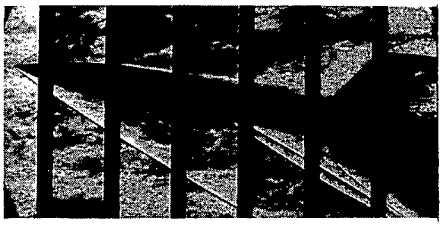


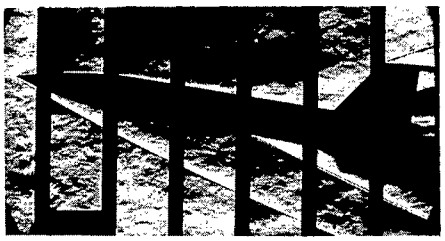
Figure 22.- Continued. L-58-1619



$\alpha=8.5^\circ, \beta=5.1^\circ$

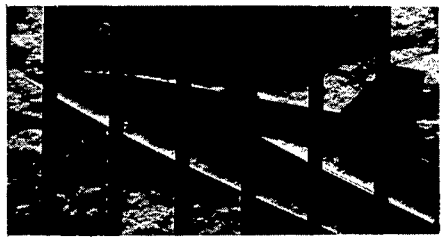
M=2.29

$\alpha=8.5^\circ, \beta=0.1^\circ$

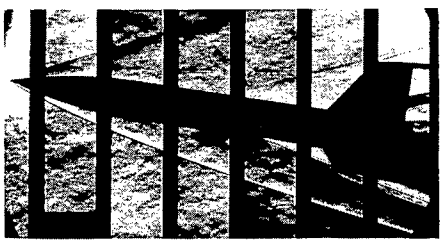


$\alpha=8.4^\circ, \beta=0^\circ$

M=2.98

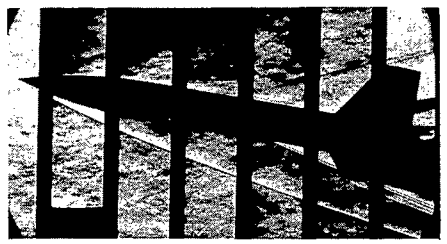


$\alpha=8.4^\circ, \beta=0.1^\circ$



$\alpha=8.2^\circ, \beta=0^\circ$

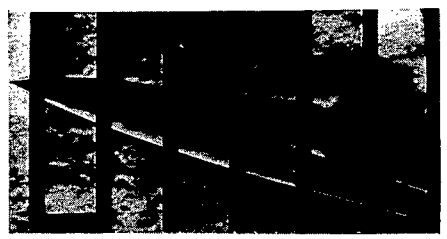
M=3.96



$\alpha=8.2^\circ, \beta=0^\circ$

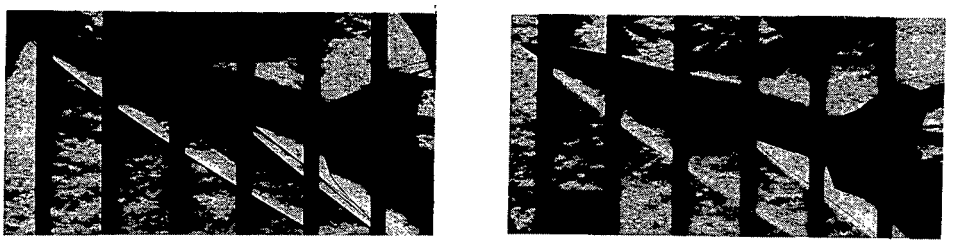
$\alpha=8.2^\circ, \beta=0^\circ$
High horizontal tail H'

M=4.65

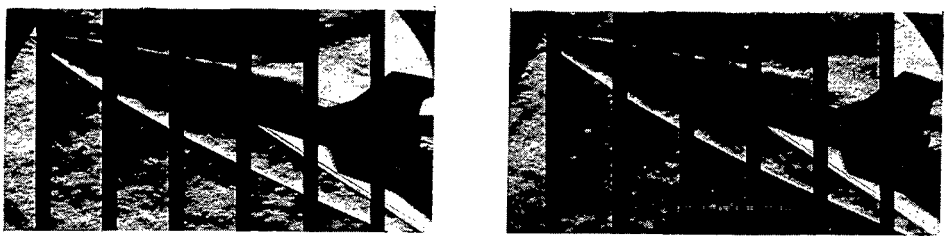


$\alpha=8.2^\circ, \beta=0^\circ$
Low horizontal tail H²

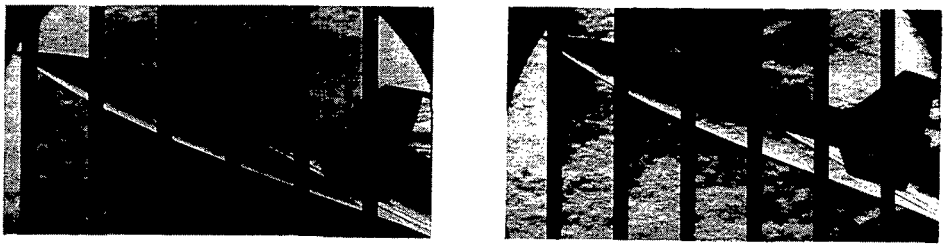
Figure 22.- Continued. L-58-1620



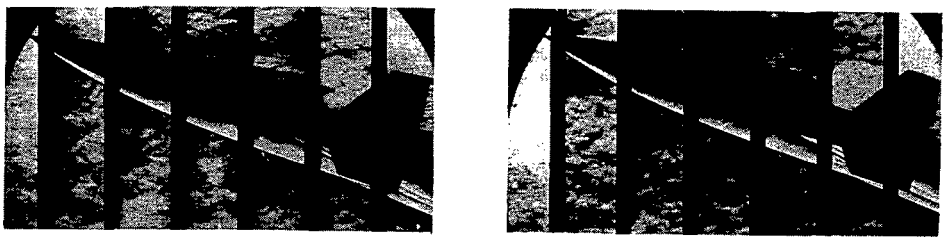
$\alpha=17.0°$; $\beta=5.1°$ M=2.29 $\alpha=17.0°$; $\beta=0.1°$



$\alpha=16.8°$; $\beta=0°$ M=2.98 $\alpha=16.8°$; $\beta=0.1°$



$\alpha=16.5°$; $\beta=0°$ M=3.96 $\alpha=16.5°$; $\beta=0°$

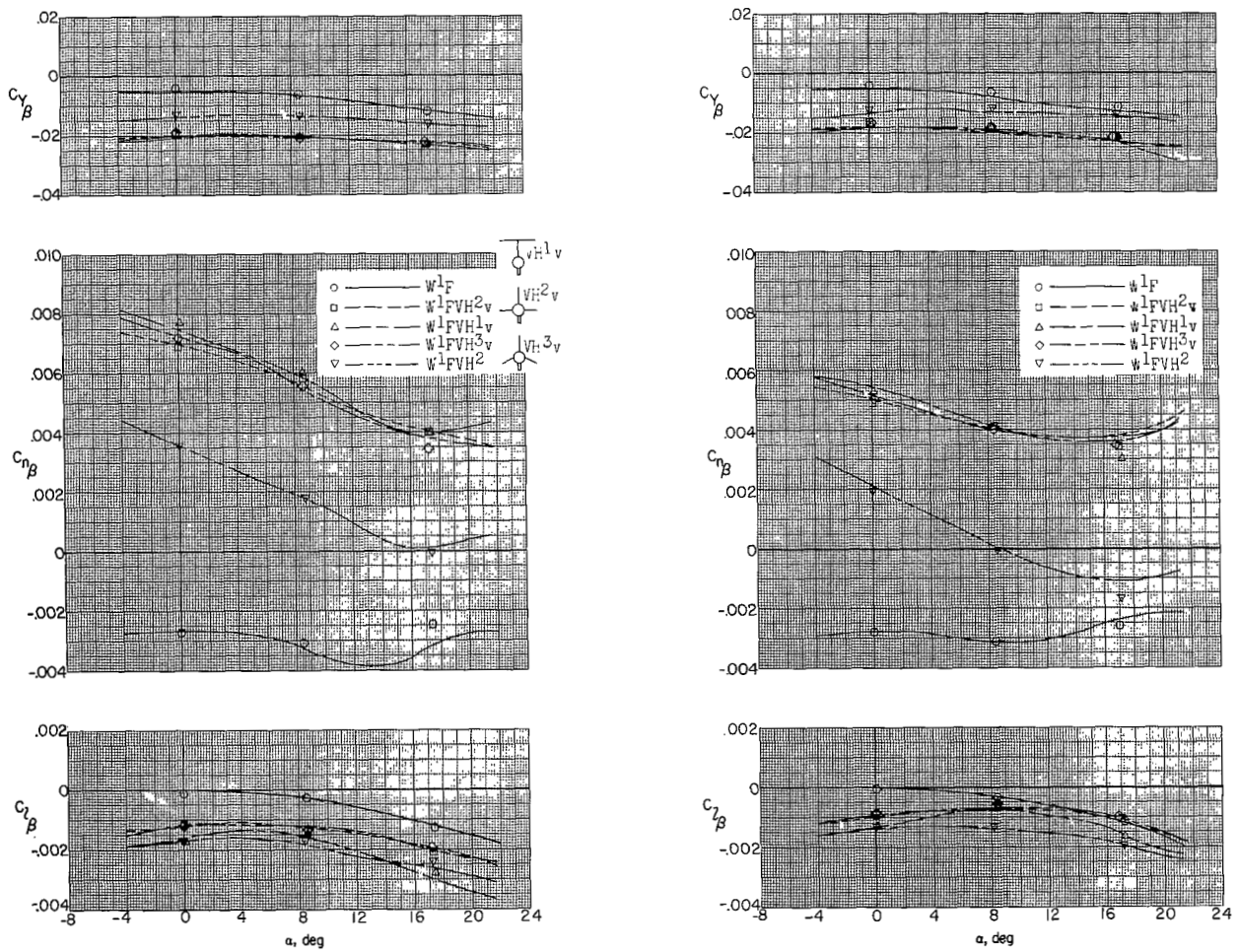


$\alpha=16.4°$; $\beta=0°$
High horizontal tail H^1

M=4.65

$\alpha=16.4°$; $\beta=0°$
Low horizontal tail H^2

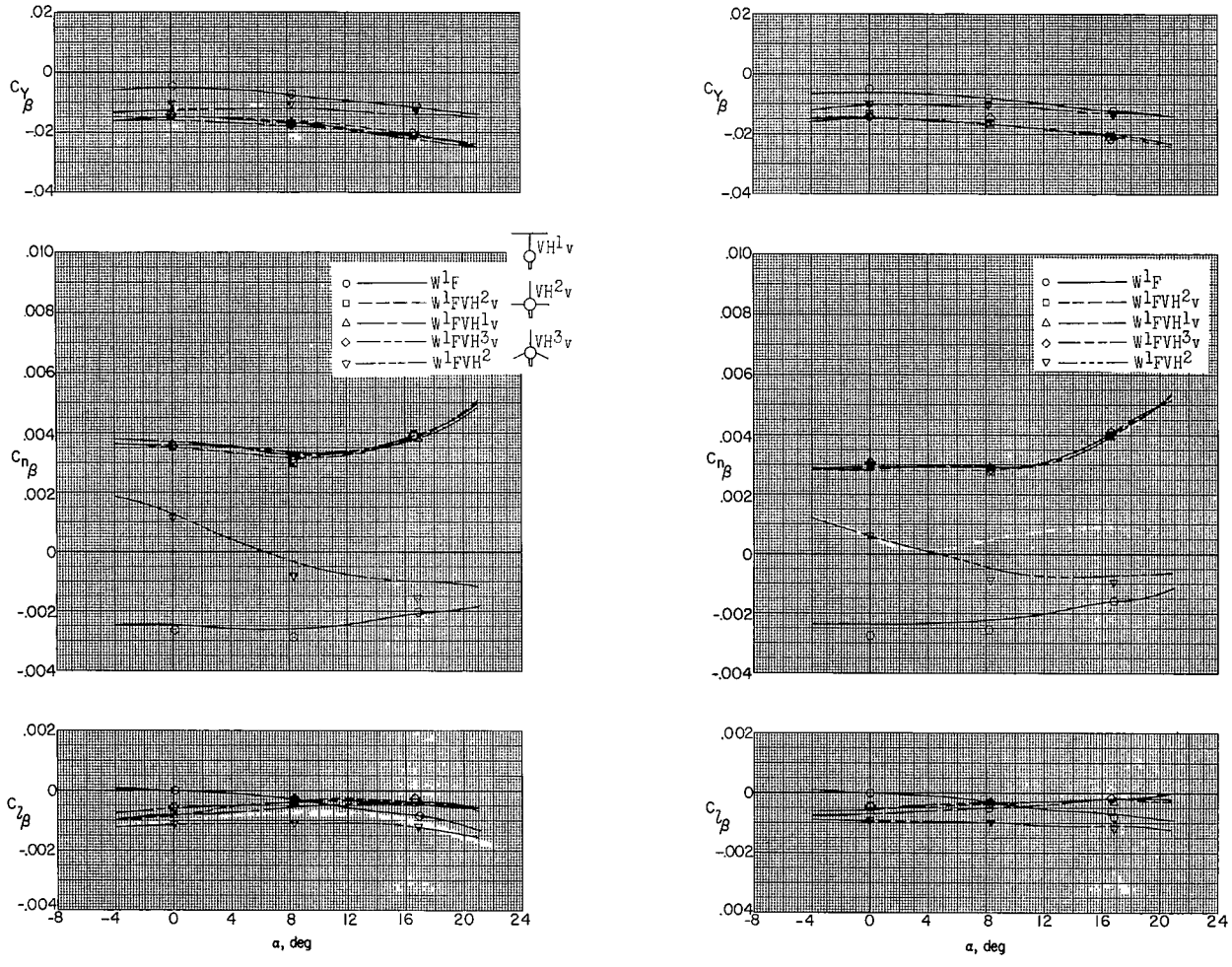
Figure 22.- Concluded. L-58-1621



(a) M = 2.29.

(b) M = 2.98.

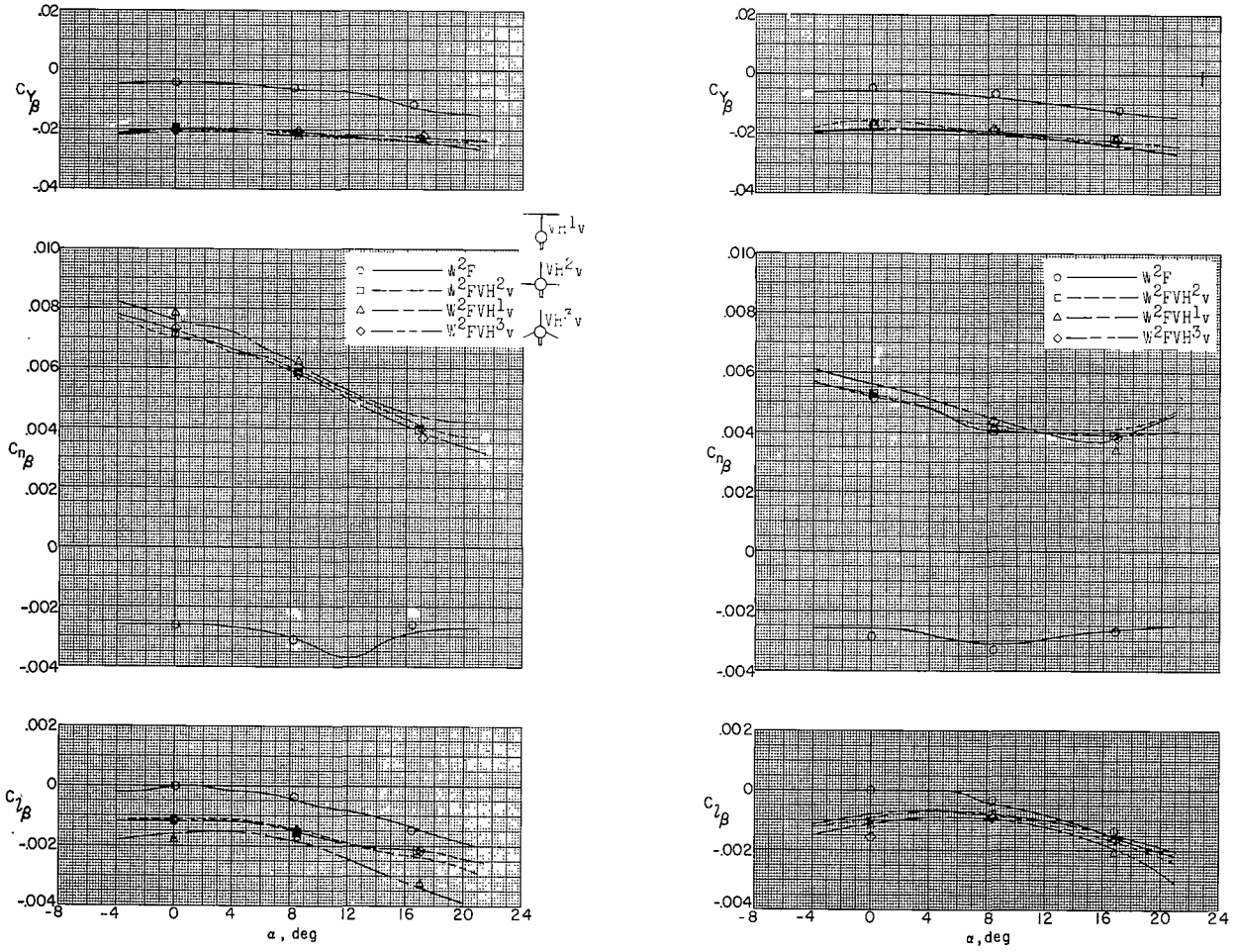
Figure 23.- Summary of the aerodynamic characteristics in sideslip of the model with the 28.8° swept wing. Symbols indicate data from tests through the sideslip range. $i_t = -4^\circ$.



(c) M = 3.96.

(d) M = 4.65.

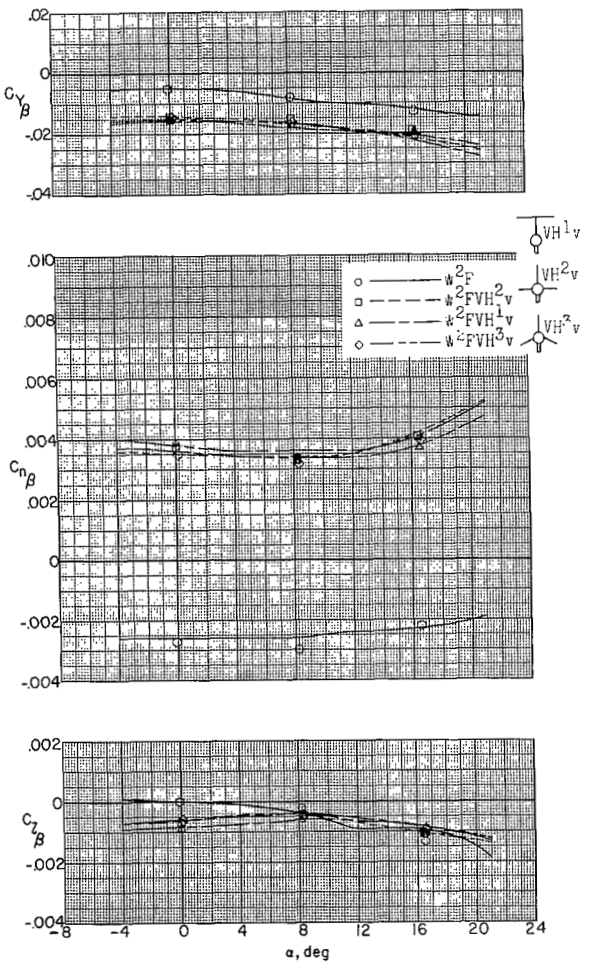
Figure 23.- Concluded.



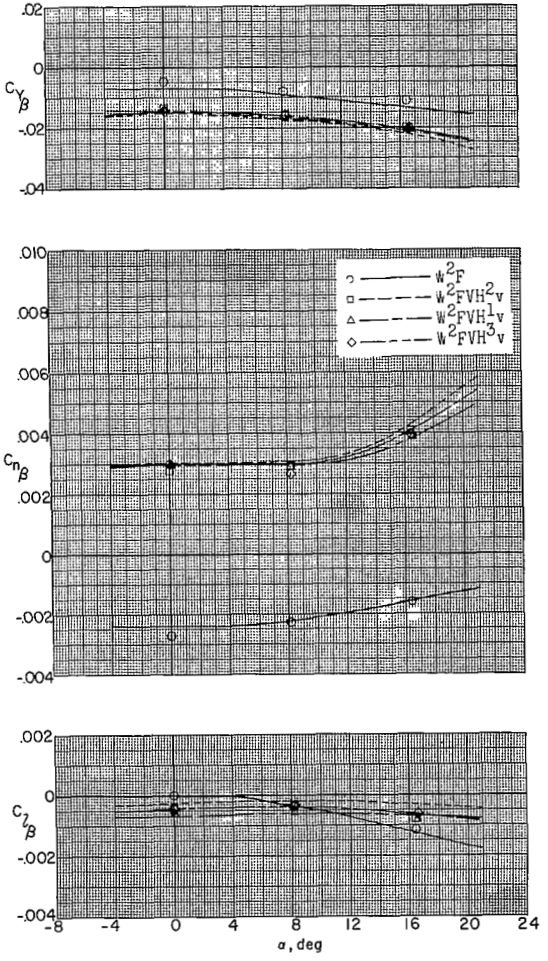
(a) M = 2.29.

(b) M = 2.98.

Figure 24.- Summary of the aerodynamic characteristics in sideslip of the model with the 45° swept wing. Symbols indicate data from tests through the sideslip range. $i_t = -4^\circ$.

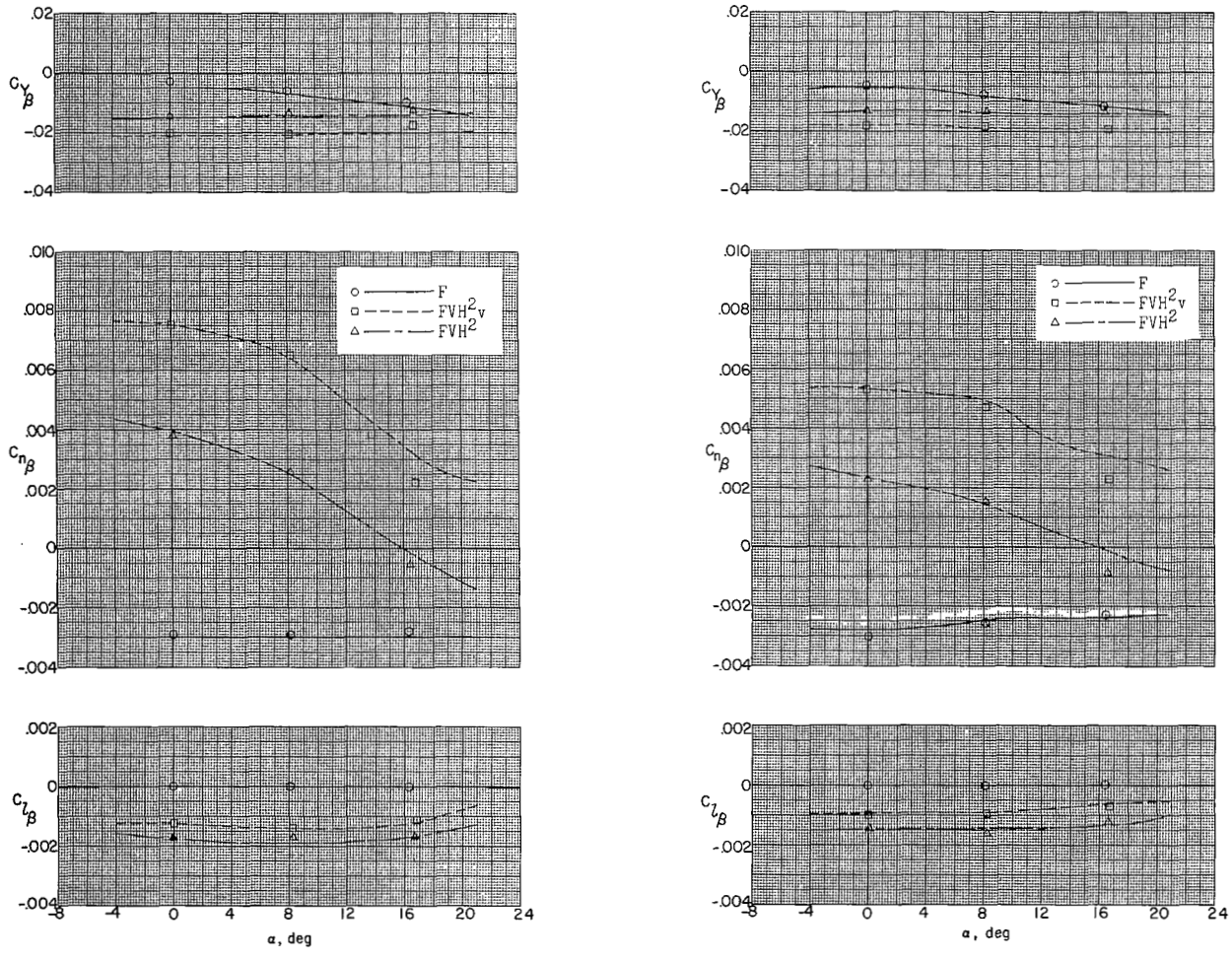


(c) M = 3.96.



(d) M = 4.65.

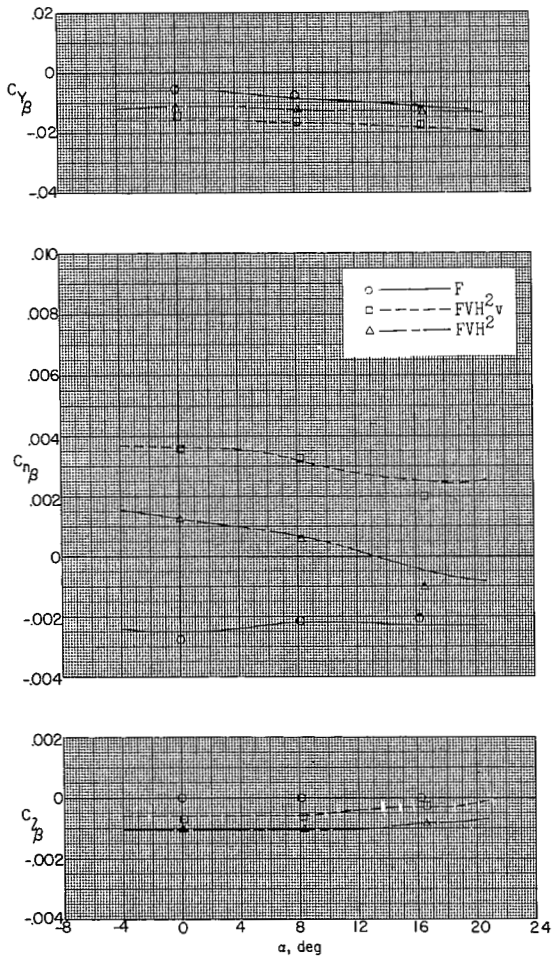
Figure 24.- Concluded.



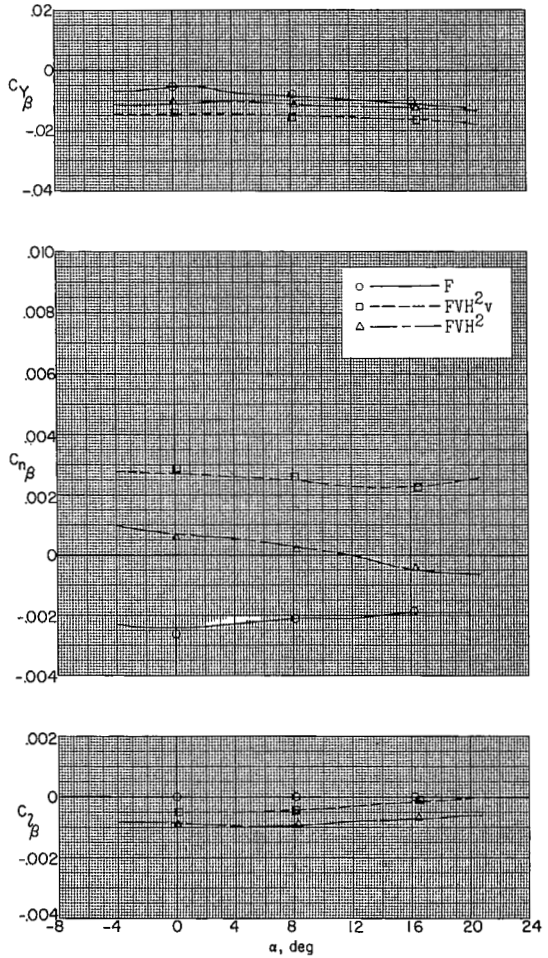
(a) M = 2.29.

(b) M = 2.98.

Figure 25.- Summary of the aerodynamic characteristics in sideslip of the model without wings and the low horizontal tail without dihedral. Symbols indicate data from tests through sideslip range. $i_t = -4^{\circ}$.



(c) M = 3.96.



(d) M = 4.65.

Figure 25.- Concluded.

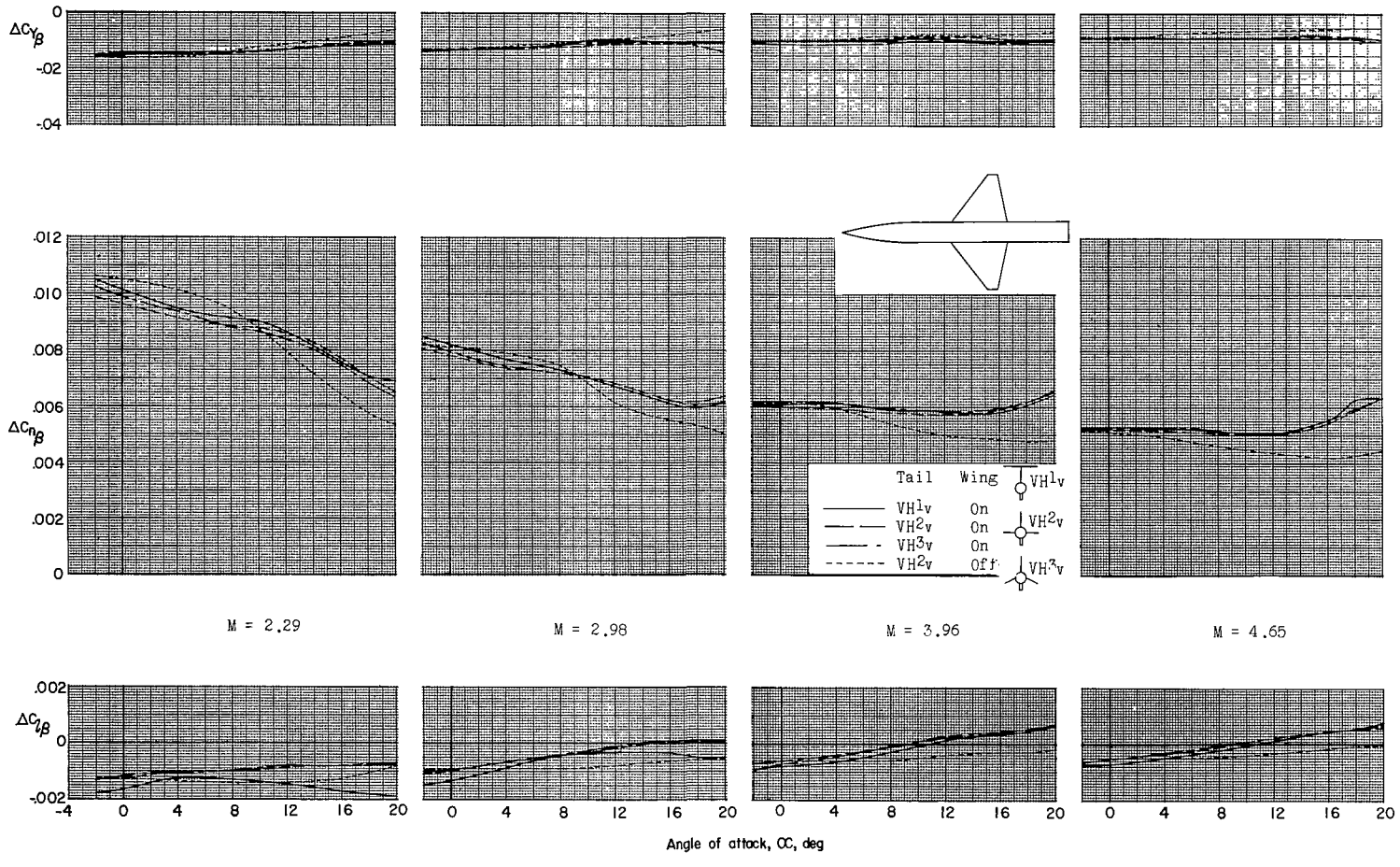


Figure 26.- Variation with α of the tail increments ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} for various model configurations with the 28.8° swept wing.

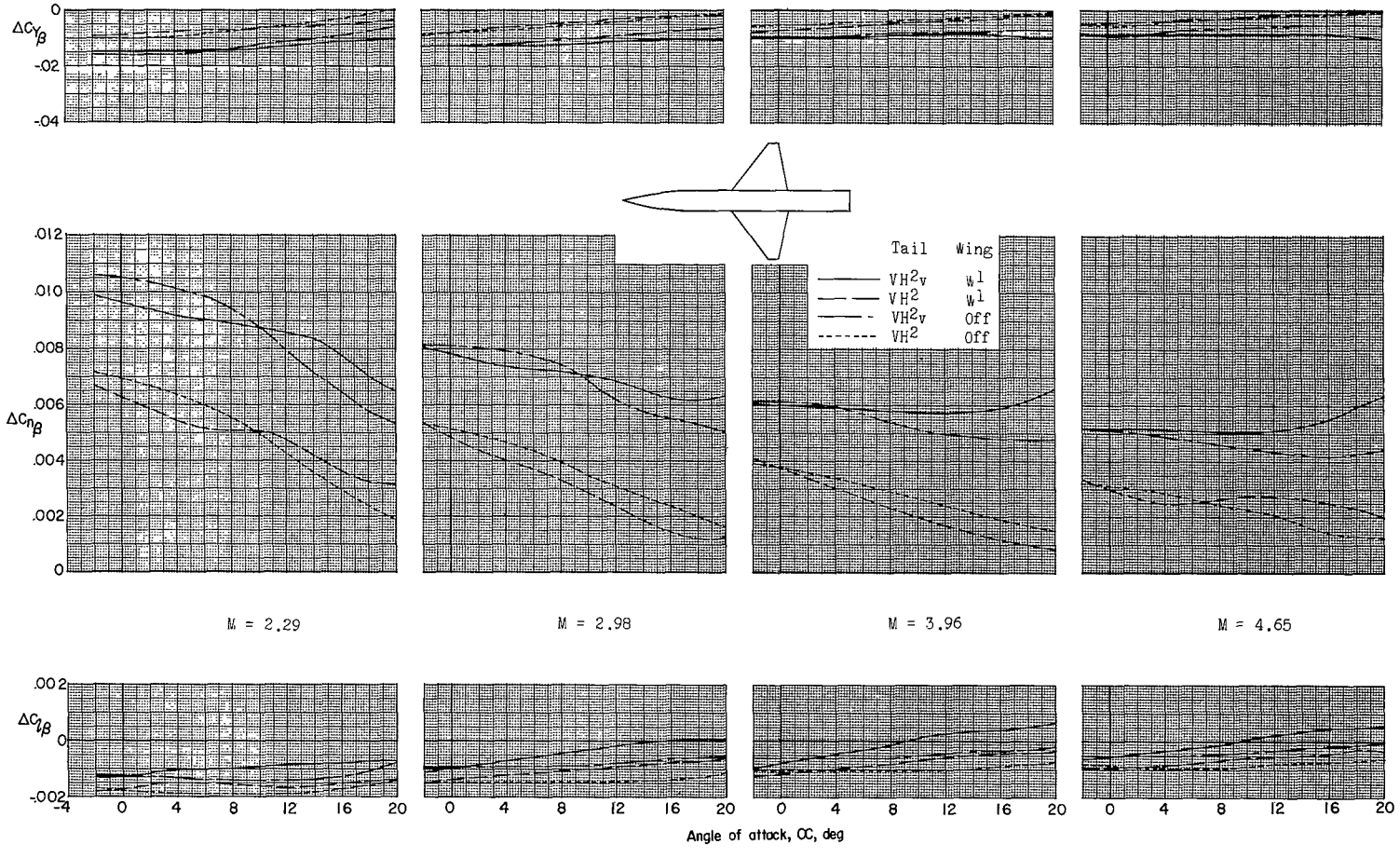


Figure 27.- Effect of ventral fin on the variation of the tail increments ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} with α for the model with and without the 28.8° swept wing.

[redacted]

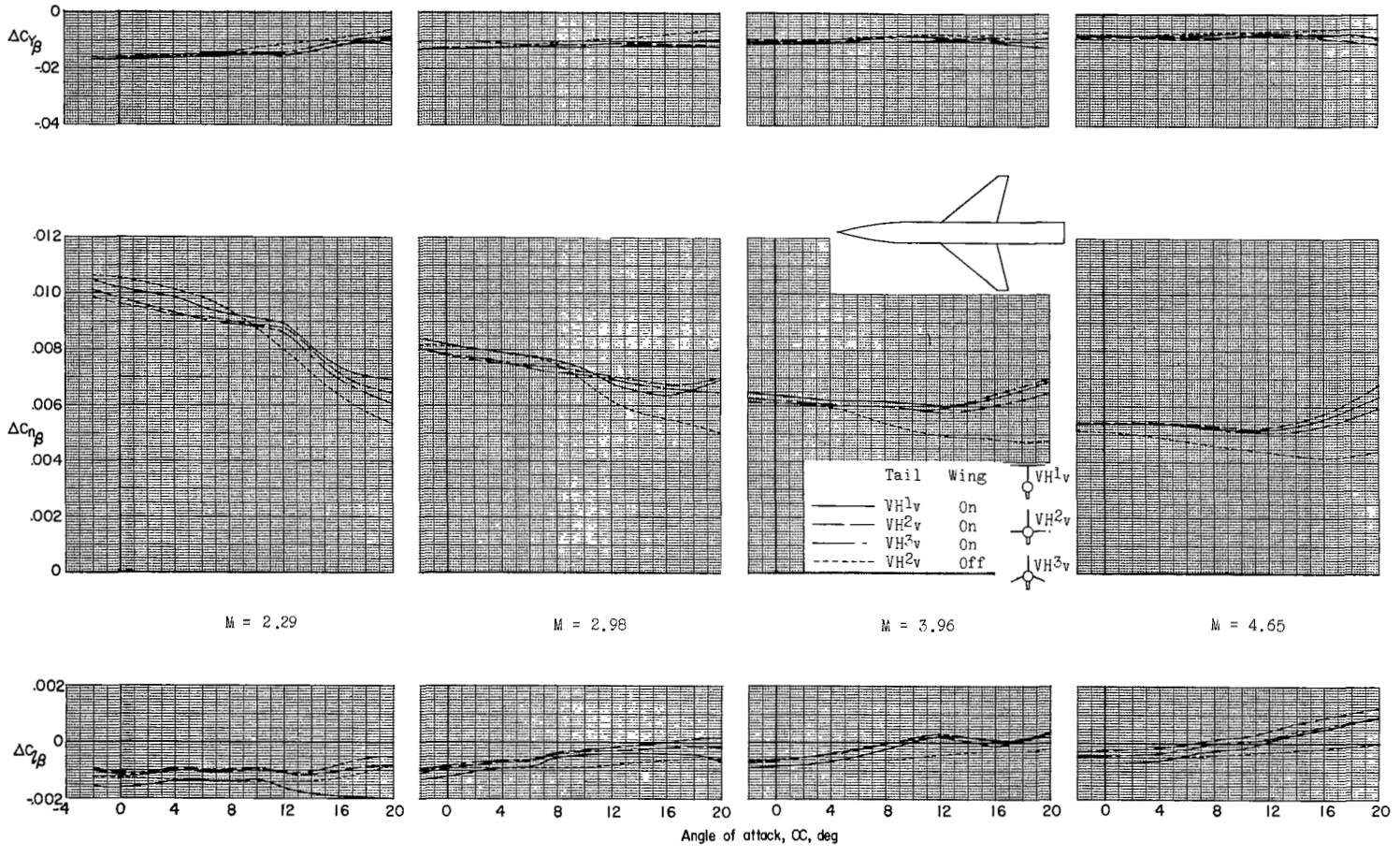


Figure 28.- Variation of the tail increments ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} with α for various model configurations with and without the 45° swept wing.

[redacted]

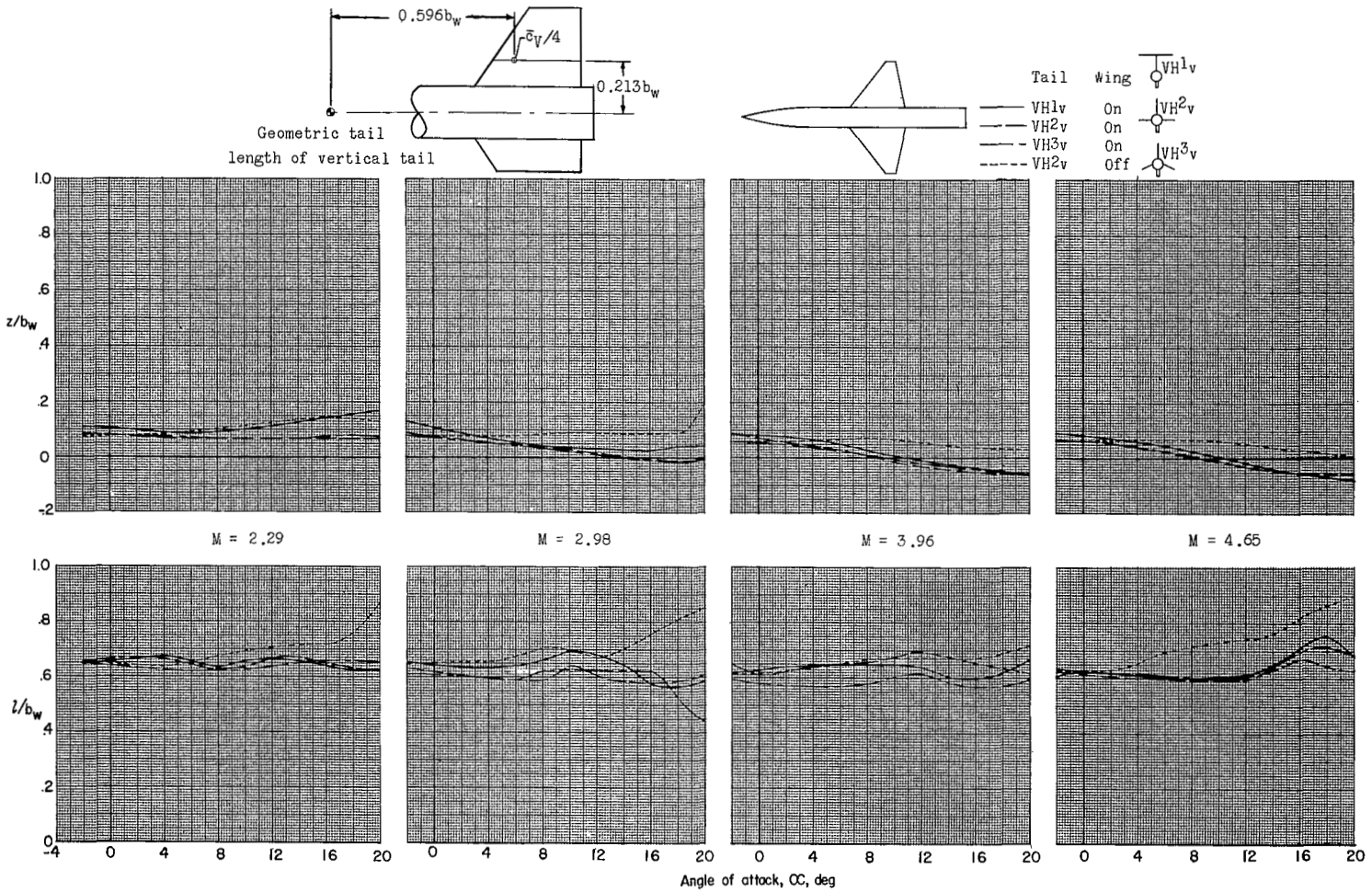


Figure 29.- Variation with α of the vertical (z/b_w) and longitudinal (l/b_w) location of the effective center of pressure of the tail for various model configurations with and without the 28.8° swept wing.

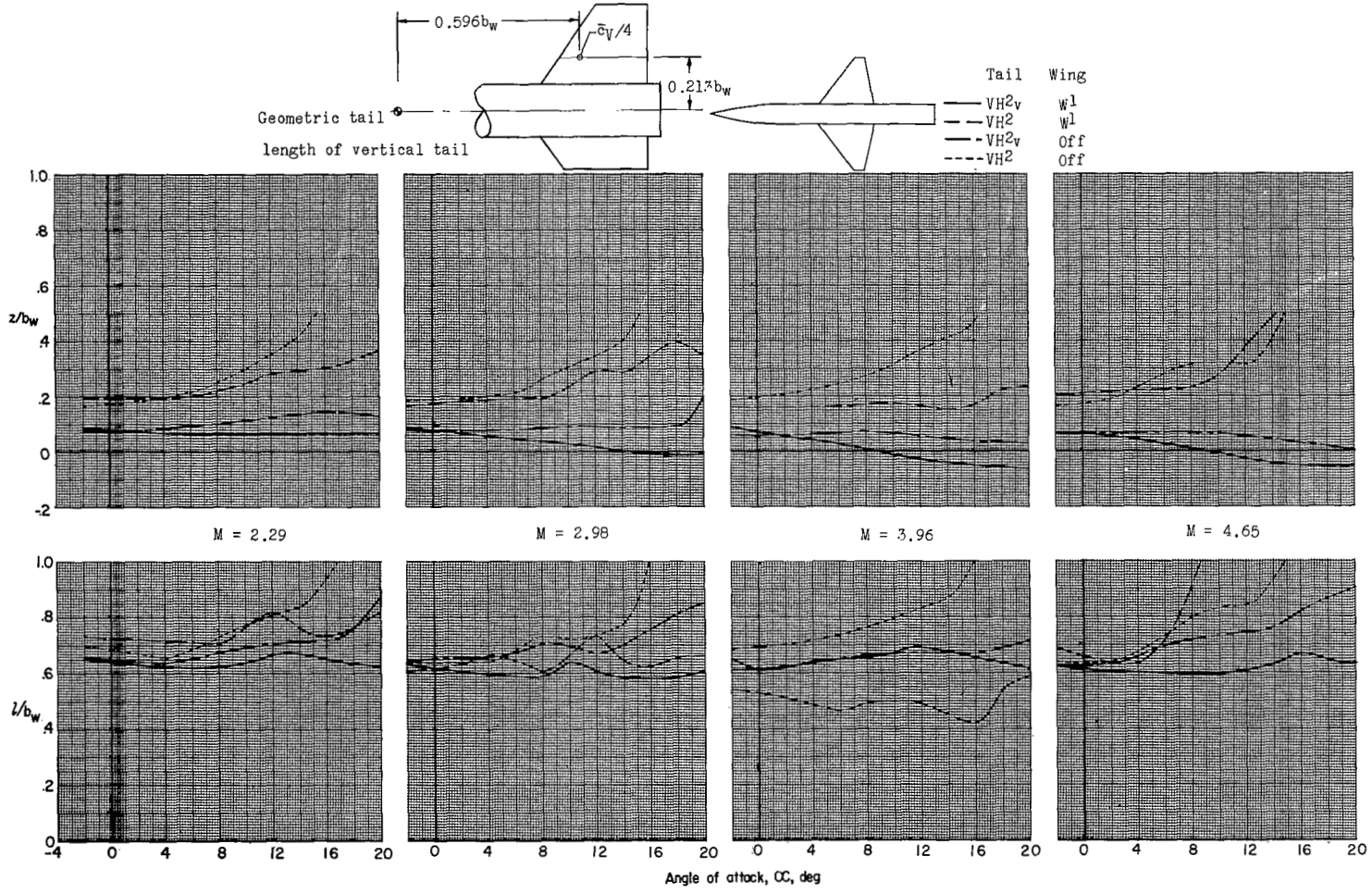


Figure 30.- Effect of ventral fin on the variation with α of vertical (z/b_w) and longitudinal (l/b_w) location of effective center of pressure of the tail for the model with and without the 28.8° swept wing.

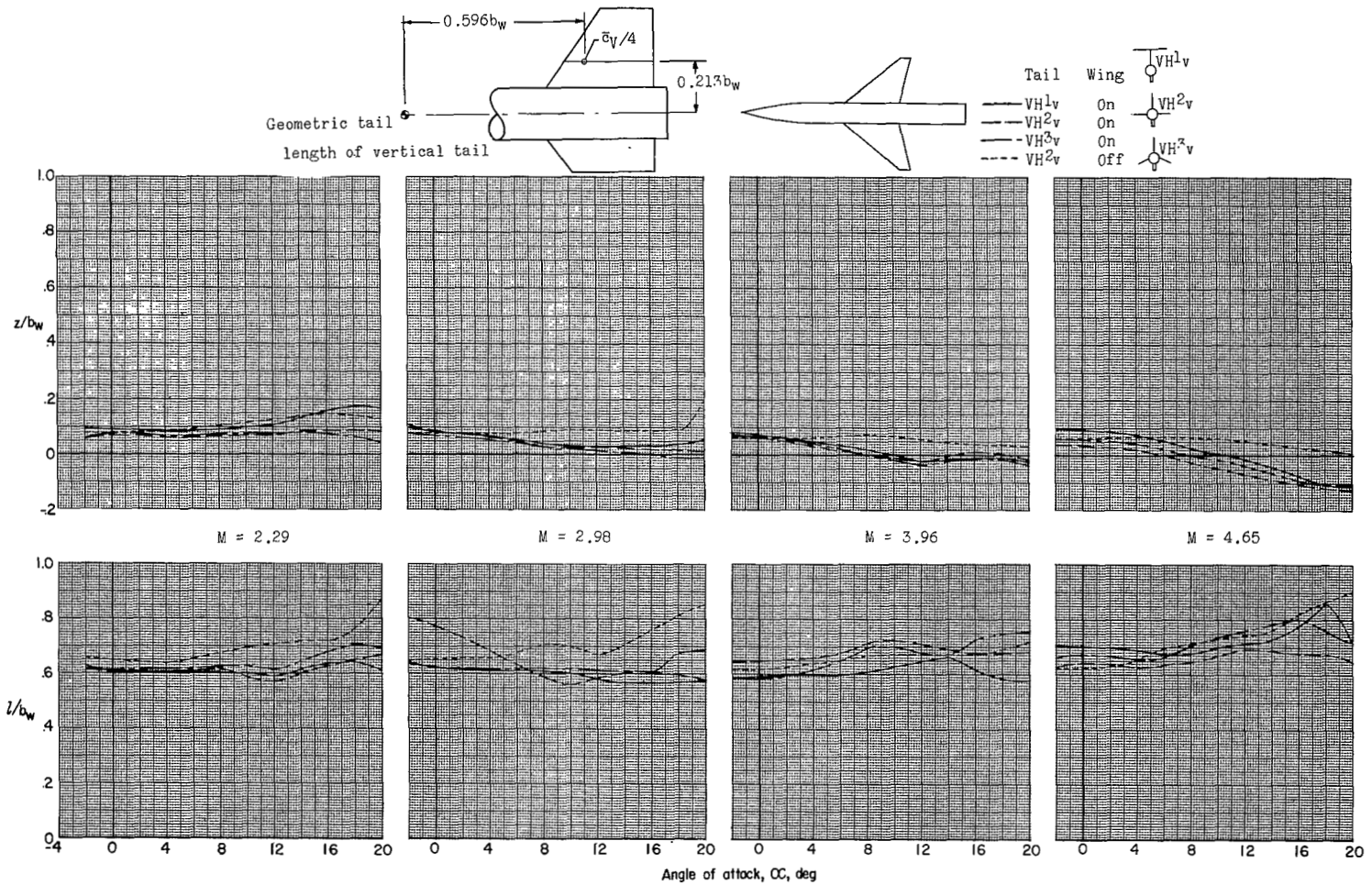
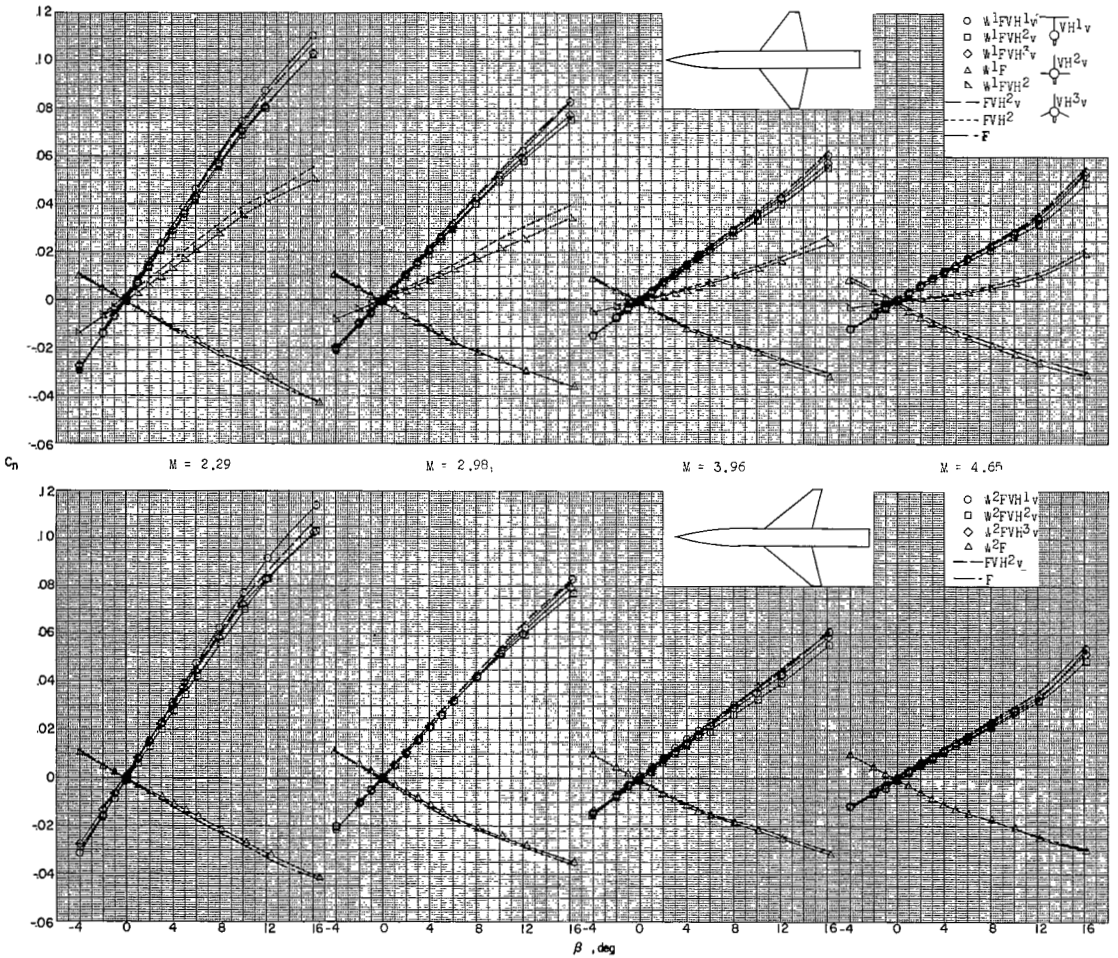
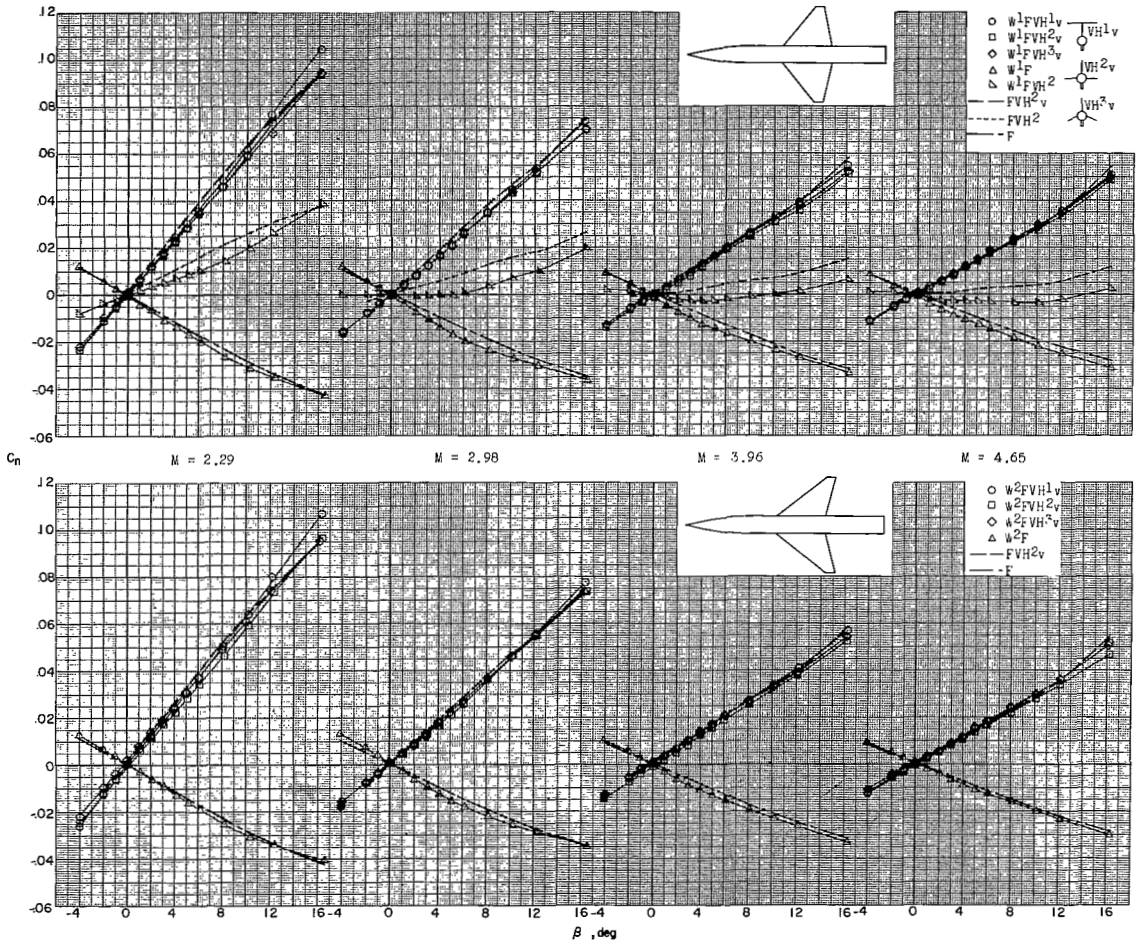


Figure 31.- Variation with α of the vertical (z/b_w) and longitudinal (l/b_w) location of the effective center of pressure of the tail for various model configurations with and without the 45° swept wing.



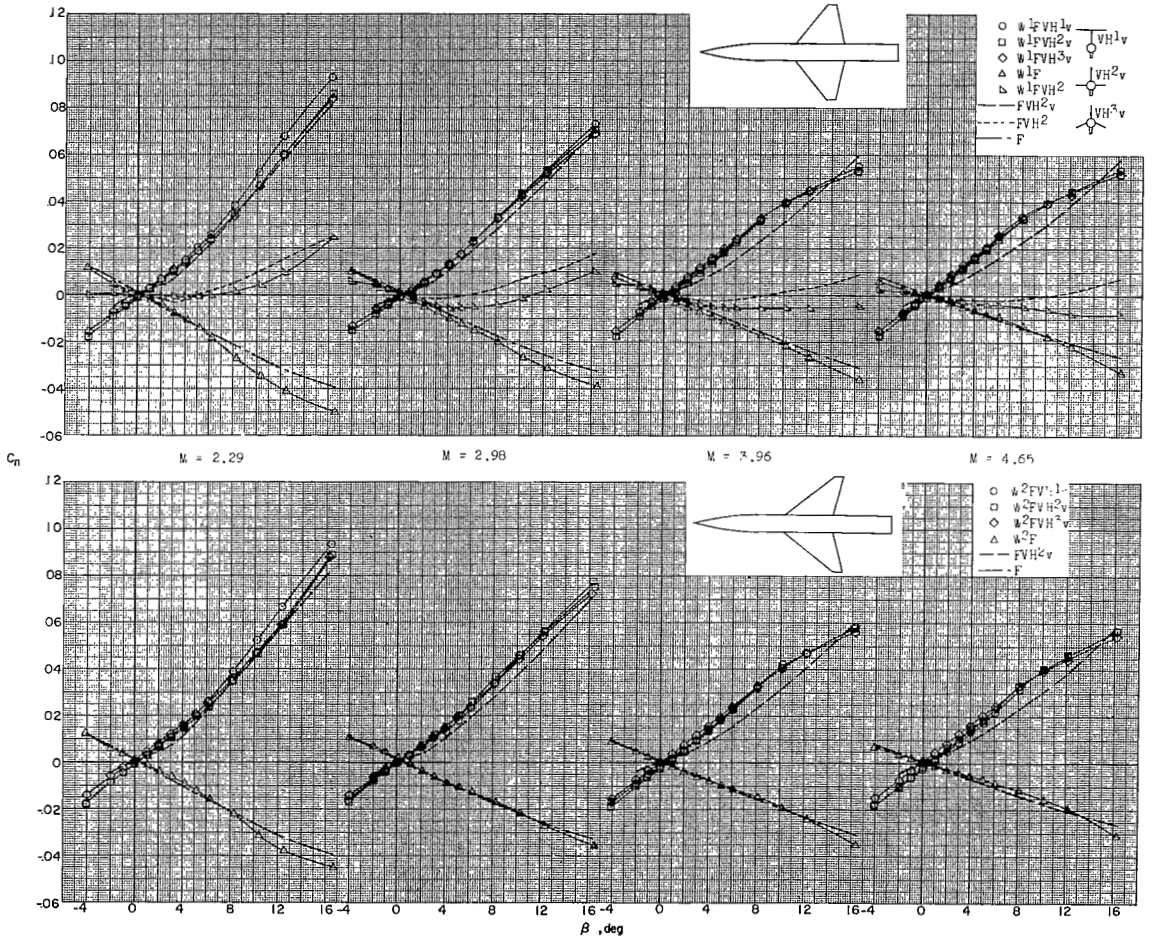
(a) Nominal angle of attack, 0°.

Figure 32.- Effect of horizontal tail configuration, wing sweep, and Mach number on the variation of C_n with angle of sideslip.



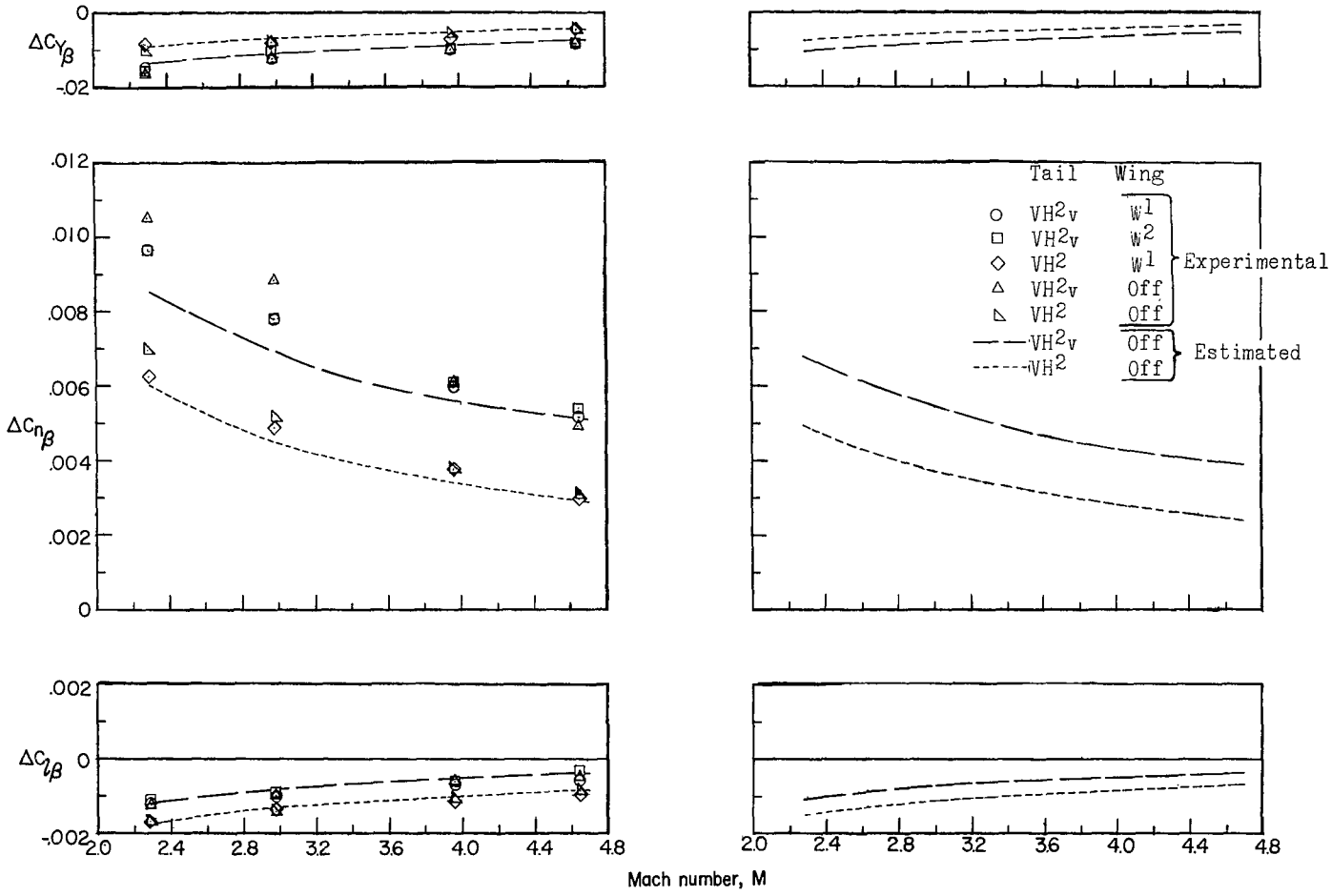
(b) Nominal angle of attack, 8°.

Figure 32.- Continued.



(c) Nominal angle of attack, 16°.

Figure 32.- Concluded.



(a) Interference included in estimates. (b) Interference neglected in estimates.

Figure 33.- Comparison of experimental and estimated values of ΔC_{Y_β}, ΔC_{n_β}, and ΔC_{l_β} at $\alpha = 0^\circ$ for model configurations with the low horizontal tail without dihedral. $i_t = -4^\circ$; $\alpha = 0^\circ$.

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