NASA CONTRACTOR REPORT 166587

An Experimental Evaluation of Advanced Rotorcraft Airfoils in the NASA Ames Eleven-Foot Transonic Wind Tunnel

Robert J. Flemming

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United Technologies
Sikorsky Aircraft

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Ames Research Center
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National Aeronautics and
Space Administration

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FOREWORD

The test and data comparisons contained in this report are the result of a cooperative rotorcraft airfoil program between the Sikorsky Aircraft Division of United Technologies Corporation and the Ames Research Center of the National Aeronautics and Space Administration. While the tested airfoils are the product of Sikorsky design efforts, the test data and theoretical comparisons are published herein to advance the state of rotorcraft airfoil performance prediction. Several comparisons are contained in this report, but the reader is invited to use the data to provide additional insight into the areas where the available theoretical methods give valid results and where further theory development is required.

Many people provided the technical support to conduct this program. The principal personnel include:

Raymond Hicks	NASA Ames	Project Coordination
LeRoy Guist	NASA Ames	Test Engineer
Donald Jepson	Sikorsky Aircraft	Model Design
Anthony Saccullo	Sikorsky Aircraft	Test Engineer
David Lednicer	Sikorsky Aircraft	Aerodynamicist

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An Experimental Evaluation of Advanced Rotorcraft Airfoils in the NASA Ames Eleven-Foot Transonic Wind Tunnel

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SUMMARY

Five full scale rotorcraft airfoils were tested in March and April 1982 in the NASA Ames Eleven-Foot Transonic Wind Tunnel for full scale Reynolds numbers at Mach numbers from 0.3 to 1.07. The models, which spanned the tunnel from floor to ceiling, included two modern baseline airfoils, the SC1095 and SC1094 R8, which have been previously tested in other facilities. Three advanced transonic airfoils, designated the SSC-A09, SSC-A07, and SSC-B08, were tested to confirm predicted performance and provide confirmation of advanced airfoil design methods. This test has shown that the eleven-foot tunnel is suited to two-dimensional airfoil testing.

The maximum lift coefficients at a Mach number of 0.3 for the SC1095 and SC1094 R8 were 1.37 and 1.72, respectively, about 9% above prior test values. The transonic airfoils had maximum lift coefficients of 1.40, 1.22, and 1.15 for the SSC-A09, -B08 and -A07, respectively. Drag divergence Mach numbers at zero lift for these airfoils were .808, .780, .833, .848 and .860. Prior to stall and drag divergence the pitching moments were generally between 0.010 and -0.015. SC1095 and SC1094 R8 lift curve slopes were 8 to 17% below that of the solid-wall United Technologies Research Center tunnel, used to test the baseline airfoils in 1975.

The airfoil analysis codes agreed well with this data, with the Grumman GRUMFOIL code giving the best overall performance correlation. The NYU Transonic Airfoil code predicted airfoil pressures and drag divergence well, but errs in the calculation of pitching moment. The Texas A&M TRANDES/TRANSEP codes show good correlation over the full range of test conditions. The AMI CLMAX code predicts the relative maximum lift coefficient of the thicker airfoils well, but fails to predict the maximum lift coefficient of the SSC-A07. The maximum lift coefficients measured in the test exceed the CLMAX code prediction and available test data from the United Technologies tunnel by about 10%.

INTRODUCTION

Rotor systems must be improved to satisfy mission requirements which demand advancements in efficiency for higher cruise speeds and lower fuel consumption and for reductions in acoustic levels. Advances in methodology have provided more rigorous means to design improved airfoils, but these codes have not had a good correlation base for rotorcraft airfoils - airfoils that have compromises between high lift at low velocities and low drag at transonic velocities, all while maintaining low pitching moments.

Sikorsky Aircraft initiated a project in 1979 to replace the SC1095 airfoil family with a family of airfoils that maintain its maximum lift capability and pitching moment levels while increasing drag divergence Mach number by .03 or more. This airfoil family was designated the SSC-AXX family. An additional design incorporated a different design philosophy to provide a pitching moment near zero. This airfoil family was designated the SSC-BXX family. The design study used many airfoil codes, including TRANDES, NYU Transonic code (program H), AMI's CLMAX code, FLO 6, and GRUMFOIL (MCMJ-9) (refs. 1-5). While these codes correlate well with modern airfoils such as the SC1095, additional data was required to validate the new transonic airfoil designs and the theories that were used to design them. A cooperative two-dimensional test program between NASA's Ames Research Center and Sikorsky Aircraft was initiated in 1980 to satisfy these validation requirements. This report describes the test procedure, data analysis methods, processed data, and code correlation for this test program, conducted in the Ames Eleven-Foot Transonic Wind Tunnel.

SYMBOLS

A	Axial Force, kg (lb)
c	Airfoil Chord, m (ft)
C_A	Axial Force Coefficient, A/Sq
C_d	Drag Coefficient, D/Sq
C_l	Lift Coefficient, L/Sq
C_m	Pitching moment coefficient reference to quarter chord, PM/Scq
C_N	Normal Force Coefficient, N/Sq
C_P	Surface Pressure Coefficient, $\frac{P_l - P_\infty}{q_\infty}$
D	Drag, newtons (lb)
h	Tunnel height, m (ft)
L	Lift, newtons (lb)
M	Mach number
M_{DD}	Mach number for drag divergence, $dC_d/dM = 0.1$
N	Normal Force, newtons (lb)
P	Pressure, newtons/m^2 (psf)
PM	Pitching Moment, newton-m (ft-lb)
q	Dynamic pressure, $\frac{1}{2}\rho V^2$, newtons/m^2 (psf)
R_N	Reynolds Number
S	Metric Section Area, m^2 (ft^2)
t	Airfoil Thickness, cm (in)
V	Velocity, mps (fps)
α	Angle of Attack, deg
ρ	Air density, newtons/m^3, (slugs/ft^3)

Subscripts

BAL	Balance
l	Local
max	Maximum
P	Pressure
W	Wake
∞	Free Stream

TEST FACILITY

The Eleven-Foot Transonic Wind Tunnel at NASA Ames is part of the Unitary Plan Wind Tunnel complex. It is a closed return, variable density tunnel with airflow produced by a three-stage axial-flow compressor. The tunnel can be operated at Mach numbers from 0.4 to 1.4 at stagnation pressures from 0.5 to 2.25 atmospheres and at lower Mach numbers at pressures above 1.4 atmospheres. For the advanced rotorcraft airfoil test the maximum Mach number was 1.07 and the stagnation pressure was held at 1.0 and 1.4 atmospheres. Stagnation temperature averaged 294°K (530°R).

The four walls of the test section are slotted with a normal porosity of 6.1%. To provide smooth flow near the ends of the airfoil model the slots adjacent to the model were taped, reducing porosity to 4.7%.

MODELS

The Sikorsky Tunnel Spanning Apparatus (TSA) was installed in the eleven-foot tunnel in a vertical orientation (see fig. 1). Dimensional data for the TSA is provided in figure 2. The base of the TSA's stainless steel spar was adapted to the tunnel yaw table and a turntable was fabricated to support the upper end of the spar. The turntables were controlled by one primary input with trim adjustments made with the upper turntable controller. Seven fiberglass-graphite airfoil panel segments for each airfoil model were attached to the spar. Surface pressures were measured using 24 upper surface and 11 lower surface .107 cm (.042 inch) orifices located 15.24 cm (6 inches) above the model centerline. The center 20.32 cm (8 inches) of the model contains a six-component Task balance and a single-component rear load cell. The metric section is sealed to the non-metric panels with .024 cm (.010 in) thick elastomeric material. Two struts with triangular cross-sections provided part-span support. The test of Reference 6 showed that the struts do not affect airfoil performance.

Five airfoil profiles (fig. 3) were fabricated for this test, including the SC1095 and SC1094 R8 for which test data in other facilities was already available. The chords of these two models are about 41 cm (16 inches). The three advanced airfoil models fabricated for this test have chords of 43.9 to 54.2 cm (17.3 to 21.3 inches). The chord increase was required to accomodate the spar for these airfoils, which are thinner than the SC1095. The airfoil metric sections are shown in figure 4. Tests near atmospheric pressure provide full scale data for aircraft in the size range of the Sikorsky S-76 and UH-60A, Bell UH-1H, and Hughes AH-64A.

While the tunnel can be operated over a wide range of stagnation pressures, data were acquired at pressures of 76 cm (30 inches) and 107 cm (42 inches) of mercury. The latter pressure was required at M = 0.3 because of minimum motor RPM constraints. The SSC-A09 airfoil was operated at Mach numbers up to .84 at both pressures to define Reynolds number trends. The test Reynolds numbers are summarized in figure 5.

Table I shows the basic geometric properties of the airfoil models. The coordinates for the SC1095 and SC1094 R8 airfoil sections are given on the first page of Table II. The coordinates for the SSC-A09 and SSC-A07 sections for which a patent is pending and the SSC-B08 section are included on the second page of Table II. The airfoil section profiles (fig. 3) were produced from aluminum molds using fiberglass with stiffening provided by graphite strips. This fabrication process generally produced airfoils to a tolerance within .03 cm (.012 inches). The panel segments of the SSC-A09 airfoil were reworked prior to Run 196 to reduce bolt head loads. This resulted in larger tolerance errors. Comparison of data taken prior to the modification with that after the modification indicates that the data of Runs 196-221 has a reduction in $C_{l_{max}}$ of 0.11, an increase in drag of 0.0014 and an increase in pitching moment of .001. This is discussed further later in this report (see page 8). Surface finish was smooth, comparable to production blade finishes. Boundary layer transition devices were not used because full scale Reynolds numbers were used during testing.

At the end of the test, several out-of-contour modifications were made to the SSC-A09 airfoil using tape and wax. The description of these changes is given in the Test Results section of this report.

INSTRUMENTATION

The airfoil section forces and moments were derived from the balance readings and by pressure integrations. The center 20.3 cm (8 inches) of the TSA span is mounted to a 2.54 cm (one-inch) diameter six component Task balance and a single component load cell (see fig. 2). Calibration of this system was made with elastomeric seals in place, using special calibration fixtures (fig.6). The balance system was check loaded for each configuration during the test.

Pressures from the model orifices and the sting-mounted wake rake were measured by an automatic scanning system with precision transducers. Half of the wake rake tubes were teed to a mercury manometer board to aid in visualization and rake placement (fig. 7).

Model incidence was measured with potentiometers on both the lower and upper turntables. The TSA spar and struts were strain gauged to permit monitoring of the component loads. All parameters were displayed on digital voltmeters to permit continuous monitoring of the data. Data were recorded on the tunnel data system and transmitted to the Ames computer for on-line data reduction and stored for final post-test processing. Final data tapes were transmitted to Sikorsky Aircraft for preparation of final data listings and to facilitate the plotting of data.

TEST PROCEDURE

The test was conducted according to a test plan which prescribed angle of attack variation from -5 degrees through stall for Mach numbers between 0.3 and 1.07, except when limited by strut compression loads. Drag divergence Mach number was defined by a Mach number sweep at zero lift. The wake rake was generally covered at Mach numbers of 0.9 and above to prevent vibratory damage to the rake tubes. Ultraviolet oil flow photographs were taken for selected conditions.

Each data point was approached from a lower angle of attack with 30 seconds allowed for the tunnel and manometer board to stabilize prior to data acquisition. Data repeatibility with angle of attack set in both the increasing and decreasing directions was evaluated during the initial test runs. Repeatibility is excellent and there are no signs of hysterisis in any parameter (fig. 8). Test repeatibility was checked during each run by repeating the Mach number of 0.4 case at angles of attack of 0 and 6 degrees.

The configurations tested are summarized in Table III. Run conditions are presented in Table IV.

DATA REDUCTION METHODS

The equations used to transform raw test data to aerodynamic coefficient follow accepted procedures. A description of the equations used in the data reduction process are given below to assist the reader in understanding the derivations of the coefficients.

The aerodynamic parameters contained in this report are corrected for the effect of the tunnel walls and spar torsion. The magnitude of the wall corrections that must be applied to the data are small. Since airfoil thickness ratios are 9.5% or less and height to chord ratios greater than 6, the wall

correction factors increase the free stream Mach number by 1%, the lift and drag coefficients decrease by 1½%, with small changes to pitching moment and angle of attack. The relationships used are given in Reference 7. An additional correction is made to the angle of attack to account for the change in angle at the metric section due to torsional moments. This correction increases the magnitude of the angle of attack about 2%. The lift curve slope in a slotted tunnel is less than that of a solid wall tunnel by 8 to 17%. The angles in this report are not corrected for the slot effect, but corrections are presented in the Test Results section of this report.

The coefficients of lift and drag are presented in the wind axis system. The wake rake drag is measured in the wind axis system, but the balance chord force and balance and surface pressure normal forces must be transformed as follows:

$$C_{L_P} = C_{N_P}(\cos \alpha + \tan \alpha \sin \alpha) - C_{D_W} \tan \alpha$$

$$C_{L_{BAL}} = C_{N_{BAL}} \cos \alpha - C_{A_{BAL}} \sin \alpha$$

$$C_{D_{BAL}} = C_{N_{BAL}} \sin \alpha + C_{A_{BAL}} \cos \alpha$$

The pitching moments for all of the airfoils, except the SC1094 R8, are referenced to the quarter chord. The SC1094 R8 pitching moment is referenced to the quarter chord of the SC1095. The quarter chord moment for the SC1094 R8 is

$$C_M = C_M - .0025\, C_L - .015\, C_D$$

Use of this transformation increases the nose down moment at high lift conditions by .005.

The wake rake data were analyzed following the procedures of Reference 8. Corrections for wall interference and the velocity gradient across the probes were applied.

TEST RESULTS

The airfoil surface pressure data, internal balance data, and wake rake pressure data were used to produce coefficients of lift, drag and quarter chord pitching moment, presented in tabular form in Appendix A. At low tunnel speeds the coefficients based on pressure data are inherently more accurate. Model flexibility results in errors in the transfer of loads to the balance, especially in the axial direction. As the tunnel speed is increased, and loads increase the agreement between pressure and balance measurements improve. At high Mach numbers the balance provides more accurate results, since the balance is not affected by force and moment pressure integration uncertainties due to rotational flow and shock position location between pressure ports. A comparison of force and moment coefficients derived from pressure and balance measurements is shown in Figure 9. The lift coefficient agreement is very good, even for cases with shock waves and for post-stall conditions (see fig. 9a). The estimated data accuracy for these measurements is given in Table V.

The wake rake provided much better drag coefficient repeatability than the balance measurements. The drag uncertainty for the balance was about 1.5 kilograms due to the flexibility in bond joints between the composite model skins and the balance clamps. (Future metric sections will be machined from solid metal to avoid this flexibility.) This 1.5 kilogram uncertainty exceeds the nominal minimum drag coefficient for Mach numbers below 0.64 (see fig. 10). Figure 9b shows the data scatter that exists in balance drag measurements. While points showing good agreement exist within the overall data scatter, balance drag values for points where the measured wake rake drag is less than 1.5 kilograms are generally not presented in Appendix A. The agreement between balance and pressure-derived pitching moment coefficients are good, improving with increasing Mach number. The plotted data presented in figures 11 through 25 are based on pressure measurements.

Figure 11 shows the force and moment coefficient data for the SC1095 airfoil for a range of Mach numbers. The maximum lift coefficient for the SC1095 at low Mach numbers as measured in the Ames 11-foot wind tunnels exceeds the maximum lift coefficient measured with the TSA in the UTRC 8-foot wind tunnel by 10%. Measured drag coefficients agree well. Force and moment coefficient data for the SSC-A09, SSC-A07, SSC-B08, and SC1094 R8 airfoils are presented in figures 12 through 15.

The SSC-A09 airfoil attachment points had to be reworked to reduce bolt head stresses. This resulted in a slight upward rotation of the leading edge piece and a corresponding dis-

continuity between the leading edge and trailing edge parts of the model for Runs 196 to 285. Post test evaluation of the data showed that this tolerance error caused a degradation in airfoil performance. The drag coefficient increased by 0.0014 and the pitching moment increased by 0.001. The maximum lift coefficient at a Mach number of 0.3 was lower by 0.11 after the rework and the point of zero lift occurs at a 0.3 degree higher angle of attack. Of this block of data only Run 196 is used in the graphical presentations in this report. This run is shown in figure 12 and exhibits a premature reduction in lift coefficient at angles of attack about 13 degrees. The dashed line in figure 12a shows the minimum performance expected for the airfoil at a Mach number of 0.4.

Figures 16 through 22 show the effect of airfoil configuration at constant Mach numbers. Figure 16a shows the low Mach number high lift characteristics of each airfoil. The high lift benefits of the leading edge camber of the SC1094 R8 are evident in this figure. The three transonic airfoils performed satisfactorily at this condition. The SSC-A09 airfoil exceeded the SC1095 airfoil maximum lift coefficient by 2%, and each transonic airfoil tested showed "gentler" stall characteristics. Low lift, low Mach number drag levels ranged from .0067 to .0088. The transonic airfoils had lower drag levels than the baseline airfoils.

The transonic airfoils produced significant performance improvements at higher Mach numbers. The maximum lift of the SSC-A09 exceeded that of the other airfoils tested at Mach numbers between 0.50 and 0.74. Above a Mach number of 0.74 the SSC-A07 had superior maximum lift capability (see fig. 23). Figure 24 shows the zero lift drag for the tested airfoils. The type of leading edge camber used for the SC1094 R8 results in an early drag rise and a drag divergence Mach number that is significantly lower than the other airfoils. The transonic airfoils maintain low drag characteristics to Mach numbers above 0.833. The drag divergence Mach number occurs at lower drag levels for the improved airfoils, providing more drag reduction than indicated by changes in drag divergence Mach number. The lift-drag ratios for the airfoils designed using modern design methods are superior to earlier rotorcraft airfoils. The airfoils in the SSC-AXX family have better maximum L/D values than the other tested airfoils (fig. 25).

Slotted wind tunnels give lower lift curve slopes than given in solid wall tunnels or by theory (see ref. 9). Figure 26 compares, for the SC1095 and SC1094 R8 airfoils, the lift curve slope derived from theory and the Ames and UTRC tunnels. The differences between tunnels ranges from 8% at low Mach numbers to 17% at high Mach numbers.

A limited number of runs at higher Reynolds numbers were made during the latter part of the test. These runs, which were at a Reynolds number 40% above the baseline, showed little change in maximum lift, a very small increase in drag coefficient (+.0008), and a small increase in pitching moment (+.004).

Five types of out-of-contour bumps and protruberances were added to the SSC-A09 airfoil at the end of the test and run over limited angle of attack and Mach number ranges. Each configuration showed a degradation in maximum lift coefficient and an increase in drag coefficient. Pitching moment coefficient changes were generally within ±.005 of the baseline value.

The first change (Configuration 6) was a simulated out-of-contour de-icing boot or abrasion strip. A soft duct tape was applied to the leading edge of the airfoil back to an x/c of 10% for both the upper and lower surfaces. The tape thickness was 0.35% of chord and ended in a step discontinuity. This resulted in a 15% reduction in maximum lift and an 80% increase in drag. This configuration was modified by adding a fairing behind the tape (Configuration 7). The fairings reduced the penalties for configuration 6 by 50%. The effect of miniature pressure transducers mounted on the blade surface was investigated (Configuration 8). Three rows of fifteen units, each having a diameter of 0.40 cm and a height of 0.08 cm with a simulated base and wiring, were placed on the model on the pressure orifice line, on the centerline of the metric section and 15 cm below the metric section centerline. The simulated transducers reduced the maximum lift by 4% and increased the drag by 18%.

Configurations 9 and 10 were smooth surface bumps. The first had a height of 0.3% of chord centered at the 50% chord station on the upper surface. The chordwise extent was 29%. This bump caused a 2% reduction in maximum lift and a 15% increase in drag. Adding a second bump at 10% chord (Configuration 10) with a height of 0.2% of chord and a chordwise extent of 14% resulted in a further loss in maximum lift of 1% and a further drag increase of 7%.

THEORY CORRELATION

Surface pressure data for the tested airfoils are presented in figures 27-32. These data have been used to compare several analysis methods (figs. 33-37). Figure 33 presents the surface pressure correlation for the five tested airfoils at low lifts and low Mach numbers. The computer codes produced similar results, and match the test data well. Pressure differences near the trailing edge are evident from these plots. Figure 34

shows similar data for high lift, low Mach number conditions. The data selected do not show separated flows on the upper surface as predicted by the AMI CLMAX code (ref. 3), although the angle of attack prediction for the input lift coefficient is good (prior to making lift curve slope corrections). The CLMAX code failed to converge at high angles of attack for the 7% thick airfoil. The Squire-Young drag coefficient ($C_{D_{S-Y}}$) in CLMAX tended to be optimistic. Additional CLMAX cases were run to evaluate the predicted maximum lift capability for each tested model. This code underpredicted the maximum lift coefficient measured in the Ames tunnel by about 10%. (It should be noted that the maximum lift from the Ames 11-foot wind tunnel exceeded that of the UTRC tunnel by 10%.) At a constant lift coefficient the pressures predicted by the NYU transonic (Korn, Garabedian, Bauer) code (ref. 2) are very good, although this code was not formulated for high lift, separated flow conditions and cannot show the same pressure distribution given by the CLMAX code. The TRANSEP code (ref. 1) predicted the pressure distributions well, showing the same or smaller separated zones at the trailing edge than the CLMAX code. The angle of attack correlation would improve if the slotted wall lift curve slope correction was applied to the data.

The surface pressures predicted by the NYU, TRANDES (see ref. 1) and MCMJ-9 GRUMFOIL code (see ref. 5) correlate very well for the moderate Mach number, moderate lift condition of figure 35. GRUMFOIL provides a better prediction of pitching moment. Similar correlation exists for the higher Mach number, moderate lift conditions of figure 36. Figure 37 shows the test data - theory comparison for a low lift, high Mach number condition. The shock position and the pitching moment for the SC1095 airfoil (fig. 37a) is predicted by GRUMFOIL, but GRUMFOIL shows the shock at a more rearward position for the SC1094 R8 airfoil. The three codes agree with the test data reasonably well for the transonic airfoils. GRUMFOIL exhibited much better pitching moment correlation than the other codes evaluated. The NYU, TRANDES and GRUMFOIL predicted the drag divergence Mach number within ±.015. TRANDES tended to underpredict the drag divergence Mach number while the other two programs matched or slightly exceeded the drag divergence Mach number based on test data. The theoretical calculations for the SC1094 R8 airfoil had the largest deviations from the test data. The predicted drag levels for the cases of figures 35-37 were very good.

CONCLUSIONS

The test confirmed that the NASA Ames Research Center Eleven-Foot Transonic Wind Tunnel is well suited to airfoil testing. This test provided data for several airfoil designs including the SSC-AXX and SSC-BXX airfoil families, showing capability greater than that of the baseline SC1095 airfoil in the areas of maximum lift, maximum L/D and drag divergence Mach number.

Several modern airfoil theories were compared with the test data. The AMI CLMAX program had good angle of attack-lift correlation for low Mach number, high lift conditions but underpredicted drag. The Texas A&M TRANSEP program showed good surface pressure correlation, but the cases run failed to give reasonable drag levels. The TRANDES and NYU Transonic codes showed good drag, lift, and surface pressure correlation at low and moderate lifts but failed to predict airfoil pitching moment. GRUMFOIL gives good surface pressure, lift, drag and pitching moment correlation for these conditions.

TABLE I. AIRFOIL CHARACTERISTICS

Configuration Airfoil Designation Airfoil Type	1 SC1095 Modern	2, 6-10* SSC-A09 Advanced	3 SSC-A07 Advanced	4 SSC-B08 Advanced	5 SC1094 R8 Modern High Lift
Thickness Ratio, t/c	.095	.090	.070	.080	.094
Chord, inches	16.070	17.290	21.350	19.685	16.230
feet	1.3392	1.4408	1.7792	1.6404	1.3525
meters	.4082	.4392	.5423	.5000	.4122
x/c For Maximum Thickness	.27	.38	.38	.38	.27
x/c For Maximum Camber	.27	.17	.17	.34	.20
Model Aspect Ratio	8.21	7.63	6.18	6.71	8.13
Tunnel Height/Chord	8.21	7.63	6.18	6.71	8.13
Distance From Trailing Edge To Wake Rake, Chords	2.06	1.86	1.36	1.54	2.03
C_{Lmax} @ M = 0.3	1.37	1.40	1.15	1.22	1.71
C_{Lmax} @ M = 0.4	1.24	1.24	1.01	1.03	1.34
M_{DD} @ C_L = 0	.808	.833	.850	.865	.78

* Configuration 2 is clean SSC-A09 airfoil. Configurations 6-10 incorporate modifications to simulate deicing boots or abrasion strips (6 with step aft edge, 7 with faired aft edge), miniature pressure transducers (8), and contour bumps (9 and 10).

TABLE II. COORDINATES FOR THE SC1095 AND SC1094 R8 AIRFOILS

	SC1095		SC1094 R8	
X/C	$Y/C)_u$	$Y/C)_l$	$Y/C)_u$	$Y/C)_l$
0	0	0	-.01729	-.01729
.0008	.00389	-.00317	-.1172	-.0225
.004	.00898	-.00744	-.00333	-.0277
.01	.0155	-.0155	.0057	-.0318
.02	.0233	-.0185	.0158	-.0344
.04	.0334	-.0259	.0291	-.0369
.06	.0395	-.0303	.0367	-.0380
.08	.0438	-.0329	.0416	-.0386
.10	.0470	-.0346	.0452	-.0389
.125	.0497	-.0362	.0483	-.0390
.15	.0517	-.0375	.0506	-.0390
.20	.0546	-.0390	.0537	-.0390
.25	.0555	-.0394	.0549	-.0390
.30	.0554	-.0393	.0548	-.0389
.35	.0545	-.0387	.0541	-.0384
.40	.0529	-.0376	.0527	-.0374
.45	.0511	-.0362	.0508	-.0360
.50	.0485	-.0345	.0484	-.0343
.55	.0457	-.0324	.0455	-.0323
.60	.0421	-.0299	.0420	-.0298
.70	.0337	-.0239	.0337	-.0238
.80	.0236	-.0166	.0236	-.0165
.90	.0124	-.0087	.0123	-.0086
.95	.0064	-.0044	.0064	-.0044
1.00	.0017	-.0017	.0017	-.0017

TABLE II (concluded)

COORDINATES FOR THE SSC-A09, SSC-A07 AND SSC-B08 AIRFOILS

	SSC-A09 (Patent Pending)		SSC-A07 (Patent Pending)		SSC-B08	
X/C	$Y/C)_u$	$Y/C)_l$	$Y/C)_u$	$Y/C)_l$	$Y/C)_u$	$Y/C)_l$
0	0	0	0	0	0	0
.0008	.0039	-.0029	.0031	-.0022	.0031	-.0030
.0045	.0099	-.0064	.0077	-.0050	.0080	-.0076
.01	.0149	-.0089	.0116	-.0070	.0130	-.0104
.02	.0215	-.0117	.0167	-.0091	.0189	-.0133
.04	.0304	-.0157	.0237	-.0122	.0268	-.0168
.06	.0369	-.0186	.0287	-.0145	.0325	-.0191
.08	.0416	-.0209	.0323	-.0163	.0367	-.0207
.10	.0449	-.0228	.0349	-.0178	.0397	-.0220
.125	.0478	-.0249	.0372	-.0193	.0424	-.0233
.15	.0499	-.0266	.0388	-.0207	.0445	-.0244
.20	.0528	-.0295	.0410	-.0229	.0474	-.0260
.25	.0544	-.0317	.0423	-.0246	.0493	-.0273
.30	.0553	-.0332	.0430	-.0258	.0504	-.0282
.35	.0556	-.0342	.0432	-.0266	.0509	-.0289
.40	.0553	-.0346	.0430	-.0269	.0507	-.0293
.45	.0544	-.0344	.0423	-.0268	.0499	-.0294
.50	.0528	-.0336	.0410	-.0261	.0484	-.0292
.55	.0505	-.0320	.0393	-.0249	.0462	-.0287
.60	.0475	-.0298	.0369	-.0232	.0432	-.0280
.70	.0389	-.0238	.0303	-.1085	.0352	-.0253
.80	.0261	-.0159	.0203	-.0124	.0248	-.0207
.90	.0113	-.0074	.0088	-.0058	.0127	-.0128
.95	.0044	-.0030	.0034	-.0023	.0059	-.0069
.97	.0030	-.0023	.0023	-.0018	.0039	-.0049
.98	.0022	-.0016	.0017	-.0009	.0033	-.0037
.99	.0021	-.0009	.0016	-.0007	.0030	-.0022
1.00	.0024	-.0008	.0019	-.0006	.0029	-.0004

TABLE III. MODEL CONFIGURATION SUMMARY

Advanced Rotorcraft Airfoil Test
NASA Ames 11-Foot Transonic Wind Tunnel

Config	Identifier	Run Number
1	SC1095 Airfoil	1 - 58
2	SSC-A09 Airfoil	59-83, 191-221
3	SSC-A07 Airfoil	84 - 115
4	SSC-B08 Airfoil	116 - 147
5	SC1094 R8 Airfoil	148 - 190
6	SSC-A09 Airfoil With Unfaired De-icing Boot	222 - 235
7	SSC-A09 Airfoil With Faired De-icing Boot	236 - 256
8	SSC-A09 Airfoil With Simulated Pressure Transducer	257 - 268
9	SSC-A09 Airfoil With Upper Surface Bump at X/C = 50%	269 - 284
10	SSC-A09 Airfoil With Upper Surface Bumps at X/C = 10% and 50%	285 - 286

TABLE IV. RUN LOG

Run No.	Total Pressure PT(in Hg)	Nominal Mach No.	Angle of Attack Range (deg)	Remarks
SC1095 Airfoil Installed, Configuration 1				
1	-	0	0	Data System Checks
2	↓	↓	↓	Balance Trial Loading
3				Balance Trial Loading
4				Data System Checks
5				Balance Trial Loading
6				No Data
7				Balance Trial Loading
8				Balance Normal Force Check Loading
9				Balance Pitching Moment Check Loading
10				Balance Axial Force Check Loading
11				Balance Chord Force Check Loading
12	30	.5,.8	0	Shake Down Run
13	35	0	0	Scanivalve Check
14	30.0	.4	-5 to 20	Hysteresis and Repeatibility
15	↓	↓	20 to -5	Check Runs
16			-5 to 20	
17			20 to -5	
18	35	0	0	Scanivalve Check
19	42	.3	0 to 16	
20	42	.3	13	
21	30	.4	0, 6	
22	30	.5	-5 to 18	
23	30	.5	-0.6	
24	30	.6	-5 to 16	
25	30	.7	-5 to 2	Run Terminated - Seals Split
26	35	0	0	Scanivalve Check
27	30	.4	0	
28	30	.7	-5 to 11	Repeat of Run 25
29	35	0	0	Scanivalve Check
30	30	.8	-3 to 8	

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
31	30	.8	-1, 0	
32	30	.4	0, 6	
33	30	.6	0 to 11	Repeat of Run 24
34	30	.7	-6	
35	30	.75	-6	
36	30	.775	-6	
37	30	.80	-6	
38	30	.82	-6	Includes Bilinear Scanivalve Check
39	30	.4	-0.8,0,6	
40	30	.4	0, 6	
41	30	.7	-.6	
42	↓	.75	↓	
43		.775		
44		.80		
45		.82		
46		.84	-0.6,-0.4	
47	35	0	0	Scanivalve Check
48	30	.4	0,6	
49	30	.9	-2 to 0	Shutdown to Check Seals.. Two Screws broken
50	35	0	0	Scanivalve Check
51	30	.4	.0,6	
52	30	.9	-1 to 5	Continuation of Run 49
53	--	--	--	No Data
54	35	0	0	Scanivalve Check
55	30	.4	0,6	
56	30	.98	-2 to 0	
57	30	1.07	-1 to 0	
58	--	0	0	N3 Check Load
SSC-A09 Airfoil Installed, Configuration 2				
59	35	0	0	Scanivalve Check
60	30	.4	0,6	
61	42	.3	0 to 15	

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
62	35	0	0	Scanivalve Check
63	30	.5	-5 to 18	
64	↓	.4	0,6	
65	↓	.6	-4 to 13	
66	35	0	0	Scanivalve Check
67	30	.4	0,6	
68	↓	.6	0,11 to 16	Continuation of Run 65
69	↓	.7	-3 to 11	
70	↓	.8	-3 to 8	
71	↓	.82	-0.7	
72	↓	.84	-1.3 to -0.7	
73	↓	.86	-1.3	
74	↓	.88	-1.3	
75	↓	.7	-1.3	
76	↓	.75	-1.3	
77	↓	.775	-1.3 to -0.8	
78	↓	.8	-0.8	
79	↓	.82	-0.8	
80	↓	.84	-1.3	
81	35	0	0	Scanivalve Check
82	30	.75 to .90	-.8 to 0	
83	30	.90	0	Run Aborted - Panel Oscillations Caused Broken Panel Screw
SSC-A07 Airfoil Installed, Configuration 3				
84	35	0	0	Scanivalve Check
85	30	.4	-5,0	
86	35	0	0	Scanivalve Check
87	30	.4	-5 to 14	
88	42	.3	0 to 14	
89	30	0	0	Static Data System Check
90	30	.4	0, 6, 12	Wake Rake Survey, Oil Flow
91	30	.5	-5 to 12	
92	35	0	0	Scanivalve Check
93	30	.6	-3 to 16	

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
94	30	.7	-3 to 10	
95	↓	.4	0,6	
96	35	0	0	Scanivalve Check
97	30	.8	-2 to 6	
98	|	.4	0,6	
99	|	.7	0.1	
100	|	.75	0.1, 0.2	
101	|	.775	0.2 to 0.5	
102	|	.8	0.4	
103	|	.83	0.4	
104	|	.85	-0.2 to 2.6	
105	|	.87	0.6	
106	↓	.89	0.6	
107	35	0	0	Scanivalve Check
108	30	.4	0, 6	
109	|	.9	-2 to 4	
110	|	.98	-1 to 2	
111	|	1.07	-1 to 2	
112	|	0	0	End Zero
113	|	|	|	Balance Normal Force Check Loading
114	|	|	|	Balance Pitching Moment Check Loading
115	↓	↓	↓	Balance Chord Force Check Loading
SSC-B08 Airfoil Installed, Configuration 4				
116	-	0	0	No Data
117	|	|	|	No Data
118	|	|	|	Balance Normal Force Check Loading
119	|	|	|	Balance Chord Force Check Loading
120	|	|	|	Balance Pitching Moment Check Loading
121	↓	↓	↓	Repeat of 121
122	30	.4	0,6	Includes Scanivalve Check at Pt = 35
123	|	.4	-5 to 18	
124	|	.5	-5 to 18	
125	35	0	0	Scanivalve Check

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
126	42	.3	0 to 15	
127	35	0	0	Scanivalve Check
128	30	.4	0, 6, 12	
129	↓	.6	-5 to 16	Includes Repeat Points
130	↓	.7	-2 to 9	
131	↓	0	0	End Zero
132	35	0	0	Scanivalve Check
133	30	.8	-1.5 to 8	Oil Flow
134	↓	.7	1 to 0	
135	↓	.75	0	
136	↓	.775	0	
137	↓	.8	0	
138	↓	.82	0	
139	↓	.84	-0.4, 0.2	
140	↓	.86	-0.4,0	
141	↓	.88	-0.5,0	
142	↓	.4	0 to 13	
143	35	0	0	Scanivalve Check
144	30	.9	-2 to 4	
145	↓	.98	-1.3 to 2	
146	↓	1.07	-1.3 to 1	
147	↓	.4	0,6,12	
SC1094 R8 Airfoil Installed Configuration 5				
148	35	0	0	Scanivalve Check
149	30	.4	-0.2,-0.1,6	Oil Flow
150	↓	.4	-5 to 18	
151	↓	.5	-5 to 18	
152	35	0	0	Scanivalve Check
153	42	.3	-5 to 18	
154	35	0	0	Scanivalve Check
155	30	.4	12 to 15	Repeat of Run 150, Oil Flow

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
156	30	.6	-5 to 10	
157	35	0	0	Scanivalve Check
158	30	.8	-0.3	
159	↓	.84	-0.3, 0.5	
160		.4	0,6	
161		.6	-5 to 16	
162	35	0	0	Scanivalve Check
163	30	.4	0,6	
164	↓	.7	-5.5 to 11	
165		.8	-2 to 8	
166		.85	0 to 5	
167	35	0	0	Scanivalve Check
168	42	.3	0 to 18	
169	30	0	0	End/Start Zeros
170	42	.4	0 to 20	
171	42	.35	0 to 20	
172	30	.4	0 to 20	
173	↓	.6	1.6, 3.6	
174		.65	1.3, 3.3	
175		.7	-1 to 3	
176		.725	-1 to 3	
177		.75	-1 to 3	
178		.775	-1 to 3	
179		.8	-1 to 3	
180		.82	-1 to 3.5	
181		.84	-0.3, 2.2	
182		.86	0.2, 2.5	
183	↓	.4	0, 6	
184	—	0	0	Balance Normal Force Check Loadings
185	↓	↓	↓	Balance Chord Force Check Loading
186				Balance Normal Force Check Loading
187				Balance Normal Force Check Loading
188				Balance Pitching Moment Check Loading

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
189	—	0	0	Balance Chord Force Check Loading
190	↓	↓	↓	↓
SSC-A09 Airfoil Installed, Configuration 2				
191	30	0	0	Bilinear Scanivalve Check
192	|	|	|	Balance Normal Force Check Loading
193	|	|	|	Balance Chord Force Check Loading
194	↓	|	|	Balance Pitching Moment Check Loading
195	35	↓	↓	Scanivalve Check
196	30	.4	-.1 to 17	
197	|	.6	-.3,-.4,6	Wake Rake Survey
198	↓	.4	-.3 to 17	Repeat of Run 196
199	42	.3	-2.6 to 17	Repeat of Run 61
200	42	.4	-1 to 17	
201	35	0	0	Scanivalve Check
202	30	.4	0,6	
203	42	.5	-2.5 to 17	
204	42	.6	-0.1 to 10	
205	35	0	0	Scanivalve Check
206	30	.4	0,6	
207	42	.7	-0.2 to 6	
208	42	.8	-0.3 to 5	
209	30	.9	0.2 to 5	
210	↓	0	0	Static Data Check
211	30	.98	0 to 3	
212	30	1.07	-0.5 to 2	
213	30	.4	0,6	
214	↓	0	0	End Zero
215	42	.3	0 to 18	Includes Scanivalve Check, Repeat of Runs 61, 199
216	42	.75	-0.4,-0.5	
217	|	.775	-0.5	
218	|	.8	-0.4	
219	↓	.82	1.0	

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
220	42	.84	1.4	
221	30	0	0	End Zero
SSC-A09 Airfoil Unfaired De-Icing Boot, Configuration 6				
222	30	.4	-2.3 to 17	
223	30	.6	-2.4 to 16	
224	30	.8	-2 to 8	
225	35	0	0	Scanivalve Check
226	42	.3	-2 to 17	
227	30	.4	0,6	
228	↓	.75	0	
229		.775	0	
230		.8	0	
231		,82	0	
232		.84	0, -0.5	
233		.86	-0.5	
234		.88	-0.5	
235		0	0	End Zero
SSC-A09 Airfoil With Faired De-Icing Boot, Configuration 7				
236	30	.4	-2 to 15	Includes Scanivalve Check
237	30	.4	0,6	Shutdown, Bad α Output
238	35	0	0	Scanivalve Check
239	30	.4	0	
240	30	.6	-2 to 16	
241	30	.8	0.1	
242	30	.75	0	
243	↓	.775	-0.4	
244		.8	-0.3	
245		.81	-0.4	
246		.84	0	No Data
247		.86	-0.4	
248		.88	-0.4	
249		0	0	End Zero

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
250	42	.3	0	Includes Scanivalve Check, Aborted, bad α output
251	35	0	0	Scanivalve Check
252	42	.3	-2 to 18	
253	30	.4	0,6	
254	30	.8	0	
255	30	.84	0	
256	—	0	0	End Zero, Scanivalve Check
SSC-A09 Airfoil With Simulated Pressure Transducers, Configuration 8				
257	30	.4	-2 to 6	
258	↓	.4	-1 to 16	
259		.6	-2 to 16	
260		.8	-2 to 8	
261	42	.3	-2 to 16	
262	30	.75	0	
263		.775	0	
264		.8	0	
265		.82	0	
266		.84	0	
267		.87	0	
268		.88	0	
SSC-A09 Airfoil With Contour With Upper Surface Contour Bump at X/C = 50%, Configuration 9				
269	35	0	0	Scanivalve Check
270	30	.4	-1 to 16	
271		.6	-1 to 12	
272		.8	-2 to 7	
273		.6	-2 to 16	
274		0	0	End Zero
275		.75	0,0.4	
276		.775	0.4	
277		.8	0.4	
278		.82	0.4	
279	↓	.84	0.4	

TABLE IV. RUN LOG (Continued)

Run No.	PT(in Hg)	Mach No.	Angle of Attack Range (deg)	Remarks
280	30	.86	0.4	
281	↓	.88	0.4	
282	↓	.4	0,6	
283	42	.3	-2 to 16	
284	30	0	0	End Zero
SCC-A09 Airfoil With Upper Surface Contour Bumps at X/C = 10% and 50%, Configuration 10				
285	30	.4	-0 to 18	
286	-	0	0	End Zero, End of Test

TABLE V. ESTIMATED DATA ACCURACY

(Based on 1σ Deviations)

	Balance Data			Pressure Data		
		Coefficient Values			Coefficient Values	
		M = 0.4	M = 0.6		M = 0.4	M = 0.6
Lift	± 1.9 kg	±.022	±.007	± 1.0 kg	±.012	±.005
Drag	± 1.5 kg	±.0170	±.0060	± 0.07 kg	±.0008	±.0004*
Pitching Moment	± 3.1 n-m	±.009	±.003	± 1.4 n-m	±.004	±.002
Surface Pressure Coefficients	--	±.01	±.01	--	±.01	±.01
Angle of Attack	± 0.1 deg	--	--	± 0.1 deg	--	--

* Not including errors caused by non-axial wake disturbances.

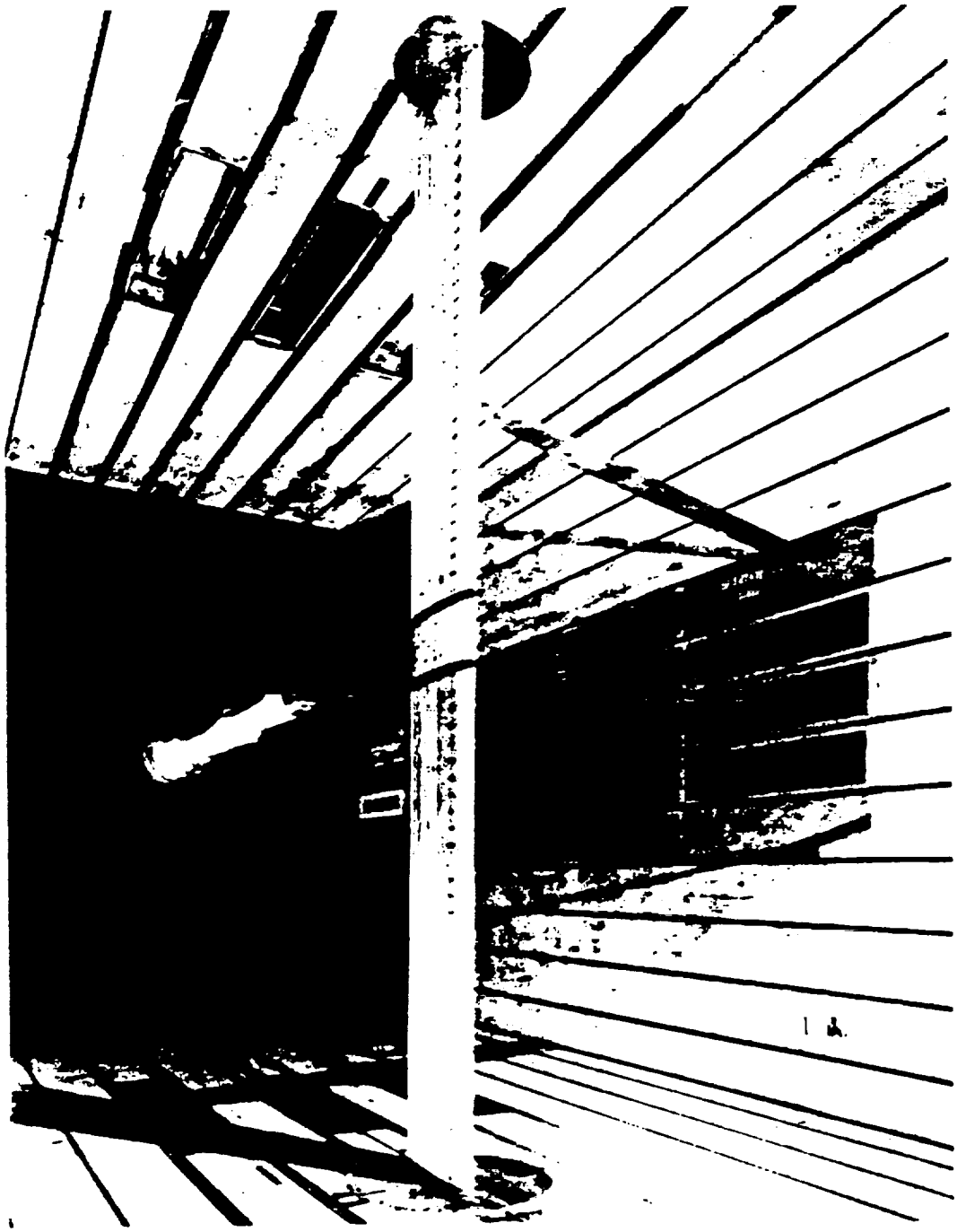


Figure 1. TSA installed in the Ames Eleven-Foot Transonic Wind Tunnel.

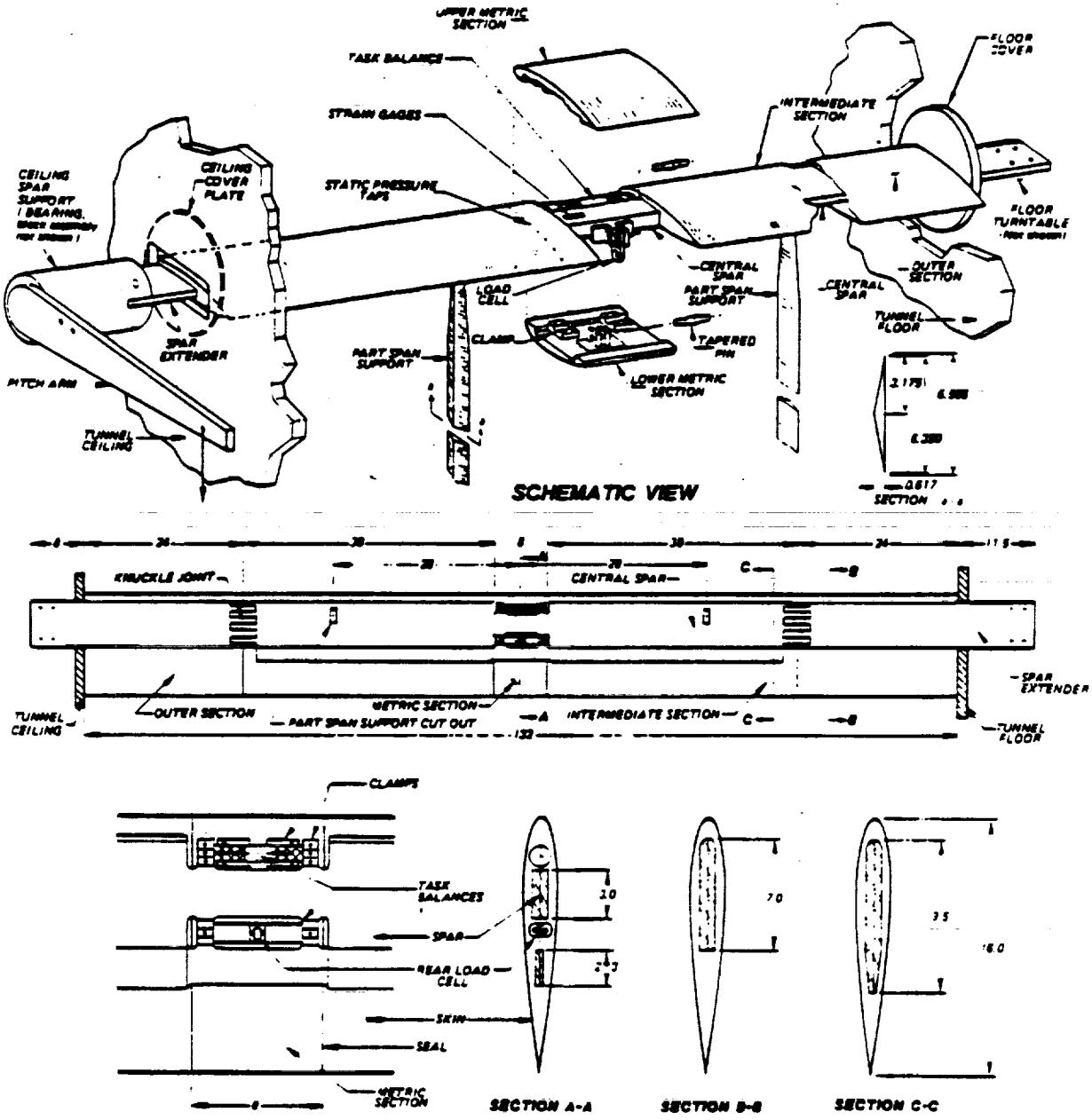


Figure 2. TSA schematic.

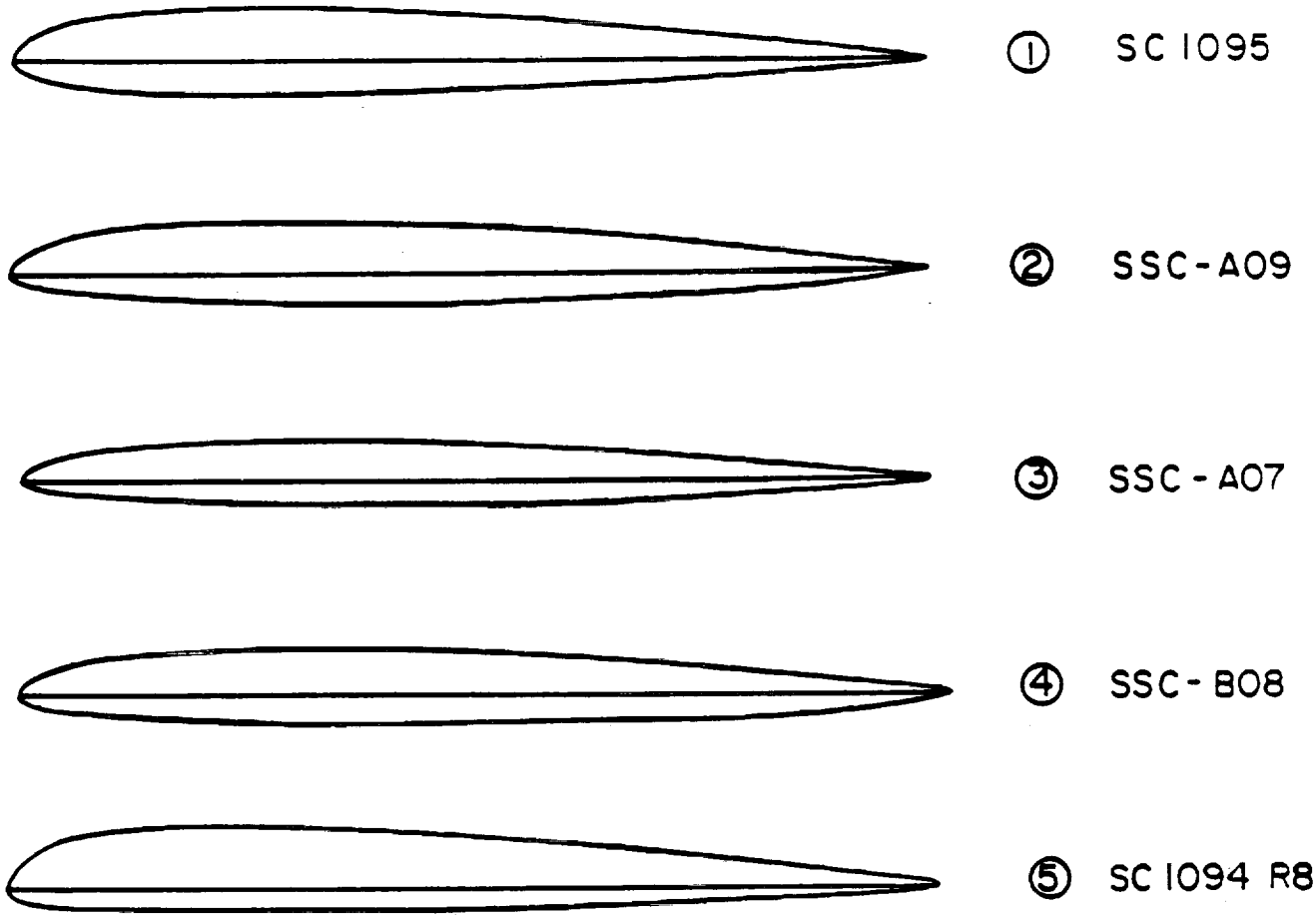


Figure 3. Airfoil section profiles.

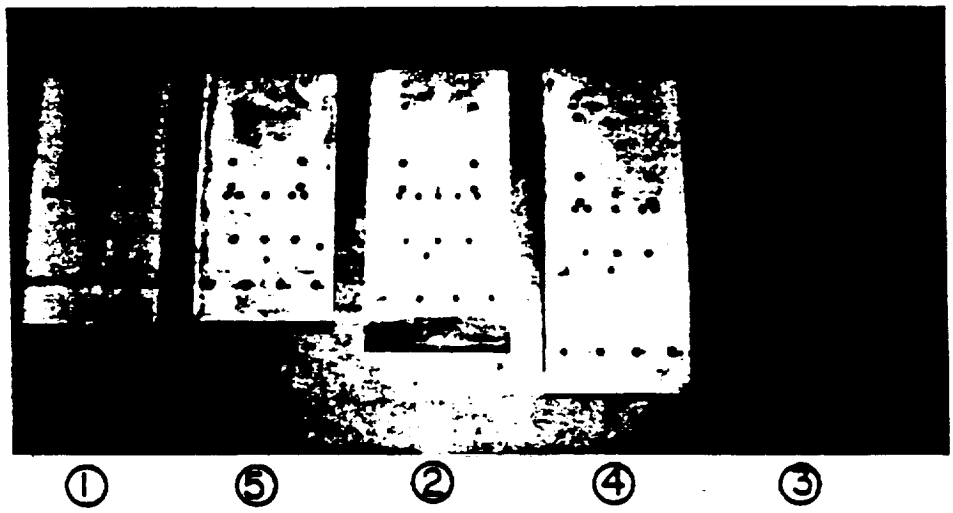


Figure 4. Airfoil metric sections.

M	RN/FT P_T = 30 PSF (1.0 ATM)	P_T = 42 PSF (1.4 ATM)
.3	–	2.91
.4	2.07	3.73
.5	3.24	4.47
.6	3.66	5.00
.7	4.00	5.52
.8	4.22	5.80
.9	4.48	–
.98	4.51	–
1.07	4.44	–

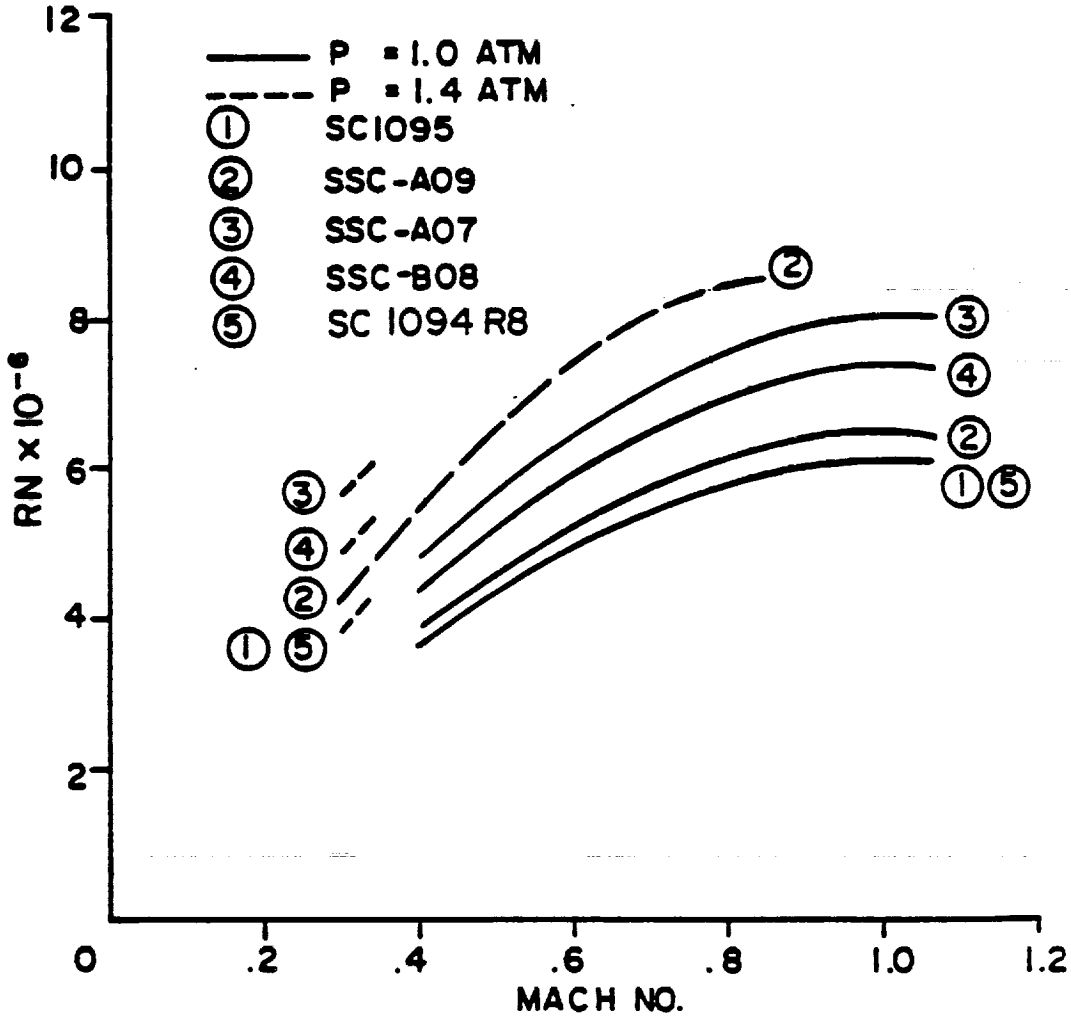


Figure 5. Test Reynolds numbers.

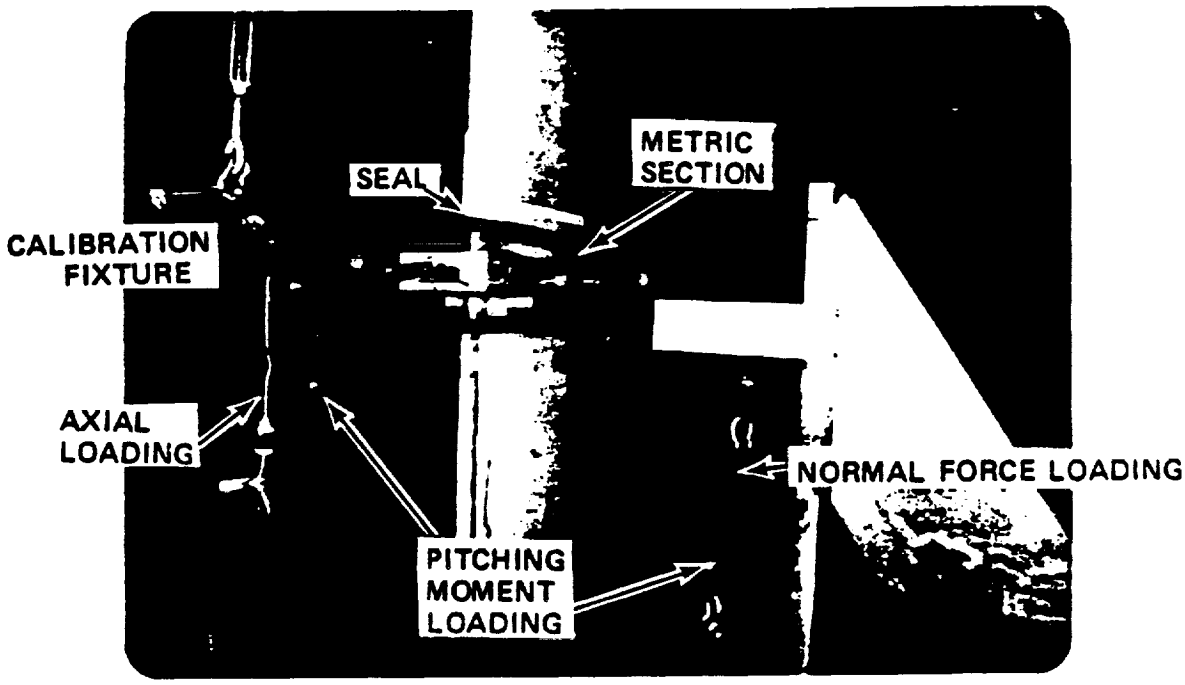


Figure 6. Metric section calibration fixture.

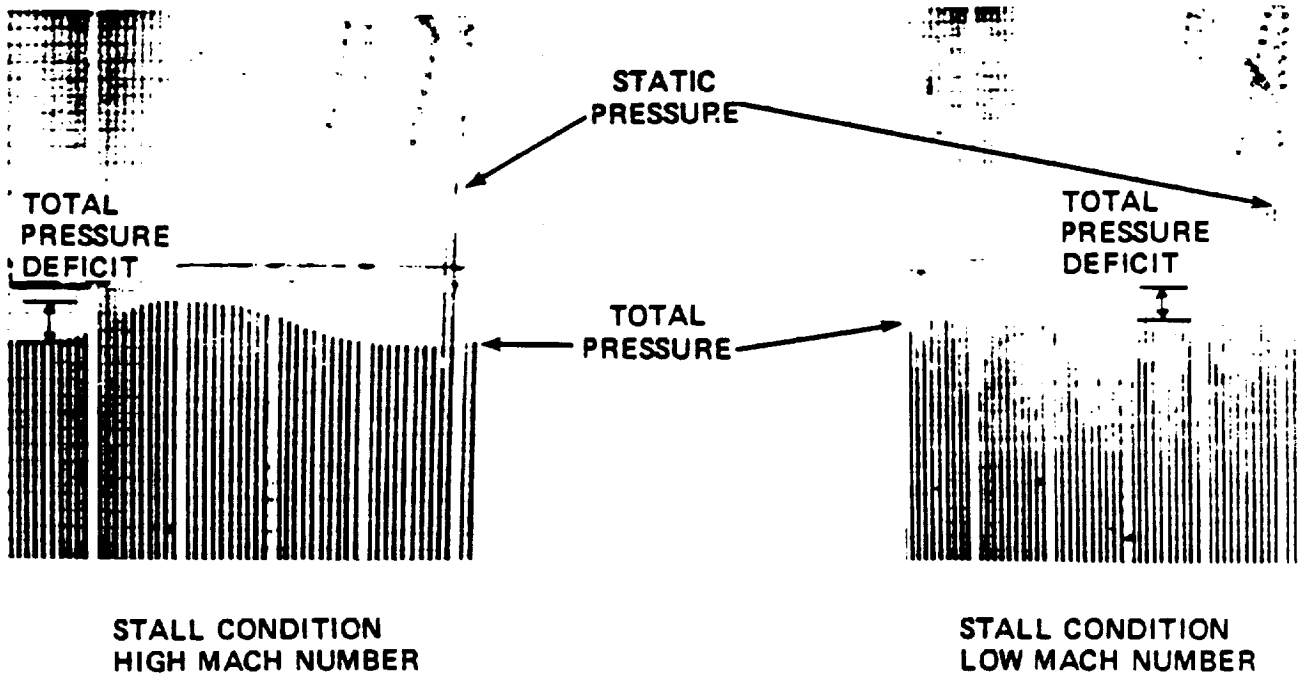
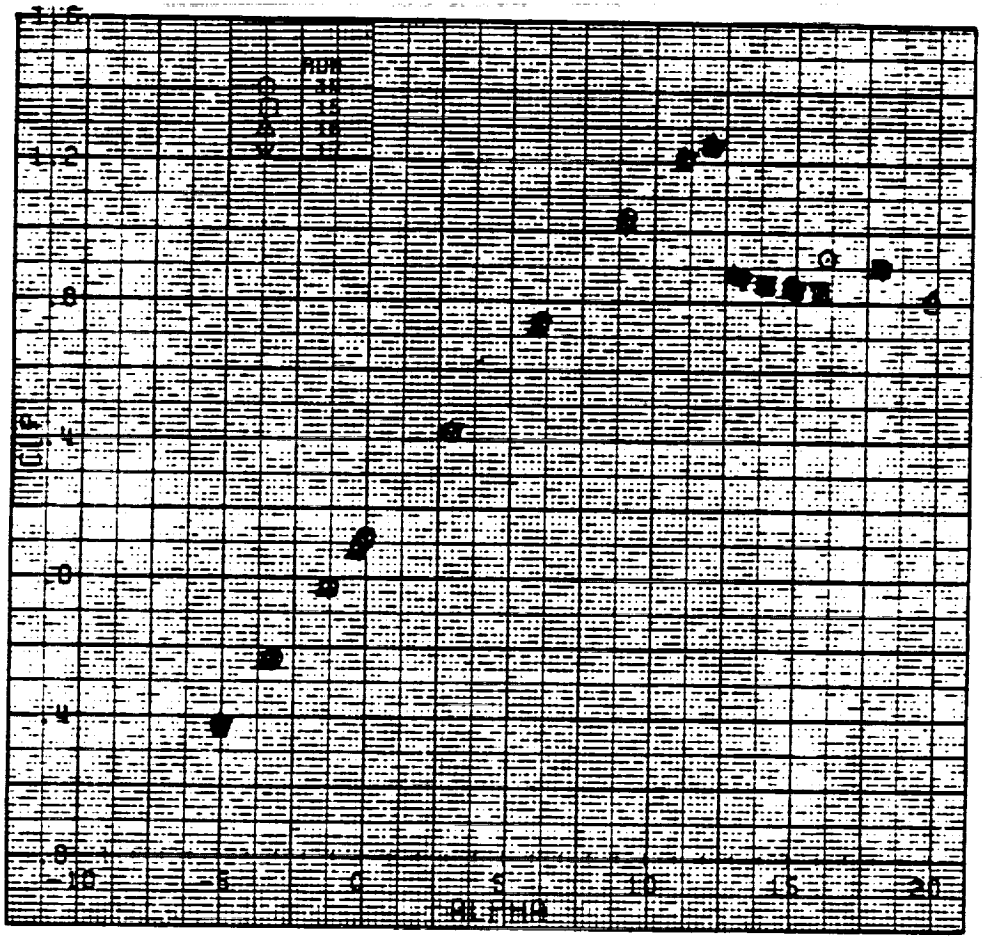
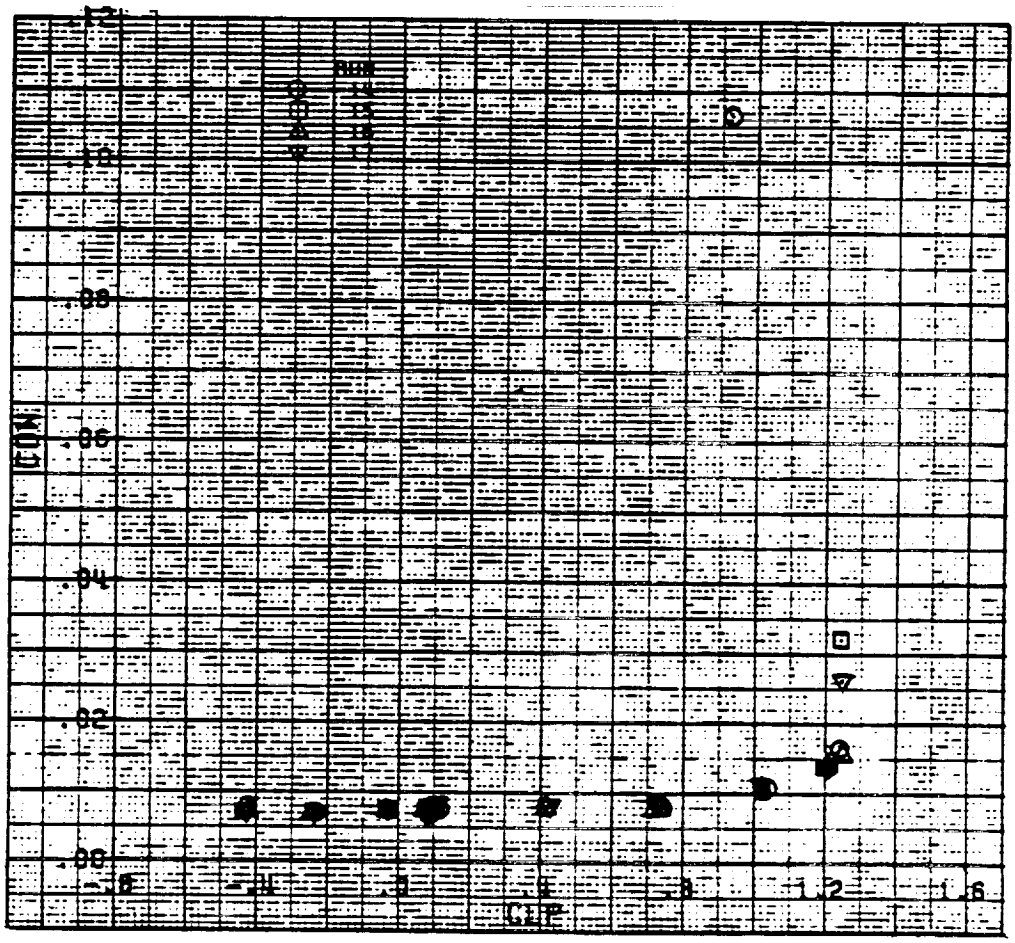


Figure 7. Representative manometer board wake rake profiles.



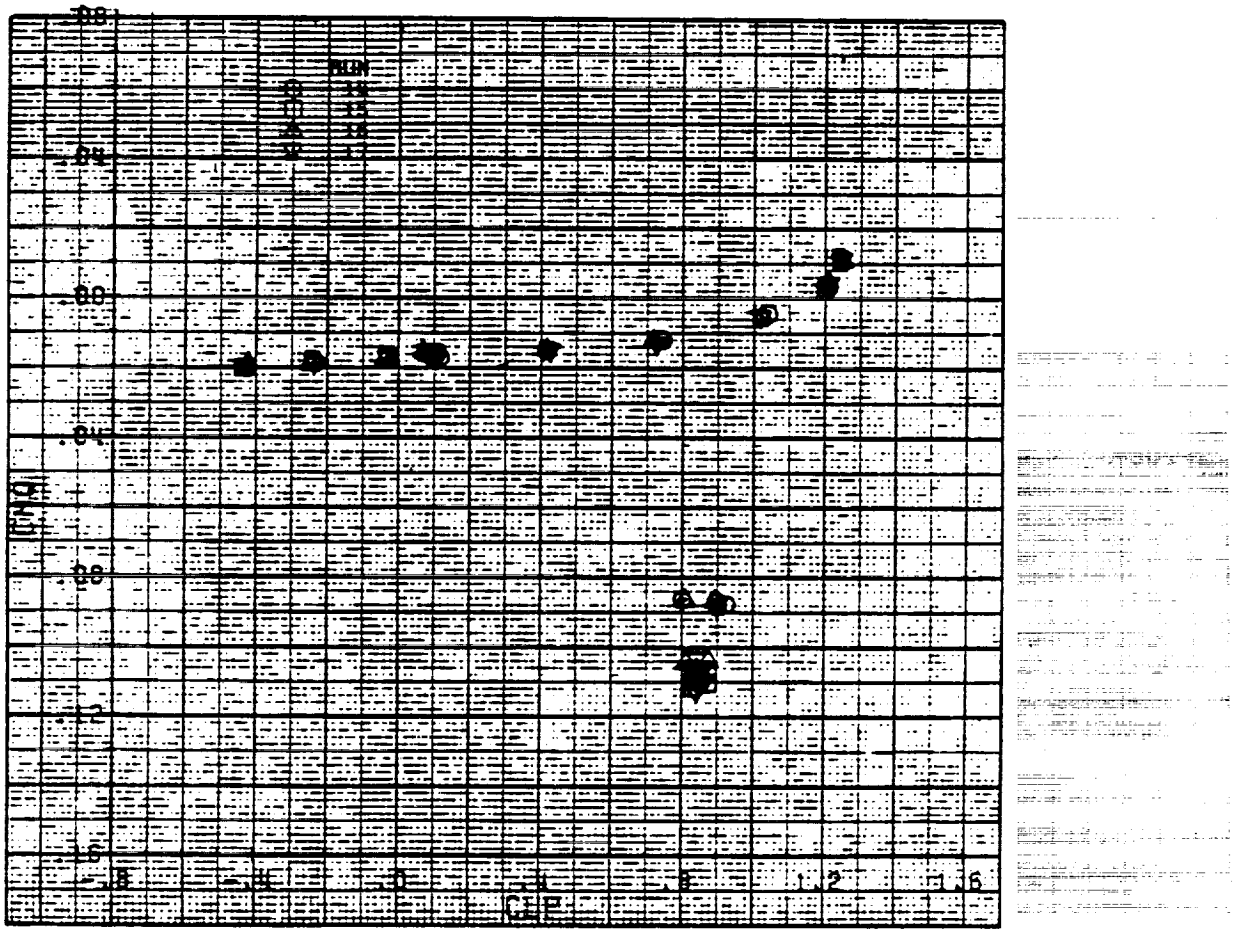
(a) Lift coefficient versus angle of attack

Figure 8.-Data repeatability - SC1095 airfoil, Mach number = 0.40.



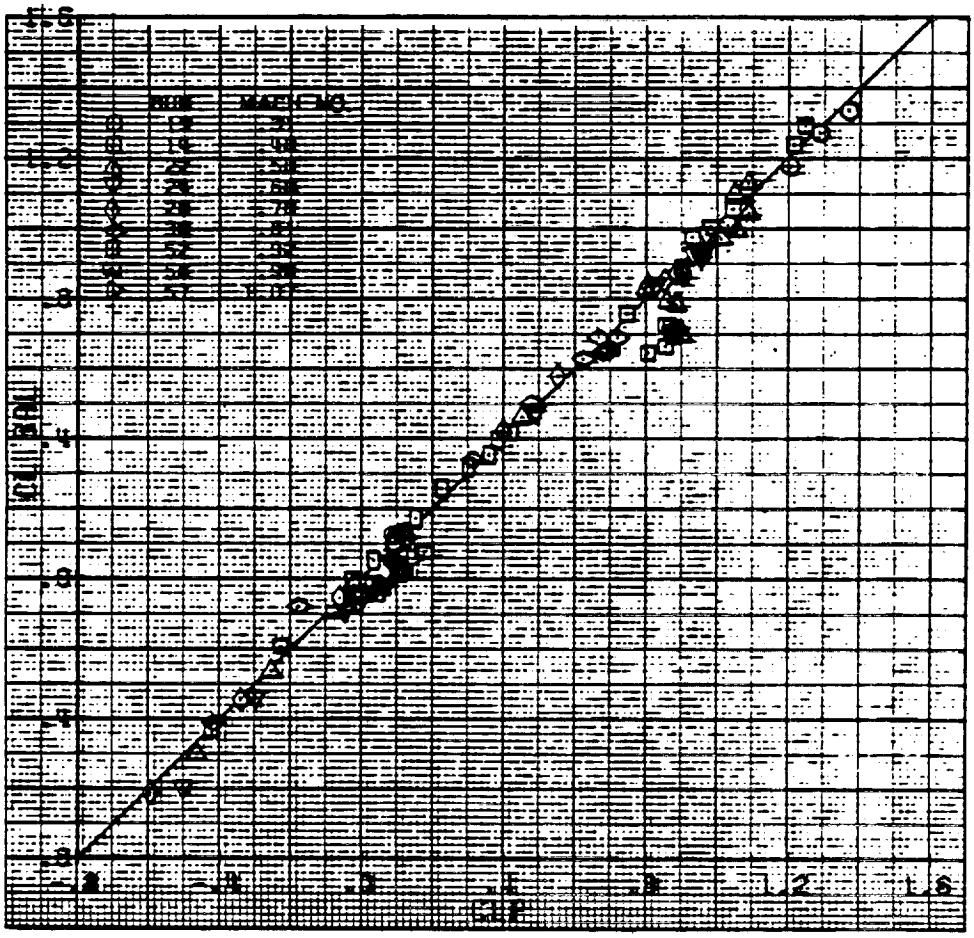
(b) Drag coefficient versus lift coefficient

Figure 8.-Continued.



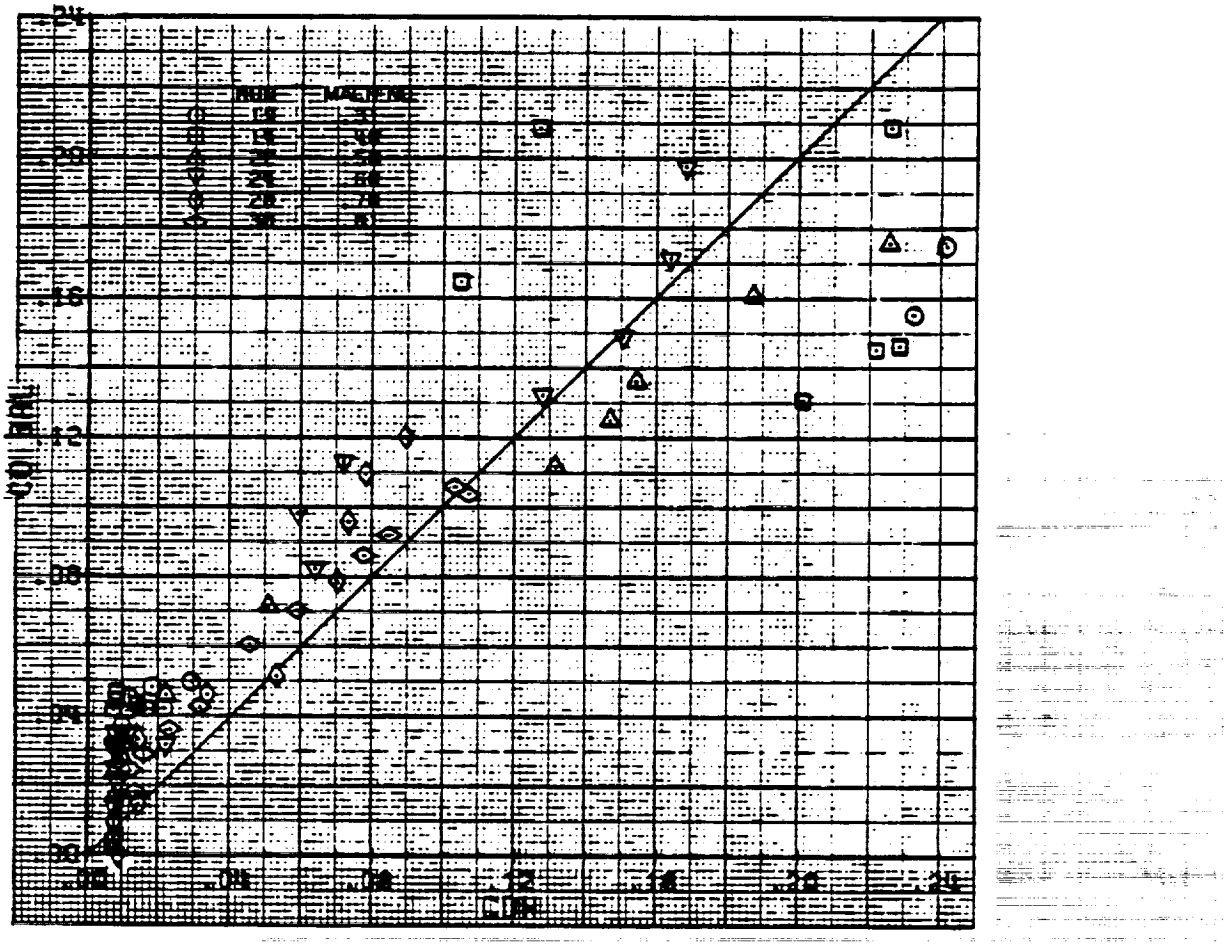
(c) Pitching Moment coefficient versus lift coefficient

Figure 8.-Concluded.



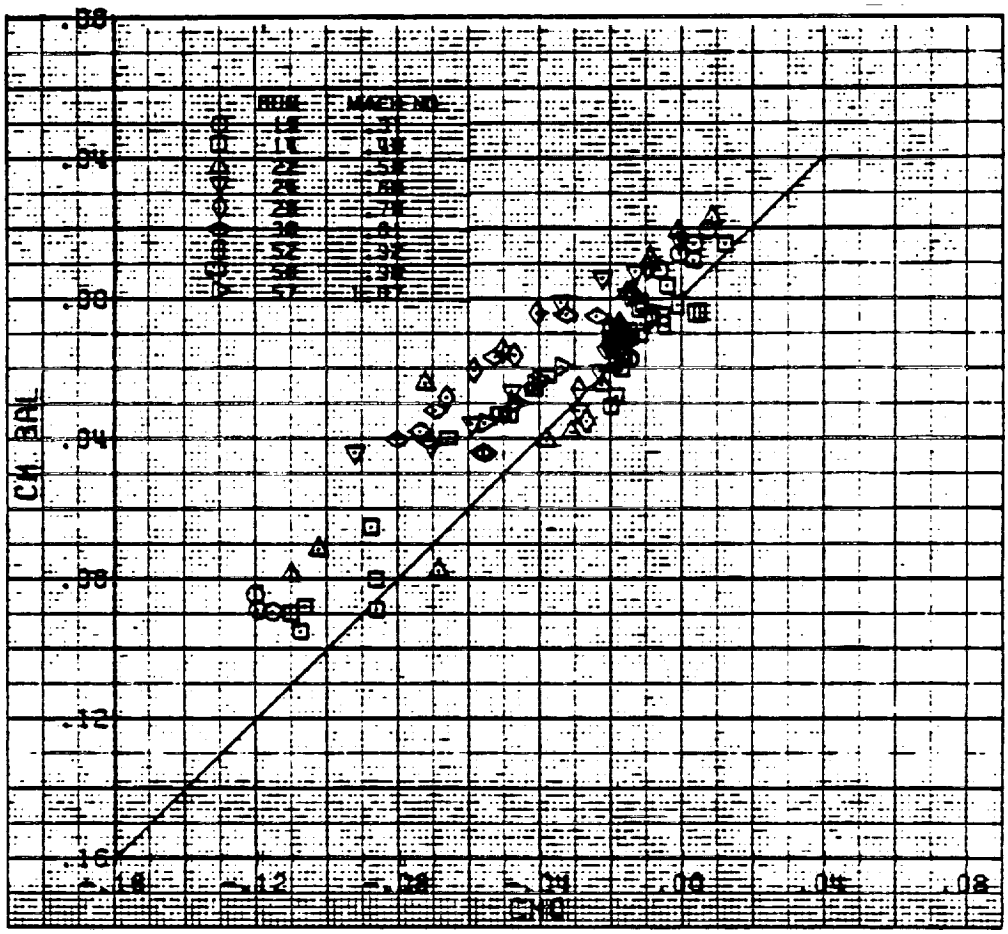
(a) Lift

Figure 9.— Balance measurement correlation with pressure measurements.



(b) Drag

Figure 9.–Continued.



(c) Pitching moment

Figure 9.–Concluded.

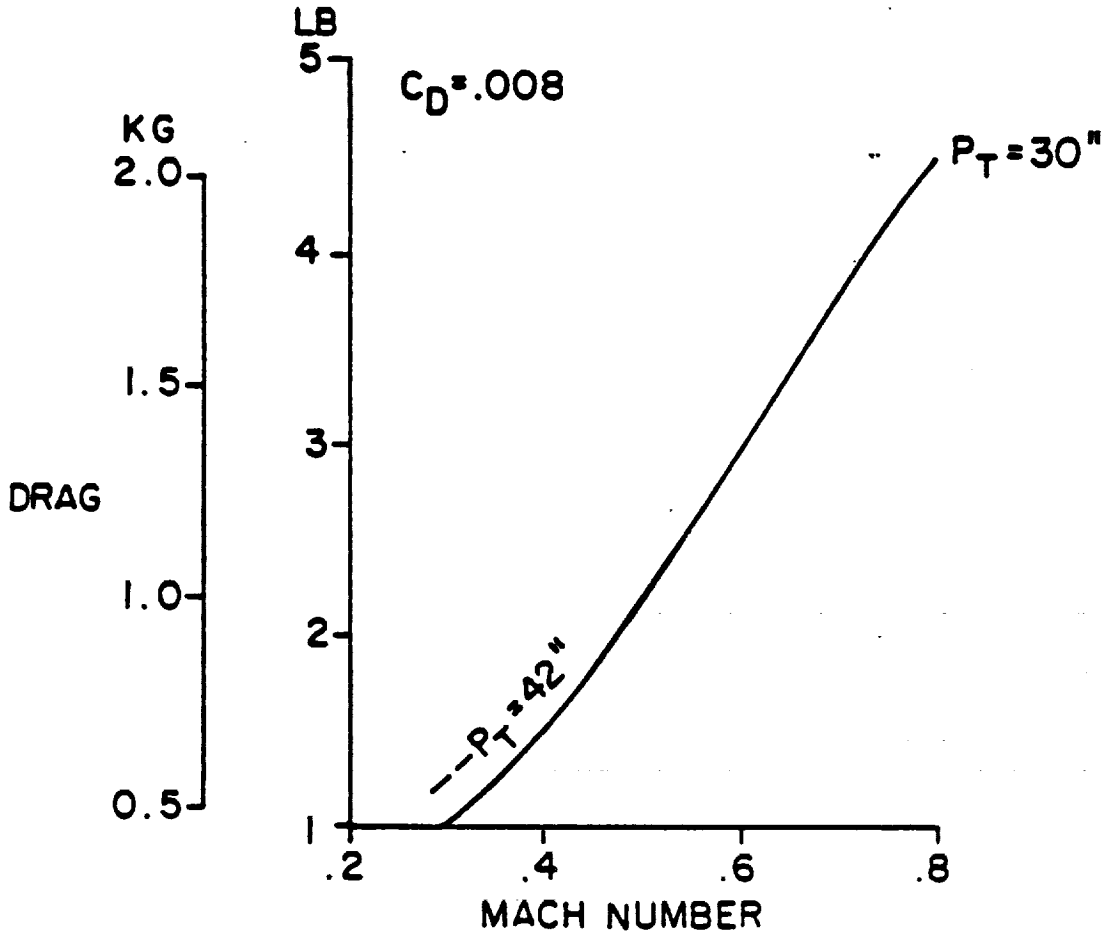
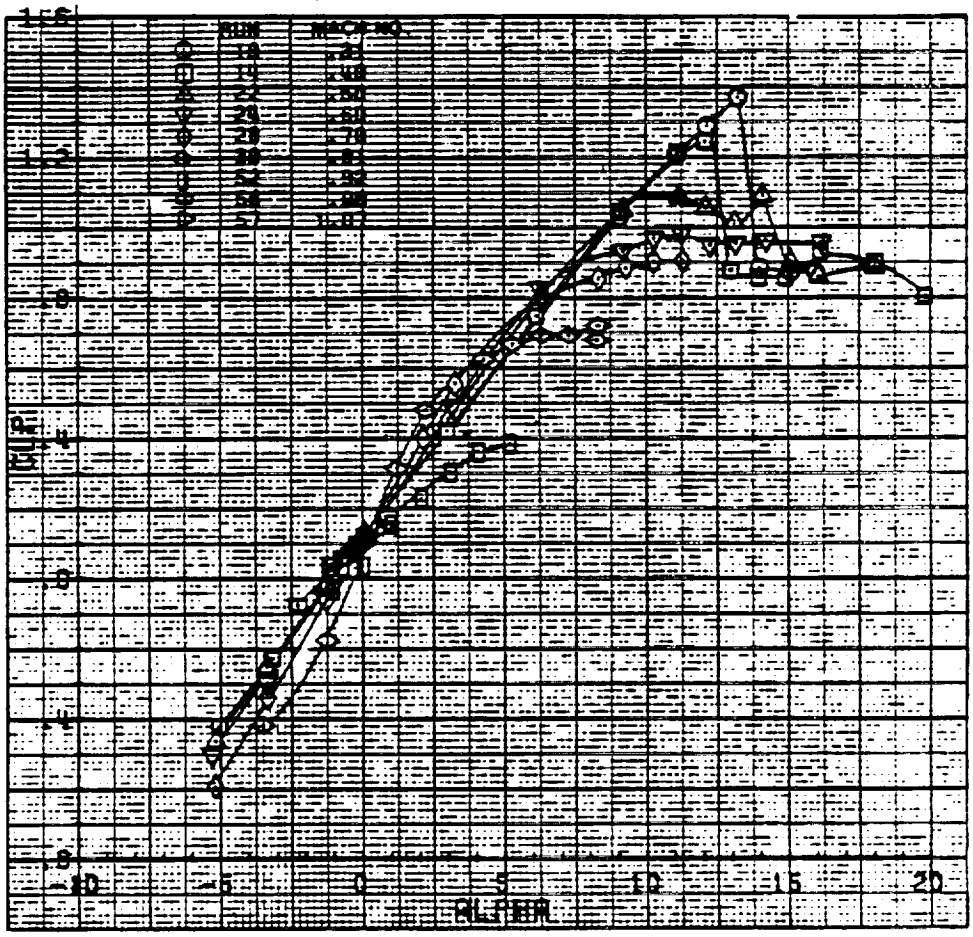
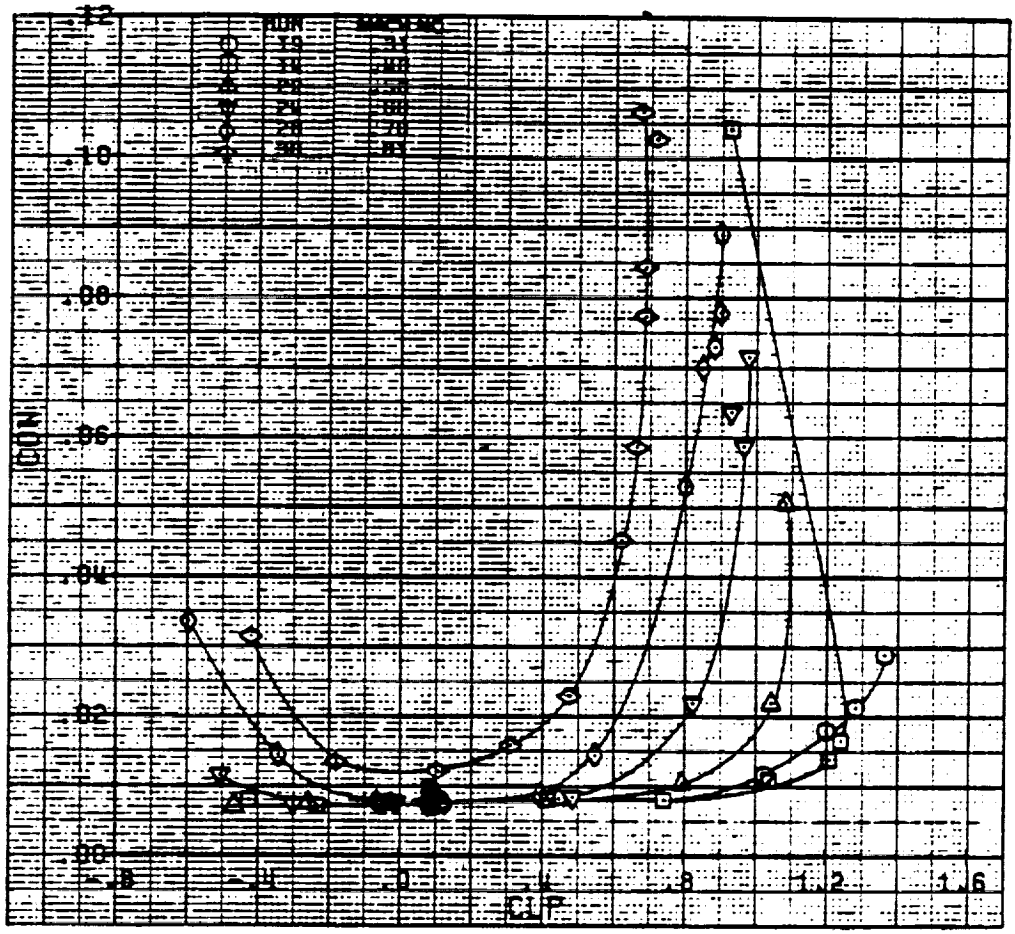


Figure 10. Drag for a drag coefficient of 0.008.



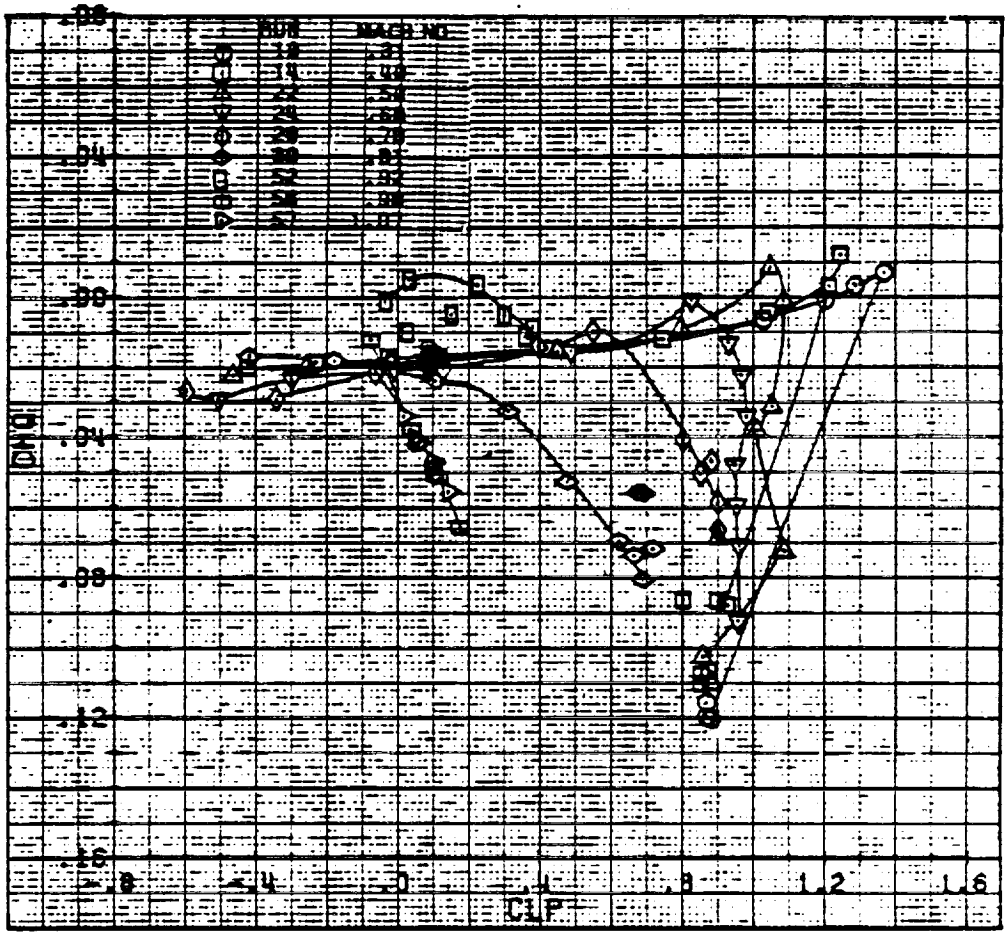
(a) Lift coefficient versus angle of attack

Figure 11.– Aerodynamic characteristics of the SC1095 airfoil.



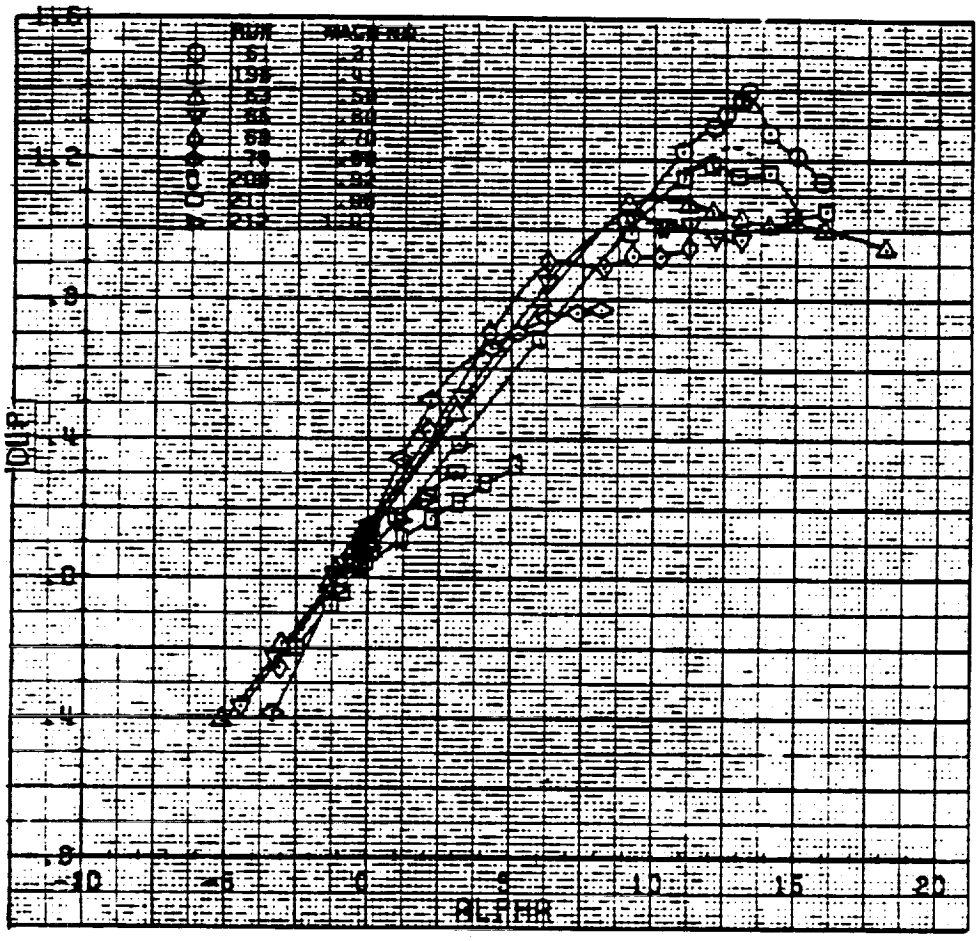
(b) Drag coefficient versus lift coefficient

Figure 11.–Continued.



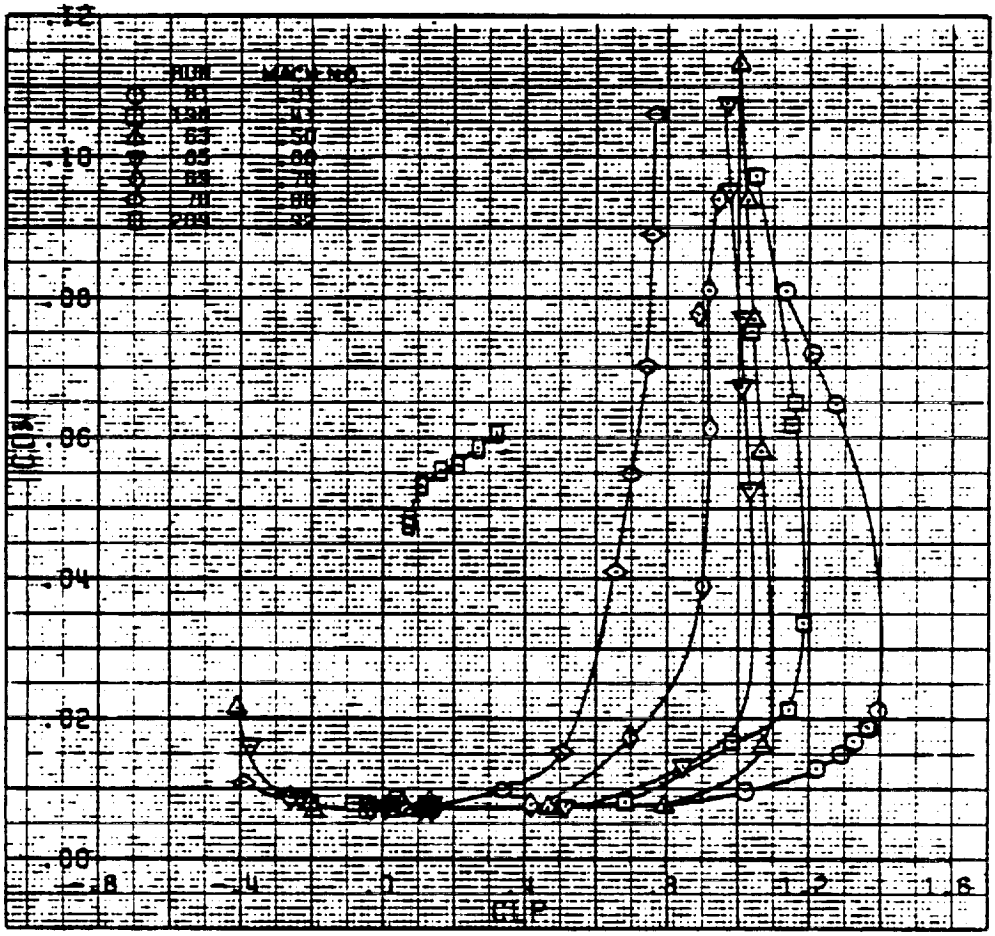
(c) Pitching moment coefficient versus lift coefficient

Figure 11.–Concluded.



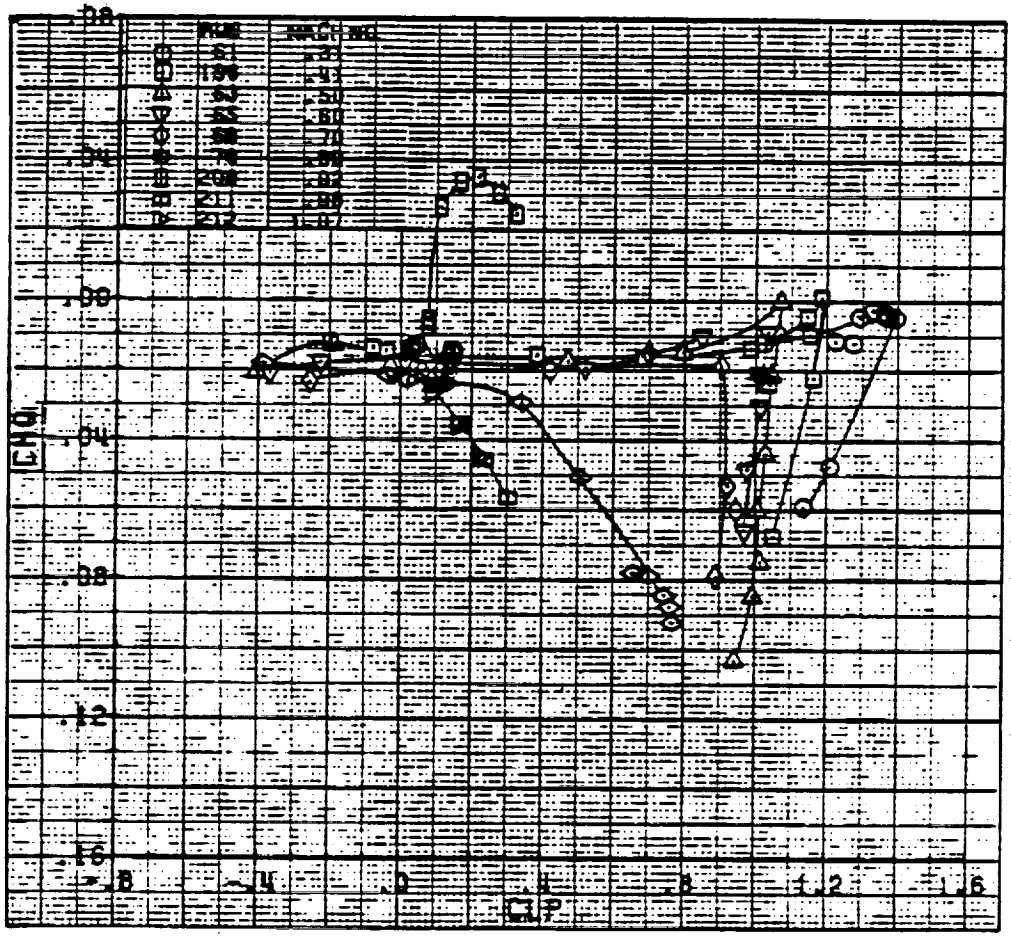
(a) Lift coefficient versus angle of attack

Figure 12.– Aerodynamic characteristics of the SSC-A09 airfoil.



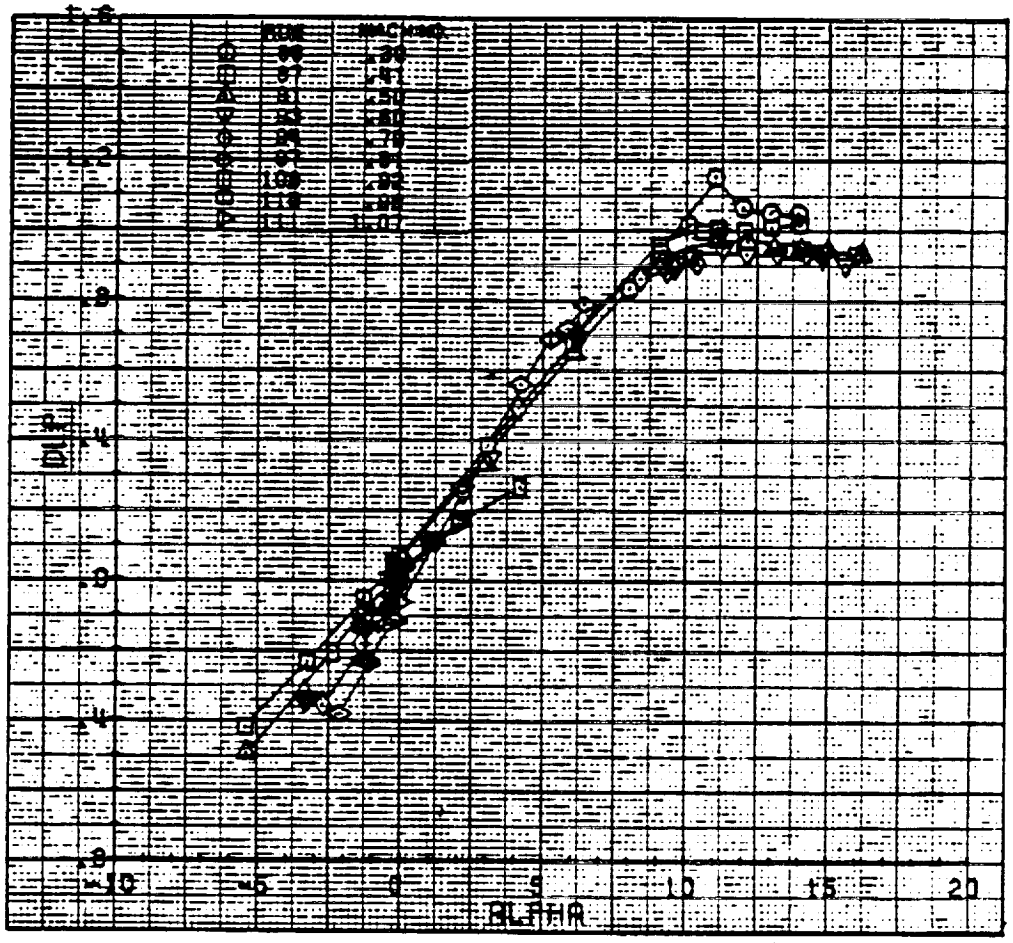
(b) Drag coefficient versus lift coefficient

Figure 12.-Continued.



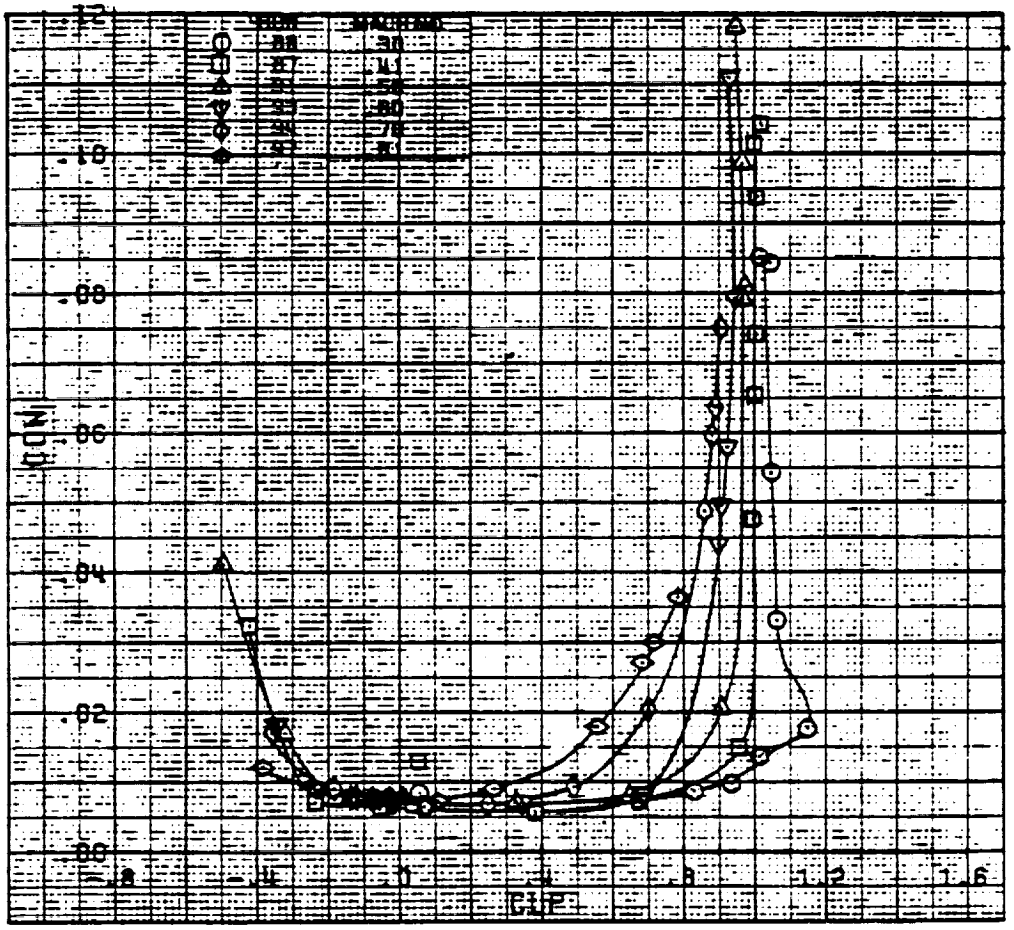
(c) Pitching moment coefficient versus lift coefficient

Figure 12.-Concluded.



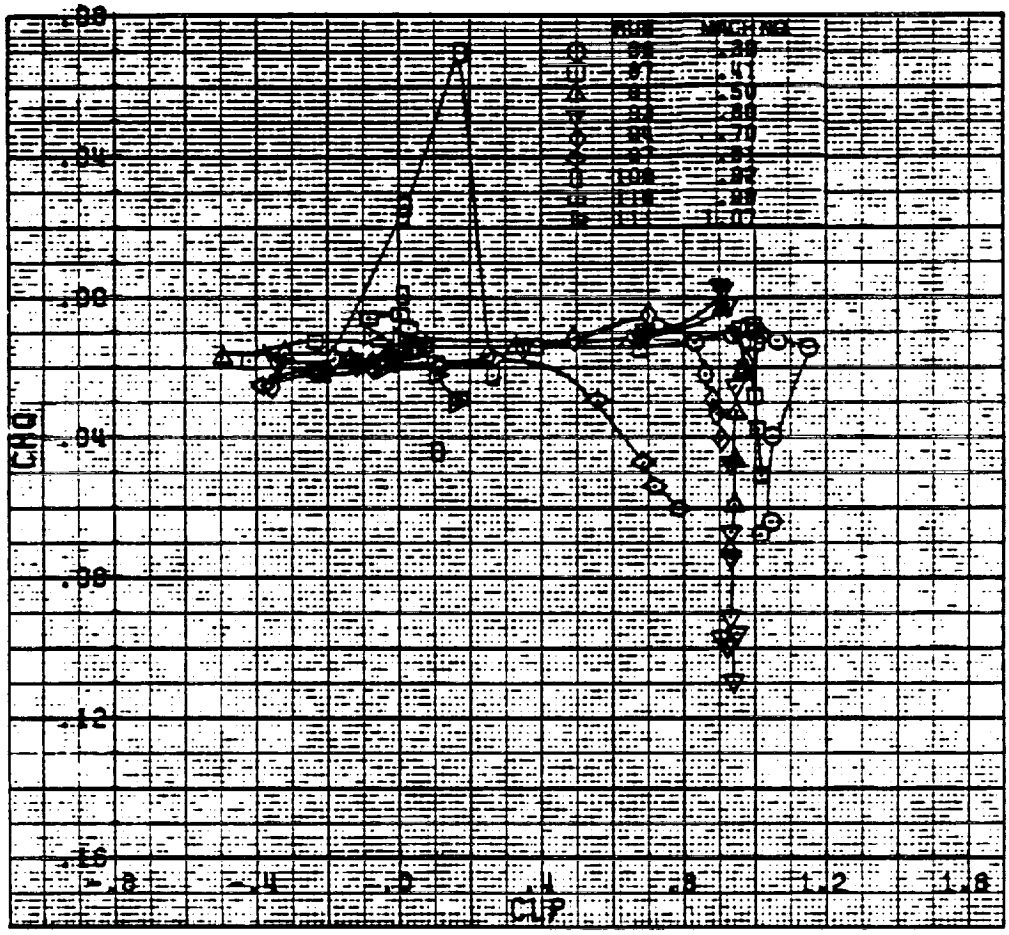
(a) Lift coefficient versus angle of attack

Figure 13. – Aerodynamic characteristics of the SSC-A07 airfoil.



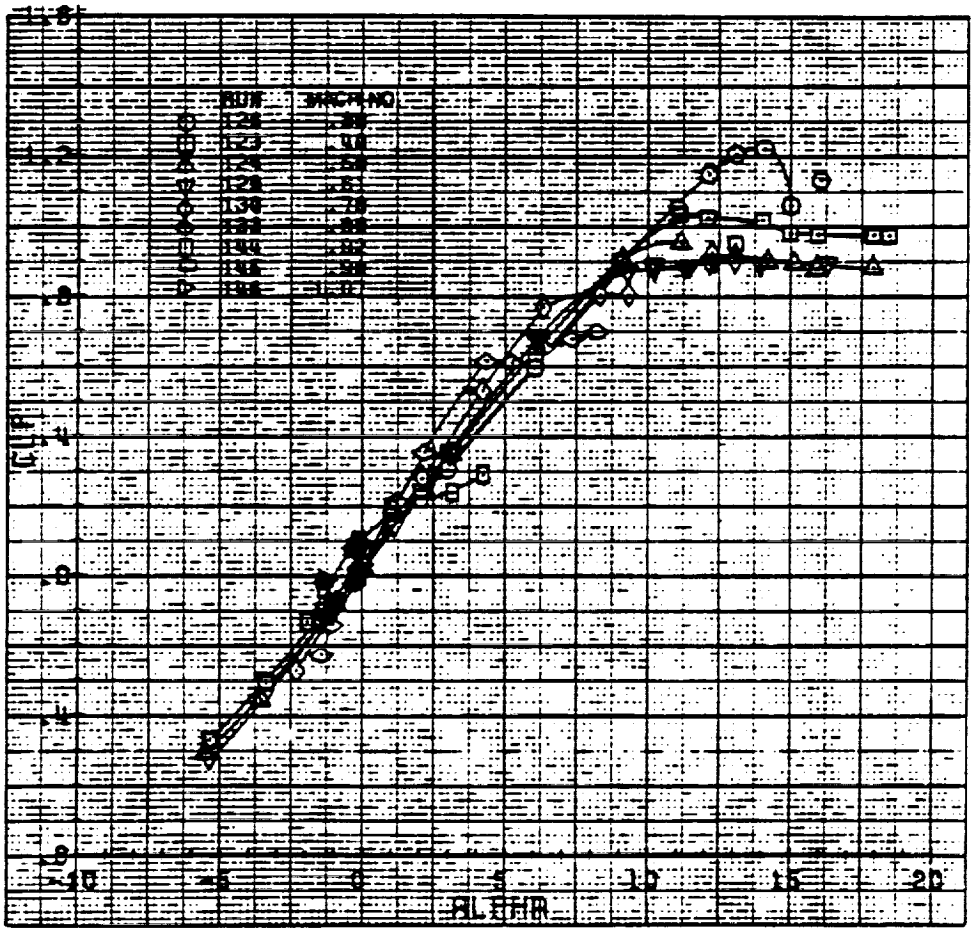
(b) Drag coefficient versus lift coefficient

Figure 13.—Continued.



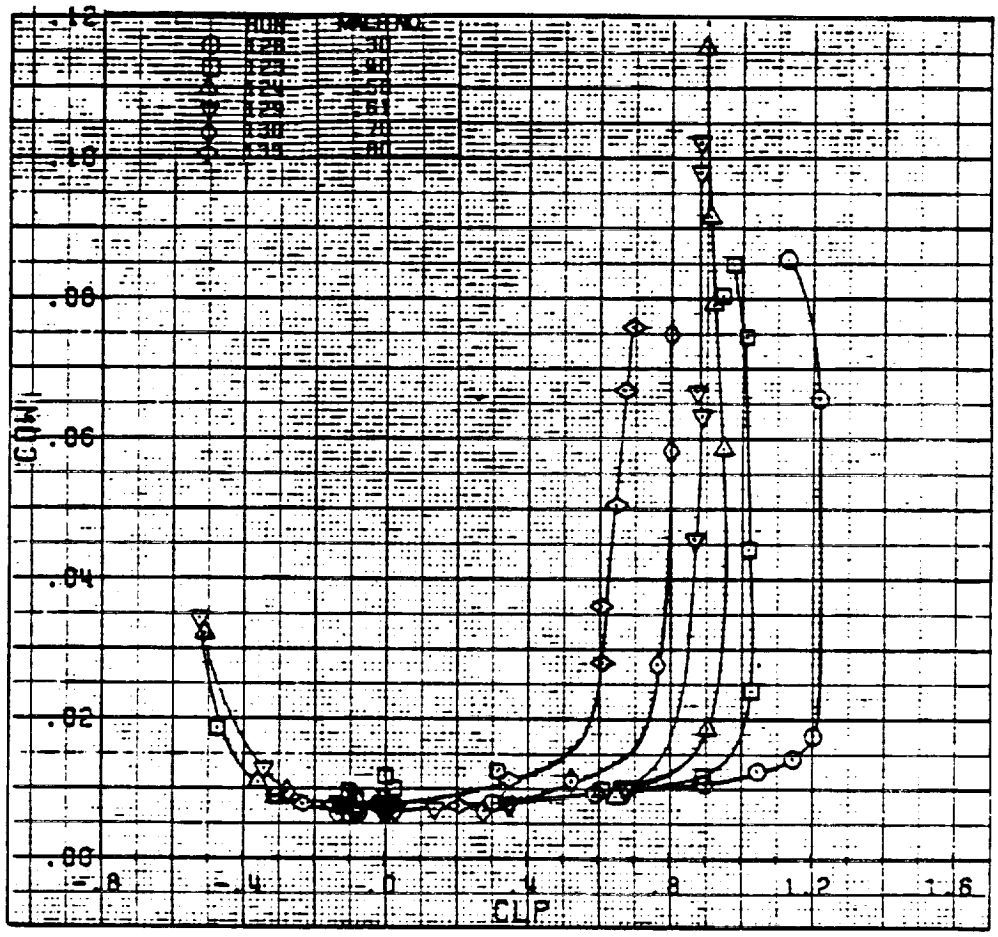
(c) Pitching moment coefficient versus lift coefficient

Figure 13.–Concluded.



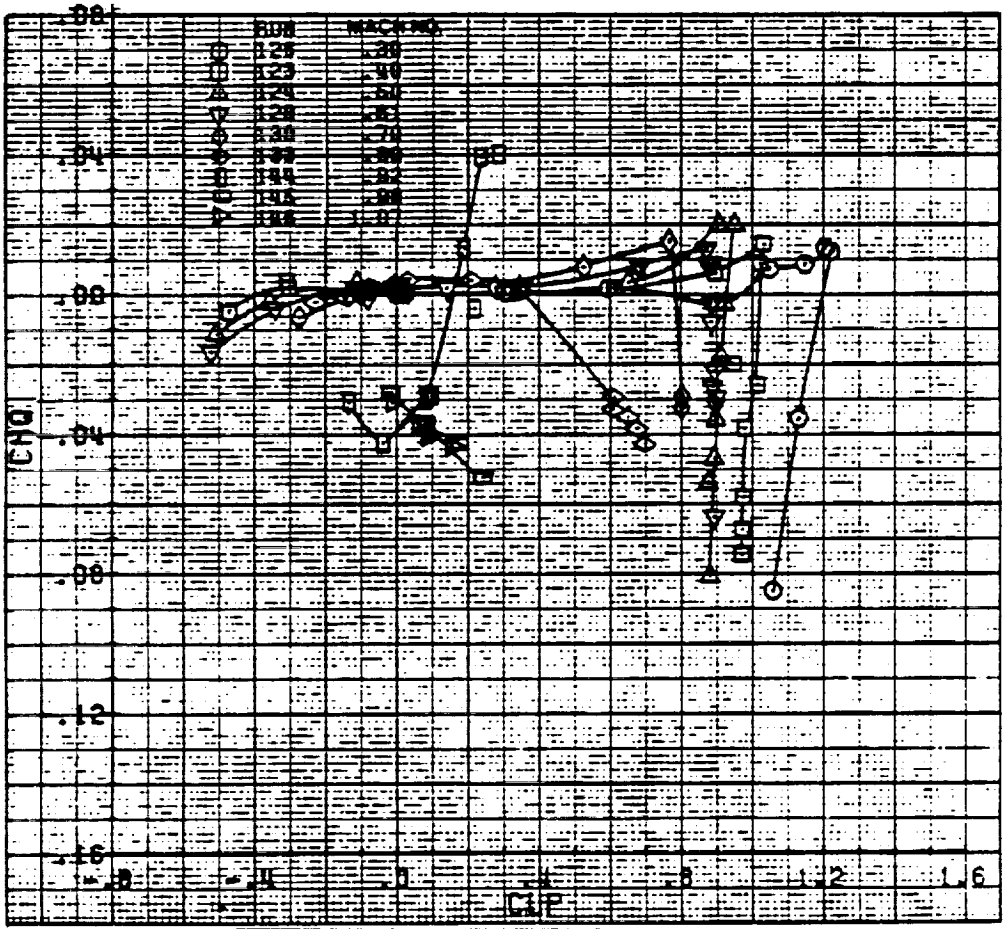
(a) Lift coefficient versus angle of attack

Figure 14.- Aerodynamic characteristics of the SSC-B08 airfoil.



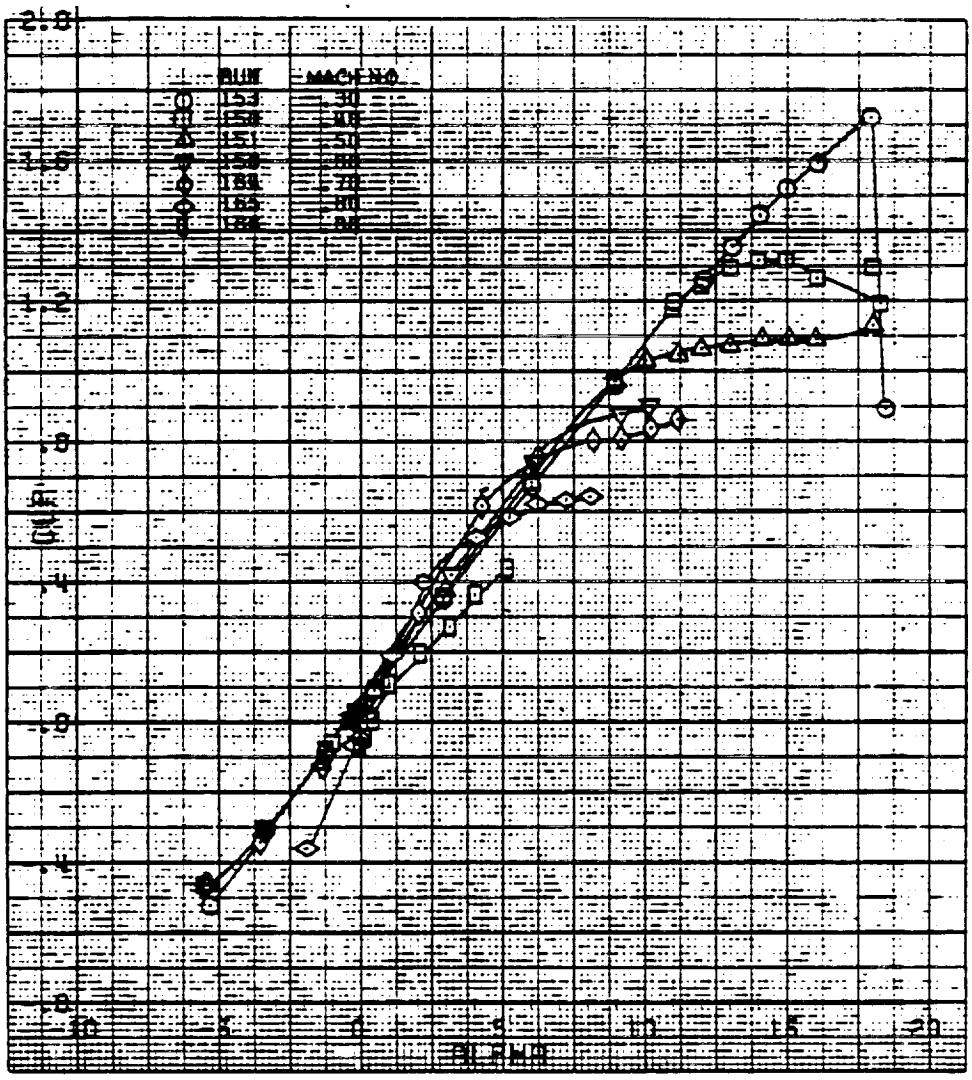
(b) Drag coefficient versus lift coefficient

Figure 14.-Continued.



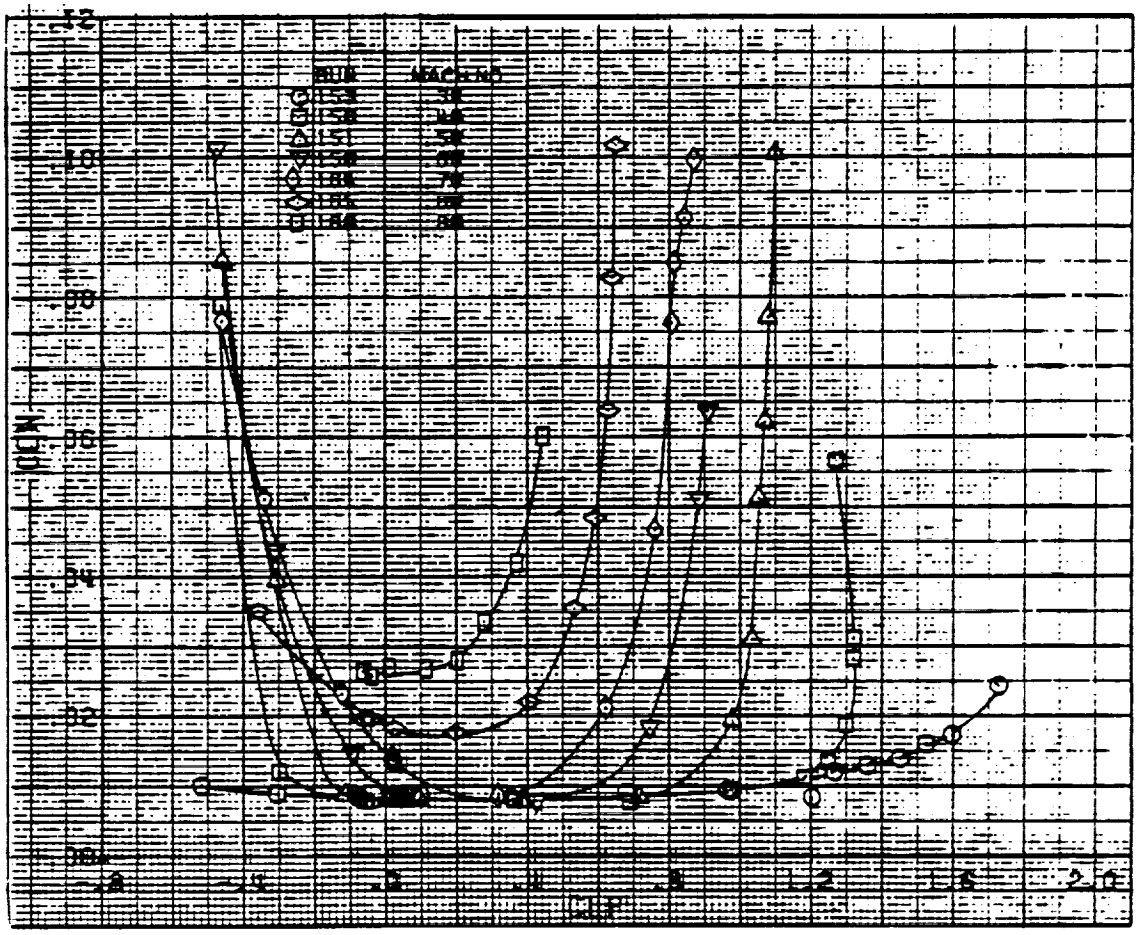
(c) Pitching moment coefficient versus lift coefficient

Figure 14.–Concluded.



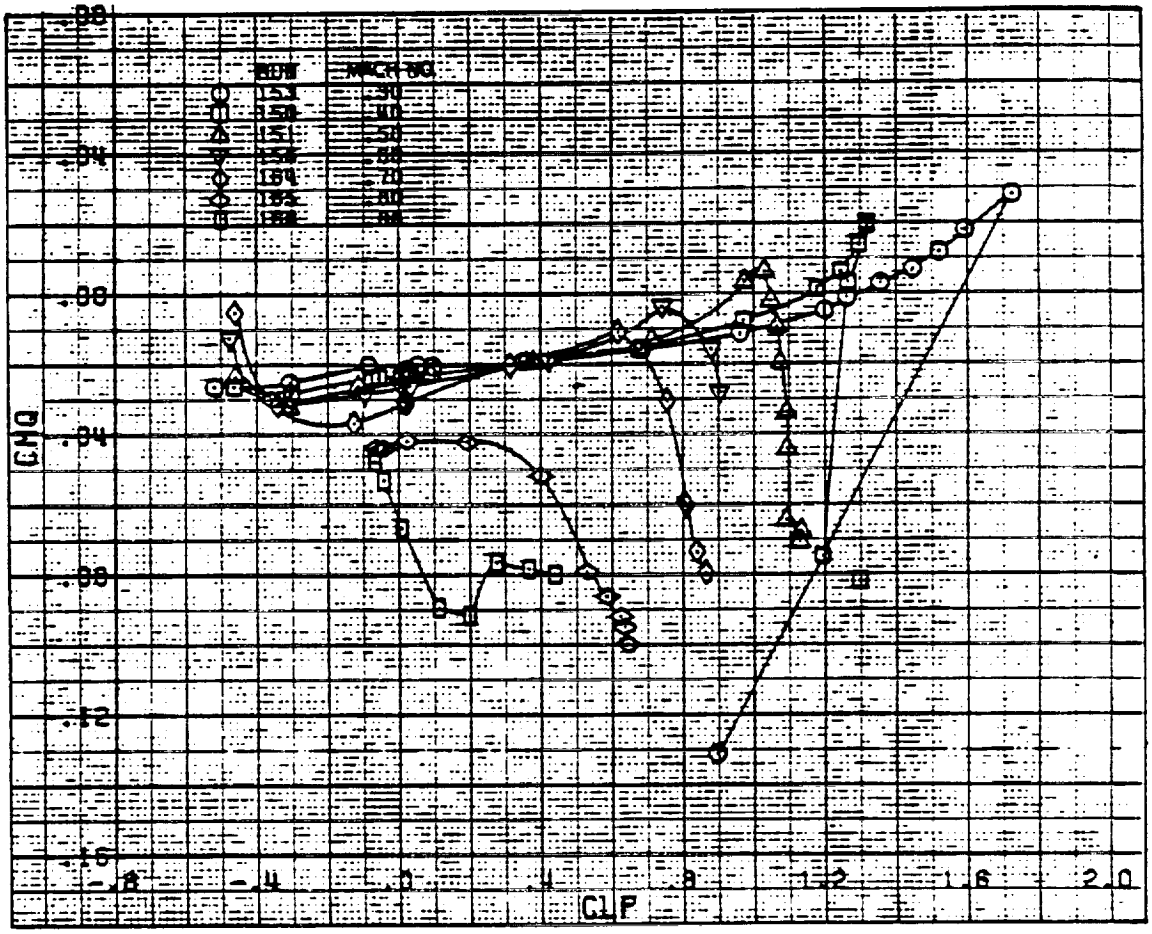
(a) Lift coefficient versus angle of attack

Figure 15. – **Aerodynamic characteristics of the SC1094 R8 airfoil.**



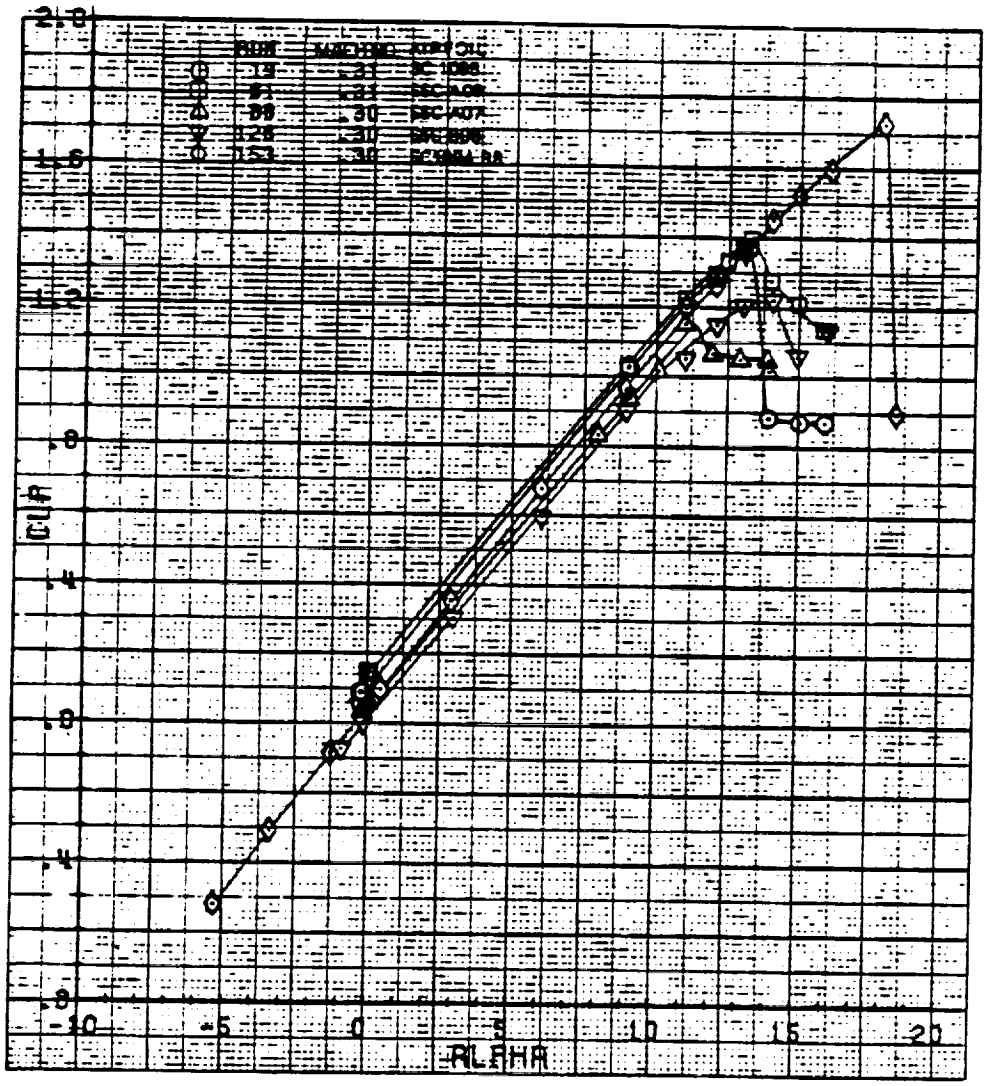
(b) Drag coefficient versus lift coefficient

Figure 15.-Continued.



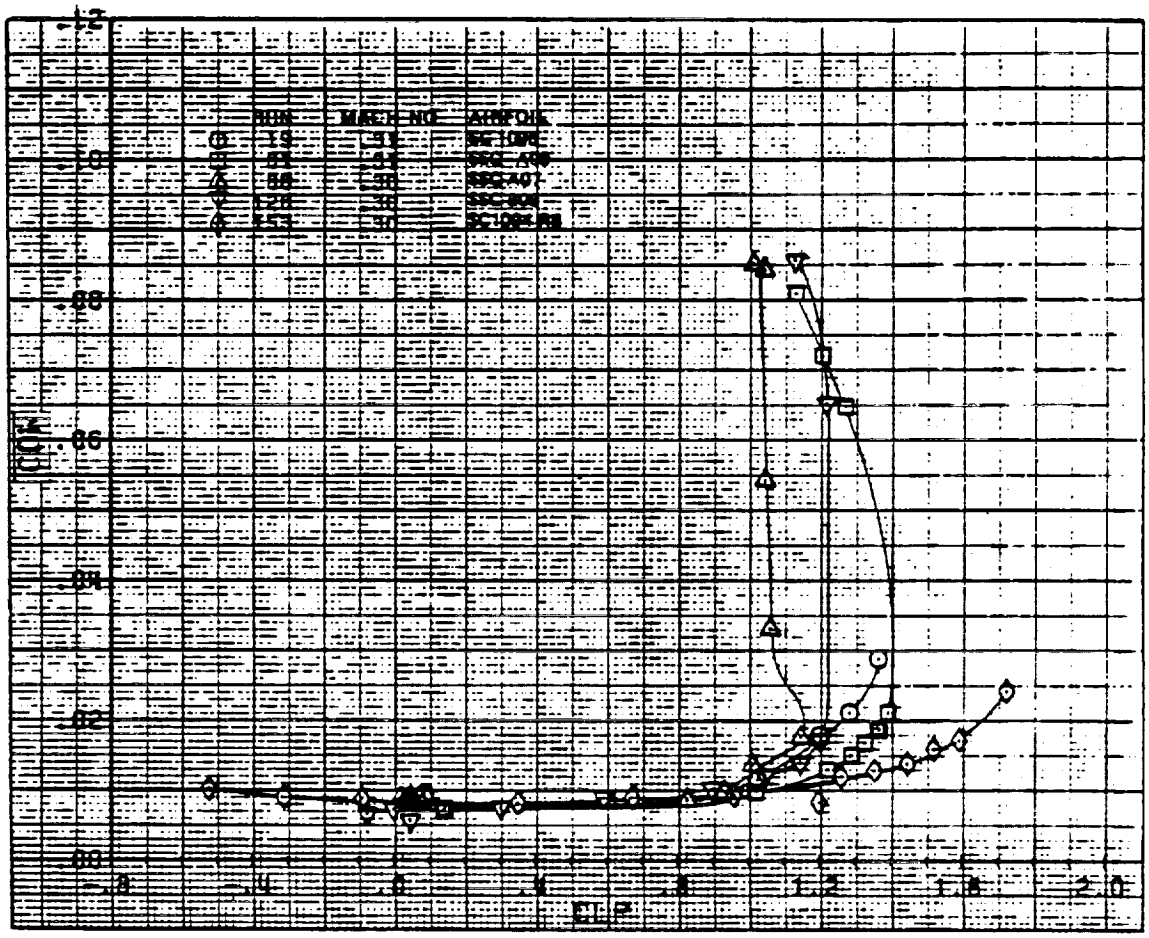
(c) Pitching moment coefficient versus lift coefficient

Figure 15.-Concluded.



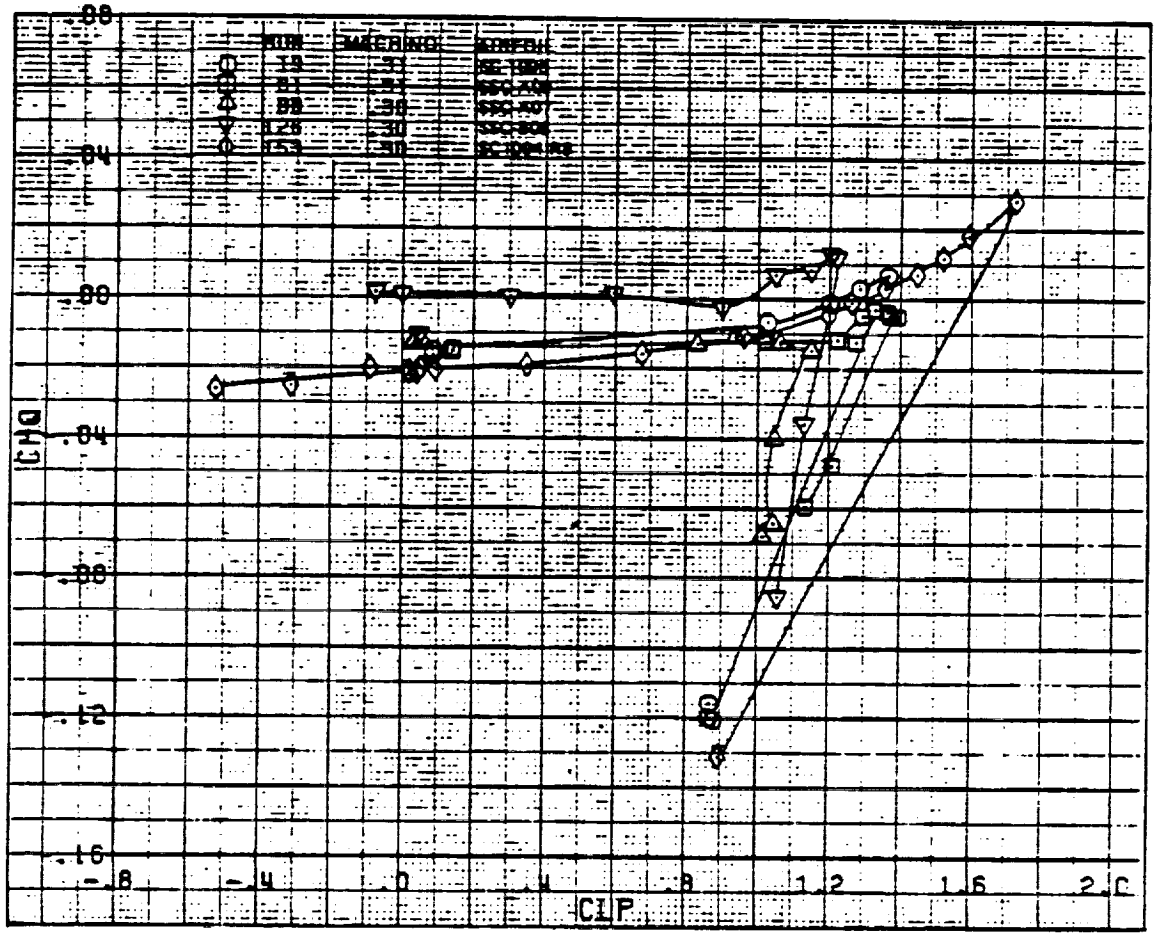
(a) Lift coefficient versus angle of attack

Figure 16.— Aerodynamic characteristics at a Mach number of 0.30.



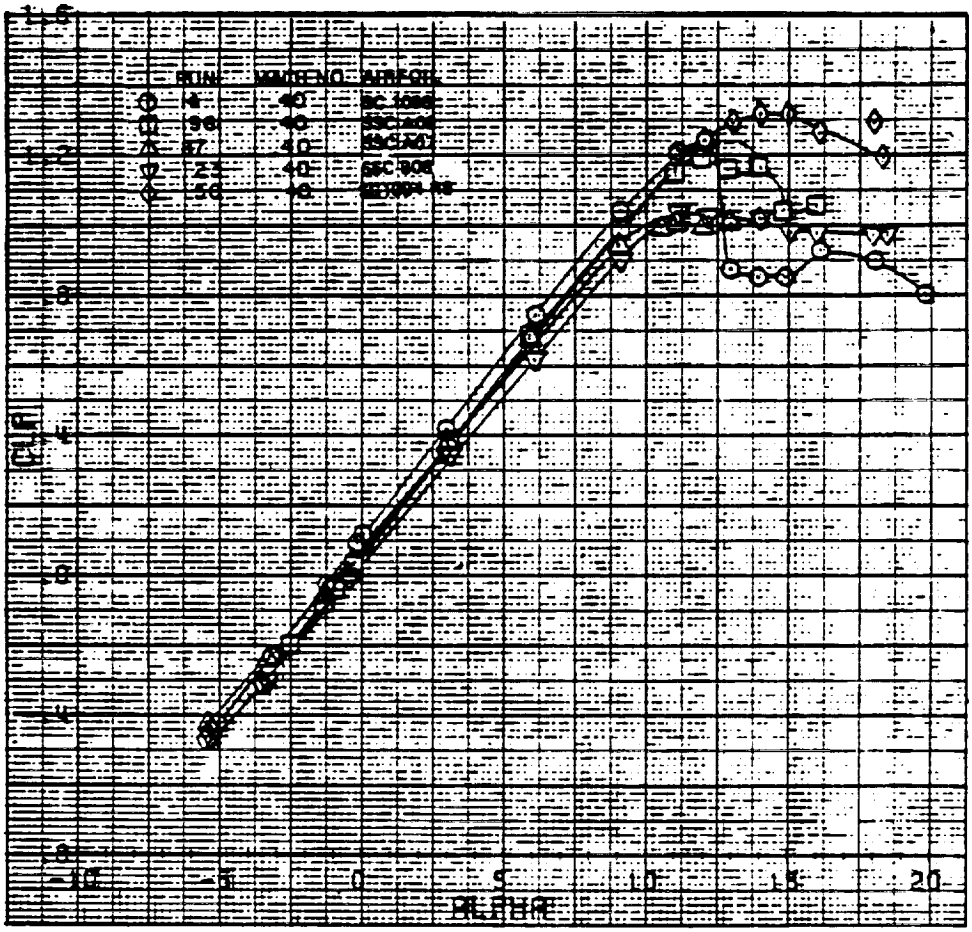
(b) Drag coefficient versus lift coefficient

Figure 16.-Continued.



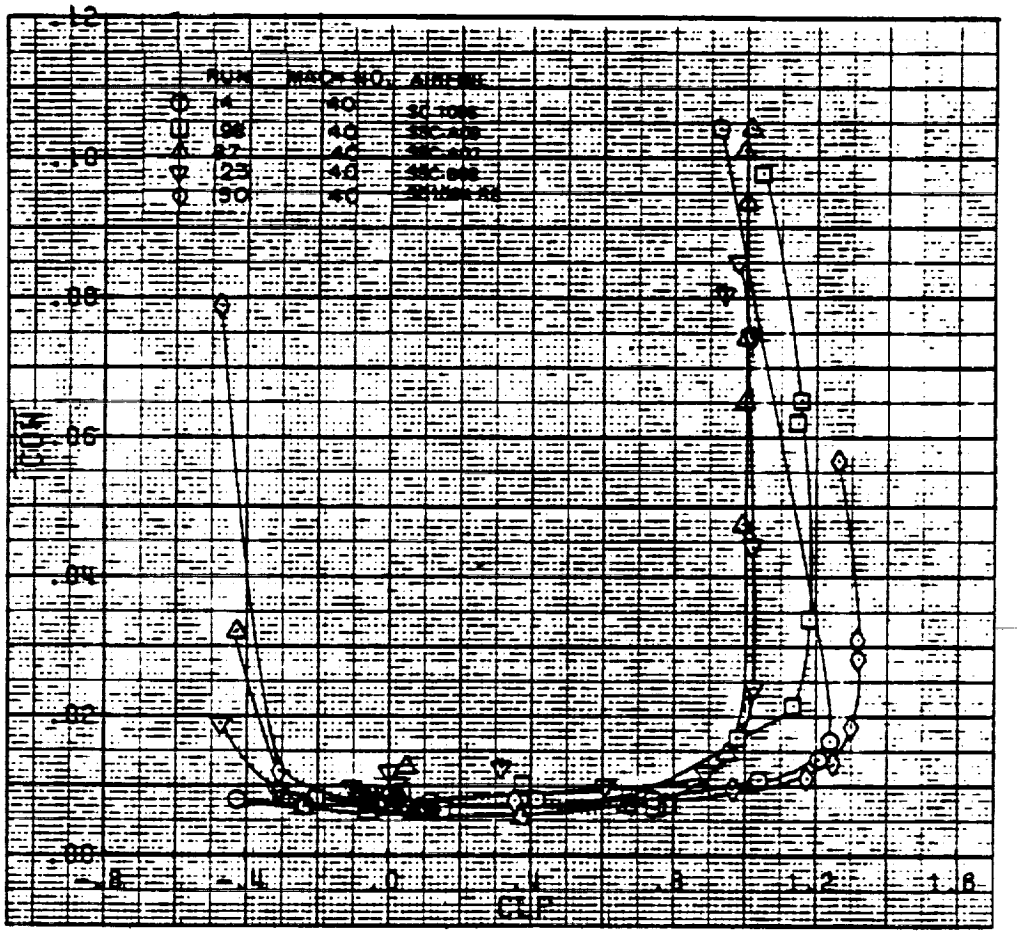
(c) Pitching moment coefficient versus lift coefficient

Figure 16.–Concluded.



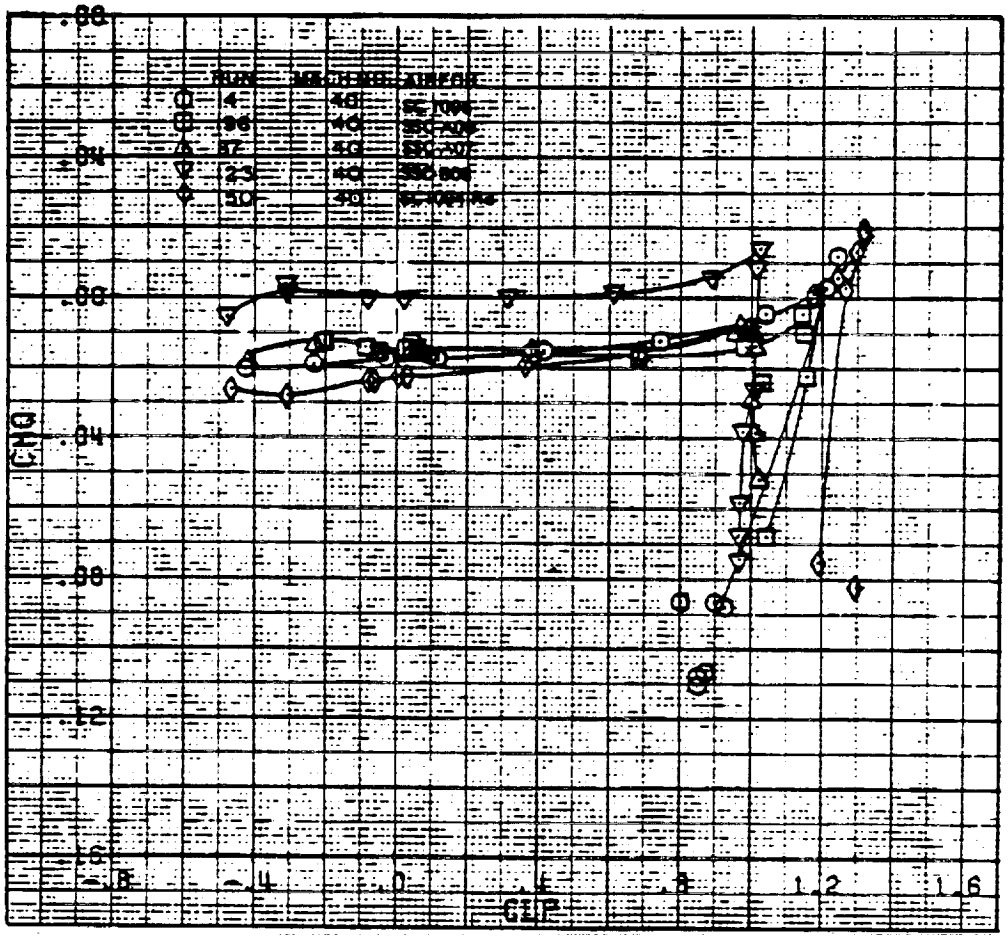
(a) Lift coefficient versus angle of attack

Figure 17.— Aerodynamic characteristics at a Mach number of 0.40.



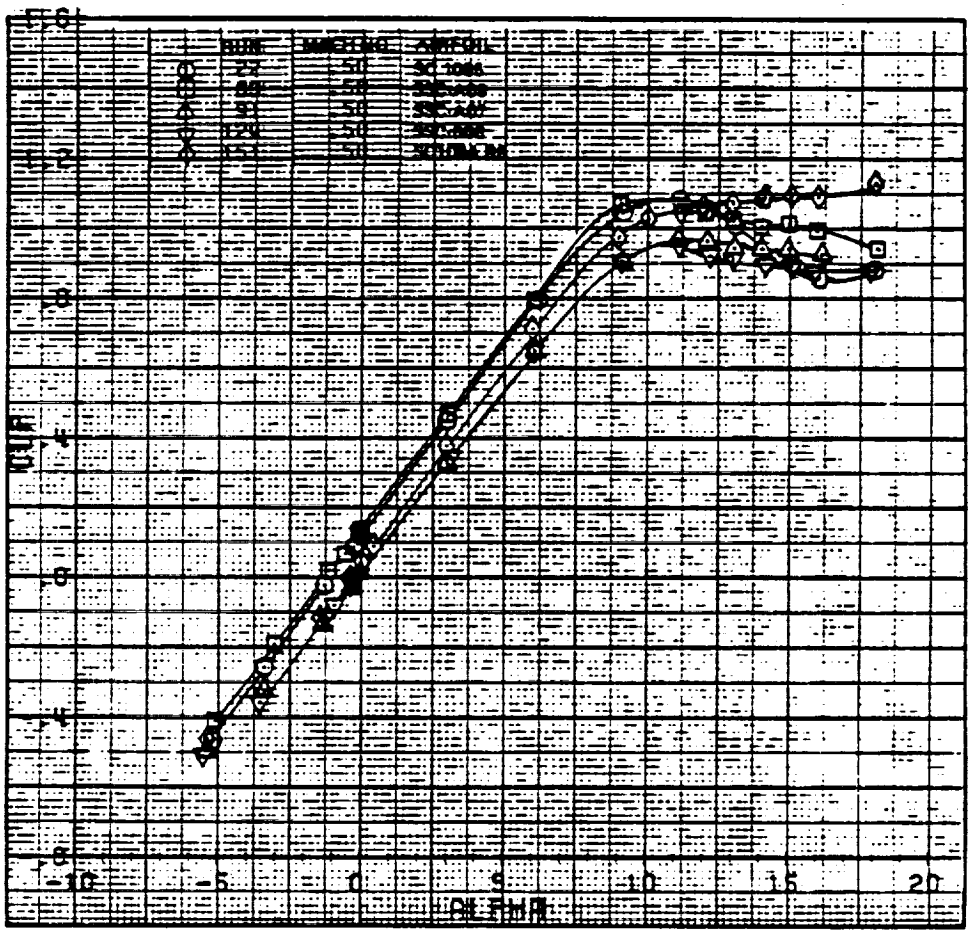
(b) Drag coefficient versus lift coefficient

Figure 17.–Continued.



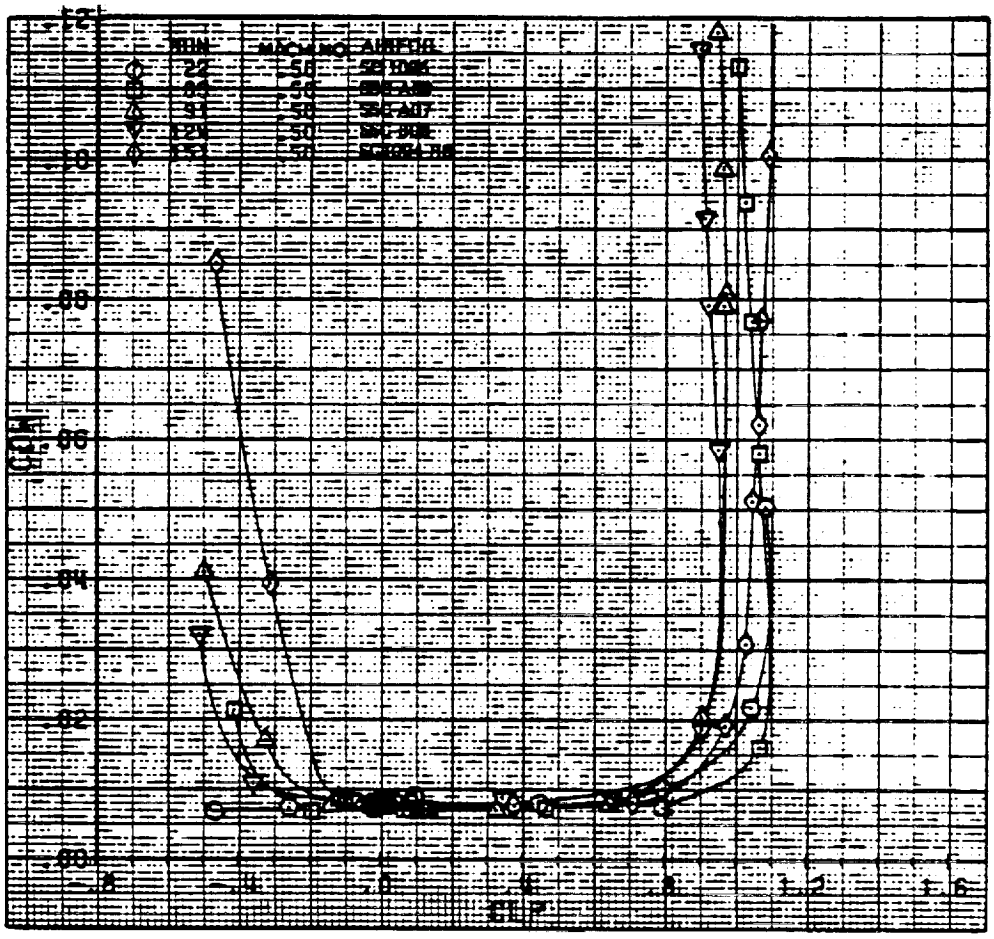
(c) Pitching moment coefficient versus lift coefficient

Figure 17.-Concluded.



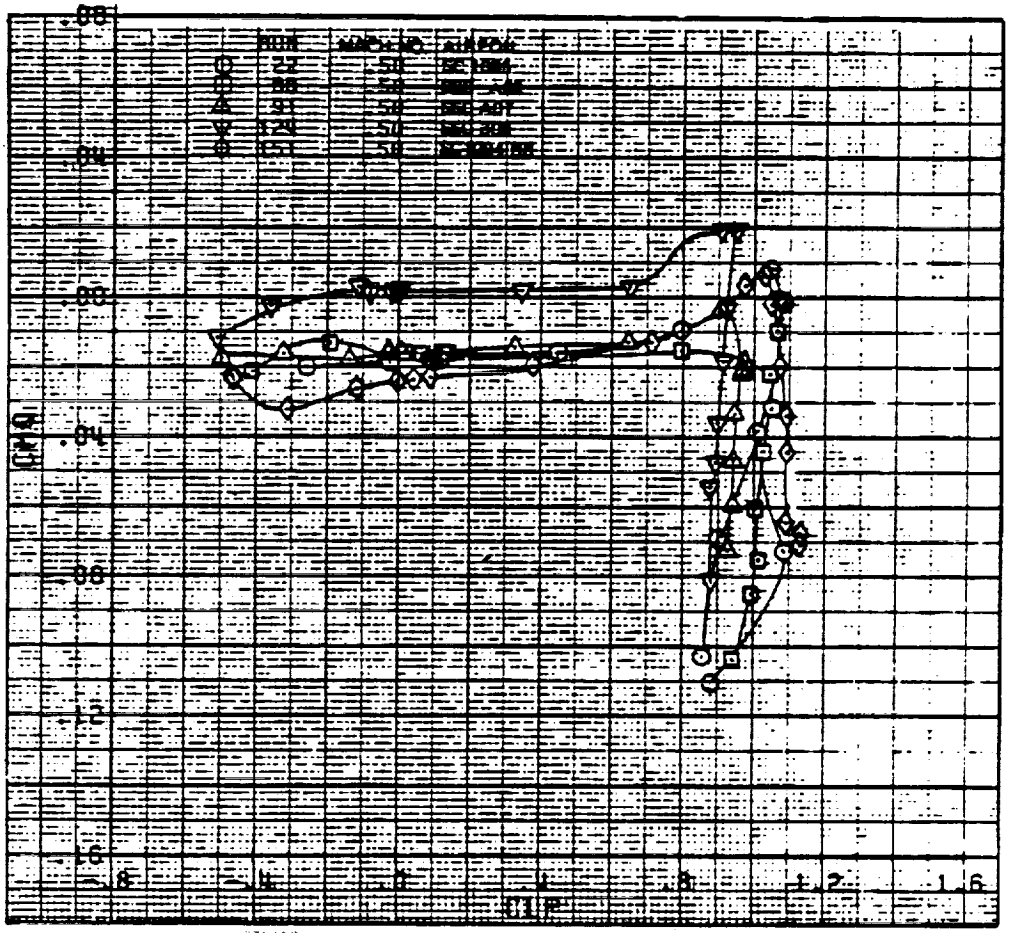
(a) Lift coefficient versus angle of attack

Figure 18.— Aerodynamic characteristics at a Mach number of 0.50.



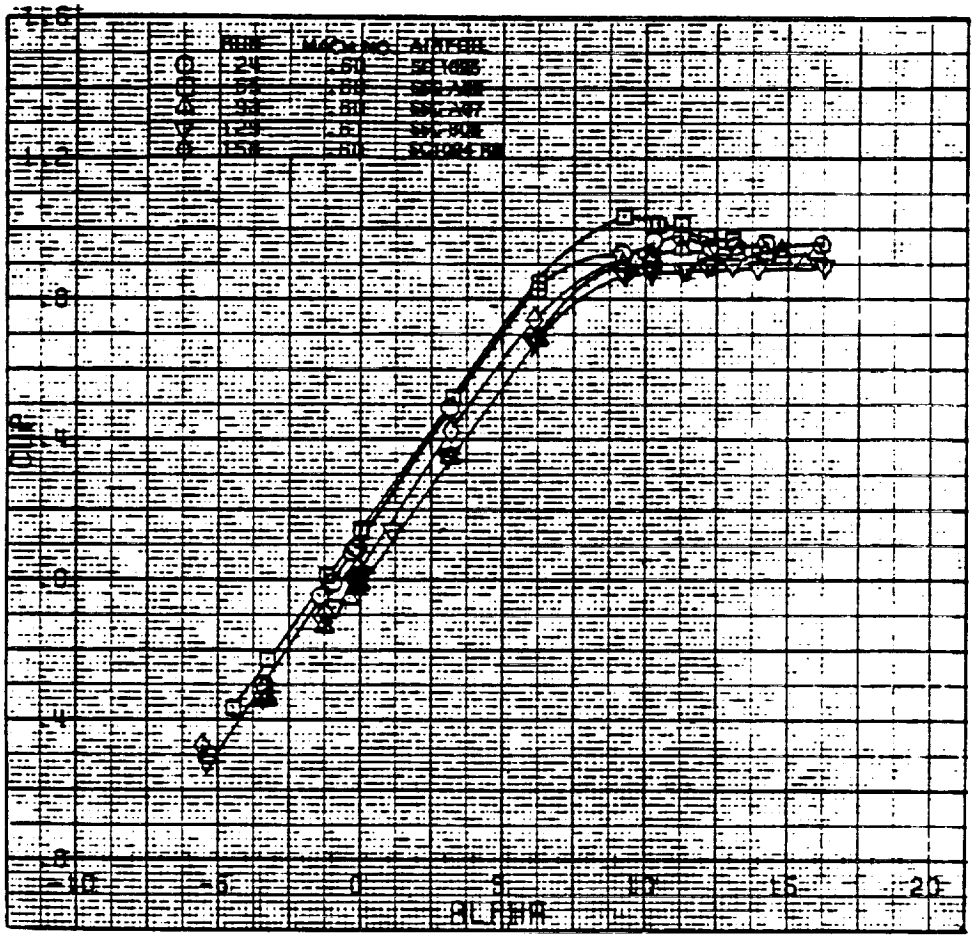
(b) Drag coefficient versus lift coefficient

Figure 18.-Continued.



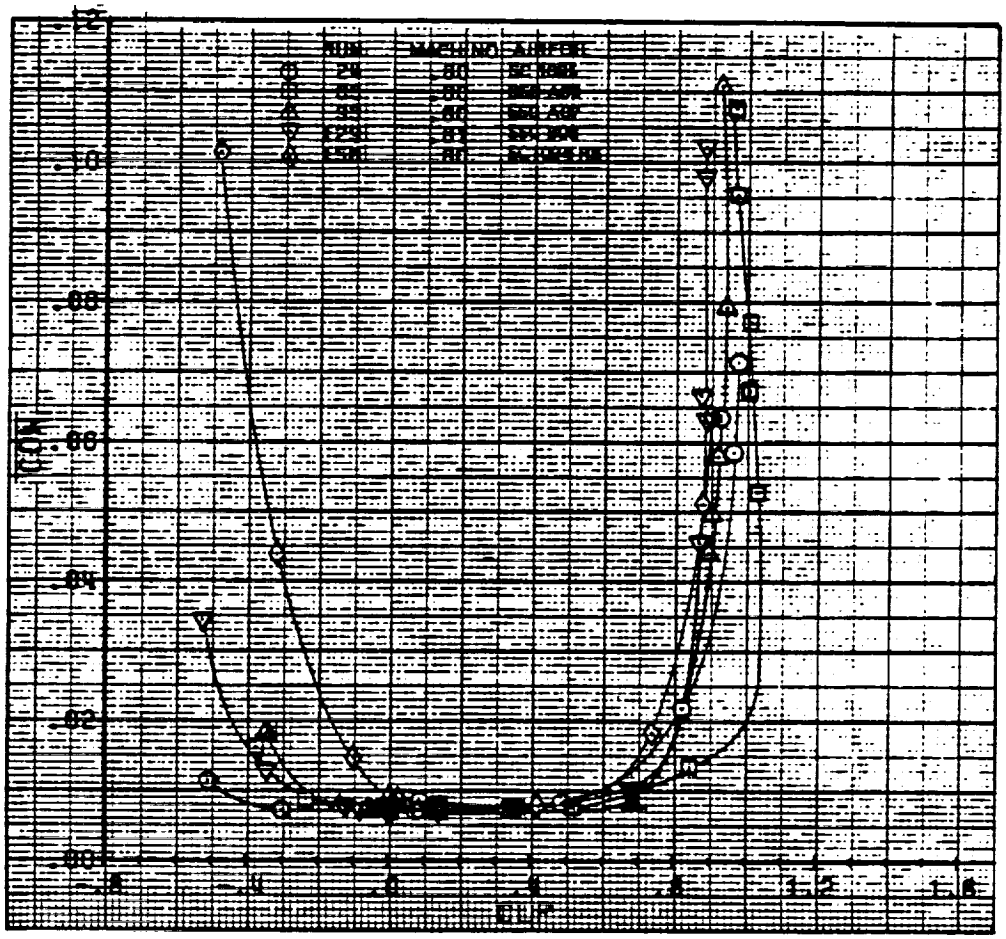
(c) Pitching moment coefficient versus lift coefficient

Figure 18.—Concluded.



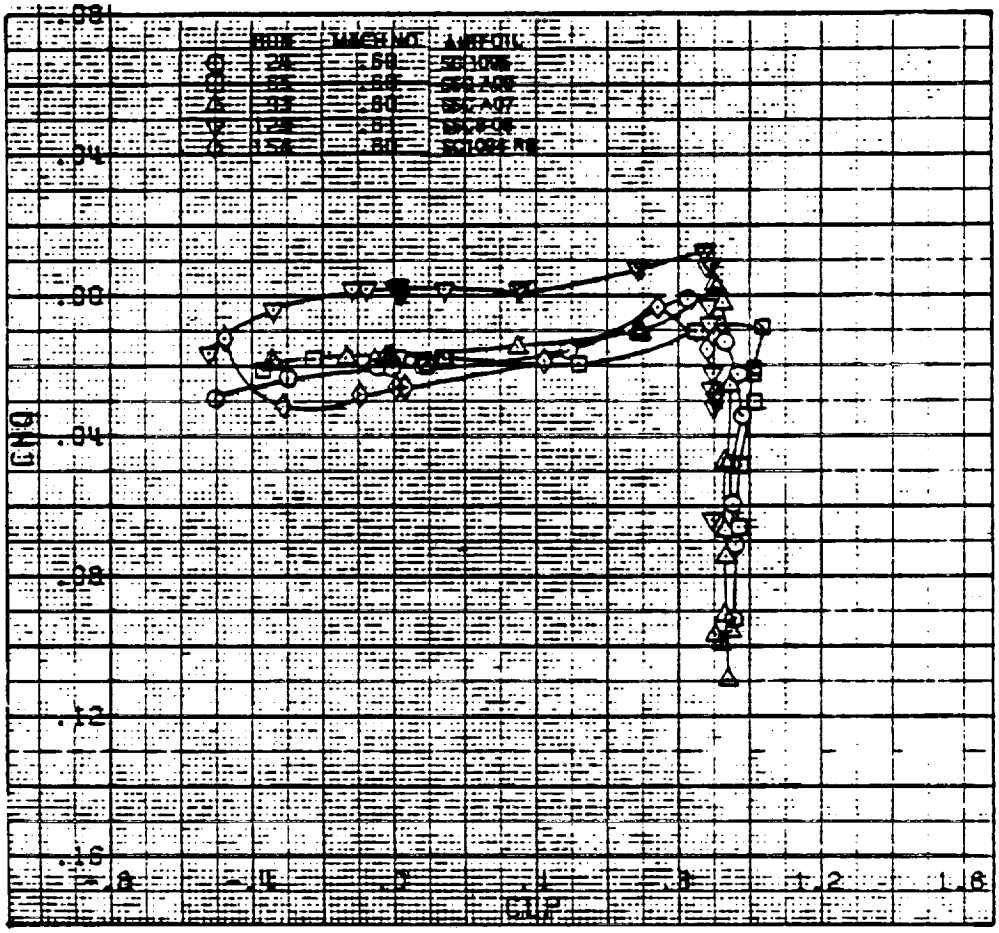
(a) Lift coefficient versus angle of attack

Figure 19.— Aerodynamic characteristics at a Mach number of 0.60.



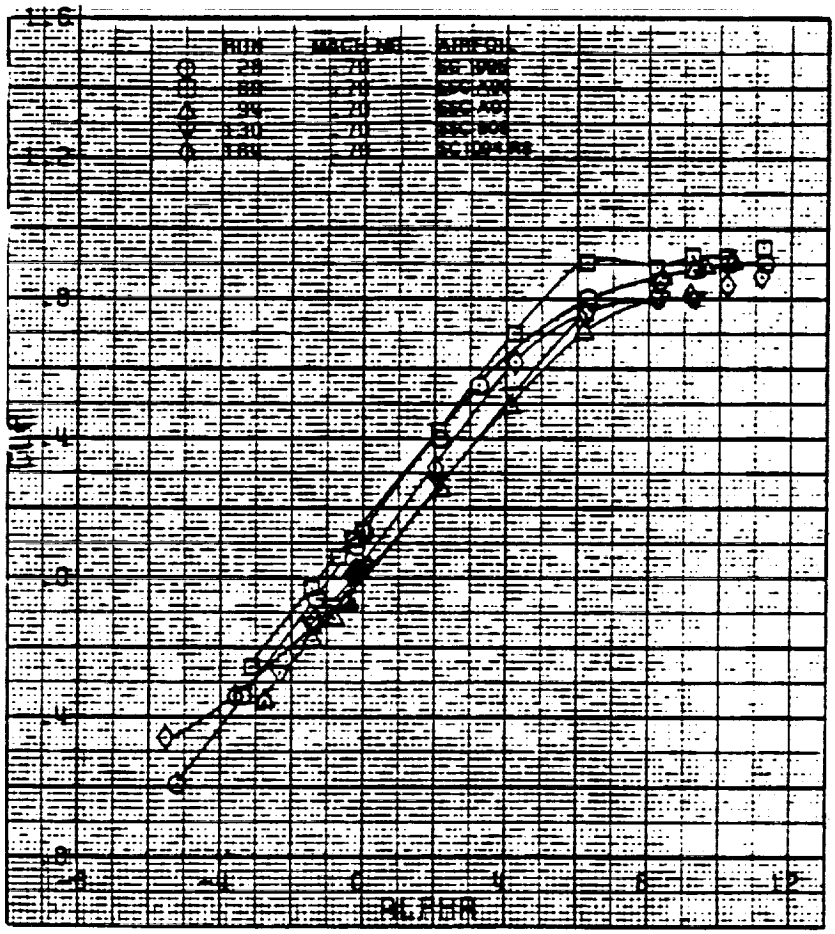
(b) Drag coefficient versus lift coefficient

Figure 19.—Continued.



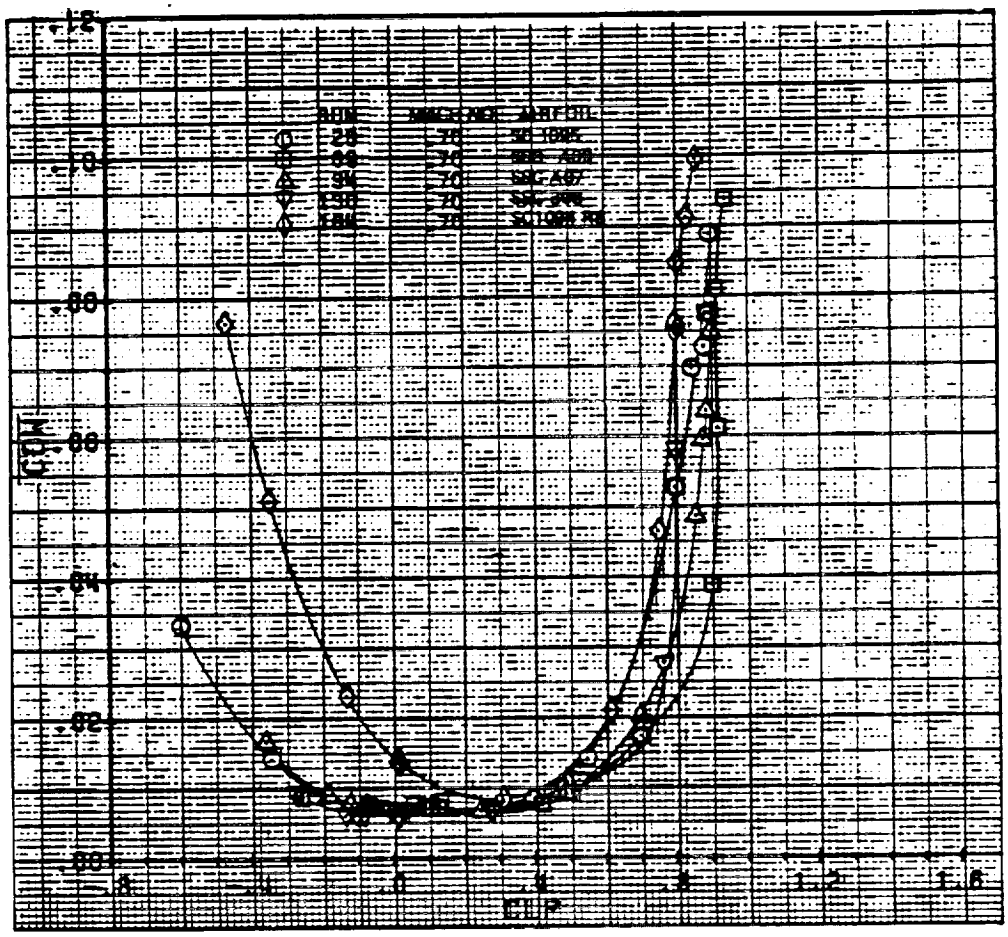
(c) Pitching moment coefficient versus lift coefficient.

Figure 19.-Concluded.



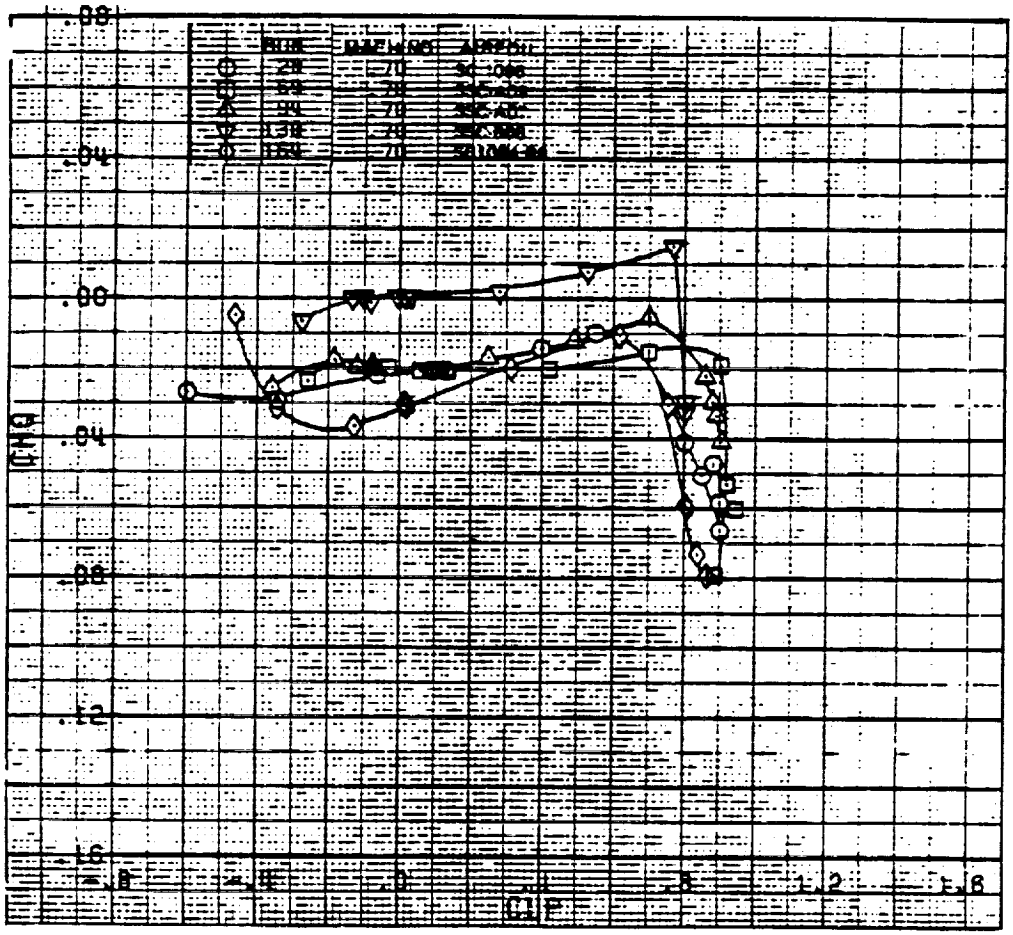
(a) Lift coefficient versus angle of attack

Figure 20.— Aerodynamic characteristics at a Mach number of 0.70.



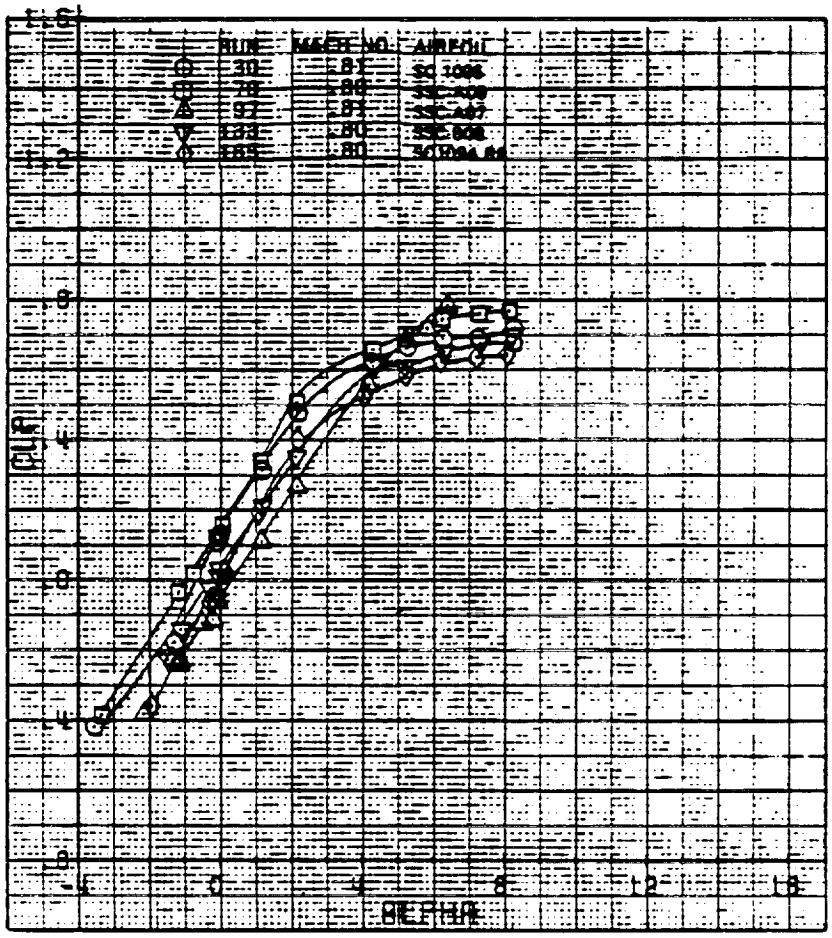
(b) Drag coefficient versus lift coefficient

Figure 20.—Continued.



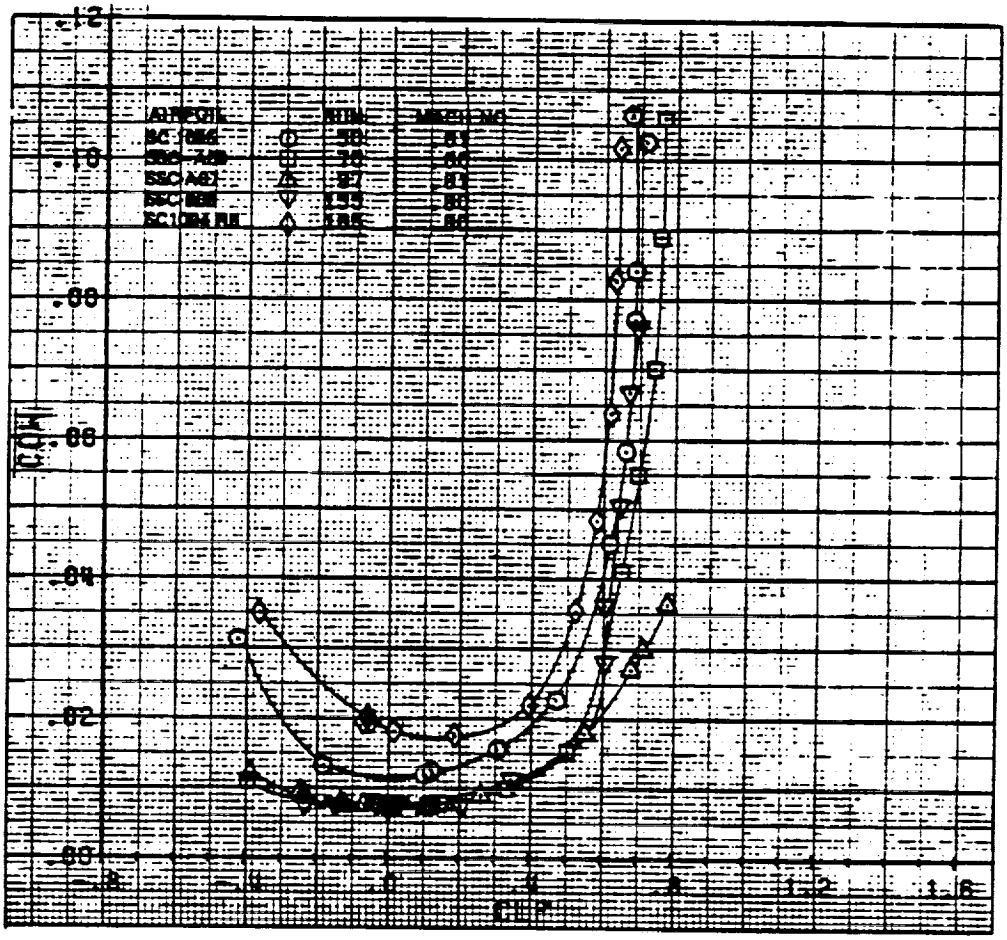
(c) Pitching moment coefficient versus lift coefficient

Figure 20.–Concluded.



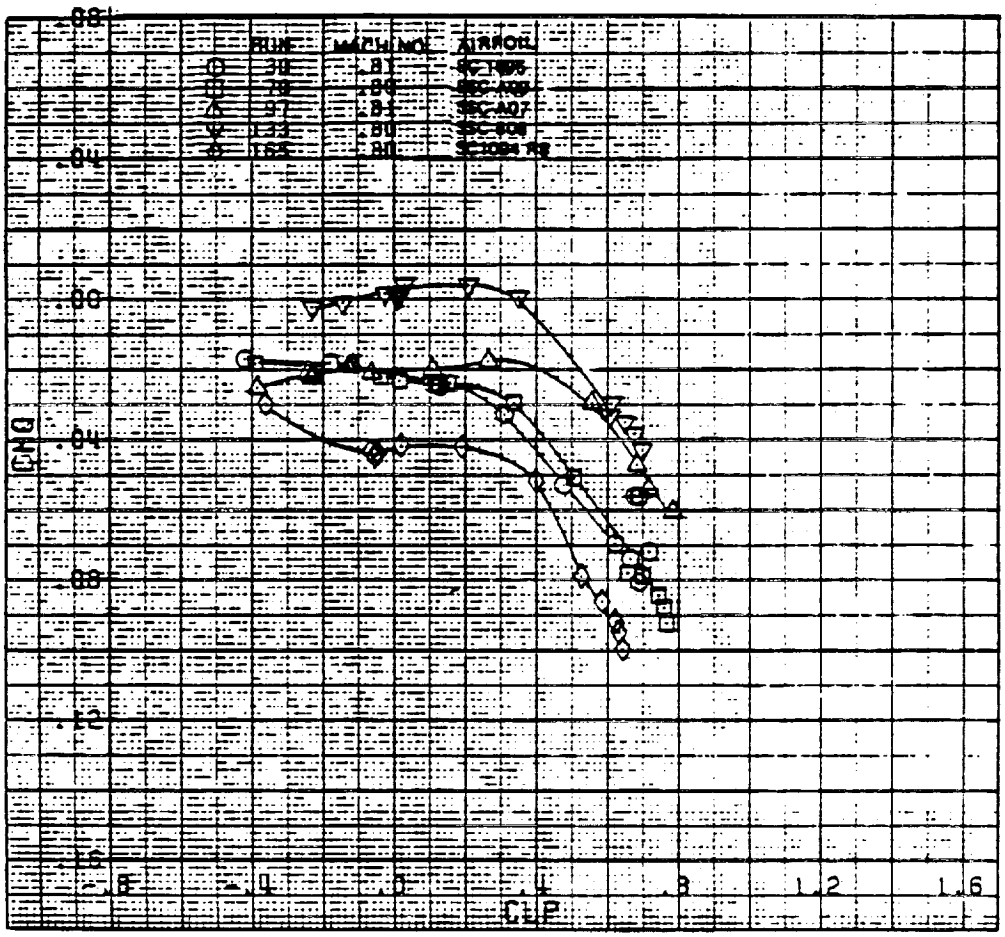
(a) Lift coefficient versus angle of attack

Figure 21.—Aerodynamic characteristics at a Mach number of 0.80.



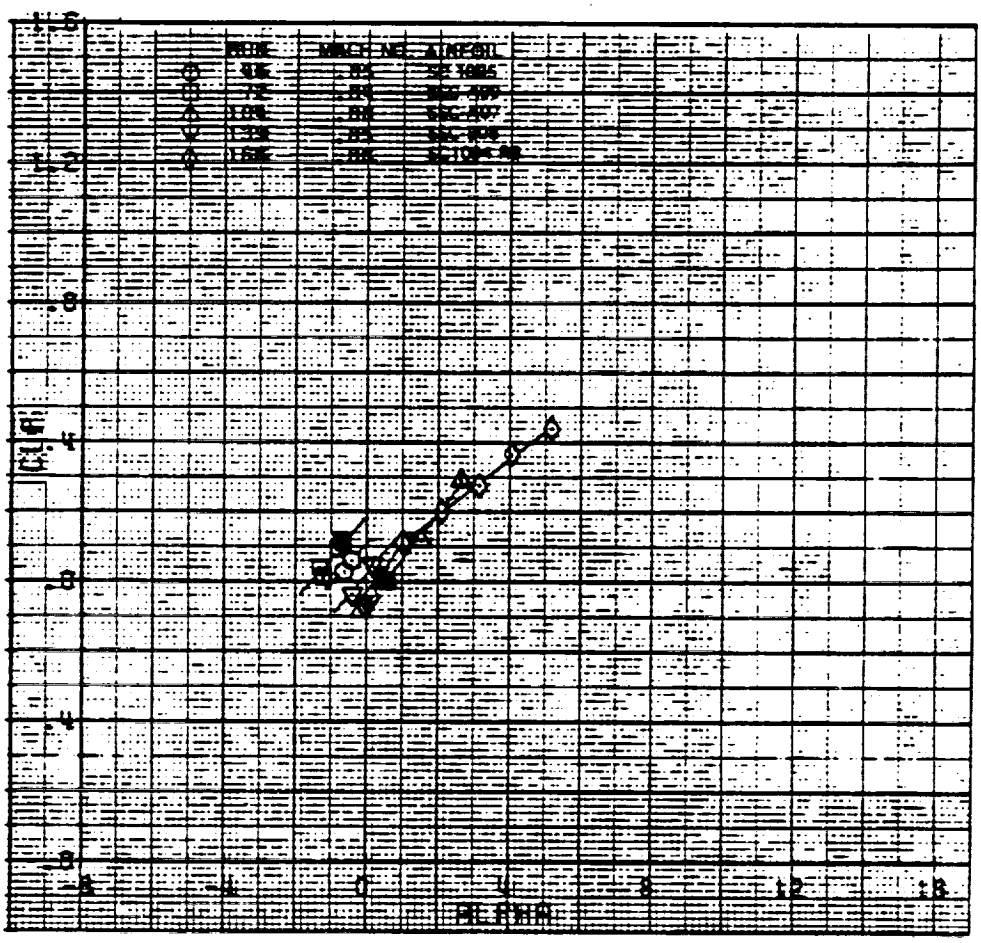
(b) Drag coefficient versus lift coefficient

Figure 21.-Continued.



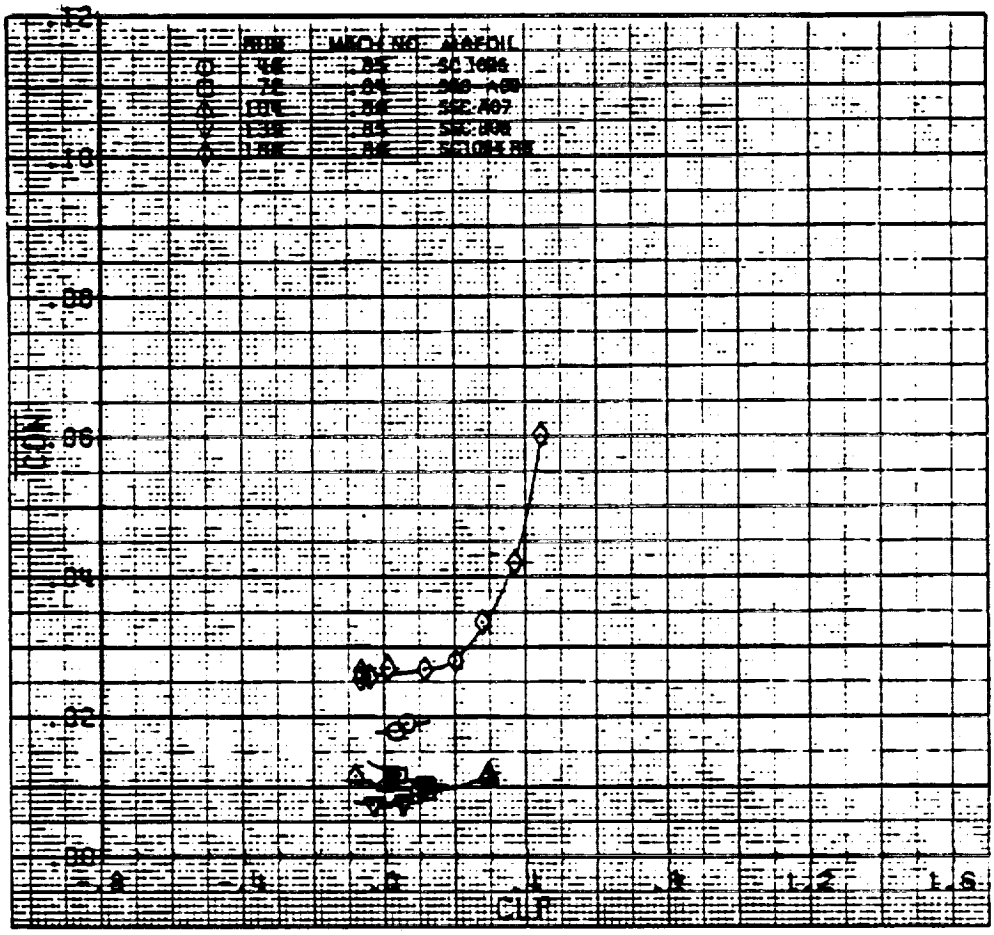
(c). Pitching moment coefficient versus lift coefficient

Figure 21.—Concluded.



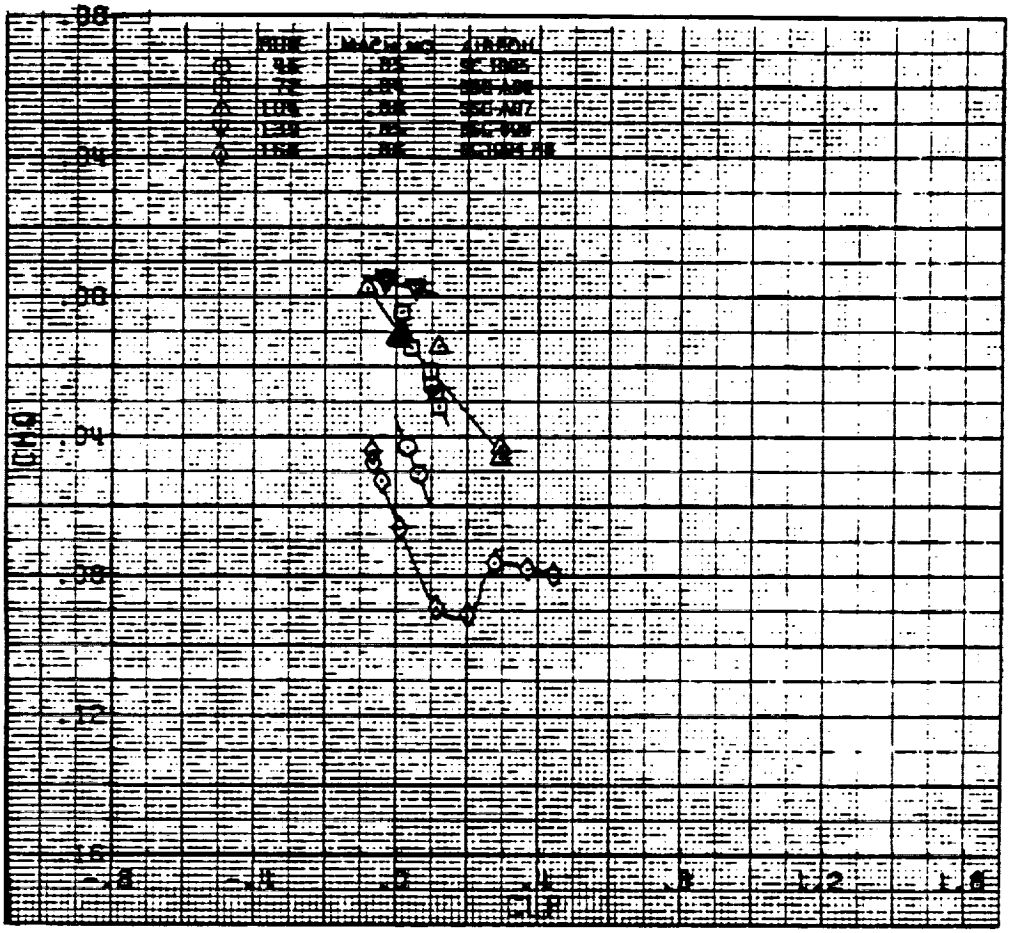
(a) Lift coefficient versus angle of attack

Figure 22.— Aerodynamic characteristics at a Mach number of 0.85.



(b) Drag coefficient versus lift coefficient

Figure 22.—Continued.



(c) Pitching moment coefficient versus lift coefficient

Figure 22.-Concluded.

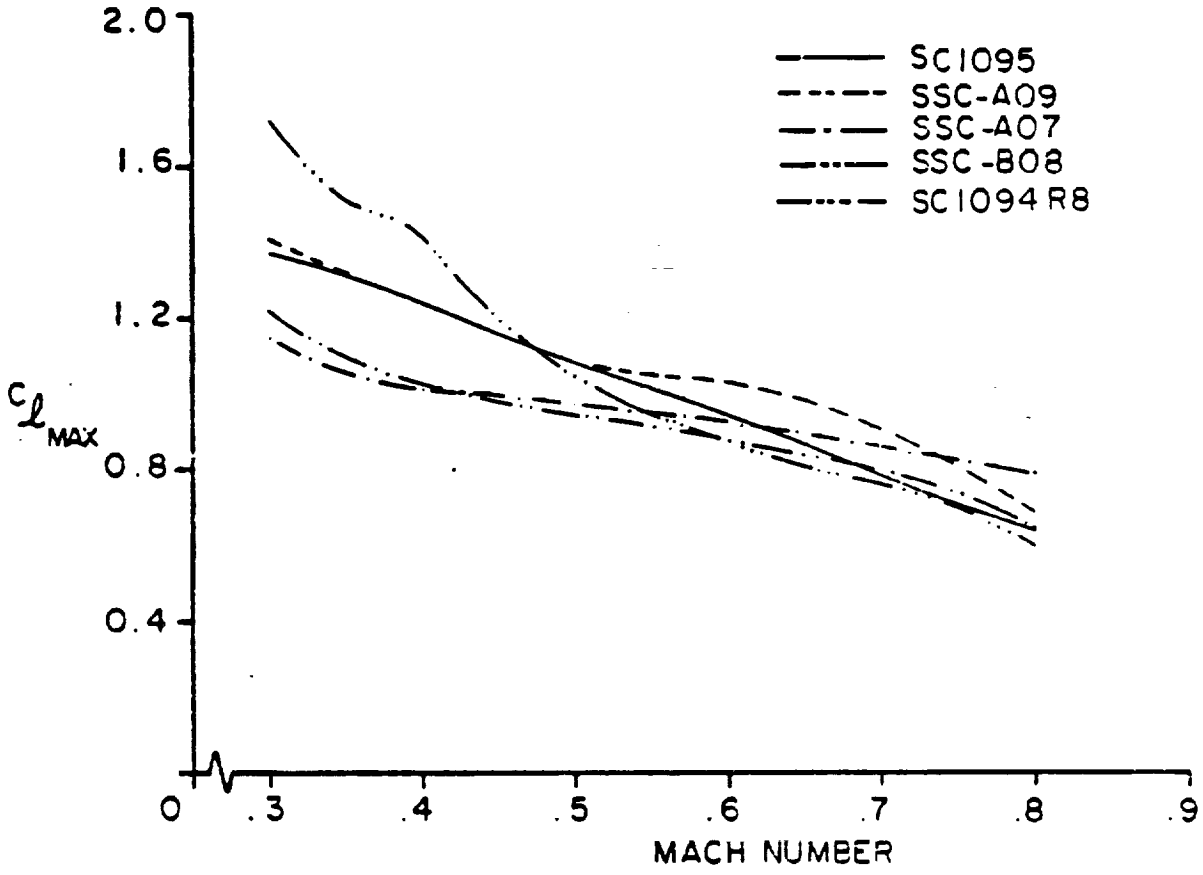


Figure 23.— Variation in maximum lift coefficient versus Mach number.

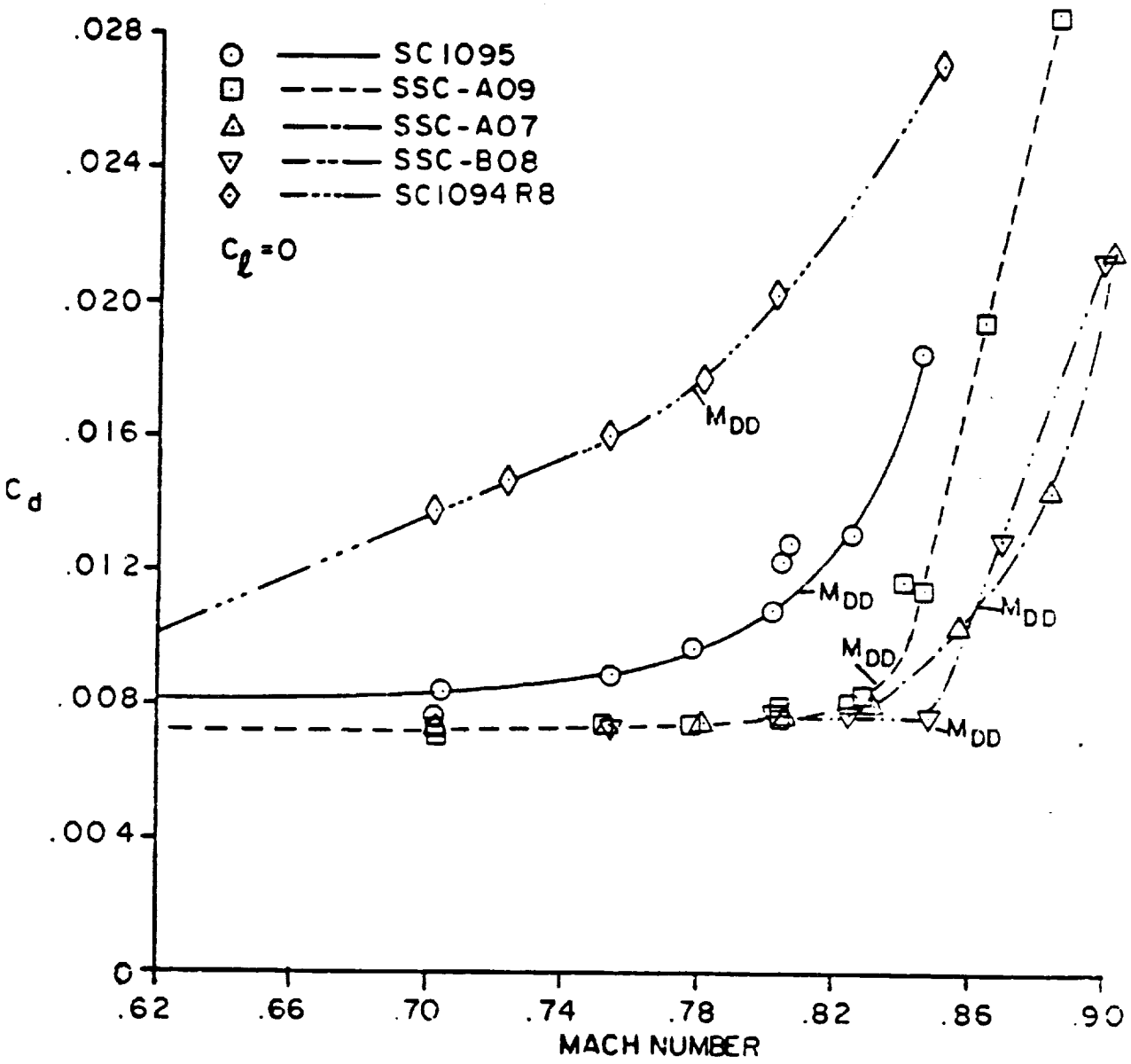


Figure 24.— Variation in drag coefficient at zero lift versus Mach number.

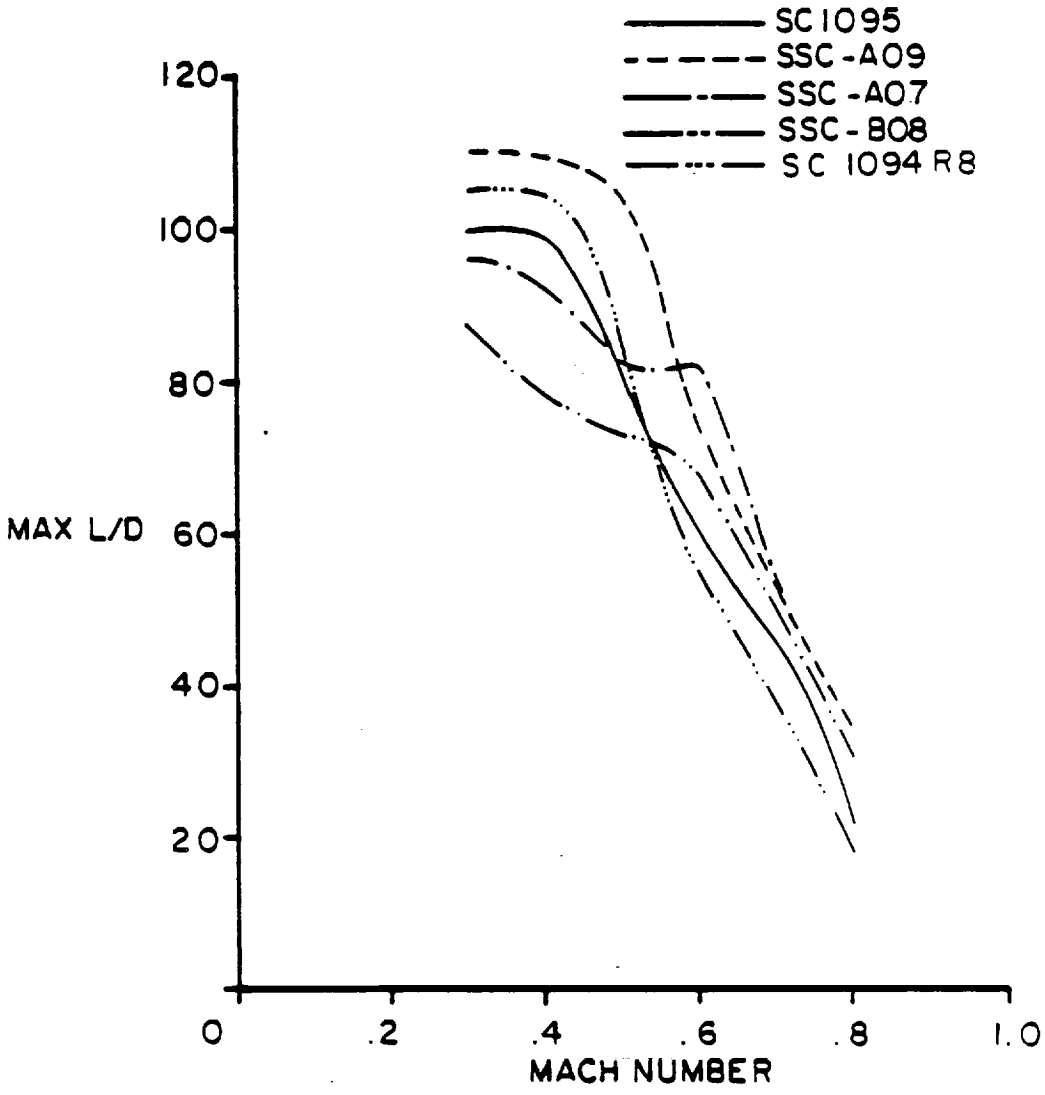


Figure 25.– Maximum L/D versus Mach number.

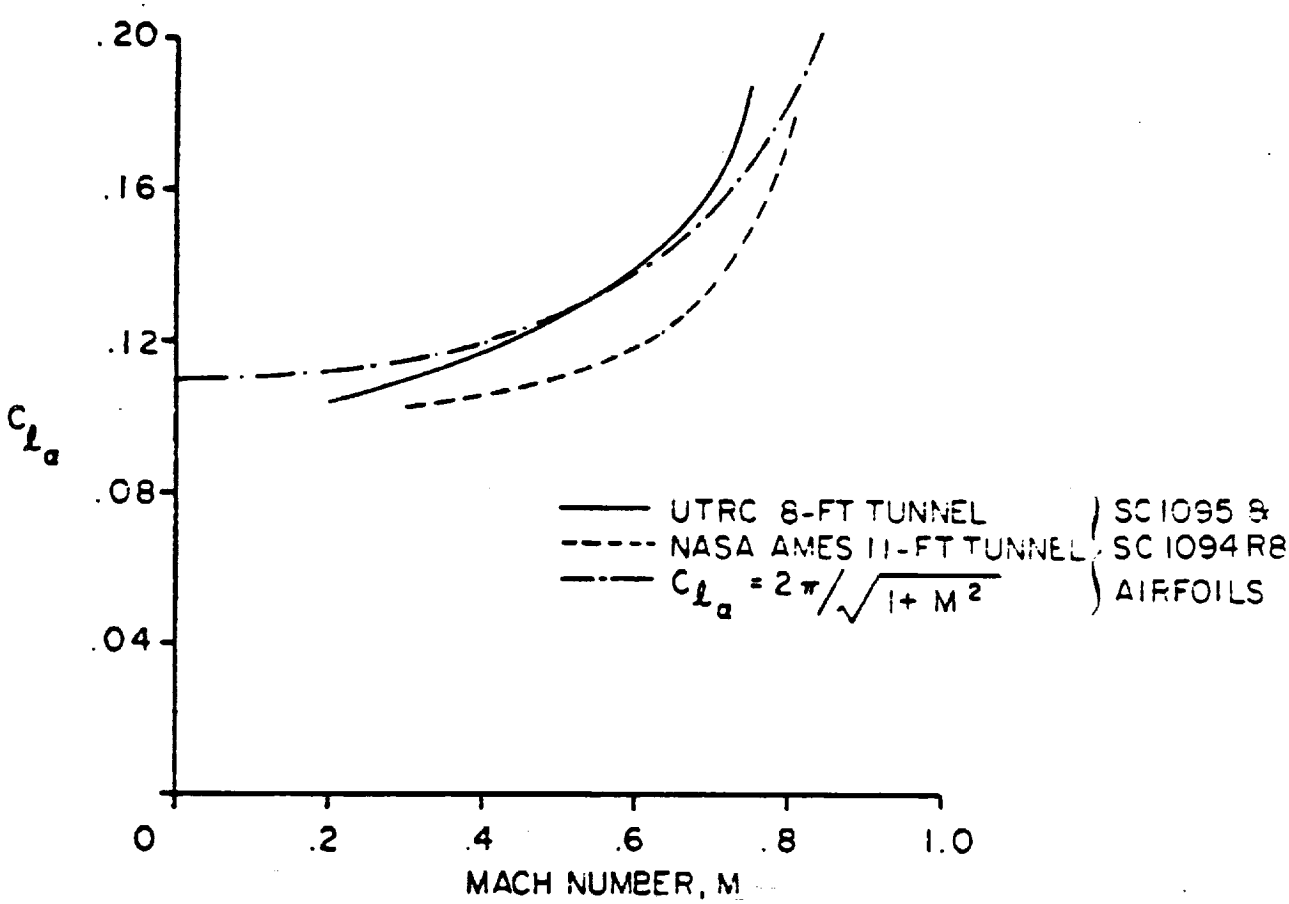
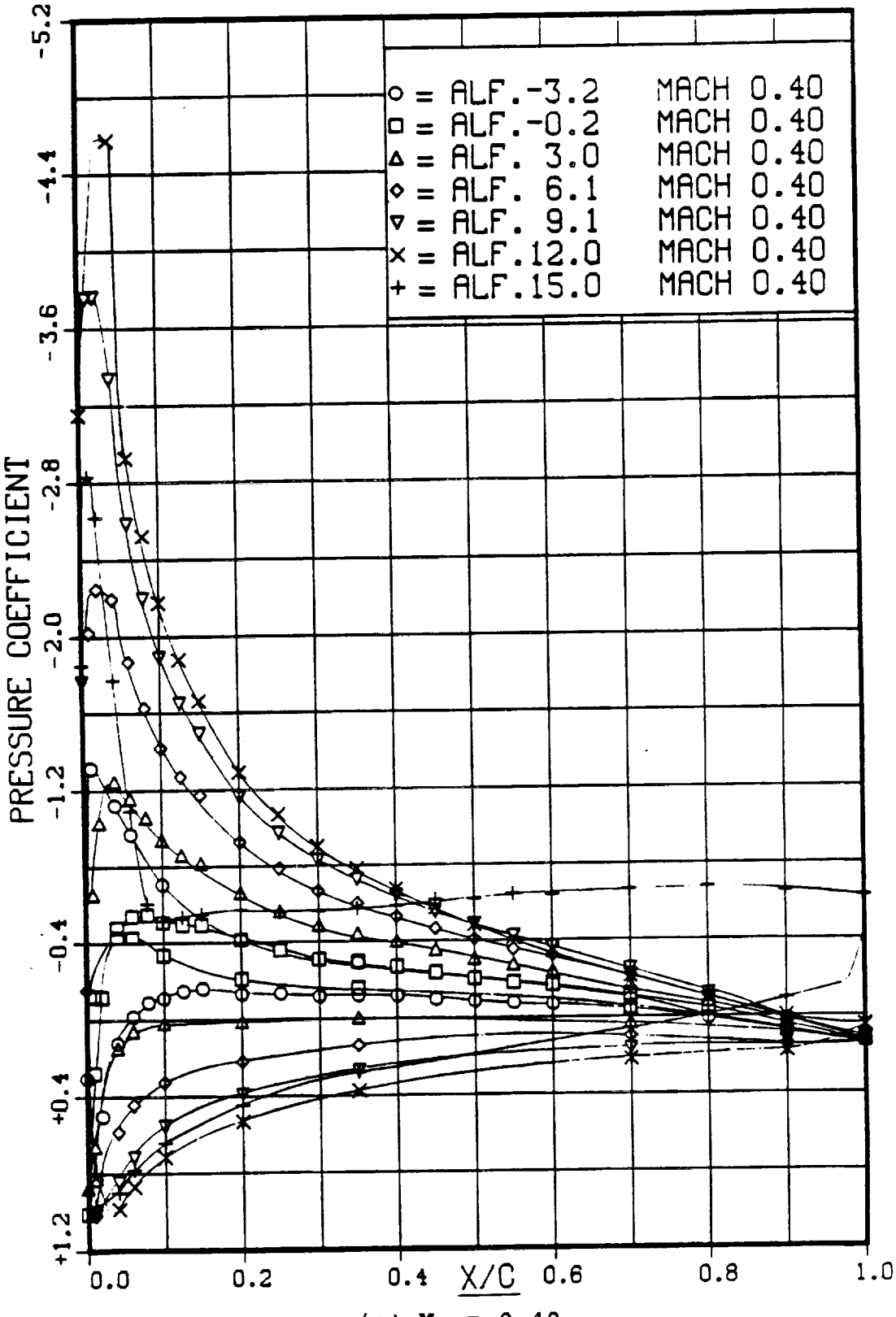
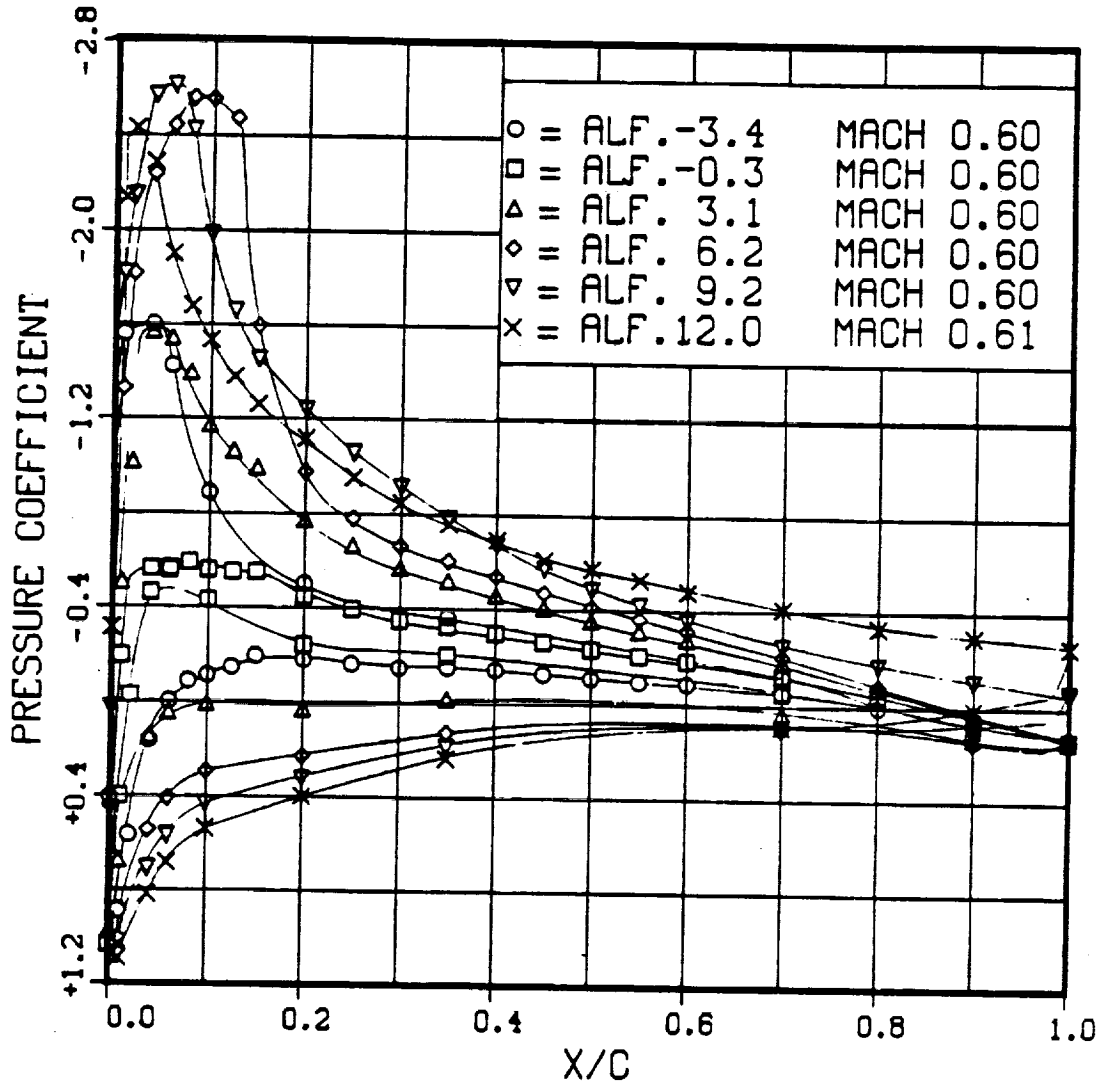


Figure 26.— Lift curve slope correlation.



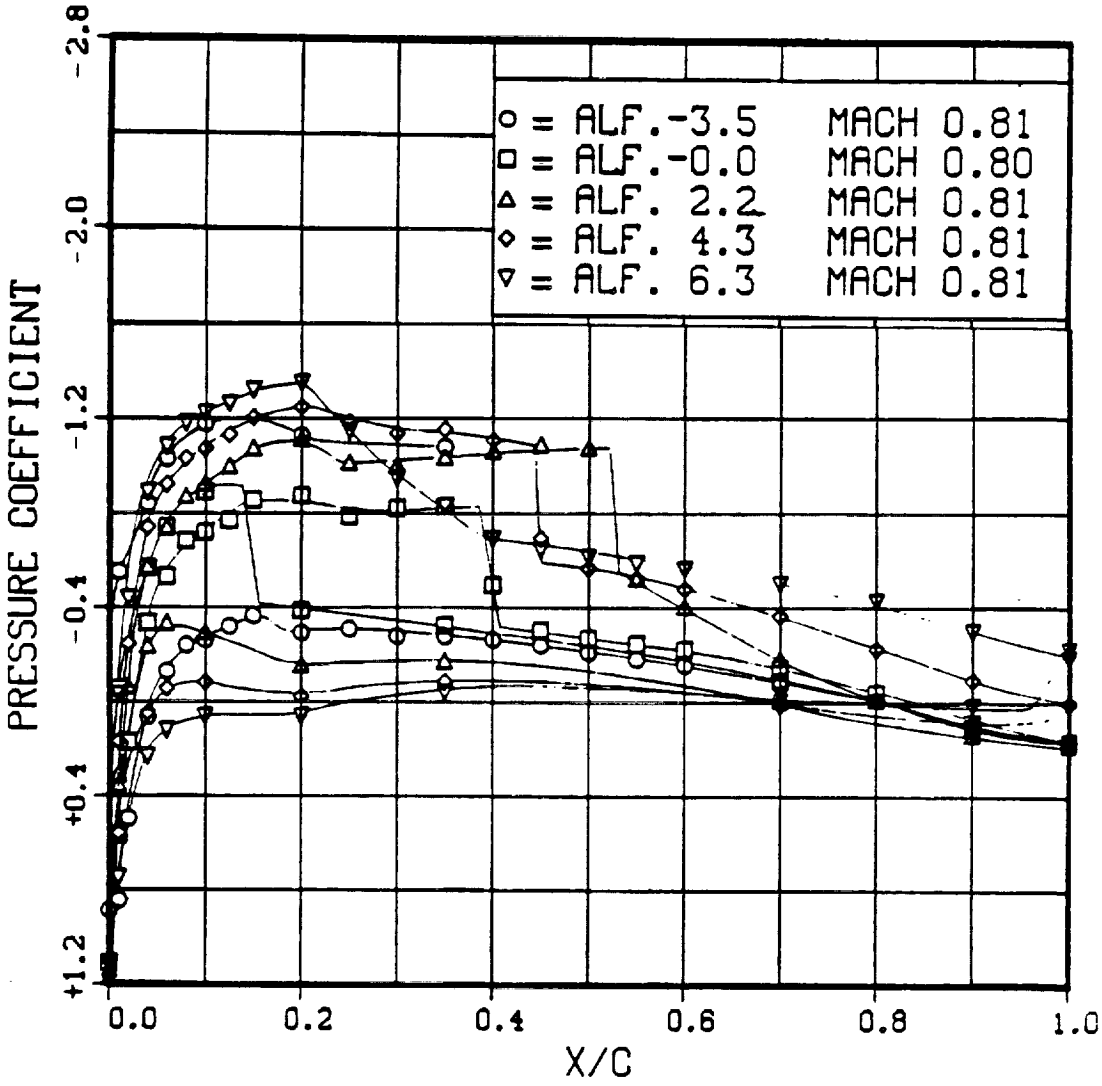
(a) M = 0.40

Figure 27.—Pressure coefficient distribution for the SC1095 airfoil.



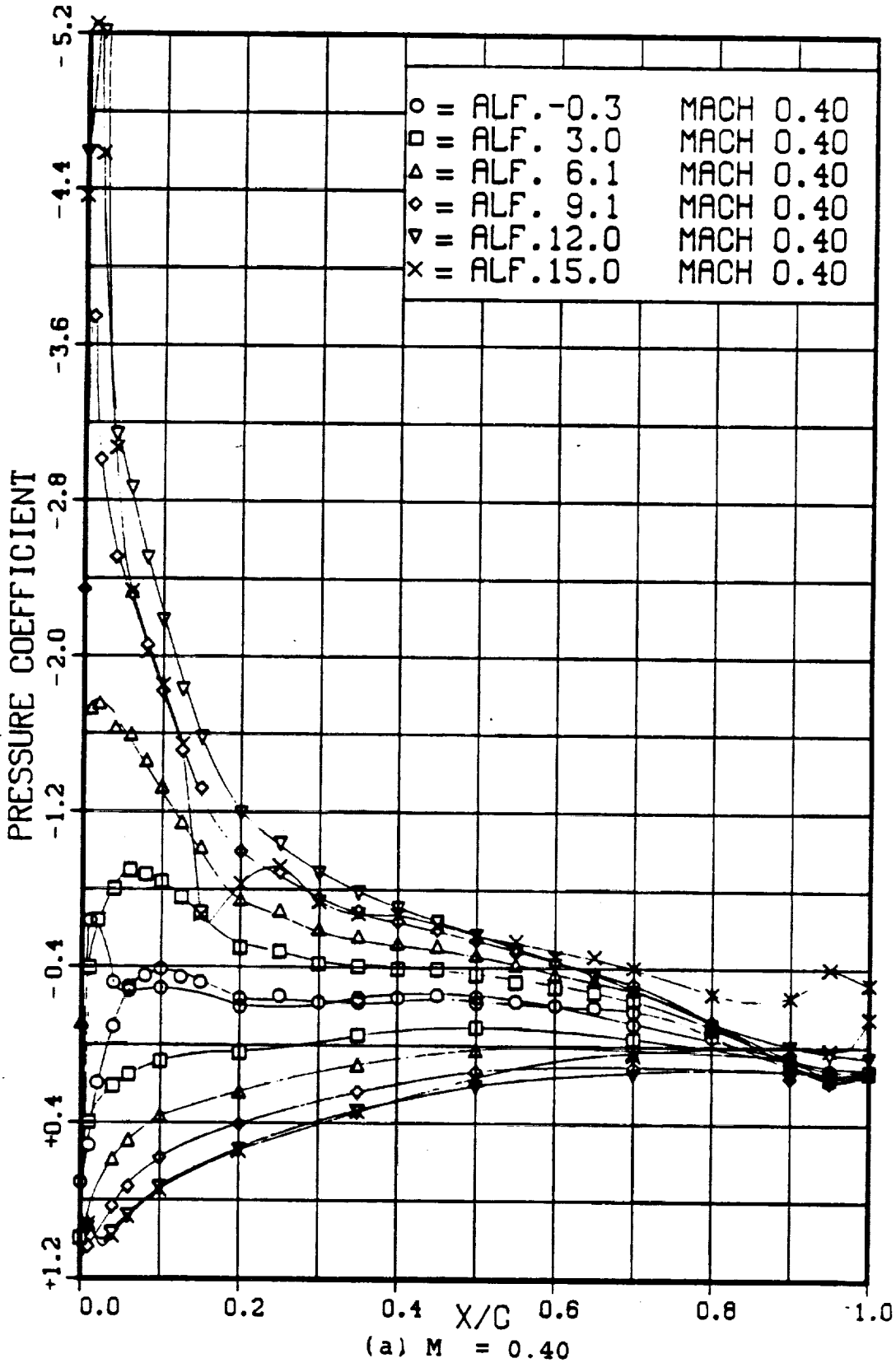
(b) M = 0.60

Figure 27.-Continued.



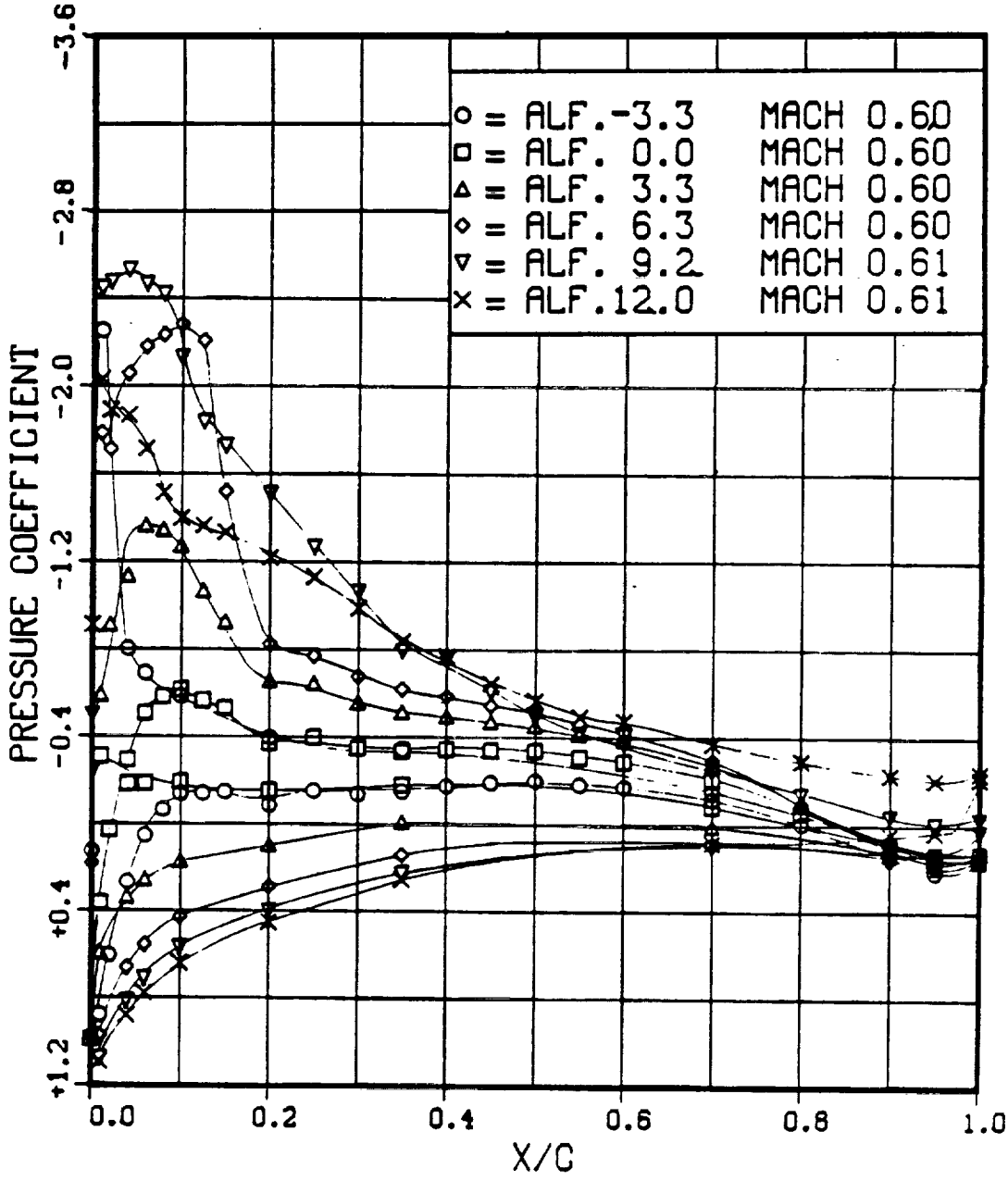
(c) M = 0.80

Figure 27.-Concluded.



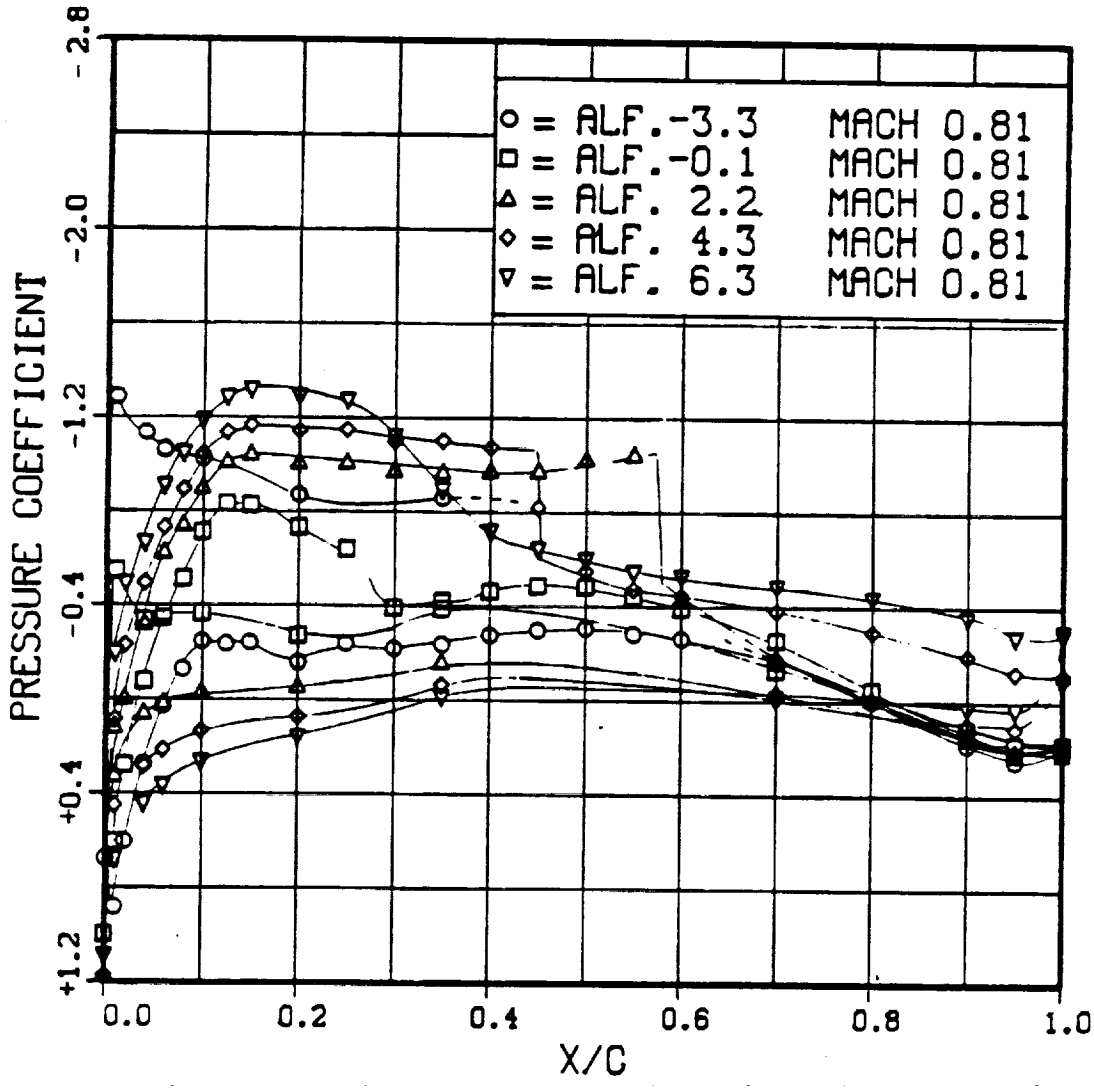
(a) M = 0.40

Figure 28.-Pressure coefficient distribution for the SSC-A09 airfoil.



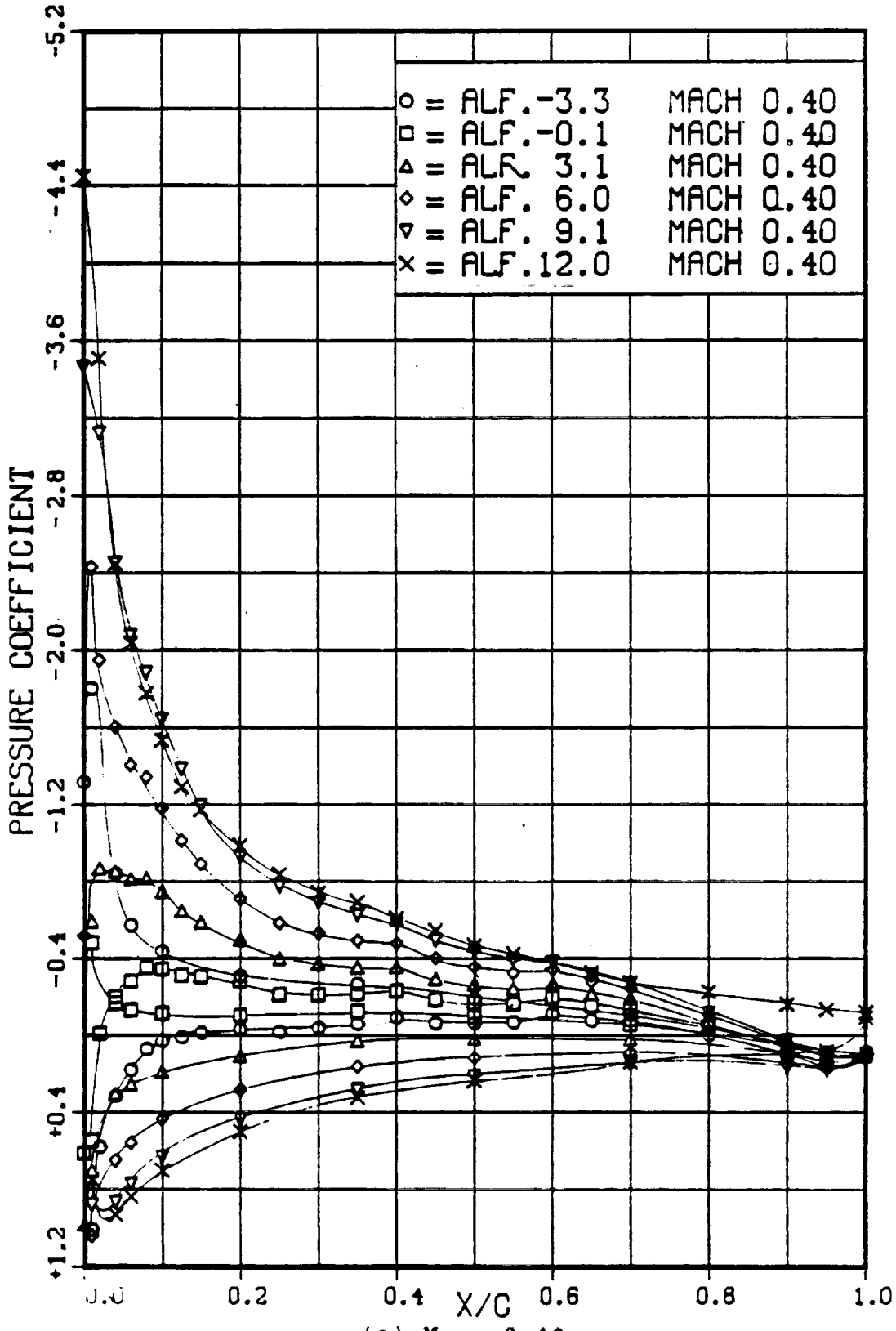
(b) M = 0.60

Figure 28.-Continued.



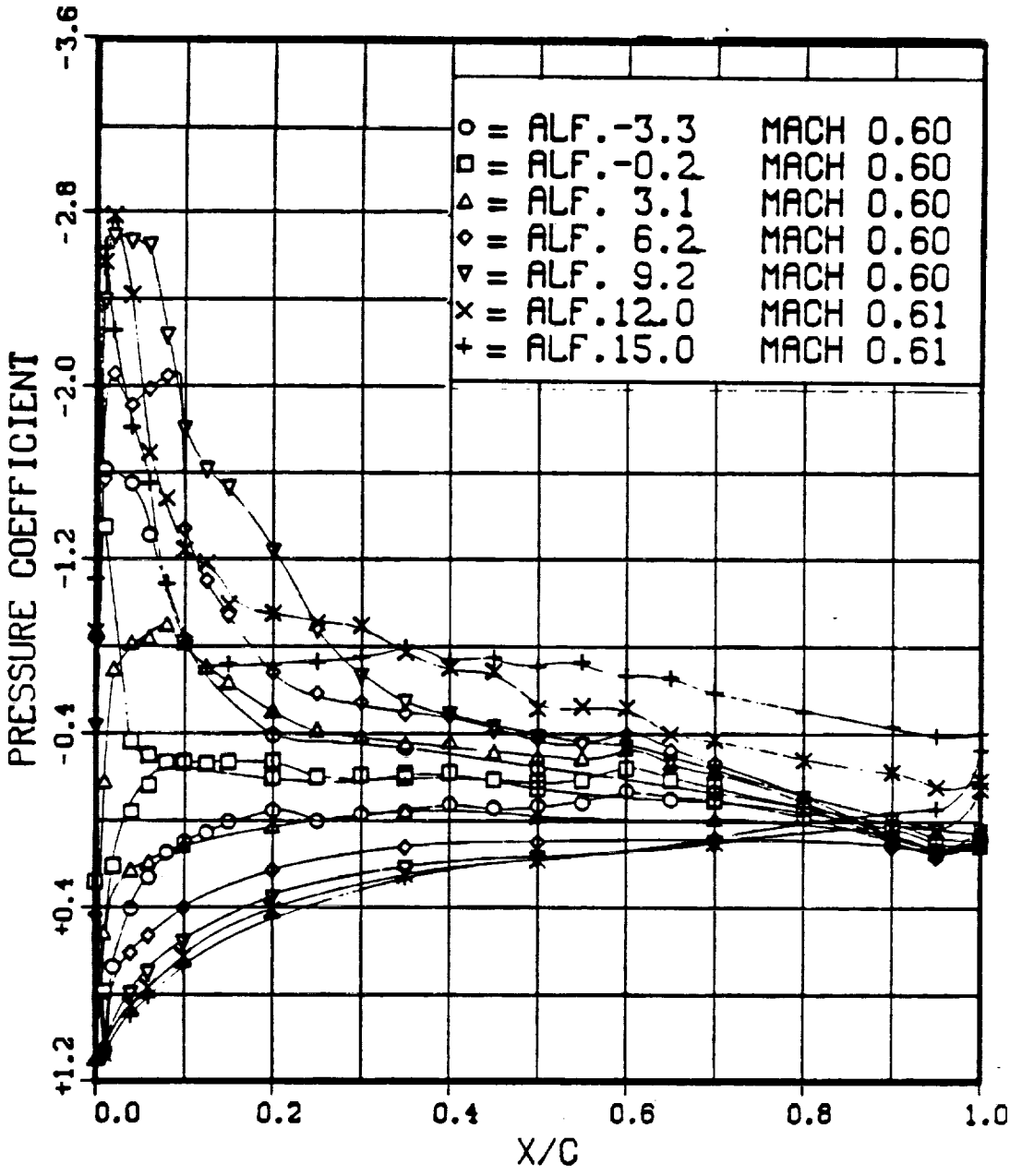
(c) M = 0.80

Figure 28.-Concluded.



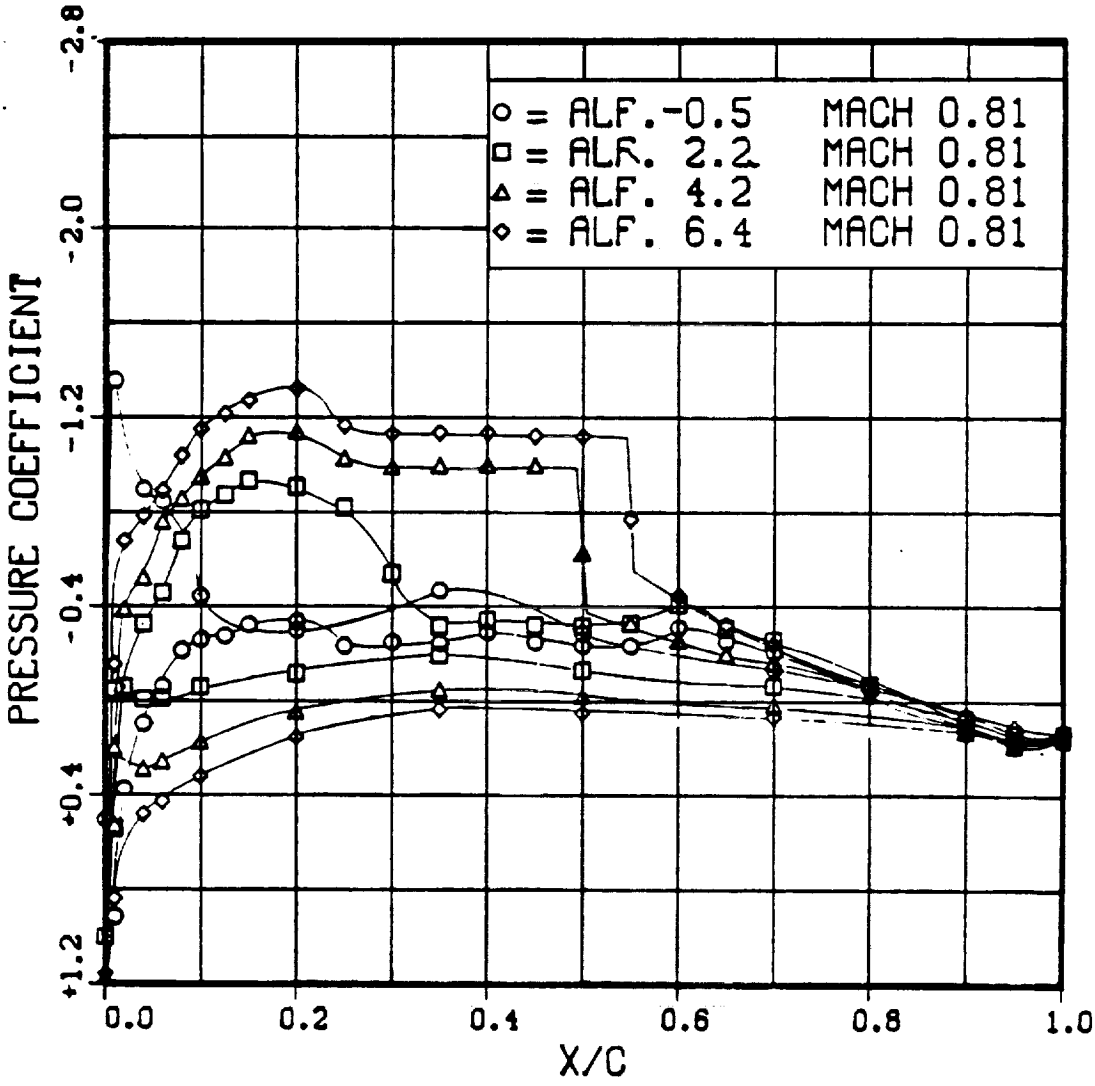
(a) M = 0.40

Figure 29.-Pressure coefficient distribution for the SSC-A07 airfoil.



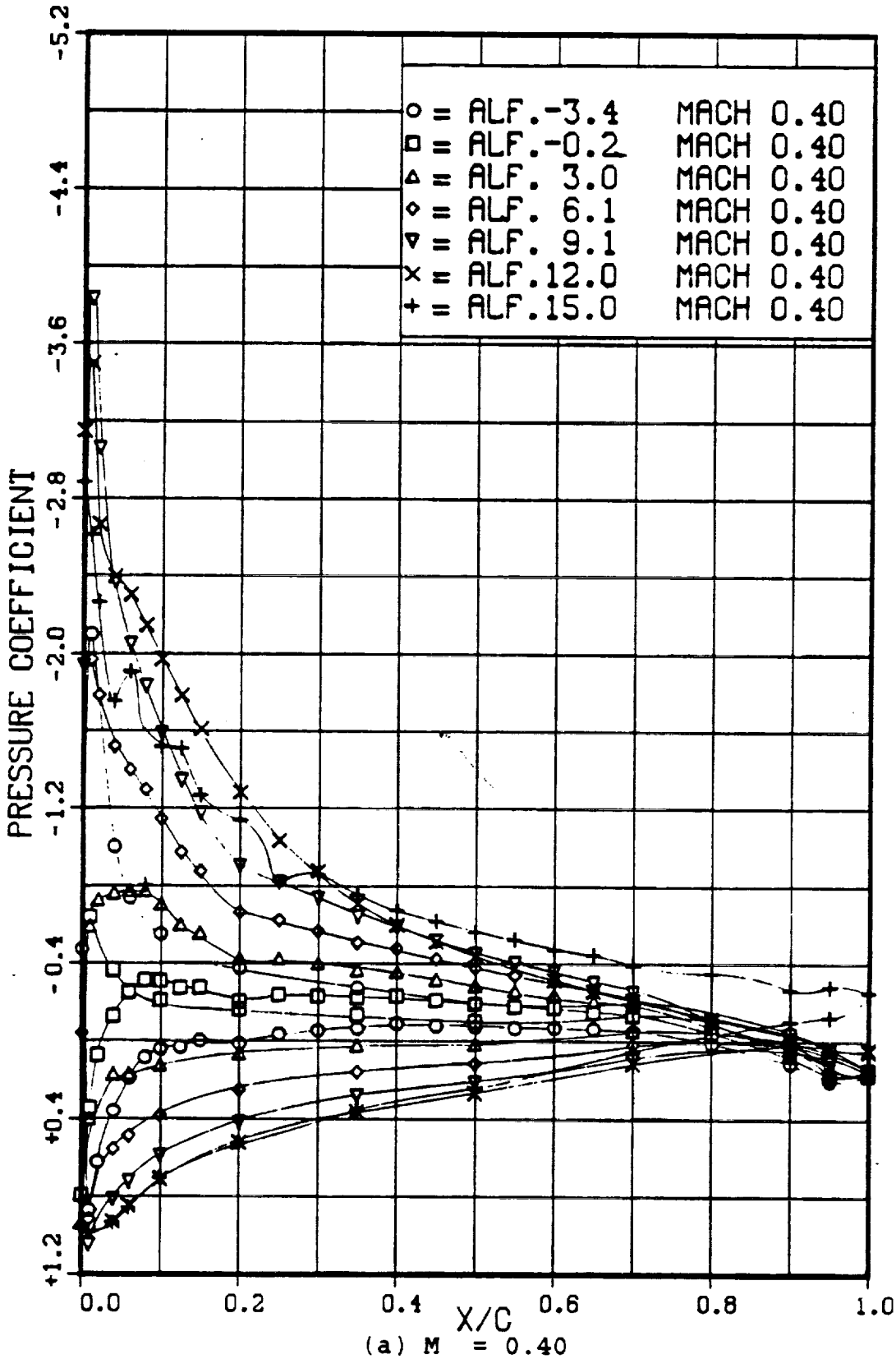
(b) M = 0.60

Figure 29.-Continued.



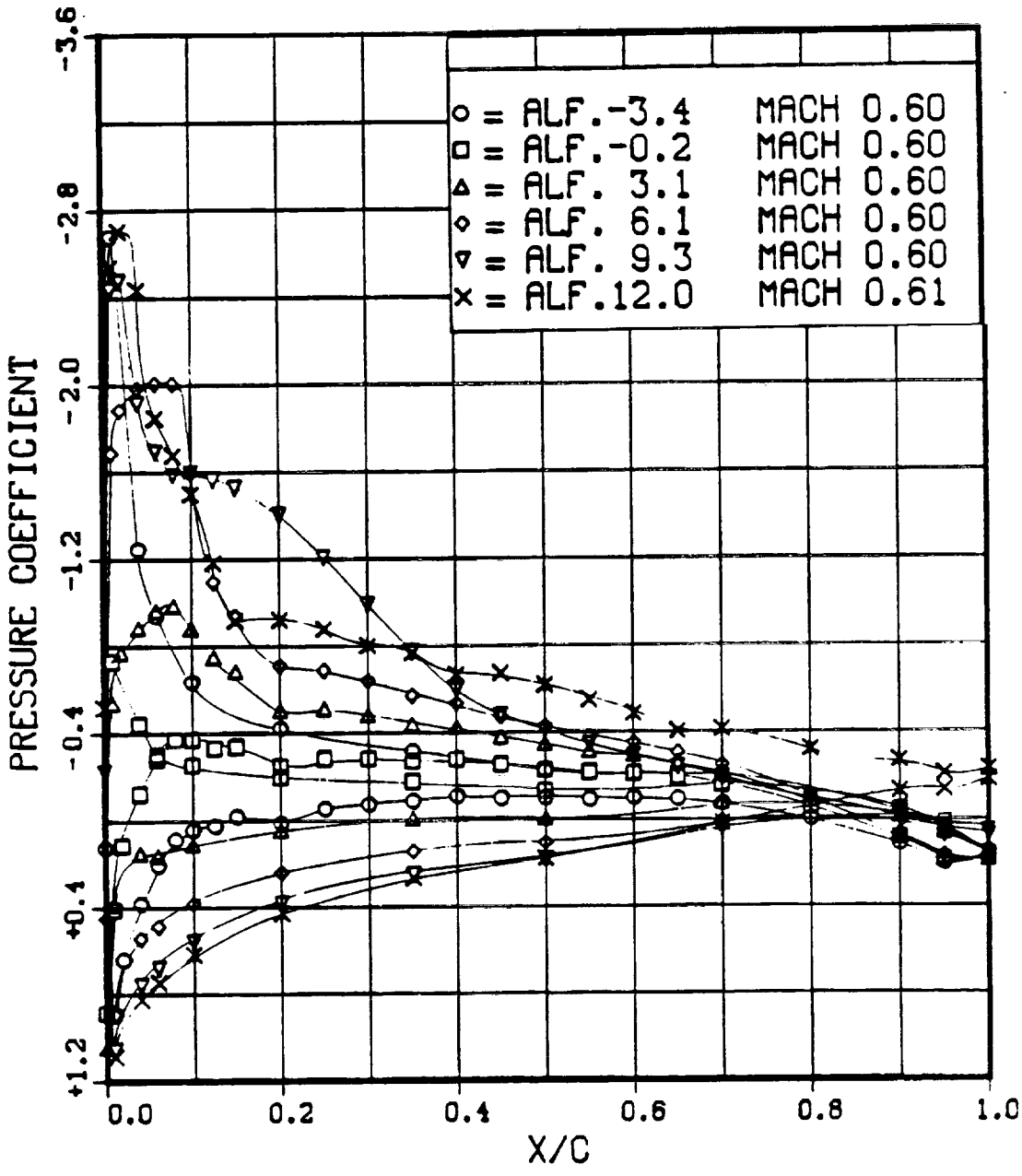
(c) M = 0.80

Figure 29.-Concluded.



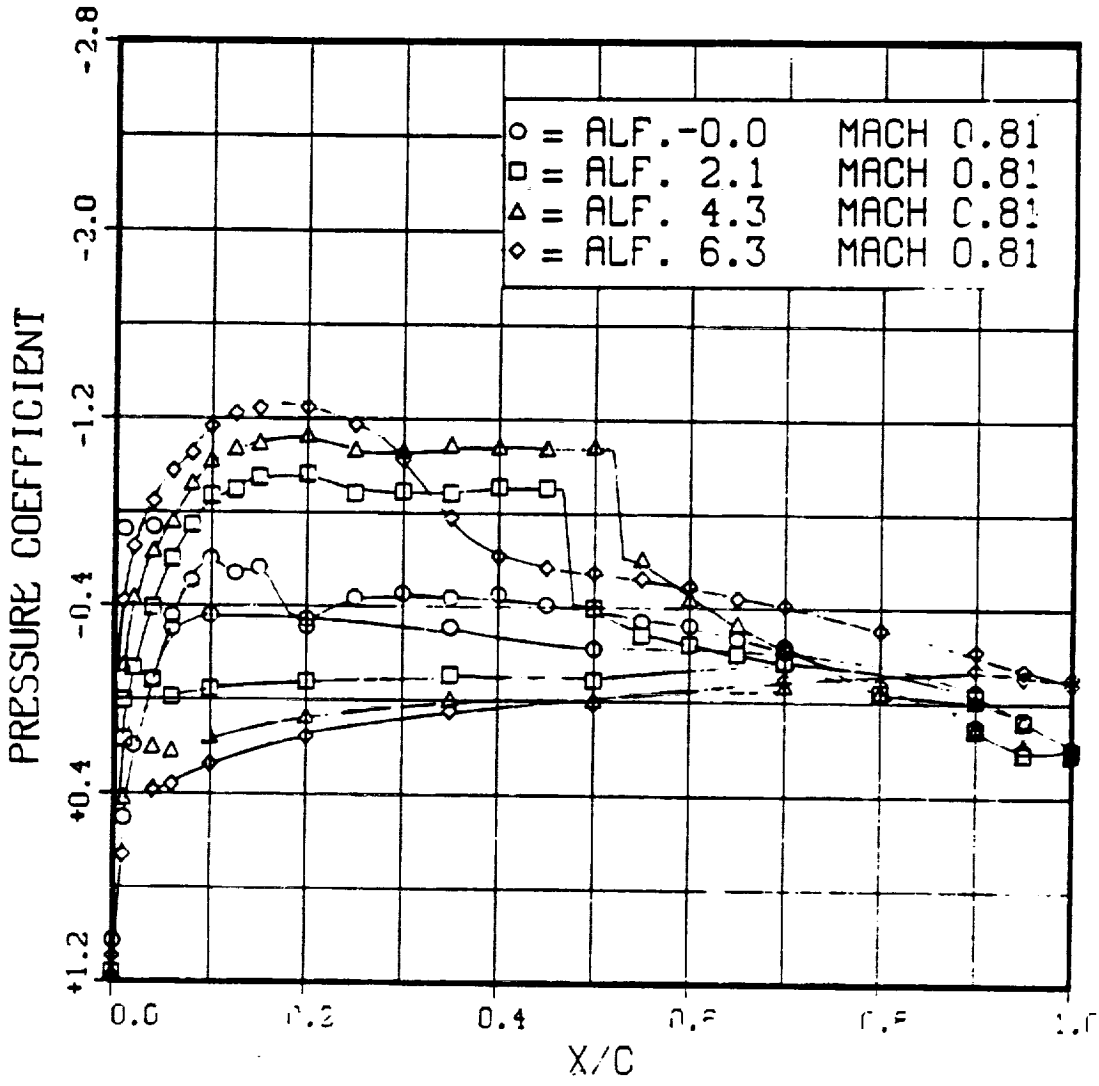
(a) M = 0.40

Figure 30.-Pressure coefficient distribution for the SSC-B08 airfoil.



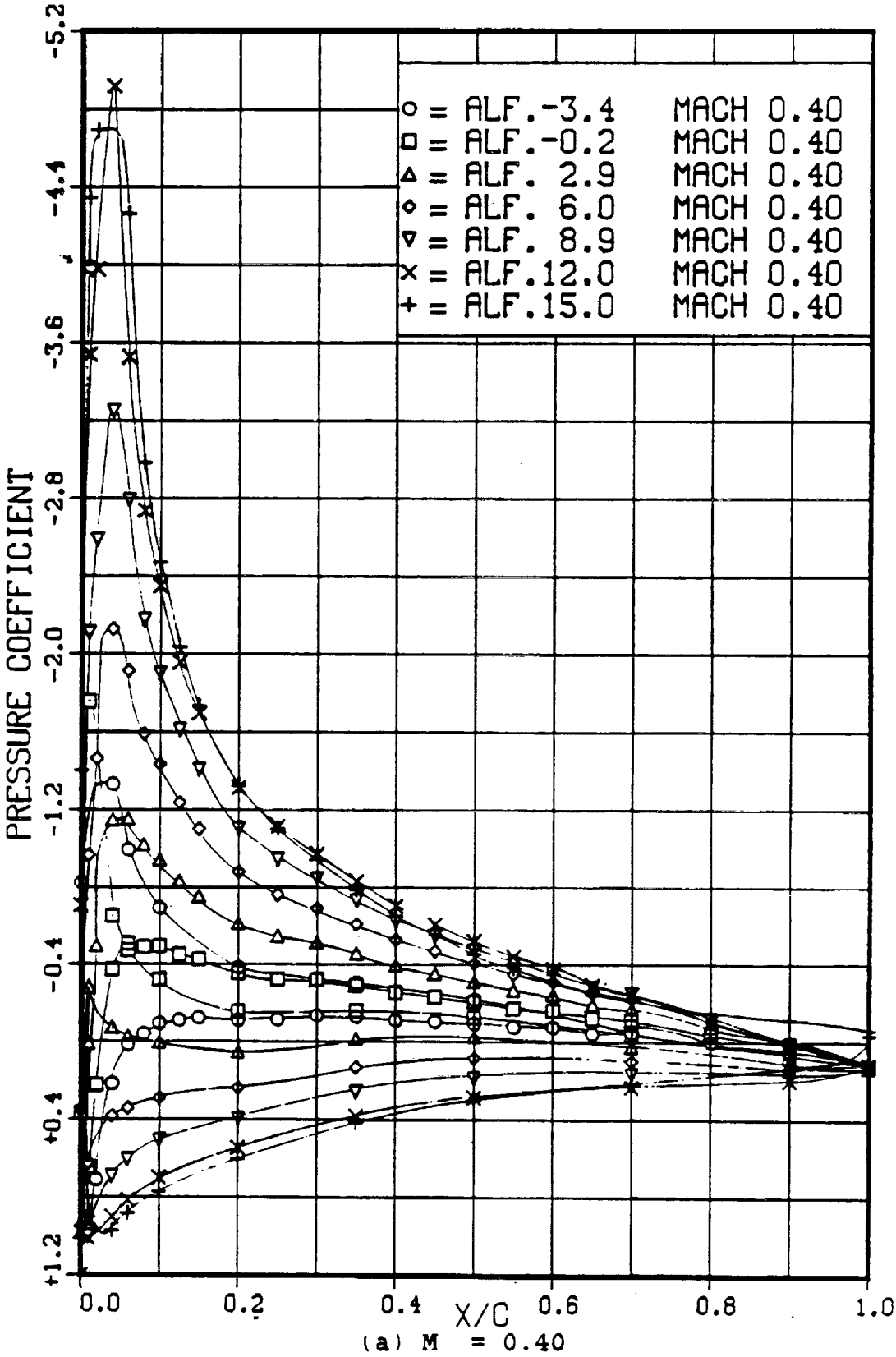
(b) M = 0.60

Figure 30.-Continued.



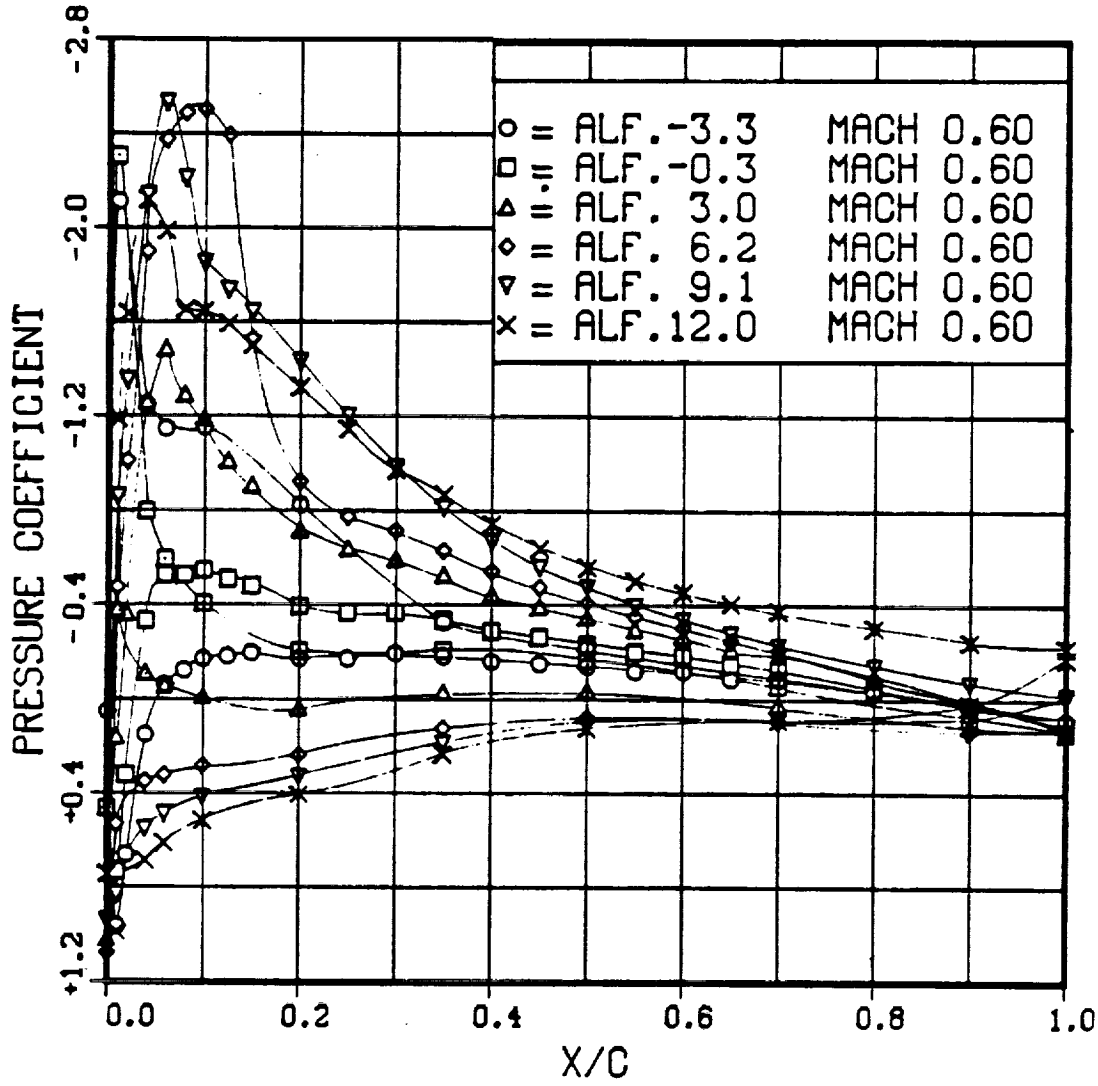
(c) M = 0.80

Figure 30. Concluded



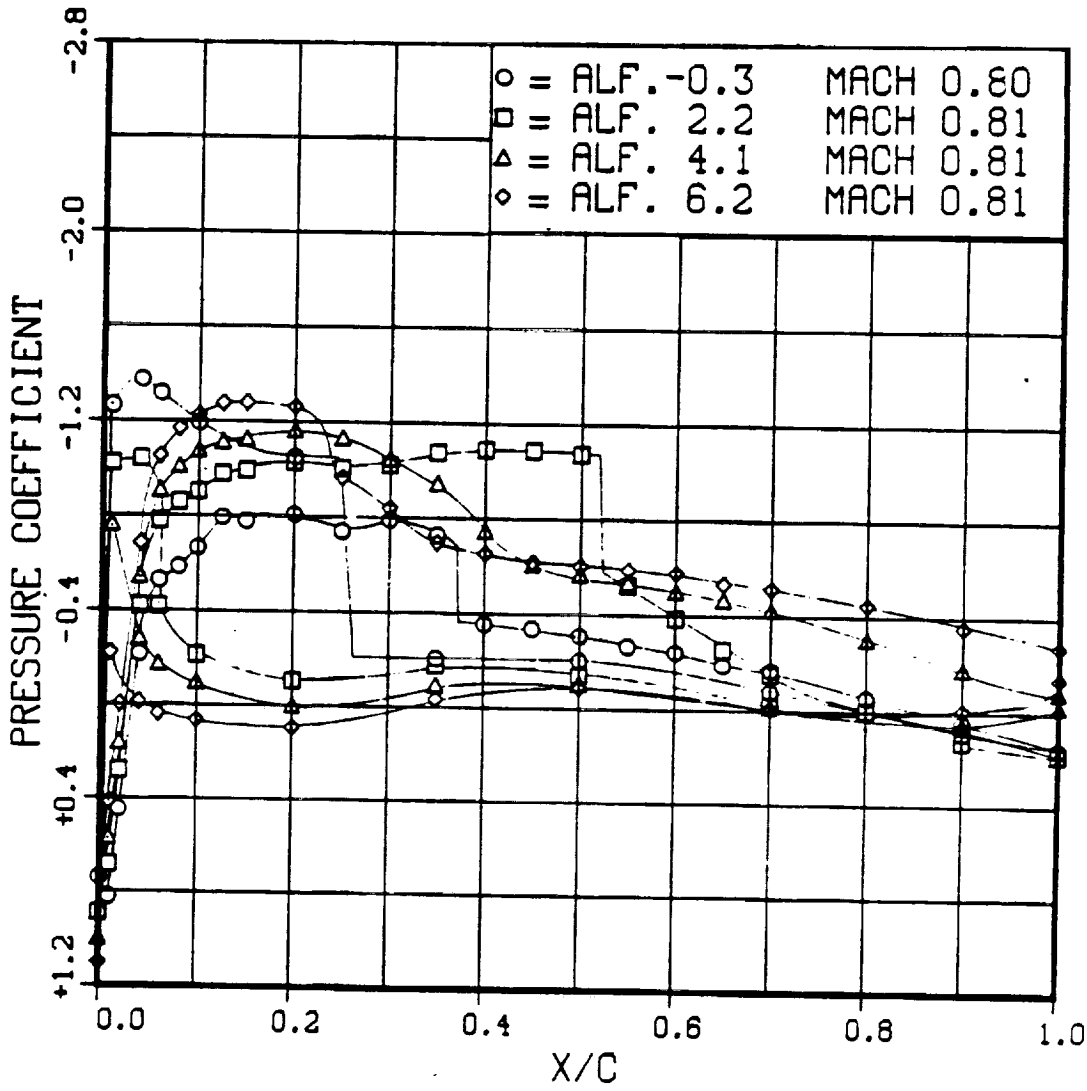
(a) M = 0.40

Figure 31.-Pressure coefficient distribution for the SC1094 R8 airfoil



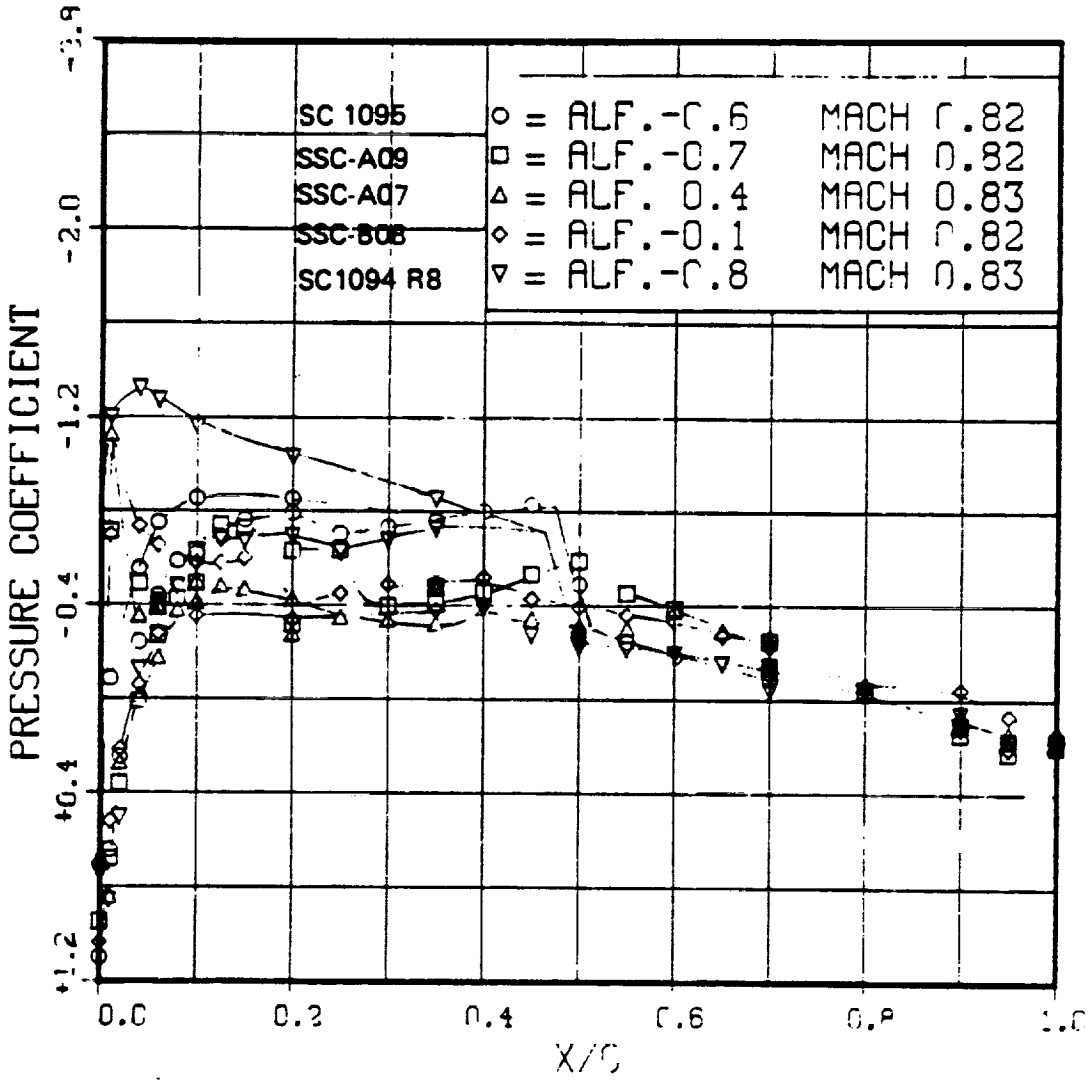
(b) M = 0.60

Figure 31.-Continued.



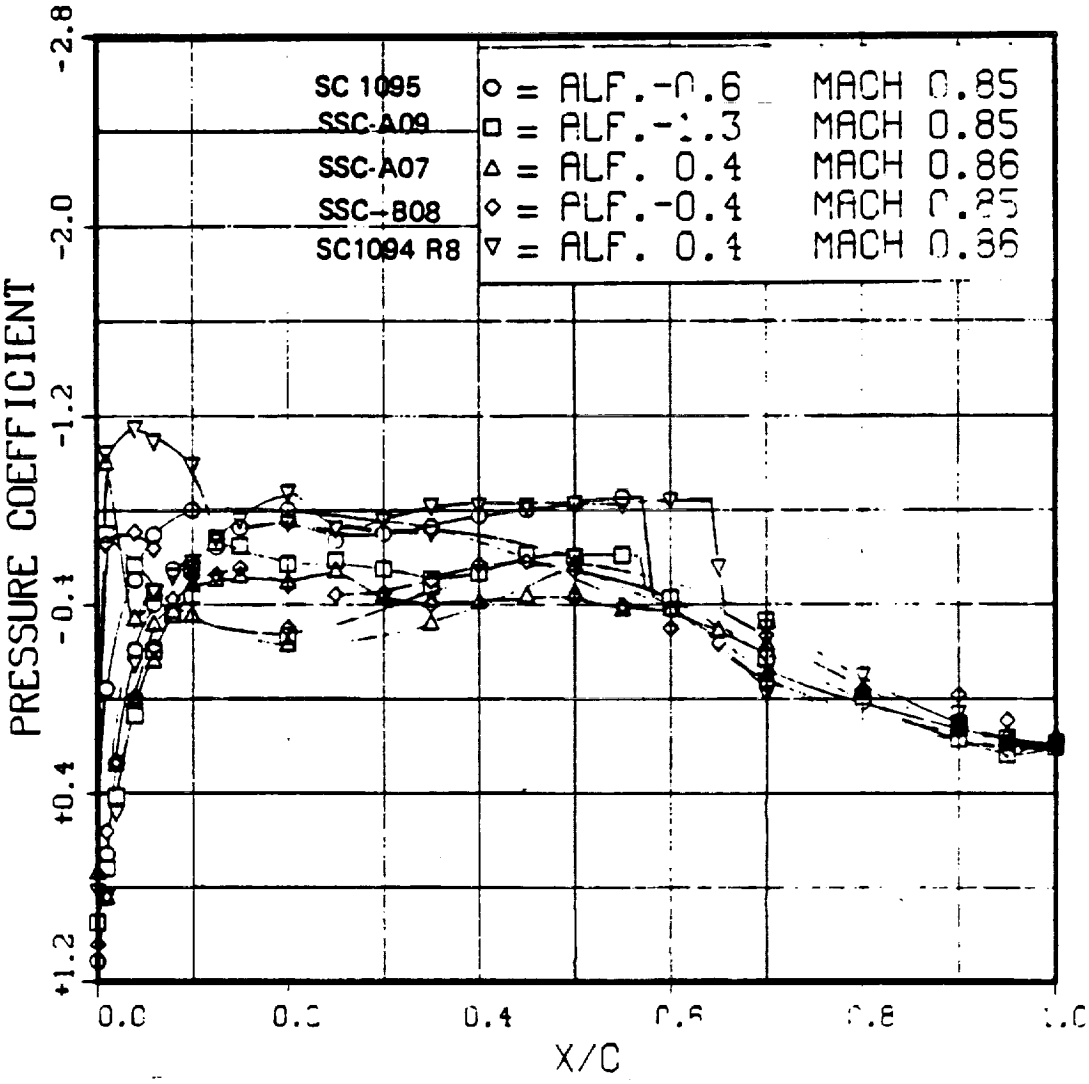
(c) M = 0.80

Figure 31.–Concluded.



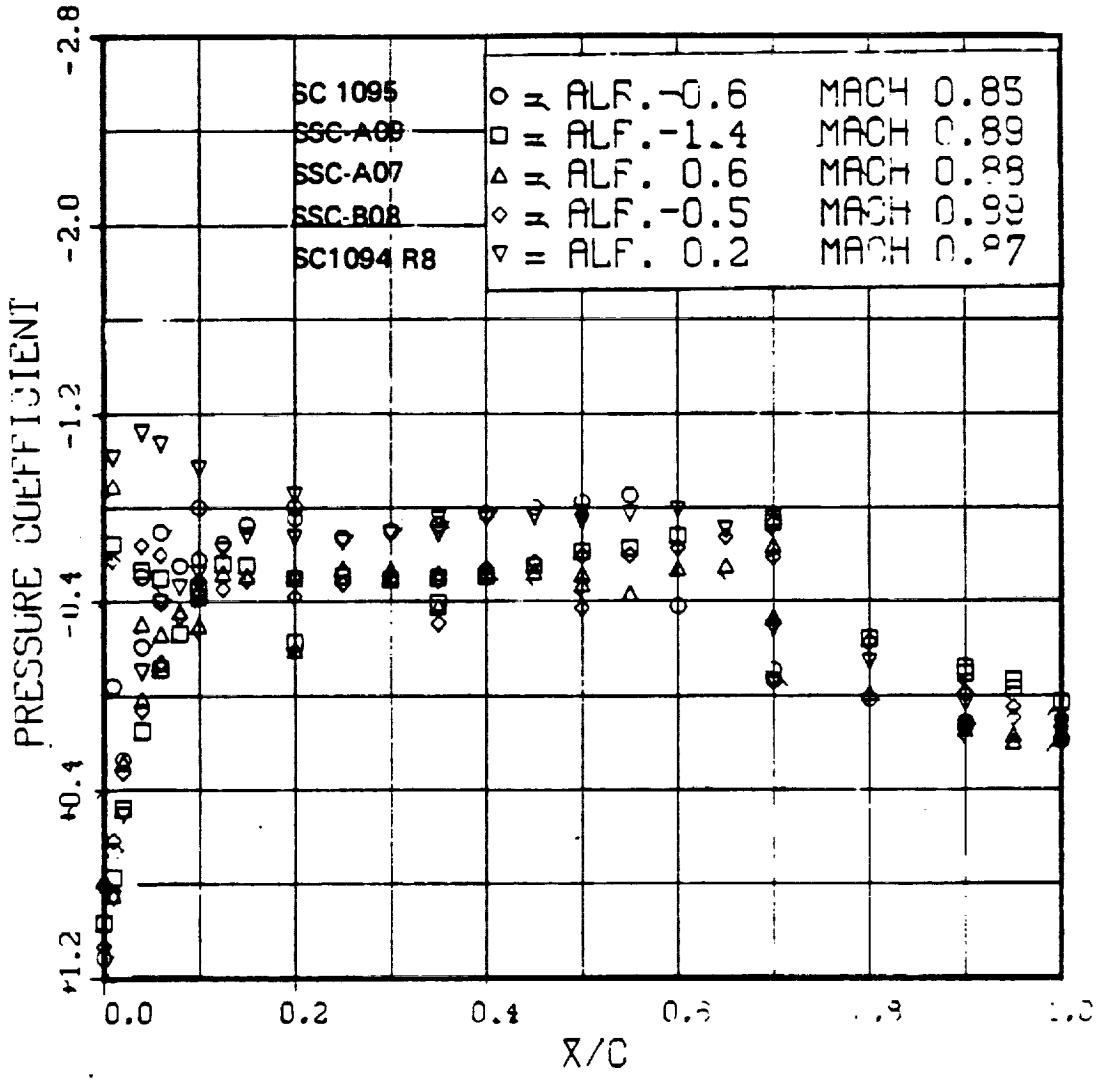
(a) M = .825

Figure 32.— Pressure coefficient distribution for low lift at high Mach numbers



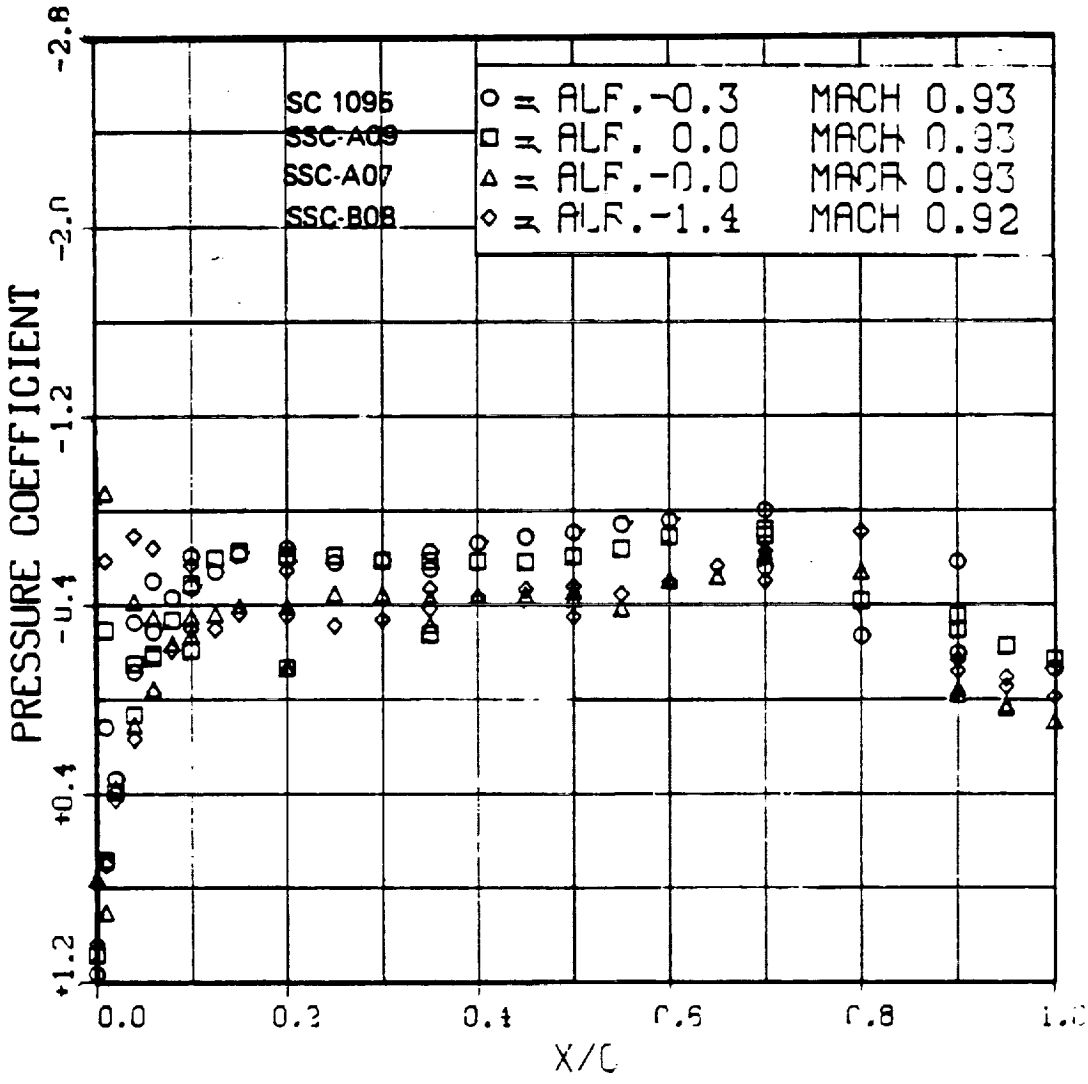
(b) M = .85

Figure 32.-Continued.



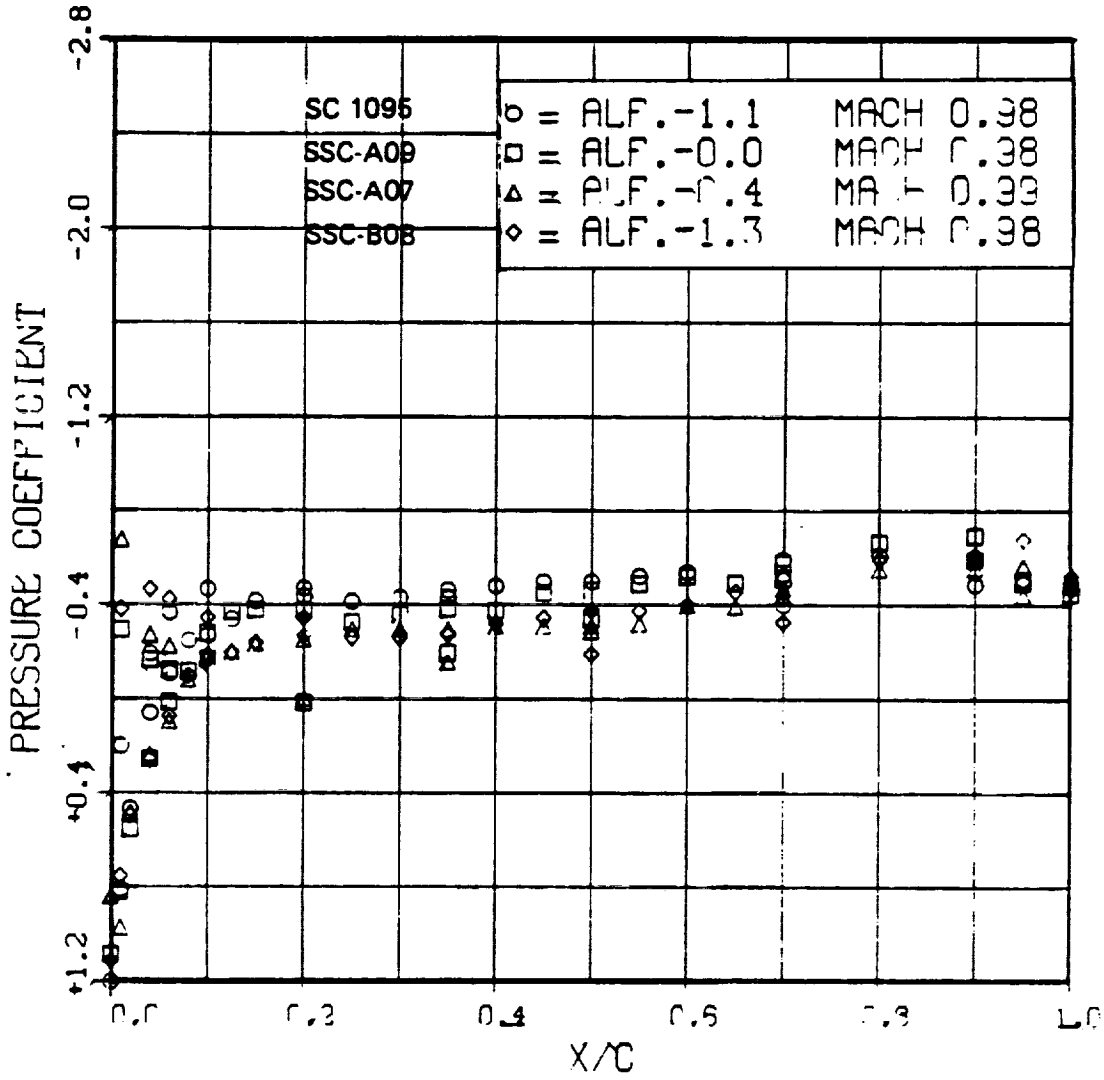
(c) M = .88

Figure 32.- Continued.



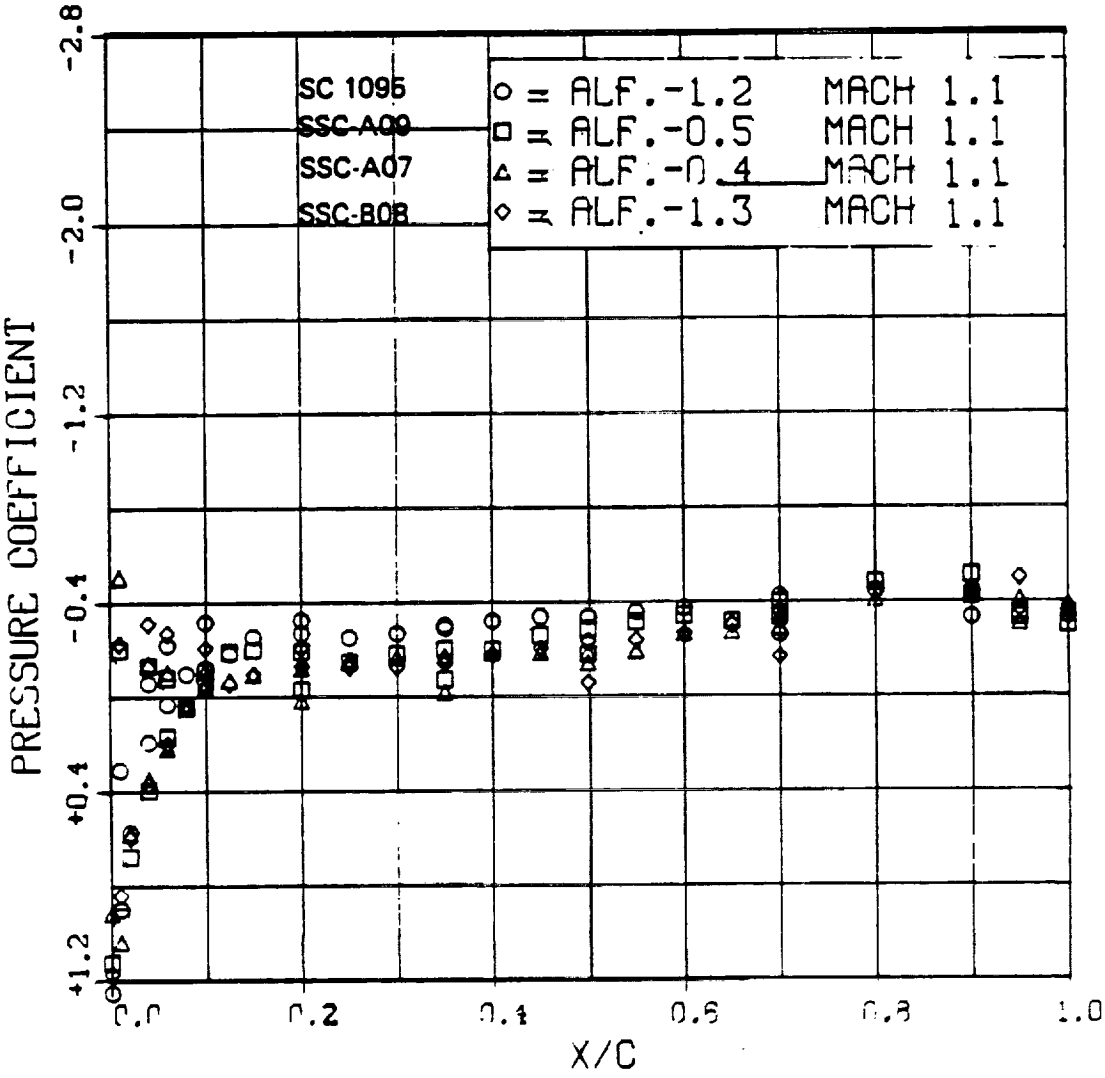
(d) M = .90

Figure 32.—Continued.



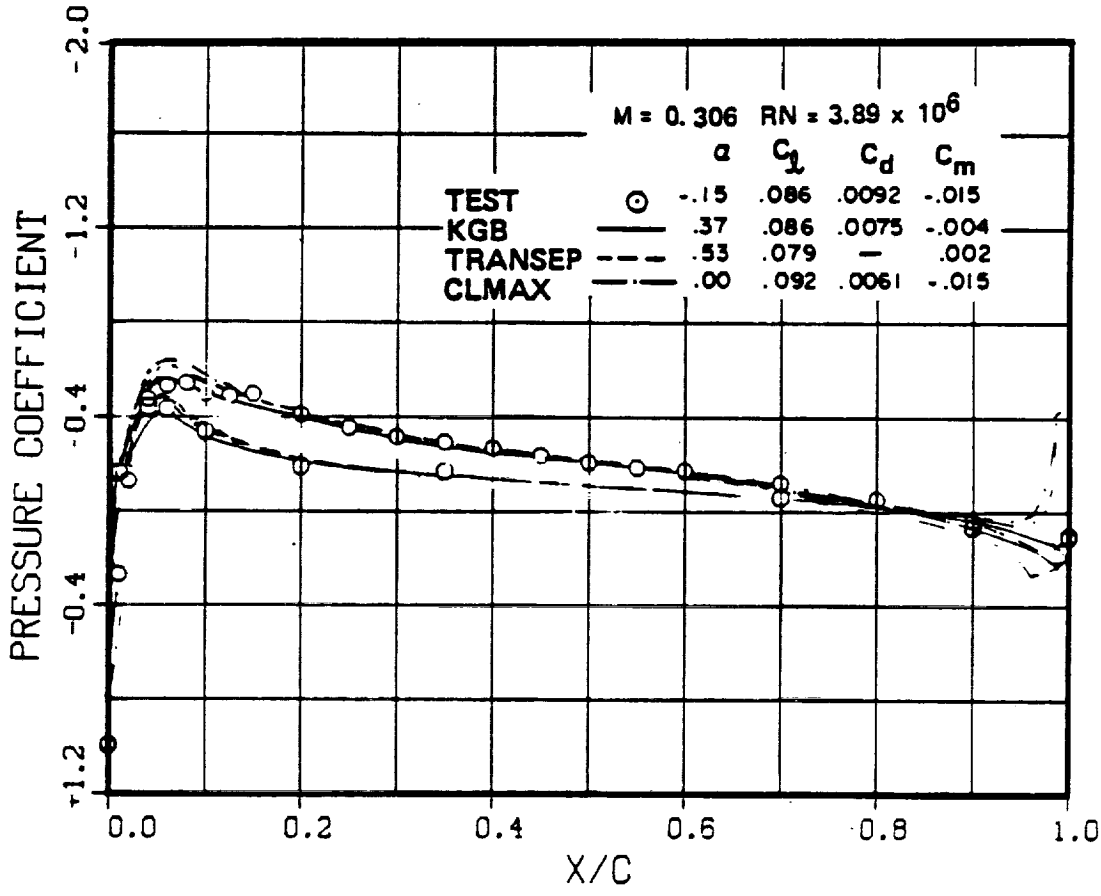
(e) M = .98

Figure 32.—Continued.



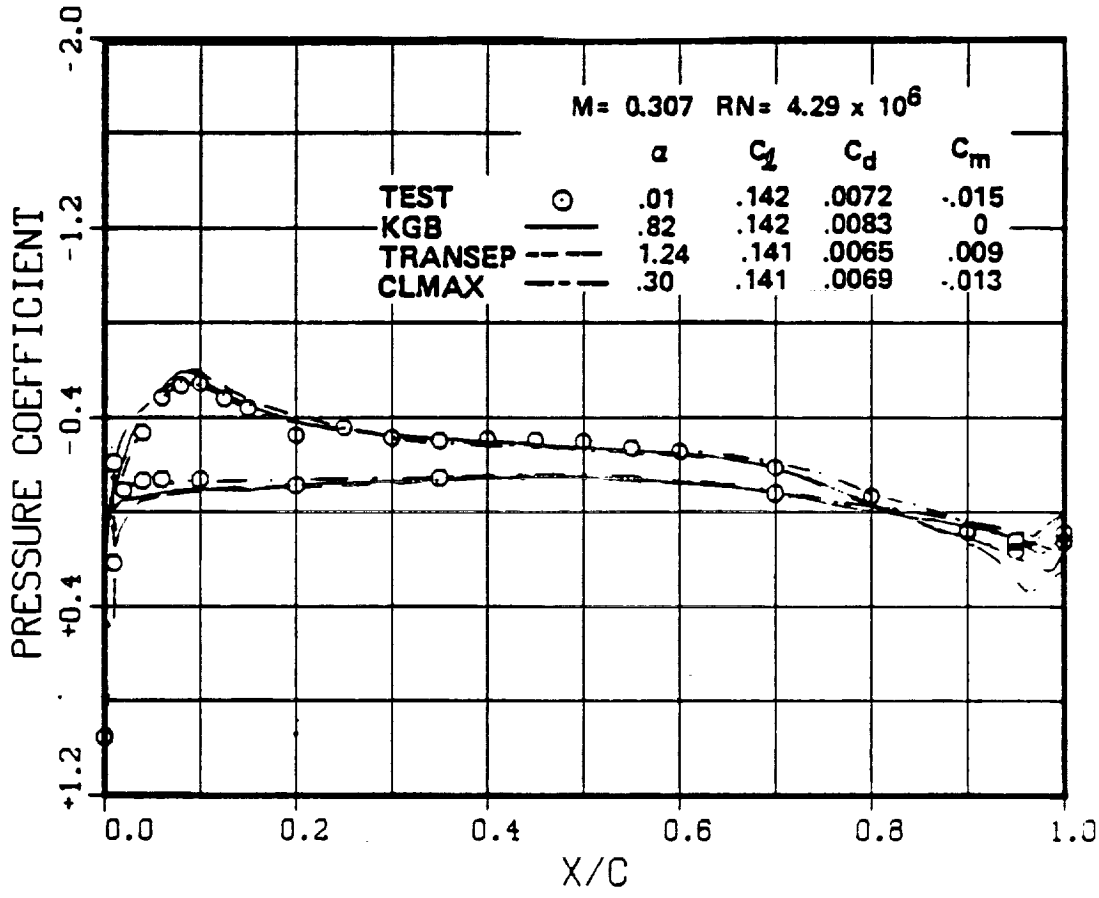
(f) M = 1.07

Figure 32.—Concluded.



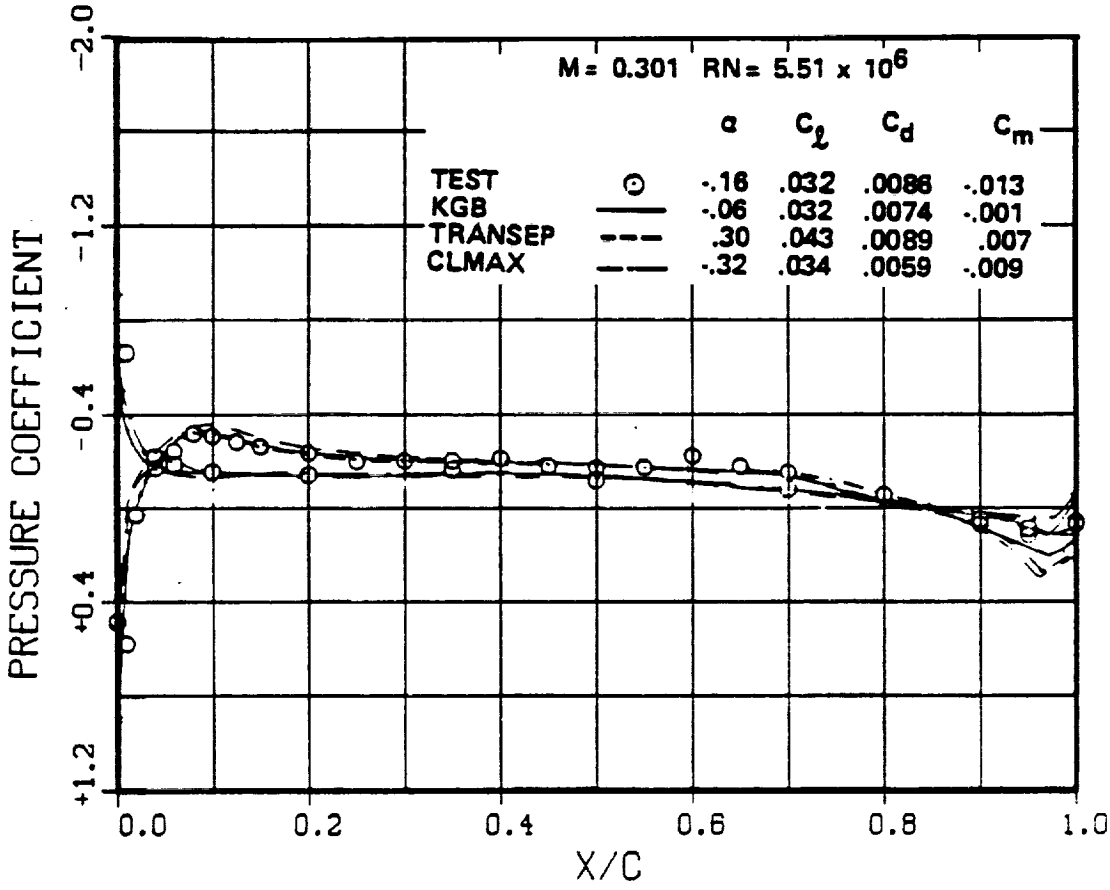
(a) SC1095

Figure 33. – Pressure coefficient correlation, M = 0.30, C_l = 0.



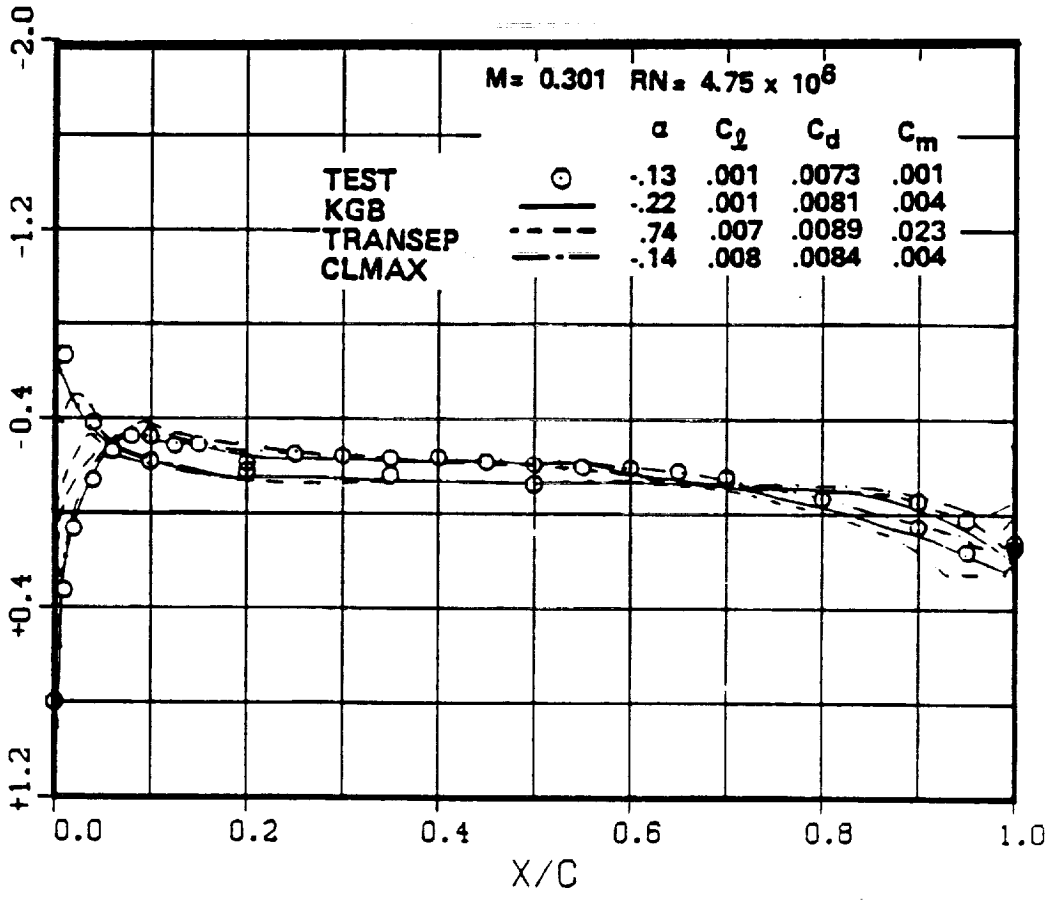
(b) SSC-A09

Figure 33.-Continued.



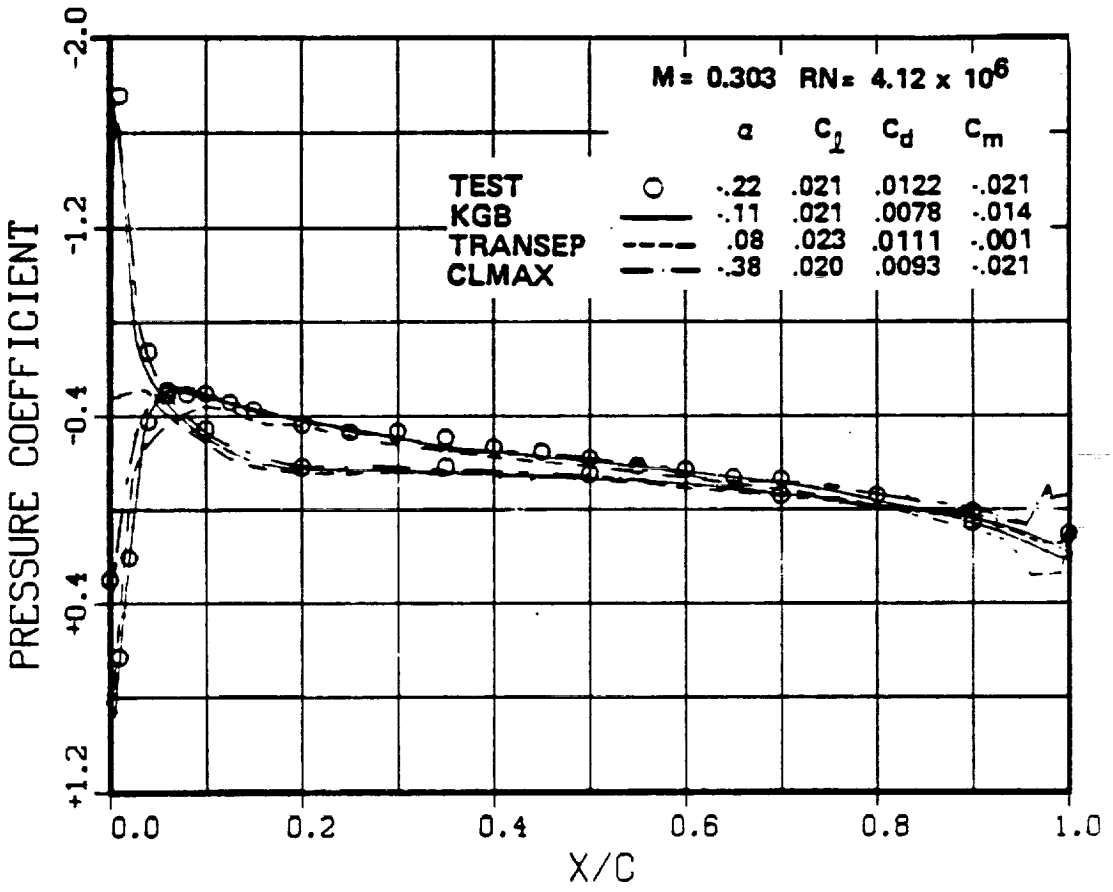
(c) SSC-A07

Figure 33.– Continued.



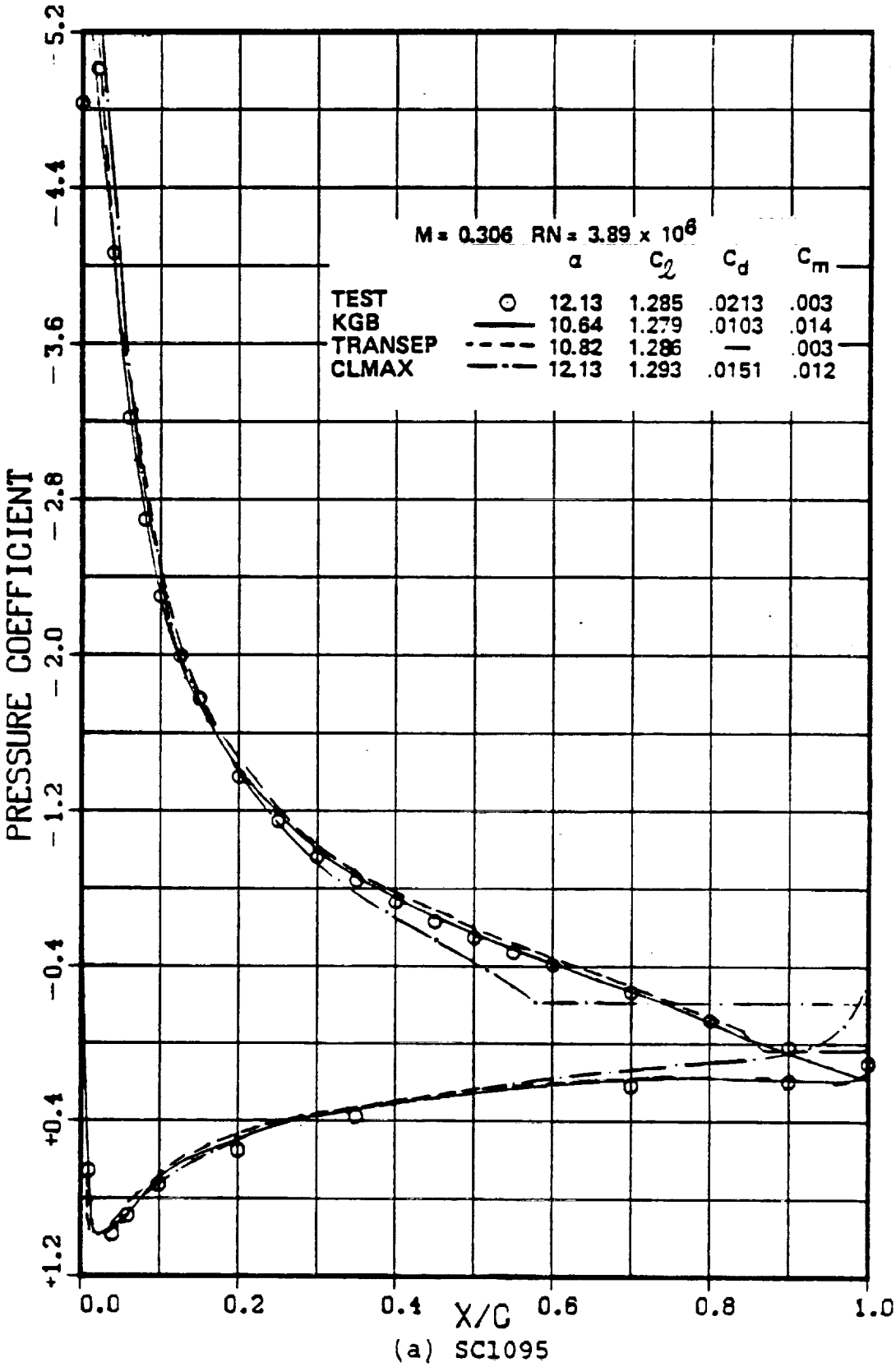
(d) SSC-B08

Figure 33.—Continued.



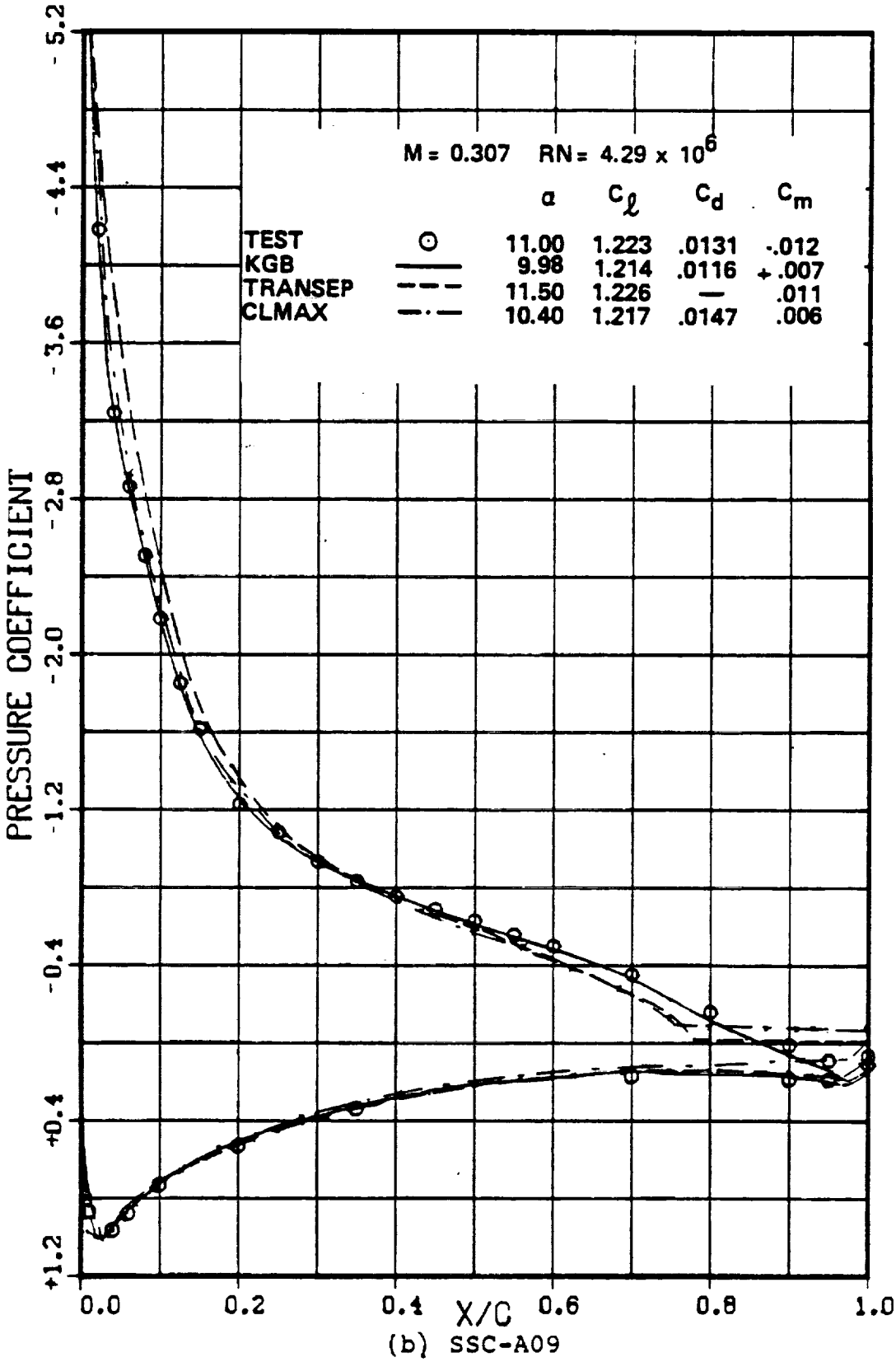
(e) SC1094 R8

Figure 33.- Concluded.



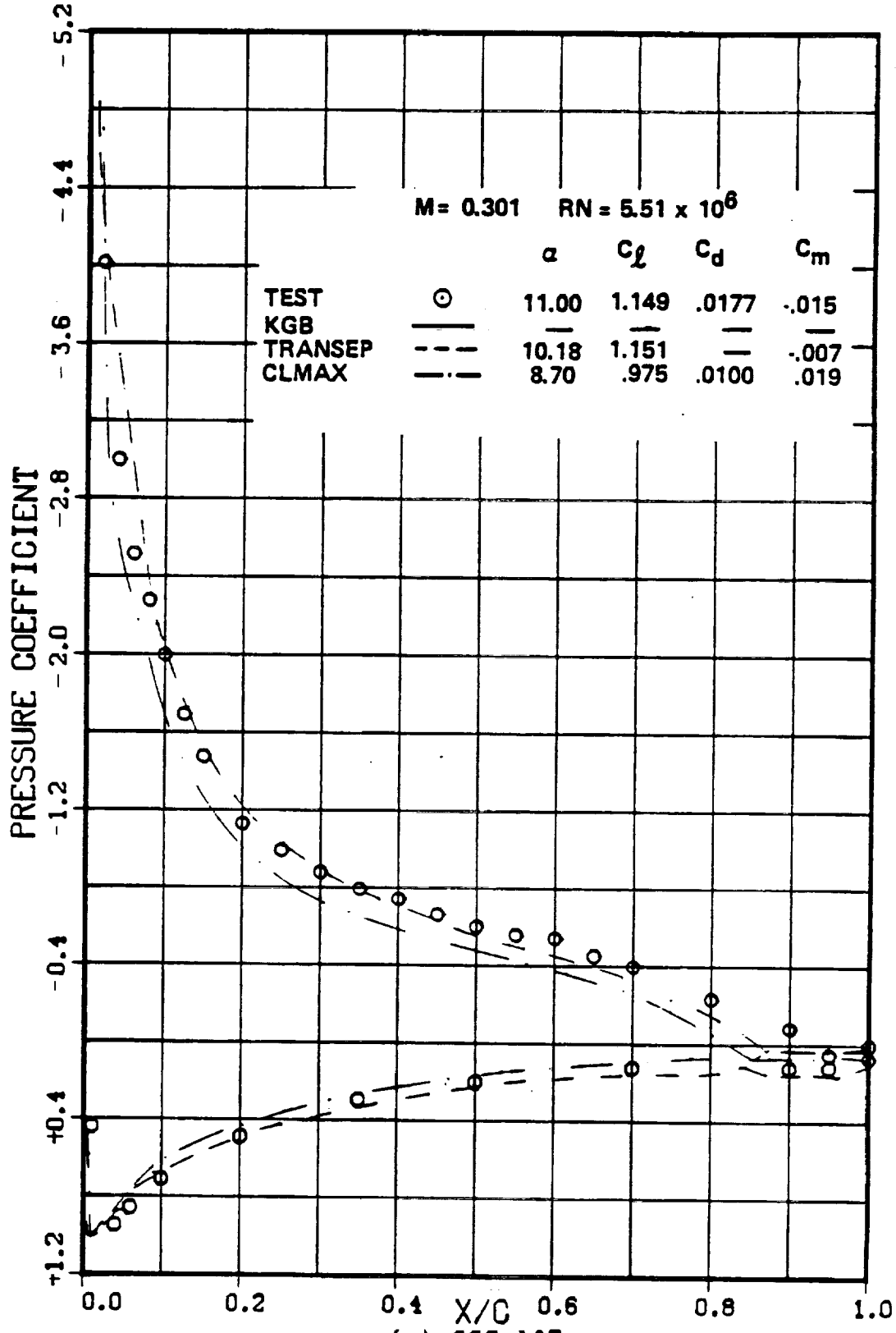
(a) SC1095

Figure 34.—Pressure coefficient correlation, M = 0.30, C_l = 1.2.



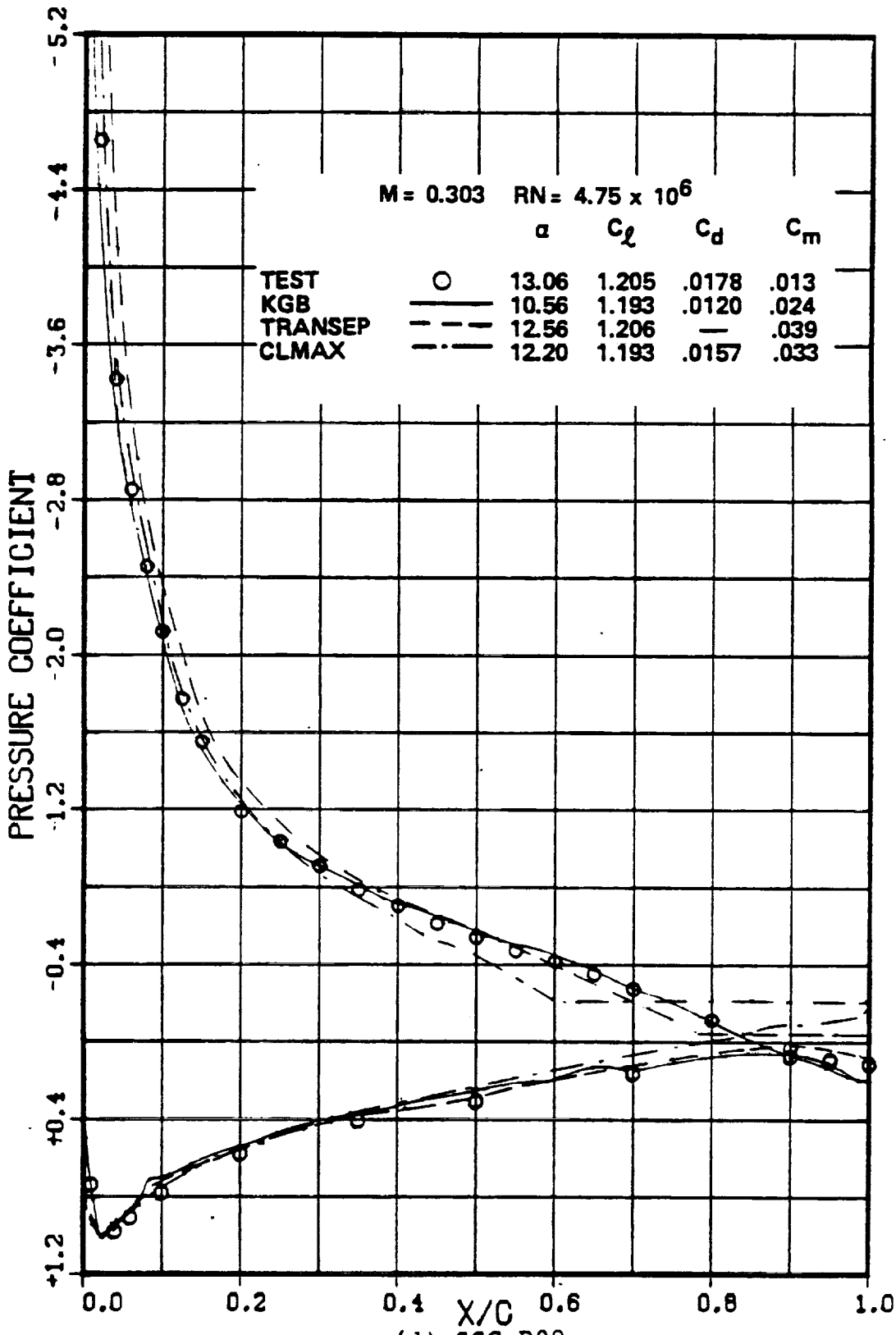
(b) SSC-A09

Figure 34.—Continued.



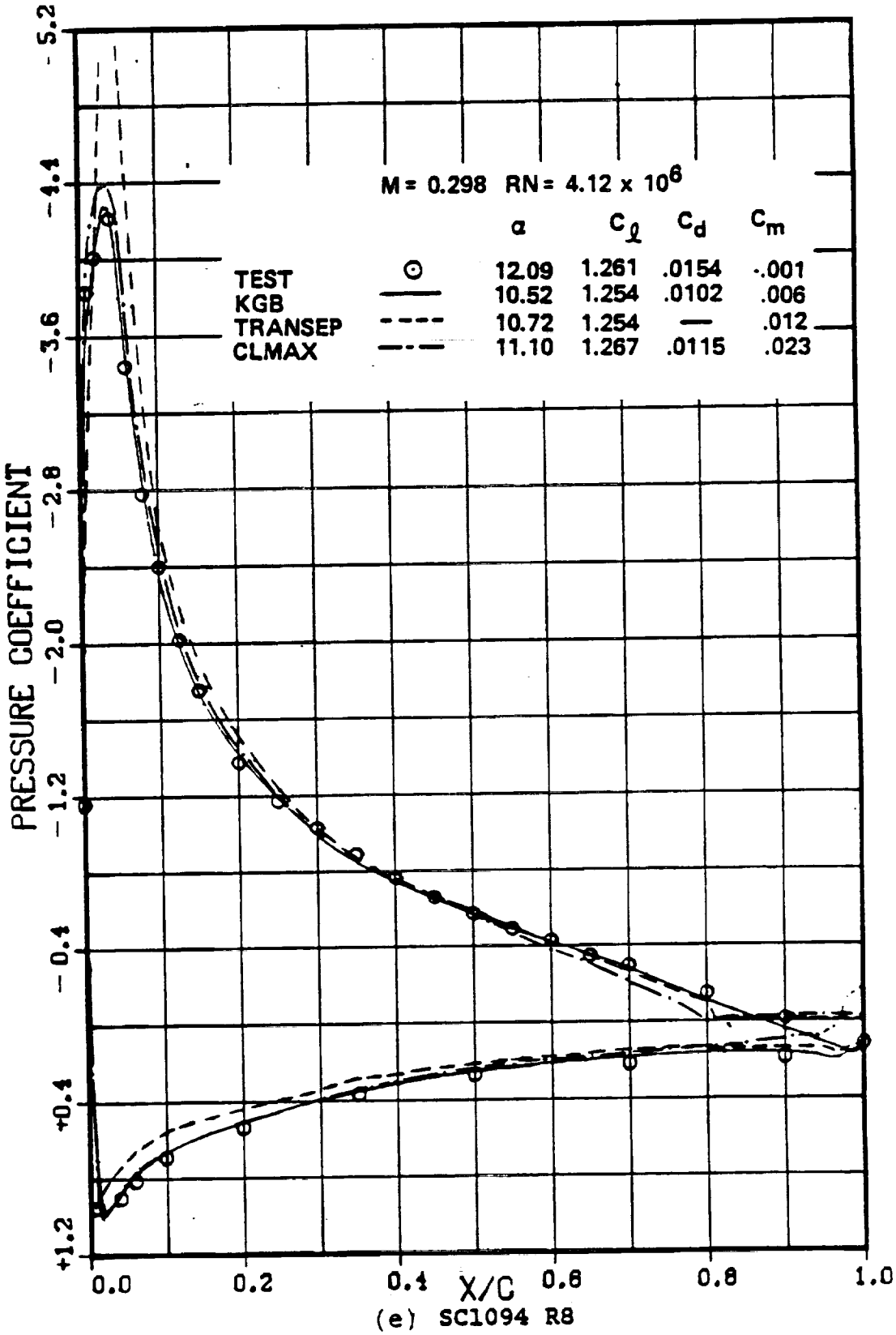
(c) SSC-A07

Figure 34.-Continued.



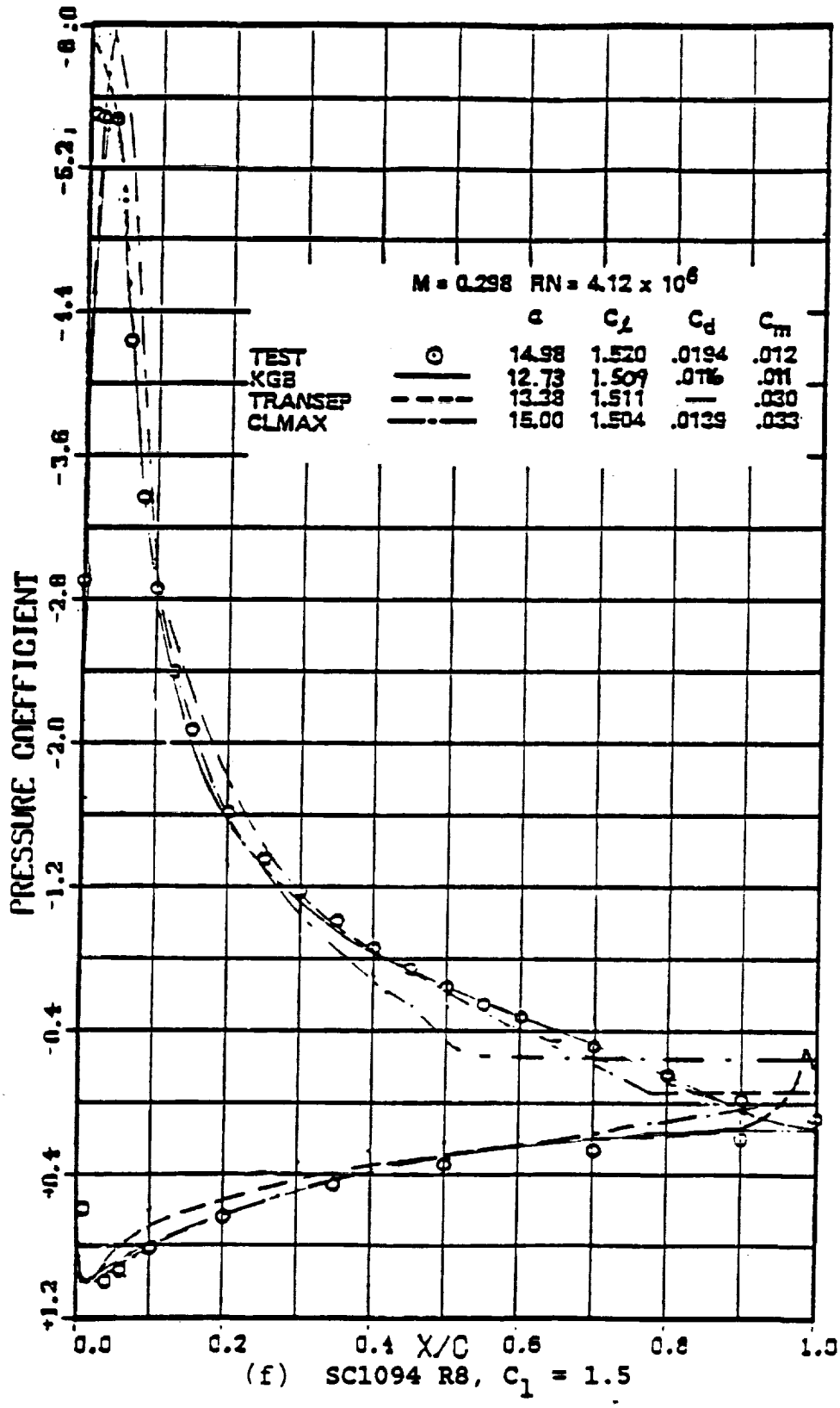
(d) SSC-B08

Figure 34.-Continued.



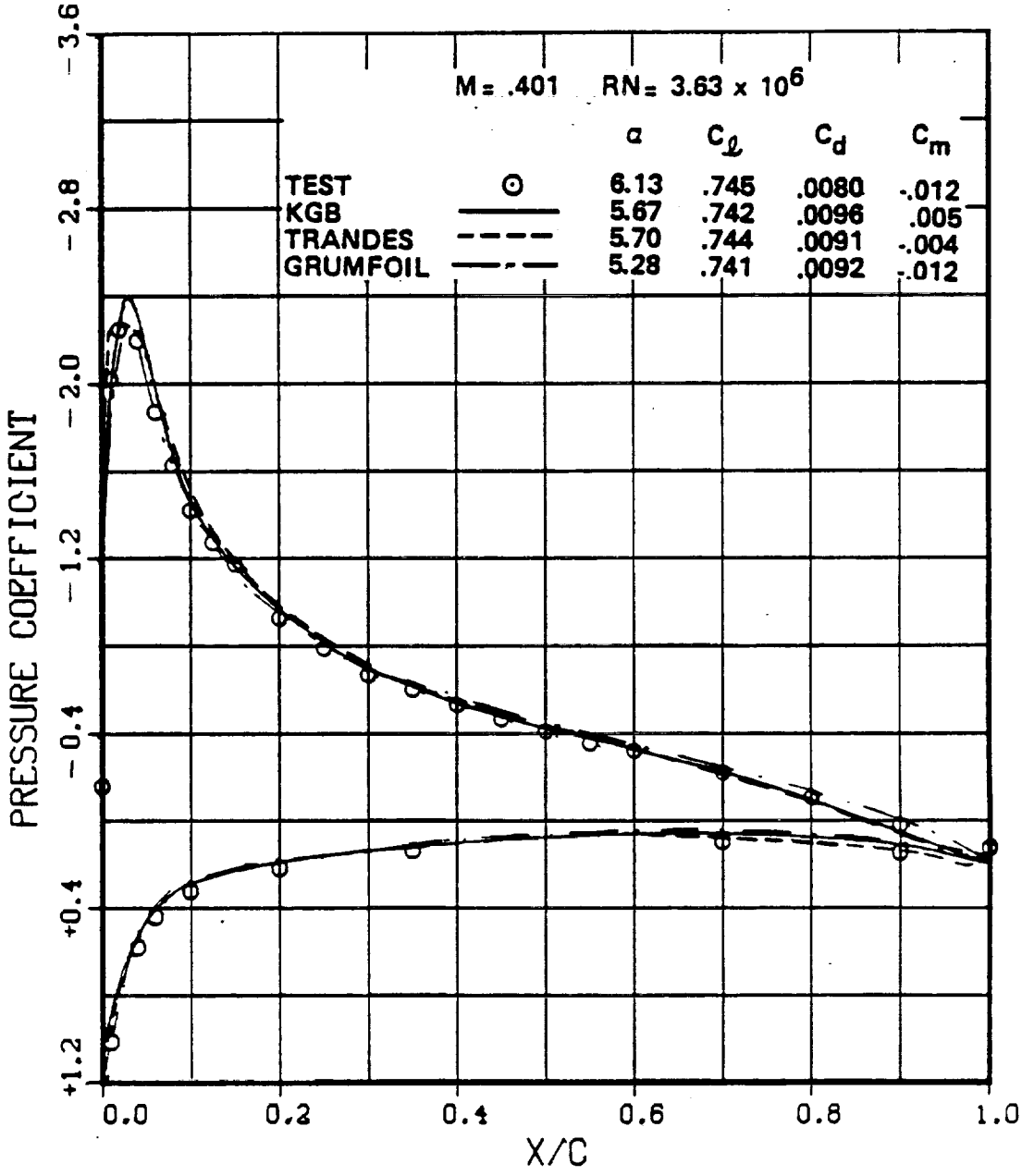
(e) SC1094 R8

Figure 34.—Continued.



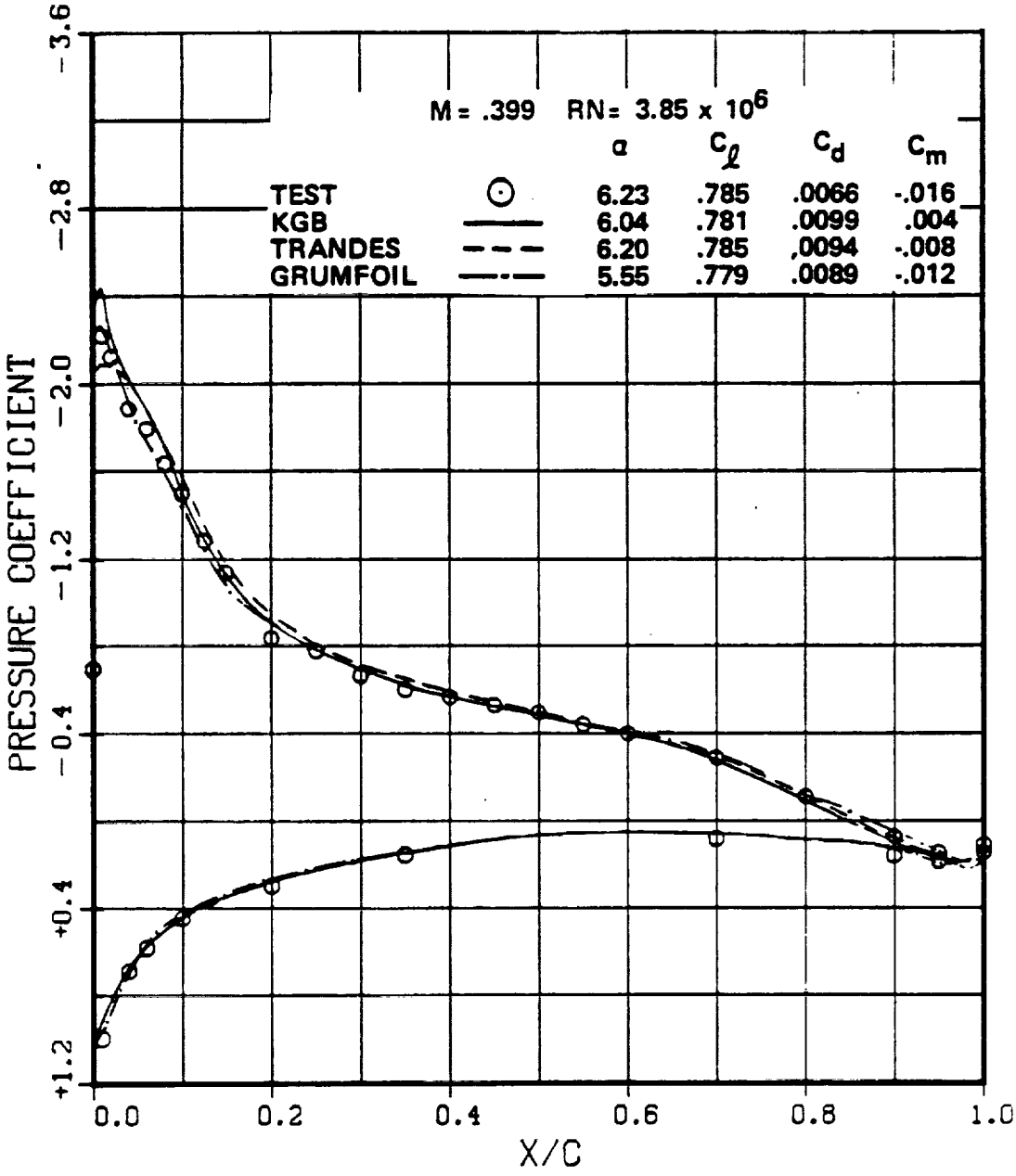
(f) SC1094 R8, C_l = 1.5

Figure 34.– Concluded.



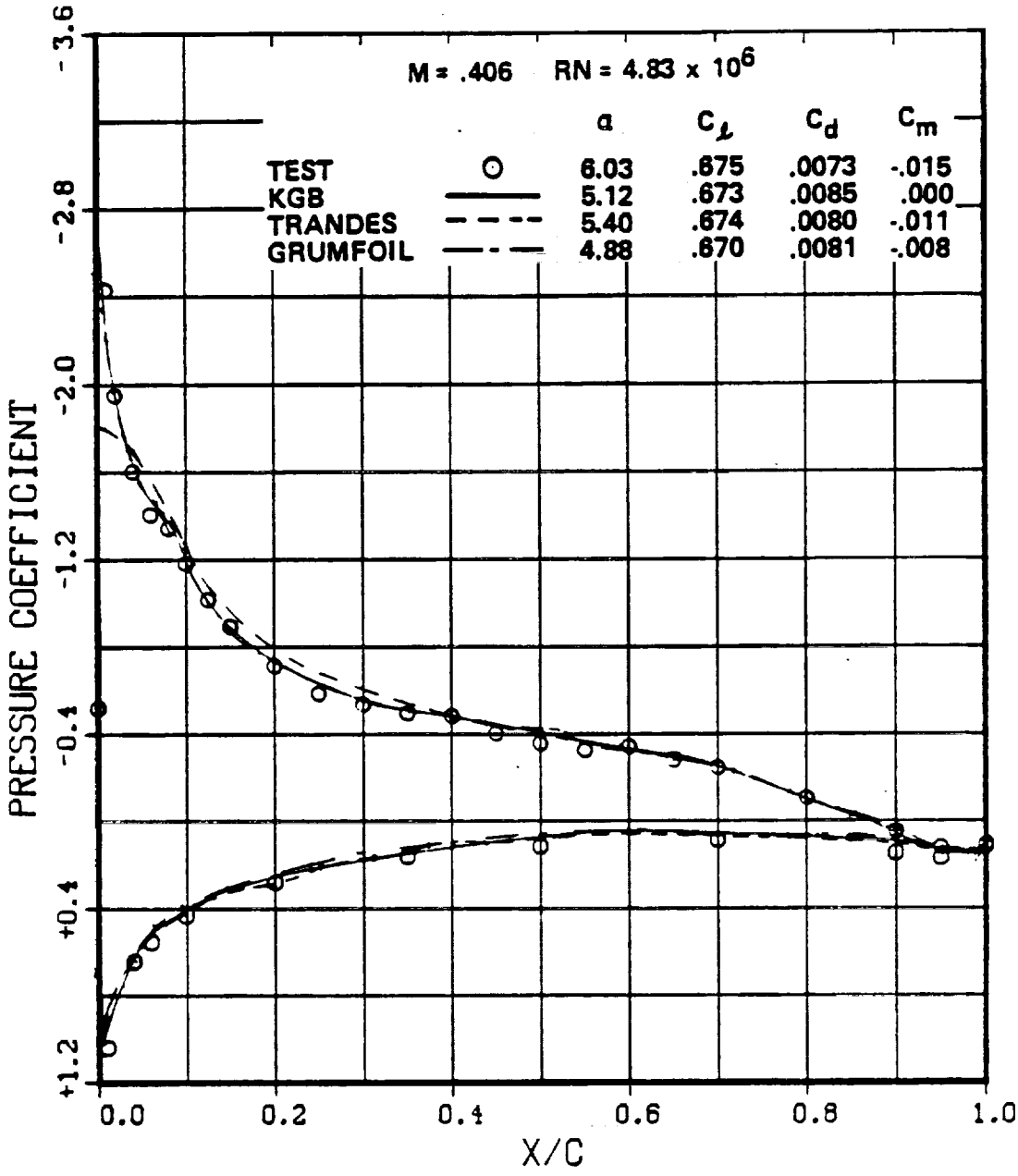
(a) SC1095

Figure 35.– Pressure coefficient correlation, M = 0.4, C_l = .7.



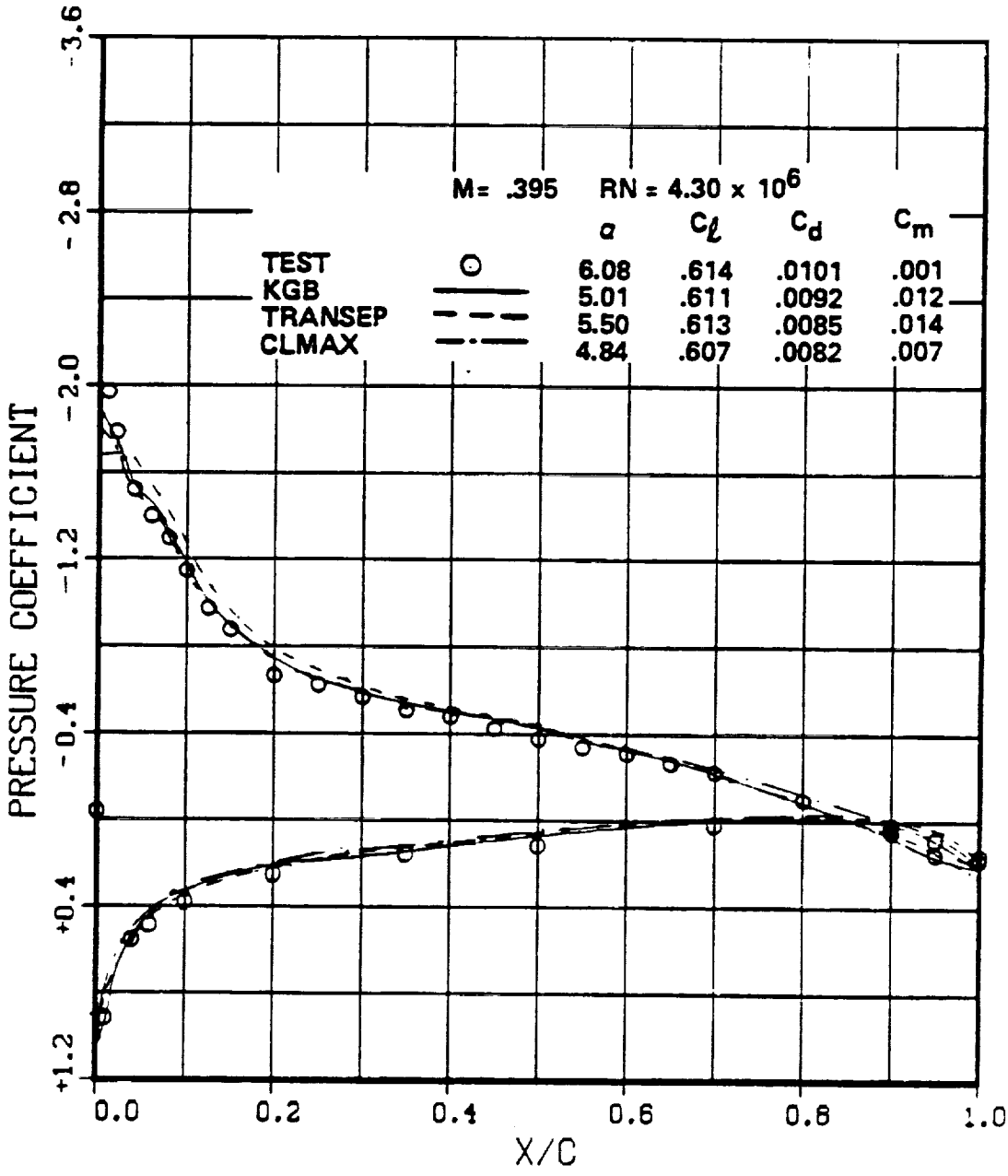
(b) SSC-A09

Figure 35.— Continued.



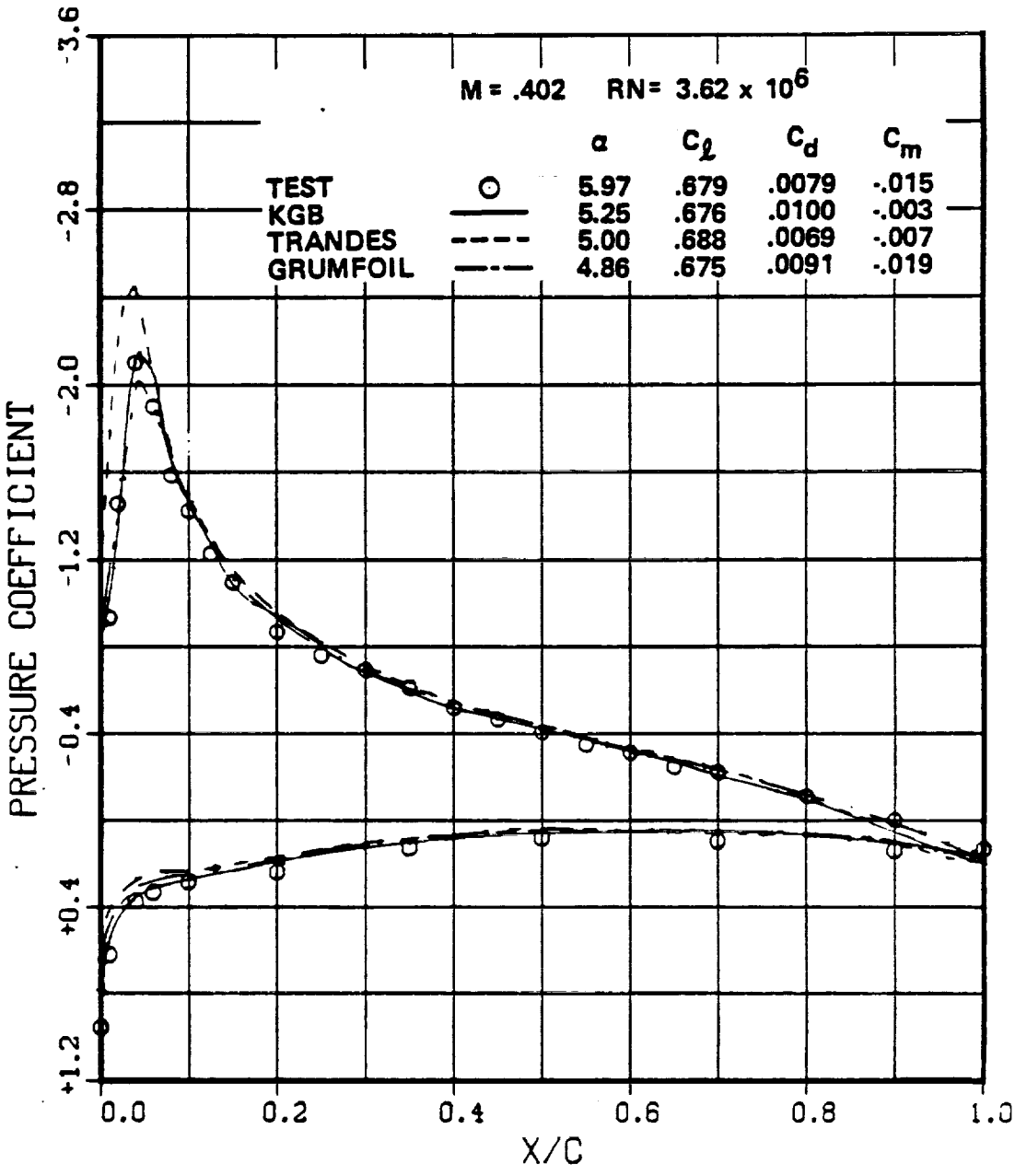
(c) SSC-A07

Figure 35.– Continued.



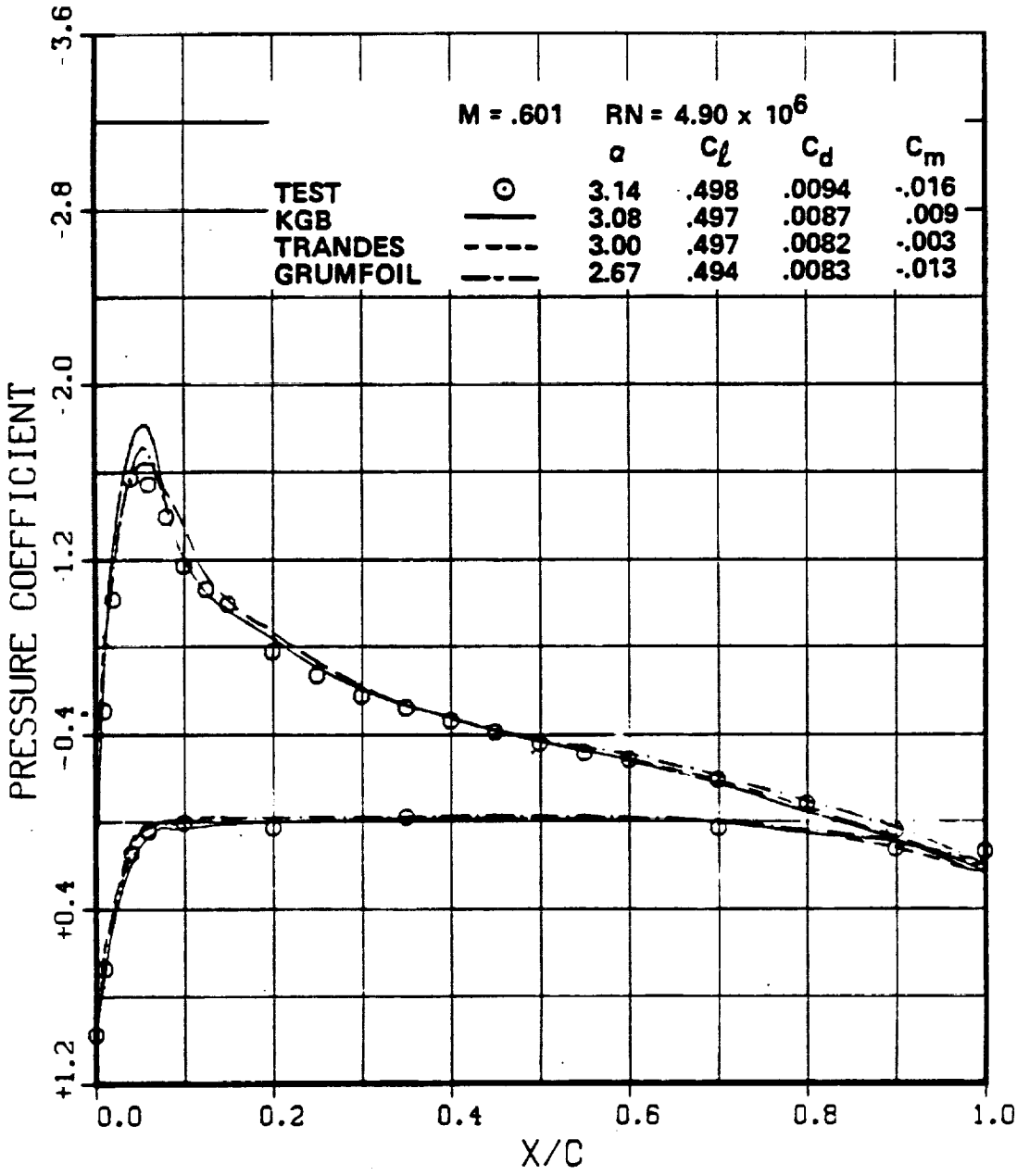
(d) SSC-B08

Figure 35.- Continued.



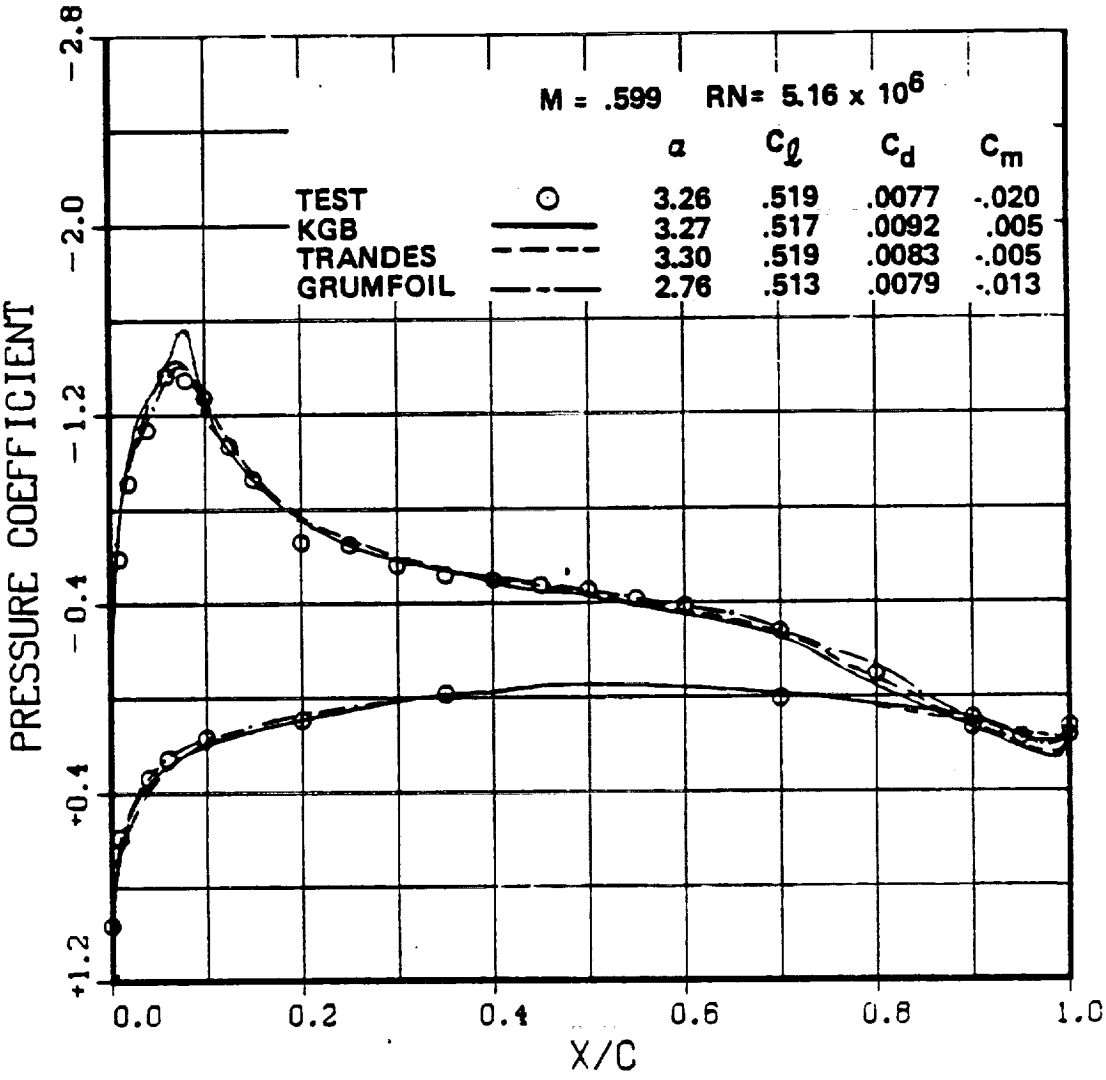
(e) SC1094 R8

Figure 35.—Concluded.



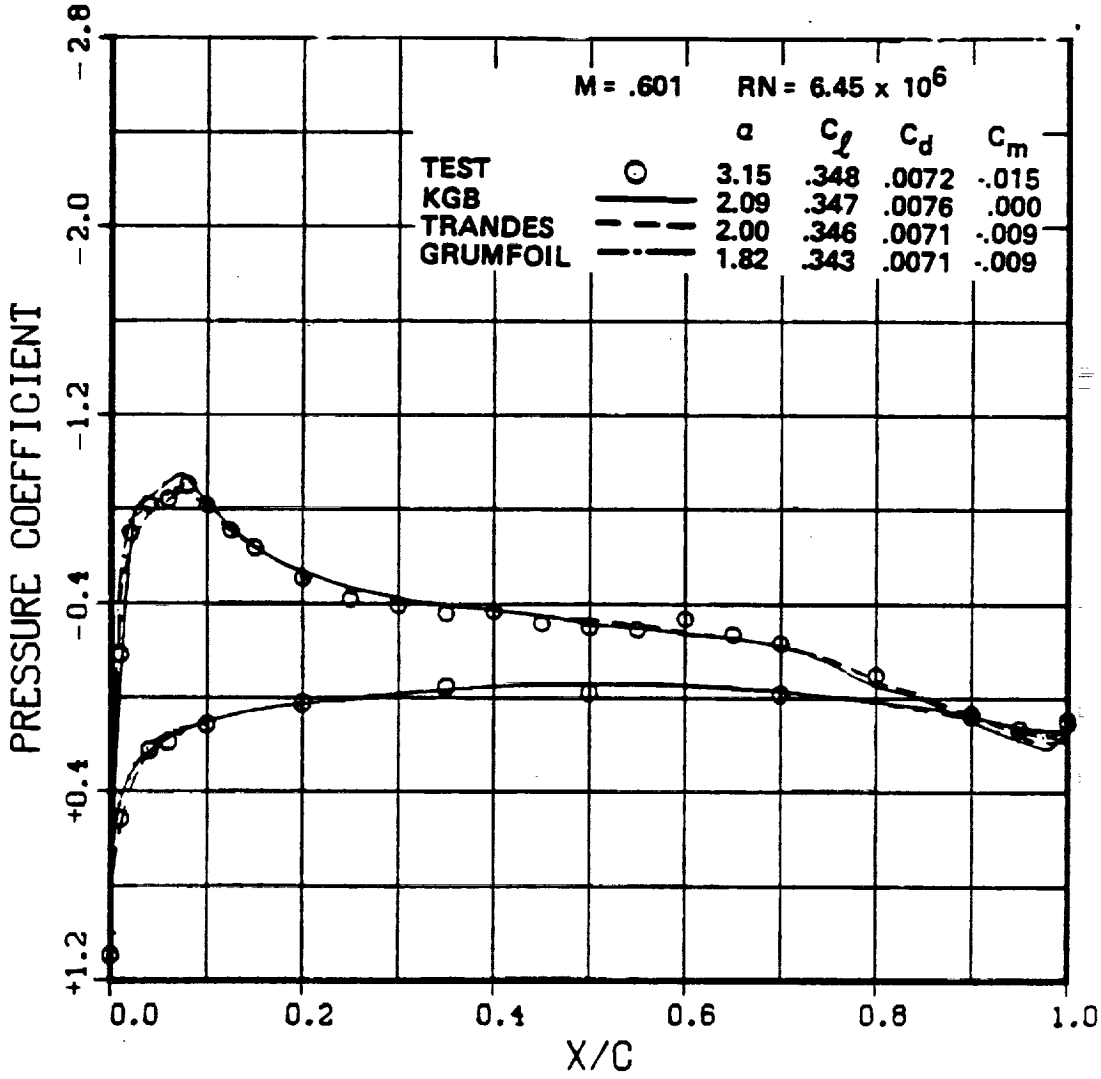
(a) SC1095

Figure 36.– Pressure coefficient correlation, M = 0.6, C_l = .4.



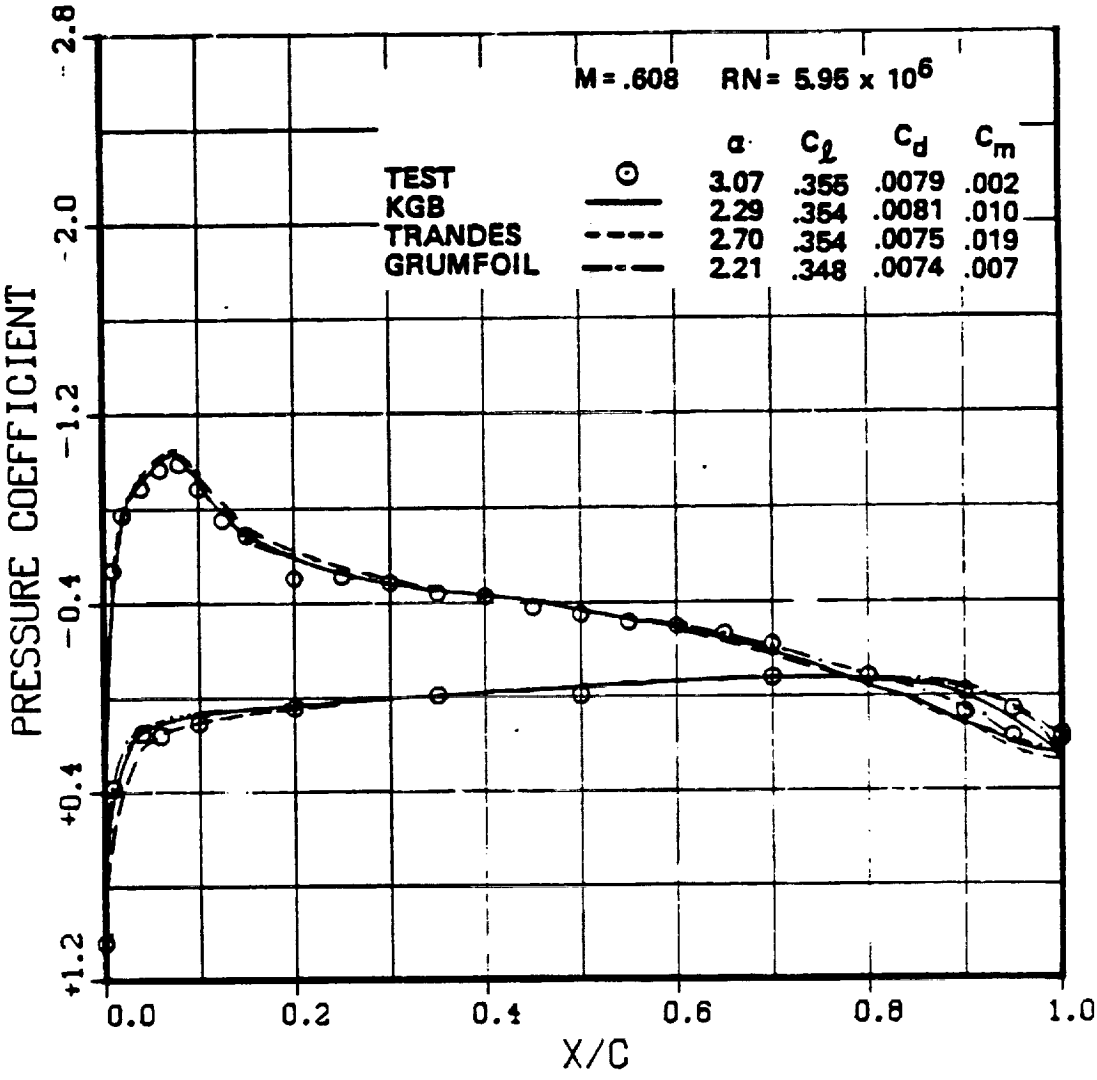
(b) SSC-A09

Figure 36. – Continued.



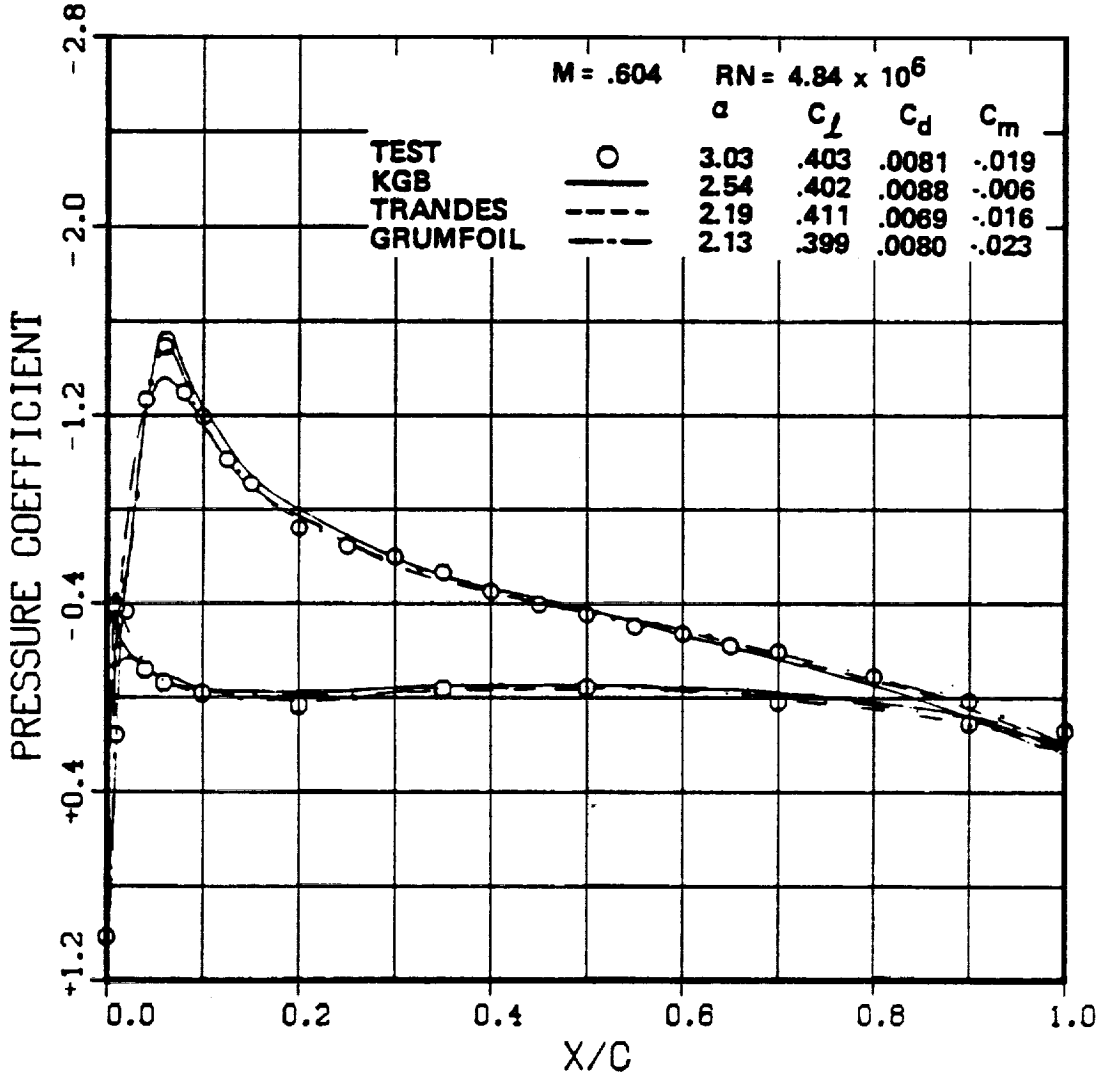
(c) SSC-A07

Figure 36. — Continued.



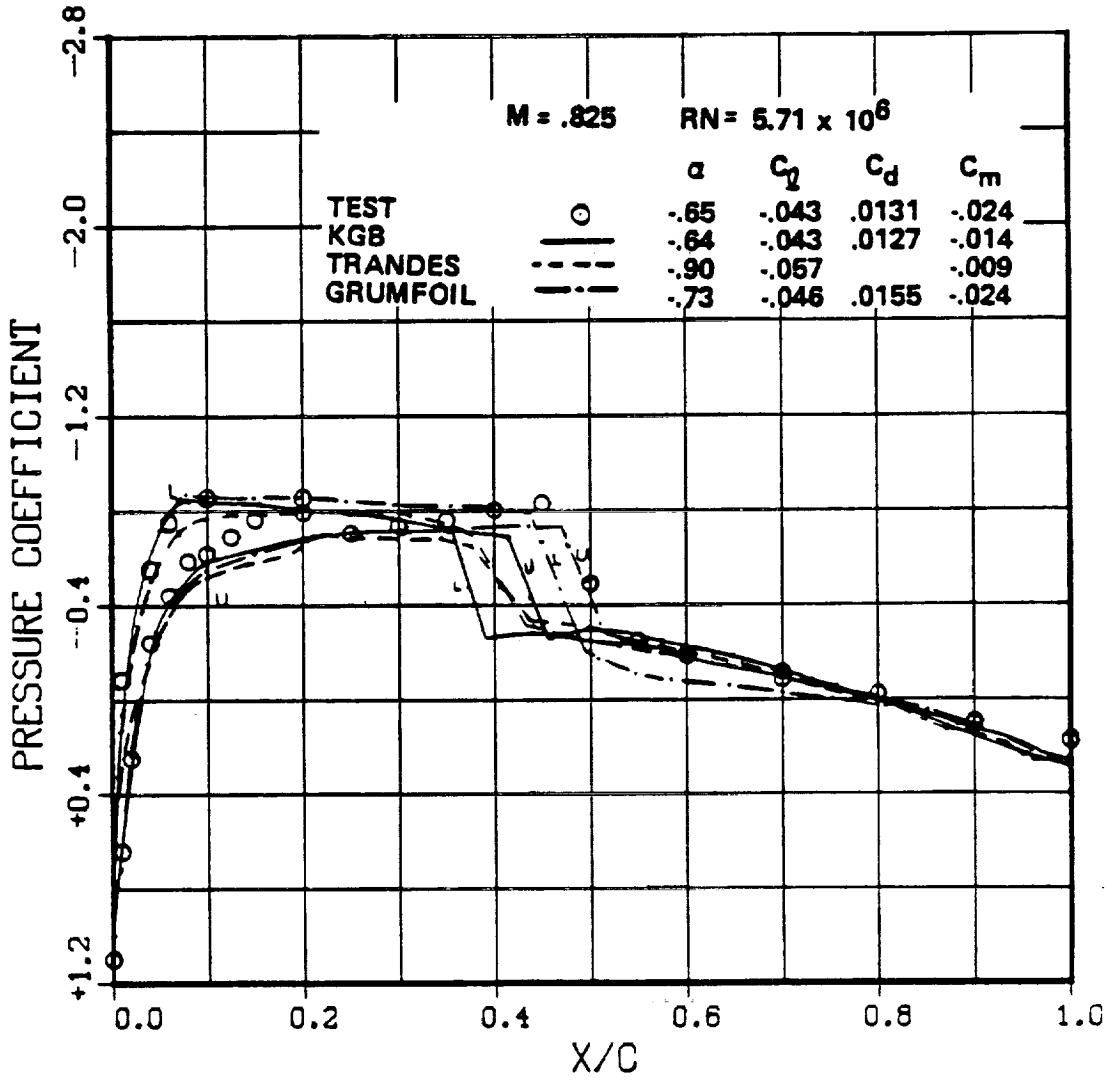
(d) SSC-B08

Figure 36.— Continued.



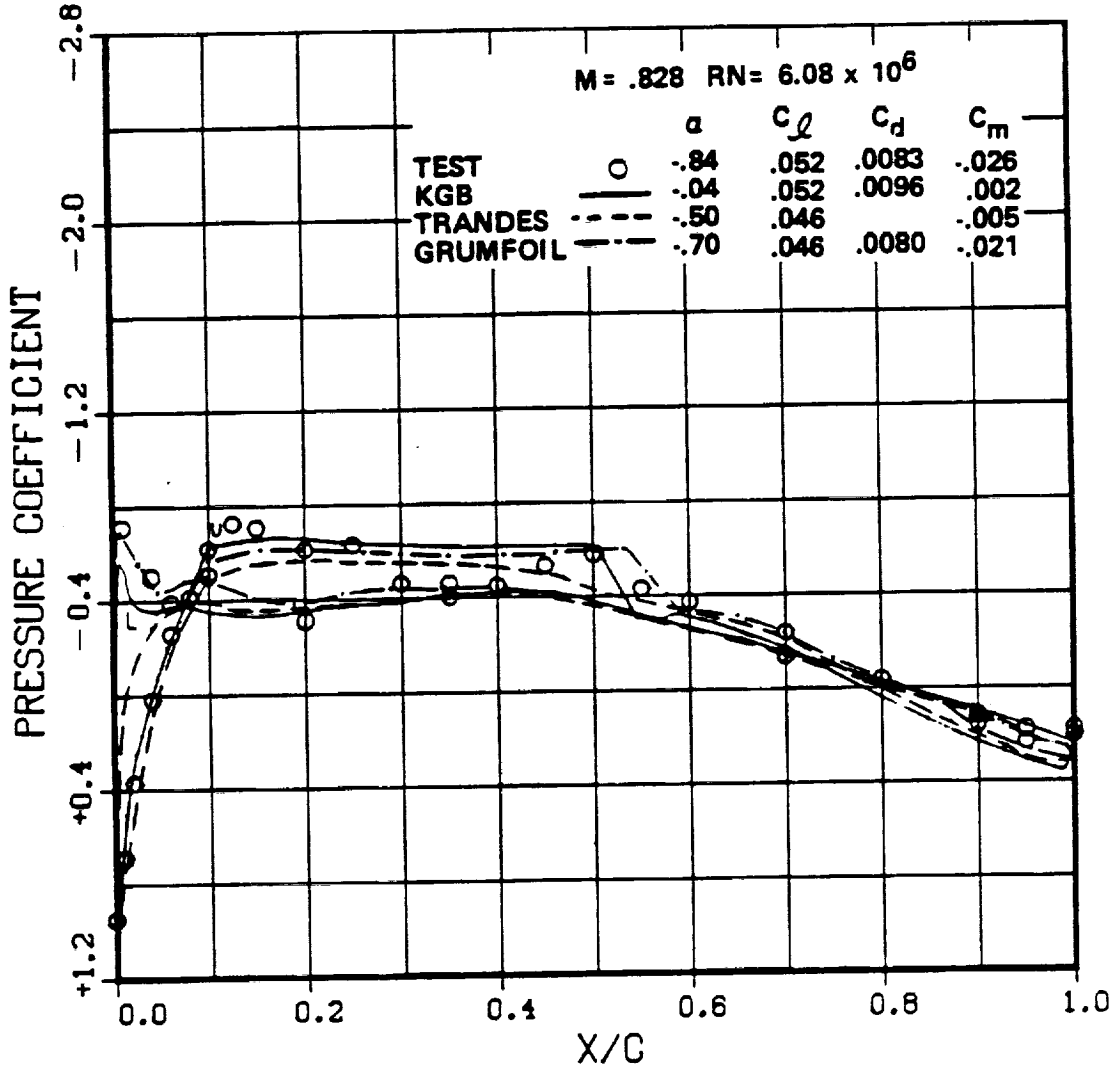
(e) SC1094 R8

Figure 36. – Concluded.



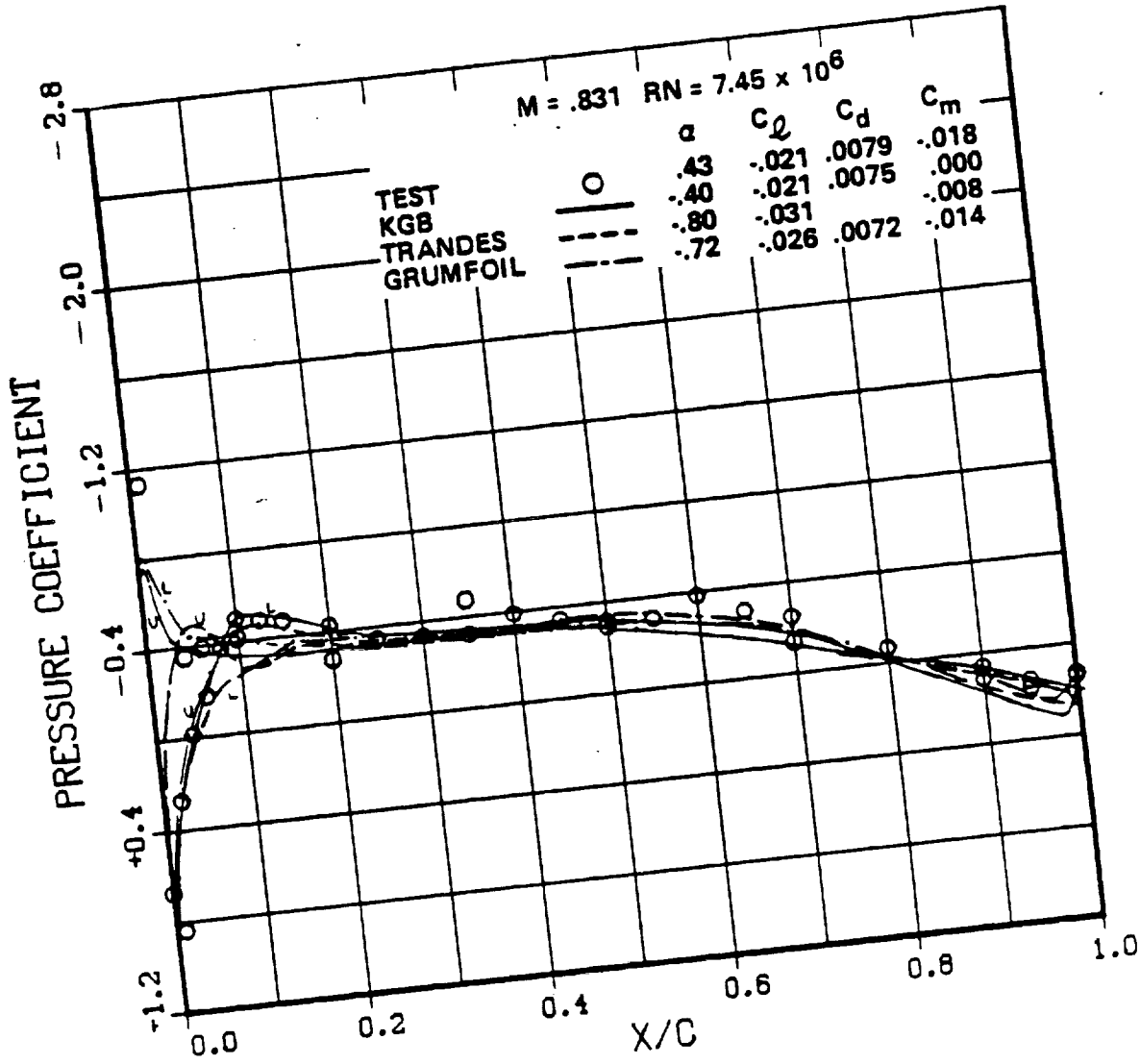
(a) SC1095

Figure 37.— Pressure coefficient correlation, M = 0.825, C_l = 0.



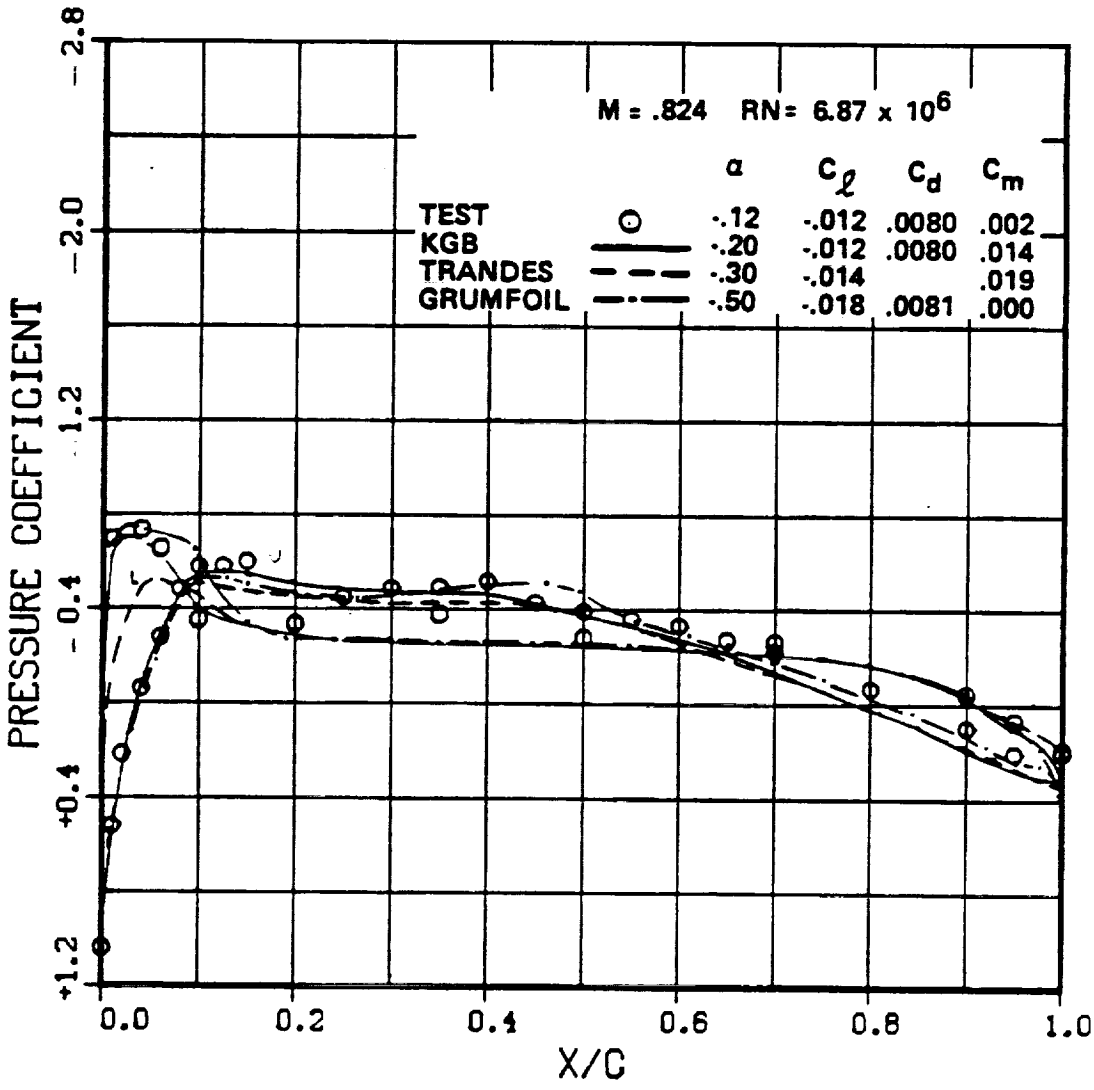
(b) SSC-A09

Figure 37.—Continued.



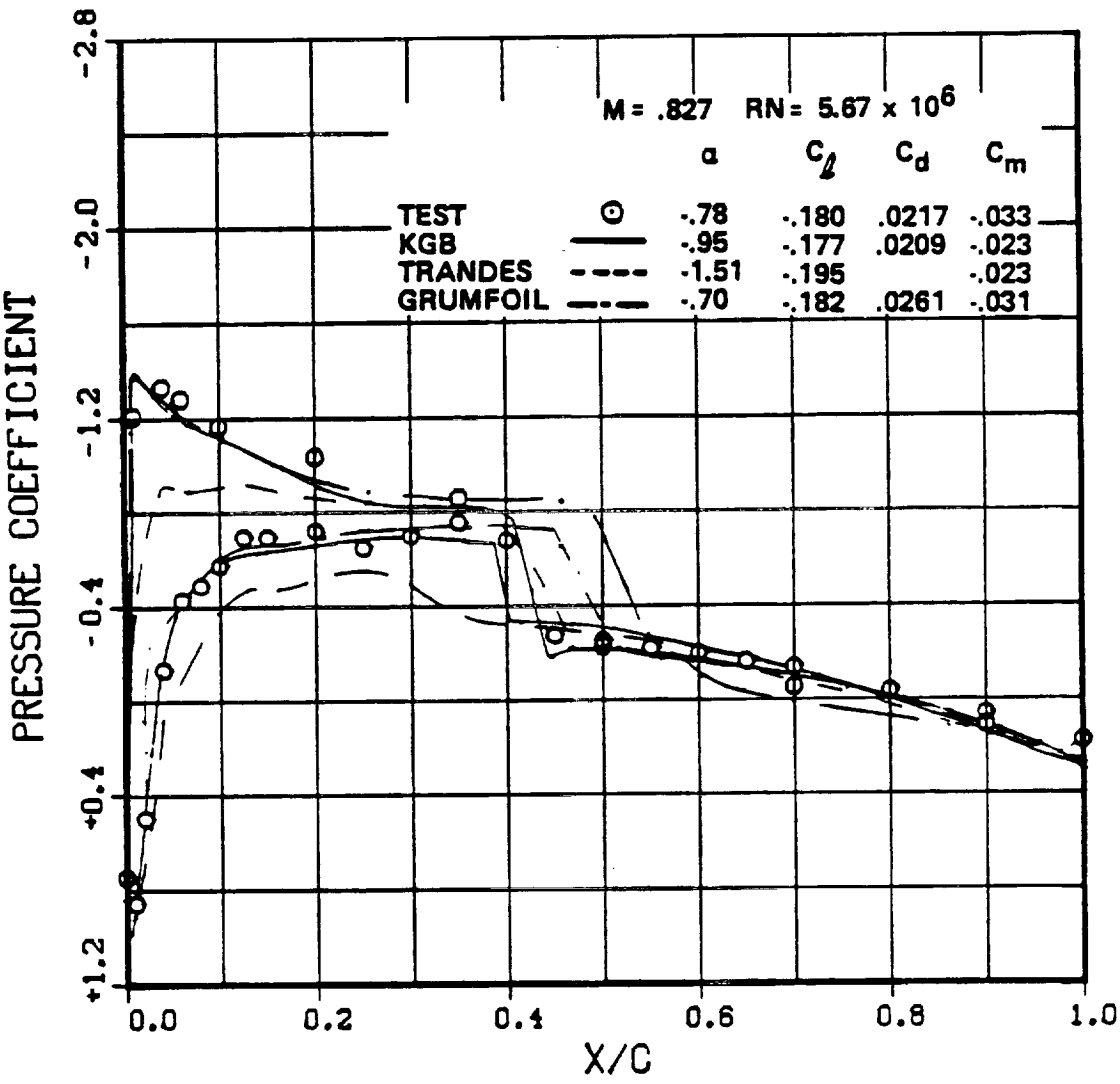
(c) SSC-A07

Figure 37.—Continued.



(d) SSC-B08

Figure 37.- Continued.



(e) SC1094 R8

Figure 37.—Concluded.

APPENDIX A

TABULATED DATA

Heading Description for Tabulated Data

ALPHA	Angle of attack, deg
CDBAL	Balance - derived drag coefficient
CDP	Wake rake - derived drag coefficient
CLBAL	Balance - derived lift coefficient
CLP	Airfoil surface pressure - derived
CMBAL	Balance - derived quarter chord pitching moment coefficient
CMP	Airfoil surface pressure - derived pitching moment coefficient

Configuration 1 = SC1095
Configuration 2 = SSC-A09
Configuration 3 = SSC-A07
Configuration 4 = SSC-B08
Configuration 5 = SC1095 R8
Configuration 6-10 = SSC-A09 Out-of-Contour Test Configuration
(See page 9 and Table IV)

L/D BAL	Balance - derived lift-drag ratio
L/D P	Surface and wake rake pressure derived lift-drag ratio
MACH	Free stream Mach number
PT	Data point number within each run
RN	Reynolds number based on airfoil chord
RUN	Test run number (see also Table V)

RUN 12 MACH= .522 RN= 4.46*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
6	0.03	0.100		-.006	0.435	0.0056	-.077		78.2
		MACH= .798							
7	0.05	0.085		-.009	0.500	0.0094	-.093		54.3

RUN 14 MACH= .401 RN= 3.63*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
4	0.05	0.132		-.016	0.118	0.0076	-.017		15.5
5	-5.05	-.432		-.031	-.424	0.0079	-.020		-53.9
6	-3.16	-.194		-.028	-.231	0.0071	-.019		-32.6
7	-1.24	-.003		-.020	-.027	0.0075	-.017		-3.6
8	-0.17	0.098		-.016	0.092	0.0069	-.017		13.4
9	2.98	0.416		-.009	0.418	0.0080	-.015		52.3
10	6.13	0.759		-.003	0.745	0.0080	-.012		92.9
11	9.09	1.056		0.004	1.041	0.0108	-.005		95.9
12	11.10	1.239		0.011	1.211	0.0138	0.003		87.2
13	12.06	1.293		0.015	1.243	0.0165	0.012		75.1
14	12.97	0.695	0.1307	-.008	0.874	0.2007	-.107	5.3	4.4
15	13.94	0.725	0.1454	-.095	0.852	0.2213	-.108	5.0	3.9
16	14.89	0.666	0.1465	-.090	0.852	0.2280	-.110	4.5	3.8
17	16.13	0.976	0.1647	-.065	0.928	0.1042	-.088	5.9	8.9
18	18.06	0.891	0.2086	-.080	0.899	0.1264	-.087	4.3	7.1
19	19.81	0.646	0.2089	-.089	0.803	0.2253	-.086	3.1	3.6

RUN 15 MACH= .405 RN= 3.64*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	19.83	0.781	0.2287	-.088	0.803	0.2327	-.087	3.4	3.5
2	17.98	0.927	0.1977	-.081	0.905	0.1250	-.089	4.7	7.2
3	15.91	0.687	0.1672	-.094	0.829	0.2257	-.112	4.1	3.7
4	15.02	0.687	0.1505	-.095	0.833	0.2254	-.106	4.6	3.7
5	13.99	0.674	0.1321	-.092	0.845	0.2216	-.110	5.1	3.8
6	13.10	0.686	0.1228	-.091	0.878	0.2094	-.111	5.6	4.2
7	11.96	1.265	0.0203	0.009	1.244	0.0322	0.010	62.5	38.5
8	11.08	1.216		0.005	1.199	0.0138	0.002		86.6
9	9.02	1.008		-.002	1.026	0.0104	-.006		98.7
10	6.05	0.718		-.011	0.737	0.0082	-.012		89.6
11	3.02	0.400		-.018	0.419	0.0080	-.015		52.1
12	0.02	0.067		-.024	0.109	0.0073	-.016		14.9
13	-1.26	-.066		-.026	-.031	0.0074	-.016		-4.2
14	-3.32	-.289		-.034	-.239	0.0071	-.018		-33.5
15	5.02	-.474		-.033	-.437	0.0071	-.020		-61.7
16	-0.26	0.040		-.018	0.076	0.0074	-.016		10.2

RUN 16 MACH= .401 RN= 3.61*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.27	0.042		-.018	0.077	0.0074		1.4	10.4
2	-5.01	-.474		-.035	-.420	0.0071		22.5	-59.8
3	-3.38	-.282		-.030	-.246	0.0067		26.9	-36.6
4	-1.36	-.067		-.022	-.035	0.0073		-2.7	-4.8
5	-0.32	0.039		-.018	0.072	0.0073		1.2	9.9
6	2.98	0.367		-.008	0.419	0.0080		9.8	52.4
7	5.96	0.676		-.002	0.719	0.0076		20.7	94.2
8	9.03	0.976		0.007	1.025	0.0109		27.8	94.0
9	11.05	1.180		0.015	1.211	0.0141		32.2	85.9
10	12.05	1.240		0.018	1.253	0.0155		37.0	80.3
11	12.85	0.702	0.1137	-.088	0.877	0.2001	-.104	6.2	4.4
12	13.94	0.674	0.1313	-.091	0.845	0.2218	-.107	5.1	3.8
13	14.88	0.676	0.1400	-.091	0.834	0.2285	-.107	4.8	3.7
14	15.93	0.679	0.1572	-.092	0.814	0.2318	-.105	4.3	3.5
15	17.99	0.880	0.1968	-.076	0.896	0.1377	-.087	4.5	6.5
16	19.94	0.647	0.2274	-.088	0.811	0.2161	-.087	2.8	3.8

RUN 17 MACH= .405 RN= 3.64*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	19.91	0.632	0.2106	-.088	0.803	0.2265	-.087	3.0	3.5
2	18.06	0.917	0.2033	-.078	0.900	0.1293	-.088	4.5	6.9
3	15.83	0.669	0.1551	-.090	0.843	0.1890	-.103	4.3	4.5
4	15.02	0.671	0.1489	-.086	0.830	0.2324	-.107	4.5	3.6
5	15.02	0.666	0.1478	-.083	0.843	0.2337	-.113	4.5	3.6
6	13.98	0.703	0.1392	-.085	0.858	0.2179	-.107	5.0	3.9
7	13.15	0.712	0.1322	-.082	0.867	0.2081	-.110	5.4	4.1
8	12.15	1.306	0.0269	0.017	1.248	0.0263	0.011	48.6	47.2
9	11.16	1.244		0.013	1.212	0.0139	0.004		86.6
10	9.02	1.047		0.004	1.019	0.0113	-.005		89.8
11	6.02	0.736		-.004	0.727	0.0086	-.013		84.6
12	3.18	0.431		-.012	0.428	0.0081	-.015		52.5
13	0.0	0.088		-.016	0.110	0.0084	-.017		13.1
14	-1.26	-.037		-.021	-.030	0.0077	-.017		3.9
15	-3.29	-.254		-.027	-.236	0.0068	-.019		-34.4
16	-4.92	-.438		-.029	-.427	0.0070	-.020		-61.2
17	-0.22	0.090		-.015	0.088	0.0065	-.015		12.3

RUN 19 MACH= .306 RN= 3.89*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.25	0.102		-.012	0.088	0.0096	-.017		9.1
2	9.05	1.011		0.008	1.027	0.0116	-.007		88.7
3	11.06	1.178		0.013	1.201	0.0180	-.001		66.6
4	12.13	1.273		0.016	1.285	0.0213	0.003		60.1
5	13.21	1.335	0.0495	0.020	1.366	0.0289	0.007	27.0	47.0
6	13.97	0.712	0.1553	-.085	0.881	0.2320	-.121	4.6	3.8
7	15.07	0.722	0.1750	-.090	0.869	0.2409	-.116	4.1	3.6
8	15.95	0.705	0.1852	-.089	0.868	0.2529	-.120	3.8	3.4
9	-0.15	0.125	-.0348	-.017	0.086	0.0092	-.015	-3.6	9.3

RUN 20 MACH= .306 RN= 3.87*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	13.02	1.352		0.015	1.335	0.0261	0.007		51.8

RUN 21 MACH= .401 RN= 3.63*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.02	0.123		-.010	0.110	0.0071	-.016		15.5
2	6.16	0.778		0.006	0.759	0.0079	-.012		95.3

RUN 22 MACH= .501 RN= 4.34*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.03	0.127		-.009	0.119	0.0074	-.018		16.1
2	-5.16	-.502		-.025	-.465	0.0070	-.023		-66.7
3	-3.37	-.265		-.019	-.255	0.0075	-.020		-34.0
4	-1.27	-.018		-.012	-.022	0.0073	-.019		-3.0
5	-0.23	0.097		-.007	0.089	0.0072	-.018		12.3
6	3.02	0.464		0.002	0.451	0.0082	-.016		55.1
7	6.21	0.828		0.011	0.796	0.0104	-.009		76.4
8	9.18	1.101	0.0459	0.023	1.046	0.0219	0.008	24.0	47.6
9	11.16	1.131	0.0713	0.019	1.085	0.0505	-.001	15.9	21.3
10	12.09	0.995	0.1117	-.038	1.052	0.1310	-.031	8.9	7.9
11	13.11	0.971	0.1250	-.041	1.010	0.1464	-.038	7.8	6.8
12	14.09	1.046	0.1362	-.024	1.086	0.1539	-.073	7.7	7.0
13	15.08	0.698	0.1607	-.078	0.900	0.1867	-.069	4.3	4.8
14	16.06	0.792	0.1758	-.072	0.857	0.2250	-.103	4.5	3.8
15	18.02	0.783	0.2142	-.079	0.884	0.2624	-.110	3.7	3.3
16	-0.12	0.045		-.017	0.098	0.0092	-.018		10.6

RUN 23 MACH= .502 RN= 4.33*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.04	-.045		-.017	0.015	0.0073	-.019		2.0

RUN 24 MACH= .601 RN= 4.90*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.19	0.043		-.012	0.092	0.0074	-.020		12.4
2	-5.30	-.598		-.032	-.505	0.0114	-.029		-44.1
3	-3.37	-.339		-.021	-.300	0.0073	-.024		-40.9
4	-1.41	-.092		-.013	-.049	0.0075	-.020		-6.5
5	-0.30	0.048		-.009	0.078	0.0072	-.020		10.9
6	3.14	0.478		0.001	0.469	0.0084	-.016		58.2
7	6.22	0.842	0.0316	0.016	0.826	0.0218	-.001	26.6	37.6
8	9.17	0.928	0.0822	0.008	0.930	0.0636	-.013	11.3	14.5
9	10.27	0.985	0.0931	0.006	0.966	0.0587	-.023	10.8	16.3
10	11.23	1.006	0.1129	-.001	0.979	0.0715	-.034	8.9	13.6
11	12.24	0.935	0.1322	-.027	0.947	0.1273	-.048	7.1	7.3
12	13.15	0.916	0.1491	-.036	0.951	0.1501	-.059	6.1	6.2
13	14.20	0.936	0.1713	-.042	0.959	0.1633	-.071	5.5	5.8
14	16.15	0.939	0.1976	-.044	0.956	0.1675	-.092	4.8	5.6
15	-0.11	0.035		-.013	0.090	0.0085	-.019		10.5
16	-0.95	-.070		-.014	-.009	0.0075	-.021		-1.2

RUN 25 MACH= .702 RN= 5.35*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.32	0.012		-.012	0.071	0.0071	-.022		10.0
2	-5.25	-.656		-.035	-.613	0.0323	-.038		-19.8
3	-3.53	-.392		-.024	-.343	0.0135	-.031		-25.3
4	-1.34	-.088		-.012	-.072	0.0077	-.023		-9.3
5	-0.21	0.067		-.007	0.065	0.0069	-.022		12.2
6	2.30	0.416		0.004	0.405	0.0083	-.016		48.7

RUN 27 MACH= .408 RN= 3.67*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	0.132		-.009	0.105	0.0082	-.017		12.8
2	6.11	0.755		0.005	0.744	0.0087	-.012		85.5

RUN 28 MACH= .704 RN= 5.41*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.06	0.117	0.0088	-.008	0.128	0.0074	-.021	13.3	17.2
2	-5.17	-.614	0.0461	-.035	-.595	0.0335	-.027	-13.3	-17.8
3	-3.35	-.347	0.0330	-.026	-.341	0.0143	-.029	-10.5	-23.7
4	-1.28	-.054	0.0136	-.014	-.063	0.0077	-.022	-4.0	-8.1
5	-0.17	0.099	0.0095	-.009	0.089	0.0074	-.021	10.4	12.0
6	2.15	0.421		0.002	0.397	0.0087	-.014		45.6
7	3.26	0.579	0.0145	0.009	0.550	0.0144	-.018	40.8	38.1
8	6.31	0.840	0.0513	-.004	0.802	0.0529	-.041	16.4	15.0
9	8.31	0.852	0.0785	-.015	0.858	0.0699	-.051	10.9	12.0
10	9.27	0.873	0.0955	-.016	0.883	0.0729	-.047	9.1	12.0
11	10.26	0.876	0.1094	-.021	0.900	0.0778	-.059	8.0	11.4
12	11.28	0.870	0.1201	-.028	0.901	0.0890	-.067	7.2	10.0

RUN 30 MACH= .806 RN= 5.73*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.0	0.095	0.0108	-.008	0.128	0.0125	-.025	5.1	10.1
2	-3.52	-.412	0.0426	-.012	-.419	0.0313	-.017	-9.7	-13.3
3	-1.26	-.079	0.0179	-.015	-.178	0.0133	-.018	-4.4	-13.3
4	-0.04	0.128	0.0243	-.005	0.106	0.0120	-.024	5.3	8.8
5	1.28	0.340	0.0287	-.005	0.312	0.0157	-.033	11.9	19.7
6	2.21	0.501	0.0361	-.017	0.477	0.0228	-.053	13.9	20.7
7	4.28	0.629	0.0601	-.032	0.622	0.0452	-.070	10.5	13.6
8	5.29	0.691	0.0701	-.038	0.665	0.0585	-.074	9.9	11.2
9	6.30	0.658	0.0860	-.040	0.689	0.0772	-.081	7.7	8.8
10	7.26	0.650	0.0918	-.044	0.690	0.0843	-.056	7.1	8.1
11	8.26	0.646	0.1034	-.045	0.676	0.1065	-.056	6.2	6.2
12	8.29	0.690	0.1058	-.041	0.717	0.1027	-.072	6.5	6.9

RUN 31 MACH= .803 RN= 5.63*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.06	-.112	0.0186	-.016	-.052	0.0123	-.026	-6.0	-4.2
2	-0.98	0.066	0.0205	-.009	0.113	0.0123	-.023	3.2	9.1

RUN 32 MACH= .396 RN= 3.45*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.01	0.079		-.006	0.098		-.017		
2	6.13	0.758		0.012	0.754		-.013		

RUN 33 MACH= .598 RN= 4.77*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.03	0.112		-.008	0.120	0.0077	-.019		15.6
2	3.16	0.510		0.004	0.485	0.0084	-.016		57.7
3	6.28	0.880	0.0084	0.023	0.814	0.0186	-.001	104.4	43.5
4	9.31	1.003	0.0718	0.017	0.937	0.0589	-.012	14.0	15.7
5	11.33	1.077	0.1184	0.009	0.979	0.0707	-.031	9.0	13.6
6	9.31	1.009	0.0708	0.017	0.935	0.0590	-.011	14.3	15.7
7	6.28	0.891	0.0098	0.023	0.811	0.0192	-.000	90.6	41.9
8	3.16	0.512		0.004	0.483	0.0085	-.015		56.4
9	0.03	0.107		-.008	0.116	0.0073	-.019		16.0
10	-3.11	-.319		-.028	-.286	0.0084	-.022		-34.4
11	0.02	0.092		-.008	0.099	0.0072	-.019		13.8

RUN 34 MACH= .697 RN= 5.20*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-6.24	-.597	0.0663	-.029	-.669	0.0504	-.017	-9.0	-13.5

RUN 35 MACH= .753 RN= 5.41*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-6.22	-.508	0.0641	-.013	-.692	0.0635	-.012	-7.9	-11.1

RUN 36 MACH= .793 RN= 5.56*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-6.22	-.494	0.0752	0.001	-.662	0.0840	0.018	-6.6	-8.8

RUN 37 MACH= .810 RN= 5.58*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-6.21	-.489	0.0850	0.014	-.679	0.0898	0.031	-5.7	-7.7

RUN 38 MACH= .830 RN= 5.62*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-6.20	-.469	0.0879	0.022	-.637	0.0866	0.035	-5.3	-7.5

RUN 39 MACH= .399 RN= 3.57*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	0.137		-.030	0.020	0.0075	-.017		2.7
2	-0.20	0.209		-.029	0.084	0.0076	-.016		11.1
3	6.15	0.894		-.012	0.747	0.0081	-.012		92.5

RUN 40 MACH= .403 RN= 3.61*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.08	0.230		-.027	0.122	0.0069	-.017		17.7
2	6.13	0.887		-.012	0.753	0.0075	-.012		99.5
3	5.91	0.873		-.013	0.731	0.0075	-.012		97.7

RUN 41 MACH= .702 RN= 5.38*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.79	0.035	0.0106	-.018	0.013	0.0075	-.022	3.3	1.8
2	-0.49	0.077	0.0094	-.017	0.050	0.0077	-.023	8.2	6.4
3	-0.58	0.064	0.0093	-.017	0.044	0.0077	-.023	6.9	5.6
4	-0.52	0.069	0.0099	-.017	0.044	0.0076	-.023	6.9	5.8

RUN 42 MACH= .754 RN= 5.53*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.61	0.032	0.0132	-.016	0.014	0.0089	-.027	2.4	1.5

RUN 43 MACH= .778 RN= 5.58*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.65	0.034	0.0072	-.019	0.031	0.0097	-.026	4.8	3.2

RUN 44 MACH= .801 RN= 5.66*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.64	0.013	0.0117	-.018	0.003	0.0108	-.028	1.1	0.3

RUN 45 MACH= .825 RN= 5.71*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.65	-.011	0.0216	-.017	-.043	0.0131	-.024	-0.5	-3.2

RUN 46 MACH= .845 RN= 5.74*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.65	-.018	0.0316	-.021	0.020	0.0179	-.043	-0.6	1.5
2	-0.44	0.014	0.0290	-.026	0.059	0.0191	-.051	0.5	3.1

RUN 48 MACH=0.401 RN= 3.59*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.11	0.177		-.023	0.099		-.017		
2	6.16	0.849		-.007	0.744		-.012		
3	-0.26	0.146		-.023	0.085		-.017		

RUN 49 MACH=0.928 RN= 6.05*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.25	0.022	0.0643	-.001	-.019		0.004	0.3	
2	-2.39	-.146	0.0761	-.021	-.112		-.018	-1.9	
3	-1.17	-.047	0.0628	0.002	-.048		-.017	-0.7	
4	-1.94	-.106	0.0650	-.007	-.079		-.076	-1.6	

RUN 51 MACH=0.404 RN= 3.64*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.22	0.185		-.020	0.102		-.017		
2	6.04	0.899		-.004	0.744		-.012		

RUN 52 MACH=0.925 RN= 6.01*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.01	0.051	0.0656	-.004	0.032		0.005	0.8	
2	1.01	0.171	0.0617	-.007	0.152		-.005	2.8	
3	2.08	0.256	0.0684	-.004	0.226		0.003	3.7	
4	3.10	0.318	0.0766	-.005	0.300		-.005	4.2	
5	4.09	0.353	0.0842	-.001	0.357		-.012	4.2	
6	5.18	0.395	0.0965	-.004	0.381		-.009	4.1	
7	1.03	-.068	0.0689	-.002	-.036		-.001	-1.0	
8	-0.31	-.020	0.0590	-.005	0.027		-.010	-0.3	

RUN 55 MACH=0.401 RN= 3.60*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.26	0.147		-.020	0.087		-.015		
2	0.16	0.208		-.020	0.132		-.015		
3	-0.03	0.178		-.021	0.114		-.015		
4	6.04	0.862		-.006	0.749		-.011		
5	6.01	0.860		-.007	0.744		-.010		
6	-0.05	0.181		-.021	0.112		-.015		

RUN 56 MACH=0.900 RN= 6.04*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.07	0.013	0.0977	-.034	0.100		-.049	0.1	
2	-2.28	-.095	0.1007	-.010	-.077		-.012	-0.9	
3	-1.09	-.046	0.1009	-.022	0.039		-.030	-0.5	
4	0.15	0.022	0.1005	-.033	0.117		-.052	0.2	
5	0.91	0.075	0.1003	-.040	0.176		-.066	0.8	
6	0.05	0.010	0.1027	-.033	0.105		-.051	0.1	
7	-0.72	-.028	0.0970	-.026	0.055		-.042	-0.3	

RUN 57 MACH=1.071 RN= 5.96*10**6 CONFIGURATION 1

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.15	0.030	0.0906	-.032	0.106		-.049	0.3	
2	-1.23	-.045	0.0883	-.019	0.018		-.034	-0.5	
3	0.01	0.021	0.0916	-.030	0.099		-.047	0.2	
4	0.70	0.057	0.0942	-.036	0.144		-.056	0.6	
5	-0.74	-.025	0.0890	-.023	0.049		-.041	-0.3	
6	0.09	0.020	0.0924	-.030	0.101		-.048	0.2	
7	-0.56	-.017	0.0893	-.024	0.059		-.042	-0.2	

RUN 60 MACH= .399 RN= 3.85*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.24	0.039			0.114	0.0066	-.015		17.1
2	6.33	0.735		-.022	0.780	0.0071	-.015		109.0
3	6.23	0.725		-.016	0.783	0.0066	-.016		119.3
4	5.94	0.700		-.022	0.751	0.0069	-.016		109.2
5	0.21	0.073			0.156	0.0067	-.015		23.4
6	-0.16	0.036			0.118	0.0070	-.014		16.7
7	0.01	0.055			0.141	0.0071	-.015		19.9

RUN 61 MACH= .307 RN= 4.29*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.01	0.042		0.008	0.140	0.0071	-.015		19.8
2	0.01	0.045		0.007	0.142	0.0072	-.015		19.8
3	8.99	0.985		-.023	1.023	0.0098	-.012		103.9
4	11.00	1.181		-.026	1.223	0.0131	-.012		93.1
5	12.00	1.282		-.026	1.292	0.0151	-.005		85.0
6	13.02	1.350		-.025	1.369	0.0188	-.005		72.7
7	14.02	1.062	0.1889	-.075	1.274	0.0648	-.012	9.8	19.5
8	14.99	1.047	0.1252	-.065	1.210	0.0722	-.048	8.4	16.6
9	15.88	0.997	0.1402	-.072	1.136	0.0810	-.059	7.1	13.9
10	12.49	1.291		-.023	1.328	0.0169	-.003		78.4
11	13.29	1.343		-.019	1.394	0.0213	-.005		65.1
12	0.09	0.055		0.006	0.146	0.0075	-.015		19.4
13	13.06	1.335		-.017	1.363	0.0191	-.004		71.2

RUN 63 MACH= .500 RN= 4.57*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.02	0.107		-.018	0.136	0.0072	-.016		18.8
2	-5.11	-.452		-.087	-.409	0.0215	-.021		-19.0
3	-3.02	-.229		-.008	-.191	0.0070	-.013		-27.3
4	-1.13	-.010		-.016	0.019	0.0077	-.016		2.4
5	-0.09	0.102		-.019	0.128	0.0074	-.016		17.3
6	3.08	0.459		-.031	0.469	0.0075	-.018		62.5
7	6.08	0.809		-.039	0.795	0.0076	-.015		104.3
8	9.09	1.121	0.0167	-.042	1.071	0.0161	-.000	67.0	66.1
9	11.20	1.100	0.1022	-.038	1.067	0.0582	-.010	10.6	18.2
10	12.05	1.035	0.1247	-.060	1.046	0.0778	-.022	8.3	13.5
11	13.04	0.993	0.1539	-.089	1.028	0.0939	-.044	6.5	10.8
12	14.02	0.961	0.1741	-.106	1.005	0.1133	-.060	5.5	8.8
13	14.99	0.940	0.1918	-.119	1.014	0.1308	-.075	4.9	7.6
14	15.97	0.922	0.2110	-.129	0.994	0.1443	-.085	4.4	6.8
15	18.12	0.864	0.2343	-.144	0.944	0.1694	-.103	3.7	5.5
16	-0.56	0.041		-.016	0.068	0.0072	-.016		9.4
17	0.02	0.109		-.021	0.135	0.0071	-.016		19.0

RUN 64 MACH= .401 RN= 3.81*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.03	0.110		-.023	0.131	0.0069	-.015		19.0
2	6.09	0.748		-.034	0.751	0.0076	-.017		98.6

RUN 65 MACH= .599 RN= 5.16*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.01	0.104		-.020	0.136	0.0077	-.018		17.7
2	-4.44	-.415		-.012	-.370	0.0163	-.021		-22.7
3	-3.25	-.269		-.014	-.229	0.0088	-.018		-25.9
4	-1.17	-.021		-.019	0.010	0.0074	-.018		1.4
5	0.02	0.189		-.022	0.140	0.0070	-.018		20.0
6	3.26	0.508		-.036	0.519	0.0077	-.020		67.3
7	6.27	0.859			0.847	0.0135	-.010		62.4
8	9.24	1.044	0.0763	-.045	1.035	0.0529	-.009	13.7	19.4
9	10.22	1.025	0.1147	-.027	1.011	0.0675	-.021	8.9	14.8
10	10.42	1.018	0.1193	-.032	1.010	0.0673	-.022	8.5	14.9
11	11.26	1.022	0.1305	-.059	1.013	0.0772	-.030	7.8	13.0
12	12.14	0.968	0.1451	-.079	0.975	0.0954	-.049	6.7	10.1
13	13.06	0.950	0.1608	-.092	0.969	0.1077	-.066	5.9	8.9
14	0.04	0.112		-.024	0.143	0.0081	-.018		17.5

RUN 67 MACH= .399 RN= 3.83*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.04	0.091		-.007	0.129	0.0070	-.014		18.4
2	5.99	0.724		-.014	0.742	0.0073	-.016		101.2

RUN 68 MACH= .603 RN= 5.21*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.02	0.093		-.013	0.139	0.0072	-.018		19.3
2	8.96	1.010	0.0883	-.019	1.013	0.0488	-.010	11.5	20.6
3	11.08	1.008	0.1206	-.035	1.022	0.0731	-.026	8.3	13.8
4	12.09	0.962	0.1346	-.072	0.993	0.0958	-.047	7.1	10.2
5	13.12	0.942	0.1507	-.084	0.971	0.1092	-.069	6.2	8.8
6	14.04	0.892	0.1670	-.105	0.961	0.1164	-.078	5.3	8.2
7	15.92	0.831	0.1958	-.135	0.946	0.1324	-.112	4.2	7.0
8	-0.28	0.055		-.012	0.10[illegible]	0.0075	-.018		13.4

RUN 69 MACH= .703 RN= 5.73*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	3.25	0.054		-.014	0.108	0.0073	-.021		14.8
2	-3.09	-.313		-.010	-.258	0.0089	-.024		-29.0
3	-1.42	-.083		-.012	-.031	0.0073	-.020		-4.3
4	-0.28	0.060		-.017	0.110	0.0073	-.021		15.1
5	2.12	0.378		-.024	0.420	0.0078	-.020		53.7
6	4.24	0.678		-.167	0.699	0.0175	-.015		39.7
7	6.28	0.878	0.0413		0.903	0.0390	-.019	21.3	23.0
8	8.23	0.860	0.0926	-.083	0.889	0.0777	-.079	9.3	11.3
9	9.24	0.879	0.1085	-.049	0.922	0.0614	-.053	8.1	14.9
10	10.21	0.855	0.1193	-.072	0.918	0.0811	-.053	7.2	11.2
11	11.23	0.866	0.1392	-.086	0.946	0.0941	-.060	6.2	9.9
12	-0.01	0.084	0.0086	-.016	0.135	0.0083	-.021	9.8	16.2
13	-0.66	0.005		-.014	0.057	0.0079	-.021		7.1

RUN 70 MACH= .804 RN= 6.31*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.09	0.096	0.0115	-.015	0.154	0.0080	-.024	8.4	19.2
2	-3.32	-.436	0.0222	-.005	-.388	0.0110	-.018	-19.6	-35.1
3	-1.15	-.095	0.0061	-.013	-.035	0.0081	-.022	-15.5	-4.3
4	-0.10	0.067		-.016	0.117	0.0077	-.024		15.1
5	1.15	0.286		-.029	0.339	0.0100	-.029		33.5
6	2.17	0.428		-.061	0.507	0.0154	-.051		32.7
7	4.32	0.550	0.0331	-.094	0.656	0.0411	-.078	16.6	15.8
8	5.24	0.595	0.0578	-.098	0.700	0.0550	-.079	10.3	12.5
9	6.27	0.637	0.0767	-.105	0.745	0.0703	-.085	8.3	10.4
10	7.31	0.652	0.0892	-.109	0.759	0.0891	-.088	7.3	8.4
11	8.15	0.665	0.0973	-.123	0.768	0.1061	-.092	6.8	7.1
13	0.01	0.070	0.0250	-.016	0.129	0.0076	-.024	2.8	16.7
14	-0.72	-.043	0.0280	-.014	0.017	0.0079	-.023	-1.5	2.1

RUN 71 MACH= .824 RN= 6.87*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.70	-.026	0.0256	-.007	0.051	0.0082	-.026	-1.0	6.2
2	-0.74	-.028	0.0249	-.008	0.051	0.0081	-.027	-1.1	6.2

RUN 72 MACH= .840 RN= 6.14*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.73	0.003	0.0325	0.001	0.117	0.0103	-.031	0.1	11.2
2	-0.69	0.004	0.0328	0.003	0.107	0.0104	-.028	0.1	10.1
3	-0.82	-.013	0.0290	0.005	0.091	0.0099	-.021	-0.4	9.1
4	-0.83	-.008	0.0279	0.005	0.093	0.0098	-.025	-0.3	9.4
5	-1.24	-.052	0.0228	0.020	0.010	0.0118	-.005	-2.3	0.9
6	-1.33	-.056	0.0193	0.018	0.038	0.0116	-.015	-2.9	3.2

RUN 73 MACH= .863 RN= 6.19*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-1.33	-.033	0.0206	0.008	-.015	0.0189	0.012	-1.6	-0.8
2	-1.26	-.032	0.0255	-.001	0.002	0.0200	0.003	-1.3	0.1

RUN 74 MACH= .894 RN= 6.25*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-1.37	-.037	0.0389	-.019	-.006	0.0289	-.000	-1.0	-0.2
2	-1.37	-.036	0.0386	-.020	-.002	0.0286	-.002	-0.9	-0.1

RUN 75 MACH= .702 RN= 5.59*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-1.29	-.060		-.018	-.032	0.0072	-.019		-4.4
2	-1.37	-.065		-.019	-.031	0.0071	-.019		-4.4

RUN 76 MACH= .751 RN= 5.80*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-1.30	-.081	0.0047	-.017	-.041	0.0074	-.022	-17.3	-5.5
2	-1.38	-.086	0.0045	-.019	-.040	0.0074	-.021	-19.1	-5.5

RUN 77 MACH= .778 RN= 5.93*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-1.31	-.100	0.0062	-.017	-.055	0.0074	-.023	-16.1	-7.4
2	-1.39	-.104	0.0058	-.018	-.058	0.0073	-.022	-17.9	-7.8
3	-0.84	-.024	0.0040	-.021	0.022	0.0075	-.023	-6.0	2.9
4	-0.85	-.023	0.0040	-.021	0.022	0.0074	-.024	-5.7	3.0

RUN 78 MACH= .804 RN= 6.01*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.81	-.037	0.0074	-.017	0.001	0.0075	-.022	-5.0	0.1
2	-0.85	-.039	0.0067	-.019	0.016	0.0075	-.025	-5.9	2.1

RUN 79 MACH= .828 RN= 6.08*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.84	-.031	0.0089	-.011	0.052	0.0083	-.026	-3.5	6.2
2	-0.80	-.028	0.0096	-.009	0.052	0.0083	-.026	-2.9	6.3

RUN 80 MACH= .846 RN= 6.12*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-1.26	-.047	0.0144	0.018	0.014	0.0119	-.004	-3.2	1.1
2	-1.33	-.058	0.0155	0.016	0.009	0.0114	-.003	-3.7	0.7
3	-1.26	-.061	0.0150	0.015	0.020	0.0110	-.013	-4.1	2.5

RUN 82 MACH: VARIABLE RN= 4.10*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	MACH NO.
1	-0.75	-.020	0.0080	-.015	0.060		-.023	-2.5	.762
2	-0.81	-.041	0.0105	-.014	0.061		-.023	-3.9	.802
3	-0.76	-.042	0.0114	-.013	0.060		-.022	-3.6	.807
4	-0.74	-.002	0.0170	0.000	0.141		0.002	-0.1	.851
5	-0.79	-.008	0.0156	0.000	0.144		0.005	-0.5	.845
6	0.04	0.092	0.0536	0.025	0.156		-.022	1.7	.933

RUN 85 MACH= .407 RN= 4.04*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.04	0.055		-.008	0.077		-.015		
2	-5.16	-.496		-.003	-.395		-.017		

RUN 87 MACH= .406 RN= 4.03*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.29	0.040		-.012	0.053	0.0130	-.015		4.0
2	-5.43	-.519	0.0469	-.010	-.421	0.0324	-.018	-11.1	-13.1
3	-3.28	-.302		-.003	-.235	0.0071	-.013		-32.8
4	-1.30	-.071		-.009	-.053	0.0065	-.016		-8.1
5	-0.06	0.050		-.008	0.071	0.0065	-.014		10.8
6	3.07	0.378		-.010	0.383	0.0056	-.014		60.2
7	6.03	0.680		-.008	0.675	0.0073	-.015		91.9
8	9.08	0.998		-.004	0.956	0.0150	-.009		63.5
9	11.11	1.047	0.0844	-.024	1.005	0.0742	-.013	12.4	13.4
10	12.06	1.019	0.1243	-.044	0.999	0.1015	-.029	8.2	9.7
11	12.99	0.987	0.1516	-.057	1.007	0.0938	-.038	6.5	10.6
12	14.02	1.017	0.1864	-.083	1.016	0.1044	-.051	5.5	9.6
13	-0.21	0.073		-.017	0.039	0.0068	-.016		5.7
14	10.57	1.036	0.0388	-.018	0.995	0.0476	-.008	26.7	20.7
15	11.13	1.032	0.0774	-.034	1.001	0.0655	-.010	13.3	15.2

RUN 88 MACH= .301 RN= 5.51*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.16	0.068		-.020	0.032	0.0086	-.013		3.7
2	8.09	0.867		-.031	0.830	0.0087	-.013		95.1
3	9.09	0.980		-.029	0.935	0.0098	-.011		95.3
4	10.08	1.050		-.022	1.014	0.0137	-.011		73.7
5	11.00	1.122		-.022	1.149	0.0177	-.015		64.8
6	11.98	1.141	0.0374	-.032	1.063	0.0333	-.013	30.5	31.8
7	12.96	1.083	0.0771	-.067	1.048	0.0544	-.040	14.0	19.1
8	13.93	1.060	0.1093	-.090	1.046	0.0844	-.064	9.7	12.3
9	13.96	1.046	0.1060	-.087	1.015	0.0852	-.060	9.9	11.8
10	0.05	0.079		-.022	0.057	0.0085	-.012		6.6

RUN 90 MACH= .401 RN= 4.78*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
5	0.0	0.003		-.007	0.020	0.0067	-.017		3.0
6	6.02	0.629		-.002	0.618	0.0078	-.014		79.2
7	6.03	0.617		0.004	0.621	0.0077	-.014		80.4
8	12.04	1.000	0.1234	0.003	1.003	0.0793	-.013	8.1	12.5
9	6.04	0.603		0.003	0.628	0.0076	-.015		82.4
10	6.06	0.595		0.007	0.620	0.0071	-.014		86.9
11	6.04	0.602		0.004	0.622	0.0080	-.014		77.5
12	6.07	0.599		0.006	0.624	0.0080	-.015		77.3
13	6.03	0.600		0.003	0.619	0.0084	-.014		73.4
14	6.04	0.599		0.004	0.622	0.0083	-.015		74.6
15	6.02	0.601		0.003	0.621	0.0077	-.014		80.8
16	6.03	0.591		0.007	0.620	0.0077	-.014		80.3
17	6.02	0.594		0.003	0.620	0.0080	-.015		76.9
18	6.01	0.601		0.003	0.619	0.0078	-.014		79.6
19	6.01	0.602		0.003	0.621	0.0076	-.014		81.2

RUN 91 MACH= .500 RN= 5.63*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.01	-.026		-.006	0.012	0.0078	-.016		1.6
2	-5.39	-.613	0.0138	-.001	-.495	0.0412	-.017	-44.3	-12.1
3	-3.37	-.418		-.000	-.322	0.0170	-.016		-18.9
4	-1.33	-.176		-.001	-.136	0.0078	-.018		-17.4
5	-0.32	-.062		-.001	-.024	0.0076	-.016		-3.2
6	3.03	0.383		0.002	0.329	0.0072	-.014		45.6
7	6.09	0.646		0.008	0.648	0.0080	-.013		80.4
8	9.16	0.953	0.0238	0.026	0.907	0.0206	-.004	40.1	43.8
9	11.11	0.988	0.0987	-.001	0.973	0.0810	-.018	10.0	11.9
10	12.14	0.970	0.1106	-.009	0.965	0.0987	-.022	8.8	9.7
11	13.09	0.939	0.1334	-.023	0.947	0.1182	-.033	7.0	7.9
12	14.04	0.928	0.1687	-.047	0.943	0.1302	-.047	5.5	7.1
13	14.97	0.912	0.1883	-.058	0.941	0.1406	-.059	4.8	6.6
14	16.16	0.895	0.2082	-.070	0.929	0.1543	-.072	4.3	5.9
15	11.11	0.994	0.1194	-.017	0.968	0.0792	-.021	8.3	12.1
16	-0.32	-.070		-.012	-.030	0.0078	-.016		3.8

RUN 93 MACH= .601 RN= 6.45*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	6.20	0.733		0.002	0.684	0.0083	-.010		82.3
2	6.19	0.742		-.012	0.689	0.0084	-.011		81.5
3	6.18	0.739		-.007	0.689	0.0083	-.011		82.8
4	-0.09	-.014		-.014	-.011	0.0077	-.017		-1.5
5	-3.36	-.417		-.012	-.347	0.0181	-.019		-19.1
6	-3.25	-.412		-.010	-.340	0.0183	-.019		-18.5
7	-1.27	-.163		-.010	-.135	0.0079	-.018		-17.1
8	-0.20	-.034		-.010	-.025	0.0072	-.018		-3.4
9	3.15	0.352		-.007	0.347	0.0072	-.015		48.1
10	6.24	0.741		0.004	0.689	0.0083	-.010		82.4
11	9.21	0.990	0.0620	0.013	0.899	0.0442	0.003	16.0	20.2
12	10.19	1.012	0.1025	-.003	0.923	0.0580	-.002	9.9	15.8
13	11.26	0.993	0.1346	-.023	0.945	0.0794	-.026	7.4	11.8
14	12.12	0.965	0.1616	-.050	0.929	0.1109	-.047	6.0	8.2
15	13.20	0.903	0.1775	-.071	0.930	0.1441	-.067	5.1	6.3
16	14.02	0.881	0.1951	-.091	0.948	0.1652	-.096	4.5	5.6
17	15.99	0.925	0.2356	-.086	0.932	0.1685	-.075	3.9	5.4
18	-0.02	-.020		-.017	-.013	0.0073	-.018		-1.8
19	9.65	1.002	0.0767	0.002	0.907	0.0496	0.002	13.1	18.1
20	14.21	0.860	0.1931	-.104	0.930	0.1669	-.091	4.5	5.5
21	14.77	0.851	0.2043	-.109	0.920	0.1870	-.099	4.2	4.8
22	14.76	0.848	0.2043	-.113	0.938	0.1849	-.110	4.2	5.0
23	15.58	0.896	0.2216	-.106	0.902	0.1938	-.097	4.0	4.6
24	-0.38	-.069	0.0026	-.018	-.055	0.0075	-.019	-26.4	-7.4

RUN 94 MACH= .701 RN= 6.97*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.40	-.088		-.018	-.074	0.0076	-.019		-9.7
2	-2.72	-.431		-.019	-.356	0.0168	-.026		-21.1
3	-1.39	-.223		-.014	-.183	0.0091	-.018		-20.8
4	-0.46	-.093		-.016	-.078	0.0076	-.019		-10.1
5	2.19	0.251		-.019	0.249	0.0069	-.017		36.1
6	4.13	0.518		-.012	0.489	0.0094	-.012		51.8
7	6.19	0.793	0.0205	0.002	0.701	0.0204	-.005	38.6	34.1
8	8.39	0.945	0.0788	-.022	0.859	0.0488	-.022	12.0	17.4
9	9.30	0.965	0.1028	-.032	0.880	0.0596	-.030	9.4	14.6
10	10.38	0.989	0.1314	-.043	0.904	0.0750	-.041	7.5	11.9
11	-0.40	-.081		-.020	-.073	0.0077	-.020		-9.5
12	-0.78	-.133		-.019	-.120	0.0078	-.020		-15.3
13	9.59	0.982	0.1197	-.037	0.890	0.0637	-.033	8.2	13.8

RUN 95 MACH= .402 RN= 4.62*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.06	0.011		-.025	-.007	0.0075	-.016		-0.9
2	5.96	0.646		-.024	0.597	0.0077	-.015		76.8

RUN 97 MACH= .805 RN= 7.56*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.05	-.083	0.0064	-.014	-.062	0.0077	-.021	-13.0	-8.0
2	-2.13	-.440		-.019	-.383	0.0121	-.025		-31.3
3	-1.31	-.298		-.017	-.227	0.0089	-.022		-25.4
4	-0.48	-.161		-.011	-.126	0.0080	-.019		-15.6
5	1.18	0.097		-.012	0.109	0.0073	-.020		14.8
6	2.18	0.267	0.0115	-.011	0.267	0.0091	-.018	23.3	29.1
7	4.20	0.562	0.0075	-.032	0.557	0.0180	-.030	74.5	30.7
8	5.25	0.679	0.0058	-.055	0.684	0.0272	-.047	116.7	24.8
9	6.42	0.769	0.0241	-.065	0.785	0.0365	-.060	31.9	21.2
10	-0.18	-.145		-.015	-.115	0.0076	-.019		-15.0
11	5.85	0.708	0.0082	-.059	0.717	0.0308	-.054	85.2	23.6
12	-1.13	-.301		-.016	-.231	0.0090	-.022		-25.5
13	-1.13	-.309		-.016	-.242	0.0095	-.021		-25.3

RUN 98 MACH= .403 RN= 4.65*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.27	-.064		-.007	-.049	0.0071	-.015		-6.8
2	6.07	0.603		-.007	0.593	0.0075	-.013		78.5

RUN 99 MACH= .704 RN= 6.97*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.11	-.047		-.011	-.033	0.0074	-.019		-4.4
2	0.11	-.046		-.011	-.035	0.0075	-.019		-4.6

RUN 100 MACH= .753 RN= 7.23*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.10	-.060		-.012	-.048	0.0074	-.019		-6.4
2	0.10	-.061		-.012	-.044	0.0074	-.020		-5.9
3	0.21	-.046		-.013	-.031	0.0076	-.020		-4.0
4	0.22	-.044		-.013	-.032	0.0073	-.019		-4.3

RUN 101 MACH= .781 RN= 7.32*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.18	-.059		-.014	-.040	0.0074	-.020		-5.4
2	0.21	-.056		-.013	-.038	0.0075	-.020		-5.1
3	0.25	-.047		-.013	-.035	0.0075	-.019		-4.6
4	0.23	-.051		-.014	-.035	0.0074	-.019		-4.7
5	0.23	-.051		-.013	-.036	0.0075	-.020		-4.8
6	0.47	-.018		-.014	-.009	0.0076	-.021		1.2
7	0.47	-.019		-.014	-.010	0.0075	-.020		1.2

RUN 102 MACH= .805 RN= 7.38*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.43	-.036	0.0039	-.014	-.025	0.0077	-.019	-8.6	-3.2
2	0.45	-.032	0.0042	-.013	-.024	0.0076	-.019	-7.6	-3.1

RUN 103 MACH= .831 RN= 7.45*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.43	-.037	0.0067	-.012	-.021	0.0079	-.018	-5.5	-2.6
2	0.43	-.036	0.0078	-.011	-.023	0.0083	-.017	-4.6	-2.7

RUN 104 MACH= .857 RN= 7.52*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.45	-.007	0.0116	0.002	-.004	0.0101	-.012	-0.6	-0.4
2	0.45	-.012	0.0103	0.001	0.002	0.0100	-.013	-1.2	0.2
3	-0.19	-.097	0.0103	0.012	-.087	0.0115	0.002	-9.4	-7.4
4	1.52	0.134	0.0086	-.020	0.115	0.0091	-.014	15.6	12.5
5	2.64	0.256	0.0026	-.046	0.288	0.0119	-.046	100.2	23.9
6	2.62	0.266	0.0023	-.047	0.289	0.0113	-.043	114.1	25.2
7	0.53	-.002	0.0119	-.001	-.001	0.0103	-.011	-0.1	-0.1
8	0.51	0.004	0.0132	0.001	0.005	0.0107	-.011	0.3	0.5

RUN 105 MACH= .883 RN= 7.61*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.56	0.032	0.0175	0.005	-.028	0.0143	0.020	1.8	-1.9
2	0.56	0.030	0.0166	0.005	-.031	0.0146	0.023	1.8	-2.1

RUN 106 MACH= .901 RN= 7.61*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.57	0.045	0.0239	0.001	0.016	0.0216	0.005	1.9	0.7

RUN 108 MACH=0.405 RN= 4.75*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.06	-.030		-.006	-.017		-.012		
2	6.02	0.590		-.001	0.593		-.029		

RUN 109 MACH=0.928 RN= 7.94*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	-.014	0.0341	0.000	0.011		0.001	-0.4	
2	-2.37	-.229	0.0247	0.029	-.209		-.022	-9.3	
3	-1.44	-.127	0.0294	-.012	-.127		0.224	-4.3	
4	-0.25	-.014	0.0330	0.004	0.015		0.026	-0.4	
5	1.12	0.091	0.0401	0.009	0.107		-.044	2.3	
6	2.03	0.141	0.0420	0.008	0.170		0.069	3.4	
7	4.19	0.252	0.0540	-.026	0.263		-.023	4.7	
8	-0.20	-.016	0.0335	0.004	0.012		0.023	-0.5	

RUN 110 MACH=0.981 RN= 7.92*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.19	0.003	0.0506	-.019	0.016		-.007	0.1	
2	-1.21	-.080	0.0498	-.016	-.085		-.006	-1.6	
3	-0.41	-.011	0.0506	-.018	0.003		-.005	-0.2	
4	1.05	0.093	0.0567	-.029	0.104		-.019	1.6	
5	2.10	0.149	0.0600	-.036	0.170		-.029	2.5	
6	-0.03	0.019	0.0504	-.022	0.027		-.009	0.3	

RUN 111 MACH=1.071 RN= 7.92*10**6 CONFIGURATION 3

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	0.015	0.0514	-.026	0.031		-.013	0.3	
2	-1.32	-.084	0.0497	-.022	-.083		-.011	-1.7	
3	-0.38	-.011	0.0491	-.024	-.000		-.012	-0.2	
4	1.12	0.089	0.0519	-.032	0.102		-.022	1.7	
5	2.04	0.143	0.0554	-.040	0.150		-.030	2.6	
6	-0.01	0.019	0.0550	-.027	0.020		-.013	0.3	

RUN 122 MACH= .411 RN= 4.49*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
5	-0.08	-.029		0.017	-.004		0.009		
6	6.08	0.567		0.013	0.609	0.0097	0.002		62.4

RUN 123 MACH= .395 RN= 4.30*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	-.018		0.019	0.027	0.0101	0.000		2.7
2	-5.37	-.526		0.010	-.471	0.0187	-.005		-25.3
3	-3.37	-.348		0.020	-.309	0.0090	0.004		-34.4
4	-1.33	-.138		0.022	-.100	0.0097	0.001		-10.3
5	-0.21	-.031		0.021	0.003	0.0110	0.002		0.2
6	-3.37	-.346		0.020	-.303	0.0091	0.002		-33.4
7	3.03	0.272		0.019	0.317	0.0127	0.000		24.9
8	6.06	0.570		0.018	0.614	0.0101	0.001		60.8
9	9.07	0.858		0.014	0.895	0.0120	0.006		74.3
10	11.10	1.015		0.022	1.033	0.0242	0.014		42.5
11	12.07	1.035	0.0499	0.019	1.022	0.0443	0.009	20.8	22.9
12	13.05	0.969	0.0934	0.009	0.949	0.0805	-.020	10.4	11.7
13	13.98	0.907	0.0874	-.011	1.015	0.0746	-.026	10.4	13.5
14	14.95	0.883	0.0934	-.010	0.978	0.0849	-.038	9.5	11.4
15	15.92	0.832	0.0991	-.050	0.974	0.1211	-.058	8.4	7.9
16	17.87	0.804	0.1171	-.073	0.972	0.1756	-.068	6.9	5.4
17	18.42	0.620	0.1011	-.092	0.971	0.1770	-.075	6.1	5.4
18	-0.26	-.077		0.019	-.004	0.0089	0.001		-8.5
19	-1.89	-.152		0.018	-.079	0.0085	0.000		-9.2

RUN 124 MACH= .498 RN= 5.16*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.07	-.033		0.015	0.008	0.0087	0.003		0.9
2	-5.52	-.546	0.0204	0.006	-.508	0.0323	-.012	-26.8	-15.8
3	-3.54	-.377		-.237	-.357	0.0110	-.002		-32.4
4	-1.23	-.142		0.018	-.112	0.0085	0.003		-13.1
5	-0.20	-.046		0.015	-.005	0.0085	0.002		-0.6
6	3.14	0.298		0.011	0.347	0.0089	0.002		39.8
7	6.07	0.612		0.008	0.651	0.0090	0.003		71.9
8	9.11	0.907		0.020	0.907	0.0187	0.019		48.8
9	11.14	0.953	0.0889	0.011	0.952	0.0587	0.019	10.7	16.1
10	12.22	0.928	0.0980	0.004	0.924	0.0794	-.003	9.5	11.5
11	13.04	0.894	0.1068	-.006	0.914	0.0917	-.010	8.4	9.8
12	14.18	0.831	0.1144	-.030	0.898	0.1158	-.036	7.3	7.7
13	15.18	0.809	0.1204	-.033	0.893	0.1396	-.047	6.7	6.3
14	15.88	0.790	0.1350	-.046	0.877	0.1546	-.054	5.8	5.6
15	17.87	0.734	0.1478	-.072	0.881	0.1804	-.081	5.0	4.8
16	-0.92	-.135		0.014	-.080	0.0086	0.001		-9.2
17	-0.36	-.080		0.012	-.019	0.0083	0.001		-2.4

RUN 126 MACH= .303 RN= 4.75*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
2	-0.17	-.025		0.008	0.048	0.0057	-.010		8.4
3	2.99	0.285		0.004	0.303	0.0076	0.000		39.8
4	6.05	0.584		0.001	0.594	0.0090	0.001		65.6
5	8.99	0.866		-.003	0.899	0.0103	-.002		86.7
6	11.02	1.075		-.003	1.050	0.0122	0.007		85.6
7	12.12	1.166		0.001	1.148	0.0140	0.008		81.4
8	13.36	1.266		-.003	1.205	0.0173	0.013		69.3
9	14.17	1.184	0.1046	-.038	1.221	0.0653	0.012	18.6	18.5
10	14.97	0.830	0.0862	-.096	1.058	0.1995	-.085	9.6	5.3
11	16.83	1.040	0.1104	-.063	1.131	0.0857	-.036	9.4	13.1
12	-0.88	-.088		0.010	-.074	0.0066	0.002		-11.2
13	-0.13	-.015		0.009	0.001	0.0073	0.001		0.1

RUN 128 MACH= .404 RN= 4.40*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.16	-.004		0.005	0.004	0.0077	0.001		0.5
2	12.04	1.094		0.008	1.025	0.0373	0.009		27.4
3	5.98	0.599		0.000	0.601	0.0108	0.001		55.4

RUN 129 MACH= .608 RN= 5.95*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.02	0.018		0.003	0.019	0.0079	0.000		2.3
2	-5.39	-.495	0.0199	-.002	-.524	0.0345	-.017	-24.8	-15.2
3	-3.42	-.327		0.003	-.342	0.0130	-.004		-26.3
4	-1.32	-.103		0.013	-.120	0.0078	0.002		-15.4
5	-0.18	0.017		0.007	0.000	0.0069	0.002		0.8
6	3.07	0.374		0.003	0.355	0.0079	0.002		44.7
7	6.06	0.723		0.005	0.678	0.0104	0.000		65.1
8	9.27	0.972		0.016	0.869	0.0458	0.012		18.9
9	10.20	0.957	0.1049	0.004	0.876	0.0667	0.008	9.1	13.0
10	11.43	0.891	0.1247	-.033	0.885	0.1023	-.000	7.1	8.5
11	12.31	0.829	0.1297	-.041	0.900	0.1278	-.030	6.4	7.0
12	13.03	0.818	0.1339	-.057	0.897	0.1340	-.032	6.1	6.6
13	13.92	0.839	0.1498	-.038	0.890	0.1296	-.027	5.6	6.8
14	14.27	0.822	0.1781	-.061	0.893	0.1641	-.044	4.6	5.4
15	-0.88	-.071		0.009	-.078	0.0073	0.002		-10.6
16	-0.11	0.012		0.003	0.008	0.0074	0.001		1.1
17	1.11	0.146		0.000	0.141	0.0072	0.002		19.5
18	3.05	0.364		-.003	0.347	0.0078	0.002		44.5
19	6.15	0.736		0.004	0.685	0.0101	0.008		67.4
20	9.25	0.979		0.011	0.871	0.0457	0.013		18.9
21	10.21	0.958	0.1161	-.001	0.890	0.0634	0.009	8.2	13.9
22	11.28	0.906	0.1338	-.025	0.884	0.0981	-.003	6.8	8.9
23	12.14	0.844	0.1294	-.048	0.894	0.1209	-.022	6.5	7.3
24	-0.05	0.020		0.007	0.010	0.0070	0.003		1.4

RUN 130 MACH= .703 RN= 6.44*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.04	0.021		0.013	0.015	0.0063	0.000		2.4
2	-2.31	-.249	0.0109	-.002	-.274	0.0095	-.007	-22.9	-28.6
3	-1.44	-.130		-.000	-.134	0.0065	-.000		-20.6
4	-1.04	-.086		-.000	-.103	0.0065	0.000		-15.7
5	0.05	0.044		-.005	0.031	0.0070	0.000		4.5
6	2.09	0.298		-.005	0.278	0.0068	0.002		40.5
7	4.20	0.581	0.0243	0.003	0.526	0.0113	0.007	23.9	46.2
8	6.32	0.845	0.0656	0.009	0.767	0.0279	0.015	12.9	27.2
9	8.31	0.847	0.0869	-.020	0.803	0.0584	-.033	9.8	13.6
10	9.31	0.865	0.0922	-.035	0.803	0.0758	-.030	9.4	10.6
11	-0.09	-.065		-.002	-.082	0.0066	-.001		-12.4
12	-0.26	0.015		-.000	-.008	0.0070	0.000		-1.1

RUN 133 MACH= .802 RN= 6.88*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.04	0.004		0.008	0.008	0.0072	0.001		1.1
2	0.0	0.022		0.013	0.031	0.0079	0.004		3.8
3	-0.01	0.007		0.009	0.010	0.0081	0.000		1.3
4	-1.45	-.195		0.021	-.230	0.0078	-.003		-29.0
5	-0.26	-.015		0.014	-.025	0.0078	0.001		-3.2
6	1.20	0.213		0.014	0.210	0.0076	0.004		27.3
7	2.15	0.351		0.004	0.351	0.0114	0.001		30.5
9	5.22	0.583	0.0742	-.022	0.609	0.0363	-.033	7.9	16.6
10	6.32	0.623	0.0877	-.015	0.651	0.0506	-.035	7.1	12.7
11	7.33	0.639	0.1016	-.025	0.675	0.0669	-.039	6.3	9.9
12	8.22	0.668	0.1106	-.030	0.697	0.0760	-.043	6.0	9.0
13	4.33	0.562	0.0584	-.030	0.611	0.0282	-.030	9.6	21.4
14	-1.09	-.132		0.022	-.143	0.0078	-.001		-18.3
15	-0.02	0.021		0.009	0.006	0.0070	0.002		0.8

x M=.846

RUN 134 MACH= .704 RN= 6.36*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.07	-.059		0.010	-.084	0.0076	-.000		-11.0
2	-0.92	-.061		0.009	-.083	0.0068	-.000		-12.1
4	-0.51	-.014		0.007	-.035	0.0069	-.000		-5.1
5	-0.49	-.015		0.008	-.036	0.0067	0.001		-5.4
6	-0.09	0.028		0.008	0.012	0.0073	0.001		1.6
7	-0.09	0.029		0.008	0.012	0.0067	0.001		1.7

RUN 135 MACH= .755 RN= 6.64*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.12	0.021		0.007	0.008	0.0075	0.000		1.0
2	-0.09	0.022		0.008	0.007	0.0067	0.000		1.1

RUN 136 MACH= .779 RN= 6.72*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.09	0.017		0.008	0.005	0.0069	0.001		0.7
2	-0.10	0.016		0.008	0.004	0.0073	0.001		0.6

RUN 137 MACH= .804 RN= 6.81*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.10	0.008		0.009	-.001	0.0071	0.001		-0.1
2	-0.10	0.008		0.009	-.006	0.0074	0.003		-0.9

RUN 138 MACH= .824 RN= 6.87*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.12	0.007		0.011	-.012	0.0080	0.002		-1.5
2	-0.10	0.007		0.011	-.012	0.0073	0.003		-1.7

RUN 139 MACH= .848 RN= 6.97*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.14	0.051		0.011	0.046	0.0075	0.003		6.1
2	0.16	0.052		0.011	0.050	0.0080	0.002		6.2
3	-0.41	-.024		0.024	-.036	0.0074	0.004		-4.9
4	-0.43	-.029		0.022	-.038	0.0076	0.006		-5.0

RUN 140 MACH= .869 RN= 7.01*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.41	-.000		0.021	-.021	0.0132	0.017		-1.6
2	-0.38	0.005		0.020	-.021	0.0122	0.015		-1.7
3	-0.04	0.036		0.011	0.030	0.0130	0.010		2.1
4	-0.06	0.033		0.013	0.022	0.0125	0.013		1.8

RUN 141 MACH= .888 RN= 7.05*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.07	0.037	0.0333	-.009	0.006	0.0211	-.029	1.1	4.0
2	-0.05	0.036	0.0342	-.008	0.002	0.0207	-.026	1.0	3.9
3	-0.50	-.003	0.0327	-.011	0.027	0.0207	-.027	-0.1	1.3
4	-0.48	-.003	0.0330	-.009	0.031	0.0195	-.027	-0.1	1.6
5	-0.53	-.004	0.0338	-.010	0.032	0.0221	-.028	-0.1	1.4
6	-0.51	-.006	0.0310	-.014	0.022	0.0228	-.025	-0.2	0.9

RUN 142 MACH= .402 RN= 4.29*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.01	0.059		0.017	0.022	0.0070	0.002		3.1
2	6.00	0.631		0.012	0.615	0.0078	0.000		78.9
3	10.13	1.015		0.013	0.986	0.0142	0.008		69.2
4	11.17	1.087		0.019	1.042	0.0228	0.014		47.2
5	12.09	1.093		0.023	1.026	0.0376	0.012		27.1
6	13.06	1.024		0.007	0.980	0.0704	-.011		13.8
7	-0.05	0.009		0.020	0.016	0.0074	0.001		2.1

RUN 144 MACH=0.923 RN= 7.33*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.17	-.015	0.0300	-.024	0.085		-.030	-0.5	
2	-1.95	-.215	0.0219	-.025	-.134		-.031	-9.8	
3	-1.35	-.147	0.0196	-.033	-.039		-.043	-7.5	
4	-0.11	0.000	0.0230	-.024	0.098		-.029	0.0	
5	1.02	0.112	0.0370	0.005	0.190		0.013	3.0	
6	2.05	0.178	0.0547	-.001	0.219		-.004	3.2	
7	3.15	0.235	0.0661	0.007	0.237		0.039	3.5	
8	4.23	0.290	0.0695	0.002	0.288		0.040	4.2	
9	-0.16	0.002	0.0280	-.026	0.002		-.030	0.1	

RUN 145 MACH=0.983 RN= 7.27*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.21	-.026	0.0545	-.051	0.080		-.037	-0.5	
2	-1.33	-.107	0.0642	-.042	-.017		-.028	-1.7	
3	-0.18	-.020	0.0542	-.052	0.083		-.037	-0.4	
4	1.04	0.064	0.0466	-.058	0.176		-.043	1.4	
5	2.09	0.118	0.0475	-.069	0.242		-.053	2.5	
6	-0.31	-.043	0.0692	-.051	0.069		-.038	-0.6	

RUN 146 MACH=1.066 RN= 7.28*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.34	-.042	0.0552	-.056	0.076		-.040	-0.8	
2	-1.31	-.110	0.0659	-.044	-.012		-.031	-1.7	
3	-0.06	-.020	0.0543	-.058	0.094		-.040	-0.4	
4	0.94	0.051	0.0483	-.063	0.155		-.044	1.1	
5	-0.12	-.024	0.0559	-.058	0.086		-.041	-0.4	

RUN 147 MACH=0.401 RN= 4.25*10**6 CONFIGURATION 4

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.06	0.034		-.007	0.010			2.4	
2	6.12	0.630		-.020	0.602			13.4	
3	12.21	1.087		-.005	0.925			8.7	
4	-0.26	0.004		-.006	-.004			0.2	

RUN 149 MACH= .402 RN= 3.62*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.09	0.026		-.020	0.042	0.0090	-.022		4.7
2	-0.07	0.023		-.018	0.037	0.0079	-.021		4.7
3	-0.17	0.006		-.016	0.030	0.0084	-.022		3.6
4	-0.19	-.001		-.017	0.031	0.0083	-.022		3.7
5	5.97	0.665		-.006	0.679	0.0079	-.015		85.9
6	5.97	0.661		-.005	0.673	0.0082	-.015		81.9

RUN 150 MACH= .401 RN= 3.60*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.16	-.007		-.013	0.031	0.0083	-.022		3.7
2	-5.56	-.549	0.0794	0.000	-.466	0.0789	-.027	-6.9	-6.0
3	-3.45	-.380		-.015	-.303	0.0121	-.028		-25.0
4	-1.27	-.132		-.014	-.077	0.0083	-.024		-9.3
5	-0.23	-.028		-.012	0.029	0.0080	-.022		3.6
6	2.91	0.311		-.007	0.361	0.0080	-.019		45.3
7	6.02	0.657			0.686	0.0077	-.015		89.0
8	8.92	0.962		-.009	0.971	0.0094	-.007		102.6
9	10.98	1.162		-.001	1.179	0.0113	0.001		104.2
10	12.00	1.233		0.004	1.246	0.0135	0.007		92.1
11	13.01	1.288		0.011	1.295	0.0188	0.014		68.7
12	13.99	1.325	0.0456	0.012	1.316	0.0283	0.021	29.1	46.2
13	14.96	1.314	0.0666	0.017	1.317	0.0312	0.019	19.7	42.0
14	16.06	1.216	0.0911	-.016	1.265	0.0567	0.003	13.3	22.1
15	18.01	1.019	0.1823	-.112	1.297	0.2068	-.082	5.6	6.1
16	18.28	0.998	0.1843	-.117	1.193	0.2134	-.075	5.4	5.5
17	-1.03	-.139		-.007	-.057	0.0079	-.023		-7.3
18	-0.41	-.074		-.005	0.006	0.0082	-.022		0.7

RUN 151 MACH= .501 RN= 4.30*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.41	-.059		-.012	-.001	0.0082	-.024		-0.2
2	-5.37	-.550	0.0826		-.462	0.0853	-.023	-6.7	-5.5
3	-3.48	-.388	0.0415	-.018	-.310	0.0395	-.032	-9.3	-7.9
4	-1.42	-.176		-.012	-.116	0.0088	-.026		-13.2
5	-0.36	-.057		-.011	-.008	0.0080	-.024		-0.0
6	2.99	0.335		-.009	0.378	0.0078	-.019		48.4
7	6.00	0.691		-.015	0.713	0.0084	-.013		84.7
8	9.00	0.960	0.0219	0.006	0.973	0.0194	0.003	43.9	50.0
9	10.06	1.017	0.0384	0.009	1.038	0.0310	0.007	26.5	33.1
10	11.19	1.036	0.0633	0.001	1.048	0.0514	-.002	16.4	20.3
11	12.00	1.060	0.0829	-.014	1.066	0.0623	-.009	12.8	17.0
12	13.02	1.050	0.1052	-.014	1.074	0.0772	-.020	10.0	13.8
13	14.15	1.048	0.1291	-.032	1.093	0.1006	-.034	8.1	10.7
14	15.08	1.068	0.1513	-.049	1.094	0.1208	-.044	7.1	8.9
15	16.02	1.024	0.1648	-.065	1.091	0.1533	-.064	6.2	7.0
16	18.03	1.032	0.2103	-.103	1.130	0.2026	-.071	4.9	5.4
17	18.04	1.003	0.2017	-.102	1.133	0.1919	-.068	5.0	5.7
18	0.46	0.032		-.010	0.091	0.0081	-.023		11.1
19	0.04	-.011		-.012	0.044	0.0085	-.023		5.1

RUN 153 MACH= .298 RN= 4.12*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.01	0.051		-.024	0.043	0.0087	-.022		4.9
2	-5.32	-.552		-.025	-.522	0.0102	-.026		-51.4
3	-3.38	-.328		-.028	-.309	0.0090	-.025		-34.3
4	-1.26	-.085		-.027	-.088	0.0088	-.020		-10.1
5	-0.22	0.025		-.025	0.021	0.0080	-.021		2.3
6	2.91	0.361		-.024	0.352	0.0083	-.019		42.3
8	6.03	0.703		-.024	0.674	0.0090	-.016		74.5
9	8.96	1.012		-.025	0.962	0.0094	-.011		102.5
10	11.02	1.251		-.015	1.200	0.0084	-.005		142.8
11	12.09	1.315		-.104	1.263	0.0120	-.001		104.4
12	13.09	1.412		-.027	1.356	0.0129	0.003		104.5
13	14.04	1.508		-.021	1.448	0.0139	0.007		103.5
14	14.98	1.591		-.027	1.522	0.0160	0.012		94.5
15	16.07	1.659		-.015	1.593	0.0173	0.018		91.4
16	17.93	1.804		-.013	1.726	0.0243	0.029		70.4
17	18.46	1.005	0.1767	-.128	0.896	0.2413	-.131	5.7	3.7
18	0.47	0.095		-.021	0.094	0.0088	-.020		10.7
19	0.89	0.050		-.023	0.051	0.0089	-.020		5.7

RUN 155 MACH= .401 RN= 3.61*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	12.89	1.389		-.011	1.263	0.0144	0.007		87.5
2	12.89	1.388		-.009	1.257	0.0148	0.007		84.5
3	14.94	1.389	0.0604	0.002	1.342	0.0347	0.023	23.0	38.4
4	14.96	1.381	0.0608	0.006	1.345	0.0326	0.021	23.0	40.9
5	6.02	0.680		-.013	0.680	0.0080	-.015		85.0
6	-0.04	0.015		-.016	0.036	0.0078	-.021		4.6

RUN 156 MACH= .601 RN= 4.90*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.06	0.013	0.0093	-.023	0.030	0.0087	-.026	1.4	3.5
2	-5.54	-.502	0.0861	0.024	-.478	0.1014	-.012	-5.8	-4.8
3	-3.35	-.327	0.0432	-.026	-.314	0.0439	-.032	-7.6	-7.2
4	-1.22	-.115	0.0145	-.026	-.098	0.0147	-.028	-7.9	-6.6
5	-0.30	-.012	0.0102	-.023	0.005	0.0090	-.026	-1.1	0.5
6	3.18	0.425	0.0134	-.019	0.422	0.0079	-.019	31.8	53.1
7	6.11	0.772	0.0298	-.013	0.741	0.0184	-.003	26.7	40.2
8	9.16	0.908	0.0861	-.006	0.880	0.0512	-.015	10.5	17.1
9	10.16	0.933	0.1072	-.028	0.903	0.0638	-.028	8.7	14.1

RUN 158 MACH= .799 RN= 5.68*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.32	-.089	0.0259	-.043	-.058	0.0201	-.043	-3.4	-2.9
2	-0.30	-.086	0.0268	-.041	-.060	0.0209	-.043	-3.2	-2.9

RUN 159 MACH= .844 RN= 5.78*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.32	-.094	0.0383	-.044	-.086	0.0281	-.038	-2.4	-3.0
2	-0.31	-.093	0.0403	-.044	-.114	0.0281	-.030	-2.3	-4.0
3	0.46	0.015	0.0352	-.070	0.065	0.0270	-.073	0.4	2.4

RUN 160 MACH= .396 RN= 3.49*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.03	0.053		-.025	0.044	0.0087	-.023		5.0
2	6.06	0.716		-.025	0.683	0.0077	-.016		89.8

RUN 161 MACH= .604 RN= 4.84*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.16	0.021	0.0125	-.029	0.019	0.0101	-.026	1.7	1.9
2	-5.34	-.465	0.0775	0.003	-.469	0.0934	-.016	-6.0	-5.1
3	-3.31	-.305	0.0391	-.030	-.312	0.0442	-.032	-7.8	-7.1
4	-1.33	-.109	0.0106	-.032	-.106	0.0144	-.028	-10.3	-7.4
5	-0.33	0.008	0.0065	-.029	0.003	0.0093	-.026	1.3	0.3
6	3.03	0.429	0.0111	-.025	0.403	0.0081	-.019	36.5	49.8
7	6.24	0.797	0.0298	-.023	0.757	0.0191	-.004	26.7	39.4
8	9.12	0.938	0.0834	-.014	0.891	0.0547	-.014	11.2	16.2
9	10.25	0.958	0.1094	-.033	0.913	0.0693	-.027	8.8	13.1
10	11.15	0.953	0.1268	-.040	0.923	0.0837	-.038	7.5	10.9
11	12.18	0.970	0.1437	-.054	0.954	0.1012	-.048	6.7	9.3
12	13.14	0.990	0.1619	-.069	0.971	0.1166	-.054	6.1	8.2
13	14.20	0.993	0.1789	-.076	0.991	0.1365	-.063	5.6	7.2
14	15.17	0.986	0.1939	-.083	1.003	0.1577	-.072	5.1	6.3
15	16.07	0.993	0.2116	-.094	0.998	0.1758	-.081	4.7	5.6
16	-0.31	0.003	0.0096	-.029	0.002	0.0105	-.027	0.3	0.2

RUN 163 MACH= .403 RN= 3.58*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
2	-0.02	0.029		-.020	0.040	0.0084	-.022		4.8
3	5.98	0.680		-.015	0.672	0.0075	-.015		88.9

RUN 164 MACH= .702 RN= 5.32*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.24	-.013	0.0166	-.031	0.015	0.0141	-.030	-0.8	1.0
2	-5.50	-.479	0.0906	0.019	-.463	0.0767	-.005	-5.3	-6.1
3	-3.55	-.348	0.0574	-.021	-.343	0.0512	-.032	-6.1	-6.7
4	-1.34	-.126	0.0190	-.032	-.128	0.0233	-.037	-6.6	-5.5
5	-0.29	-.005	0.0117	-.029	0.011	0.0138	-.031	-0.4	0.8
6	2.04	0.305	0.0084	-.018	0.312	0.0086	-.028	36.6	36.1
7	4.27	0.625	0.0274	0.009	0.617	0.0211	-.011	22.8	29.0
8	6.25	0.768	0.0614	-.038	0.754	0.0467	-.031	12.5	16.0
9	8.20	0.788	0.0911	-.053	0.803	0.0764	-.059	8.7	10.4
10	9.18	0.816	0.1087	-.057	0.809	0.0849	-.060	7.5	9.4
11	10.22	0.833	0.1280	-.063	0.838	0.0915	-.073	6.5	9.1
12	11.16	0.854	0.1415	-.066	0.864	0.0997	-.080	6.0	8.6
13	-0.18	-.006	0.0149	-.032	0.019	0.0136	-.031	-0.4	1.4
14	-0.17	-.008	0.0150	-.032	0.019	0.0137	-.031	-0.5	1.4

RUN 165 MACH= .803 RN= 5.64*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.20	-.079	0.0266	-.042	-.052	0.0284	-.045	-3.0	-2.5
2	-1.91	-.337	0.0609	-.026	-.368	0.0351	-.038	-5.5	-10.2
3	-0.26	-.061	0.0218	-.039	-.065	0.0195	-.044	-2.8	-3.3
4	1.10	0.197	0.0251	-.042	0.192	0.0176	-.042	7.9	10.8
5	2.20	0.377	0.0293	-.052	0.400	0.0220	-.052	12.9	18.0
6	4.08	0.530	0.0629	-.074	0.528	0.0355	-.079	8.4	14.7
8	5.24	0.592	0.0727	-.076	0.586	0.0485	-.086	8.1	12.8
9	6.22	0.613	0.0860	-.079	0.623	0.0638	-.092	7.1	9.6
10	7.23	0.646	0.0979	-.083	0.633	0.0828	-.095	6.6	7.5
11	8.09	0.658	0.1114	-.092	0.644	0.1018	-.100	5.9	6.2
12	8.16	0.681	0.0225	-.044	0.021	0.0182	-.042	0.0	1.1
13	-0.05	-.051	0.0216	-.045	-.045	0.0195	-.044	-2.3	-2.3

RUN 166 MACH= .856 RN= 5.71*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	-.069	0.0438	-.059	-.072	0.0254	-.044	-1.6	-2.8
2	0.99	0.059	0.0329	-.094	0.110	0.0268	-.089	1.8	4.1
3	2.08	0.172	0.0427	-.097	0.198	0.0281	-.091	4.0	7.8
4	3.14	0.287	0.0575	-.090	0.274	0.0335	-.077	5.0	8.1
5	4.04	0.363	0.0673	-.084	0.366	0.0420	-.078	5.4	8.6
6	5.16	0.427	0.0828	-.080	0.439	0.0602	-.080	5.2	7.2
7	0.13	-.047	0.0420	-.069	-.045	0.0257	-.053	-1.1	-1.7
8	0.41	-.019	0.0413	-.078	0.007	0.0270	-.067	-0.5	0.2
14	-0.06	-.074	0.0401	-.059	-.070	0.0264	-.048	-1.8	-2.6

RUN 168 MACH= .308 RN= 3.97*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.01	0.007			-.011	0.006		-.013	
2	3.01	0.312			-.011	0.279		-.019	
3	6.07	0.627			-.005	0.540		-.021	5.1
4	0.03	-.012			-.006	0.049	0.0096	-.023	35.4
5	2.92	0.292			-.004	0.339	0.0096	-.018	84.1
6	5.96	0.603			-.005	0.655	0.0078	-.016	103.8
7	8.99	0.929			-.007	0.964	0.0093	-.011	108.2
8	10.98	1.135			-.007	1.155	0.0107	-.005	104.4
9	12.05	1.230			-.001	1.236	0.0118	0.002	98.2
10	12.98	1.315			0.003	1.344	0.0137	0.002	102.7
11	13.92	1.405			-.002	1.414	0.0137	0.007	93.4
12	15.08	1.489			0.006	1.486	0.0159	0.014	97.8
13	16.10	1.545			0.010	1.582	0.0163	0.016	5.0
14	17.89	0.935	0.1287		-.103	1.313	0.2582	-.097	7.3 4.9
15	19.92	0.938	0.1611		-.110	1.339	0.2648	-.099	5.8 5.5
16	0.0	-.041			-.001	0.045	0.0082	-.021	

RUN 170 MACH= .403 RN= 5.05*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.01	0.030			-.023	0.038	0.0076	-.022	5.0
2	2.99	0.352			-.019	0.353	0.0079	-.020	44.9
3	5.98	0.687			-.019	0.664	0.0087	-.015	75.8
4	9.13	1.038			-.019	0.984	0.0090	-.008	109.0
5	11.16	1.242			-.020	1.175	0.0113	-.001	103.6
6	12.17	1.343			-.019	1.240	0.0141	0.003	87.7
7	13.14	1.389	0.0304		-.006	1.281	0.0193	0.008	66.2
8	14.03	1.060	0.1262		-.114	1.183	0.1701	-.044	45.8 6.9
9	14.97	1.050	0.1410		-.126	1.201	0.1945	-.058	8.4 6.8
10	16.05	1.049	0.1632		-.126	1.205	0.1975	-.053	7.4 5.9
11	17.92	1.018	0.1820		-.125	1.211	0.2282	-.071	6.4 5.2
12	19.92	1.001	0.2131		-.126	1.207	0.2418	-.077	5.6 4.8
13	-0.33	-.010			-.023	-.002	0.0089	-.023	4.7 -0.2

RUN 171 MACH= .347 RN= 4.41*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.32	-.007			-.023	0.000	0.0096	-.022	0.0
2	0.98	0.142			-.024	0.144	0.0082	-.021	17.5
3	3.05	0.365			-.023	0.362	0.0077	-.020	46.9
4	6.12	0.702			-.020	0.679	0.0079	-.015	85.3
5	9.02	0.995			-.017	0.957	0.0083	-.009	116.0
6	11.13	1.234			-.018	1.176	0.0105	-.002	112.2
7	13.09	1.426			-.042	1.346	0.0118	0.005	113.8
8	14.06	1.514			-.021	1.439	0.0134	0.011	107.6
9	15.02	1.560			-.012	1.504	0.0151	0.017	99.5
10	15.89	1.036	0.1332		-.128	1.272	0.2242	-.073	7.8 5.5
11	16.07	0.991	0.1600		-.121	1.317	0.2538	-.096	6.2 5.0
12	16.08	1.028	0.1673		-.128	1.321	0.2575	-.092	6.1 4.9
13	19.90	0.954	0.1765		-.119	0.843	0.2537	-.125	5.4 3.3
14	-0.13	0.012			-.021	0.026	0.0083	-.021	3.1

RUN 172 MACH= .401 RN= 3.60*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.15	0.015		-.022	0.028	0.0070	-.022		4.0
2	2.99	0.355		-.020	0.362	0.0075	-.019		48.6
3	6.02	0.688		-.019	0.677	0.0078	-.014		86.9
4	9.05	1.015		-.014	0.906	0.0087	-.007		113.7
5	11.05	1.215		-.015	1.102	0.0105	0.002		113.2
6	12.03	1.315		-.018	1.253	0.0135	0.007		92.5
7	13.13	1.359	0.0205	-.005	1.306	0.0177	0.015	66.3	73.9
8	13.77	1.385	0.0288	-.001	1.327	0.0234	0.019	48.1	56.7
9	14.28	1.041	0.1166	-.115	1.201	0.1781	-.041	8.9	6.6
10	14.92	1.015	0.1215	-.112	1.206	0.1925	-.047	8.4	6.2
11	15.96	1.032	0.1377	-.113	1.208	0.1914	-.044	7.5	6.1
12	15.95	1.013	0.1375	-.112	1.208	0.1912	-.042	7.4	6.1
13	17.91	0.999	0.1643	-.116	1.215	0.2179	-.057	6.1	5.4
14	19.90	0.967	0.1898	-.111	1.211	0.2546	-.084	5.1	4.6
15	-0.02	0.014		-.019	0.043	0.0078	-.022		5.6

RUN 173 MACH= .597 RN= 4.86*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	1.60	0.225		-.023	0.230	0.0079	-.023		29.0
2	1.61	0.224		-.022	0.228	0.0079	-.022		28.8
3	3.56	0.472		-.020	0.464	0.0086	-.019		53.7
4	3.56	0.474		-.021	0.465	0.0080	-.018		58.1

RUN 174 MACH= .651 RN= 5.13*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	1.33	0.201		-.025	0.201	0.0080	-.025		25.0
2	1.33	0.201		-.025	0.199	0.0082	-.024		24.1
3	3.30	0.463		-.019	0.444	0.0092	-.017		47.9
4	3.31	0.460		-.017	0.446	0.0091	-.017		48.9

RUN 175 MACH= .698 RN= 5.33*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.95	-.104	0.0177	-.036	-.079	0.0181	-.033	-5.9	-4.4
2	-0.95	-.104	0.0176	-.035	-.077	0.0192	-.034	-5.9	-4.0
3	1.67	0.262		-.025	0.255	0.0092	-.023		27.6
4	1.68	0.261		-.025	0.254	0.0094	-.022		27.0
5	3.20	0.480	0.0085	-.014	0.450	0.0130	-.015	56.6	34.5
6	3.18	0.487	0.0079	-.017	0.449	0.0134	-.015	61.3	33.4

RUN 176 MACH= .723 RN= 5.38*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.87	-.078	0.0152	-.037	-.085	0.0180	-.036	-5.1	-4.5
2	-0.83	-.077	0.0175	-.036	-.089	0.0188	-.035	-4.4	-4.7
3	1.51	0.252	0.0085	-.025	0.243	0.0090	-.021	29.6	26.6
4	1.52	0.250	0.0093	-.024	0.239	0.0090	-.021	26.8	26.4
5	3.00	0.488	0.0187	-.018	0.444	0.0141	-.015	26.0	31.3
6	2.99	0.483	0.0187	-.018	0.442	0.0146	-.015	25.8	30.1

RUN 177 MACH= .753 RN= 5.48*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.91	-.118	0.0203	-.042	-.125	0.0213	-.040	-5.8	-5.8
2	-0.94	-.123	0.0203	-.044	-.130	0.0207	-.041	-6.0	-6.2
3	1.10	0.217	0.0119	-.028	0.201	0.0106	-.023	18.2	18.8
4	1.19	0.217	0.0116	-.028	0.204	0.0104	-.023	18.6	19.6
5	2.93	0.491	0.0289	-.022	0.458	0.0179	-.020	17.0	25.8
6	2.94	0.490	0.0287	-.022	0.453	0.0183	-.020	17.1	24.6

RUN 178 MACH= .781 RN= 5.57*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.88	-.144	0.0225	-.046	-.160	0.0230	-.043	-6.4	-7.0
2	-0.91	-.149	0.0221	-.048	-.138	0.0226	-.042	-6.7	-6.1
3	1.08	0.210	0.0100	-.032	0.192	0.0129	-.026	11.6	14.8
4	1.08	0.208	0.0101	-.031	0.193	0.0135	-.027	11.5	14.2
5	2.72	0.473	0.0323	-.036	0.442	0.0212	-.032	14.6	20.7
6	2.72	0.480	0.0321	-.039	0.448	0.0215	-.032	15.0	20.3

RUN 179 MACH= .805 RN= 5.64*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.91	-.172	0.0293	-.044	-.209	0.0212	-.038	-5.9	-9.8
2	-0.91	-.173	0.0293	-.044	-.190	0.0220	-.039	-5.9	-8.6
3	1.23	0.238	0.0257	-.046	0.188	0.0171	-.040	9.3	10.9
4	1.23	0.238	0.0259	-.046	0.191	0.0177	-.041	9.2	10.7
5	2.90	0.474	0.0396	-.068	0.459	0.0268	-.059	11.9	16.9
6	2.89	0.486	0.0389	-.070	0.467	0.0250	-.060	12.5	18.5

RUN 180 MACH= .827 RN= 5.67*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.83	-.179	0.0303	-.035	-.196	0.0246	-.032	-5.9	-7.9
2	1.81	0.305	0.0280	-.077	0.279	0.0241	-.069	10.9	11.5
3	1.81	0.307	0.0280	-.077	0.282	0.0240	-.069	11.0	11.6
4	3.50	0.456	0.0552	-.085	0.418	0.0294	-.077	8.3	14.1
5	3.50	0.462	0.0548	-.085	0.426	0.0281	-.078	8.4	15.0
6	-0.78	-.165	0.0289	-.038	-.180	0.0217	-.033	-5.7	-8.3

RUN 181 MACH= .852 RN= 5.74*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.27	-.065	0.0340	-.049	-.119	0.0308	-.033	-1.9	-3.8
2	-0.28	-.068	0.0332	-.048	-.119	0.0289	-.032	-2.0	-4.1
3	2.18	0.256	0.0402	-.097	0.238	0.0234	-.067	6.4	10.1
4	2.17	0.262	0.0398	-.099	0.253	0.0272	-.068	6.6	9.2
5	2.19	0.262	0.0398	-.096	0.261	0.0253	-.067	6.6	10.2

RUN 182 MACH= .870 RN= 5.77*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	2.49	0.206	0.0545	-.089	0.167	0.0310	-.079	3.8	5.3
2	2.50	0.201	0.0550	-.086	0.165	0.0316	-.077	3.7	5.2
3	0.19	-.022	0.0437	-.071	-.039	0.0277	-.062	-0.5	-1.4
4	0.21	-.027	0.0478	-.067	-.049	0.0289	-.057	-0.6	-1.7

RUN 183 MACH= .488 RN= 3.55*10**6 CONFIGURATION 5

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.12	0.075			0.025	0.0101			
2	6.04	0.747			0.670	0.0117			

RUN 196 MACH= .405 RN= 3.91*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.07	-.004		-.001	0.043	0.0088	-.013		4.9
2	-2.50	-.252		-.003	-.200	0.0081	-.012		-24.5
3	-1.29	-.130		-.000	-.080	0.0080	-.014		-10.0
4	-0.26	-.024		-.003	0.030	0.0080	-.014		3.8
5	3.17	0.319		-.001	0.383	0.0100	-.016		38.2
6	5.99	0.613		-.001	0.686	0.0083	-.017		82.1
7	9.17	0.920		0.005	0.986	0.0169	-.014		58.3
8	11.05	1.085	0.0688	0.011	1.146	0.0214	-.005	15.8	53.2
9	12.01	1.129	0.0864	0.019	1.186	0.0338	0.001	13.1	34.9
10	12.94	1.063	0.1154	0.003	1.152	0.0619	-.010	9.2	18.4
11	14.04	0.992	0.1295	-.028	1.162	0.0651	-.022	7.7	17.7
12	14.89	0.928	0.1276	-.035	1.038	0.0752	-.024	7.3	13.7
13	16.02	0.839	0.1412	-.053	1.050	0.0974	-.068	5.9	10.7
15	-0.88	-.110		-.002	-.043	0.0070	-.015		-6.2
16	-0.25	-.040		-.005	0.028	0.0071	-.015		3.9

RUN 197 MACH= .604 RN= 5.26*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.26	-.026	0.0080	-.010	0.022	0.0092	-.016	-3.3	2.4
2	6.20	0.742	0.0290	-.068	0.765	0.0122	-.012	24.9	62.3
3	6.21	0.746	0.0291	-.010	0.768	0.0119	-.013	25.7	64.4
4	6.20	0.752	0.0286	-.012	0.778	0.0116	-.012	26.3	66.1
5	6.23	0.748	0.0287	-.008	0.769	0.0137	-.012	25.8	55.8
6	6.18	0.754	0.0278	-.013	0.767	0.0136	-.012	27.1	56.3
7	6.24	0.748	0.0292	-.009	0.763	0.0142	-.012	25.3	53.5
8	6.21	0.746	0.0292	-.010	0.767	0.0114	-.013	25.5	67.3
9	6.19	0.757	0.0277	-.015	0.772	0.0120	-.013	27.3	64.0
10	-0.37	-.025	0.0050	-.012	0.009	0.0098	-.017	-5.0	0.9

RUN 198 MACH= .404 RN= 3.83*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.34	-.028		-.010	0.016	0.0087	-.015		1.9
2	6.07	0.639		-.022	0.689	0.0090	-.017		76.0
3	11.04	1.106	0.0644	-.010	1.149	0.0209	-.007	17.2	54.8
4	12.12	1.155	0.0896	0.003	1.189	0.0310	0.000	12.9	38.2
5	13.04	1.082	0.1131	-.027	1.166	0.0645	-.011	9.6	17.9
6	13.96	1.017	0.1357	-.045	1.135	0.0617	-.013	7.5	18.2
7	15.00	0.942	0.1492	-.056	1.119	0.0767	-.057	6.3	14.5
8	16.00	0.854	0.1458	-.066	0.996	0.0993	-.065	5.9	9.9
9	17.36	0.805	0.1697	-.083	0.962	0.1216	-.086	4.7	7.8
10	12.51	1.102	0.1111	-.017	1.164	0.0644	-.005	9.9	17.9
11	13.15	1.069	0.1223	-.031	1.151	0.0692	-.014	8.7	16.5
12	13.61	1.048	0.1328	-.028	1.150	0.0641	-.016	7.9	17.8

RUN 199 MACH= .302 RN= 4.18*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.01	-.012		-.009	0.024	0.0088	-.009		2.7
2	3.04	0.306		-.010	0.340	0.0077	-.009		44.1
3	5.97	0.594		-.011	0.648	0.0087	-.013		74.1
4	9.12	0.897		-.015	0.949	0.0111	-.011		84.7
5	11.22	1.082		-.008	1.122	0.0163	-.006		68.3
6	12.25	1.165		-.006	1.207	0.0151	-.004		79.2
7	13.11	1.250		-.010	1.291	0.0181	-.002		70.9
8	14.08	1.048	0.1144	-.042	1.257	0.0608	-.005	9.2	20.4
9	15.03	1.042	0.1368	-.049	1.198	0.0705	-.018	7.7	16.8
10	16.03	0.940	0.1406	-.055	1.045	0.0941	-.063	6.7	11.0
11	17.24	0.946	0.1677	-.074	1.112	0.1311	-.084	5.6	8.4
12	-2.56	-.278		-.009	-.242	0.0107	-.006		-22.5
13	-0.25	-.046		-.010	0.008	0.0183	-.013		0.5

RUN 200 MACH= .400 RN= 5.36*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
2	-0.08	-.012		-.006	0.021	0.0088	-.010		2.4
3	-1.38	-.143		-.009	-.109	0.0097	-.009		-11.3
4	-0.29	-.032		-.008	0.000	0.0092	-.010		0.0
6	3.03	0.306		-.037	0.347	0.0087	-.012		40.0
7	6.07	0.627		-.012	0.669	0.0088	-.013		75.7
8	9.08	0.943		-.013	0.963	0.0137	-.010		69.0
9	11.17	1.118		-.004	1.141	0.0192	-.002		59.1
10	12.13	1.170	0.0741	0.003	1.191	0.0270	0.006	15.8	43.9
11	13.16	1.102	0.1122	-.022	1.182	0.0489	0.003	9.8	24.0
12	14.13	1.052	0.1329	-.013	1.154	0.0644	-.005	7.9	17.0
13	15.08	0.958	0.1438	-.056	1.083	0.0814	-.026	6.7	13.2
14	16.14	0.892	0.1600	-.076	0.968	0.0957	-.078	5.6	10.0
15	17.32	0.861	0.1801	-.084	0.977	0.1211	-.083	4.8	8.0
16	-1.00	-.105		-.019	-.079	0.0089	-.010		-8.8
17	-0.32	-.035		-.017	-.005	0.0082	-.011		-0.6

RUN 202 MACH= .399 RN= 3.88*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.18	0.013		-.007	0.021	0.0082	-.011		2.5
2	6.06	0.654		-.011	0.673	0.0081	-.014		83.4

RUN 203 MACH= .501 RN= 6.45*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.28	-.003		-.010	0.005	0.0083	-.012		0.5
2	-2.49	-.238		-.009	-.228	0.0082	-.009		-27.6
3	-1.34	-.120		-.007	-.116	0.0075	-.011		-15.4
4	-0.23	0.004		-.008	0.007	0.0078	-.011		0.9
5	3.13	0.363		-.020	0.368	0.0079	-.014		46.3
6	6.12	0.693		-.013	0.690	0.0088	-.014		78.3
13	12.30	1.075	0.1422	-.019	1.060	0.0698	-.003	7.6	15.0
14	9.35	1.058	0.0722	-.015	1.031	0.0154	-.001	14.6	65.0
15	11.21	1.120	0.1121	-.012	1.086	0.0413	0.009	10.0	26.1
16	13.25	1.024	0.1592	-.028	1.048	0.0967	-.018	6.4	10.7
17	14.17	0.984	0.1737	-.051	1.028	0.1159	-.033	5.7	8.8
18	15.19	0.932	0.1878	-.071	1.003	0.1474	-.050	5.0	6.7
19	16.13	0.882	0.1995	-.081	0.984	0.1651	-.058	4.4	5.9
20	17.24	0.861	0.2176	-.098	0.940	0.1768	-.073	4.0	5.2
21	-0.91	-.061		-.021	-.067	0.0076	-.012		-8.9
22	-0.37	-.006		-.022	-.006	0.0089	-.013		-0.7

RUN 204 MACH= .601 RN= 7.22*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.08	0.027		-.022	0.025	0.0159	-.015		1.6
2	3.08	0.393		-.024	0.386	0.0168	-.017		23.0
3	6.34	0.791	0.0243	-.027	0.757	0.0199	-.010	32.5	38.0
4	9.42	1.021	0.0906	-.013	0.983	0.0489	0.002	11.3	20.0
5	10.43	1.022	0.1248	-.024	1.003	0.0717	-.002	8.2	13.9
6	-0.08	0.034	0.0098	-.028	0.026	0.0136	-.015	3.4	1.9

RUN 206 MACH= .401 RN= 3.88*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.12	-.004		0.000	0.034	0.0076	-.012		4.5
2	6.18	0.635		0.002	0.690	0.0124	-.014		55.6

RUN 207 MACH= .704 RN= 7.97*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.58	0.088	0.0088	-.013	0.103	0.0135	-.016	9.9	7.6
2	-0.06	0.008		-.012	0.021	0.0132	-.017		1.6
3	2.22	0.298		-.011	0.306	0.0161	-.017		19.0
4	4.29	0.575	0.0167	-.011	0.571	0.0199	-.012	34.4	28.6
5	6.44	0.844	0.0642	-.016	0.824	0.0390	-.009	13.2	21.0
6	5.36	0.726	0.0421	-.013	0.714	0.0291	-.010	17.3	24.4
7	-0.18	0.001		-.015	0.009	0.0114	-.016		0.8

RUN 208 MACH= .809 RN= 8.38*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.21	-.045	0.0069	-.013	-.060	0.0112	-.007	-6.5	-6.0
2	-0.25	-.050	0.0062	-.014	-.052	0.0121	-.012	-8.0	-4.3
3	1.14	0.169	0.0112	-.016	0.171	0.0119	-.016	15.1	14.3
4	2.13	0.317	0.0124	-.029	0.332	0.0155	-.023	25.6	21.2
5	4.26	0.525	0.0254	-.067	0.603	0.0295	-.061	20.7	20.2
6	5.37	0.575	0.0500	-.074	0.651	0.0421	-.064	11.5	15.3
7	3.28	0.445	0.0200	-.054	0.497	0.0219	-.045	22.2	22.5
8	-0.20	-.055	0.0040	-.015	-.065	0.0128	-.013	-13.7	-5.0

RUN 209 MACH= .918 RN= 6.29*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.18	0.054	0.0513	0.016	0.073	0.0477	-.008	1.1	1.5
2	1.10	0.136	0.0554	0.020	0.110	0.0533	0.026	2.5	2.0
3	2.19	0.207	0.0617	0.017	0.165	0.0554	0.033	3.4	2.9
4	3.17	0.264	0.0674	0.015	0.214	0.0563	0.035	3.9	3.7
5	4.10	0.317	0.0742	0.007	0.271	0.0587	0.030	4.3	4.5
6	5.17	0.372	0.0825	-.012	0.324	0.0607	0.024	4.5	5.2
7	0.15	0.060	0.0504	0.021	0.077	0.0486	-.006	1.2	1.5

RUN 211 MACH=0.979 RN= 6.43*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.0	0.036	0.0628	-.041	0.100		-.025	0.6	
2	1.01	0.094	0.0620	-.053	0.168		-.035	1.5	
3	2.05	0.150	0.0640	-.064	0.236		-.046	2.3	
4	3.09	0.208	0.0678	-.078	0.303		-.057	3.1	
5	-0.03	0.032	0.0615	-.043	0.090		-.025	0.5	

RUN 212 MACH=1.069 RN= 6.40*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.03	0.033	0.0550	-.046	0.089		-.026	0.6	
2	1.13	0.089	0.0556	-.055	0.162		-.036	1.6	
3	2.03	0.143	0.0565	-.066	0.221		-.045	2.5	
4	0.04	0.032	0.0555	-.045	0.085		-.027	0.6	
5	-0.54	-.004	0.0548	-.040	0.038		-.023	-0.1	

RUN 213 MACH=0.401 RN= 3.75*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.01	0.035		-.010	0.042		-.011		
2	6.04	0.644		-.024	0.655		-.018		

RUN 215 MACH= .304 RN= 4.21*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
7	2.94	0.256		-.001	0.289		-.007		
8	5.93	0.560		0.001	0.613	0.0112	-.009		54.5
9	9.05	0.843		0.005	0.919	0.0134	-.011		68.0
10	11.04	1.022		0.016	1.123	0.0143	-.009		78.1
11	12.14	1.125		0.018	1.190	0.0173	-.004		68.5
12	12.95	1.191		0.015	1.270	0.0202	-.005		62.4
13	14.13	1.210	0.1007	0.018	1.273	0.0480	-.007	12.0	26.3
14	16.12	0.987	0.1256	-.040	1.124	0.0743	-.023	7.9	15.0
15	17.73	0.917	0.1520	-.042	1.088	0.1151	-.079	6.0	9.3

RUN 216 MACH= .757 RN= 8.20*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.48	-.092	0.0030	-.010	-.066	0.0085	-.016	-30.7	-7.7

RUN 217 MACH= .781 RN= 8.29*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.49	-.103	0.0038	-.012	-.080	0.0091	-.017	-27.1	-8.8
2	-0.46	-.105	0.0039	-.012	-.080	0.0085	-.016	-26.8	-9.4

RUN 218 MACH= .803 RN= 8.36*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.41	-.104	0.0049	-.009	-.100	0.0094	-.010	-21.3	-10.6
2	-0.42	-.107	0.0044	-.011	-.102	0.0087	-.009	-24.5	-11.7

RUN 219 MACH= .825 RN= 8.42*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.95	0.099	0.0086	-.016	0.101	0.0090	-.010	11.5	10.2
2	0.96	0.098	0.0090	-.014	0.110	0.0100	-.012	10.9	10.9

RUN 220 MACH= .841 RN= 8.47*10**6 CONFIGURATION 2

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	1.36	0.125	0.0076	-.032	0.186	0.0149	-.038	16.5	12.3
2	1.36	0.121	0.0090	-.034	0.192	0.0157	-.041	13.5	12.1

RUN 222 MACH= .402 RN= 3.85*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
5	-0.34	-.029	0.0155	-.002	-.001	0.0119	-.020	-1.8	-0.1
6	-2.26	-.238	0.0182	-.001	-.202	0.0123	-.017	-12.6	-16.5
7	-1.33	-.142	0.0166	0.001	-.107	0.0123	-.018	-8.5	-8.7
8	-0.14	-.017	0.0118	-.000	0.017	0.0122	-.020	-1.5	1.4
9	3.09	0.312	0.0117	0.002	0.347	0.0120	-.022	26.7	29.0
10	6.13	0.611	0.0147	0.008	0.651	0.0138	-.022	41.7	47.1
11	9.08	0.917	0.0276	0.014	0.932	0.0167	-.019	33.3	55.7
12	11.16	1.095	0.0463	0.021	1.029	0.0244	-.020	23.7	42.0
13	12.08	1.132	0.0629	0.022	1.033	0.0297	-.021	18.0	34.7
14	13.05	1.124	0.1151	0.026	1.029	0.0422	-.021	9.8	24.2
15	14.02	0.965	0.1413	-.039	0.865	0.1435	-.064	6.8	6.8
16	15.01	0.689	0.1346	-.088	0.849	0.1888	-.105	5.1	4.5
17	16.03	0.900	0.1687	-.045	0.941	0.1909	-.133	5.3	4.9
18	17.08	0.795	0.1779	-.067	0.886	0.2090	-.126	4.5	4.2
19	-0.84	-.109	0.0186	0.017	-.071	0.0139	-.015	-5.9	-5.1
20	-0.88	-.033	0.0174	0.009	0.005	0.0123	-.016	-1.9	0.4

RUN 223 MACH= .603 RN= 5.24*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
3	-1.37	-.146	0.0070	-.006	-.125	0.0112	-.018	-21.0	-11.2
4	-0.19	-.017	0.0075	-.003	-.000	0.0115	-.020	-2.3	-0.0
5	-2.35	-.266	0.0079	-.006	-.224	0.0128	-.013	-33.4	-16.7
6	0.02	0.010	0.0096	-.004	0.023	0.0113	-.020	1.1	2.0
7	3.06	0.364	0.0108	-.008	0.370	0.0117	-.021	33.7	31.6
8	6.21	0.748	0.0302	0.001	0.704	0.0206	-.015	24.5	34.0
9	9.17	0.912	0.1002	0.004	0.856	0.0539	-.018	9.1	15.8
10	10.30	0.898	0.1267	-.023	0.886	0.0939	-.041	7.1	9.3
11	11.23	0.813	0.1320	-.055	0.785	0.1149	-.099	6.2	6.8
12	12.19	0.831	0.1450	-.070	0.746	0.1375	-.115	5.7	5.4
13	13.18	0.825	0.1628	-.086	0.748	0.1535	-.122	5.1	4.8
14	14.16	0.808	0.1754	-.094	0.734	0.1721	-.123	4.6	4.2
15	16.17	0.835	0.2121	-.099	0.932	0.1702	-.089	3.9	5.4
16	-0.88	-.089	0.0091	-.014	-.062	0.0136	-.017	-9.8	-6.5
17	-0.20	-.007	0.0092	-.014	0.013	0.0134	-.017	-0.8	0.9

RUN 224 MACH= .802 RN= 6.05*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.26	-.041	0.0151	-.015	-.019	0.0171	-.017	-2.7	-1.1
2	-2.42	-.374	0.0145	-.021	-.333	0.0207	-.022	-25.8	-16.0
3	-1.33	-.211	0.0124	-.017	-.209	0.0170	-.016	-16.9	-12.2
4	-0.27	-.032	0.0105	-.017	-.022	0.0175	-.016	-3.1	-1.3
5	1.05	0.160	0.0101	-.013	0.174	0.0180	-.014	9.9	9.6
6	2.06	0.317	0.0227	-.023	0.348	0.0209	-.024	14.0	16.1
7	4.19	0.502	0.0397	-.049	0.552	0.0404	-.046	12.6	13.5
8	5.22	0.558	0.0587	-.047	0.599	0.0576	-.051	9.4	10.3
9	6.29	0.582	0.0747	-.048	0.633	0.0677	-.048	7.8	9.2
10	7.16	0.626	0.0876	-.053	0.665	0.0706	-.052	7.1	9.3
11	8.25	0.657	0.1062	-.061	0.703	0.0820	-.055	6.1	8.4
12	-0.98	-.154	0.0136	-.021	-.137	0.0172	-.014	-11.3	-7.9
13	-0.14	-.022	0.0131	-.019	-.009	0.0163	-.017	-1.7	-0.5

RUN 226 MACH= .298 RN= 4.14*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.04	-.001	0.0136	0.004	0.025	0.0108	-.011	-0.1	2.3
2	-2.25	-.223	0.0164	0.004	-.198	0.0150	-.007	-13.6	-13.2
3	-1.16	-.105	0.0136	0.001	-.078	0.0153	-.010	-7.7	-5.1
4	-0.04	-.008	0.0125	0.010	0.021	0.0160	-.010	-0.6	1.3
5	3.05	0.298	0.0085	0.007	0.330	0.0151	-.015	35.3	21.8
6	5.96	0.592	0.0097	0.009	0.614	0.0178	-.018	61.0	34.3
7	9.04	0.889	0.0217	0.011	0.881	0.0216	-.020	41.0	40.7
12	14.95	0.801	0.1076	-.072	0.800	0.1834	-.134	7.4	4.4
13	11.13	1.064	0.0581	0.018	1.041	0.0339	-.016	18.3	30.6
14	12.13	1.125	0.0665	0.023	1.110	0.0388	-.013	16.9	28.4
15	13.07	1.213	0.0790	0.018	1.142	0.0452	-.009	15.4	25.1
16	14.07	1.125	0.1018	0.016	1.175	0.0651	-.018	11.0	17.9
17	15.96	0.995	0.1388	-.027	1.072	0.1183	-.071	7.2	9.0
18	16.67	0.836	0.1372	-.070	1.064	0.1378	-.082	6.1	7.6
19	-0.67	-.092	0.0128	0.021	-.021	0.0114	-.009	-7.7	-1.8
20	-0.04	-.020	0.0116	0.010	0.031	0.0102	-.008	-2.4	3.0

RUN 227 MACH= .402 RN= 3.87*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.06	-.014	0.0157	0.016	0.057	0.0093	-.012	-0.9	6.1
2	6.13	0.608	0.0259	0.013	0.657	0.0121	-.016	23.5	54.2

RUN 228 MACH= .752 RN= 5.98*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.01	0.007	0.0129	-.006	0.044	0.0116	-.016	0.5	3.8
2	-0.01	0.007	0.0124	-.007	0.047	0.0120	-.016	0.6	3.8

RUN 229 MACH= .776 RN= 6.04*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.0	0.003	0.0153	-.008	0.050	0.0137	-.014	0.2	3.6
2	0.02	0.003	0.0155	-.008	0.051	0.0136	-.013	0.2	3.7

RUN 230 MACH= .805 RN= 6.12*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.02	0.005	0.0172	-.008	0.067	0.0143	-.009	0.3	4.6
2	0.02	0.005	0.0174	-.007	0.065	0.0150	-.008	0.3	4.3

RUN 231 MACH= .825 RN= 6.15*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.0	0.018	0.0190	-.005	0.064	0.0149	0.001	0.9	4.2
2	0.04	0.021	0.0219	-.004	0.064	0.0150	0.001	1.0	4.8

RUN 232 MACH= .843 RN= 6.21*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.04	0.035	0.0268	-.005	0.119	0.0180	-.006	1.3	6.5
2	-0.50	-.030	0.0185	0.012	0.031	0.0178	0.001	-1.6	1.7
3	-0.50	-.029	0.0188	0.012	0.039	0.0192	0.003	-1.6	2.0

RUN 233 MACH= .865 RN= 6.22*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.49	-.012	0.0262	0.000	0.033	0.0275	0.018	-0.5	1.2
2	-0.50	-.013	0.0254	0.000	0.014	0.0262	0.027	-0.5	0.5

RUN 234 MACH= .895 RN= 6.27*10**6 CONFIGURATION 6

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.47	-.015	0.0406	0.009	0.078	0.0413	-.002	-0.4	1.6
2	-0.49	-.015	0.0410	0.009	0.074	0.0420	-.002	-0.4	1.7

RUN 236 MACH= .404 RN= 3.86*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
18	-0.12	-.018	0.0158	-.003	0.003	0.0086	-.017	-1.1	0.3
19	-2.34	-.249	0.0091	-.006	-.174	0.0093	-.007	-27.5	-18.7
20	-1.40	-.168	0.0080	-.003				-21.0	
21	-0.01	-.018	0.0071	-.000	0.044	0.0086	-.011	-2.6	5.1
22	2.91	0.277	0.0136	0.000	0.297	0.0085	-.022	20.4	35.0
23	6.04	0.590	0.0280	0.001	0.617	0.0103	-.024	21.1	60.1
24	9.10	0.893	0.0527	0.010	0.926	0.0122	-.019	16.9	75.7
25	9.10	0.897	0.0512	0.011	0.929	0.0119	-.018	17.5	77.6
26	11.06	1.068	0.0734	0.016	1.100	0.0166	-.008	14.6	65.9
27	12.13	0.977	0.0977	-.044	0.975	0.1070	-.077	10.0	9.0
28	13.02	0.937	0.1145	-.052	0.949	0.1473	-.111	8.2	6.4
29	13.92	0.905	0.1255	-.071	0.897	0.1543	-.117	7.2	5.8
30	15.02	0.948	0.1423	-.041	0.966	0.1452	-.098	6.7	6.6

RUN 237 MACH= .404 RN= 3.89*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
4	-0.19	0.004		-.020	0.023	0.0090	-.011		2.6
5	-0.21	-.001		-.022	0.022	0.0088	-.011		2.5
6	5.96	0.651		-.035	0.611	0.0097	-.026		62.9

RUN 238 MACH= .599 RN= 5.21*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.28	-.021		-.019	0.014	0.0088	-.013		1.6

RUN 239 MACH= .406 RN= 3.90*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.05	-.011	0.0134	-.007	0.041	0.0149	-.012	-0.8	2.8

RUN 240 MACH= .602 RN= 5.23*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.19	-.031	0.0079	-.010	0.030	0.0087	-.011	-4.0	3.4
2	-2.23	-.273	0.0046	-.014	-.158	0.0099	-.001	-59.1	-15.9
3	-1.43	-.179	0.0052	-.011	-.083	0.0088	-.005	-34.5	-9.4
4	-0.34	-.055	0.0060	-.010	0.016	0.0088	-.009	-9.1	1.8
5	2.97	0.334	0.0142	-.101	0.331	0.0096	-.025	23.5	34.2
6	6.19	0.712	0.0361	-.004	0.678	0.0164	-.020	19.7	41.2
7	9.29	0.940	0.0974	0.002	0.882	0.0484	-.013	9.7	18.1
8	10.28	0.935	0.1197	-.013	0.902	0.0689	-.027	7.8	13.0
9	11.25	0.897	0.1380	-.032	0.924	0.0984	-.037	6.5	9.3
10	12.16	0.880	0.1505	-.042	0.894	0.1177	-.046	5.8	7.5
11	13.16	0.823	0.1581	-.080	0.796	0.1629	-.124	5.2	4.9
12	14.19	0.822	0.1758	-.095	0.781	0.1773	-.124	4.7	4.4
13	16.26	0.818	0.2061	-.112	0.772	0.2152	-.129	4.0	3.6
14	-0.99	-.151	0.0099	-.008	-.083	0.0091	-.016	-15.2	-9.1
15	0.05	-.036	0.0104	-.007	0.024	0.0088	-.017	-3.5	2.7

RUN 241 MACH= .806 RN= 6.03*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
2	0.09	-.086	0.0148	-.013	-.038	0.0163	-.017	-5.8	-2.3

RUN 242 MACH= .748 RN= 5.79*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.0	-.045	0.0109	-.015	-.017	0.0114	-.018	-4.1	-1.5

RUN 243 MACH= .781 RN= 5.98*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.45	-.113	0.0115	-.018	-.087	0.0138	-.020	-9.8	-6.3
2	-0.43	-.105	0.0116	-.017	-.089	0.0149	-.020	-9.0	-5.9

RUN 244 MACH= .796 RN= 5.94*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.35	-.119	0.0129	-.018	-.094	0.0142	-.020	-9.2	-6.5
2	-0.34	-.120	0.0132	-.018	-.101	0.0153	-.017	-9.1	-6.5

RUN 245 MACH= .822 RN= 6.02*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.40	-.107	0.0159	-.011	-.115	0.0147	-.011	-6.7	-7.7
2	-0.39	-.111	0.0152	-.013	-.111	0.0156	-.011	-7.3	-7.1

RUN 247 MACH= .872 RN= 6.15*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.43	-.038	0.0256	-.005	-.047	0.0268	0.004	-1.5	-1.7
2	-0.39	-.035	0.0272	-.007	-.066	0.0292	0.014	-1.3	-2.2

RUN 248 MACH= .896 RN= 6.20*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.40	-.039	0.0400	-.002	-.011	0.0393	-.012	-1.0	-0.3
2	-0.43	-.040	0.0423	0.000	-.011	0.0418	-.012	-0.9	-0.3

RUN 252 MACH= .302 RN= 4.20*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.03	-.007	0.0087	-.002	0.026	0.0131	-.005	-0.8	2.0
3	-2.05	-.220	0.0113	-.002	-.171	0.0095	0.003	-19.4	-17.9
4	-1.06	-.121	0.0095	-.001	-.074	0.0095	-.002	-12.8	-7.7
5	0.0	-.013	0.0072	-.002	0.021	0.0091	-.004	-1.8	2.3
6	3.02	0.284		-.006	0.282	0.0088	-.014		32.1
7	6.08	0.589	0.0030	-.006	0.588	0.0163	-.018	196.5	36.0
8	9.19	0.893	0.0213	0.000	0.891	0.0133	-.012	41.9	66.6
9	11.24	1.092	0.0363	-.003	1.101	0.0134	-.010	30.1	82.3
10	11.24	1.091	0.0370	-.003	1.087	0.0165	-.009	29.5	65.7
11	12.21	1.179	0.0462	-.001	1.168	0.0163	-.006	25.5	71.6
12	13.18	1.255	0.0599	0.003	1.239	0.0184	-.003	21.0	67.1
13	14.17	1.123	0.0941	-.015	1.193	0.0515	-.004	11.9	23.0
14	14.17	1.134	0.1092	-.011	1.157	0.0569	-.001	10.4	20.2
15	15.12	1.113	0.1209	-.034	1.203	0.0563	-.014	9.2	21.2
16	16.21	0.970	0.1299	-.058	1.035	0.0742	-.077	7.5	13.9
17	17.63	0.883	0.1507	-.072	1.026	0.1132	-.094	5.9	9.8
18	-0.67	-.082	0.0090	-.006	-.044	0.0096	-.002	-9.1	-4.6
19	0.06	-.010	0.0119	-.002	0.027	0.0141	-.006	-0.8	1.9

RUN 253 MACH= .400 RN= 3.84*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.04	-.012	0.0135	-.003	0.037	0.0087	-.007	-0.9	4.3
2	6.18	0.599	0.0306	-.002	0.602	0.0097	-.019	19.6	62.0

RUN 254 MACH= .809 RN= 6.89*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDCAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.04	-.042	0.0111	-.017	-.030	0.0140	-.016	-3.8	-2.1

RUN 255 MACH= .851 RN= 6.19*10**6 CONFIGURATION 7

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.32	0.043	0.0207	-.012	0.092	0.0185	-.019	2.1	4.9
3	0.17	0.028	0.0218	-.008	0.070	0.0207	-.015	1.3	3.7
4	0.18	0.028	0.0213	-.008	0.050	0.0191	-.006	1.3	2.6
5	0.01	0.014	0.0206	-.005	0.045	0.0206	-.007	0.7	2.1
6	0.03	0.012	0.0206	-.004	0.034	0.0193	-.005	0.6	1.7

RUN 257 MACH= .402 RN= 3.86*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.02	-.003		-.004	-.019	0.0079	-.008		-2.4
2	-2.41	-.249		-.004	-.269	0.0080	-.008		-33.4
3	-1.24	-.138		-.001	-.155	0.0080	-.009		-19.2
4	-0.07	-.021		-.002	-.028	0.0076	-.008		-3.7
5	3.13	0.287		-.003	0.306	0.0085	-.008		36.0
6	6.09	0.585		0.001	0.622	0.0096	-.008		64.7
7	-0.30	-.053		0.000	-.052	0.0075	-.008		-6.9

RUN 258 MACH= .400 RN= 3.84*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
8	-0.05	-.004		-.005	0.000	0.0080	-.013		0.0
9	3.15	0.306		-.008	0.337	0.0081	-.013		41.5
10	6.16	0.605		-.005	0.657	0.0097	-.012		67.8
11	9.15	0.899		-.002	0.943	0.0131	-.004		71.8
12	11.25	1.092		-.002	1.114	0.0183	0.012		68.7
13	12.23	1.131	0.0728	0.005	1.138	0.0303	0.022	15.5	37.4
14	13.31				1.109		0.019		
15	14.26	1.002	0.1353	-.028	1.001	0.0636	0.007	7.4	16.9
16	15.24	0.970	0.1506	-.045	1.079	0.0719	-.004	6.4	14.9
17	16.24	0.895	0.1528	-.055	0.938	0.0898	-.048	5.9	10.4
18	-0.05	-.104		-.002	-.089	0.0078	-.013		-11.3
19	-0.20	-.034		-.003	-.016	0.0079	-.014		-2.8

RUN 259 MACH= .598 RN= 5.21*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.18	-.027	0.0090	-.007	-.038	0.0077	-.014	-2.8	-5.8
2	-2.58	-.283	0.0041	-.010	-.294	0.0089	-.022	-68.3	-33.8
3	-1.17	-.136	0.0051	-.008	-.164	0.0076	-.013	-26.5	-21.5
4	-0.22	-.028	0.0063	-.008	-.048	0.0077	-.013	-4.5	-6.2
5	3.06	0.343	0.0128	0.0	0.345	0.0084	-.013	26.7	41.1
6	6.34	0.727	0.0334	-.007	0.698	0.0118	-.053	21.8	59.8
7	9.45	0.980	0.0936	0.002	0.871	0.0408	0.019	10.5	21.2
8	10.22	0.982	0.1182	-.021	0.885	0.0599	0.015	8.3	14.7
9	11.44	0.959	0.1421	-.028	0.886	0.0733	0.002	6.7	12.0
10	12.44	0.911	0.1527	-.059	0.890	0.0991	-.007	6.0	8.9
11	13.45	0.928	0.1760	-.060	0.905	0.1066	-.022	5.3	8.4
12	14.46	0.877	0.1844	-.074	0.880	0.1094	-.036	4.8	8.0
13	16.38	0.843	0.2189	-.112	0.860	0.1277	-.069	3.9	6.7
14	-1.01	-.124	0.0062	-.015	-.153	0.0076	-.015	-20.0	-19.9
15	-0.20	-.029	0.0075	-.016	-.067	0.0077	-.013	-3.9	-8.6

RUN 260 MACH= .806 RN= 6.06*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.25	-.083	0.0083	-.017	-.170	0.0091	-.002	-9.9	-18.6
2	-2.56	-.414	0.0129	-.014	-.419	0.0157	-.015	-32.0	-26.4
3	-1.50	-.257	0.0058	-.016	-.324	0.0103	-.000	-44.7	-31.2
4	-0.30	-.071	0.0057	-.016	-.196	0.0090	0.005	-12.6	-21.7
5	1.08	0.143	0.0102	-.017	0.005	0.0089	0.002	14.0	0.6
6	2.27	0.327	0.0155	-.033	0.191	0.0127	0.001	21.1	14.9
7	4.25	0.513	0.0241	-.072	0.430	0.0298	-.025	21.3	14.3
8	5.35	0.583	0.0467	-.078	0.494	0.0425	-.028	12.5	11.5
9	6.31	0.626	0.0696	-.081	0.534	0.0570	-.033	9.0	9.3
10	7.44	0.650	0.0951	-.085	0.610	0.0752	-.027	6.8	8.0
11	8.36	0.678	0.1079	-.094	0.653	0.0924	-.033	6.3	7.0
12	-1.02	-.178	0.0087	-.018	-.168	0.0098	-.010	-20.5	-17.0
13	-0.27	-.069	0.0091	-.019	-.073	0.0093	-.017	-7.5	-7.8

RUN 261 MACH= .298 RN= 4.86*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.25	0.010		-.027	-.049	0.0206	-.008		-2.4
2	-2.34	-.201		-.026	-.219	0.0083	-.015		-26.4
3	-1.20	-.086		-.025	-.103	0.0085	-.015		-12.1
4	-0.35	-.004		-.023	-.017	0.0082	-.015		-2.0
5	3.24	0.348		-.027	0.361	0.0091	-.017		39.5
6	6.13	0.627		-.000	0.647	0.0102	-.013		63.2
7	9.10	0.906		-.029	0.942	0.0121	-.009		77.8
8	11.22	1.101		-.025	1.123	0.0150	-.000		74.7
9	12.23	1.192		-.027	1.207	0.0171	0.003		70.4
10	13.35	1.265		-.017	1.273	0.0214	0.010		59.3
11	14.25	1.283	0.1115	-.022	1.273	0.0383	0.009	11.5	33.8
12	15.27	1.157	0.1340	-.036	1.210	0.0633	0.002	8.6	19.8
13	16.27	1.049	0.1418	-.069	1.168	0.0691	-.046	7.4	16.8
14	-0.97	-.090		-.017	-.082	0.0083	-.016		-9.9
15	-0.06	-.002		-.018	0.012	0.0083	-.016		1.5

RUN 262 MACH= .751 RN= 5.88*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.02	-.022	0.0089	-.017	-.014	0.0081	-.022	-2.5	-1.7
2	-0.04	-.023	0.0088	-.018	-.013	0.0082	-.022	-2.6	-1.6

RUN 263 MACH= .779 RN= 5.98*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	-.030	0.0090	-.018	-.031	0.0087	-.020	-3.1	-3.6
2	-0.05	-.033	0.0097	-.019	-.031	0.0090	-.021	-3.4	-3.4

RUN 264 MACH= .803 RN= 6.03*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	-.038	0.0111	-.017	-.050	0.0090	-.017	-3.4	-5.4
2	-0.03	-.038	0.0116	-.016	-.049	0.0116	-.016	-3.3	-4.2

RUN 265 MACH= .818 RN= 6.06*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.05	-.034	0.0127	-.015	-.044	0.0100	-.013	-2.7	-4.4
2	-0.05	-.028	0.0137	-.013	-.040	0.0102	-.014	-2.0	-3.9

RUN 266 MACH= .842 RN= 6.09*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	0.003	0.0190	-.006	0.019	0.0142	-.016	0.2	1.3
2	-0.02	0.008	0.0204	-.007	0.006	0.0150	-.010	0.4	0.4

RUN 267 MACH= .877 RN= 0.0 *10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03								
2	-0.03	0.013	0.0290	-.013	-.031	0.0296	0.012	0.5	-1.0

RUN 268 MACH= .895 RN= 6.26*10**6 CONFIGURATION 8

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.0	0.011	0.0402	-.001	-.020	0.0398	0.009	0.3	-0.5
2	-0.01	0.011	0.0413	0.001	-.030	0.0402	0.015	0.3	-0.7

RUN 270 MACH= .399 RN= 3.79*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.03	-.011	0.0107	-.005	0.038	0.0077	-.015	-1.1	5.0
2	-2.31	-.253	0.0121	-.003	-.211	0.0076	-.011	-20.8	-27.7
3	-1.40	-.164	0.0100	-.001	-.112	0.0082	-.013	-16.4	-13.7
4	-0.27	-.050	0.0075	-.001	0.013	0.0081	-.015	-6.6	1.6
5	3.03	0.282	0.0051	-.005	0.351	0.0080	-.017	55.3	44.0
6	6.19	0.607	0.0095	-.002	0.674	0.0084	-.017	63.9	80.4
7	9.32	0.912	0.0246	0.001	0.985	0.0115	-.014	37.0	85.2
8	11.33	1.090	0.0445	0.008	1.150	0.0177	-.007	24.5	64.9
9	12.17	1.122	0.0557	0.009	1.167	0.0257	0.001	20.2	45.2
10	13.13	1.072	0.0989	-.000	1.156	0.0659	-.010	10.8	17.4
11	14.20	1.021	0.1159	-.025	1.150	0.0665	-.018	8.8	17.1
12	15.19	0.996	0.1262	-.032	1.108	0.0930	-.041	7.9	11.8
13	16.26	0.885	0.1196	-.054	1.107	0.0968	-.075	7.4	11.3
14	-1.00	-.138	0.0066	0.001	-.065	0.0078	-.014	-20.9	-8.3
15	-0.22	-.060	0.0075	0.008	0.014	0.0078	-.015	-7.9	1.8

RUN 271 MACH= .602 RN= 5.15*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.23	-.044	0.0053	-.006	0.005	0.0079	-.017	-8.2	0.6
2	-2.35	-.285	0.0024	-.007	-.232	0.0093	-.018	-118.2	-24.8
3	-1.31	-.163	0.0030	-.007	-.110	0.0079	-.016	-53.7	-13.9
4	-0.28	-.047	0.0043	-.005	0.002	0.0086	-.017	-11.0	0.2
5	3.18	0.343	0.0078	-.018	0.395	0.0082	-.019	44.3	48.0
6	6.24	0.722	0.0214	-.009	0.745	0.0111	-.013	33.8	66.8
7	9.35	0.992	0.0674	0.001	0.983	0.0393	-.005	11.4	24.8
8	10.32	0.989	0.1200	-.016	0.994	0.0625	-.008	8.2	15.8
9	11.45	0.967	0.1348	-.025	0.994	0.0734	-.021	7.2	13.4
10	12.41	0.948	0.1433	-.062	0.998	0.0942	-.031	6.6	10.5
11	13.38	0.938	0.1617	-.060	0.985	0.1007	-.050	5.8	9.7
12	14.33	0.915	0.1766	-.081	1.000	0.1071	-.065	5.2	9.2
13	16.38	0.851	0.2044	-.095	0.965	0.1292	-.101	4.2	7.4
14	-1.46	-.181	0.0066	-.012	-.134	0.0078	-.019	-27.5	-17.0
15	-0.98	-.124	0.0040	-.011	-.078	0.0082	-.017	-31.3	-9.5
16	-0.22	-.035	0.0052	-.010	0.007	0.0078	-.017	-6.6	0.9

RUN 272 MACH= .803 RN= 5.97*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.25	-.084	0.0059	-.016	-.047	0.0090	-.019	-14.2	-5.2
2	-2.52	-.427	0.0097	-.012	-.358	0.0136	-.022	-44.1	-26.0
3	-1.34	-.247	0.0031	-.011	-.252	0.0093	-.011	-80.6	-26.9
4	-0.29	-.089	0.0033	-.013	-.068	0.0091	-.014	-27.3	-7.4
5	1.03	0.121	0.0042	-.017	0.138	0.0104	-.017	28.9	13.2
6	2.07	0.290	0.0130	-.024	0.319	0.0106	-.022	22.3	29.8
7	4.39	0.514	0.0258	-.069	0.591	0.0295	-.060	20.0	19.8
8	5.37	0.555	0.0461	-.071	0.634	0.0403	-.062	12.1	15.5
9	6.35	0.609	0.0674	-.073	0.692	0.0526	-.064	9.0	13.0
10	7.25	0.651	0.0868	-.080	0.733	0.0648	-.068	7.5	11.1
11	7.26	0.648	0.0874	-.080	0.749	0.0668	-.068	7.4	11.0
12	8.38	0.698	0.1071	-.092	0.795	0.0808	-.064	6.5	9.7
13	-2.50	-.418	0.0143	-.013	-.413	0.0140	-.010	-29.3	-29.3
14	-1.41	-.254	0.0060	-.017	-.272	0.0092	-.008	42.1	-29.3
15	-0.89	-.177	0.0054	-.016	-.178	0.0086	-.007	-32.7	-20.6
16	-0.10	-.054	0.0054	-.017	-.041	0.0090	-.015	-10.0	-4.5

RUN 273 MACH= .601 RN= 5.03*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.09	-.006		-.016	0.006	0.0080	-.014		0.7
2	-1.30	-.147	0.0067	-.013	-.134	0.0085	-.014	-21.8	-15.8
3	-2.44	-.275	0.0056	-.014	-.257	0.0092	-.016	-49.1	-27.9
4	-0.38	-.030	0.0066	-.014	-.017	0.0079	-.014	-4.6	-2.2
5	3.15	0.362	0.0081	-.016	0.375	0.0079	-.016	44.5	47.6
6	6.29	0.732	0.0244	-.017	0.731	0.0108	-.010	30.0	67.7
7	9.38	0.998	0.0864	-.006	0.974	0.0407	0.002	11.6	23.8
8	10.38	1.003	0.1172	-.020	1.001	0.0587	-.001	8.6	16.9
9	11.36	1.000	0.1361	-.037	0.998	0.0673	-.013	7.3	14.7
10	12.38	0.955	0.1483	-.061	0.998	0.0900	-.021	6.4	11.0
11	14.27	0.932	0.1029	-.084	0.970	0.1147	-.056	5.1	8.4
12	13.38	0.948	0.1639	-.074	0.974	0.0998	-.044	5.8	9.7
13	13.36	0.954	0.1639	-.068	0.977	0.1013	-.039	5.8	9.5
14	16.42	0.876	0.2129	-.110	0.949	0.1326	-.098	4.1	7.1
15	-0.86	-.102	0.0081	-.014	-.087	0.0080	-.015	-12.5	-10.7
16	0.01	-.000	0.0087	-.015	0.013	0.0079	-.014	-0.0	1.6

RUN 275 MACH= .752 RN= 5.78*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.02	-.023	0.0056	-.018	-.004	0.0081	-.019	-4.1	-0.5
2	0.39	0.032	0.0049	-.018	0.049	0.0081	-.019	6.6	6.1
3	0.39	0.030	0.0049	-.017	0.051	0.0096	-.019	6.2	5.2

RUN 276 MACH= .779 RN= 5.88*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.37	0.024	0.0058	-.020	0.038	0.0086	-.019	4.2	4.3
2	0.37	0.025	0.0058	-.020	0.039	0.0089	-.020	4.3	4.3

RUN 277 MACH= .803 RN= 5.94*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.37	0.015	0.0070	-.021	0.022	0.0094	-.018	2.1	2.3
2	0.38	0.015	0.0073	-.020	0.027	0.0107	-.018	2.0	2.5

RUN 278 MACH= .826 RN= 5.99*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.36	0.018	0.0101	-.019	0.016	0.0116	-.014	1.7	1.4
2	0.38	0.019	0.0106	-.018	0.016	0.0109	-.014	1.8	1.5

RUN 279 MACH= .845 RN= 6.02*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.38	0.043	0.0196	-.014	0.077	0.0147	-.019	2.2	5.2
2	0.38	0.043	0.0197	-.015	0.078	0.0141	-.019	2.2	5.4

RUN 280 MACH= .871 RN= 6.10*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.38	0.041	0.0314	-.006	0.033	0.0270	0.002	1.3	1.2
2	0.40	0.042	0.0285	-.010	0.015	0.0288	0.011	1.5	0.5

RUN 281 MACH= .892 RN= 6.16*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	0.40	0.041	0.0407	0.013	0.056	0.0389	-.004	1.0	1.4
2	0.40	0.040	0.0437	0.016	0.050	0.0391	-.000	0.9	1.3

RUN 282 MACH= .402 RN= 3.73*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.08	0.003	0.0012	-.007	0.012	0.0082	-.011	2.8	1.5
2	6.12	0.632	0.0078	-.010	0.640	0.0086	-.015	81.1	74.1

RUN 283 MACH= .302 RN= 4.07*10**6 CONFIGURATION 9

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.07	-.003		0.000	0.000	0.0155	-.010		0.5
2	-2.31	-.231		0.004	-.220	0.0140	-.009		-15.8
3	-1.14	-.119		-.001	-.105	0.0117	-.008		-8.9
4	-0.08	-.012		0.005	0.007	0.0130	-.010		0.5
5	2.99	0.283		0.005	0.314	0.0154	-.012		20.4
6	6.19	0.602		0.003	0.634	0.0135	-.013		46.9
7	9.18	0.899	0.0110	0.002	0.922	0.0161	-.012	81.4	57.2
8	11.25	1.094	0.0266	0.002	1.112	0.0166	-.008	41.1	66.8
9	12.14	1.149	0.0350	0.000	1.172	0.0203	-.005	32.8	57.5
10	13.18	1.250	0.0475	0.005	1.267	0.0199	-.003	26.3	63.5
11	14.21	1.314	0.0782	0.006	1.304	0.0304	-.004	16.8	42.6
12	15.15	1.205	0.0961	-.012	1.215	0.0703	-.010	12.5	17.1
13	16.28	1.046	0.1083	-.056	1.174	0.0841	-.052	9.7	13.8
14	-0.86	-.109		0.012	-.069	0.0140	-.009		-4.9
15	0.01	-.023		0.012	0.015	0.0125	-.010		1.2

RUN 285 MACH= .402 RN= 3.77*10**6 CONFIGURATION 10

PT	ALPHA	CLBAL	CDBAL	CMBAL	CLP	CDP	CMP	L/D BAL	L/D P
1	-0.06	-.000	0.0073	-.013	0.012	0.0086	-.010	-0.1	1.4
2	3.09	0.315		-.012	0.334	0.0083	-.012		40.0
3	6.11	0.636	0.0098	-.035	0.640	0.0091	-.013	64.6	70.0
4	9.11	0.925	0.0310	-.010	0.934	0.0120	-.009	29.9	77.5
5	11.31	1.125	0.0548	-.012	1.121	0.0188	-.003	20.5	59.5
6	12.14	1.171	0.0686	-.012	1.155	0.0252	0.004	17.1	45.6
7	13.25	1.105	0.0873	-.029	1.146	0.0428	0.003	12.7	26.6
8	14.28	0.996	0.0903	-.055	1.132	0.0574	-.011	11.0	19.6
9	15.12	0.976	0.1101	-.065	1.025	0.0798	-.053	8.9	12.7
10	16.19	0.924	0.1293	-.088	0.989	0.1020	-.062	7.1	9.6
11	17.64	0.914	0.1606	-.111	0.969	0.1283	-.084	5.7	7.5
12	0.0	0.056		-.031	0.014	0.0084	-.010		1.7

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15. Supplementary Notes

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16. Abstract

Five full scale rotorcraft airfoils were tested in March and April 1982 in the NASA Ames Eleven-Foot Transonic Wind Tunnel for full scale Reynolds numbers at Mach numbers from 0.3 to 1.07. The models, which spanned the tunnel from floor to ceiling, included two modern baseline airfoils, the SC1095 and SC1094 R8, which have been previously tested in other facilities. Three advanced transonic airfoils, designated the SSC-A09, SSC-A07, and SSC-B08, were tested to confirm predicted performance and provide confirmation of advanced airfoil design methods.

This test has shown that the eleven-foot tunnel is suited to two-dimensional airfoil testing.

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