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An Experimental Study of Dynamic Stall on Advanced Airfoil Sections Volume 2. Pressure and Force Data

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SYMBOLS

- c airfoil chord, m
 C_D drag coefficient derived from surface pressures, drag/ qcs
 C_L lift coefficient derived from surface pressures, lift/ qcs
 C_M moment coefficient derived from surface pressures, moment/ qc^2s
 C_p pressure coefficient, $(p - p_\infty)/q$
 k reduced frequency, $\omega c/2U_\infty$
 M Mach number
 p surface pressure, N/m^2
 p_∞ free-stream static pressure, N/m^2
 p_T free-stream total pressure, N/m^2
 q free-stream dynamic pressure, N/m^2
 Re Reynolds number based on chord and free-stream conditions
 s airfoil span, m
 t time, sec
 U_∞ free-stream velocity, m/sec
 x chordwise coordinate, m
 y normal coordinate, m
 α airfoil incidence, deg
 α_0 mean angle of oscillation, deg
 α_1 amplitude of oscillation, deg
 ζ aerodynamic pitch damping coefficient, $-\frac{1}{4\alpha_1^2} \oint C_M d\alpha$
 ω circular frequency, rad/sec

AN EXPERIMENTAL STUDY OF DYNAMIC STALL ON ADVANCED AIRFOIL SECTIONS

VOLUME 2. PRESSURE AND FORCE DATA

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SUMMARY

Experimentally derived force and moment data are presented for eight airfoil sections that were tested at fixed and varying incidence in a subsonic two-dimensional stream. Airfoil incidence was varied through sinusoidal oscillations in pitch over a wide range of amplitude and frequency. The surface pressure distribution, as well as the lift, drag, and pitching moment derived therefrom, are displayed in a uniform fashion to delineate the static and dynamic characteristics of each airfoil both in and out of stall.

INTRODUCTION

The experiment reported in these volumes was undertaken to investigate the effects of airfoil geometry and free-stream Mach number on the phenomenon of dynamic stall. The experiment and its principal results are summarized in volume 1 (Summary of the Experiment), and boundary-layer transition, flow reversal, and reattachment results are presented in volume 3 (Hot-Wire and Hot-Film Measurements). Pressure, force, and moment data are contained in this volume.

Eight airfoil profiles, consisting of a NACA 0012 section, six rotor-blade sections, and a fixed-wing supercritical section (fig. 1 and tables 1-4), were tested at both fixed incidence and varying incidence, $\alpha = \alpha_0 + \alpha_1 \sin \omega t$, over a range of Mach numbers to 0.30. Because the intention was to fulfill the requirement for a data base applicable to the retreating-blade stall problem on helicopter rotors, most of the unsteady data accumulated can be classified as large amplitude (typically $\alpha_1 = 10^\circ$) and at fundamental reduced frequencies (typically $k \leq 0.20$). Although numerous diagnostic techniques were employed during the course of this study, the purpose of the present volume is to describe the pressure reduction phase of the experiment and to present both steady and unsteady results in a uniform graphical format.

DATA ACQUISITION

Although differential pressure measurements (obtained by referencing the upper surface to the lower surface at the same chord location) would have sufficed for deriving the normal force and pitching moment on the airfoil, single surface-pressure measurements were preferred because (1) they provided a more definitive observation of the formation and passage of the stall vortex over the upper surface of the airfoil and (2) they enabled the calculation of chord force (due to pressure only) and, later, the construction of lift and drag forces. These two considerations, in turn, strongly influenced the distribution of the pressure transducers around the airfoil (fig. 2 and table 5).

In all, 30 quantities were recorded in analog form on magnetic tape. These consisted of (1) airfoil incidence, α , (2) tunnel dynamic pressure, $p_T - p_\infty$, (3) airfoil surface pressures, p_1 through p_{26} , (4) 200/rev pulse train synchronous with ωt , and (5) 1/rev pulse synchronous with the beginning of each cycle of airfoil oscillation. The total pressure, p_T , was essentially invariant during the course of any given test case, and was therefore recorded by hand in the test log. Other quantities that originally appeared in the test log include (1) airfoil designation code; (2) type code for identifying the data as relating to reference voltage, amplifier gain, transducer calibration, reference zero, steady test data, or unsteady test data; (3) frequency, mean angle, and amplitude of oscillation; (4) free-stream and model-core temperatures; and (5) the real time at the beginning of each data frame. This information was later appended to the test data during the analog-to-digital conversion phase of the data reduction.

All analog signals were conditioned by amplifiers and recorded on a 32-channel magnetic tape machine at a tape speed of 0.4 m/sec. Approximately 65 analog tapes were required for the entire experiment. Because of the large quantity of data to be acquired and the impracticality of reviewing a test recording before proceeding to the next case, certain standards were adopted. At the discretion of the test engineer, transducers were mechanically exercised and allowed to reach the mean environmental temperature by operating the tunnel and airfoil at the test condition of interest. This pre-run rehearsal provided an opportunity not only for identifying anomalous transducer responses, but also for adjusting the gains for maximum output voltages in order to maximize the signal-to-noise ratio. The tunnel and airfoil were then brought to rest so that transducer signals could be rebalanced to near-zero output voltage. If the gain of any amplifier needed to be changed, all channels were switched to sense a fixed reference voltage and a brief recording made on analog tape. From this record the corresponding gains could be inferred and properly accounted for during the data-reduction phase.

Another practice, considered of equal importance, was to obtain zero-flow records on a frequent basis. Careful calibrations before the experiment indicated that acceptable transducer drifts due to time and temperature could be bounded by allowing no more than 20 min or a change of 1°F between zero records. Although individual transducer temperatures were not monitored, the model-core temperature was taken to be representative for the purpose of scheduling a zero record.

A standard procedure was also adopted for configuring data on magnetic tape so that each tape could be independently processed as well as reduced in an automatic fashion. These two requirements led to the following test procedures:

1. Initialize each tape with recordings of an electrical short and ± 1 V references
2. Record transducer gain evaluation voltages
3. Record prescribed sequence of pressure transducer calibrations
4. Record transducer gain evaluation voltages (if changed) before test cases
5. Record zero-flow signals before test cases (initial zero)
6. Record test cases
7. Record zero-flow signals following test cases (final zero)

8. Repeat (4) through (7) until near the end of the tape
9. Repeat (2) and (3) at the end of the tape

The technique used for systematically subjecting the transducers to given pressure levels is shown in figure 3. Shop air was used to continuously supply a tank to which six pressure regulators were attached. The regulators were preset to pressures of 0.3, 0.6, 1.0, 2.0, 3.0, and 5.0 psig. These six pressures, along with that from the tunnel pitot probe, were used as the pressure references for the test. By selecting any one of these seven pressure sources, the reference side of all pressure transducers in the model could be simultaneously exposed to either a calibration pressure or to the tunnel total-pressure. By using positive gage pressures for calibration references, the transducer diaphragms were deformed in the same direction as when the airfoil-surface sides of the transducers were exposed to suction during a test run. This procedure eliminated the need for calibrating through zero pressure. A detailed estimation of the uncertainty and accuracy of the pressure measurements is given in volume 1.

DATA REDUCTION

The first step in the data reduction process was the conversion of analog data to digital form. This required that each frame of data be replayed in real time, digitized using the 200/rev and 1/rev synchronizing signals, and stored on a digital tape. It was during this latter step that various test parameters recorded by hand in the log were coded and appended to each corresponding frame of data. A hardware incompatibility prevented the digitizer from responding to the 200/rev signal directly, and a synthetic pulse train based on this signal had to be substituted. Since the computed period for the synthetic signal was dependent on the period of the test data just completed on the analog tape, a slight fluctuation from cycle to cycle during the original recording of unsteady data sometimes resulted in a slightly incorrect synthetic period. As a result, ensemble averages of the digital data would correspond to specific values of ωt only in the mean, and the resulting periods would either fall short or go beyond the correct completion of the cycle. In order to render the data more amenable to analysis, it was decided that the unsteady data would be interpolated and reordered (to begin at mean angle) during the final stage of reduction. As explained in volume 1, the final data appear at convenient increments, but suffer an effective "smearing" that at worst would be equivalent to having sampled at a rate of 100 points per cycle instead of 200 points per cycle.

Once the data were placed on digital tape, they were transferred to a more versatile computer where (1) the unsteady data were ensemble-averaged, (2) the gain factors were divided out, (3) the time-averaged zero-flow values were calculated and subtracted, and (4) the calibrations were applied to scale the data to coefficient form. After imposing a Mach number correction to the pitot-static measurement, the instantaneous value of the dynamic pressure was used to calculate the pressure coefficients.

Airloads were computed using a simple trapezoidal rule integration around the airfoil. Since the pressure was not actually measured at the trailing edge, a value was calculated based on the average between upper and lower surface extrapolations from neighboring points. Curve-fitting the data was not attempted because of the possibility of irregular results as the vortex passed over the rear of the airfoil where transducers were relatively far apart.

The pressure was integrated over x to give the normal force and over y to give the chord force. Given the airfoil incidence, the normal and chord forces were used to calculate the lift and drag forces. Although the chord force contributes little to the pitching moment, its effect was included for completeness. Since viscous forces were not measured, the calculated chord force is incomplete, and hence the lift and drag forces must be regarded as approximate. This approximation is considered good, however, under conditions of unsteady large-amplitude motion where pressure forces are dominant. On the other extreme, the steady-flow drag data at low incidence should be interpreted with caution.

DATA PRESENTATION

Both steady and unsteady data have been graphically displayed (figs. 4-19) in a uniform format to facilitate comparison between cases. The axes scales for the lift, drag, and pitching-moment coefficients have been fixed. All unsteady cases have been plotted against ωt (beginning at minimum incidence) to more clearly show the resulting loads around maximum incidence. The unsteady loops that are created when the data are plotted against α have been divided into two parts, the solid portion corresponding to $\dot{\alpha} > 0$, and the dashed portion corresponding to $\dot{\alpha} < 0$. The dotted line appearing in the lift versus incidence plots represents an approximation of the quasi-static lift behavior at low incidence for the given flow condition (see vol. 1).

To simplify the presentation of pressure, the sign of the coefficient has been changed, the lower-surface values have been suppressed, and the upper-surface values skewed over time in a carpet fashion. The pressures at each x/c have been connected by a straight line and the leading-edge pressure has been identified by a bold-appearing dot. The first curve shows the pressure distribution at minimum incidence, and the succeeding curves correspond to equal increments in time ($\omega t = 18^\circ$) over one full cycle of airfoil oscillation. The scale of the ordinate is either 10 or 20, depending on the range of pressures to be displayed. The symbol * appearing on the ordinate denotes the sonic pressure corresponding to the free-stream Mach number for that test case. A number of quantities characterizing a particular unsteady case have been included on each display. These are

1. Airfoil name and frame number
2. Average Reynolds number
3. Maximum lift force and the angle at which it occurs
4. Angle at which the minimum chord force occurs
5. Mean angle and amplitude of oscillation
6. Minimum value of pitching moment
7. Pitch-damping coefficient
8. Maximum suction detected during the cycle
9. Reduced frequency of oscillation
10. Free-stream Mach number

11. Maximum pressure drag

12. Maximum local Mach number based on minimum pressure, and the angle at which it occurs.

In the case of the steady-data displays, dashed lines denote data points reached from a stalled condition. The pressure distribution covers both upper and lower surface and corresponds to that obtained just before stall. References to the data, either by frame number (ordered according to their position of an archival tape) or test condition, are given in tables 6 to 19. Test cases for numerical analysis are shown in table 20.

All of the data presented in this volume have been archived on magnetic tape, according to airfoil. Although NASA is not responsible for the data, these data can be obtained by submitting a written request to the Computer Documentation Service, Ames Research Center, NASA, Moffett Field, California 94035. Archived data tape numbers for the eight airfoils are shown in table 21. The magnetic tapes were written in a widely compatible format, the attributes for which are given in table 22. The organization and format of the data on magnetic tape are given in the appendix, along with a definition of the argument symbols.

APPENDIX

PROGRAM FOR READING DATA TAPES ON THE CDC 7600 COMPUTER

SUBROUTINE RECALL (FRAME, INIT, LIST, INUNIT, LSUNIT, ID, X, Y, NPTS, TRIP,
 1 ALPHA0, ALPHA1, AVEQ, AVEM, REC, RF, FREQ, NPARTS, ALPHA, Q, CP, CL, CD, CM,
 2 PT, ERR)

```

C
C
C   Module Name:      RECALL
C   Author:          Ken McAlister
C   Date:            February 1981
C   Modifications:   July 1981 by Steve Pucci
C                   December 1981 by Steve Pucci
C   Purpose:         This routine was designed to read one data frame
C                   from the data tapes produced from the 1979 oscillating
C                   airfoil experiment.
C   Inputs:          FRAME : The identifying number of the frame desired.
C                   If this number is input as zero, the next frame
C                   on the tape will be read.
C                   INIT  : If true, the subroutine will read off the
C                   initial data on the tape. For the normal
C                   airfoil tapes, this should be set to true for
C                   the first frame read from the tape, and false
C                   for all others. For the special tape generated
C                   for the AIAA paper 81-0051, this should be set
C                   to true for all frames.
C                   LIST  : If true, the subroutine will write a summary of
C                   the frame read.
C                   INUNIT: The unit number associated with the tape to be
C                   read.
C                   LSUNIT: The unit number associated with the listing, if
C                   one is desired.
C   Outputs:         ID   : The name of the airfoil tested in the data
C                   frame. Note that this, the following two
C                   arrays X and Y, and the value of NPTS are
C                   only changed in the subroutine if the input
C                   parameter INIT has been set to true (see
C                   Inputs, above).
C                   X,Y   : The coordinates of the pressure transducers,
C                   normalized by the chord length, where 0,0 is
C                   at the leading edge of the airfoil.
C                   NPTS  : The length of the X,Y arrays, and the number
C                   of pressure transducers.
C                   TRIP  : This parameter is set to true if a boundary
C                   layer trip is present on the airfoil tested.
C                   ALPHA0: The mean angle of attack of the airfoil, in
C                   degrees.
C                   ALPHA1: The amplitude of the angle of attack oscilla-
C                   tion of the airfoil, also in degrees.
C                   AVEQ  : Average free-stream dynamic pressure, in PSI.
C                   AVEM  : Average free-stream Mach number.
  
```

```

C      REC   : Average Reynolds number based on chord.
C      RF    : Reduced frequency of oscillation.
C      FREQ  : Frequency of oscillation, Hz.
C      NPARTS: Number of time increments describing data.
C      ALPHA : Instantaneous airfoil angle of attack, degrees:
C              Vector of length NPARTS.
C      Q     : Instantaneous free-stream dynamic pressure, PSI:
C              Vector of length NPARTS.
C      CP    : Instantaneous surface pressure coefficient:
C              Matrix of length (NPARTS,NPTS).
C      CL    : Instantaneous lift coefficient:
C              Vector of length NPARTS.
C      CD    : Instantaneous drag coefficient:
C              Vector of length NPARTS.
C      CM    : Instantaneous moment coefficient:
C              Vector of length NPARTS.
C      PT    : Total pressure, PSI.
C      ERR   : Returned true if:
C              (1) FRAME was input as zero, and there are no
C                  more frames on the tape, OR
C              (2) a specific FRAME was input, and that frame
C                  was not found on the tape.
C              If ERR is returned as true, the tape has been
C              rewound (but not yet initialized).
C      FRAME : If a frame has been found, this is its
C              identifying number.

```

```

C      LOGICAL TRIP,INIT,ERR,LIST
C      INTEGER FRAME

```

```

C      DIMENSION X(28),Y(28),ALPHA(200),Q(200),CP(200,28)
C      DIMENSION CL(200),CD(200),CM(200),ID(40),WORDS(80)

```

```

C      DATA ITOTLN /45/

```

```

C      ITOTLN is the total number of lines that will fit on one page of
C      output.

```

```

C      1000 FORMAT(1X,I5)
C      1001 FORMAT(1X,80A1)
C      1002 FORMAT(1X,I5,1X,L1,1X,I5,3(1X,E14.7))
C      1003 FORMAT(5E14.7)

```

```

C      2000 FORMAT(1H1,32H...BRIEF SUMMARY OF DATA TAPE.../)
C      2001 FORMAT(/7H  FRAME,1X,4HTRIP,3X,4HTYPE,5X,2HA0,9X,2HA1,8X,1HQ,
C              1 10X,1HM,6X,2HRE,8X,1HK,8X,4HFREQ)
C      2002 FORMAT(2X,I5,2X,L1,3X,8H  STEADY,2X,2(F5.1,4H DEG,2X),F5.3,4H PSI,
C              1 2X,F5.3,2X,F8.0,2X,F6.4,2X,F5.2,3H HZ)
C      2003 FORMAT(2X,I5,2X,L1,3X,8HUNSTEADY,2X,2(F5.1,4H DEG,2X),F5.3,4H PSI,
C              1 2X,F5.3,2X,F8.0,2X,F6.4,2X,F5.2,3H HZ)
C      2004 FORMAT(/1X,11HDATA FOR...,80A1)
C      2005 FORMAT(/1X,23HTRANSDUCER COORDINATES:/)
C      2006 FORMAT(1X,3HNO.,I2,3X,4HX/C=,F10.6,3X,4HY/C=,F10.6)

```

```

2007 FORMAT(1H1,6H ALPHA,3X,1HQ,3X,13(2X,2HCP,I2,1X),4X,2HCL,
1          5X,2HCD,5X,2HCM)
2008 FORMAT(14X,13(2X,2HCP,I2,1X)//)
2009 FORMAT(2X,F5.1,1X,F5.3,1X,13(F6.2,1X),1X,F6.3,1X,F6.3,2X,F6.4)
2010 FORMAT(14X,13(F6.2,1X)/)
C
3000 FORMAT(///5X,13HFRAME NUMBER ,I6,24H NOT FOUND ON THIS TAPE)
3001 FORMAT (47H END OF PRIVATE DATA TAPE ENCOUNTERED ON UNIT 1)
C
C
C
      IF (.NOT.INIT) GO TO 100
C...The following section initializes the tape by reading off the header info.
      IF (LIST) WRITE (LSUNIT,2000)
      READ(INUNIT,1000) LINES
      IF(EOF(INUNIT).NE.0) GO TO 9000
      DO 10 N=1,LINES
          READ(INUNIT,1000) NUMBER
          READ(INUNIT,1001) (WORDS(I),I=1,NUMBER)
          IF (LIST) WRITE(LSUNIT,1001) (WORDS(I),I=1,NUMBER)
10      CONTINUE
          DO 20 N=1,40
              ID(N)=1H
20      CONTINUE
C...      ( initialize ID array )
      READ(INUNIT,1000) IDLEN
      READ(INUNIT,1001) (ID(I),I=1,IDLEN)
      IF (LIST) WRITE(LSUNIT,2004) (ID(I),I=1,IDLEN)
      READ(INUNIT,1000) NPTS
      READ(INUNIT,1003) (X(I),I=1,NPTS)
      READ(INUNIT,1003) (Y(I),I=1,NPTS)
      IF (LIST) WRITE(LSUNIT,2005)
      IF (LIST) WRITE(LSUNIT,2006) ((I,X(I),Y(I)),I=1,NPTS)
C
100 CONTINUE
C
      READ(INUNIT,1002) NUMBER,TRIP,NPARTS,ALPHA0,ALPHA1,PT
      IF(EOF(INUNIT).NE.0) GO TO 9000
      READ(INUNIT,1003) AVEQ,AVEM,REC,RF,FREQ
      DO 110 J=1,NPARTS
          READ(INUNIT,1003) ALPHA(J),Q(J),(CP(J,K),K=1,NPTS)
          READ(INUNIT,1003) CL(J),CD(J),CM(J)
110 CONTINUE
      IF(NUMBER.NE.FRAME.AND.FRAME.NE.0) GO TO 100
C
      FRAME=NUMBER
      ERR=.FALSE.
C
C
      IF(.NOT.LIST) RETURN
C
      WRITE(LSUNIT,2001)
      IF(NPARTS.EQ.1) WRITE(LSUNIT,2002) FRAME,TRIP,ALPHA0,ALPHA1,

```

```

1  AVEQ,AVEM,REC,RF,FREQ
   IF(NPARTS.NE.1) WRITE(LSUNIT,2003) FRAME,TRIP,ALPHA0,ALPHA1,
1  AVEQ,AVEM,REC,RF,FREQ
   NCOUNT=1
   ITOTCT = ITOTLN/3 - 1
   DO 200 J=1,NPARTS
     IF(NCOUNT.EQ.1) WRITE(LSUNIT,2007) (K,K=1,13)
     IF(NCOUNT.EQ.1) WRITE(LSUNIT,2008) (K,K=14,26)
     WRITE(LSUNIT,2009) ALPHA(J),Q(J),(CP(J,K),K=1,13),CL(J),CD(J),
1    CM(J)
     WRITE(LSUNIT,2010) (CP(J,K),K=14,26)
     NCOUNT=NCOUNT+1
     IF(NCOUNT.GT.ITOTCT) NCOUNT=1
200  CONTINUE
     RETURN
C
C
C...This routine is used when the end of the tape is reached.
9000 CONTINUE
     ERR = .TRUE.
C
   IF (FRAME.EQ.0) GO TO 600
   WRITE(LSUNIT,3000)FRAME
   REWIND INUNIT
   RETURN
C
600 WRITE (LSUNIT,3001)
     RETURN
     END

```

TABLE 1.- AIRFOIL COORDINATES: NACA 0012 AND AMES A-01 AIRFOILS

x/c	NACA 0012, y/c		AMES A-01, y/c	
	upper	lower	upper	lower
0.0000	0.00000	0.00000	0.00000	0.00000
0.0005	0.00395	-0.00395	0.00377	-0.00338
0.0010	0.00556	-0.00556	0.00541	-0.00472
0.0020	0.00781	-0.00781	0.00766	-0.00651
0.0035	0.01027	-0.01027	0.01013	-0.00844
0.0050	0.01221	-0.01221	0.01214	-0.00994
0.0065	0.01386	-0.01386	0.01388	-0.01120
0.0080	0.01531	-0.01531	0.01543	-0.01227
0.0100	0.01704	-0.01704	0.01732	-0.01350
0.0125	0.01894	-0.01894	0.01945	-0.01481
0.0160	0.02127	-0.02127	0.02214	-0.01634
0.0200	0.02360	-0.02360	0.02490	-0.01777
0.0250	0.02615	-0.02615	0.02801	-0.01922
0.0350	0.03043	-0.03043	0.03335	-0.02137
0.0500	0.03555	-0.03555	0.03991	-0.02365
0.0650	0.03966	-0.03966	0.04523	-0.02549
0.0800	0.04307	-0.04307	0.04961	-0.02710
0.1000	0.04683	-0.04683	0.05421	-0.02902
0.1250	0.05055	-0.05055	0.05829	-0.03104
0.1500	0.05345	-0.05345	0.06098	-0.03277
0.2000	0.05737	-0.05737	0.06344	-0.03551
0.2500	0.05941	-0.05941	0.06431	-0.03727
0.3000	0.06002	-0.06002	0.06446	-0.03828
0.3500	0.05949	-0.05949	0.06409	-0.03866
0.4000	0.05803	-0.05803	0.06316	-0.03848
0.4500	0.05581	-0.05581	0.06154	-0.03782
0.5000	0.05294	-0.05294	0.05924	-0.03665
0.5500	0.04952	-0.04952	0.05623	-0.03501
0.6000	0.04563	-0.04563	0.05249	-0.03297
0.6500	0.04132	-0.04132	0.04792	-0.03056
0.7000	0.03664	-0.03664	0.04246	-0.02785
0.7500	0.03160	-0.03160	0.03600	-0.02486
0.8000	0.02623	-0.02623	0.02860	-0.02153
0.8500	0.02053	-0.02053	0.02064	-0.01786
0.9000	0.01448	-0.01448	0.01260	-0.01374
0.9250	0.01132	-0.01132	0.00899	-0.01144
0.9500	0.00807	-0.00807	0.00598	-0.00888
0.9750	0.00472	-0.00472	0.00392	-0.00603
0.9900	0.00265	-0.00265	0.00322	-0.00421
1.0000	0.00126	-0.00126	0.00299	-0.00300
	$r_o/c = 0.0158$		$r_o/c = 0.012$	

TABLE 2.- AIRFOIL COORDINATES: WORTMANN FX-098 AND SIKORSKY SC-1095 AIRFOILS

x/c	WORTMANN FX-098, y/c		SIKORSKY SC-1095, y/c	
	upper	lower	upper	lower
0.0000	0.00000	0.00000	0.00000	0.00000
0.0005	0.00293	-0.00249	0.00307	-0.00257
0.0010	0.00426	-0.00343	0.00443	-0.00368
0.0020	0.00619	-0.00471	0.00640	-0.00535
0.0035	0.00837	-0.00609	0.00865	-0.00724
0.0050	0.01017	-0.00717	0.01054	-0.00880
0.0065	0.01175	-0.00807	0.01221	-0.01016
0.0080	0.01319	-0.00886	0.01374	-0.01138
0.0100	0.01494	-0.00978	0.01560	-0.01285
0.0125	0.01692	-0.01079	0.01771	-0.01450
0.0160	0.01944	-0.01202	0.02041	-0.01657
0.0200	0.02204	-0.01321	0.02320	-0.01865
0.0250	0.02501	-0.01451	0.02635	-0.02092
0.0350	0.03021	-0.01664	0.03140	-0.02454
0.0500	0.03681	-0.01913	0.03677	-0.02842
0.0650	0.04234	-0.02111	0.04070	-0.03108
0.0800	0.04705	-0.02277	0.04374	-0.03295
0.1000	0.05222	-0.02464	0.04680	-0.03464
0.1250	0.05714	-0.02658	0.04963	-0.03619
0.1500	0.06073	-0.02819	0.05174	-0.03739
0.2000	0.06491	-0.03059	0.05447	-0.03884
0.2500	0.06650	-0.03198	0.05548	-0.03933
0.3000	0.06630	-0.03251	0.05524	-0.03918
0.3500	0.06515	-0.03242	0.05437	-0.03858
0.4000	0.06336	-0.03184	0.05299	-0.03760
0.4500	0.06097	-0.03096	0.05105	-0.03622
0.5000	0.05798	-0.02982	0.04854	-0.03446
0.5500	0.05445	-0.02843	0.04555	-0.03234
0.6000	0.05040	-0.02678	0.04212	-0.02985
0.6500	0.04586	-0.02487	0.03819	-0.02702
0.7000	0.04085	-0.02273	0.03375	-0.02384
0.7500	0.03543	-0.02034	0.02887	-0.02034
0.8000	0.02962	-0.01768	0.02362	-0.01658
0.8500	0.02337	-0.01473	0.01808	-0.01265
0.9000	0.01642	-0.01134	0.01235	-0.00865
0.9250	0.01253	-0.00932	0.00943	-0.00664
0.9500	0.00856	-0.00702	0.00642	-0.00454
0.9750	0.00476	-0.00423	0.00328	-0.00233
0.9900	0.00255	-0.00237	0.00132	-0.00093
1.0000	0.00110	-0.00110	0.00000	0.00000

$r_o/c = 0.007$

$r_o/c = 0.008$

TABLE 3.- AIRFOIL COORDINATES: HUGHES HH-02 (-5° TAB) AND VERTOL VR-7 (-3° TAB) AIRFOILS

x/c	HUGHES HH-02, y/c		VERTOL VR-7, y/c	
	upper	lower	upper	lower
0.0000	0.00000	0.00000	0.00000	0.00000
0.0005	0.00283	-0.00284	0.00337	-0.00330
0.0010	0.00405	-0.00388	0.00483	-0.00460
0.0020	0.00594	-0.00532	0.00696	-0.00633
0.0035	0.00819	-0.00683	0.00943	-0.00800
0.0050	0.01009	-0.00800	0.01149	-0.00919
0.0065	0.01176	-0.00895	0.01330	-0.01010
0.0080	0.01327	-0.00978	0.01494	-0.01086
0.0100	0.01510	-0.01072	0.01695	-0.01172
0.0125	0.01717	-0.01172	0.01923	-0.01263
0.0160	0.01975	-0.01290	0.02213	-0.01367
0.0200	0.02237	-0.01404	0.02512	-0.01467
0.0250	0.02531	-0.01524	0.02846	-0.01575
0.0350	0.03029	-0.01714	0.03423	-0.01751
0.0500	0.03640	-0.01943	0.04144	-0.01966
0.0650	0.04137	-0.02127	0.04759	-0.02154
0.0800	0.04553	-0.02276	0.05299	-0.02320
0.1000	0.05012	-0.02432	0.05922	-0.02516
0.1250	0.05468	-0.02575	0.06565	-0.02709
0.1500	0.05828	-0.02675	0.07091	-0.02855
0.2000	0.06328	-0.02793	0.07887	-0.03055
0.2500	0.06608	-0.02843	0.08378	-0.03186
0.3000	0.06738	-0.02834	0.08592	-0.03273
0.3500	0.06750	-0.02755	0.08574	-0.03308
0.4000	0.06640	-0.02600	0.08365	-0.03271
0.4500	0.06391	-0.02377	0.07984	-0.03148
0.5000	0.06008	-0.02104	0.07451	-0.02952
0.5500	0.05504	-0.01797	0.06781	-0.02712
0.6000	0.04891	-0.01482	0.05996	-0.02464
0.6500	0.04174	-0.01176	0.05171	-0.02207
0.7000	0.03344	-0.00952	0.04322	-0.01929
0.7500	0.02403	-0.00851	0.03442	-0.01639
0.8000	0.01436	-0.00889	0.02527	-0.01346
0.8500	0.00481	-0.00984	0.01575	-0.01050
0.9000	-0.00431	-0.01041	0.00558	-0.00744
0.9250	-0.00394	-0.00777	0.00117	-0.00609
0.9500	-0.00203	-0.00583	-0.00016	-0.00512
0.9750	-0.00006	-0.00387	0.00115	-0.00380
0.9900	0.00112	-0.00269	0.00194	-0.00300
1.0000	0.00190	-0.00190	0.00247	-0.00247
	$r_o/c = 0.008$		$r_o/c = 0.011$	

TABLE 4.- AIRFOIL COORDINATES: NLR-1 AND NLR-7301 AIRFOILS

x/c	NLR-1, y/c		NLR-7301, y/c	
	upper	lower	upper	lower
0.0000	0.00000	0.00000	0.00000	0.00000
0.0005	0.00359	-0.00288	0.00730	-0.00748
0.0010	0.00499	-0.00388	0.01051	-0.01020
0.0020	0.00687	-0.00518	0.01518	-0.01373
0.0035	0.00890	-0.00643	0.02030	-0.01735
0.0050	0.01053	-0.00730	0.02424	-0.02016
0.0065	0.01194	-0.00799	0.02756	-0.02252
0.0080	0.01321	-0.00858	0.03043	-0.02455
0.0100	0.01475	-0.00929	0.03375	-0.02688
0.0125	0.01648	-0.01006	0.03729	-0.02935
0.0160	0.01868	-0.01101	0.04140	-0.03225
0.0200	0.02097	-0.01196	0.04514	-0.03502
0.0250	0.02358	-0.01301	0.04873	-0.03794
0.0350	0.02799	-0.01477	0.05372	-0.04264
0.0500	0.03328	-0.01688	0.05920	-0.04806
0.0650	0.03750	-0.01859	0.06321	-0.05229
0.0800	0.04093	-0.02007	0.06636	-0.05576
0.1000	0.04435	-0.02179	0.06985	-0.05962
0.1250	0.04701	-0.02363	0.07347	-0.06358
0.1500	0.04905	-0.02522	0.07648	-0.06689
0.2000	0.05200	-0.02775	0.08115	-0.07194
0.2500	0.05386	-0.02958	0.08441	-0.07527
0.3000	0.05489	-0.03082	0.08649	-0.07713
0.3500	0.05528	-0.03154	0.08755	-0.07763
0.4000	0.05511	-0.03185	0.08764	-0.07672
0.4500	0.05443	-0.03176	0.08678	-0.07412
0.5000	0.05327	-0.03126	0.08495	-0.06934
0.5500	0.05164	-0.03025	0.08206	-0.06237
0.6000	0.04948	-0.02882	0.07789	-0.05386
0.6500	0.04677	-0.02707	0.07212	-0.04397
0.7000	0.04348	-0.02503	0.06458	-0.03316
0.7500	0.03892	-0.02276	0.05551	-0.02227
0.8000	0.03172	-0.02028	0.04523	-0.01221
0.8500	0.02368	-0.01756	0.03415	-0.00409
0.9000	0.01562	-0.01427	0.02269	0.00108
0.9250	0.01179	-0.01199	0.01696	0.00228
0.9500	0.00811	-0.00903	0.01129	0.00246
0.9750	0.00454	-0.00511	0.00577	0.00153
0.9900	0.00244	-0.00253	0.00258	0.00042
1.0000	0.00103	-0.00103	0.00055	-0.00055
	$r_o/c = 0.007$		$r_o/c = 0.055$	

TABLE 5.- TRANSDUCER LOCATIONS ON THE AIRFOILS

Transducer Number ^a	Nominal ^b x/c		Actual pressure transducer location									
	Pressure	Hot wire	0012	A-01	FX-098	SC-1095	VR-7	NLR-1	NLR-7301	HH-02		
1 LE	0.		0.	0.	0.0002U	0.	0.	0.	0.0015U	0.		
2 U	.005 (.004)		.0060	.0054	.0038	.0040	.0044	.0054	.0101	.0050		
3	.010 (.010)		.0103	.010	.0067	.0110	.0083	.0108	.0165	.0087		
4	.025 (.030)	0.025 (.025)	.0242	.024	.0196	.0275	.0225	.028	.0335	.0326		
5	.050 (.06)		.052	.050	.051	.053	.050	.051	.0512	.0581		
6	.100 (.12)	.10 (.12)	.102	.100	.101	.1025	.100	.101	.102	.1167		
7	.175 (.18)		.176	.175	.177	.178	.175	.177	.177	.183		
8	.25 (.25)		.252	.250	.252	.252	.250	.250	.252	.250		
9	.325 (.32)		.326	.325	.326	.325	.325	.325	.326	.317		
10	.40 (.38)	.40 (.38)	.40	.40	.40	.40	.40	.40	.40	.383		
11	.50 (.48)		.50	.50	.50	.50	.50	.50	.50	.472		
12	.60 (.56)	.60 (.56)	.60	.60	.60	.60	.60	.60	.60	.561		
13	.70 (.65)		.70	.70	.70	.70	.70	.70	.70	.650		
14	.80 (.74)	.80 (.74)	.80	.80	.80	.80	.80	.80	.80	.739		
15	.90 (.84)		.899	.90	.90	.90	.90	.90	.90	.840		
16 U	.98 (.93)		.98	.98	.98	.98	.98	.98	.98	.925		
17 L	.98 (.93)		.979	.98	.98	.98	.98	.98	.98	.925		
18	.90 (.84)		.90	.90	.90	.90	.90	.90	.90	.840		
19	.70 (.65)		.70	.70	.70	.70	.70	.70	.70	.650		
20	.50 (.48)		.50	.50	.50	.50	.50	.50	.50	.472		
21	.30 (.29)		.30	.30	.30	.30	.30	.30	.30	.294		
22	.15 (.16)		.153	.150	.153	.150	.150	.150	.155	.161		
23	.05 (.072)		.0504	.050	.051	.052	.050	.051	.0517	.0730		
24	.025 (.030)		.023	.026	.027	.028	.0246	.0220	.0194	.0293		
25	.010 (.010)		.0093	.0130	.0125	.009	.0094	.0108	.0051	.0081		
26 L	.005 (.004)		.0049	.0073	.0061	.005	.0040	.0062	.0021	.0044		

^aLE = leading edge; U = upper surface; L = lower surface.

^bLocations for HH-02, for which c = 68.6 cm, are shown in parentheses; for all other airfoils shown, c = 61.0 cm.

TABLE 6.- Continued.

(a) Concluded.

A										B	
FRAME	TRIP	TYPE	AD	A1	Q	M	RE	K	FREQ	FRAME	
10105	N	US	12.0	8.0	.878	.302	3694271.	.0968	5.35		
10108	N	US	12.0	8.0	.847	.295	3635589.	.1253	6.81		
10113	N	US	15.0	5.0	.876	.302	3896845.	.0098	.53		
10114	N	US	15.0	5.0	.841	.295	3801337.	.0252	1.34		
10118	N	US	15.0	5.0	.823	.291	3749526.	.1020	5.36		
10120	N	US	15.0	5.0	.845	.294	3785165.	.1511	8.04		
10123	N	US	15.0	5.0	.832	.293	3758528.	.2024	10.72		
10202	N	US	10.0	5.0	.877	.301	3558103.	.0098	.54		
10203	N	US	10.0	5.0	.877	.301	3547481.	.0246	1.34		
10204	N	US	10.0	5.0	.870	.300	3826414.	.0493	2.68		
10207	N	US	10.0	5.0	.877	.302	3524529.	.0740	4.02		
10208	N	US	10.0	5.0	.870	.300	3559785.	.0990	5.36		
10211	N	US	10.0	5.0	.870	.300	3663353.	.1486	8.04		
10212	N	US	10.0	5.0	.870	.300	3650737.	.1979	10.72		
10218	N	US	5.0	5.0	.880	.300	3933484.	.0098	.53		
10221	N	US	5.0	5.0	.878	.301	3925387.	.0993	5.36		
10222	N	US	5.0	5.0	.878	.301	3912114.	.1983	10.72		
10303	N	US	5.0	10.0	.877	.301	3910580.	.0991	5.36		
10305	N	US	3.8	10.0	.877	.301	3911328.	.0991	5.36		
10309	N	US	2.8	10.0	.877	.301	3896361.	.0989	5.36		
12020	N	US	20.0	10.0	.718	.270	3490909.	.0010	.05	12033	
12102	N	US	5.0	10.0	.882	.302	3920000.	.0009	.05	12105	
12109	N	US	6.0	10.0	.756	.279	3455755.	.0010	.05	12112	
12118	N	US	20.0	10.0	.676	.262	3246704.	.0010	.05	12121	
12203	N	US	20.0	10.0	.531	.231	2587477.	.0011	.05	12121	
12208	N	US	7.0	10.0	.587	.244	3269975.	.0010	.05	12212	
12300	N	US	20.0	10.0	.421	.204	2706734.	.0011	.04	12301	
12305	N	US	20.0	10.0	.292	.169	2252844.	.0011	.03	12306	
13010	N	US	7.0	10.0	.350	.186	2469266.	.0010	.03		
13021	N	US	7.0	10.0	.120	.108	1502757.	.0017	.03		
13107	N	US	20.0	10.0	.113	.105	1421201.	.0017	.03	13104	
13115	N	US	20.0	10.0	.048	.068	915563.	.0027	.03	13116	
13120	N	US	5.0	10.0	.053	.072	962303.	.0025	.03	13202	
13205	N	US	5.0	10.0	.014	.036	488772.	.0025	.02	13213	
13217	N	US	20.0	10.0	.013	.036	485631.	.0026	.02		
13222	N	US	20.0	10.0	.749	.276	3656957.	.0010	.05		
13303	N	US	7.0	10.0	.603	.247	3298109.	.0010	.05		
13308	N	US	7.0	10.0	.461	.215	2884310.	.0010	.04		
13310	N	US	7.0	10.0	.466	.216	2884723.	.0010	.04		
13313	Y	US	7.0	10.0	.332	.181	2404930.	.0010	.03	13316	
13321	Y	US	7.0	10.0	.639	.294	3740354.	.0009	.05	13405	
14019	Y	US	15.0	10.0	.339	.183	2456640.	.0499	1.65	14020	
14021	Y	US	15.0	10.0	.336	.182	2454182.	.1001	3.30	14022	
14023	Y	US	15.0	10.0	.335	.182	2426579.	.1504	4.95	14100	
14104	Y	US	15.0	10.0	.338	.183	2448651.	.0499	1.65	14105	
14106	Y	US	15.0	10.0	.340	.184	2449339.	.0994	3.30	14107	
14108	Y	US	15.0	10.0	.339	.183	2443079.	.1493	4.95	14109	
14117	Y	US	15.0	10.0	.837	.293	3843264.	.0257	1.35	14118	
14119	Y	US	15.0	10.0	.836	.293	3818432.	.0509	2.68	14120	
14200	Y	US	15.0	10.0	.843	.294	3822179.	.0253	1.34	14201	
14202	Y	US	15.0	10.0	.839	.293	3792702.	.0506	2.68	14203	
14208	Y	US	15.0	10.0	.828	.291	3764396.	.1019	5.36	14209	
14210	Y	US	15.0	10.0	.832	.292	3760353.	.1014	5.36	14211	
14218	N	US	15.0	10.0	.830	.292	3762798.	.0254	1.34		
14219	N	US	15.0	10.0	.824	.291	3735990.	.0509	2.68	14221	
14220	N	US	15.0	10.0	.805	.287	3683317.	.1031	5.36		
15218	N	US	15.0	10.0	.818	.290	3678973.	.0994	5.24		
10117	N	US	15.0	5.0	.843	.295	3802563.	.0504	2.68		
7202	N	US	12.0	5.0	.877	.302	3861194.	.0496	2.70	7201	
7222	N	US	10.0	5.0	.876	.298	3975490.	.0509	2.70	7223	

TABLE 6.- Continued.
(b) Concluded.

A	FRAME	TRIP	TYPE	AC	A1	Q	M	RE	K	FREQ	B
25102	N	US	10.0	10.0	861	302	3831527	0.489	2.68	29100	
25104	N	US	10.0	10.0	880	302	3816708	0.978	5.36	25103	
25109	N	US	10.0	10.0	879	302	3810775	1.468	8.04	25108	
25117	N	US	10.0	5.0	884	303	3829075	0.244	1.34		
25118	N	US	10.0	5.0	879	302	3803407	0.489	2.68		
25119	N	US	10.0	5.0	863	303	3805390	0.975	5.36		
25121	N	US	10.0	5.0	881	302	3813088	1.465	8.04		
25122	N	US	10.0	5.0	884	303	3819823	1.462	8.04		
25123	N	US	10.0	5.0	885	303	3816827	1.947	10.72		
29023	Y	US	15.0	10.0	820	291	3697799	0.248	1.31	29100	
29101	Y	US	15.0	10.0	805	298	3639654	0.500	2.62	29102	
29106	Y	US	15.0	10.0	806	288	3646183	1.001	5.24	29107	
29115	Y	US	15.0	10.0	340	184	2418131	0.494	1.65	29116	
29117	Y	US	15.0	10.0	341	184	2418248	0.987	3.30	29118	
29119	Y	US	15.0	10.0	341	184	2417060	1.481	4.95	29121	
29205	N	US	5.0	10.0	876	301	3947215	0.098	5.3	29206	
29207	N	US	5.0	10.0	877	301	3918856	0.496	2.68	29210	
29211	N	US	5.0	10.0	877	301	3902857	0.991	5.36	29212	
29213	N	US	5.0	10.0	879	301	3876095	1.483	8.04	29214	
29215	N	US	5.0	10.0	879	301	3891313	1.481	8.04		
29223	N	US	13.5	2.0	876	301	3511977	1.965	10.72	29300	
29304	N	US	14.5	2.0	870	300	3772473	1.967	10.72	29306	
29309	N	US	16.5	2.0	852	296	3722411	1.986	10.72	29310	
29317	N	US	15.0	10.0	013	035	472349	1.021	6.5	29318	
30019	N	US	15.0	10.0	865	298	3856941	0.097	5.2	30021	
30020	N	US	15.0	10.0	864	298	3828146	0.096	5.2	30021	
30105	N	US	10.0	10.0	880	301	3844592	0.097	5.3	30106	
30110	N	US	15.0	5.0	877	301	3817844	0.097	5.3	30111	
30119	N	US	10.0	5.0	874	300	3819252	0.097	5.3	30120	
30201	N	US	11.0	5.0	877	301	3814196	0.099	5.4	30202	
30206	N	US	14.0	2.0	876	301	3818990	0.037	5.3	30208	
30215	N	US	7.5	10.0	338	183	2415733	0.099	3.3	30216	
31102	N	US	10.0	10.0	877	302	3882093	0.247	1.34	31103	
31104	N	US	10.0	10.0	878	302	3859857	0.492	2.68	31105	
31110	N	US	10.0	10.0	880	302	3841535	1.471	8.04	31111	
31112	N	US	10.0	10.0	860	302	3832051	1.469	8.04	31111	
31119	N	US	5.0	10.0	884	303	3856266	0.245	1.34	31120	
31121	N	US	5.0	10.0	880	302	3826584	0.489	2.68	31122	
31123	N	US	5.0	10.0	884	303	3823741	0.975	5.36	31200	
31201	N	US	5.0	10.0	883	303	3816623	1.463	8.04	31202	
31209	N	US	15.0	10.0	341	184	2421425	0.987	3.30	31210	
31215	N	US	7.5	10.0	341	184	2425499	0.494	1.65	31216	
31217	N	US	7.5	10.0	341	185	2423083	1.972	6.60	31218	
31302	N	US	14.5	2.0	852	297	3765532	1.990	10.72	31304	
31310	N	US	14.5	2.0	854	298	3731489	1.485	8.04	31312	
25204	N	US	15.0	5.0	877	301	3973275	0.249	1.34		
25205	N	US	15.0	5.0	878	301	3952662	0.497	2.68		
25208	N	US	15.0	5.0	878	301	3950602	0.994	5.36		
25209	N	US	15.0	5.0	857	298	3897313	1.506	8.04		
25210	N	US	15.0	5.0	852	297	3865306	2.013	10.72		
25214	N	US	11.0	5.0	860	302	3926436	0.495	2.68	25215	
25216	N	US	11.0	5.0	883	302	3909711	0.986	5.36	25217	
25301	N	US	5.0	5.0	884	302	3903948	0.984	5.36	25302	
25303	N	US	5.0	5.0	865	303	3878688	1.962	10.72	25304	
25311	N	US	5.0	10.1	881	302	3852707	0.982	5.36	25312	
25319	N	US	5.5	10.0	881	302	3833693	0.980	5.36	25320	

TABLE 6.- Continued.

(c) Concluded.

A				B						
FRAME	TRIP	TYPE	A0	A1	G	M	RE	K	FREQ	FRAME
17200	N	UN	15.0	10.0	.814	.290	3702477.	.0999	5.24	17201
21106	N	UN	15.0	10.0	.823	.291	3718613.	.0098	.52	21102
21107	N	UN	10.0	10.0	.857	.299	3792469.	.0098	.53	21201
21200	N	UN	10.0	5.0	.875	.301	3932117.	.0097	.53	21209
21208	N	UN	3.3	10.0	.882	.302	3295549.	.0098	.33	21220
21219	N	UN	6.5	10.0	.339	.184	2455459.	.0247	1.31	22100
22023	N	UN	15.0	10.0	.827	.293	3727983.	.0492	2.62	22104
22103	N	UN	15.0	10.0	.837	.294	3749080.	.1008	5.24	22202
22201	N	UN	15.0	10.0	.785	.285	3554419.	.1542	7.86	22207
22206	N	UN	15.0	10.0	.754	.279	3477029.	.0969	4.98	22209
22208	N	UN	15.0	10.0	.763	.281	3483672.	.0243	1.34	
22216	N	UN	10.0	10.0	.875	.302	3732111.	.0495	2.68	
22217	N	UN	10.0	10.0	.875	.302	3720266.	.0977	5.36	
22218	N	UN	10.0	10.0	.862	.300	3684571.	.1490	8.04	22223
22219	N	UN	10.0	10.0	.835	.294	3618509.	.0246	1.34	22300
22307	N	UN	10.0	5.0	.875	.301	3954387.	.0491	2.68	22301
22308	N	UN	10.0	5.0	.893	.303	3857324.	.0960	5.36	22302
22309	N	UN	10.0	5.0	.881	.303	3853451.	.1475	8.04	22303
22311	N	UN	10.0	5.0	.877	.302	3849798.	.1957	10.72	
22312	N	UN	10.0	5.0	.882	.303	3849072.	.0248	1.34	
23021	N	UN	15.0	5.0	.858	.298	3792196.	.0497	2.68	
23022	N	UN	15.0	5.0	.851	.297	3750472.	.1000	5.36	
23023	N	UN	15.0	5.0	.840	.295	3716891.	.1515	8.04	23108
23100	N	UN	15.0	5.0	.822	.292	3670934.	.0986	5.36	23110
23107	N	UN	5.0	5.0	.867	.300	3822826.	.1970	10.72	23118
23109	N	UN	5.0	5.0	.847	.300	3789174.	.0985	5.36	23202
23117	N	UN	5.0	10.0	.869	.299	3803440.	.1003	5.36	23207
23201	N	UN	3.8	10.0	.866	.299	3428210.	.0500	2.68	23210
23206	N	UN	3.3	10.0	.871	.300	3924045.	.0996	5.36	23212
23208	N	UN	3.3	10.0	.870	.300	3914485.	.1492	8.04	23220
23211	N	UN	3.3	10.0	.864	.299	3895319.	.1994	10.72	23306
23219	N	UN	12.0	2.0	.858	.299	3555609.	.1995	10.72	23309
23305	N	UN	14.0	2.0	.839	.294	3631711.	.2014	10.72	23311
23310	N	UN	16.0	2.0	.873	.301	3768762.	.0099	.53	
21112	N	UN	15.0	5.0	.873	.301	3940131.	.2049	10.72	
23101	N	UN	15.0	5.0	.800	.287	3617353.			

TABLE 6.- Continued.

(d) Concluded.

A				B						
FRAME	TRIP	TYPE	AO	A1	Q	M	RE	K	FREQ	FRAME
39110	N	UN	11.0	5.0	.869	.299	3896687.	.0099	.53	
39115	N	UN	14.0	2.0	.865	.298	3838622.	.0100	.54	
38110	N	UN	15.0	2.0	.832	.293	3754517.	.2023	10.72	38111
39107	N	UN	10.0	5.0	.876	.300	3939495.	.0098	.53	

TABLE 6.- Continued.

(e) Concluded.

A	FRAME	TRIP	TYPE	AO	A1	Q	H	RE	K	FREQ	B
44112	N	US	10.0	5.0	.680	.303	4003278.		.1989	10.72	44113
44118	N	US	10.0	5.0	.680	.302	4037690.		.0999	5.36	
44119	N	US	10.0	5.0	.676	.302	4019097.		.0250	1.34	
44120	N	US	10.0	5.0	.678	.302	4007236.		.1997	10.72	
44202	N	US	14.0	2.0	.675	.301	4004232.		.1001	5.36	44203
44204	N	US	14.0	2.0	.672	.301	3987136.		.2002	10.72	44205
44209	N	US	17.5	2.0	.773	.282	3756572.		.2132	10.72	
44212	N	US	15.5	2.0	.854	.297	3961107.		.0102	.54	
44214	N	US	15.5	2.0	.851	.297	3917470.		.0253	1.34	
44215	N	US	15.5	2.0	.849	.296	3904494.		.0506	2.68	
44216	N	US	15.5	2.0	.829	.293	3854581.		.1024	5.36	
44217	N	US	15.5	2.0	.820	.291	3826794.		.1545	8.04	
44218	N	US	15.5	2.0	.824	.292	3832243.		.2054	10.72	
44221	N	US	12.5	2.0	.671	.301	3955305.		.0101	.54	
44222	N	US	12.5	2.0	.677	.302	3943321.		.0248	1.34	
44223	N	US	12.5	2.0	.671	.301	3926000.		.0493	2.68	
44300	N	US	12.5	2.0	.874	.301	3929775.		.0994	5.36	
44303	N	US	12.5	2.0	.877	.302	3952217.		.1490	8.04	
44304	N	US	12.5	2.0	.878	.302	3945318.		.1984	10.72	
44308	N	US	15.0	5.0	.813	.290	3609287.		.1549	8.04	

TABLE 6.- Continued.

(f) Concluded.

A	FRAME	TRIP	TYPE	A0	A1	Q	M	RE	K	FREQ	B
54216	N	UN	15.0	10.0	.340	.184	2547606.	.1514	4.95	54217	
48019	N	UN	4.1	10.0	.874	.299	4215503.	.0103	.54	48020	
48023	N	UN	4.1	10.0	.880	.300	4189905.	.0255	1.34	48100	
48101	N	UN	4.1	10.0	.877	.299	4160141.	.0509	2.68	48102	
48103	N	UN	4.1	10.0	.879	.300	4154411.	.1016	5.36	48104	
48116	N	UN	13.0	2.0	.878	.299	4094662.	.0253	1.34	48117	
48118	N	UN	13.0	2.0	.878	.299	4059323.	.0504	2.68	48119	
48122	N	UN	13.0	2.0	.876	.298	4057706.	.1010	5.36	48123	
48209	N	UN	16.0	2.0	.870	.288	4055728.	.2828	10.72	48211	
48215	N	UN	14.0	2.0	.877	.300	4057579.	.0504	2.68		
48216	N	UN	14.0	2.0	.879	.300	4047826.	.1005	5.36		
48217	N	UN	14.0	2.0	.879	.300	4035020.	.2009	10.72	49218	
48300	N	UN	12.5	2.0	.878	.300	4033369.	.0101	.54		
48301	N	UN	12.5	2.0	.878	.300	4011900.	.0251	1.34		
48302	N	UN	12.5	2.0	.831	.301	4009055.	.0500	2.69		
48303	N	UN	12.5	2.0	.874	.299	3996169.	.1004	5.36		
48304	N	UN	12.5	2.0	.873	.299	3983450.	.1505	8.04		
48308	N	UN	12.5	2.0	.875	.300	3998448.	.2007	10.72	48309	
49110	N	UN	15.0	10.0	.339	.184	2634248.	.0257	.83	49111	
49117	N	UN	15.0	10.0	.342	.185	2619356.	.0507	1.65	49118	
49120	N	UN	15.0	10.0	.340	.185	2599912.	.1014	3.30	49121	
49203	N	UN	15.0	10.0	.341	.185	2592737.	.1518	4.95	49204	
49206	N	UN	15.0	10.0	.341	.185	2584516.	.2020	6.60	49207	
49216	N	UN	4.7	10.0	.340	.184	2550439.	.0234	.83	49217	
49300	N	UN	4.7	10.0	.338	.184	2535655.	.1009	3.30	49301	
49307	N	UN	4.7	10.0	.342	.185	2545693.	.2005	6.60	49308	
49310	N	UN	4.7	10.0	.343	.185	2543519.	.2503	8.25	49311	
49323	N	UN	15.0	10.0	.338	.184	2543127.	.0101	.33	49100	
50116	N	UN	4.7	10.0	.339	.183	2531156.	.0101	.33	50117	
57018	N	UN	15.0	10.0	.338	.184	2555187.	.1516	4.95	57019	
58018	N	UN	15.0	10.0	.338	.183	2437793.	.1495	4.95	58019	
58102	N	UN	15.0	10.0	.340	.184	2551877.	.0983	.65	58103	
58111	N	UN	15.0	10.0	.121	.109	1528745.	.1010	1.96	58112	
58120	N	UN	15.0	10.0	.340	.184	2536174.	.1511	4.95		
58121	N	UN	15.0	10.0	.340	.184	2532330.	.1007	3.30		
47022	Y	UN	15.0	10.0	.841	.246	3990015.	.0501	2.62	47023	
48200	N	UN	13.0	2.0	.884	.301	4062447.	.2006	10.72	48201	

TABLE 6.- Continued.

(g) Concluded.

A	FRAME	TRIP	TYPE	AO	A1	Q	M	RE	K	FREQ	B
63320	N	US	2.5	10.0	.878	.303	3739575.	.0969		5.36	63321
63323	N	US	2.7	10.0	.880	.303	3746774.	.0969		5.36	63400
64019	Y	US	15.0	10.0	.844	.296	3865490.	.0247		1.31	64020
64021	Y	US	15.0	10.0	.840	.295	3813567.	.0493		2.62	64022
64023	Y	US	15.0	10.0	.821	.292	3752005.	.0997		5.24	64100
64107	Y	US	15.0	10.0	.340	.185	2448919.	.0496		1.65	64108
64109	Y	US	15.0	10.0	.340	.184	2439010.	.0991		3.30	64110
64111	Y	US	15.0	10.0	.341	.185	2439626.	.1481		4.95	64112
64119	Y	US	2.5	10.0	.876	.302	3823417.	.0099		.54	64120
64121	Y	US	2.5	10.0	.875	.302	3795031.	.0244		1.34	64122
64202	Y	US	2.5	10.0	.879	.303	3794515.	.0737		2.69	64203
64204	Y	US	2.5	10.0	.878	.302	3774318.	.0974		5.36	64205
64212	Y	US	-2.0	10.0	.877	.302	3717936.	.0098		.54	
64213	Y	US	-2.0	10.0	.878	.303	3695424.	.0241		1.34	
64214	Y	US	-2.0	10.0	.878	.302	3685179.	.0482		2.68	
64215	Y	US	-2.0	10.0	.880	.303	3683703.	.0963		5.36	
65121	N	US	-2.0	10.0	.899	.300	3717371.	.0098		.54	
65122	N	US	-2.0	10.0	.873	.301	3700235.	.0243		1.34	
65123	N	US	-2.0	10.0	.874	.301	3694893.	.0495		2.63	
65200	N	US	-3.0	10.0	.877	.302	3594943.	.0968		5.36	
65207	N	US	15.0	10.0	.325	.199	2644668.	.0937		3.57	
65209	N	US	15.0	10.0	.829	.242	3775170.	.1019		5.36	
65223	N	US	7.0	5.0	.121	.109	1475396.	.0249		.49	
65300	N	US	7.0	5.0	.879	.301	3862901.	.1996		3.92	
65311	N	US	7.0	5.0	.876	.301	389117.	.0100		.54	
65309	N	US	15.0	2.0	.818	.291	3675799.	.2028		10.72	63223

TABLE 6. - Concluded.

(h) Concluded.

A	FRAME	TRIP	TYPE	AO	A1	G	M	RE	K	FREQ	B	FRAME
69100	N	US	10.0	10.0	.873	.300	3918798.	.0249	1.34	69101		
69102	N	US	10.0	10.0	.876	.300	3900063.	.0496	2.68	69103		
69105	N	US	10.0	10.0	.877	.301	3904003.	.0991	5.36	69106		
69107	N	US	10.0	10.0	.876	.300	3884160.	.1484	8.04	69108		
69119	N	US	16.8	2.0	.727	.273	3492462.	.0270	1.34	69120		
69121	N	US	16.8	2.0	.710	.270	3420737.	.0546	2.69	69122		
69123	N	US	16.8	2.0	.700	.268	3396634.	.1100	5.36	69200		
69201	N	US	16.8	2.0	.692	.267	3356733.	.2208	10.72	69202		
69206	N	US	17.2	2.0	.734	.275	3450351.	.0268	1.34	69207		
69208	N	US	17.2	2.0	.745	.277	3469110.	.0530	2.69	69209		
69211	N	US	17.2	2.0	.709	.270	3370669.	.1086	5.36	69212		
69213	N	US	17.2	2.0	.719	.272	3397722.	.1616	8.04	69214		
69215	N	US	17.2	2.0	.755	.279	3459727.	.2098	10.72	69216		
69221	N	US	17.5	2.0	.726	.273	3404711.	.0536	2.68	69222		
69223	N	US	17.5	2.0	.694	.265	3295912.	.2205	10.72	69300		
69304	N	US	18.5	2.0	.688	.266	3295767.	.0549	2.68	69305		
69310	N	US	16.5	2.0	.671	.262	3216013.	.0554	2.68	69311		
70019	N	US	9.4	10.0	.541	.153	2444307.	.0245	.83	70020		
70021	N	US	9.4	10.0	.540	.155	2335519.	.0973	3.30	70022		
70023	N	US	9.4	10.0	.540	.185	2336677.	.1948	6.60	70100		
70107	N	US	5.7	10.0	.875	.301	3916444.	.0104	.56	70108		
70109	N	US	5.7	10.0	.876	.301	3876178.	.0247	1.34	70110		
70113	N	US	5.7	10.0	.872	.300	3851589.	.0495	2.68	70114		
70115	N	US	5.7	10.0	.875	.301	3854654.	.0986	5.36	70116		
70117	N	US	5.7	10.0	.874	.301	3843662.	.1479	8.04	70118		

TABLE 7.- LIST OF STATIC DATA

Airfoil α	M_∞	First frame	Last frame	No. of frames	α_{min}	α_{max}	Figure	Airfoil α	M_∞	First frame	Last frame	No. of frames	α_{min}	α_{max}	Figure
N-0012	0.30	04019	04412	24	-5.0	20.0		FX-098T	0.30	17208	17314	8	0.0	20.0	
	.30	11018	11309	33	-5.0	30.0	9,12,16	FX-098T	.18	18019	18206	10	0.0	20.0	
	.30	12102	(quasi-steady)		-5.0	15.0	16	SC-1095	.30	35021	35214	17	-5.0	16.0	19
	.28	12109			-4.0	16.0		SC-1095	.25	35220	35401	20	-5.0	25.0	
	.28	13222			10.1	29.9		SC-1095	.18	36019	36120	10	-5.0	20.0	
	.27	12020			10.1	29.9		SC-1095	.11	36202	36218	11	-5.0	20.0	
	.26	12118			10.1	29.9		SC-1095T	.30	34022	34115	8	0.0	16.0	
	.25	12208			-3.0	17.0		SC-1095T	.18	34200	34214	7	0.0	16.0	
	.25	13303			-3.0	17.0		HH-02	.30	40222	41103	20	-5.0	20.0	20
	.23	12203			10.1	29.9		HH-02	.25	41110	41215	20	-5.0	20.0	
	.22	13308			-3.0	17.0		HH-02	.18	40114	40215	10	-5.0	20.0	
	.22	13310			-3.0	17.0		HH-02	.11	40018	40108	11	-5.0	20.0	
	.20	12300			10.1	29.9		HH-02T	.30	41221	41314	8	0.0	16.0	
	.18	12310			-3.0	17.0		HH-02T	.18	41401	41419	10	0.0	16.0	
	.17	12305			10.1	29.9		VR-7	.30	46418	46615	18	-5.0	25.0	11,21
	.11	13021			-3.0	17.0		VR-7	.25	46307	46412	19	-5.0	25.0	
	.11	13107			10.1	29.9		VR-7	.18	46116	46301	13	-5.0	25.0	
	.07	13120			-3.0	17.0		VR-7	.11	46018	46110	13	-5.0	25.0	
	.04	13205			10.1	29.9		VR-7T	.30	46802	46823	10	0.0	20.0	
	.04	13217			-5.0	15.0		VR-7T	.18	46621	46718	10	0.0	20.0	
N-0012T	.29	13321			10.1	29.9		NLR-1	.30	61407	61606	19	-5.0	25.0	22
N-0012T	.18	13313			-3.0	17.0		NLR-1	.25	61221	61401	19	-5.0	25.0	
Ames-01	.30	26020	26307	23	-3.0	17.0	17	NLR-1	.18	61114	61215	10	-5.0	20.0	
Ames-01	.25	26313	27117	22	-5.0	25.0		NLR-1	.11	61018	61108	11	-5.0	20.0	
Ames-01	.18	27123	27318	22	-5.0	25.0		NLR-1T	.30	65019	65115	13	-11.0	16.0	
Ames-01	.11	27400	28120	21	-5.0	25.0		NLR-1T	.18	64221	64311	8	0.0	16.0	
Ames-01T	.30	28312	28410	9	0.0	16.0		NLR-7301	.30	66019	66209	17	-5.0	20.0	23
Ames-01T	.19	28207	28304	10	0.0	20.0	18	NLR-7301	.25	66214	66314	17	-5.0	25.0	
FX-098	.30	20118	20322	21	-5.0	25.0		NLR-7301	.18	66320	66511	18	-5.0	25.0	
FX-098	.25	19314	20112	22	-5.0	25.0		NLR-7301T	.11	66516	66617	17	-5.0	25.0	
FX-098	.18	19020	19308	23	-5.0	25.0		NLR-7301T	.30	66810	66822	6	0.0	13.0	
FX-098	.11	18215	18502	23	-5.0	25.0	10	NLR-7301T	.18	66623	66802	13	0.0	25.0	

α_T = trip.

TABLE 8.- MACH NUMBER SWEEP AT $\alpha = 15^\circ + 10^\circ \sin \omega t$, $k = 0.10$

M_∞^α	NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1	NLR-7301
0.035	8102		16019			58102		
.07	8114	24323	16105	33022	42121	47123	62020	
.11	8214	24314	16114	33106	42321	{47206 58111	62104	67120
.18	8220	{24217 31209	16200	33110	42302	{47213 58121	62112	67220
.18T	{14021 14106	29117	17103	34321	42110	47112	64109	67021
.20							{62114 65207	
.22	9202	24209	16300	33205	42309	47217	62208	
.25	9203	24201	16308	33207	42313	47301	62210	67305
.28	9208	24117	22208	33215	42218	47305	62218	
.29	{9217 14220	24105	22201	33300	42210	45023	{62307 65209	
.29T	{14208 14210	29106	17200	34308	42100	47100	64023	

$\alpha_T = \text{trip.}$

TABLE 9.- FREQUENCY SWEEP AT $M_\infty = 0.29$, $\alpha = 15^\circ + 10^\circ \sin \omega t$

k^α	NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1	NLR-7301
0.01	9210	{30019 30020	21100	38300				
.025	{9213 14218	24022	22023	33217	42206	45019	62302	
.025T	{14117 14200	29023	17117		42019	47020	64019	
.05	{9214 14219	24100	22103	33222	42208	45021	62304	
.05T	{14119 14202	29101	17119	34306	42021	47022	64021	
.10	{9217 14220	24105	22201	33300	42210	45023	{62307 65209	
.10T	{14208 14210	29106	17200	34308	42100	47100	64023	
.15	9218	24109	22206	34409	{42212 42217	45101	62309	

$\alpha_T = \text{trip.}$

TABLE 10.- FREQUENCY SWEEP AT $M_\infty = 0.30$, $\alpha = 10^\circ + 10^\circ \sin \omega t$

k	NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1	NLR-7301
0.01	9221	30105	21107	38306	43019	45109	62317	69019
.025	9222	{25022 31102}	22216	37023	43106	45111	62320	69100
.05	9223	{25102 31104}	22217	37101	43108	45113	62322	69102
.10	9302	25104	22218	37107	43112	45117	62400	69105
.12							62403	
.15	9307	{25109 31110 31112}	22219	37109	{43114 43117}	45119	62405	69107

TABLE 11.- FREQUENCY SWEEP AT $M_\infty = 0.30$, $\alpha = 15^\circ + 5^\circ \sin \omega t$

k	NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1	NLR-7301
0.01	10113	30110	21112	39104		45203	63018	68019
.025	10114	25204	23021	38021	43303	45205	63019	68100
.05	10117	25205	23022	38022	43304	45207	63020	68102
.10	10118	25208	23023	38102	43305	45209	63021	68104
.12							63100	
.15	10120	25209	23100	38103	43308	45211	63101	68109
.20	10123	25210	23101	38104	43309	45213	63102	68111

TABLE 12.- FREQUENCY SWEEP AT $M_\infty = 0.30$, $\alpha = 10^\circ + 5^\circ \sin \omega t$

k	NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1	NLR-7301	NLR-7301T
0.01	10202	30119	21200	39107	44019			68119	
.025	{7112 10203}	25117	22307	37207	{44021 44119}	45221	63108	68121	67108
.05	{7222 10204}	25118	22308	37208	44023	45223		68123	67110
.075	10207								
.10	{7113 10208}	25119	22309	37210	{44104 44118}	45300	63112	68201	67112
.15	{7300 10211}	{25121 25122}	22311	37213	44106	45302			
.20	{7114 10212}	25123	22312	37215	{44112 44120}	45303	63114	68203	

TABLE 13.- STALL ONSET AT $M_{\infty} = 0.30$, $\alpha = \alpha_0 + 10^\circ \sin \omega t$, $k = 0.10$

NACA 0012, $\alpha_0 = 3.8^\circ$	A-01, $\alpha_0 = 5.5^\circ$	FX-098, $\alpha_0 = 3.8^\circ$	SC-1095, $\alpha_0 = 4.4^\circ$	HH-02, $\alpha_0 = 4.0^\circ$	VR-7, $\alpha_0 = 4.6^\circ$	NLR-1, $\alpha_0 = 2.7^\circ$	NLR-7301, $\alpha_0 = 5.7^\circ$
10305	25319	23201	34418	43219	63323	70115	

TABLE 14.- STALL SUPPRESSION AT $M_{\infty} = 0.30$, $\alpha = \alpha_0 + 10^\circ \sin \omega t$

k	NACA 0012	A-01, $\alpha_0 = 5.0^\circ$	FX-098, $\alpha_0 = 3.3^\circ$	SC-1095, $\alpha_0 = 4.1^\circ$	HH-02, $\alpha_0 = 3.8^\circ$	VR-7, $\alpha_0 = 4.1^\circ$	NLR-1, α $\alpha_0 = 2.5^\circ$	NLR-7301, $\alpha_0 = 5.7^\circ$
0.01		29205	21208	39021	43215	48019	63312	70107
.025		31119			43202	48023	63314	70109
.05		{29207 31121	23206	37119	43204	48101	63318	70113
.10		{25311 29211 31123	23208	37121	43206	48103	63320	70115
.15		{29213 29215 31201	23211	37123	43209			70117

^aSee table 19.

TABLE 15.- STALL SUPPRESSION AT $M_{\infty} = 0.18$, $\alpha = \alpha_0 + 10^\circ \sin \omega t$

k	NACA 0012, $\alpha_0 = 8.0^\circ$	A-01, $\alpha_0 = 7.5^\circ$	FX-098, $\alpha_0 = 6.5^\circ$	SC-1095, $\alpha_0 = 6.2^\circ$	HH-02	VR-7, $\alpha_0 = 4.7^\circ$	NLR-1	NLR-7301, $\alpha_0 = 9.4^\circ$
0.01	9110	30215	21219			50116		70019
.025						49216		
.05	9112	{24302 31215	16213	33118				
.10						49300		70021
.20	9118	{24306 31217	16215	33121		49307		70023
.25						49310		

TABLE 16.- PITCH DAMPING STUDIES AT $M_\infty = 0.30$, $\alpha = \alpha_0 + 2^\circ \sin \omega t$

NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1	NLR-7301 α
$k = 0.01$							
$\alpha_0 = 14.0^\circ$ 30206	$\alpha_0 = 14.0^\circ$ 39115	$\alpha_0 = 12.5^\circ$ 44221	$\alpha_0 = 12.5^\circ$ 48300	$\alpha_0 = 12.5^\circ$ 48301	$\alpha_0 = 12.5^\circ$ 48116	$\alpha_0 = 11.1^\circ$ 63302	$\alpha_0 = 16.5^\circ$ 69310
	$\alpha_0 = 15.5^\circ$ 44212	$\alpha_0 = 13.0^\circ$ 44214	$\alpha_0 = 13.0^\circ$ 48118	$\alpha_0 = 13.0^\circ$ 48215	$\alpha_0 = 14.0^\circ$ 48215	$\alpha_0 = 15.0^\circ$ 63220	$\alpha_0 = 16.8^\circ$ 69121
						$\alpha_0 = 17.0^\circ$ 63213	$\alpha_0 = 17.2^\circ$ 69208
							$\alpha_0 = 17.5^\circ$ 69221
							$\alpha_0 = 18.5^\circ$ 69304
$k = 0.05$							
							$\alpha_0 = 16.8^\circ$ 69119
							$\alpha_0 = 17.2^\circ$ 69206
$k = 0.10$							
							$\alpha_0 = 16.8^\circ$ 69123
							$\alpha_0 = 17.2^\circ$ 69211
							$\alpha_0 = 14.0^\circ$ 44202
							$\alpha_0 = 15.5^\circ$ 44216
							$\alpha_0 = 14.0^\circ$ 48216

TABLE 16.- Concluded.

NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1	NLR-7301 ^a
k = 0.15							
$\alpha_0 = 14.5^\circ$ 31310				$\alpha_0 = 12.5^\circ$ 44303	$\alpha_0 = 12.5^\circ$ 48304		$\alpha_0 = 17.2^\circ$ 69213
				$\alpha_0 = 15.5^\circ$ 44217			
k = 0.20							
$\alpha_0 = 13.5^\circ$ 29223	$\alpha_0 = 12.0^\circ$ 23219	$\alpha_0 = 12.3^\circ$ 38201	$\alpha_0 = 12.5^\circ$ 44304	$\alpha_0 = 12.5^\circ$ 48308	$\alpha_0 = 11.1^\circ$ 63304	$\alpha_0 = 16.8^\circ$ 69201	
$\alpha_0 = 14.5^\circ$ 29304	$\alpha_0 = 14.0^\circ$ 23305	$\alpha_0 = 14.0^\circ$ 38119	$\alpha_0 = 14.0^\circ$ 44204	$\alpha_0 = 13.0^\circ$ 48200	$\alpha_0 = 15.0^\circ$ 63222	$\alpha_0 = 17.2^\circ$ 69215	
$\alpha_0 = 16.0^\circ$ 31302	$\alpha_0 = 16.0^\circ$ 23310	$\alpha_0 = 16.0^\circ$ 38110	$\alpha_0 = 15.5^\circ$ 42218	$\alpha_0 = 14.0^\circ$ 48217	$\alpha_0 = 16.4^\circ$ 63208	$\alpha_0 = 17.5^\circ$ 69223	
$\alpha_0 = 16.5^\circ$ 29309			$\alpha_0 = 17.5^\circ$ 44209	$\alpha_0 = 16.0^\circ$ 48209	$\alpha_0 = 17.0^\circ$ 63215		

^aSee table 19.

TABLE 17.- NO SEPARATION: $M_\infty = 0.30$, $\alpha = 5^\circ + 5^\circ \sin \omega t$

k	NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1 ^a	NLR-7301 ^a
0.01	10218							
.10	10221	25301	23107					
.20	10222	25303	23109					68211

^aSee table 19.

TABLE 18.- DYNAMIC BOUNDARY-LAYER TRIP DATA

M_∞	k	NACA 0012	A-01	FX-098	SC-1095	HH-02	VR-7	NLR-1	NLR-7301
0.18	0.05	14019	29115	17100	34318	42108	47110	64107	67019
		14104							
.18	.10	14021	29117	17103	34321	42110	47112	64109	67021
		14106							
.18	.15	14023	29119	17109	34323	42113	47114	64111	
		14108							
.18	.20								67023
.30	.025	14117	29023	17117		42019	47020	64019 ^a	(a)
		14200							
.30	.05	14119	29101	17119	34306	42021	47022	64021 ^a	(a)
		14202							
.30	.10	14208	29106	17200	34308	42100	47100	64023 ^a	(a)
		14210							

^aSee table 19.

TABLE 19.- MISCELLANEOUS DYNAMIC DATA

Airfoil	Frame	M_∞	α_0	α_1	k	Remarks
N-0012	8019	0.035	10.0	10.0	0.10	Low Reynolds number, 0.5×10^6
	8021	.035	10.0	10.0	.15	
	8023	.035	10.0	10.0	.25	
	8104	.035	15.0	10.0	.15	
	8106	.035	15.0	14.0	.10	
	8116	.07	15.0	10.0	.15	Match reference 3
	8118	.07	15.0	10.0	.25	
	8123	.07	15.0	14.0	.10	Match reference 3
	8203	.07	10.0	10.0	.25	
	8210	.11	10.0	10.0	.25	
	8222	.18	15.0	10.0	.15	Match reference 3
	8306	.18	15.0	14.0	.10	Match reference 3
	9022	.18	15.0	6.0	.24	Match reference 3
	9101	.18	15.0	5.0	.29	
	9106	.18	10.0	10.0	.25	
	7108	.30	8.0	5.0	.025	Variable α_0
	7110		8.0		.10	
	7111		8.0		.20	
	7216		8.8		.05	
	7214		8.8		.10	
	7212		8.8		.15	
	7104		9.0		.025	
	7019		9.0		.05	
	7021		9.0		.10	
	7101		9.0		.15	
	7023		9.0		.20	
			10.0			See table 17
	7117		11.0		.025	
	7118		11.0		.05	
	7119		11.0		.10	
	7120		11.0		.15	
	7121		11.0		.20	
	7200		12.0		.025	
	7202		12.0		.05	
	7205		12.0		.10	
	7305		12.0		.15	
	7207		12.0		.20	
			15.0			See table 16
	10309		2.8	10.0	.10	
	10305		3.8			
	10303		5.0			
	9302		10.0			
	10022		12.0			
	9217	.29	15.0			
	14220	.29	15.0			
	10101	.27	20.0			
	10104	.30	12.0	8.0	.05	Match reference 17
	10105	.30	12.0	8.0	.10	Match reference 17
	10108	.30	12.0	8.0	.13	Match reference 17
	15218	.29	15.0	10.0	.10	Pressure orifices closed

TABLE 19.- Continued.

Airfoil	Frame	M_∞	α_0	α_1	k	Remarks	
N-0012	Many	Variable	Variable	10.0	0.001	Quasi-static; see table 12	
W-098	23117	0.30	5.0	10.0	.10		
Ames-01	30201	↓	11.0	5.0	.01		
Ames-01	25214		↓	↓	.05		
Ames-01	25216		↓	↓	.10		
SC-1095	39110		↓	↓	.01		
	37219		↓	↓	.05		
	37221		↓	↓	.10		
	37304		↓	12.0	8.0	.05	Match reference 18
	37305		↓	12.0	8.0	.10	Match reference 18
	37306		↓	12.0	8.0	.13	Match reference 18
HH-02	43314		↓	11.0	5.0	.025	
HH-02	43315	↓	11.0	5.0	.05		
HH-02	43316	↓	11.0	5.0	.10		
VR-7	54019	.18	10.0	10.0	.025		
	54022	↓	10.0	↓	.05		
	54101	↓	10.0	↓	.10		
	54110	↓	10.0	↓	.15		
	54113	↓	10.0	↓	.20		
	54116	↓	10.0	↓	.25		
	49023	↓	15.0	↓	.01		
	49110	↓	↓	↓	.025		
	49117	↓	↓	↓	.05		
	49120	↓	↓	↓	.10		
	58121	↓	↓	↓	.10		
	49203	↓	↓	↓	.15		
	54216	↓	↓	↓	.15		
	57018	↓	↓	↓	.15		
	58018	↓	↓	↓	.15		
	58120	↓	↓	↓	.15		
	49206	↓	↓	↓	.20		
NLR-1	65223	.11	7.0	5.0	.025	No separation	
	65300	.11	7.0	5.0	.20	No separation	
	62114	.20	15.0	10.0	.10		
	65207	.20	15.0	10.0	.10		
	62121	.20	10.0	10.0	.17	Match reference 19	
	62202	.20	15.0	5.0	.17		
	62201	.20	15.0	5.0	.28		
	62403	.30	10.0	10.0	.12		
	63100	↓	15.0	5.0	.12		
	63122	↓	12.0	8.0	.12		
	65309	↓	7.0	5.0	.01	No separation	
	65311	↓	7.0	5.0	.20	No separation	
	65121	↓	-2.0	10.0	.01	Stall at negative α	
	65122	↓	↓	↓	.025	Stall at negative α	
	65123	↓	↓	↓	.05	Stall at negative α	
	65200	↓	↓	↓	.10	Stall at negative α	
NLR-1T	64212	↓	↓	↓	.01	Trip; stall at negative α	
NLR-1T	64213	↓	↓	↓	.025	Trip; stall at negative α	
NLR-1T	64214	↓	↓	↓	.05	Trip; stall at negative α	

TABLE 19.- Concluded.

Airfoil	Frame	M_∞	α_0	α_1	k	Remarks
NLR-1T	64215	0.30	-2.0	10.0	0.10	Trip; stall at negative α
NLR-1T	64119	.30	2.5	↓	.01	Trip; stall suppression
NLR-1T	64121	.30	2.5		.025	Trip; stall suppression
NLR-1T	64202	.30	2.5		.05	Trip; stall suppression
NLR-1T	64204	.30	2.5		.10	Trip; stall suppression
NLR-7	67201	.11	10.0		.10	
	67208	.18	10.0		.025	
	67210	.18	10.0		.10	
	67212	.18	10.0		.20	
	67218	.18	15.0		.025	
	67220	.18	15.0		.10	
	67222	.18	15.0		.20	
	67310	.25	10.0		.10	
	68219	.30	12.0		2.0	.05
	68221	.30	12.0	2.0	.10	No separation
	68304	.30	12.0	2.0	.20	No separation
NLR-7T	67108	.30	10.0	5.0	.025	Trip
NLR-7T	67110	.30	10.0	5.0	.05	Trip
NLR-7T	67112	.30	10.0	5.0	.10	Trip

TABLE 20.- TEST CASES FOR NUMERICAL ANALYSIS (ref. 1)

Case	Frame	Airfoil	α_0	α_1	k	Case	Frame	Airfoil	α_0	α_1	k
1	10222	NACA 0012	5	5	0.20	7	10212	NACA 0012	10	5	0.20
2	68211	NLR-7301	5	↓	↓	8	9302	↓	10	10	.10
3	7111	NACA 0012	8	↓	↓	9	10113	↓	15	5	.01
4	68203	NLR-7301	10	↓	↓	10	10114	↓	↓	↓	.025
5	7023	NACA 0012	9	↓	↓	10	10117	↓	↓	↓	.05
6	45221	VR-7	10	↓	.025	10	10118	↓	↓	↓	.10
↓	45223	↓	↓	↓	.05	10	10120	↓	↓	↓	.15
↓	45300	↓	↓	↓	.10	10	10123	↓	↓	↓	.20
↓	45302	↓	↓	↓	.15	10	45203	VR-7	↓	↓	.01
↓	45303	↓	↓	↓	.20	10	45205	↓	↓	↓	.025
7	10202	NACA 0012	↓	↓	.01	10	45207	↓	↓	↓	.05
↓	10203	↓	↓	↓	.025	10	45209	↓	↓	↓	.10
↓	10204	↓	↓	↓	.05	10	45211	↓	↓	↓	.15
↓	10208	↓	↓	↓	.10	10	45213	↓	↓	↓	.20
↓	10211	↓	↓	↓	.15	10	↓	↓	↓	↓	↓

TABLE 21.- ARCHIVED TAPE ASSIGNMENT

Airfoil	Tape number
NACA 0012	03462B
Ames A-01	C1065C
Wortmann FX 69-H-098	C1064C
Hughes HH-02 (with tab)	C1066C
Sikorsky SC-1095	C1067C
Vertol VR-7 (with tab)	03469B
NLR-1	C1069C
NLR-7301	C1074C

TABLE 22.- MAGNETIC TAPE
ATTRIBUTES

<p>Unlabeled file sequence 2400-ft reel 9 Track 1600 Bits/in. Odd parity EBCDIC mode Blocked (4000 bytes - 50 records) Fixed-length records (80 bytes) Formatted data</p>

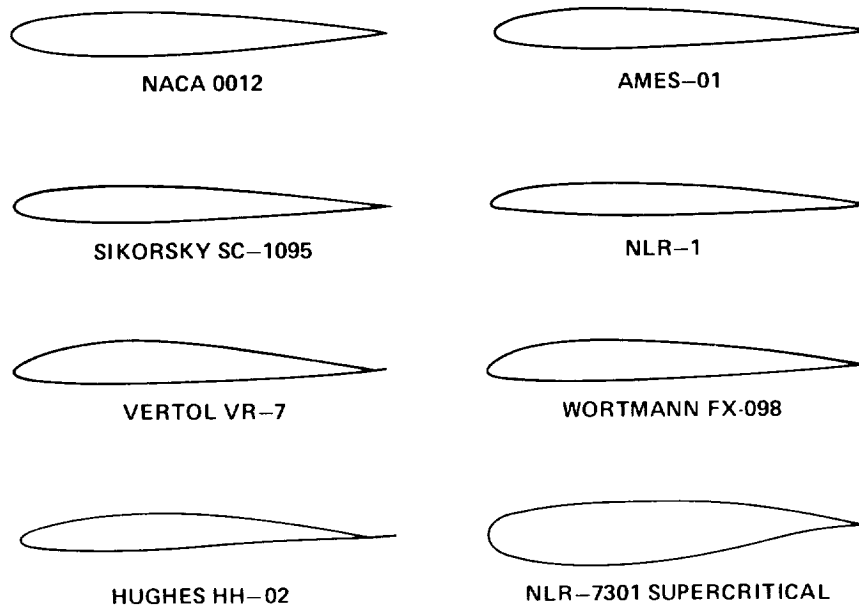
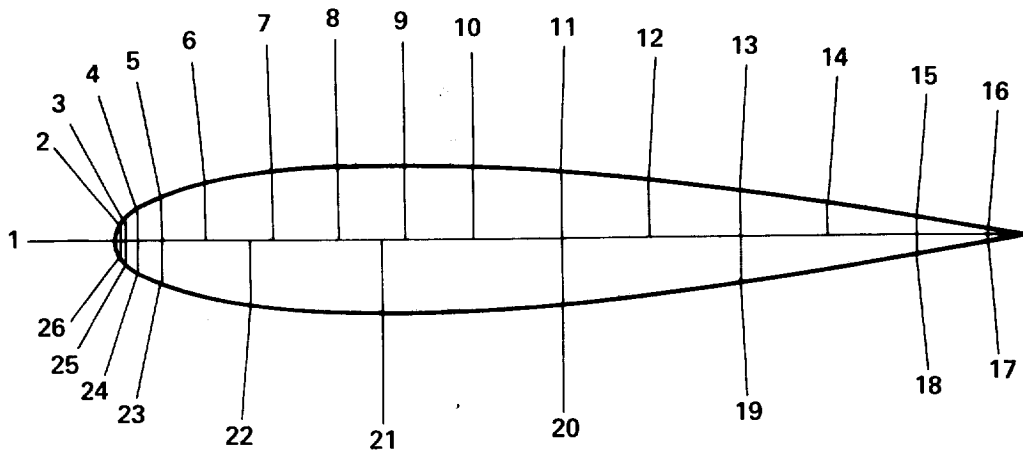


Figure 1.- Airfoil profiles tested.



NOMINAL LOCATIONS OF PRESSURE TRANSDUCERS

1:0.000	5:0.050	9:0.325	13:0.700	17:0.980	21:0.300	25:0.010
2:0.005	6:0.100	10:0.400	14:0.800	18:0.900	22:0.150	26:0.005
3:0.010	7:0.175	11:0.500	15:0.900	19:0.700	23:0.050	
4:0.025	8:0.250	12:0.600	16:0.980	20:0.500	24:0.025	

Figure 2.- Upper and lower surface-pressure transducer locations.

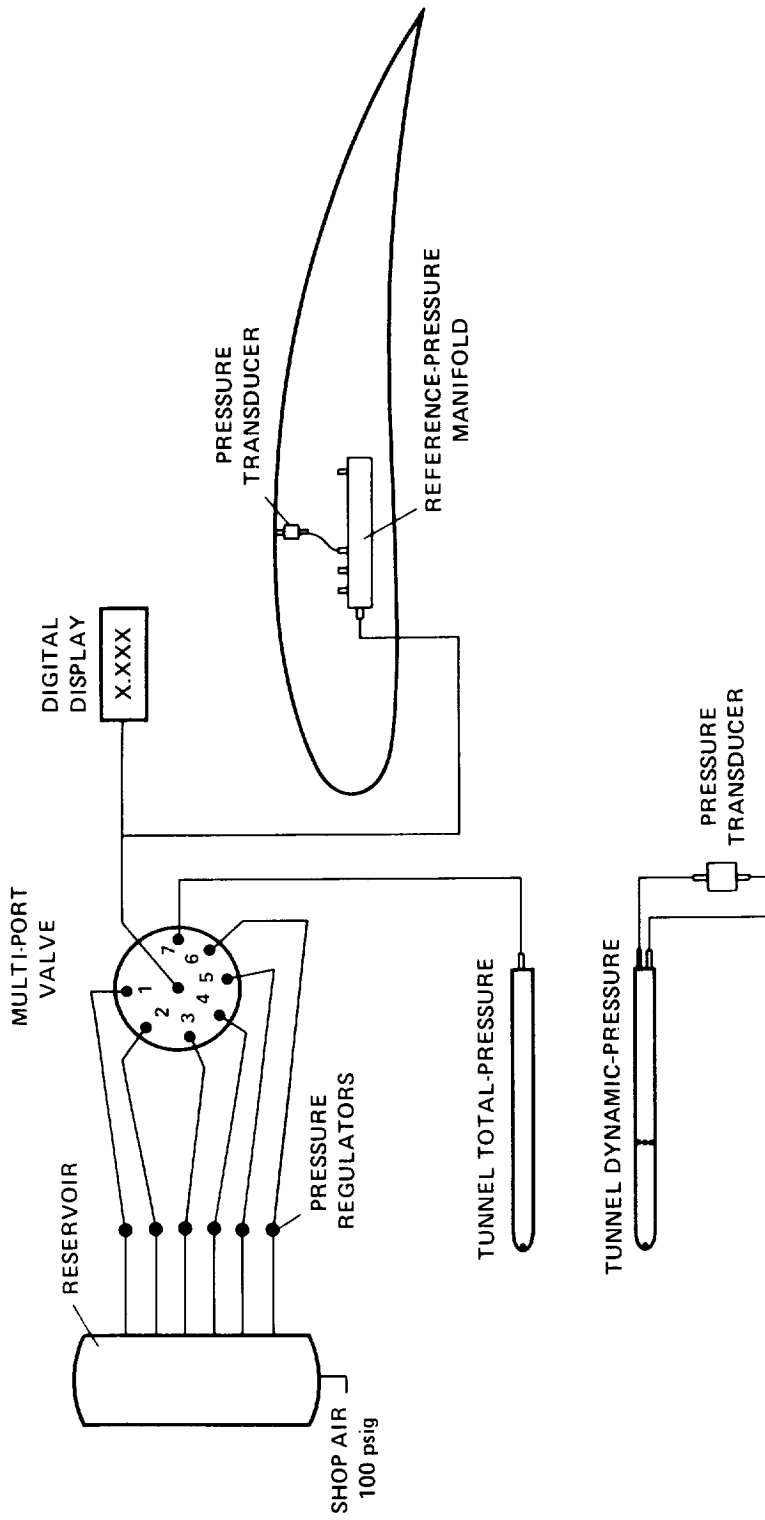


Figure 3.- Plumbing for reference pressures.

NACA 0012 AIRFOIL

STEADY DATA

FRAME : 4019

Re : 3.91 E6 M = 0.301

$C_{Lmax} = 1.40$

$C_{Mmin} = -0.10$

$C_{Dmax} = 0.38$

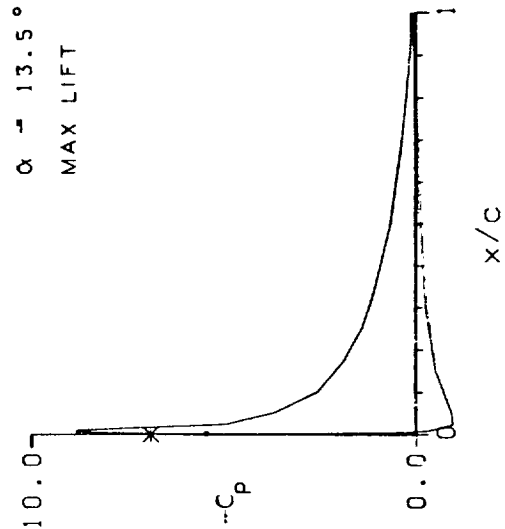
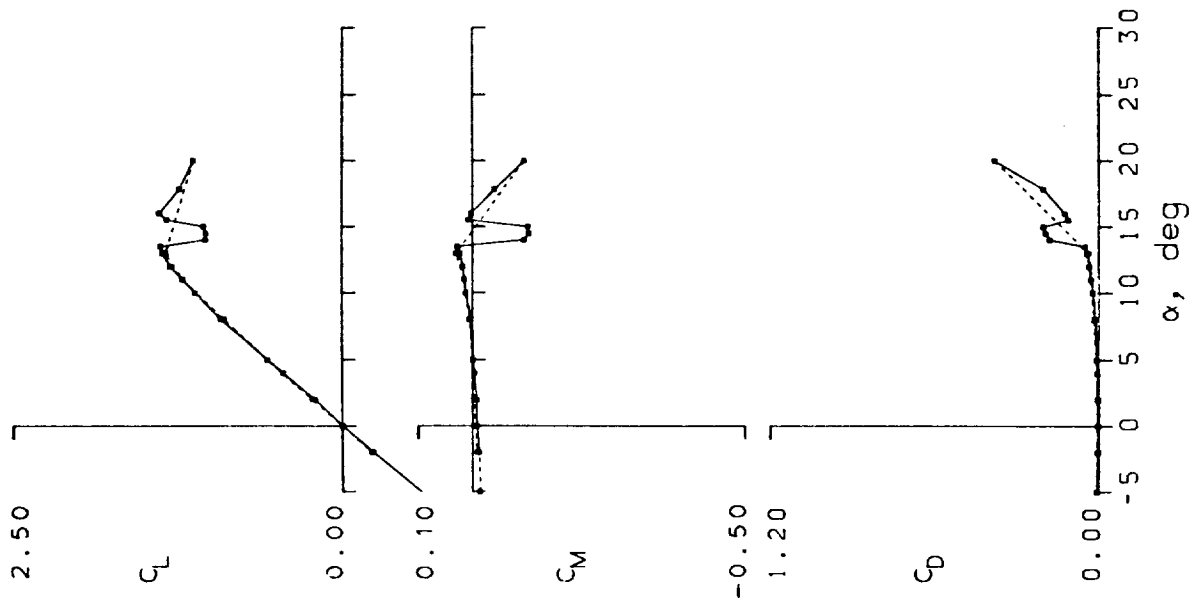


Figure 4.- Static data for NACA 0012 airfoil.

NACA 0012 AIRFOIL
 STEADY DATA
 FRAME : 11018
 Re : 3.95 E6 M = 0.301
 $C_{Lmax} = 1.38$
 $C_{Mmin} = -0.16$
 $C_{Dmax} = 0.63$

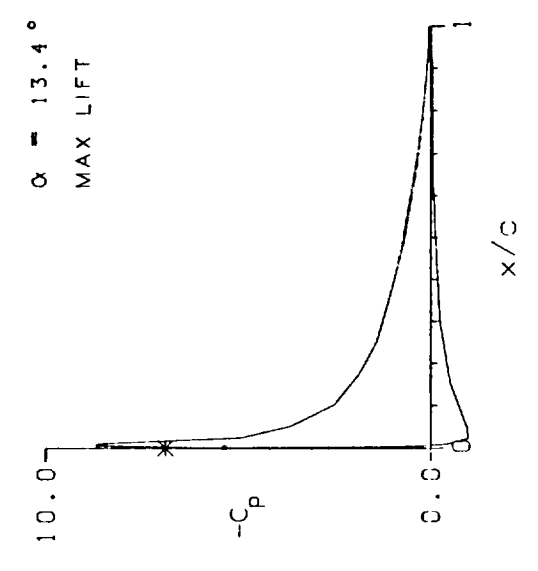
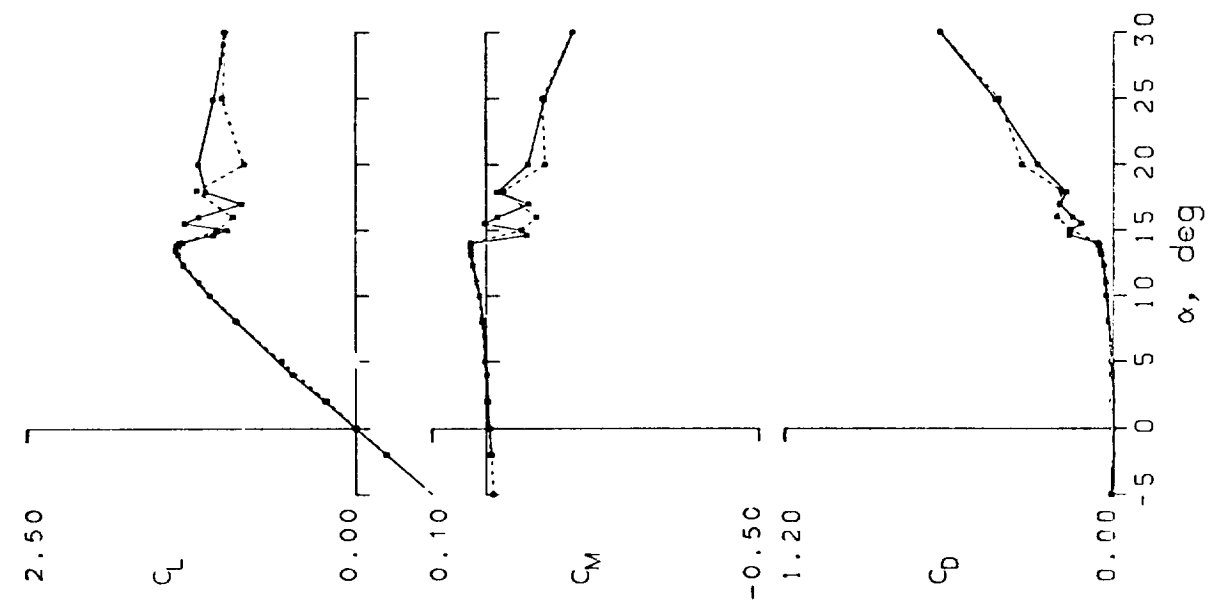


Figure 4.- Concluded.

AMES-01 AIRFOIL

STEADY DATA

FRAME : 26020

Re : 3.84 E6 M = 0.301

CLmax = 1.49

CMmin = -0.11

CDmax = 0.38

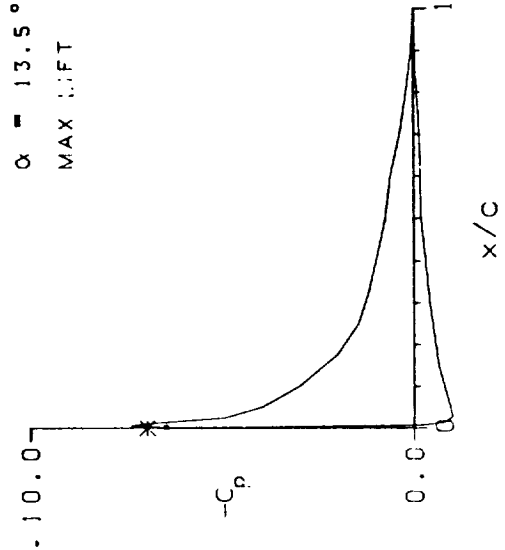
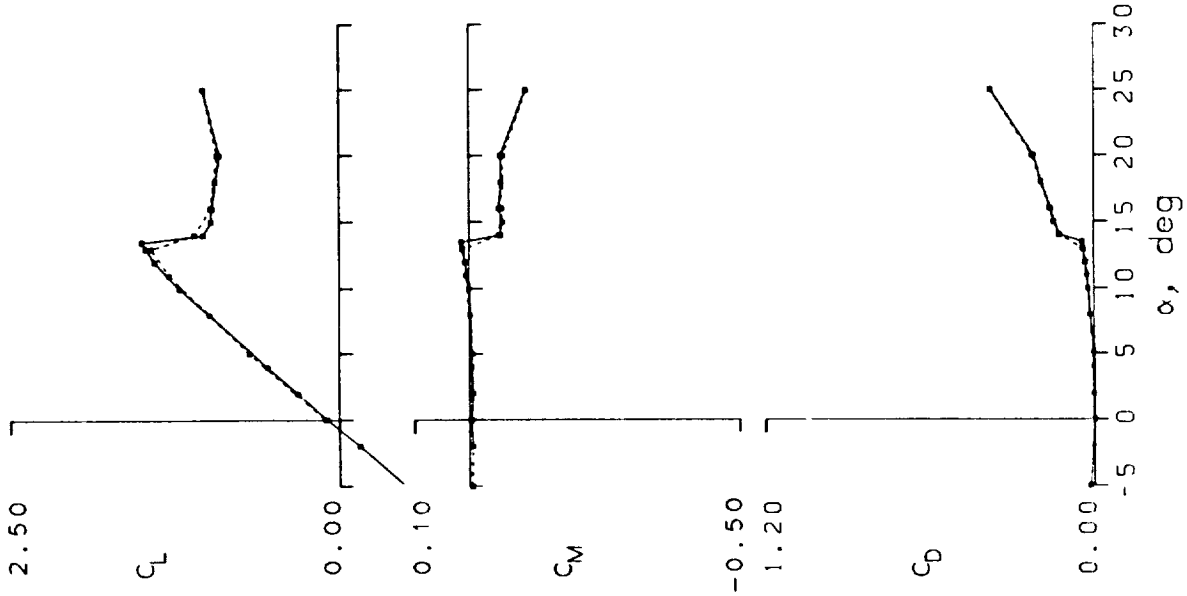


Figure 5.- Static data for Ames A-01 airfoil.

AMES-01 AIRFOIL

STEADY DATA

FRAME : 26313

Re : 3.23 E6 M = 0.250

$C_{Lmax} = 1.59$

$C_{Mmin} = -0.10$

$C_{Dmax} = 0.38$

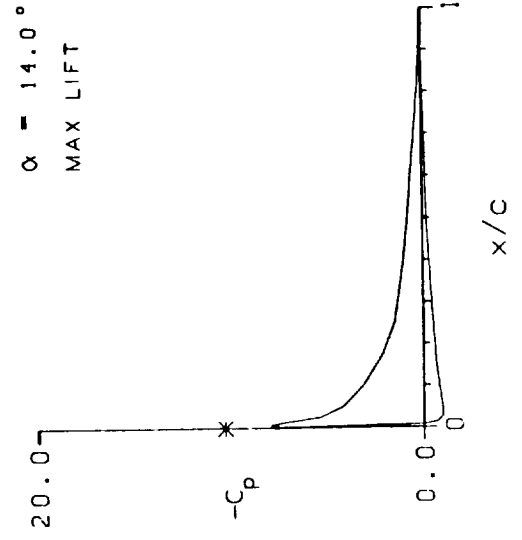
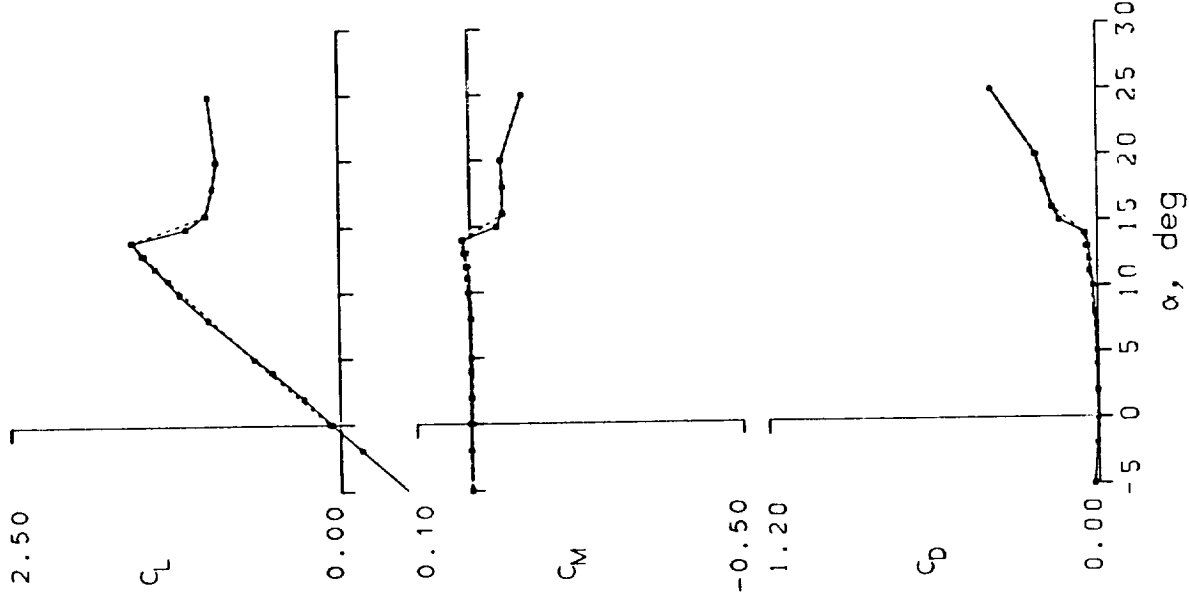


Figure 5.- Continued.

AMES-01 AIRFOIL
 STEADY DATA
 FRAME : 27123
 Re : 2.43 E6 M = 0.185
 $C_{Lmax} = 1.53$
 $C_{Mmin} = -0.12$
 $C_{Dmax} = 0.45$

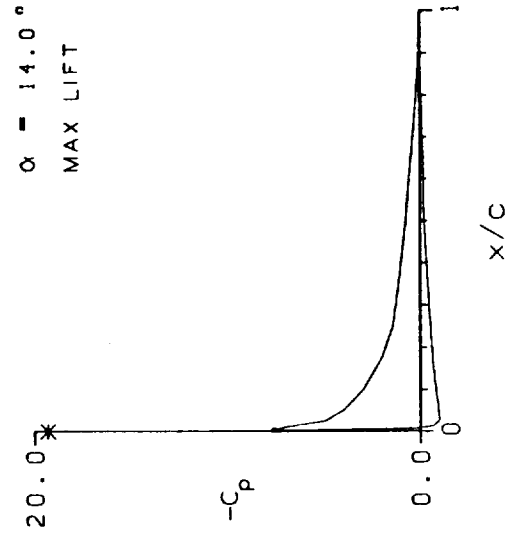
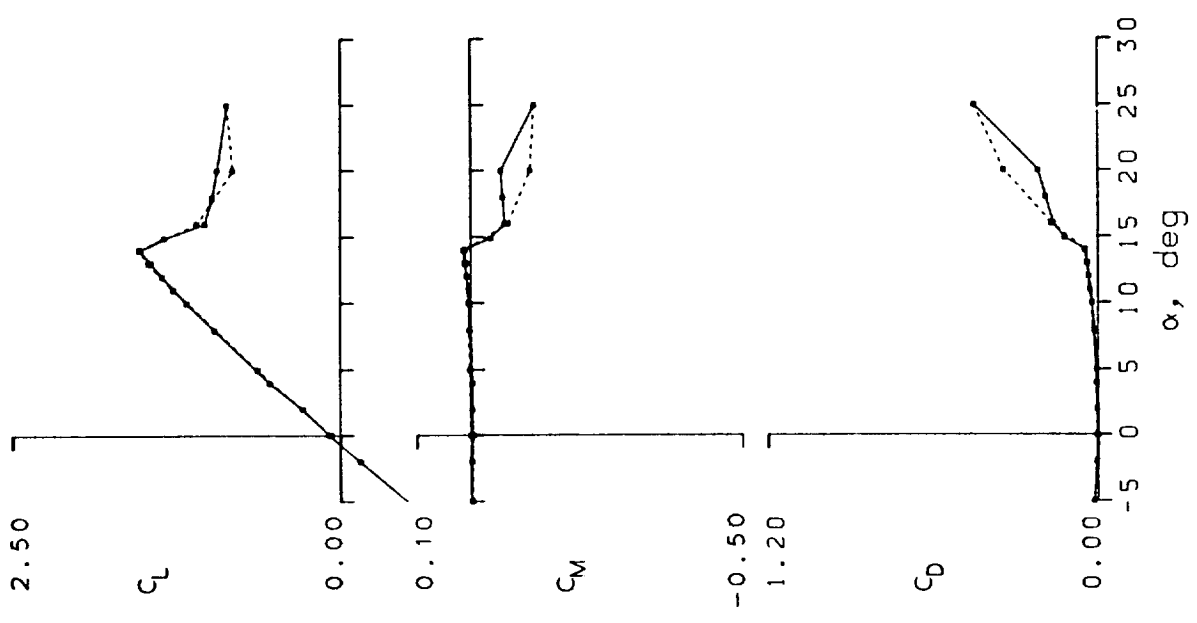


Figure 5.- Continued.

AMES-01 AIRFOIL

STEADY DATA

FRAME : 27400

Re : 1.52 E6 M = 0.109

CLmax = 1.48

CMmin = -0.11

CDmax = 0.45

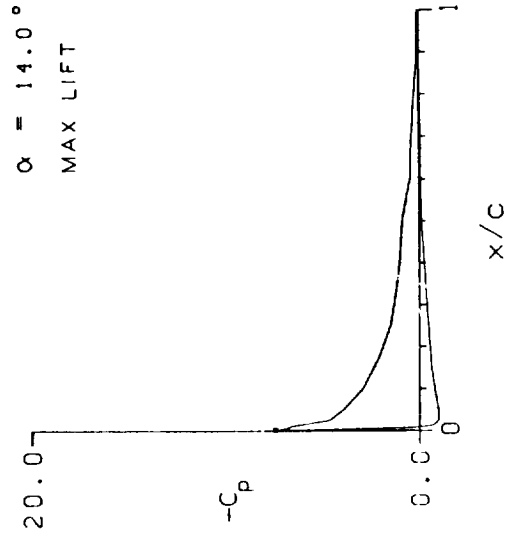
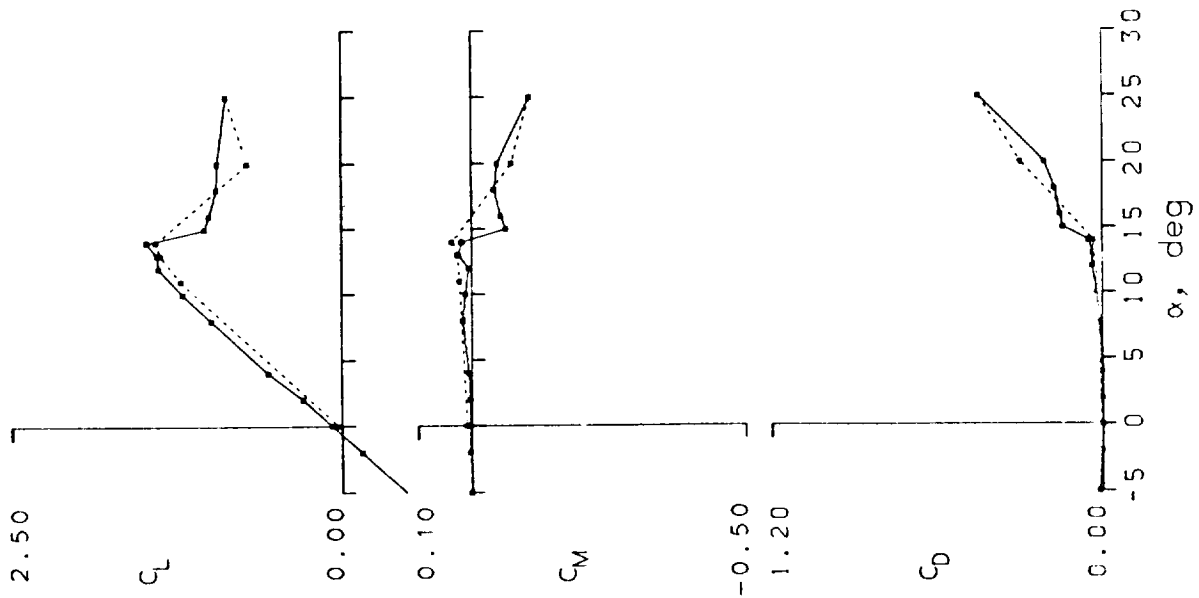


Figure 5.- Continued.

AMES-01 AIRFOIL

STEADY DATA--TRIP

FRAME : 28207

Re : 2.44 E6 M = 0.184

CLmax = 1.46

CMmin = -0.07

CDmax = 0.26

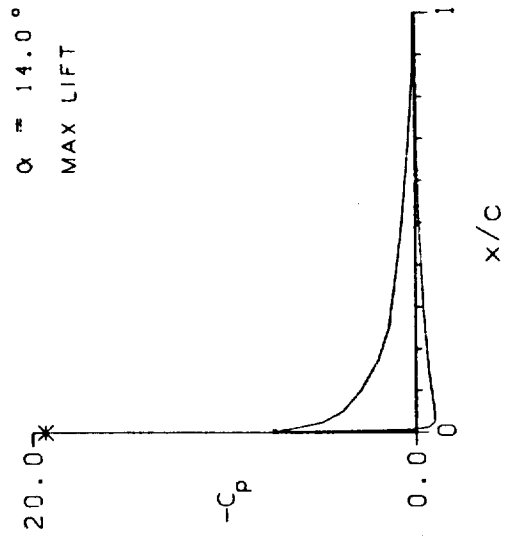
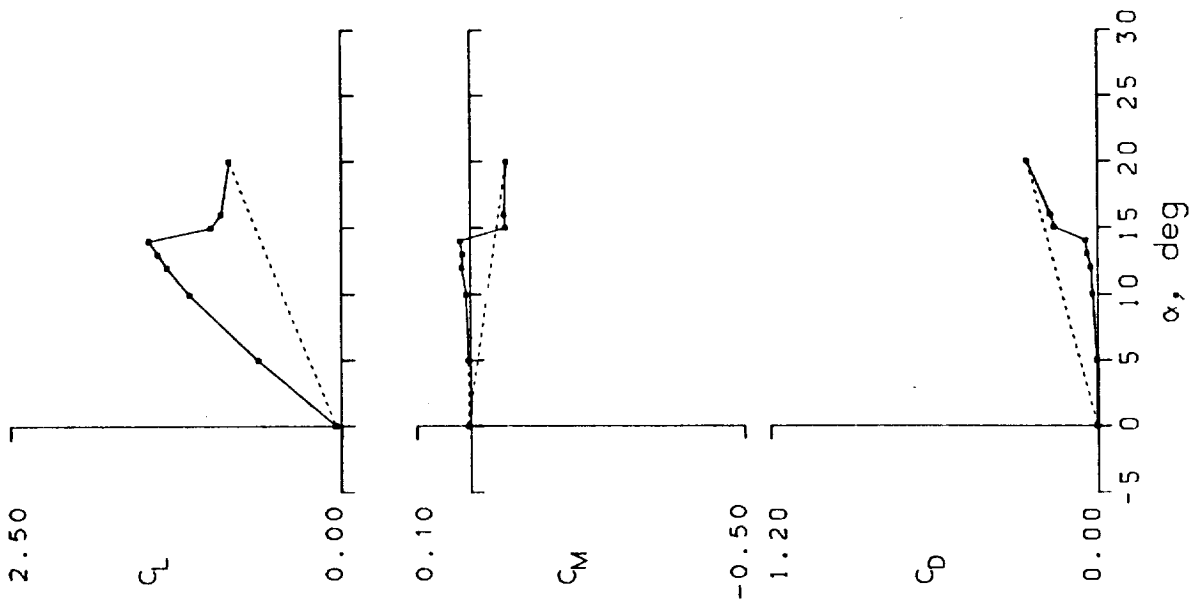


Figure 5.- Continued.

AMES-01 AIRFOIL

STEADY DATA--TRIP

FRAME : 26312

Re : 3.90 E6 M = 0.300

$C_{Lmax} = 1.50$

$C_{Mmin} = -0.08$

$C_{Dmax} = 0.19$

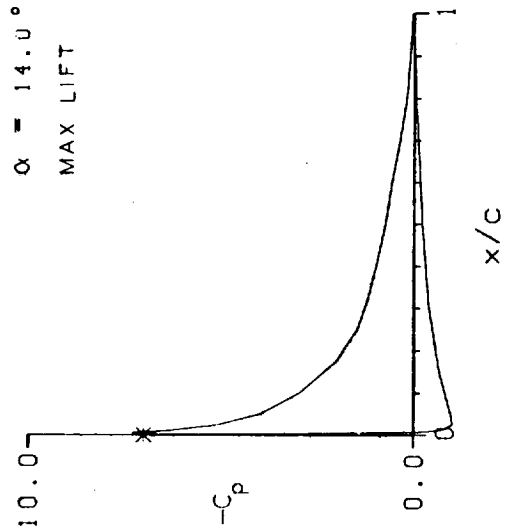
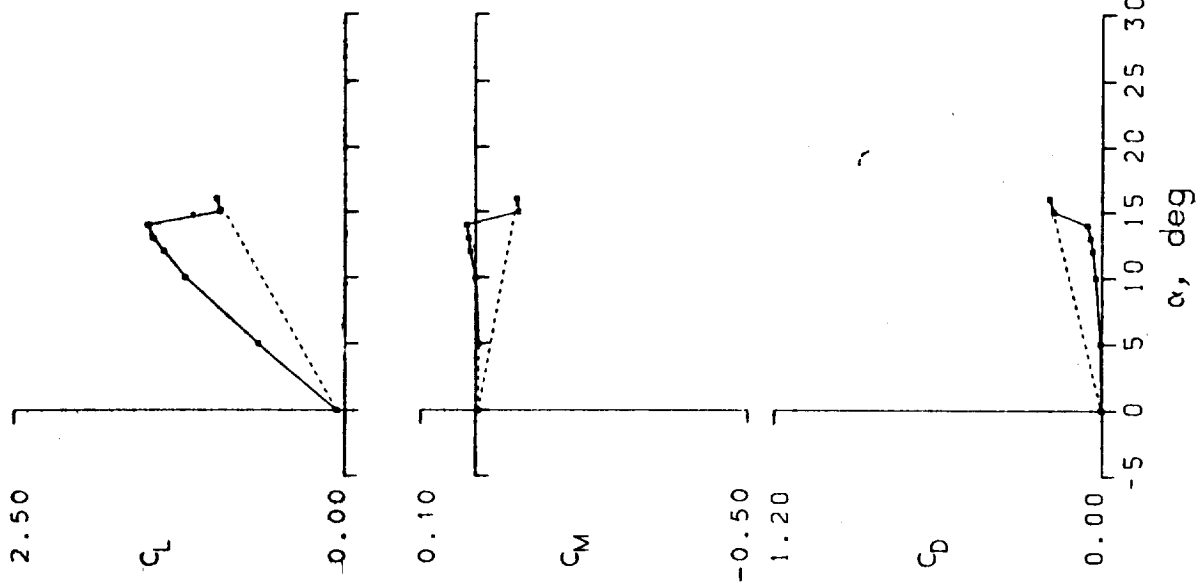


Figure 5.- Concluded.

WORTMANN FX 69-H-098 AIRFOIL

STEADY DATA--TRIP

FRAME : 17208

Re : 3.90 E6 M = 0.300

CLmax = 1.37

CMmin = -0.11

CDmax = 0.23

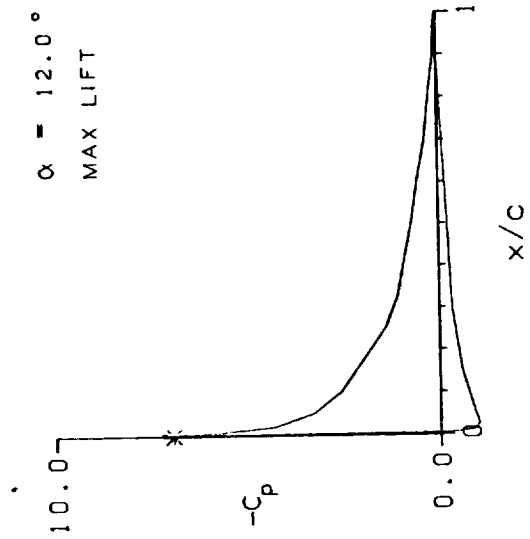
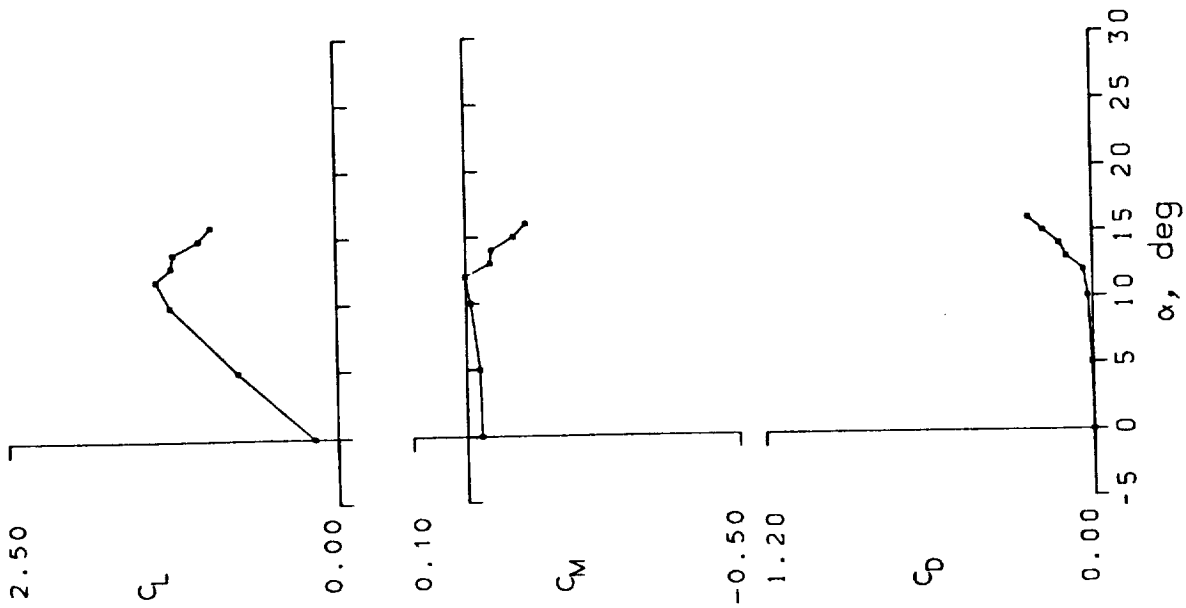


Figure 6.- Static data for Wortmann FX-098 airfoil.

WORTMANN FX 69-H-098 AIRFOIL

STEADY DATA--TRIP

FRAME : 18019

Re : 2.39 E6 M = 0.185

CLmax = 1.36

CMmin = -0.09

CDmax = 0.31

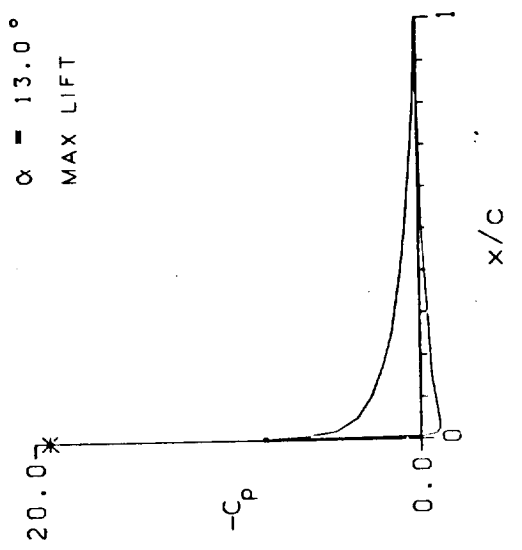
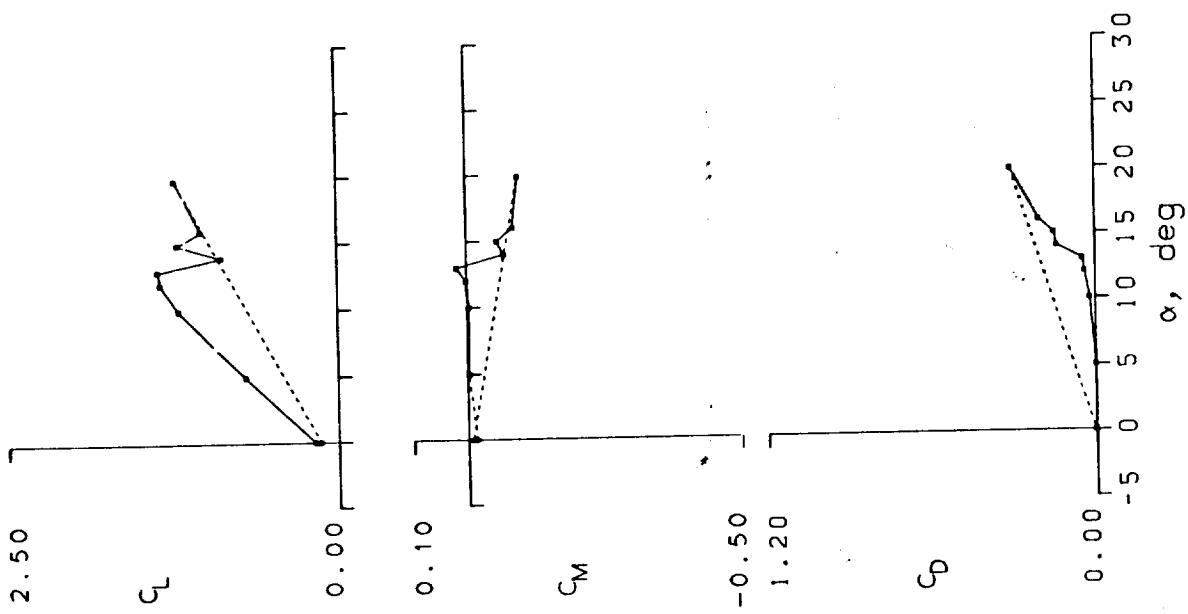


Figure 6.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

STEADY DATA

FRAME : 18215

Re : 1.49 E6 M = 0.109

CLmax = 1.44

CMmin = -0.13

CDmax = 0.51

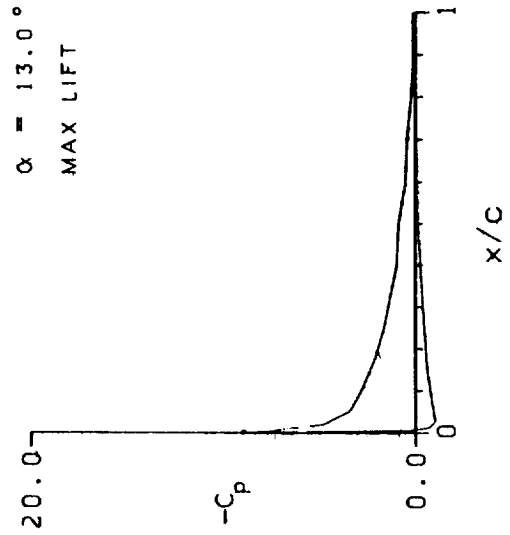
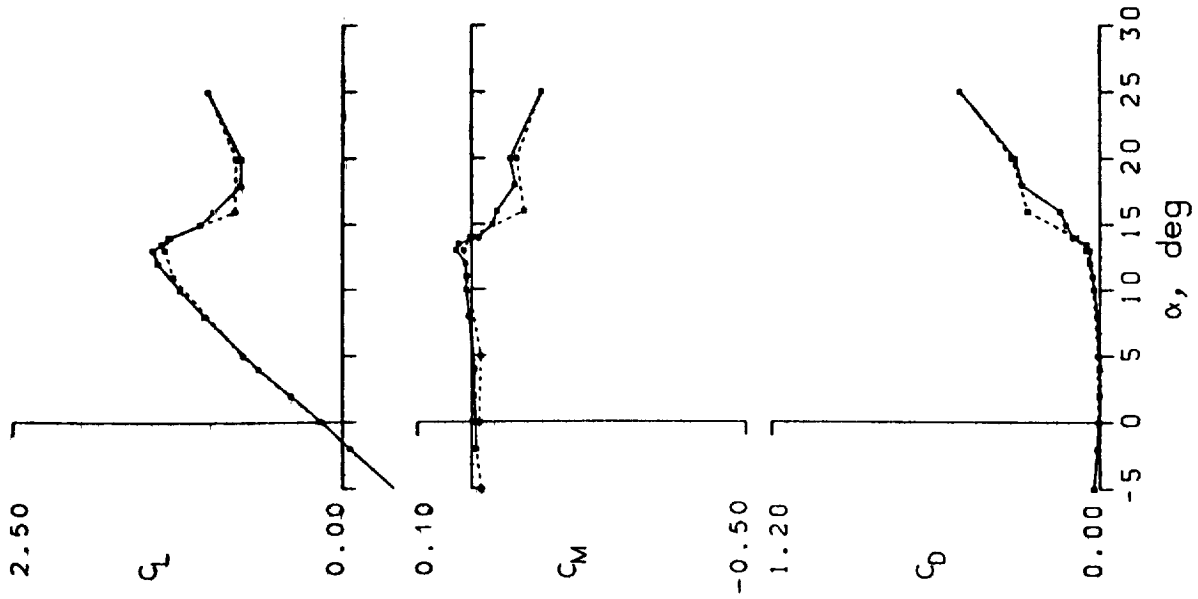


Figure 6.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

STEADY DATA

FRAME : 19020

Re : 2.40 E6 M ± 0.185

CLmax = 1.51

CMmin = -0.14

CDmax = 0.49

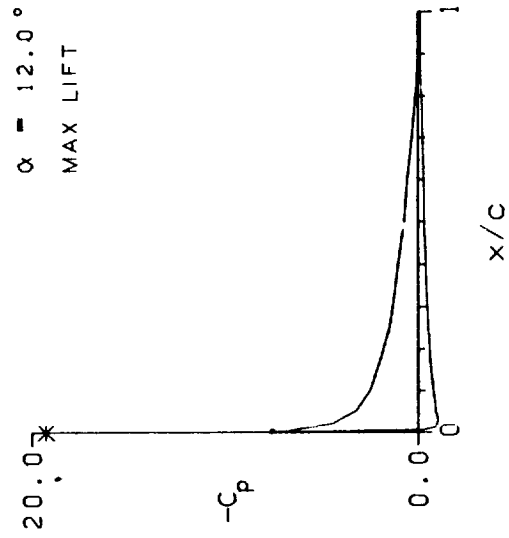
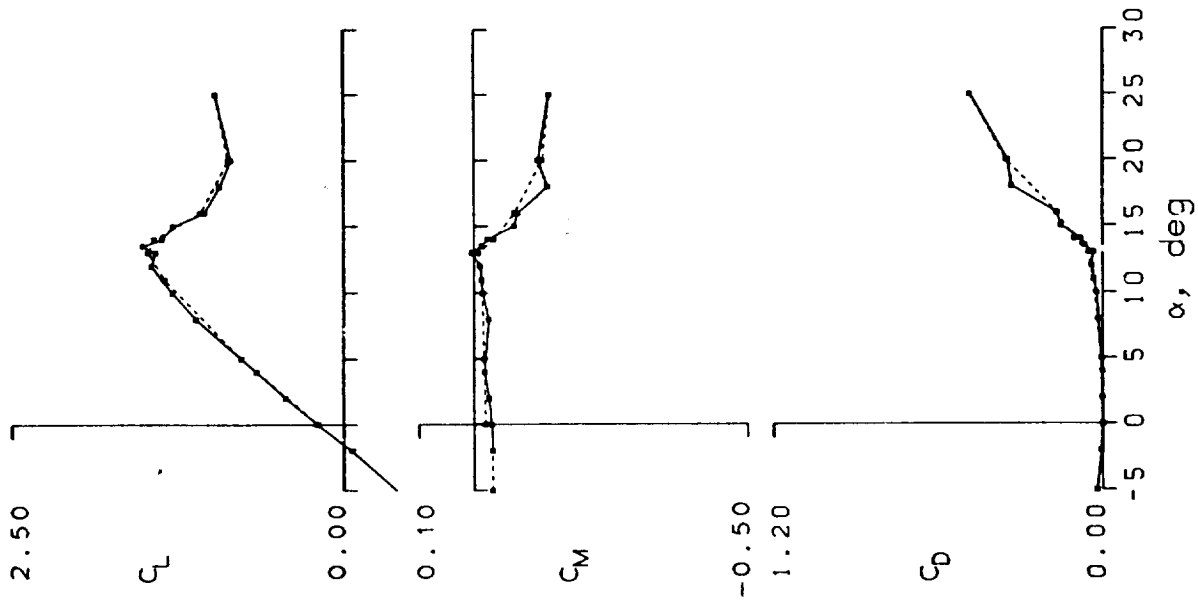


Figure 6.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

STEADY DATA

FRAME : 19314

R_e : 3.24 E6 $M = 0.251$

$C_{Lmax} = 1.50$

$C_{Mmin} = -0.11$

$C_{Dmax} = 0.44$

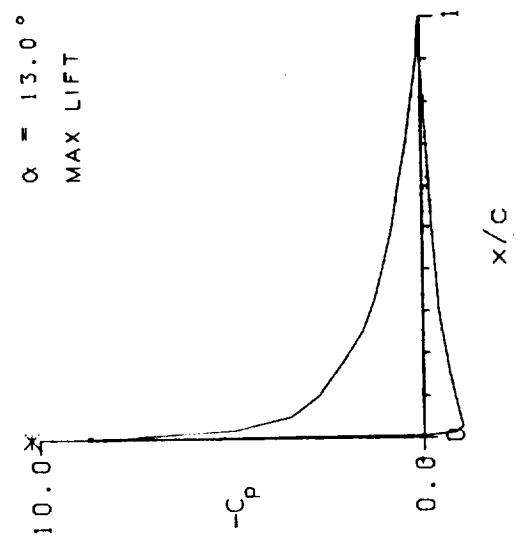
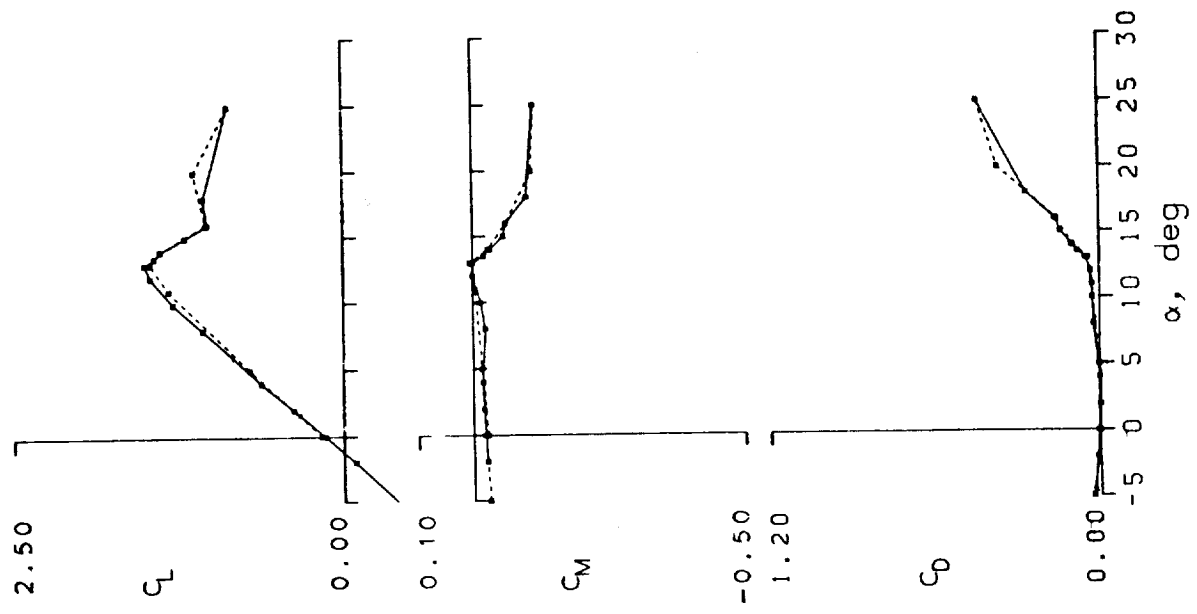


Figure 6.- Continued.

WORTMANN FX 59-H-098 AIRFOIL

STEADY DATA

FRAME : 20118

Re : 3.76 E6 M = 0.301

CLmax = 1.49

CMmin = -0.12

CDmax = 0.43

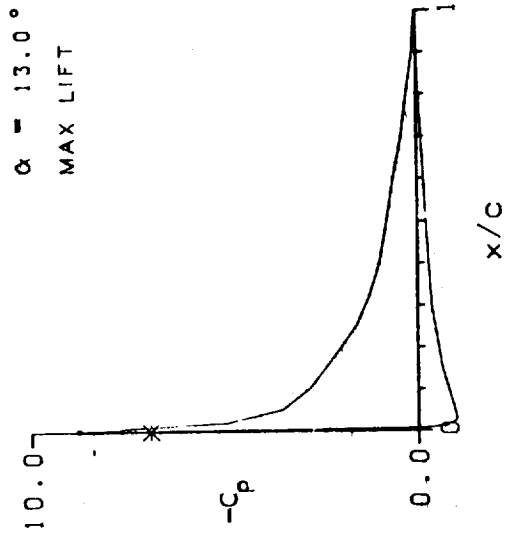
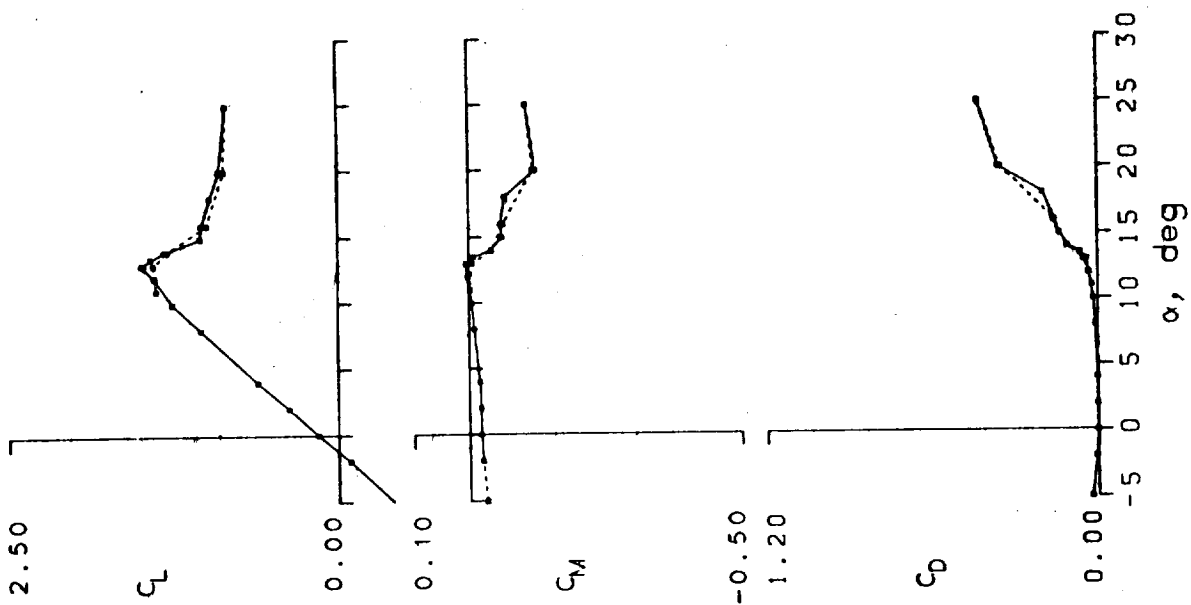


Figure 6.- Concluded.

SIKORSKY SC-1095 AIRFOIL

STEADY DATA--TRIP

FRAME : 34022

Re : 3.97 E6 M = 0.302

CLmax = 1.43

CMmin = -0.12

CDmax = 0.25

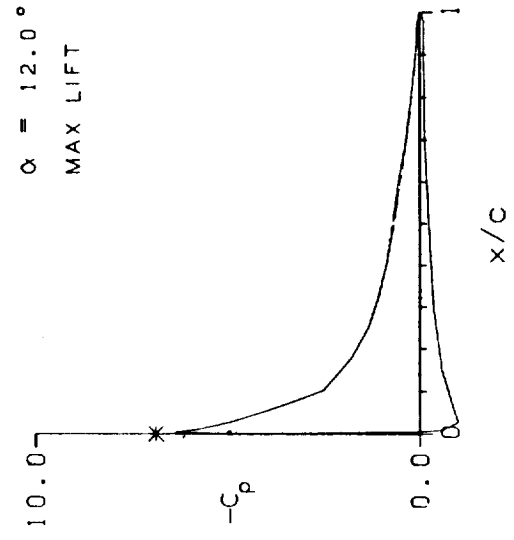
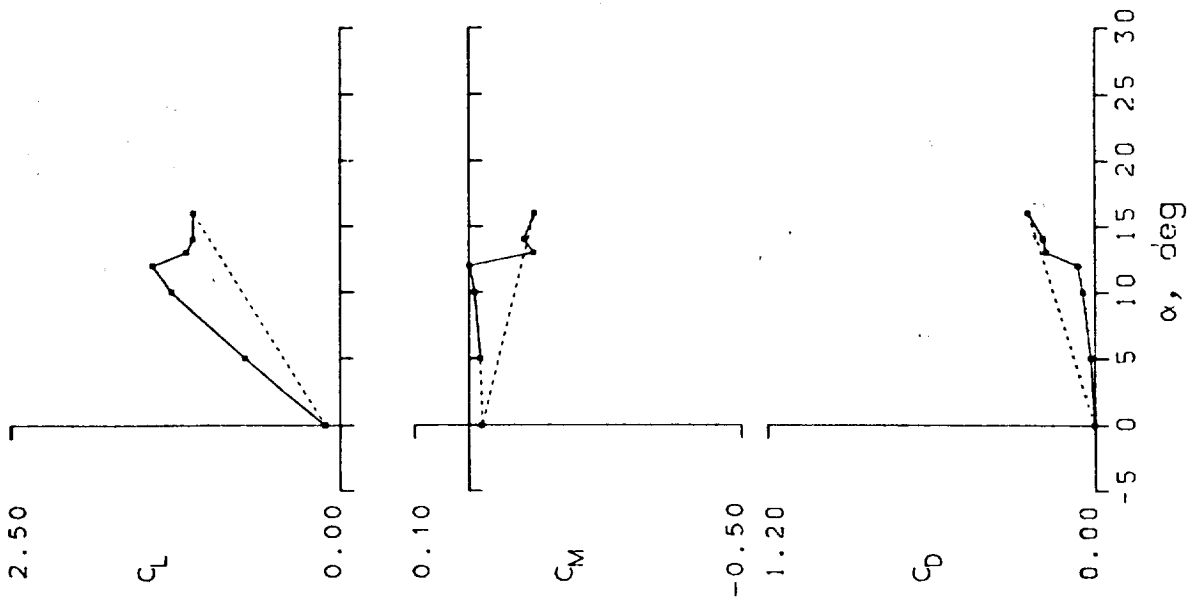


Figure 7.- Static data for Sikorsky SC-1095 airfoil.

SIKORSKY SC-1095 AIRFOIL
 STEADY DATA--TRIP
 FRAME : 34200
 $Re : 2.46 E6$ $M = 0.164$
 $C_{Lmax} = 1.47$
 $C_{Mmin} = -0.10$
 $C_{Dmax} = 0.23$

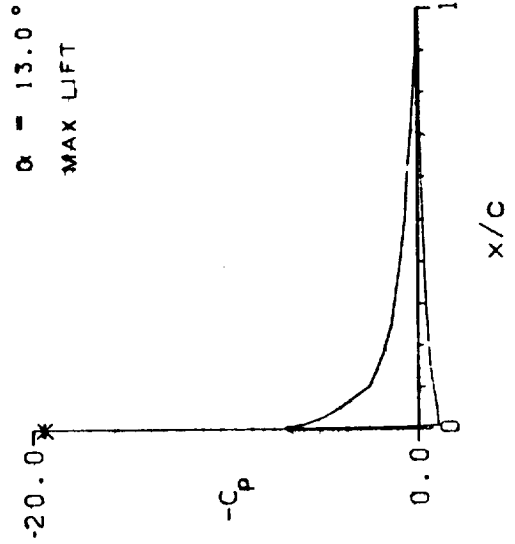
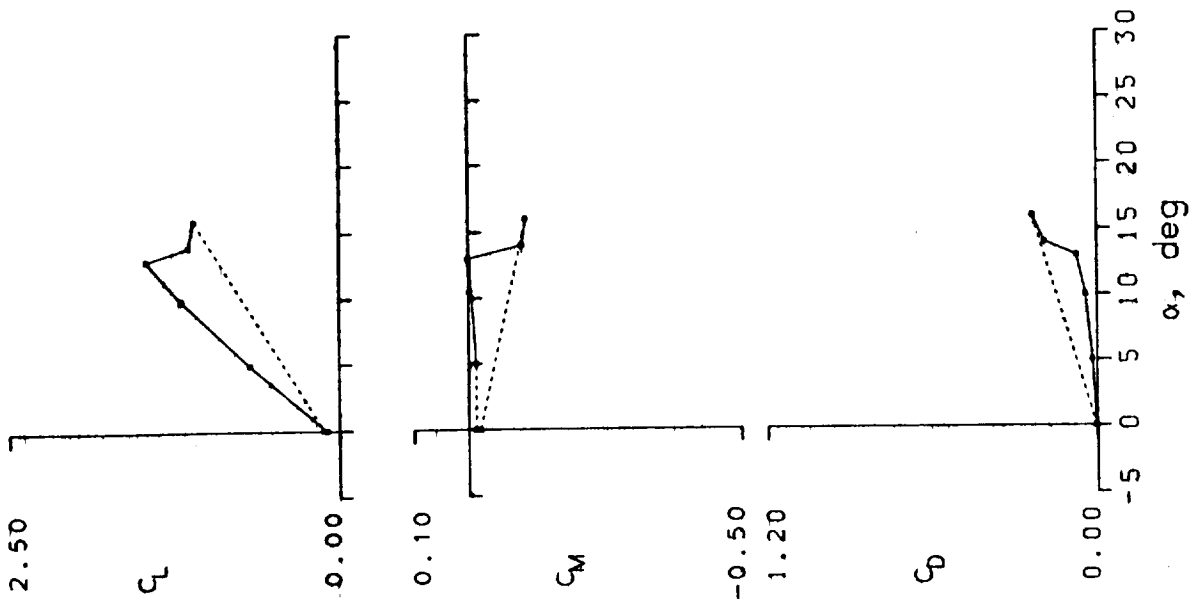


Figure 7.- Continued.

SIKORSKY SC-1095 AIRFOIL

STEADY DATA

FRAME : 35021

Re : 3.88 E6 M = 0.300

$C_{Lmax} = 1.58$

$C_{Mmin} = -0.11$

$C_{Dmax} = 0.22$

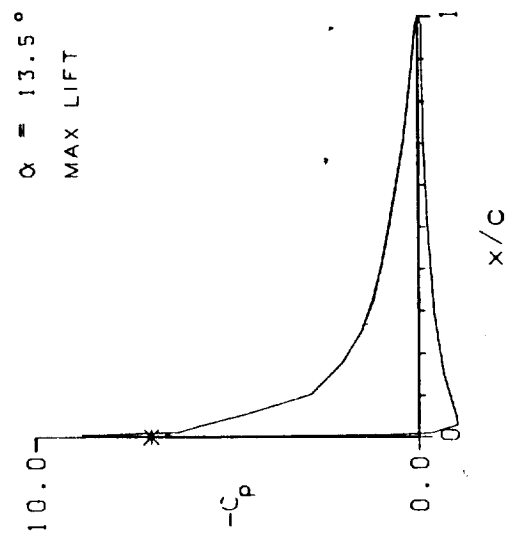
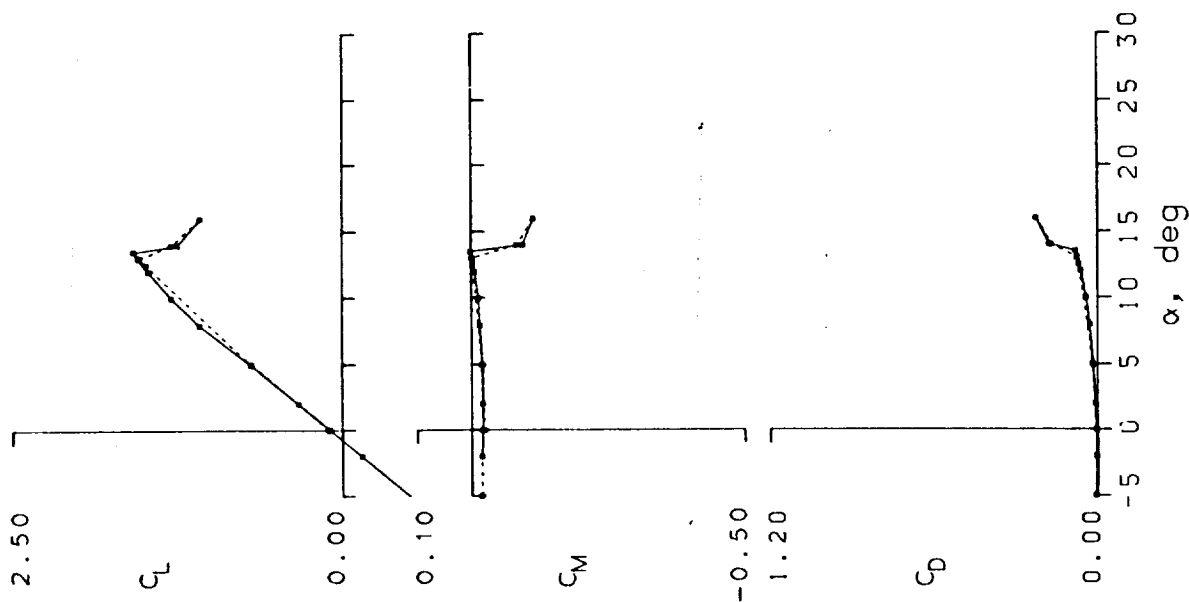


Figure 7.- Continued.

SIKORSKY SC-1095 AIRFOIL

STEADY DATA

FRAME : 35220

Re : 3.21 E6 M = 0.249

CLmax = 1.53

CMmin = -0.14

CDmax = 0.45

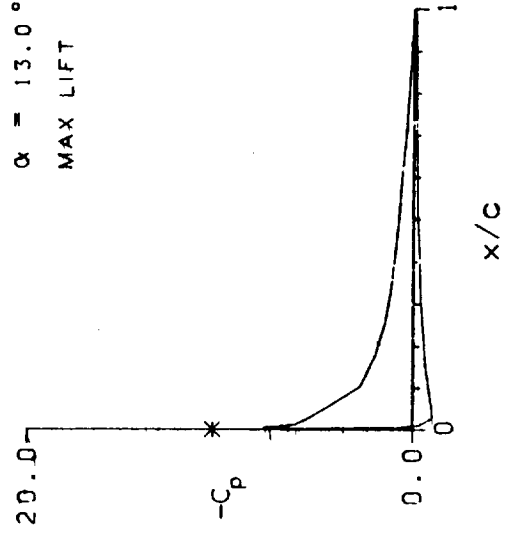
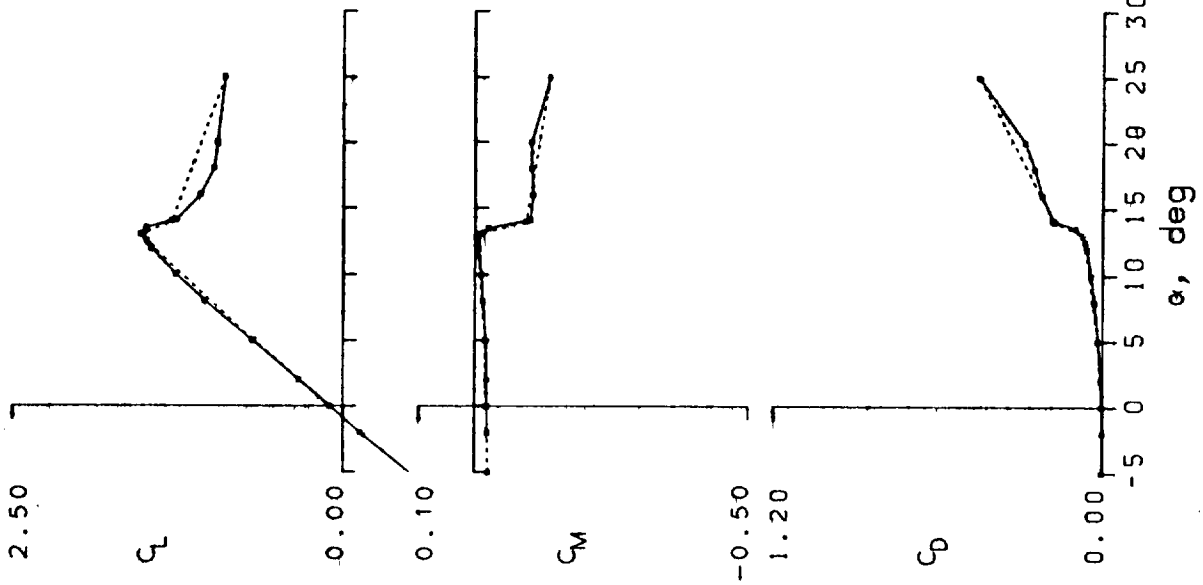


Figure 7.- Continued.

SIKORSKY SC-1095 AIRFOIL

STEADY DATA

FRAME : 36019

Re : 2.48 E6 M = 0.184

$C_{Lmax} = 1.58$

$C_{Mmin} = -0.10$

$C_{Dmax} = 0.27$

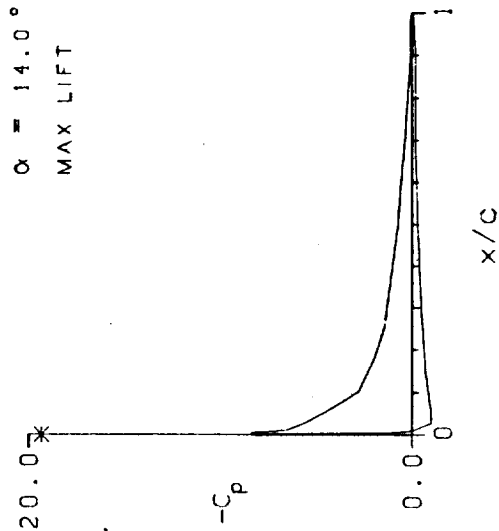
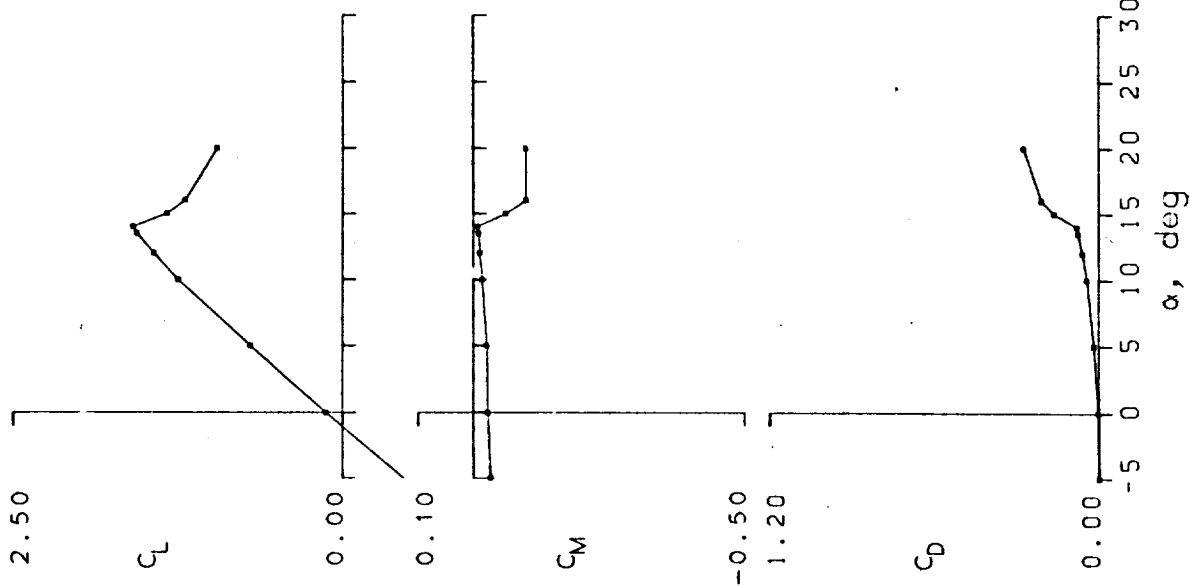


Figure 7.- Continued.

SIKORSKY SC-1095 AIRFOIL

STEADY DATA

FRAME : 36202

Re : 1.44 E6 M = 0.110

C_{Lmax} = 1.55

C_{Mmin} = -0.13

C_{Dmax} = 0.28

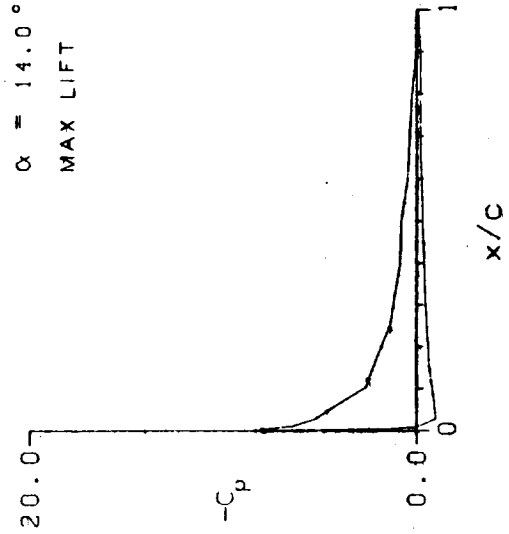
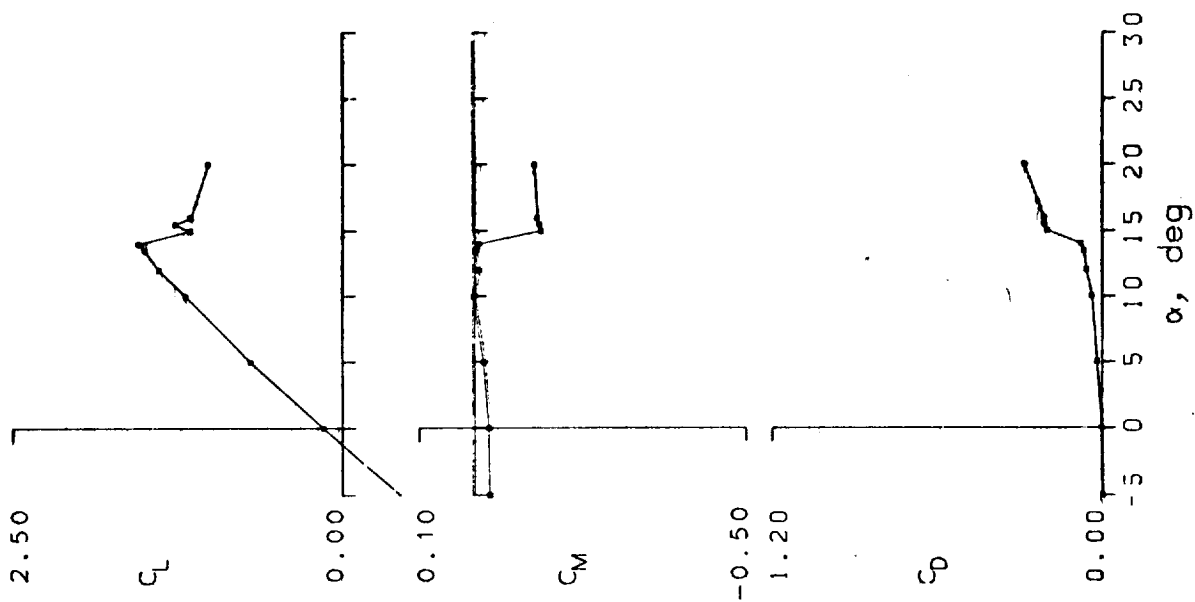


Figure 7.- Concluded.

HUGHES HH-02 -WITH TAB- AIRFOIL

STEADY DATA

FRAME : 40018

Re : 1.51 E6 M = 0.110

CLmax = 1.36

CMmin = -0.14

CDmax = 0.33

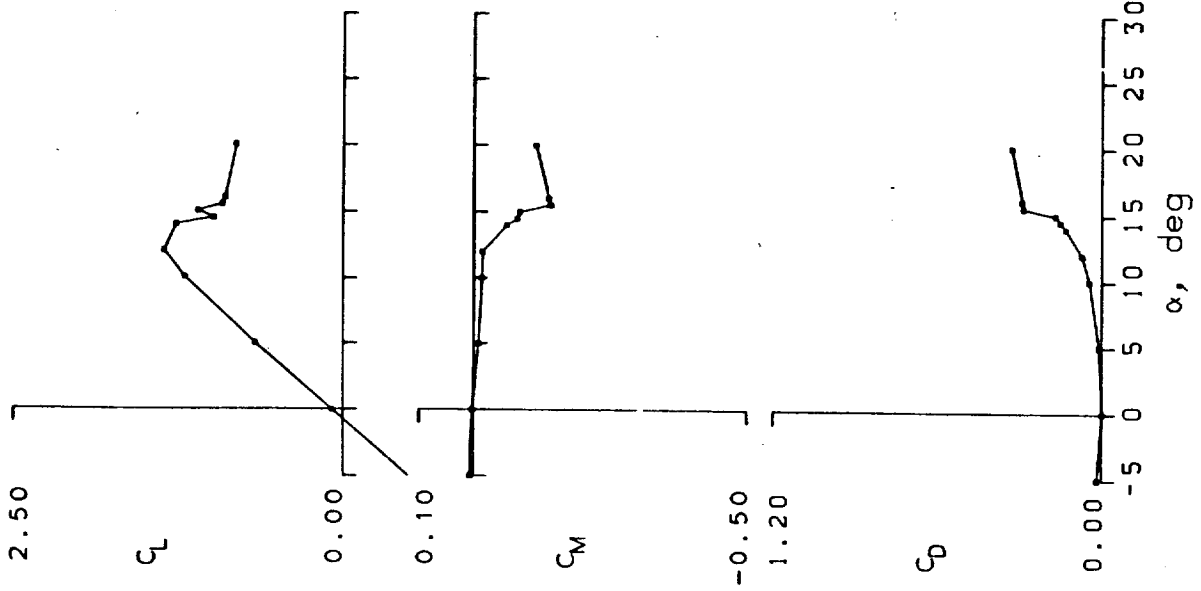


Figure 8.- Static data for Hughes HH-02 airfoil.

HUGHES MH-02 -WITH TAB- AIRFOIL

STEADY DATA

FRAME : 40114

Re : 2.47 E6 M = 0.185

CLmax = 1.48

CMmin = -0.13

CDmax = 0.34

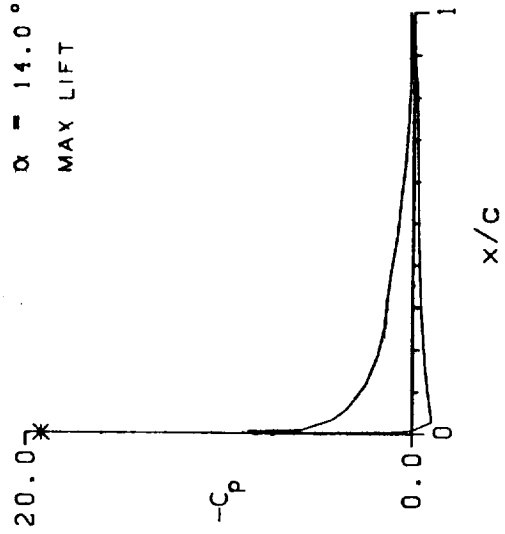
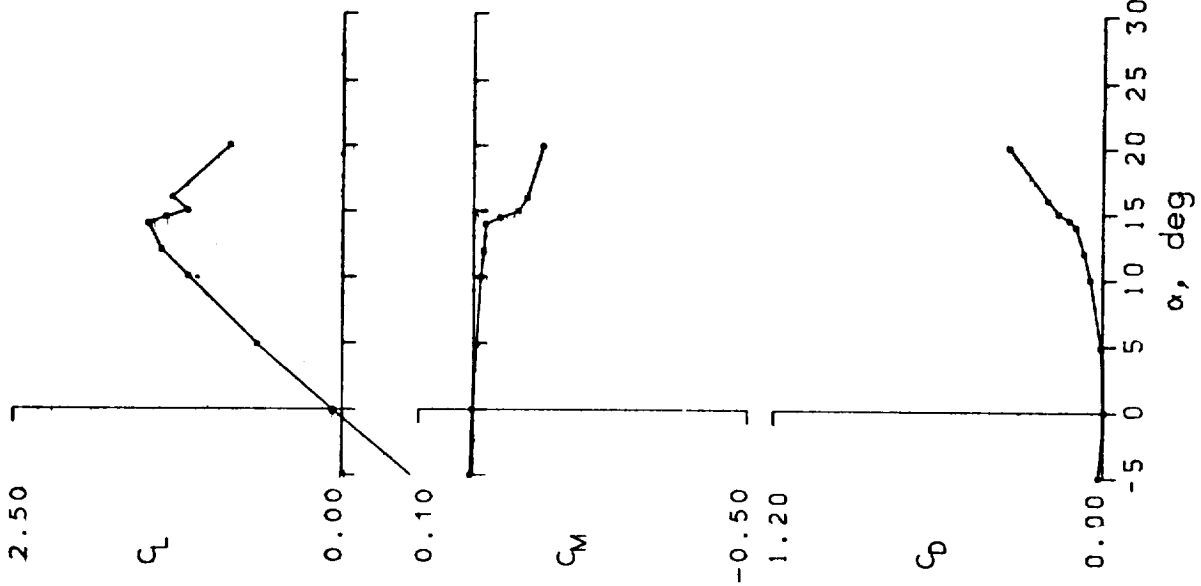


Figure 8.- Continued.

HUGHES HH-02 - WITH TAB - AIRFOIL

STEADY DATA

FRAME : 41019

Re : 4.10 E6 M = 0.300

CLmax = 1.47

CMmin = -0.12

CDmax = 0.32

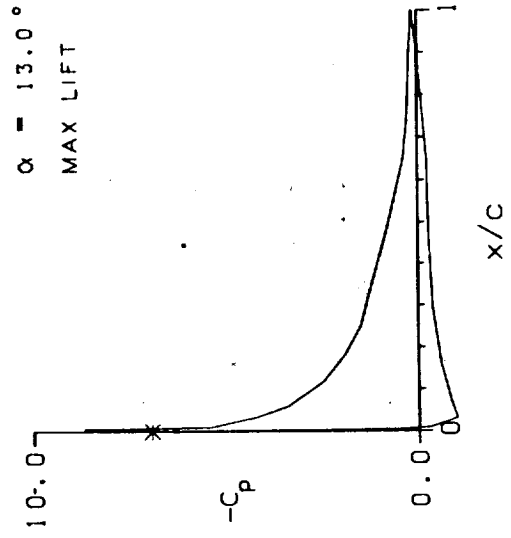
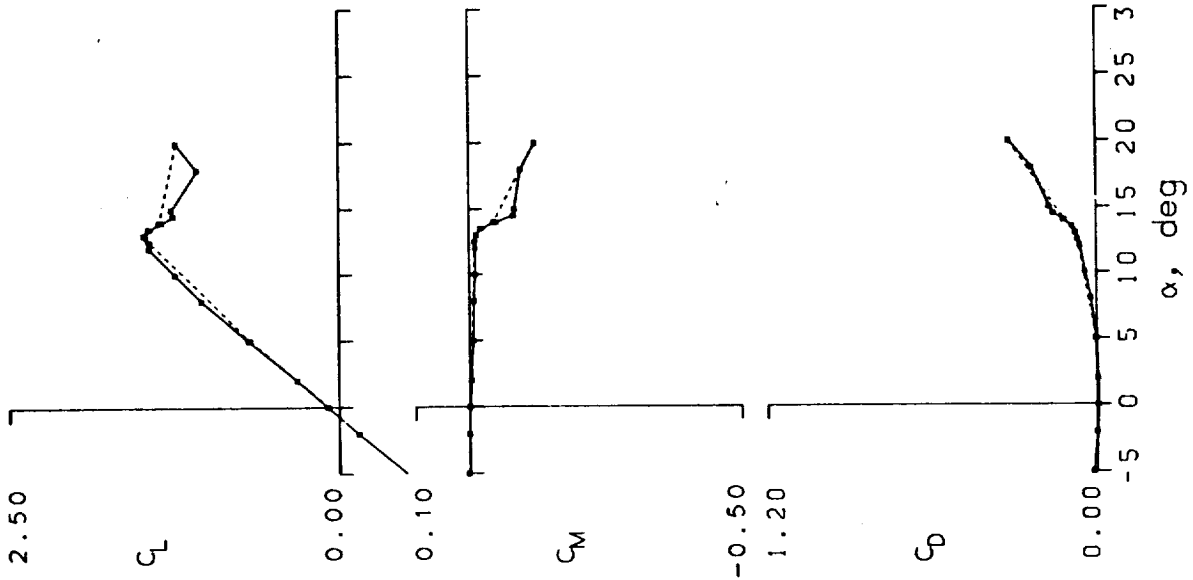


Figure 8.- Continued.

HUGHES HH-02 - WITH TAB - AIRFOIL
 STEADY DATA
 FRAME : 41110
 Re : 3.37 E6 M = 0.248
 C_{Lmax} = 1.54
 C_{Mmin} = -0.10
 C_{Dmax} = 0.28

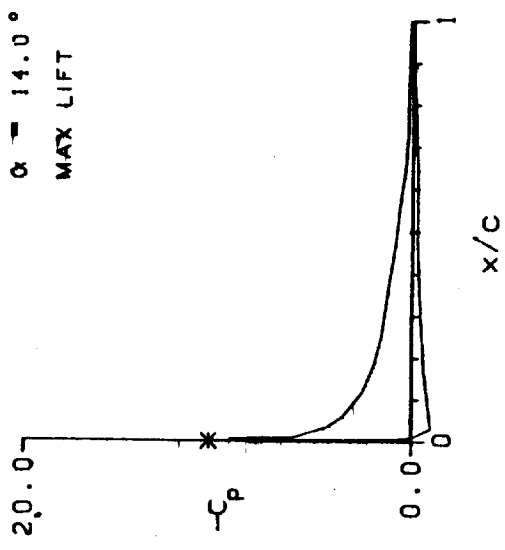
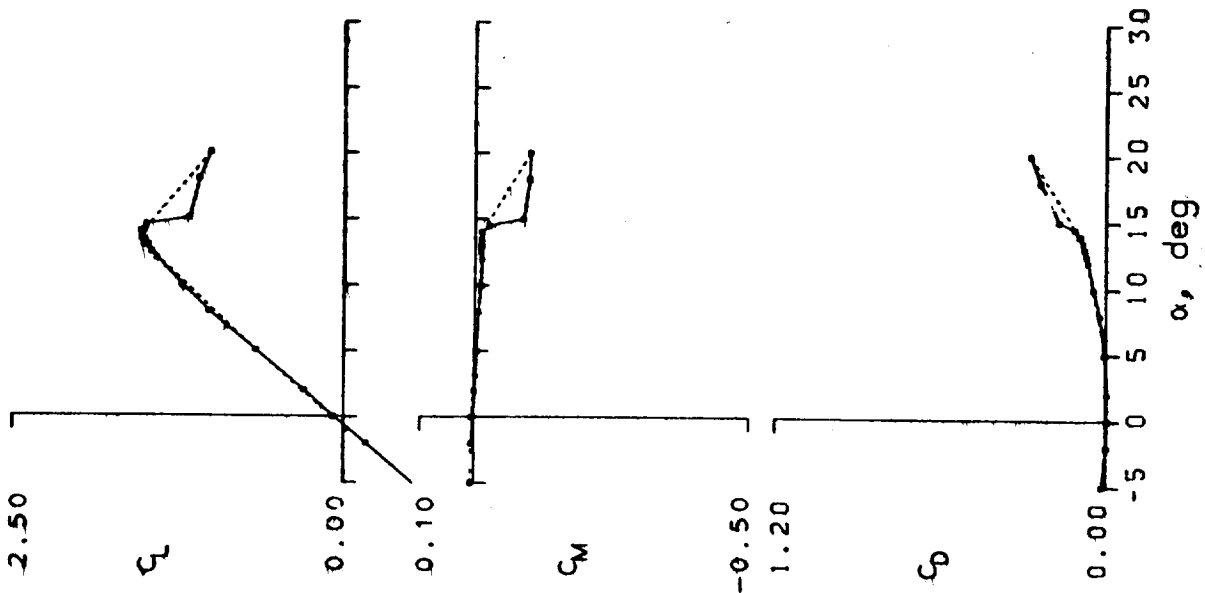


Figure 8.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

STEADY DATA--TRIP

FRAME : 41221

Re : 4.01 E6 M = 0.299

CLmax = 1.42

CMmin = -0.11

CDmax = 0.23

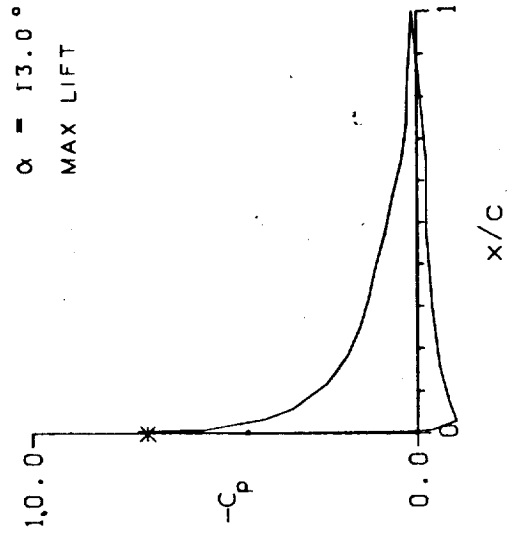
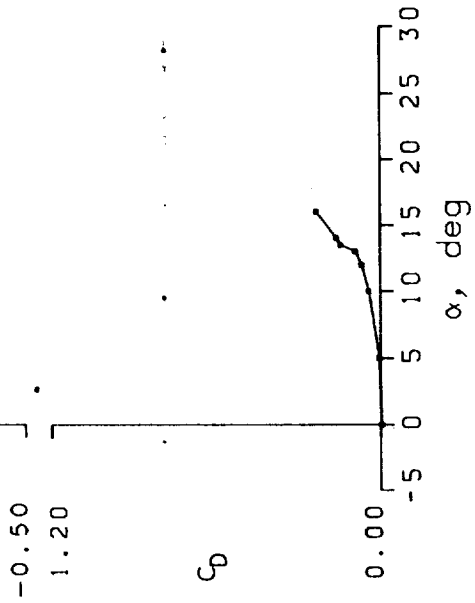
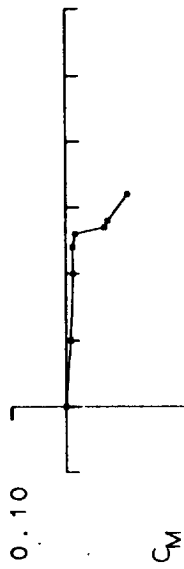
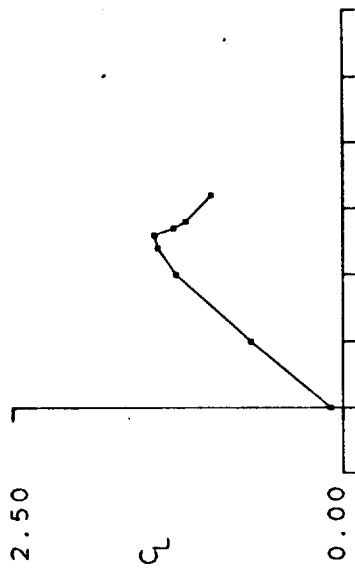


Figure 8.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

STEADY DATA--TRIP

FRAME : 41401

R_0 : 2.50 E6 $M = 0.183$

$C_{Lmax} = 1.46$

$C_{Mmin} = -0.12$

$C_{Dmax} = 0.23$

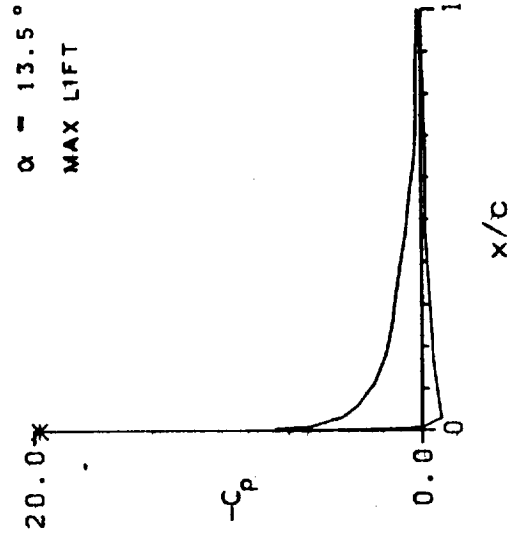
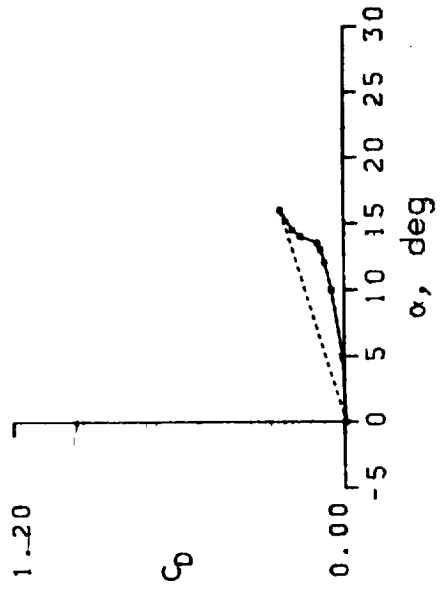
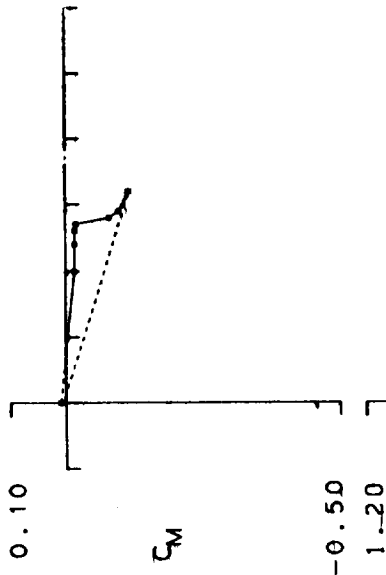
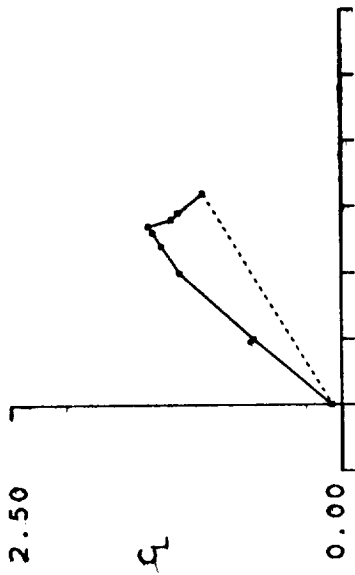


Figure 8.- Concluded.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

STEADY DATA

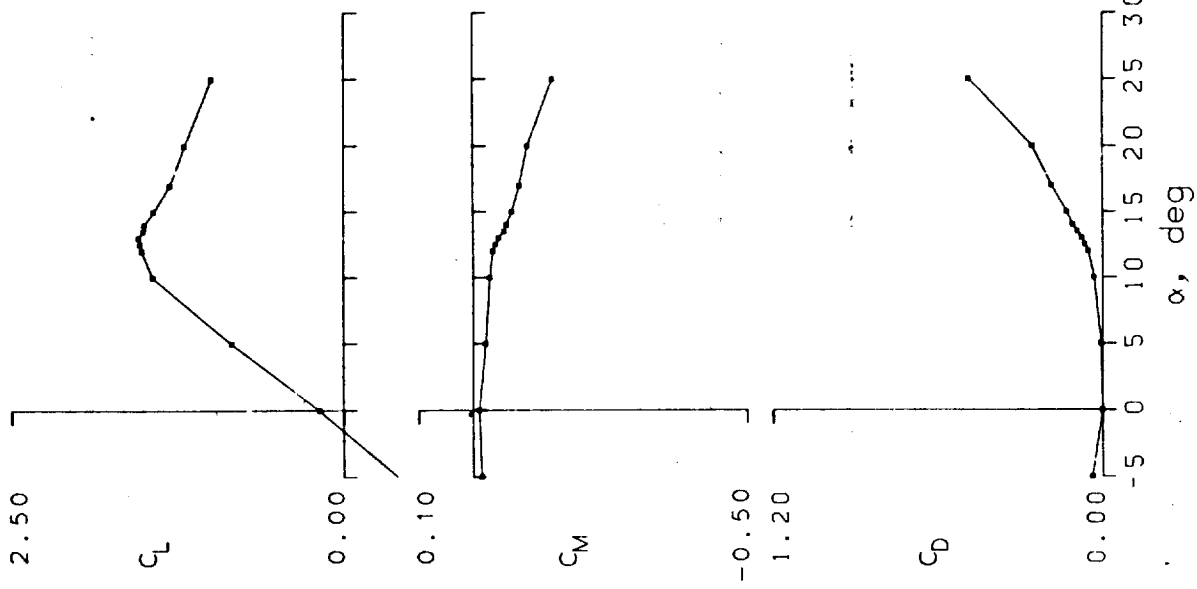
FRAME : 46018

Re : 1.54 E6 M = 0.109

C_{Lmax} = 1.55

C_{Mmin} = -0.15

C_{Dmax} = 0.49



$\alpha = 13.0^\circ$
MAX LIFT

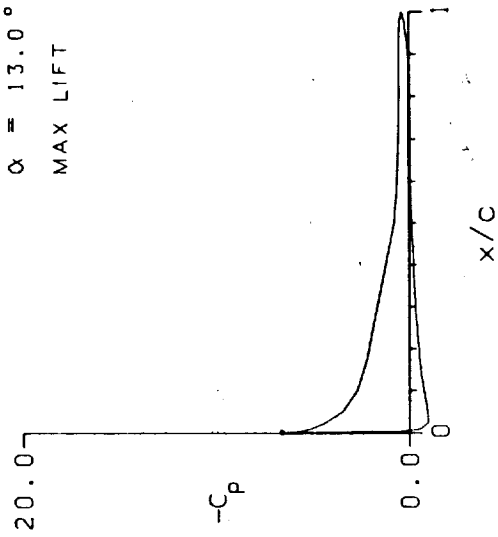


Figure 9.- Static data for Vertol VR-7 airfoil.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

STEADY DATA

FRAME : 46116

Re : 2.56 E6 M = 0.184

CLmax = 1.51

CMmin = -0.13

CDmax = 0.40

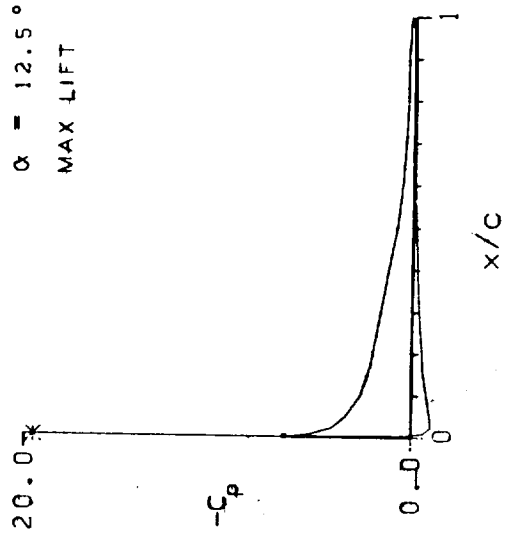
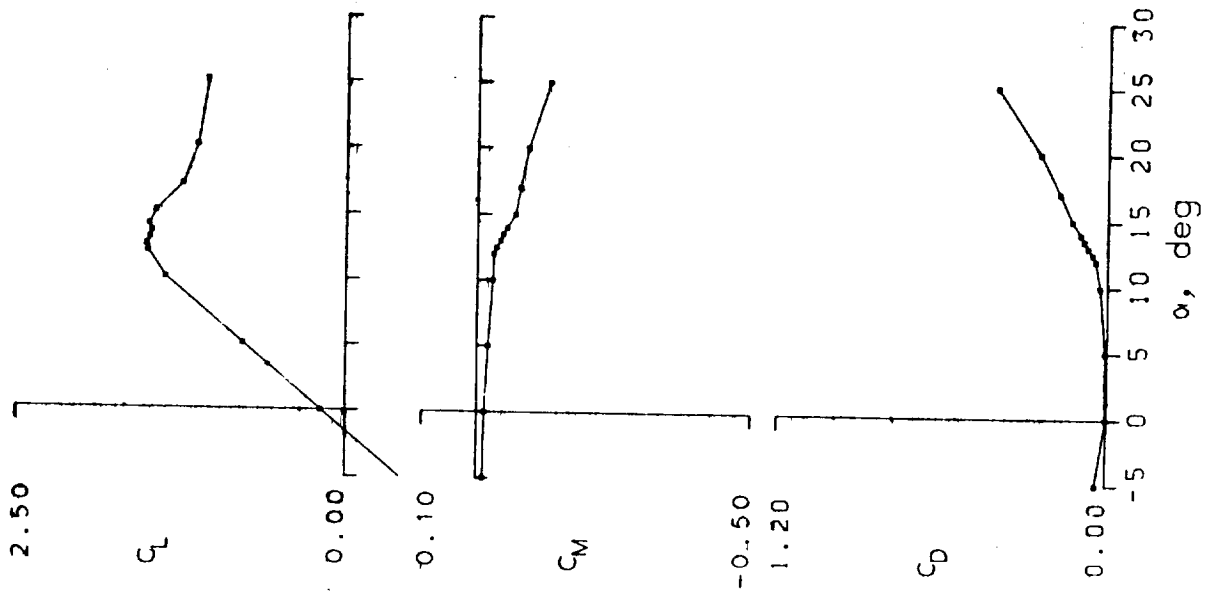


Figure 9.- Continued.

BOEING-VERTOL VR-7 - WITH TAB - AIRFOIL

STEADY DATA

FRAME : 46307

Re : 3.44 E6 M = 0.248

CLmax = 1.57

CMmin = -0.14

CDmax = 0.40

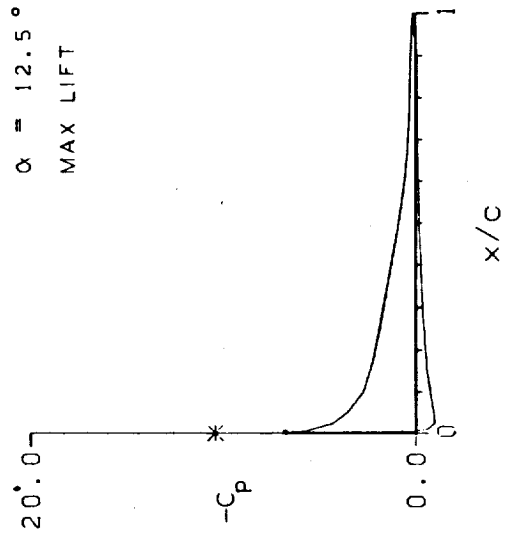
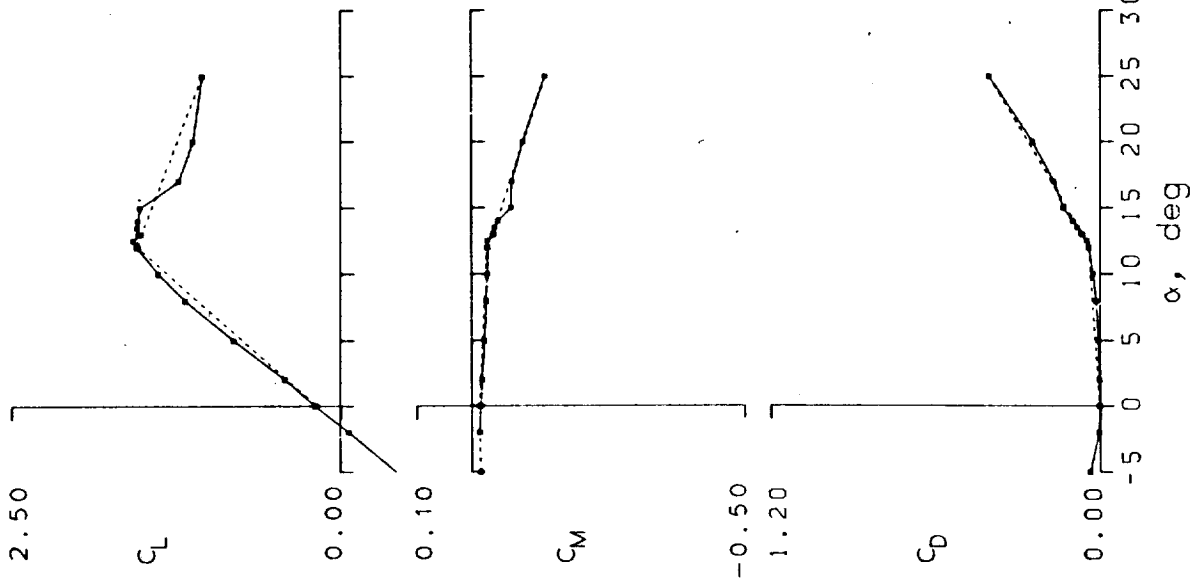


Figure 9.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

STEADY DATA

FRAME : 46418

Re : 4.05 E6 M = 0.300

CLmax = 1.56

CMmin = -0.13

CDmax = 0.41

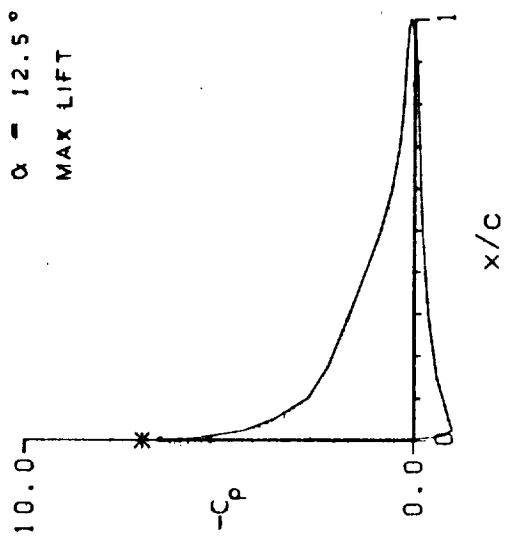
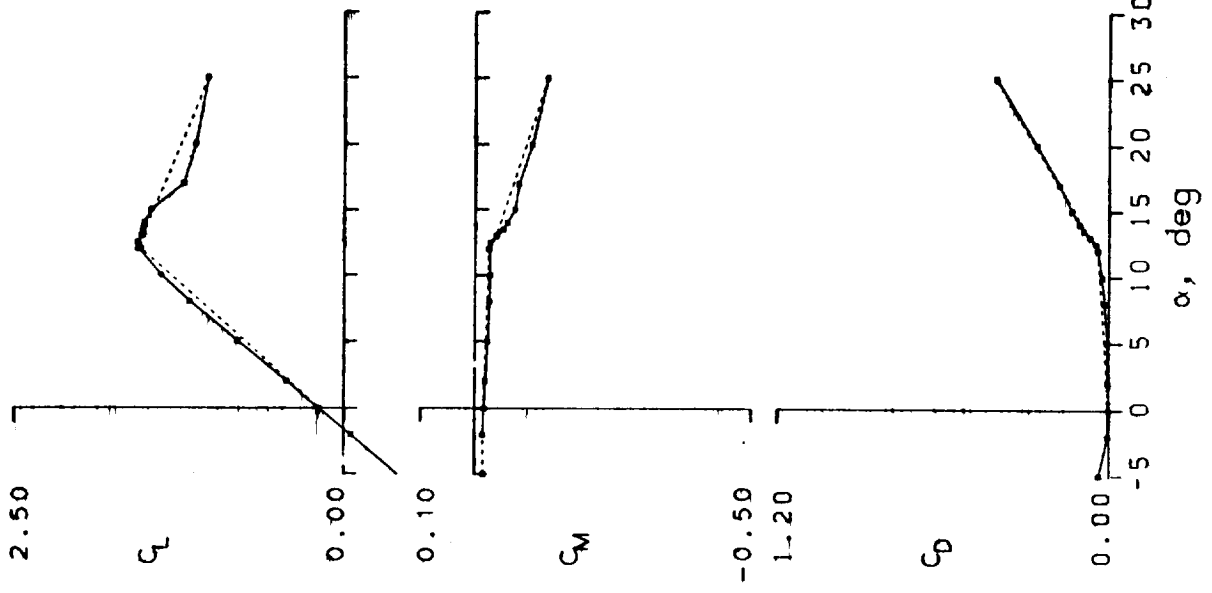


Figure 9.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

STEADY DATA--TRIP

FRAME : 46621

Re : 2.51 E6 M = 0.183

C_{Lmax} = 1.38

C_{Mmin} = -0.10

C_{Dmax} = 0.28

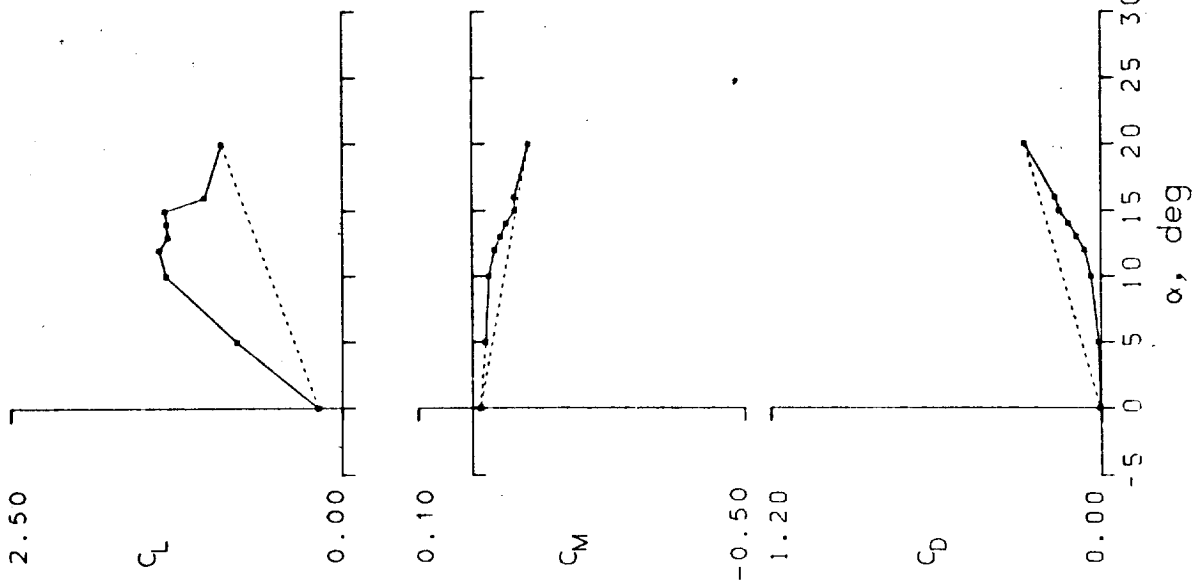


Figure 9.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

STEADY DATA--TRIP

FRAME : 46802

Re : 4.17 E6 M = 0.301

C_{Lmax} = 1.44

C_{Mmin} = -0.12

C_{Dmax} = 0.30

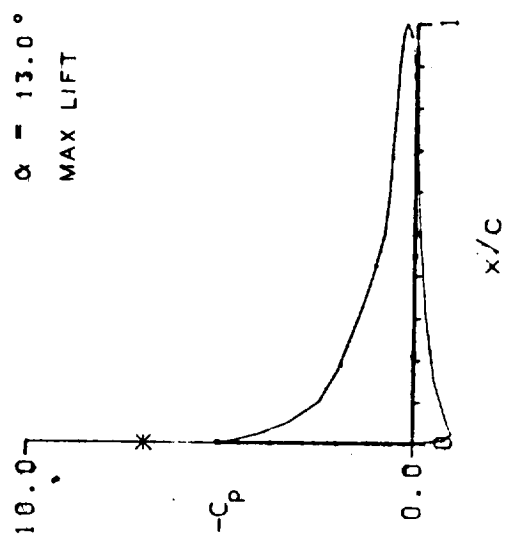
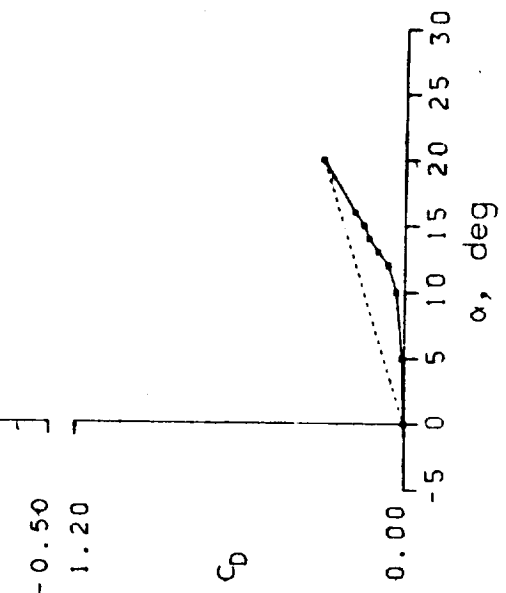
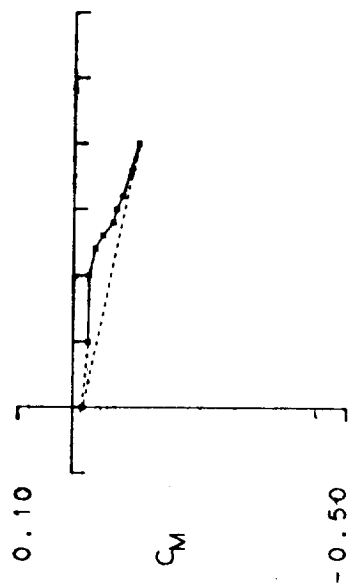
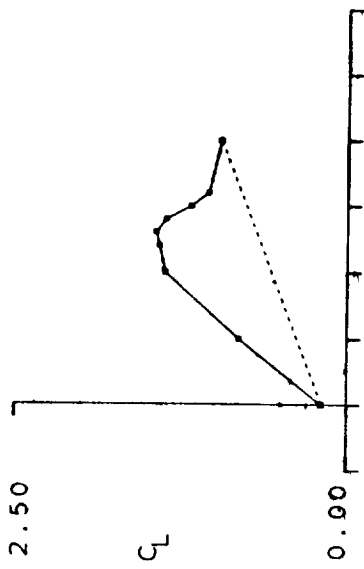


Figure 9.- Concluded.

NLR-1 AIRFOIL
STEADY DATA

FRAME : 61018

Re : 1.53 E6 M = 0.110

CLmax = 1.41

CMmin = -0.10

CDmax = 0.31

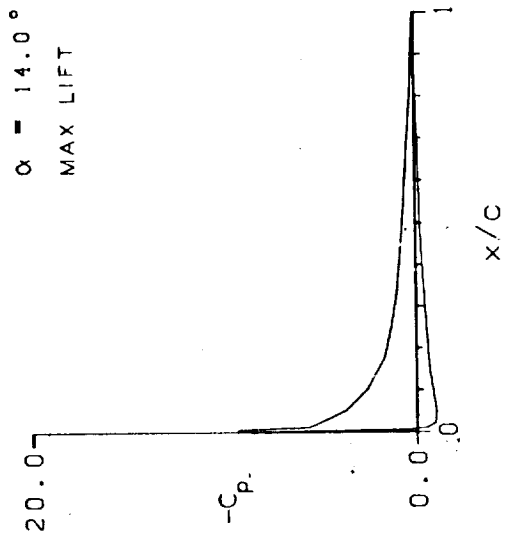
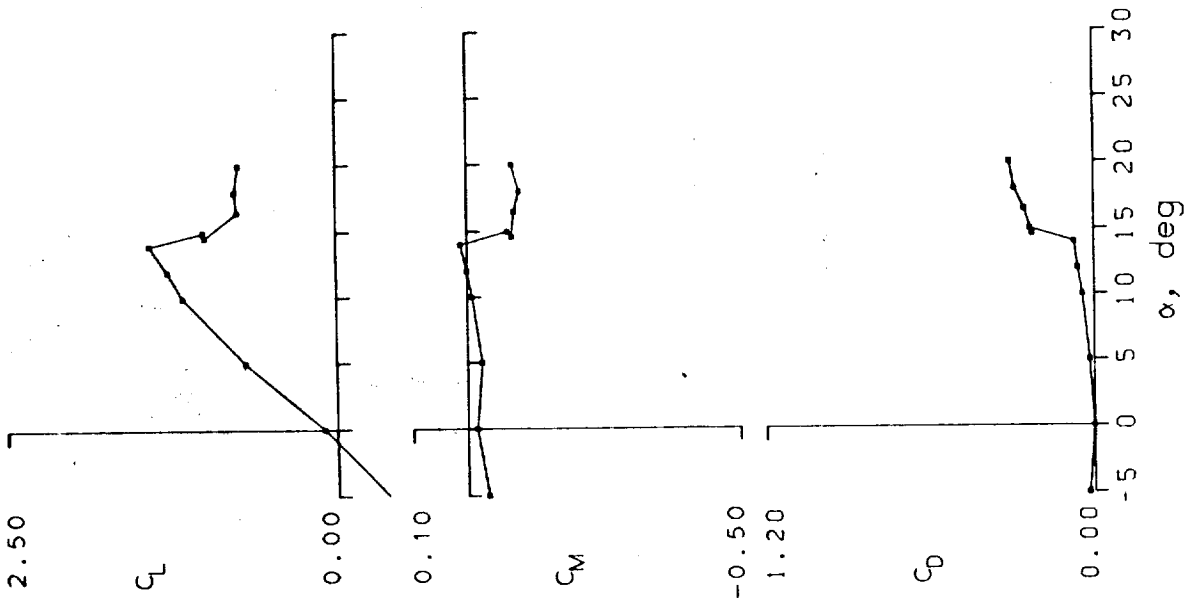


Figure 10.- Static data for NLR-1 airfoil.

NLR-1 AIRFOIL
 STEADY DATA
 FRAME : 61114
 $R_e : 2.44 E6$ $M = 0.185$
 $C_{Lmax} = 1.53$
 $C_{Mmin} = -0.10$
 $C_{Dmax} = 0.31$

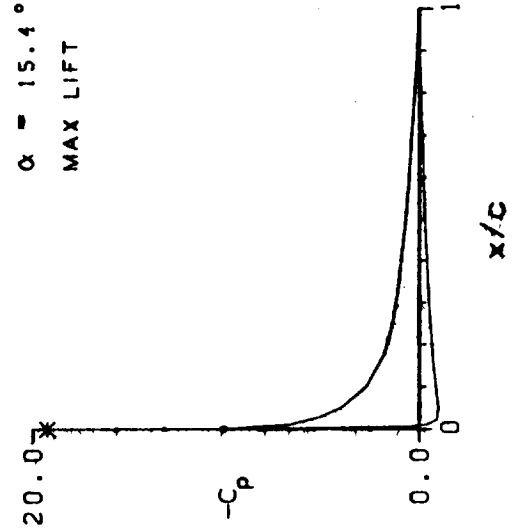
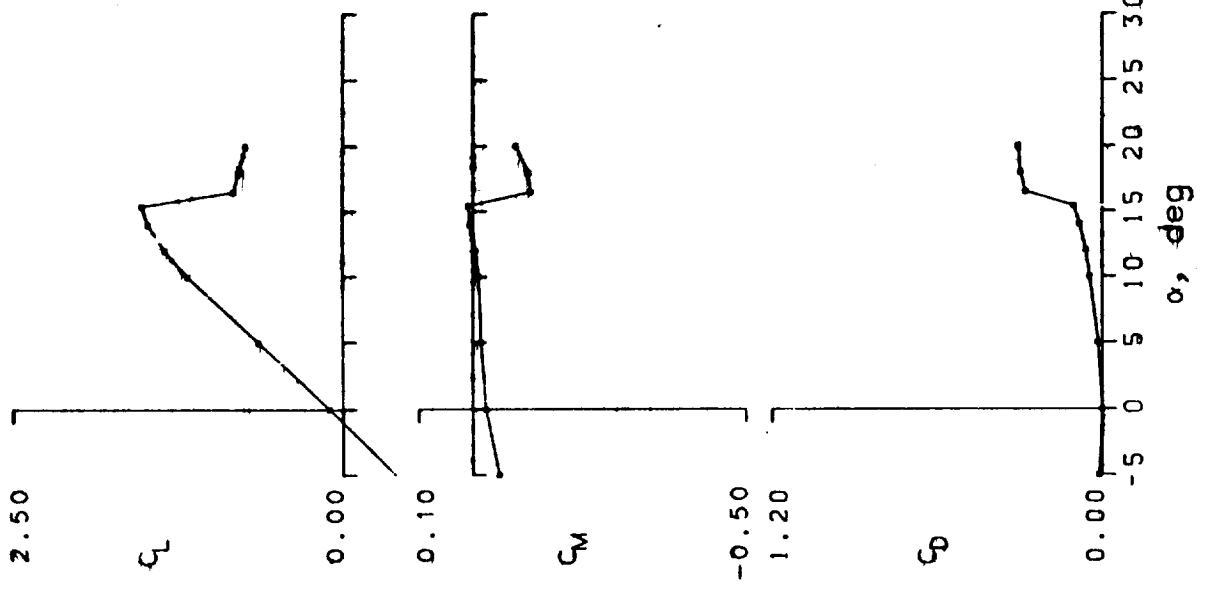
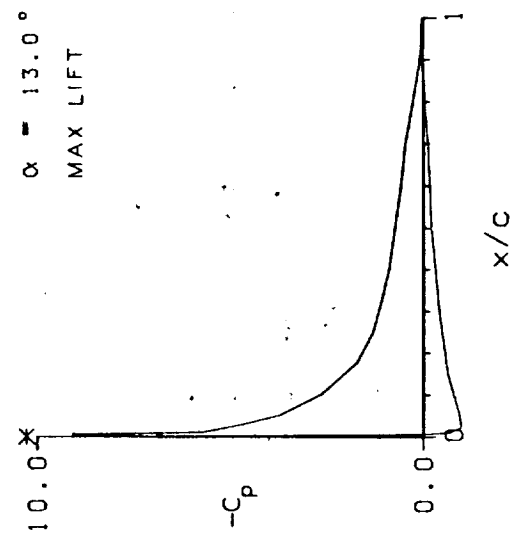
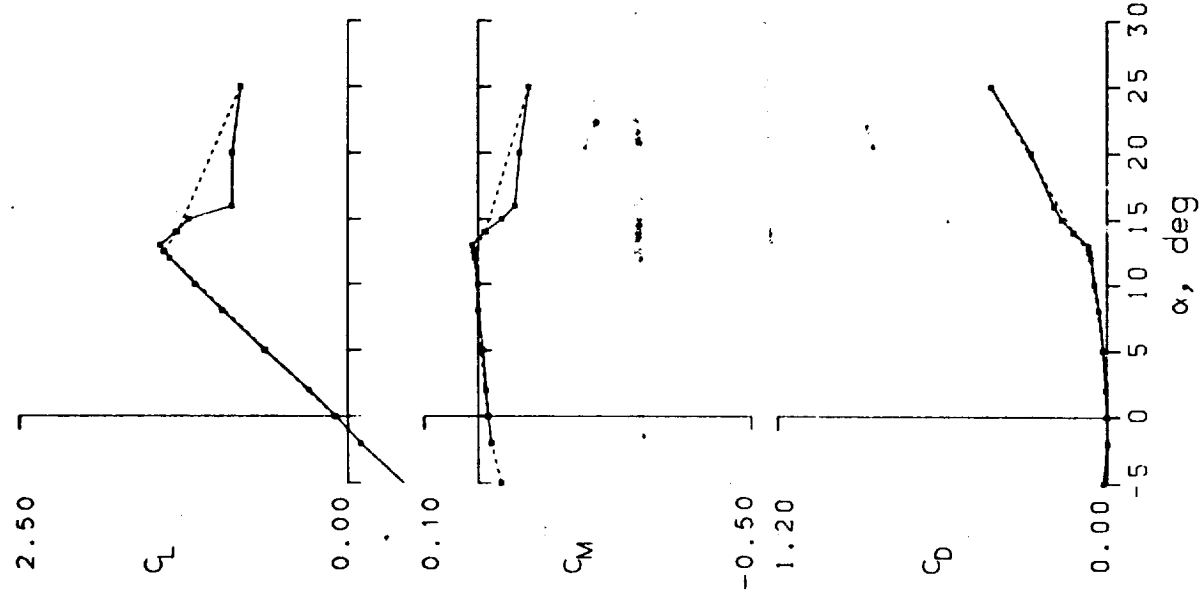


Figure 10.- Continued.

NLR-1 AIRFOIL
 STEADY DATA
 FRAME : 61221
 Re : 3.29 E6 M = 0.250
 C_{Lmax} = 1.43
 C_{Mmin} = -0.09
 C_{Dmax} = 0.42



$\alpha = 13.0^\circ$
 MAX LIFT

Figure 10.- Continued.

NLR-1 AIRFOIL
 STEADY DATA
 FRAME : 61407
 Re : 3.91 E6 M = 0.298
 C_{Lmax} = 1.35
 C_{Mmin} = -0.10
 C_{Dmax} = 0.42

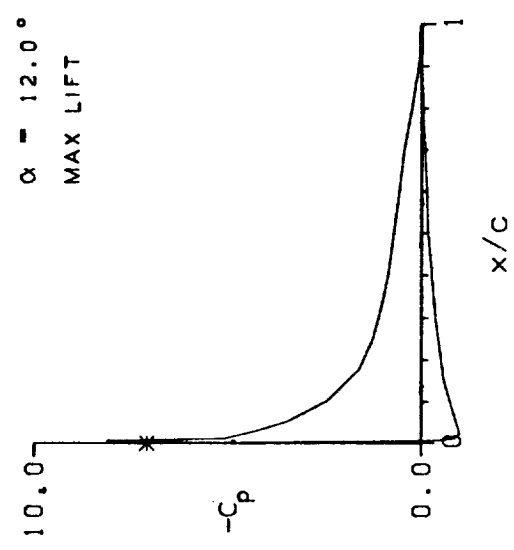
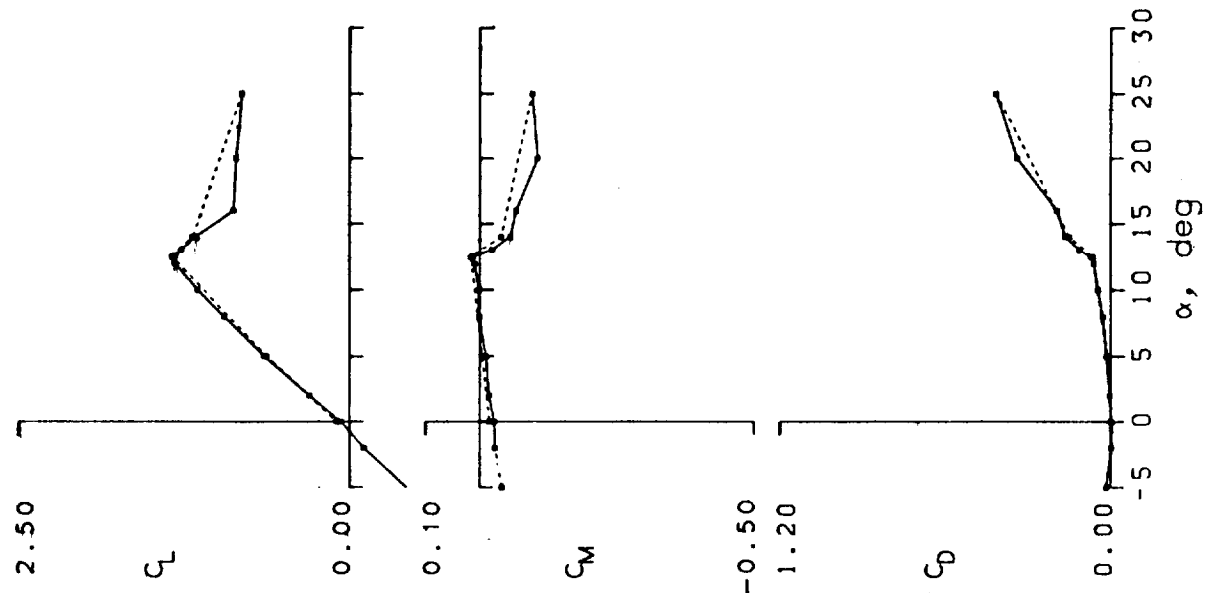


Figure 10.- Continued.

NLR-1 AIRFOIL
 STEADY DATA--TRIP

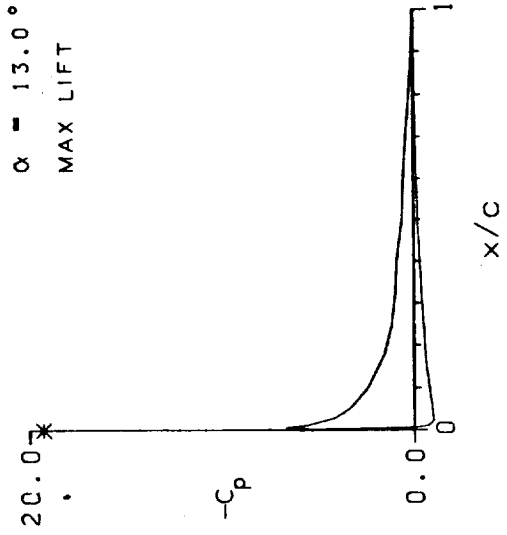
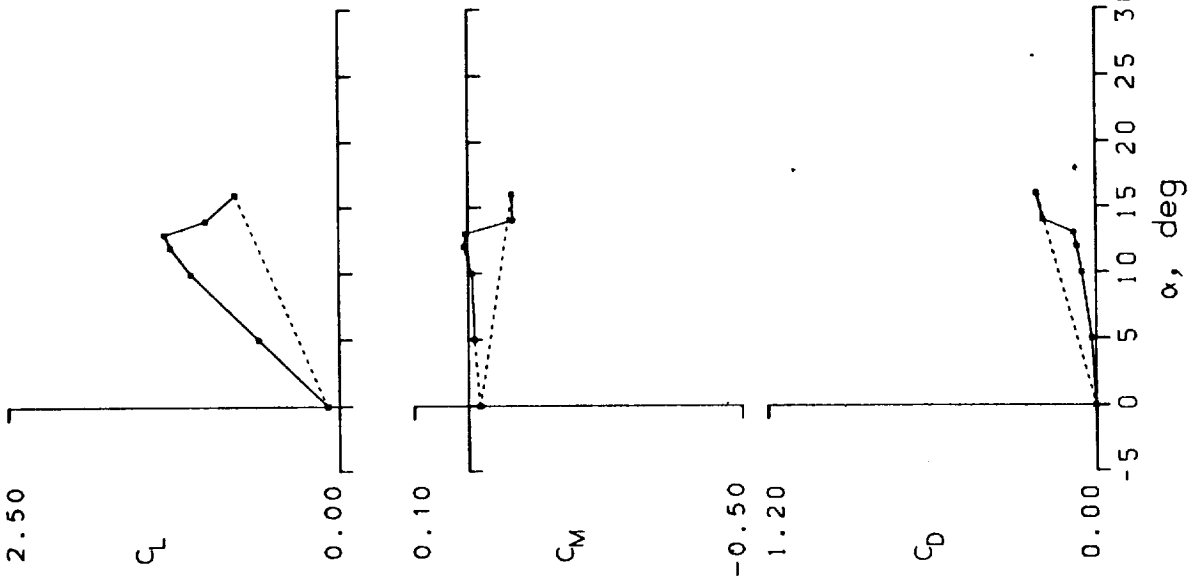
FRAME : 64221

Re : 2.35 E6 M = 0.185

CLmax = 1.31

CMmin = -0.08

CDmax = 1.22



NLR-1 AIRFOIL
 STEADY DATA--TRIP
 FRAME : 65019
 Re : 3.78 E6 M = 0.301
 CLmax = 1.26
 CMmin = -0.98
 CDmax = 0.23

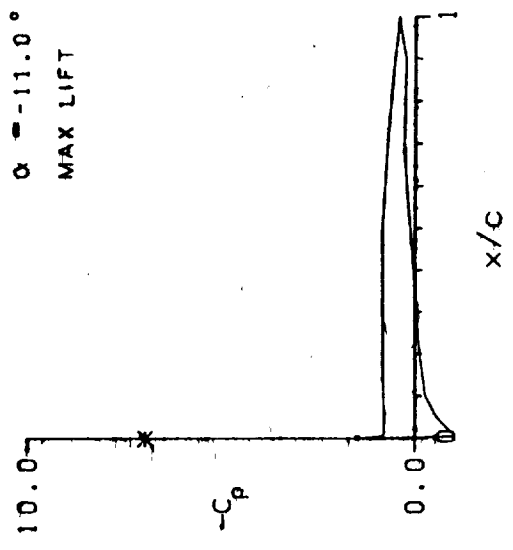
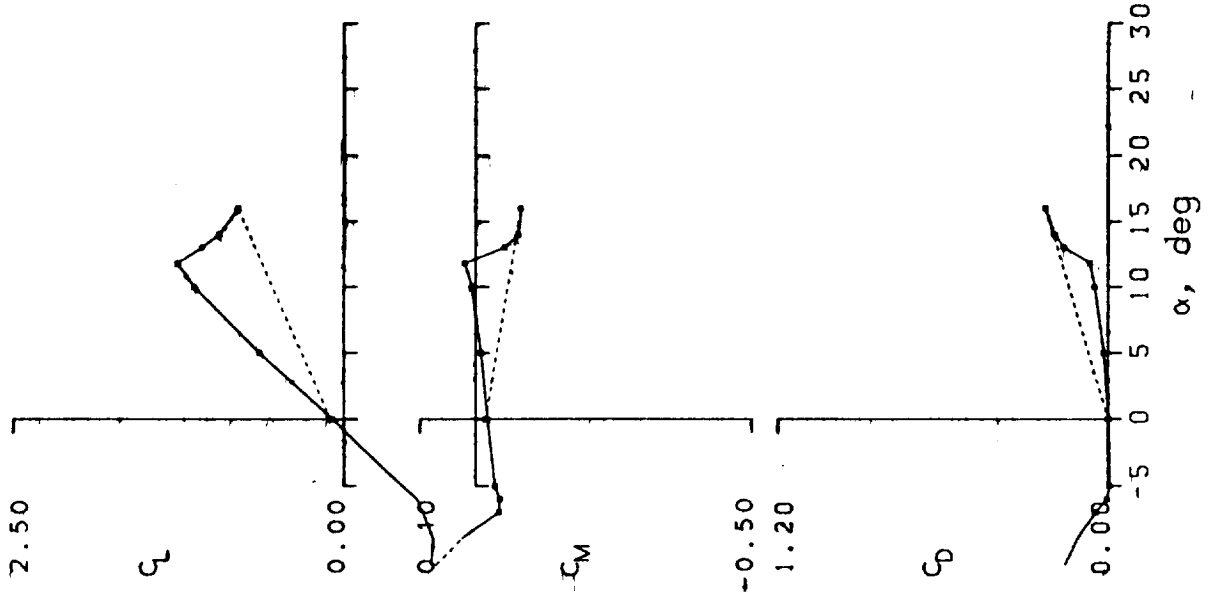


Figure 10.- Concluded.

NLR-7301 AIRFOIL

STEADY DATA

FRAME : 66019

Re : 3.88 E6 M = 0.293

$C_{Lmax} = 1.88$

$C_{Mmin} = -0.10$

$C_{Dmax} = 0.21$

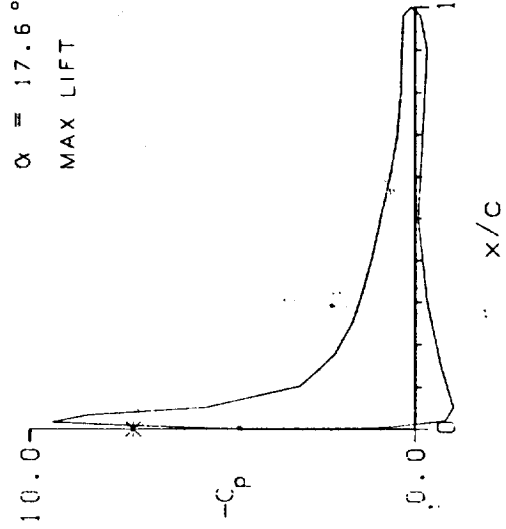
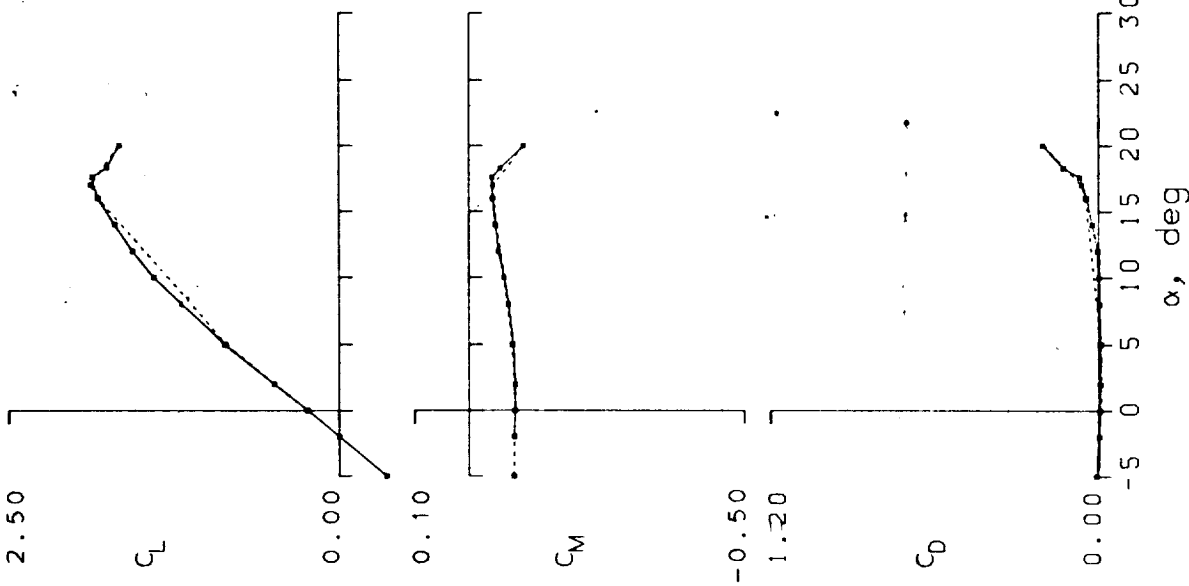


Figure 11.- Static data for NLR-7301 airfoil.

NLR-7301 AIRFOIL
 STEADY DATA
 FRAME : 66214
 Re : 3.26 E6 M = 0.248
 C_{Lmax} = 1.86
 C_{Mmin} = -0.20
 C_{Dmax} = 0.48

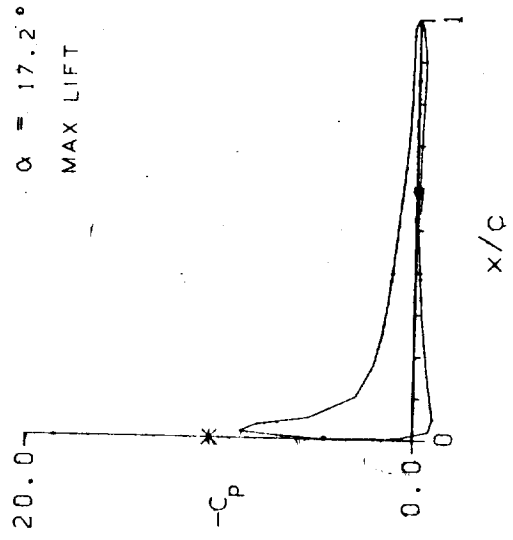
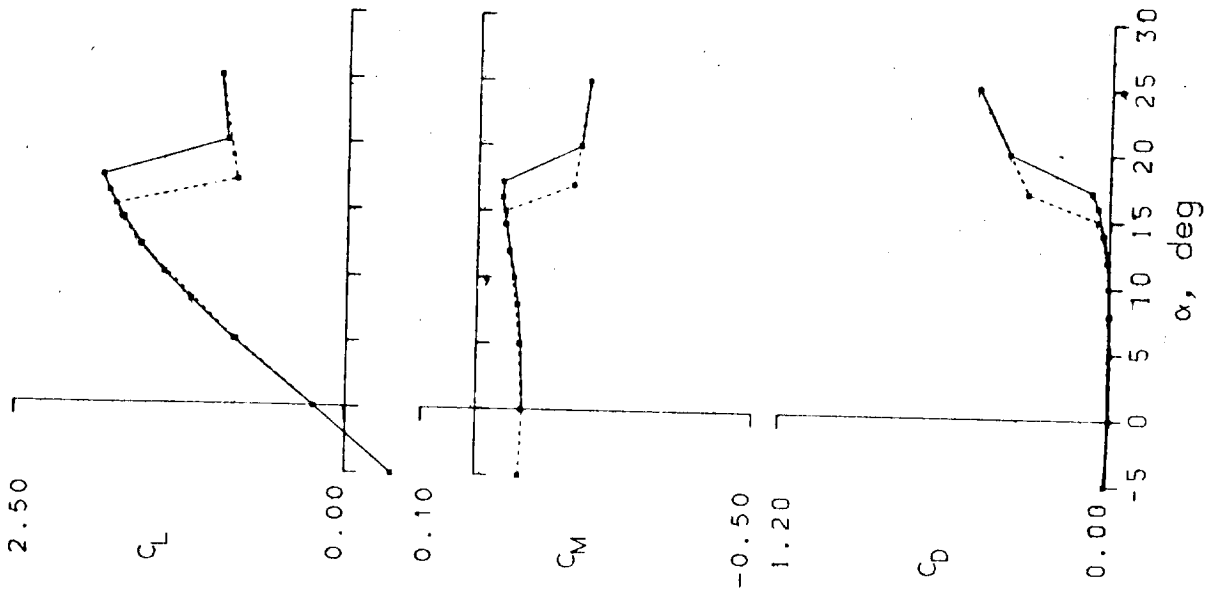


Figure 11.- Continued.

NLR-7301 AIRFOIL

STEADY DATA

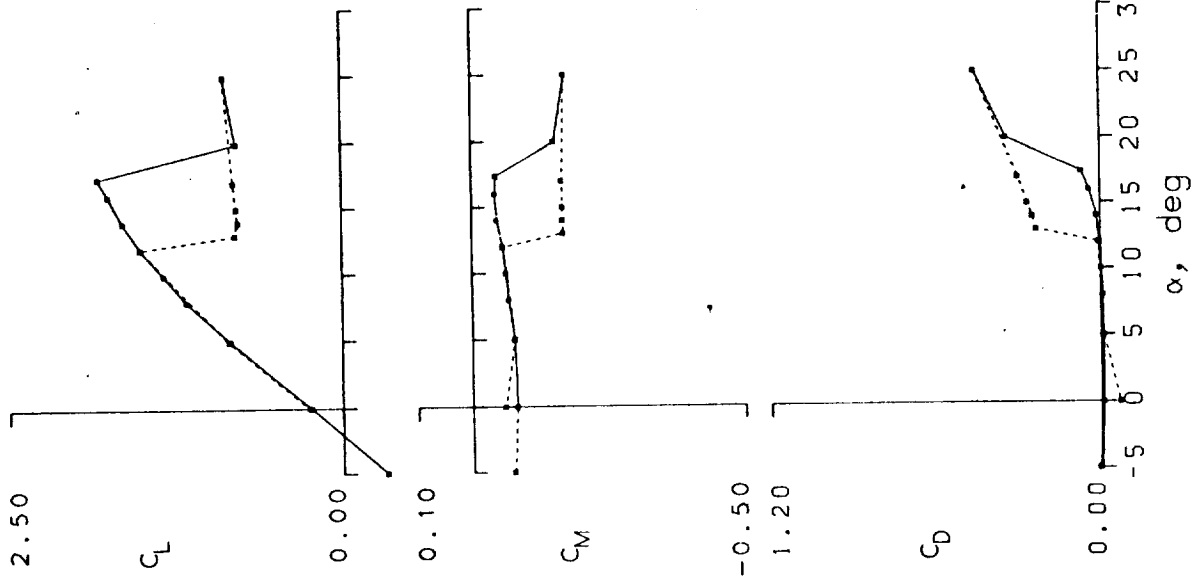
FRAME : 66320

Re : 2.46 E6 M = 0.183

$C_{Lmax} = 1.83$

$C_{Mmin} = -0.17$

$C_{Dmax} = 0.46$



$\alpha = 17.4^\circ$
MAX LIFT

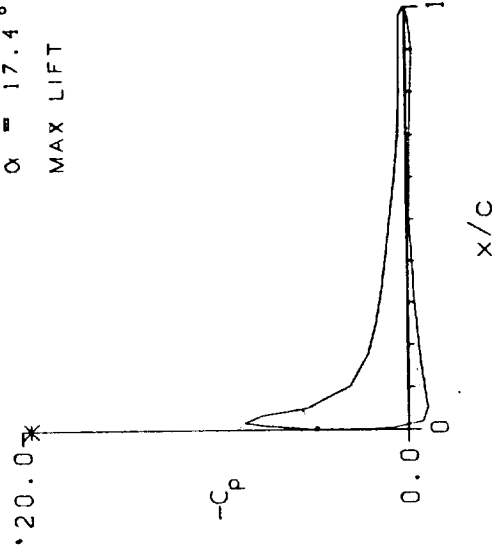


Figure 11.- Continued.

NLR-7301 AIRFOIL
 STEADY DATA
 FRAME : 66516
 Re : 1.53 E6 M = 0.109
 $C_{Lmax} = 1.68$
 $C_{Mmin} = -0.18$
 $C_{Dmax} = 0.47$

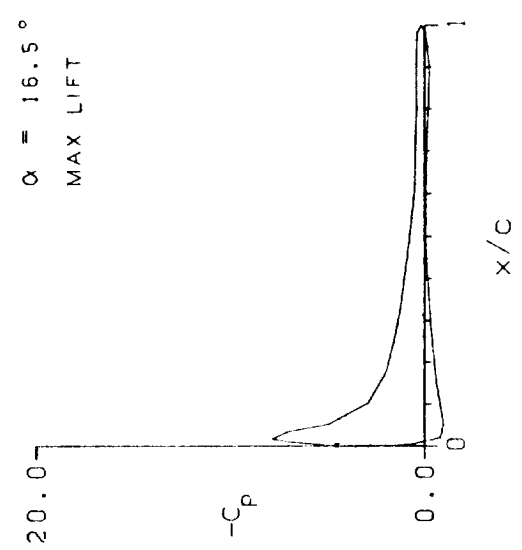
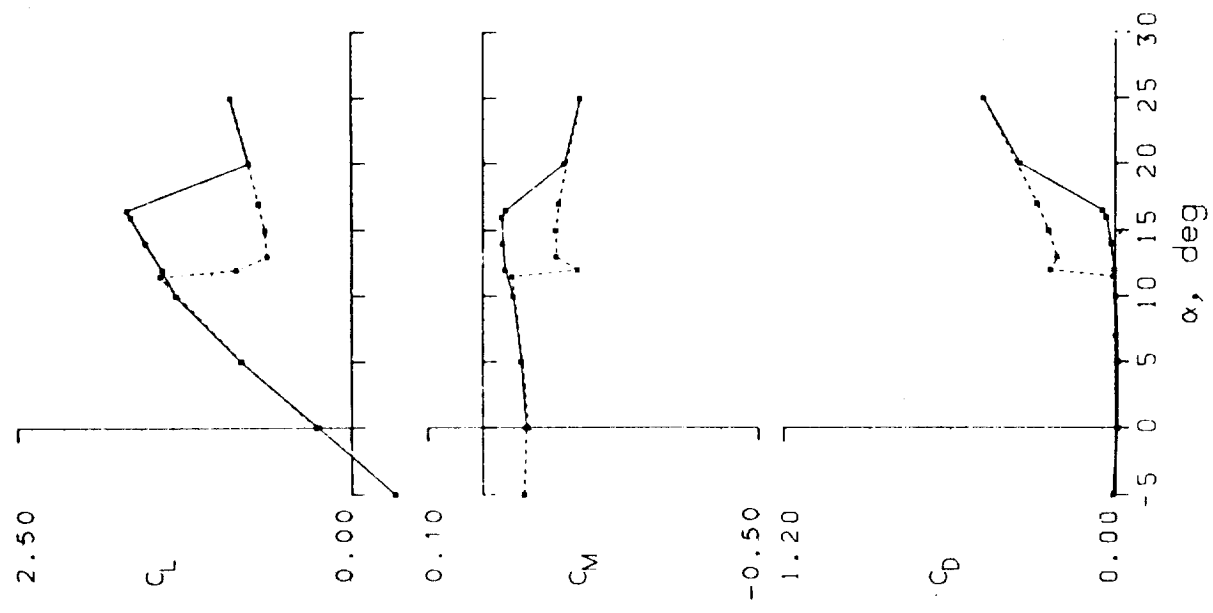


Figure 11.- Continued.

NLR-7301 AIRFOIL
 STEADY DATA--TRIP

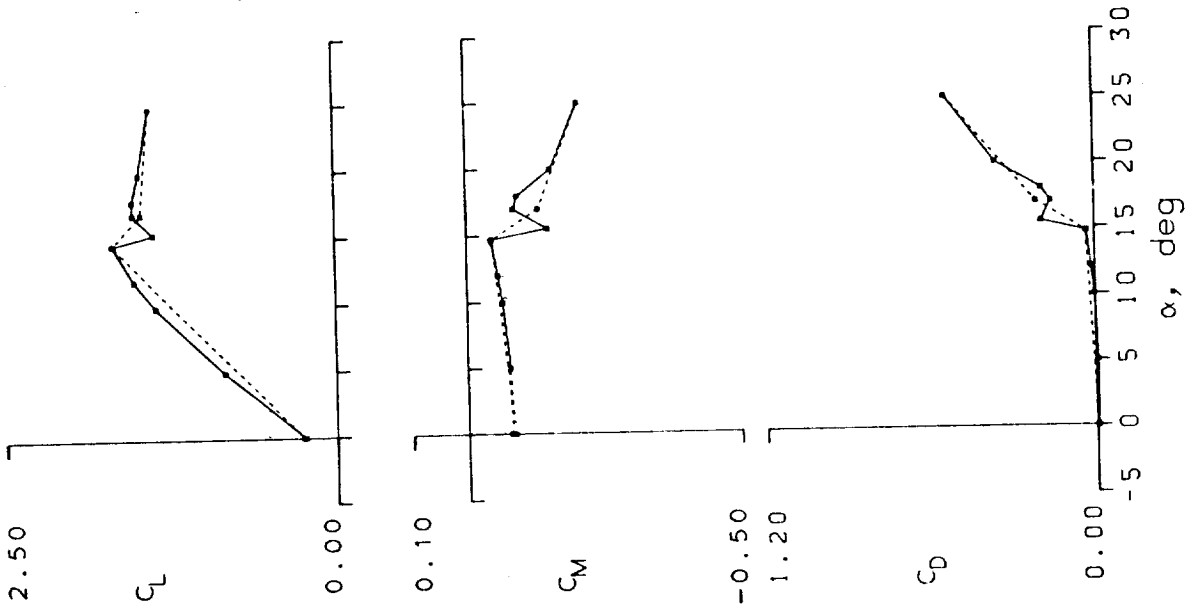
FRAME : 66623

Re : 2.46 E6 M = 0.183

C_{Lmax} = 1.67

C_{Mmin} = -0.21

C_{Dmax} = 0.54



$\alpha = 14.7^\circ$
 MAX LIFT

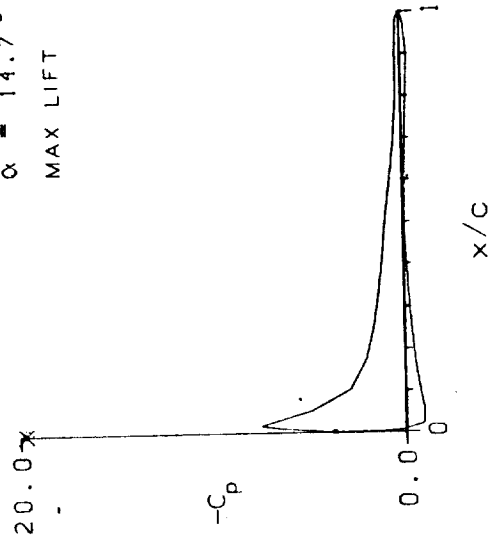


Figure 11.- Continued.

NLR-7301 AIRFOIL
 STEADY DATA--TRIP

FRAME : 66810

Re : 3.91 E6 M = 0.297

C_{Lmax} = 1.64

C_{Mmin} = -0.09

C_{Dmax} = 0.02

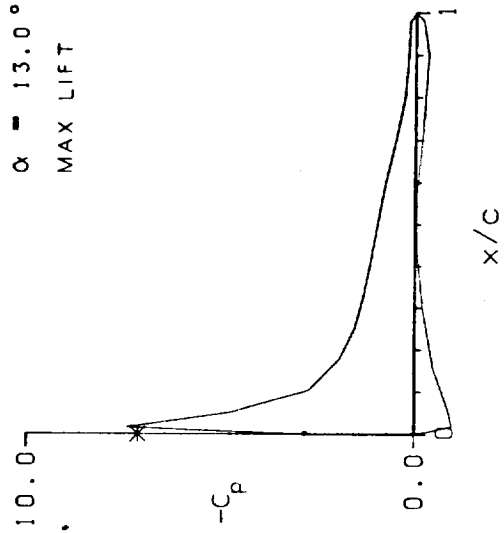
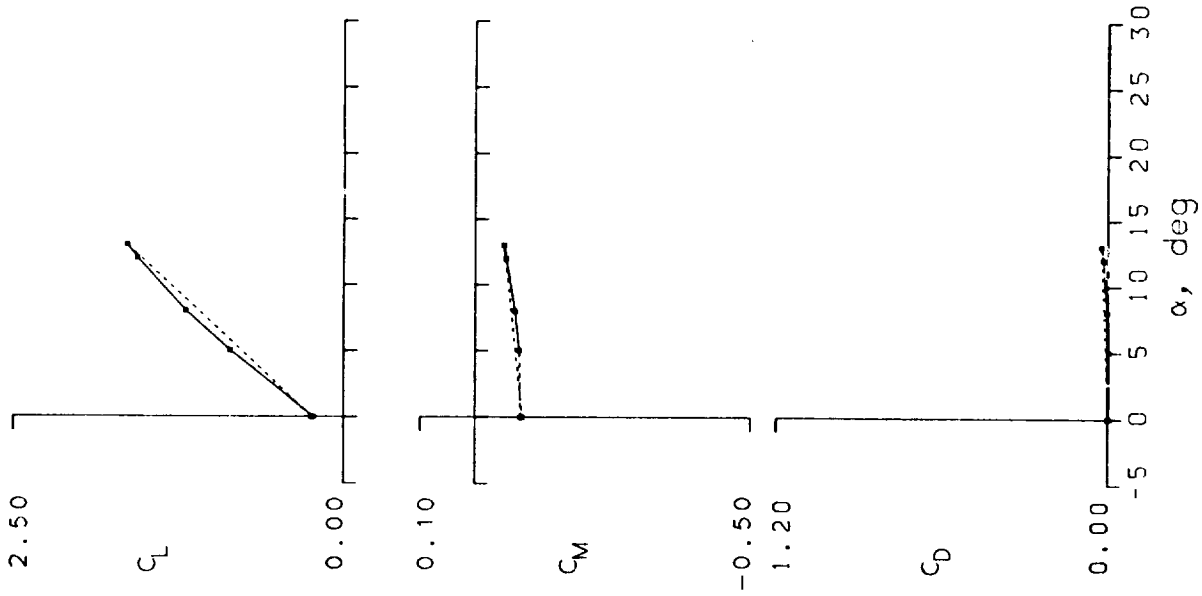


Figure 11.- Concluded.

NACA 0012 AIRFOIL
 FRAME : 7019 A0 = 8.99° k = 0.051
 Re = 3.89 E6 A1 = 4.91° M = 0.297
 CLmax = 1.44 CMmin = 0.00 CDmax = 0.07
 αLmax = 13.5° ξ = 0.094 Mmax = 1.234
 αCmin = 8.3° -Cpmax = 9.1 αMmax = 13.7°

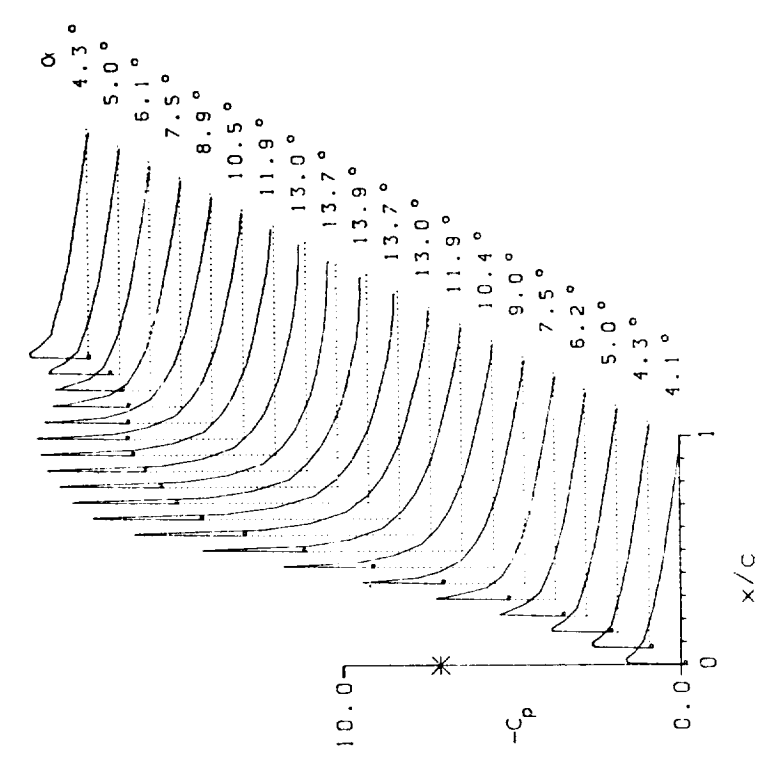
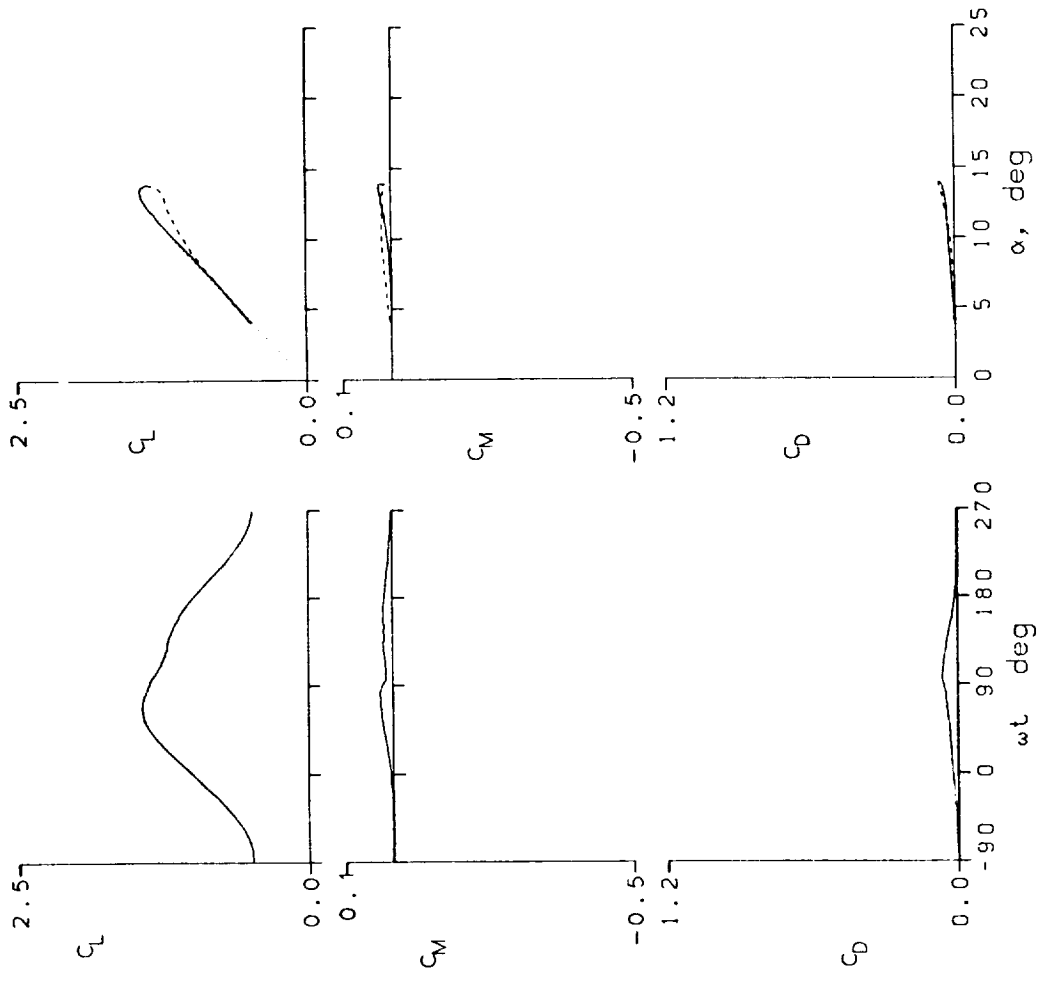


Figure 12.- dynamic data for NACA 0012 airfoil.

NACA 0012 AIRFOIL
 FRAME : 7021 A0 = 8.99° k = 0.100
 Re = 3.95 E6 A1 = 4.91° M = 0.299
 $C_{Lmax} = 1.48$ $C_{Mmin} = -0.09$ $C_{Dmax} = 0.16$
 $\alpha_{Lmax} = 13.8^\circ$ $\zeta = -0.193$ $M_{max} = 1.238$
 $\alpha_{Cmin} = 8.8^\circ$ $-C_{pmax} = 9.1$ $\alpha_{Mmax} = 13.7^\circ$

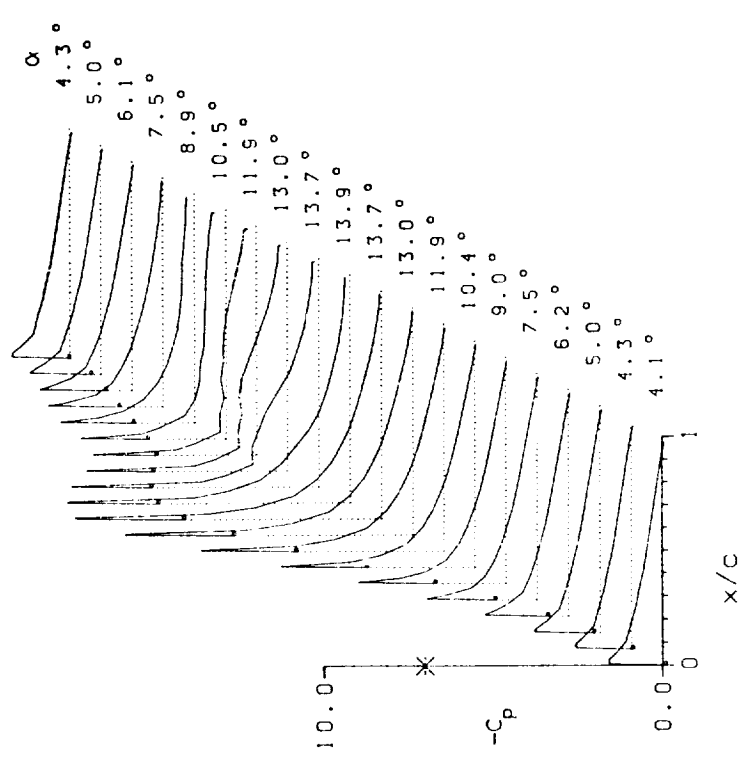
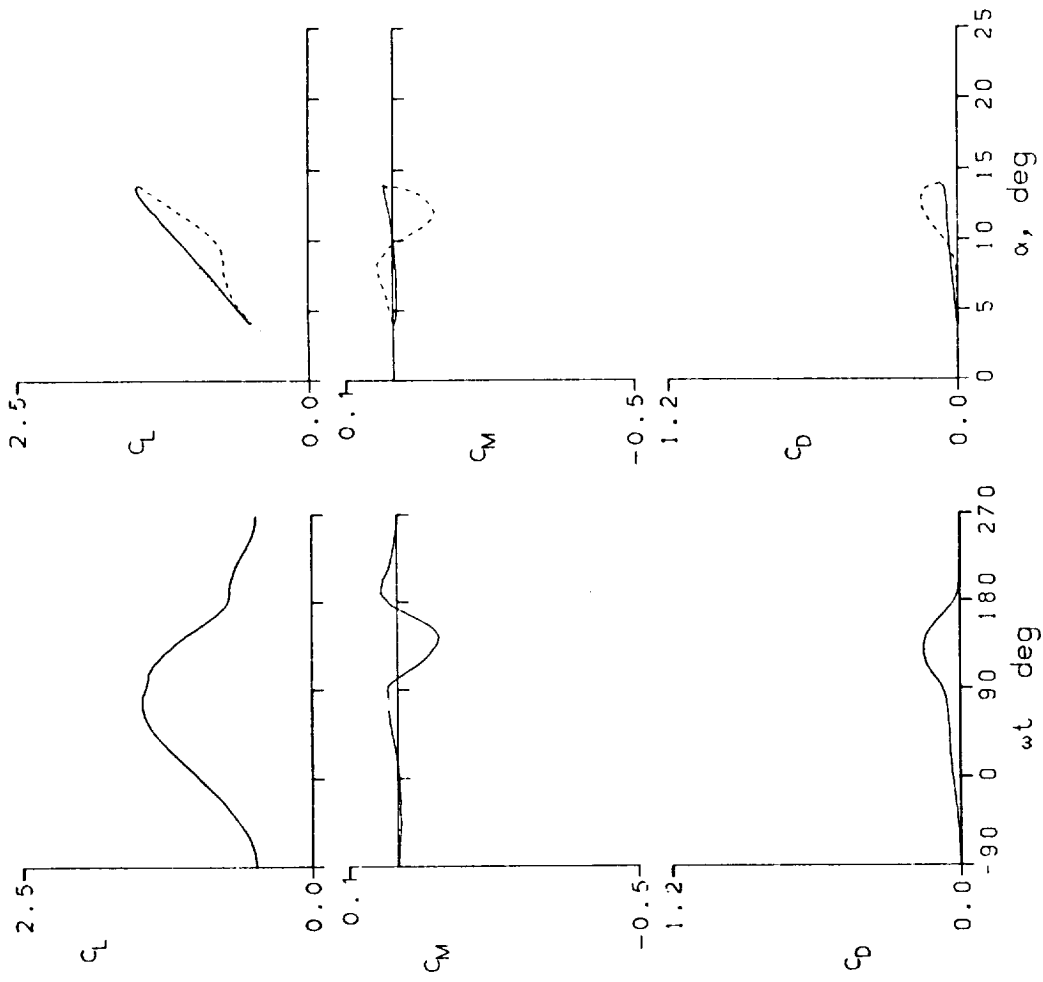


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7023 A0 = 8.99° k = 0.201
 Re = 3.94 E6 A1 = 4.91° M = 0.299
 C_{Lmax} = 1.59 C_{Mmin} = -0.05 C_{Dmax} = 0.15
 α_{Lmax} = 13.9° ζ = 0.226 M_{max} = 1.246
 α_{Cmin} = 8.8° -C_{pmax} = 9.1 α_{Mmax} = 13.6°

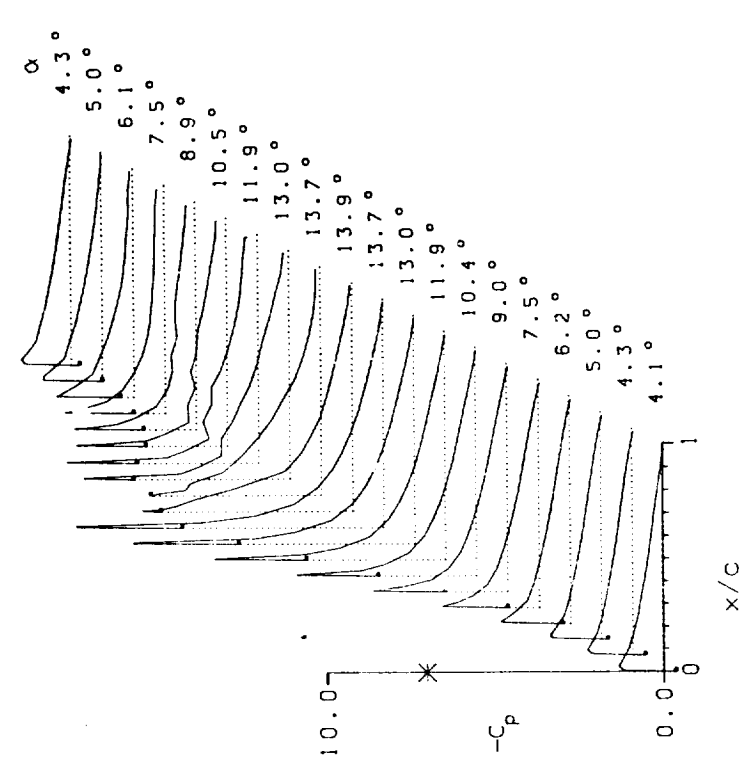
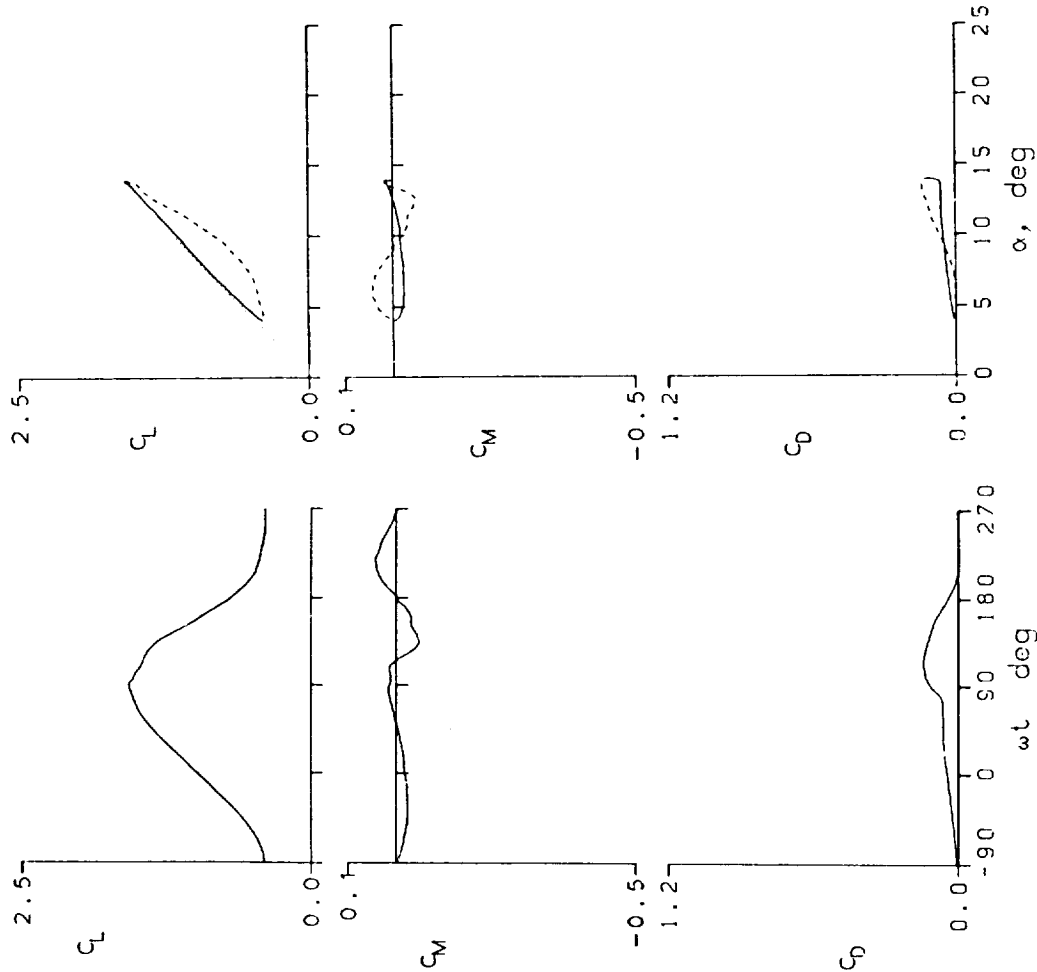


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7101 A0 = 8.99° k = 0.150
 Re = 3.91 E6 A1 = 4.91° M = 0.301
 CLmax = 1.52 CMmin = -0.05 CDmax = 0.12
 α Lmax = 13.9° ξ = 0.076 Mmax = 1.245
 α Cmin = 8.8° -CPmax = 9.2 α Mmax = 13.8°

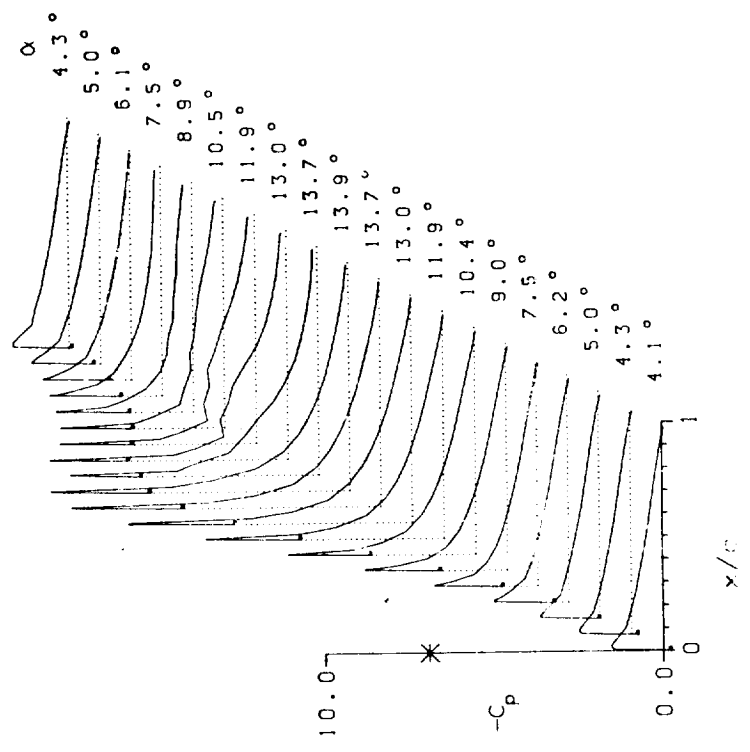
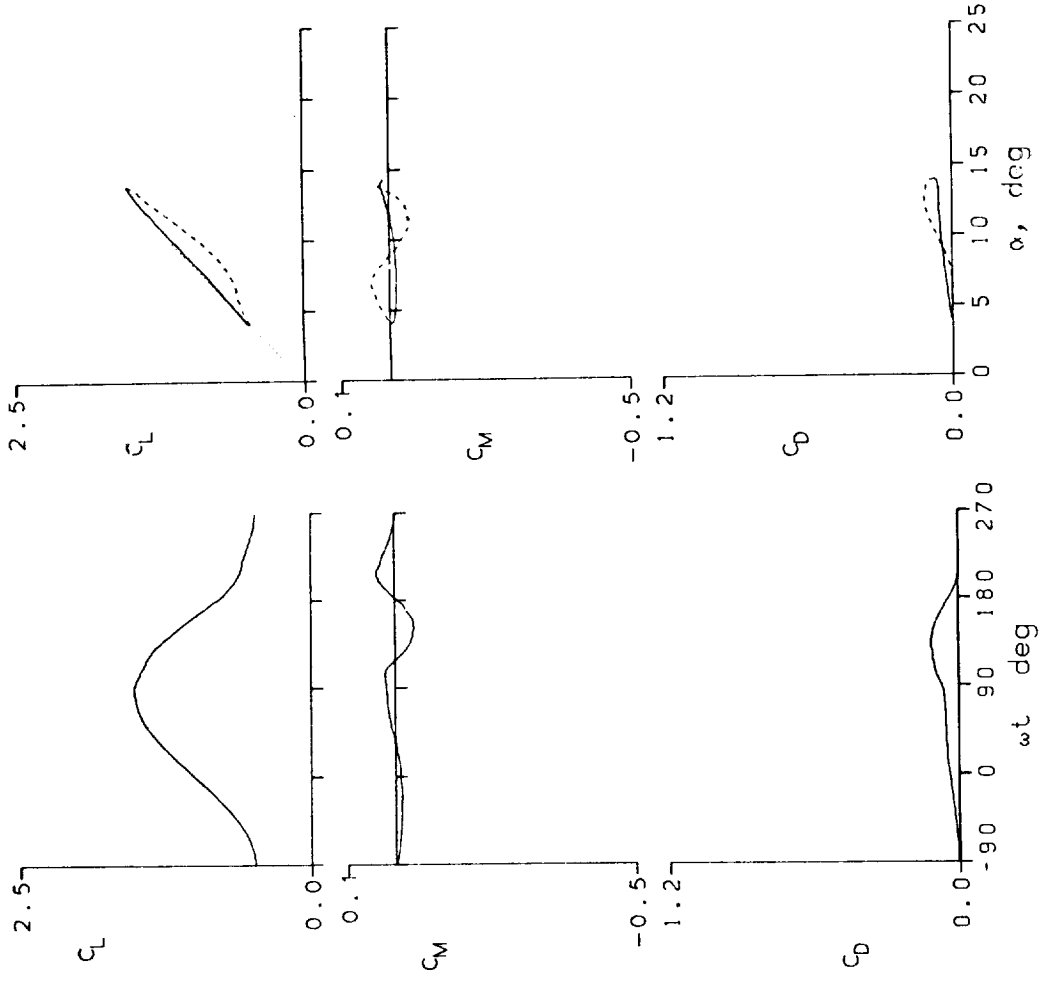


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7104 A0 = 8.97° k = 0.025
 Re = 3.90 E6 A1 = 4.90° M = 0.301
 C_{Lmax} = 1.41 C_{Mmin} = -0.01 C_{Dmax} = 0.05
 α_{Lmax} = 13.2° ζ = 0.067 M_{max} = 1.215
 α_{Cmin} = 8.8° -C_{Pmax} = 9.0 α_{Mmax} = 13.8°

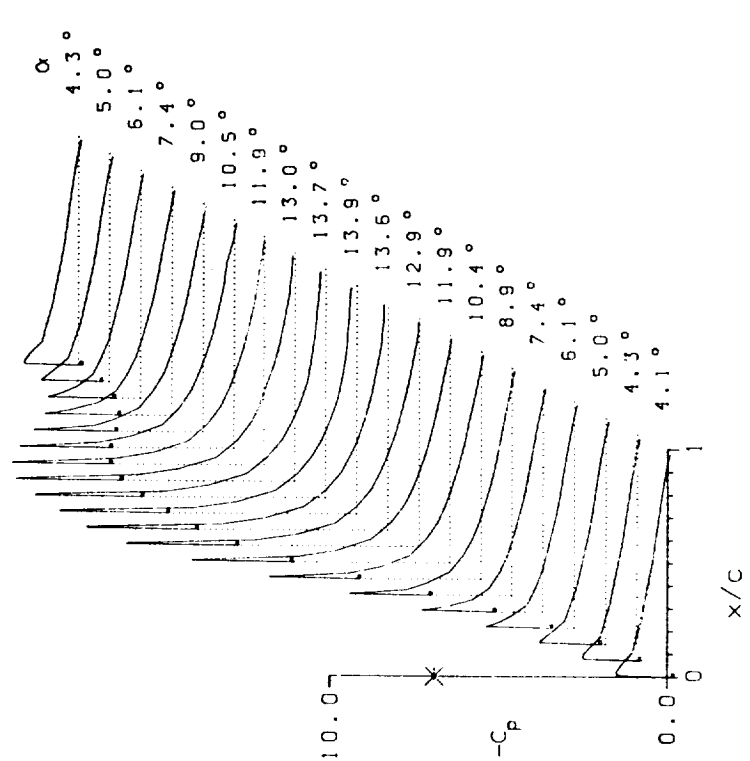
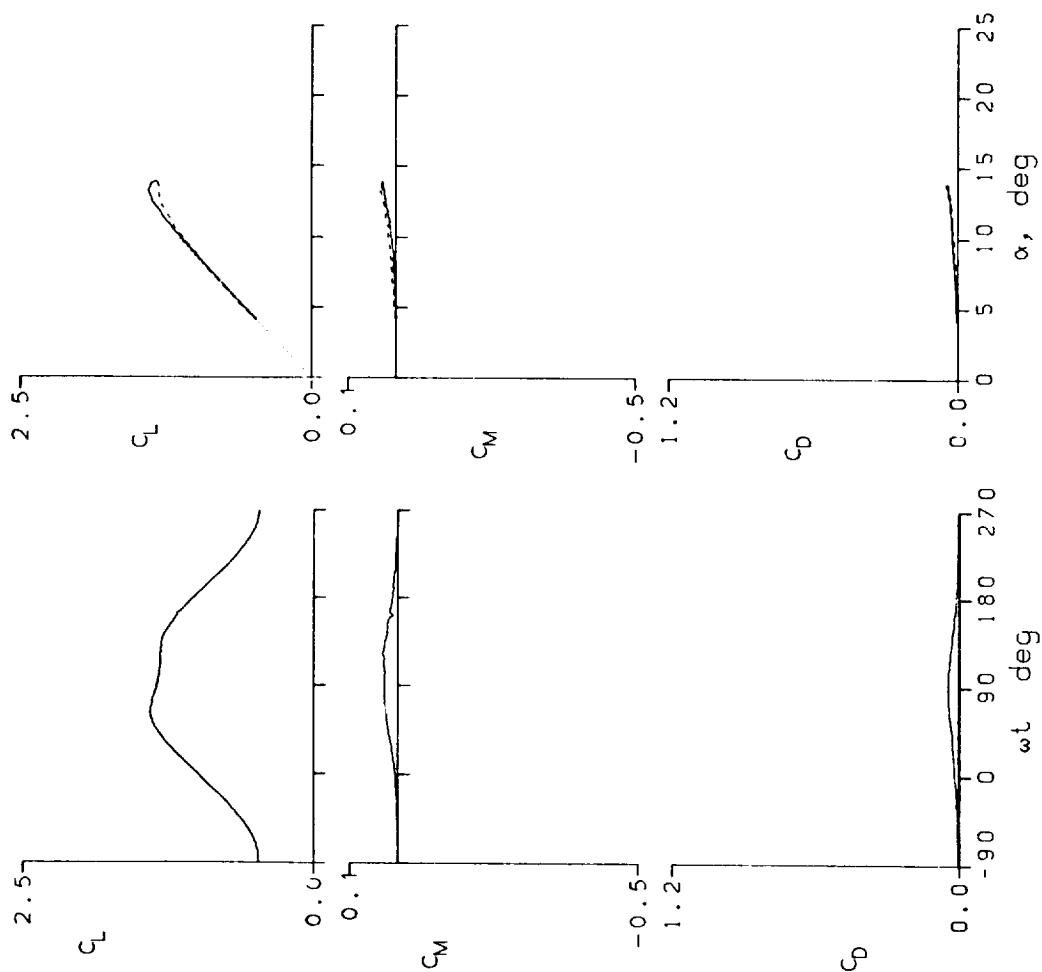


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7108	A0 = 7.97 °	k = 0.025
Re = 3.92 E6	A1 = 4.90 °	M = 0.301
CLmax = 1.37	CMmin = 0.00	CDmax = 0.03
α Lmax = 12.8 °	ξ = 0.073	Mmax = 1.187
α Cmin = 7.8 °	-CPmax = 8.7	α Mmax = 12.9 °

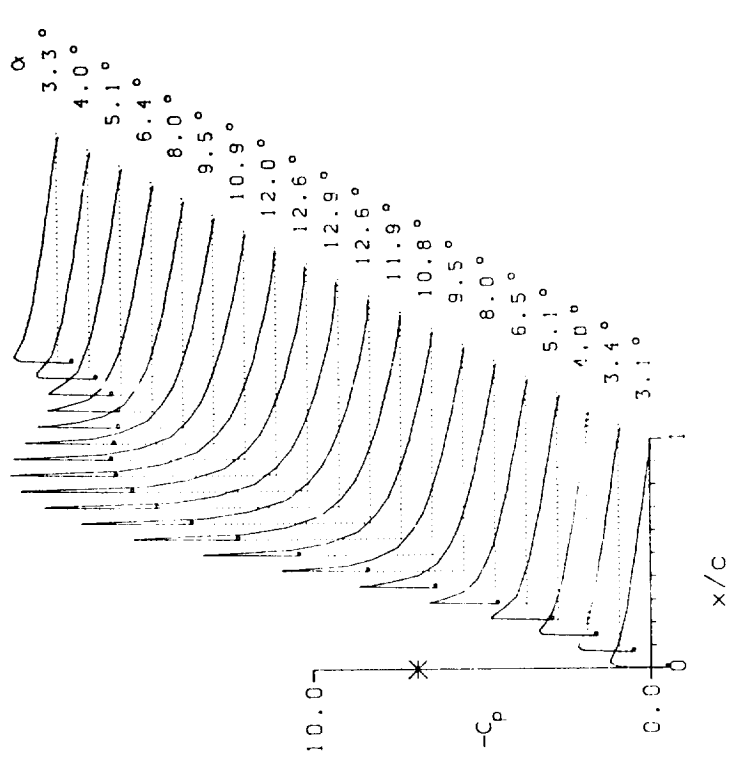
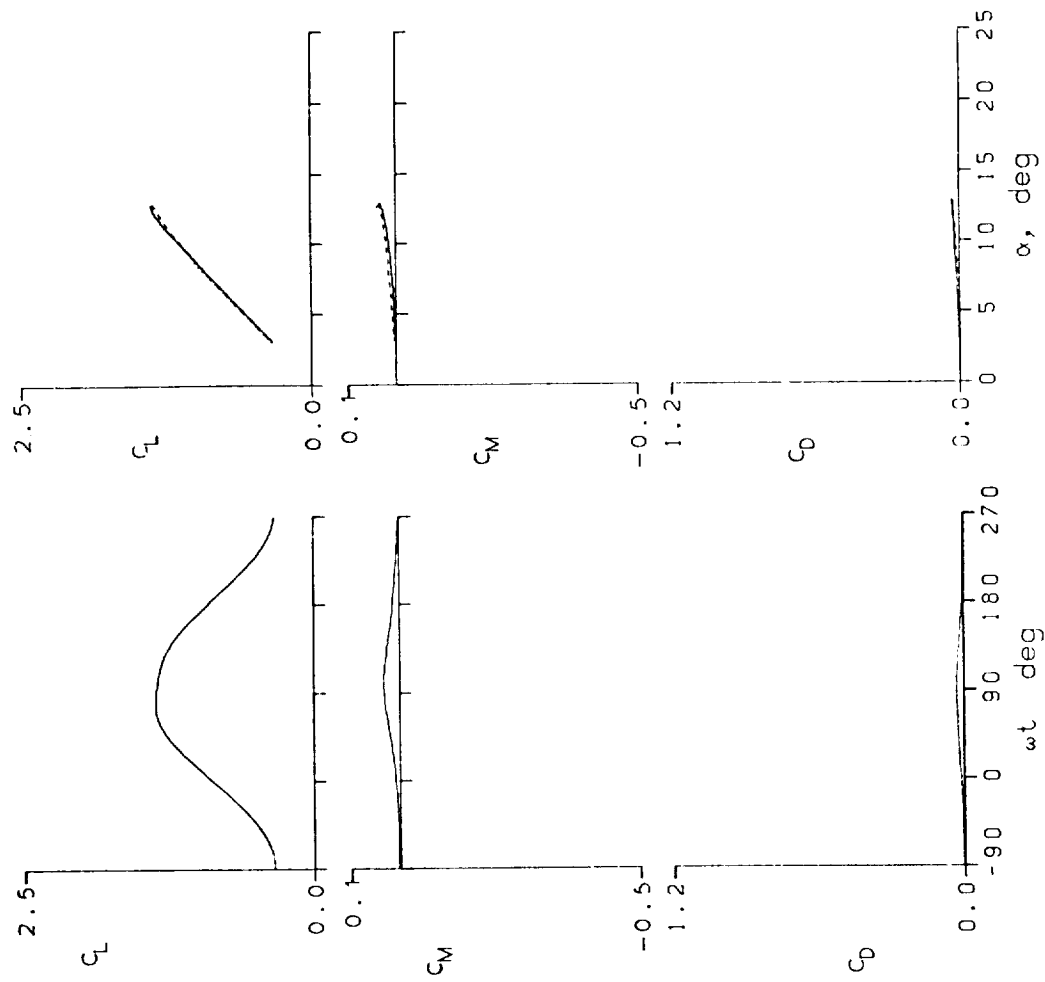


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 71:0 A0 = 7.96° k = 0.100
 Re = 3.90 E6 A1 = 4.90° M = 0.301
 $C_{Lmax} = 1.41$ $C_{Mmin} = -0.01$ $C_{Dmax} = 0.04$
 $\alpha_{Lmax} = 12.8^\circ$ $\zeta = 0.306$ $M_{max} = 1.200$
 $\alpha_{Cmin} = 7.7^\circ$ $-C_{Pmax} = 8.8$ $\alpha_{Mmax} = 12.9^\circ$

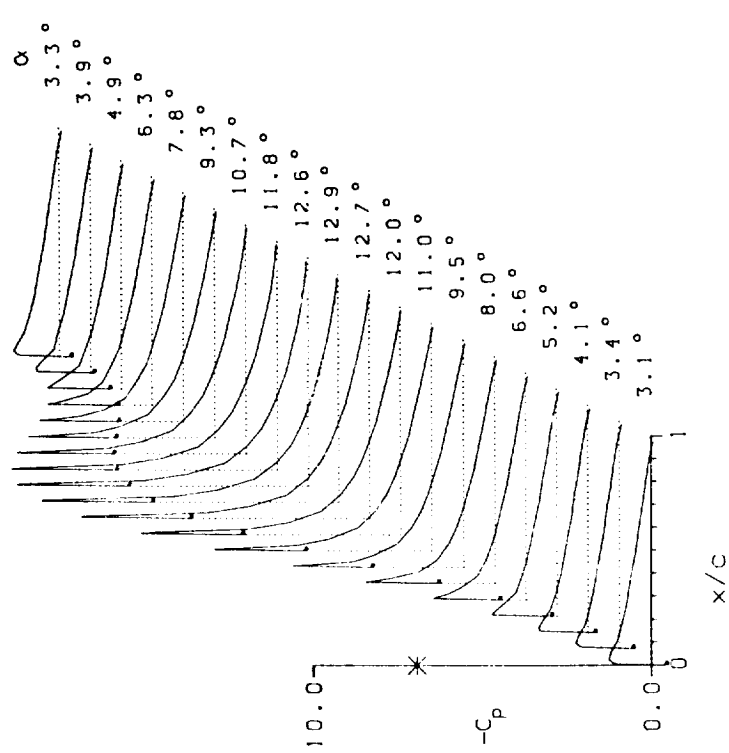
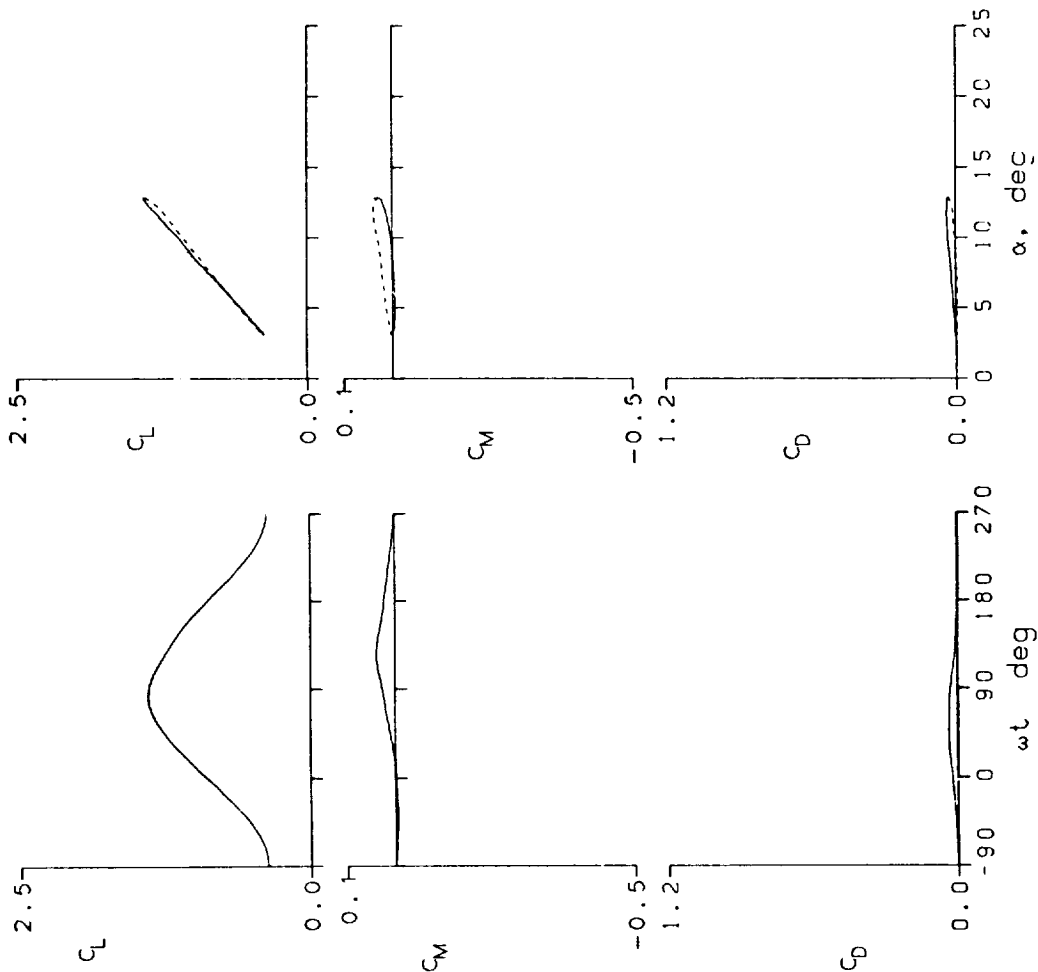


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7111 A0 = 7.97 ° k = 0.199
 Re = 3.89 E6 A1 = 4.91 ° M = 0.301
 $C_{Lmax} = 1.45$ $C_{Mmin} = -0.03$ $C_{Dmax} = 0.05$
 $\alpha_{Lmax} = 12.9 °$ $\zeta = 0.706$ $M_{max} = 1.232$
 $\alpha_{Cmin} = 7.7 °$ $-C_{Pmax} = 9.1$ $\alpha_{Mmax} = 12.9 °$

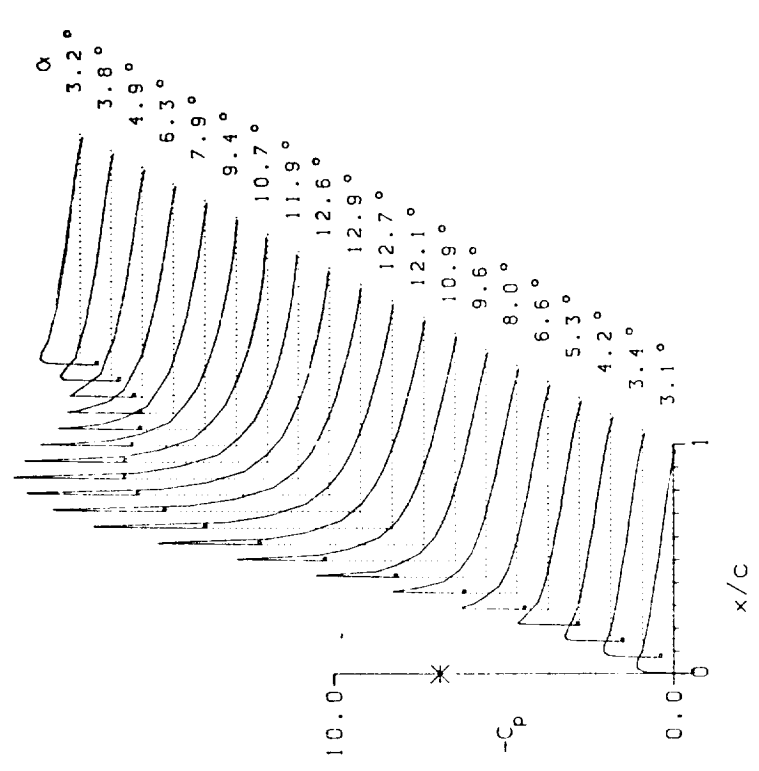
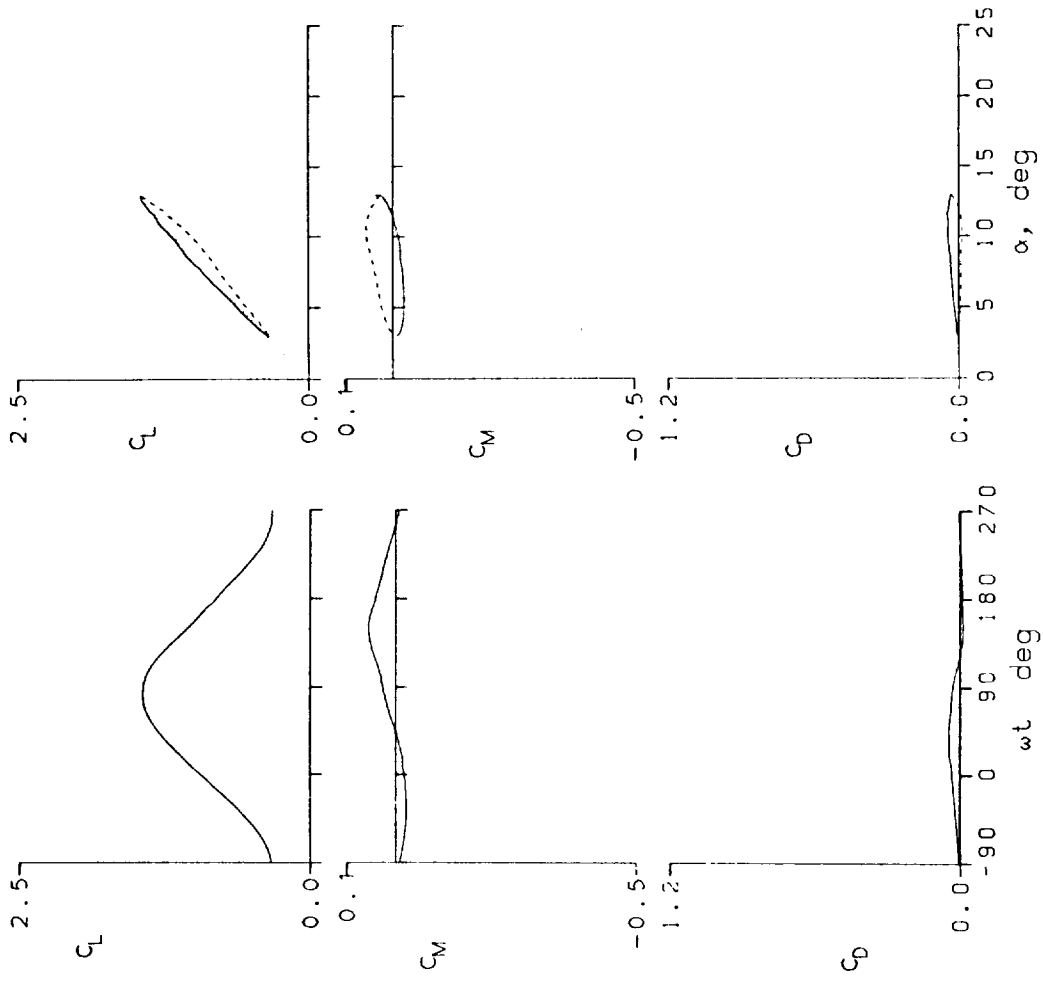


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7112 A0 = 9.97° k = 0.025
 Re = 3.88 E6 A1 = 4.90° M = 0.301
 C_{Lmax} = 1.42 C_{Mmin} = -0.10 C_{Dmax} = 0.18
 α_{Lmax} = 13.5° ζ = -0.110 M_{max} = 1.222
 α_{Cmin} = 9.8° -C_{Pmax} = 9.0 α_{Mmax} = 13.8°

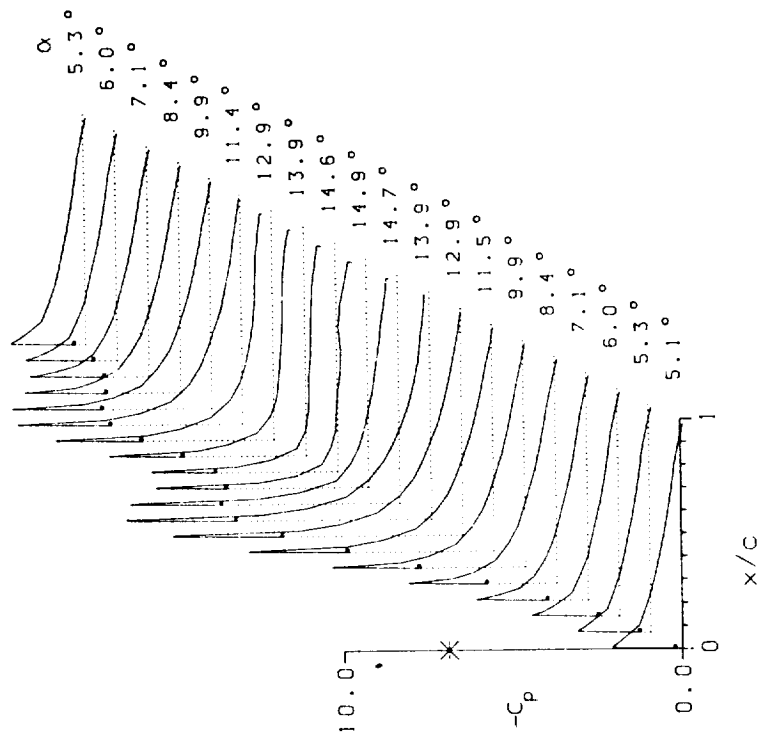
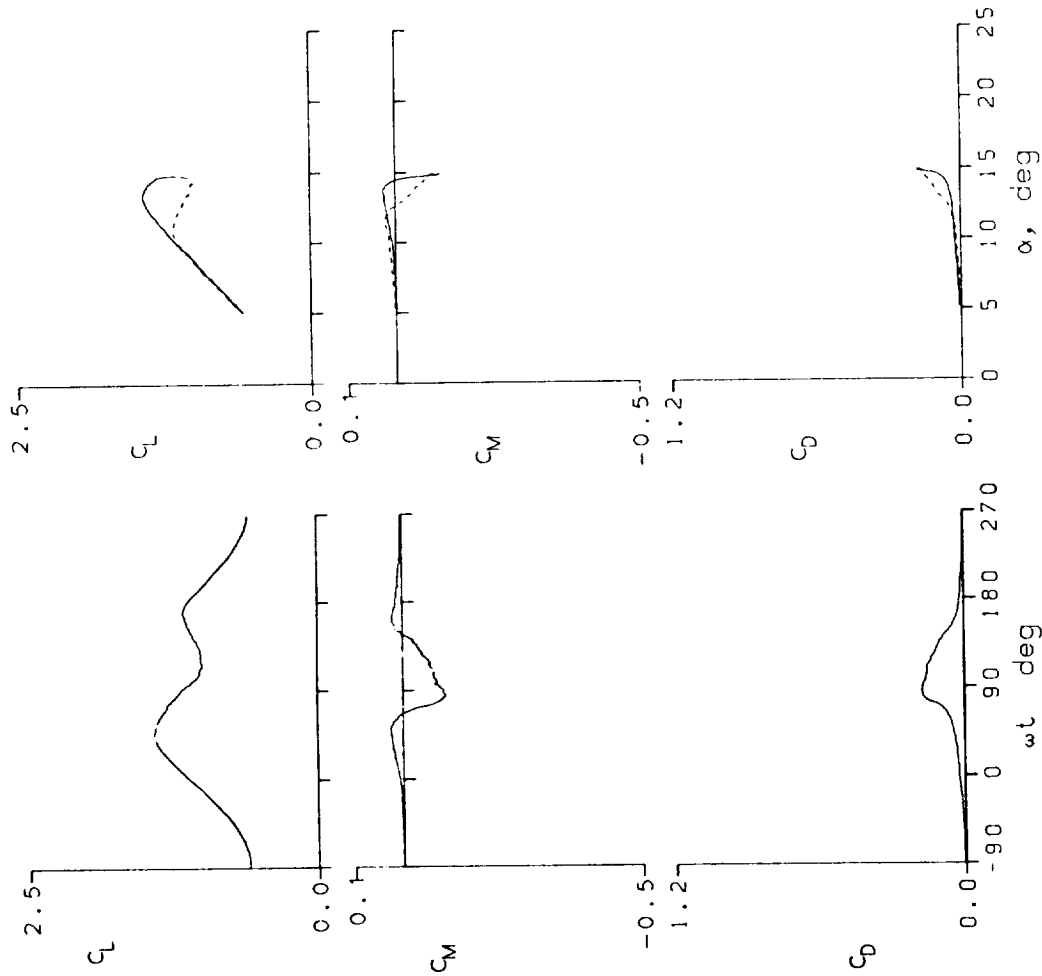


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7113 A0 = 9.95° k = 0.099
 Re = 3.88 E6 A1 = 4.91° M = 0.301
 CLmax = 1.54 CMmin = -0.08 CDmax = 0.24
 αLmax = 14.3° ζ = -0.032 Mmax = 1.230
 αCmin = 9.7° -CDmax = 9.1 αMmax = 13.8°

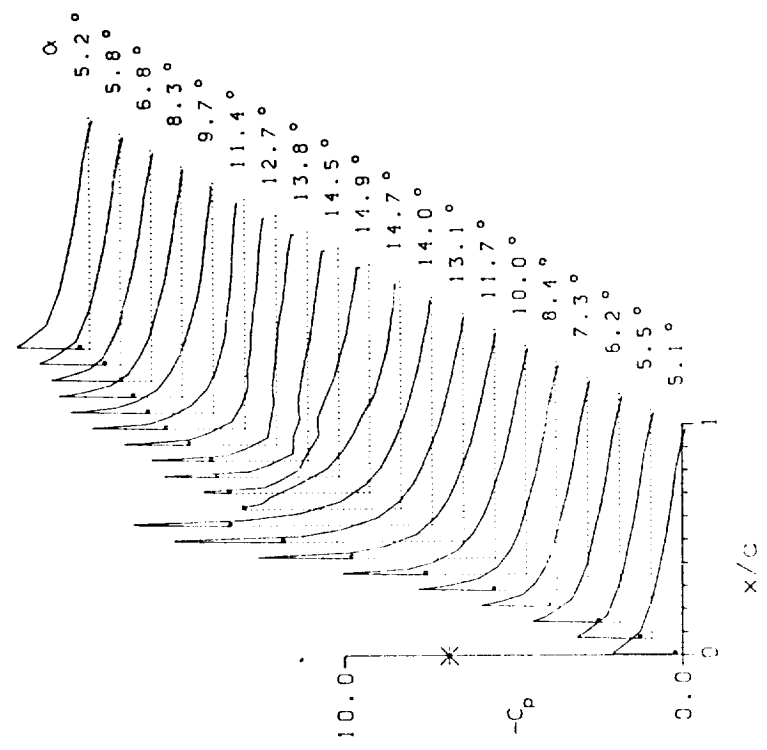
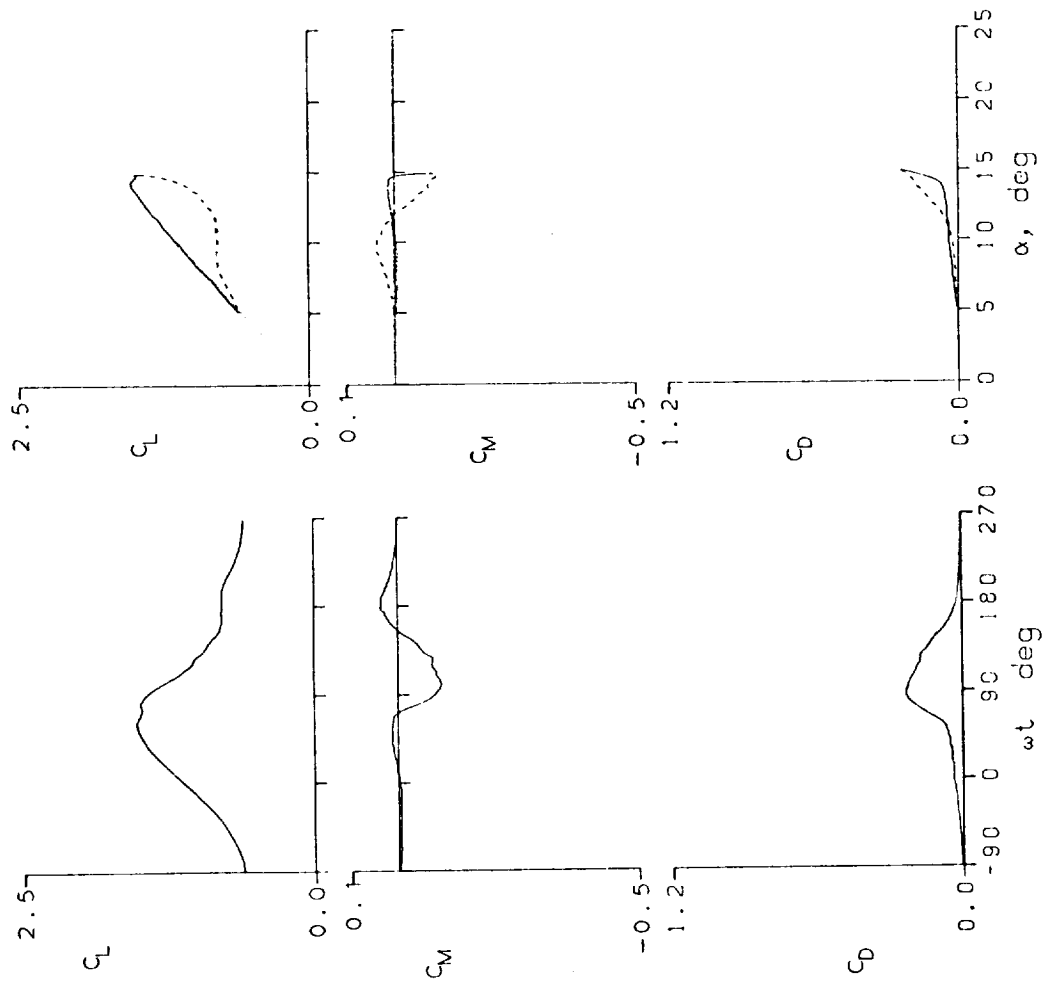


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7114 A0 = 9.91° k = 0.199
 Re = 3.87 E6 A1 = 4.93° M = 0.101
 C_{Lmax} = 1.65 C_{Mmin} = -0.17 C_{Dmax} = 0.33
 α_{Lmax} = 14.4° ζ = 0.073 M_{max} = 1.227
 α_{Cmin} = 9.7° -C_{pmax} = 9.1 α_{Mmax} = 13.8°

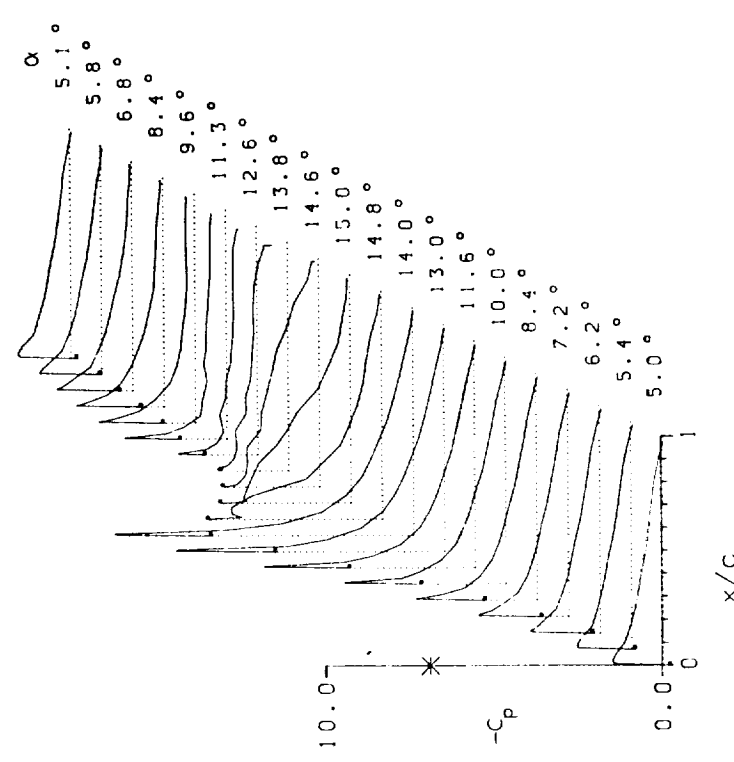
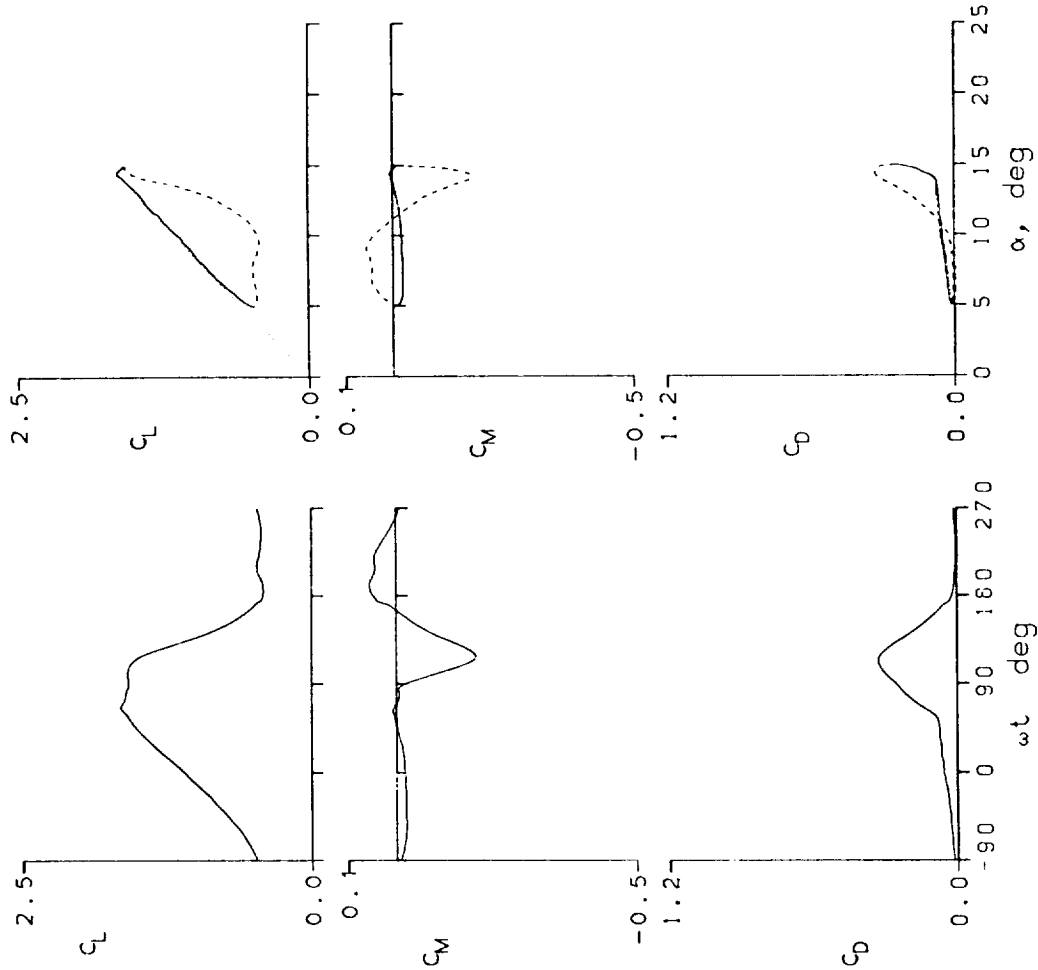


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7117 A0 = 10.92° k = 0.025
 Re = 3.89 E6 A1 = 4.90° M = 0.301
 CLmax = 1.42 CMmin = -0.12 CDmax = 0.22
 αLmax = 13.6° ζ = -0.201 Mmax = 1.218
 αCmin = 10.6° -CPmax = 9.0 αMmax = 14.0°

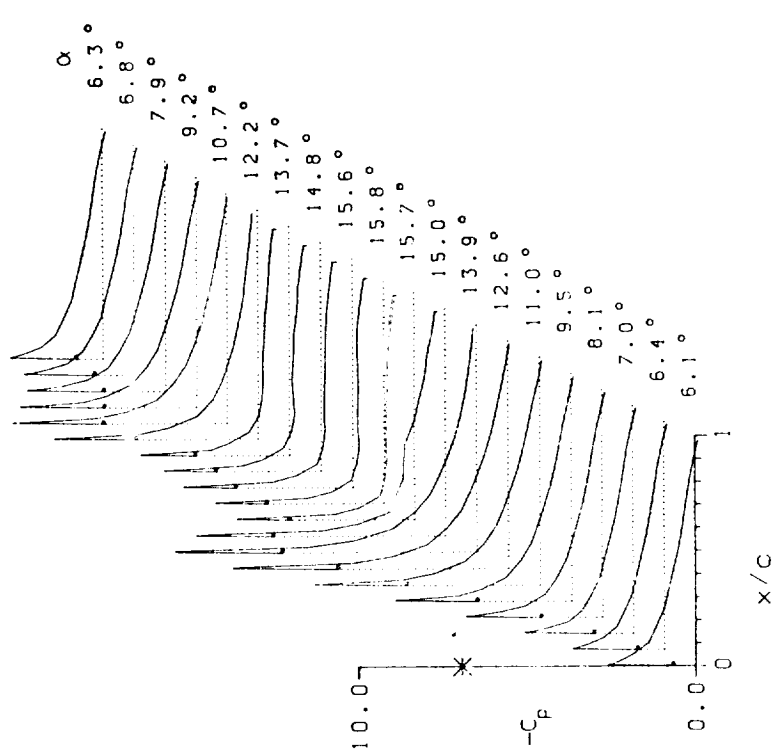
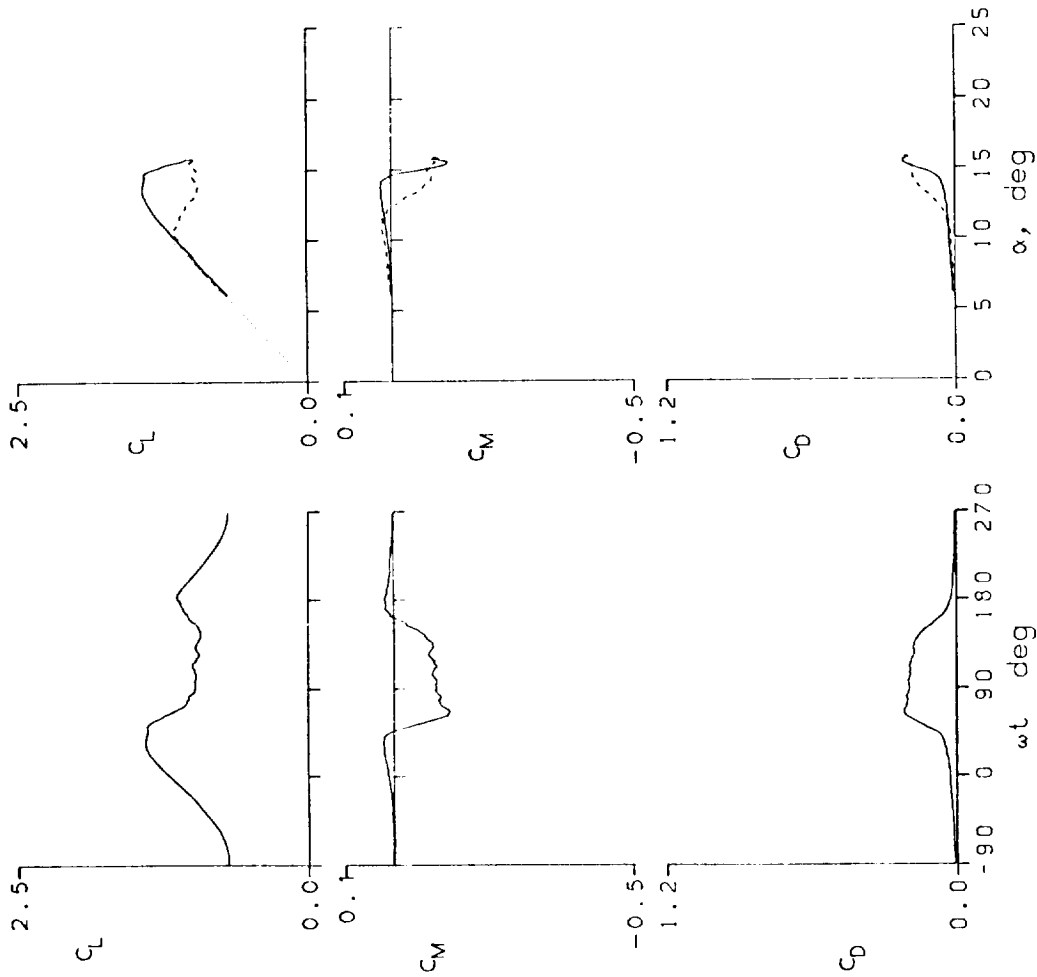


Figure 12.- Continued.

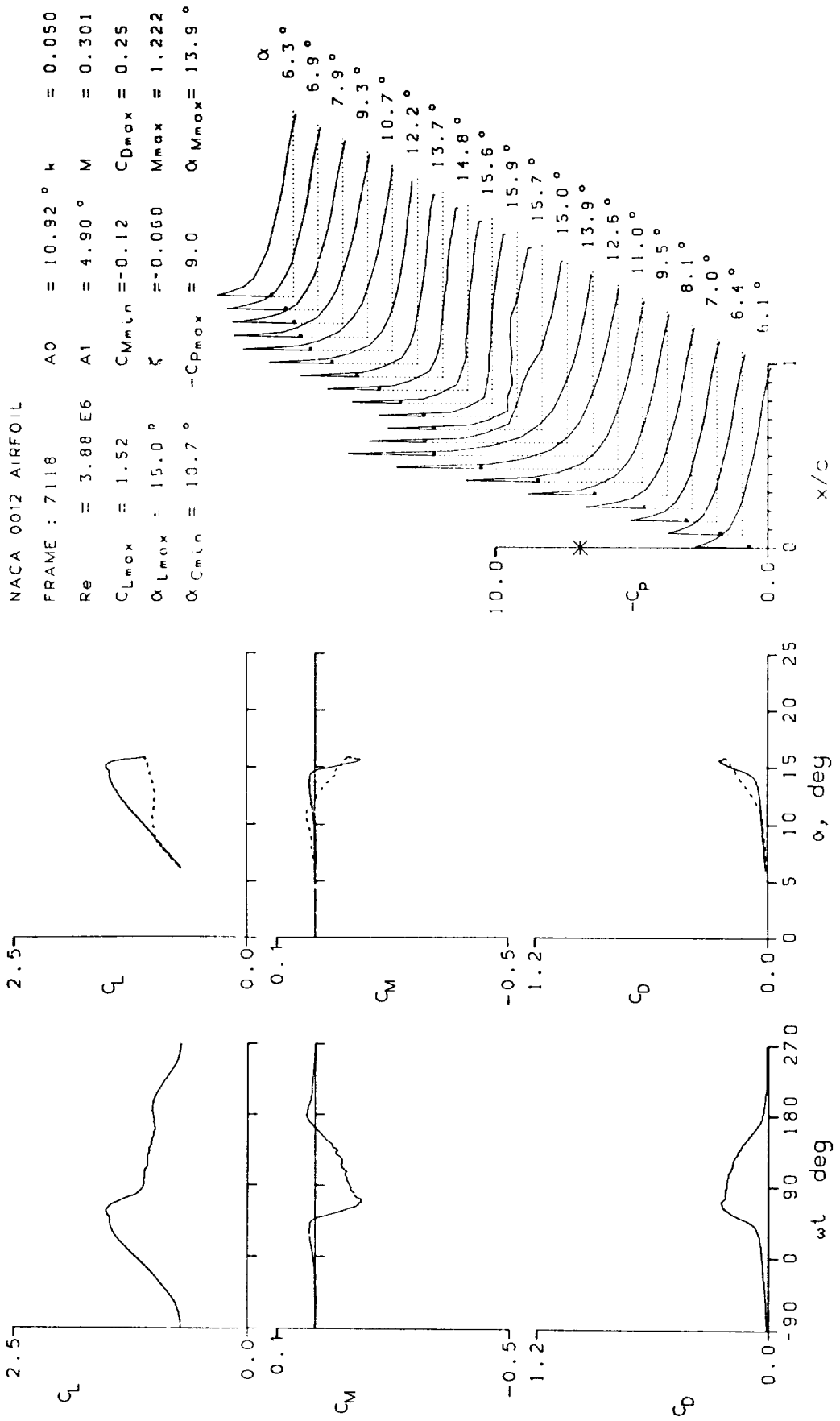


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7119 A0 = 10.92° k = 0.099
 Re = 3.87 E6 A1 = 4.89° M = 0.301
 $C_{Lmax} = 1.58$ $C_{Mmin} = -0.13$ $C_{Dmax} = 0.33$
 $\alpha_{Lmax} = 14.6^\circ$ $\xi = 0.017$ $M_{max} = 1.225$
 $\alpha_{Cmin} = 10.7^\circ$ $-C_{Dmax} = 9.0$ $\alpha_{Mmax} = 13.9^\circ$

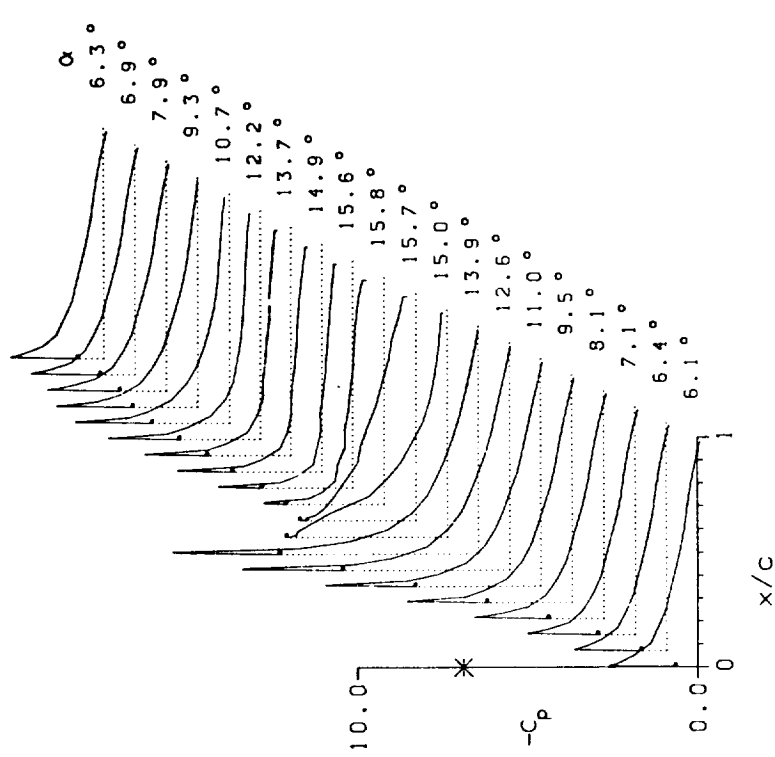
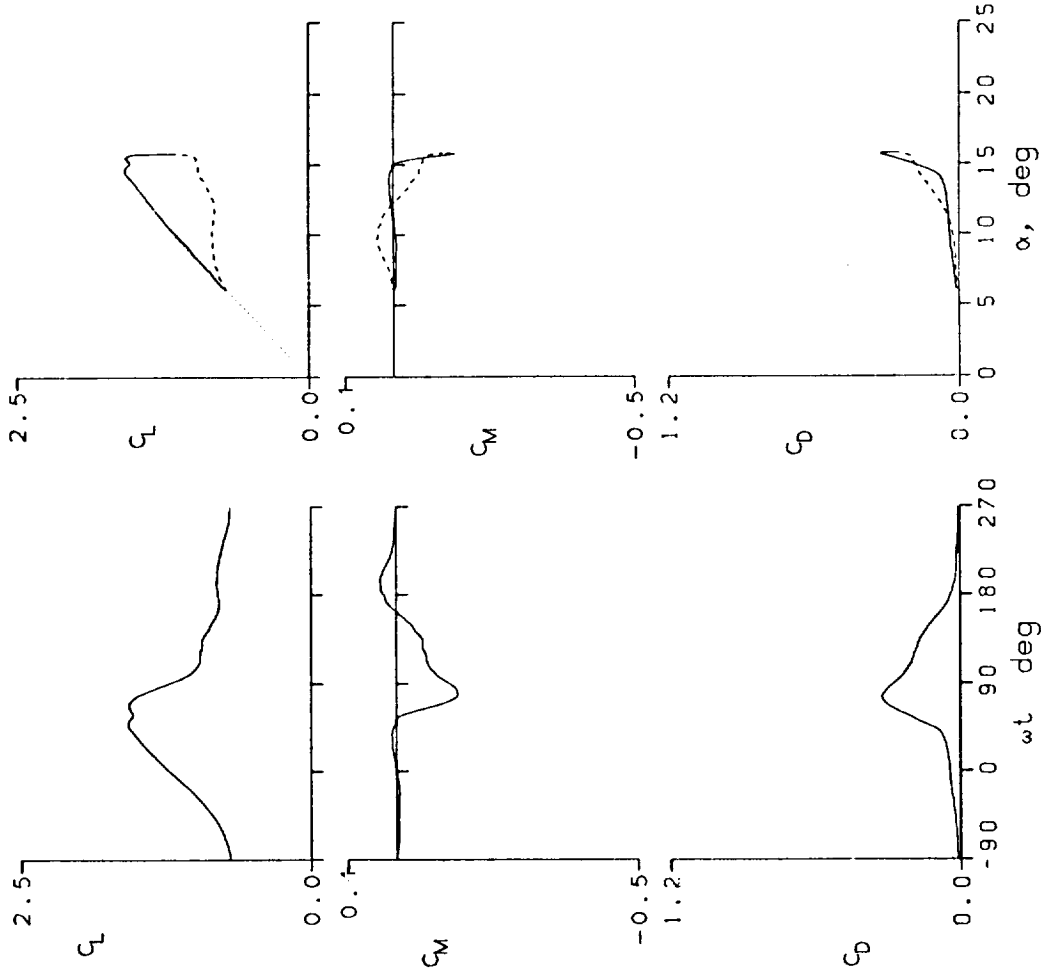
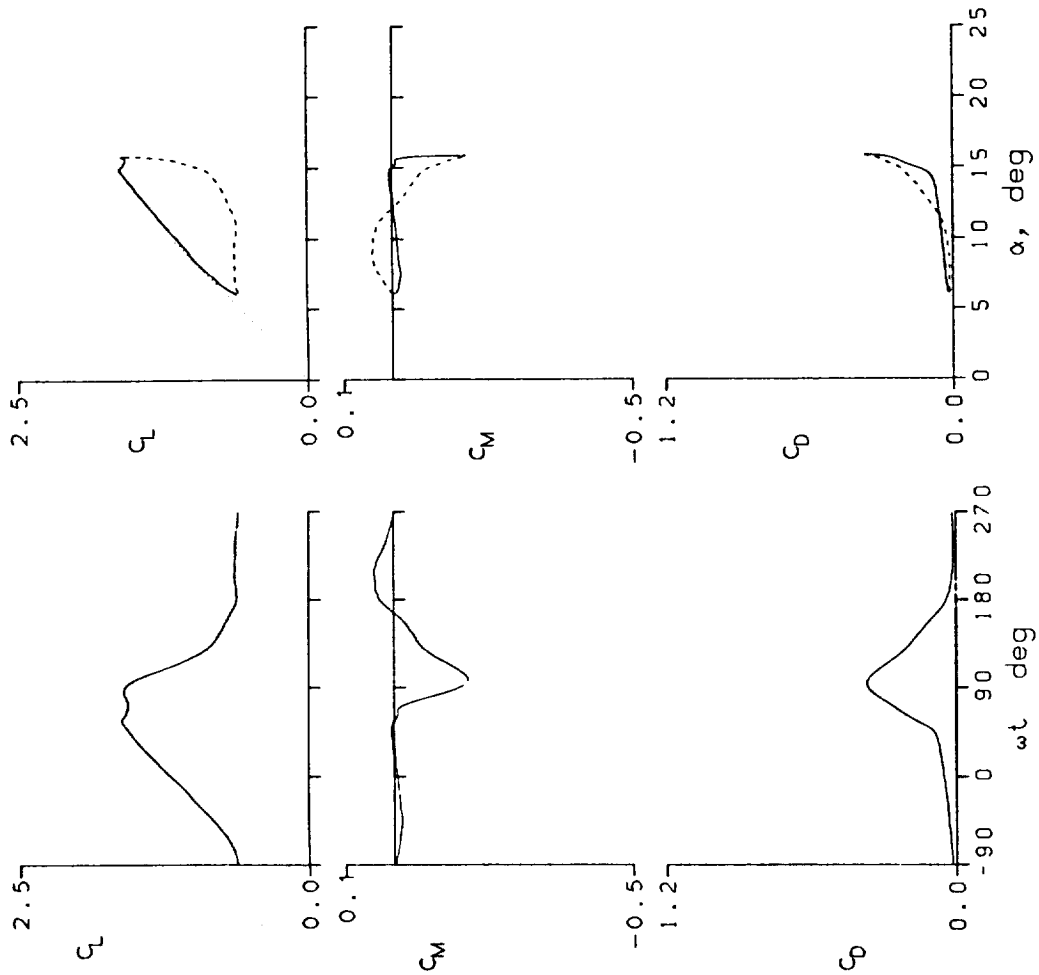


Figure 12.- Continued.



NACA 0012 AIRFOIL
 FRAME : 7120 A0 = 10.96° k = 0.149
 Re = 3.86 E6 A1 = 4.89° M = 0.301
 CLmax = 1.62 CMmin = -0.16 CDmax = 0.37
 αLmax = 15.0° ζ = 0.071 Mmax = 1.228
 αCmin = 10.8° -Cpmax = 9.1 αMmax = 14.1°

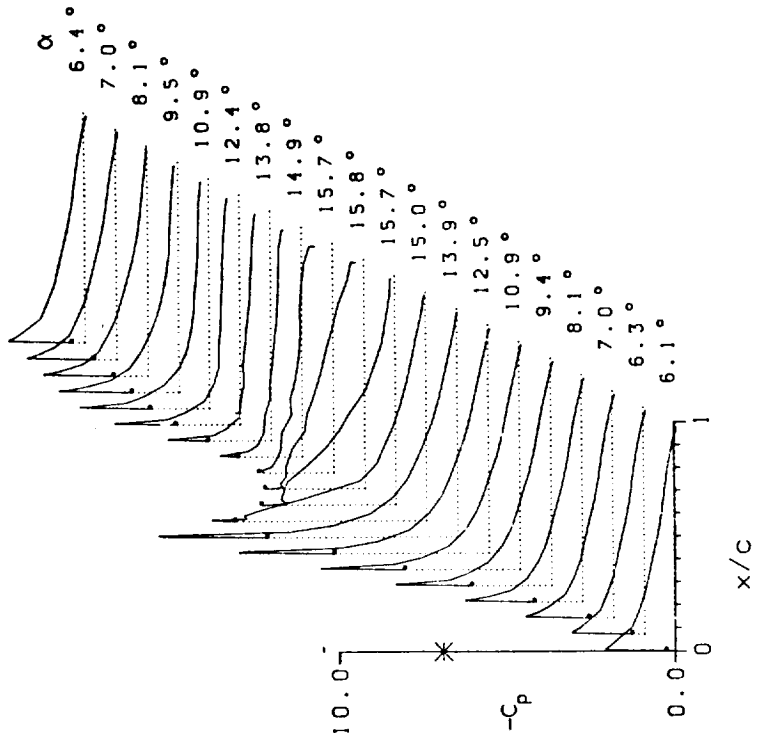


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7121 A0 = 10.88 ° k = 0.198
 Re = 3.85 E6 A1 = 4.90 ° M = 0.301
 C_{Lmax} = 1.71 C_{Mmin} = -0.24 C_{Dmax} = 0.43
 α_{Lmax} = 15.8 ° ζ = 0.118 M_{max} = 1.219
 α_{Cmin} = 10.5 ° -C_{Pmax} = 9.0 α_{Mmax} = 14.1 °

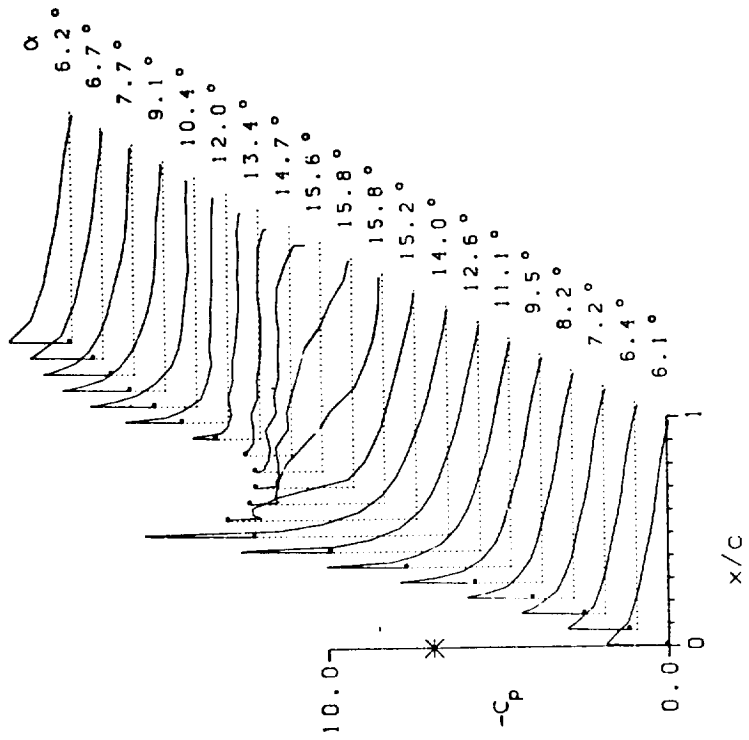
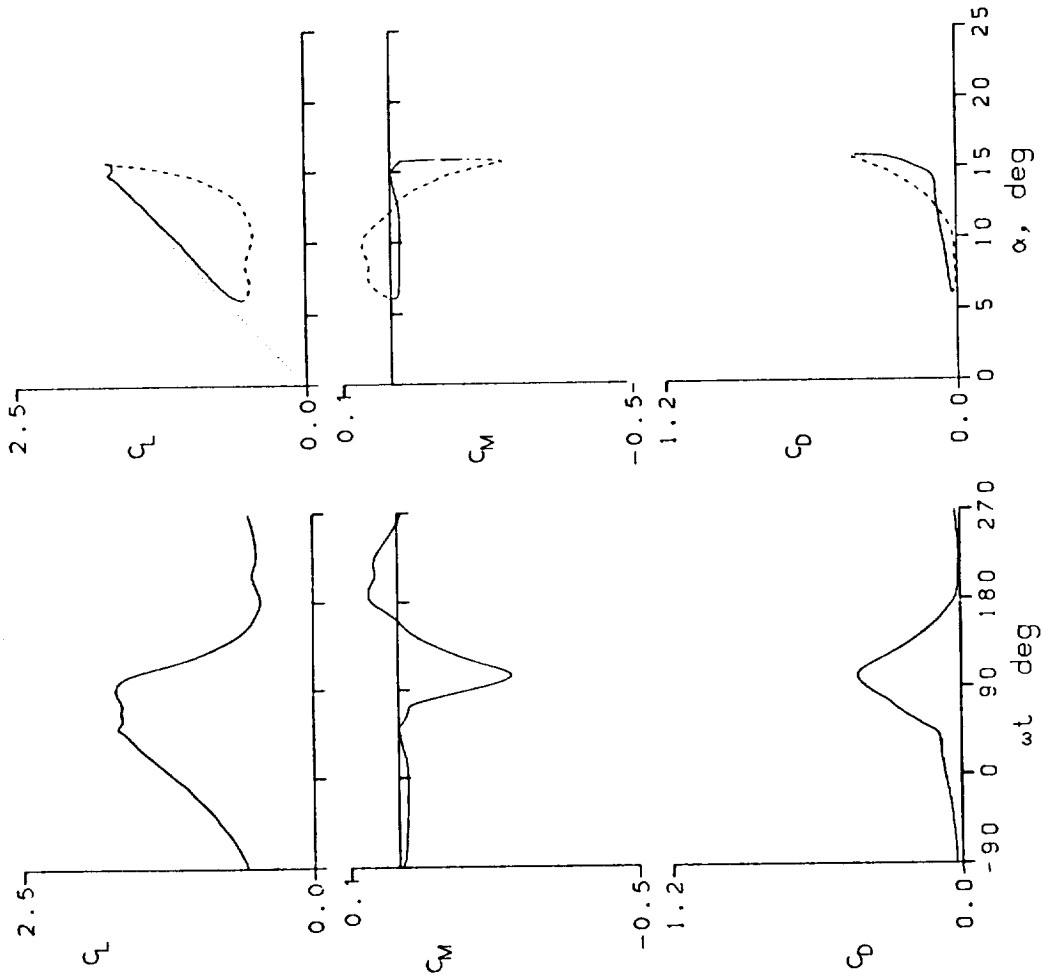


Figure 12.- Continued.

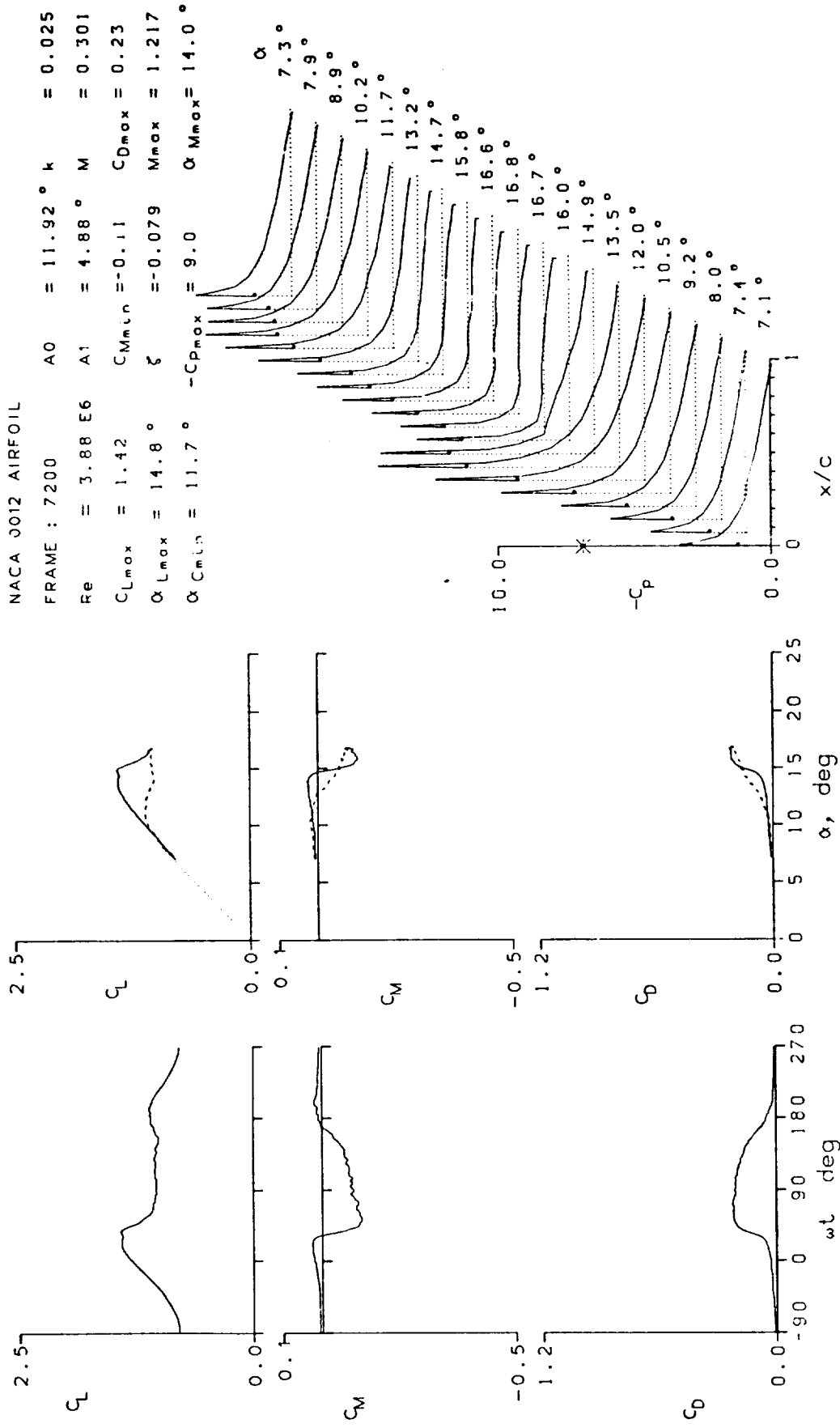
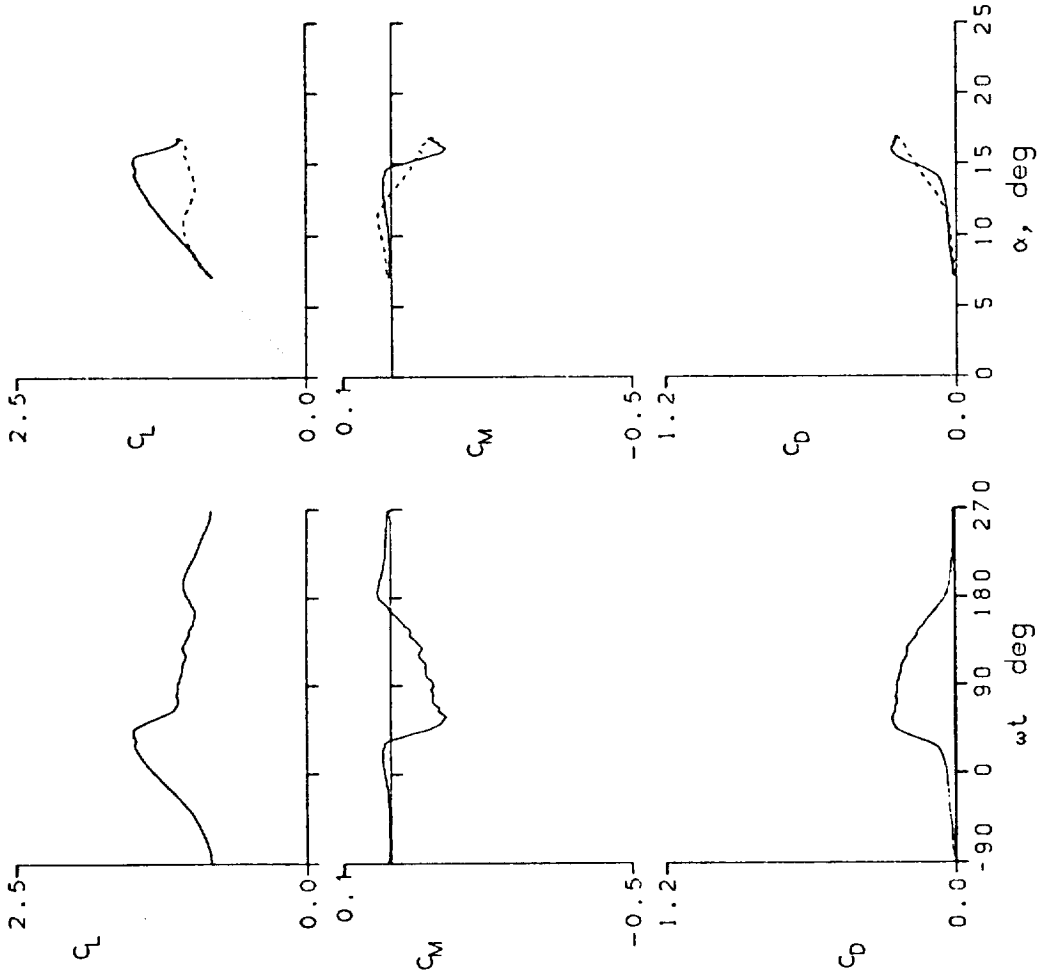


Figure 12.- Continued.



NACA 0012 AIRFOIL

FRAME : 7202 A0 = 11.93° k = 0.050
 Re = 3.86 E6 A1 = 4.89° M = 0.302
 CLmax = 1.50 CMmin = -0.12 CDmax = 0.27
 α Lmax = 15.1° ζ = 0.039 Mmax = 1.213
 α Cmin = 11.7° -CPmax = 8.9 α Mmax = 13.9°

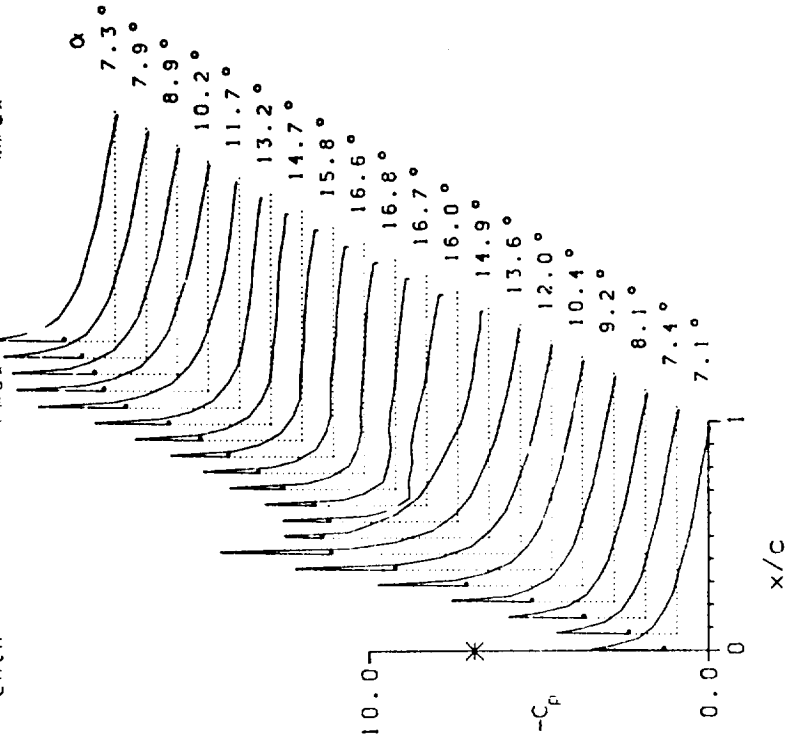


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7205 A0 = 11.92° k = 0.099
 Re = 3.85 E6 A1 = 4.90° M = 0.302
 C_{Lmax} = 1.61 C_{Mmin} = -0.17 C_{Dmax} = 0.39
 α_{Lmax} = 16.0° ζ = 0.101 M_{max} = 1.227
 α_{Cmin} = 11.7° -C_{pmax} = 9.1 α_{Mmax} = 13.9°

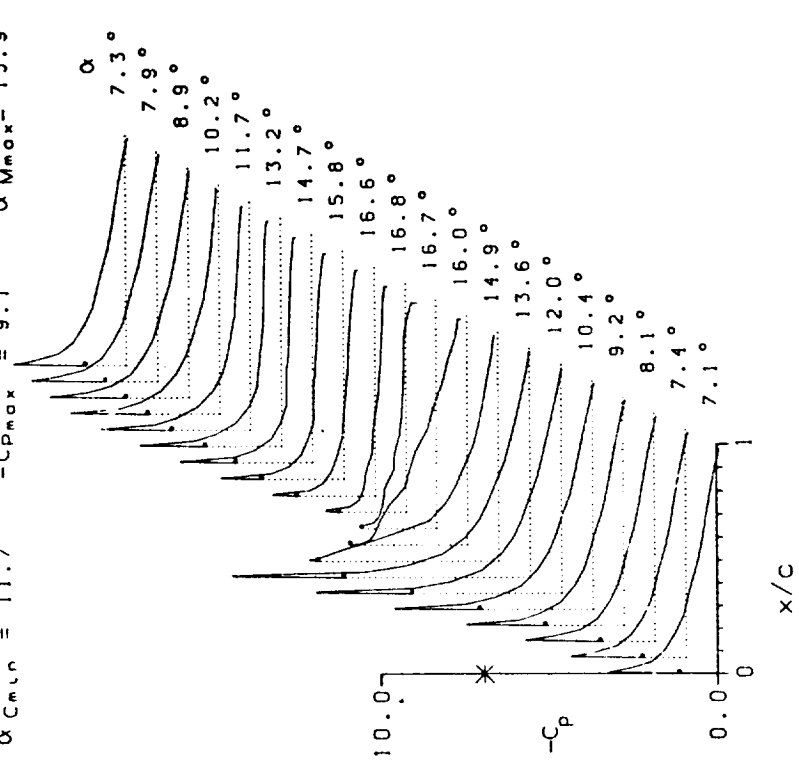
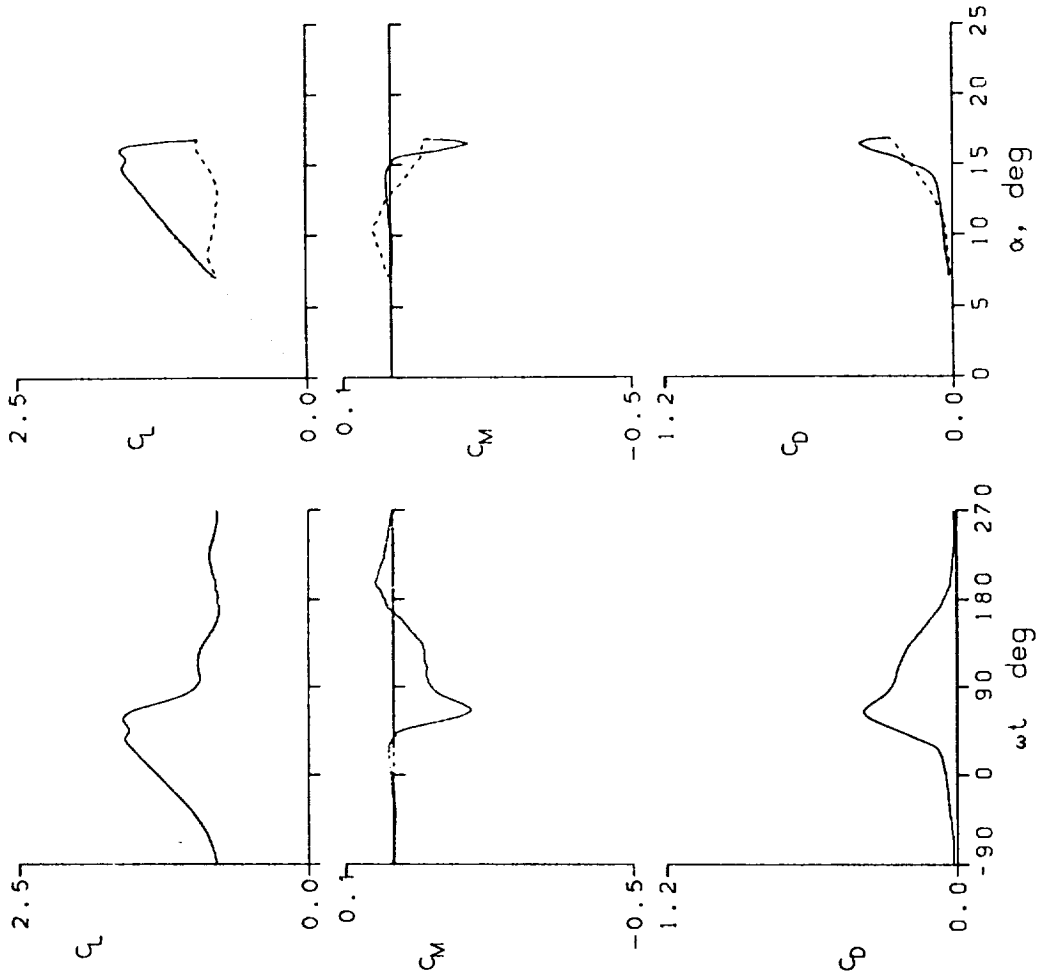


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7207 A0 = 11.88 ° k = 0.198
 Re = 3.85 E6 A1 = 4.90 ° M = 0.302
 $C_{Lmax} = 1.81$ $C_{Mmin} = -0.28$ $C_{Dmax} = 0.50$
 $\alpha_{Lmax} = 16.8^\circ$ $\zeta = 0.208$ $M_{max} = 1.221$
 $\alpha_{Cmin} = 11.5^\circ$ $-C_{Pmax} = 9.0$ $\alpha_{Mmax} = 14.4^\circ$

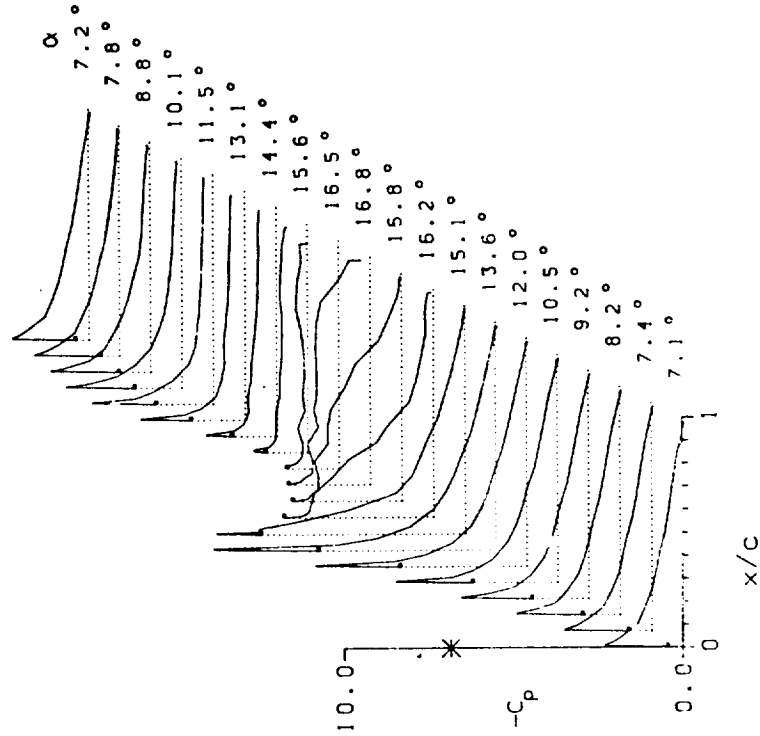
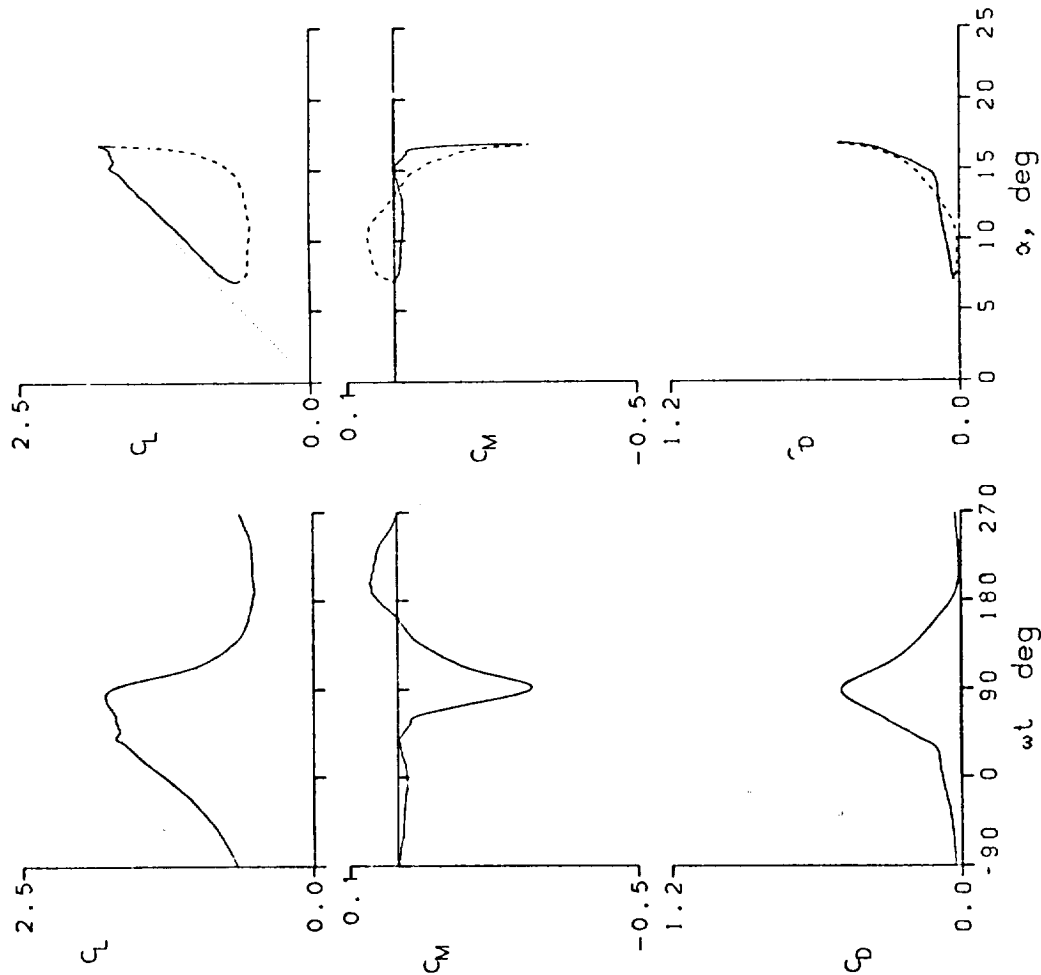


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7212	A0 = 8.71°	k = 0.149
Re = 3.86 E6	A1 = 4.90°	M = 0.302
CLmax = 1.49	CMmin = -0.02	CDmax = 0.07
αLmax = 13.7°	ξ = 0.325	Mmax = 1.231
αCmin = 8.4°	-CPmax = 9.1	αMmax = 13.6°

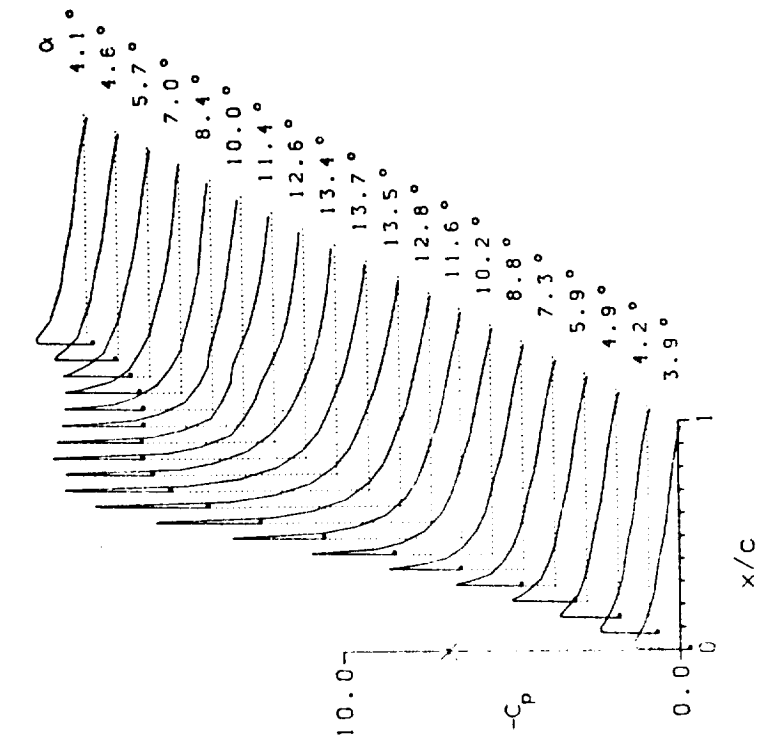
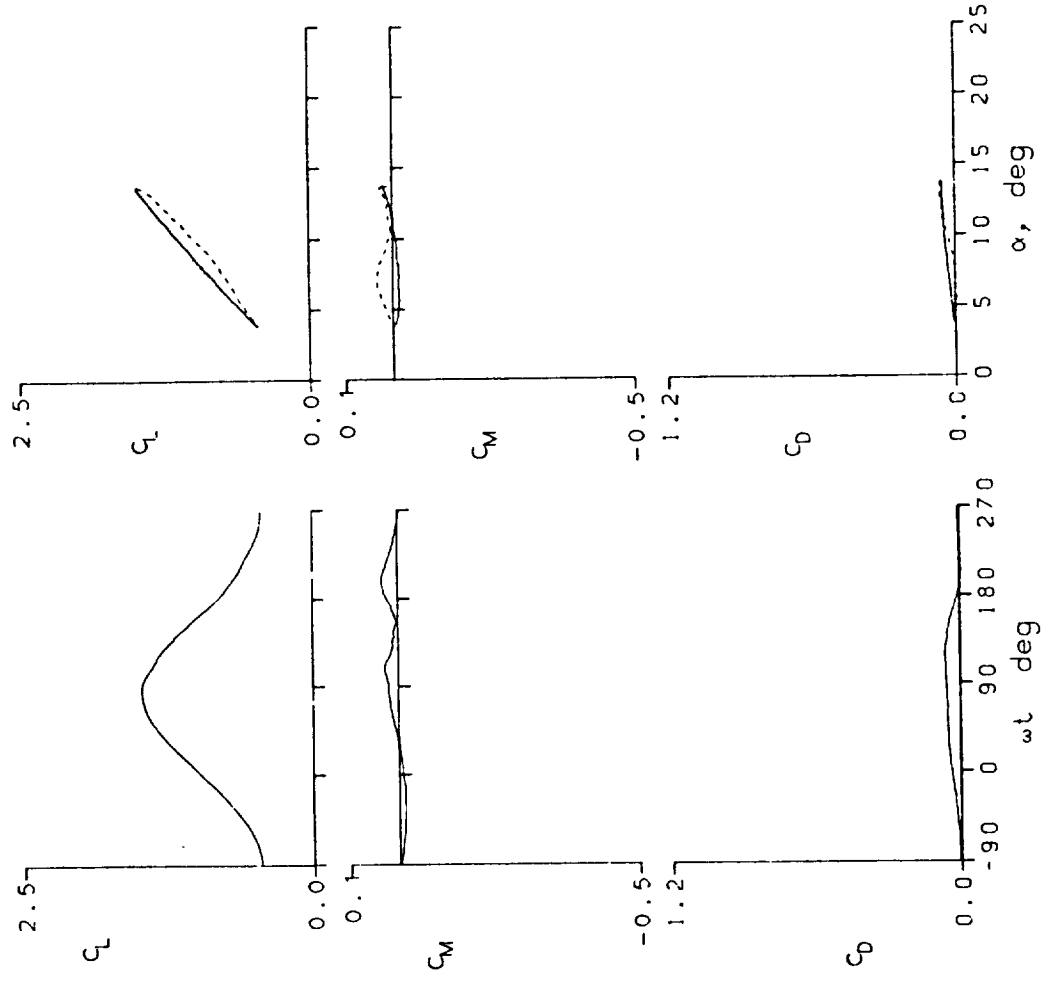


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7214 A0 = 8.71° k = 0.099
 Re = 3.86 E6 A1 = 4.90° M = 0.302
 $C_{Lmax} = 1.45$ $C_{Mmin} = -0.01$ $C_{Dmax} = 0.06$
 $\alpha_{Lmax} = 13.6^\circ$ $\zeta = 0.231$ $M_{max} = 1.224$
 $\alpha_{Cmin} = 8.4^\circ$ $-C_{Pmax} = 9.0$ $\alpha_{Mmax} = 13.7^\circ$

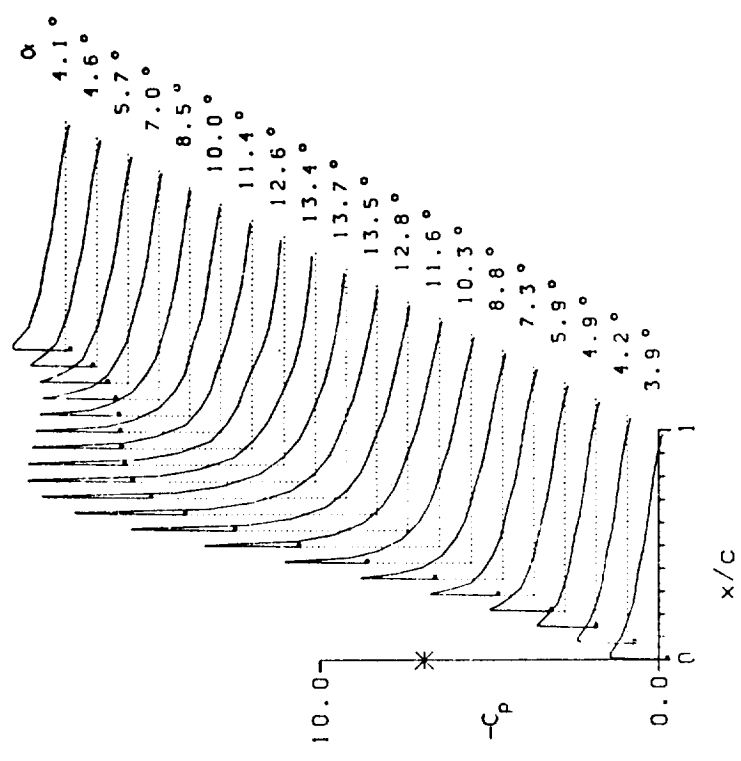
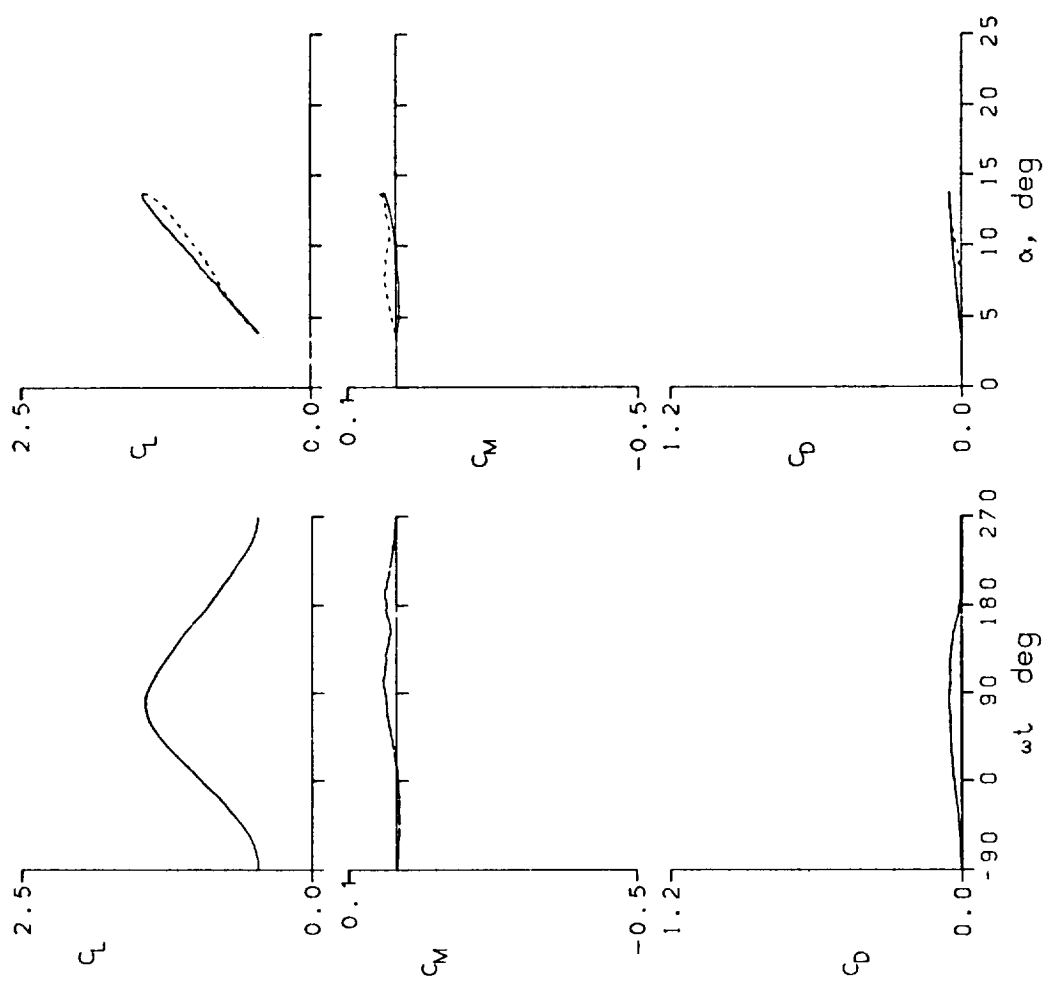


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 7216 A0 = 8.71° k = 0.050
 Re = 3.86 E6 A1 = 4.89° M = 0.302
 $C_{Lmax} = 1.42$ $C_{Mmin} = -0.01$ $C_{Dmax} = 0.05$
 $\alpha_{Lmax} = 13.4^\circ$ $\zeta = 0.165$ $M_{max} = 1.212$
 $\alpha_{Cmin} = 8.5^\circ$ $-C_{Pmax} = 8.9$ $\alpha_{Mmax} = 13.6^\circ$

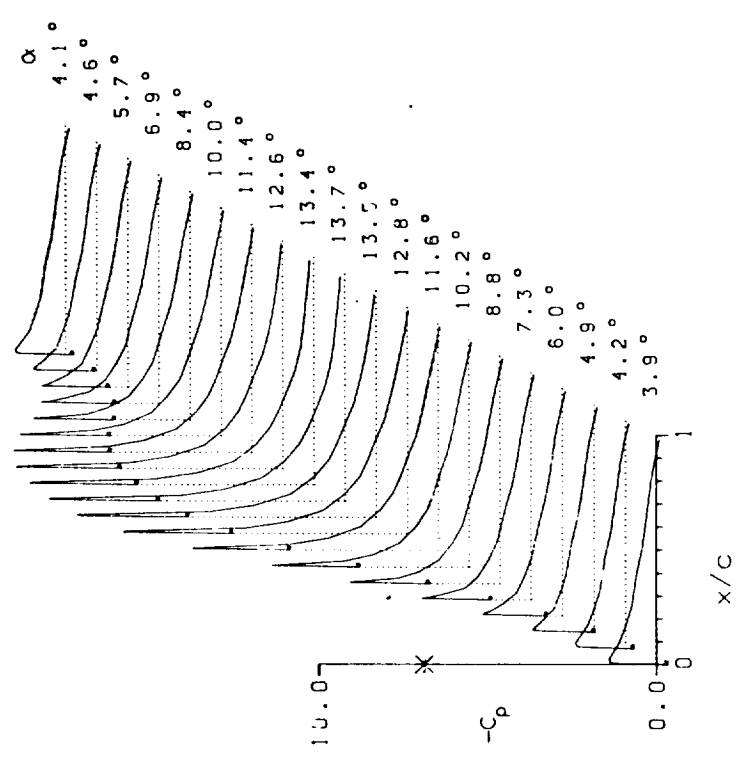
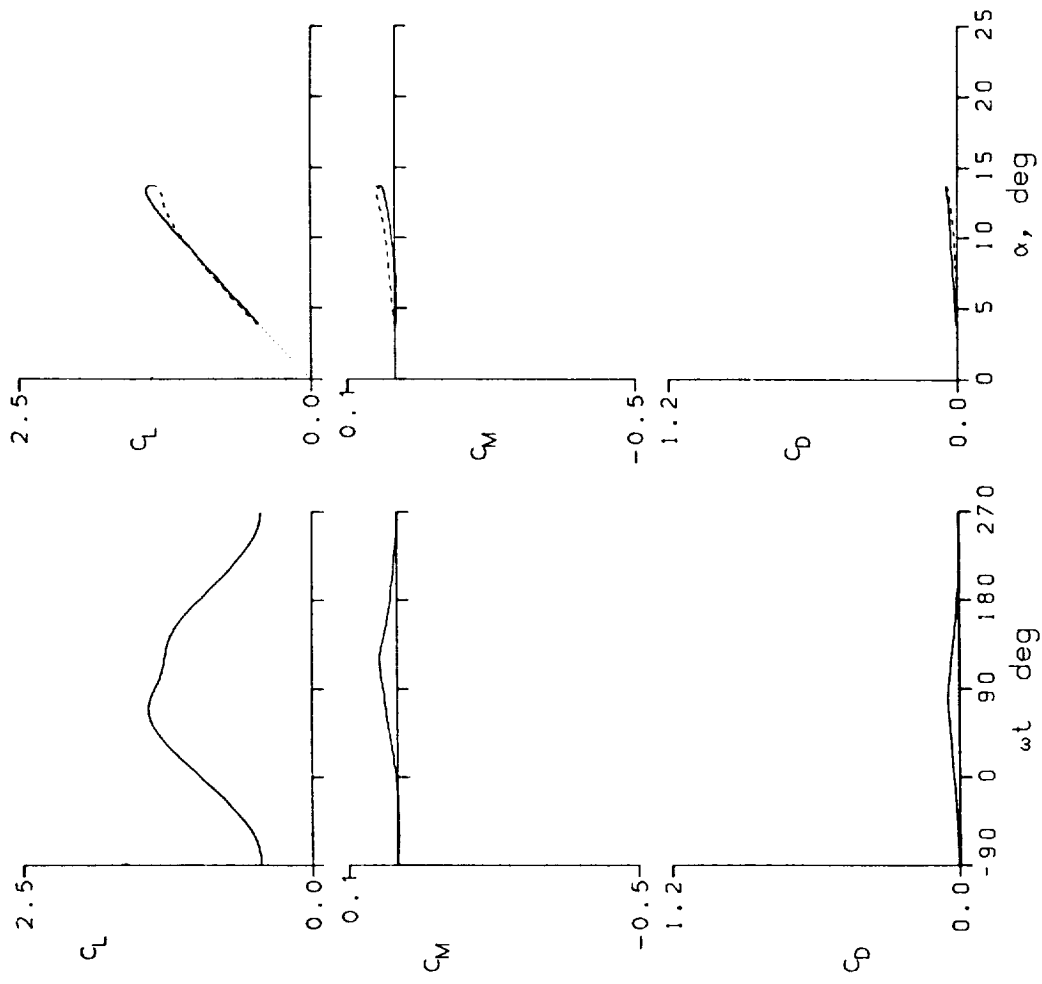


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7222 A0 = 9.76° k = 0.051
 Re = 3.98 E6 A1 = 4.95° M = 0.298
 $C_{Lmax} = 1.47$ $C_{Mmin} = -0.09$ $C_{Dmax} = 0.20$
 $\alpha_{Lmax} = 13.9^\circ$ $\xi = -0.292$ $M_{max} = 1.247$
 $\alpha_{Cmin} = 9.4^\circ$ $-C_{Pmax} = 9.4$ $\alpha_{Mmax} = 14.1^\circ$

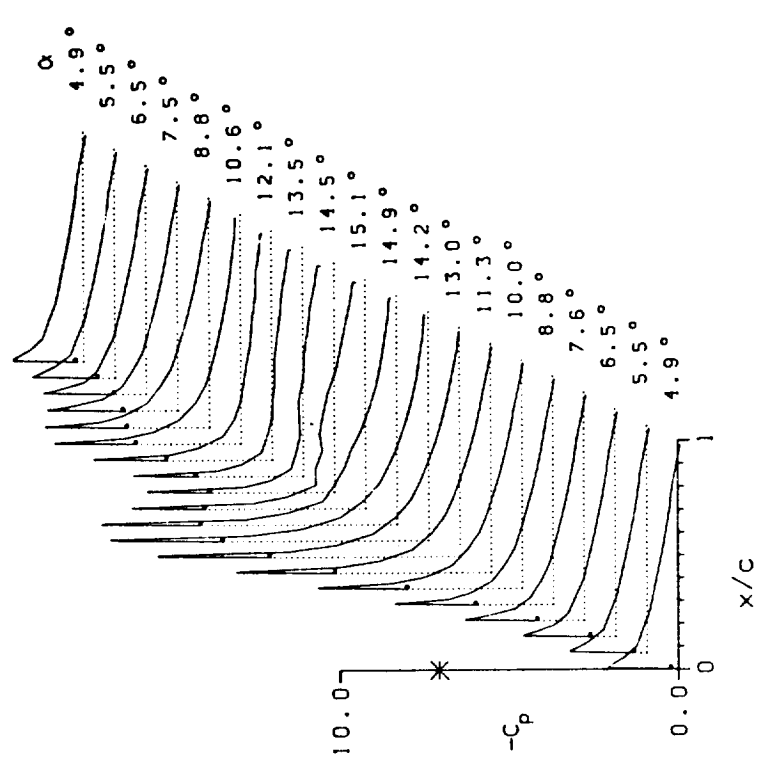
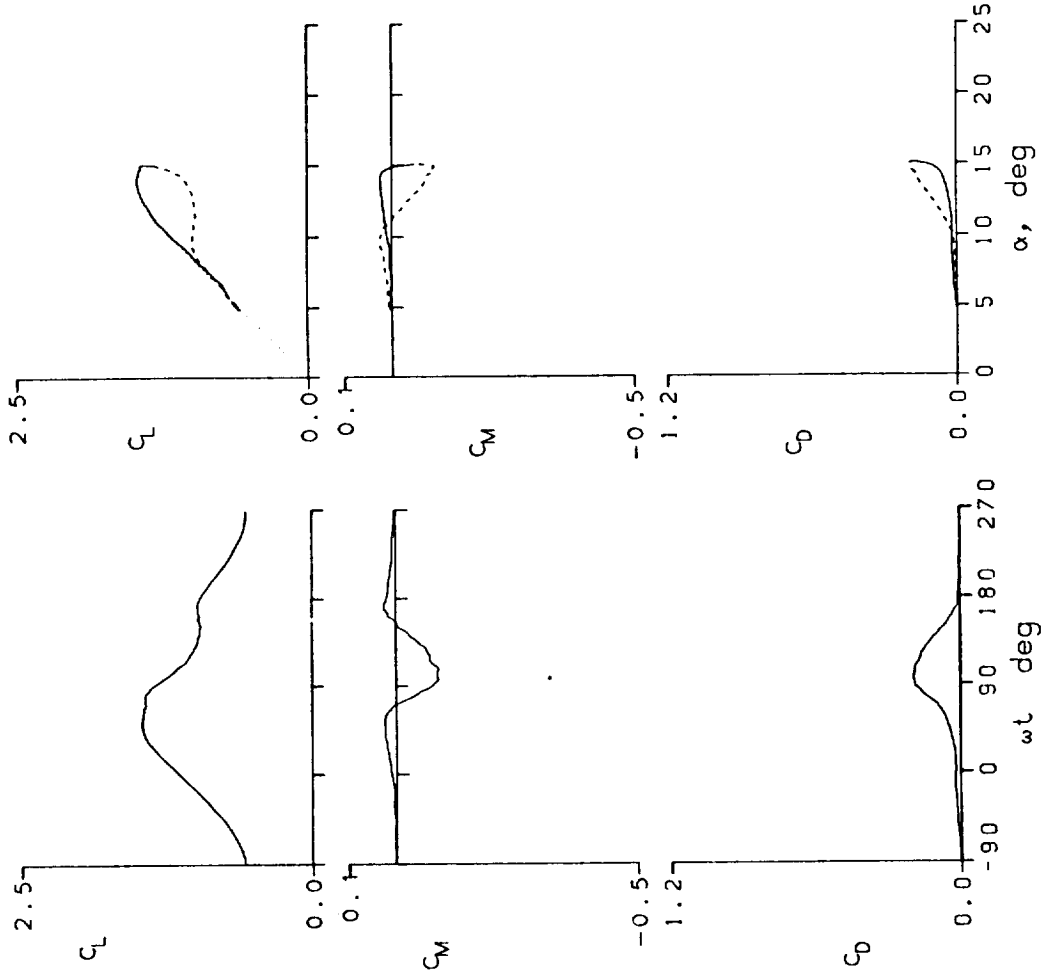


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7300 A0 = 9.93° k = 0.151
 Re = 3.99 E6 A1 = 4.90° M = 0.300
 CLmax = 1.59 CMmin = -0.08 CDmax = 0.26
 αLmax = 14.6° ζ = -0.017 Mmax = 1.251
 αCmin = 9.7° -CPmax = 9.4 αMmax = 14.2°

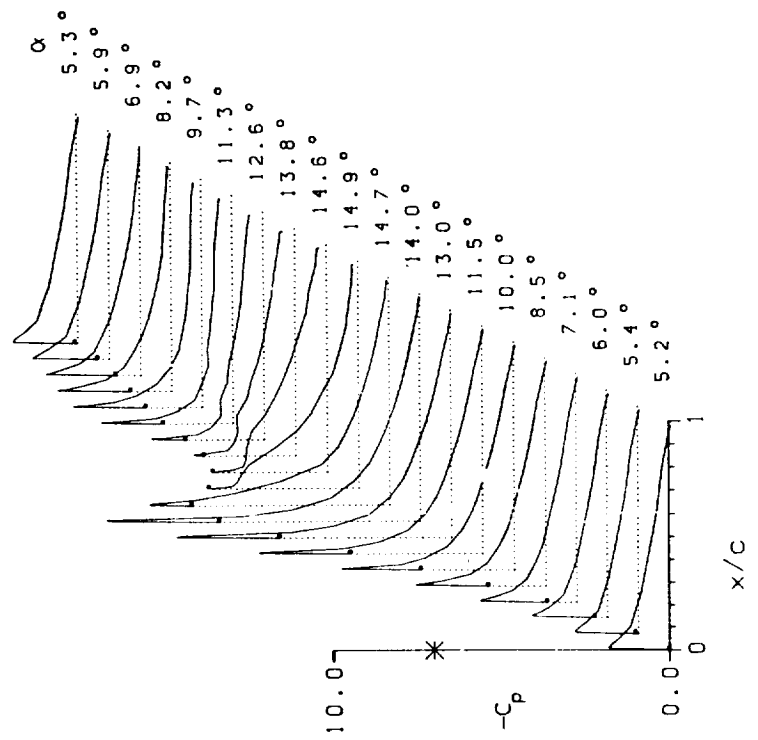
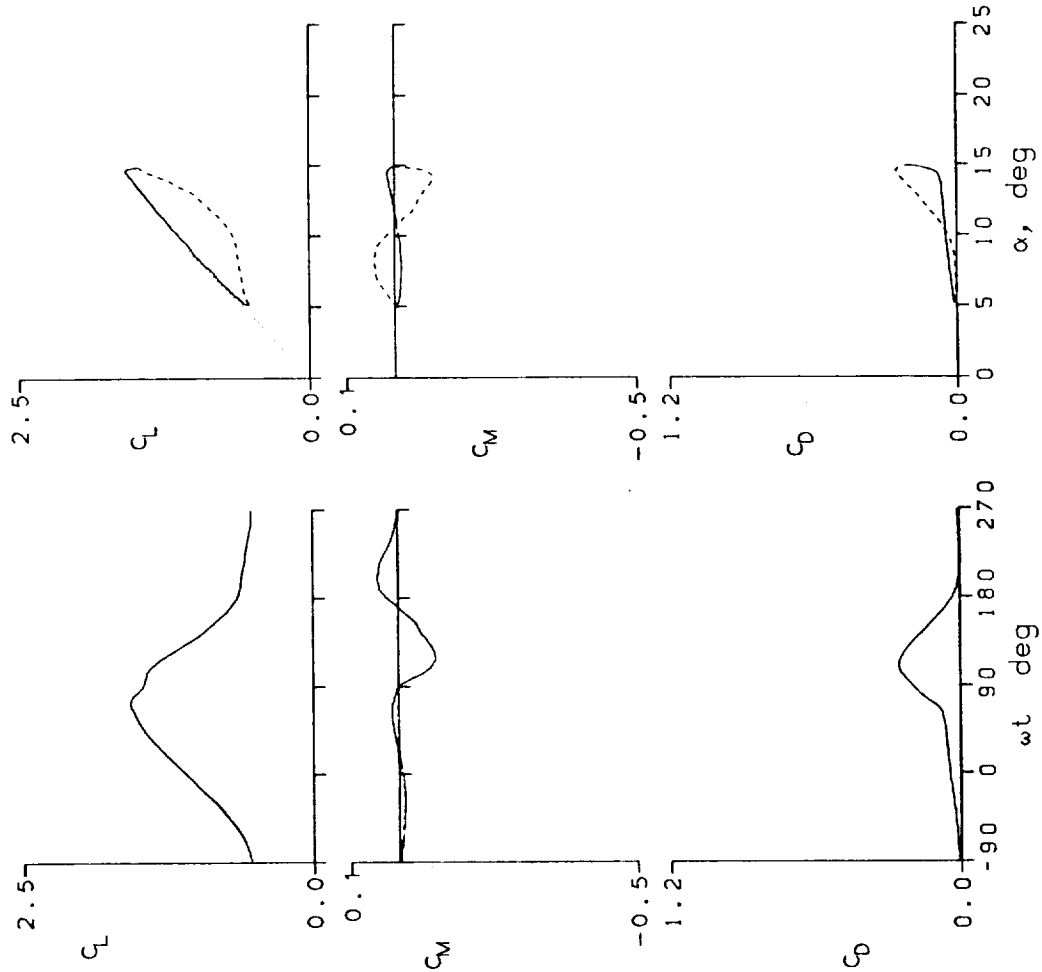


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7302 A0 = 9.93° k = 0.074
 Re = 3.96 E6 A1 = 4.90° M = 0.300
 $C_{Lmax} = 1.52$ $C_{Mmin} = -0.10$ $C_{Dmax} = 0.21$
 $\alpha_{Lmax} = 14.1^\circ$ $\zeta = -0.127$ $M_{max} = 1.244$
 $\alpha_{Cmin} = 9.7^\circ$ $-C_{Pmax} = 9.3$ $\alpha_{Mmax} = 14.0^\circ$

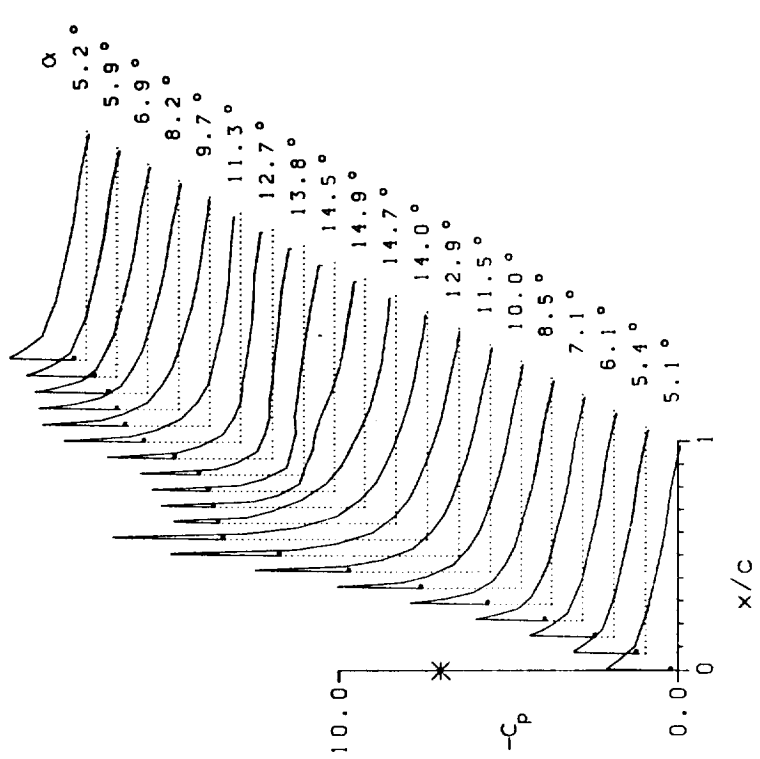
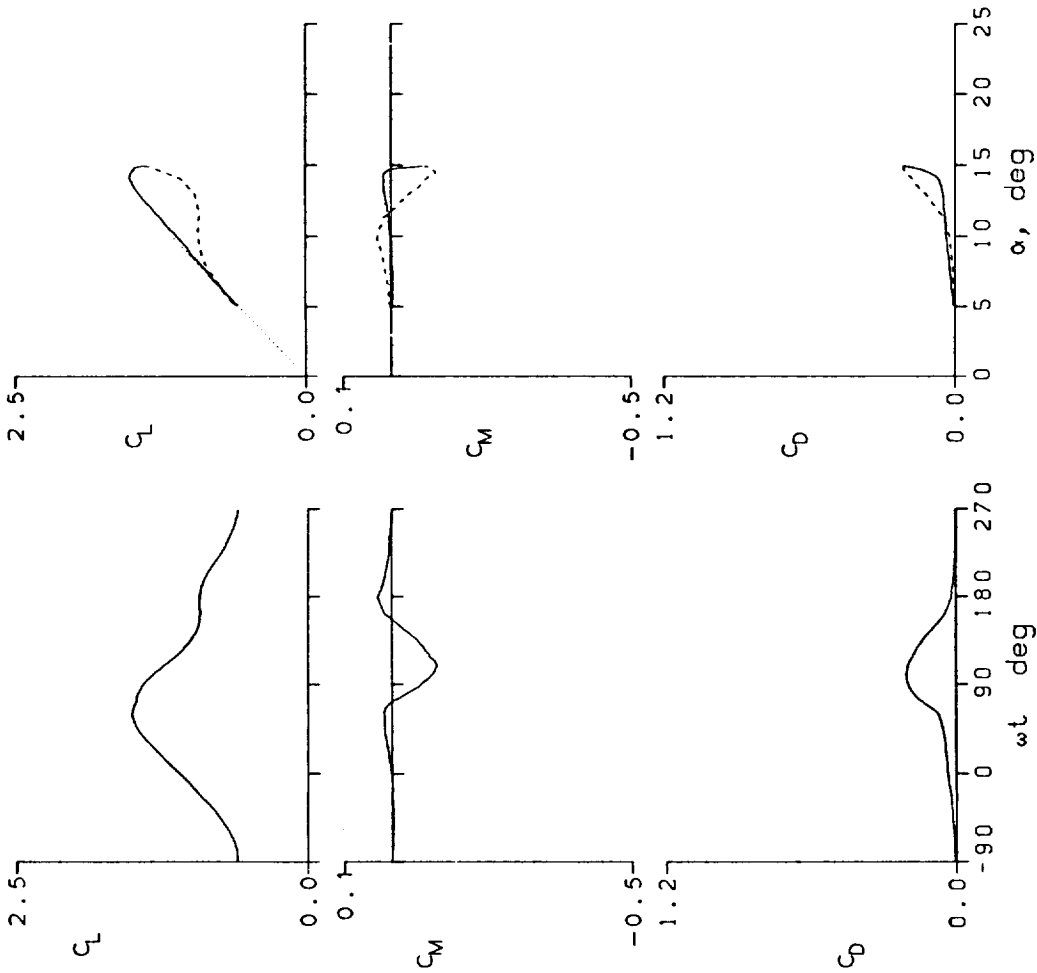


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 7305 A0 = 11.97° k = 0.151
 Re = 3.97 E6 A1 = 4.90° M = 0.300
 $C_{Lmax} = 1.67$ $C_{Mmin} = -0.20$ $C_{Dmax} = 0.44$
 $\alpha_{Lmax} = 15.3^\circ$ $\zeta = 0.072$ $M_{max} = 1.245$
 $\alpha_{Cmin} = 11.7^\circ$ $-C_{Pmax} = 9.3$ $\alpha_{Mmax} = 14.3^\circ$

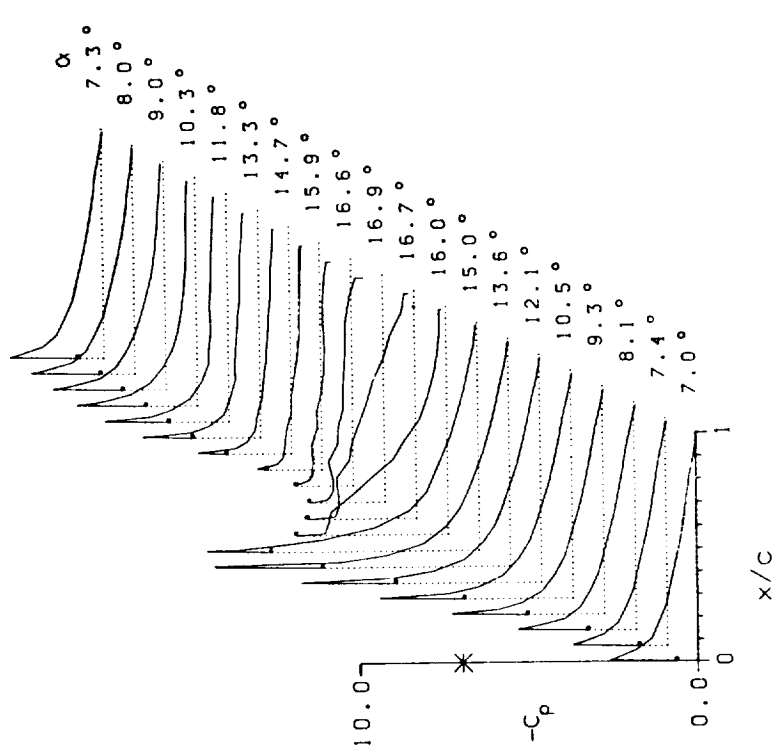
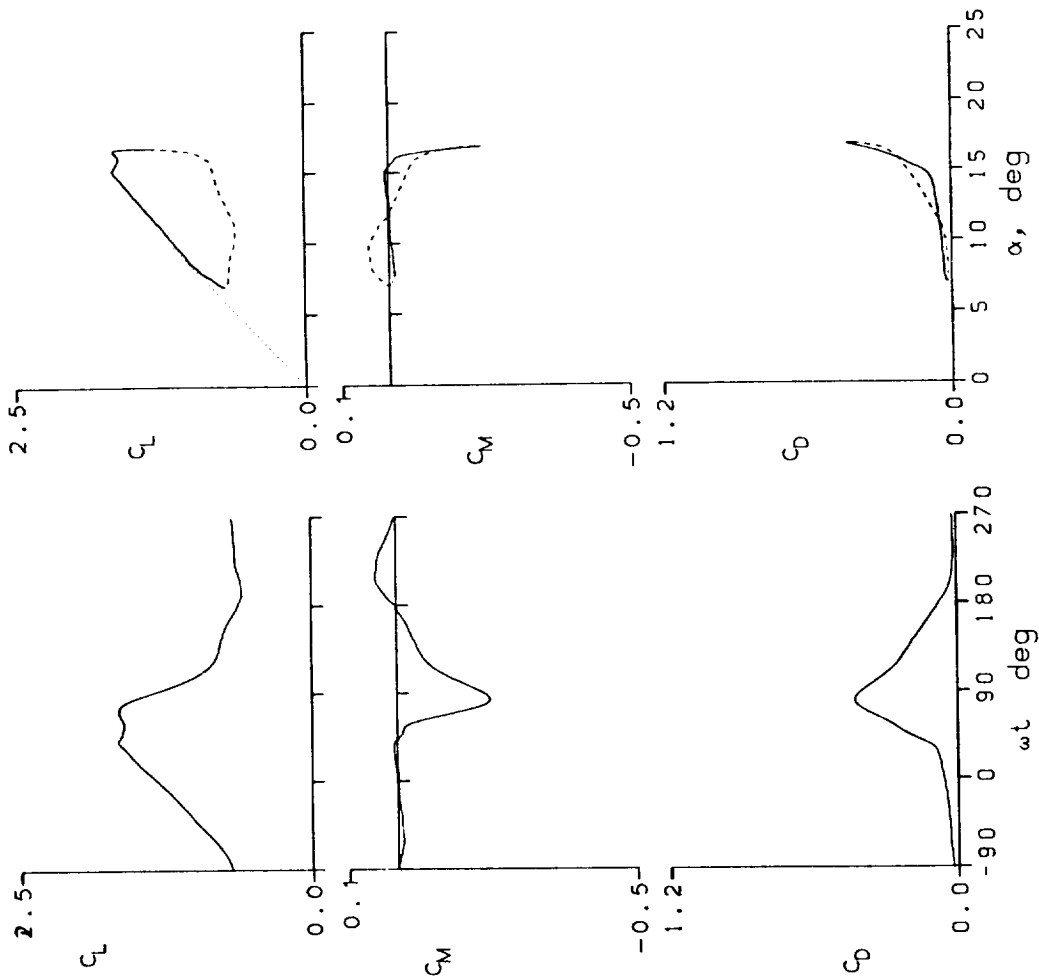


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 8019 A0 = 9.82 ° k = 0.104
 Re = 0.49 E6 A1 = 9.90 ° M = 0.035
 CLmax = 2.08 CMmin = -0.42 CDmax = 0.72
 α Lmax = 18.9 ° ζ = 0.125 Mmax = 0.104
 α Cmin = 9.3 ° -CPmax = 7.5 α Mmax = 15.3 °

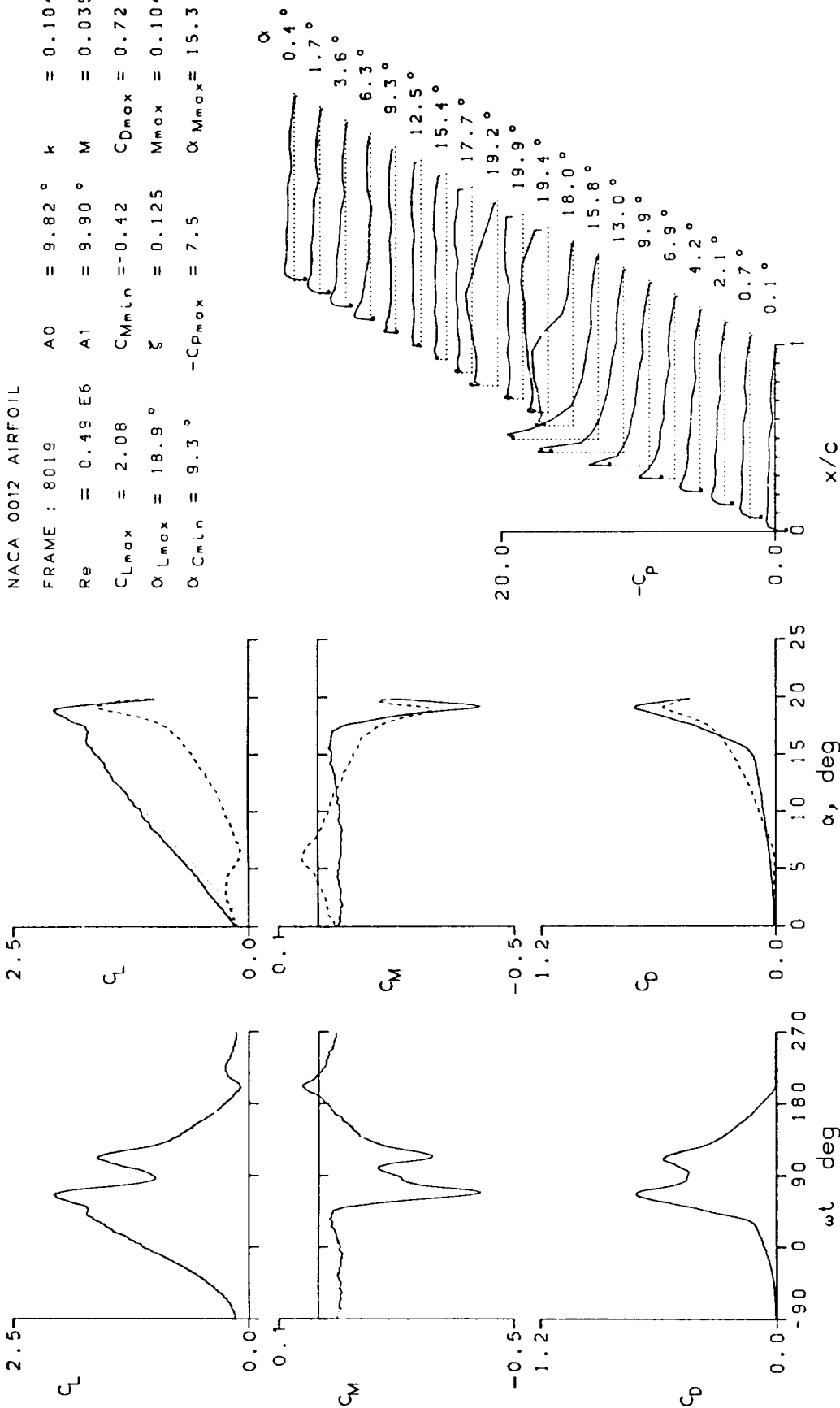


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 8021 A0 = 9.80° k = 0.151
 Re = 0.49 E6 A1 = 9.92° M = 0.035
 C_{Lmax} = 2.16 C_{Mmin} = -0.46 C_{Dmax} = 0.79
 α_{Lmax} = 19.8° ζ = -0.063 M_{max} = 0.103
 α_{Cmin} = 9.3° -C_{pmax} = 7.4 α_{Mmax} = 15.8°

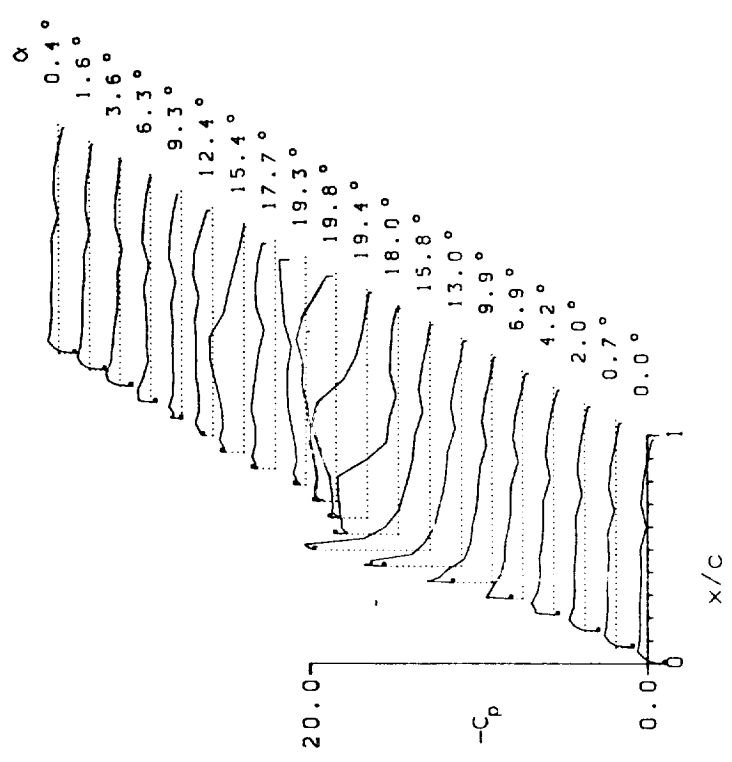
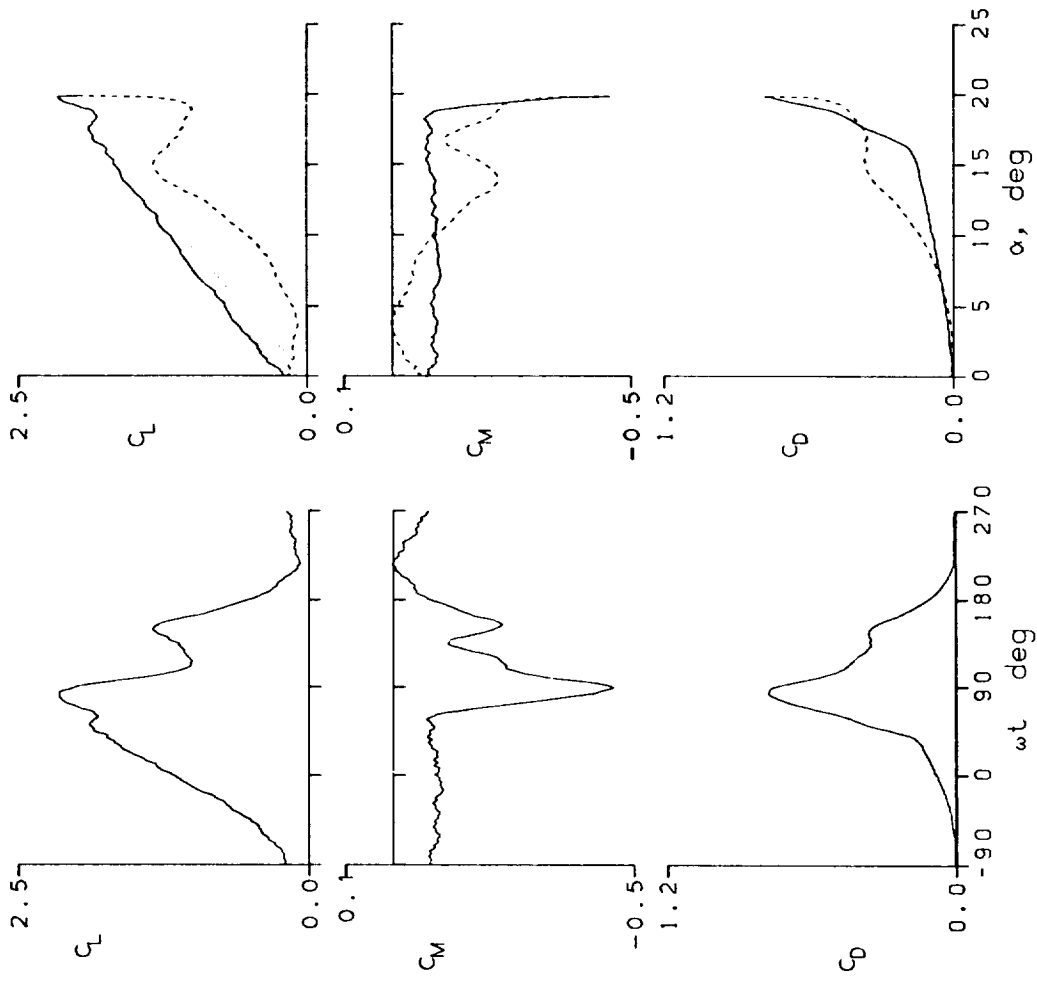


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 8023 A0 = 9.78° k = 0.253
 Re = 0.49 E6 A1 = 9.93° M = 0.035
 $C_{Lmax} = 2.10$ $C_{Mmin} = -0.44$ $C_{Dmax} = 0.71$
 $\alpha_{Lmax} = 19.8^\circ$ $\zeta = -0.274$ $M_{max} = 0.107$
 $\alpha_{Cmin} = 9.3^\circ$ $-C_{Pmax} = 8.1$ $\alpha_{Mmax} = 17.2^\circ$

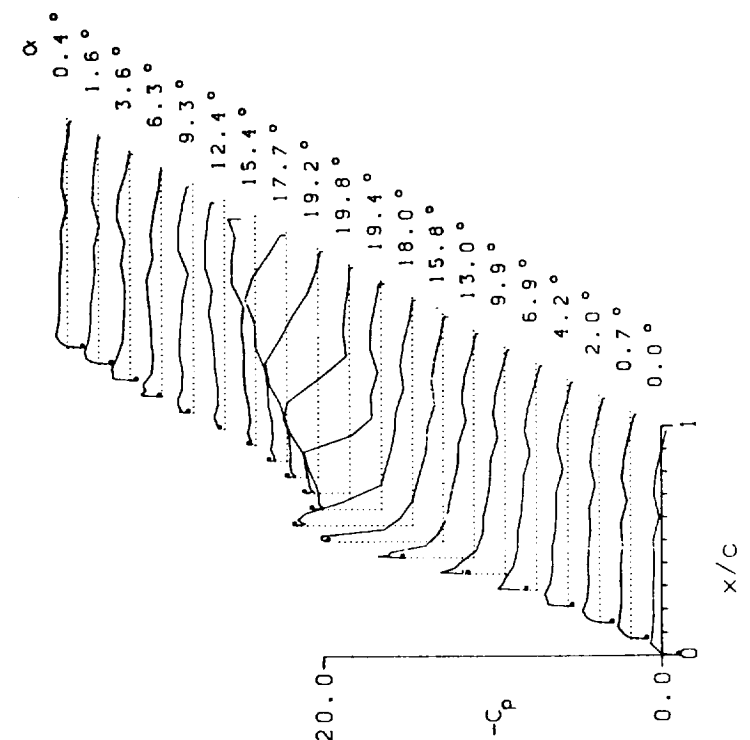
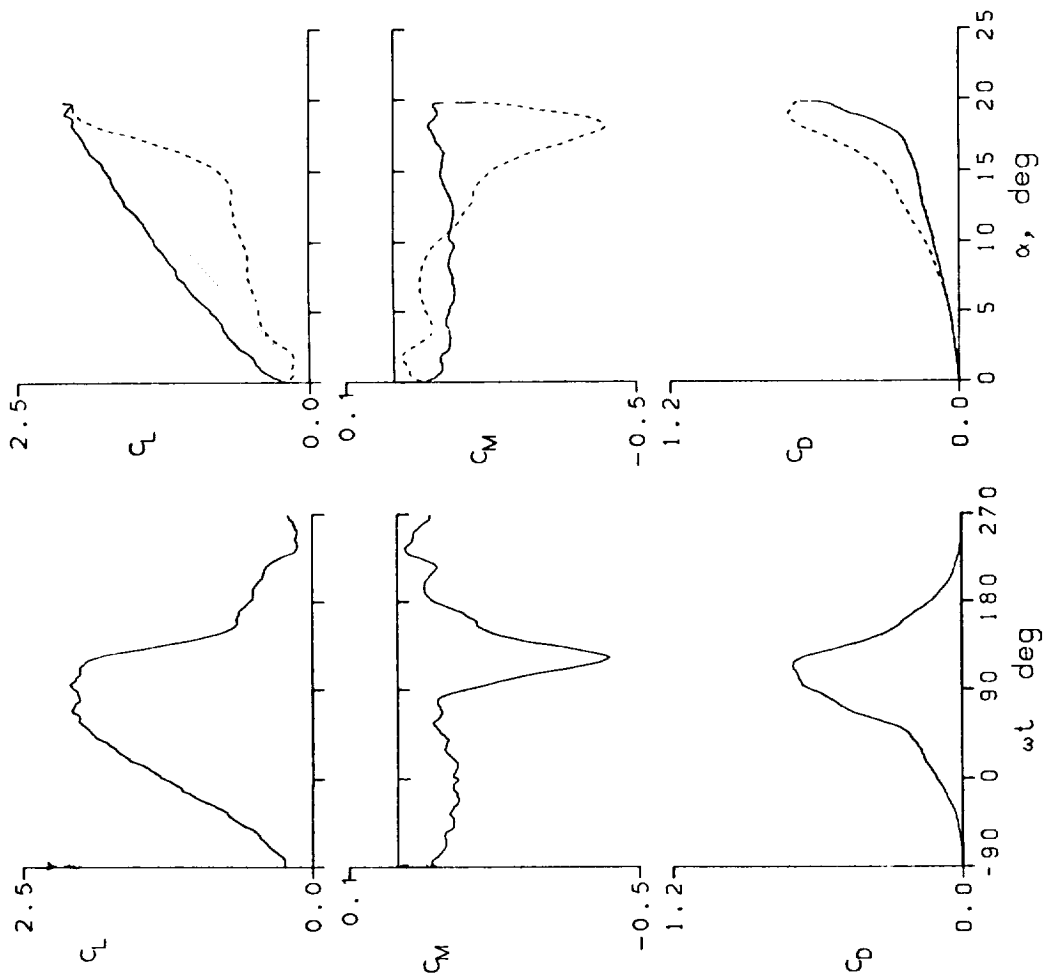


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 8102	A0 = 14.85°	k = 0.103
Re = 0.49 E6	A1 = 9.90°	M = 0.036
C _{Lmax} = 2.12	C _{Mmin} = -0.42	C _{Dmax} = 0.86
α _{Lmax} = 20.8°	ξ = 0.433	M _{max} = 0.106
α _{Cmin} = 14.4°	-C _{pmax} = 7.9	α _{Mmax} = 15.3°

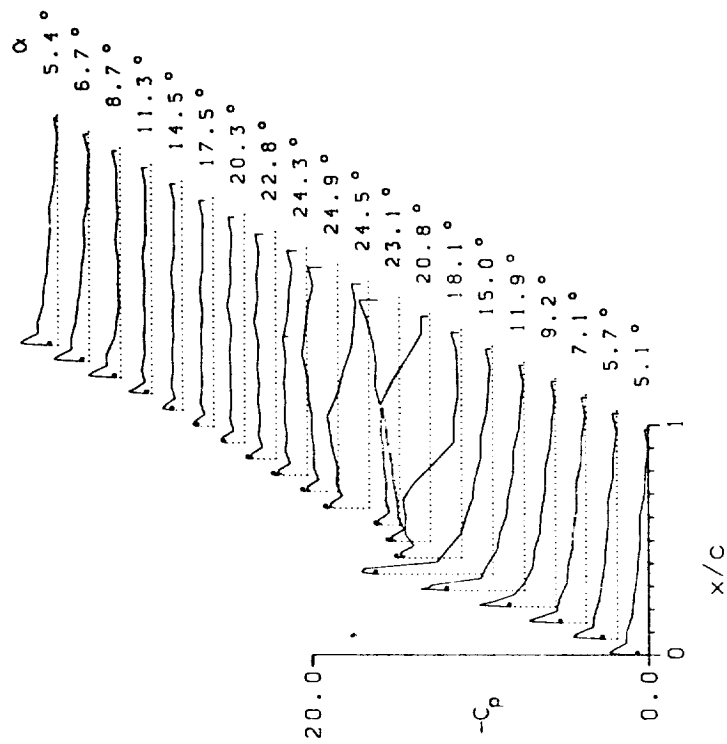
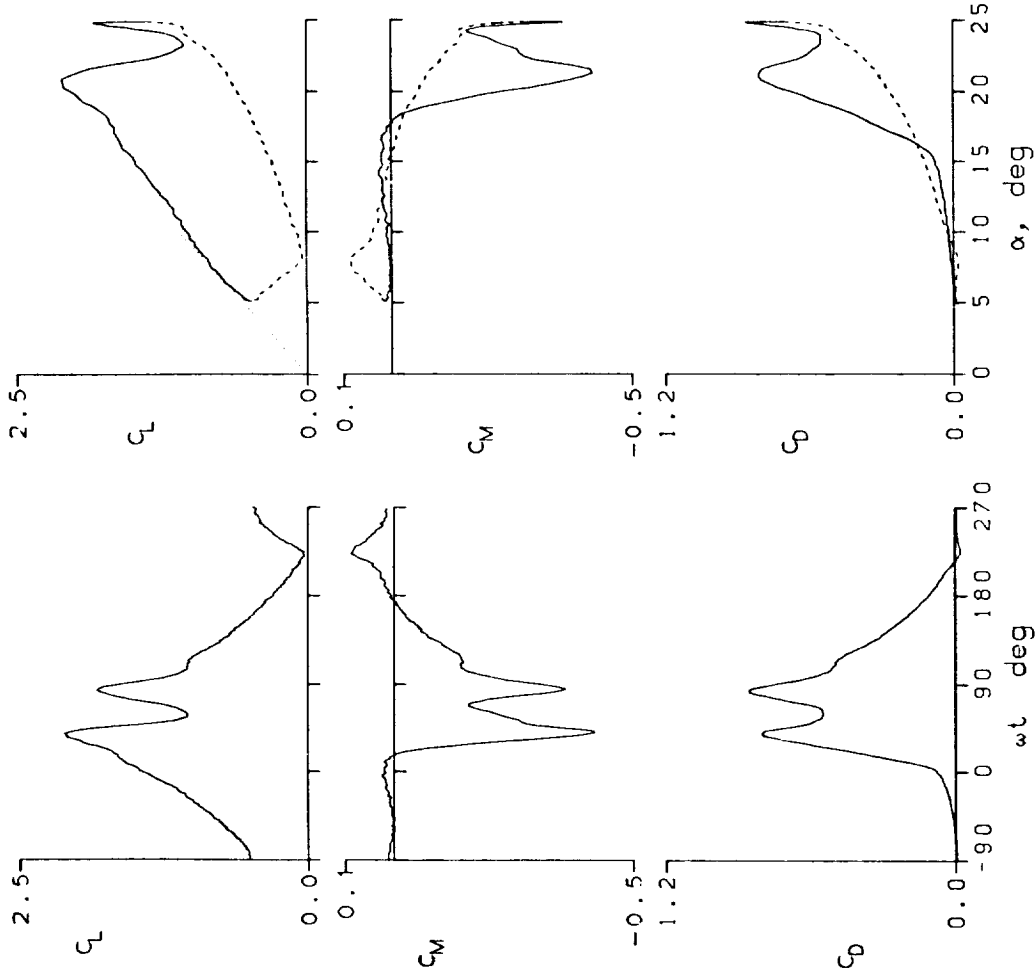


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 8104 A0 = 14.84° k = 0.153
 Re = 0.48 E6 A1 = 9.90° M = 0.036
 C_{Lmax} = 2.12 C_{Mmin} = -0.41 C_{Dmax} = 0.92
 α_{Lmax} = 22.5° ζ = 0.142 M_{max} = 0.103
 α_{Cmin} = 14.4° -C_{pmax} = 7.4 α_{Mmax} = 16.2°

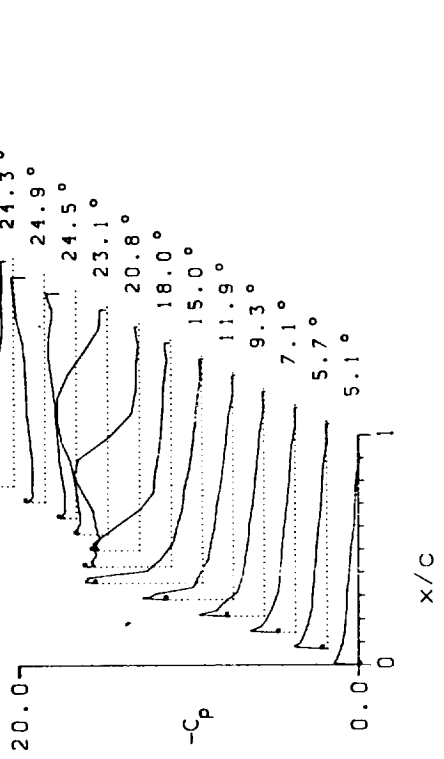
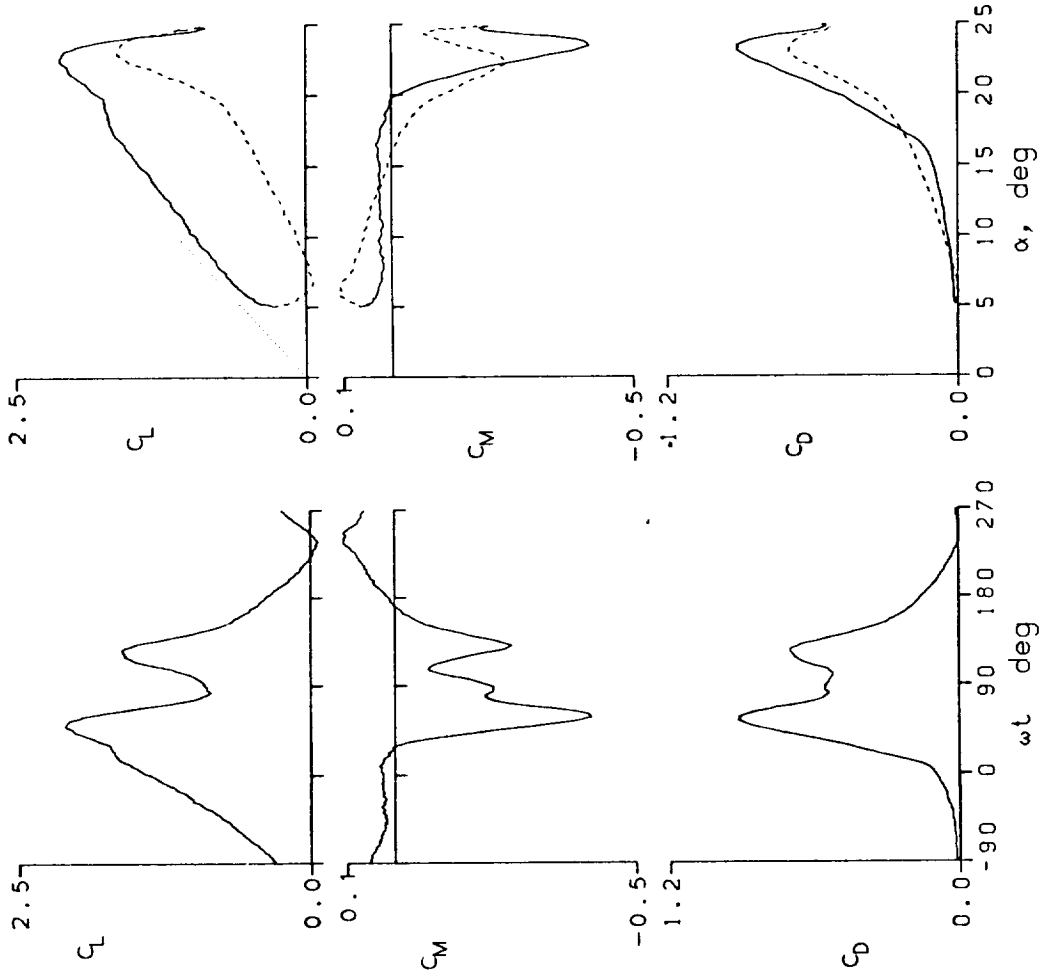


Figure 12.- Continued.

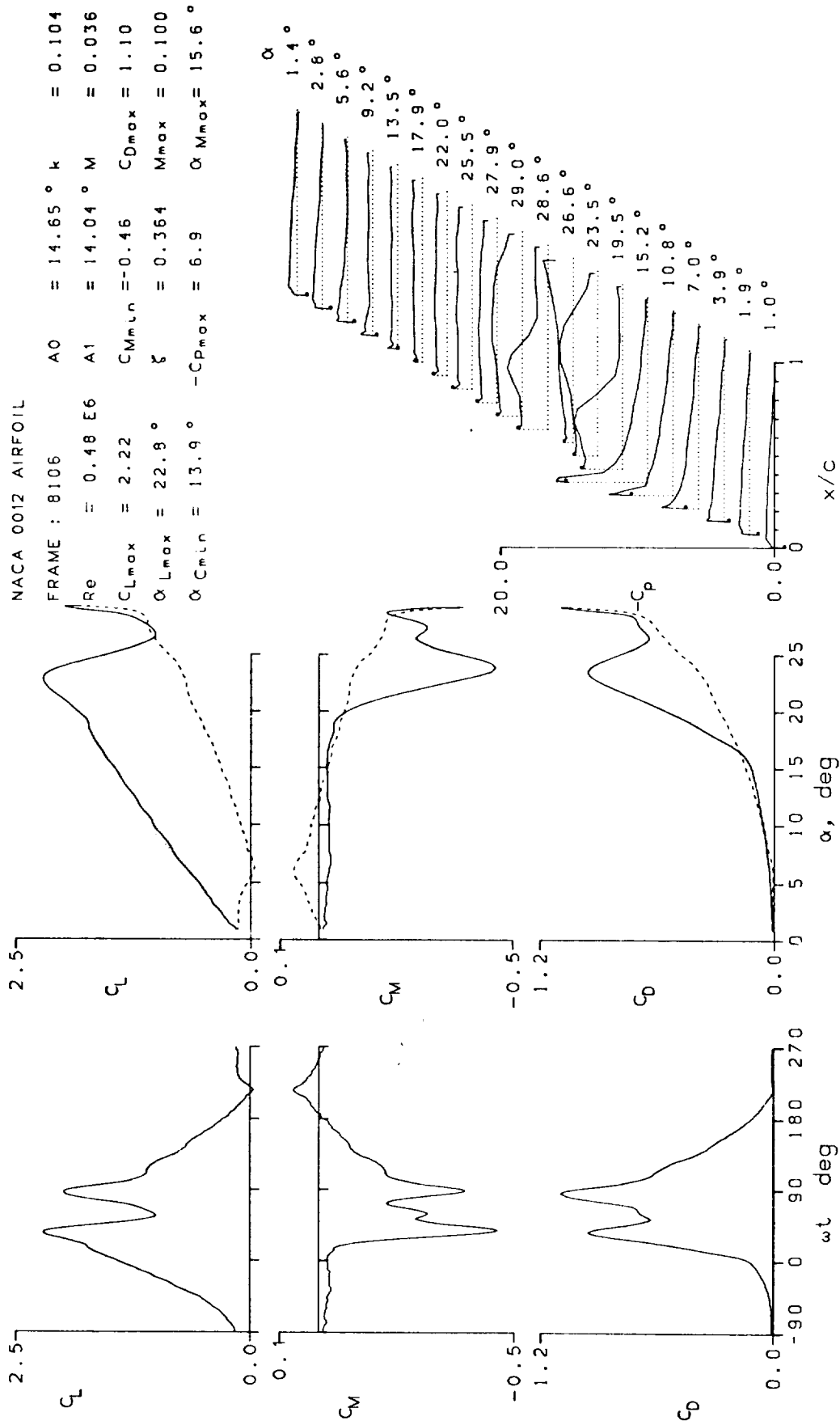


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 8114 A0 = 14.80° k = 0.099
 Rb = 0.98 E6 A1 = 9.94° M = 0.072
 CLmax = 2.20 CMmin = -0.41 CDmax = 0.93
 αLmax = 22.2° ζ = 0.114 Mmax = 0.273
 αCMmin = 14.4° -CPmax = 12.8 αMmax = 21.3°

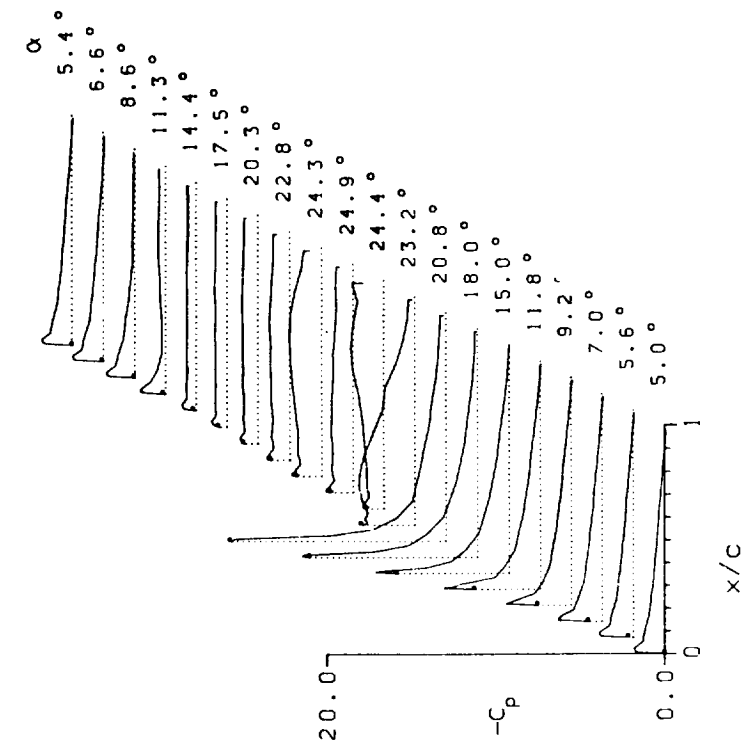
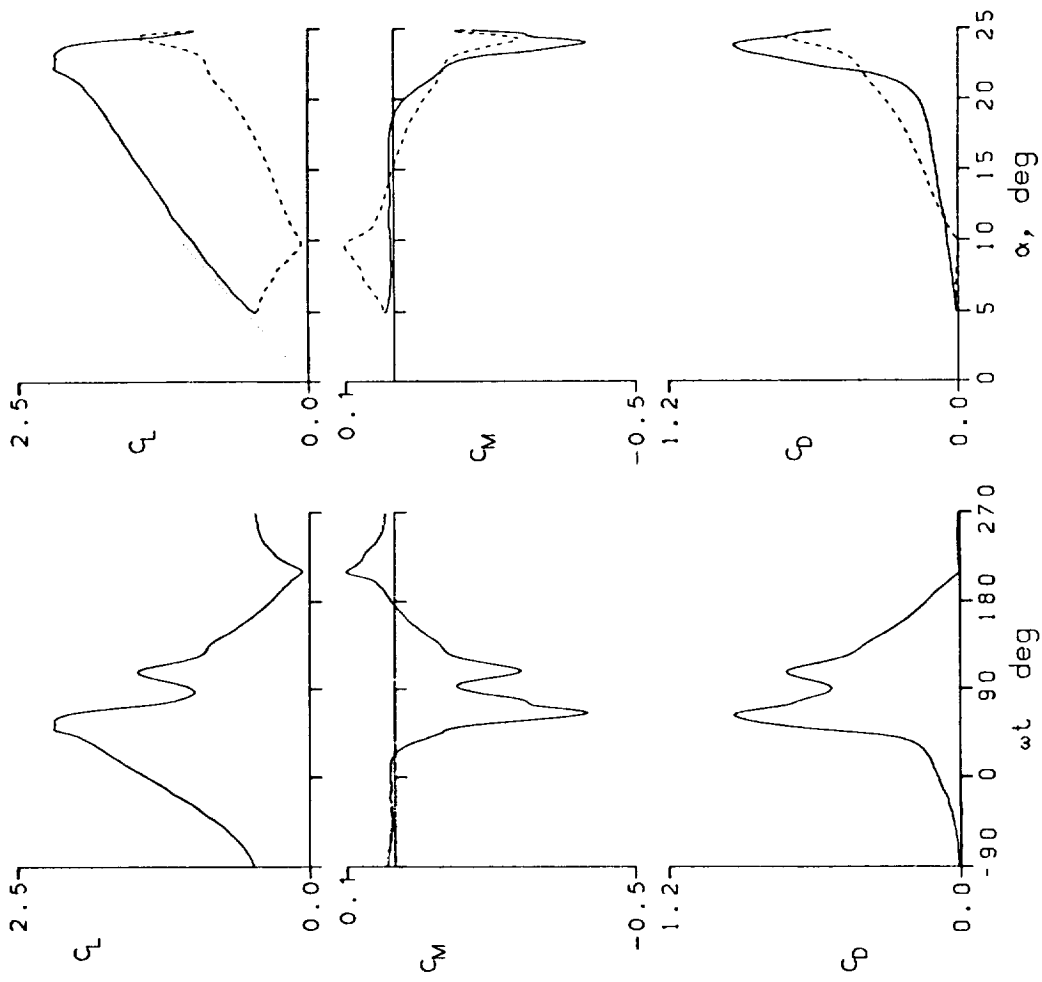


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 8116 A0 = 14.85° k = 0.149
 Re = 0.98 E6 A1 = 9.89° M = 0.072
 C_{Lmax} = 2.35 C_{Mmin} = -0.45 C_{Dmax} = 1.06
 α_{Lmax} = 24.5° ζ = -0.208 M_{max} = 0.289
 α_{Cmin} = 14.4° -C_{pmax} = 14.4 α_{Mmax} = 22.8°

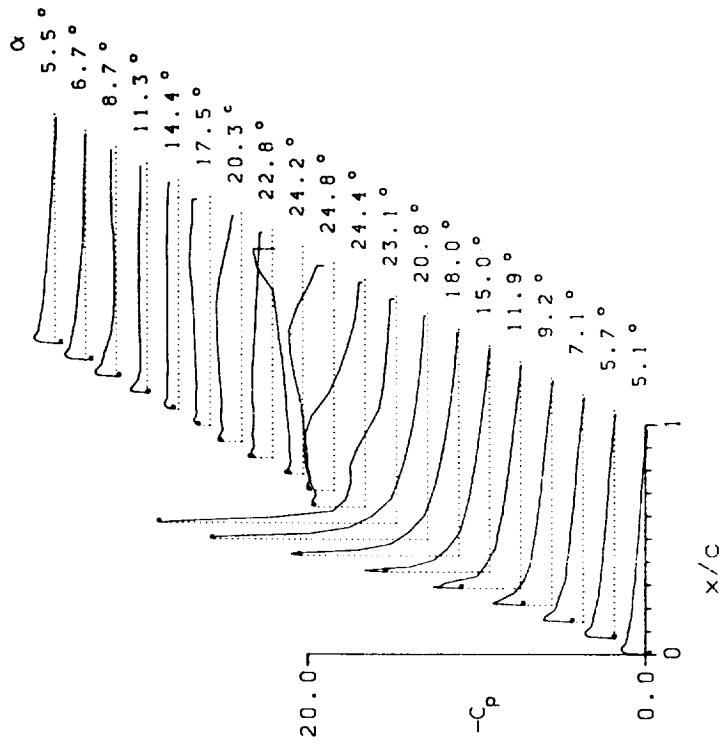
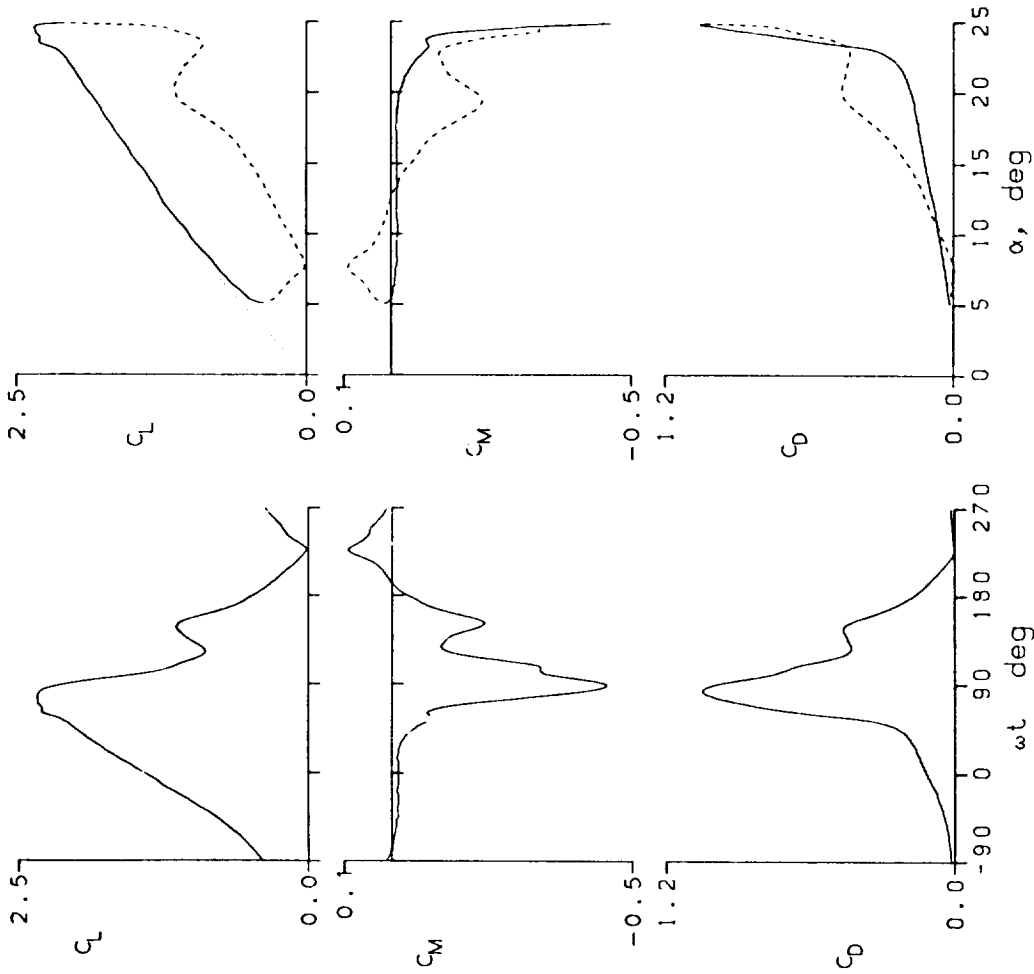


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 8118 A0 = 14.84° k = 0.248
 Re = 0.98 E6 A1 = 9.89° M = 0.072
 C_{Lmax} = 2.43 C_{Mmin} = -0.43 C_{Dmax} = 0.98
 α_{Lmax} = 24.8° ζ = -0.607 M_{max} = 0.308
 α_{Cmin} = 14.4° -C_{pmax} = 16.3 α_{Mmax} = 24.3°

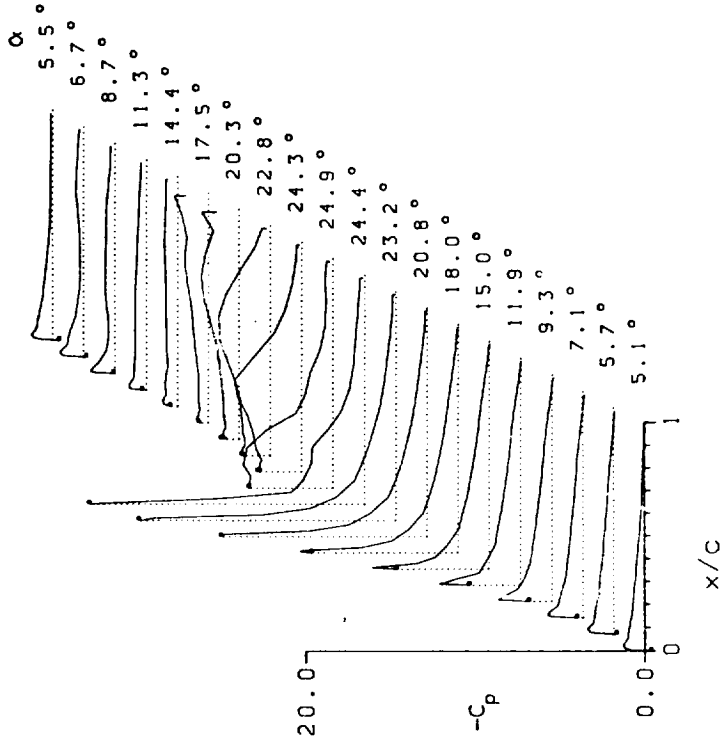
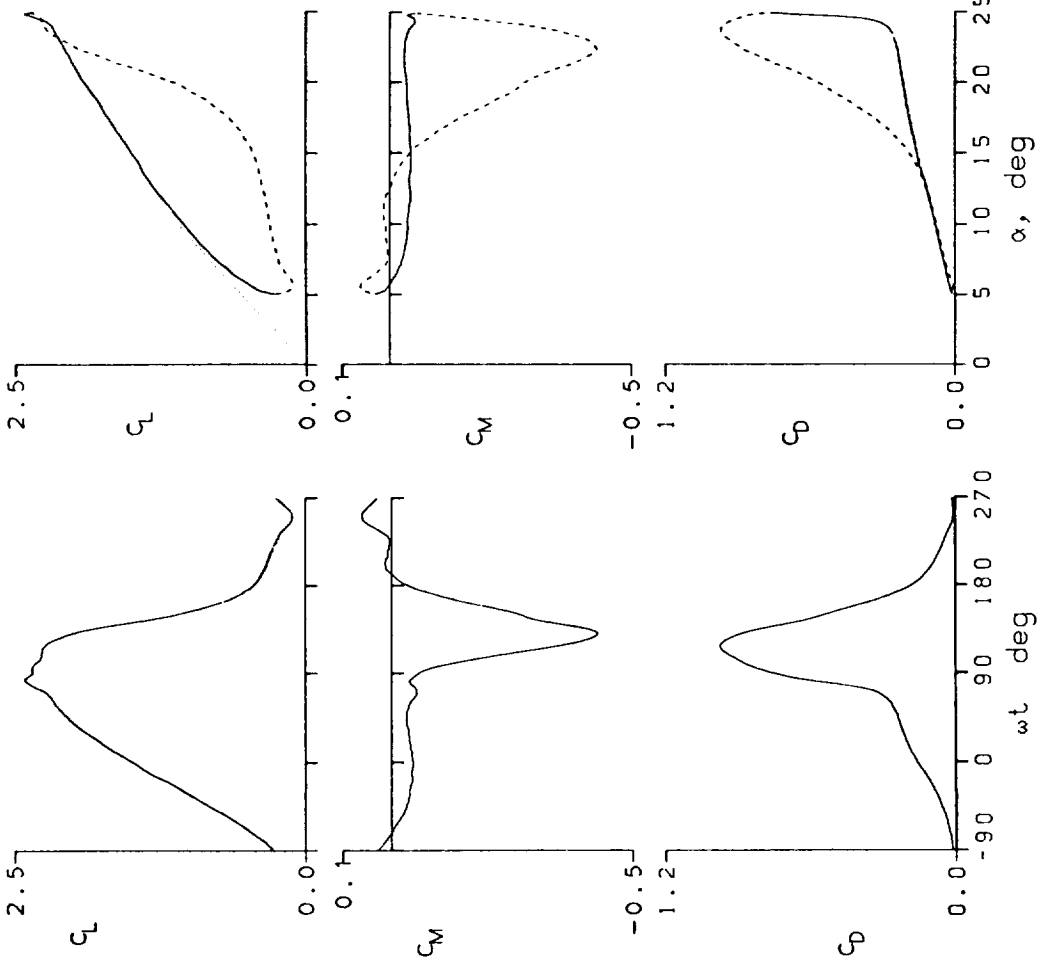


Figure 12.- Continued.

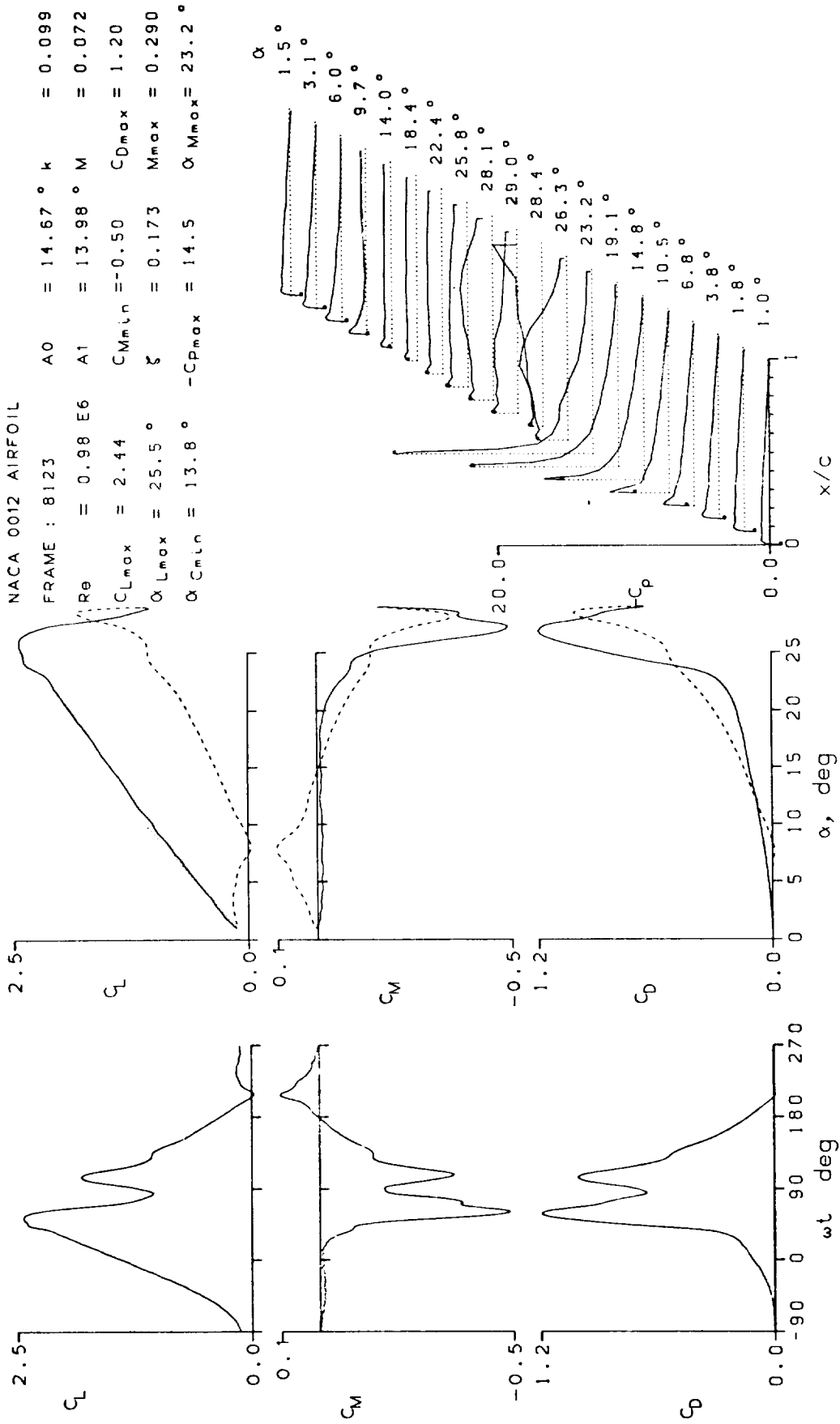


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 8203 A0 = 9.81° k = 0.248
 Re = 0.38 E6 A1 = 9.89° M = 0.072
 CLmax = 1.01 CMmin = -0.07 CDmax = 0.16
 α Lmax = 19.7° ξ = 0.283 Mmax = 0.266
 α Cmin = 9.3° -CPmax = 12.1 α Mmax = 19.8°

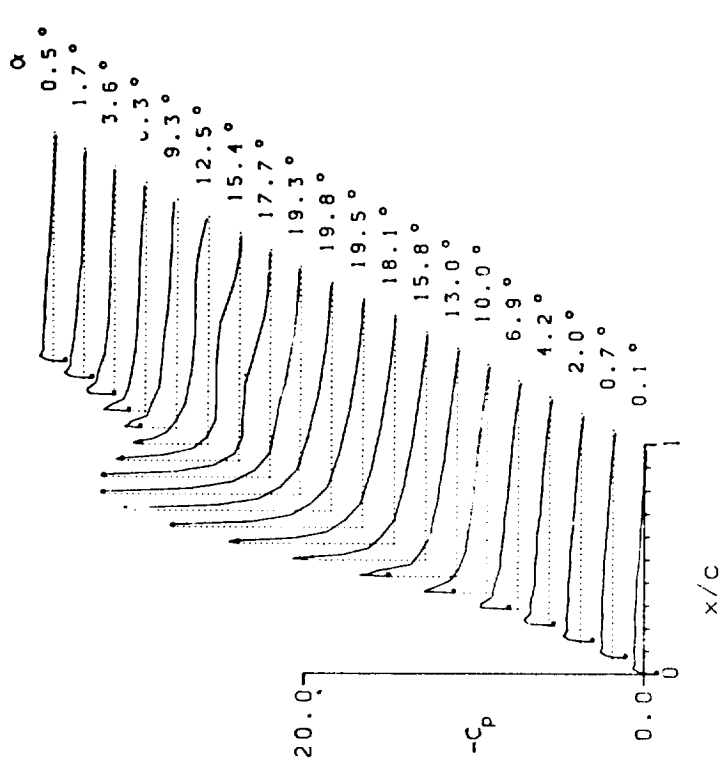
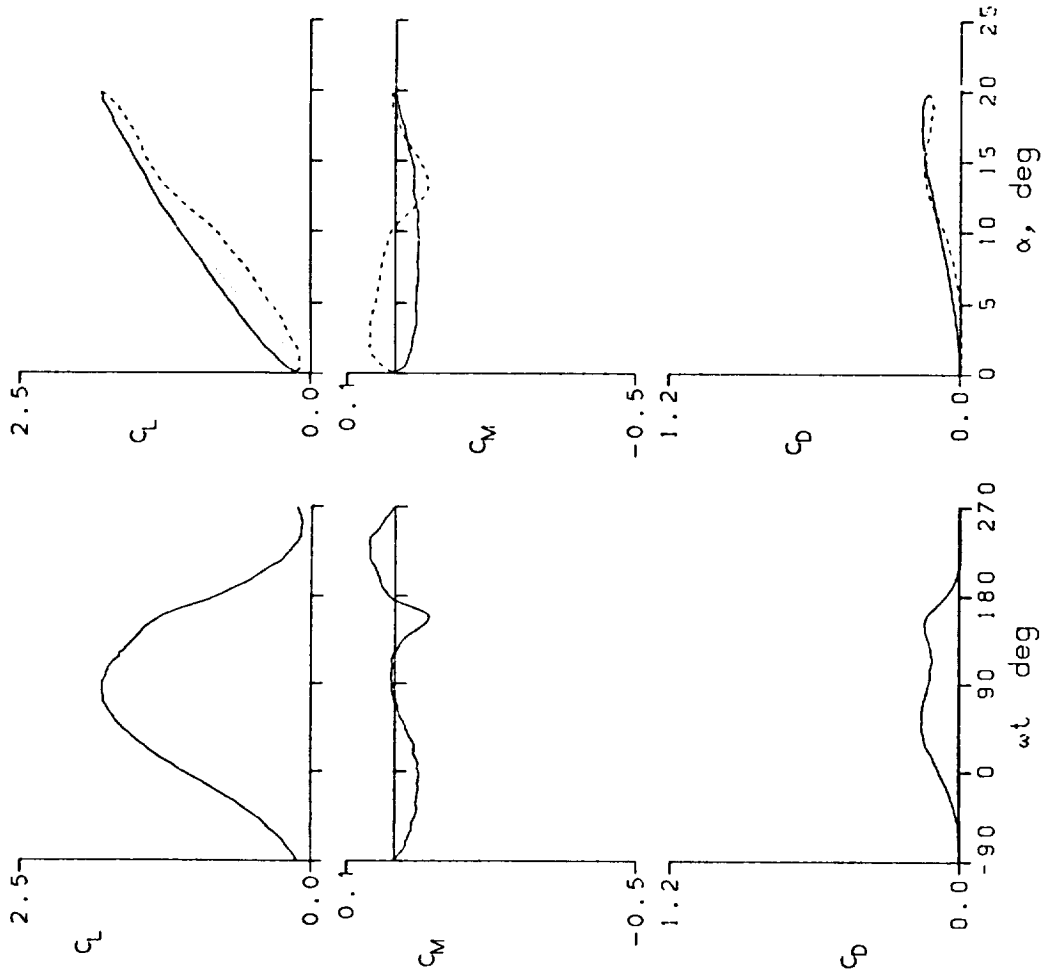


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 8210	A0 = 9.81 °	k = 0.250
Re = 1.49 E6	A1 = 9.89 °	M = 0.109
CLmax = 1.87	CMmin = -0.06	CDmax = 0.14
α Lmax = 19.7 °	ζ = 0.600	Mmax = 0.427
α Cmin = 9.3 °	-CPmax = 13.3	α Mmax = 19.8 °

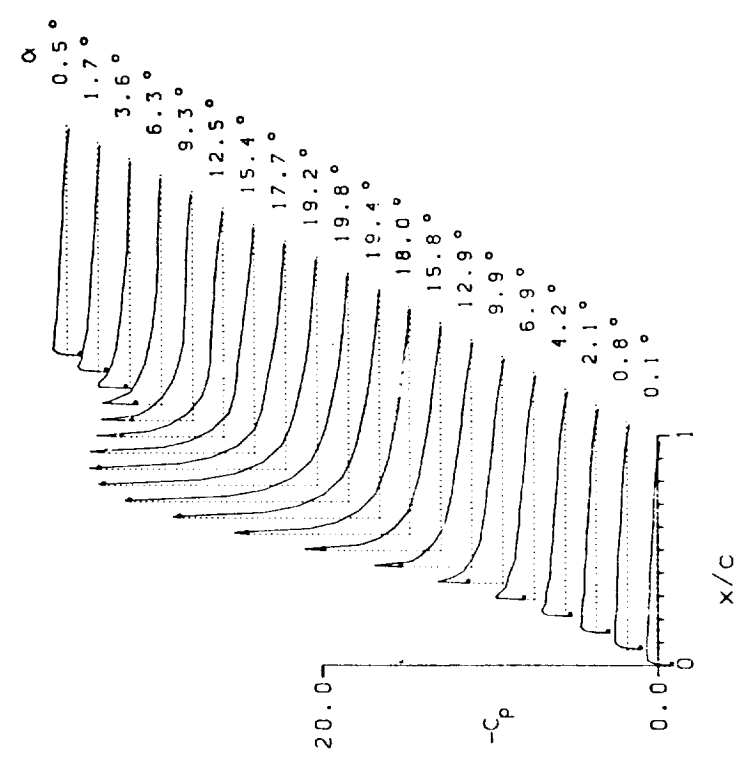
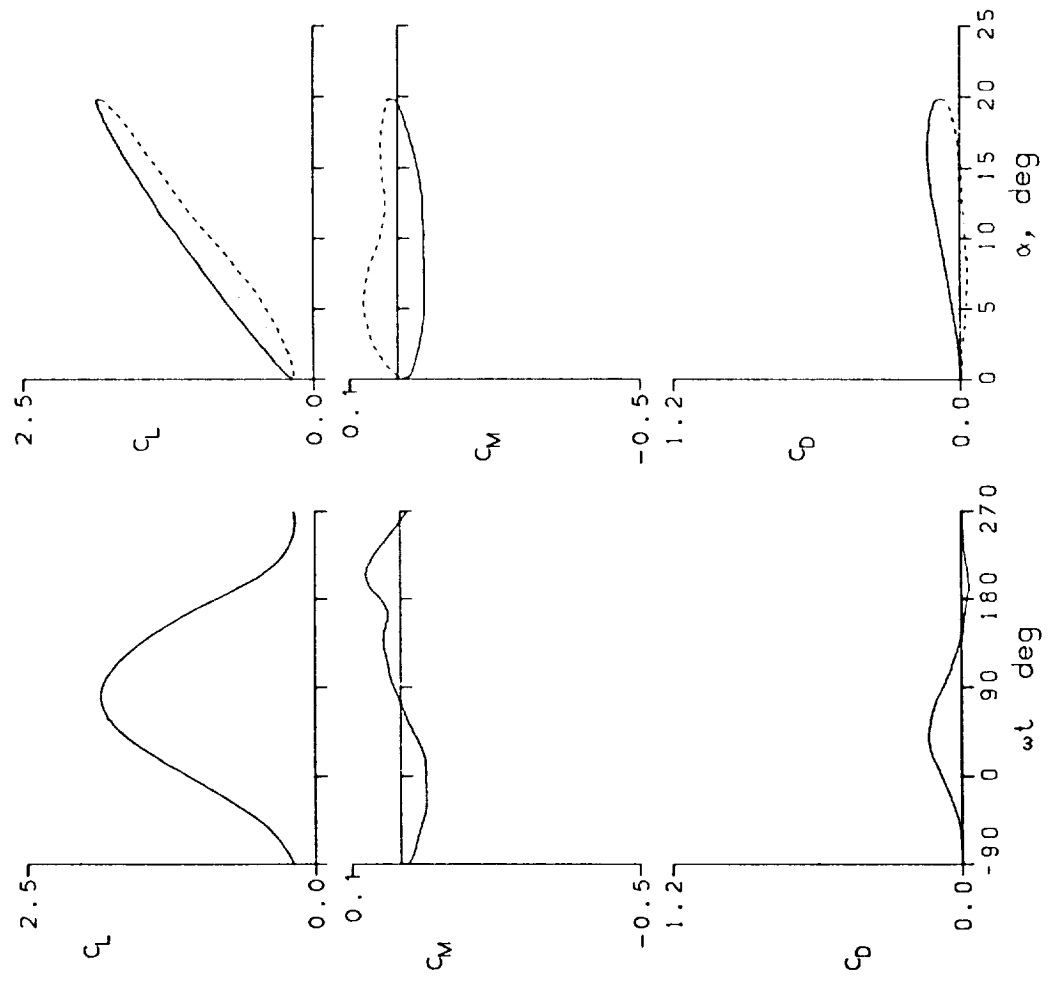


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 8214 A0 = 14.84° k = 0.100
 Re = 1.48 E6 A1 = 9.89° M = 0.109
 CLmax = 2.28 CMmin = -0.41 CDmax = 0.97
 αLmax = 23.6° ζ = -0.038 Mmax = 0.451
 αCMmin = 14.4° -CPmax = 14.8 αMmax = 22.1°

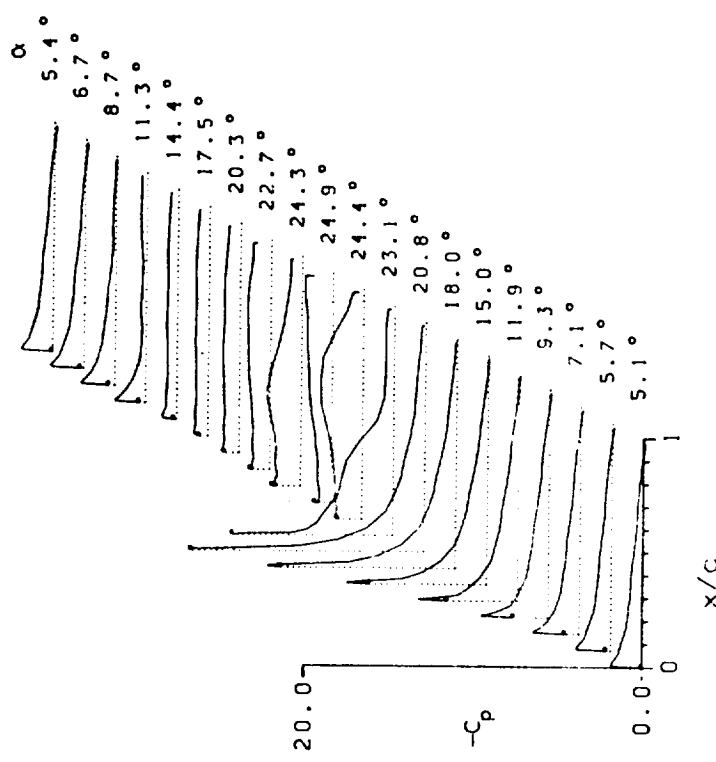
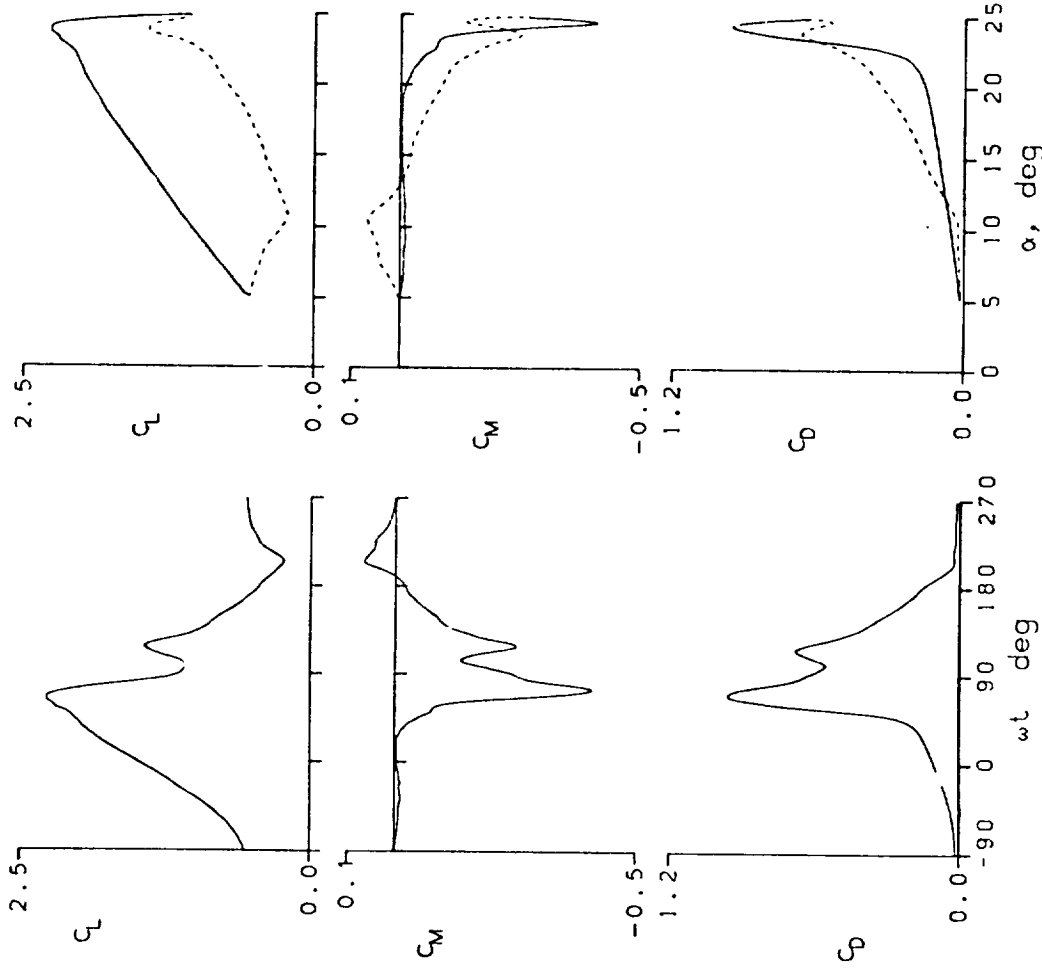
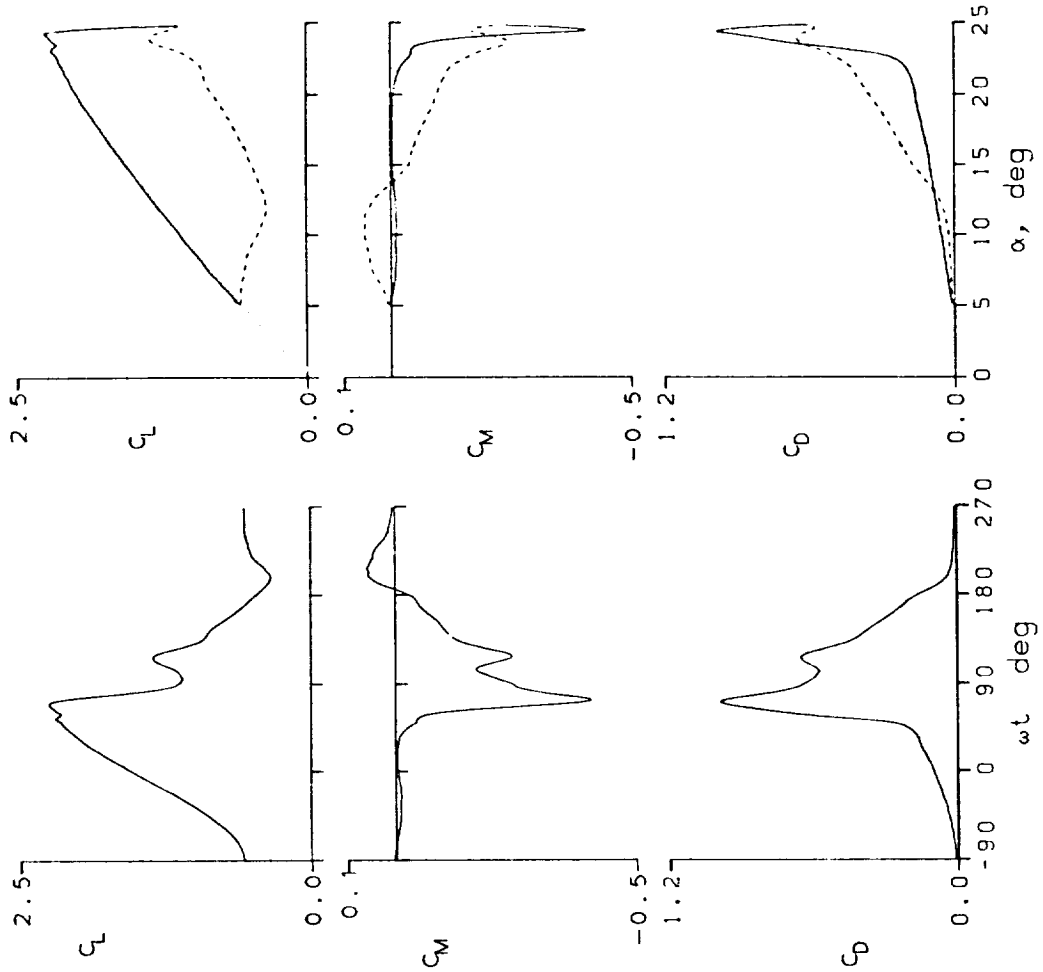


Figure 12.- Continued.



NACA C012 AIRFOIL

FRAME : 8220 A0 = 14.85 ° k = 0.099
 Re = 2.43 E6 A1 = 9.90 ° M = 0.184
 CLmax = 2.26 CMmin = -0.41 CDmax = 0.99
 αLmax = 24.2 ° ζ = -0.104 Mmax = 0.905
 αCmin = 14.4 ° -CPmax = 16.9 αMmax = 22.3 °

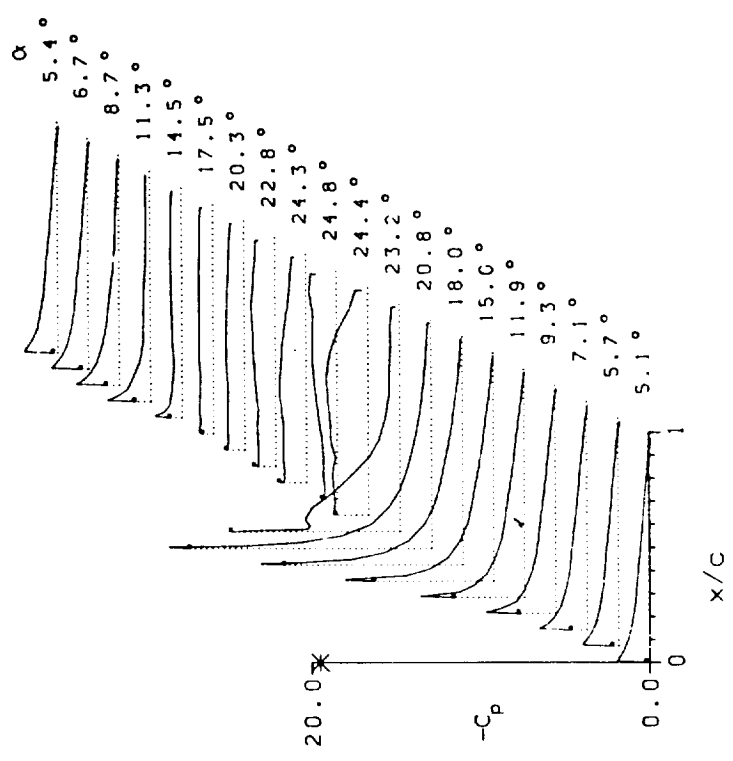


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 8222 $A_0 = 14.84^\circ$ $k = 0.149$
 $R_0 = 2.42 \text{ E}6$ $A_1 = 9.90^\circ$ $M = 0.184$
 $C_{L_{max}} = 2.38$ $C_{M_{min}} = -0.47$ $C_{D_{max}} = 1.08$
 $\alpha_{L_{max}} = 24.9^\circ$ $\zeta = -0.350$ $M_{max} = 0.937$
 $\alpha_{C_{min}} = 14.4^\circ$ $-C_{P_{max}} = 17.8$ $\alpha_{M_{max}} = 23.2^\circ$

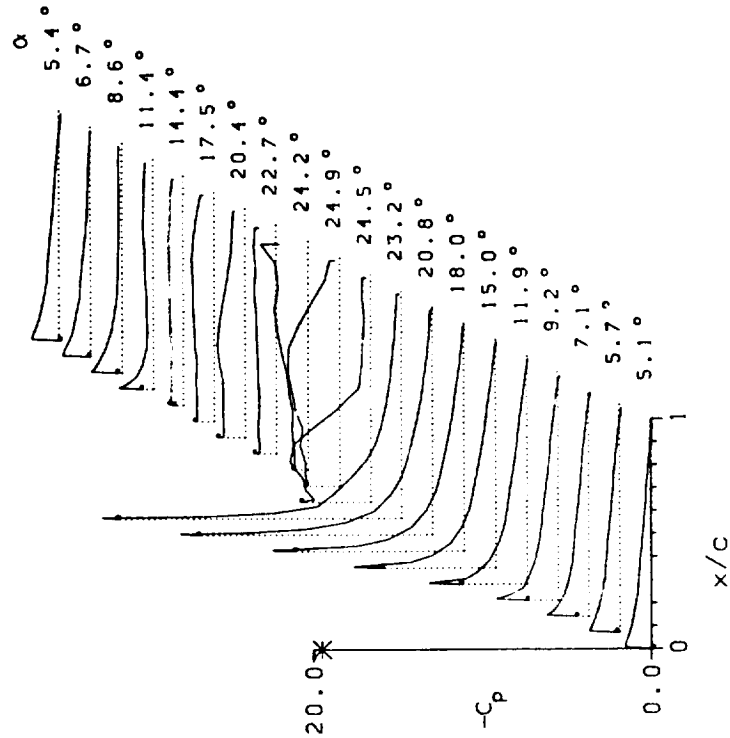
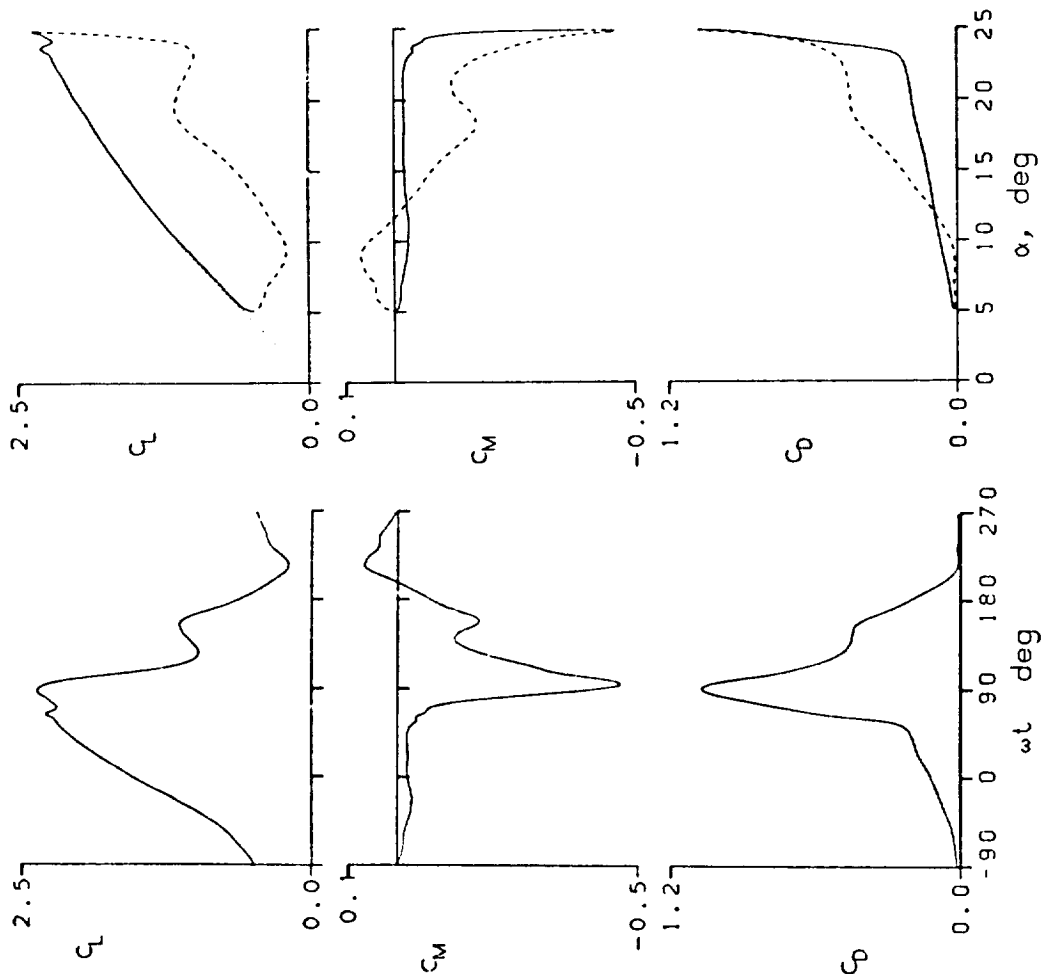


Figure 12.- Continued.

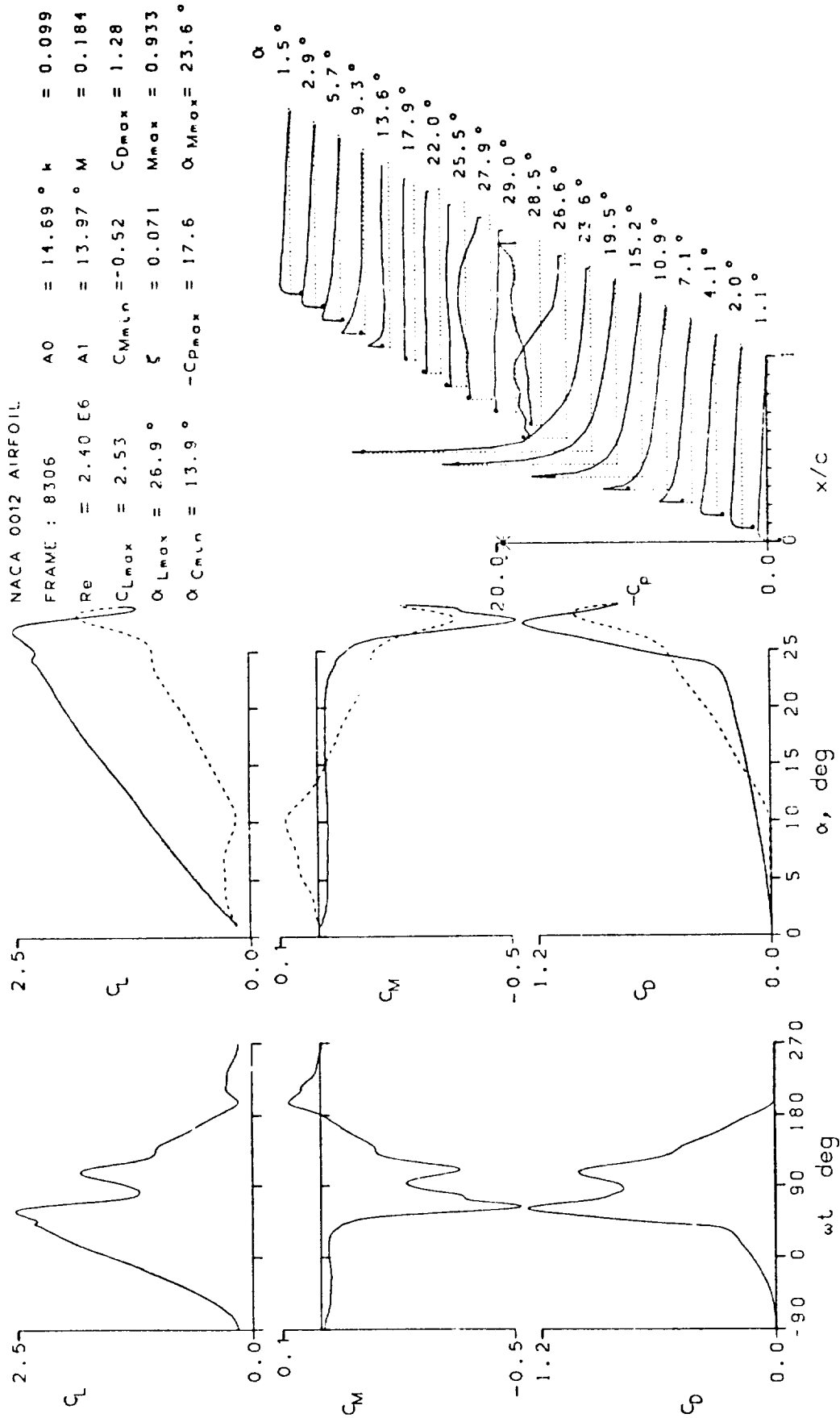


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9022 A0 = 14.89° k = 0.235
 Re = 2.36 E6 A1 = 6.00° M = 0.184
 CLmax = 2.06 CMmin = -0.20 CDmax = 0.50
 αLmax = 20.8° ζ = -1.068 Mmax = 0.903
 αCmin = 14.6° -CPmax = 15.8 αMmax = 20.9°

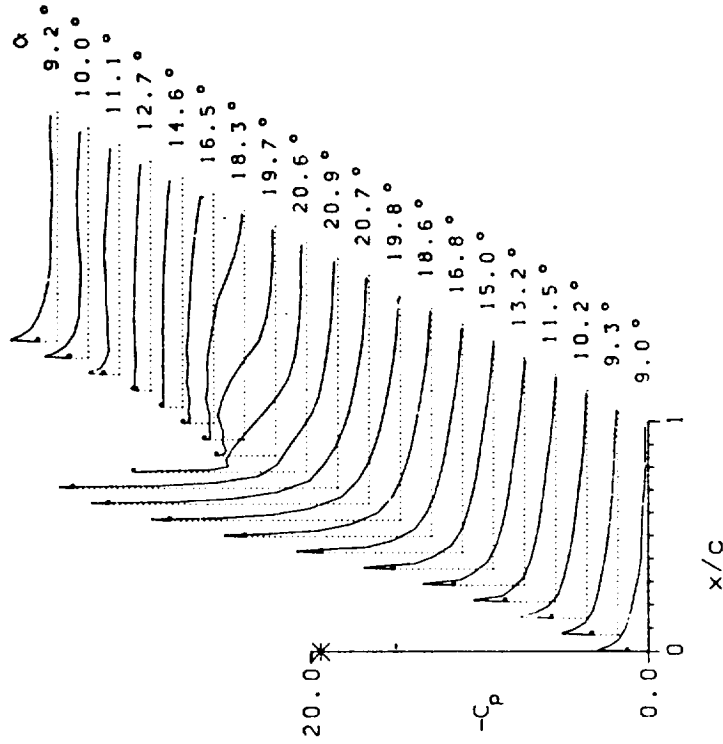
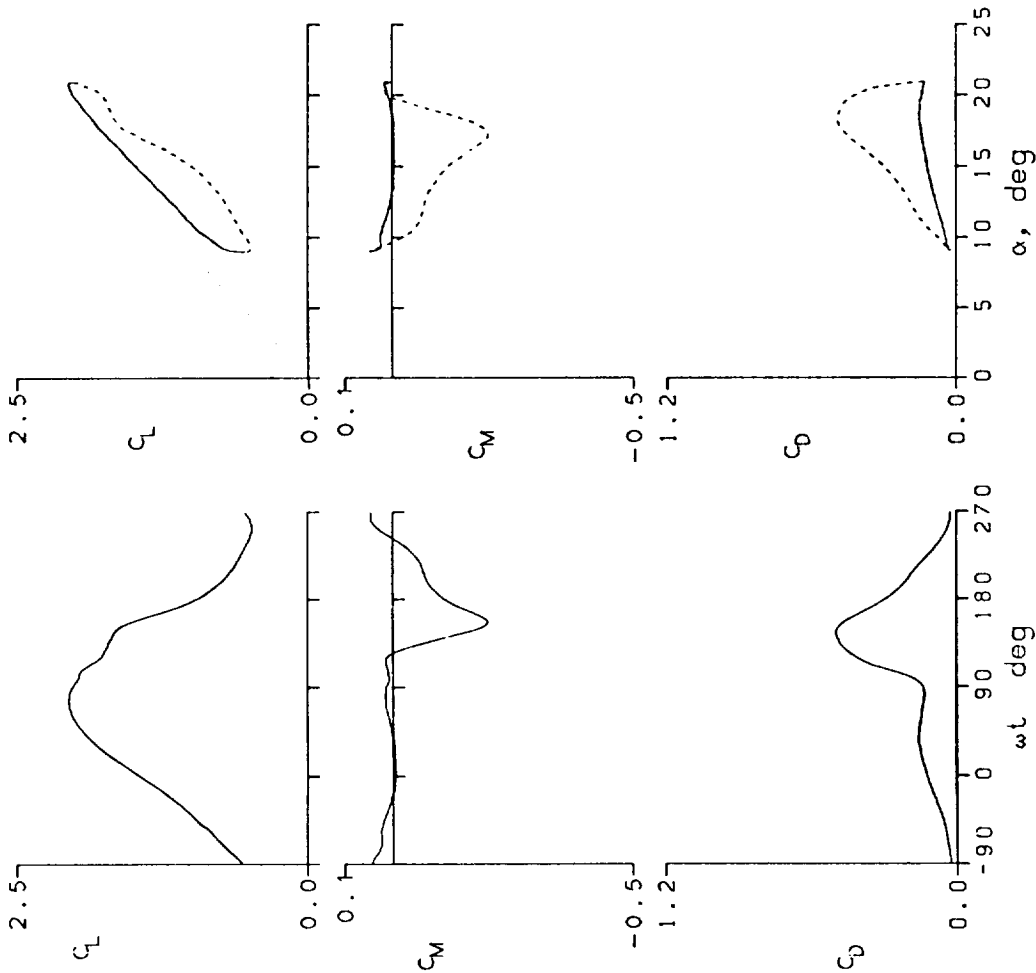


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9101 A0 = 14.98° k = 0.284
 Re = 2.36 E6 A1 = 4.89° M = 0.184
 $C_{Lmax} = 1.95$ $C_{Mmin} = -0.02$ $C_{Dmax} = 0.14$
 $\alpha_{Lmax} = 19.8^\circ$ $\zeta = 0.008$ $M_{max} = 0.854$
 $\alpha_{Cmin} = 14.8^\circ$ $-C_{Pmax} = 15.4$ $\alpha_{Mmax} = 19.8^\circ$

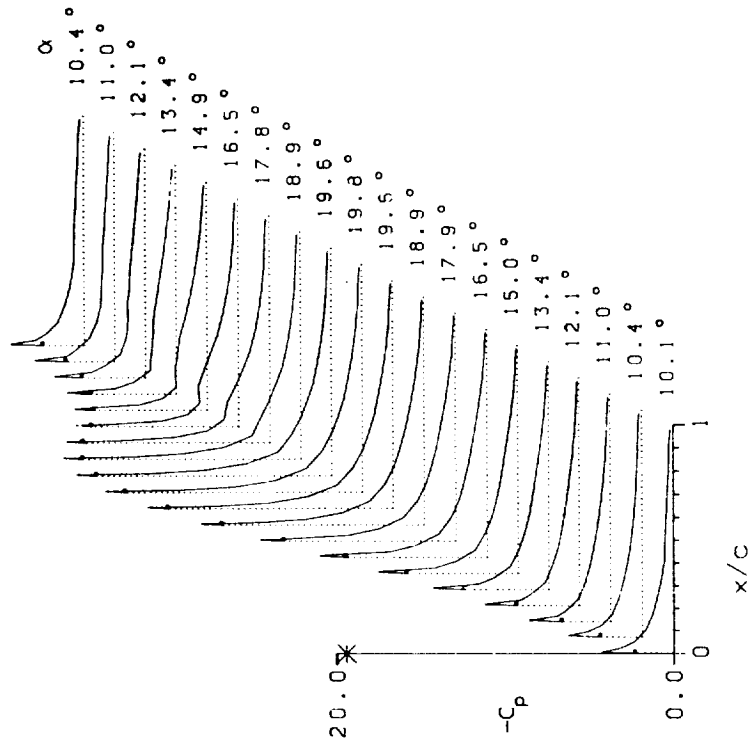
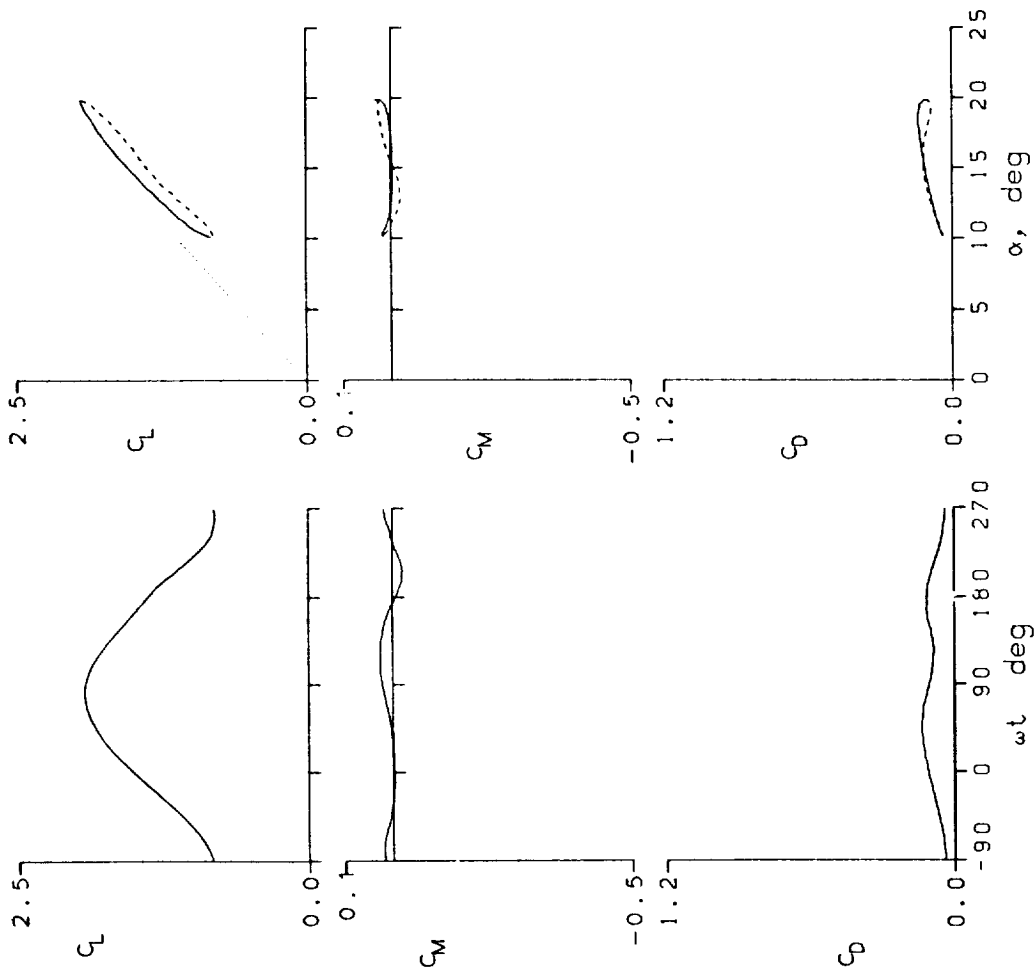


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9106 A0 = 9.79° k = 0.245
 Re = 2.37 E6 A1 = 9.87° M = 0.184
 CLmax = 2.02 CMmin = -0.05 CDmax = 0.16
 αLmax = 19.7° ζ = 0.585 Mmax = 0.883
 αCmin = 9.4° -CPmax = 16.2 αMmax = 19.5°

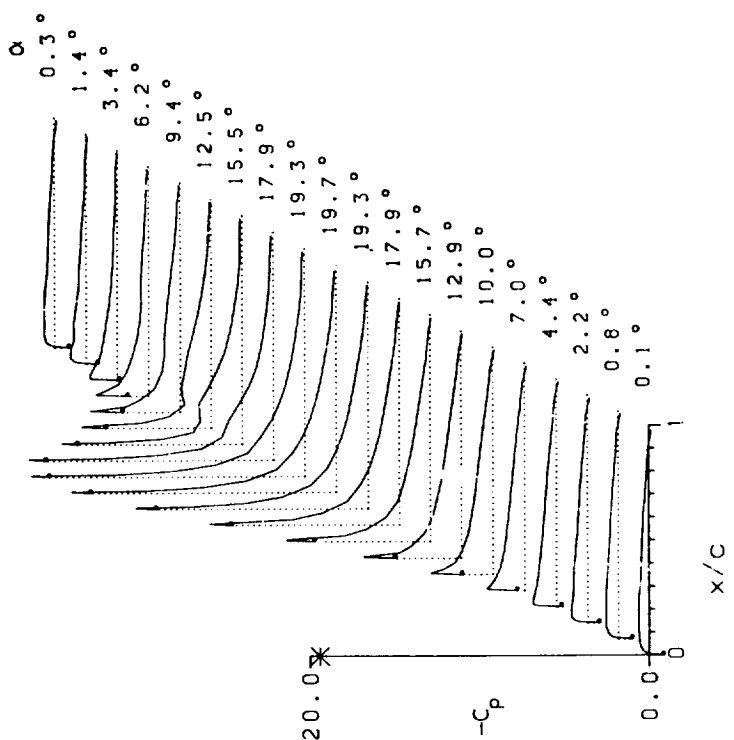
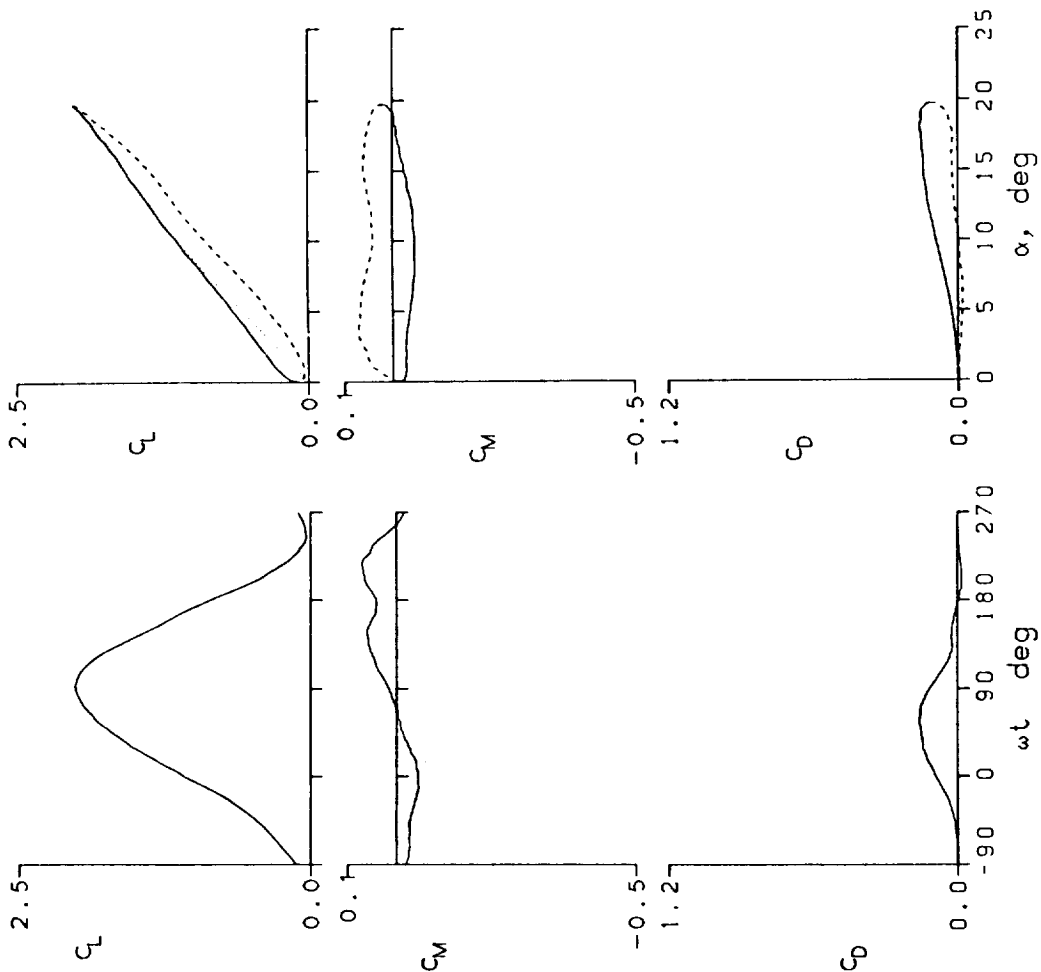


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9110	A0 = 7.80°	k = 0.010
Re = 2.48 E6	A1 = 9.95°	M = 0.184
C _{Lmax} = 1.70	C _{Mmin} = -0.18	C _{Dmax} = 0.36
α _{Lmax} = 16.6°	ξ = -0.130	M _{max} = 0.726
α _{Cmin} = 7.3°	-C _{Pmax} = 11.8	α _{Mmax} = 17.0°

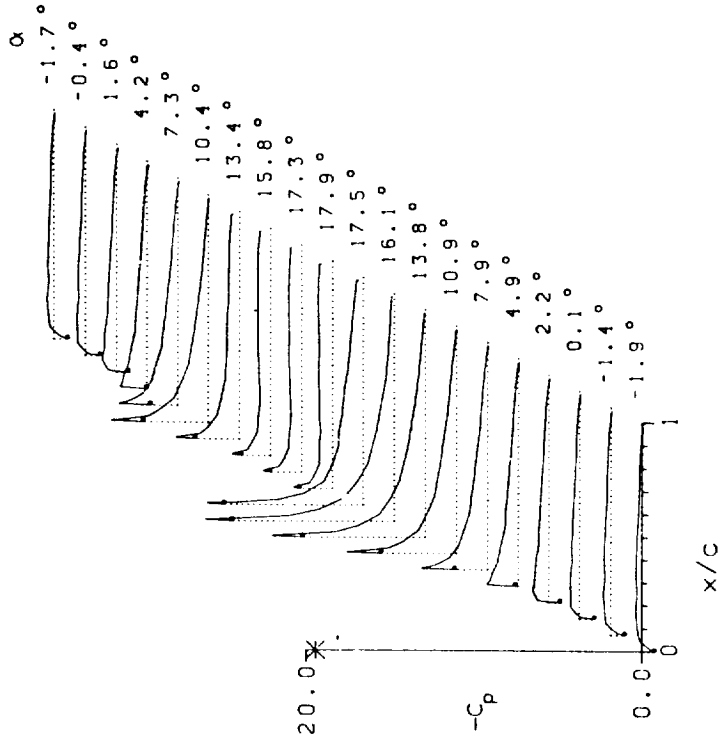
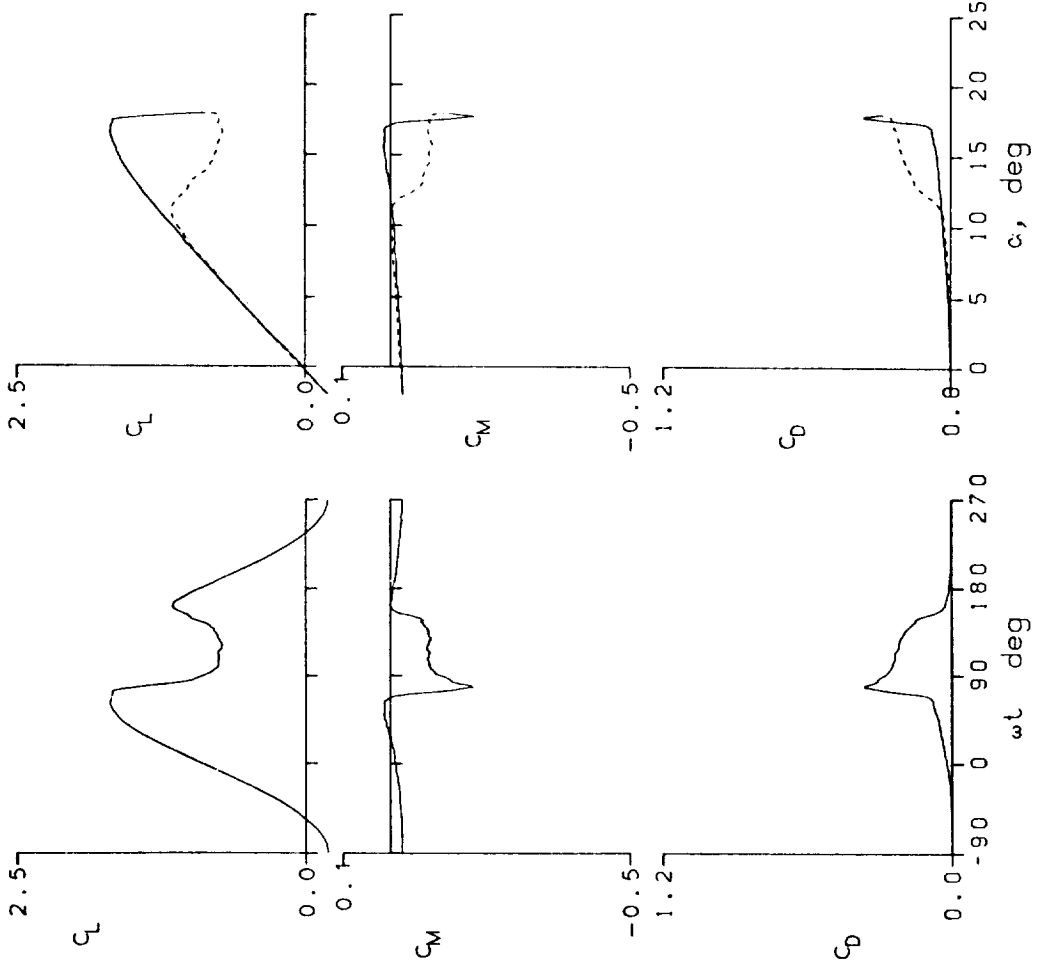


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9112	A0 = 7.82 °	k = 0.050
Re = 2.48 E6	A1 = 9.93 °	M = 0.183
C _{Lmax} = 1.76	C _{Mmin} = -0.10	C _{Dmax} = 0.22
α _{Lmax} = 17.6 °	ξ = -0.030	M _{max} = 0.763
α _{Cmin} = 7.3 °	-C _{pmax} = 12.8	α _{Mmax} = 17.9 °

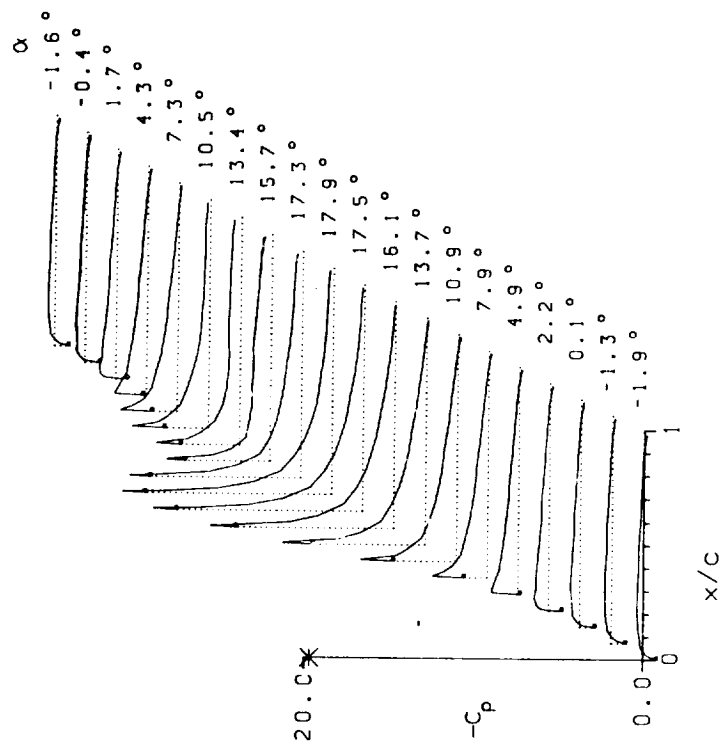
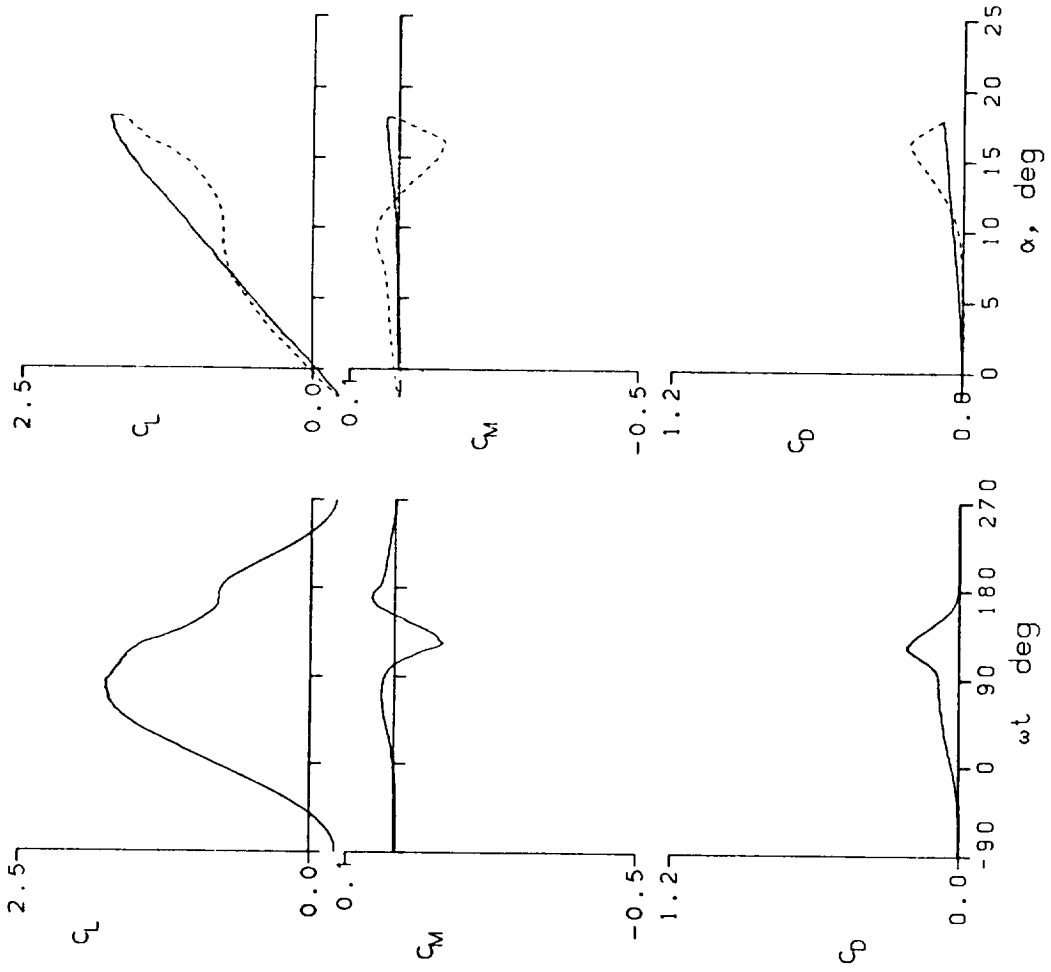


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9118 A0 = 7.78 ° k = 0.199
 Re = 2.45 E6 A1 = 9.95 ° M = 0.184
 $C_{Lmax} = 1.78$ $C_{Mmin} = -0.04$ $C_{Dmax} = 0.12$
 $\alpha_{Lmax} = 17.9^\circ$ $\zeta = 0.614$ $M_{max} = 0.770$
 $\alpha_{Cmin} = 7.2^\circ$ $-C_{Pmax} = 13.0$ $\alpha_{Mmax} = 17.7^\circ$

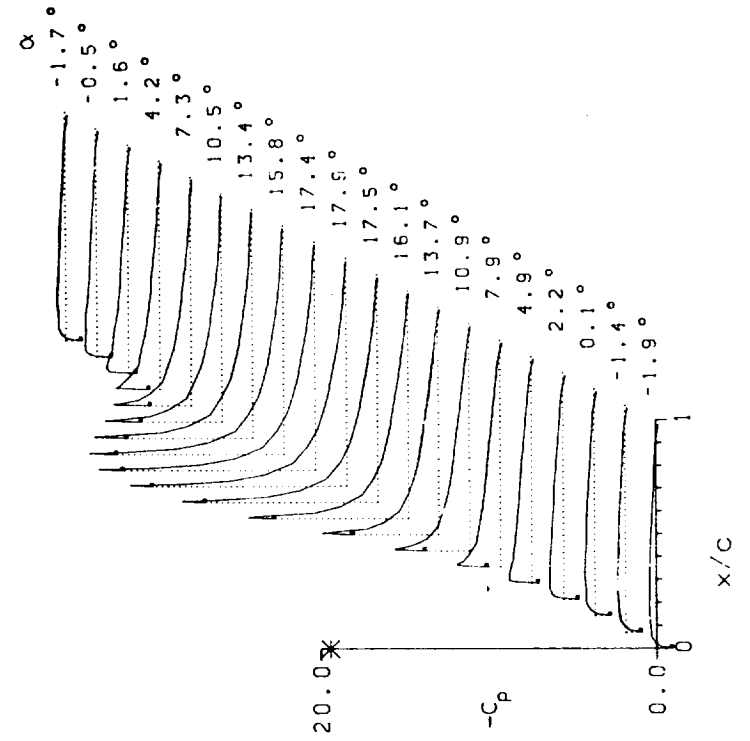
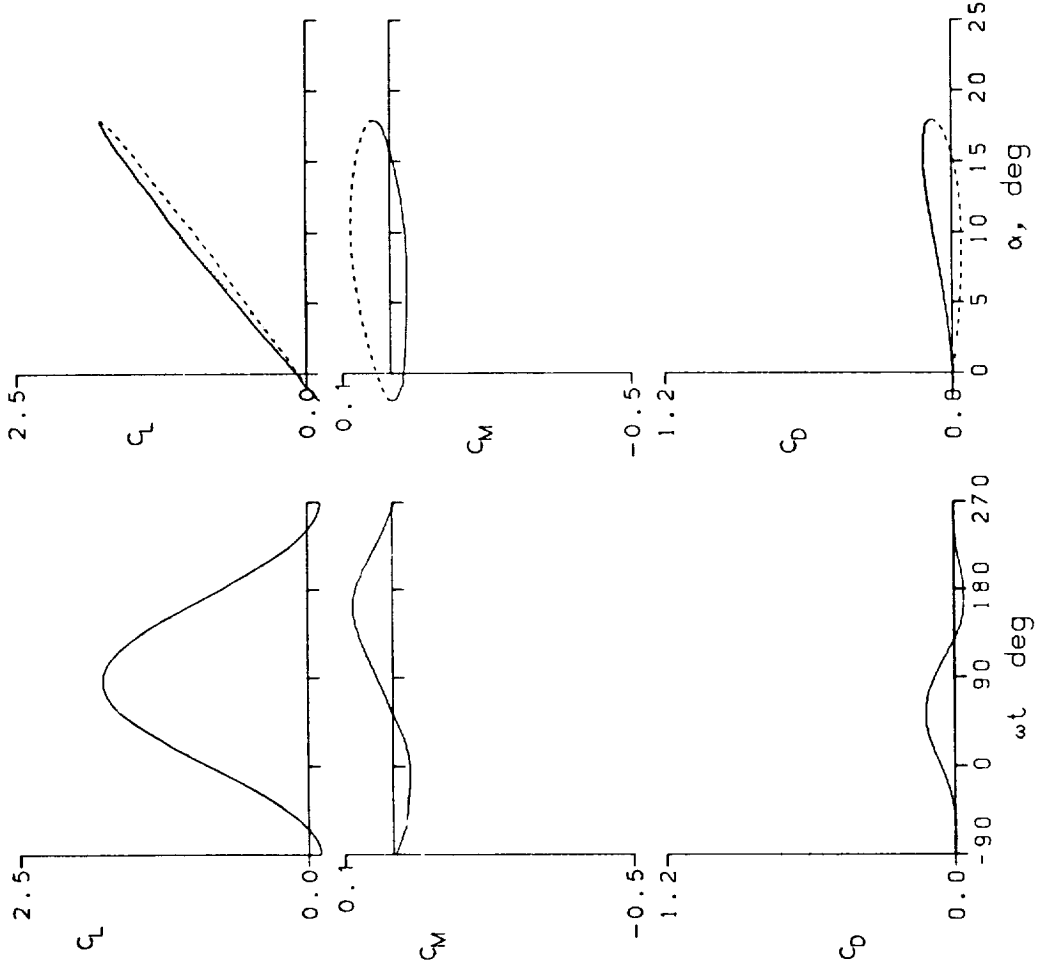


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9202 A0 = 14.83° k = 0.098
 Re = 2.85 E6 A1 = 9.91° M = 0.220
 CLmax = 2.20 CMmin = -0.43 CDmax = 0.96
 αLmax = 23.4° ζ = 0.078 Mmax = 1.106
 αCmin = 14.5° -CPmax = 15.4 αMmax = 20.3°

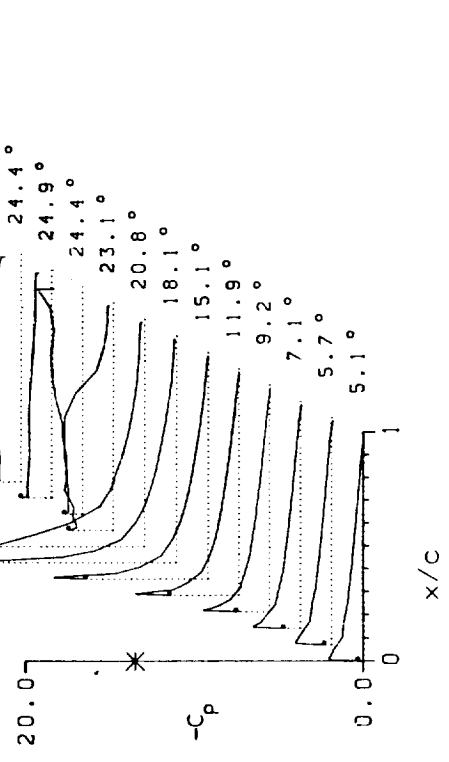
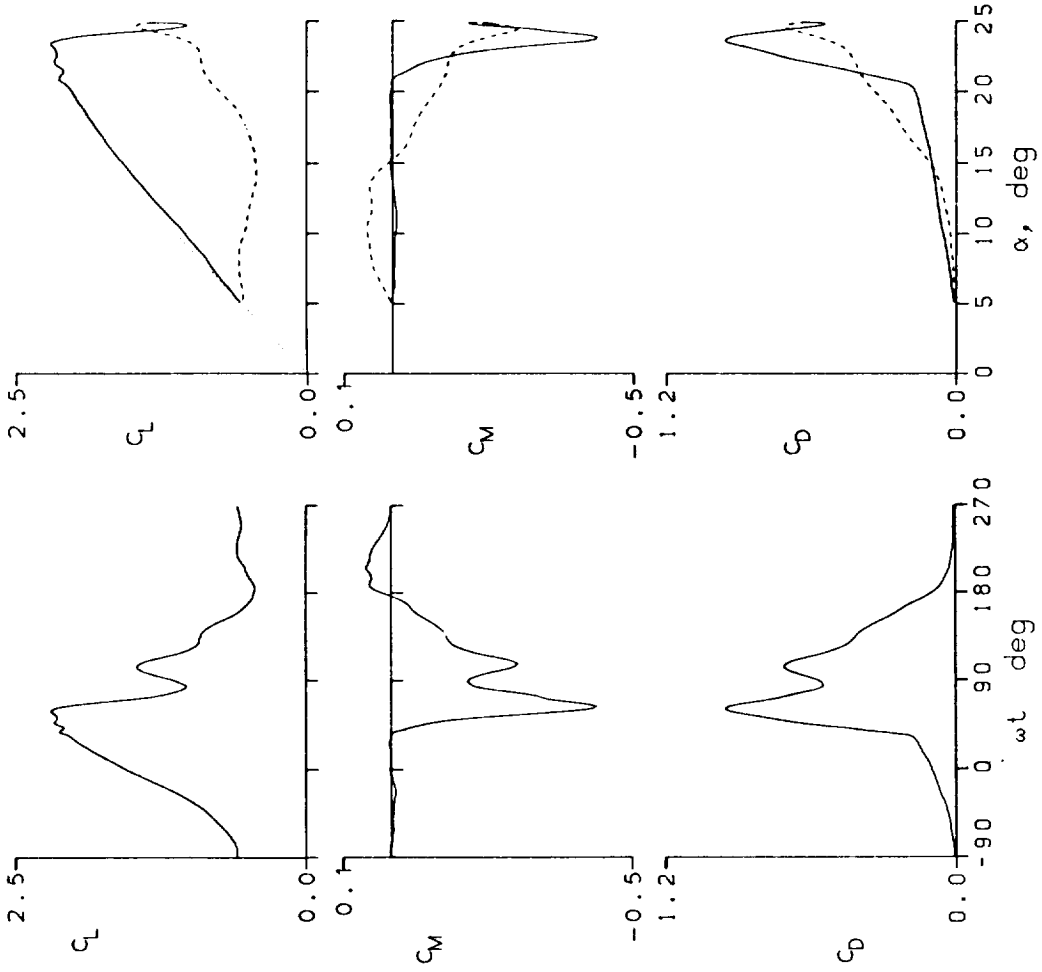


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9203 A0 = 14.85 ° k = 0.098
 Rθ = 3.19 E6 A1 = 9.88 ° M = 0.249
 C_{Lmax} = 2.12 C_{Mmin} = -0.42 C_{Dmax} = 0.87
 α_{Lmax} = 21.9 ° ξ = 0.373 M_{max} = 1.142
 α_{Cmin} = 14.4 ° $-C_{Pmax}$ = 12.4 α_{Mmax} = 18.3 °

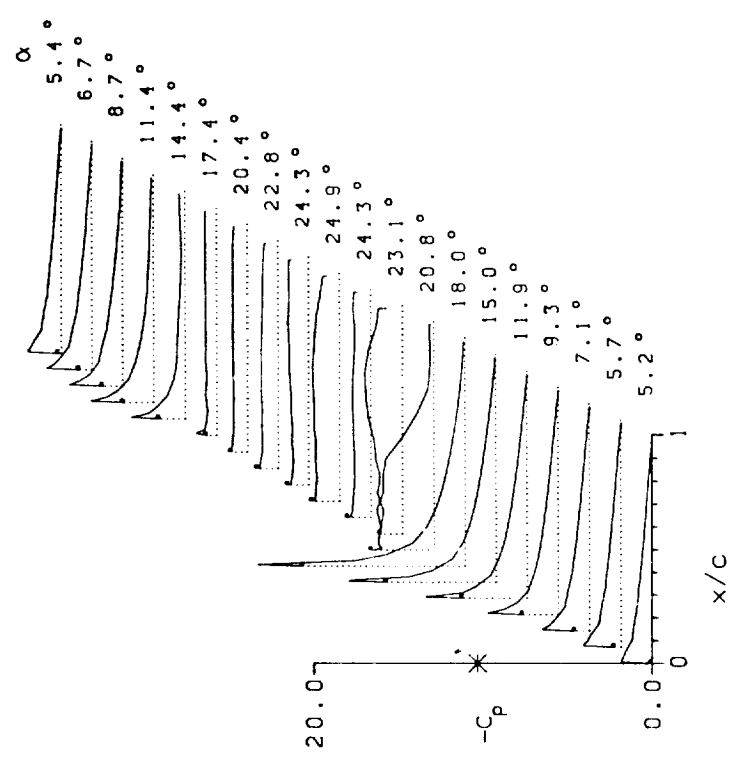
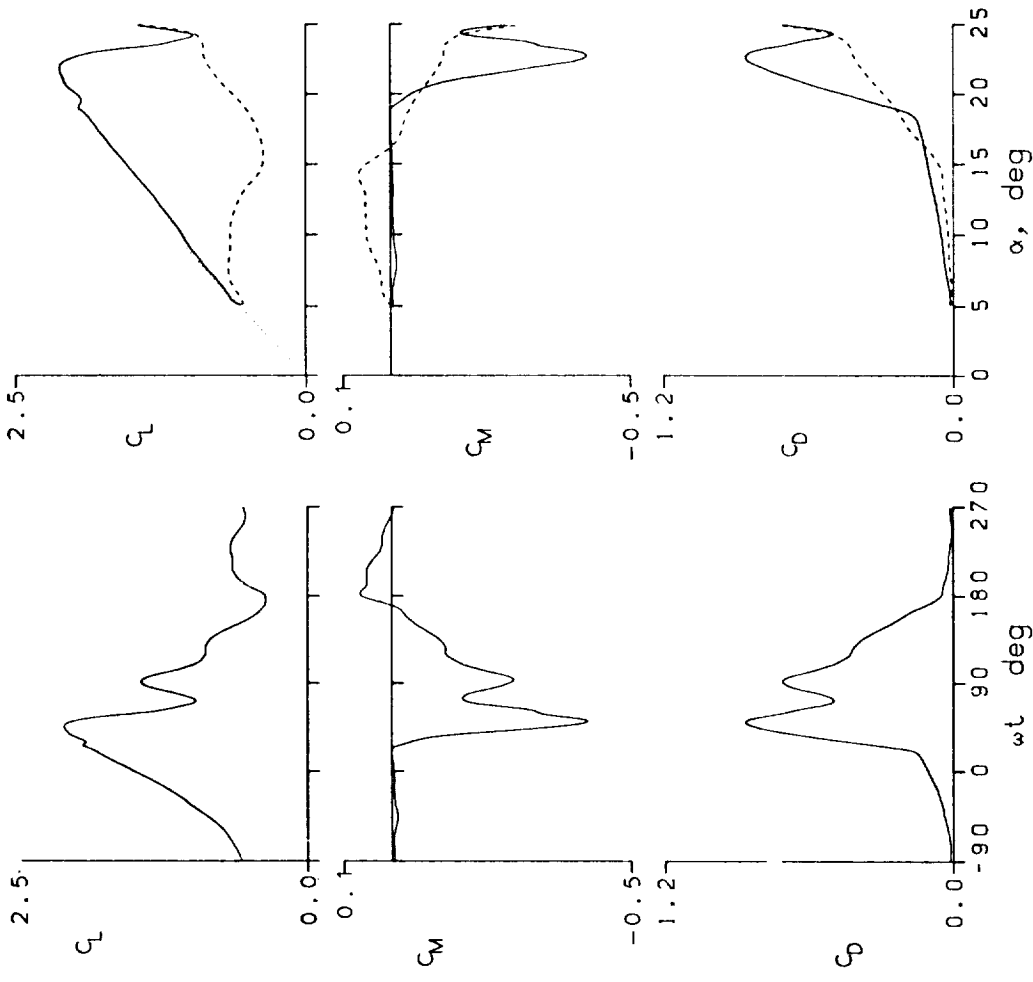


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9208 A0 = 14.84 ° k = 0.097
 Re = 3.52 E6 A1 = 9.87 ° M = 0.280
 CLmax = 2.01 CMmin = -0.38 CDmax = 0.78
 α Lmax = 20.5 ° ζ = 0.539 Mmax = 1.214
 α Cmin = 14.4 ° -CPmax = 10.5 α Mmax = 16.2 °

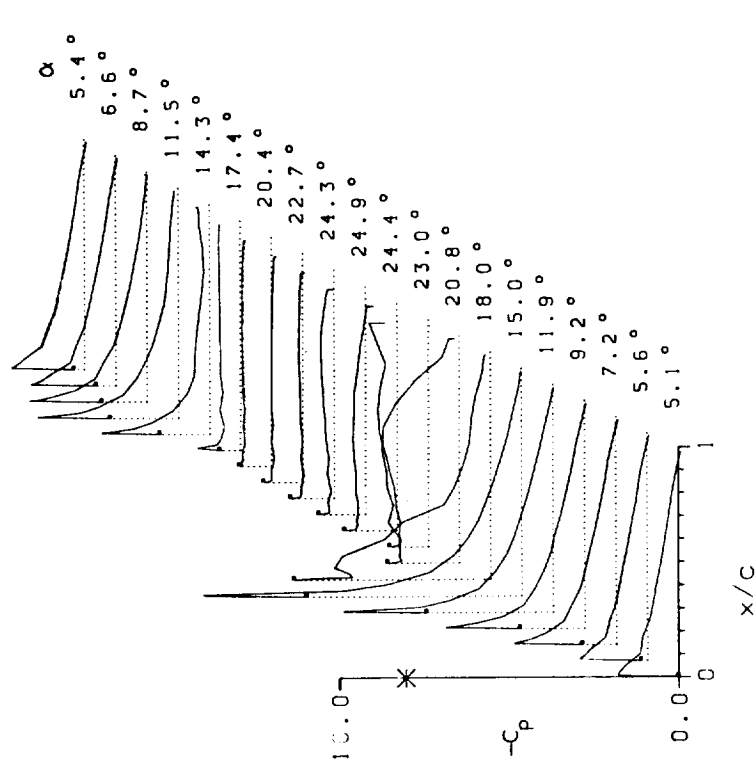
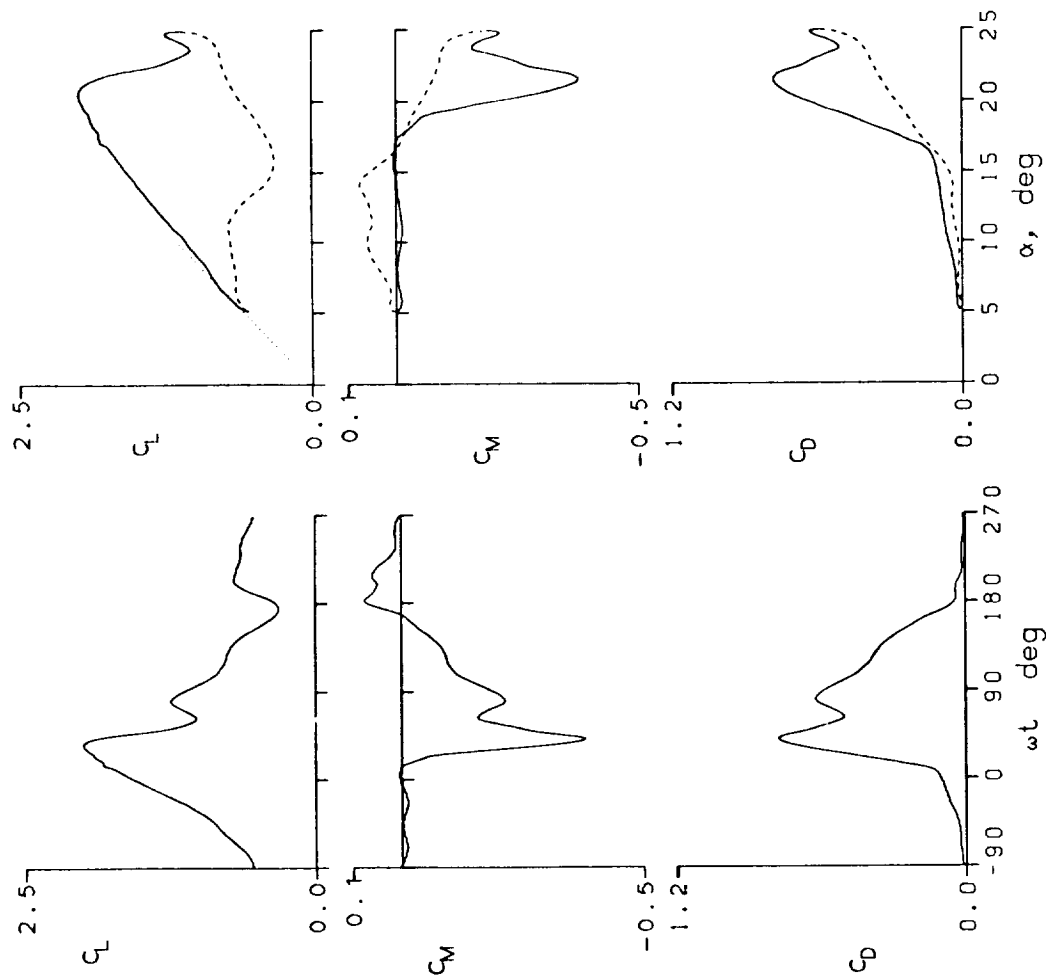


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9210 A0 = 14.81° k = 0.010
 Re = 3.67 E6 A1 = 9.90° M = 0.295
 CLmax = 1.42 CMmin = -0.14 CDmax = 0.43
 αLmax = 14.3° ζ = -0.019 Mmax = 1.168
 αCMmin = 14.3° -CPMPX = 8.9 αMmax = 14.0°

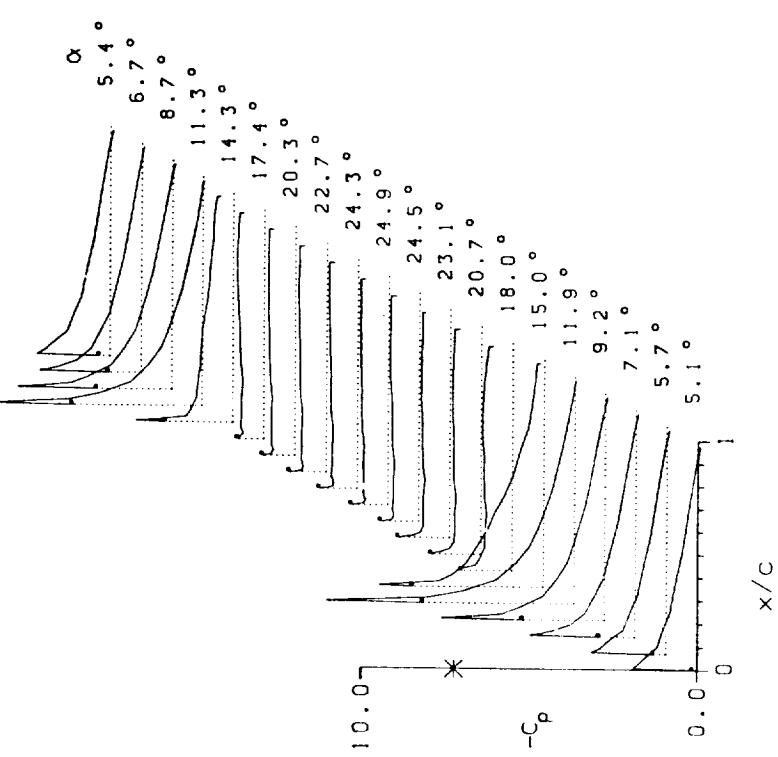
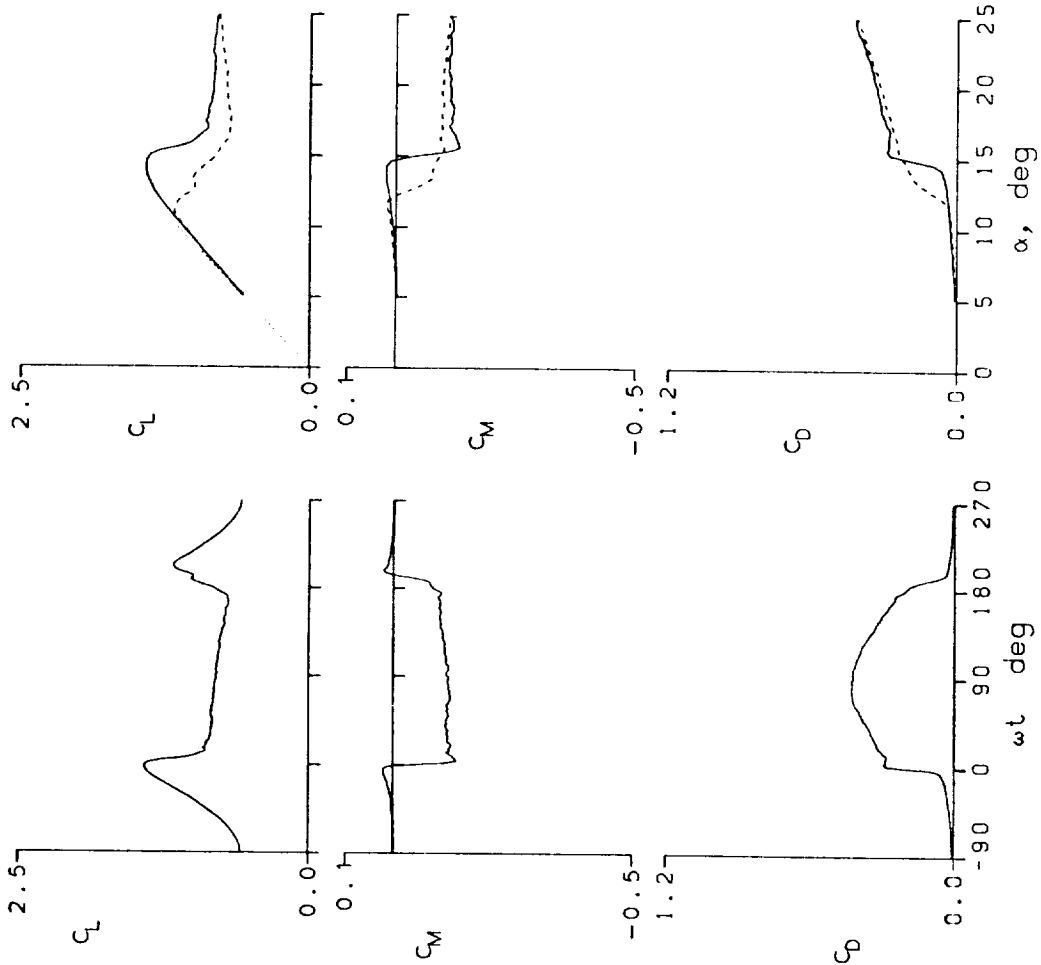
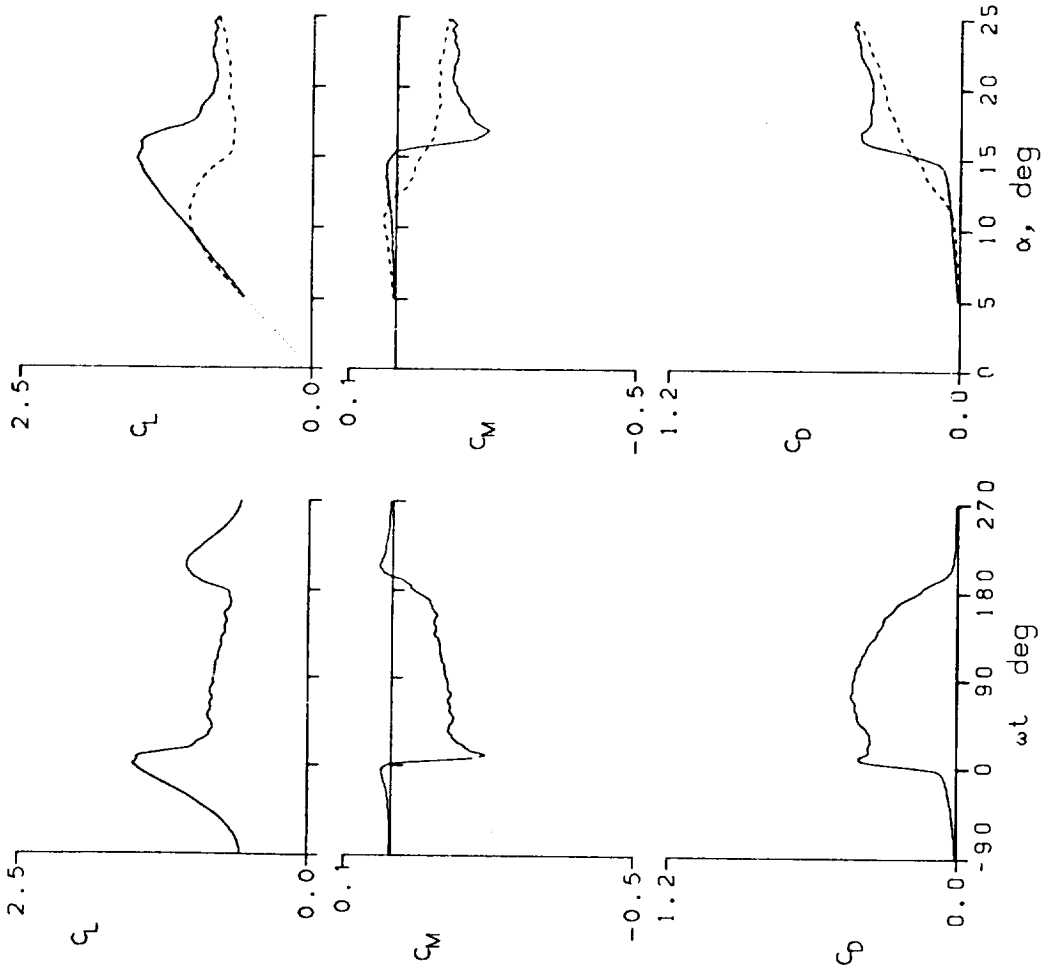


Figure 12.- Continued.



NACA 0012 AIRFOIL
 FRAME : 9213 A0 = 14.86 ° k = 0.024
 Re = 3.60 E6 A1 = 9.88 ° M = 0.294
 CLmax = 1.52 CMmin = -0.20 CDmax = 0.45
 α Lmax = 14.7 ° ζ = 0.106 Mmax = 1.198
 α Cmin = 14.4 ° -CPmax = 9.3 α Mmax = 14.4 °

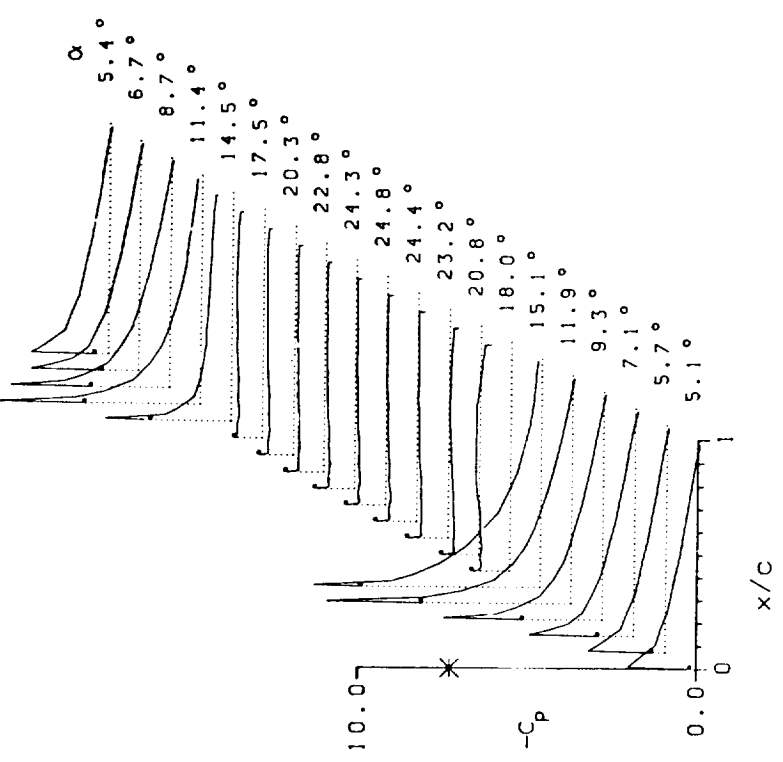


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9214 A0 = 14.84 ° k = 0.049
 Re = 3.57 E6 A1 = 9.90 ° M = 0.292
 C_{Lmax} = 1.71 C_{Mmin} = -0.26 C_{Dmax} = 0.53
 α_{Lmax} = 17.5 ° ζ = 0.274 M_{max} = 1.215
 α_{Cmin} = 14.4 ° $-C_{pmax}$ = 9.6 α_{Mmax} = 14.7 °

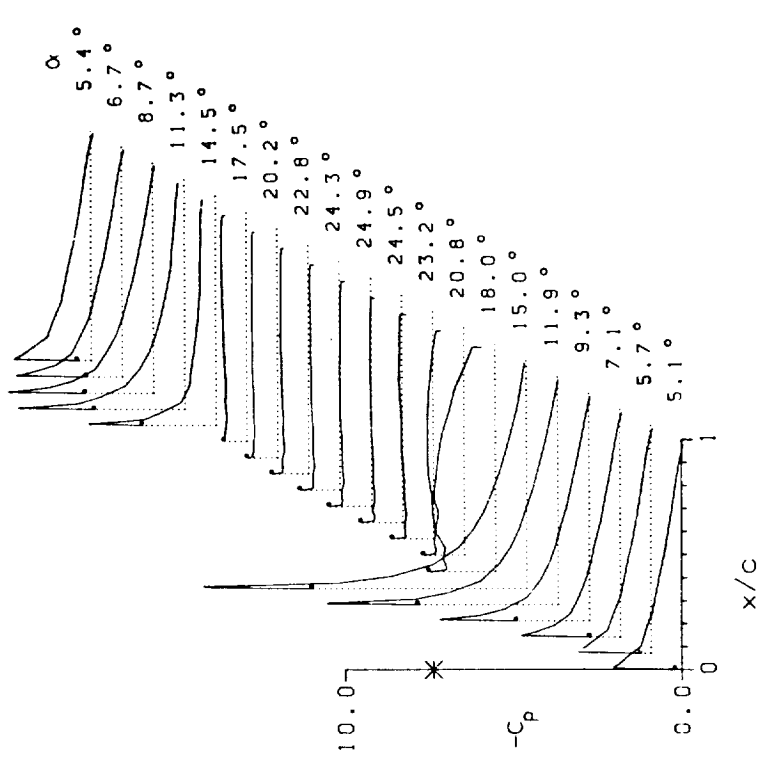
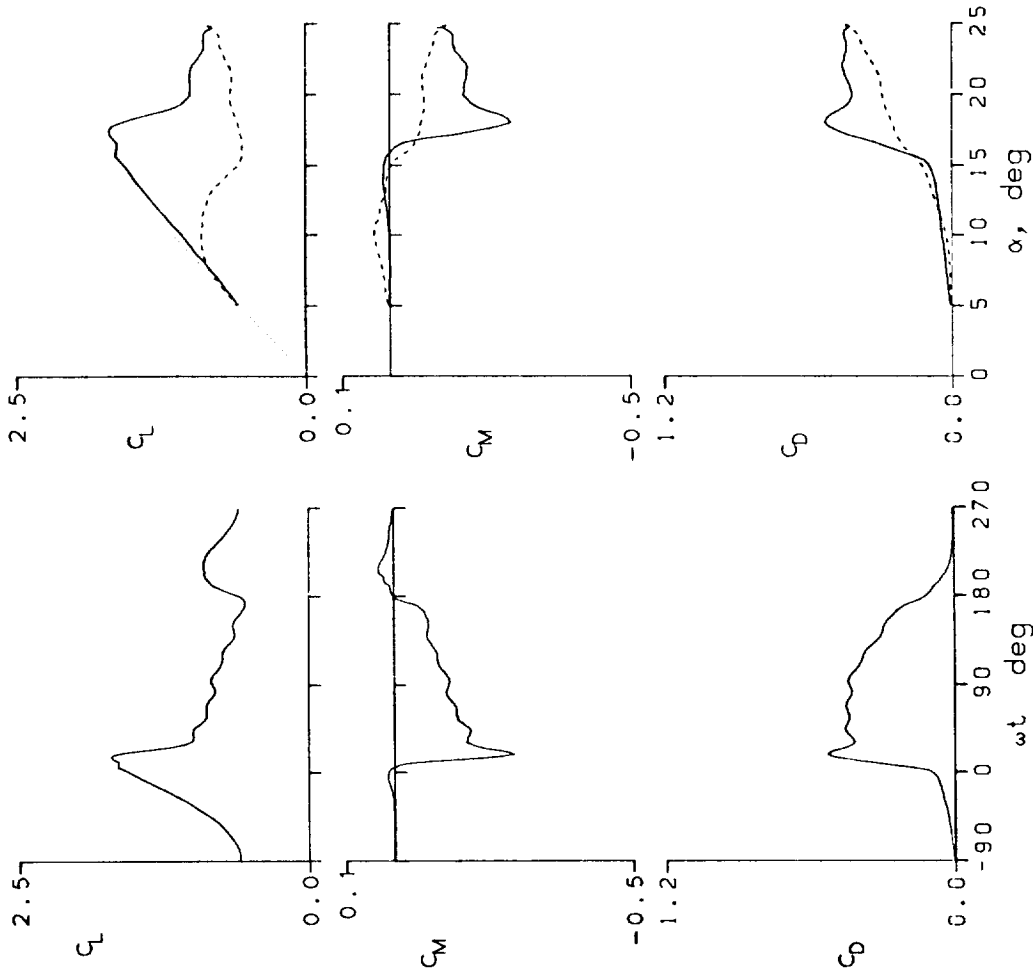


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 9217 A0 = 14.84 ° k = 0.098
 Re = 3.55 E6 A1 = 9.89 ° M = 0.290
 C_{Lmax} = 2.08 C_{Mmin} = -0.32 C_{Dmax} = 0.67
 α_{Lmax} = 19.8 ° ζ = 0.534 M_{max} = 1.232
 α_{Cmin} = 14.4 ° -C_{Pmax} = 9.9 α_{Mmax} = 15.6 °

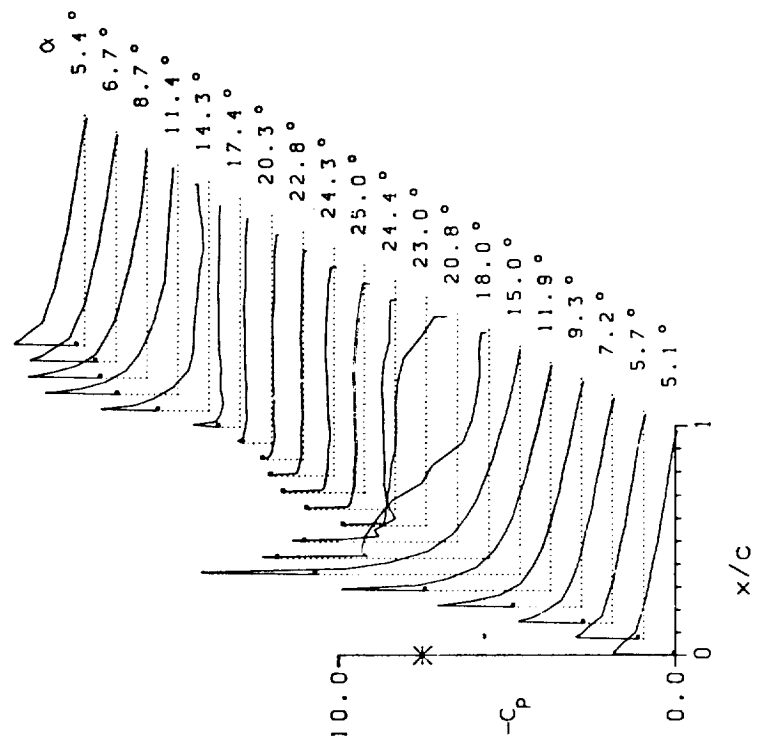
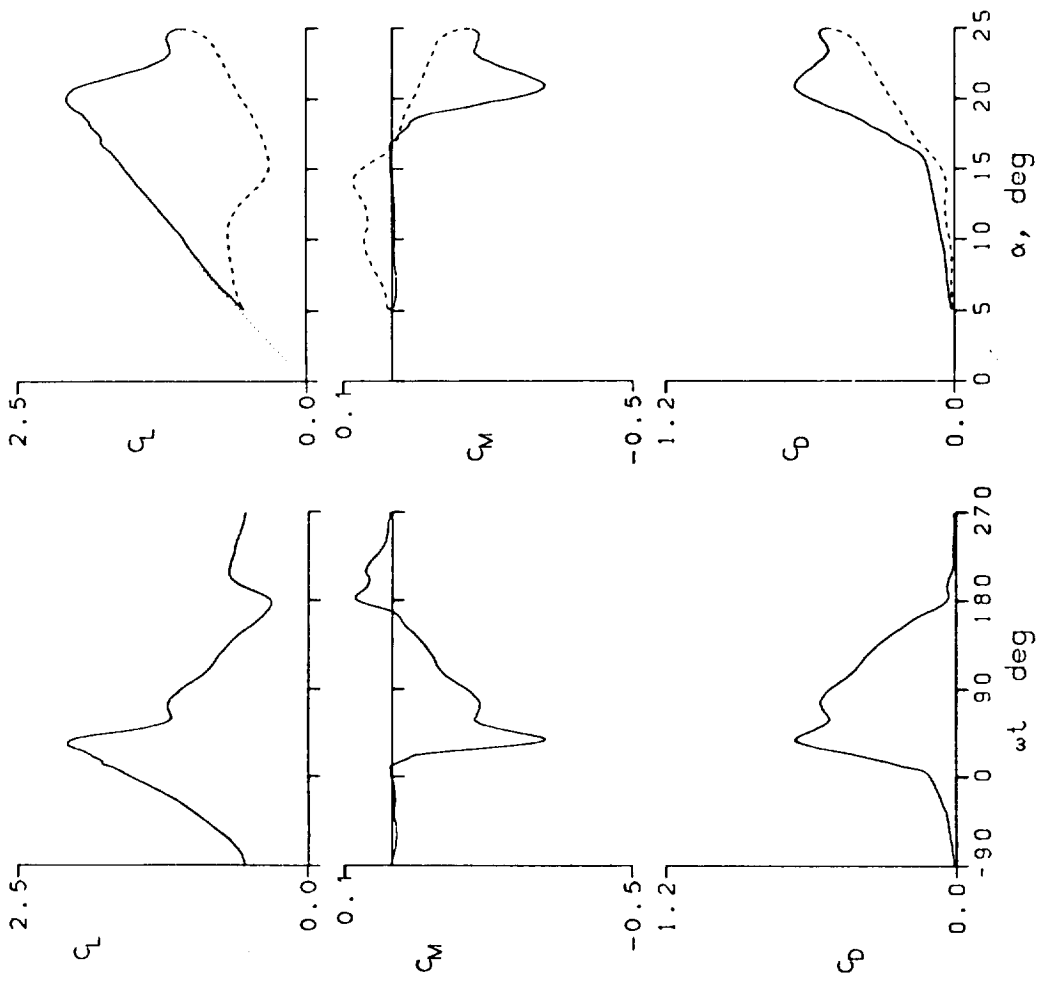


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 9218 A0 = 14.91° k = 0.151
 Re = 3.45 E6 A1 = 9.88° M = 0.283
 C_{Lmax} = 2.17 C_{Mmin} = -0.42 C_{Dmax} = 0.89
 α_{Lmax} = 22.7° ζ = 0.456 M_{max} = 1.224
 α_{Cmin} = 14.6° -C_{pmax} = 10.4 α_{Mmax} = 17.0°

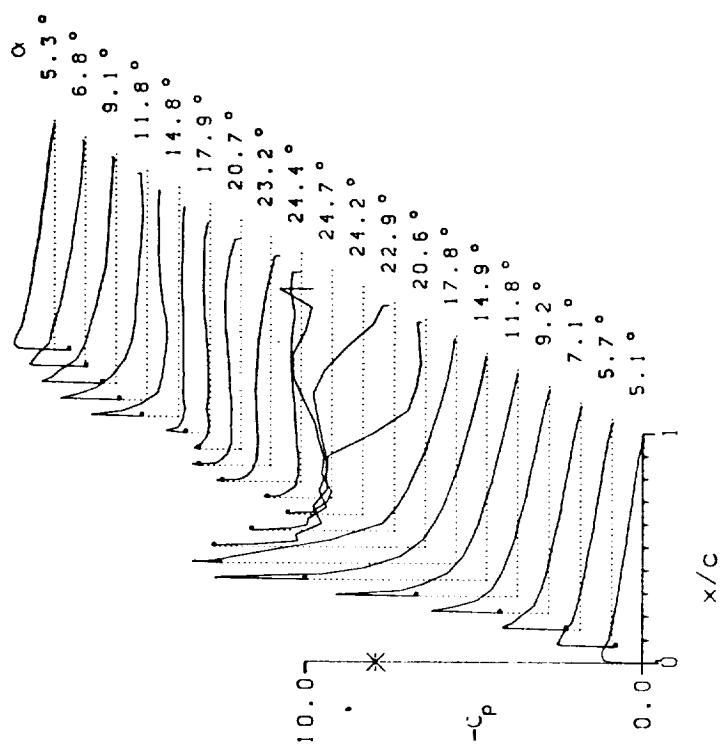
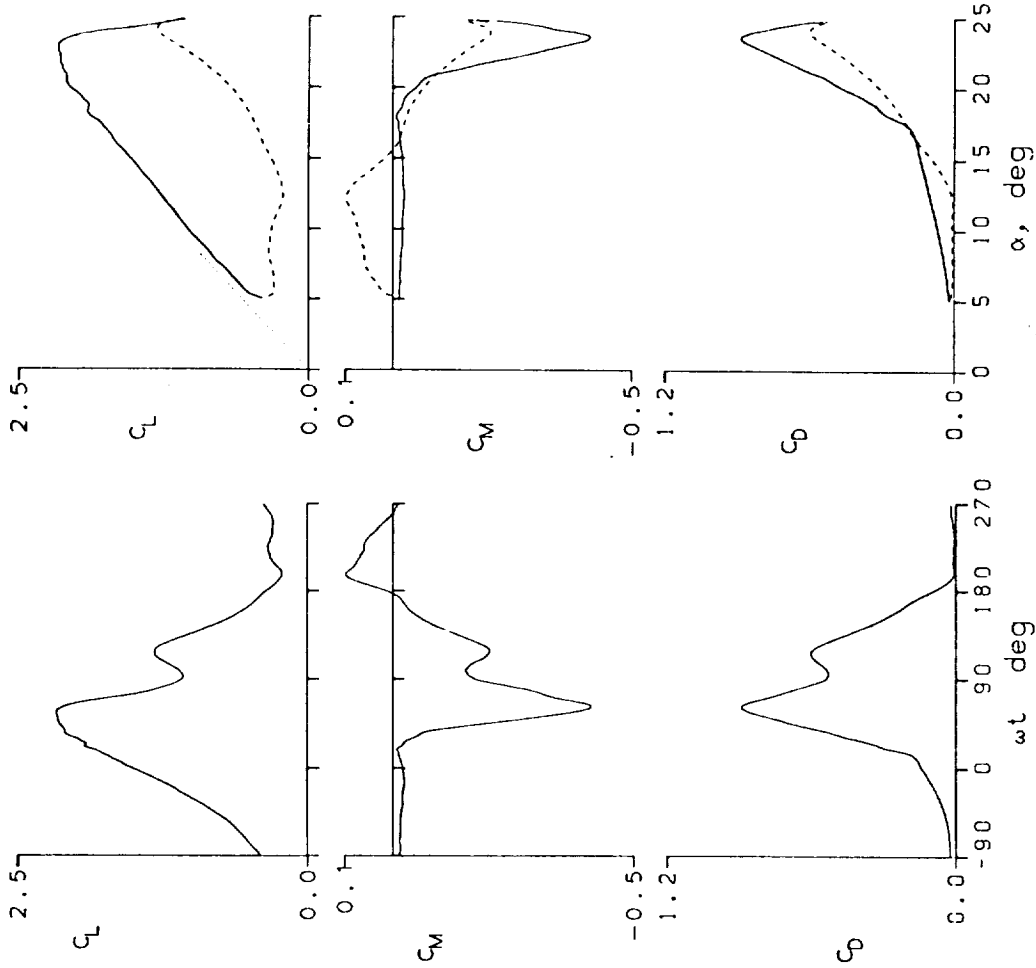


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9221 A0 = 9.86° k = 0.010
 Re = 3.67 E6 A1 = 9.90° M = 0.302
 $C_{Lmax} = 1.41$ $C_{Mmin} = -0.14$ $C_{Dmax} = 0.34$
 $\alpha_{Lmax} = 14.0^\circ$ $\zeta = 0.000$ $M_{max} = 1.184$
 $\alpha_{Cmin} = 9.5^\circ$ $-C_{pmax} = 8.7$ $\alpha_{Mmax} = 13.3^\circ$

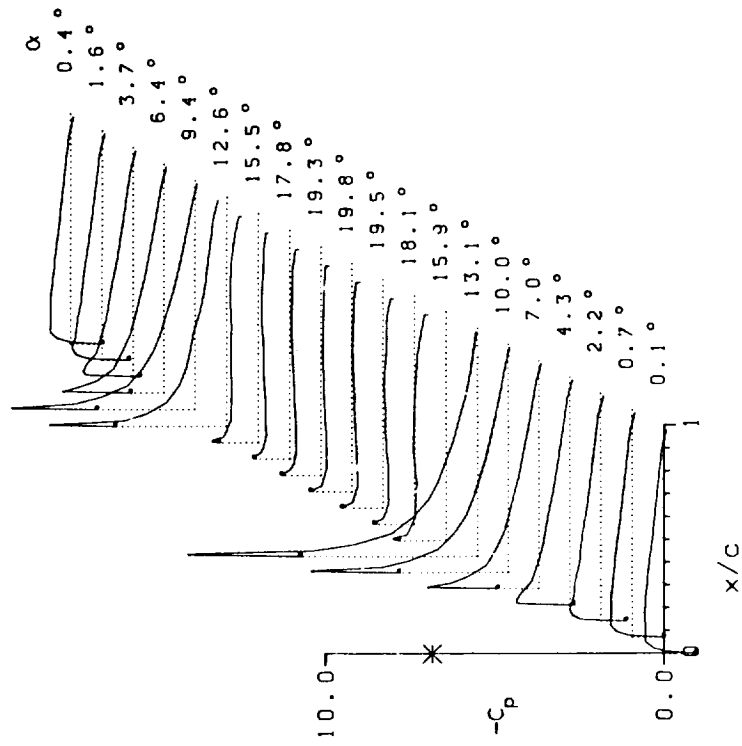
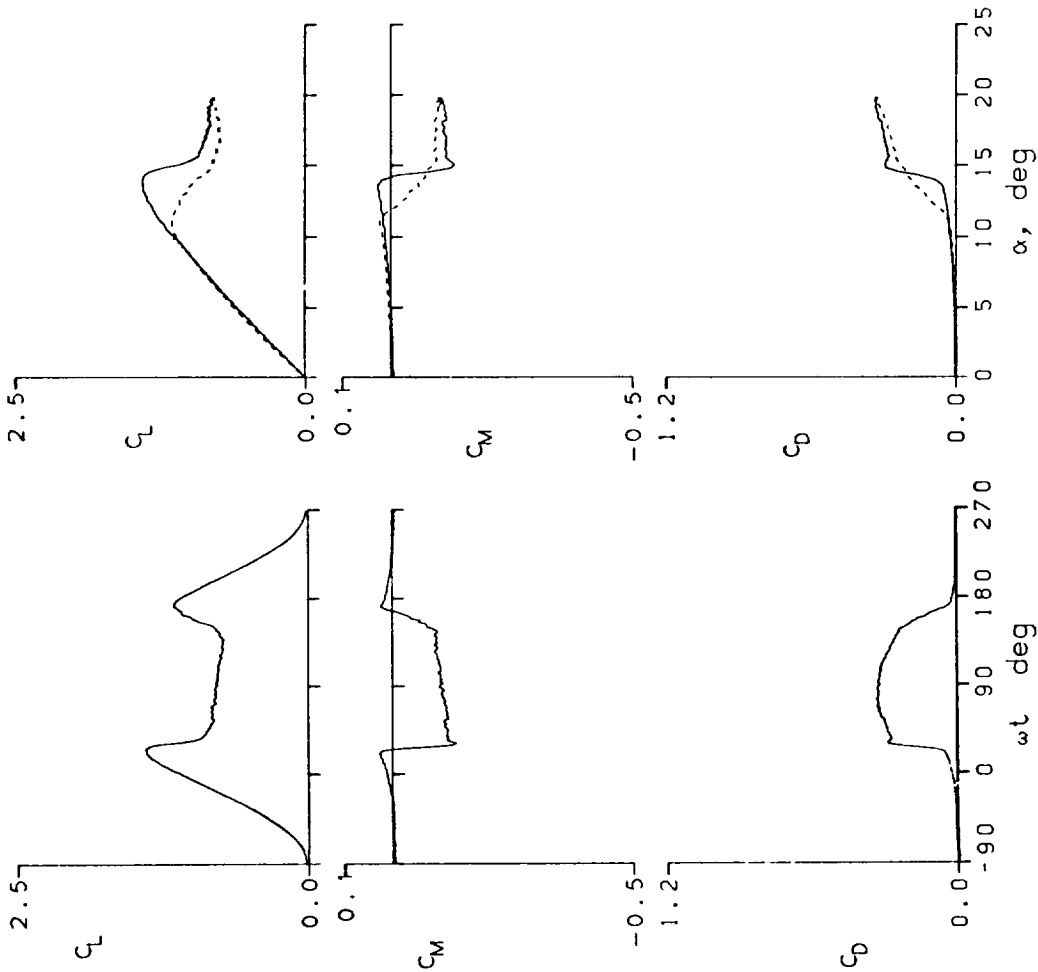
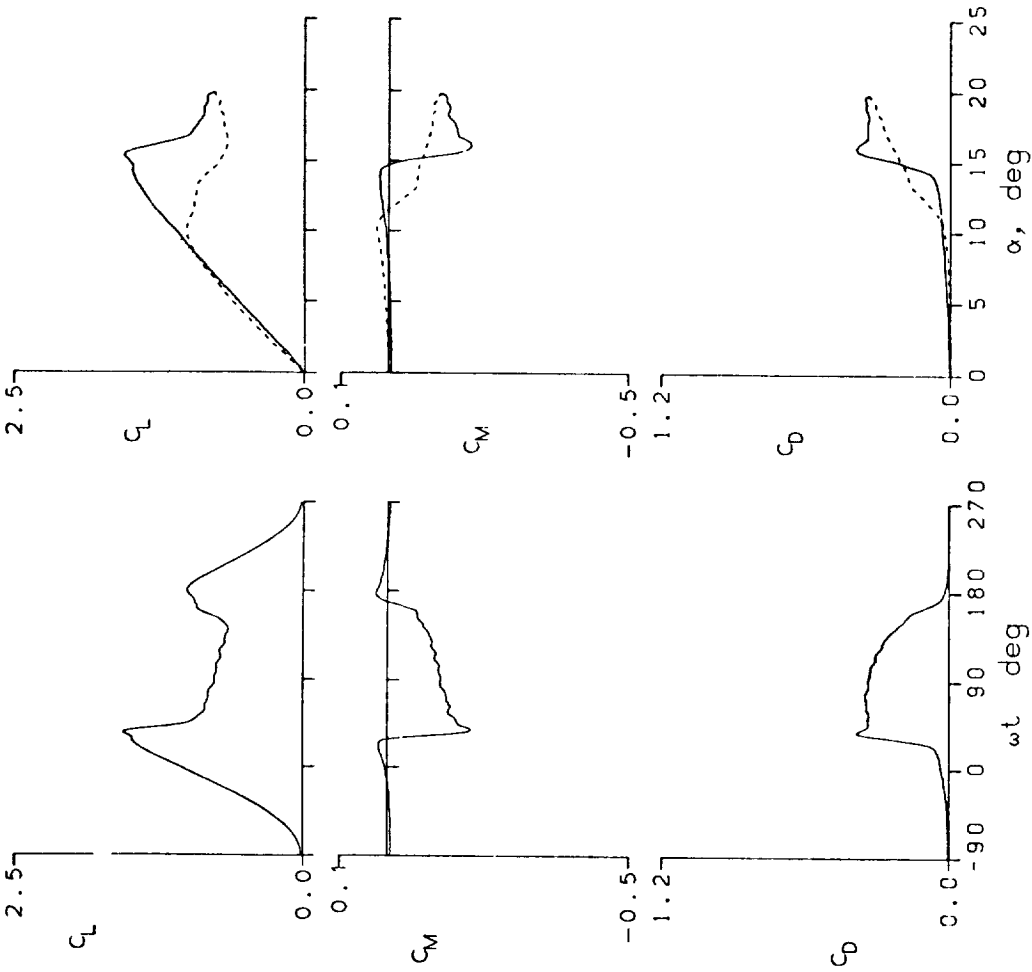


Figure 12.- Continued.



NACA 0012 AIRFOIL

FRAME : 9222 A0 = 9.84 ° k = 0.024

Re = 3.66 E6 A1 = 9.88 ° M = 0.302

C_{Lmax} = 1.57 C_{Mmin} = -0.18 C_{Dmax} = 0.39

α_{Lmax} = 15.3 ° ζ = 0.042 M_{max} = 1.220

α_{Crin} = 9.4 ° $-C_{pmax}$ = 9.0 α_{Mmax} = 13.9 °

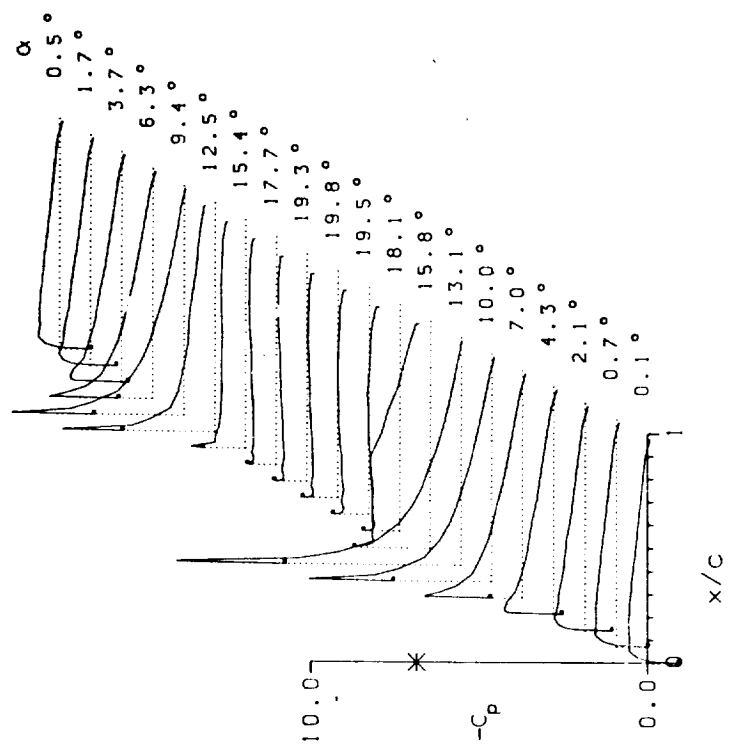


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 9223 A0 = 9.83° k = 0.048
 Re = 3.65 E6 A1 = 9.88° M = 0.302
 CLmax = 1.68 CMmin = -0.19 CDmax = 0.41
 α Lmax = 16.4° ζ = 0.140 Mmax = 1.224
 α Cmin = 9.3° -CDmax = 9.0 α Mmax = 14.2°

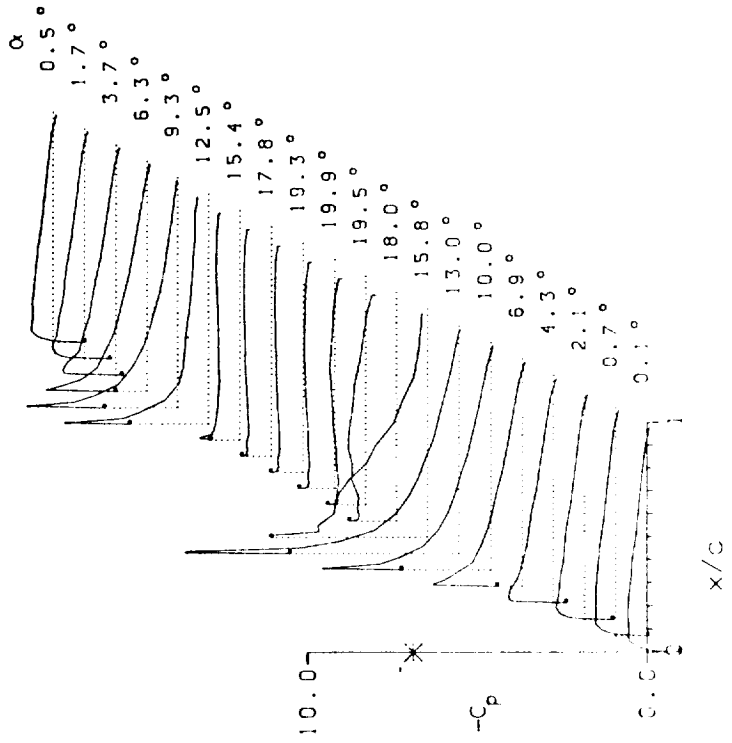
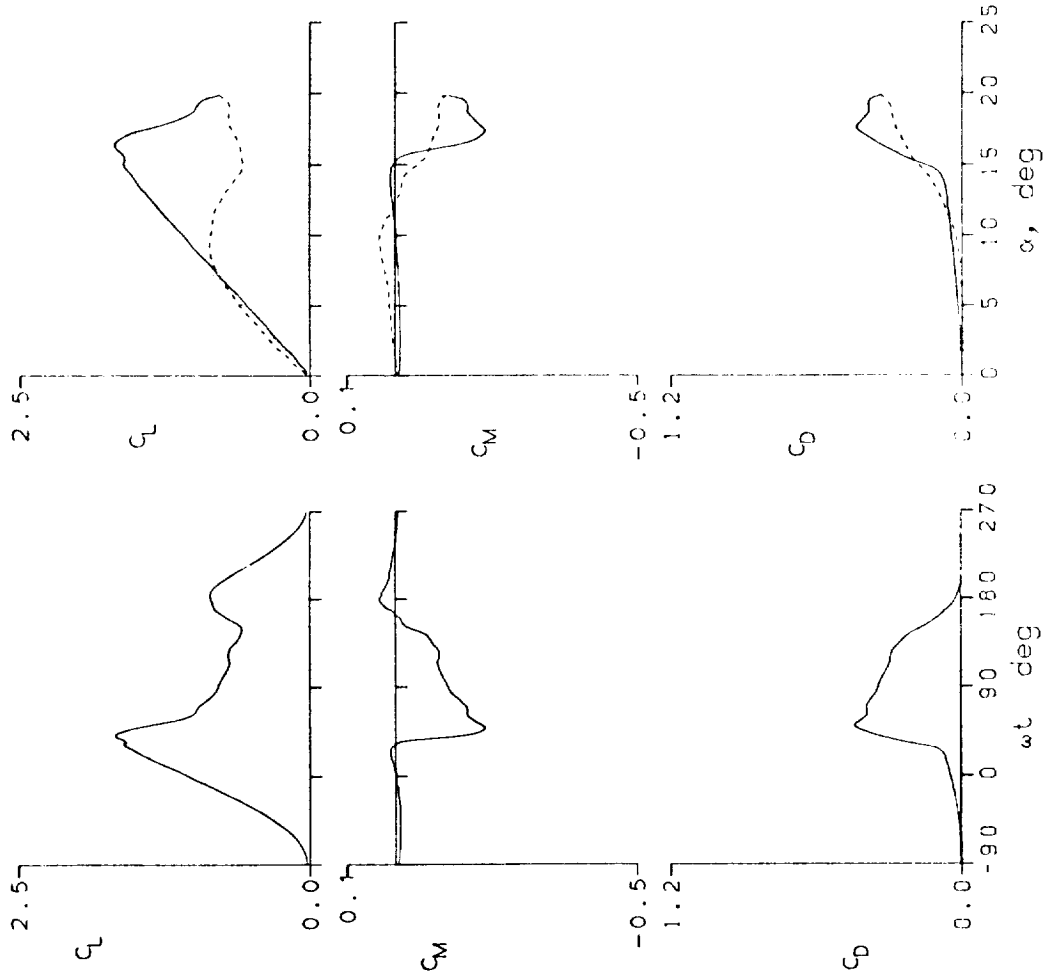


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 9307 A0 = 9.97 ° k = 0.145
 Re = 3.67 E6 A1 = 9.88 ° M = 0.302
 $C_{Lmax} = 1.86$ $C_{Mmin} = -0.30$ $C_{Dmax} = 0.61$
 $\alpha_{Lmax} = 19.1^\circ$ $\xi = 0.277$ $M_{max} = 1.238$
 $\alpha_{Cmin} = 9.5^\circ$ $-C_{Pmax} = 9.1$ $\alpha_{Mmax} = 15.5^\circ$

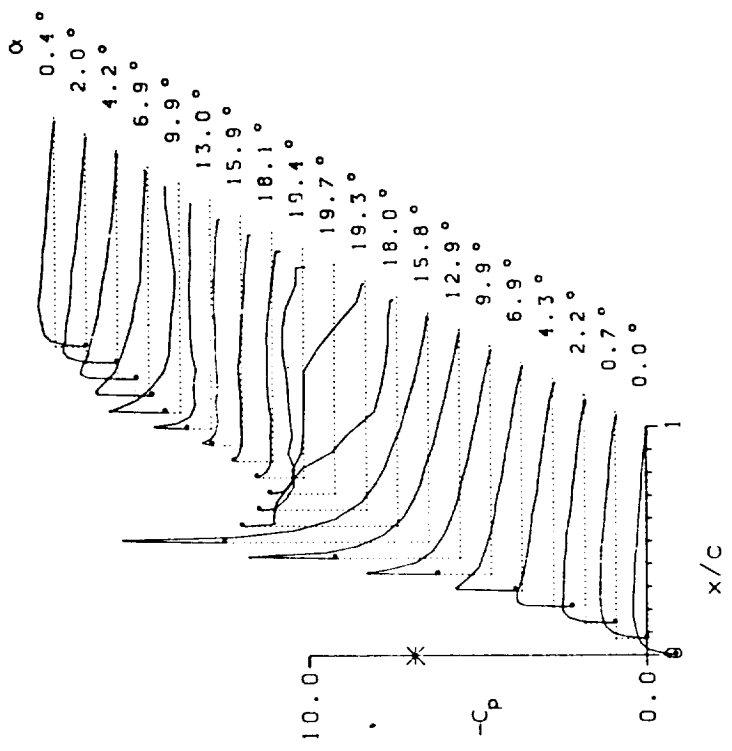
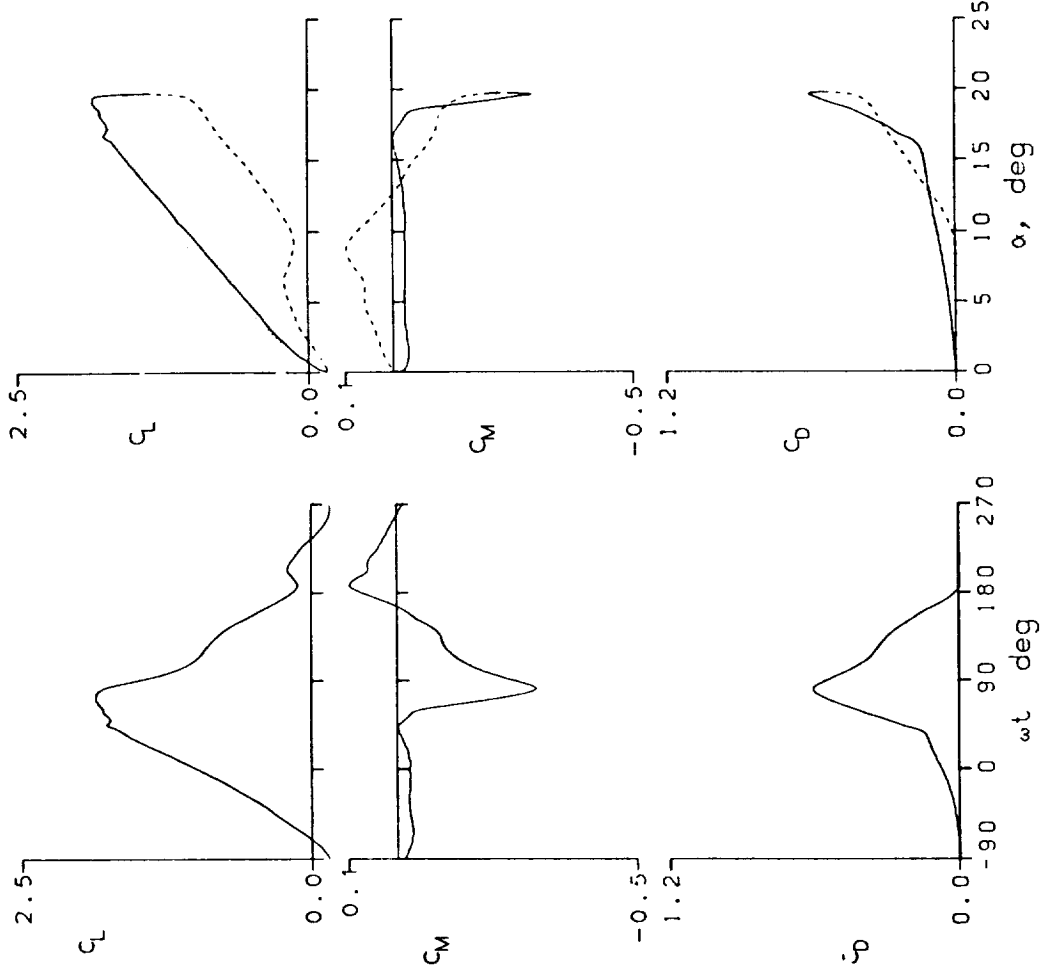


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10022 A0 = 11.84 ° k = 0.098
 Re = 3.77 E6 A1 = 9.87 ° M = 0.301
 CLmax = 1.90 CMmin = -0.30 CDmax = 0.63
 α Lmax = 19.2 ° ζ = 0.326 Mmax = 1.226
 α CMln = 11.4 ° -CPmax = 9.1 α Mmax = 15.0 °

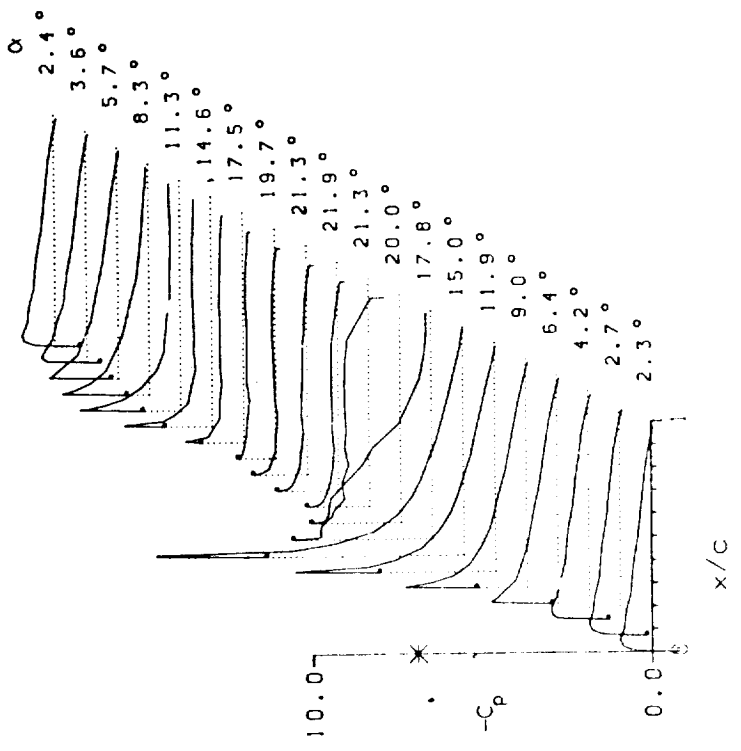
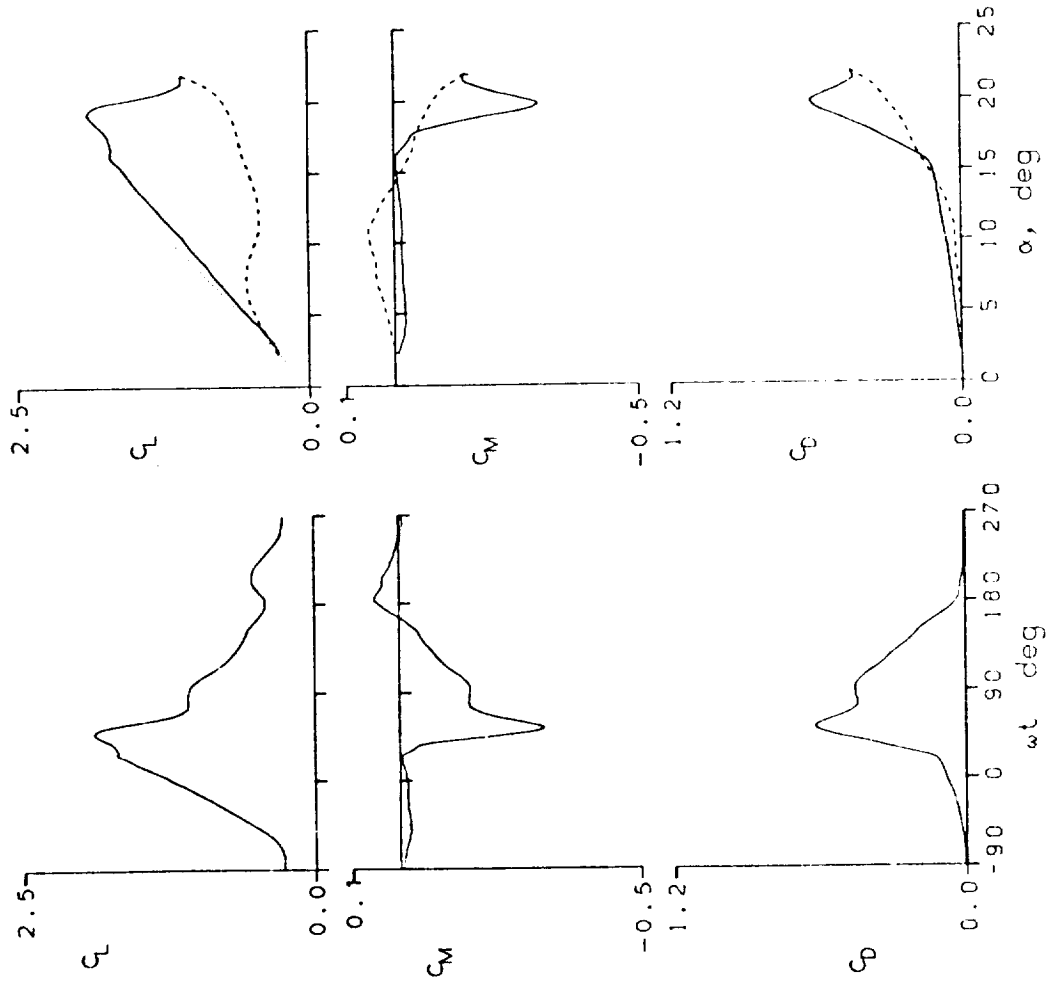


Figure 12.- Continued.

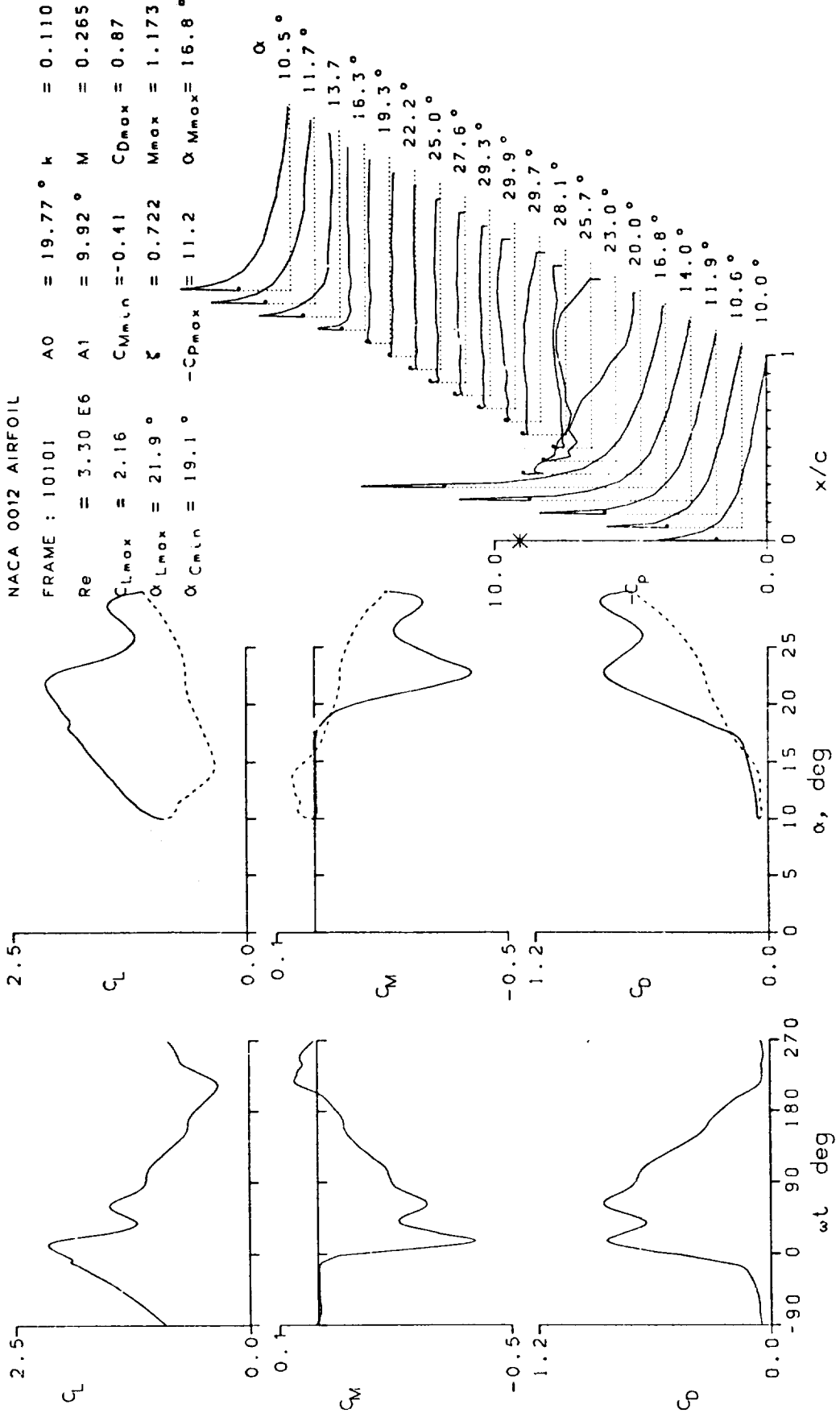


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10104 A0 = 11.90° k = 0.048
 Re = 3.71 E6 A1 = 7.90° M = 0.302
 CLmax = 1.66 CMmin = -0.14 CDmax = 0.40
 αLmax = 16.3° ζ = 0.042 Mmax = 1.217
 αCmin = 11.5° -CPmax = 9.0 αMmax = 14.3°

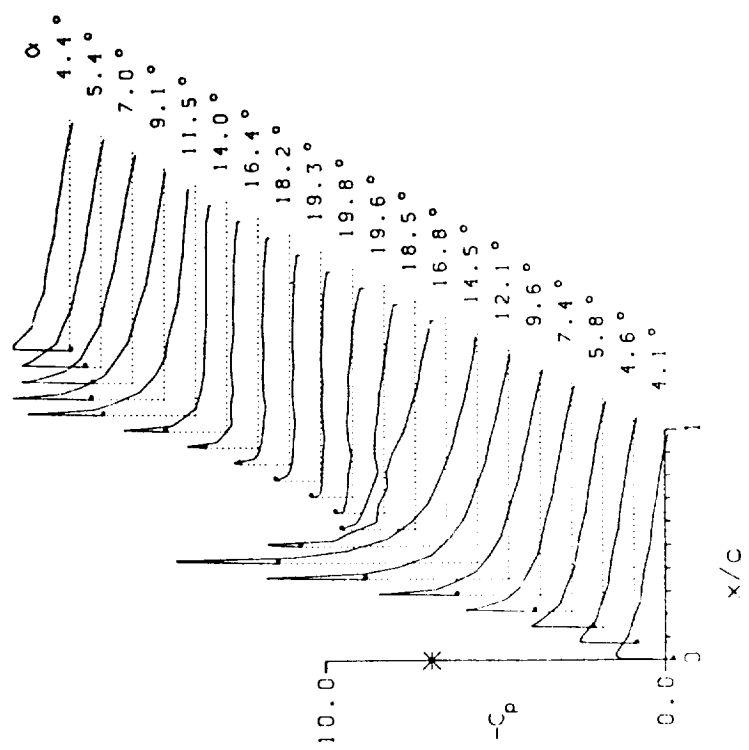
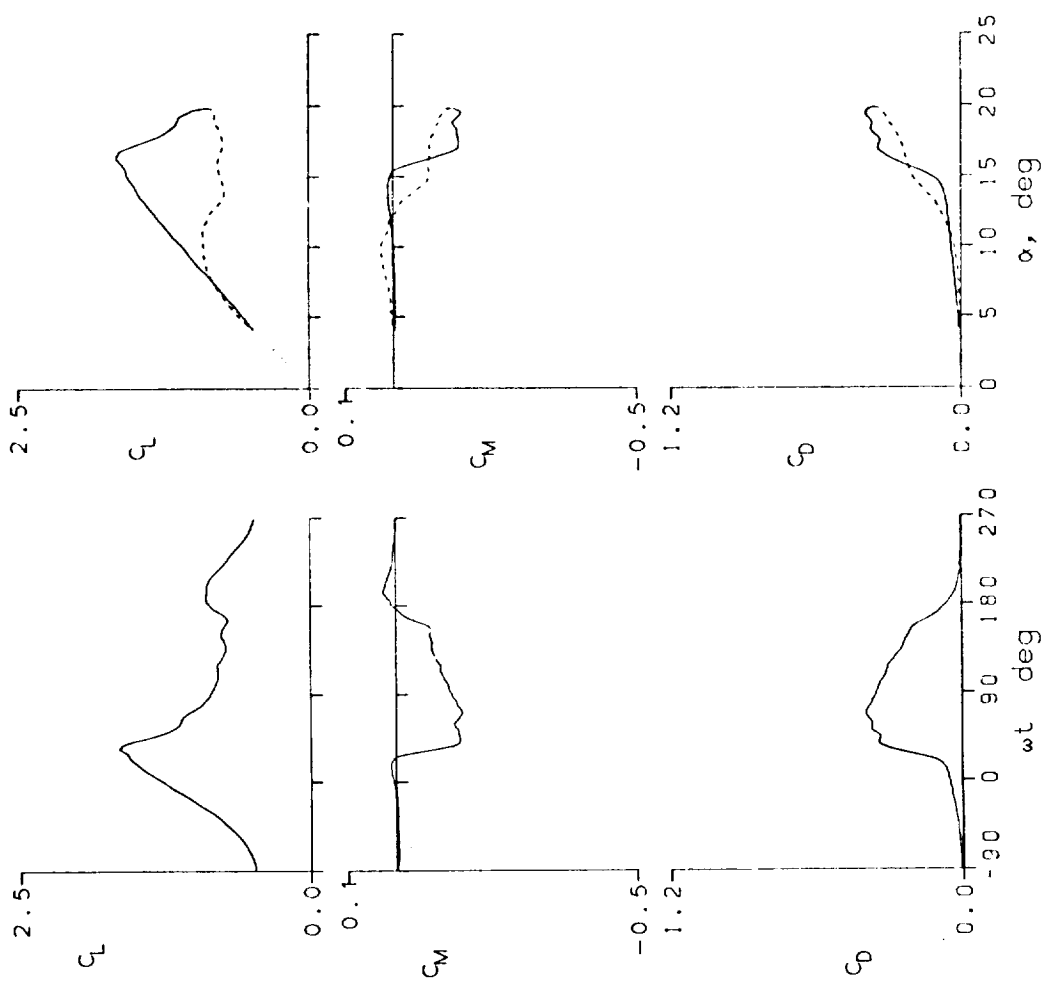


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10105 A0 = 11.90 ° k = 0.097
 Re = 3.69 E6 A1 = 7.89 ° M = 0.302
 C_{Lmax} = 1.76 C_{Mmin} = -0.24 C_{Dmax} = 0.53
 α_{Lmax} = 18.0 ° ζ = 0.234 M_{max} = 1.217
 α_{Cmin} = 11.5 ° -C_{pmax} = 9.0 α_{Mmax} = 14.8 °

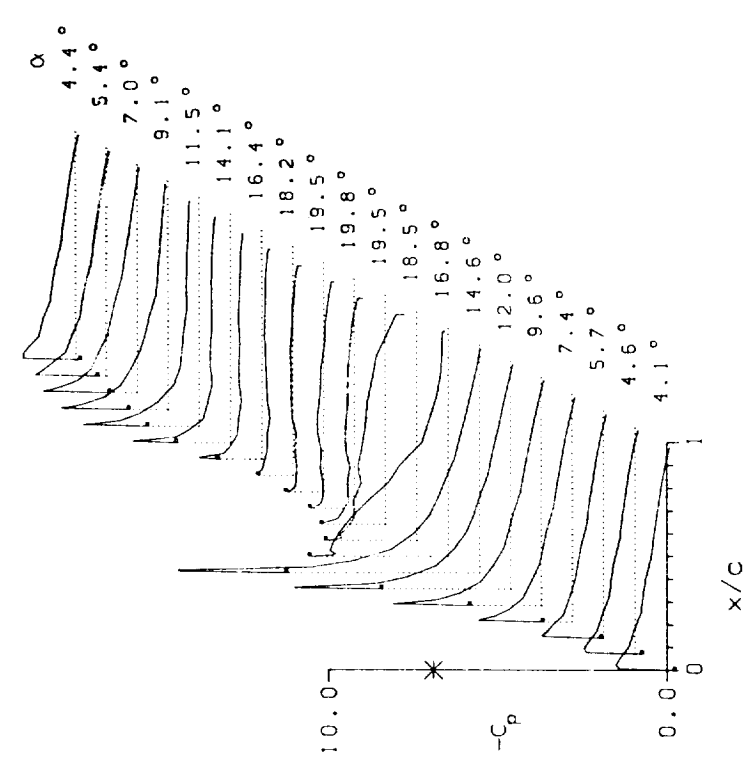
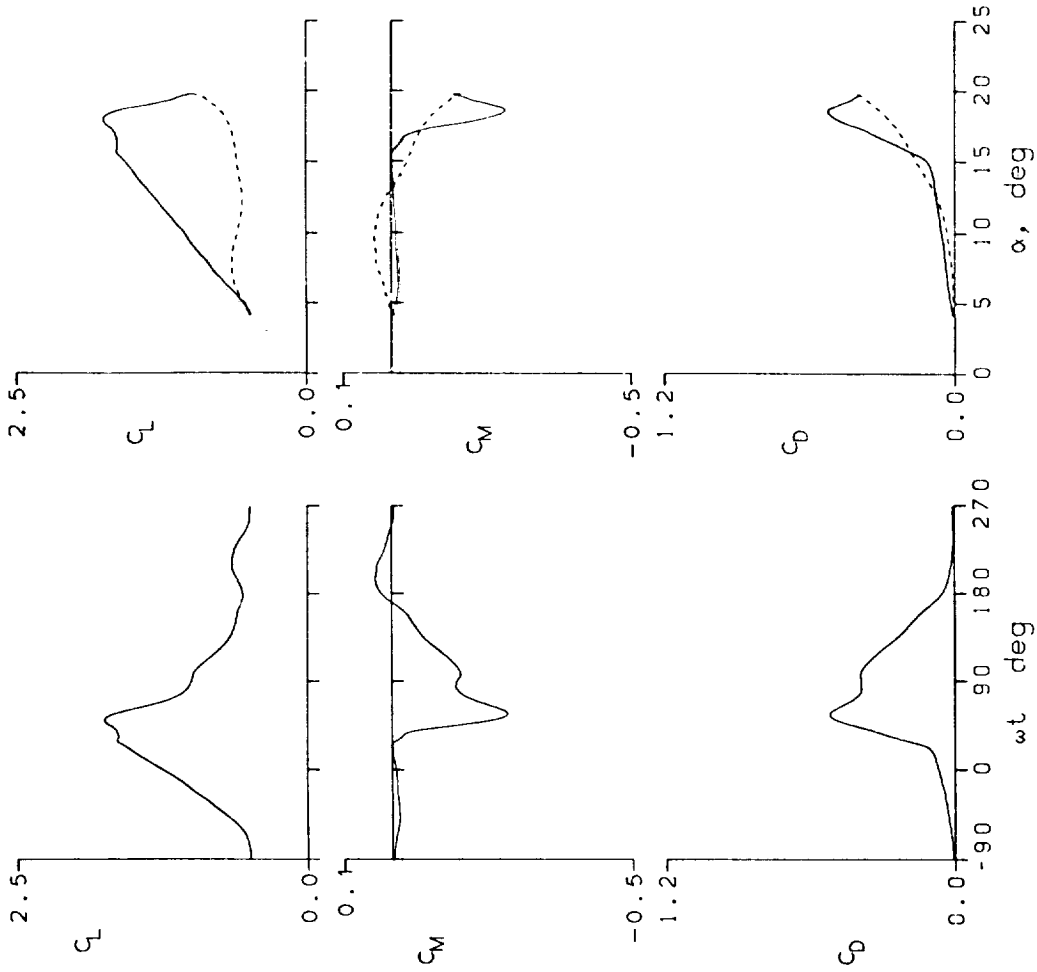


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME: 10108 $A_0 = 11.95^\circ$ $k = 0.125$
 $Re = 3.64 \times 10^6$ $A_1 = 7.89^\circ$ $M = 0.296$
 $C_{Lmax} = 1.97$ $C_{Mmin} = -0.33$ $C_{Dmax} = 0.64$
 $\alpha_{Lmax} = 19.1^\circ$ $\zeta = 0.203$ $M_{max} = 1.214$
 $\alpha_{Cmin} = 11.7^\circ$ $-C_{Pmax} = 9.3$ $\alpha_{Mmax} = 15.4^\circ$

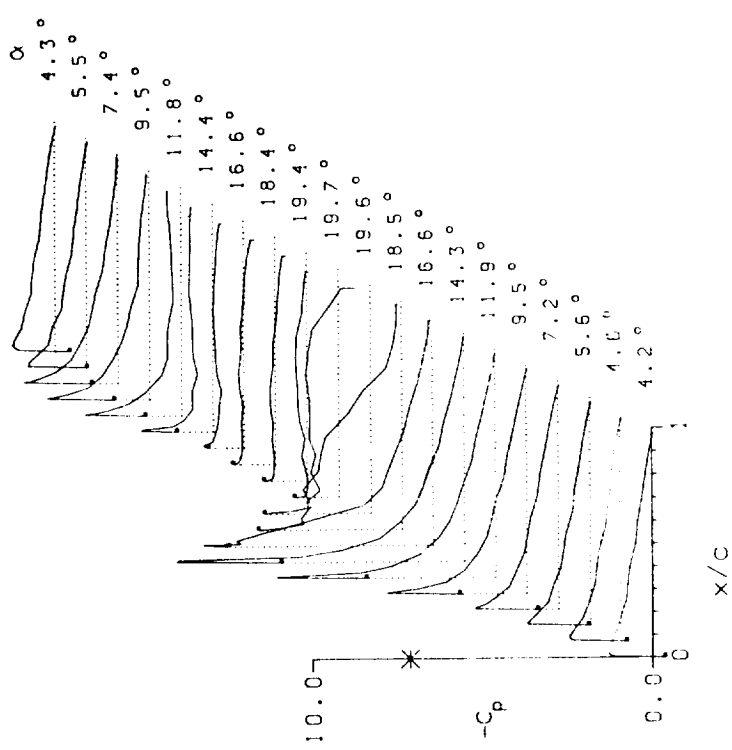
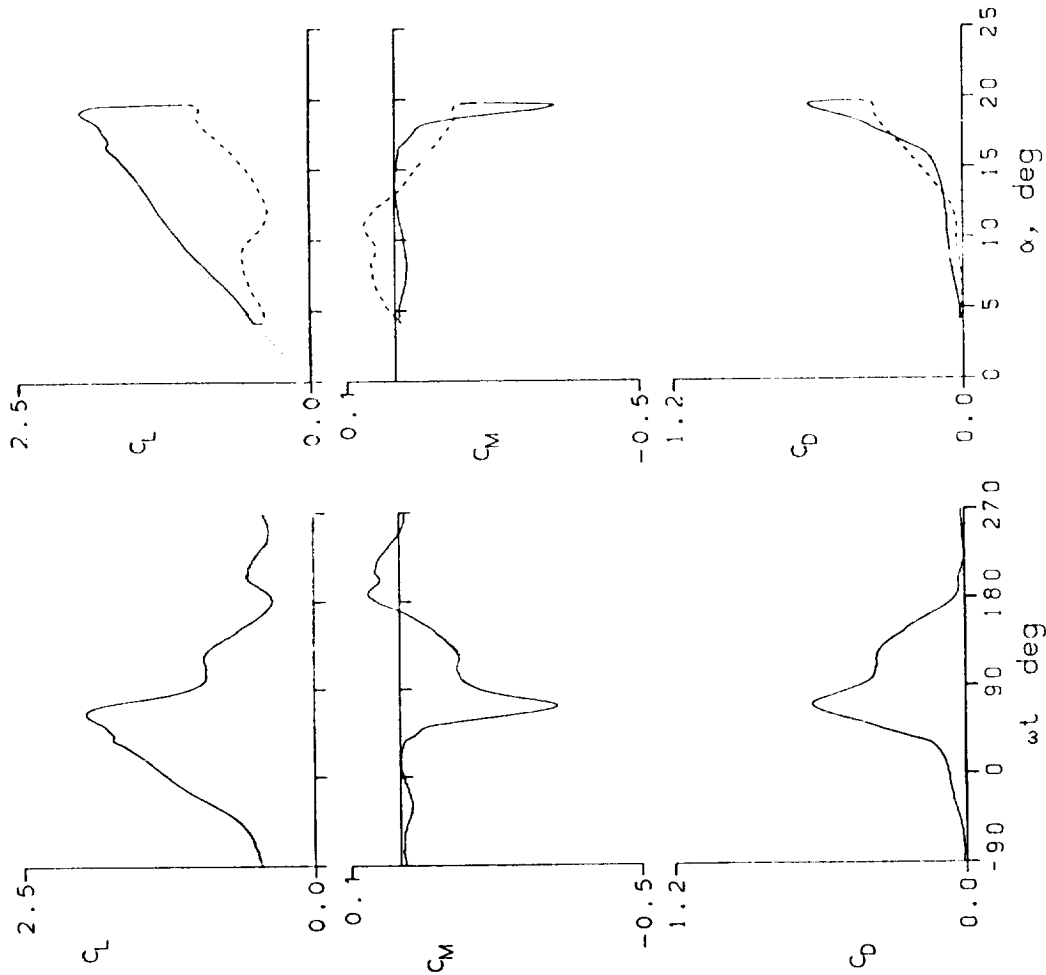


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10113 A0 = 14.97 ° k = 0.010
 Re = 3.90 E6 A1 = 4.91 ° N' = 0.302
 C_{Lmax} = 1.39 C_{Mm} = -0.09 C_{Dmax} = 0.27
 α_{Lmax} = 13.5 ° ζ = -0.048 M_{max} = 1.212
 α_{Cmin} = 14.9 ° -C_{pmb} = 9.0 α_{Mmax} = 14.0 °

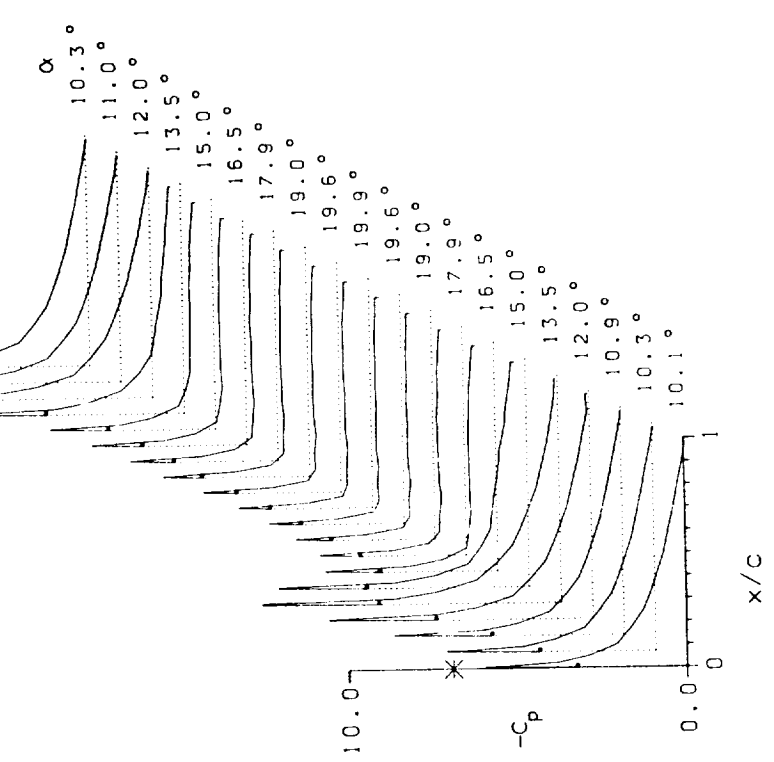
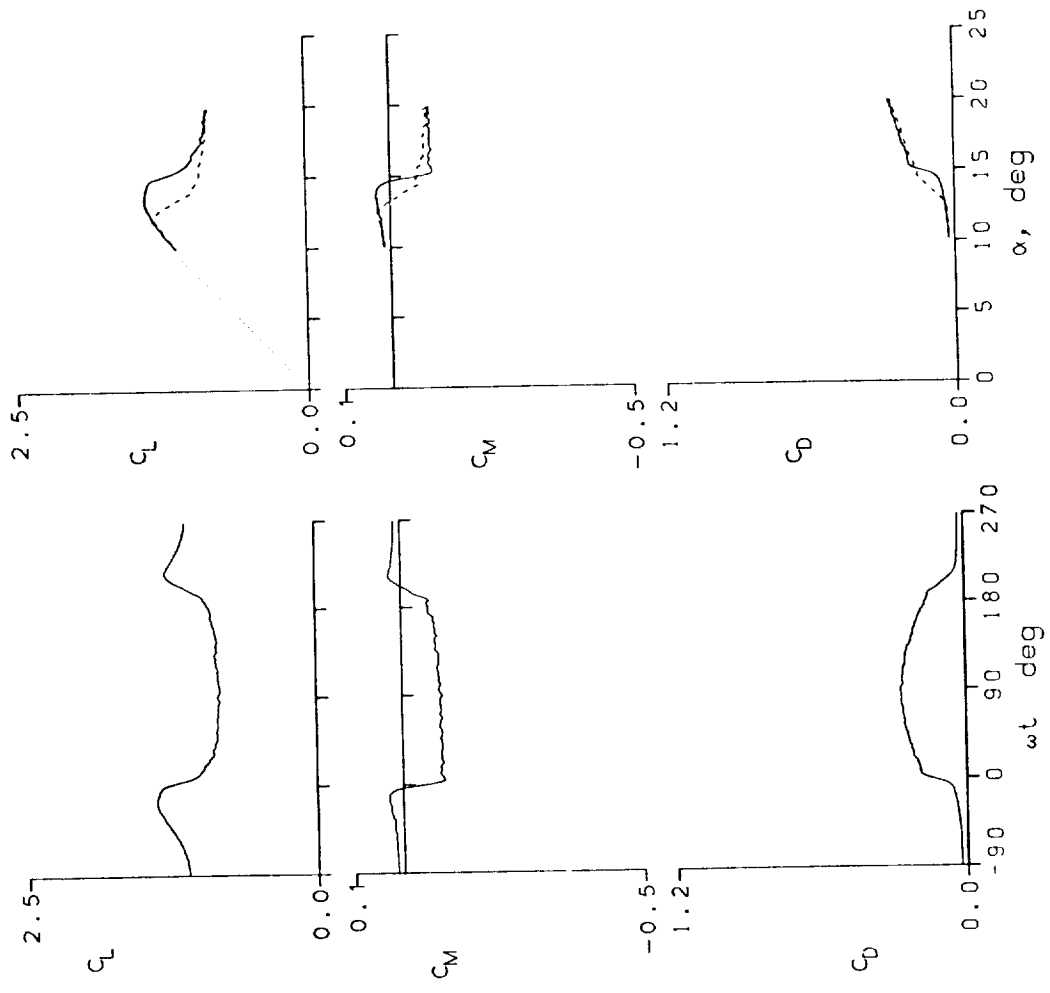


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10114 A0 = 14.97° k = 0.025
 Re = 3.80 E6 A1 = 4.90° M = 0.295
 C_{Lmax} = 1.48 C_{Mmin} = -0.13 C_{Dmax} = 0.36
 α_{Lmax} = 15.3° ζ = -0.146 M_{max} = 1.224
 α_{Cmin} = 14.9° -C_{pmax} = 9.5 α_{Mmax} = 14.4°

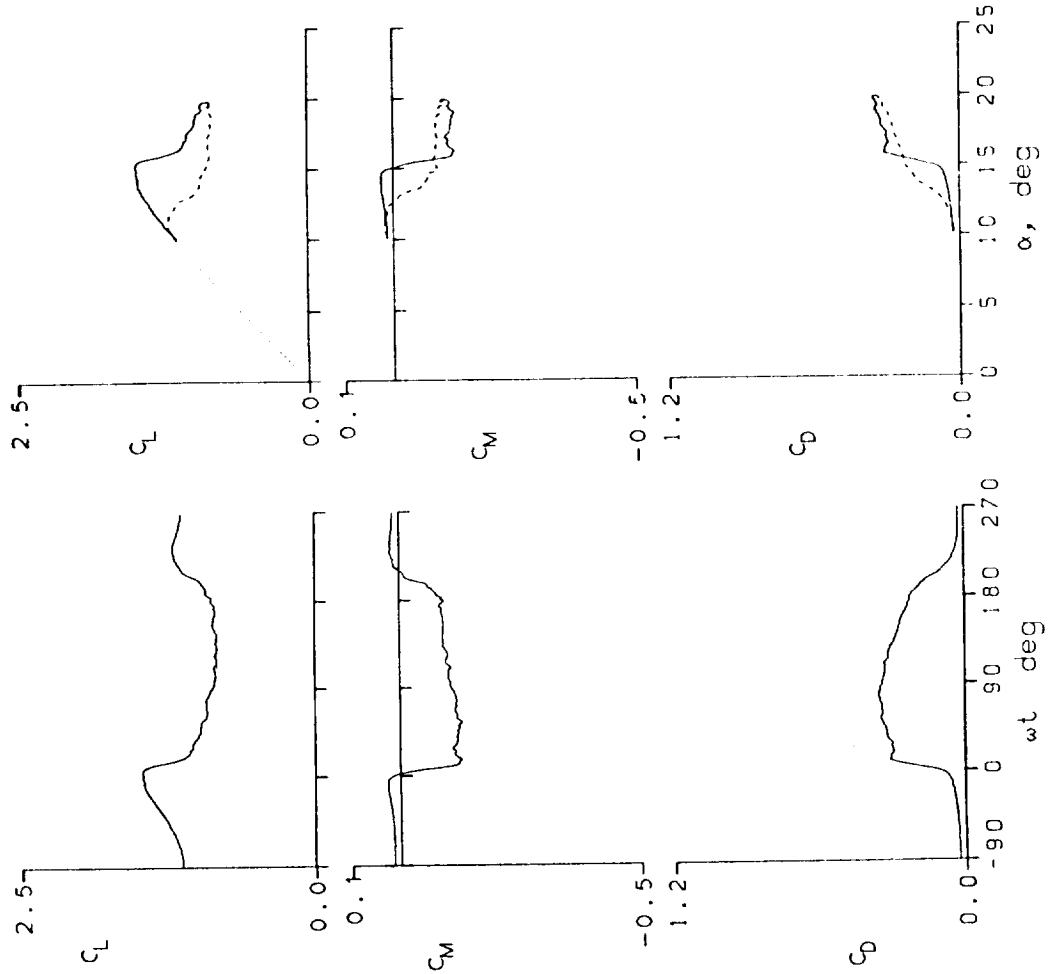


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10117 A0 = 14.96° k = 0.050
 Re = 3.80 E6 A1 = 4.90° M = 0.295
 CLmax = 1.61 CMmin = -0.13 CDmax = 0.33
 α Lmax = 16.3° ζ = -0.006 Mmax = 1.236
 α Cmin = 14.8° -CPmax = 9.6 α Mmax = 14.8°

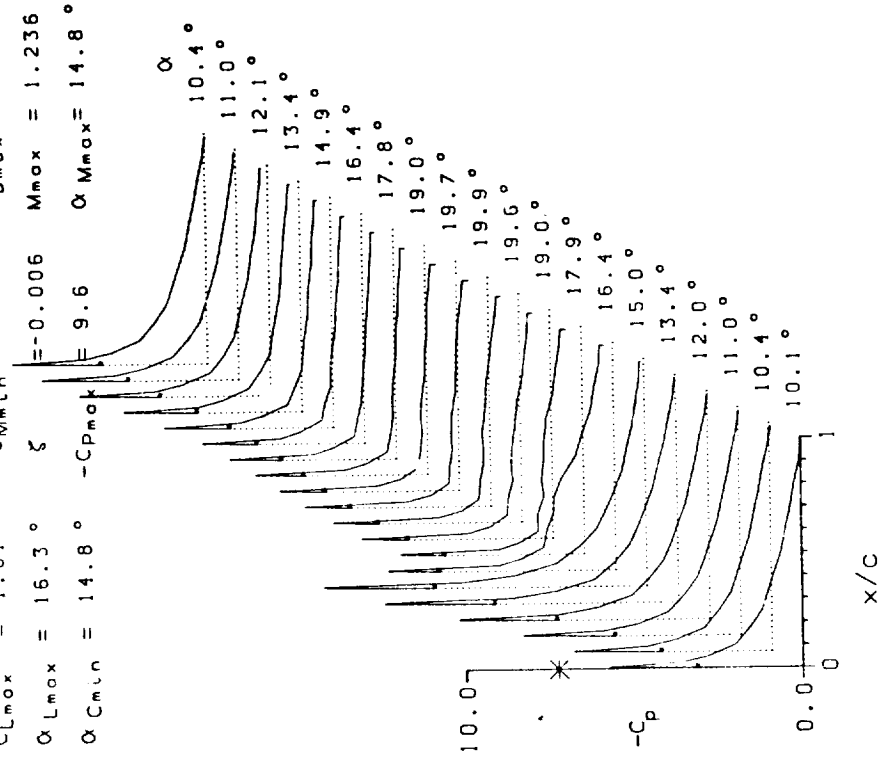
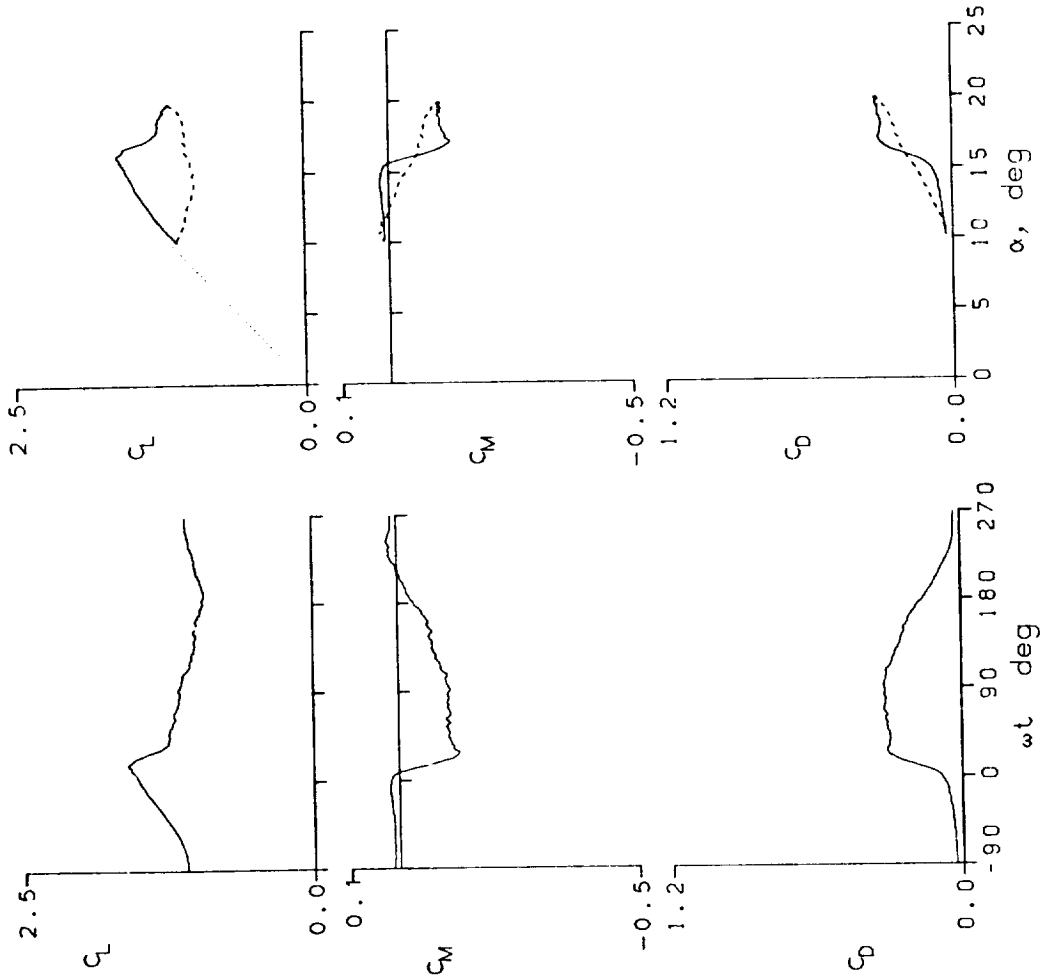


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10118 A0 = 14.95° k = 0.102
 Re = 3.75 E6 A1 = 4.90° M = 0.291
 C_{Lmax} = 1.77 C_{Mmin} = -0.17 C_{Dmax} = 0.42
 α_{Lmax} = 17.4° ζ = 0.149 M_{max} = 1.241
 α_{Cmin} = 14.8° -C_{pmax} = 9.9 α_{Mmax} = 15.0°

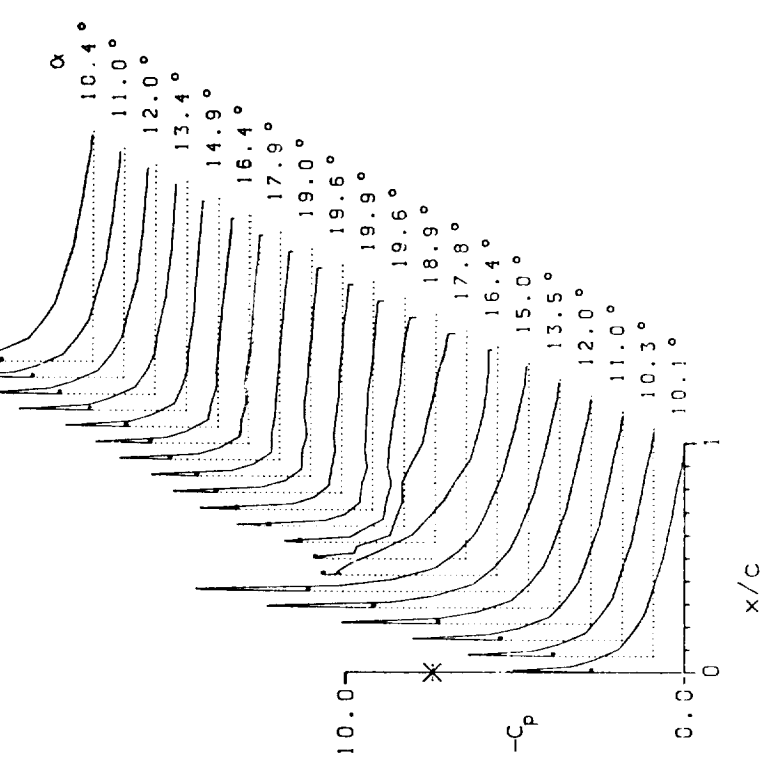
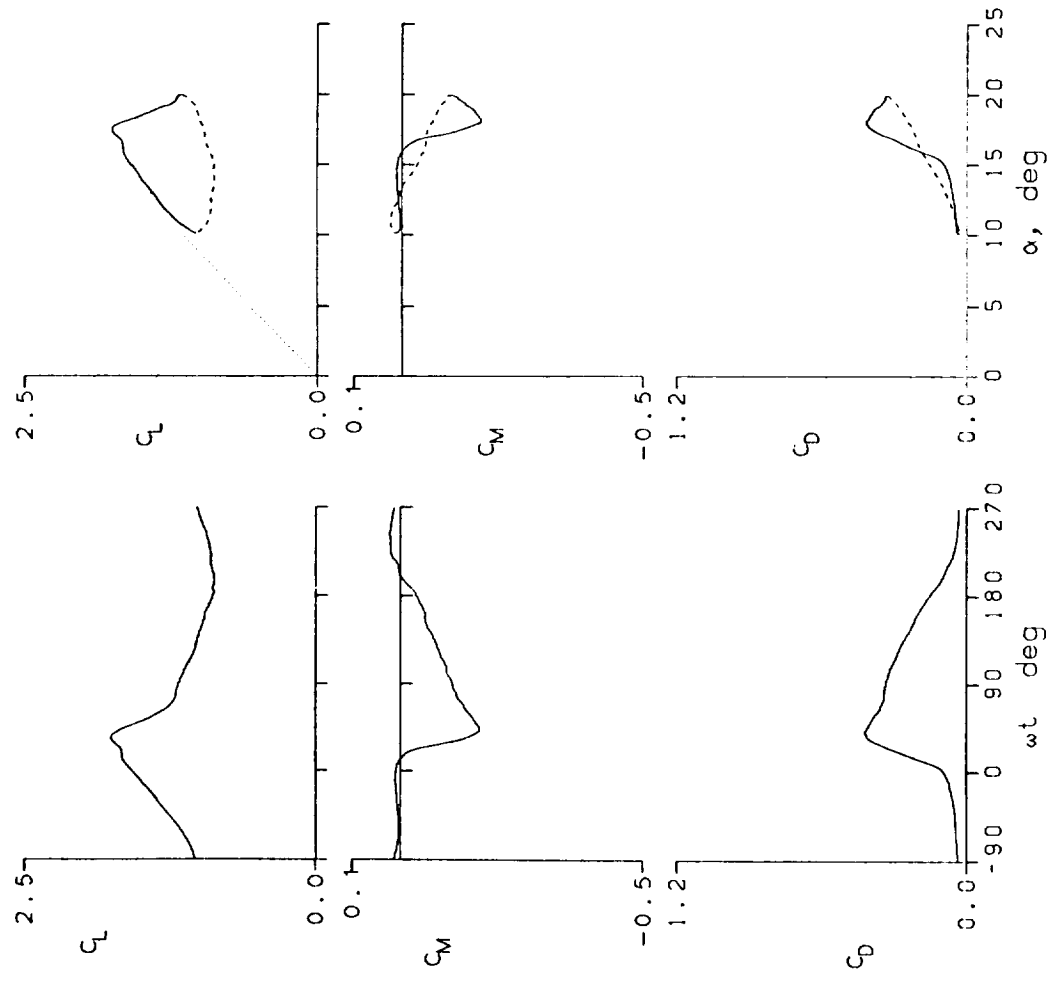


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10120 A0 = 14.95° k = 0.151
 Re = 3.73 E6 A1 = 4.90° M = 0.294
 C_{Lmax} = 1.88 C_{Mmin} = -0.24 C_{Dmax} = 0.54
 α_{Lmax} = 18.5° ζ = 0.344 M_{max} = 1.244
 α_{Cmin} = 14.8° $-C_{Pmax}$ = 9.6 α_{Mmax} = 15.1°

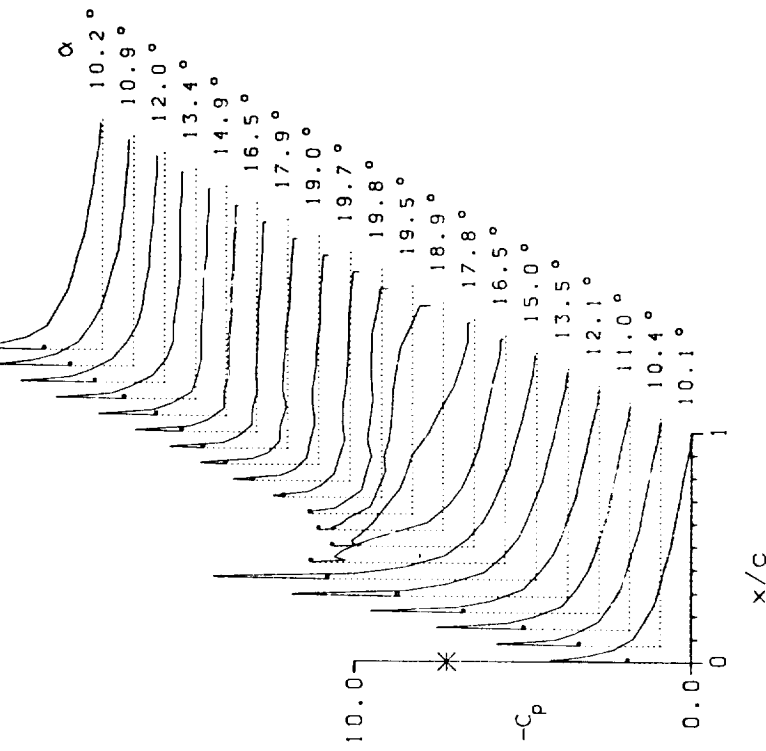
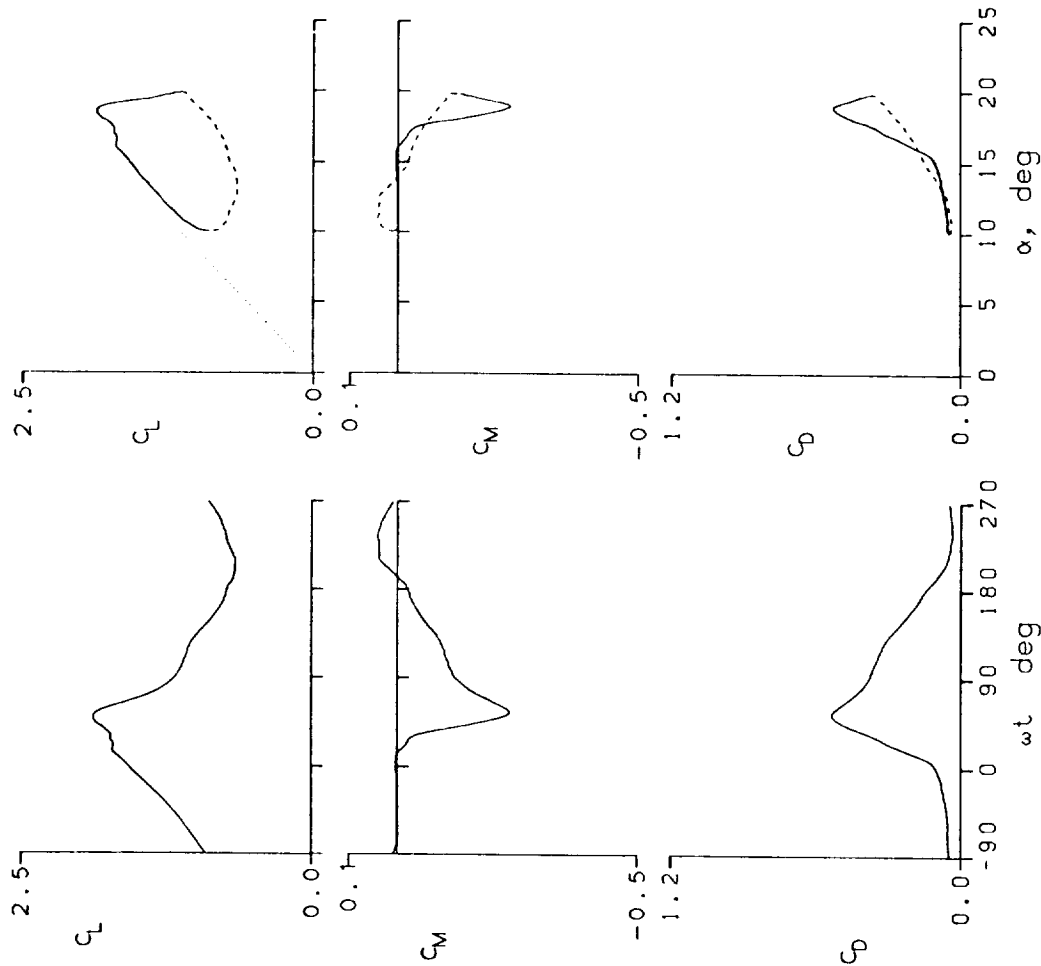


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10123	A0 = 14.96 °	k = 0.202
Re = 3.76 E6	A1 = 4.87 °	M = 0.293
$C_{Lmax} = 1.97$	$C_{Mmin} = -0.37$	$C_{Dmax} = 0.68$
$\alpha_{Lmax} = 19.3 °$	$\xi = 0.145$	$M_{max} = 1.251$
$\alpha_{Cmin} = 14.8 °$	$-C_{pmax} = 9.8$	$\alpha_{Mmax} = 15.8 °$

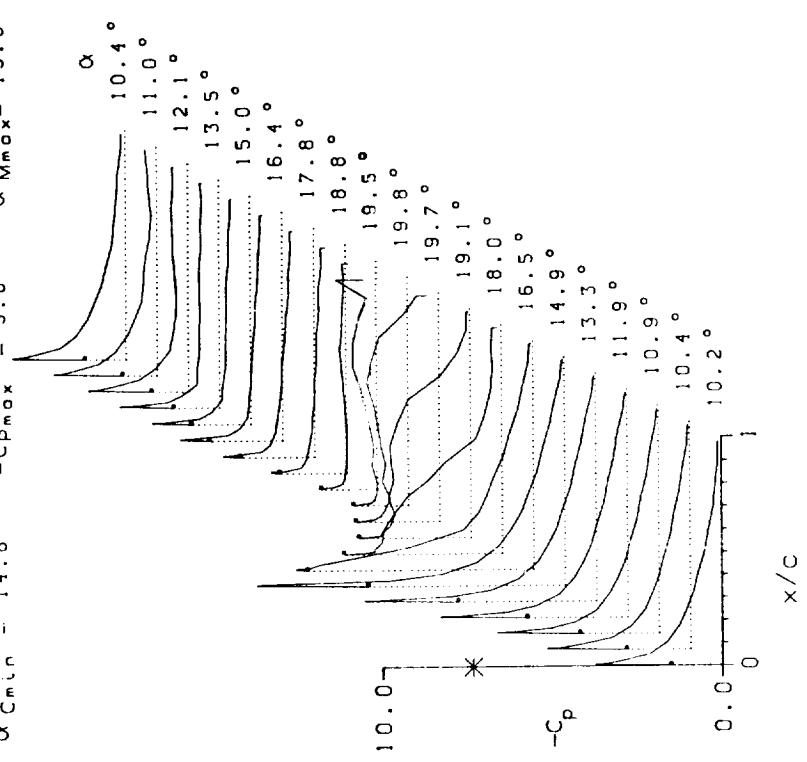
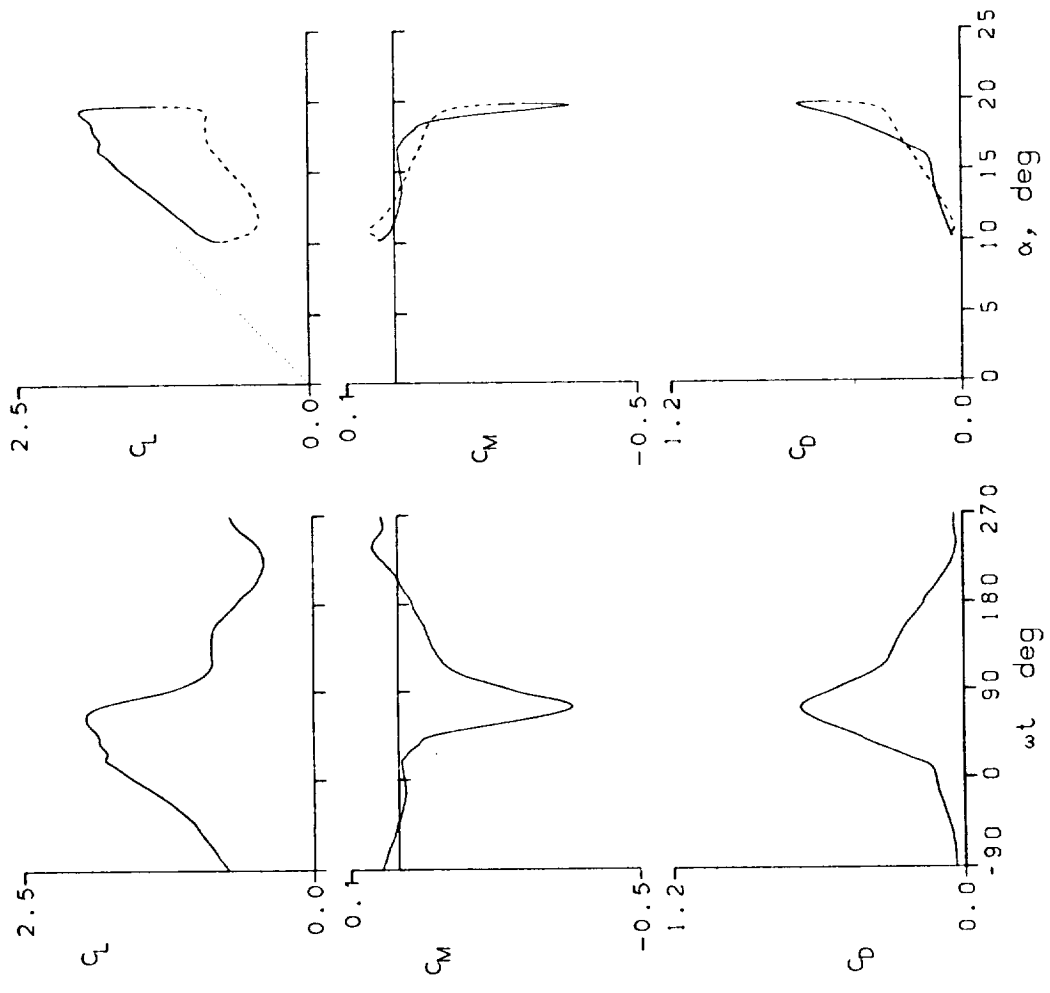


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10202 A0 = 9.95° k = 0.010
 Re = 3.86 E6 A1 = 4.90° M = 0.301
 C_{Lmax} = 1.37 C_{Mmin} = -0.06 C_{Dmax} = 0.15
 α_{Lmax} = 13.6° ζ = -0.110 M_{max} = 1.219
 α_{Cmin} = 9.8° -C_{pmax} = 9.0 α_{Mmax} = 13.7°

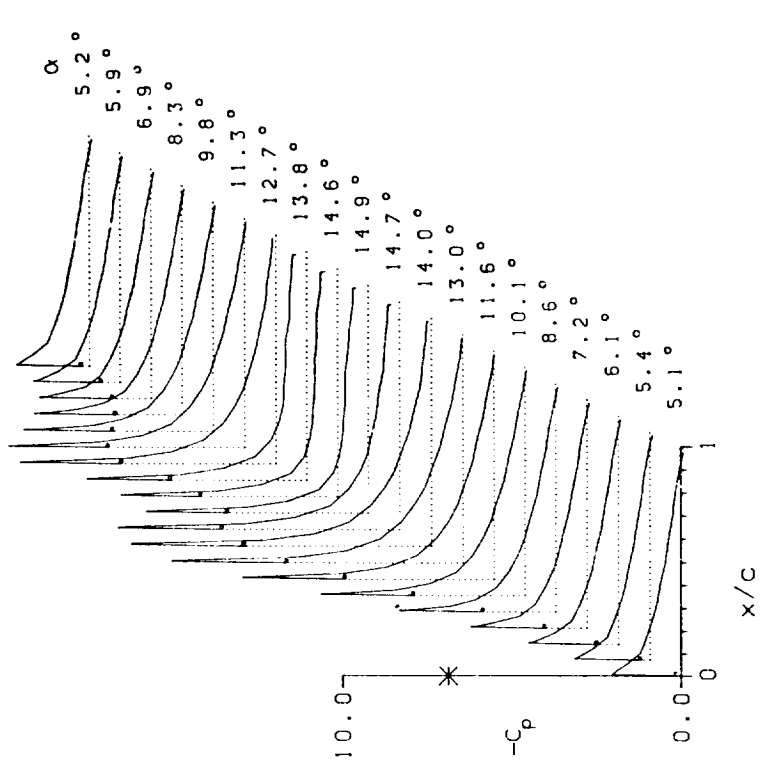
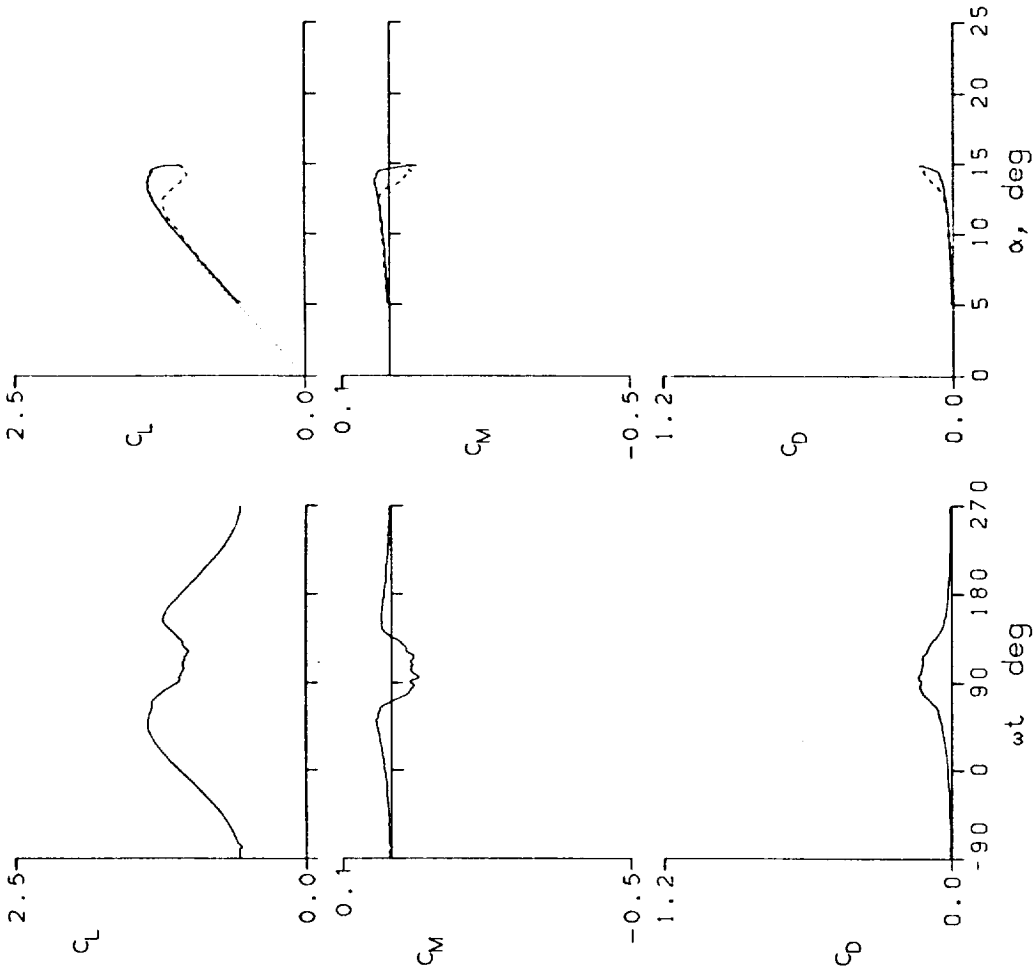


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10203 A0 = 9.95° k = 0.025
 Re = 3.85 E6 A1 = 4.90° M = 0.301
 CLmax = 1.38 CMmin = -0.04 CDmax = 0.13
 αLmax = 13.5° ζ = -0.050 Mmax = 1.227
 αCmin = 9.8° -CPmax = 9.1 αMmax = 14.1°

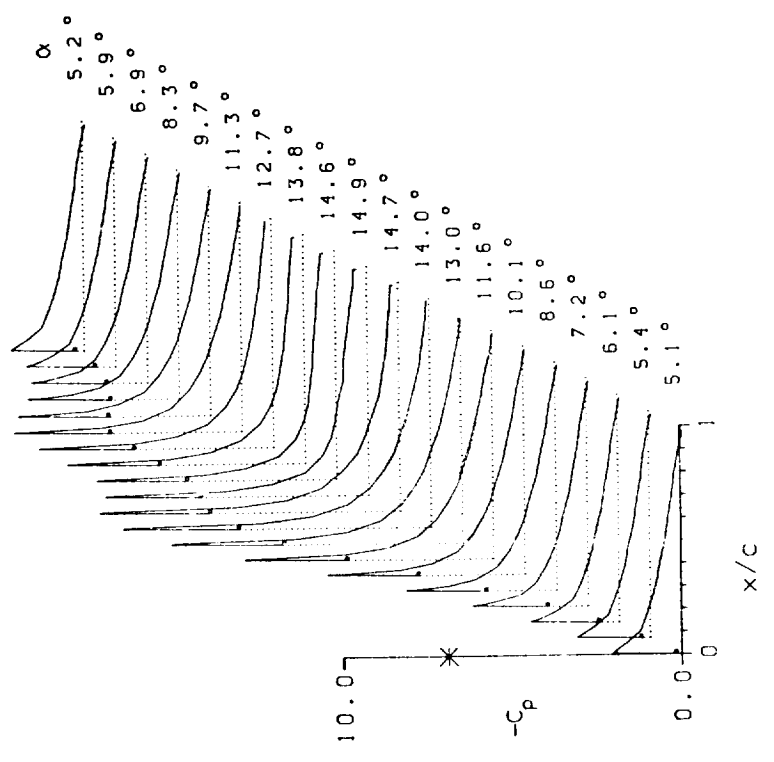
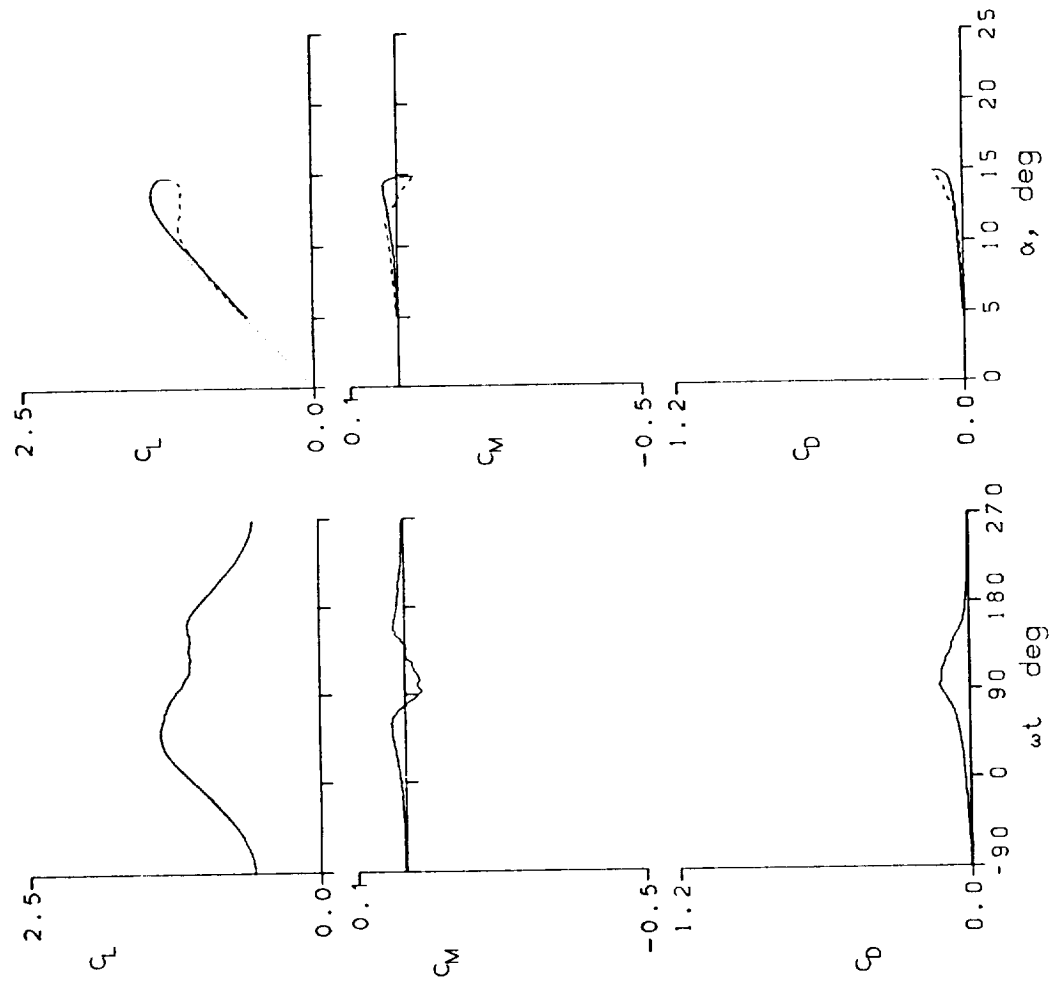


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10204 A0 = 9.95° k = 0.049
 Re = 3.83 E6 A1 = 4.90° M = 0.300
 C_{Lmax} = 1.48 C_{Mmin} = -0.10 C_{Dmax} = 0.20
 α_{Lmax} = 14.6° ζ = -0.226 M_{max} = 1.248
 α_{Cmin} = 9.8° $-C_{Pmax}$ = 9.3 α_{Mmax} = 13.9°

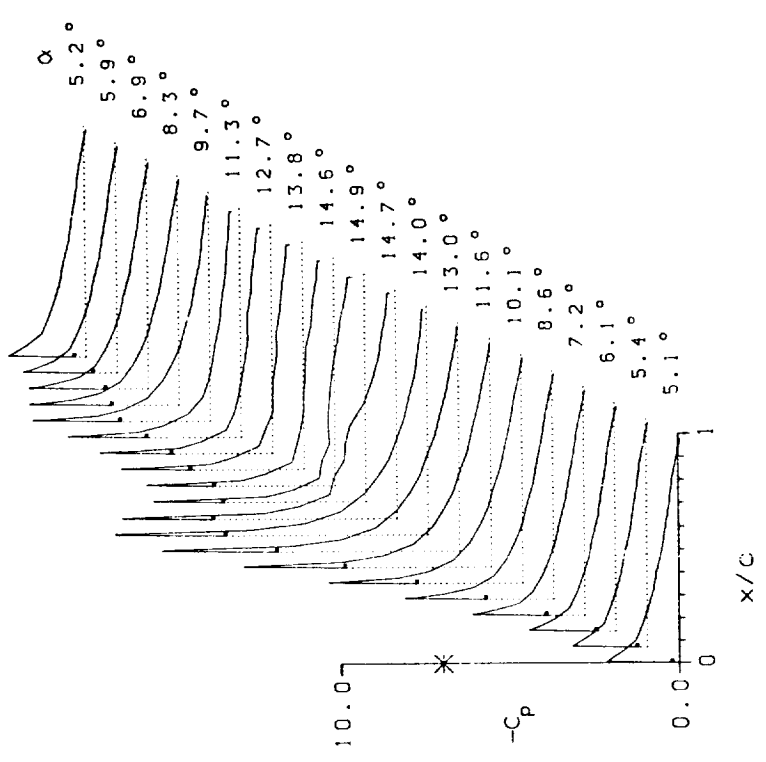
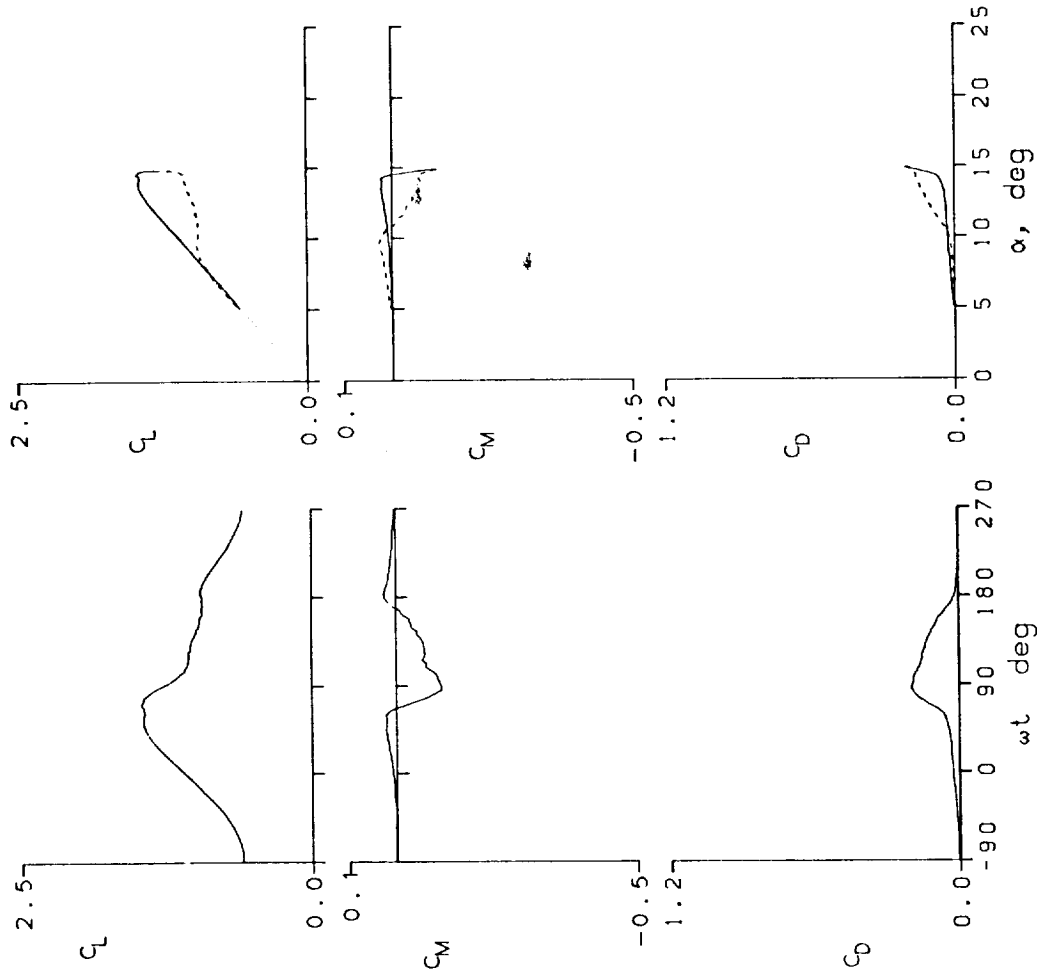


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10207 A0 = 9.96° k = 0.074
 Re = 3.88 E6 A1 = 4.90° M = 0.302
 $C_{Lmax} = 1.51$ $C_{Mmin} = -0.10$ $C_{Dmax} = 0.21$
 $\alpha_{Lmax} = 14.9^\circ$ $\xi = -0.086$ $M_{max} = 1.251$
 $\alpha_{Cmin} = 9.8^\circ$ $-C_{pmax} = 9.3$ $\alpha_{Mmax} = 14.0^\circ$

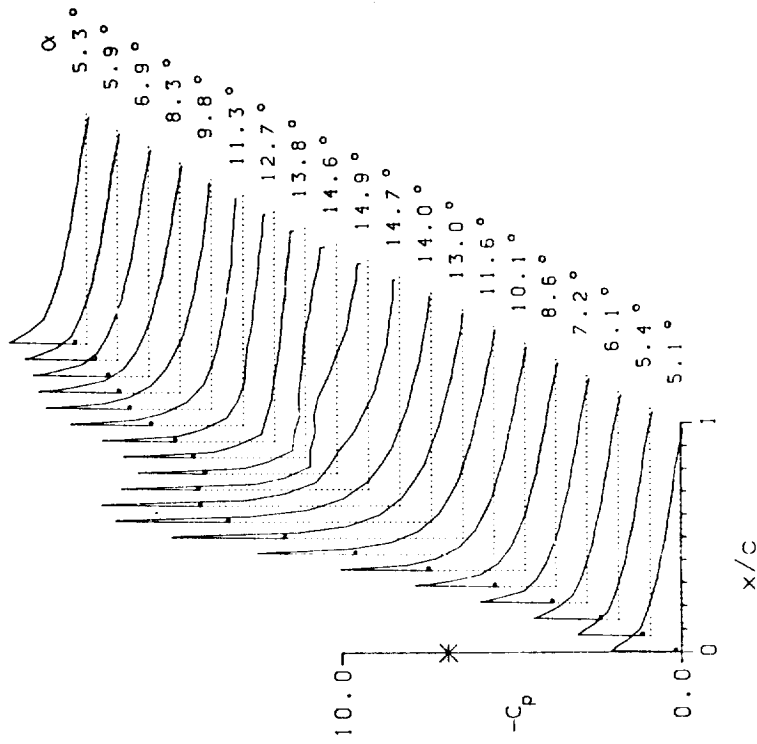
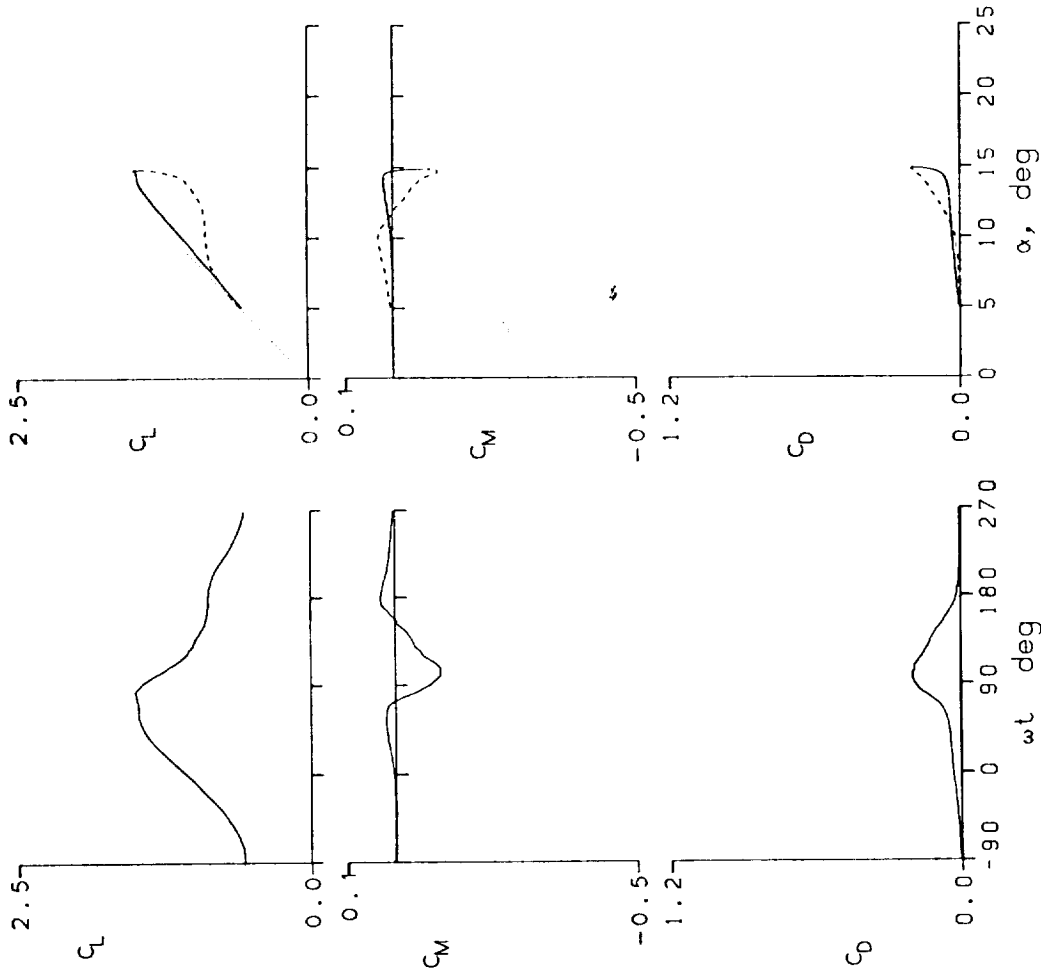


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10208 A0 = 9.96° k = 0.099
 Re = 3.86 E6 A1 = 4.90° M = 0.300
 CLmax = 1.53 CMmin = -0.09 CDmax = 0.20
 αLmax = 14.5° ζ = -0.080 Mmax = 1.250
 αCmin = 9.7° -CPmax = 9.4 αMmax = 14.0°

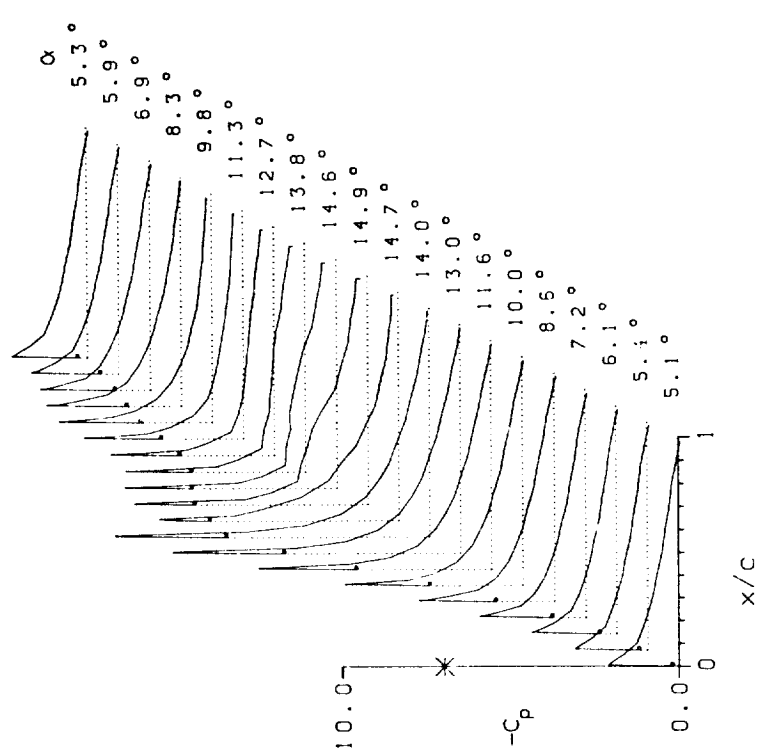
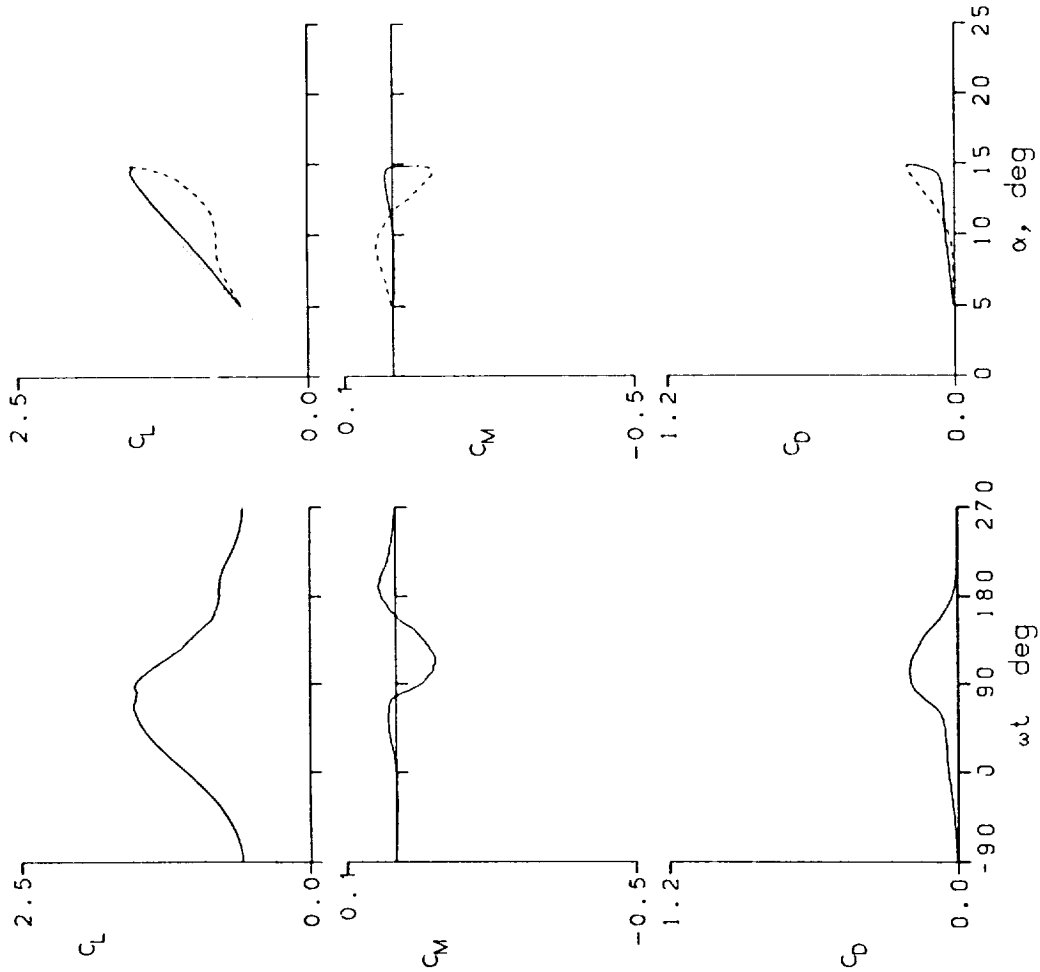


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10211 A0 = 9.97° k = 0.149
 Re = 3.85 E6 A1 = 4.90° M = 0.300
 C_{Lmax} = 1.57 C_{Mmin} = -0.07 C_{Dmax} = 0.22
 α_{Lmax} = 14.7° ζ = -0.088 M_{max} = 1.259
 α_{Cmin} = 9.8° -C_{pmax} = 9.4 α_{Mmax} = 14.2°

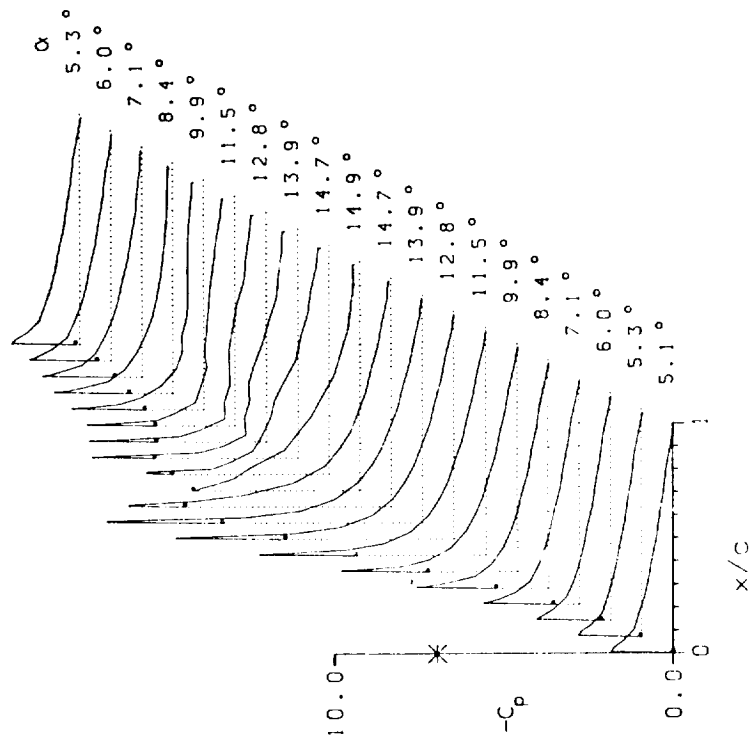
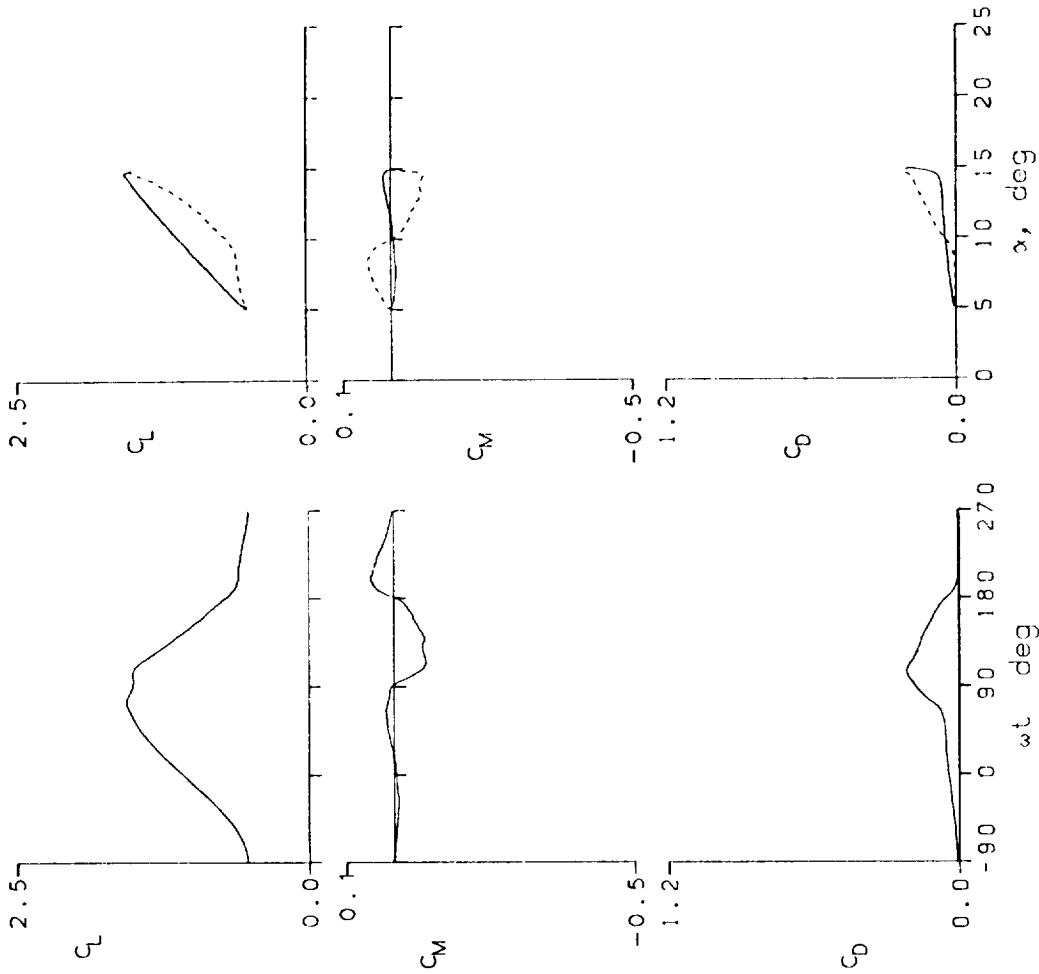


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10212 A0 = 9.92° k = 0.198
 Re = 3.85 E6 A1 = 4.91° M = 0.300
 CLmax = 1.64 CMmin = -0.14 CDmax = 0.30
 α Lmax = 14.6° ξ = -0.025 Mmax = 1.257
 α Cmin = 9.7° -CPmax = 9.4 α Mmax = 14.0°

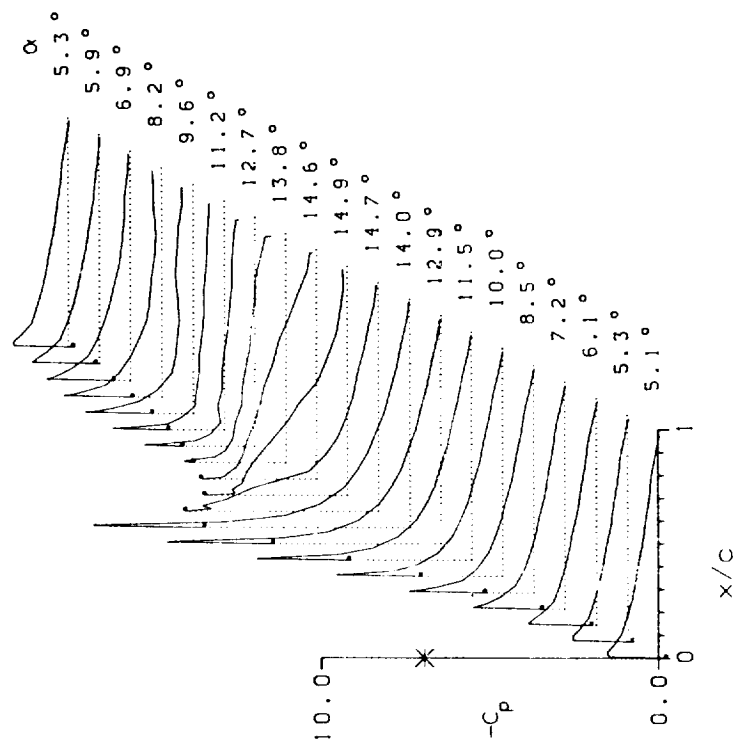
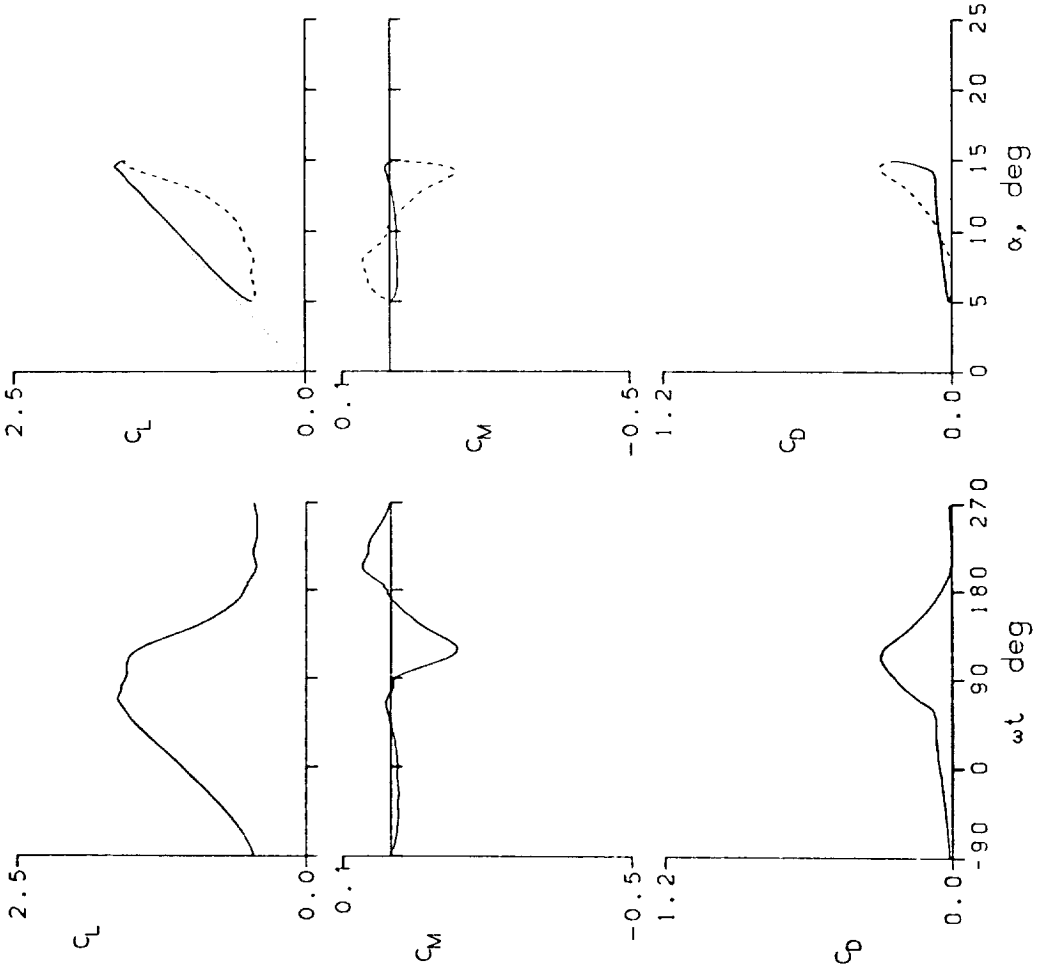


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10218 A0 = 4.95° k = 0.010
 Re = 3.93 E6 A1 = 5.00° M = 0.300
 CLmax = 1.13 CMmin = -0.02 CDmax = 0.03
 αLmax = 10.0° ζ = 0.029 Mmax = 0.898
 αCmin = 4.8° -CPmax = 5.8 αMmax = 10.0°

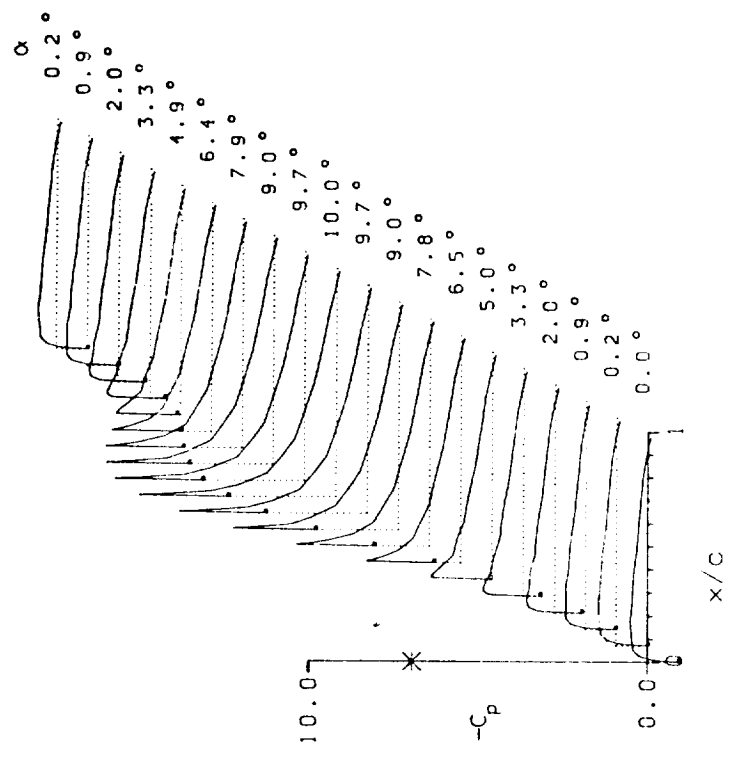
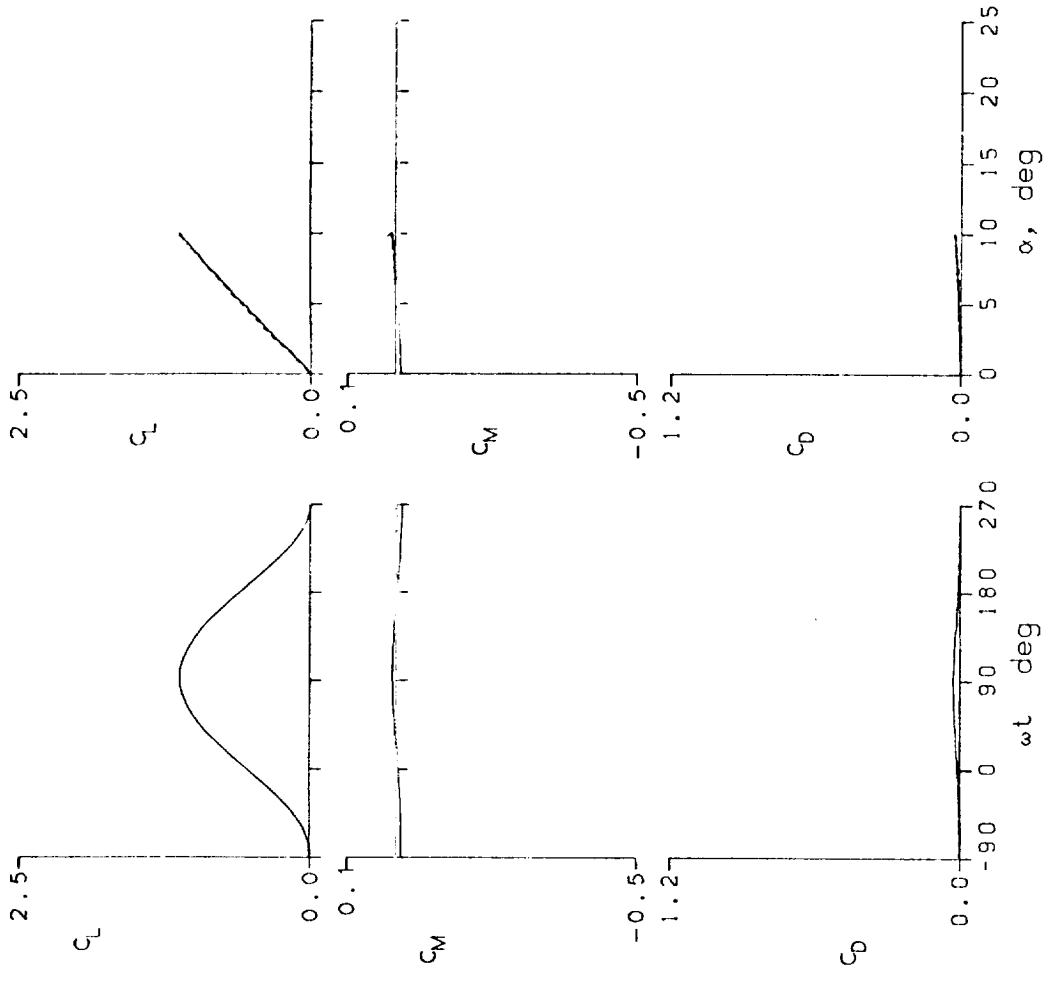


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10221 A0 = 4.94 ° k = 0.099
 Re = 3.93 E6 A1 = 5.00 ° M = 0.301
 C_{Lmax} = 1.12 C_{Mmin} = -0.02 C_{Dmax} = 0.04
 α_{Lmax} = 10.0 ° ζ = 0.286 M_{max} = 0.897
 α_{Cmin} = 4.8 ° -C_{pmax} = 5.8 α_{Mmax} = 9.9 °

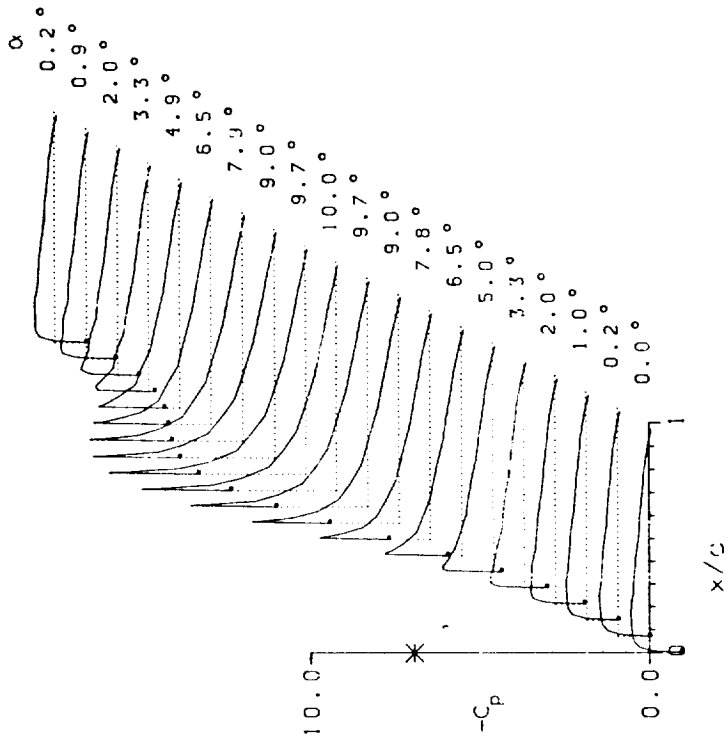
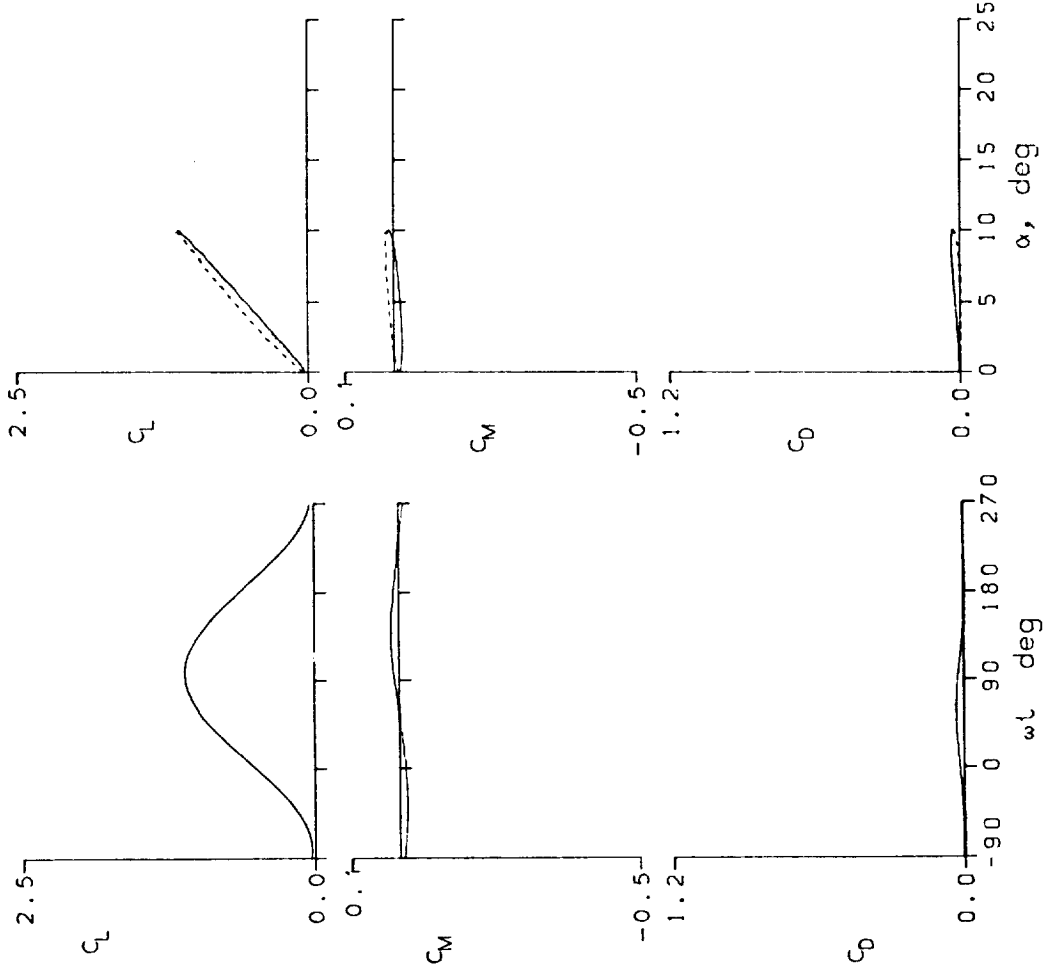


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10222 A0 = 4.93° k = 0.198
 Re = 3.91 E6 A1 = 4.99° M = 0.301
 CLmax = 1.13 CMmin = -0.04 CDmax = 0.05
 αLmax = 10.0° ζ = 0.656 Mmax = 0.922
 αCMmin = 4.7° -CDmax = 6.1 αMmax = 9.9°

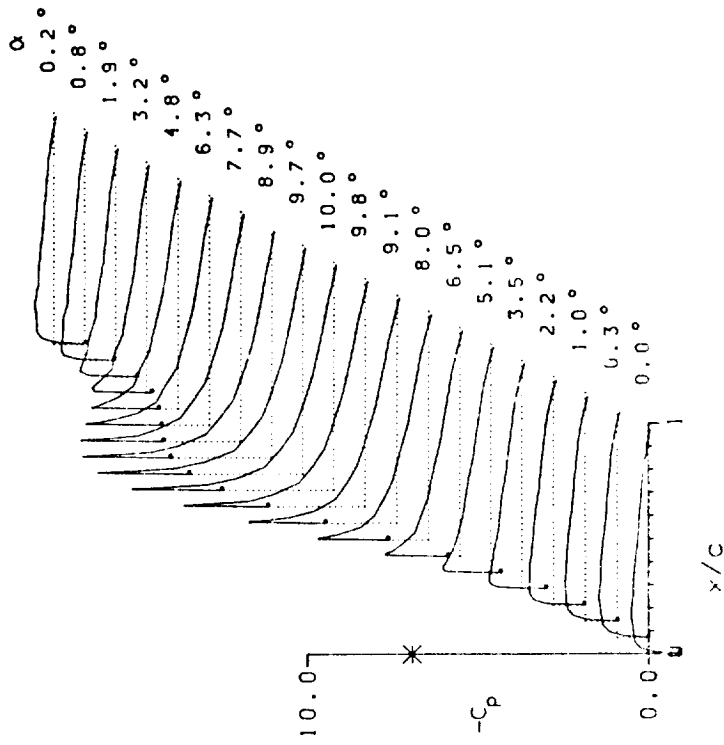
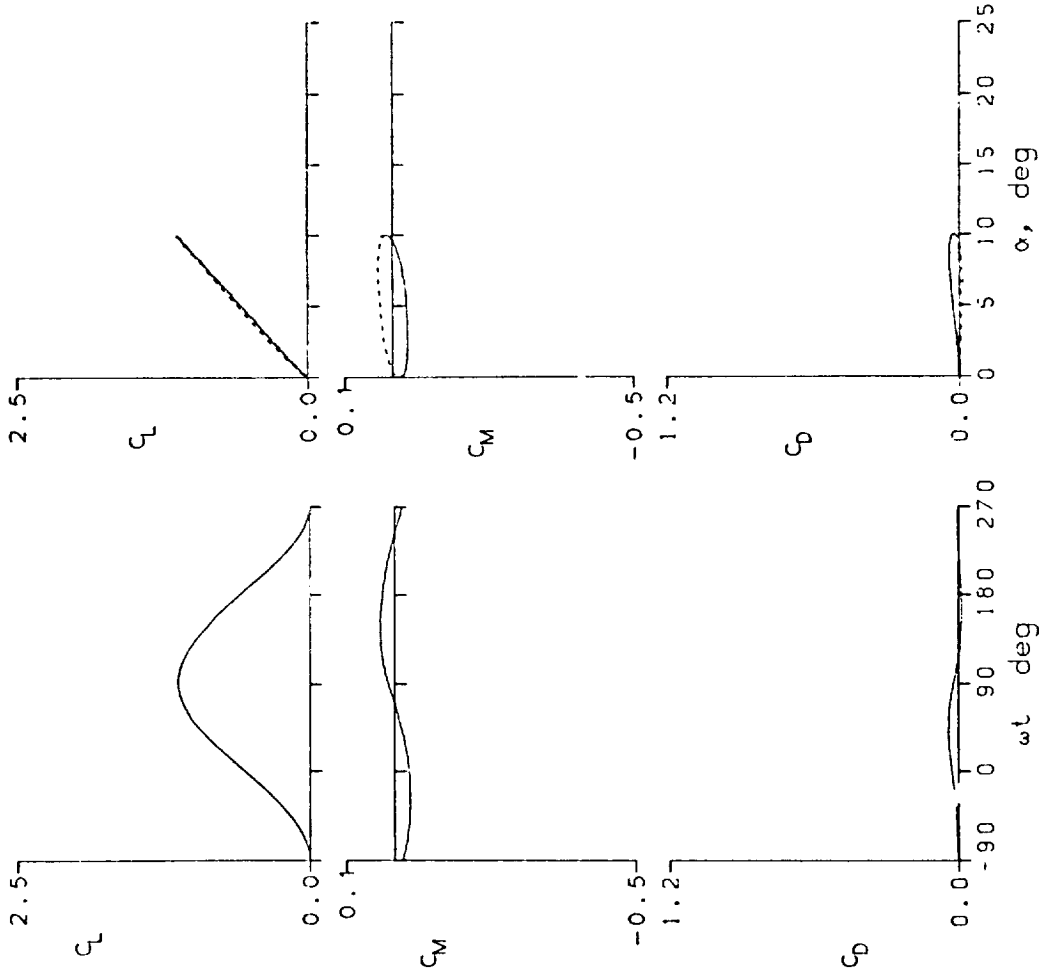


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 10303 A0 = 4.86° k = 0.099
 Re = 3.91 E6 A1 = 10.05° M = 0.301
 CLmax = 1.57 CMmin = -0.08 CDmax = 0.20
 α Lmax = 14.9° ζ = 0.169 Mmax = 1.239
 α Cmin = 4.3° -CPmax = 9.2 α Mmax = 14.5°

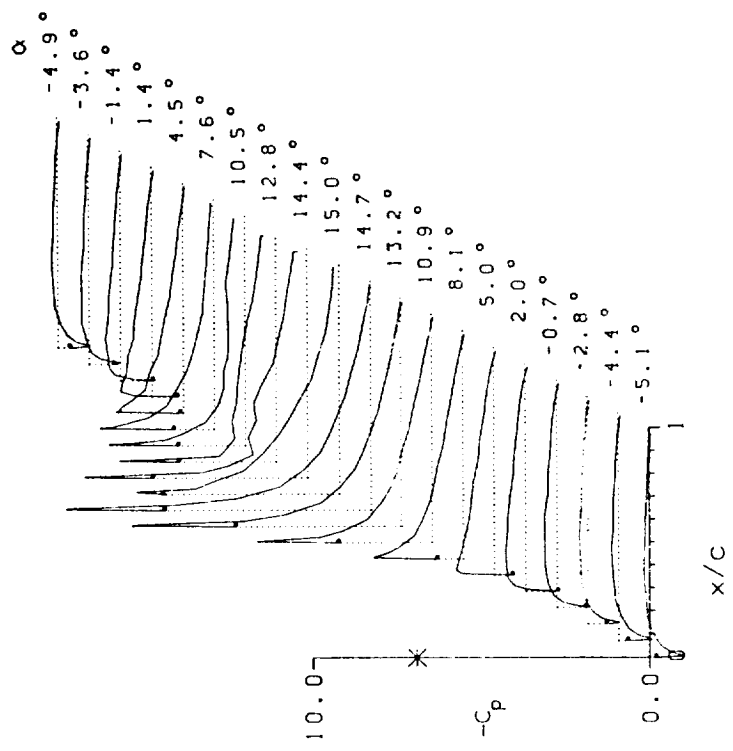
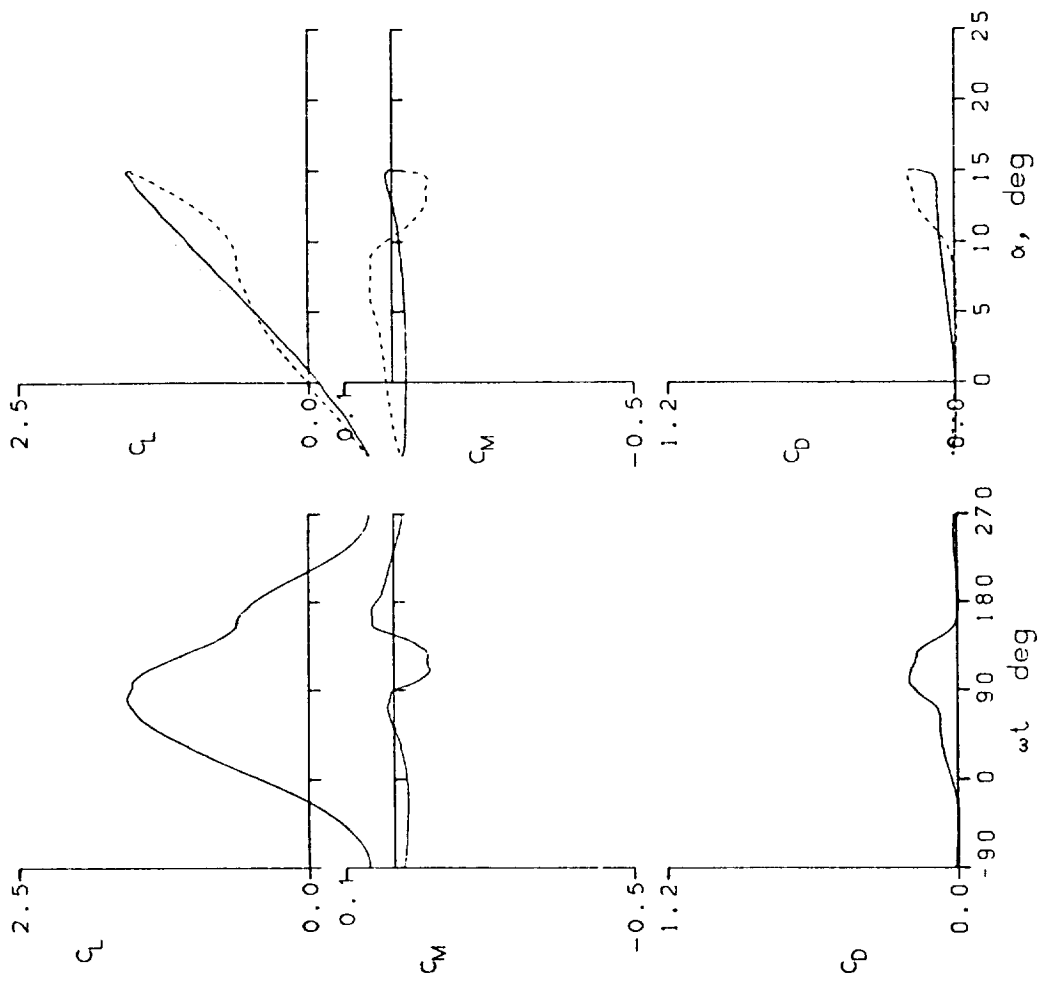


Figure 12.- Continued.

NACA 00'2 AIRFOIL

FRAME : 10305 A0 = 3.64 ° k = 0.099
 Re = 3.91 E6 A1 = 10.11 ° M = 0.301
 $C_{Lmax} = 1.49$ $C_{Mmin} = -0.04$ $C_{Dmax} = 0.07$
 $\alpha_{Lmax} = 13.9^\circ$ $\zeta = 0.255$ $M_{max} = 1.241$
 $\alpha_{Cmin} = 0.0^\circ$ $-C_{pmax} = 9.2$ $\alpha_{Mmax} = 13.9^\circ$

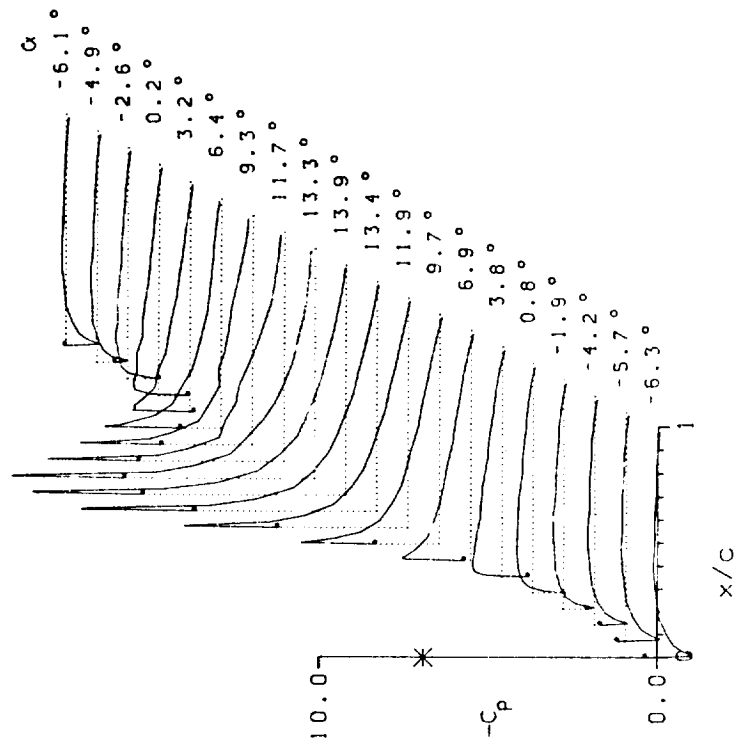
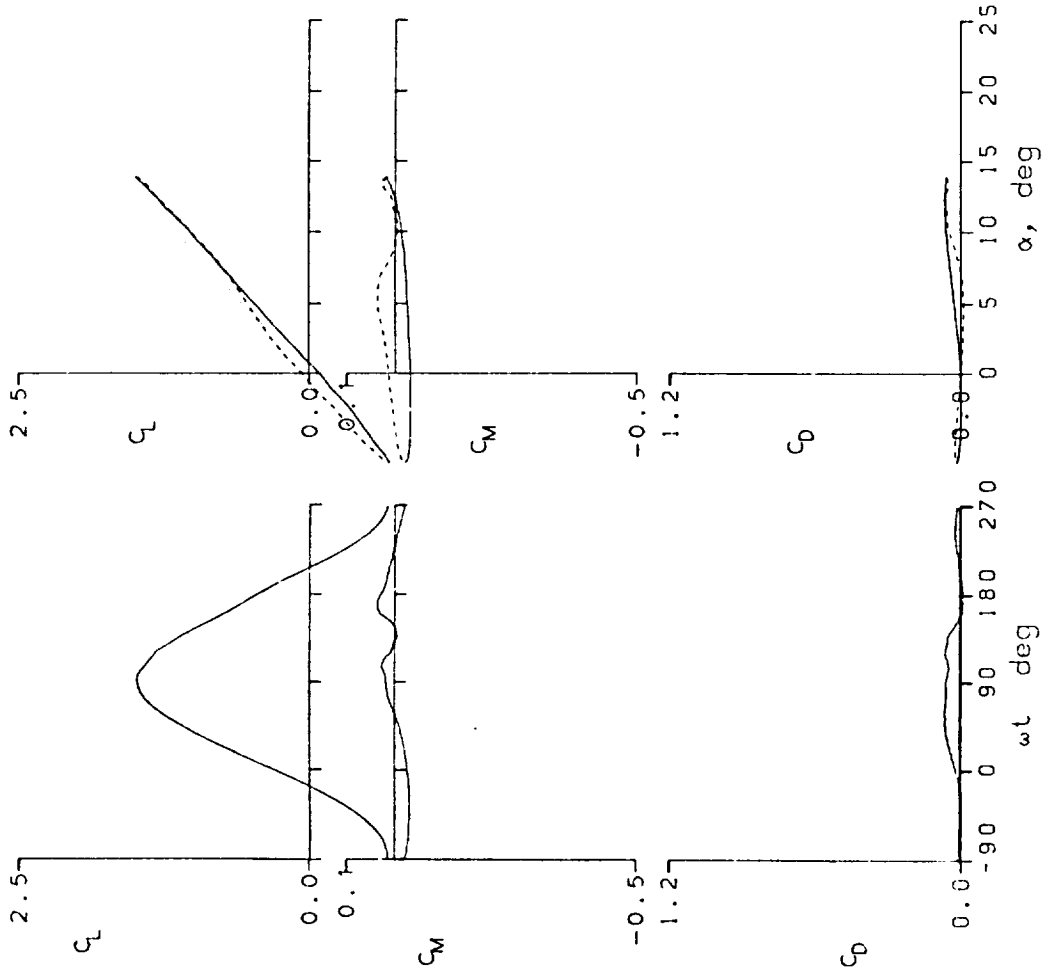


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 10309	A0 = 2.64°	k = 0.099
Rb = 3.90 E6	A1 = 10.16°	M = 0.301
CLmax = 1.42	CMmin = -0.04	CDmax = 0.06
αLmax = 12.9°	ξ = 0.309	Mmax = 1.208
αCMmin = -0.2°	-CPmax = 8.9	αMmax = 12.8°

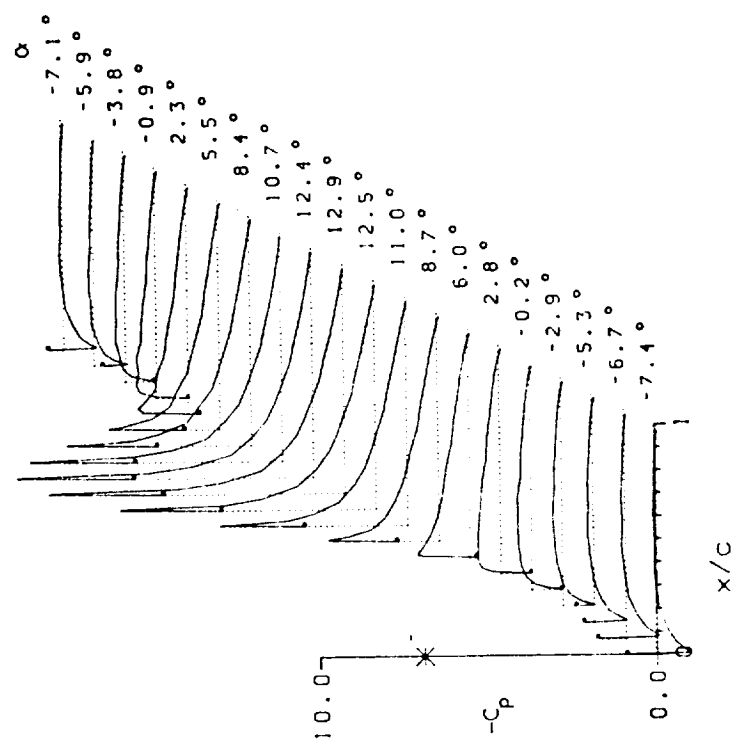
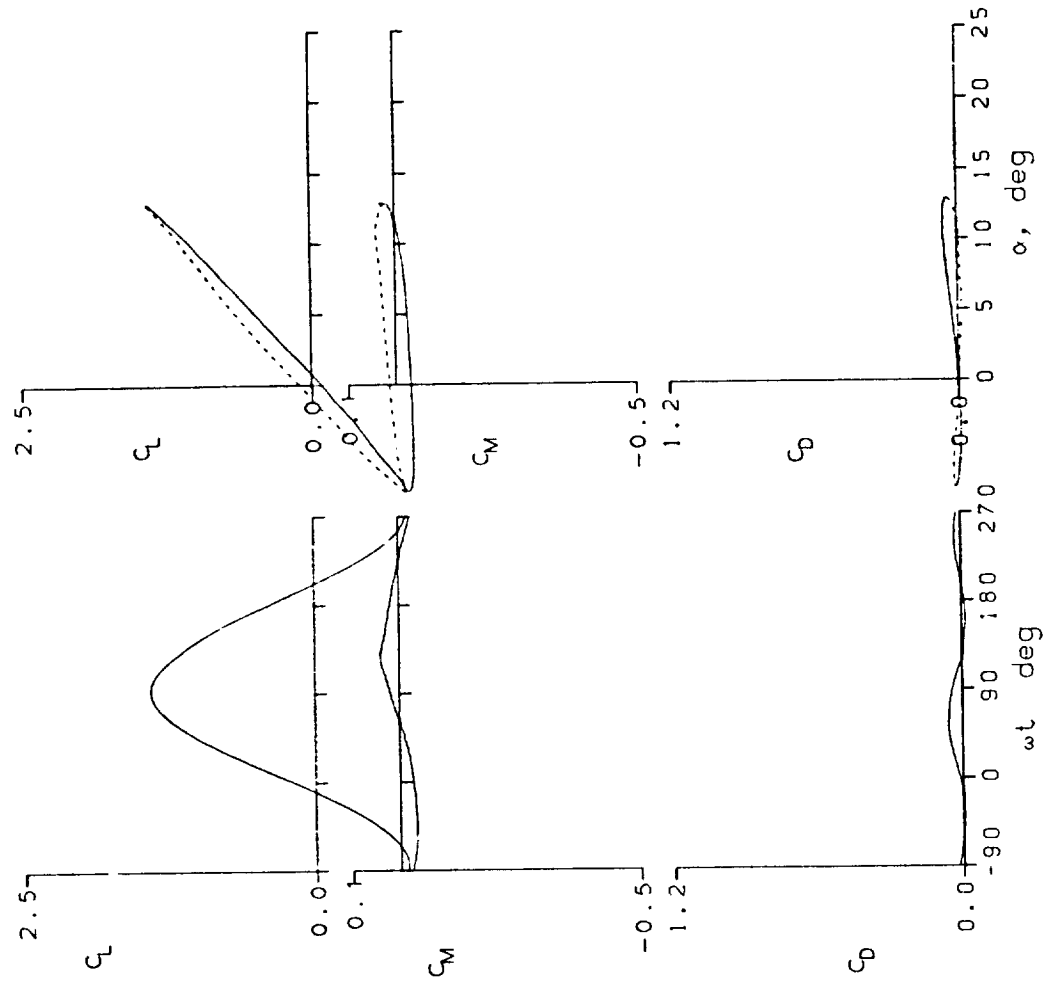


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 12020 A0 = 19.77° k = 0.001
 Re = 3.49 E6 A1 = 9.91° M = 0.270

$C_{Lmax} = 1.39$ $C_{Mmin} = -0.16$ $C_{Dmax} = 0.60$
 $\alpha_{Lmax} = 13.1^\circ$ $\xi = -0.114$ $M_{max} = 1.029$
 $\alpha_{Cmin} = 19.2^\circ$ $-C_{Pmax} = 9.0$ $\alpha_{Mmax} = 13.8^\circ$

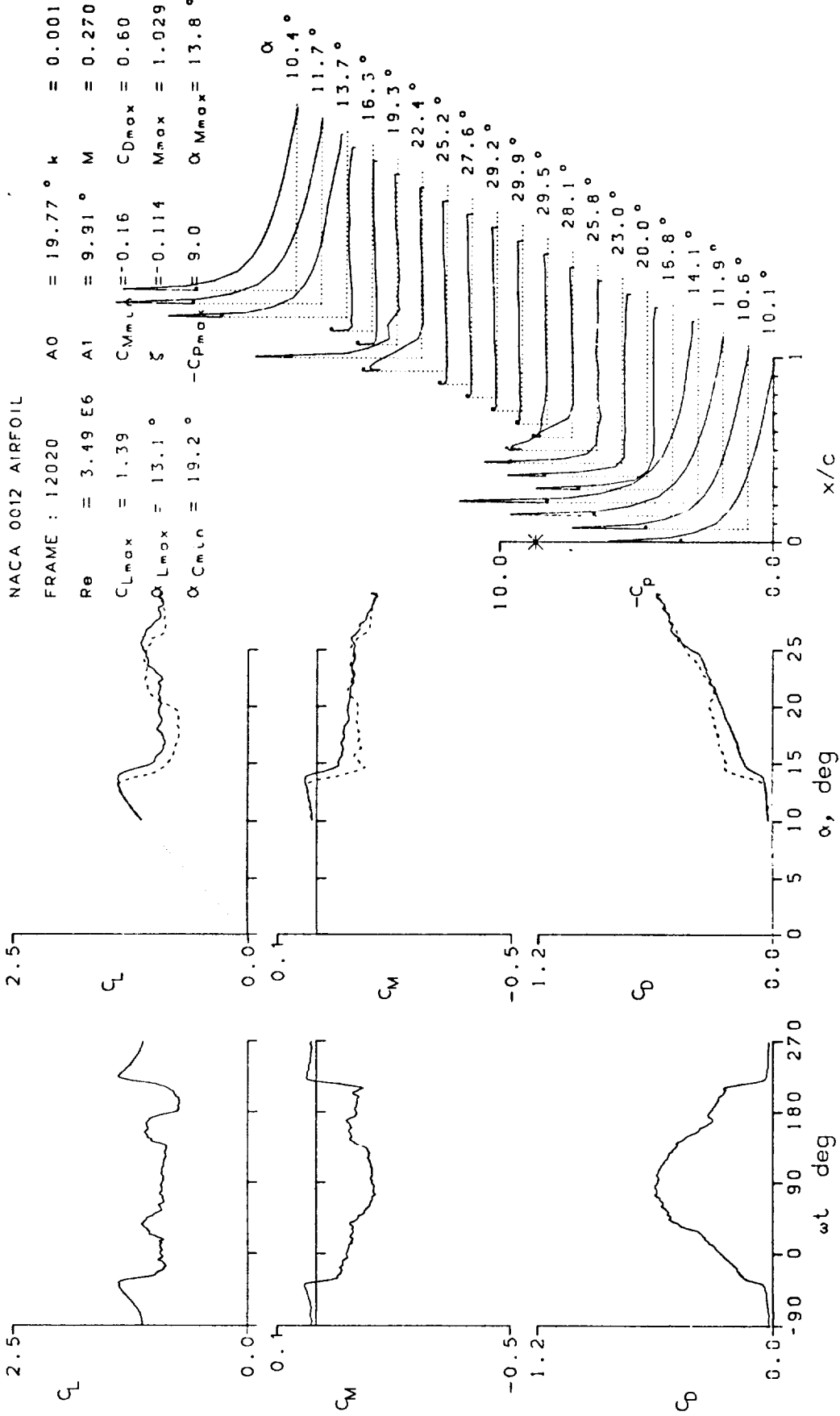


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 12102 A0 = 4.86° k = 0.001
 Re = 3.82 E6 A1 = 10.06° M = 0.302
 $C_{Lmax} = 1.38$ $C_{Mmin} = -0.08$ $C_{Dmax} = 0.16$
 $\alpha_{Lmax} = 13.4^\circ$ $\xi = 0.002$ $M_{max} = 1.206$
 $\alpha_{Cmin} = 4.3^\circ$ $-C_{Dmax} = 8.8$ $\alpha_{Mmax} = 13.6^\circ$

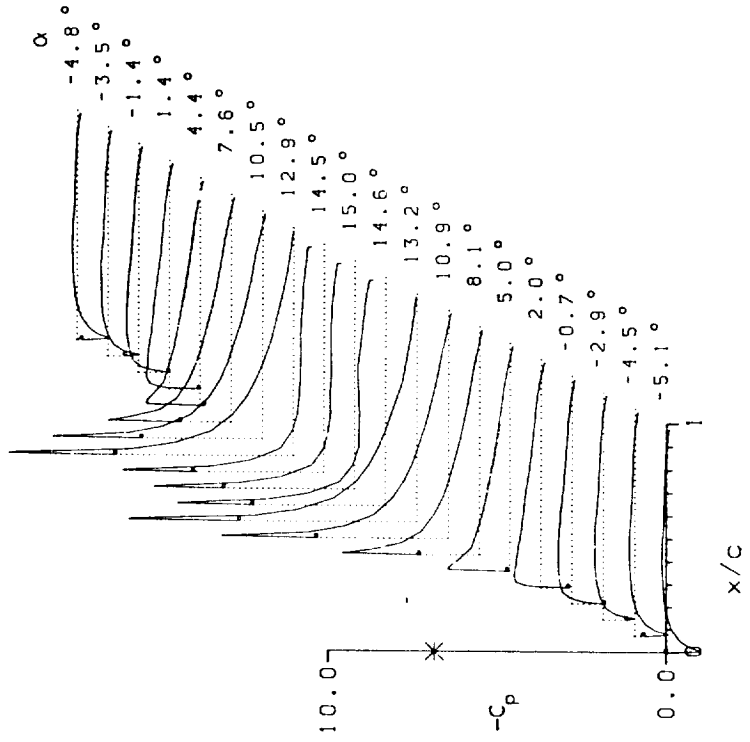
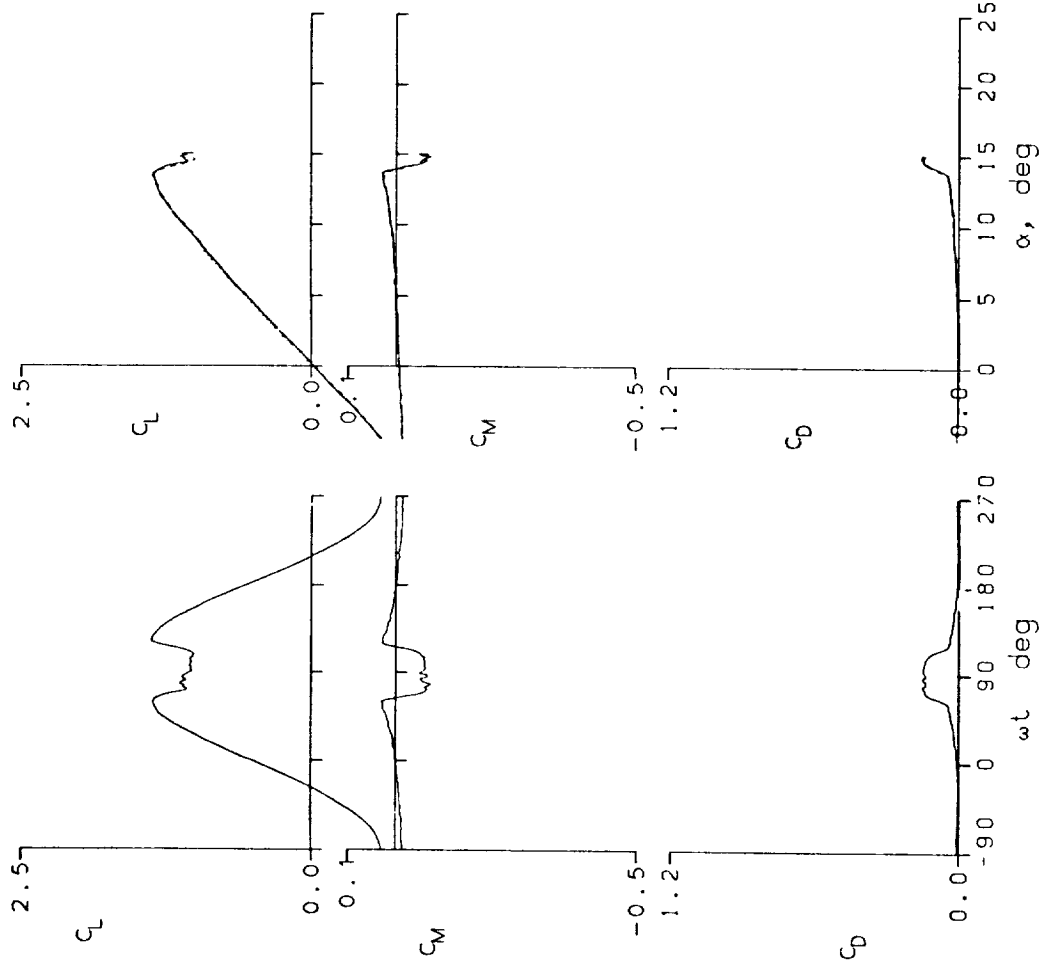


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 12109 A0 = 5.82° k = 0.001
 Re = 3.49 E6 A1 = 10.00° M = 0.279
 C_{Lmax} = 1.43 C_{Mmin} = -0.08 C_{Dmax} = 0.18
 α_{Lmax} = 14.3° ζ = -0.023 Mmax = 1.114
 α_{Cmin} = 5.3° -C_{pmax} = 9.5 α_{Mmax} = 14.5°

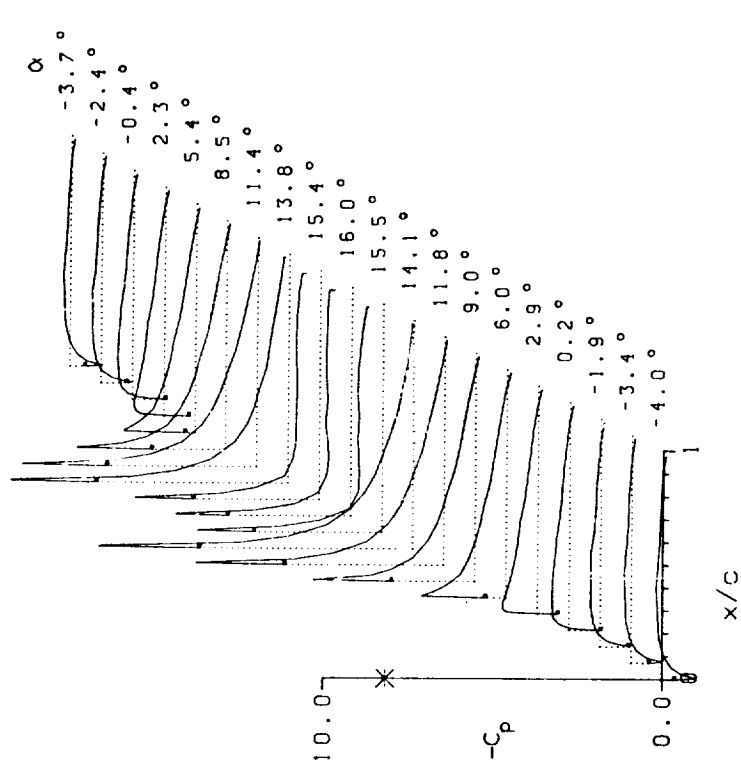
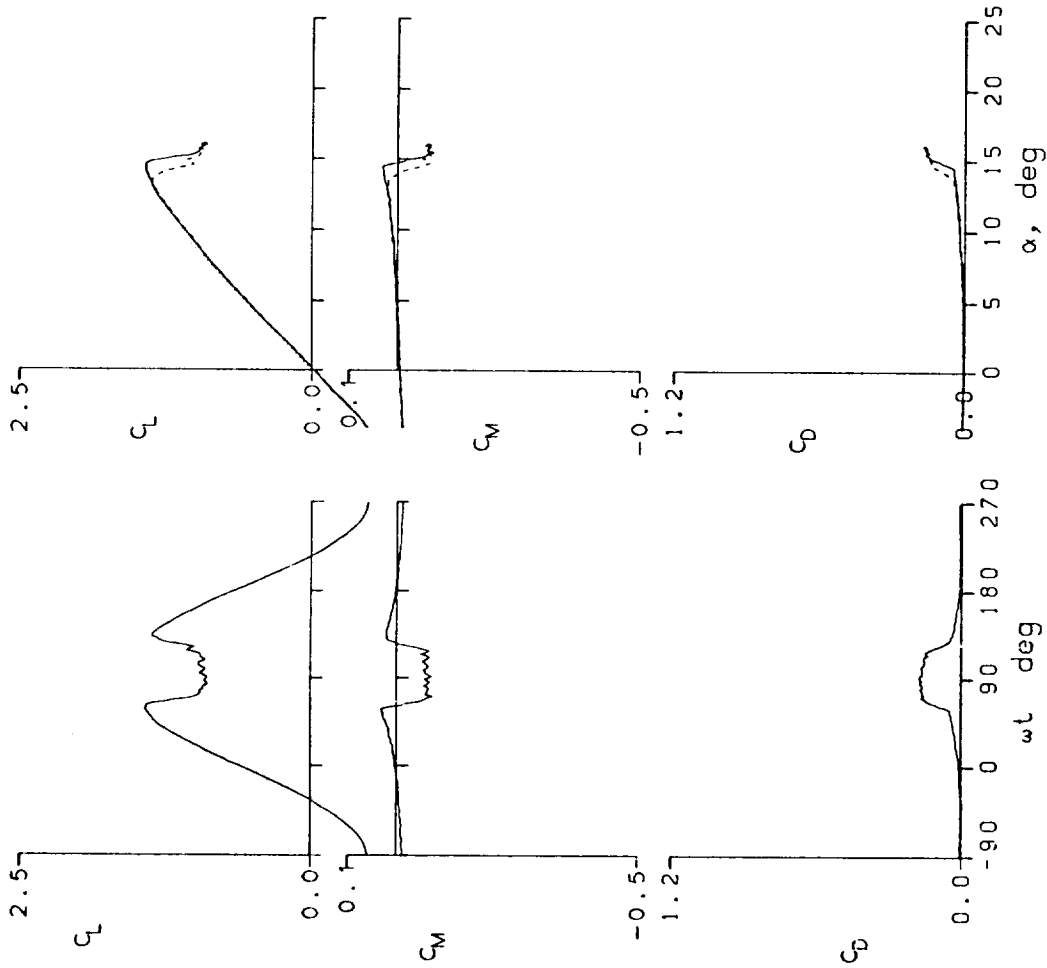


Figure 12.- Continued.

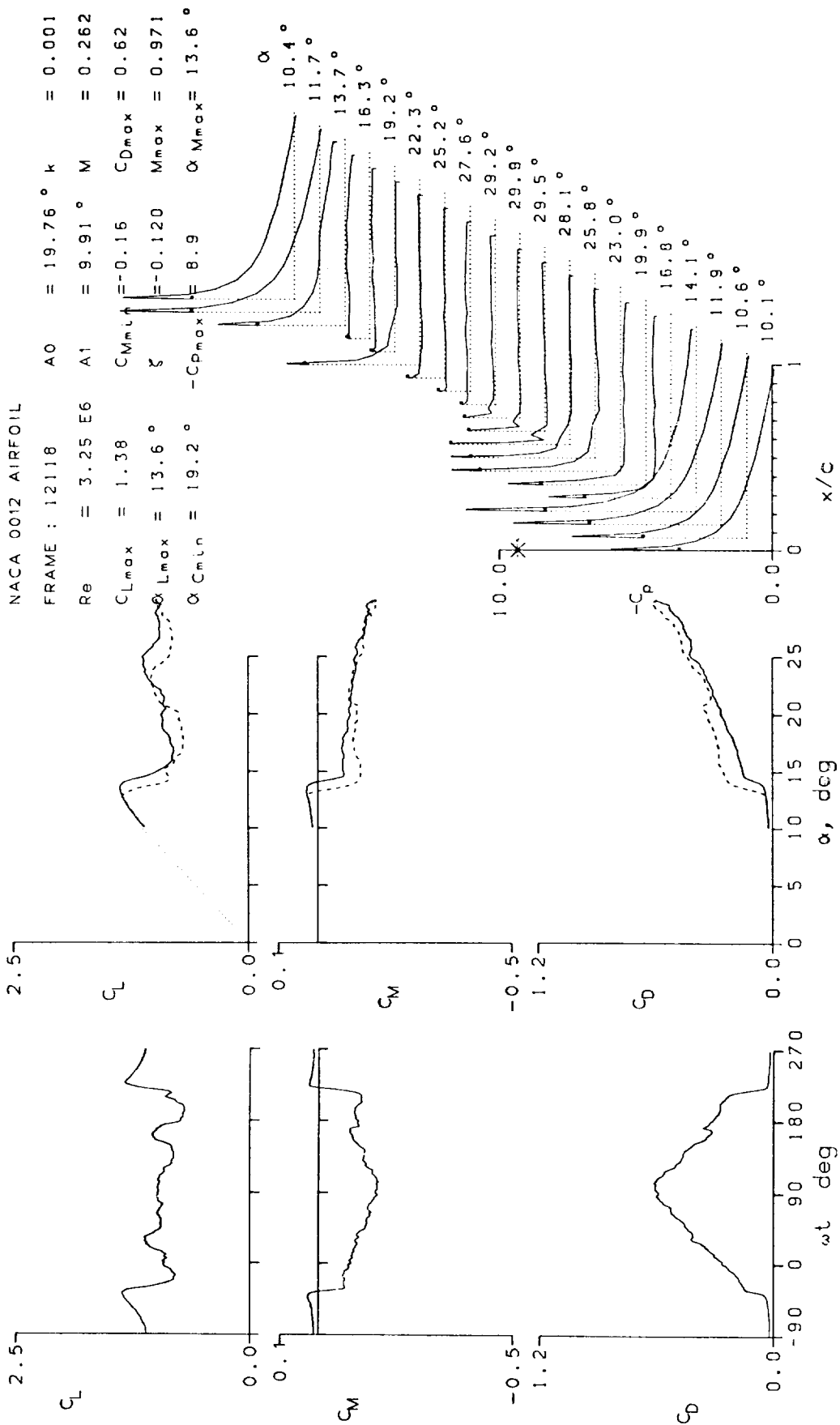


Figure 12.- Continued.

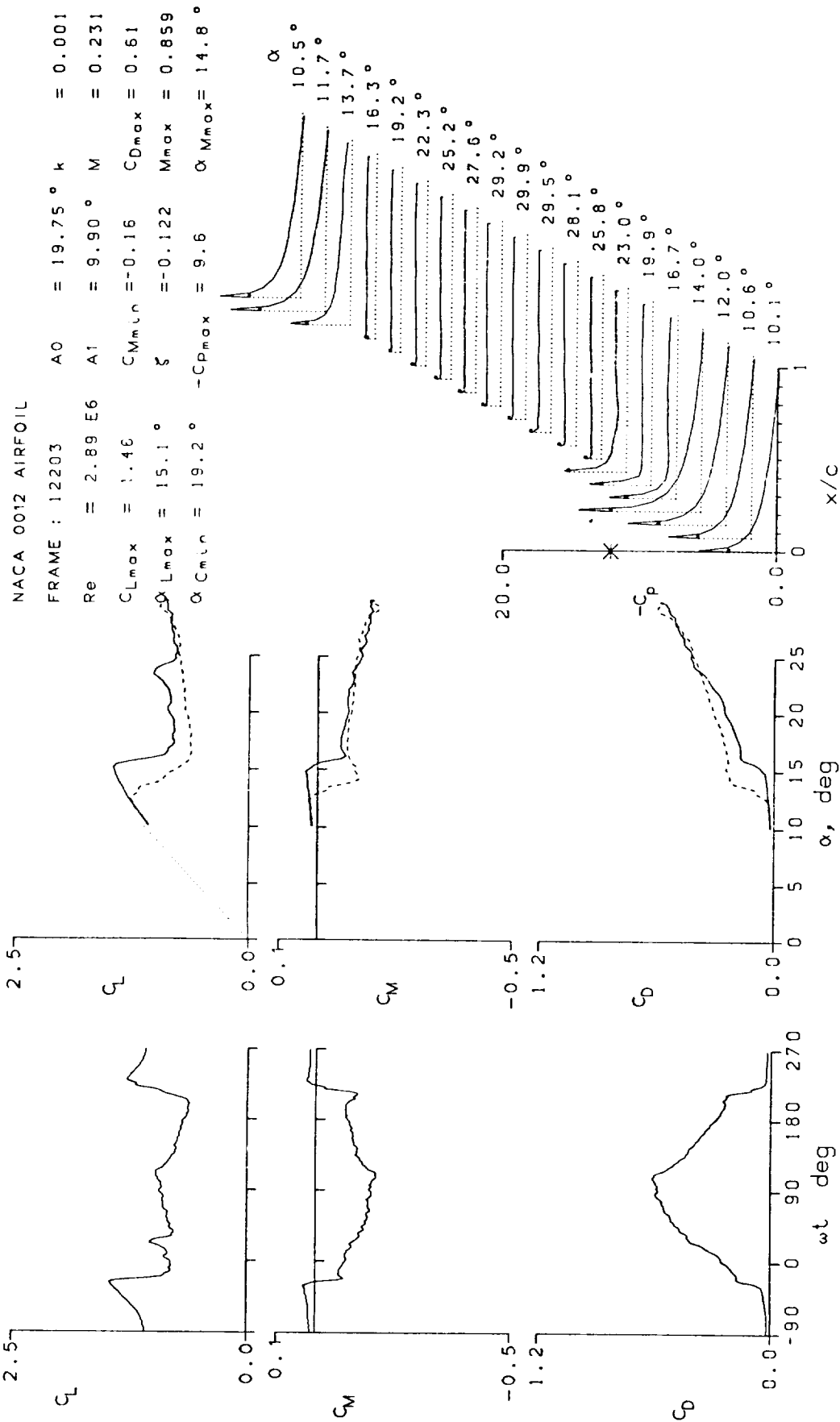


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 12208 A0 = 6.80° k = 0.001
 Re = 3.27 E6 A1 = 10.00° M = 0.244
 C_{Lmax} = 1.57 C_{Mmin} = -0.08 C_{Dmax} = 0.19
 α_{Lmax} = 16.0° ζ = -0.069 M_{max} = 1.004
 α_{Cmin} = 6.3° $-C_{Pmax}$ = 10.9 α_{Mmax} = 16.1°

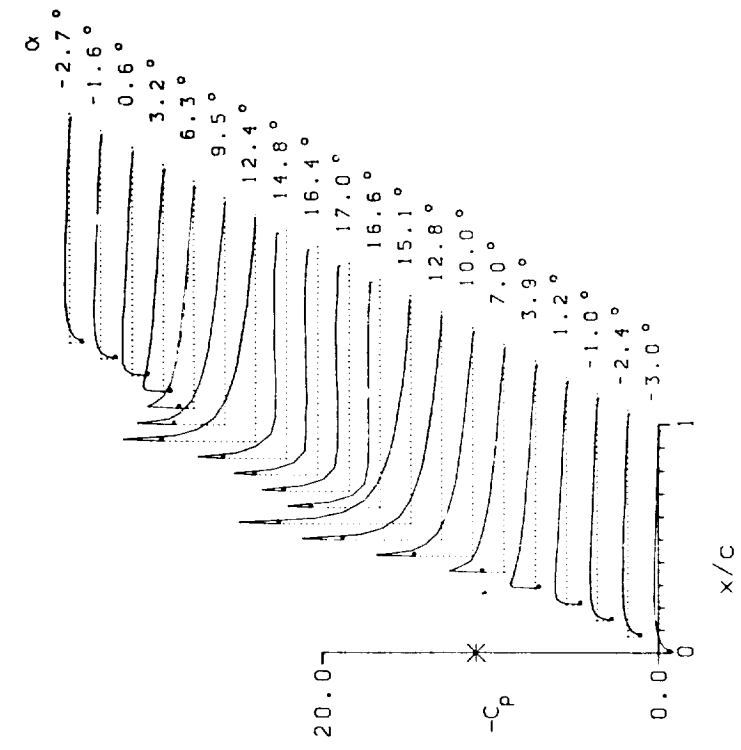
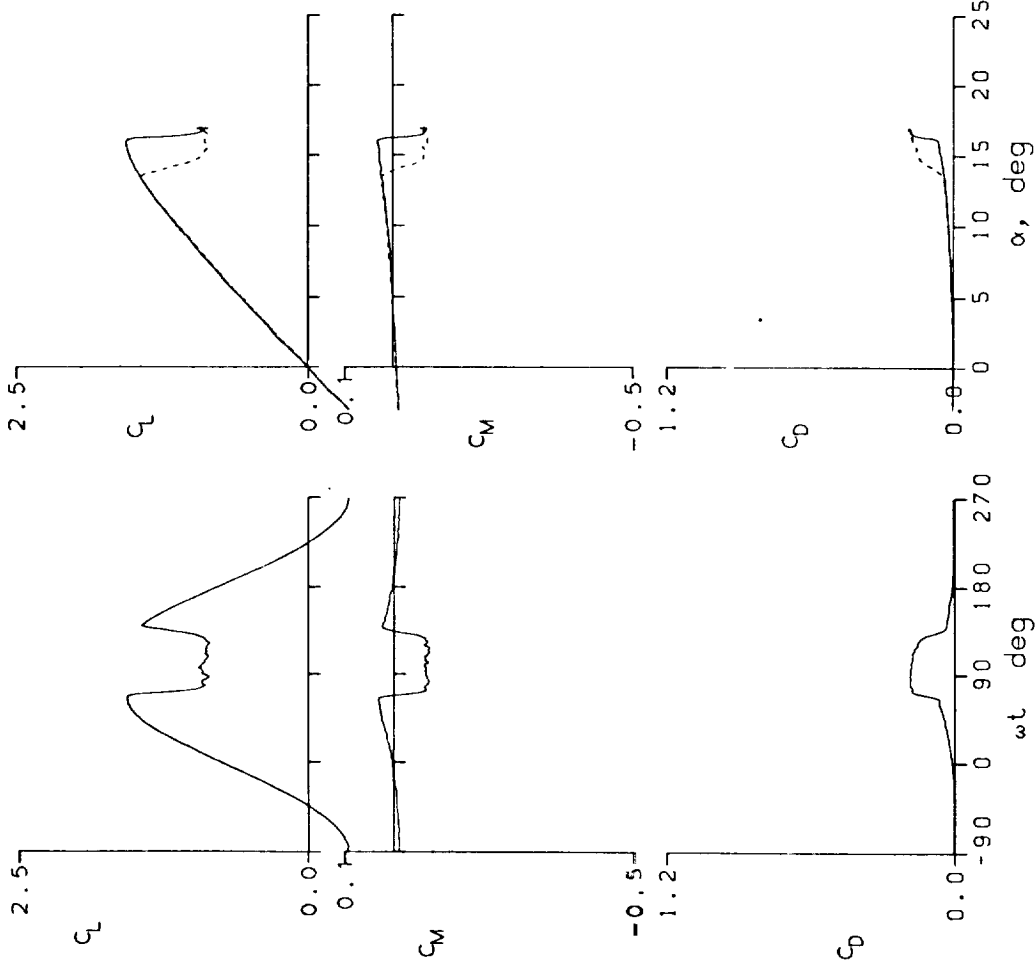


Figure 12.- Continued.

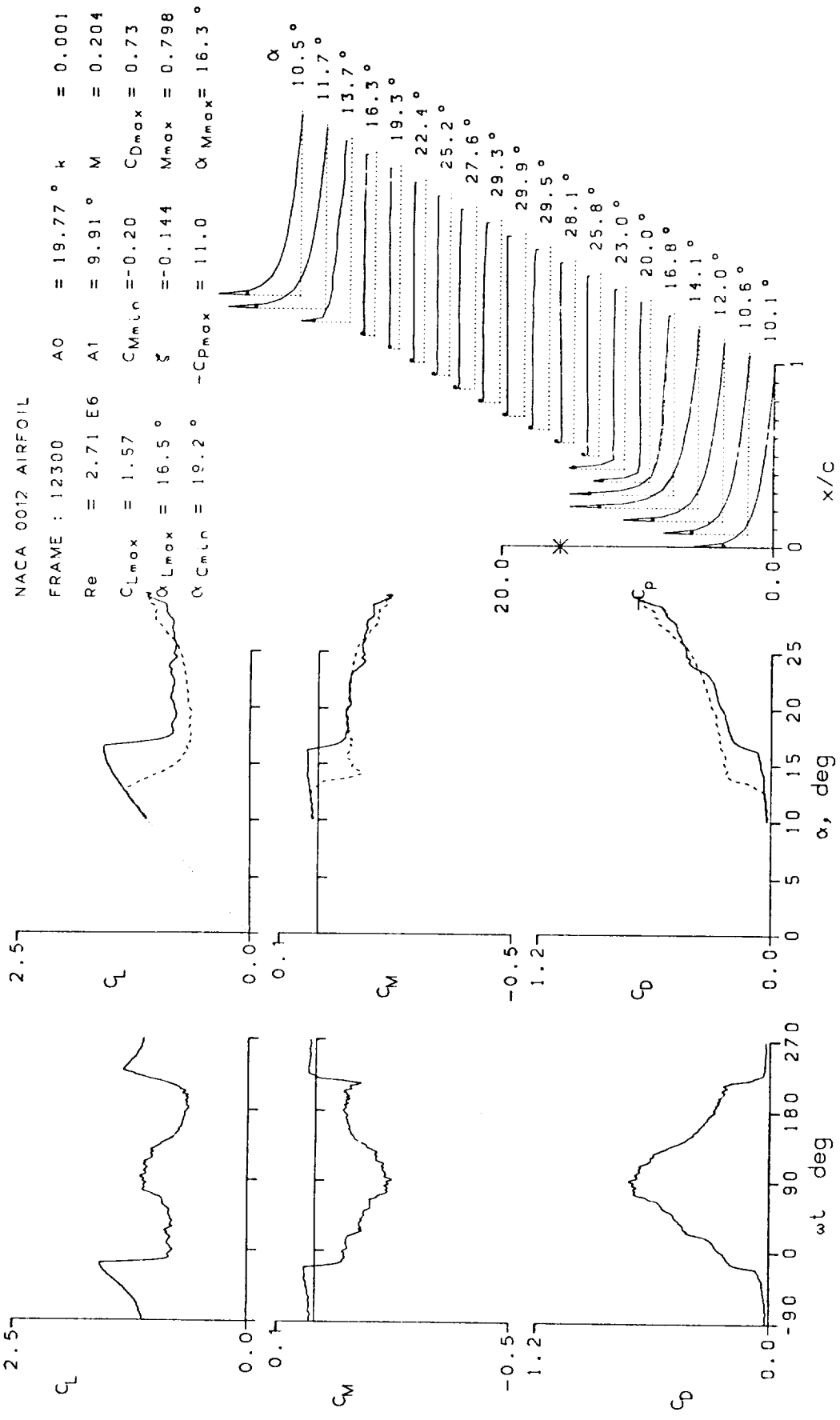


Figure 12.- Continued.

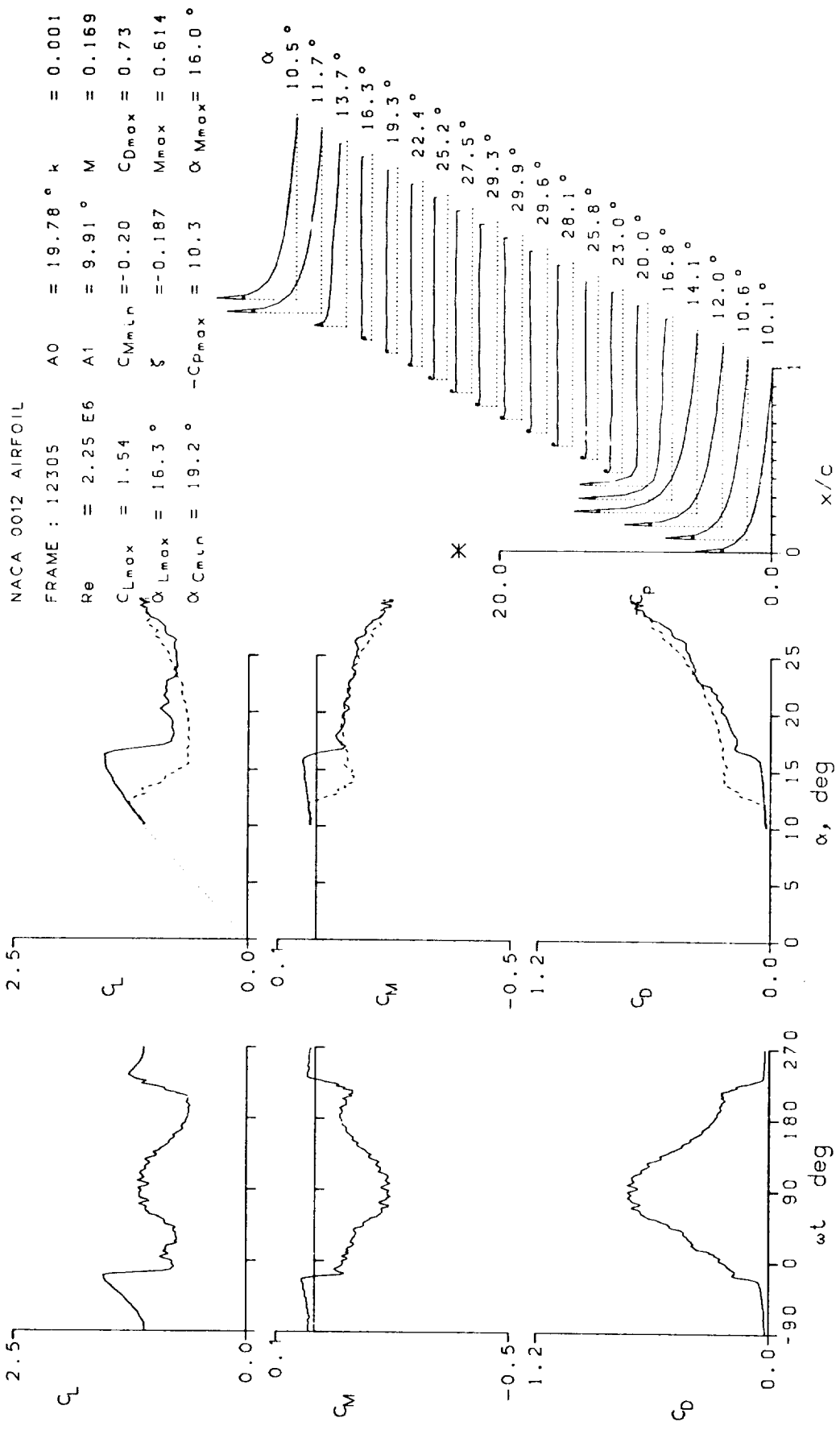


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 12310	A0 = 6.79 °	k = 0.001
Re = 2.47 E6	A1 = 10.00 °	M = 0.186
$C_{Lmax} = 1.54$	$C_{Mmin} = -0.09$	$C_{Dmax} = 0.24$
$\alpha_{Lmax} = 15.9 °$	$\xi = -0.106$	$M_{max} = 0.691$
$\alpha_{Cmin} = 6.3 °$	$-C_{pmax} = 10.5$	$\alpha_{Mmax} = 16.2 °$

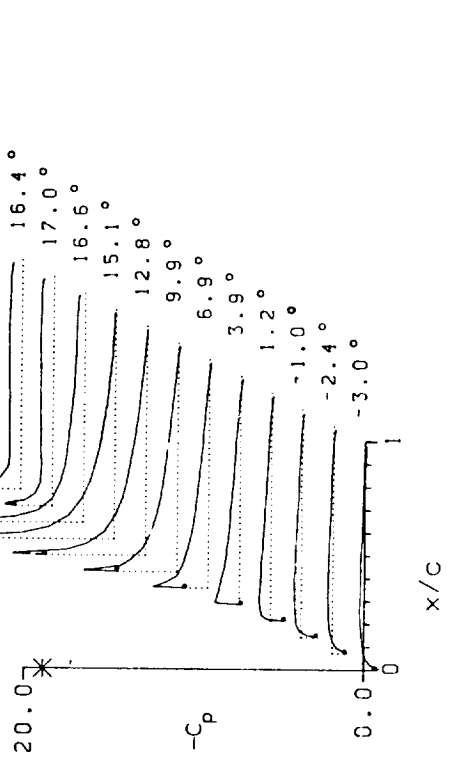
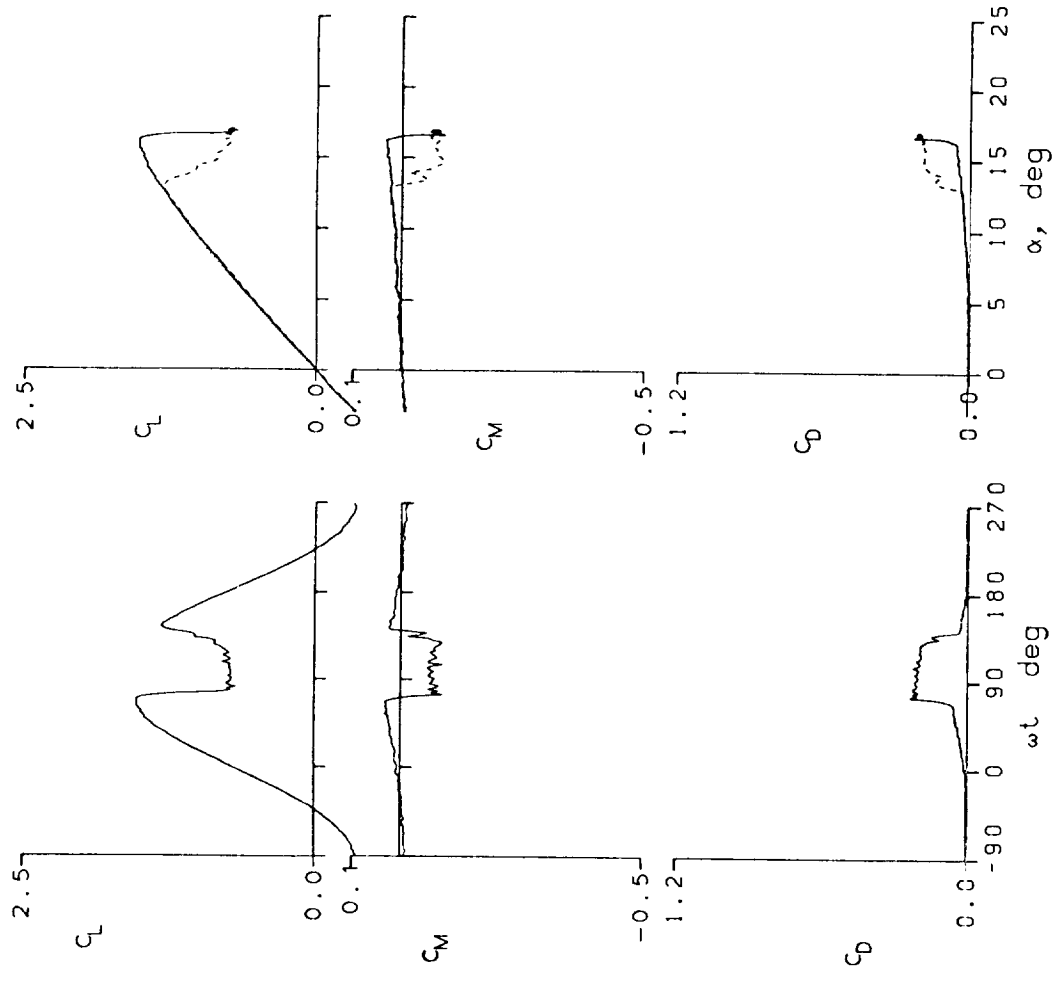


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 13021 A0 = 6.79 ° k = 0.002
 Re = 1.50 E6 A1 = 10.00 ° M = 0.108
 C_{Lmax} = 1.42 C_{Mmin} = -0.07 C_{Dmax} = 0.20
 α_{Lmax} = 14.9 ° ζ = -0.059 M_{max} = 0.348
 α_{Cmin} = 6.3 ° -C_{Pmax} = 8.9 α_{Mmax} = 14.7 °

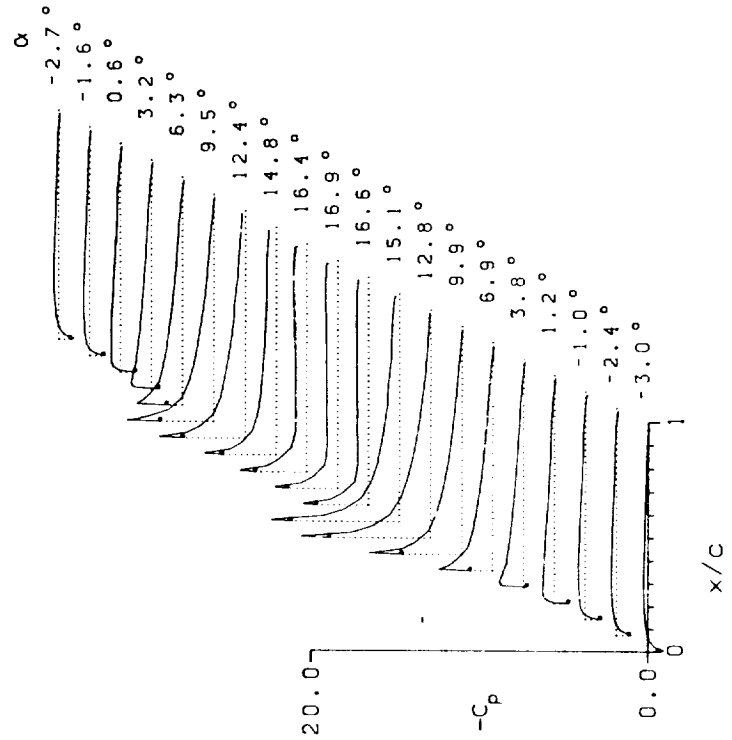
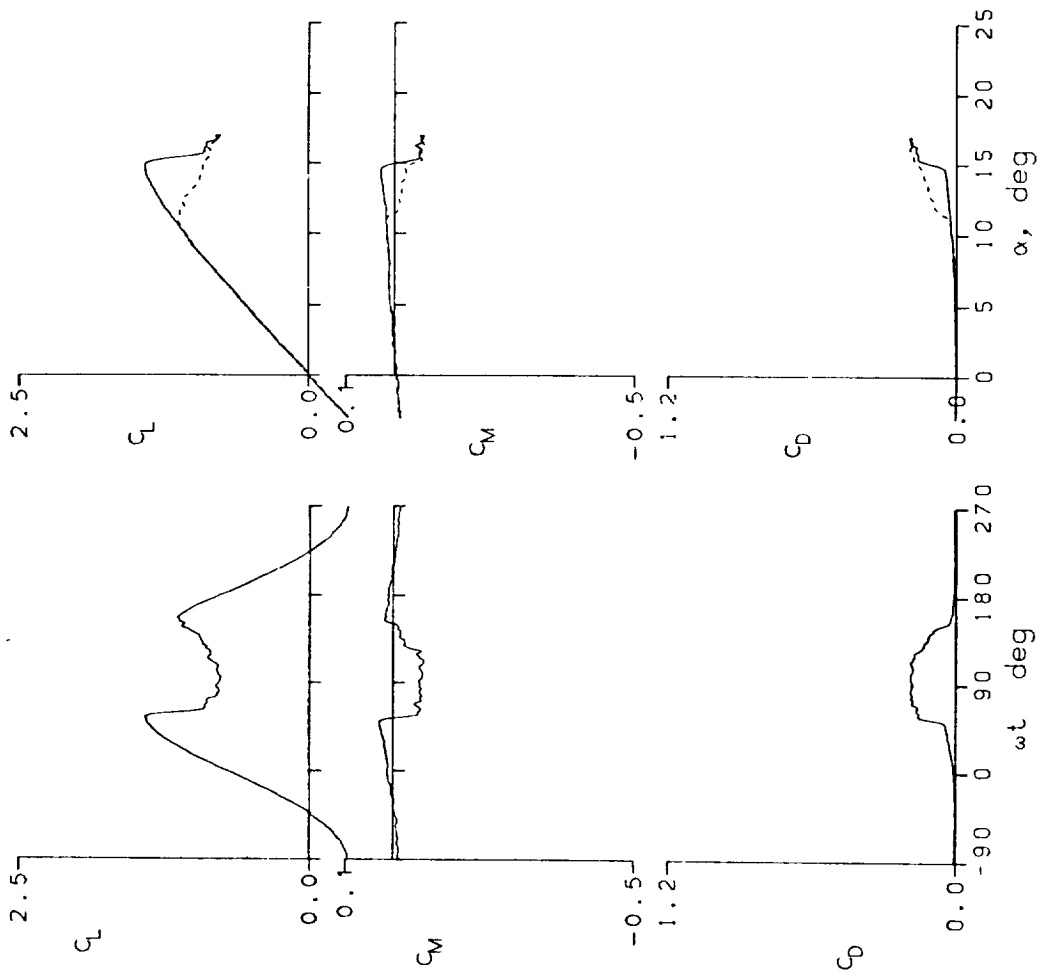


Figure 12.- Continued.

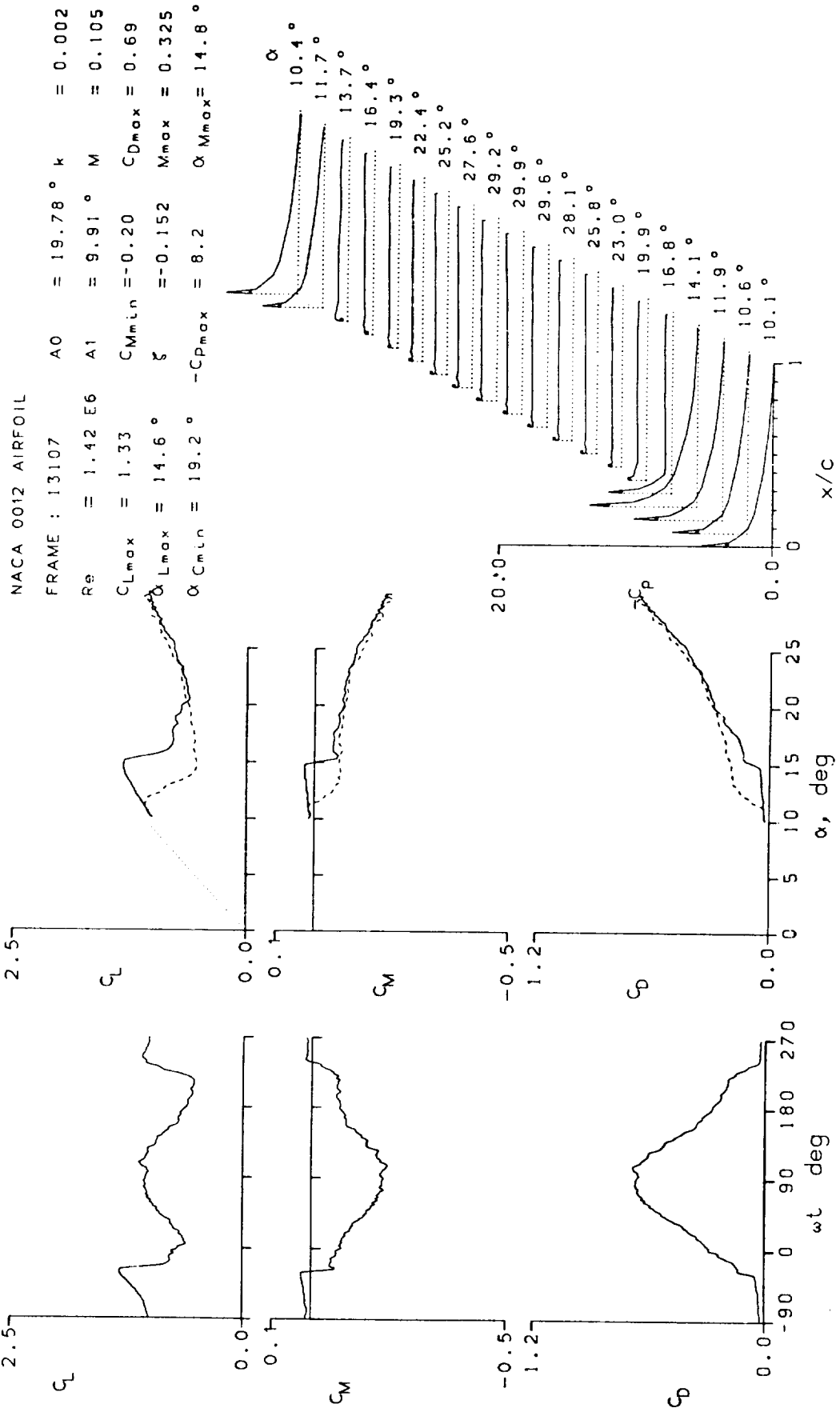


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 13115 A0 = 19.78 ° k = 0.003
 Re = 0.92 E6 A1 = 9.91 ° M = 0.068
 C_{Lmax} = 1.27 C_{Mmin} = -0.21 C_{Dmax} = 0.72
 α_{Lmax} = 14.1 ° ζ = -0.112 M_{max} = 0.197
 α_{Cmin} = 16.5 ° -C_{pmax} = 7.2 α_{Mmax} = 13.8 °

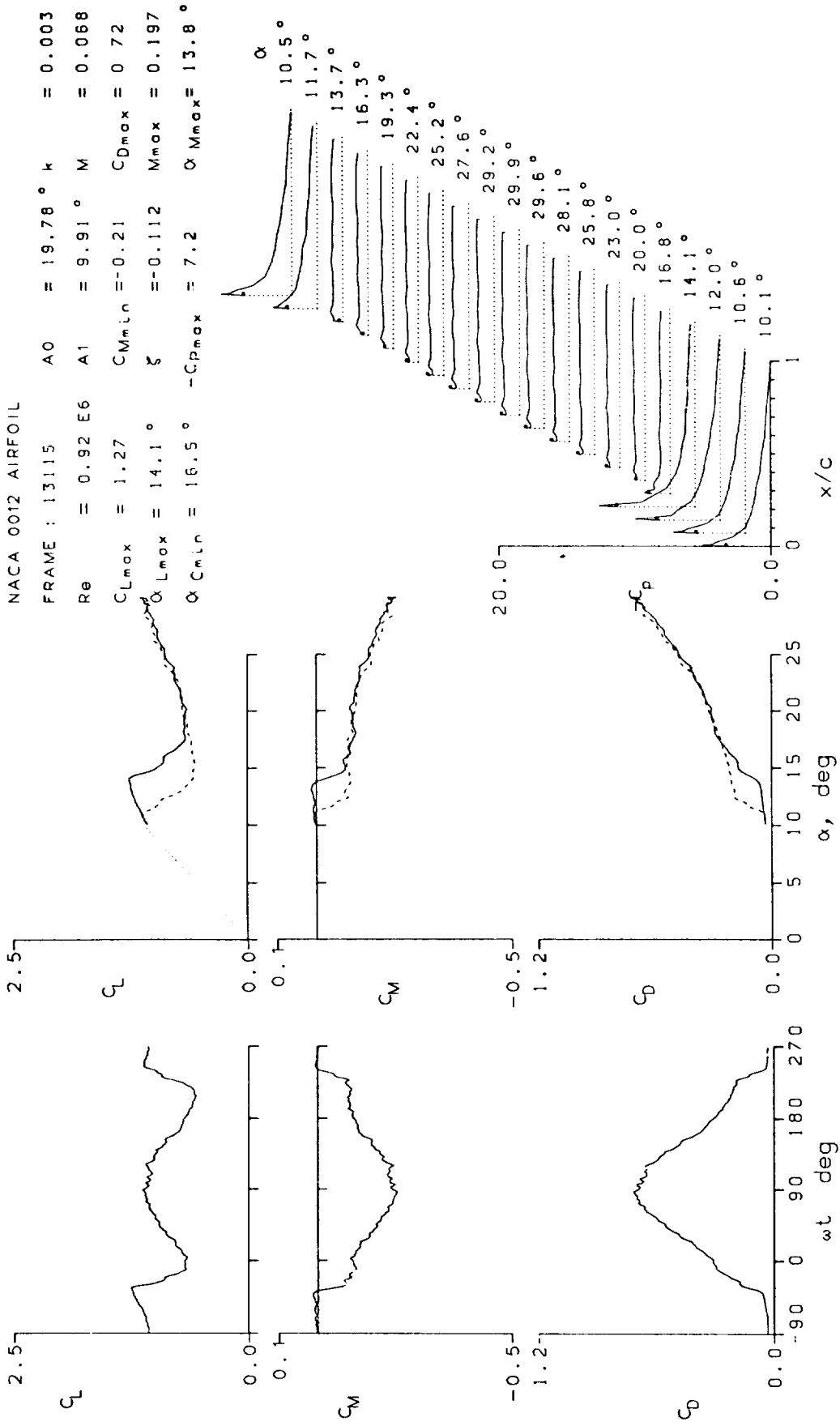


Figure 12.- Continued.

NACA 0012 A RECON
 FRAME : 13120 AC = 4.84° k = 0.003
 Re = 0.96 E6 A' = 10.06° V = 0.072
 CLmax = 1.25 CVmin = -0.06 CDmax = 0.15
 α Lmax = 13.4° ζ = -0.015 Vmax = 0.206
 α Cmin = 4.3° -CPmax = 7.1° α Mmax = 13.7°

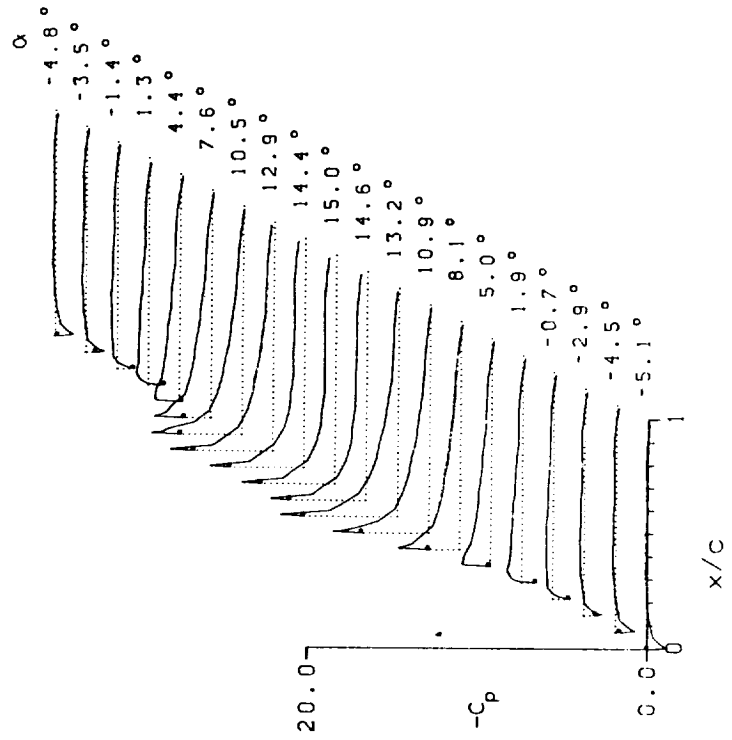
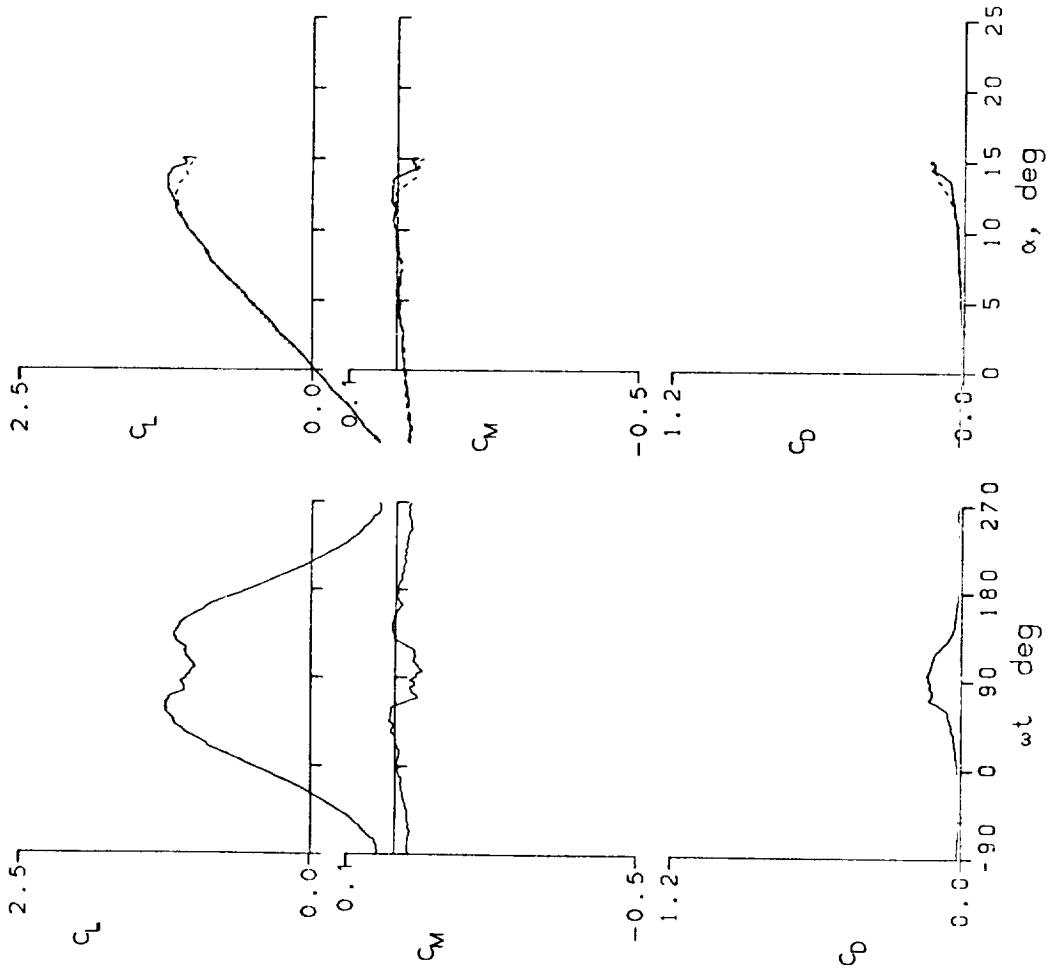


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 13205	A0 = 4.84 °	k = 0.003
Re = 0.49 E6	A1 = 10.06 °	M = 0.036
$C_{Lmax} = 1.13$	$C_{Mmin} = -0.12$	$C_{Dmax} = 0.23$
$\alpha_{Lmax} = 12.6 °$	$\zeta = -0.059$	$M_{max} = 0.094$
$\alpha_{Cmin} = 4.3 °$	$-C_{Pmax} = 5.6$	$\alpha_{Mmax} = 12.1 °$

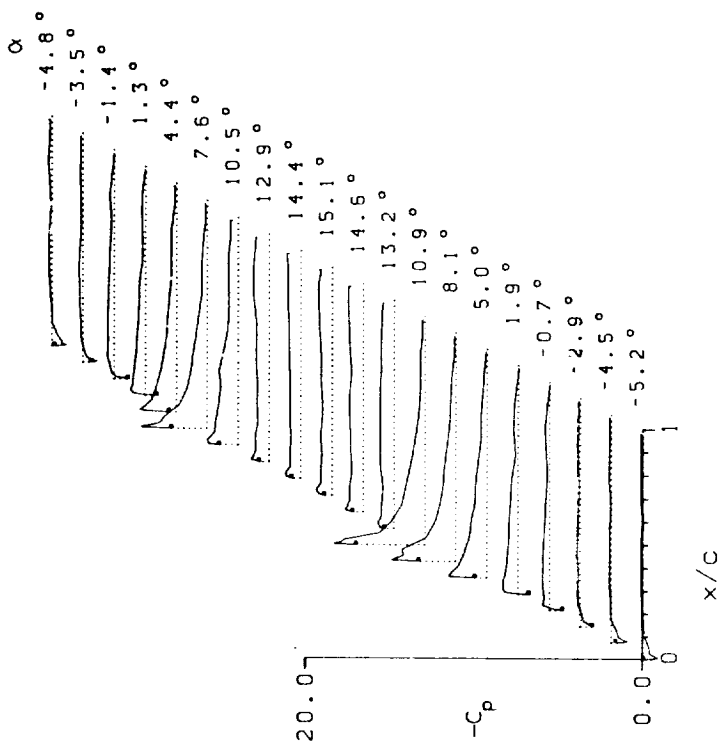
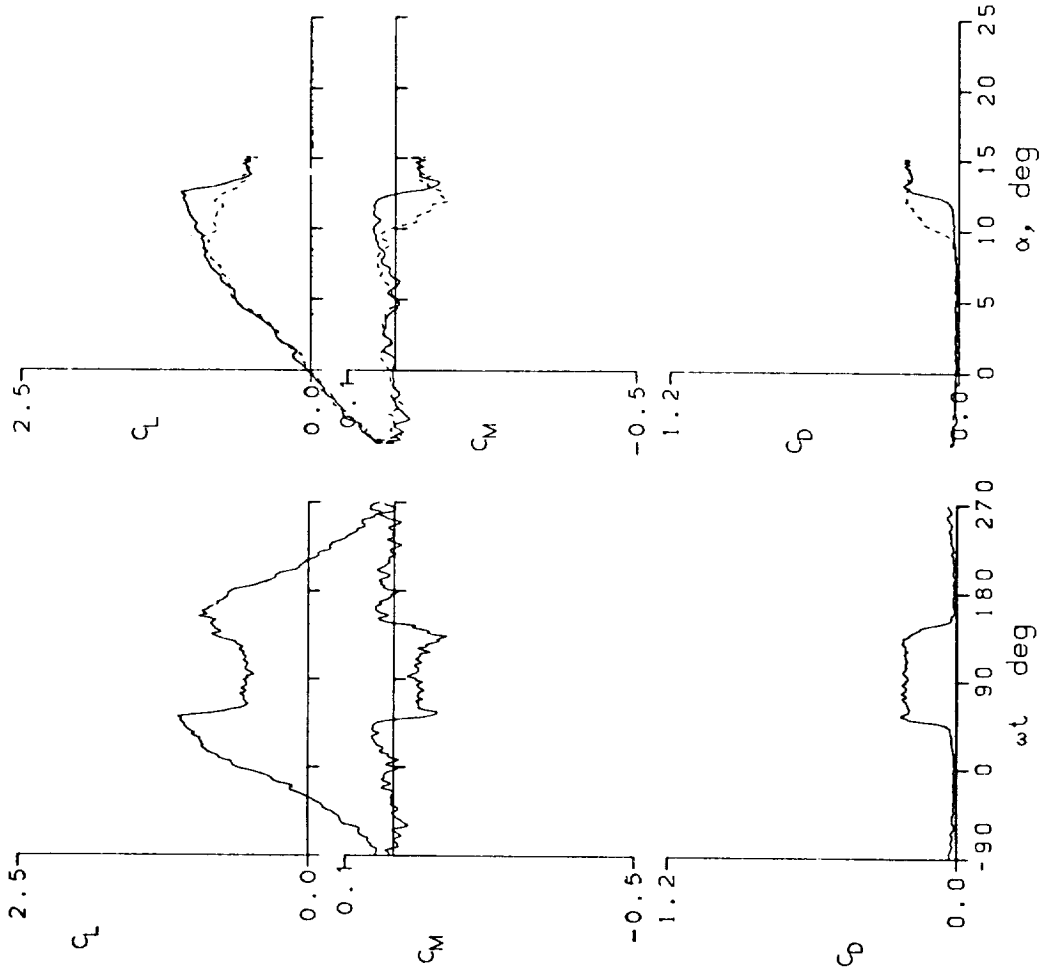


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 13217 A0 = 19.79° k = 0.003
 Re = 0.49 E6 A1 = 9.91° M = 0.036
 C_{Lmax} = 1.12 C_{Mmin} = -0.16 C_{Dmax} = 0.67
 α_{Lmax} = 12.1° ζ = -0.017 M_{max} = 0.086
 α_{Cmin} = 12.5° -C_{Pmax} = 4.7 α_{Mmax} = 11.9°

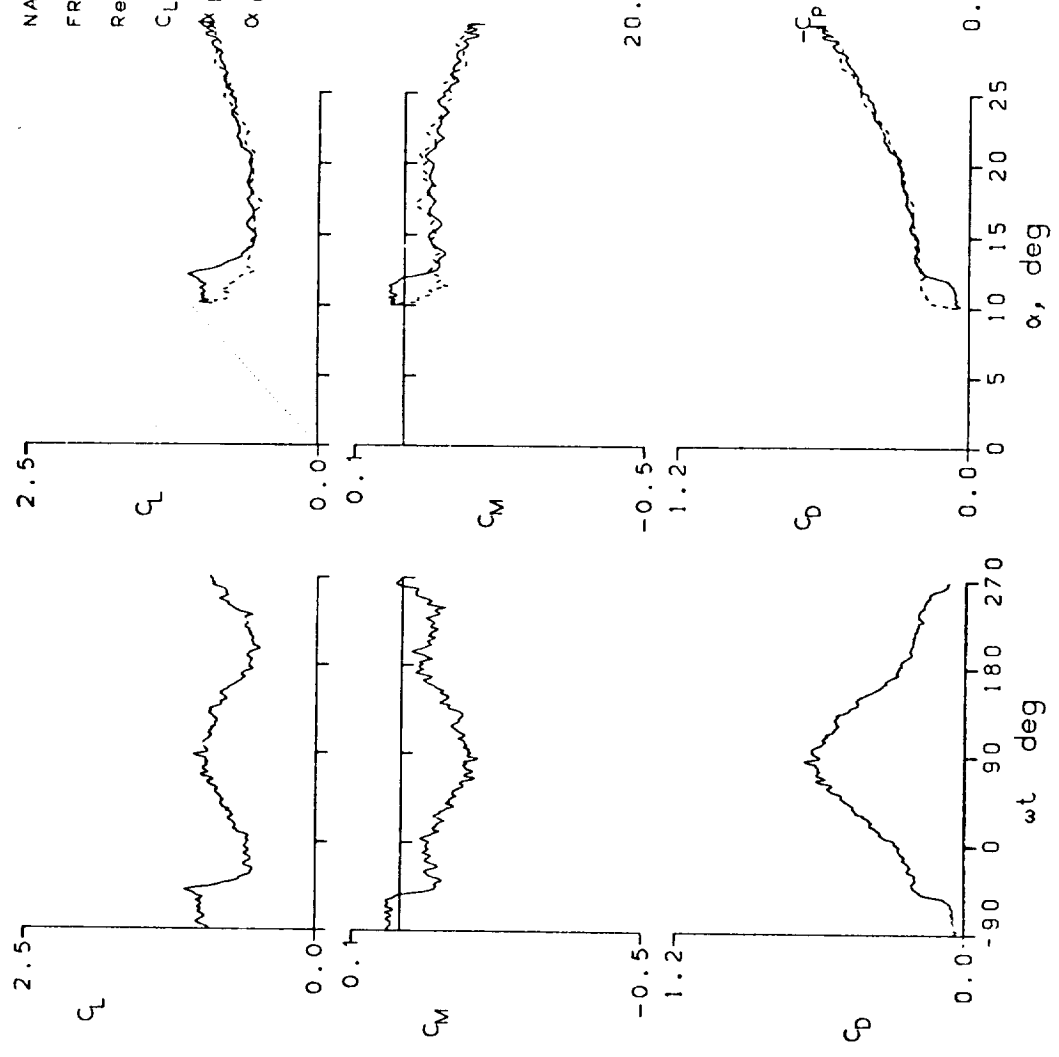


Figure 12.- Continued.

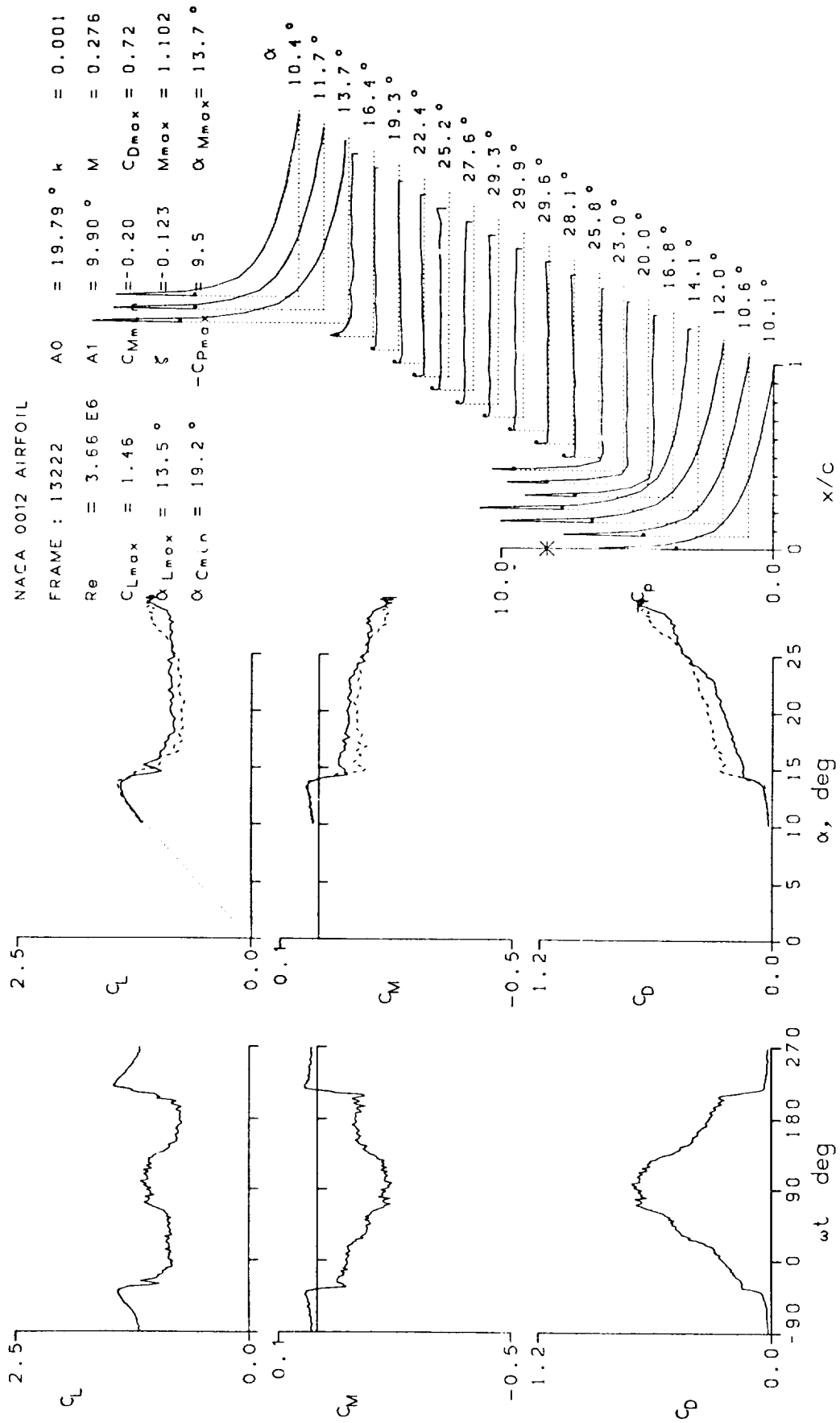


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 13303 A0 = 6.80° k = 0.001
 Re = 3.30 E6 A1 = 10.00° M = 0.247
 $C_{Lmax} = 1.57$ $C_{Mmin} = -0.08$ $C_{Dmax} = 0.19$
 $\alpha_{Lmax} = 15.5^\circ$ $\zeta = -0.057$ $M_{max} = 1.033$
 $\alpha_{Cmin} = 6.3^\circ$ $-C_{Pmax} = 11.0$ $\alpha_{Mmax} = 15.8^\circ$

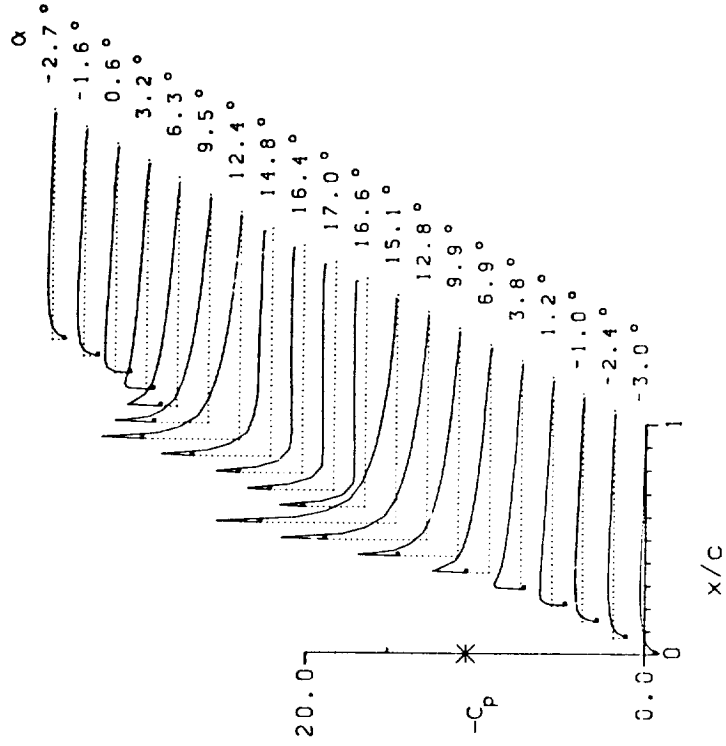
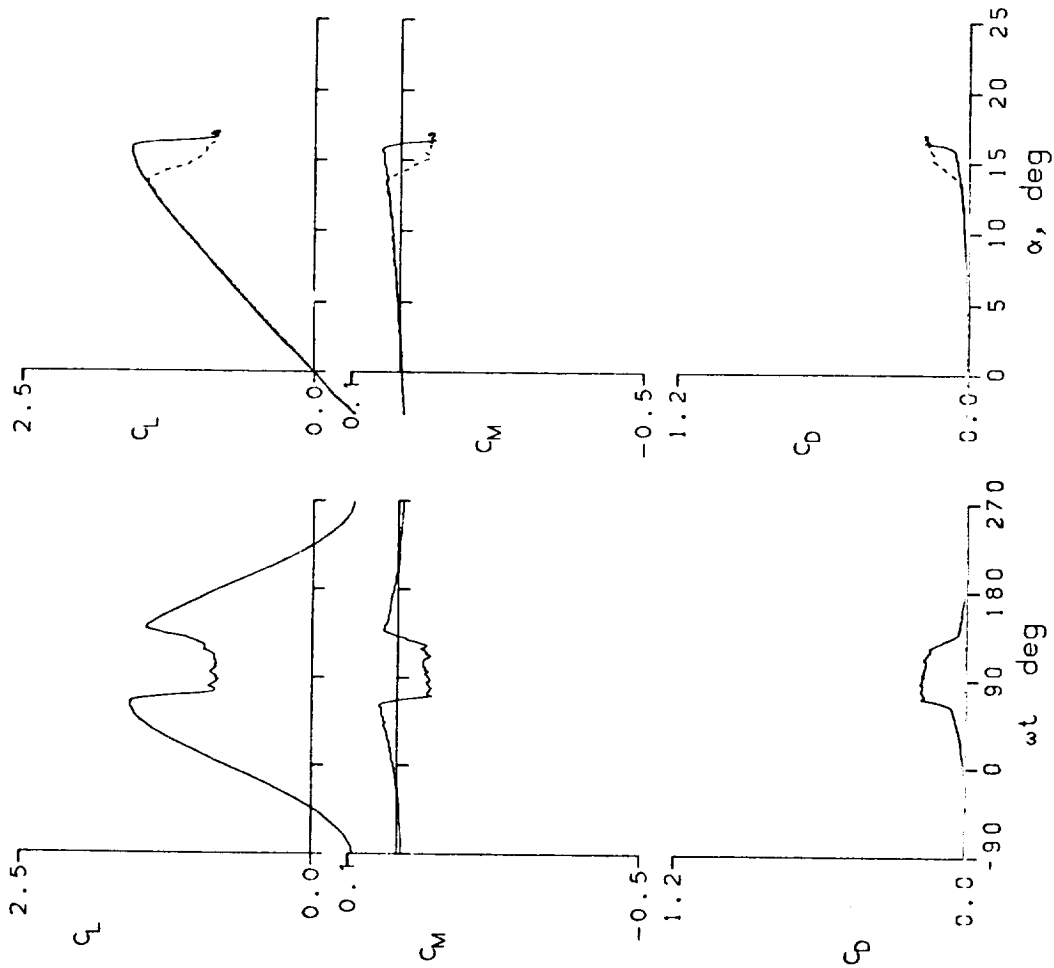


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 13308 A0 = 6.79° k = 0.001

Re = 2.88 E6 A1 = 10.00° M = 0.215

C_{Lmax} = 1.64 C_{Mmin} = -0.08 C_{Dmax} = 0.21

α_{Lmax} = 16.2° ζ = -0.100 M_{max} = 0.874

α_{Cmin} = 6.3° $-C_{pmax}$ = 11.5 α_{Mmax} = 16.3°

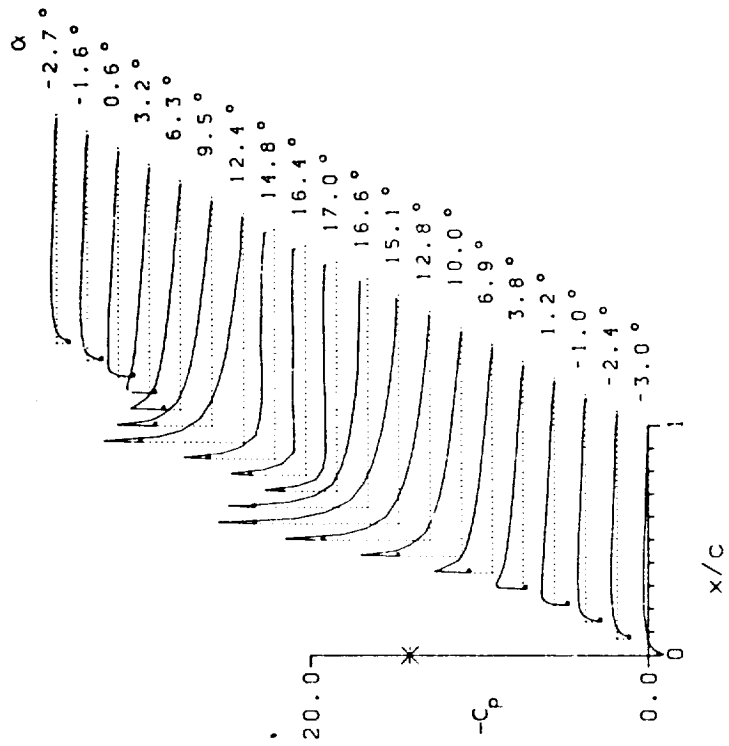
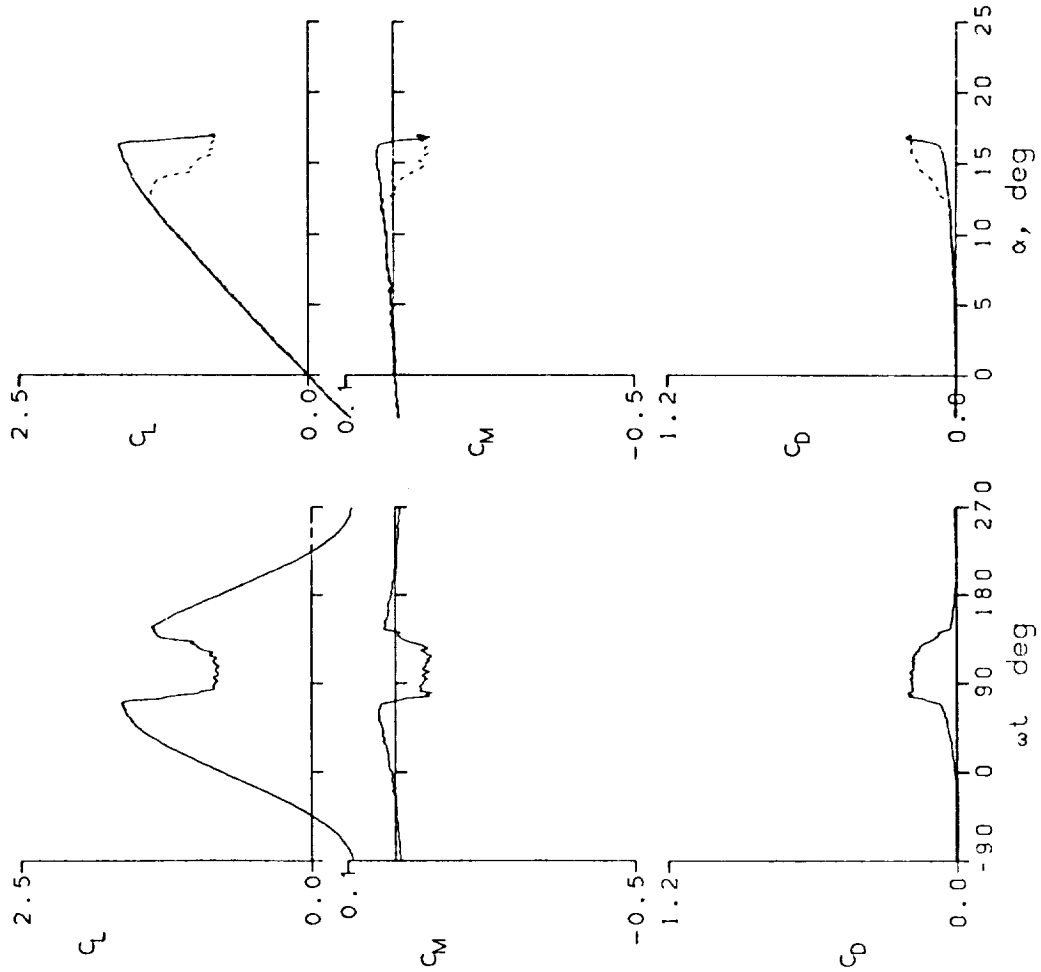


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 13310 A0 = 6.79° k = 0.001
 Re = 2.88 E6 A1 = 10.00° M = 0.216
 CLmax = 1.64 CMmin = -0.09 CDmax = 0.21
 αLmax = 16.0° ζ = -0.072 Mmax = 0.880
 αCmin = 6.3° -CPmax = 11.5 αMmax = 16.1°

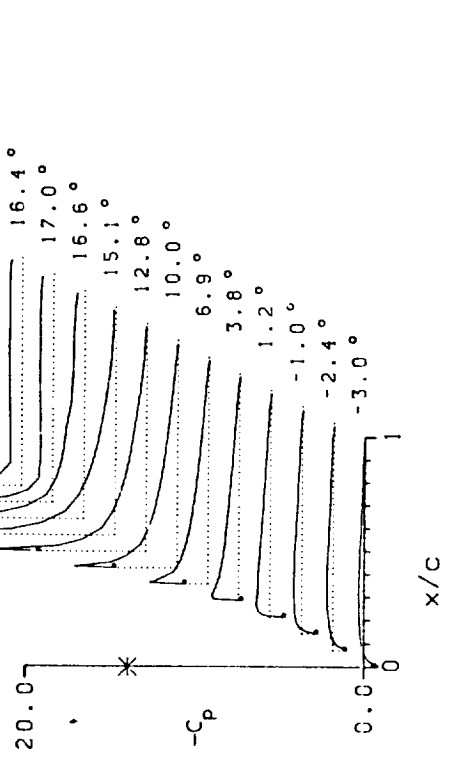
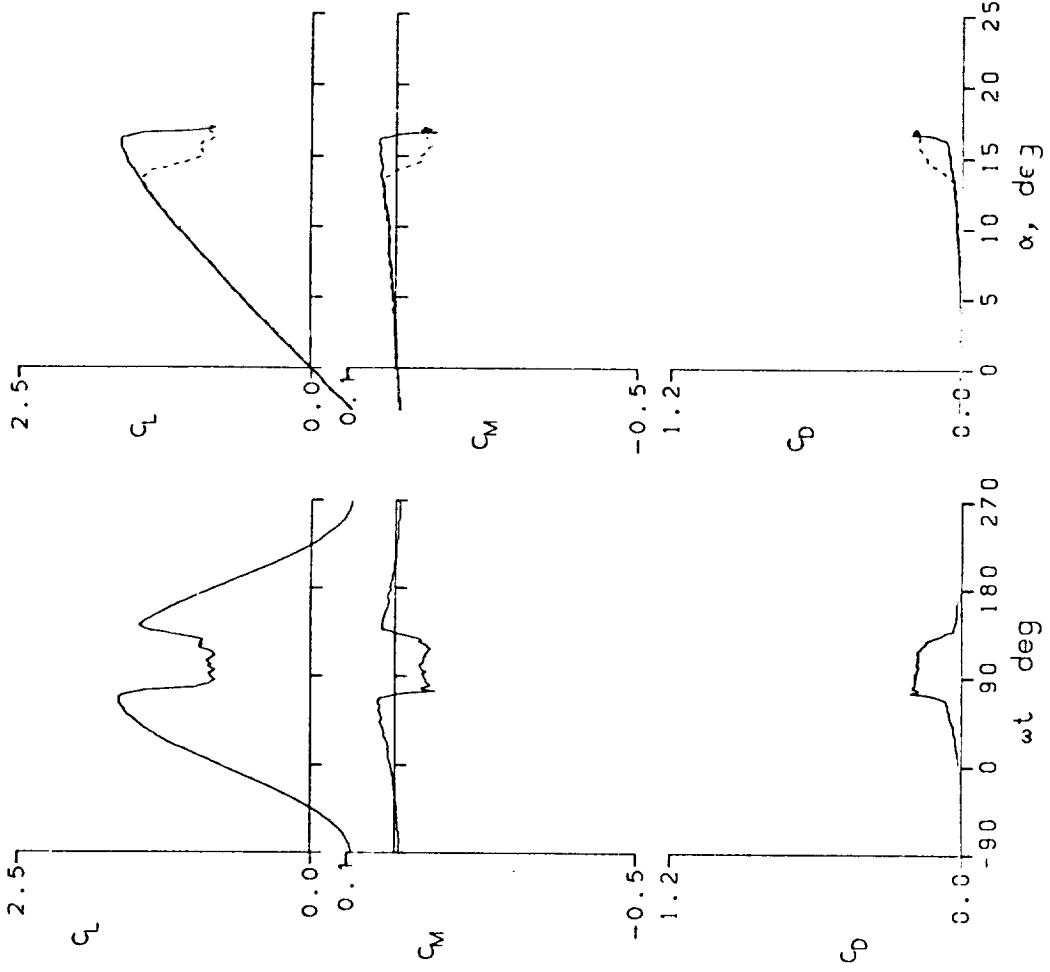


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 13321	A0 = 6.85 °	k = 0.001	TRIP
Re = 3.74 E6	A1 = 9.97 °	M = 0.294	
$C_{Lmax} = 1.37$	$C_{Mmin} = -0.14$	$C_{Dmax} = 0.31$	
$C_{Lmax} = 13.1 °$	$\xi = -0.081$	$M_{max} = 1.217$	
$\alpha_{C_{Lmin}} = 6.4 °$	$-C_{Dmax} = 9.5$	$\alpha_{Mmax} = 13.1 °$	

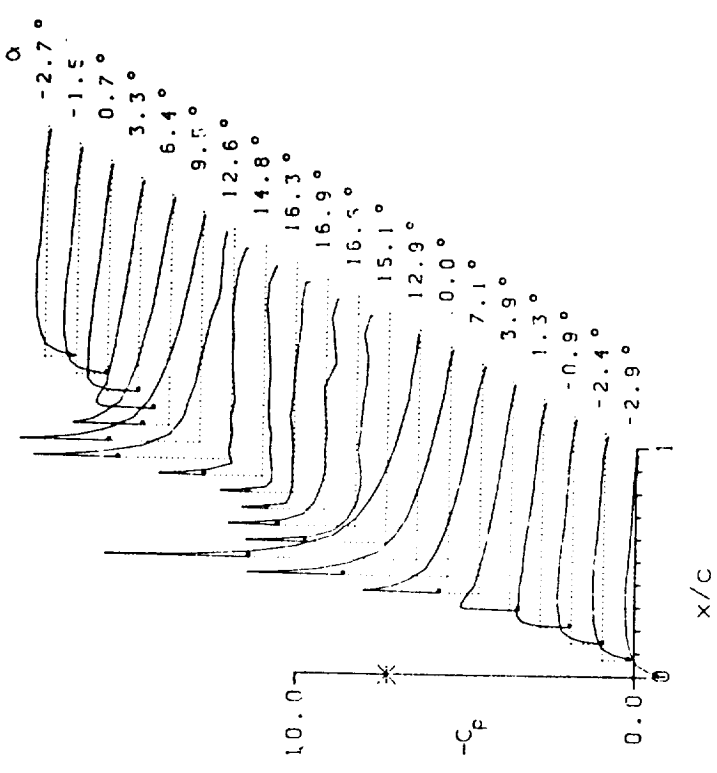
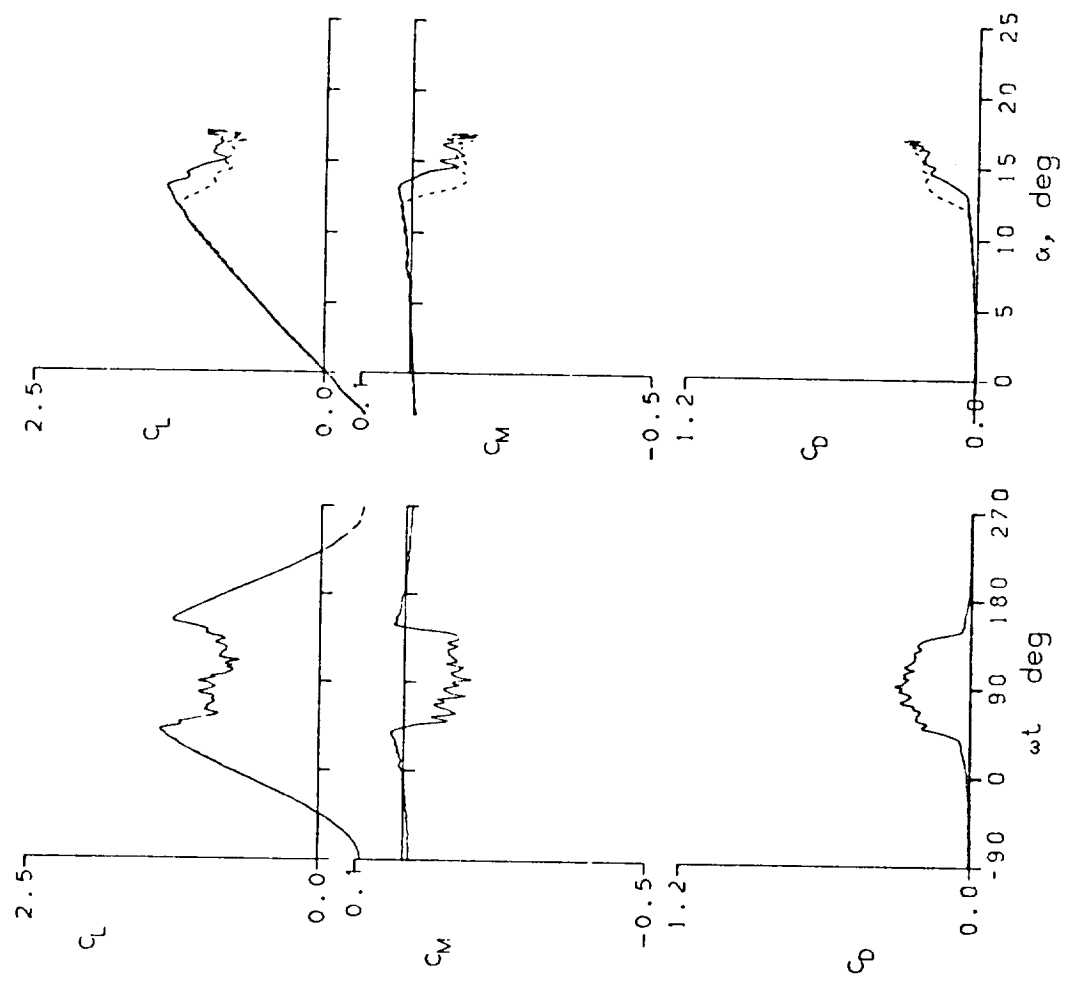


Figure 12.- Continued.

NACA 0012 AIRFOIL TRIP

FRAME : 14021 A0 = 14.83° k = 0.100

Re = 2.43 E6 A1 = 9.90° M = 0.182

$C_{Lmax} = 2.09$ $C_{Mmin} = -0.42$ $C_{Dmax} = 0.87$

$\alpha_{Lmax} = 21.8^\circ$ $\xi = 0.257$ $M_{max} = 0.710$

$\alpha_{Cmin} = 14.4^\circ$ $-C_{pmax} = 11.5$ $\alpha_{Mmax} = 18.6^\circ$

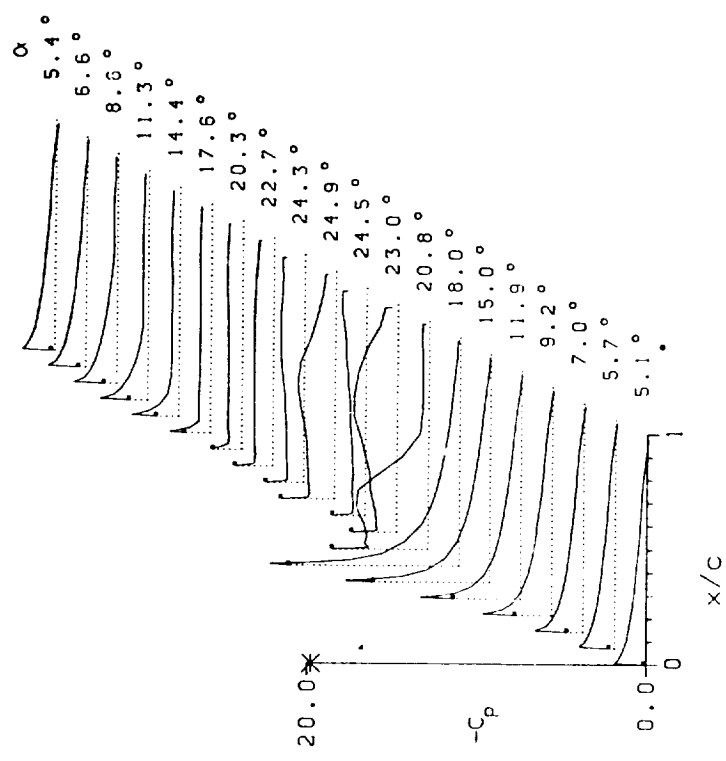
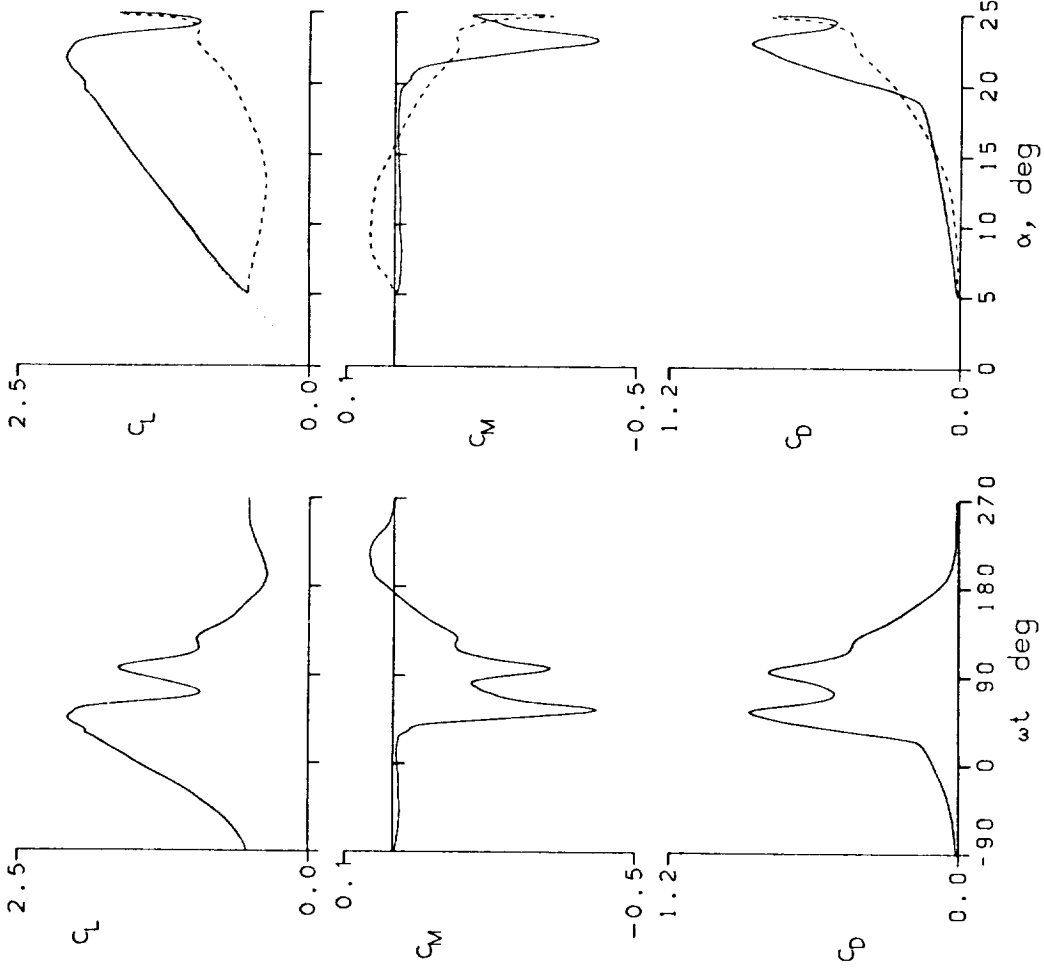


Figure 12.- Continued.

NACA 0012 AIRFOIL TRIP

FRAME : 14023 A0 = 14.83° k = 0.150

Re = 2.43 E6 A1 = 9.89° M = 0.182

$C_{Lmax} = 2.17$ $C_{Mmin} = -0.46$ $C_{Dmax} = 1.00$

$\alpha_{Lmax} = 23.6^\circ$ $\xi = 0.011$ $M_{max} = 0.723$

$\alpha_{C_{min}} = 14.4^\circ$ $-C_{Pmax} = 12.0$ $\alpha_{Mmax} = 19.5^\circ$

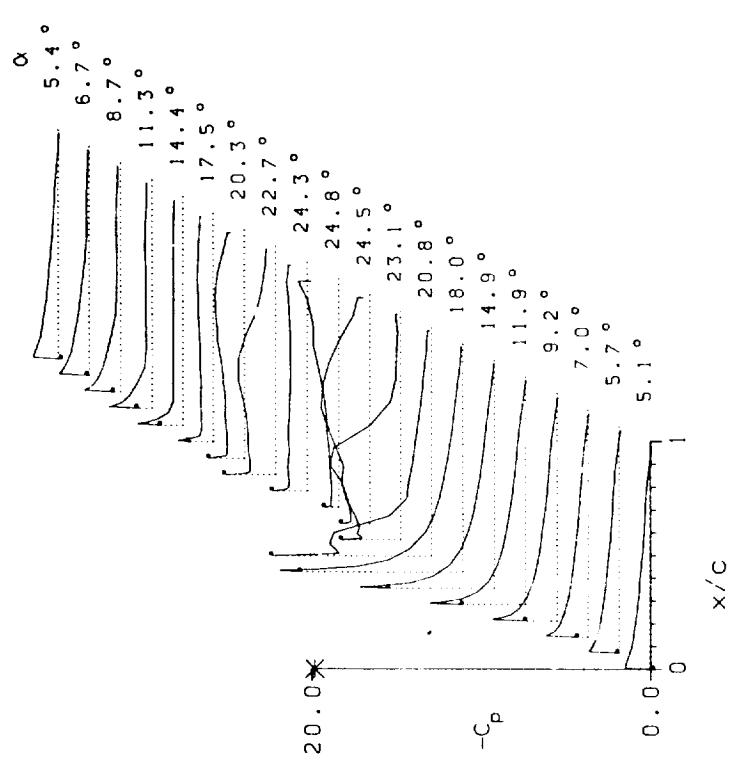
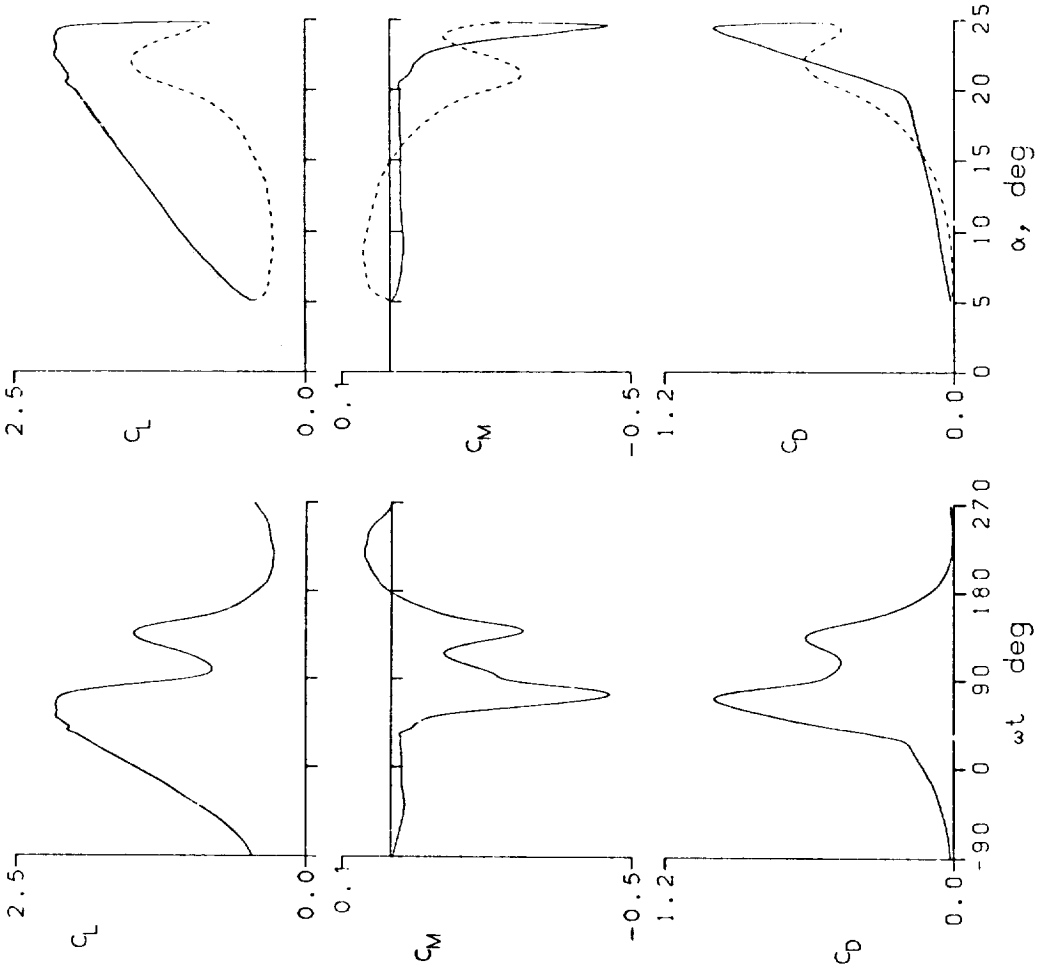


Figure 12.- Continued.

NACA 0012 AIRFOIL TRIP
 FRAME : 14104 A0 = 14.83° k = 0.050
 Re = 2.45 E6 A1 = 9.90° M = 0.183
 C_{Lmax} = 1.91 C_{Mmin} = -0.35 C_{Dmax} = 0.67
 α_{Lmax} = 19.8° ζ = 0.251 M_{max} = 0.692
 α_{Cmin} = 14.4° $-C_{pmax}$ = 10.9 α_{Mmax} = 17.8°

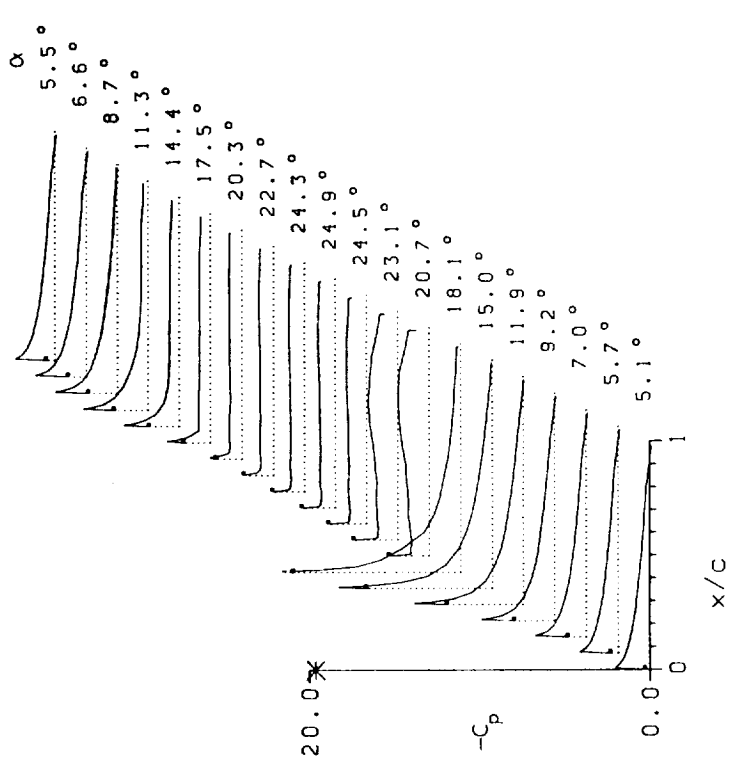
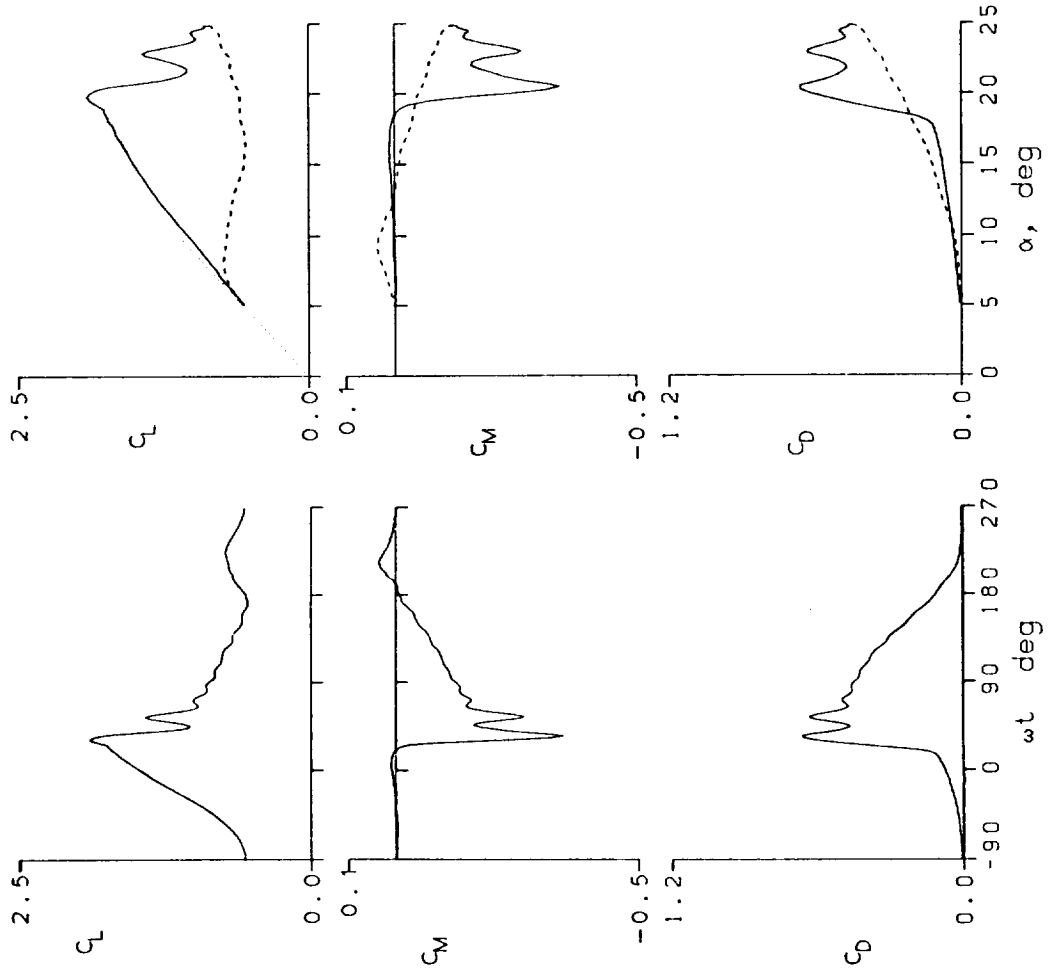


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 14108	A0 = 14.82 °	k = 0.149	TRIP
Re = 2.44 E6	A1 = 9.89 °	M = 0.183	
CLmax = 2.16	CMmin = -0.45	CDmax = 0.99	
α Lmax = 22.5 °	ξ = 0.029	Mmax = 0.727	
α Cmin = 14.4 °	-CPmax = 11.9	α Mmax = 19.5 °	

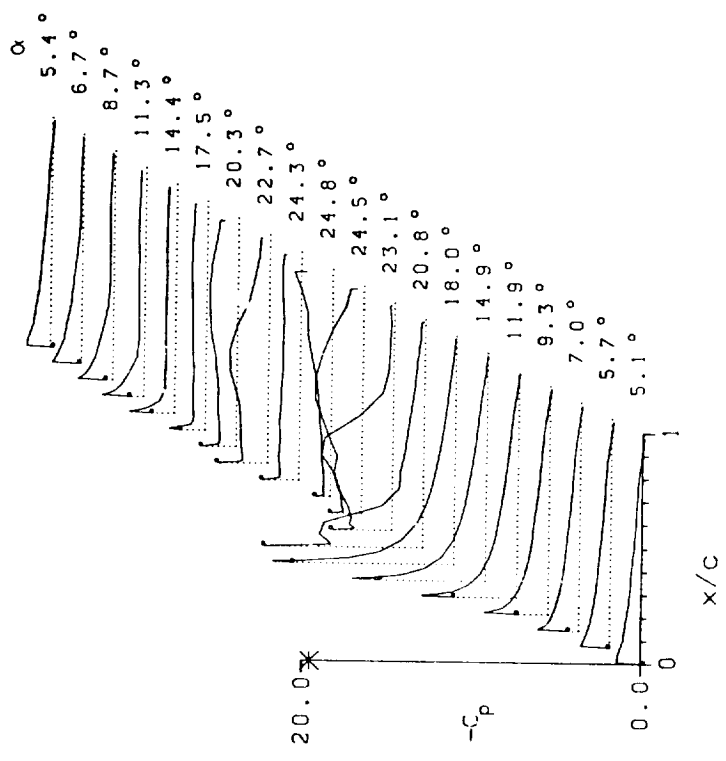
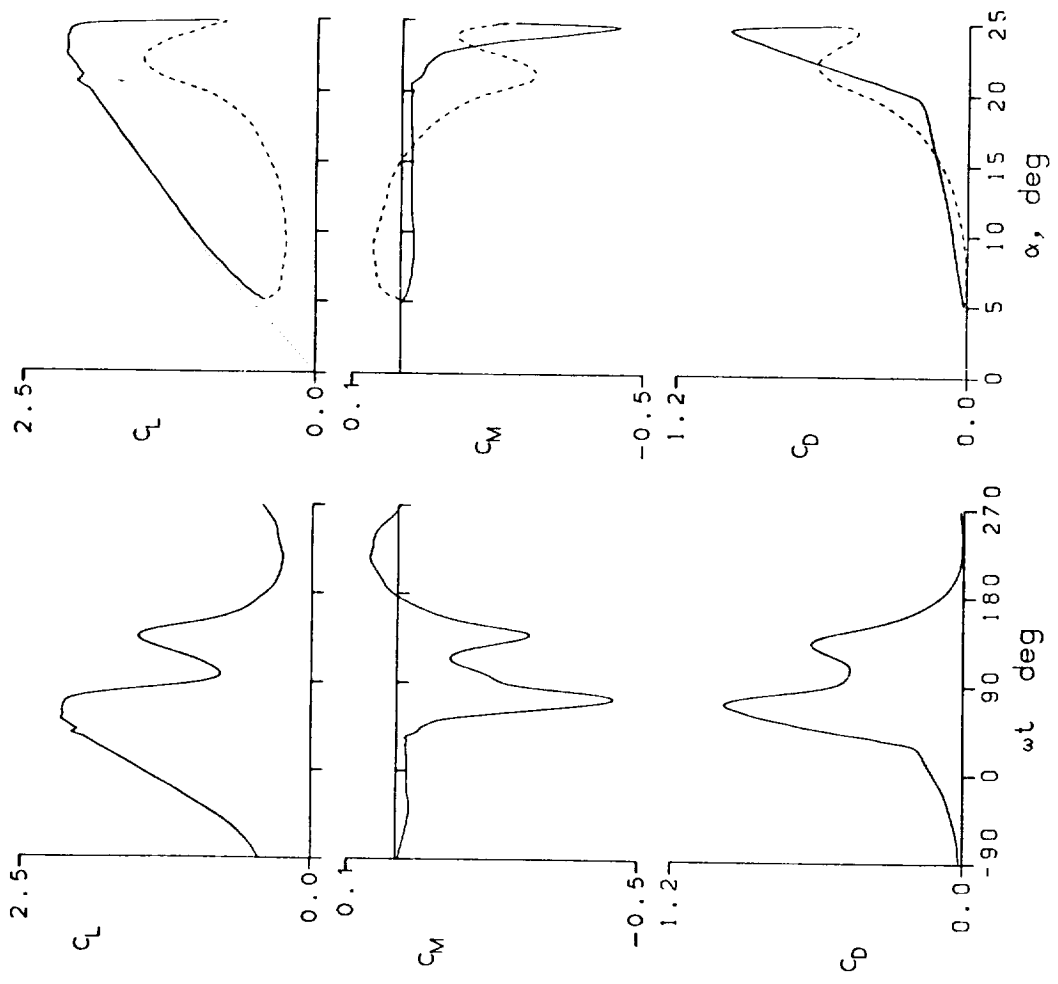


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 14117 A0 = 14.85 ° k = 0.026

Re = 3.84 E6 A1 = 9.90 ° M = 0.293

CLmax = 1.56 CMmin = -0.23 CDmax = 0.46

α Lmax = 15.0 ° ξ = 0.088 Mmax = 1.325

α Cmin = 14.4 ° -CPmax = 10.5 α Mmax = 14.4 °

TRIP

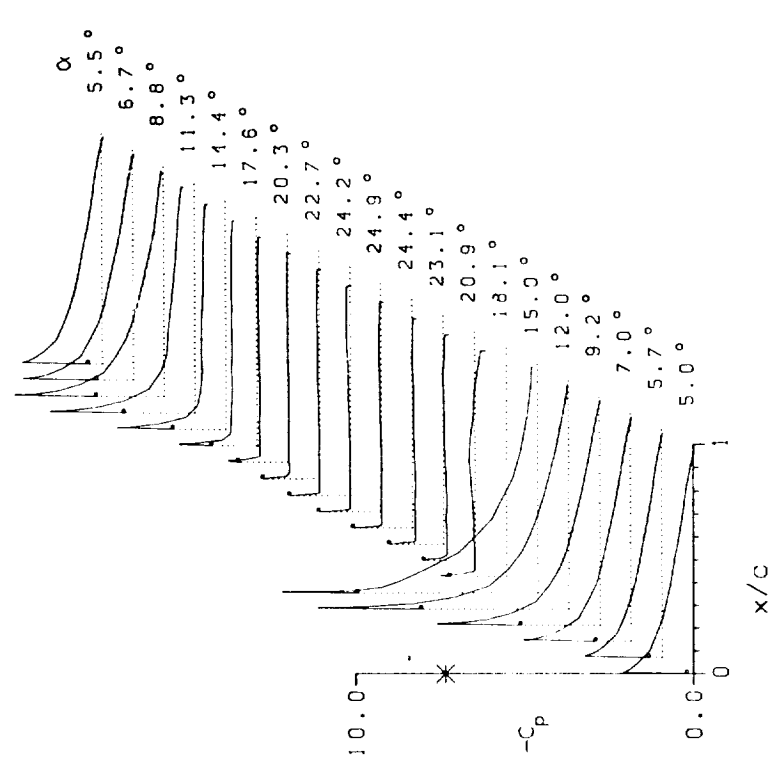
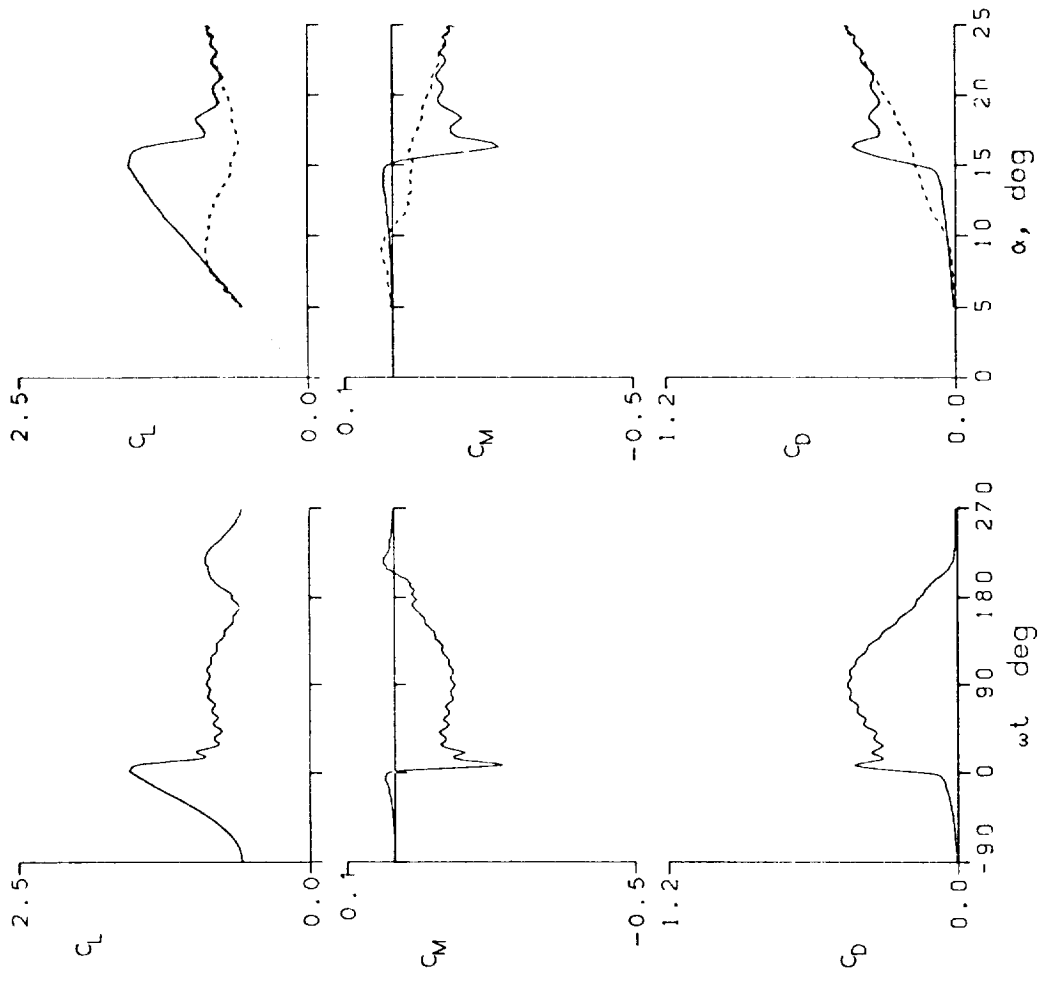


Figure 12.- Continued.

NACA 0012 AIRFOIL TRIP

FRAME : 14119 A0 = 14.82 ° k = 0.051

Re = 3.82 E6 A1 = 9.90 ° M = 0.293

C_{Lmax} = 1.71 C_{Mmin} = -0.31 C_{Dmax} = 0.56

α_{Lmax} = 17.5 ° ξ = 0.341 Mmax = 1.336

α_{Cmin} = 14.4 ° $-C_{Pmax}$ = 10.6 α_{Mmax} = 15.0 °

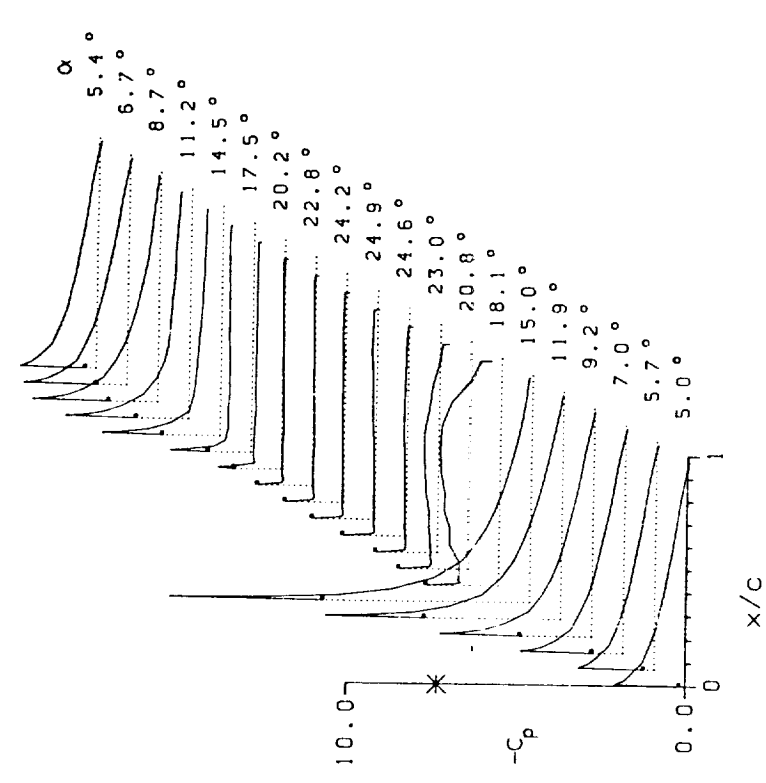
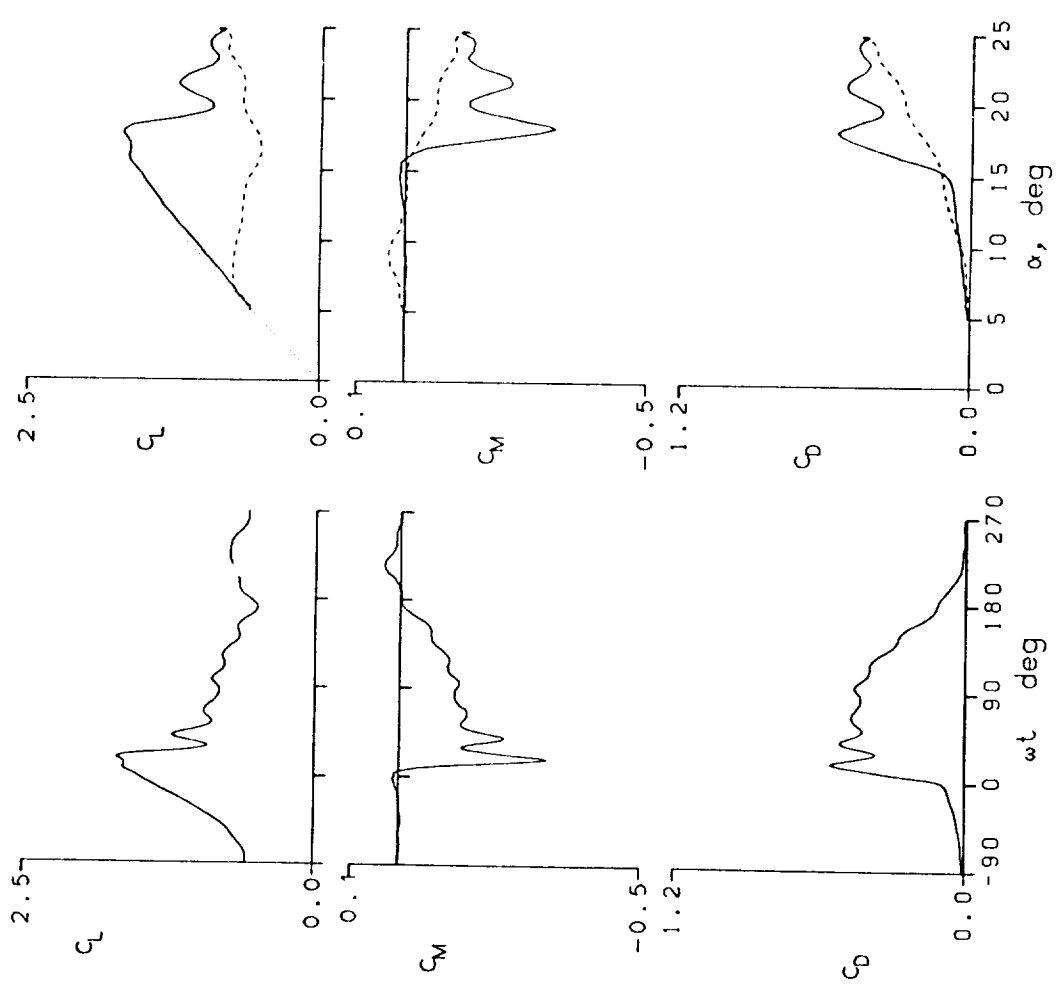


Figure 12.- Continued.

NACA 0012 AIRFOIL TRIP

FRAME : 14200 A0 = 14.83° k = 0.025

Re = 3.82 E6 A1 = 9.88° M = 0.294

C_{Lmax} = 1.54 C_{Mmin} = -0.24 C_{Dmax} = 0.46

α_{Lmax} = 14.7° ζ = 0.055 M_{max} = 1.335

α_{Cmin} = 14.4° $-C_{Dmax}$ = 10.5 α_{Mmax} = 14.4°

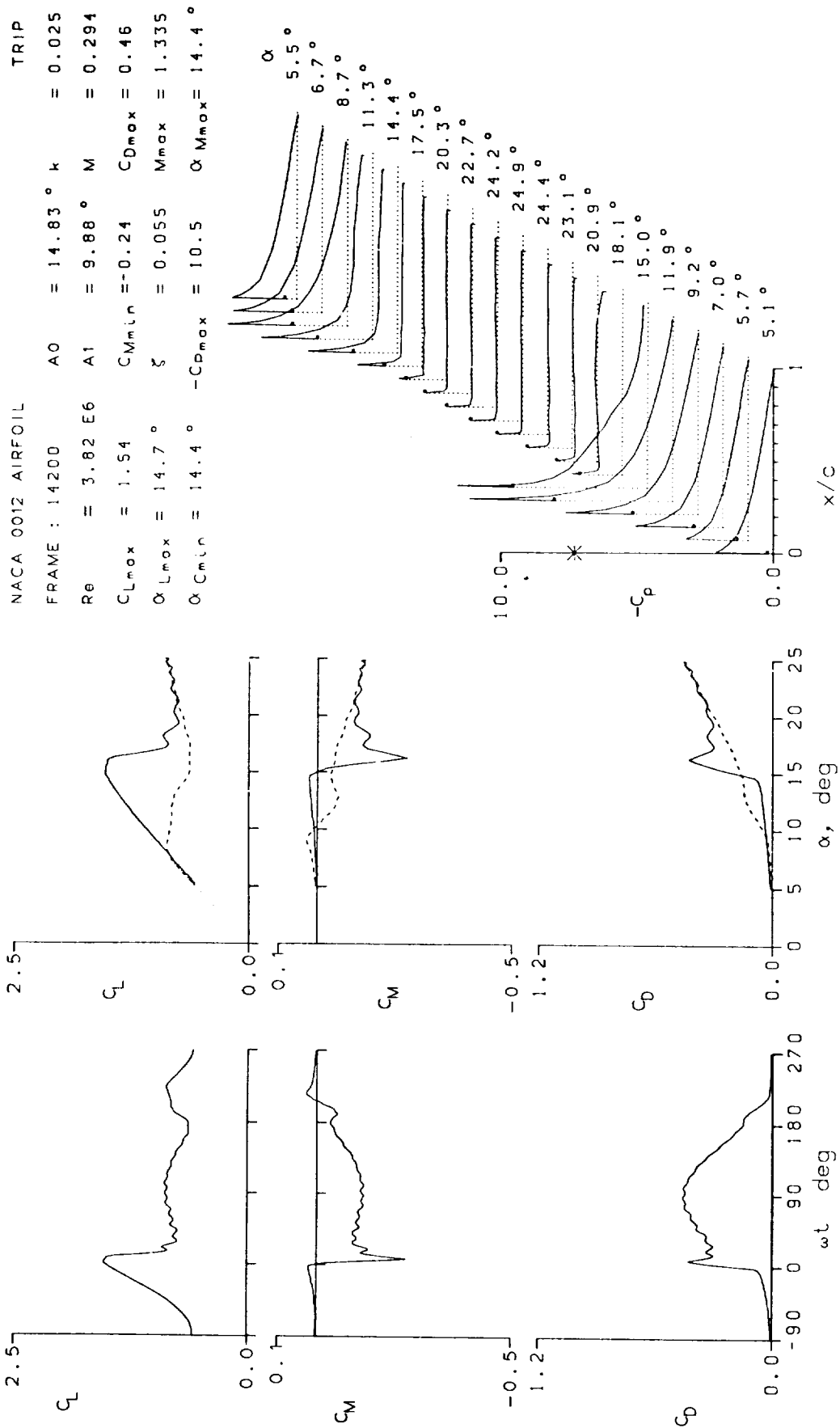


Figure 12.- Continued.

NACA 0012 AIRFOIL TRIP

FRAME : 14208 A0 = 14.84 ° k = 0.102

Re = 3.76 E6 A1 = 9.89 ° M = 0.291

$C_{Lmax} = 1.96$ $C_{Mmin} = -0.42$ $C_{Dmax} = 0.77$

$\alpha_{Lmax} = 20.5 °$ $\xi = 0.567$ $N_{max} = 1.366$

$\alpha_{Cmin} = 14.4 °$ $-C_{Pmax} = 11.0$ $\alpha_{Mmax} = 16.0 °$

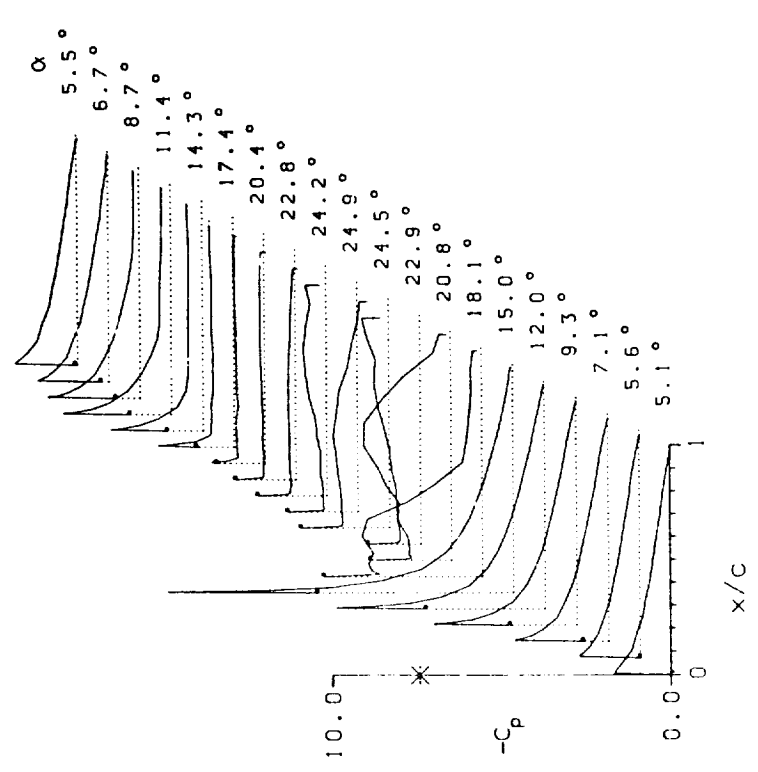
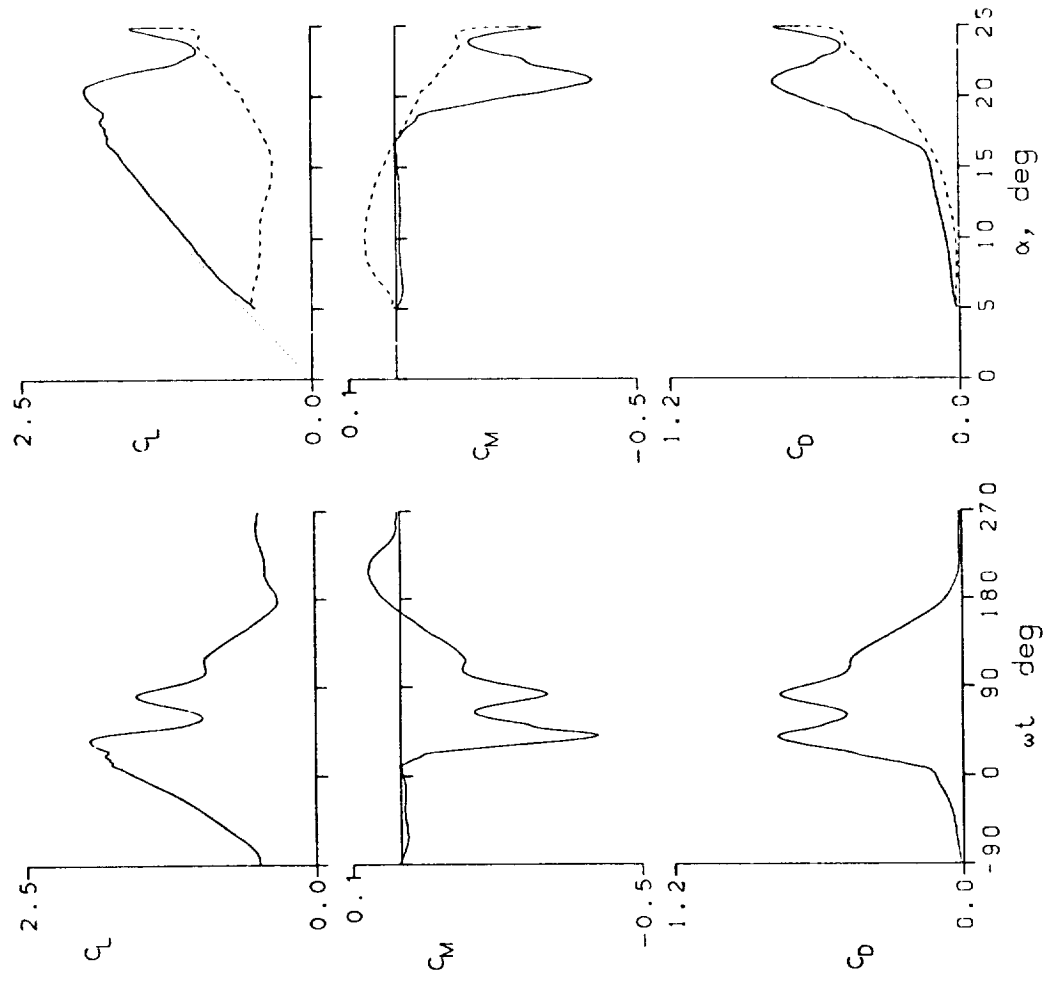


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 14218 A0 = 14.84° k = 0.025
 Re = 3.76 E6 A1 = 9.92° M = 0.292
 CLmax = 1.69 CMmin = -0.16 CDmax = 0.45
 αLmax = 16.0° ζ = 0.108 Mmax = 1.208
 αCmin = 14.4° -Cpmpx = 9.5 αMmax = 14.4°

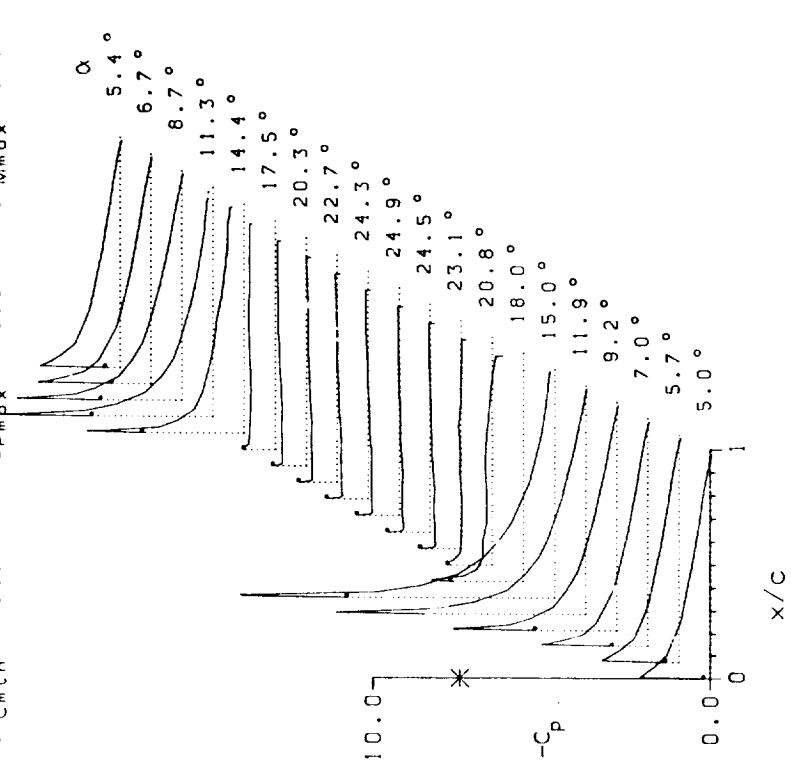
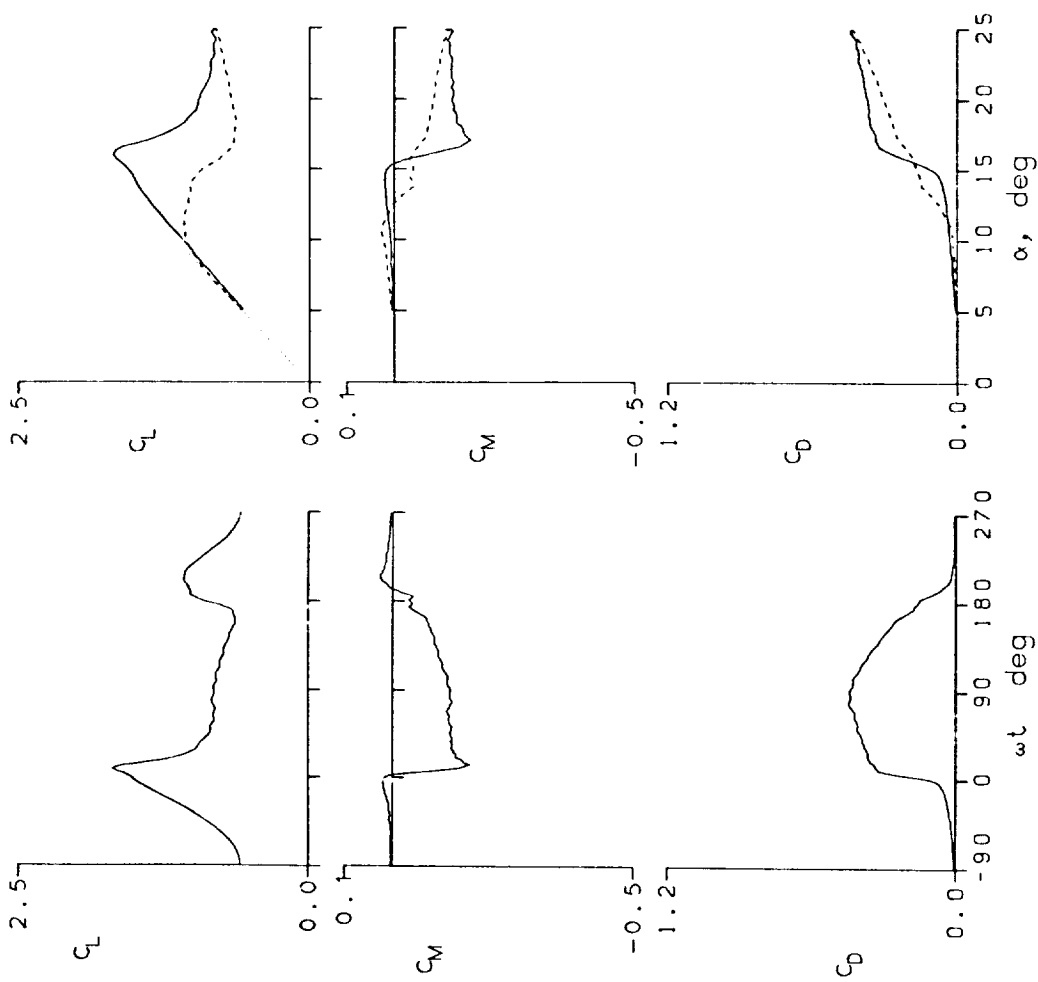


Figure 12.- Continued.

NACA 0012 AIRFOIL
 FRAME : 14219 A0 = 14.82° k = 0.051
 Re = 3.74 E6 A1 = 9.90° M = 0.291
 CLmax = 1.82 CMmin = -0.22 CDmax = 0.49
 αLmax = 17.5° ζ = 0.304 Mmax = 1.213
 αCmin = 14.4° -CPmax = 9.7 αMmax = 14.7°

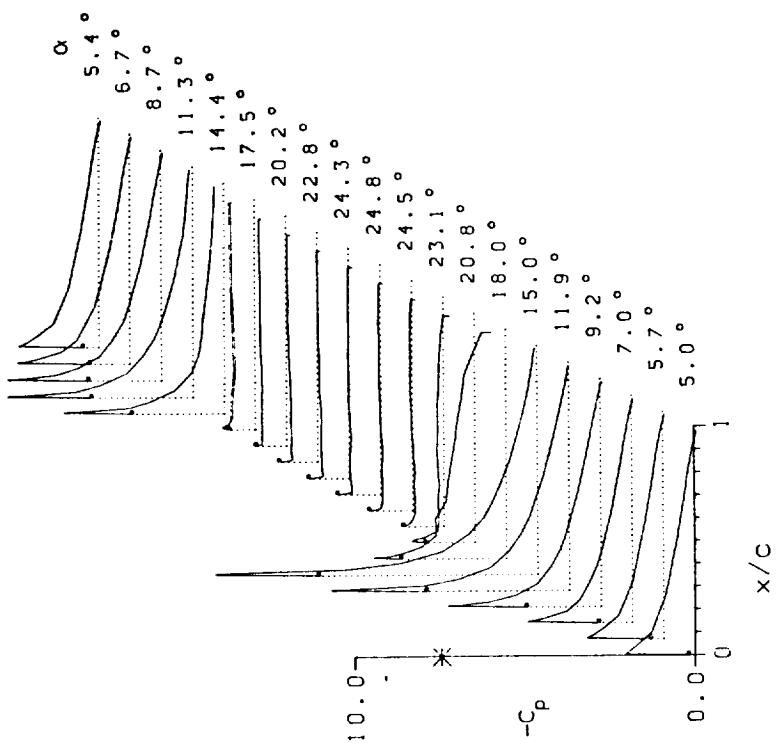
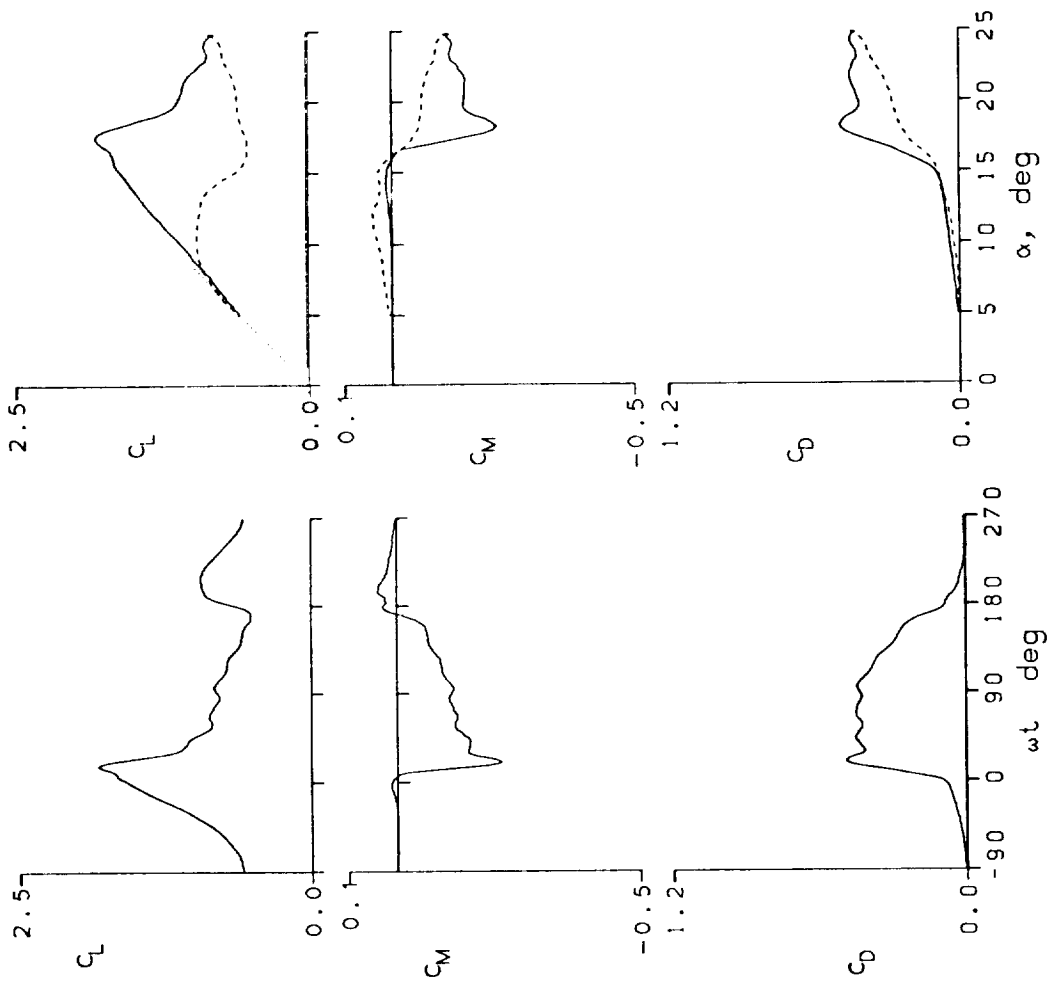


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 14220 A0 = 14.83° k = 0.103

Re = 3.68 E6 A1 = 9.90° M = 0.287

C_{Lmax} = 2.07 C_{Mmin} = -0.39 C_{Dmax} = 0.78

α_{Lmax} = 20.5° ζ = 0.572 M_{max} = 1.219

α_{Cmin} = 14.4° $-C_{pmax}$ = 10.0 α_{Mmax} = 15.6°

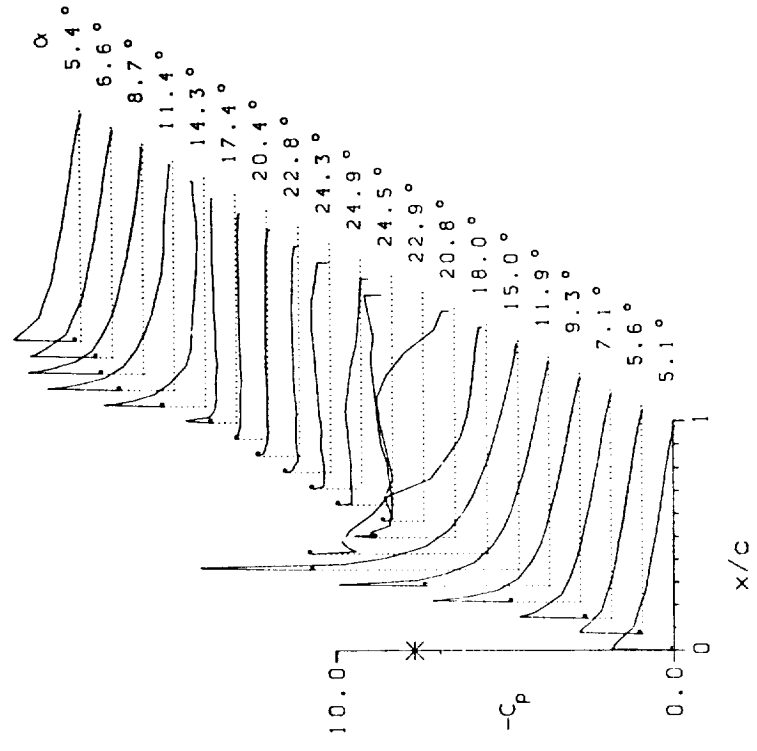
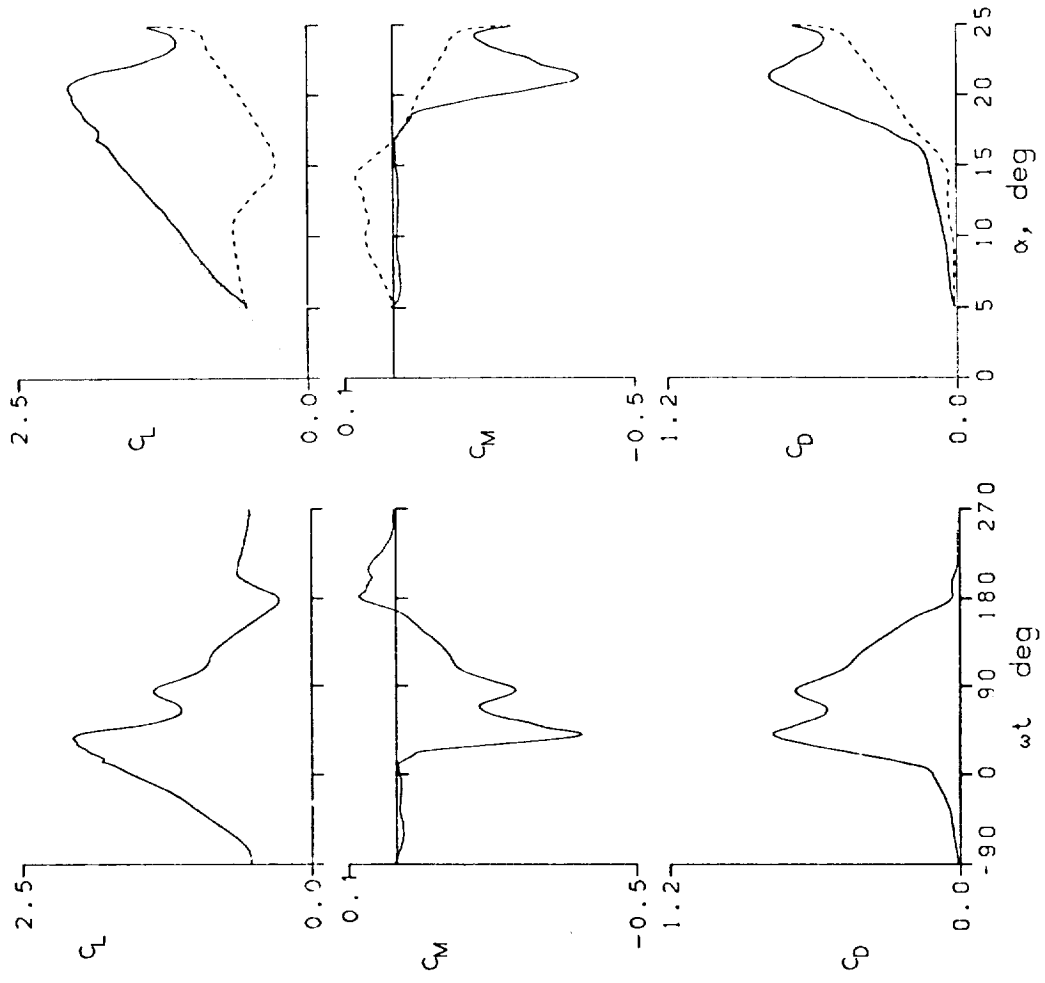


Figure 12.- Continued.

NACA 0012 AIRFOIL

FRAME : 15218 A0 = 14.78 ° k = 0.099

Re = 3.68 E6 A1 = 9.94 ° M = 0.290

$C_{Lmax} = 0.00$ $C_{Mmin} = -0.01$ $C_{Dmax} = 0.00$

$\alpha_{Lmax} = 24.7 °$ $\xi = -0.001$ $M_{max} = 0.090$

$\alpha_{Cmin} = 14.3 °$ $-C_{Pmax} = -0.9$ $\alpha_{Mmax} = 24.4 °$

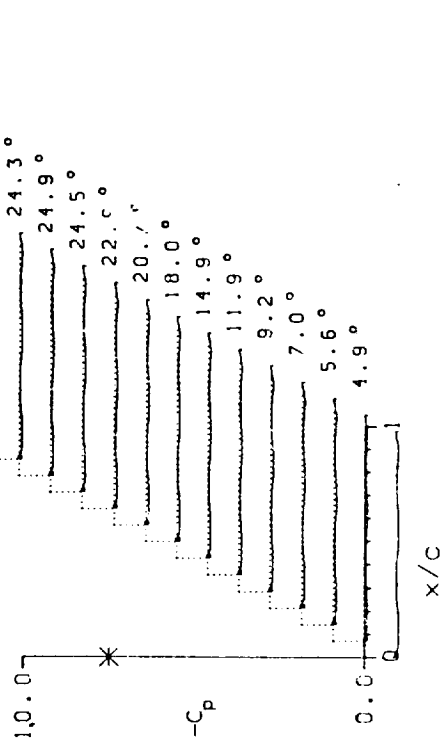
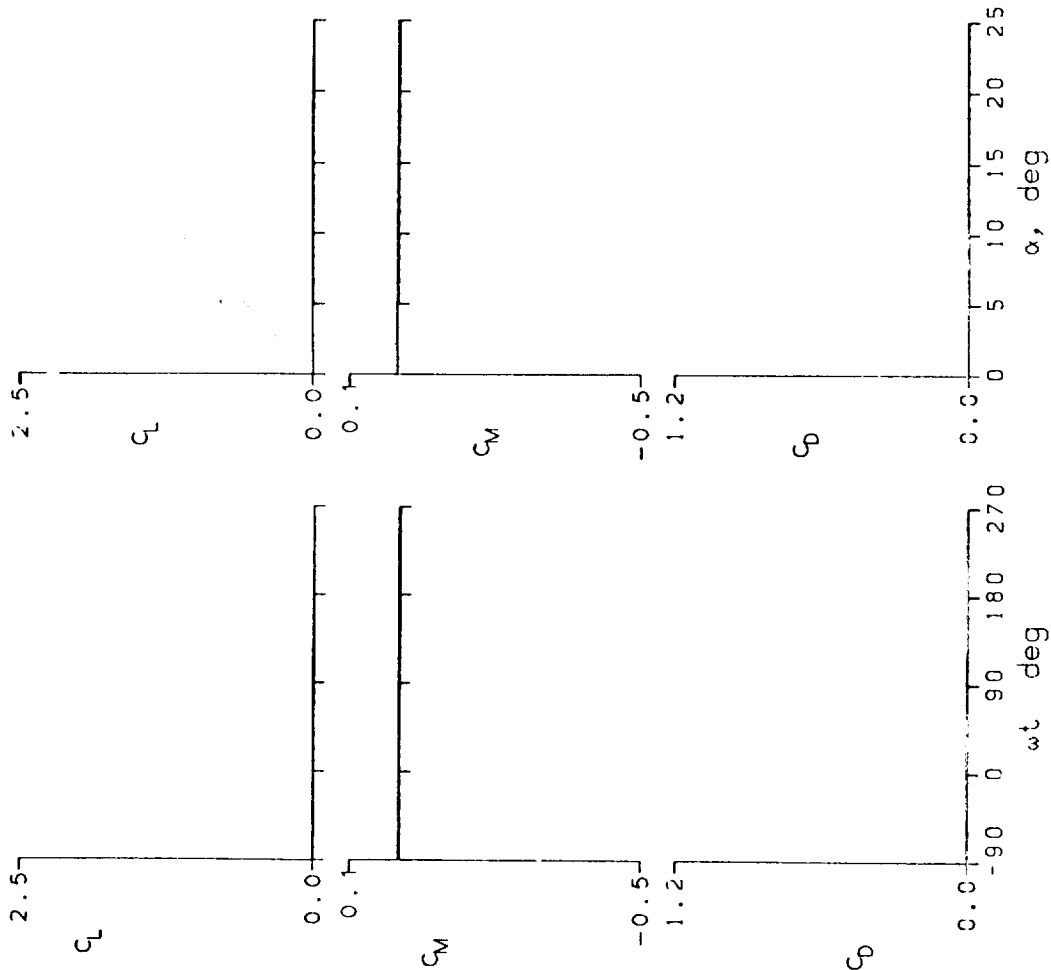


Figure 12.- Concluded.

AMES-01 AIRFOIL
 FRAME : 24022 A0 = 14.84 ° k = 0.025
 Re = 3.84 E6 A1 = 9.91 ° M = 0.296
 CLmax = 1.81 CMmin = -0.19 CDmax = 0.41
 α Lmax = 17.2 ° ζ = 0.145 Mmax = 1.262
 α Cmin = 14.4 ° -CPmax = 9.7 α Mmax = 16.2 °

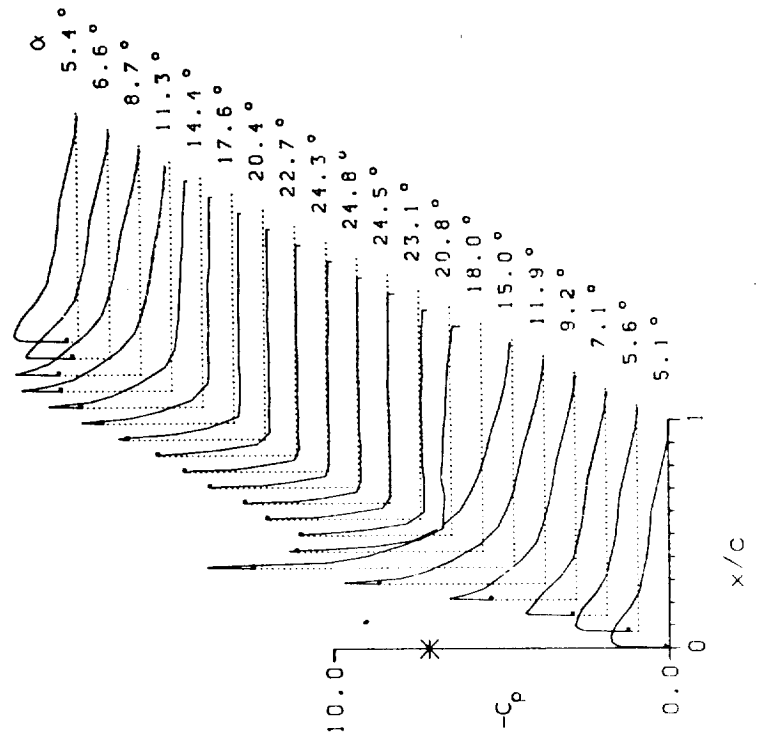
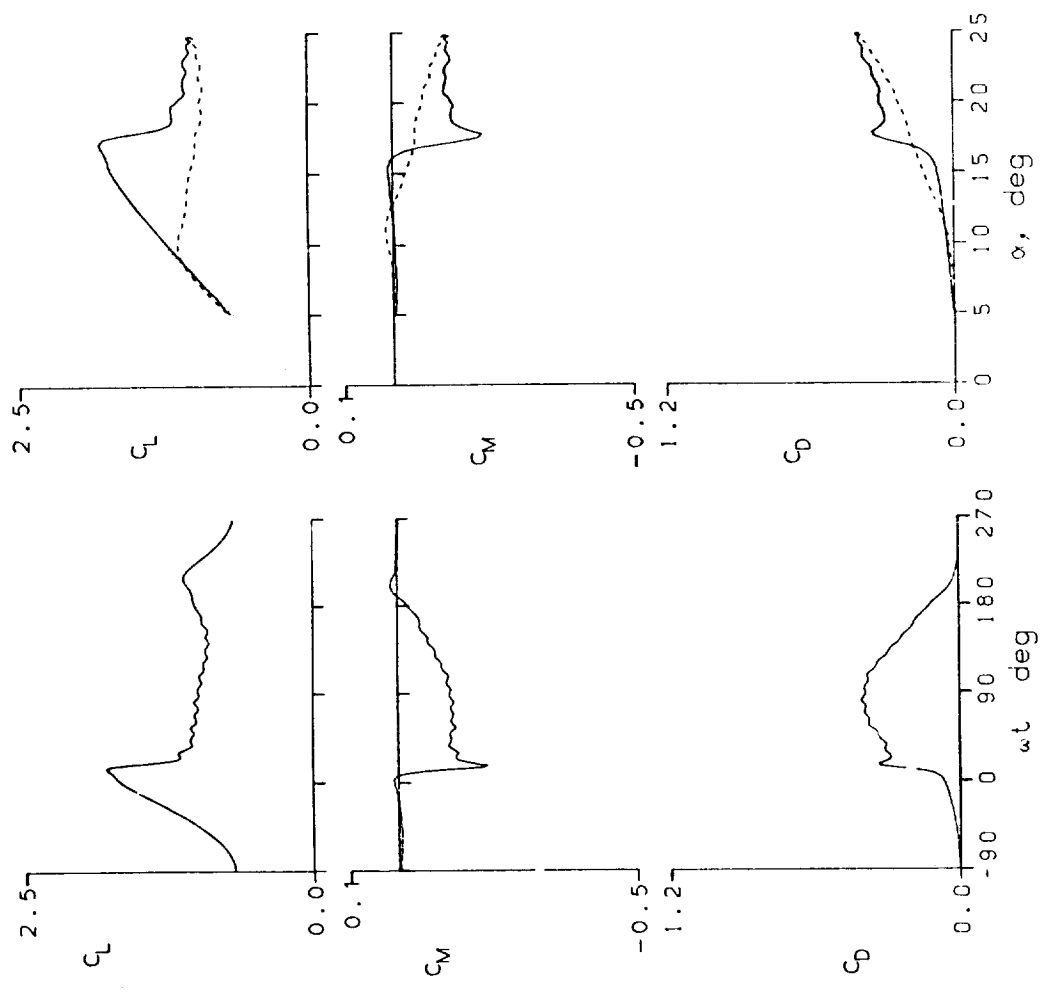


Figure 13.- Dynamic data for Ames A-01 airfoil.

AMES-01 AIRFOIL
 FRAME : 24100 A0 = 14.82° k = 0.050
 Re = 3.73 E6 A1 = 9.91° M = 0.290
 C_{Lmax} = 2.05 C_{Mmin} = -0.25 C_{Dmax} = 0.48
 α_{Lmax} = 18.9° ζ = 0.214 M_{max} = 1.277
 α_{Cmin} = 14.4° -C_{pmax} = 10.3 α_{Mmax} = 17.1°

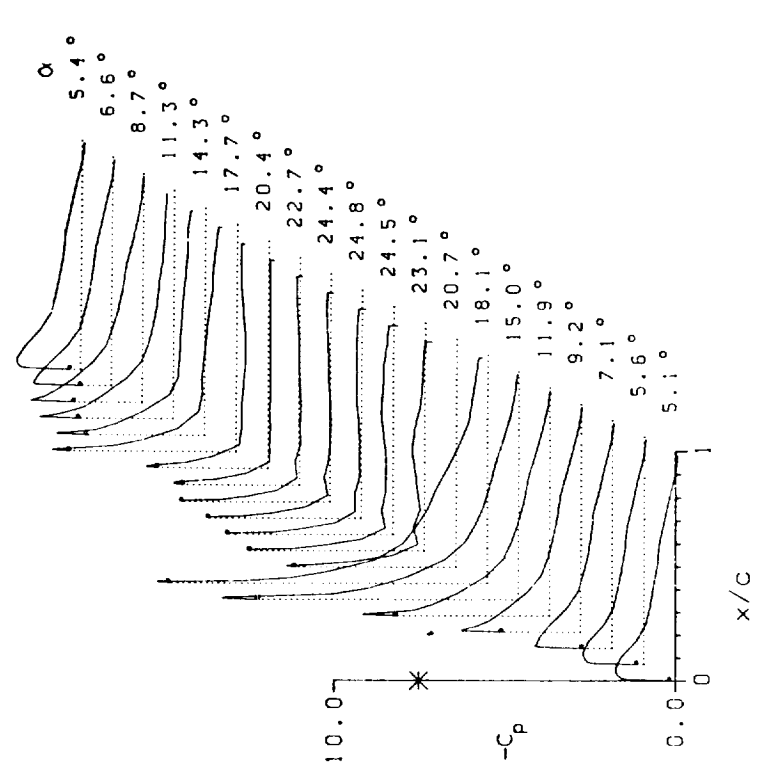
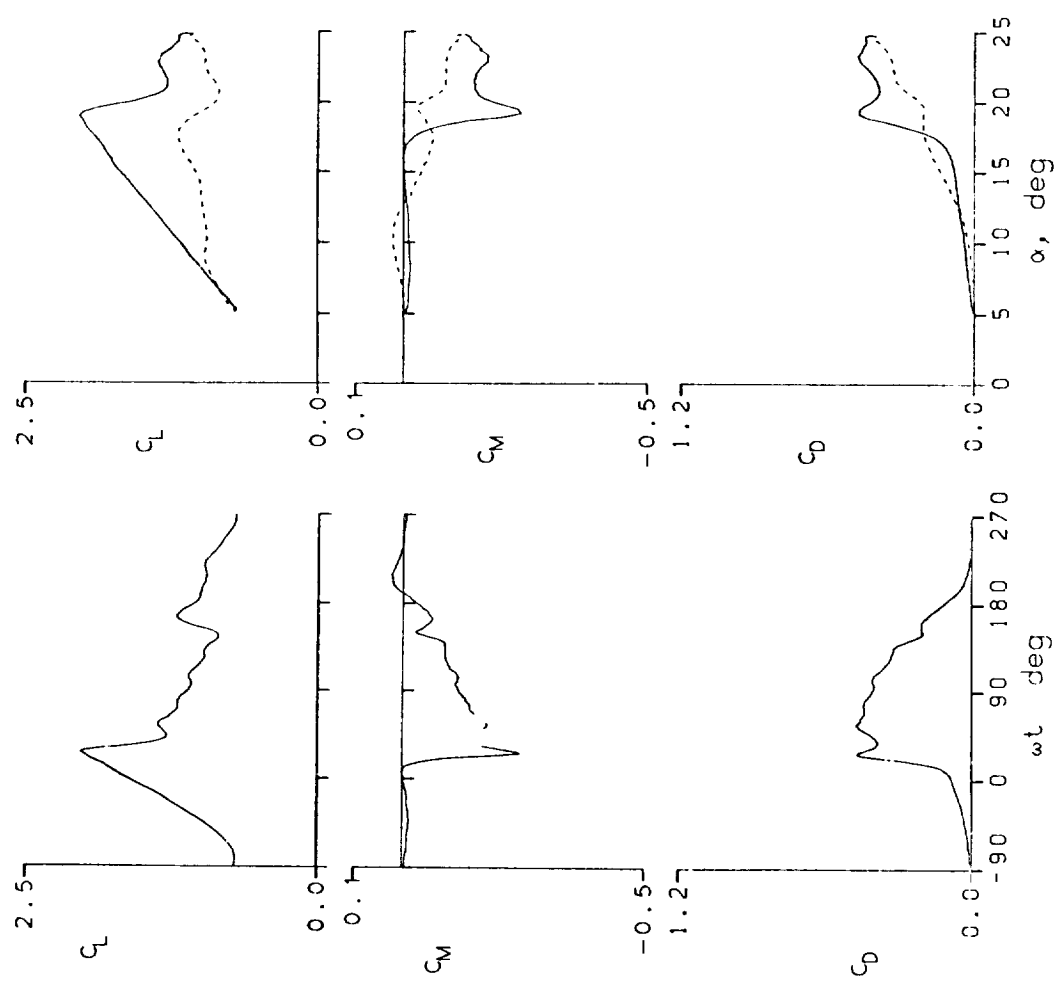


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 24105 A0 = 14.83° k = 0.100
 Re = 3.71 E6 A1 = 9.88° M = 0.289
 CLmax = 2.31 CMmin = -0.39 CDmax = 0.76
 αLmax = 21.3° ζ = 0.497 Mmax = 1.283
 αCMmin = 14.5° -CPmax = 10.4 αMmax = 17.8°

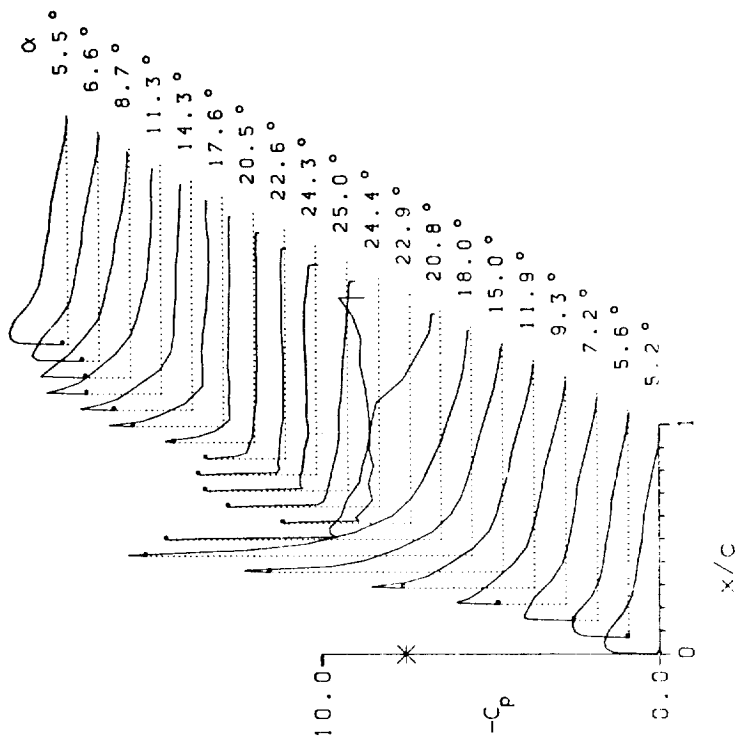
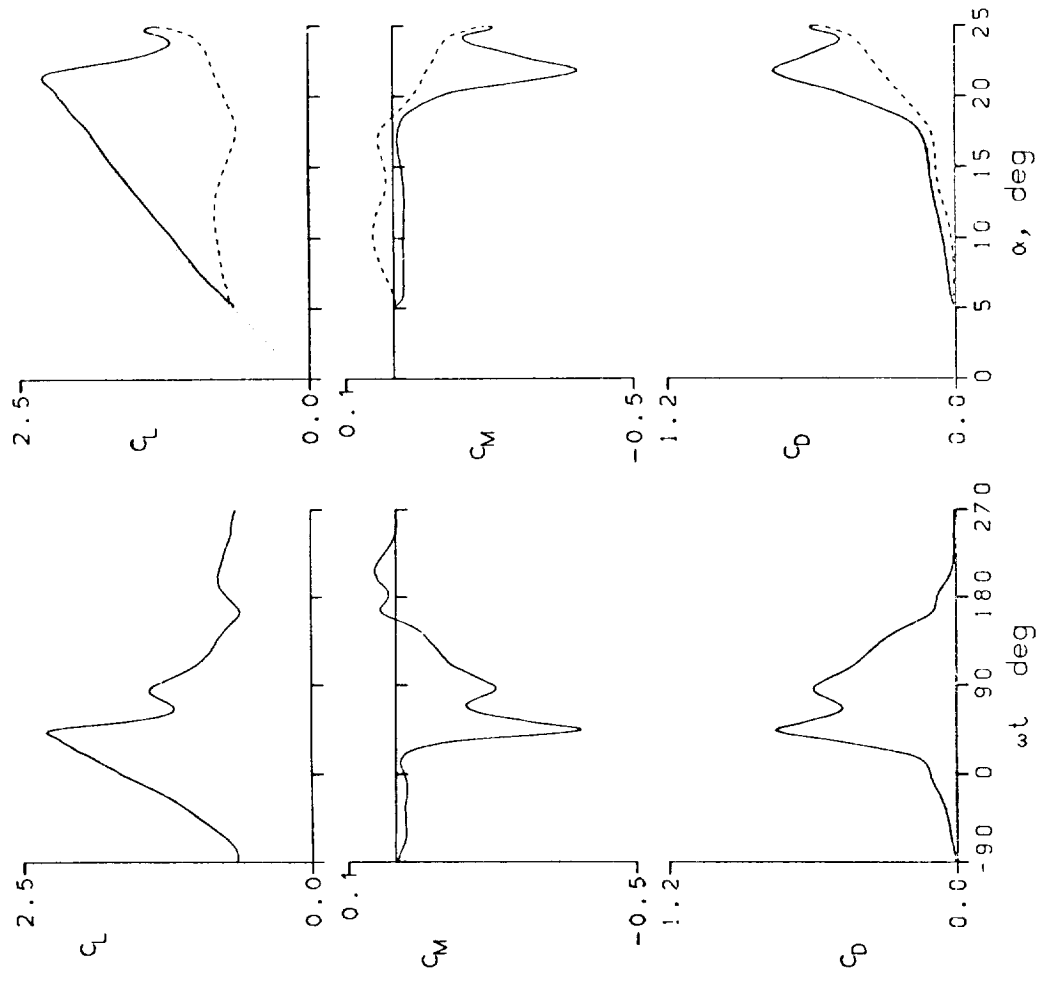


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 24109 A0 = 14.91 ° k = 0.153
 Re = 3.63 E6 A1 = 9.87 ° M = 0.283
 C_{Lmax} = 2.41 C_{Mmin} = -0.45 C_{Dmax} = 0.94
 α_{Lmax} = 23.2 ° ζ = 0.413 M_{max} = 1.272
 α_{Cmin} = 14.6 ° -C_{pmax} = 10.8 α_{Mmax} = 18.8 °

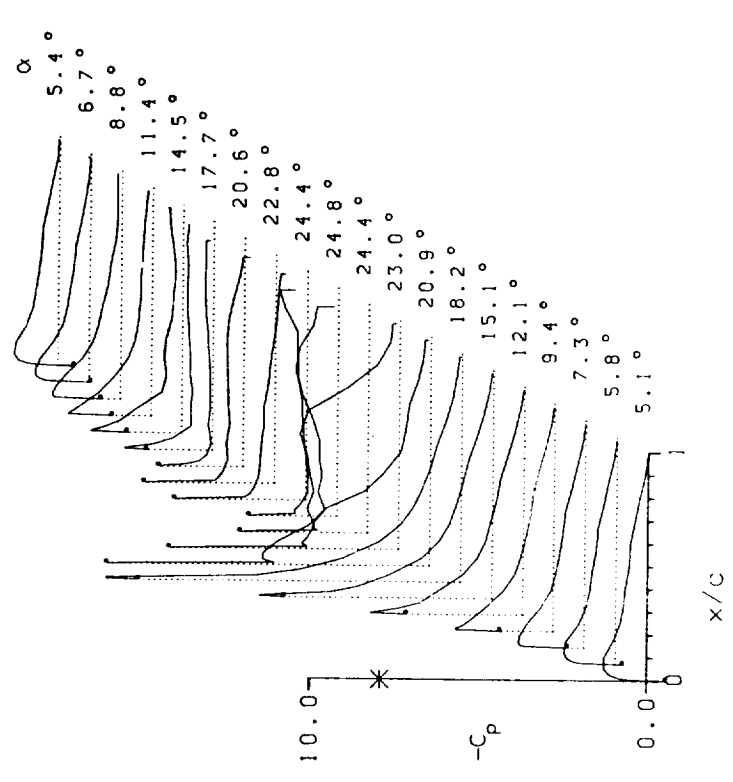
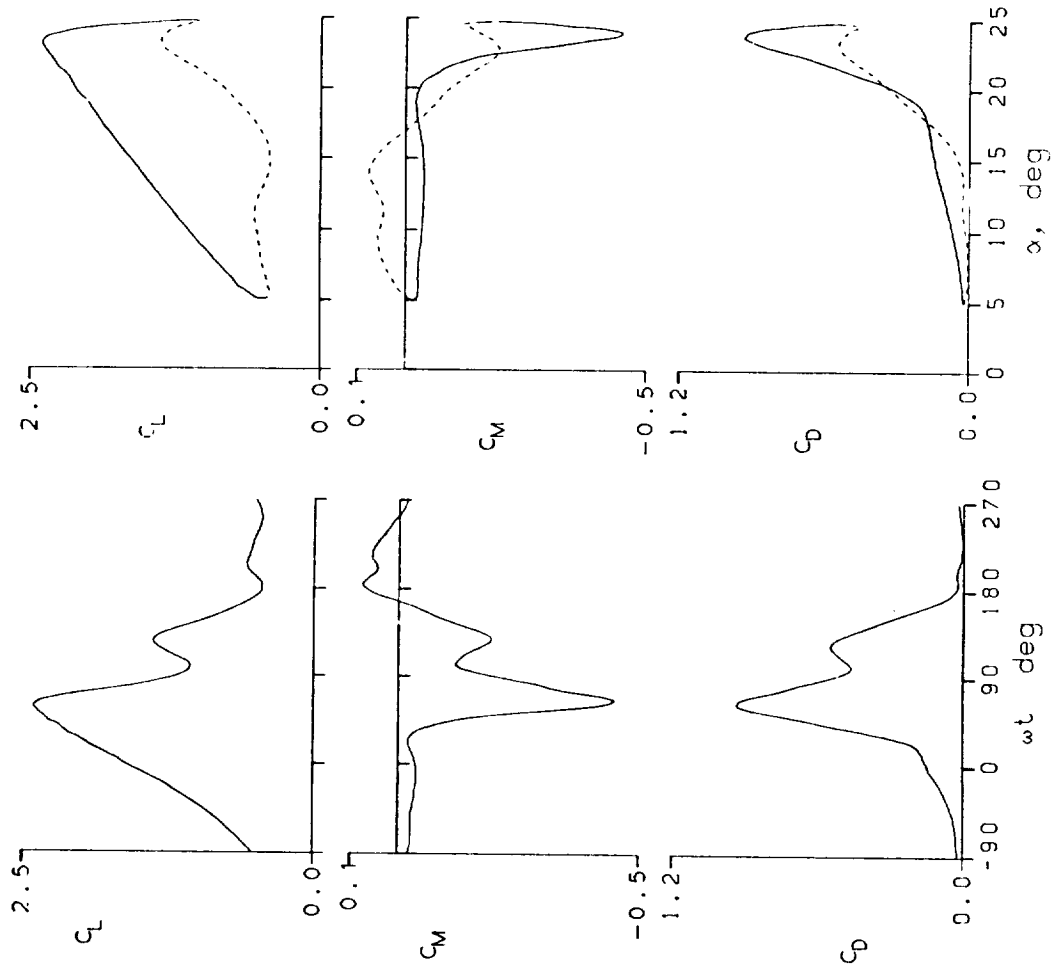


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 24117 A0 = 14.83° k = 0.098
 Re = 3.60 E6 A1 = 9.87° M = 0.280
 C_{Lmax} = 2.40 C_{Mmin} = -0.41 C_{Dmax} = 0.80
 α_{Lmax} = 21.8° ζ = 0.453 M_{max} = 1.261
 α_{Cmin} = 14.5° -C_{pmax} = 10.9 α_{Mmax} = 18.3°

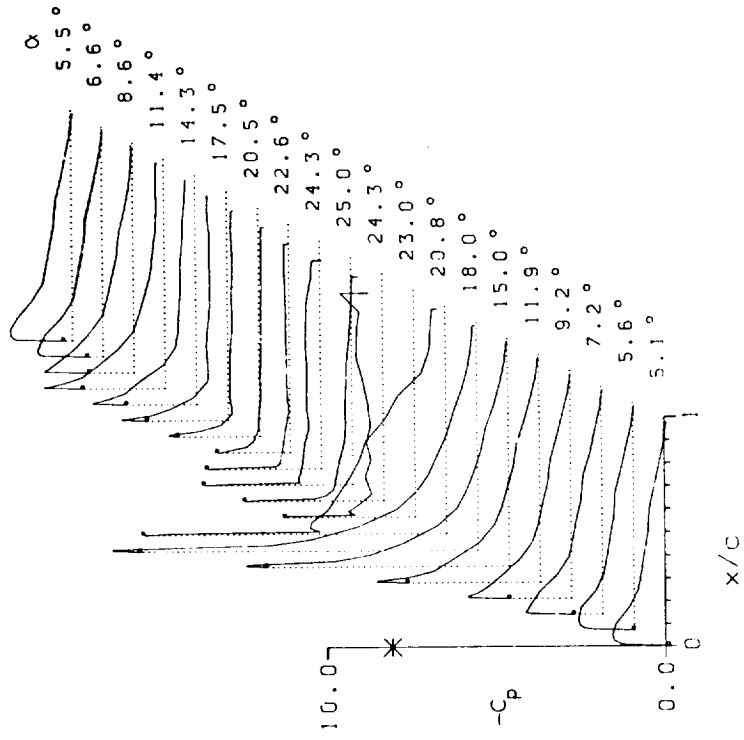
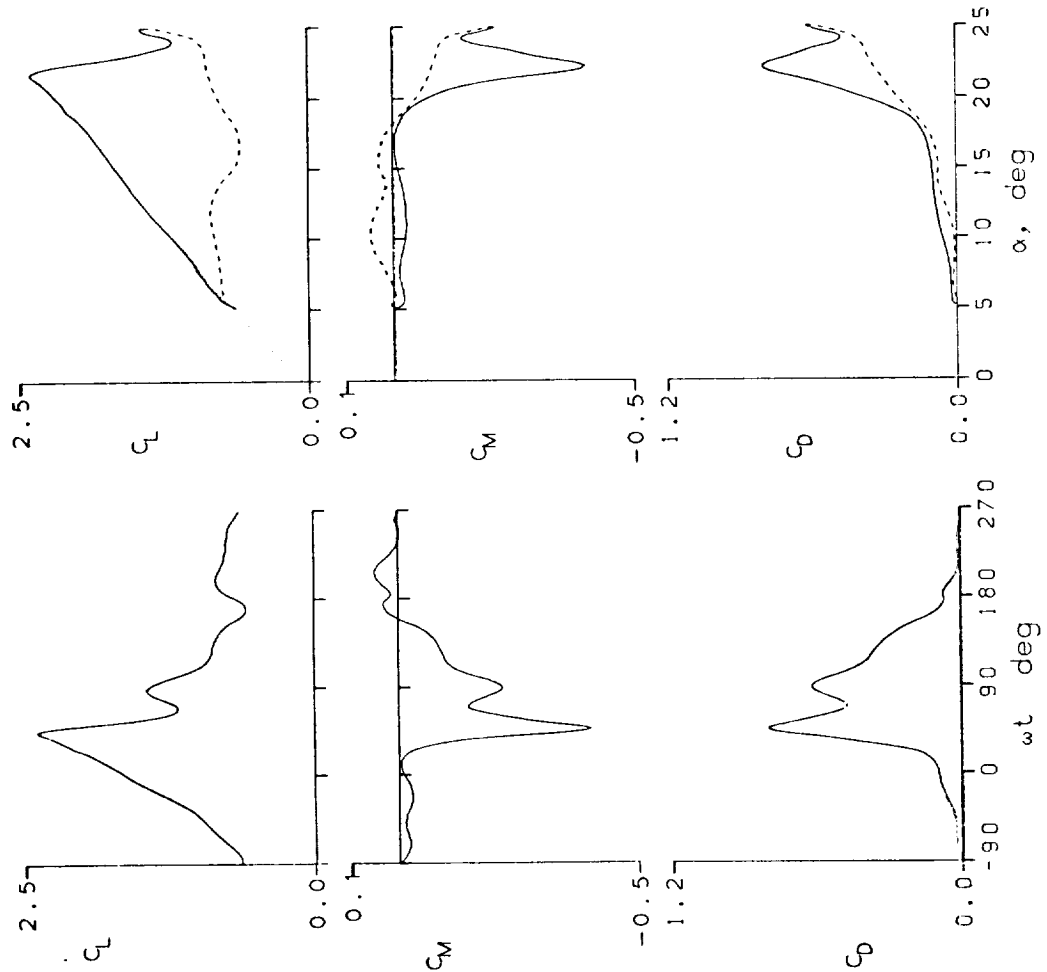


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 24201 A0 = 14.83° k = 0.099
 Re = 3.21 E6 A1 = 9.88° M = 0.248
 CLmax = 2.48 CMmin = -0.39 CDmax = 0.85
 αLmax = 22.5° ζ = 0.395 Mmax = 1.222
 αCMmin = 14.4° -CPmax = 13.5 αMmax = 20.4°

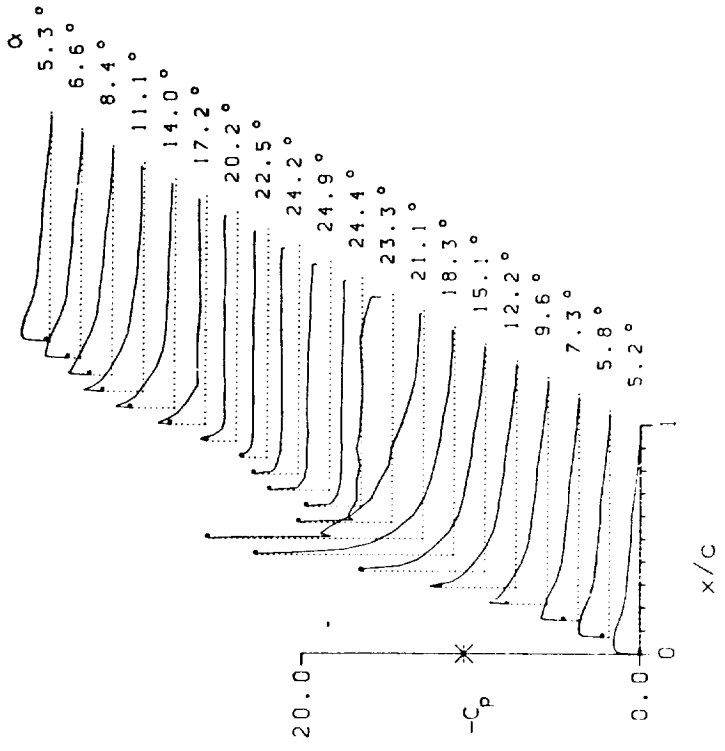
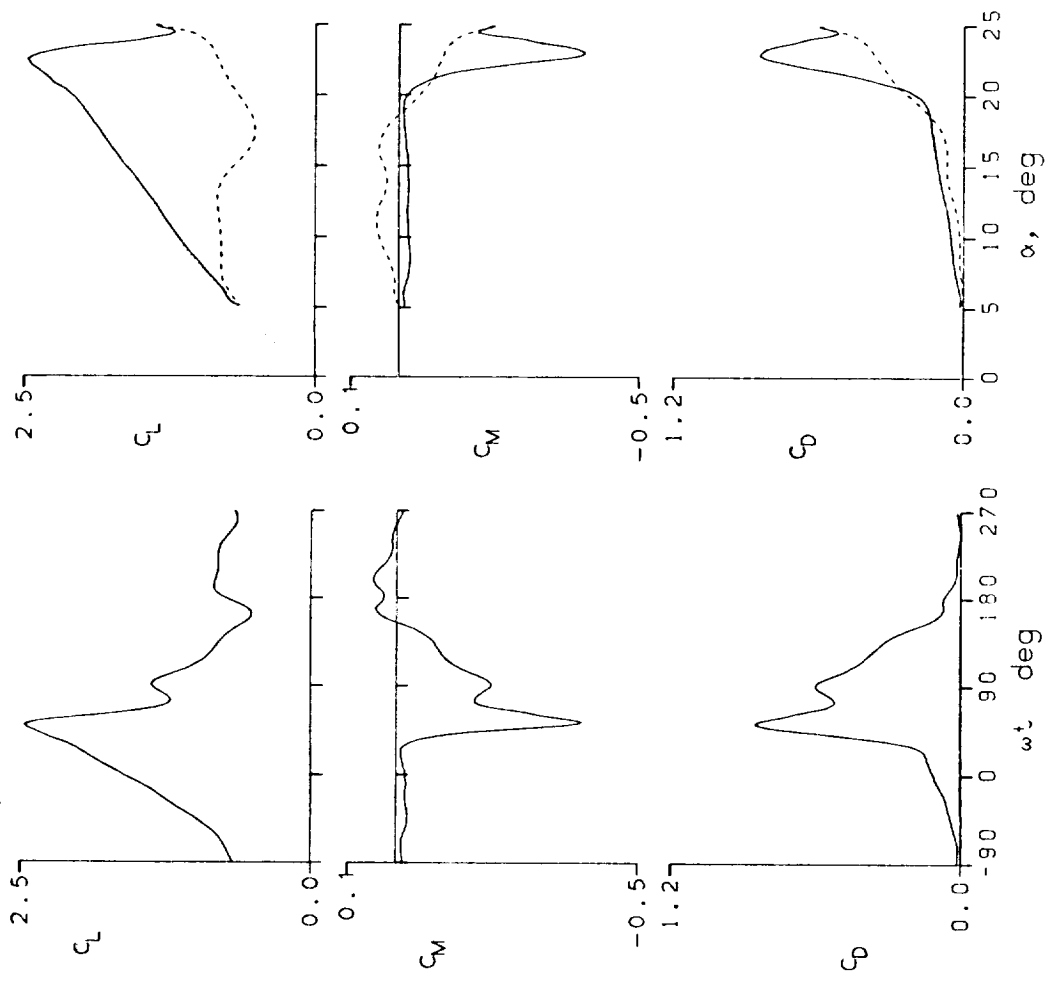


Figure 13.- Continued.

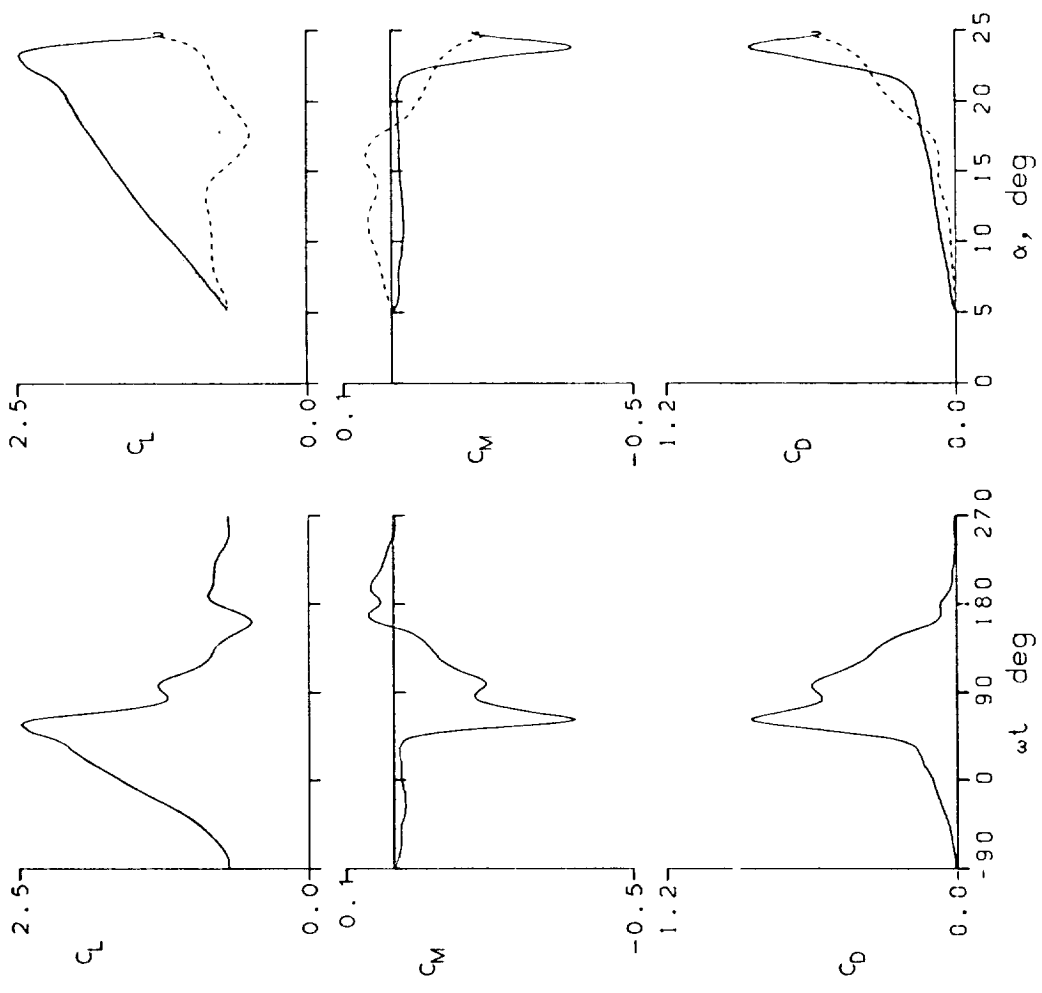
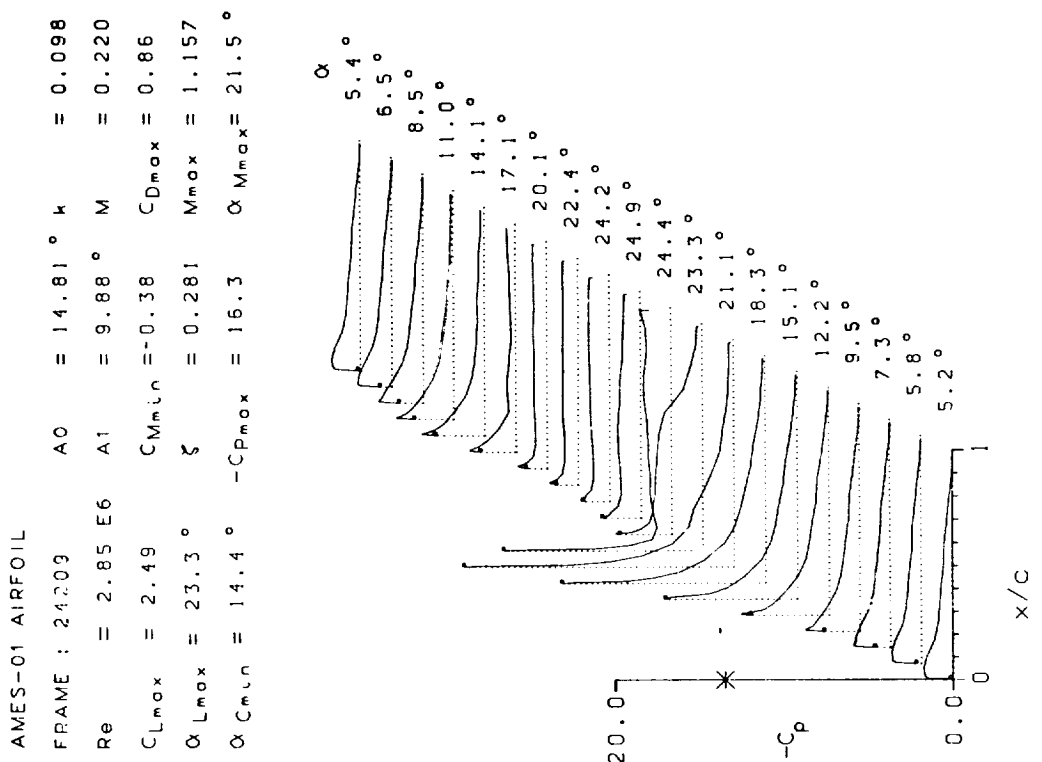


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 24217 A0 = 14.80° k = 0.099
 Re = 2.40 E6 A1 = 9.93° M = 0.184
 CLmax = 2.64 CMmin = -0.37 CDmax = 0.90
 αLmax = 23.8° ζ = 0.189 Mmax = 0.936
 αCmin = 14.3° -CPmax = 17.7 αMmax = 22.5°

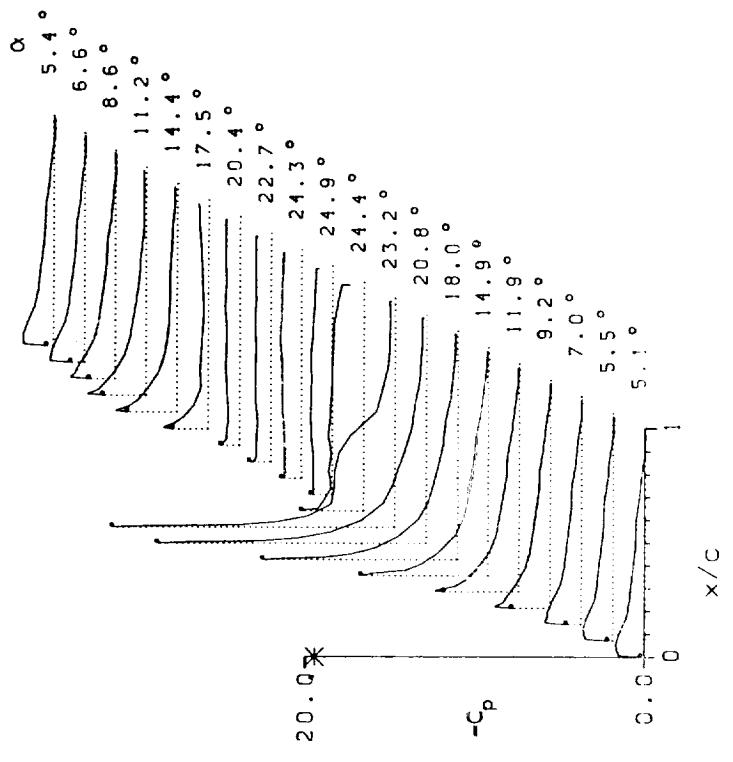
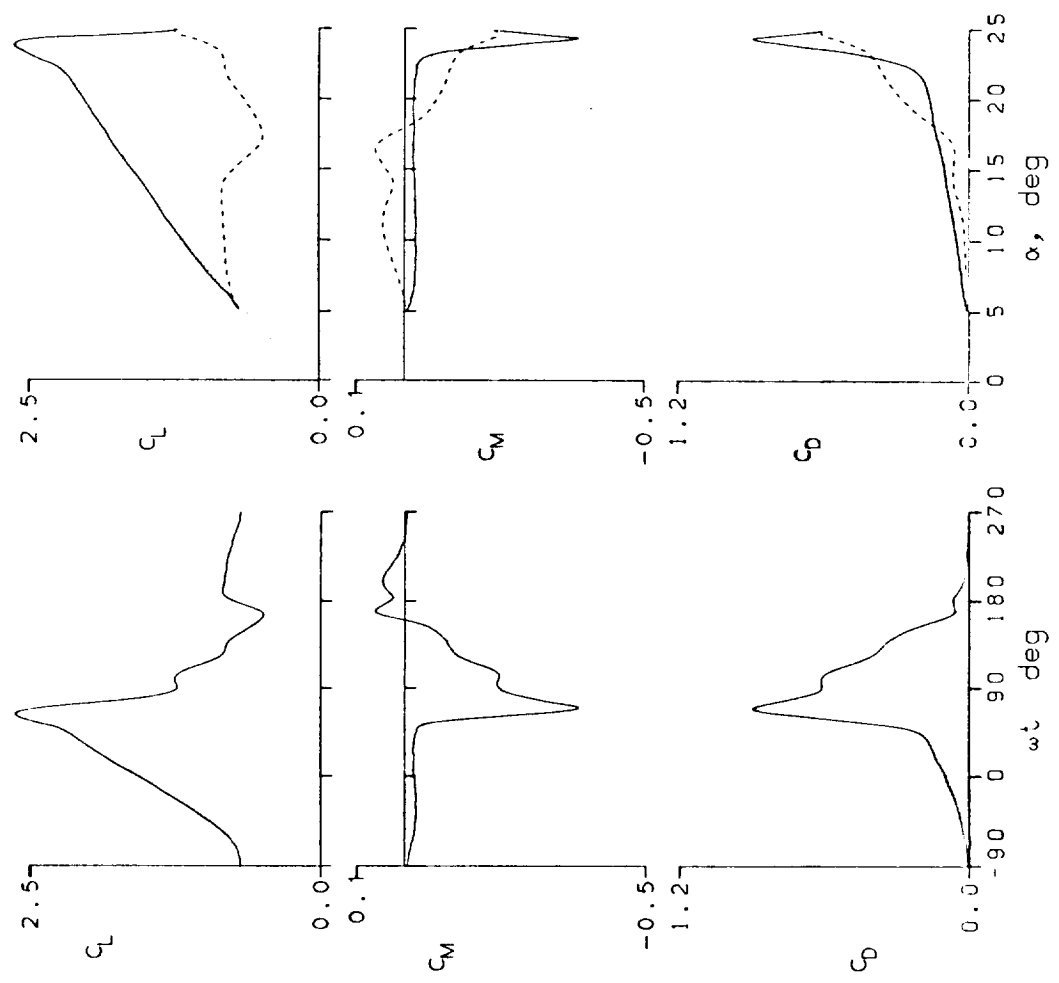


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 24302 A0 = 7.26° k = 0.049
 Re = 2.40 E6 A1 = 10.01° M = 0.184
 CLmax = 1.76 CMmin = -0.05 CDmax = 0.14
 αLmax = 17.2° ξ = 0.059 Mmax = 0.713
 αCMmin = 6.7° -CPmax = 11.4 αMmax = 17.5°

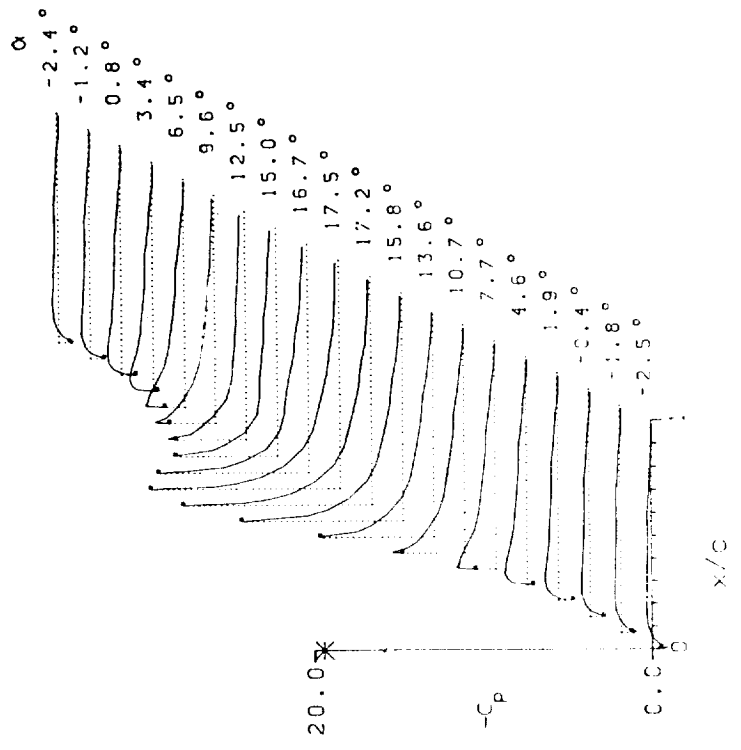
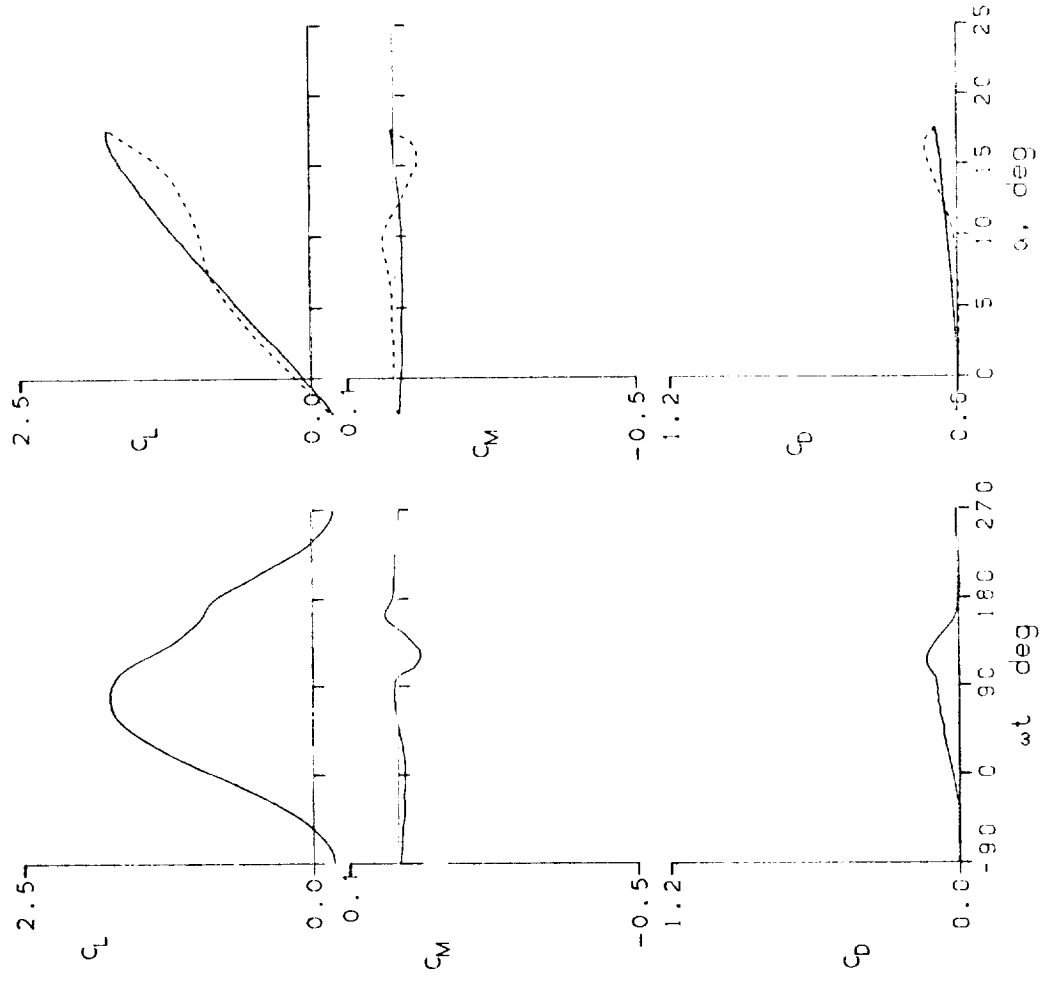


Figure 13.- Continued.

AMES--01 AIRFOIL

FRAME : 24306	A0 = 7.28°	k = 0.197
Re = 2.39 E6	A1 = 10.01°	M = 0.184
CLmax = 1.81	CMmin = -0.06	CDmax = 0.13
αLmax = 17.4°	ξ = 0.591	Mmax = 0.729
αCMmin = 6.7°	-CDmax = 11.8	αMmax = 17.4°

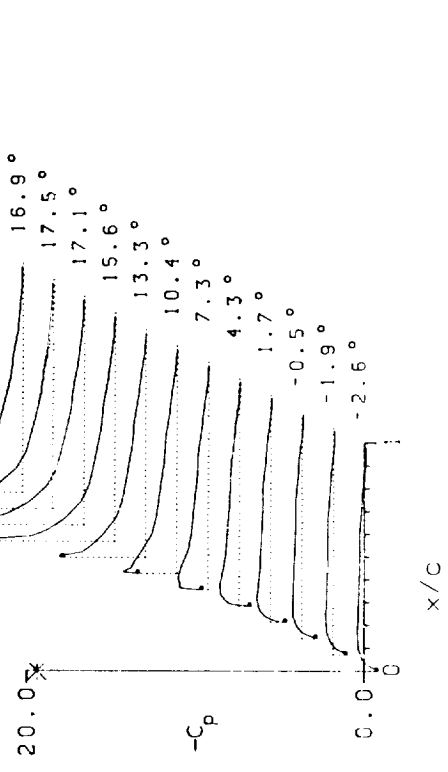
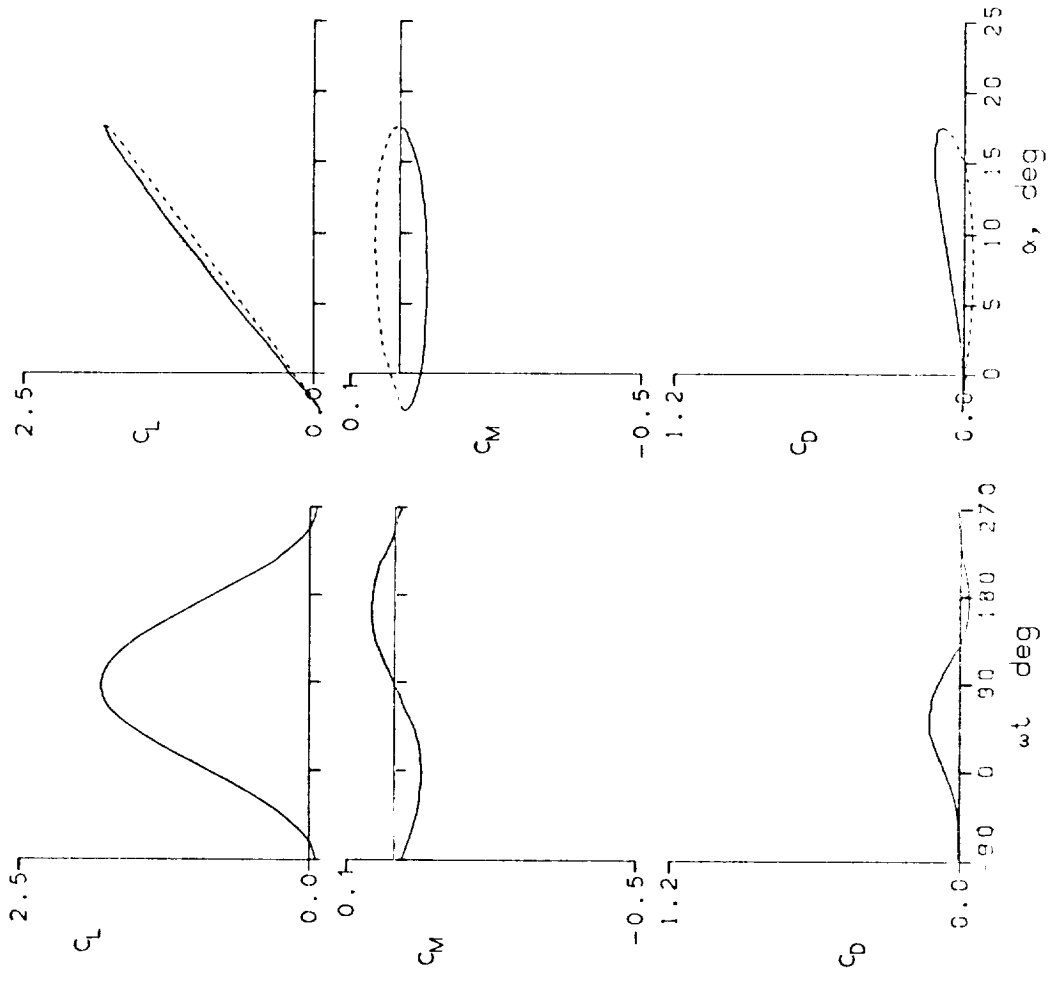


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 24314 A0 = 14.82° k = 0.099
 Re = 1.50 E6 A1 = 9.89° M = 0.110
 CLmax = 2.65 CMmin = -0.44 CDmax = 1.04
 αLmax = 23.6° ζ = 0.133 Mmax = 0.488
 αCMmin = 14.3° -CPmax = 16.9 αMmax = 22.4°

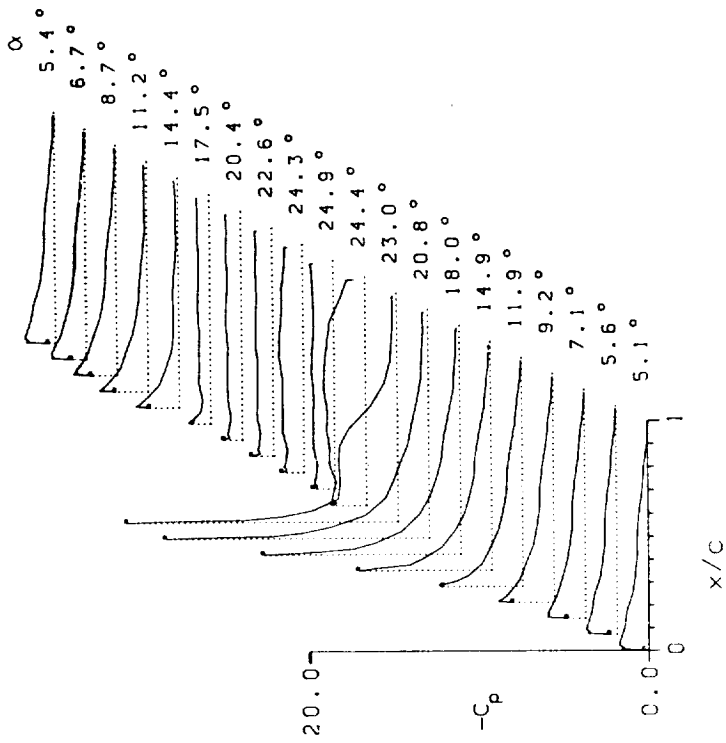
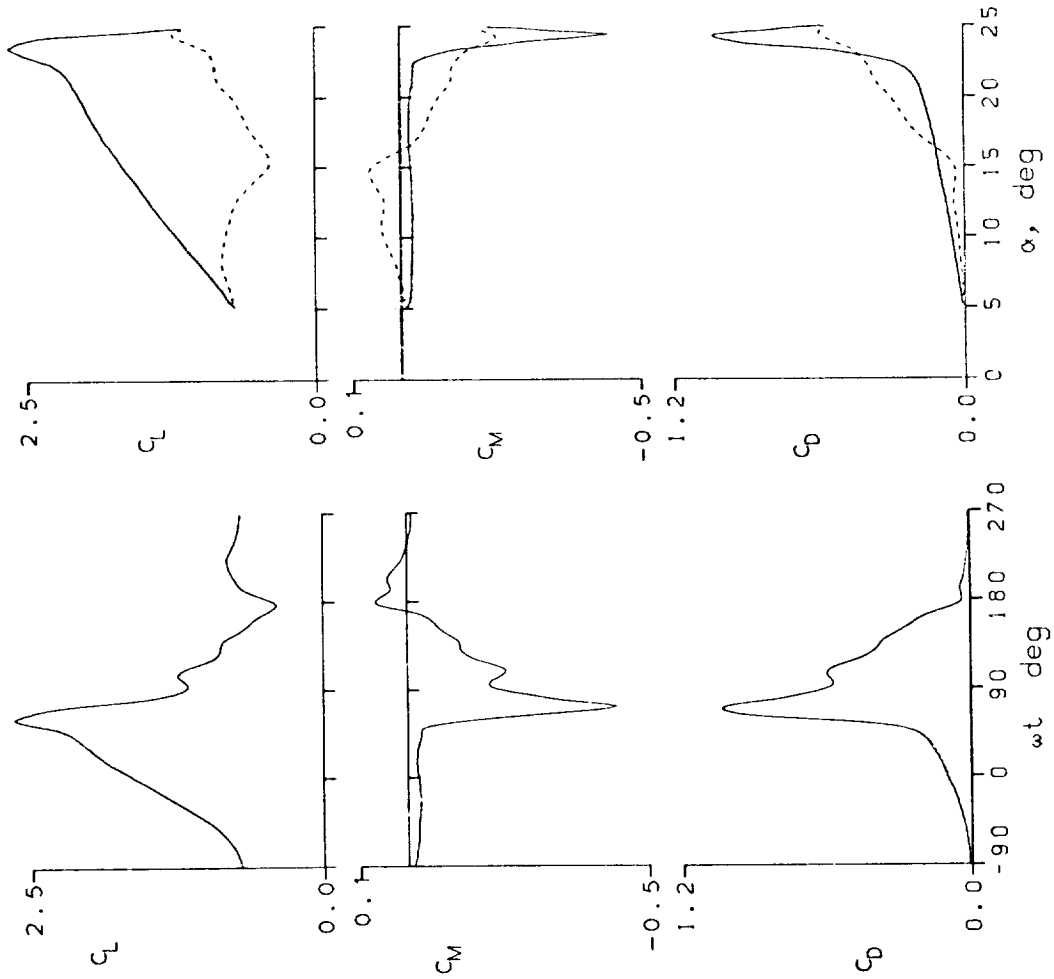


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 24323 A0 = 14.81° k = 0.099
 Re = 0.99 E6 A1 = 9.91° M = 0.073
 CLmax = 2.57 CMmin = -0.40 CDmax = 1.00
 αLmax = 23.0° ζ = 0.227 Mmax = 0.300
 αCMmin = 14.3° -CPmax = 15.4 αMmax = 21.7°

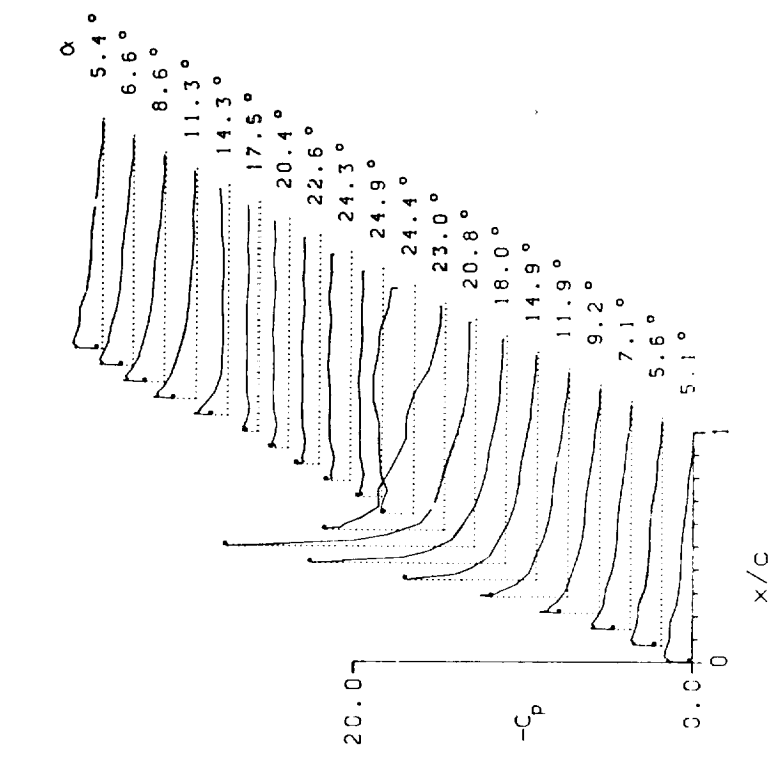
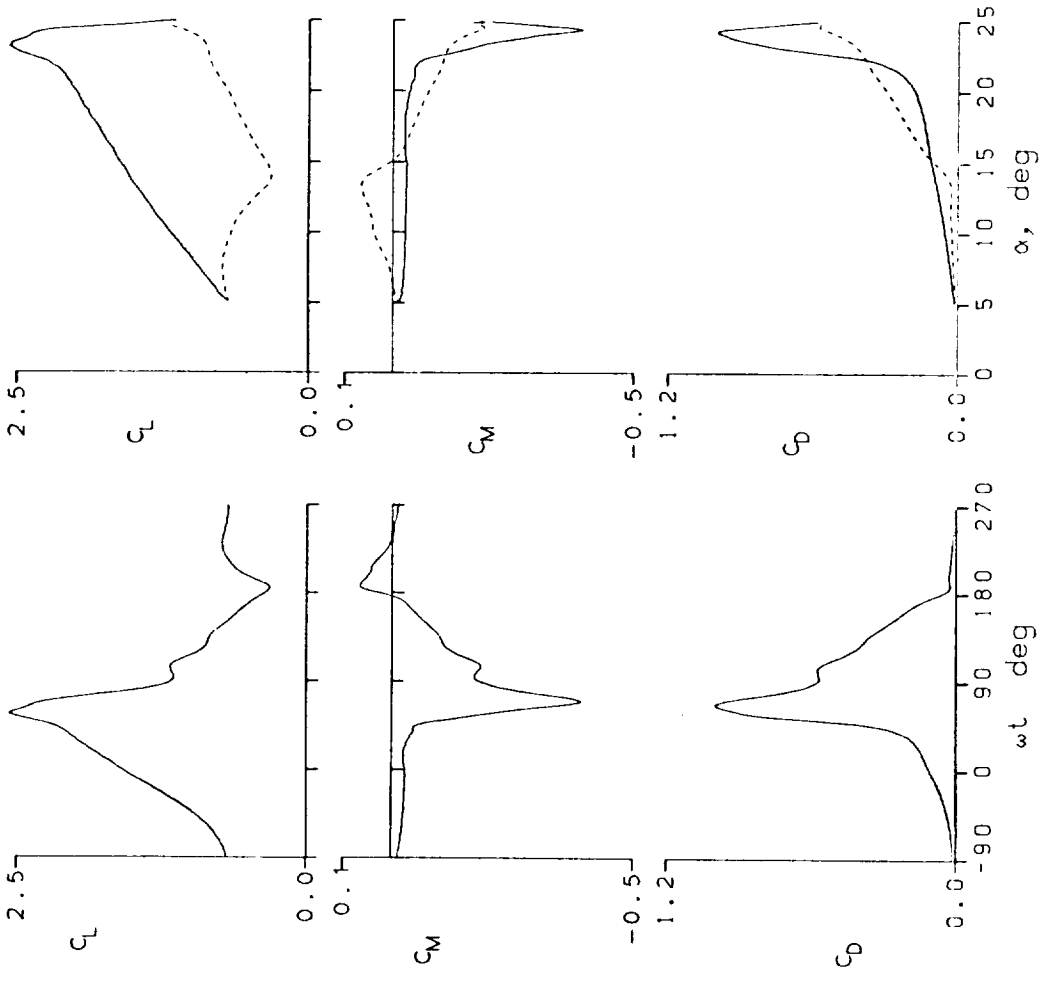


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25022	A0 = 9.79 °	k = 0.025
Re = 3.84 E6	A1 = 9.91 °	M = 0.302
CLmax = 1.79	CMmin = -0.18	CDmax = 0.34
αLmax = 16.6 °	ζ = 0.069	Mmax = 1.296
αCMmin = 9.3 °	-CPmax = 9.6	αMmax = 15.8 °

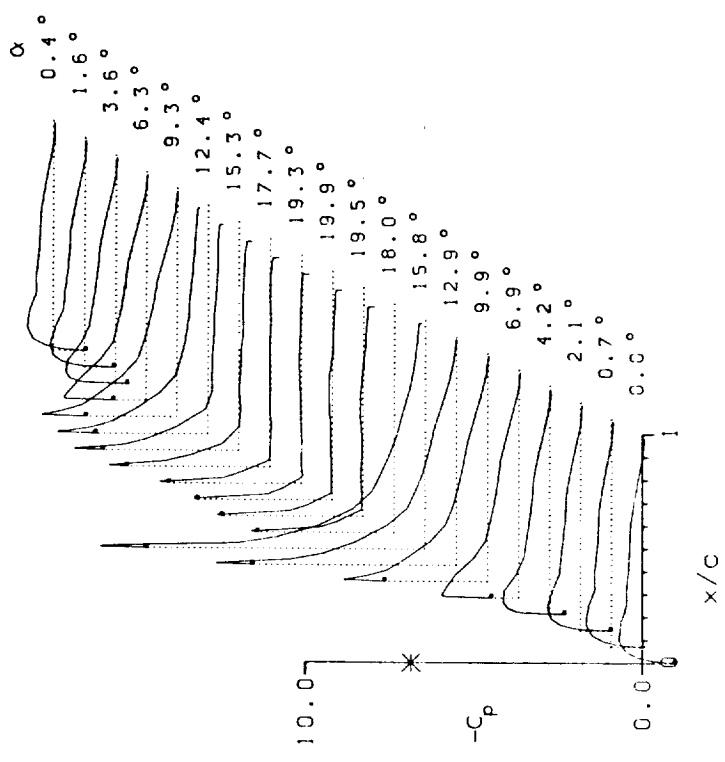
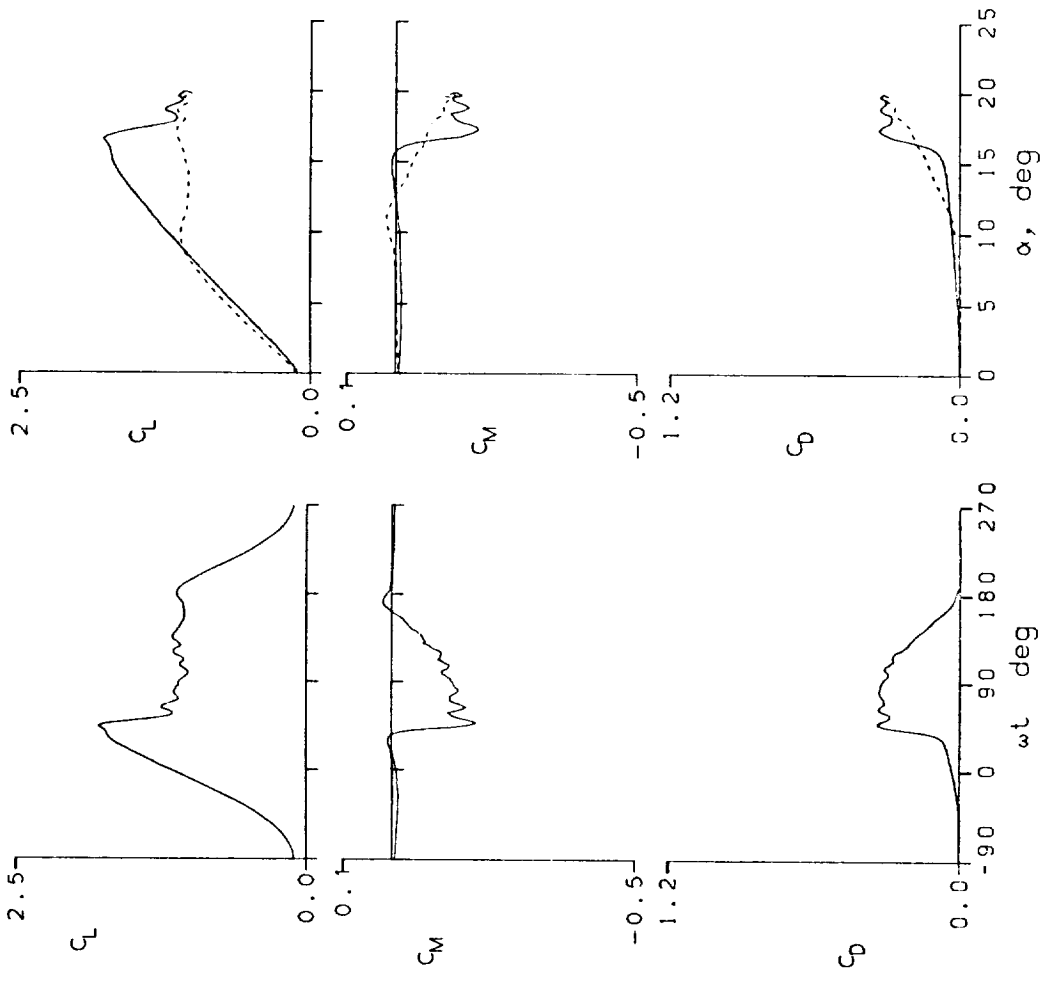


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 25102 A0 = 9.79 ° k = 0.049
 Re = 3.83 E6 A1 = 9.91 ° M = 0.302
 CLmax = 1.96 CMmin = -0.19 CDmax = 0.36
 α Lmax = 17.5 ° ζ = 0.083 Mmax = 1.326
 α Cmin = 9.2 ° -CPmax = 9.9 α Mmax = 16.4 °

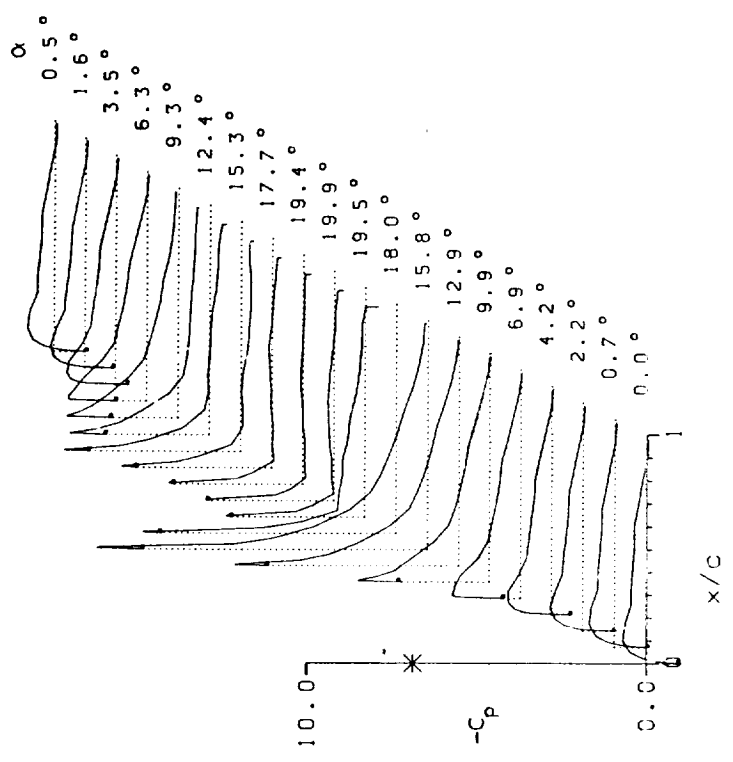
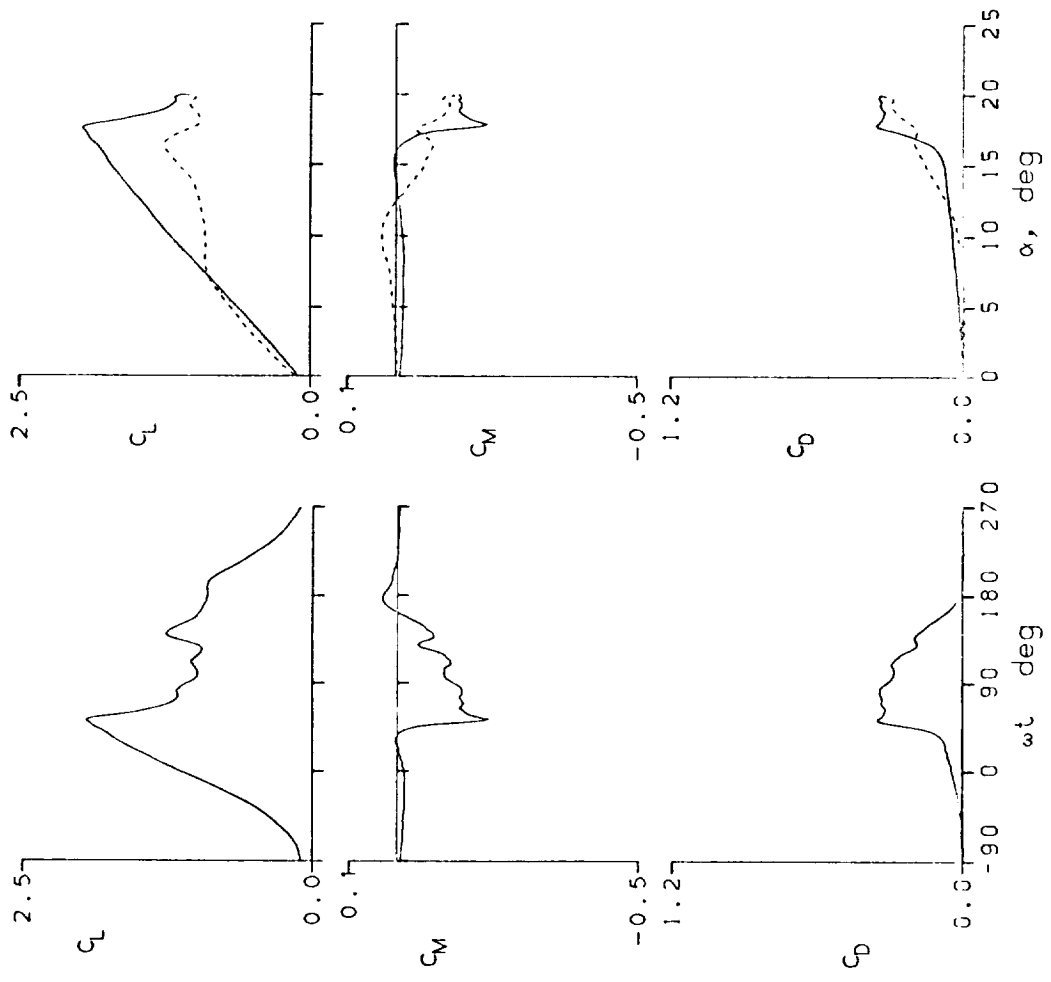


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25104	A0 = 9.80 °	k = 0.098
Re = 3.82 E6	A1 = 9.88 °	M = 0.302
C _{Lmax} = 2.11	C _{Mmin} = -0.30	C _{Dmax} = 0.52
α _{Lmax} = 18.8 °	ξ = 0.258	Mr x = 1.333
α _{Cmin} = 9.3 °	-C _{Dmax} = 9.9	α _{Mmax} = 16.6 °

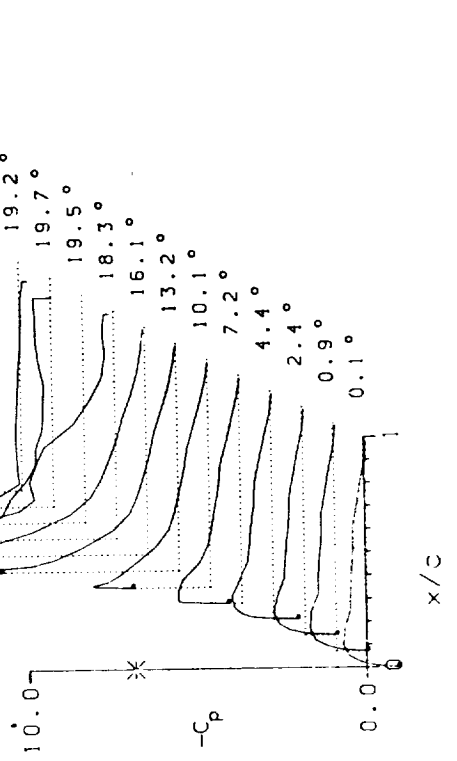
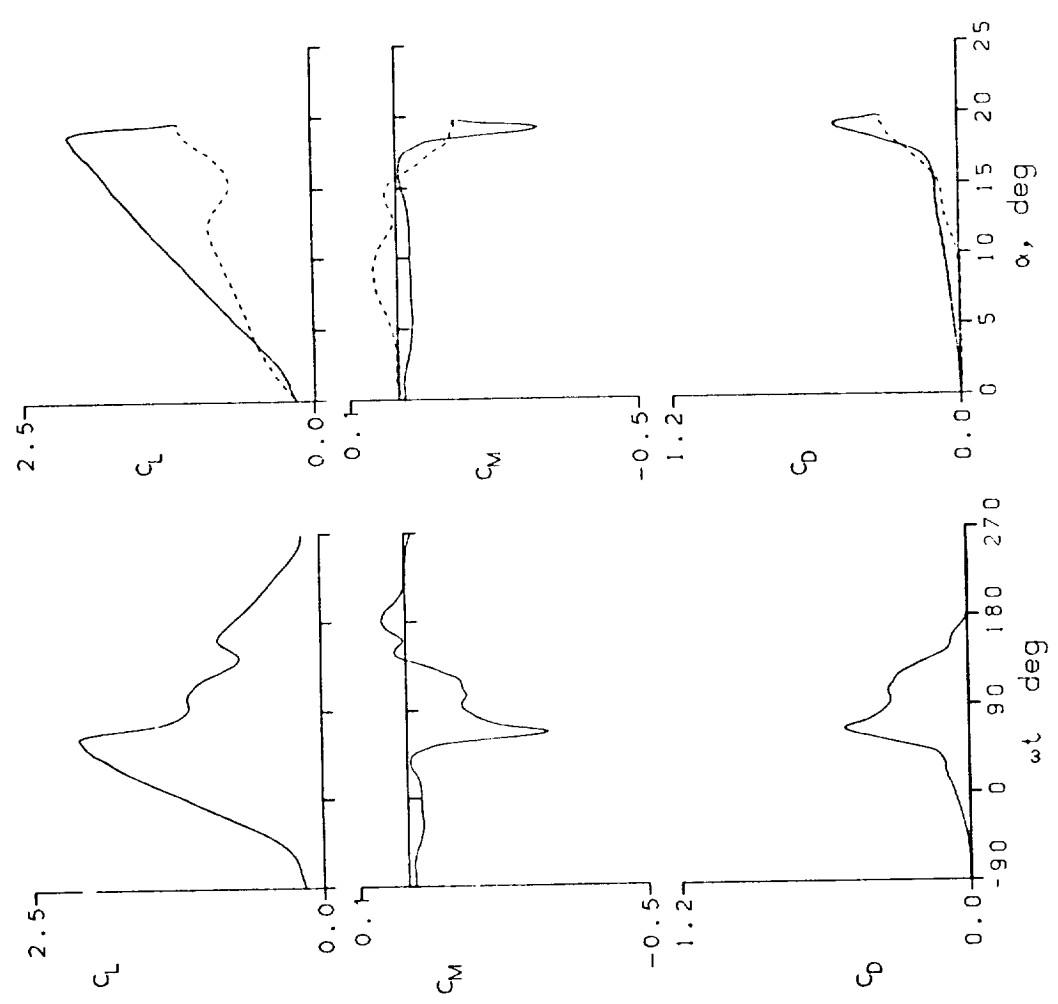


Figure 13.- Continued.

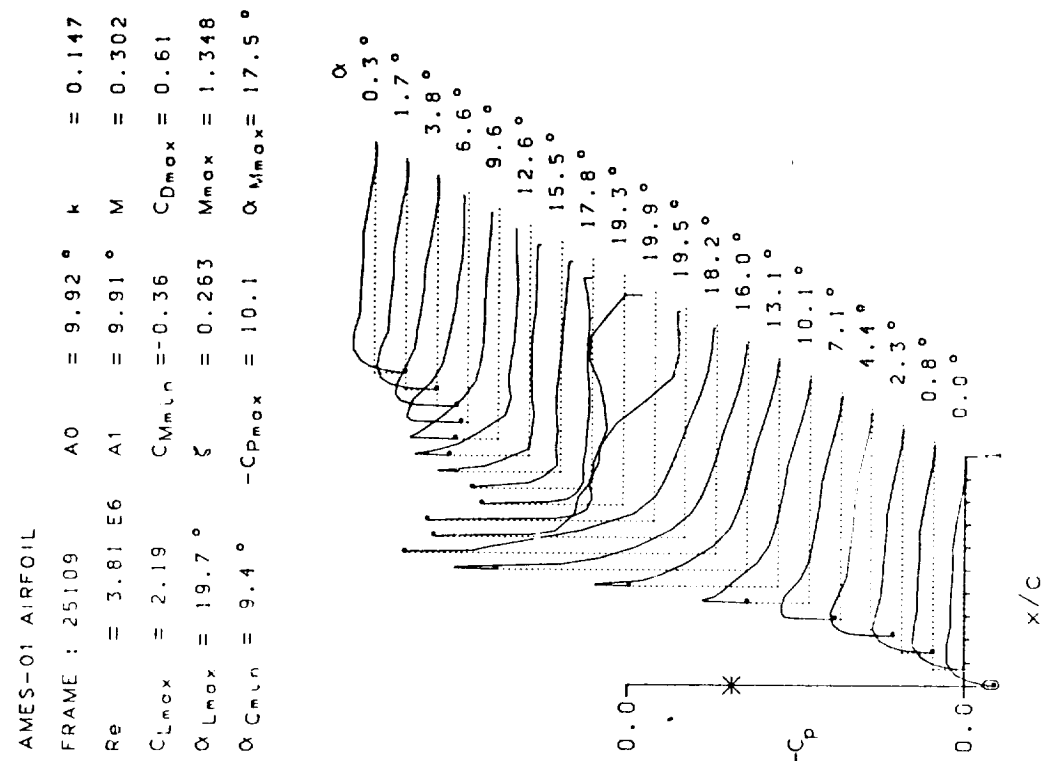


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25117	A0 = 9.94 °	k = 0.024
Re = 3.83 E6	A1 = 4.90 °	M = 0.303
CLmax = 1.62	CMmin = -0.04	CDmax = 0.11
α Lmax = 14.5 °	ζ = -0.055	Mmax = 1.203
α Cmin = 9.8 °	-CPmax = 8.8	α Mmax = 14.7 °

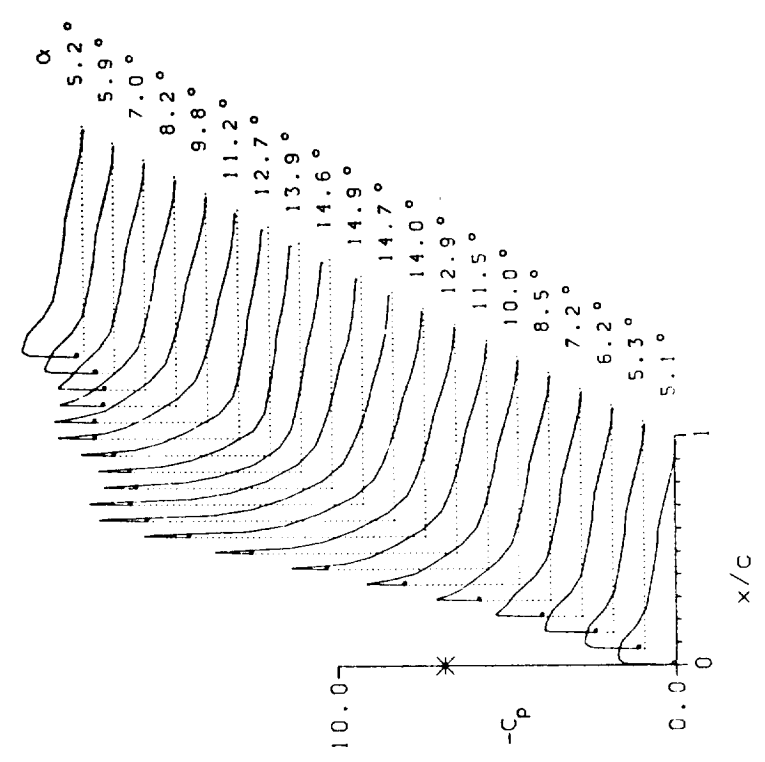
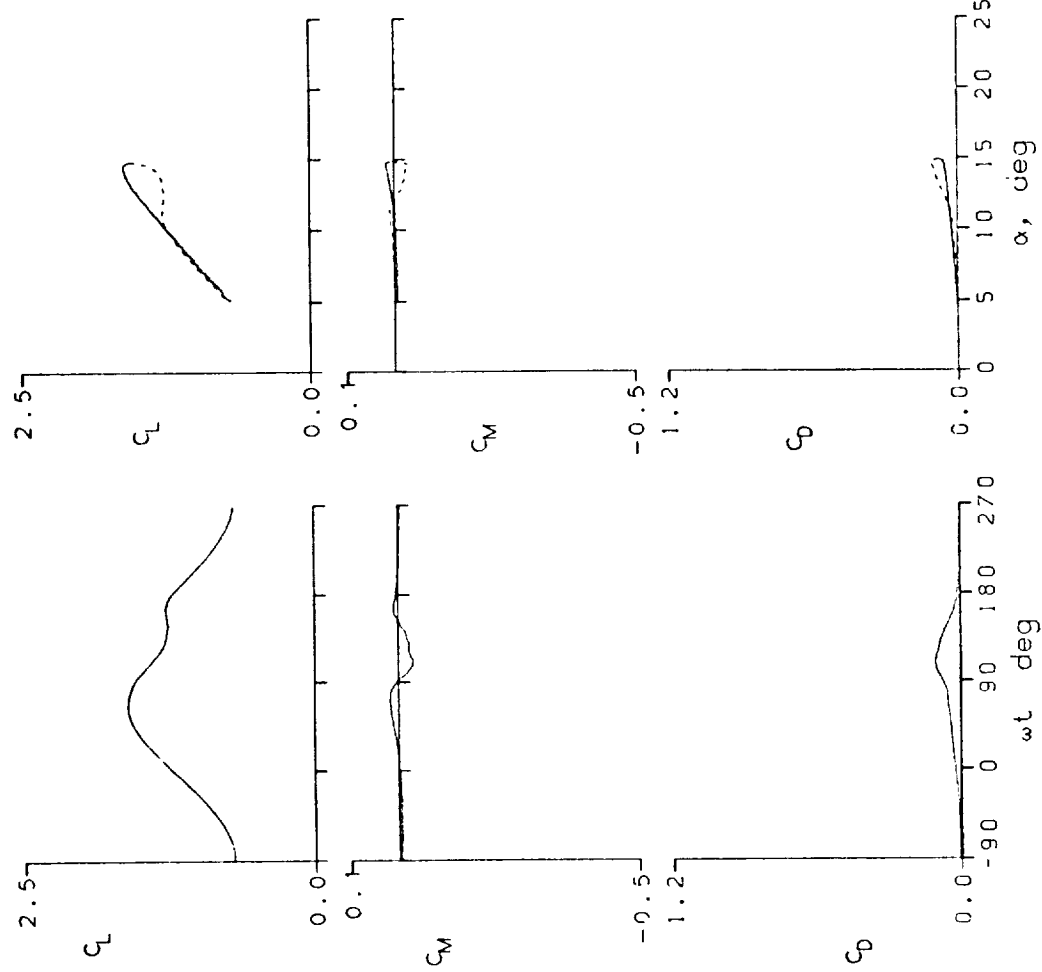


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 25118 A0 = 9.93° k = 0.049
 Re = 3.80 E6 A1 = 4.90° M = 0.302
 CLmax = 1.65 CMmin = -0.02 CDmax = 0.08
 αLmax = 14.6° ζ = 0.072 Mmax = 1.223
 αCMmin = 9.8° -CPmax = 9.0 αMmax = 14.7°

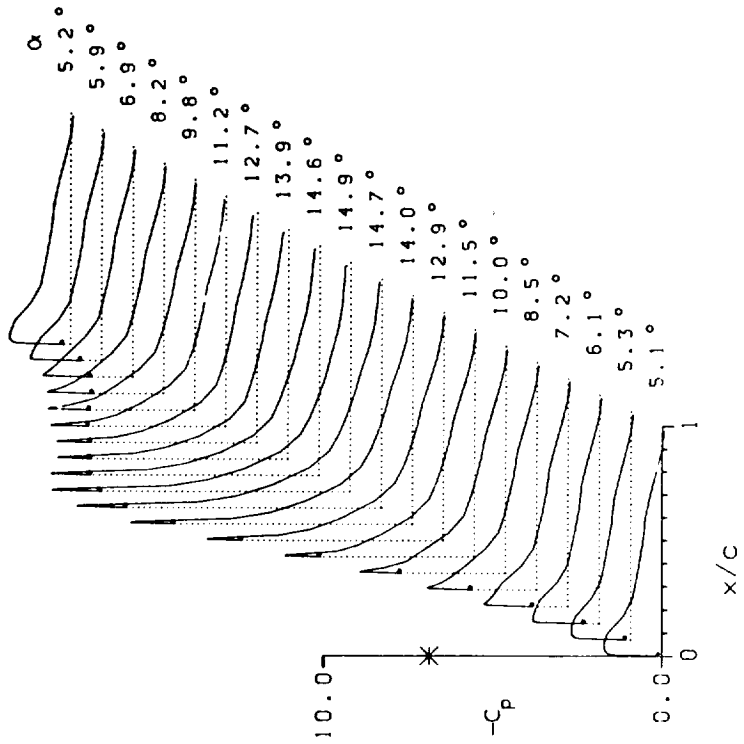
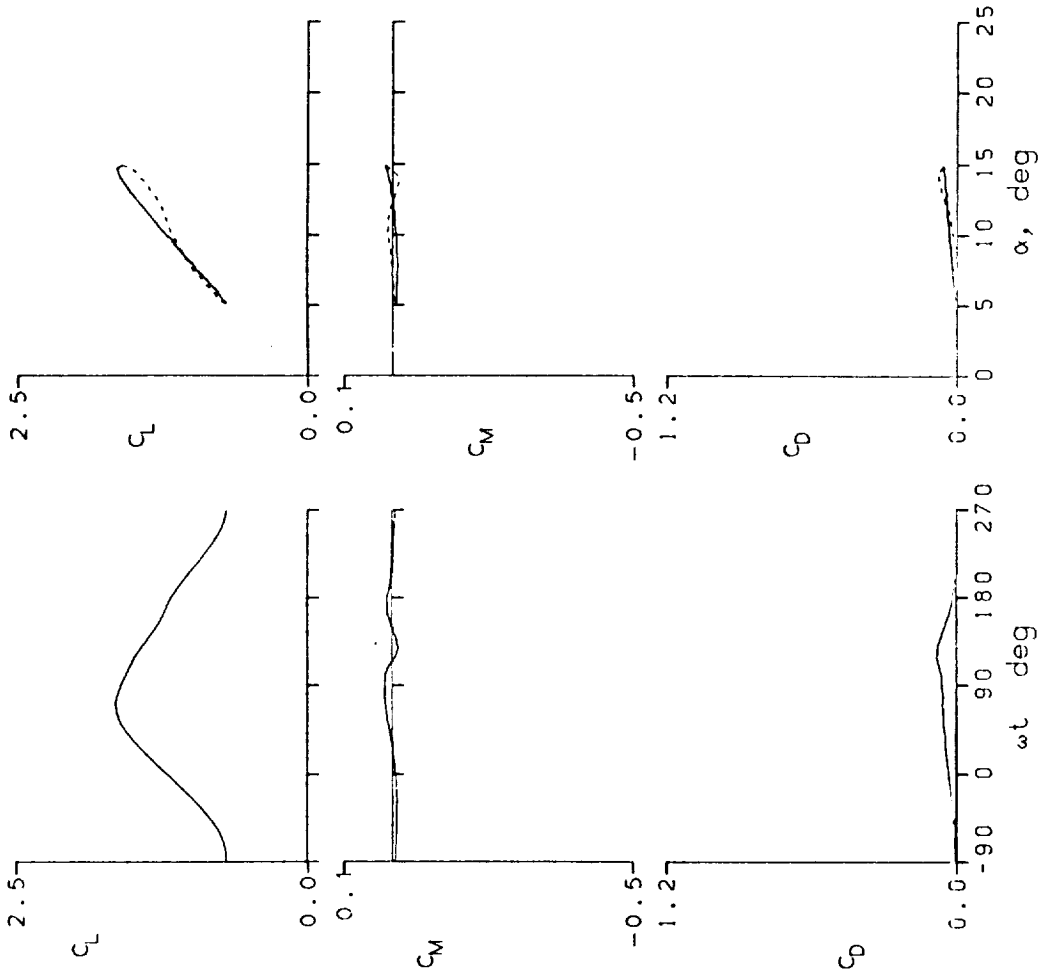


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25119	A0 = 9.93°	k = 0.097
Re = 3.81 E6	A1 = 4.90°	M = 0.303
CLmax = 1.70	CMmin = -0.02	CDmax = 0.07
α Lmax = 14.8°	ξ = 0.235	Mmax = 1.265
α Cmin = 9.8°	-CPmax = 9.3	α Mmax = 14.9°

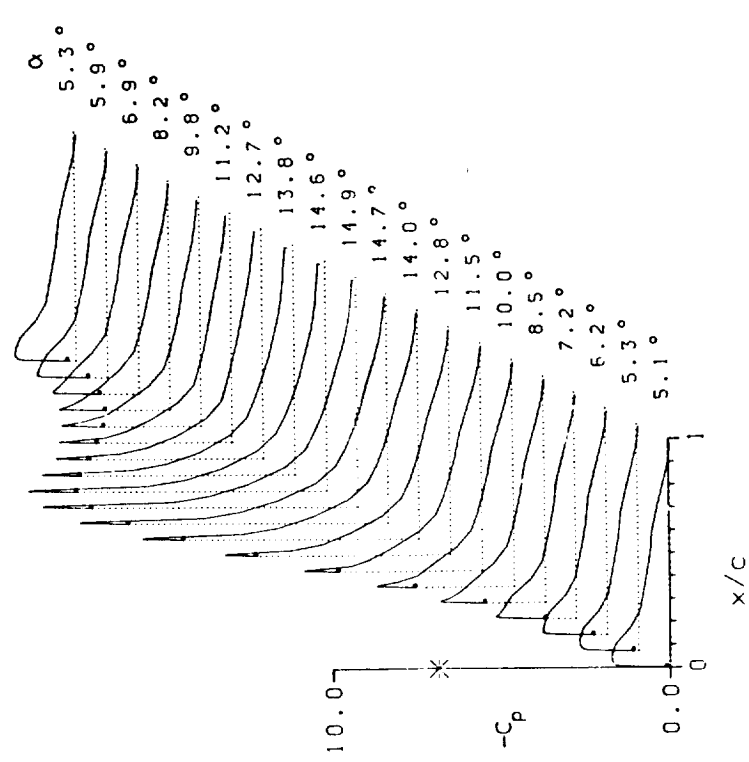
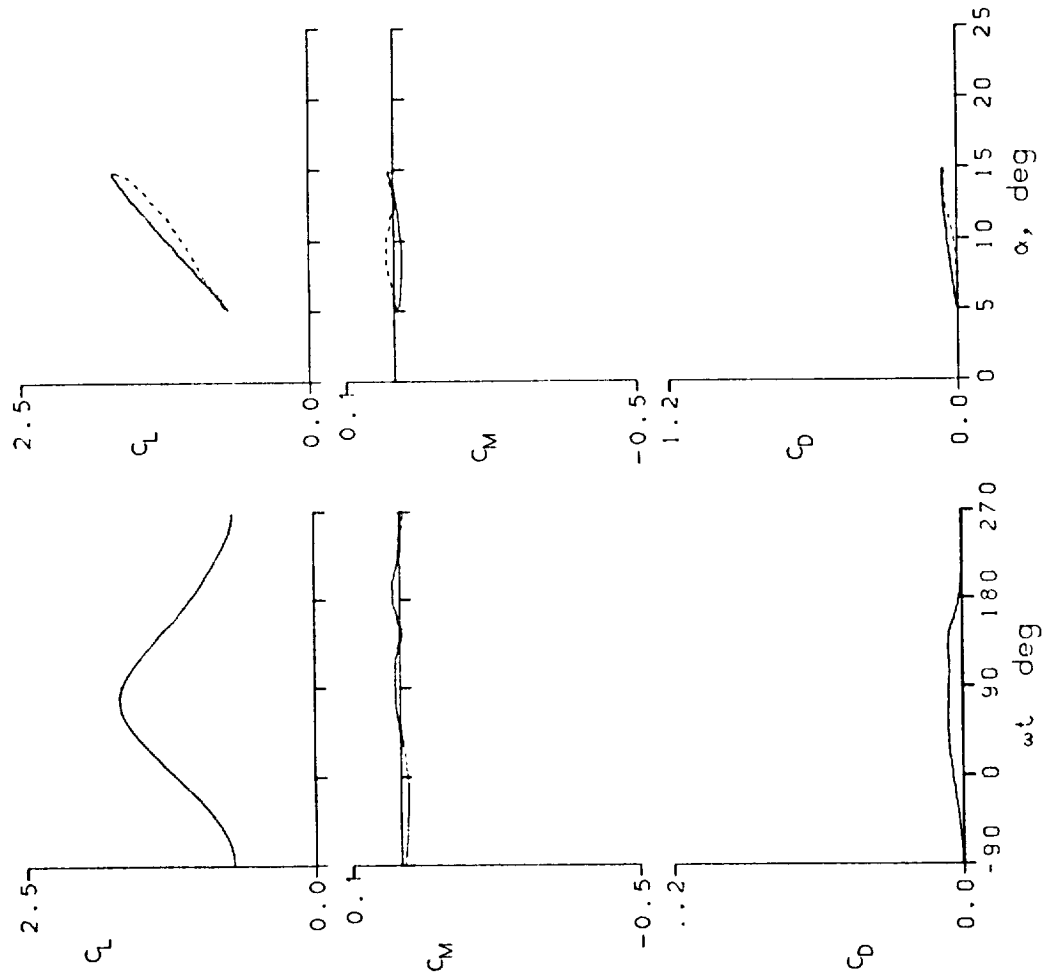
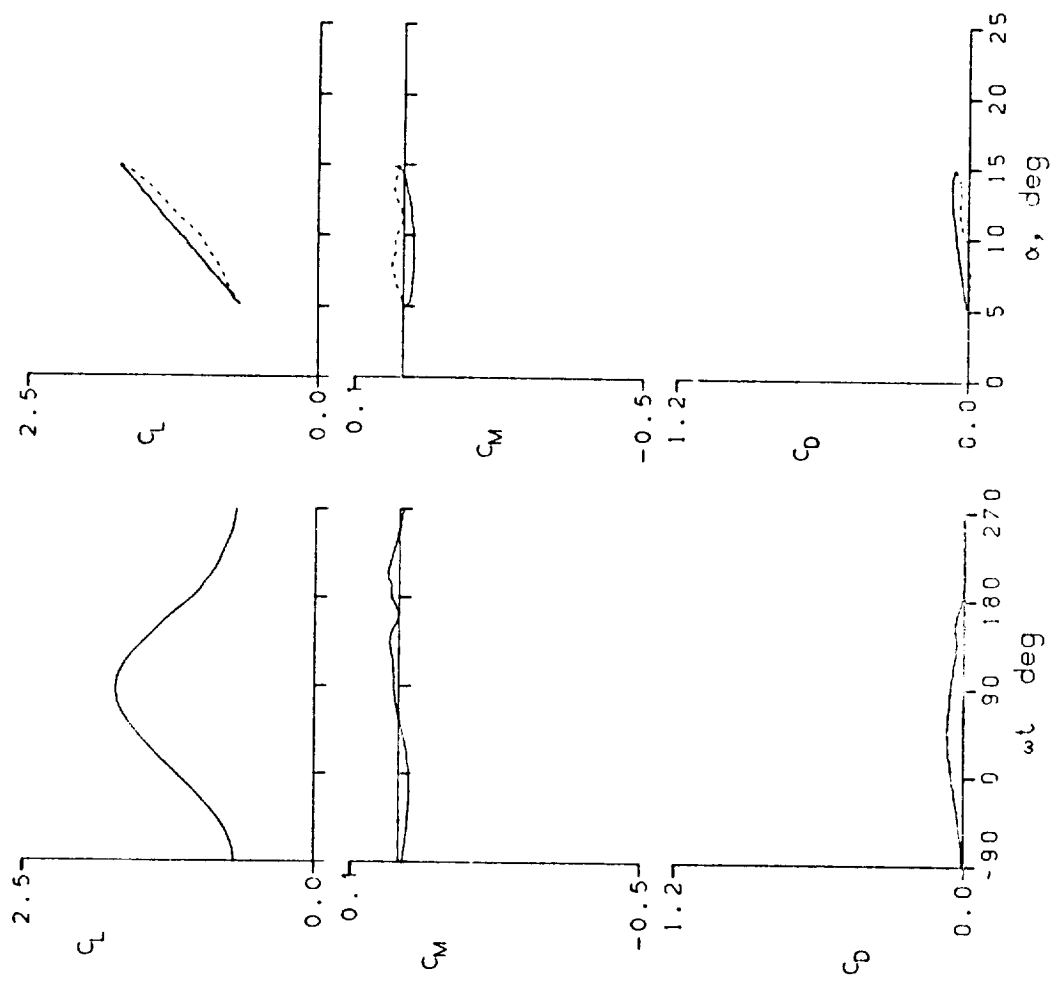


Figure 13.- Continued.



AMES-G1 AIRFOIL
 FRAME : 25121 A0 = 9.94° k = 0.147
 Re = 3.81 E6 A1 = 4.90° M = 0.302
 CLmax = 1.72 CMmin = -0.03 CDmax = 0.07
 αLmax = 14.9° ζ = 0.407 Mmax = 1.293
 αCmin = 9.8° -CPmax = 9.6 αMmax = 14.9°

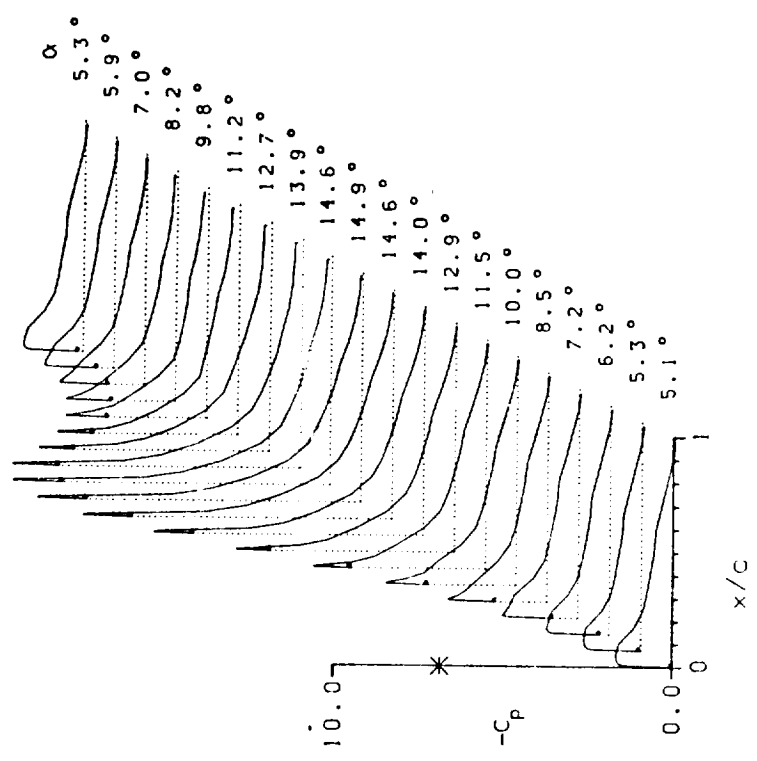


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25122	A0 = 9.94 °	k = 0.116
Re = 3.82 E6	A1 = 4.91 °	M = 0.303
$C_{Lmax} = 1.73$	$C_{Mmin} = -0.03$	$C_{Dmax} = 0.07$
$\alpha_{Lmax} = 14.9 °$	$\zeta = 0.406$	$M_{max} = 1.300$
$\alpha_{C_{Lmin}} = 9.8 °$	$-C_{Pmax} = 9.6$	$\alpha_{Mmax} = 14.9 °$

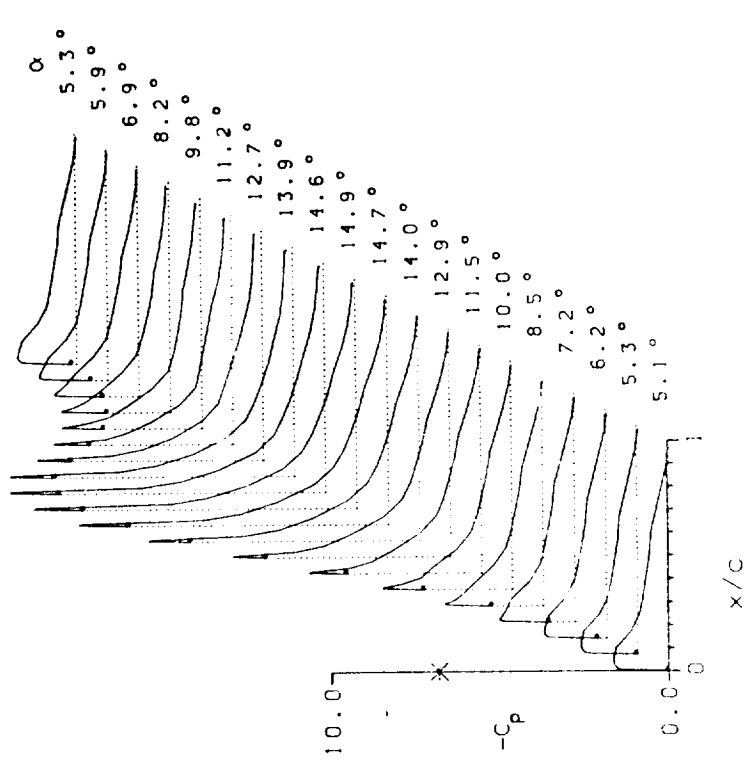
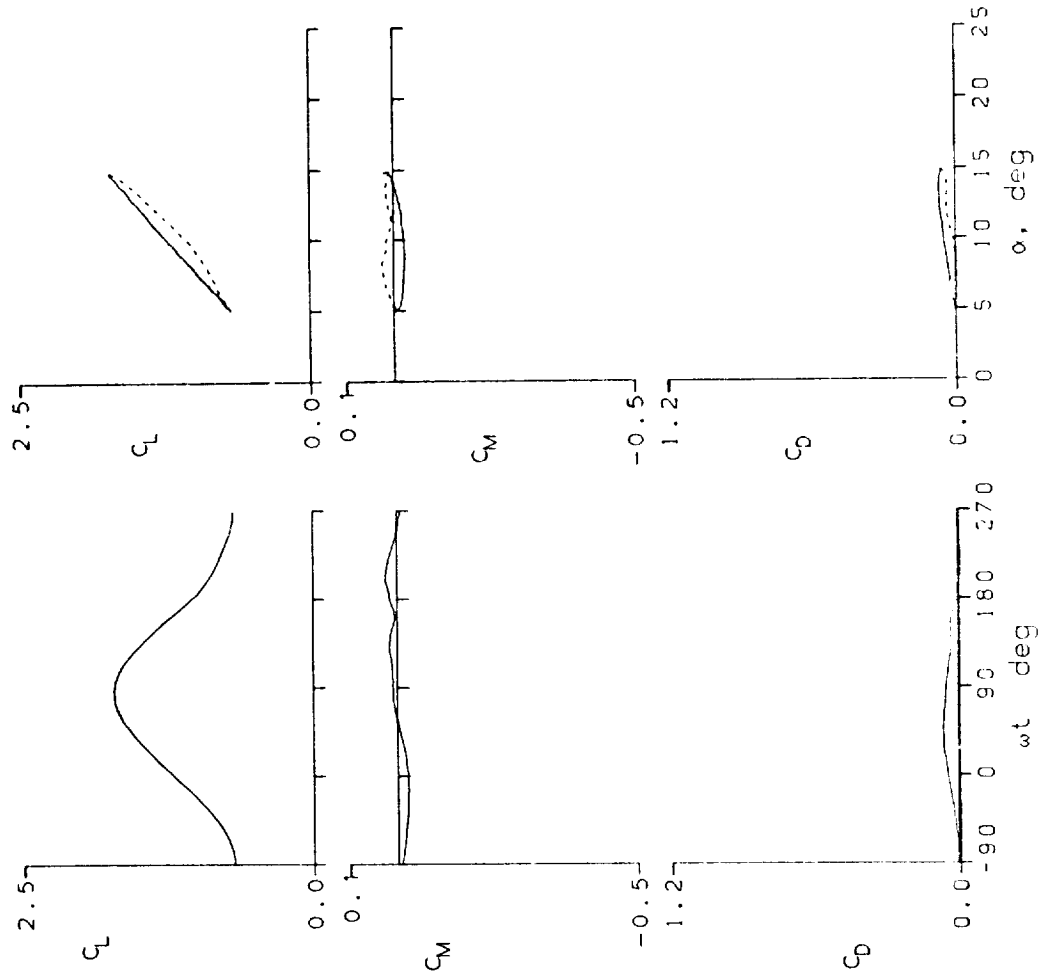


Figure 13.- Continued.

AMES-01: AIRFOIL
 FRAME : 25123 A0 = 9.92° k = 0.195
 Rb = 3.82 E6 A1 = 4.90° M = 0.303
 CLmax = 1.77 CMmin = -0.04 CDmax = 0.08
 α Lmax = 14.9° ζ = 0.364 Mmax = 1.326
 α Cmin = 9.8° -CPmax = 9.8 α Mmax = 14.9°

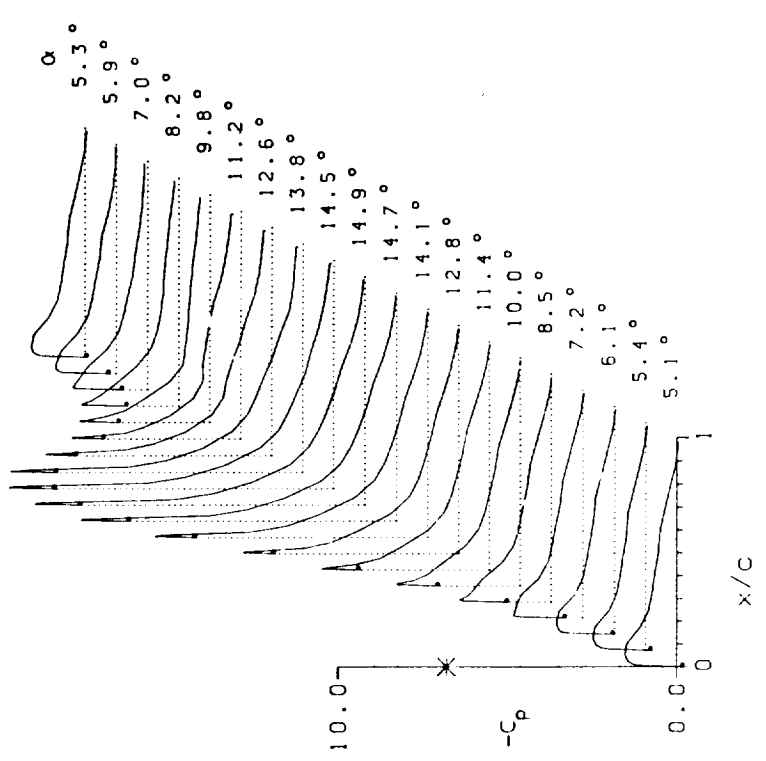
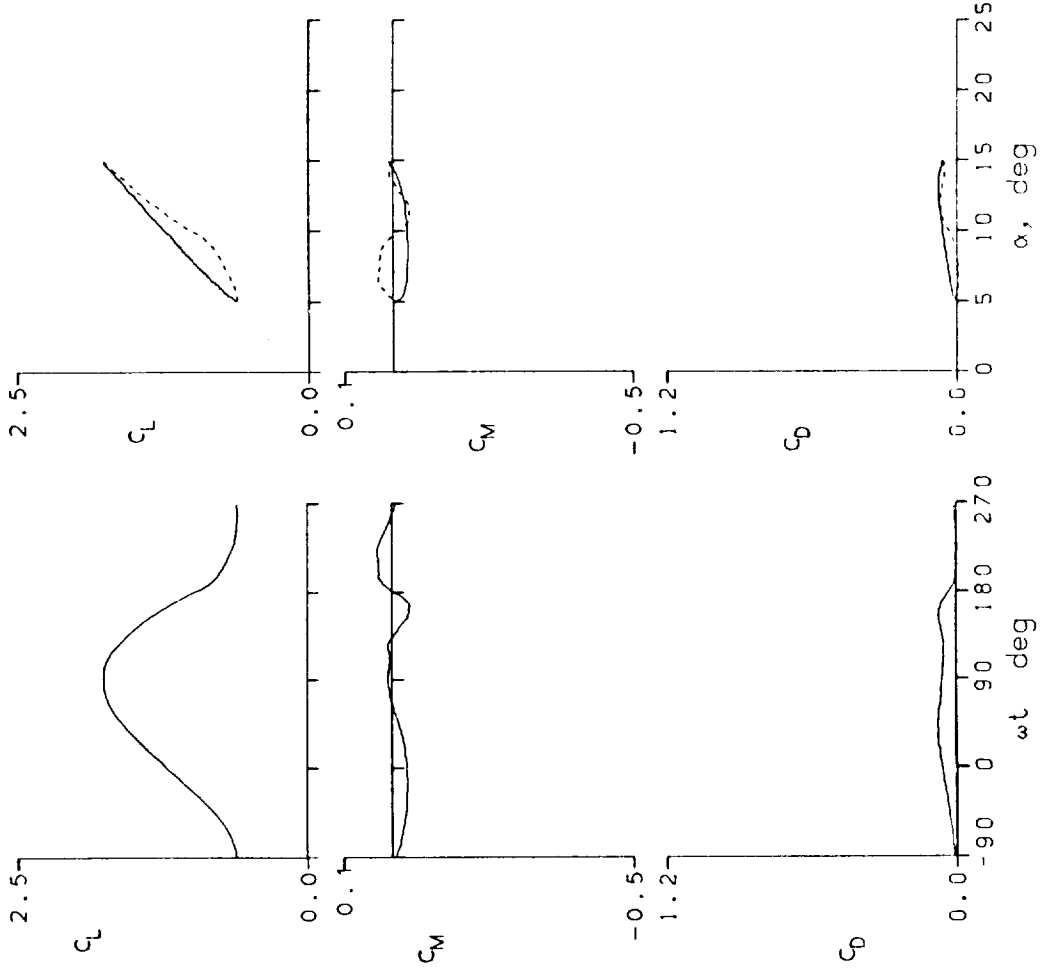


Figure 13.- Continued.

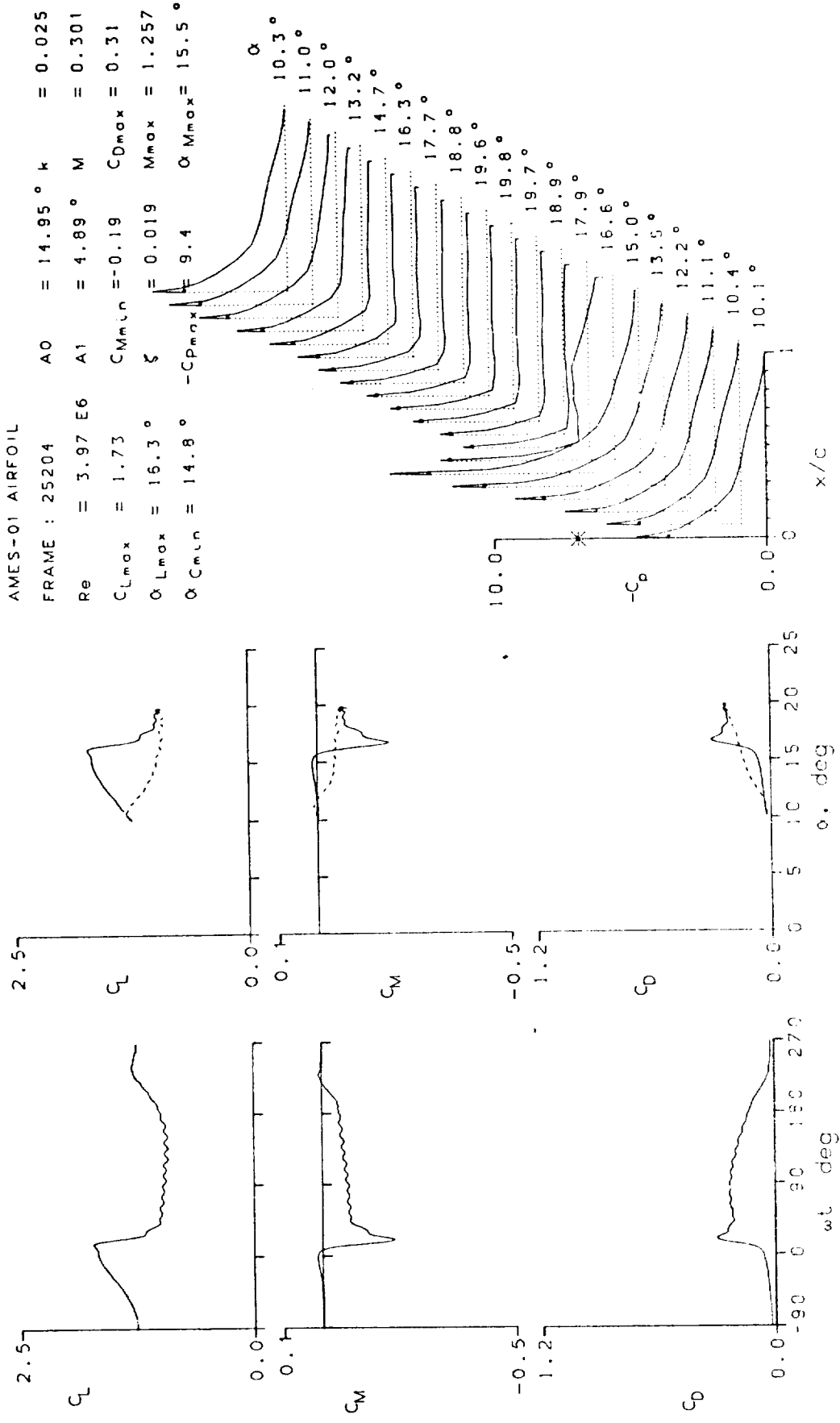


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 25205 A0 = 14.96° k = 0.050
 Re = 3.95 E6 A1 = 4.90° M = 0.301
 CLmax = 1.85 CMmin = -0.15 CDmax = 0.31
 αLmax = 17.0° ζ = 0.126 Mmax = 1.303
 αCmin = 14.8° -CPmax = 9.7 αMmax = 16.2°

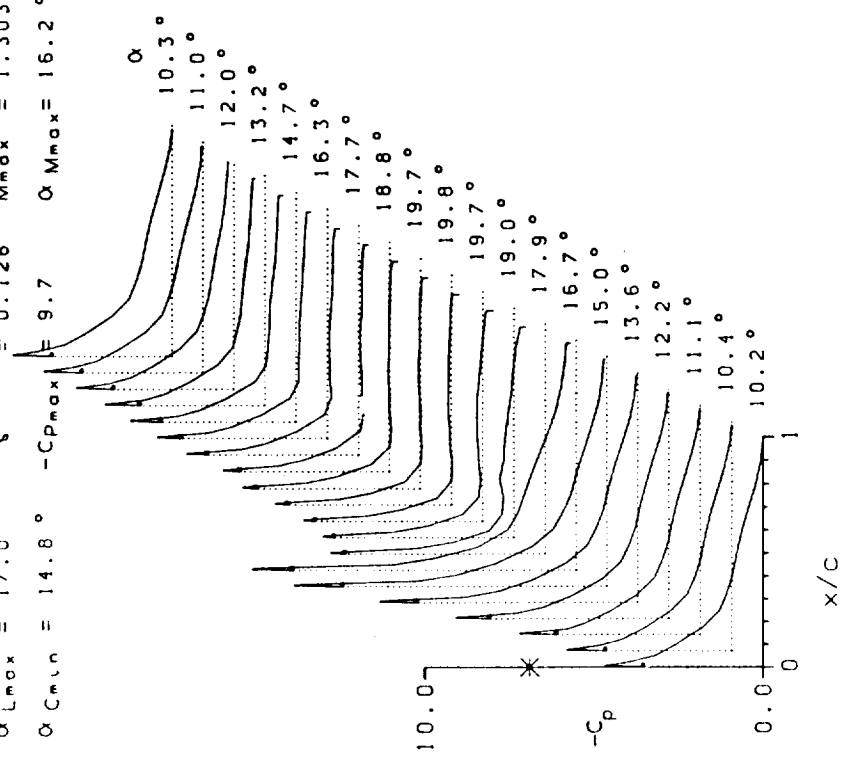
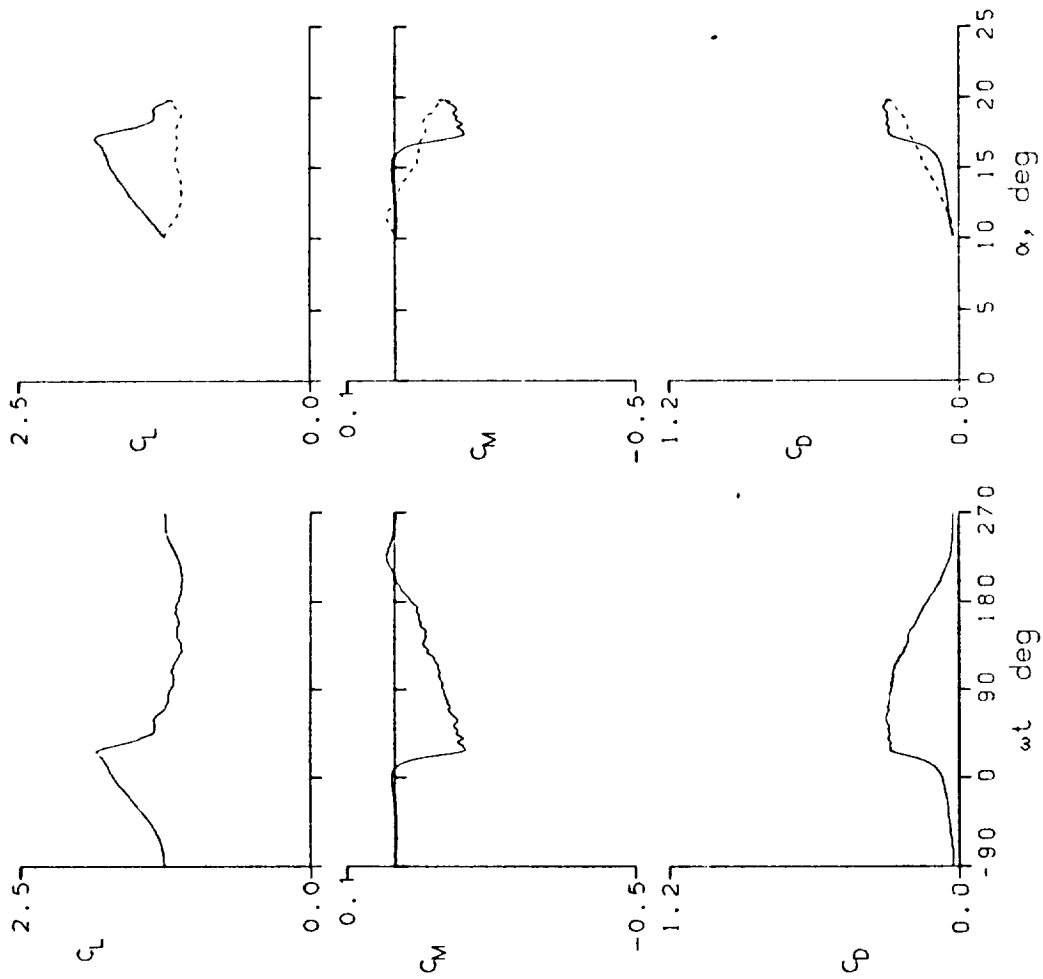


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25208 A0 = 14.96° k = 0.099
 Re = 3.95 E6 A1 = 4.89° M = 0.301
 CLmax = 1.97 CMmin = -0.21 CDmax = 0.39
 αLmax = 18.0° ζ = 0.133 Mmax = 1.341
 αCmin = 14.8° -CPmax = 10.0 αMmax = 16.5°

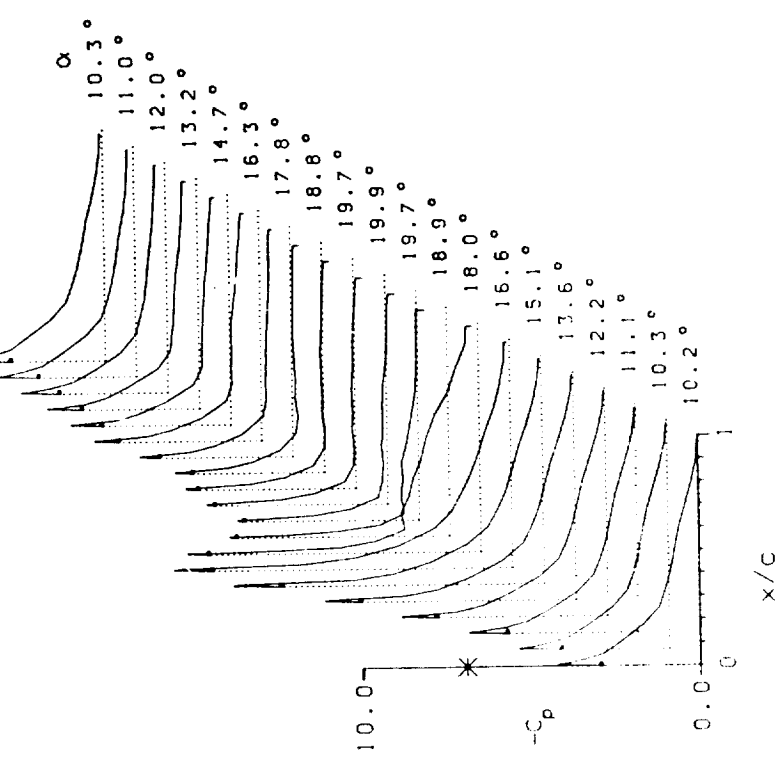
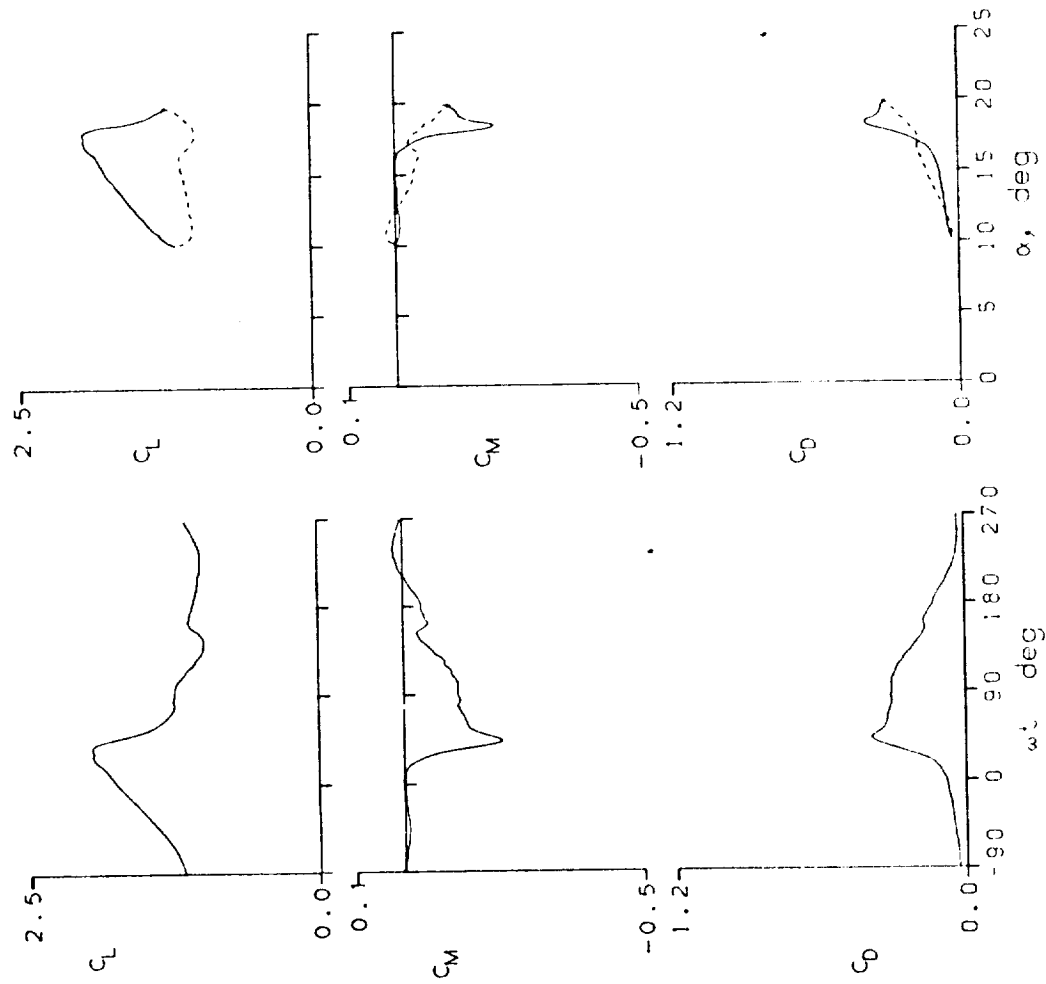


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25209	A0 = 14.97°	k = 0.151
Re = 3.89 E6	A1 = 4.90°	M = 0.298
C _{Lmax} = 2.12	C _{Mmin} = -0.27	C _{Dmax} = 0.50
α _{Lmax} = 19.0°	ζ = 0.324	M _{max} = 1.344
α _{Cmin} = 14.8°	-C _{Pmax} = 10.3	α _{Mmax} = 16.9°

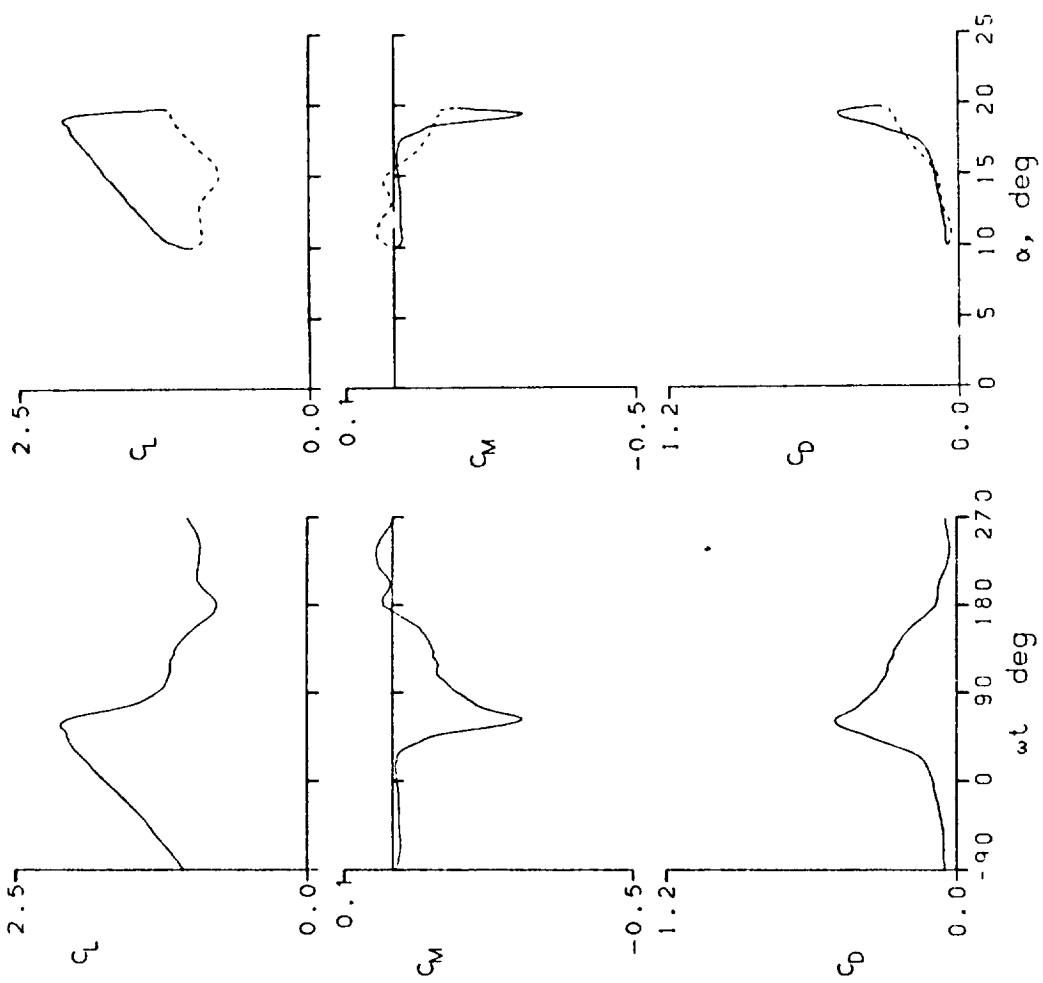


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25210 A0 = 14.94° k = 0.201
 Re = 3.87 E6 A1 = 4.89° M = 0.297
 CLmax = 2.24 CMmin = -0.38 CDmax = 0.64
 αLmax = 19.6° ξ = 0.173 Mmax = 1.323
 αCmin = 14.7° -CPmax = 10.2 αMmax = 17.2°

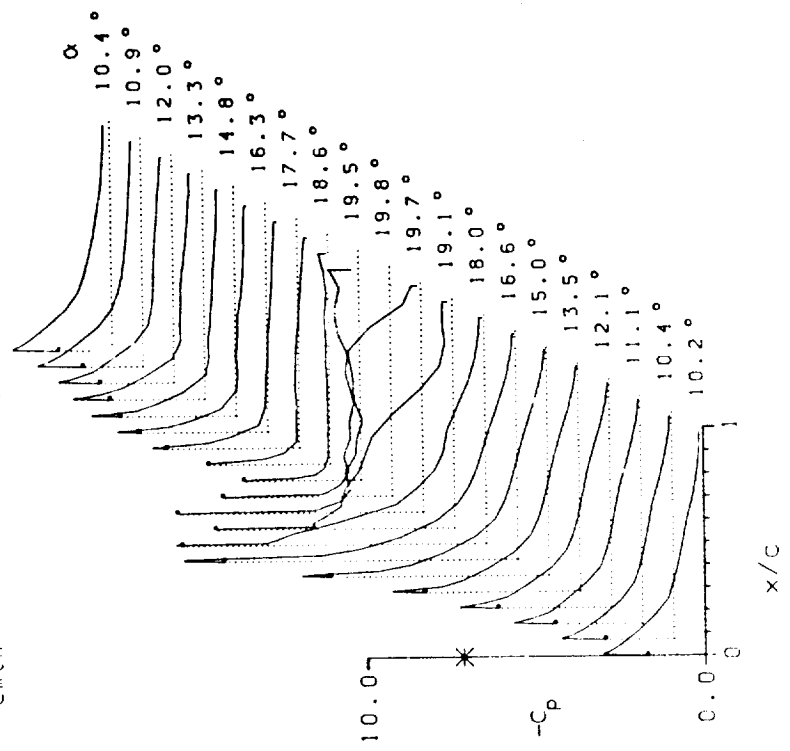
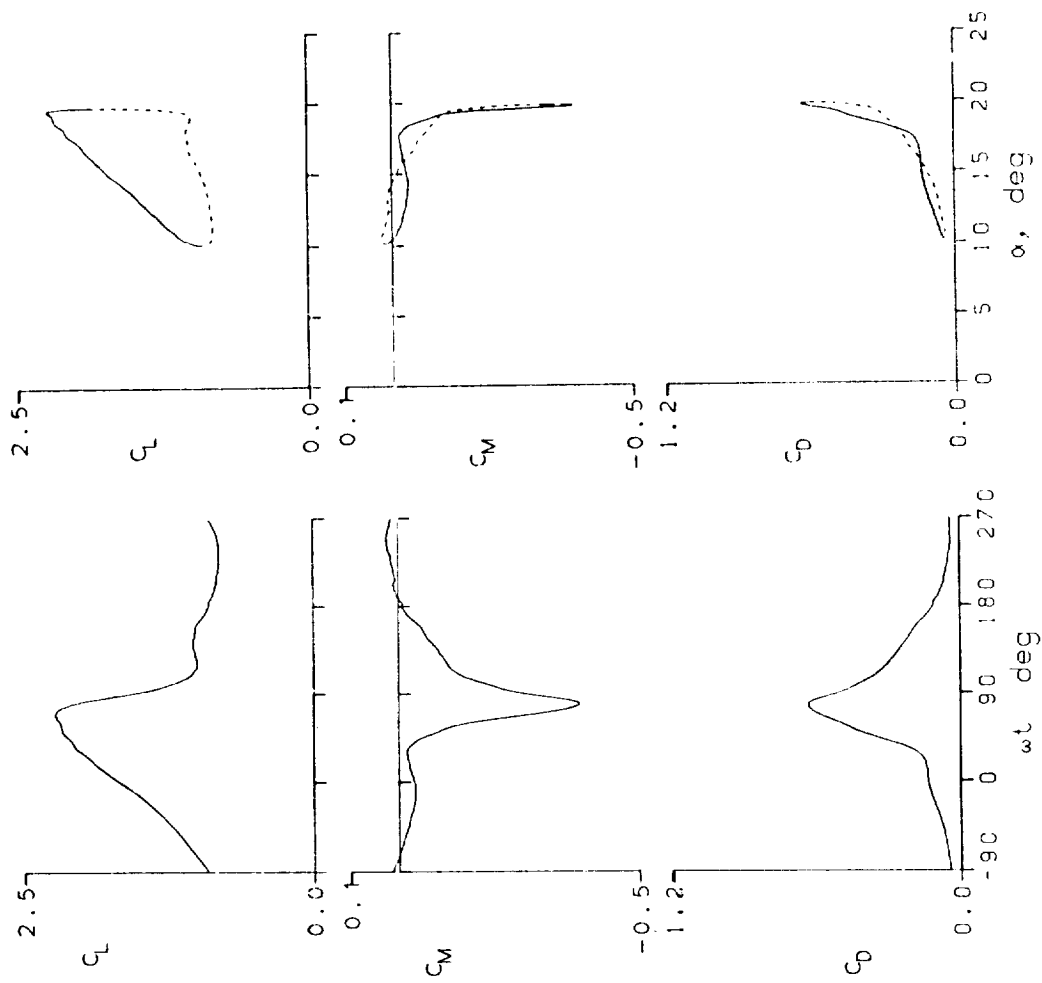


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 25214 A0 = 10.90° k = 0.049
 Re = 3.93 E6 A1 = 4.91° M = 0.302
 CLmax = 1.69 CMmin = -0.15 CDmax = 0.25
 αLmax = 15.3° ζ = -0.199 Mmax = 1.271
 αCMmin = 10.6° -CPmax = 9.4 αMmax = 15.4°

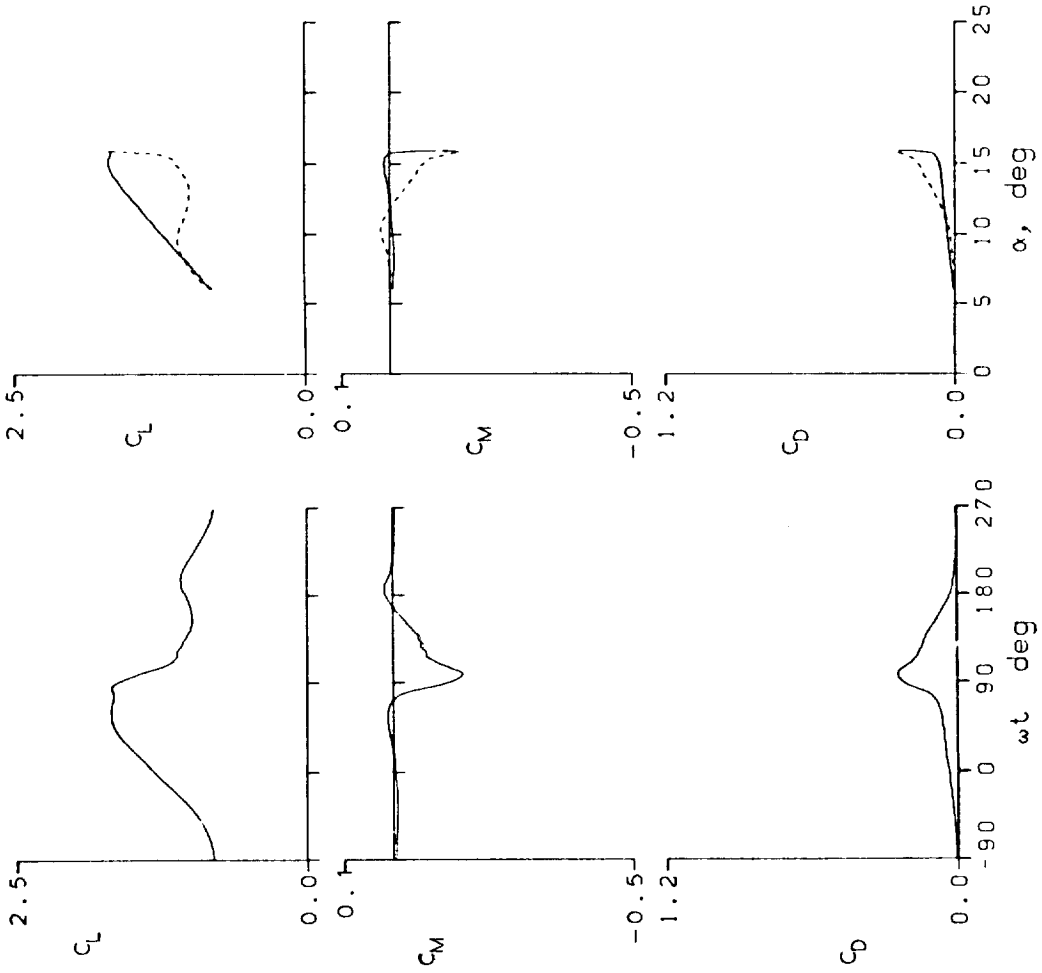


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25216 A0 = 10.91° k = 0.099
 Re = 3.91 E6 A1 = 4.90° M = 0.302
 CLmax = 1.76 CMmin = -0.09 CDmax = 0.19
 αLmax = 15.8° ζ = -0.007 Mmax = 1.316
 αCmin = 10.6° -CDmax = 9.8 αMmax = 15.7°

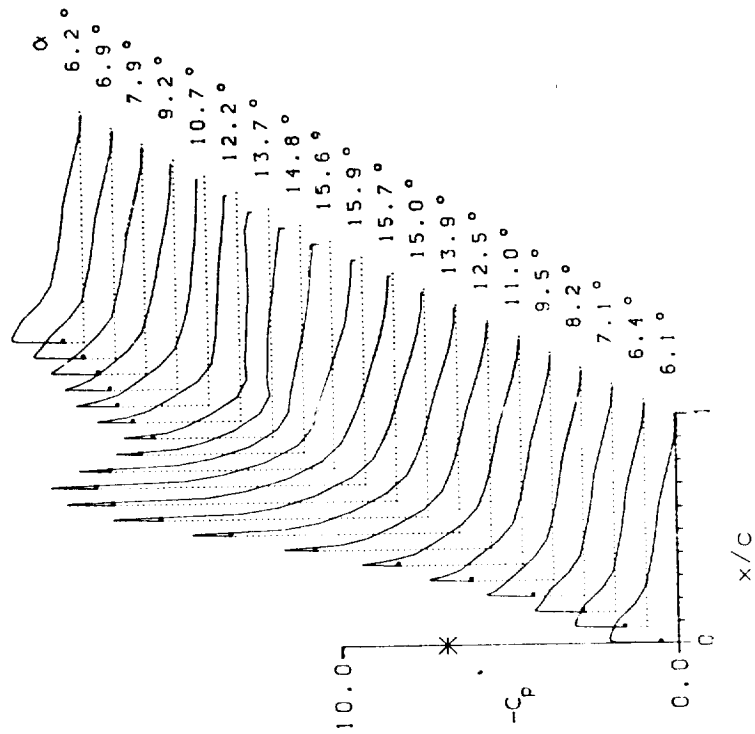
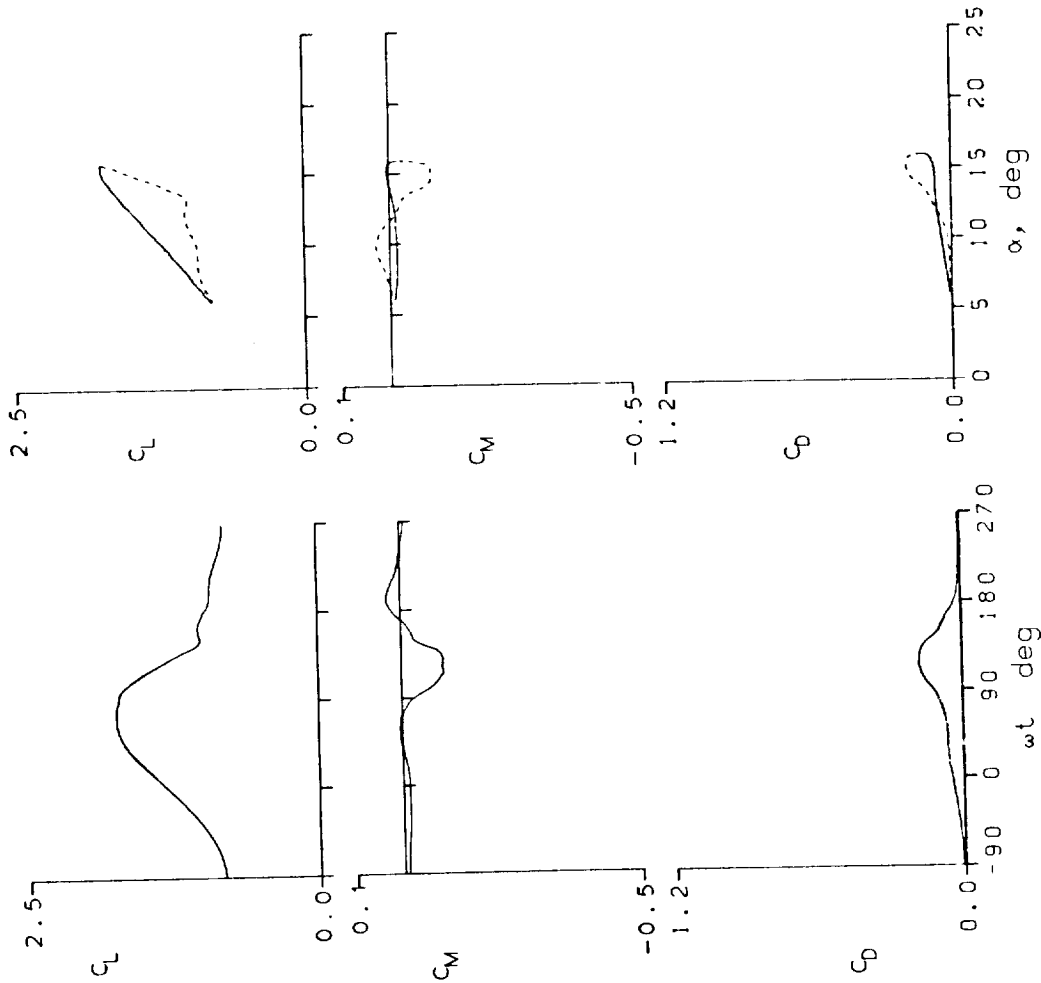


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 25301 A0 = 4.96 ° k = 0.098
 Re = 3.90 E6 A1 = 5.00 ° M = 0.302
 C_{Lmax} = 1.22 C_{Mmin} = -0.02 C_{Dmax} = 0.04
 α_{Lmax} = 9.9 ° ζ = 0.287 M_{max} = 0.779
 α_{Cmin} = 4.7 ° -C_{pmax} = 4.5 α_{Mmax} = 9.9 °

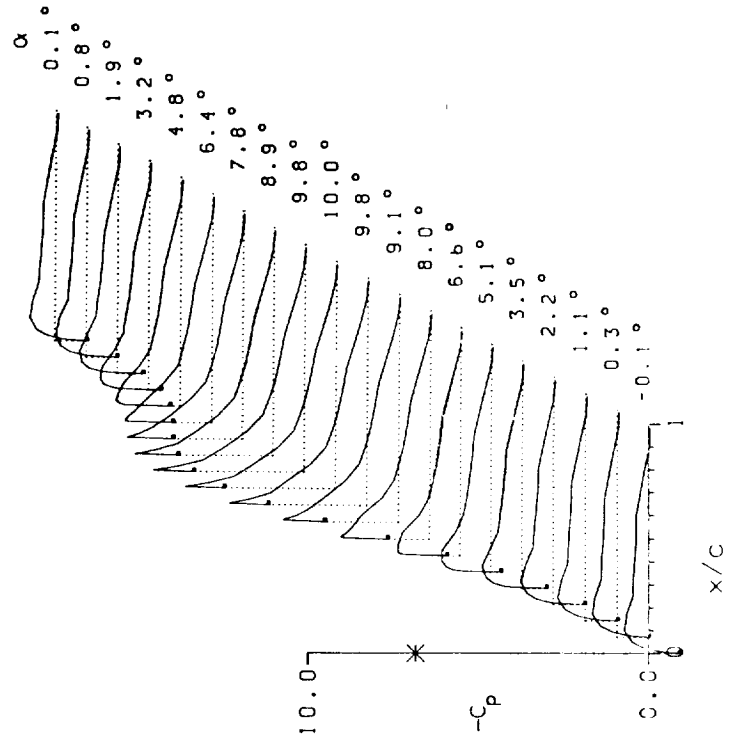
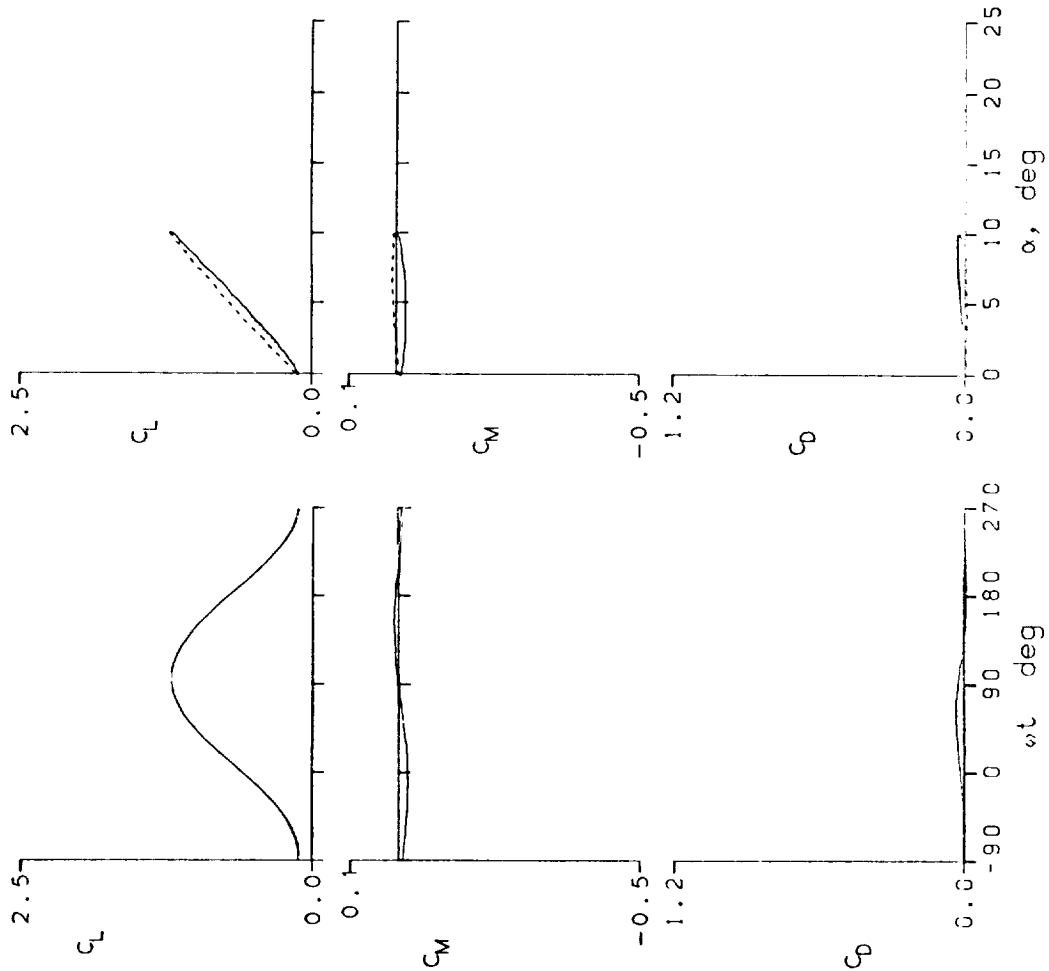


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25303 A0 = 4.97° k = 0.196
 Re = 3.88 E6 A1 = 5.00° M = 0.303
 CLmax = 1.25 CMmin = -0.04 CDmax = 0.05
 αLmax = 10.0° ζ = 0.680 Mmax = 0.805
 αCMmin = 4.8° -CPmax = 4.8 αMmax = 9.9°

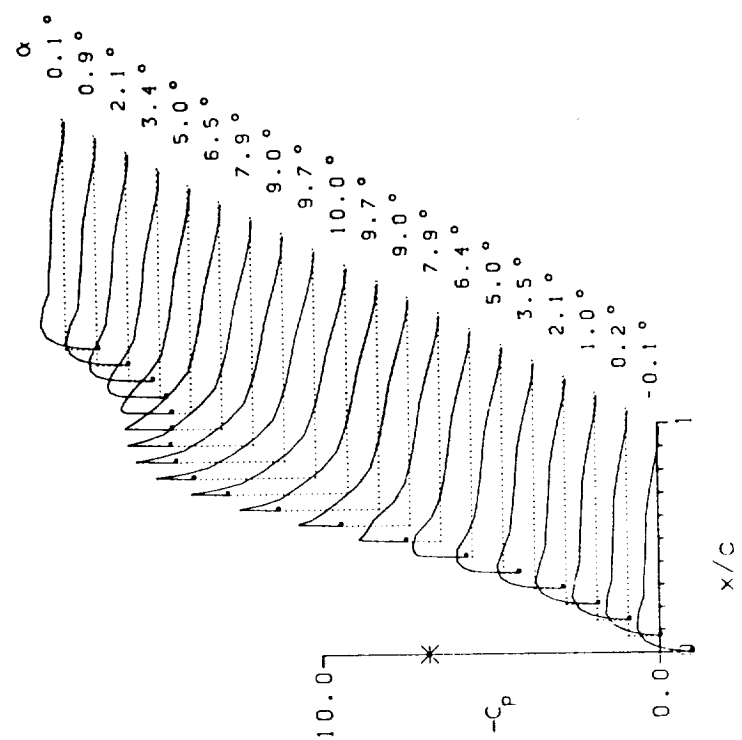
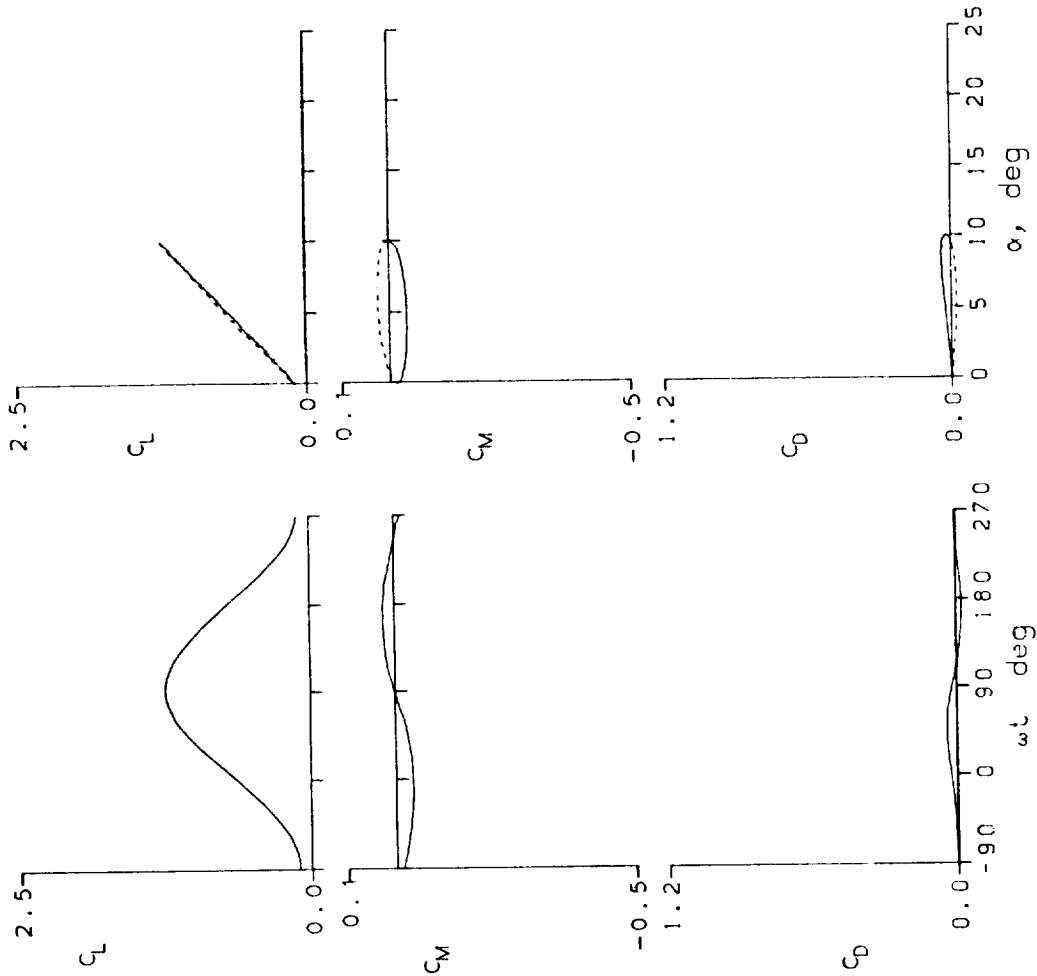


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 25311 A0 = 4.86° k = 0.098
 Re = 3.85 E6 A1 = 10.11° M = 0.302
 CLmax = 1.72 CMmin = -0.03 CDmax = 0.08
 α Lmax = 15.1° ζ = 0.297 Mmax = 1.291
 α Cmin = 4.4° -CPmax = 9.6 α Mmax = 15.0°

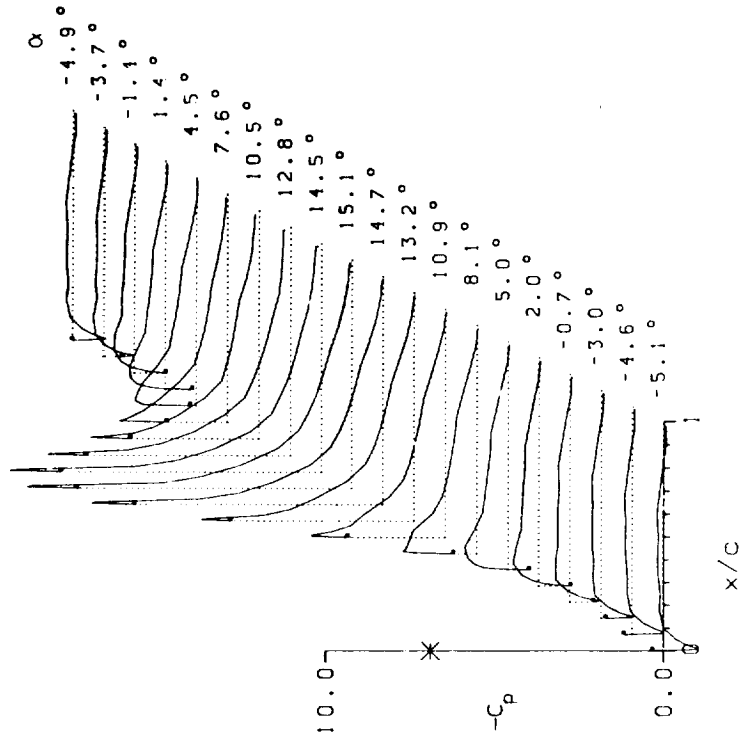
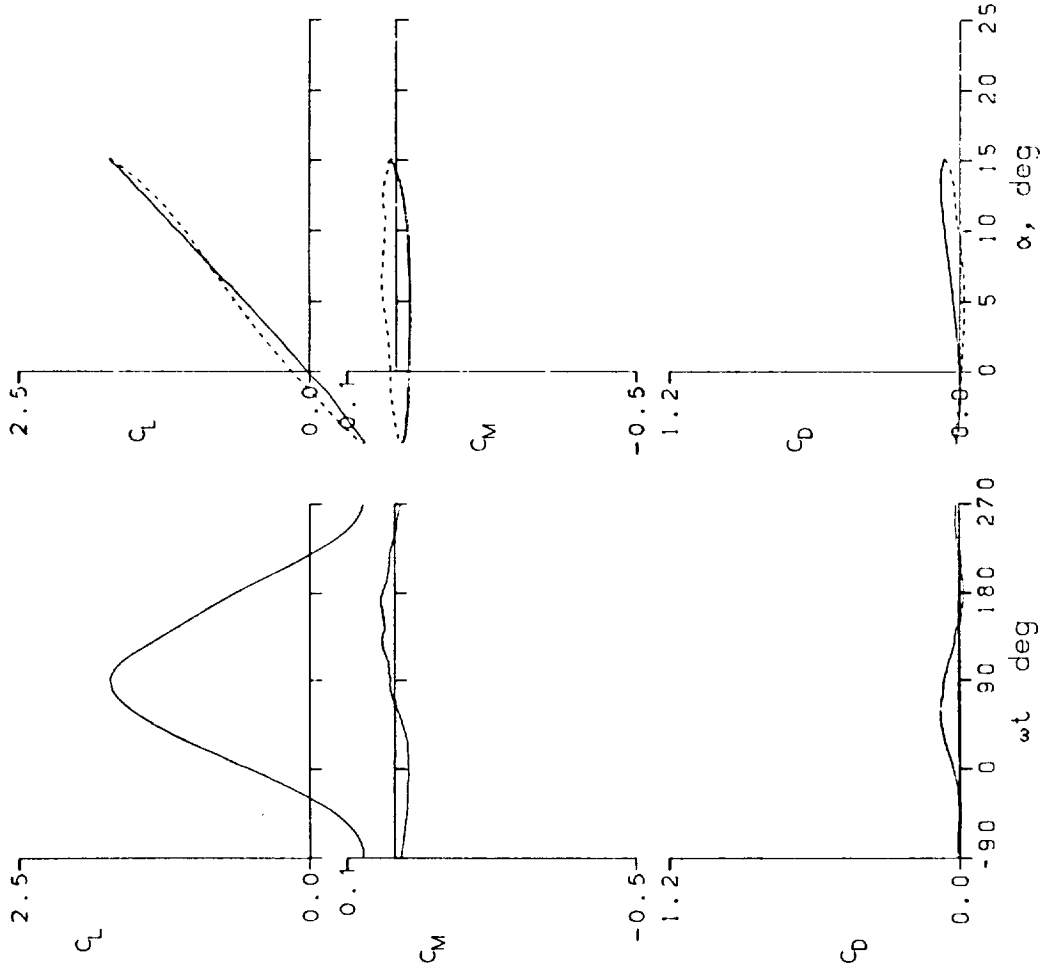


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 25319	A0 = 5.32°	k = 0.098
Re = 3.83 E6	A1 = 10.07°	M = 0.302
CLmax = 1.74	CMmin = -0.05	CDmax = 0.11
α Lmax = 15.6°	ζ = 0.216	Mmax = 1.303
α Cmin = 4.8°	-CPmax = 9.7	α Mmax = 15.6°

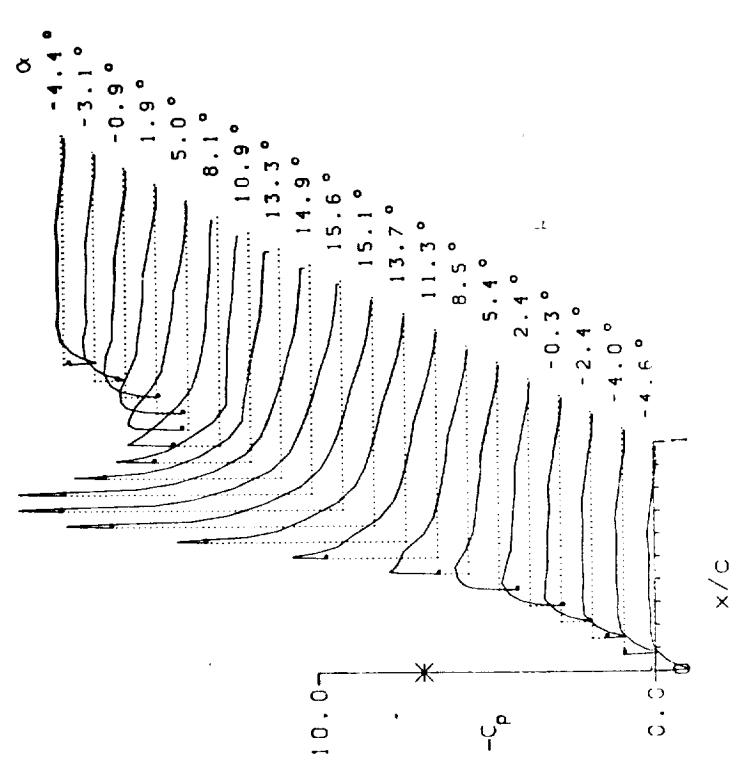
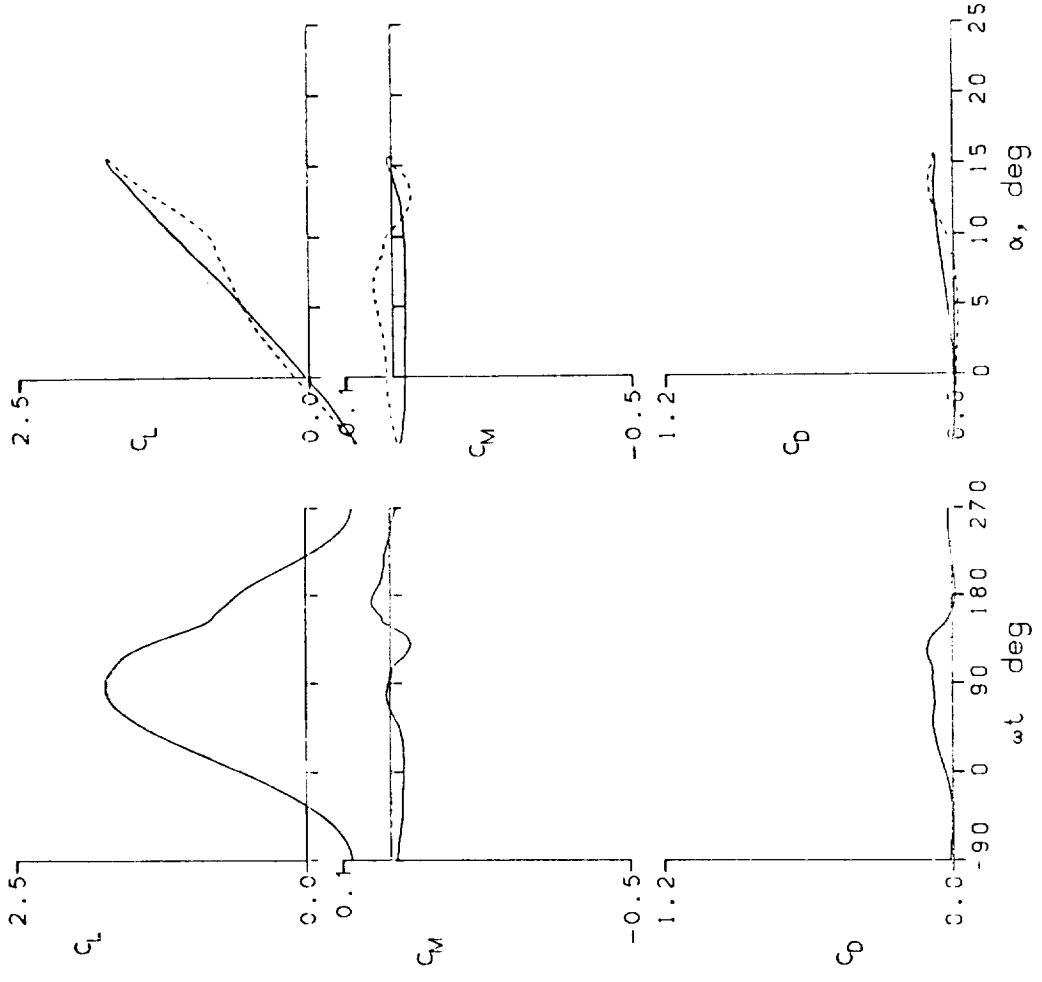


Figure 13.- Continued.

AMES-01 AIRFOIL TRIP

FRAME : 29023 A0 = 14.85° k = 0.025

Re = 3.70 E6 A1 = 9.90° M = 0.291

C_{Lmax} = 1.78 C_{Mmin} = -0.23 C_{Dmax} = 0.47

α_{Lmax} = 17.6° ξ = 0.081 M_{max} = 1.299

$\alpha_{C_{min}}$ = 14.5° $-C_{Pmax}$ = 10.4 α_{Mmax} = 16.6°

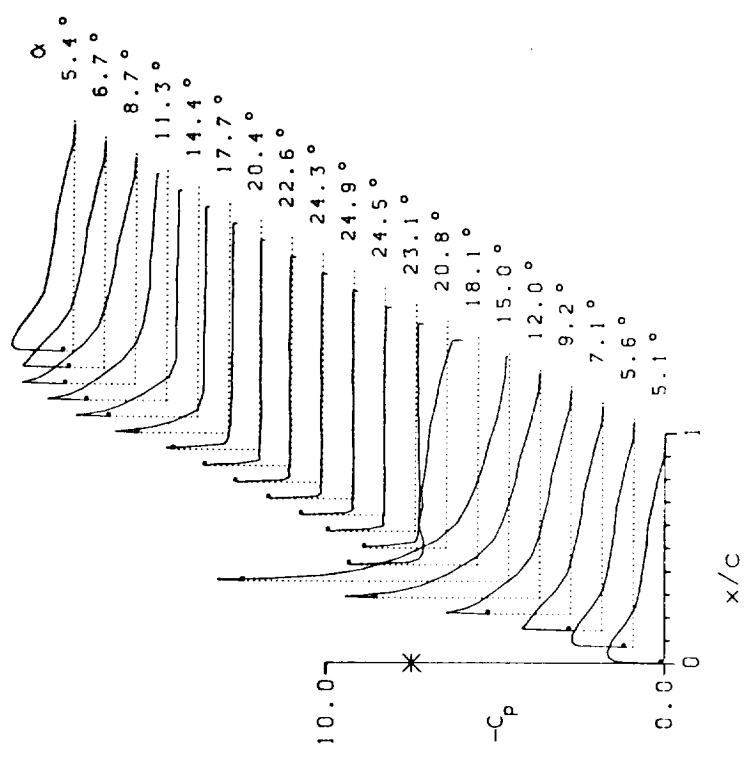
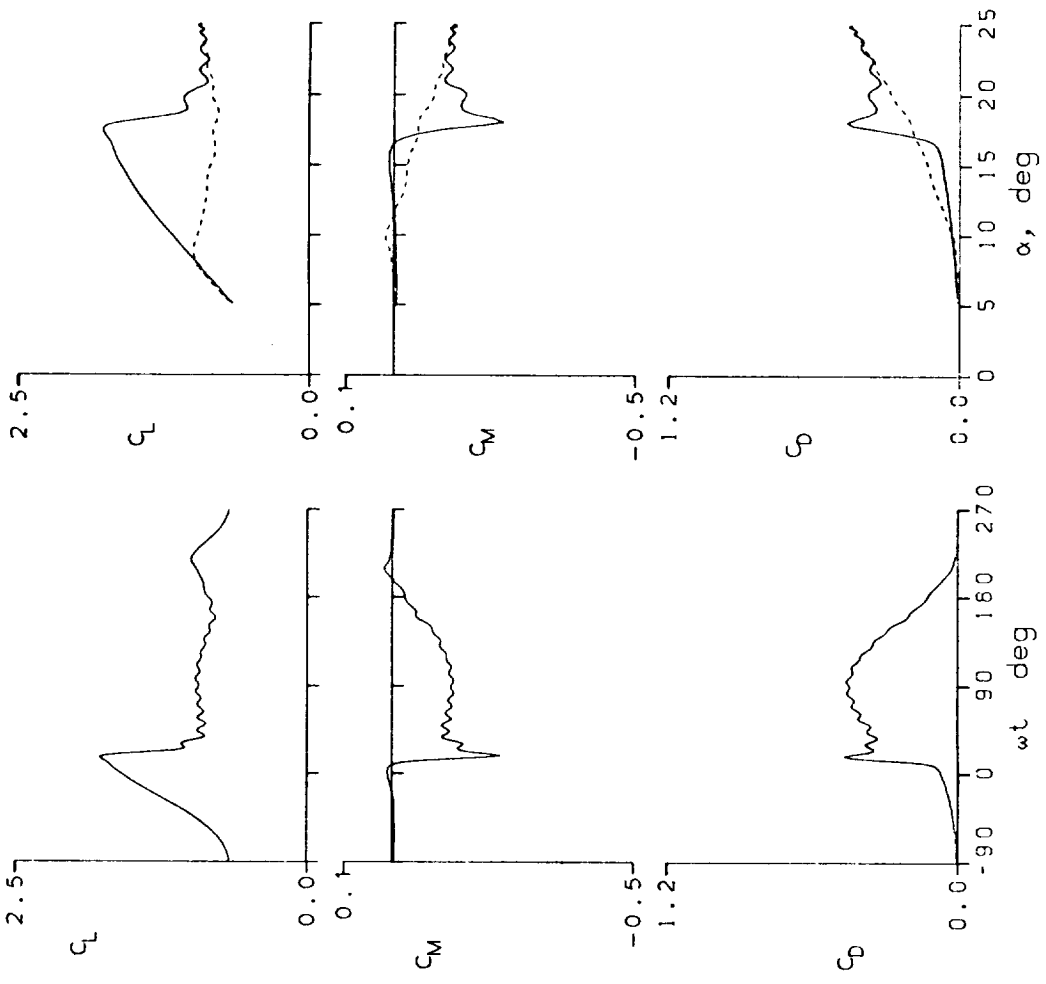


Figure 13.- Continued.

AMES-01 AIRFOIL TRIP

FRAME : 29101 A0 = 14.83° k = 0.050

Re = 3.64 E6 A1 = 9.90° M = 0.288

CLmax = 1.97 CMmin = -0.33 CDmax = 0.64

αLmax = 18.1° ζ = 0.307 Mmax = 1.355

αCmin = 14.4° -CPmax = 11.2 αMmax = 17.2°

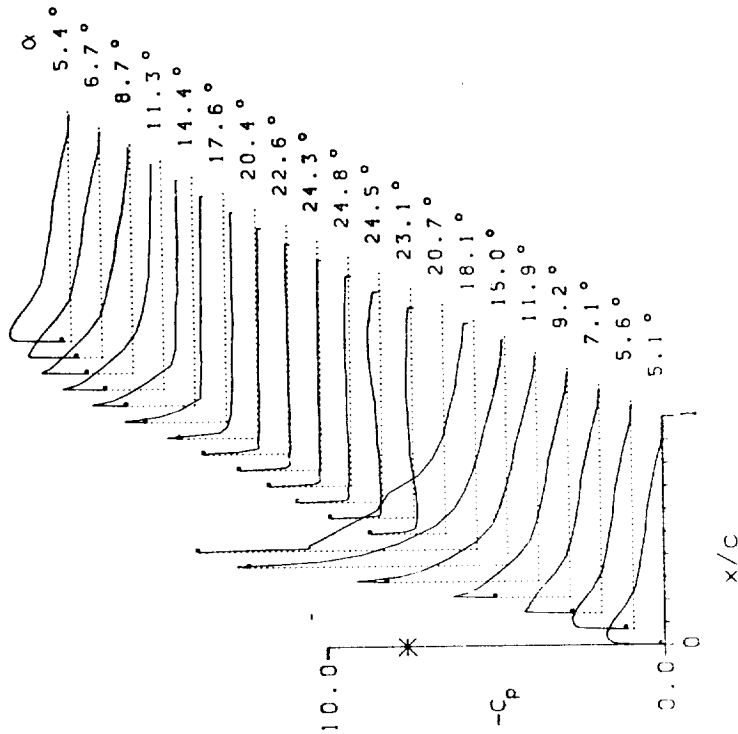
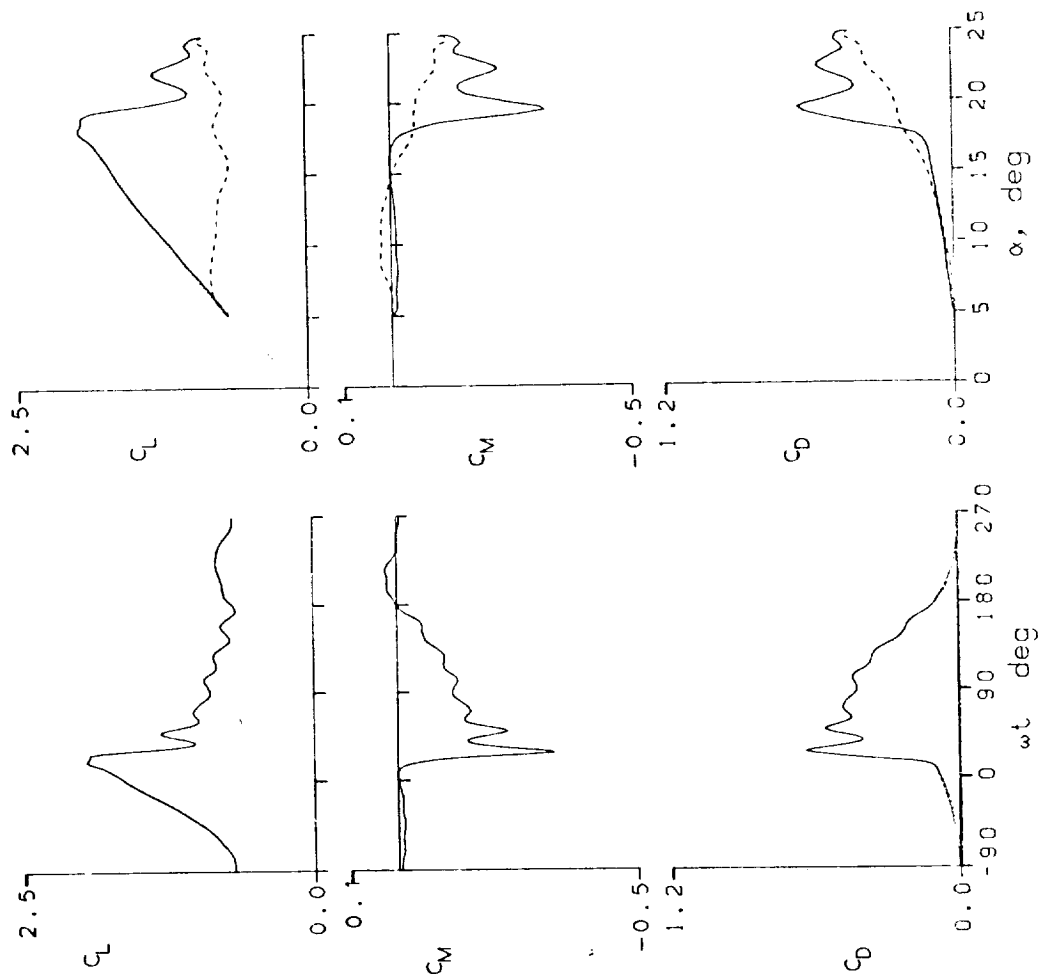


Figure 13.- Continued.

AMES-01 AIRFOIL TRIP

FRAME : 29115 A0 = 14.83° k = 0.049

Re = 2.42 E6 A1 = 9.90° M = 0.184

C_{Lmax} = 2.05 C_{Mmin} = -0.35 C_{Dmax} = 0.73

α_{Lmax} = 20.6° ζ = 0.258 M_{max} = 0.745

α_{Cmin} = 14.4° $-C_{pmax}$ = 12.3 α_{Mmax} = 18.9°

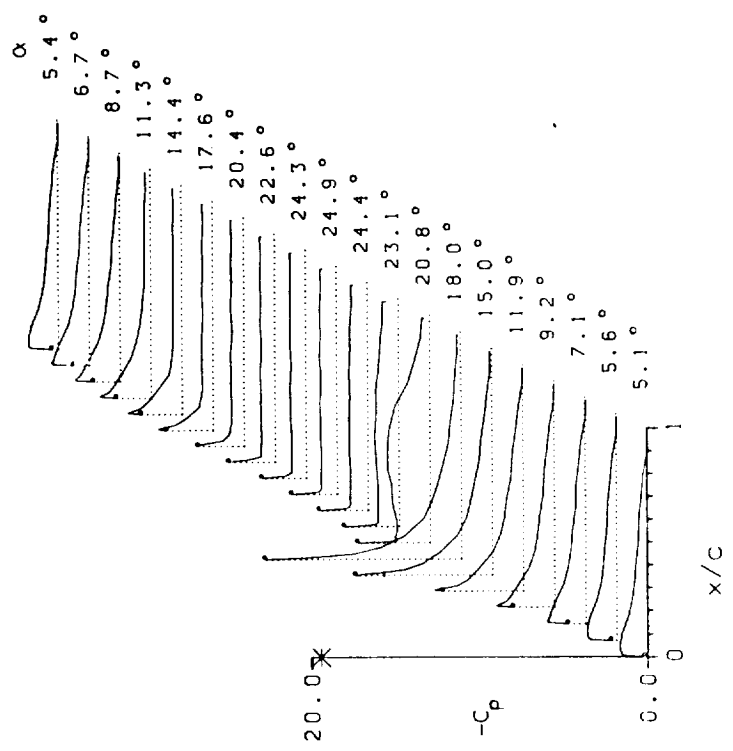
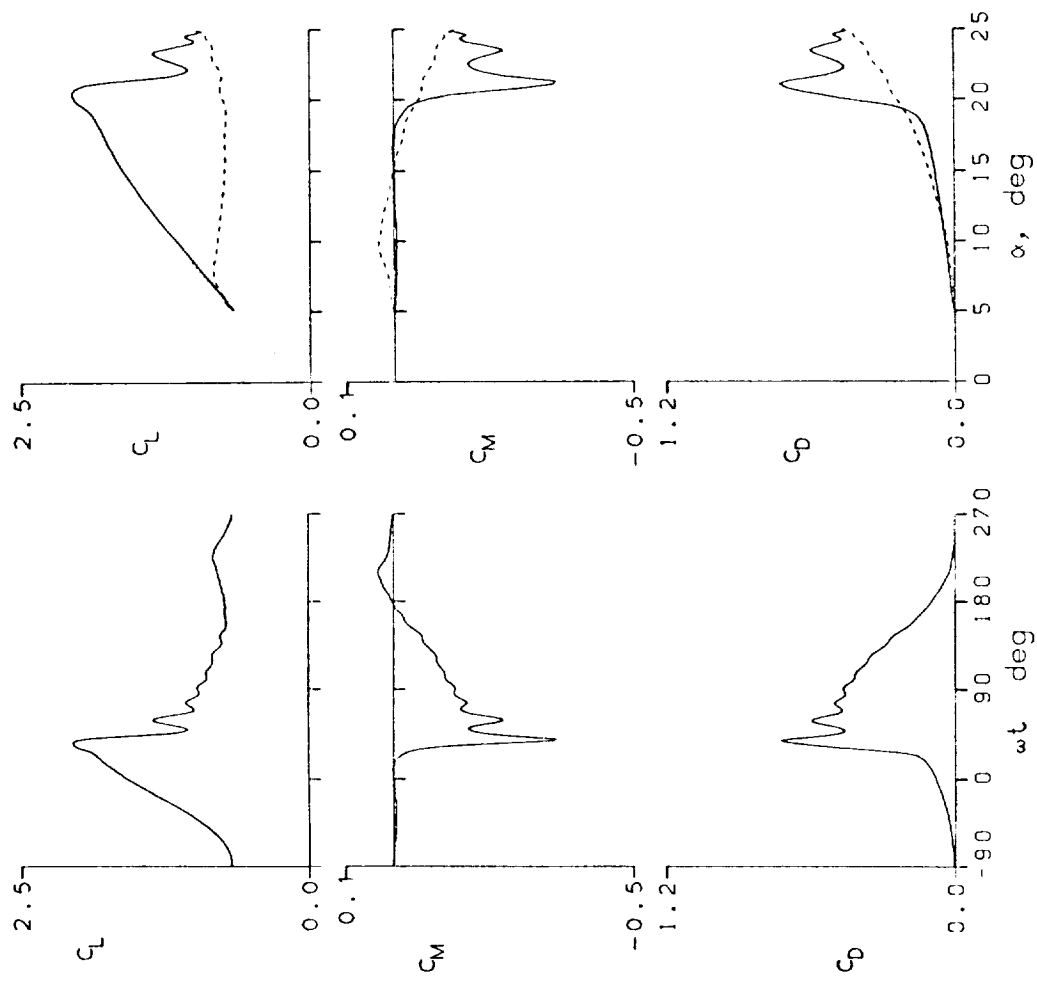


Figure 13.- Continued.

AMES-01 AIRFOIL TRIP

FRAME : 29117 A0 = 14.81° k = 0.099

Re = 2.42 E6 A1 = 9.91° M = 0.184

CLmax = 2.32 CMmin = -0.40 CDmax = 0.91

α Lmax = 22.0° ξ = 0.292 Mmax = 0.823

α Cmin = 14.4° -CPmax = 14.5 α Mmax = 20.6°

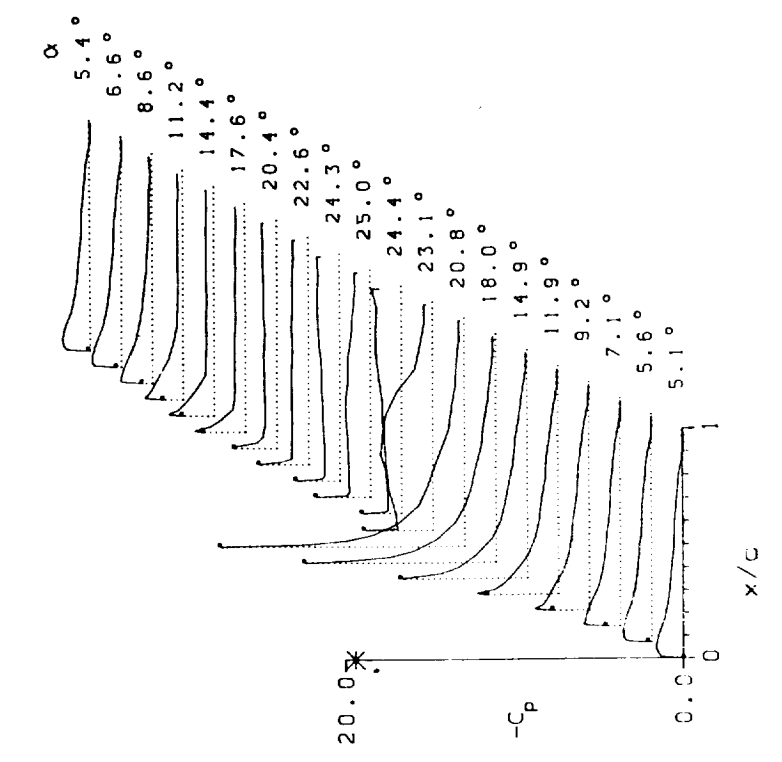
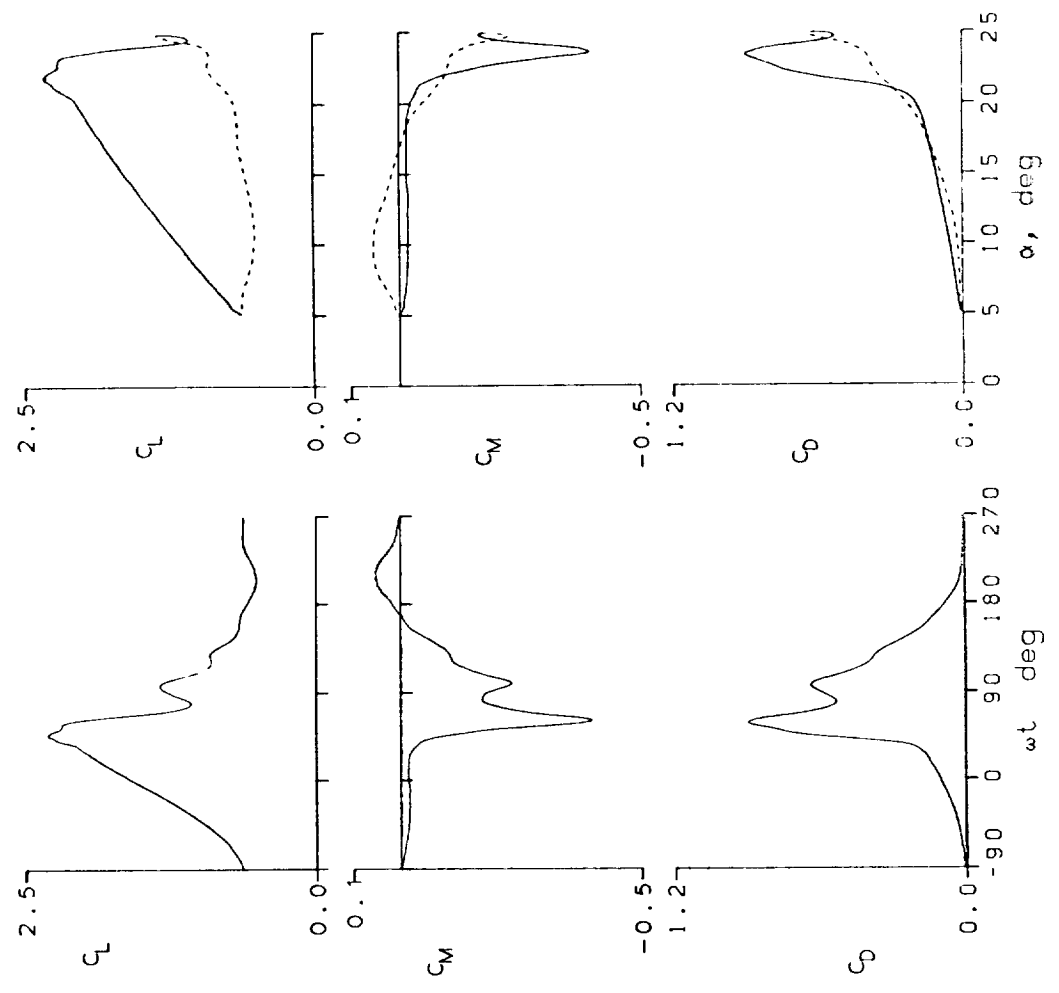


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 29205 A0 = 4.88° k = 0.010
 Re = 3.95 E6 A1 = 10.05° M = 0.301
 CLmax = 1.61 CMmin = -0.03 CDmax = 0.10
 αLmax = 14.7° ζ = -0.003 Mmax = 1.192
 αCMmin = 4.4° -CPmax = 8.8 αMmax = 14.9°

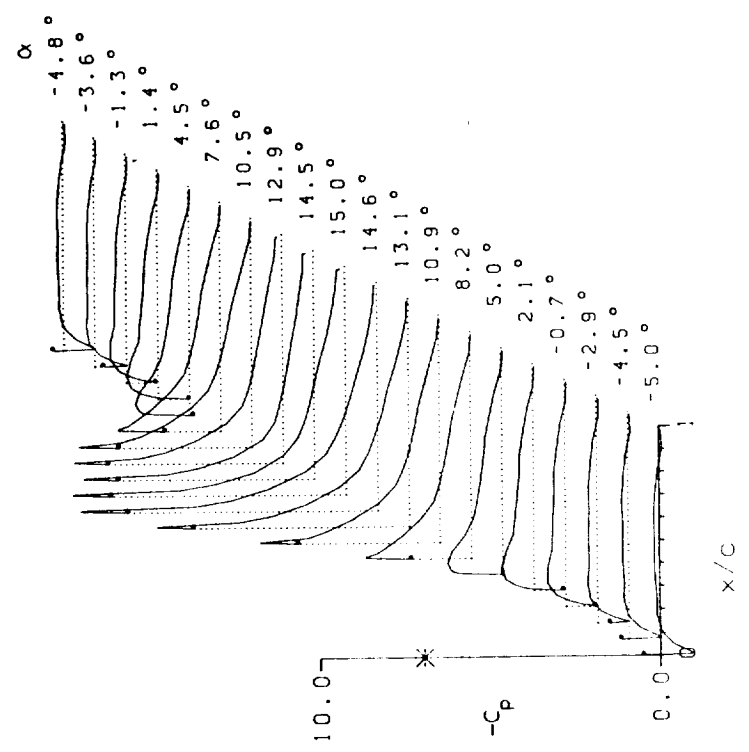
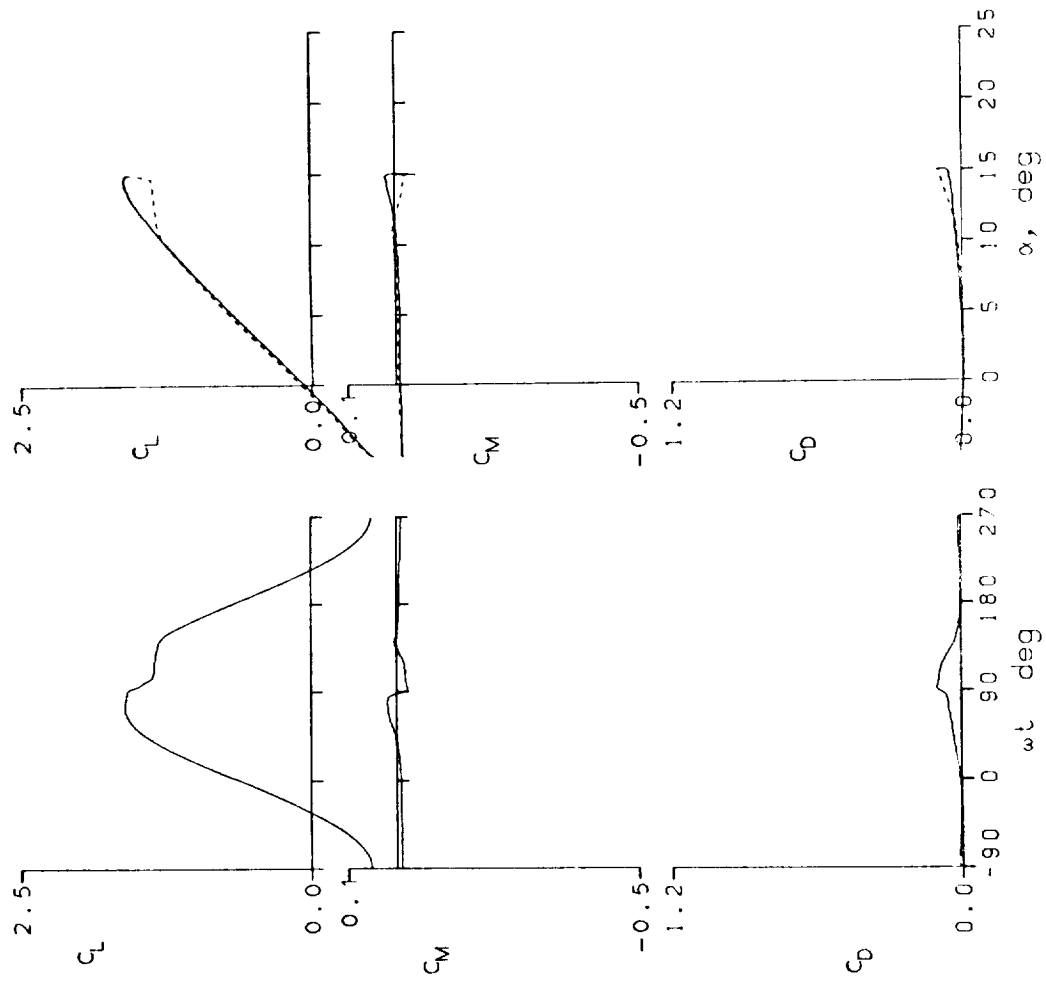


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 29207 A0 = 4.80° k = 0.050
 Re = 3.92 E6 A1 = 10.08° M = 0.301
 CLmax = 1.69 CMmin = -0.03 CDmax = 0.09
 αLmax = 14.8° ζ = 0.103 Mmax = 1.252
 αCmin = 4.3° -CPmax = 9.3 αMmax = 14.9°

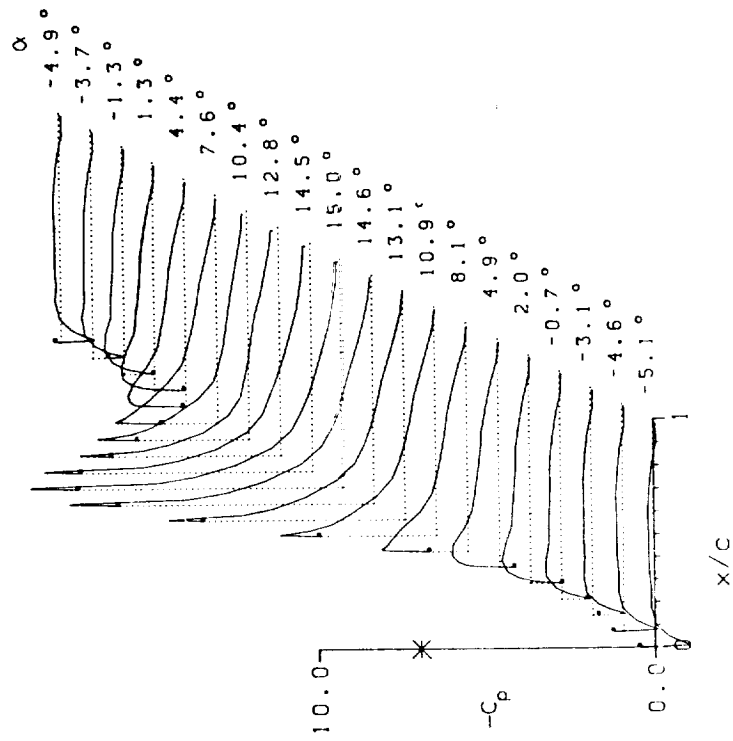
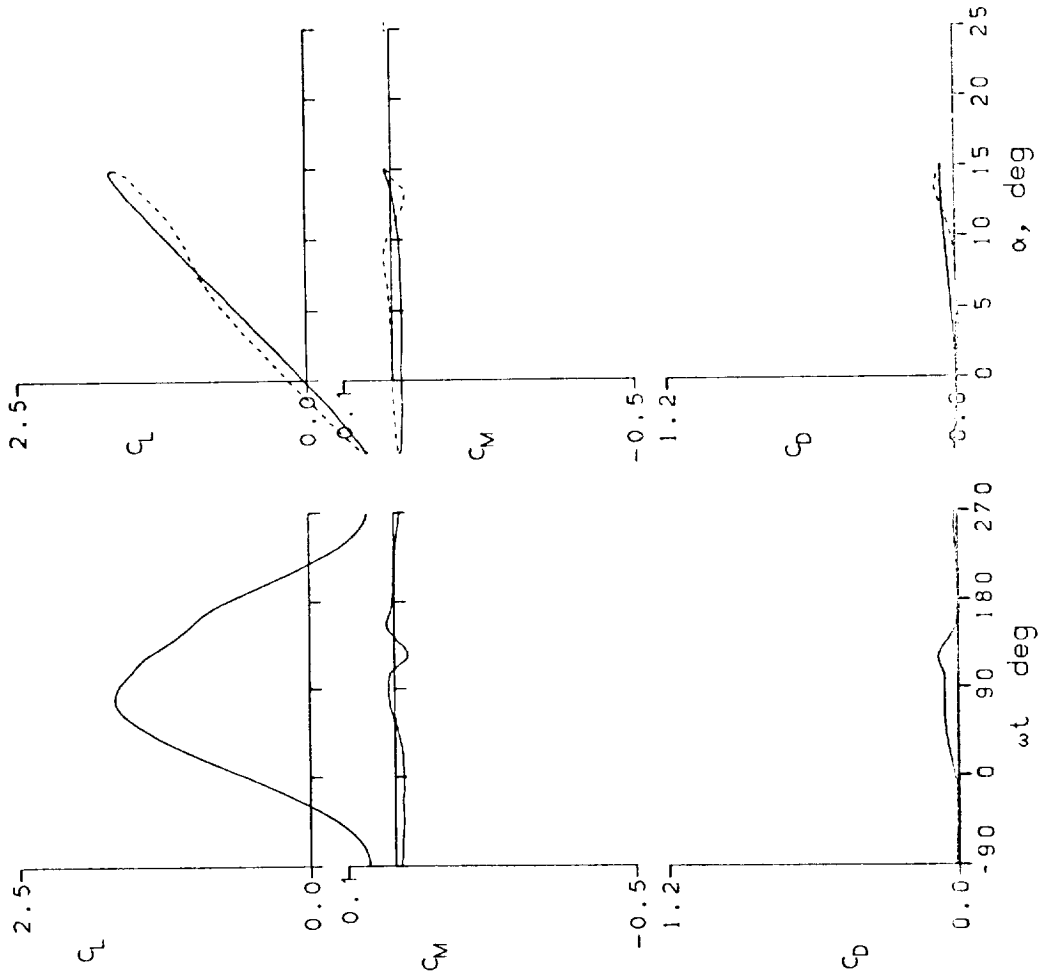


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 29211	A0 = 4.85°	k = 0.099
Re = 3.90 E6	A1 = 10.06°	M = 0.301
$C_{Lmax} = 1.71$	$C_{Mmin} = -0.03$	$C_{Dmax} = 0.08$
$\alpha_{Lmax} = 15.0^\circ$	$\xi = 0.317$	$M_{max} = 1.281$
$\alpha_{Cmin} = 4.3^\circ$	$-C_{pmax} = 9.6$	$\alpha_{Mmax} = 15.0^\circ$

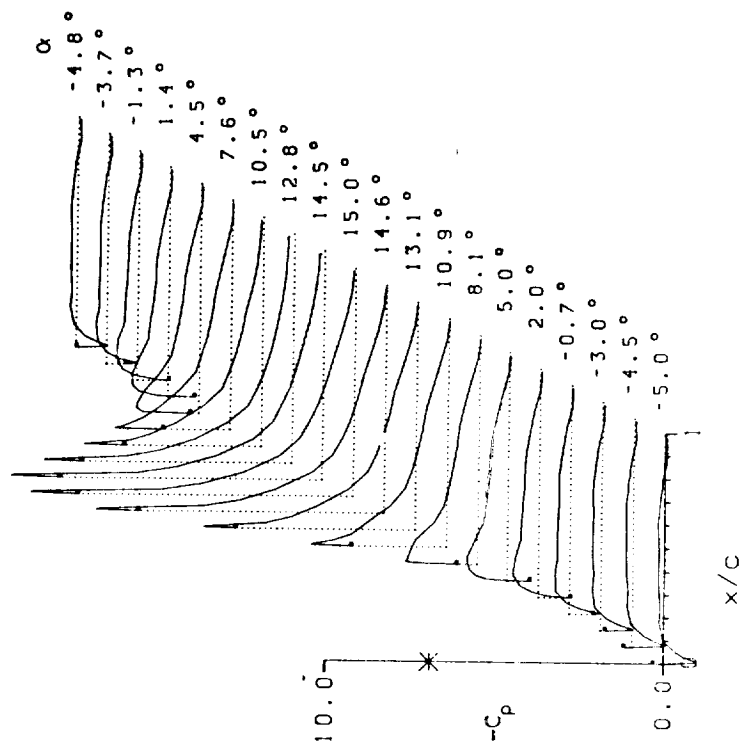
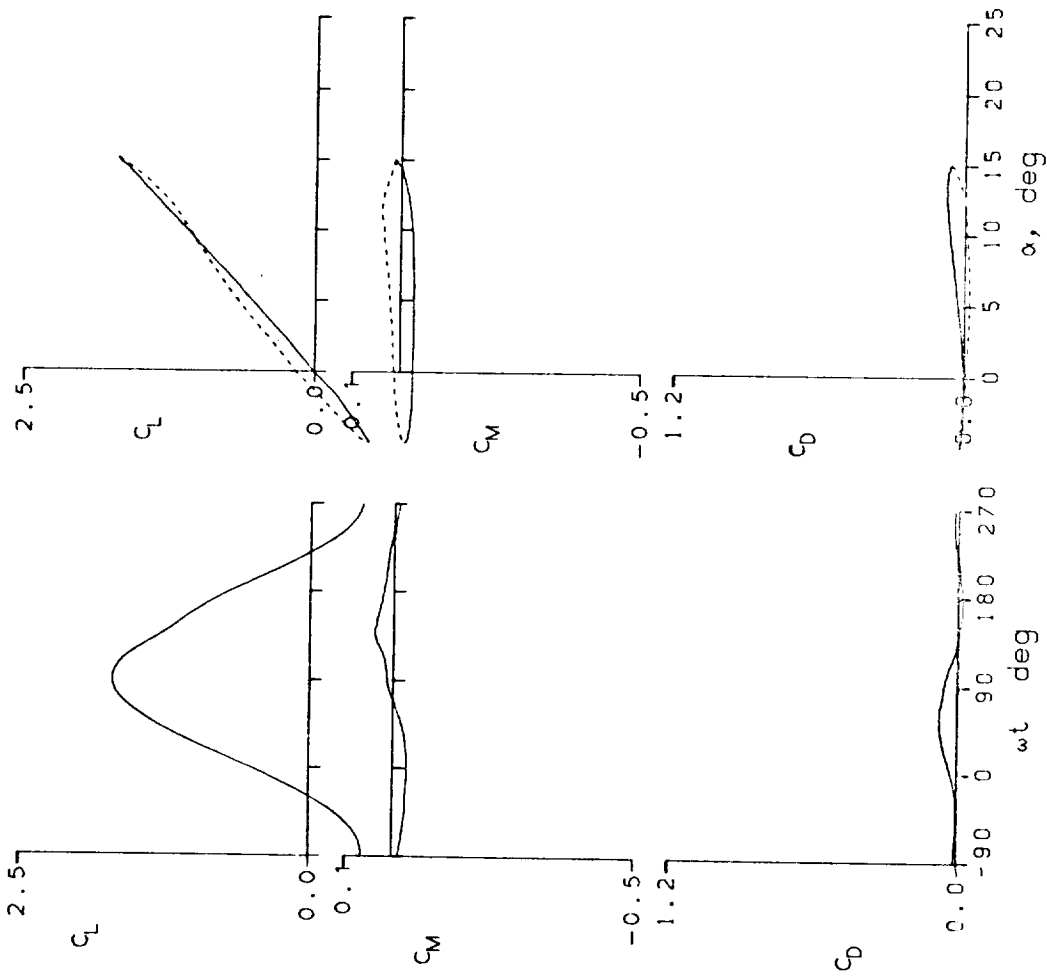


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 29213 A0 = 4.80° k = 0.148
 Re = 3.90 E6 A1 = 10.06° M = 0.301
 CLmax = 1.74 CMmin = -0.05 CDmax = 0.10
 αLmax = 14.9° ζ = 0.473 Mmax = 1.317
 αCMmin = 4.4° -CPmax = 9.9 αMmax = 14.7°

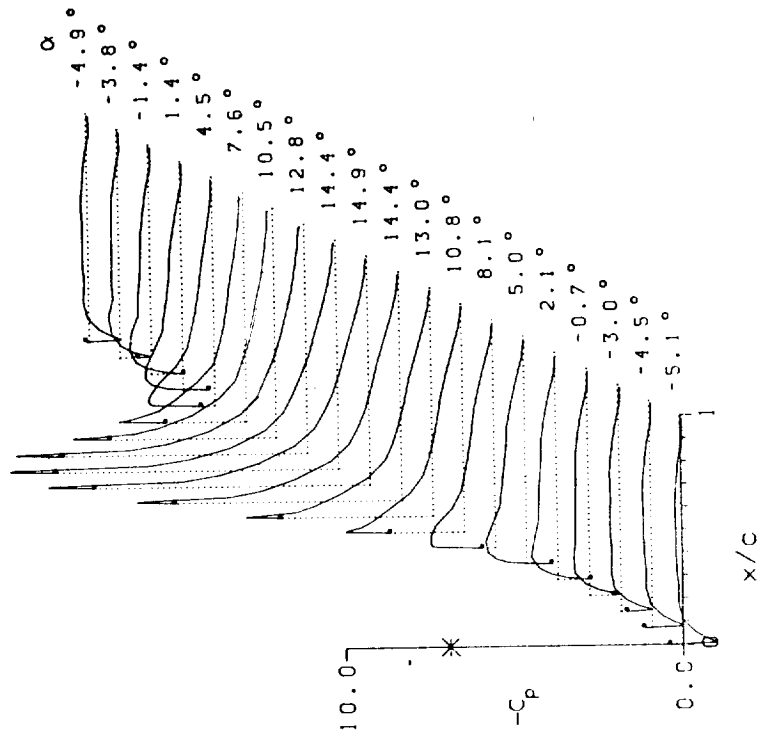
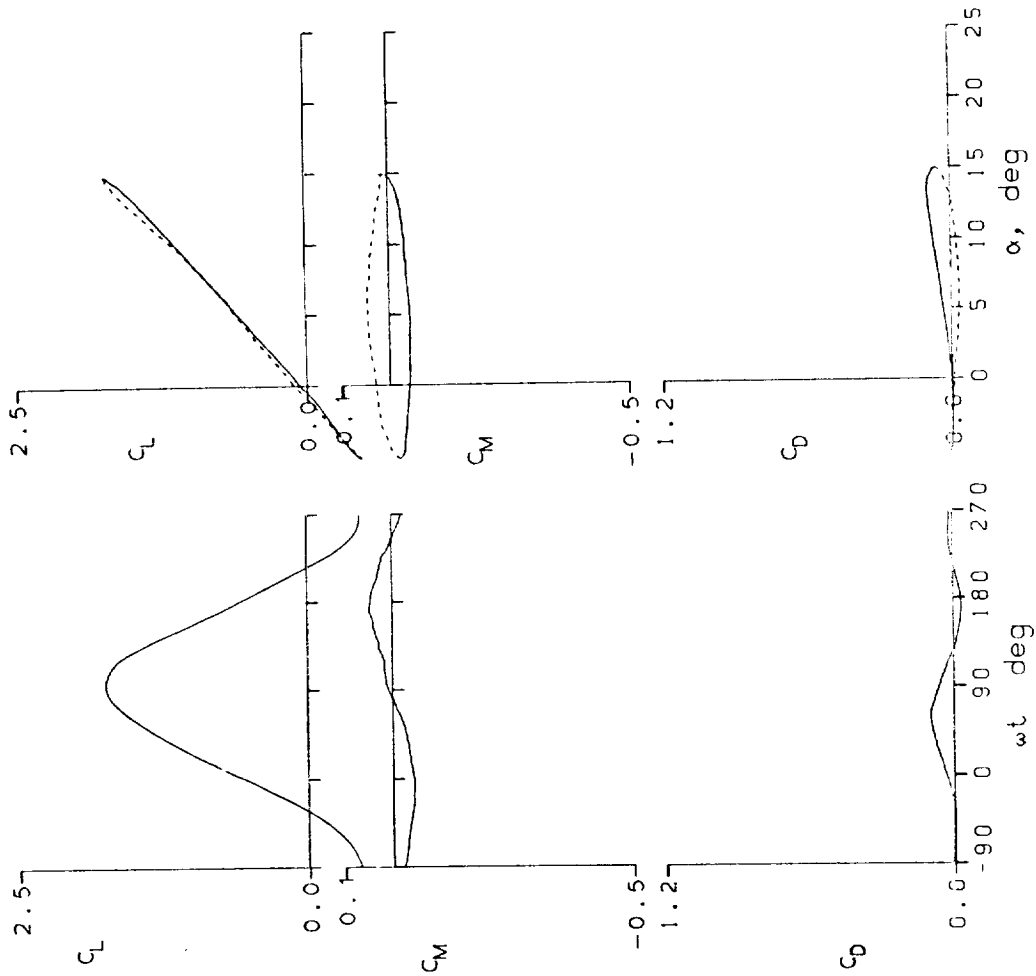


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 29215 A0 = 4.79° k = 0.148
 Re = 3.89 E6 A1 = 10.06° M = 0.301
 CLmax = 1.74 CMmin = -0.05 CDmax = 0.10
 αLmax = 14.9° ζ = 0.471 Mmax = 1.317
 αCMmin = 4.4° -CPmax = 9.9 αMmax = 14.7°

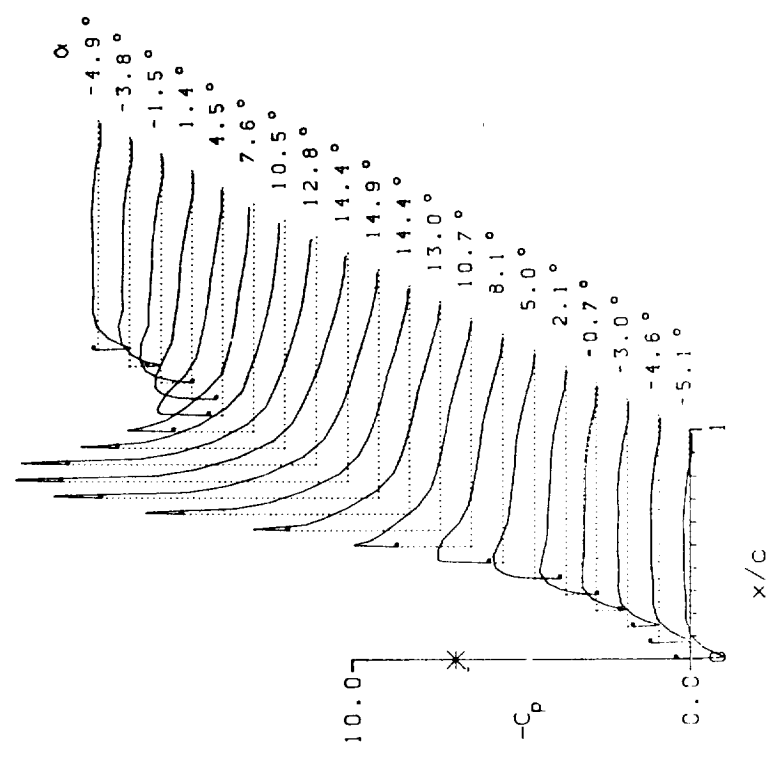
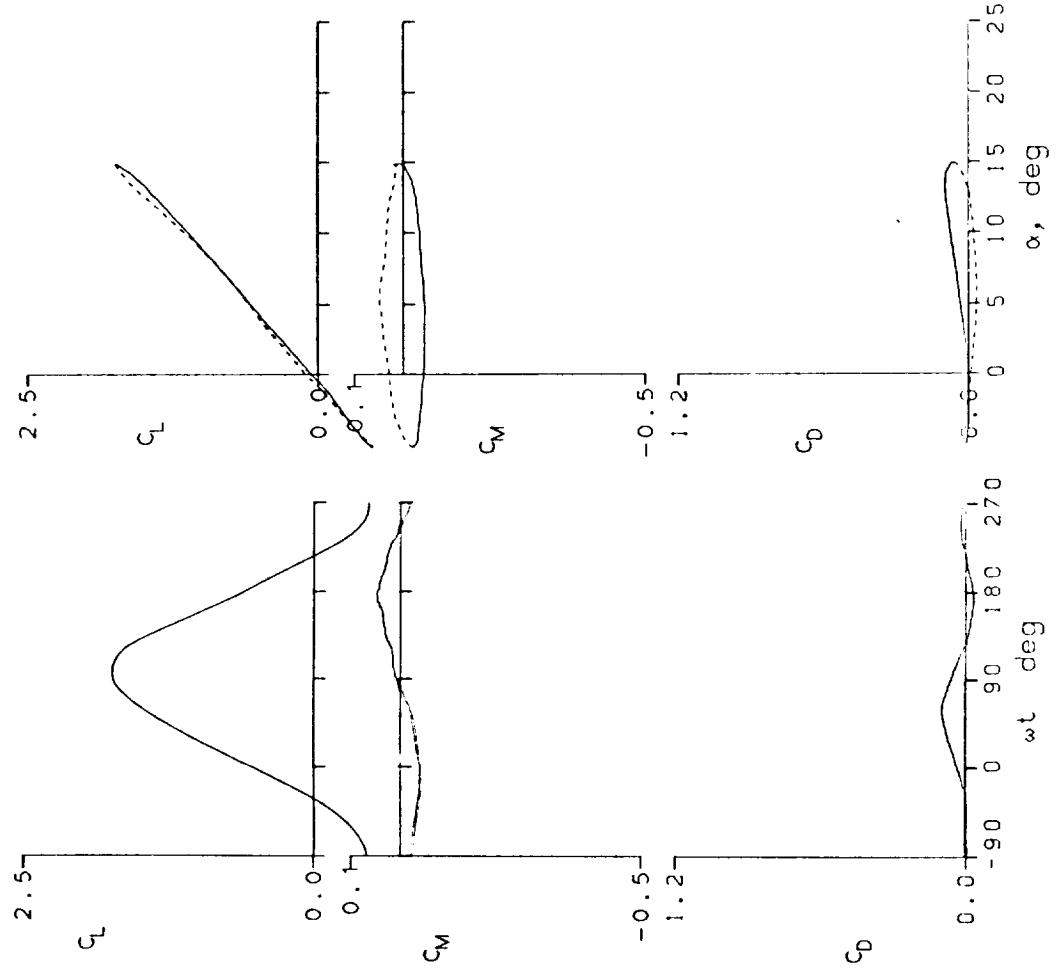


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 29223 A0 = 13.47° k = 0.196
 Re = 3.81 E6 A1 = 2.01° M = 0.301
 CLmax = 1.72 CMmin = -0.05 CDmax = 0.12
 αLmax = 15.5° ζ = -1.040 Mmax = 1.290
 αCmin = 13.4° -CPmax = 9.7 αMmax = 15.5°

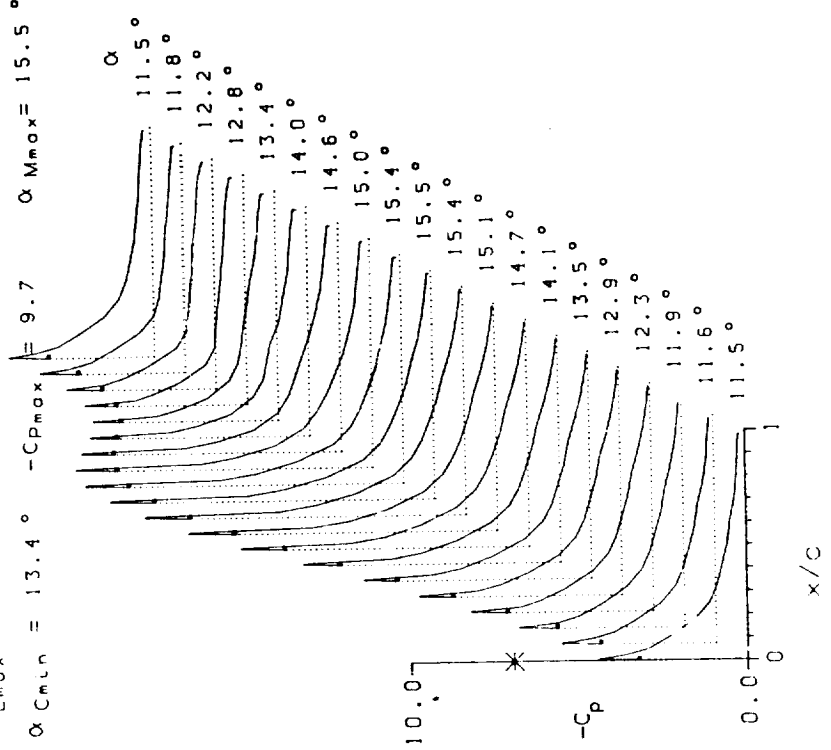
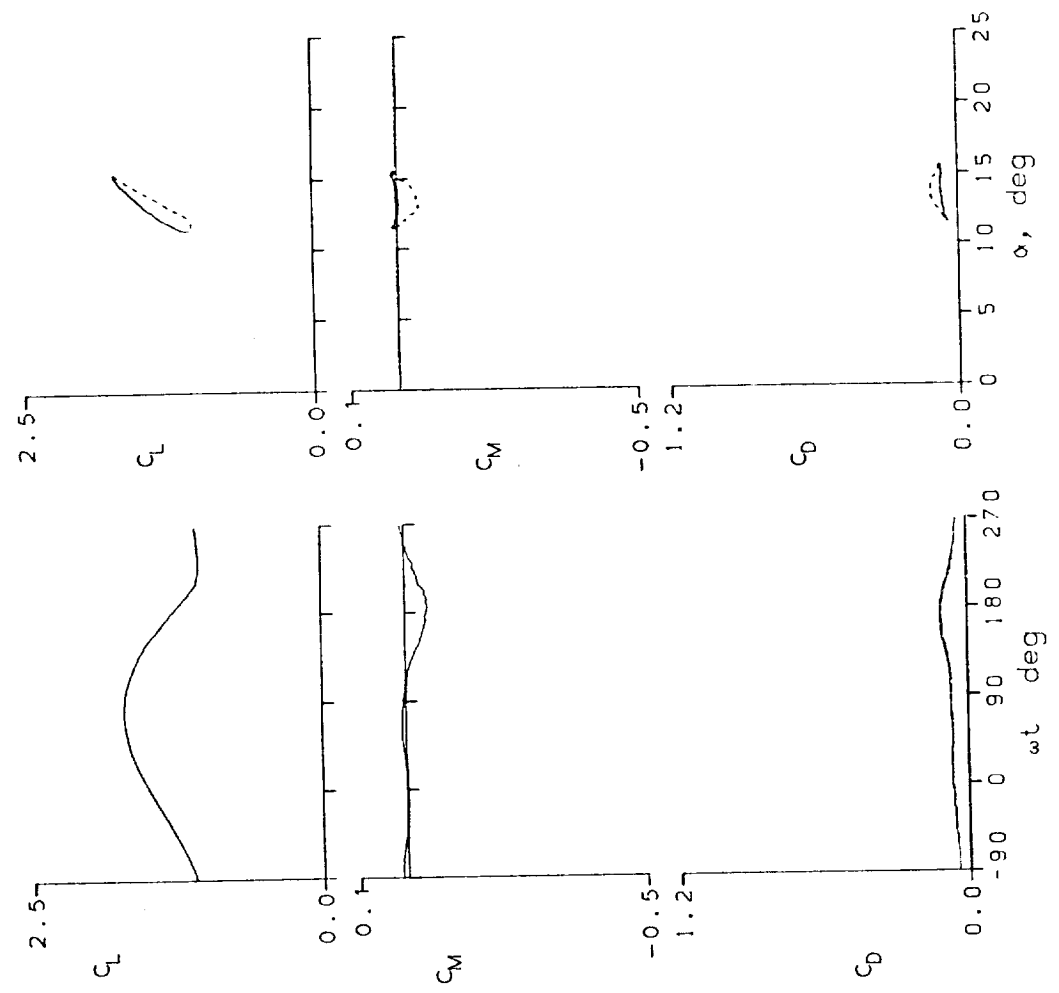
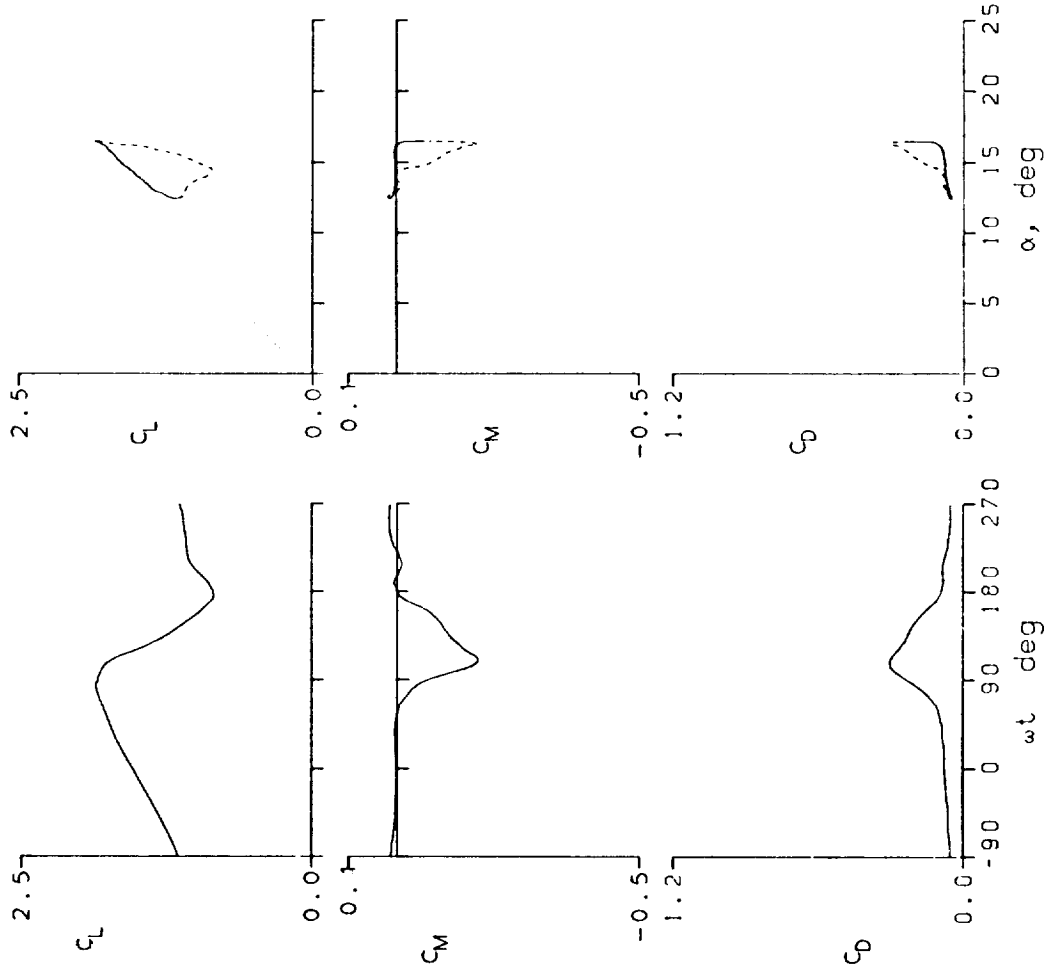


Figure 13.- Continued.



AMES-01 AIRFOIL
 FRAME : 29304 $A_0 = 14.41^\circ$ $k = 0.197$
 $Re = 3.78 E6$ $A_1 = 2.01^\circ$ $M = 0.300$
 $C_{Lmax} = 1.86$ $C_{Mmin} = -0.17$ $C_{Dmax} = 0.31$
 $\alpha_{Lmax} = 16.5^\circ$ $\xi = -1.836$ $M_{max} = 1.305$
 $\alpha_{Cmin} = 14.3^\circ$ $-C_{Pmax} = 9.9$ $\alpha_{Mmax} = 16.2^\circ$

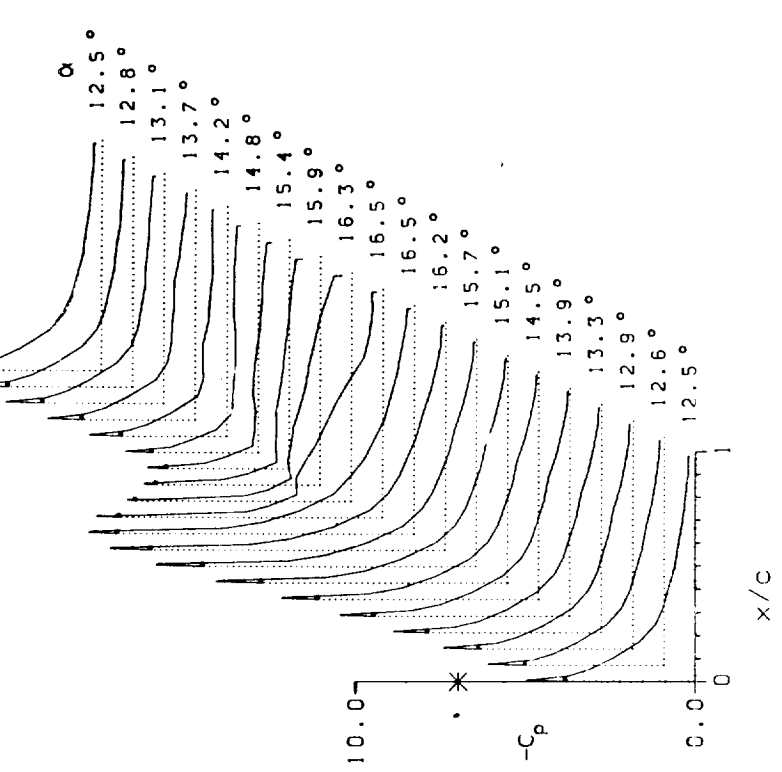


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 29309	A0 = 16.52 °	k = 0.199
Re = 3.72 E6	A1 = 1.98 °	M = 0.296
CLmax = 1.67	CMmin = -0.19	CDmax = 0.35
α Lmax = 17.9 °	ζ = 1.447	Mmax = 1.010
α Cmin = 16.5 °	-CPmax = 7.3	α Mmax = 17.6 °

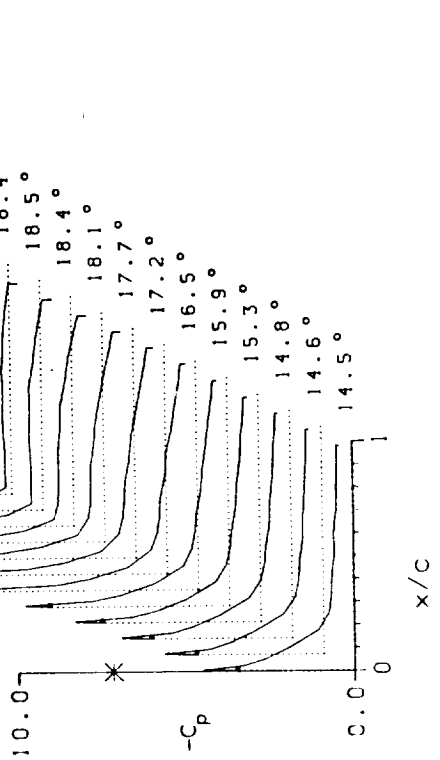
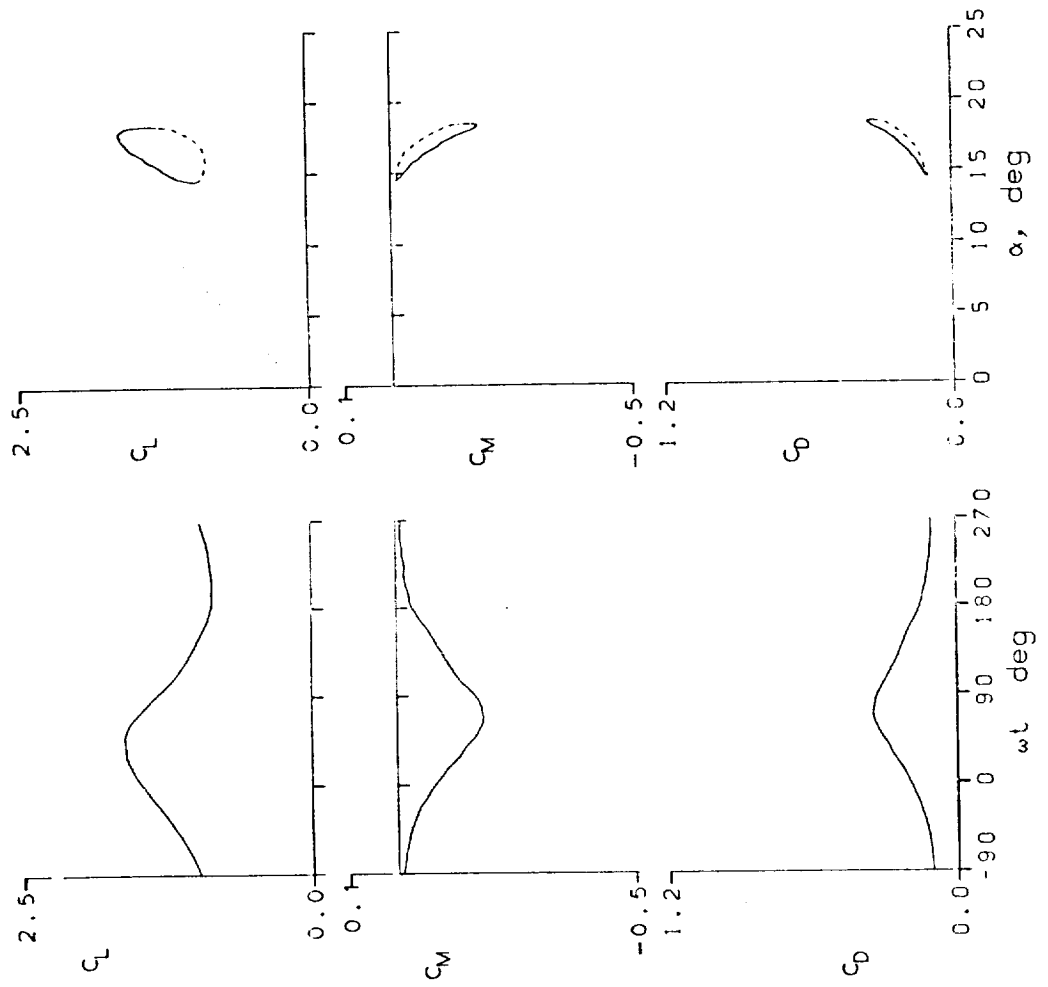
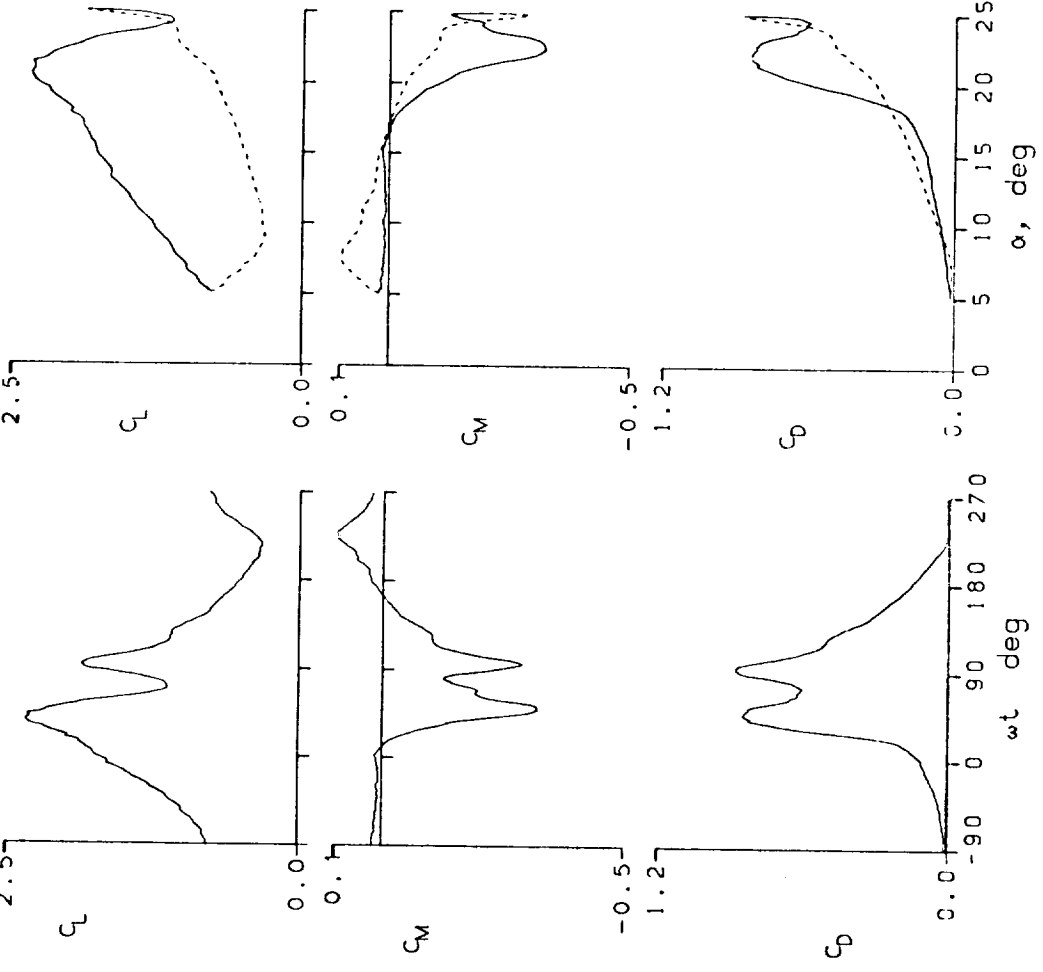


Figure 13.- Continued.



AMES-01 AIRFOIL

FRAME : 29317 A0 = 14.81° k = 0.102
 Re = 0.47 E6 A1 = 9.91° M = 0.035
 CLmax = 2.34 CMmin = -0.33 CDmax = 0.88
 αLmax = 20.5° ζ = 0.405 Mmax = 0.120
 αCmin = 14.4° -CDmax = 10.7 αMmax = 17.8°

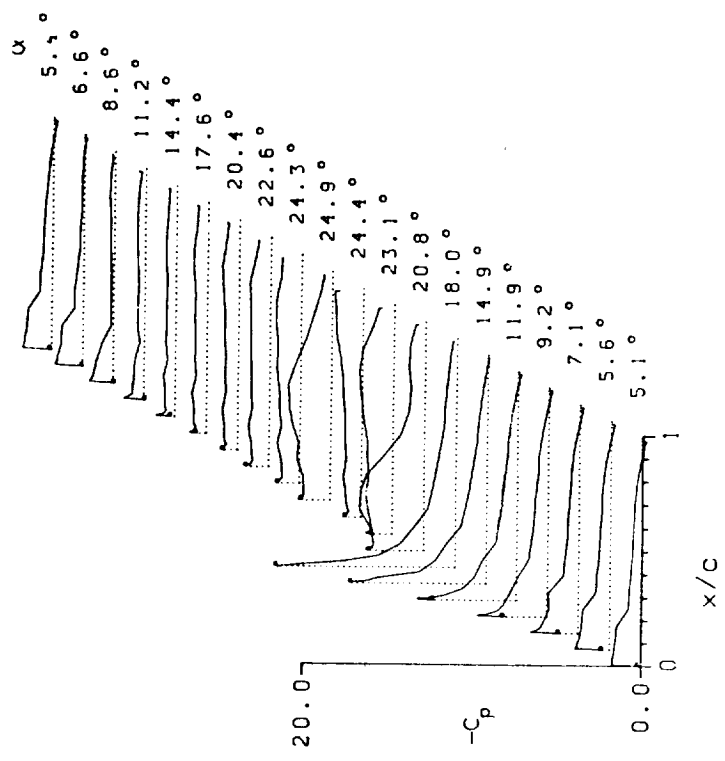


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 30019 A0 = 14.93° k = 0.010
 Re = 3.86 E6 A1 = 9.87° M = 0.298
 C_{Lmax} = 1.62 C_{Mmin} = -0.15 C_{Dmax} = 0.38
 α_{Lmax} = 15.8° ζ = 0.024 M_{max} = 1.192
 α_{Cmin} = 14.6° -C_{Pmax} = 9.0 α_{Mmax} = 15.4°

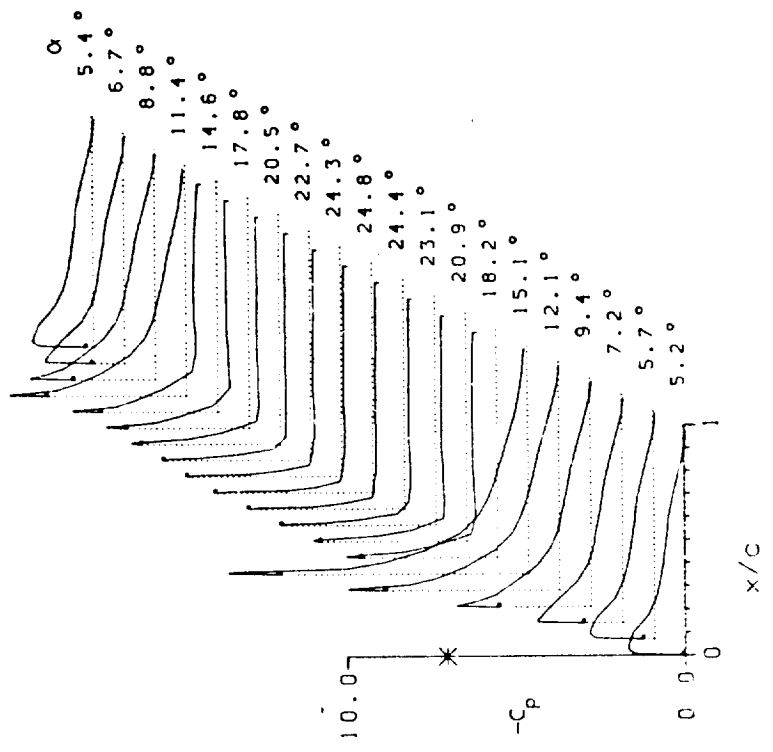
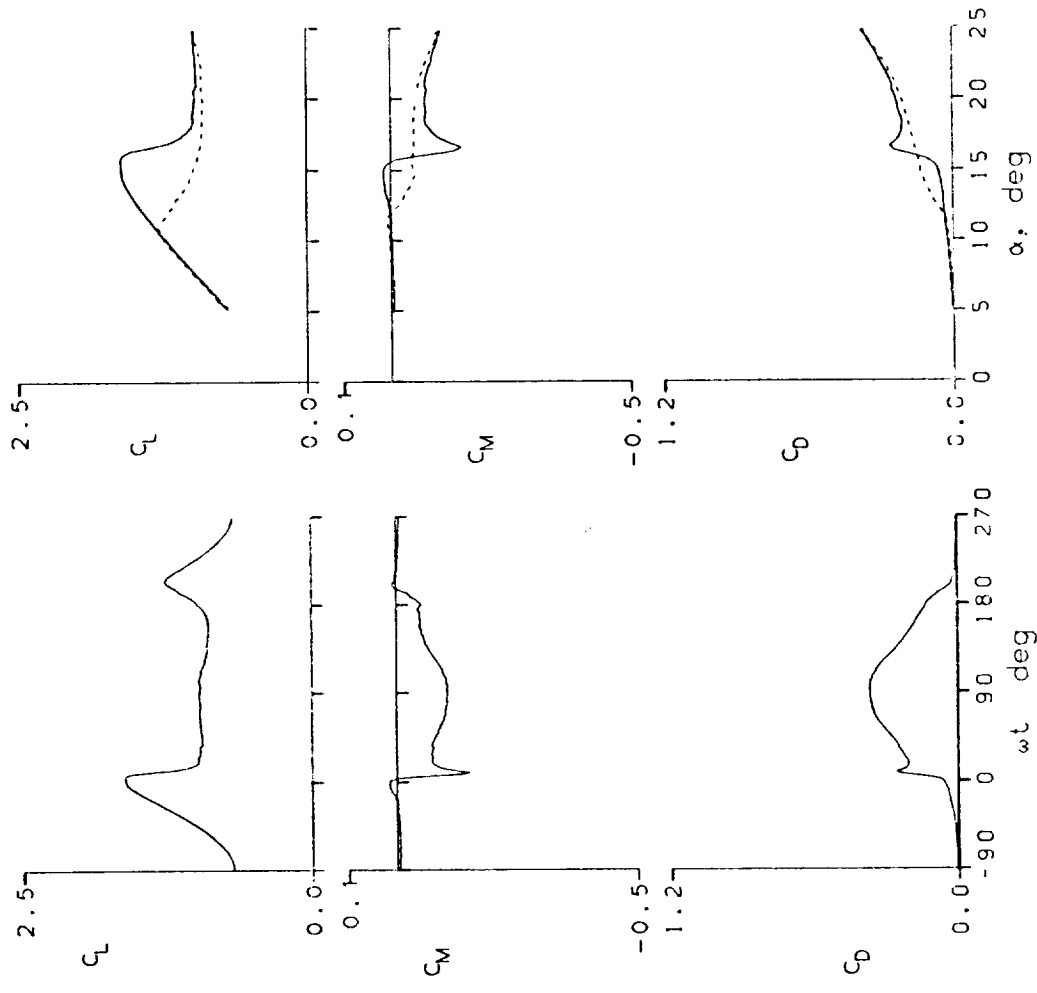


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 30020 A0 = 14.94° k = 0.010
 Re = 3.83 E6 A1 = 9.88° M = 0.298
 CLmax = 1.64 CMmin = -0.13 CDmax = 0.38
 αLmax = 15.7° ζ = 0.023 Mmax = 1.203
 αCMmin = 14.7° -CPmax = 9.1 αMmax = 15.4°

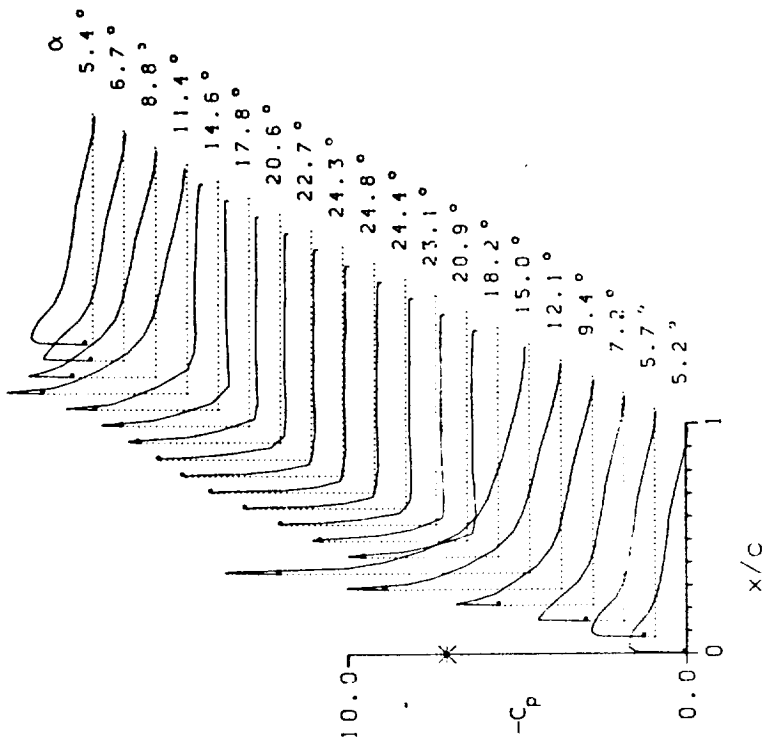
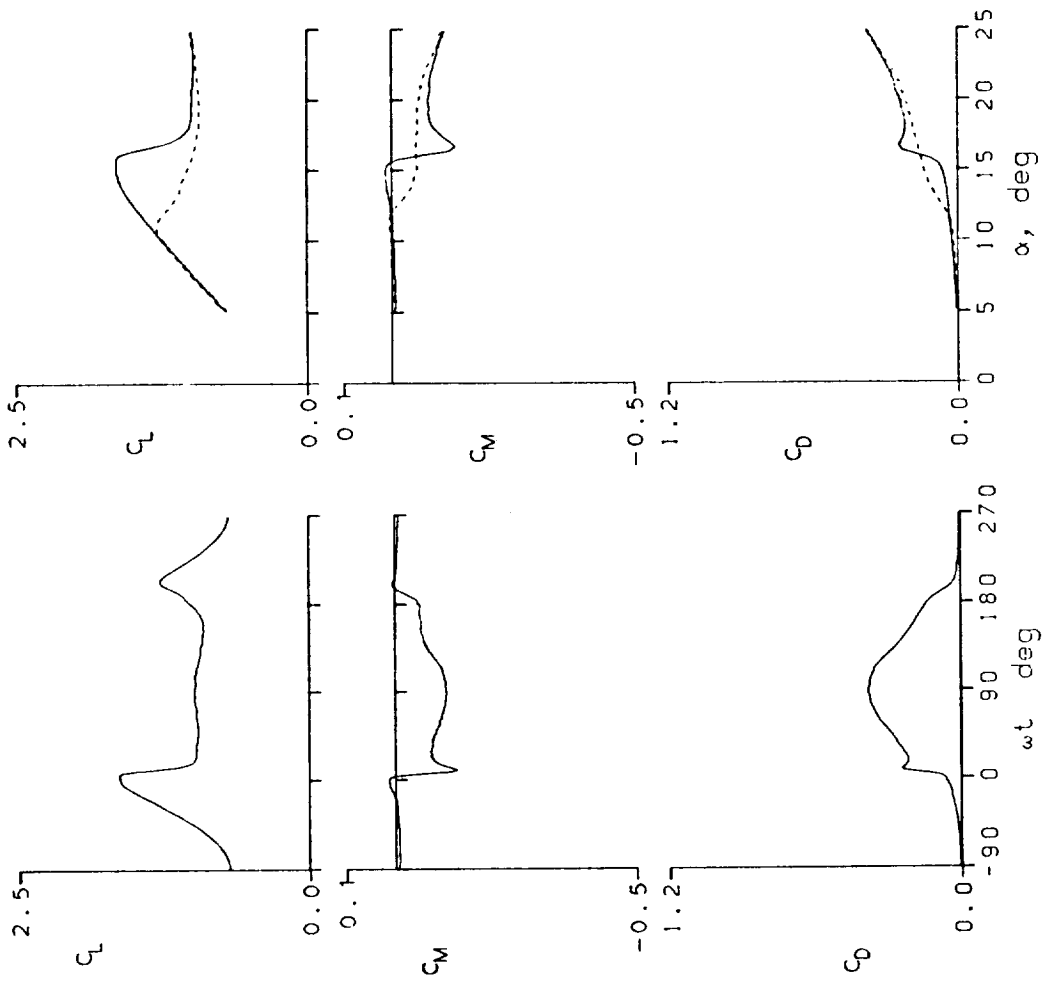


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 30105 A0 = 9.82° k = 0.010
 Re = 3.84 E6 A1 = 9.91° M = 0.301
 CLmax = 1.61 CMmin = -0.12 CDmax = 0.23
 αLmax = 14.5° ζ = -0.013 Mmax = 1.195
 αCmin = 9.3° -CPmax = 8.8 αMmax = 15.0°

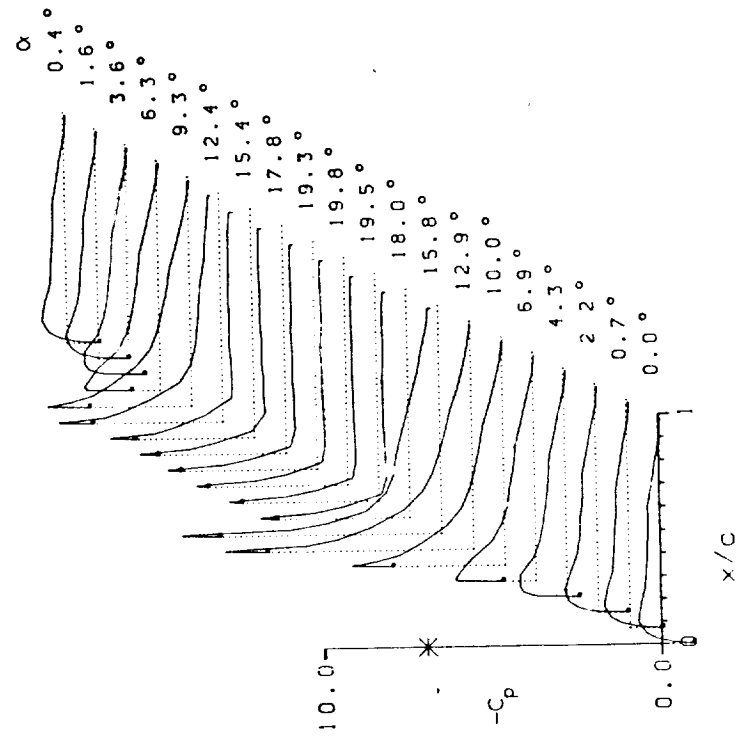
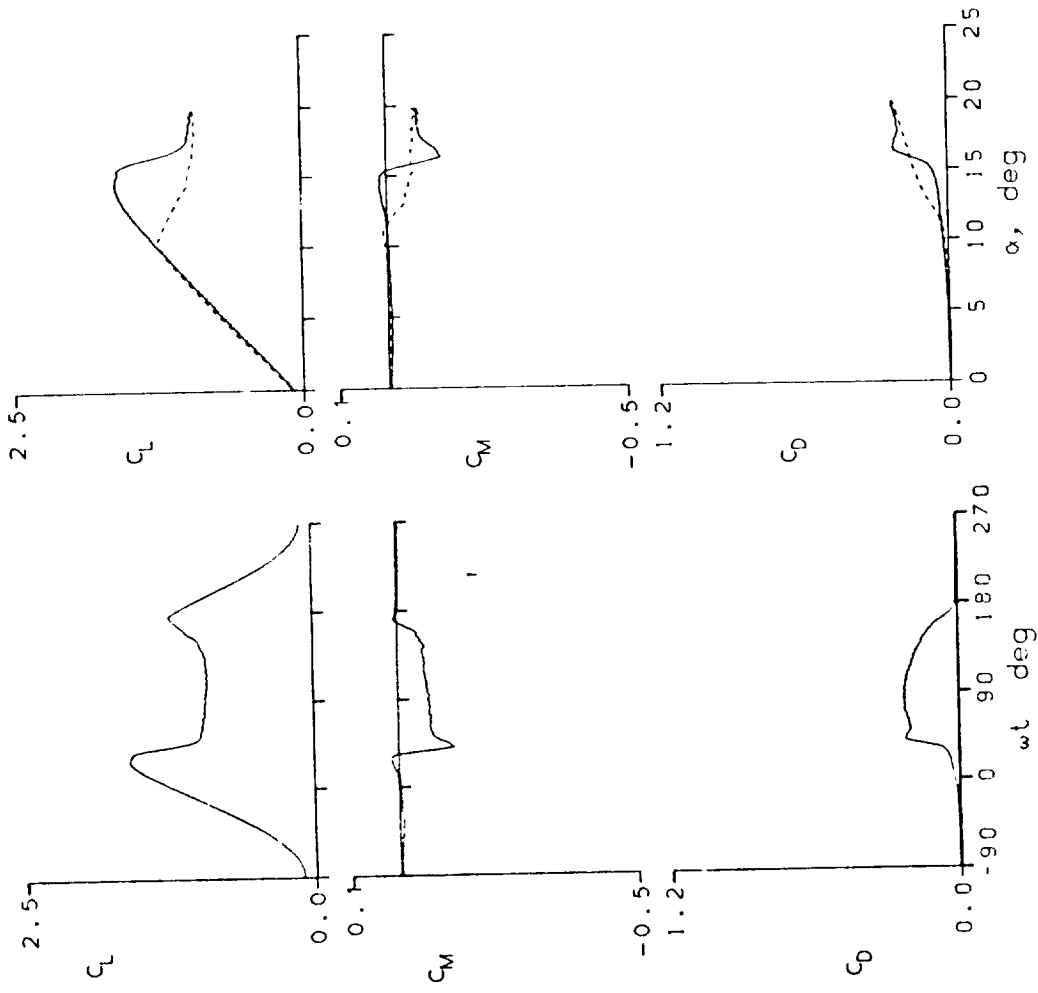


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 30110 A0 = 14.96° k = 0.010
 Re = 3.82 E6 A1 = 4.91° M = 0.301
 C_{Lmax} = 1.57 C_{Mmin} = -0.10 C_{Dmax} = 0.23
 α_{Lmax} = 14.5° ξ = -0.167 M_{max} = 1.151
 α_{Cmin} = 14.8° -C_{pmax} = 8.4 α_{Mmax} = 14.7°

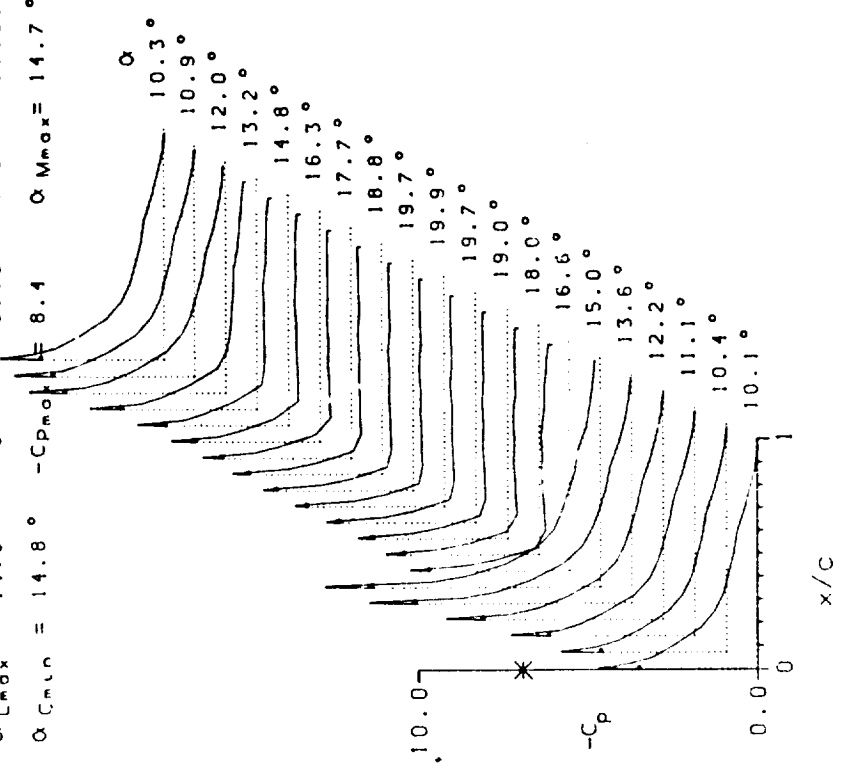
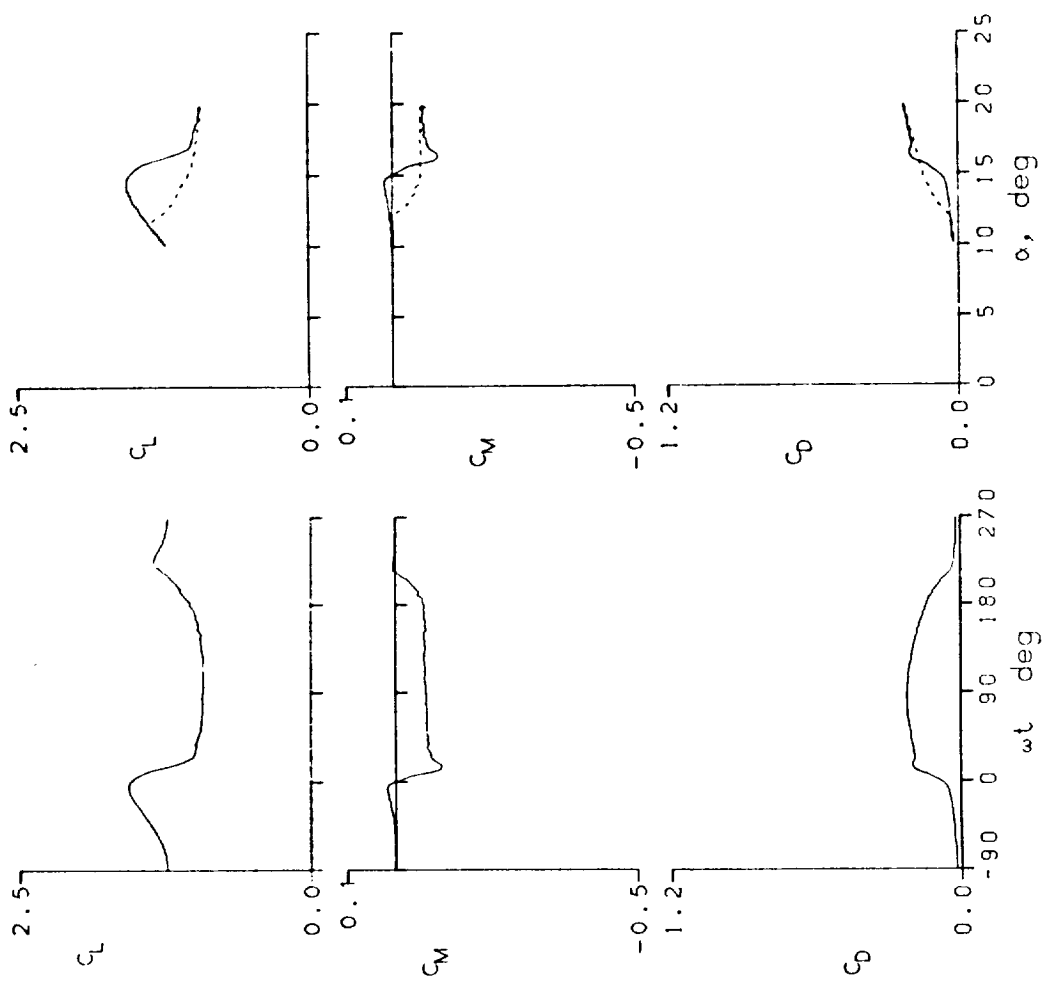


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 30119 A0 = 9.93° k = 0.010
 Re = 3.82 E6 A1 = 4.92° M = 0.300
 CLmax = 1.56 CMmin = -0.04 CDmax = 0.12
 αLmax = 14.5° ζ = -0.096 Mmax = 1.129
 αCmin = 9.8° -CPmax = 8.3 αMmax = 14.6°

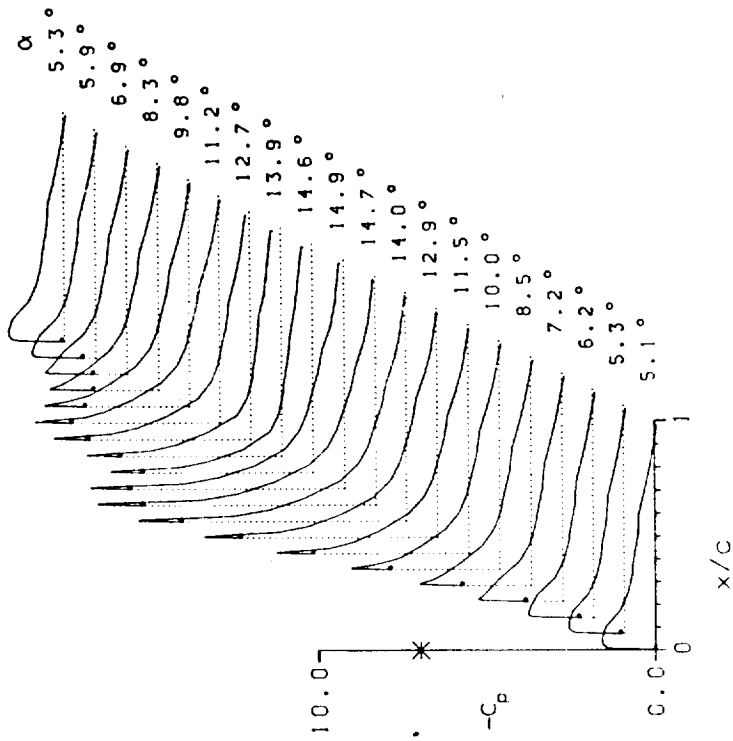
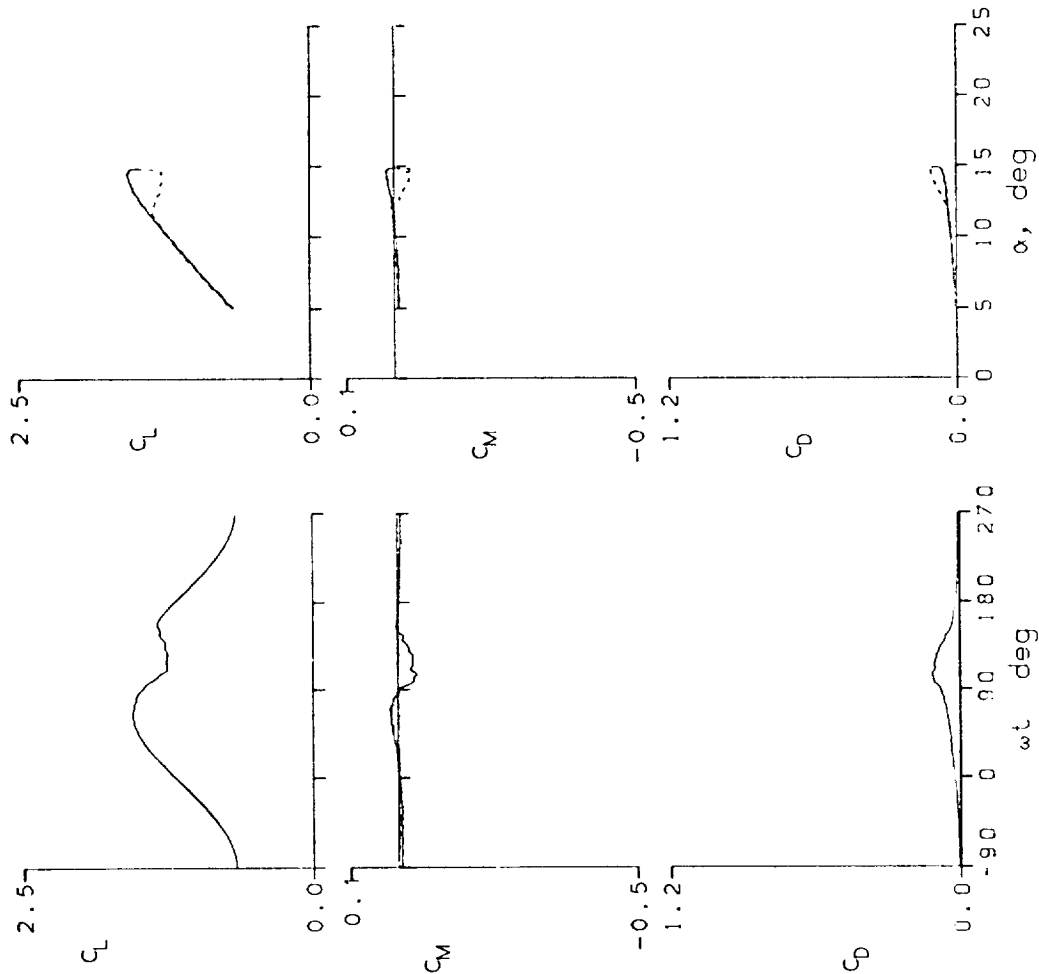


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 30201 A0 = 10.92° k = 0.010
 Re = 3.81 E6 A1 = 4.90° M = 0.301
 $C_{Lmax} = 1.57$ $C_{Mmin} = -0.09$ $C_{Dmax} = 0.17$
 $\alpha_{Lmax} = 14.4^\circ$ $\zeta = -0.222$ $M_{max} = 1.137$
 $\alpha_{Cmin} = 10.7^\circ$ $-C_{Pmax} = 8.3$ $\alpha_{Mmax} = 14.5^\circ$

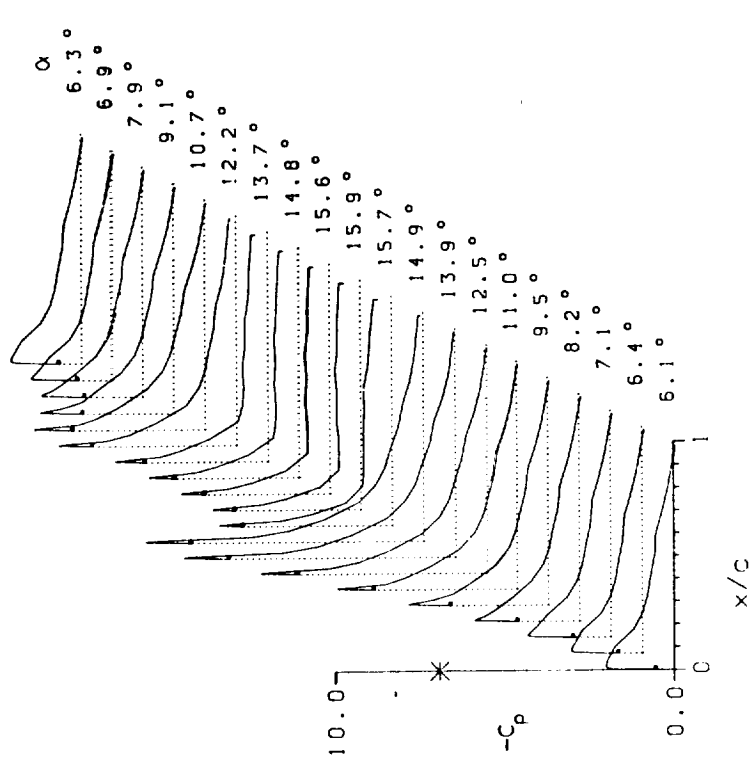
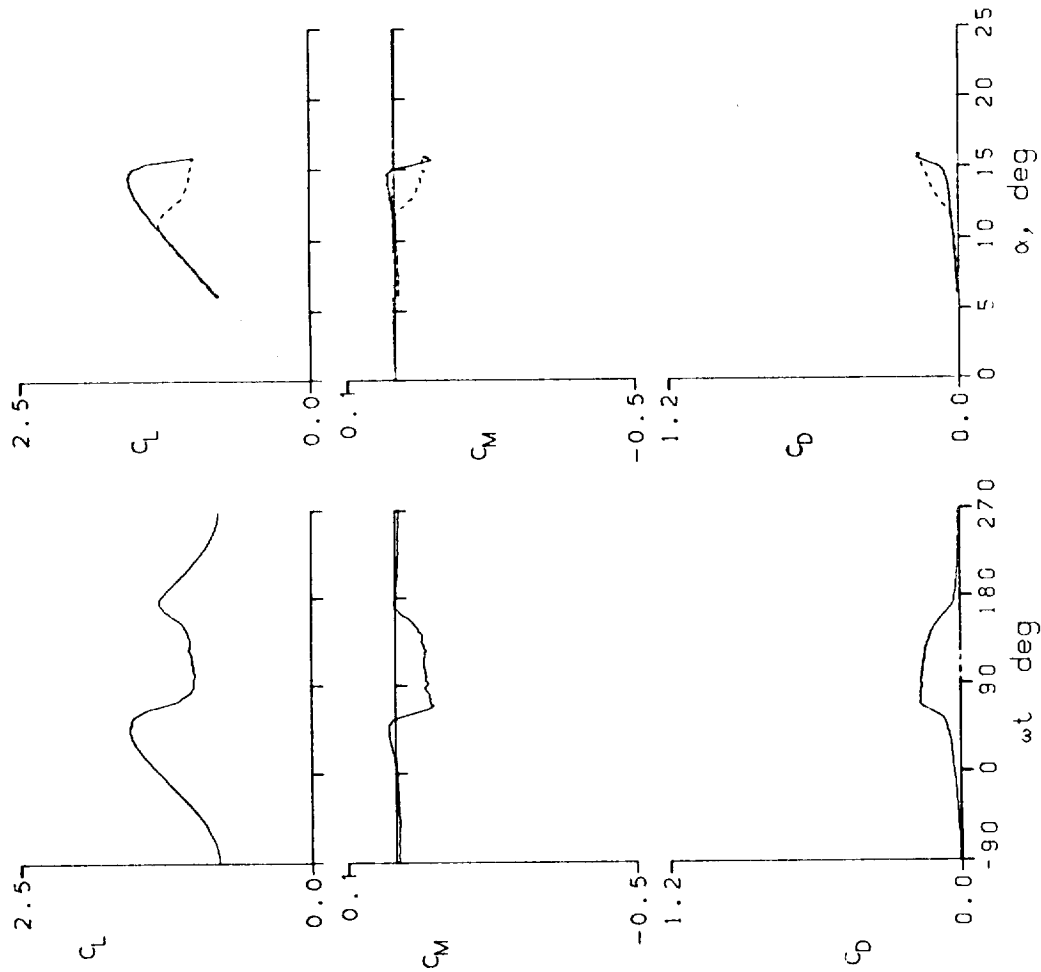


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 30206 A0 = 14.02° k = 0.010
 Re = 3.82 E6 A1 = 1.98° M = 0.301
 CLmax = 1.55 CMmin = -0.07 CDmax = 0.17
 α Lmax = 14.5° ζ = -1.389 Mmax = 1.134
 α Cmin = 14.0° -CPmax = 8.3 α Mmax = 14.6°

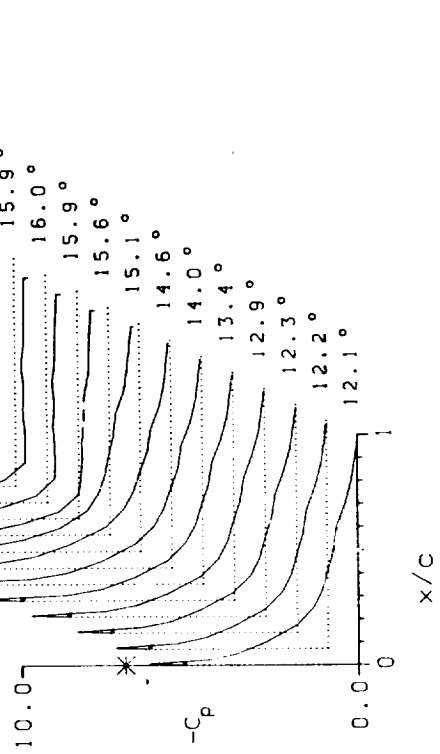
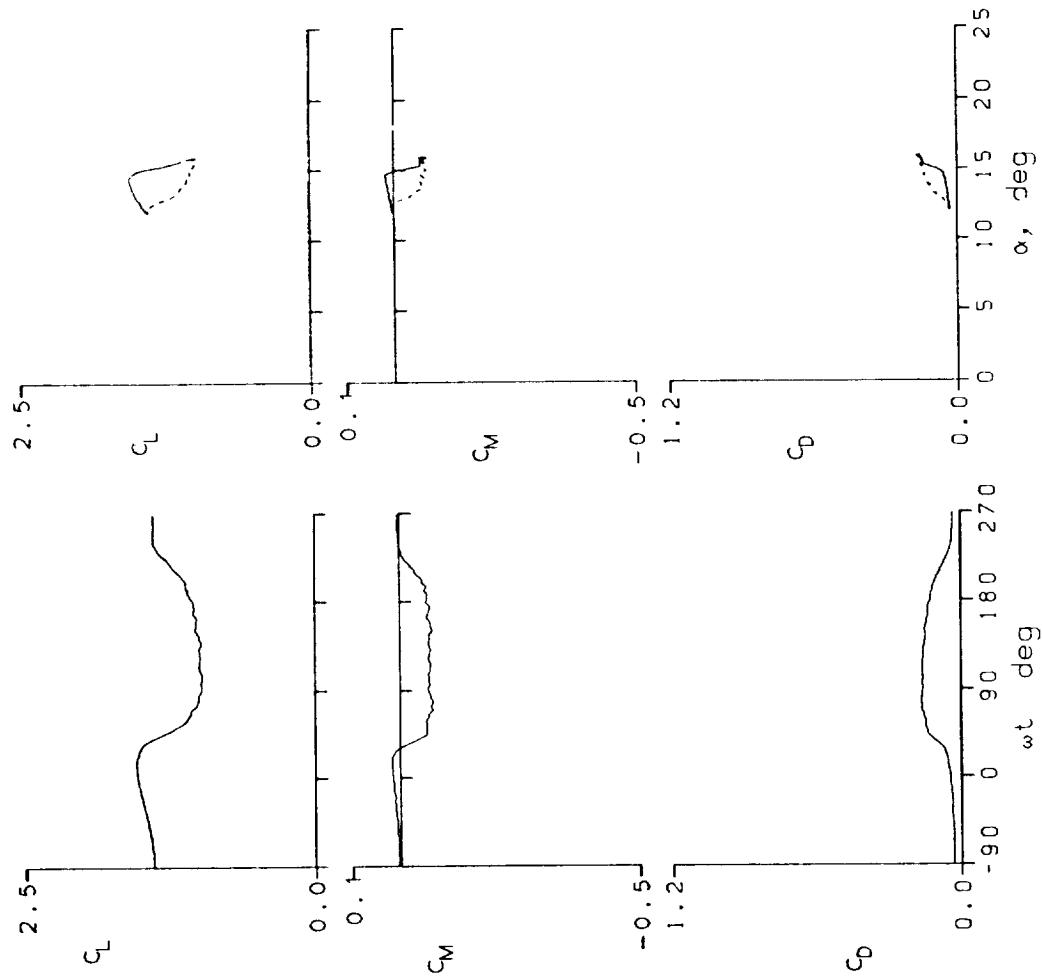


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 30215 A0 = 7.30° k = 0.010
 Re = 2.42 E6 A1 = 10.00° M = 0.183
 C_{Lmax} = 1.66 C_{Mmin} = -0.09 C_{Dmax} = 0.20
 α_{Lmax} = 16.5° ζ = -0.068 M_{max} = 0.654
 α_{Cmin} = 6.8° -C_{Pmax} = 9.9 α_{Mmax} = 16.5°

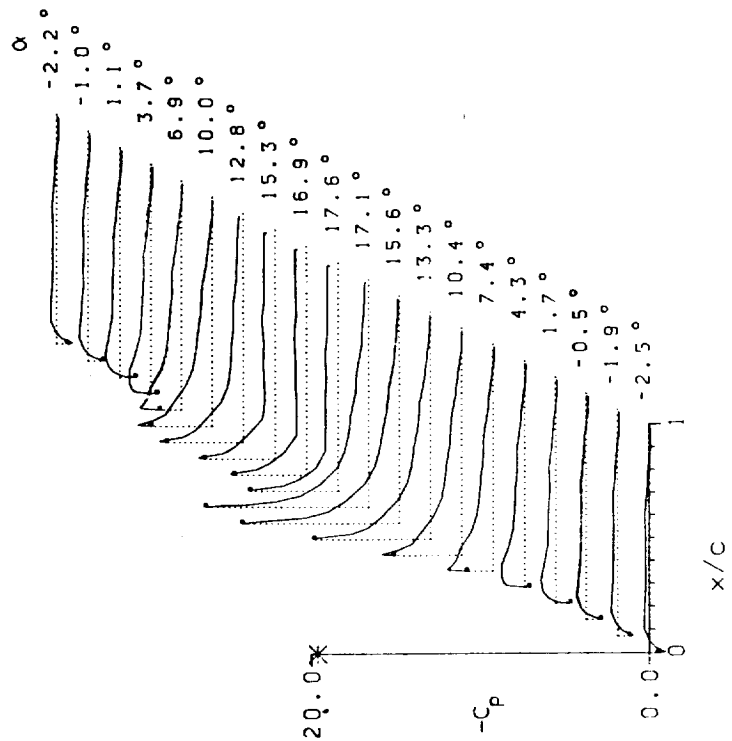
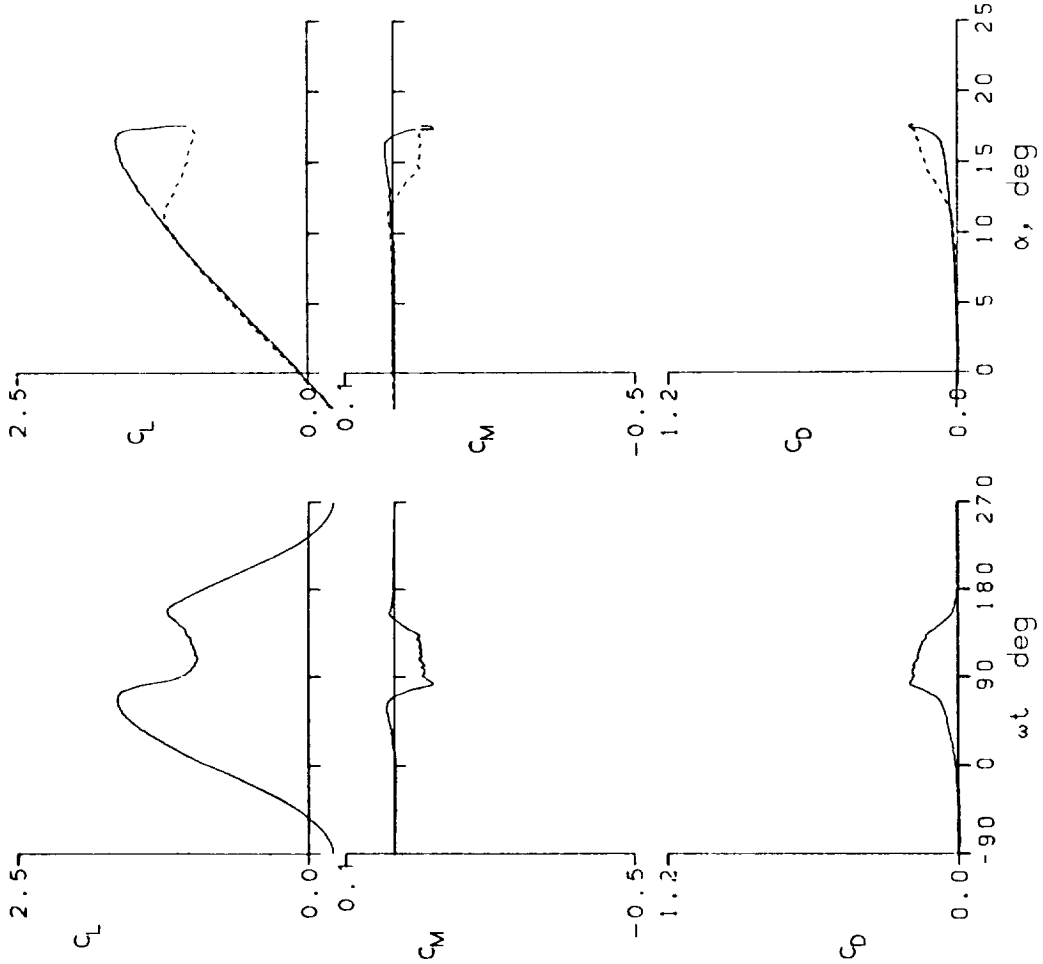


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 31102 A0 = 9.80° k = 0.025
 Re = 3.88 E6 A1 = 9.90° M = 0.302
 $C_{Lmax} = 1.82$ $C_{Mmin} = -0.17$ $C_{Dmax} = 0.32$
 $\alpha_{Lmax} = 16.8^\circ$ $\xi = 0.073$ $M_{max} = 1.268$
 $\alpha_{Cmin} = 9.2^\circ$ $-C_{pmax} = 9.4$ $\alpha_{Mmax} = 16.1^\circ$

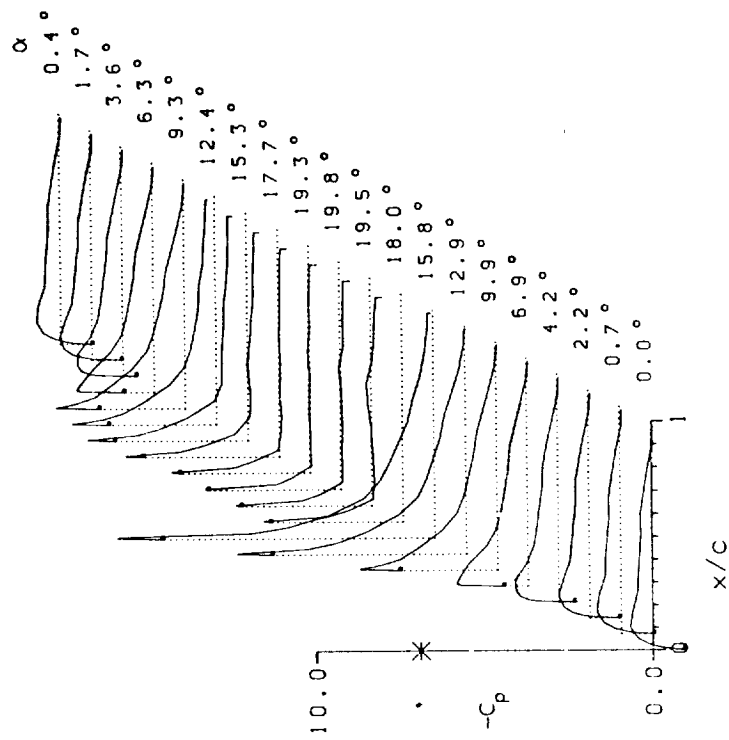
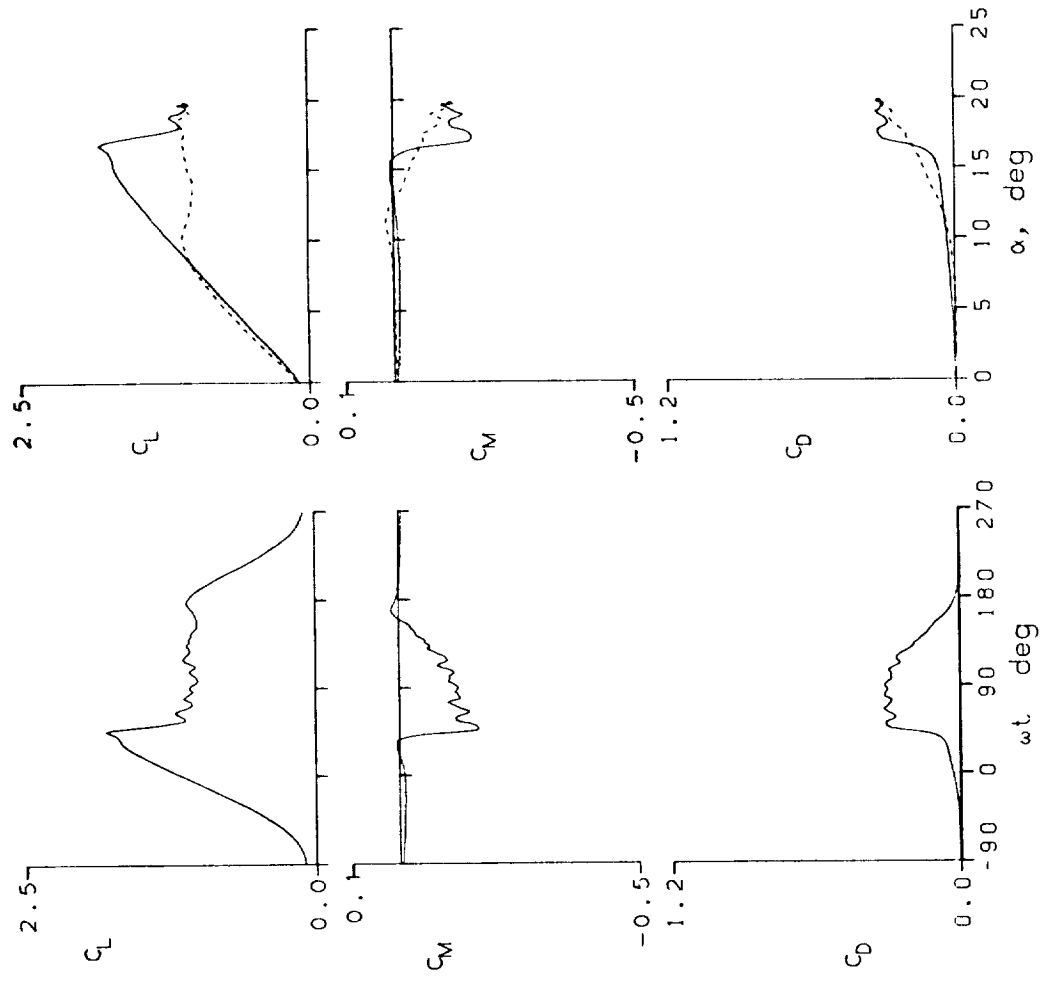


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 31104	A0 = 9.78 °	k = 0.049
Re = 3.86 E6	A1 = 9.91 °	M = 0.302
C _{Lmax} = 1.96	C _{Mmin} = -0.20	C _{Dmax} = 0.37
α _{Lmax} = 17.7 °	ξ = 0.091	M _{max} = 1.305
α _{Cmin} = 9.2 °	-C _{Pmax} = 9.7	α _{Mmax} = 16.4 °

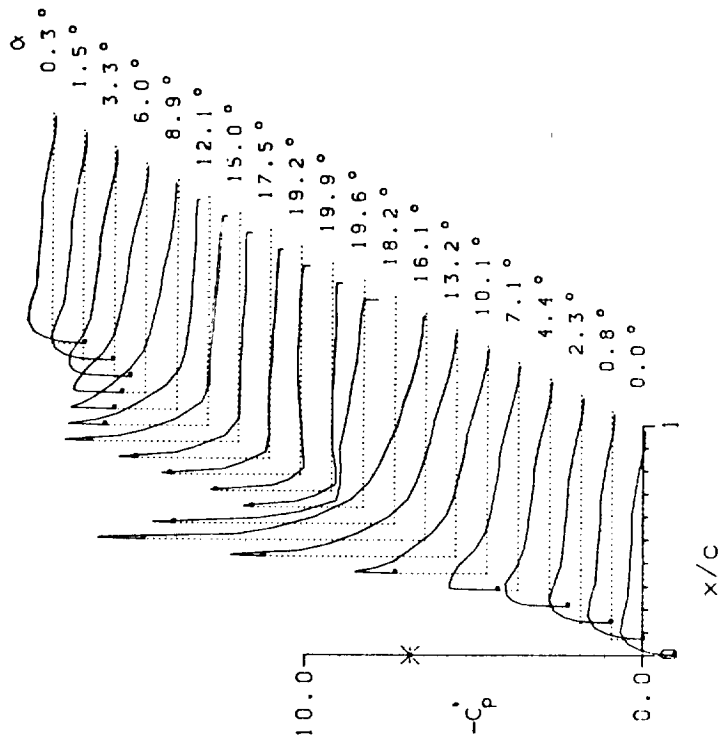
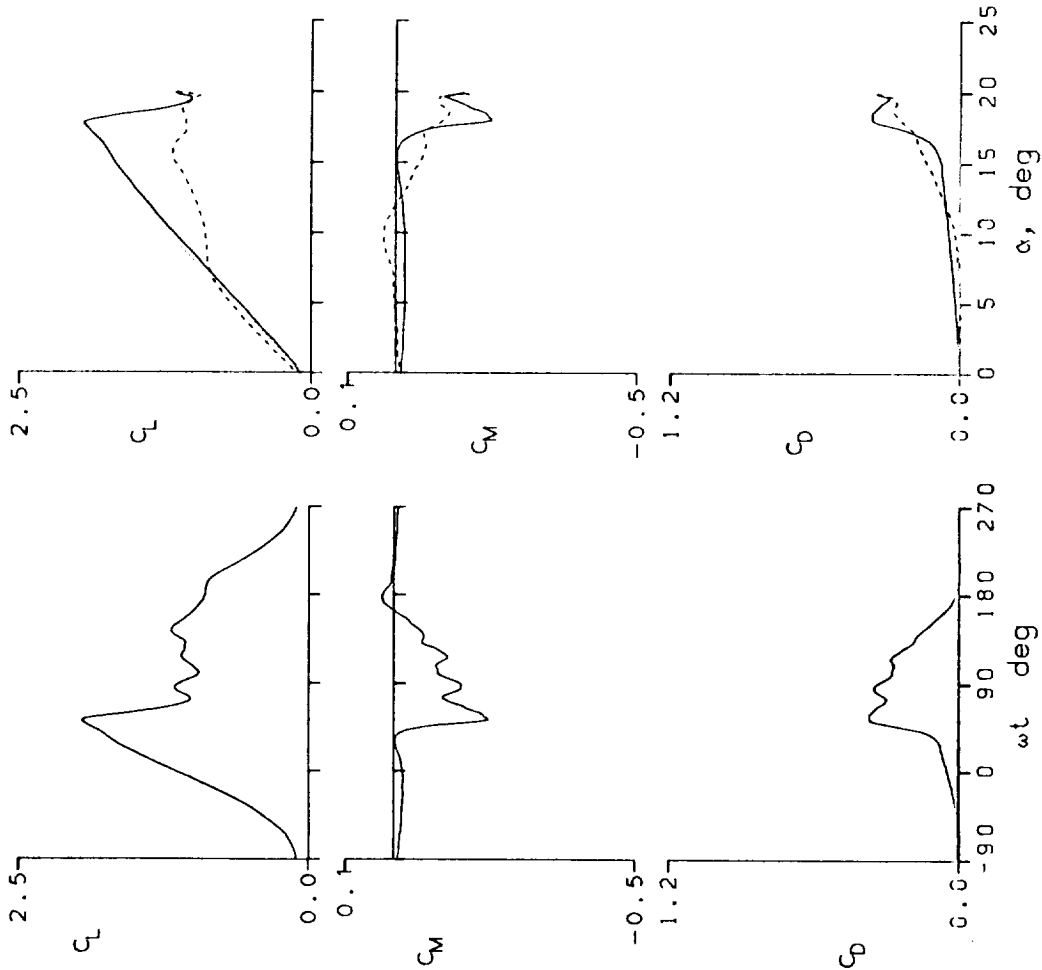


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 31110	A0 = 9.92°	k = 0.147
Re = 3.84 E6	A1 = 9.91°	M = 0.302
$C_{Lmax} = 2.19$	$C_{Mmin} = -0.36$	$C_{Dmax} = 0.62$
$\alpha_{Lmax} = 19.8^\circ$	$\zeta = 0.278$	$M_{max} = 1.332$
$\alpha_{Cmin} = 9.5^\circ$	$-C_{Pmax} = 9.9$	$\alpha_{Mmax} = 17.7^\circ$

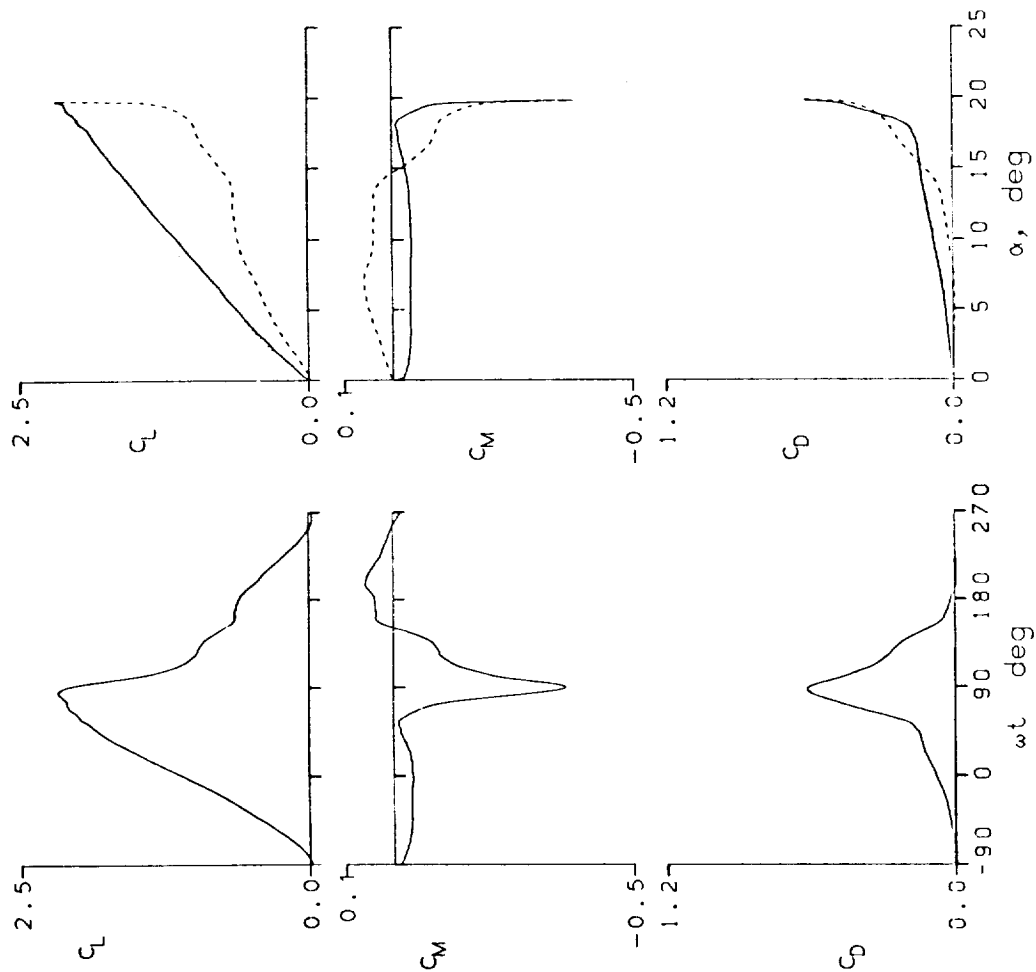


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 31112 A0 = 9.91° k = 0.147
 Re = 3.83 E6 A1 = 9.91° M = 0.302
 CLmax = 2.19 CMmin = -0.35 CDmax = 0.62
 αLmax = 19.8° ζ = 0.282 Mmax = 1.332
 αCMmin = 9.4° -CPmax = 9.9 αMmax = 17.7°

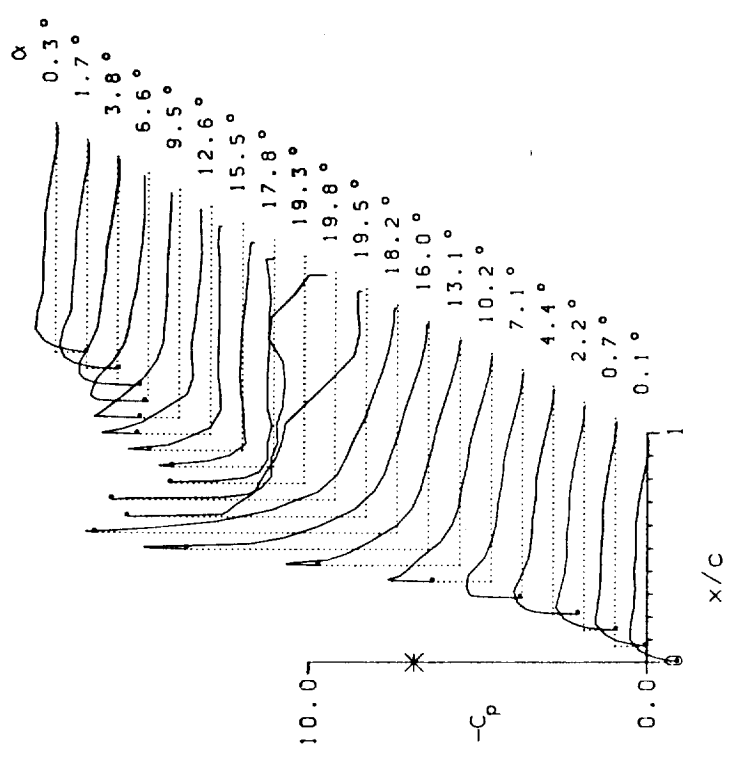
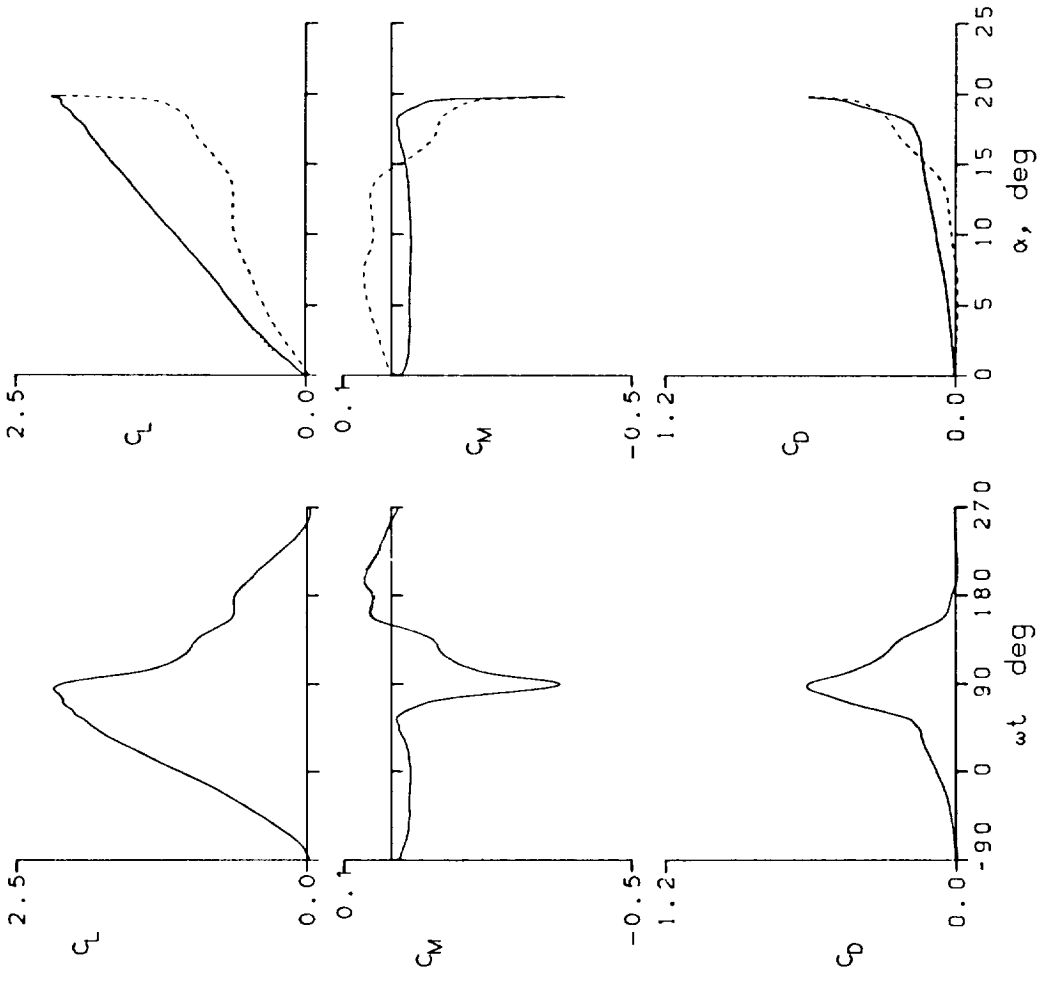


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 31119 A0 = 4.90° k = 0.024
 Re = 3.86 E6 A1 = 10.02° M = 0.303
 C_{Lmax} = 1.61 C_{Mmin} = -0.04 C_{Dmax} = 0.11
 α_{Lmax} = 14.6° ζ = 0.047 M_{max} = 1.206
 α_{Cmin} = 4.4° -C_{pmax} = 8.8 α_{Mmax} = 14.8°

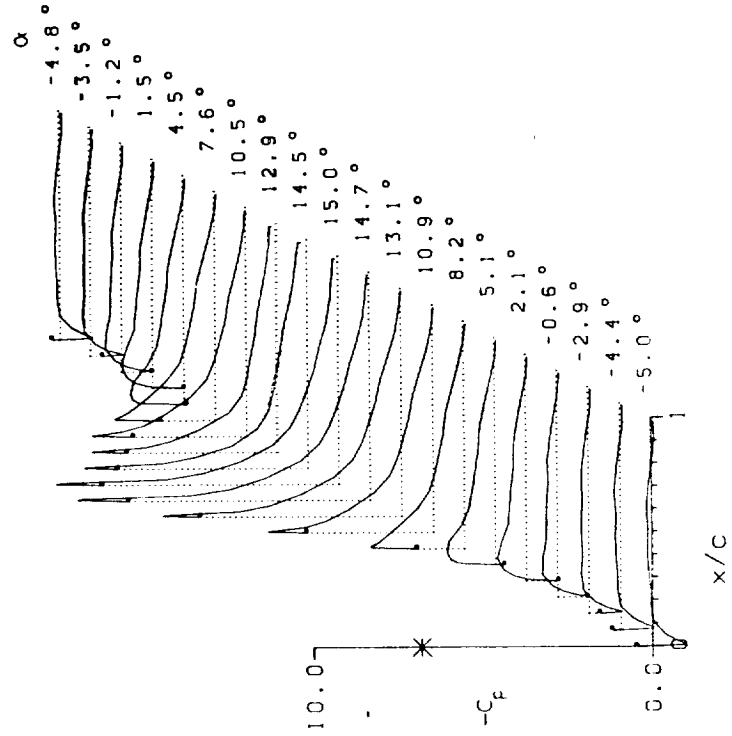
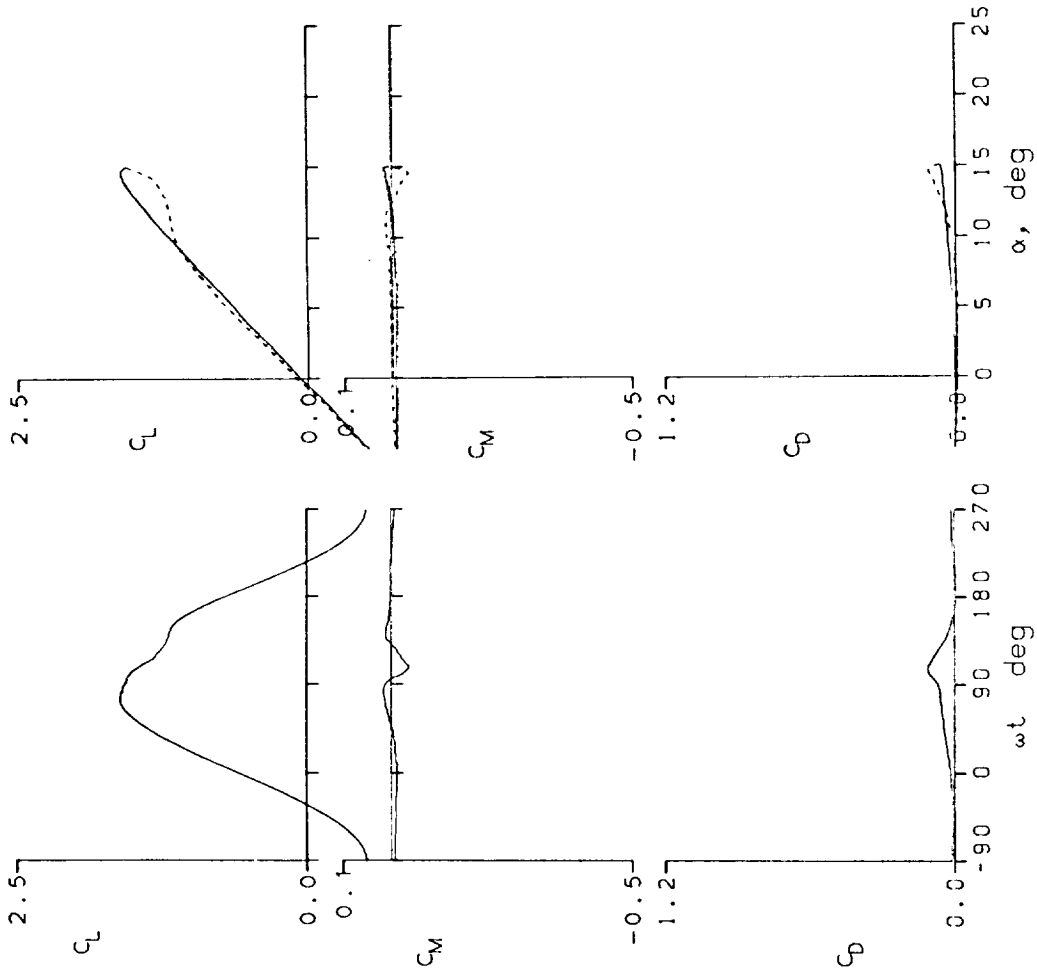


Figure 13.- Continued.

ANES-01 AIRFOIL
 FRAME : 31121 A0 = 4.81° k = 0.049
 Re = 3.83 E6 A1 = 10.08° M = 0.302
 C_{Lmax} = 1.66 C_{Mmin} = -0.02 C_{Dmax} = 0.08
 α_{Lmax} = 14.8° ζ = 0.118 M_{max} = 1.231
 α_{Cmin} = 4.3° -C_{Pmax} = 9.1 α_{Mmax} = 14.9°

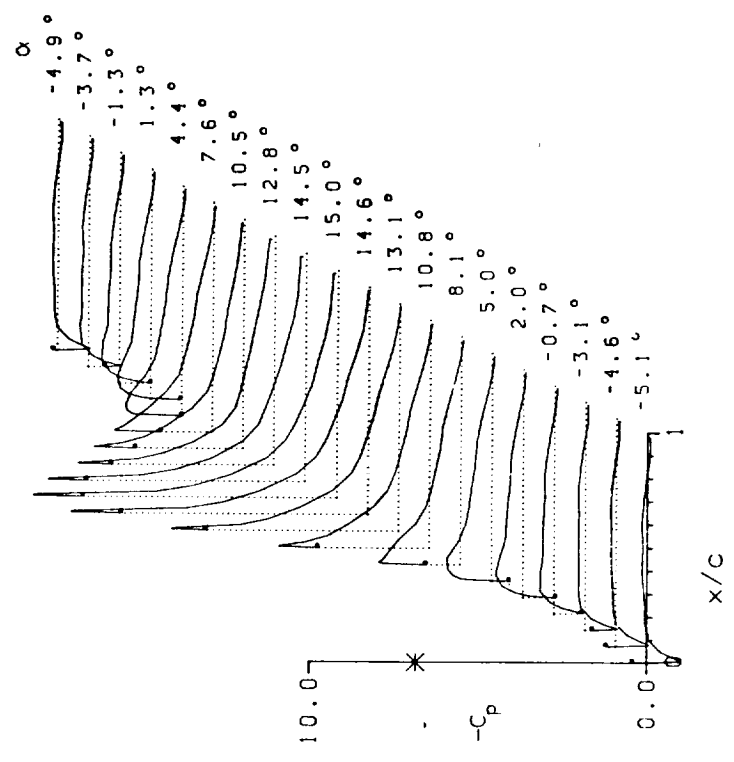
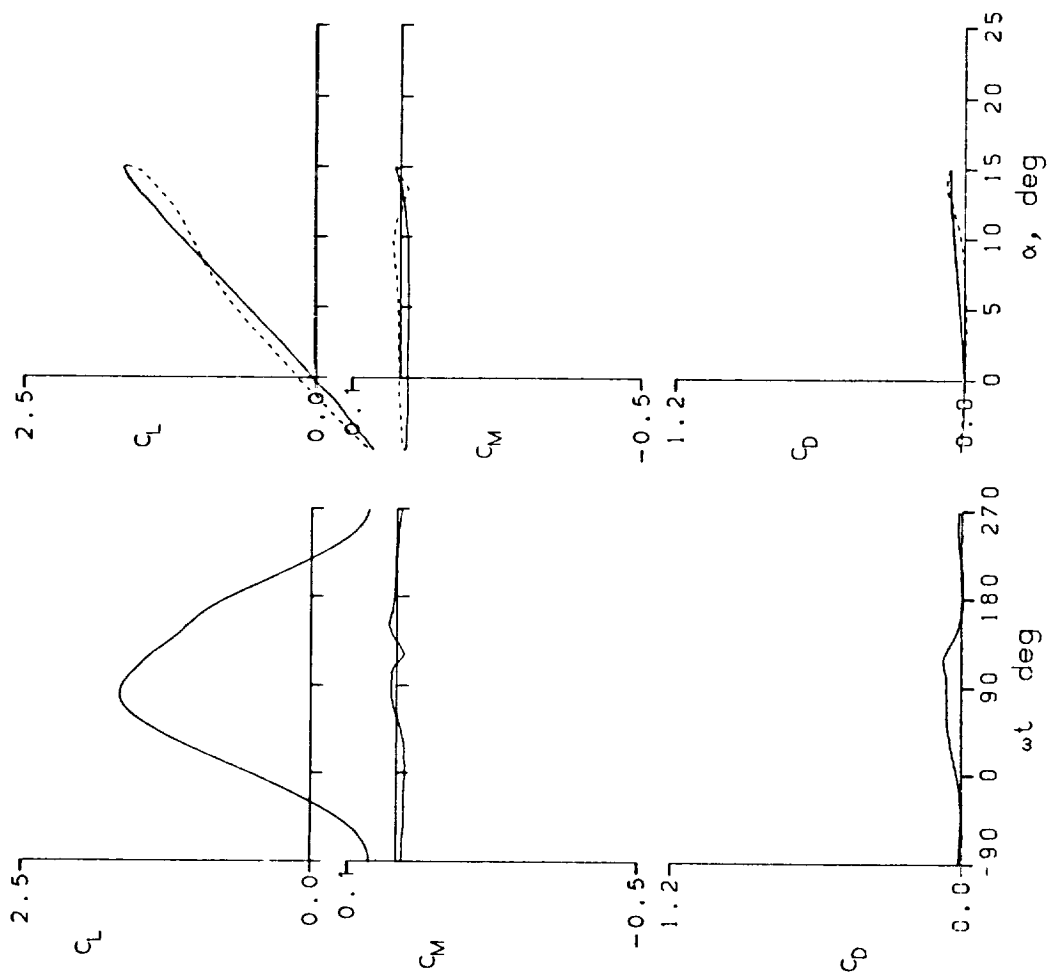


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 31123 A0 = 4.84 ° k = 0.098
 Re = 3.82 E6 A1 = 10.06 ° M = 0.303
 C_{Lmax} = 1.70 C_{Mmin} = -0.03 C_{Dmax} = 0.09
 α_{Lmax} = 15.1 ° ζ = 0.288 M_{max} = 1.272
 α_{Cmin} = 4.3 ° -C_{pmax} = 9.4 α_{Mmax} = 15.0 °

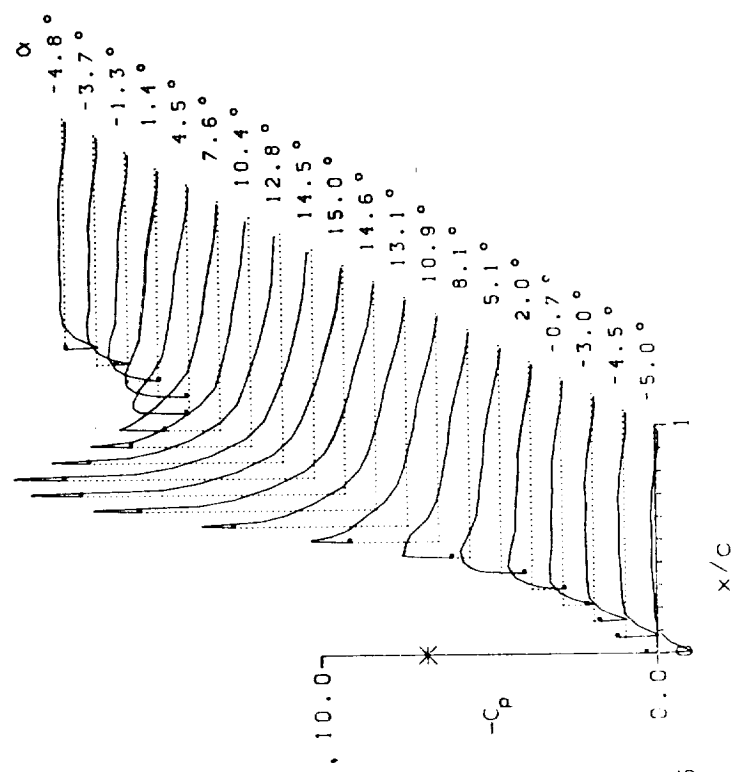
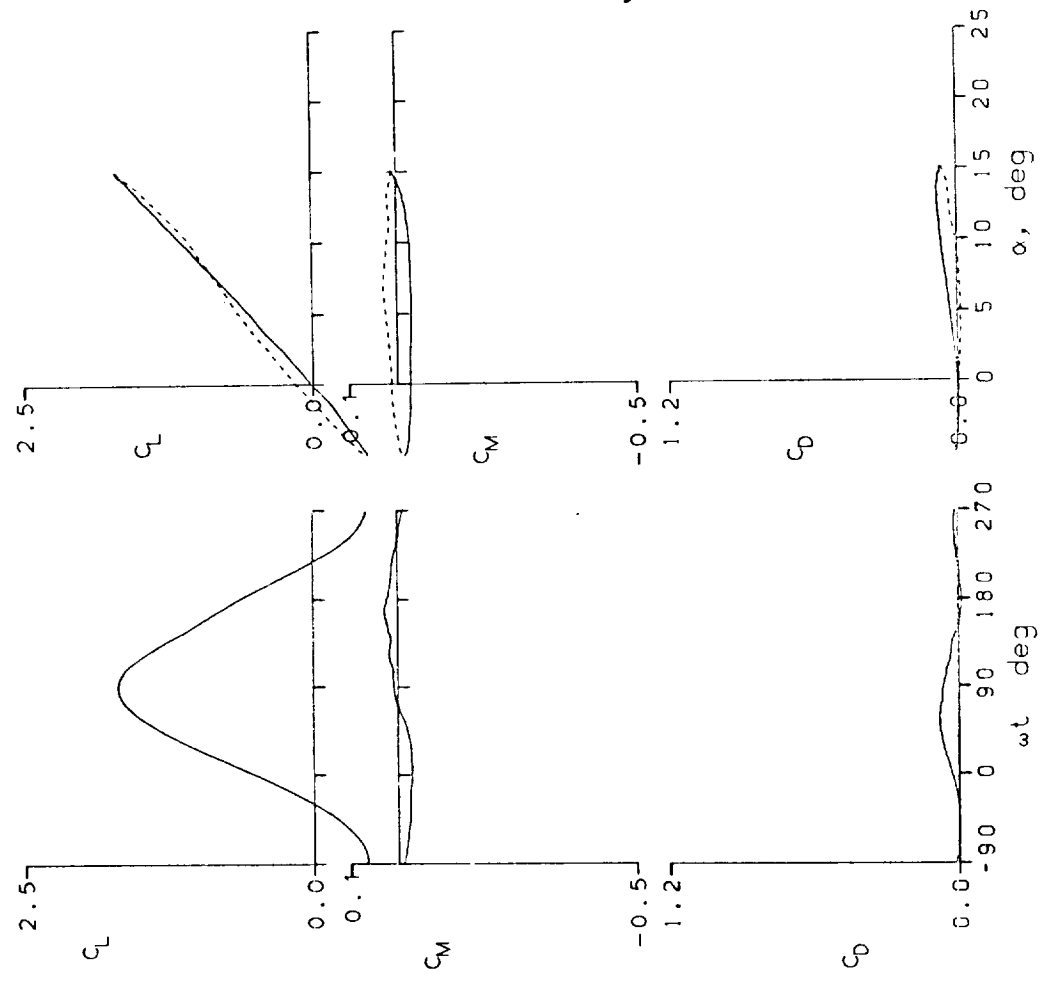


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 31201 A0 = 4.82° k = 0.146
 Re = 3.82 E6 A1 = 10.06° M = 0.303
 $C_{Lmax} = 1.73$ $C_{Mmin} = -0.05$ $C_{Umax} = 0.10$
 $\alpha_{Lmax} = 14.9^\circ$ $\zeta = 0.441$ $M_{max} = 1.297$
 $\alpha_{Cmin} = 4.4^\circ$ $-C_{Pmax} = 9.6$ $\alpha_{Mmax} = 14.7^\circ$

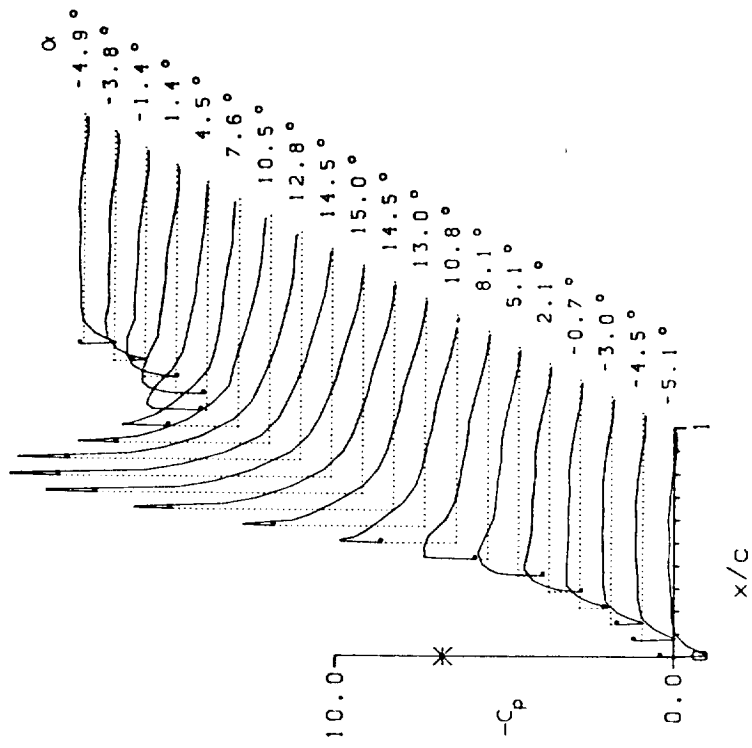
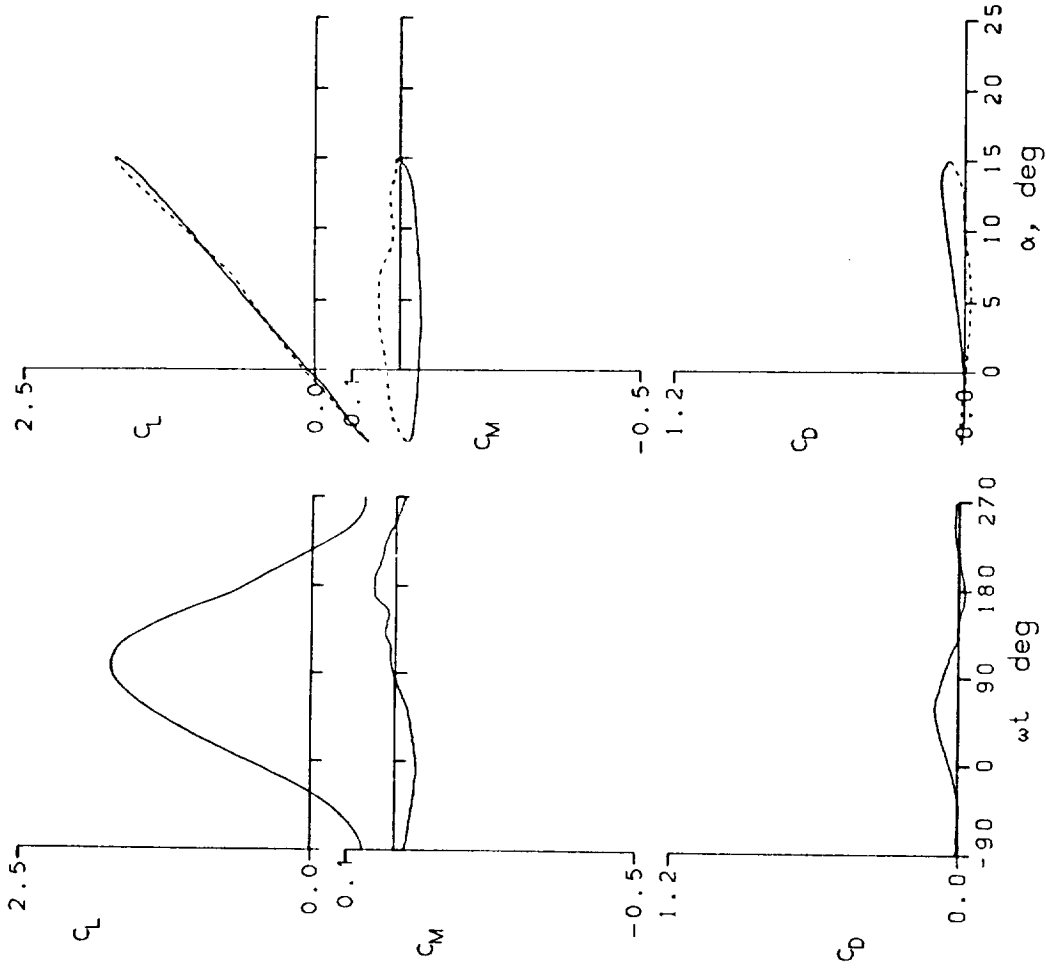


Figure 13.- Continued.

AMES-01 AIRFOIL
 FRAME : 31209 A0 = 14.82° k = 0.099
 Re = 2.42 E6 A1 = 9.91° M = 0.184
 CLmax = 2.53 CMmin = -0.39 CDmax = 0.98
 α Lmax = 23.4° ζ = 0.174 Mmax = 0.938
 α Cmin = 14.4° -CPmax = 17.6 α Mmax = 22.5°

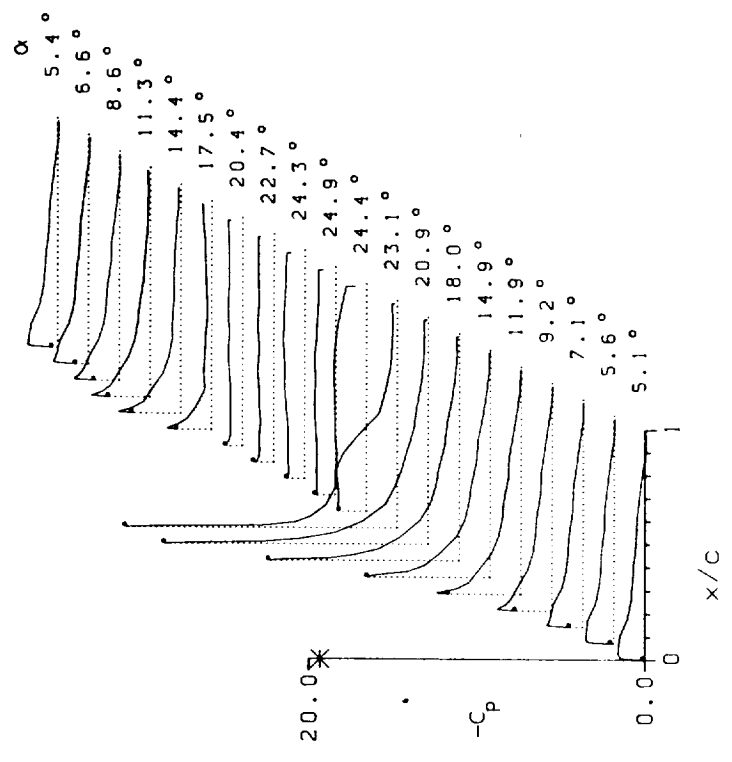
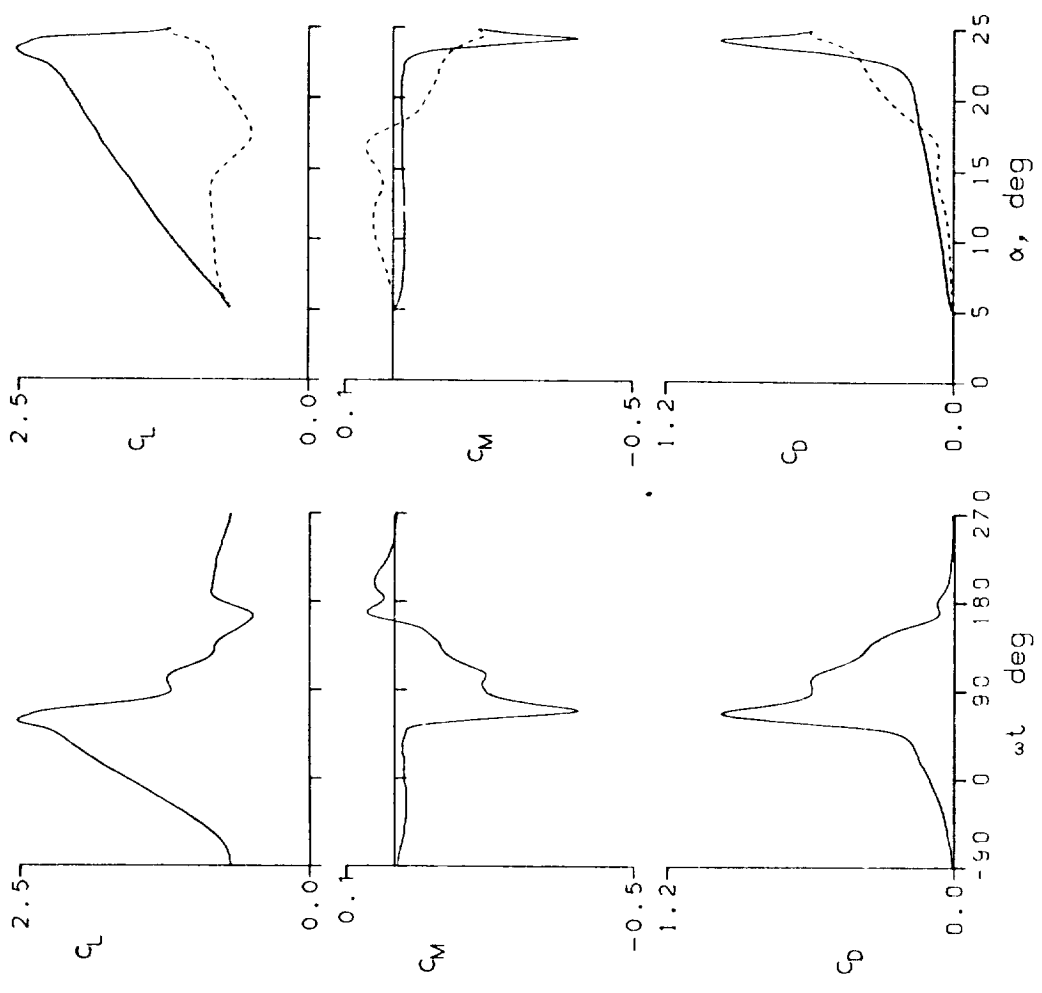


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 31215	A0 = 7.26 °	k = 0.049
Re = 2.43 E6	A1 = 10.02 °	M = 0.184
CLmax = 1.76	CMmin = -0.04	CDmax = 0.12
α Lmax = 17.3 °	ξ = 0.073	Mmax = 0.712
α Cmin = 6.7 °	-CPmax = 11.3	α Mmax = 17.5 °

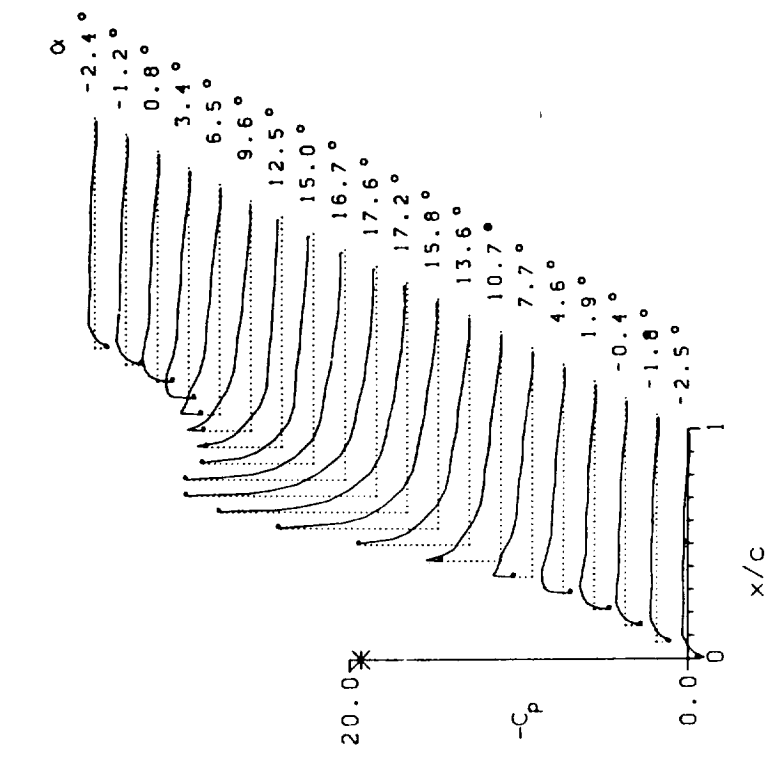
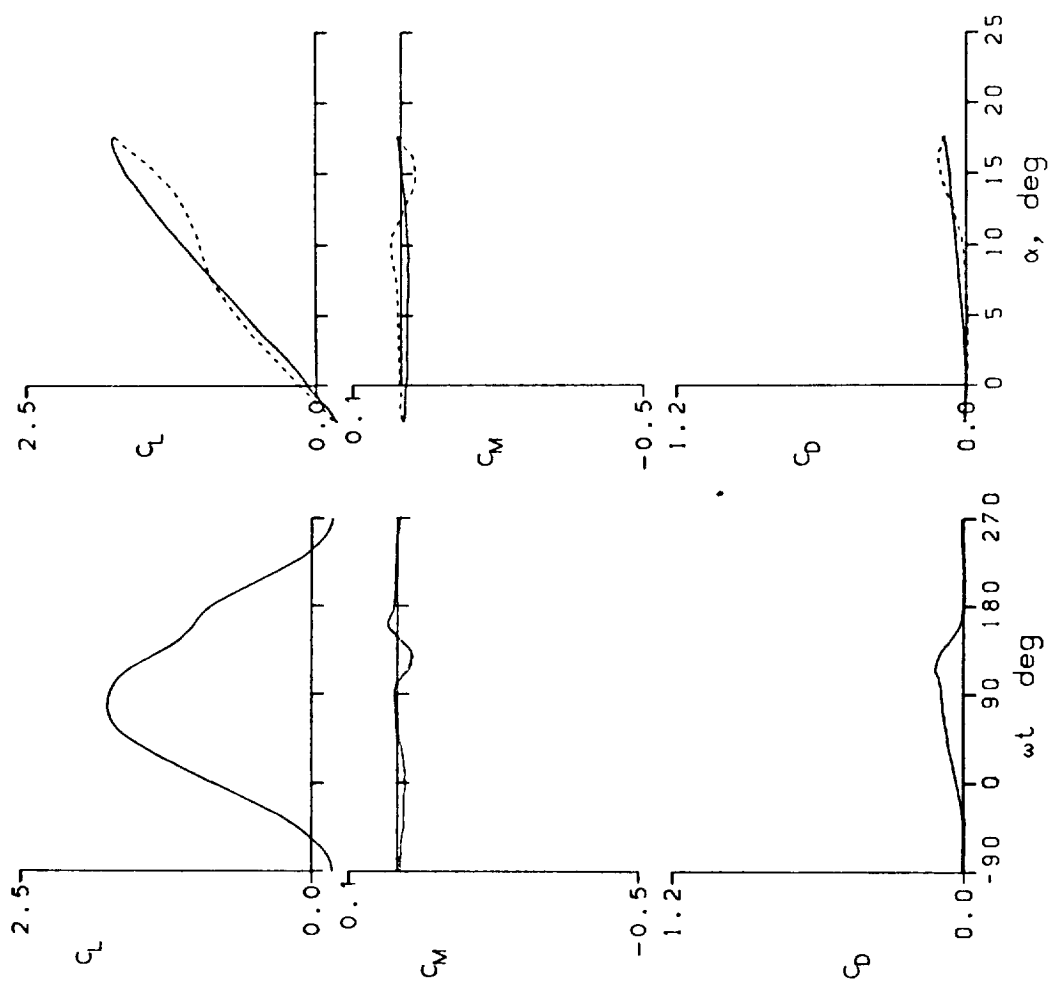


Figure 13.- Continued.

AMES-01 AIRFOIL

FRAME : 31217 A0 = 7.27° k = 0.197
 Re = 2.42 E6 A1 = 10.01° M = 0.185
 CLmax = 1.80 CMmin = -0.06 CDmax = 0.13
 αLmax = 17.5° ζ = 0.574 Mmax = 0.727
 αCMmin = 6.6° -CPmax = 11.7 αMmax = 17.5°

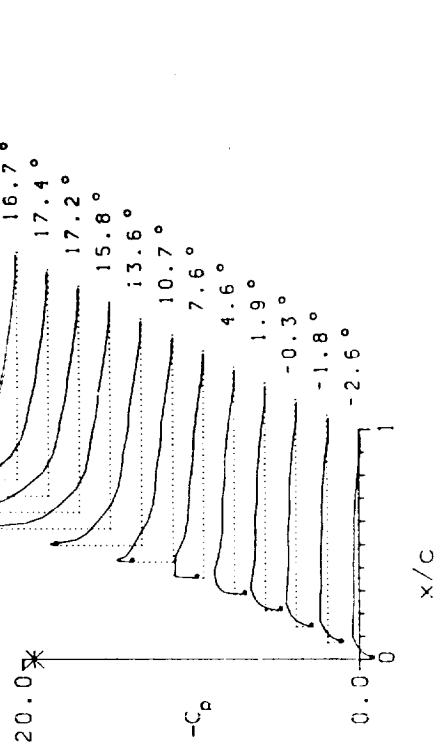
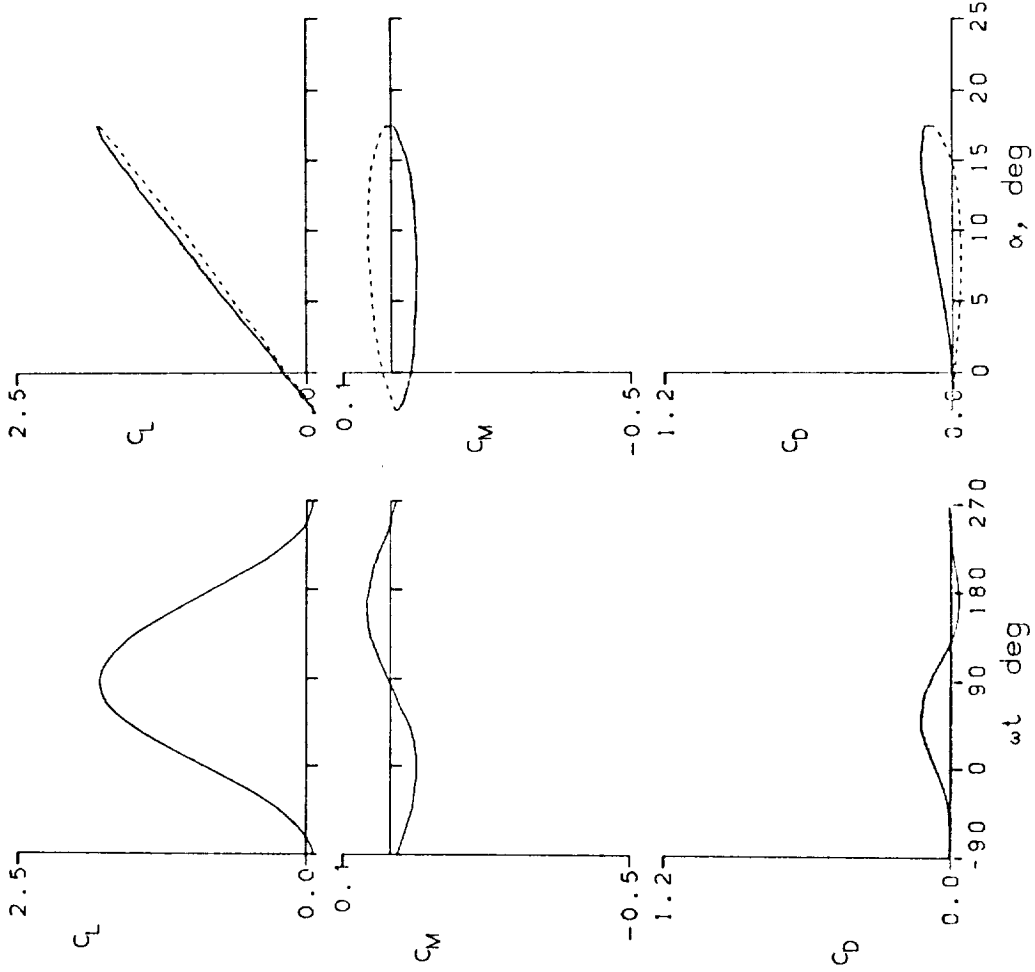


Figure 13.- Continued.

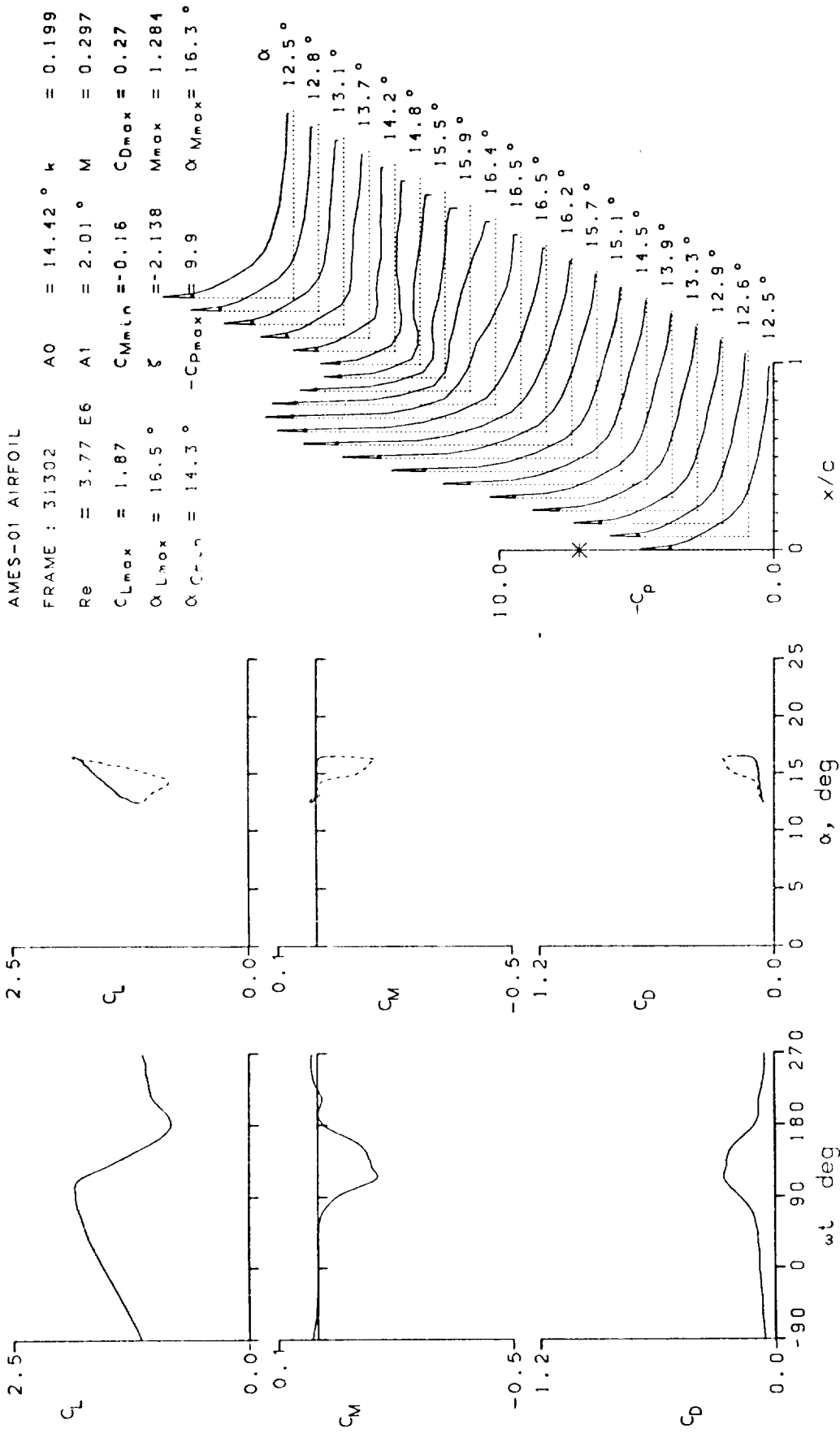


Figure 13.- Continued.

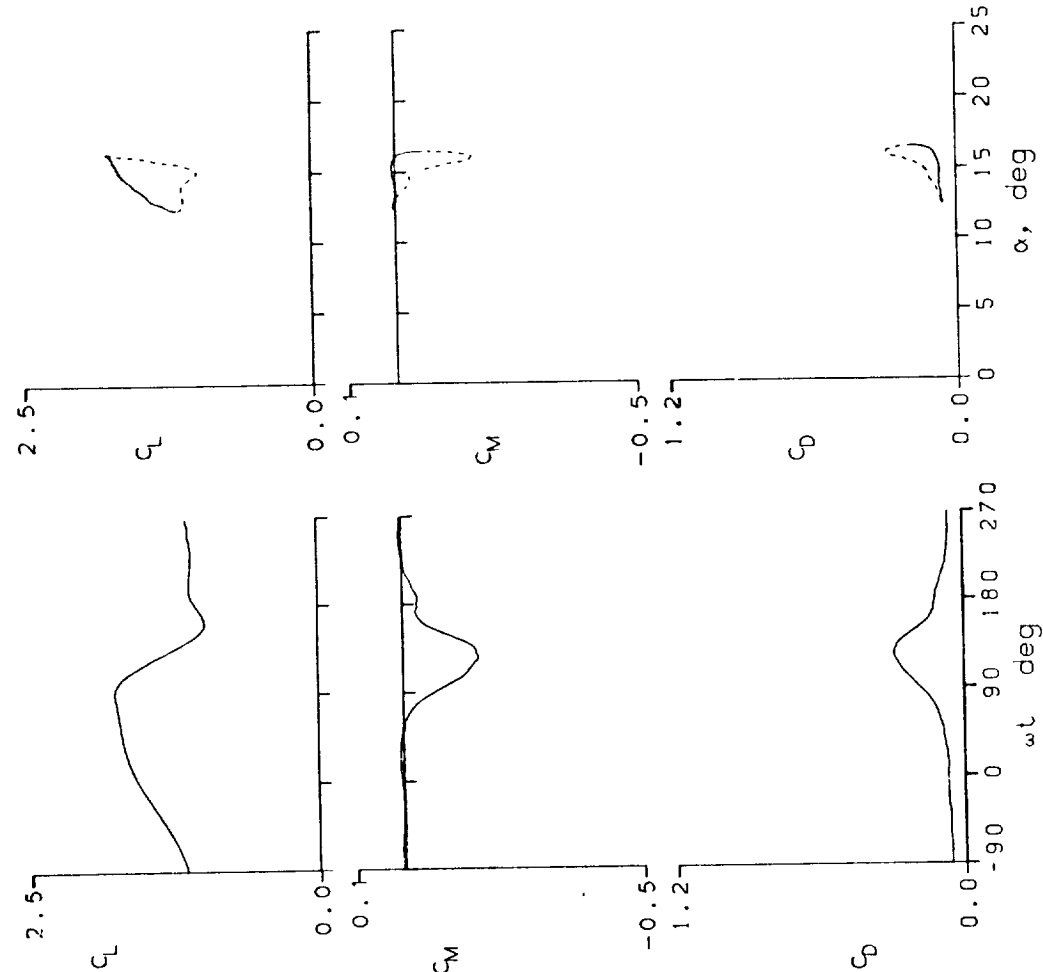
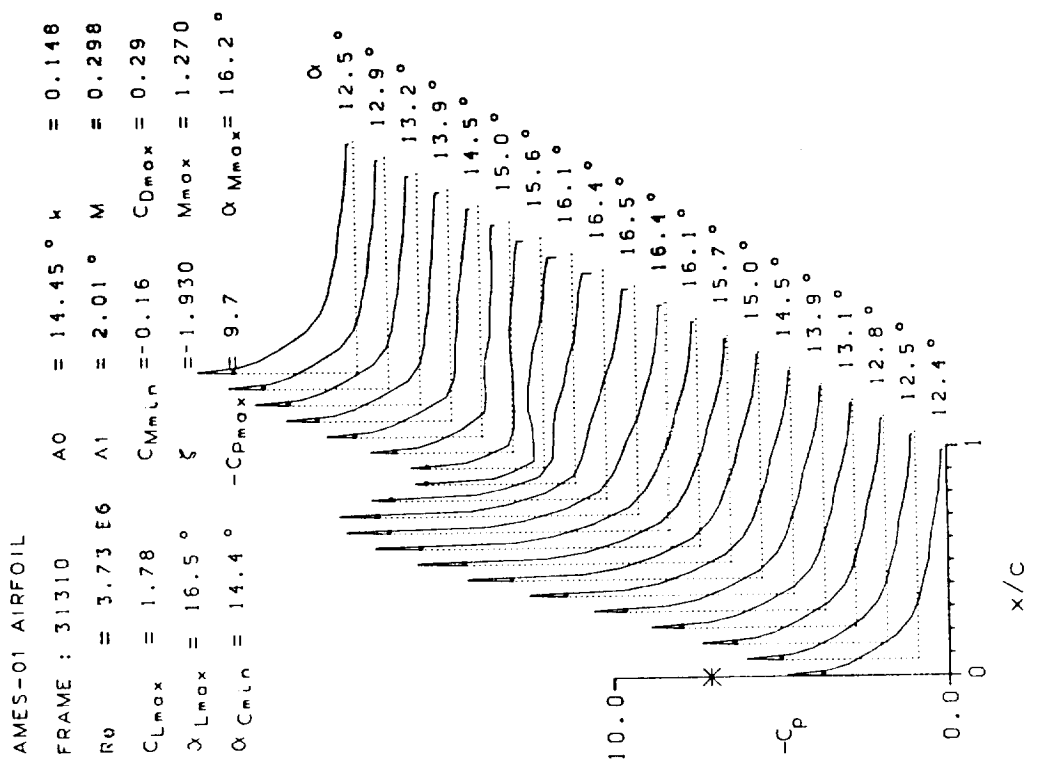


Figure 13.- Concluded.

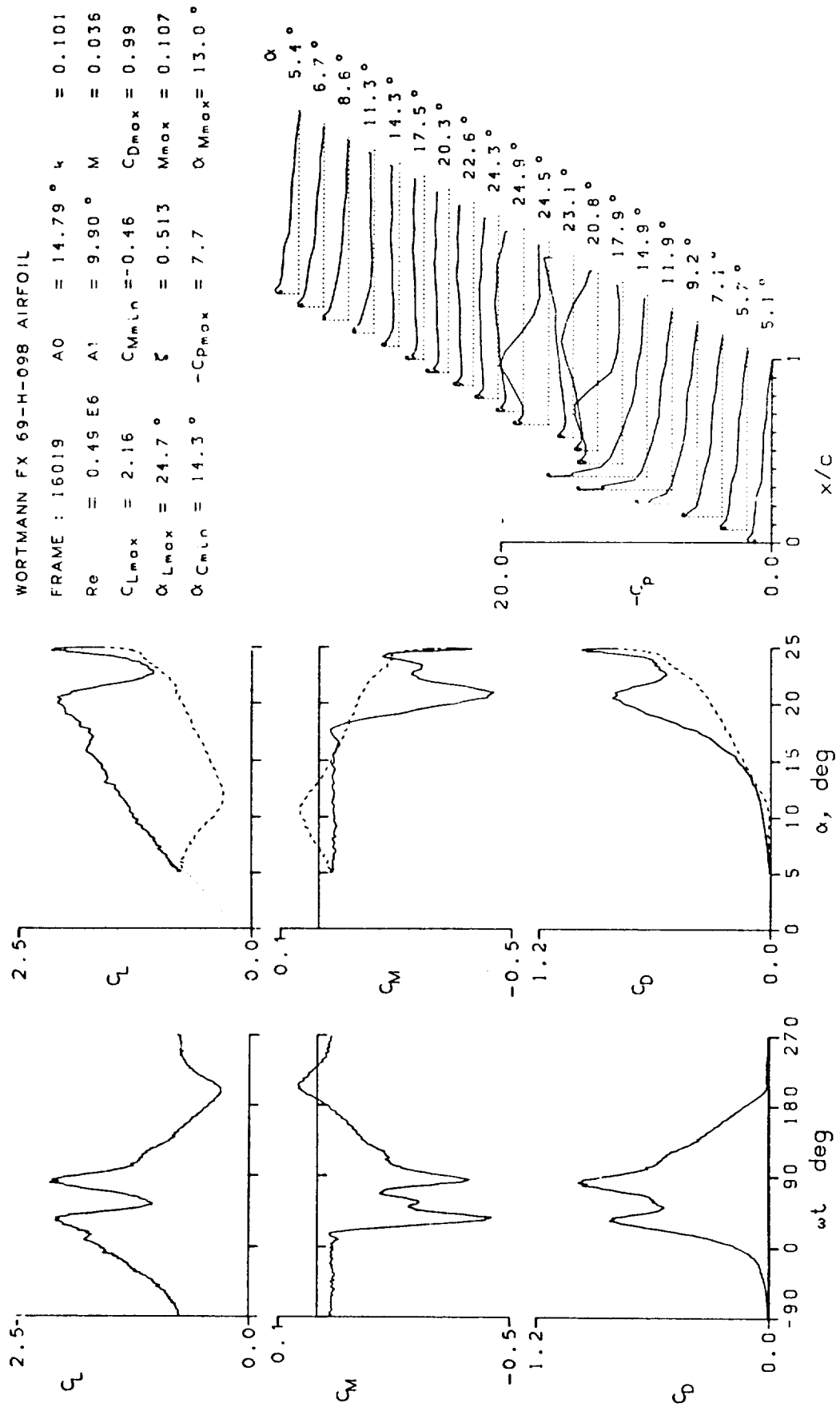


Figure 14.- Dynamic data for Wortmann FX-098 airfoil.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 16105 A0 = 14.80° k = 0.097
 Re = 0.99 E6 A1 = 9.90° M = 0.074
 $C_{Lmax} = 2.37$ $C_{Mmin} = -0.43$ $C_{Dmax} = 0.98$
 $\alpha_{Lmax} = 21.1^\circ$ $\xi = 0.407$ $M_{max} = 0.325$
 $\alpha_{Cmin} = 14.3^\circ$ $-C_{Pmax} = 17.5$ $\alpha_{Mmax} = 19.7^\circ$

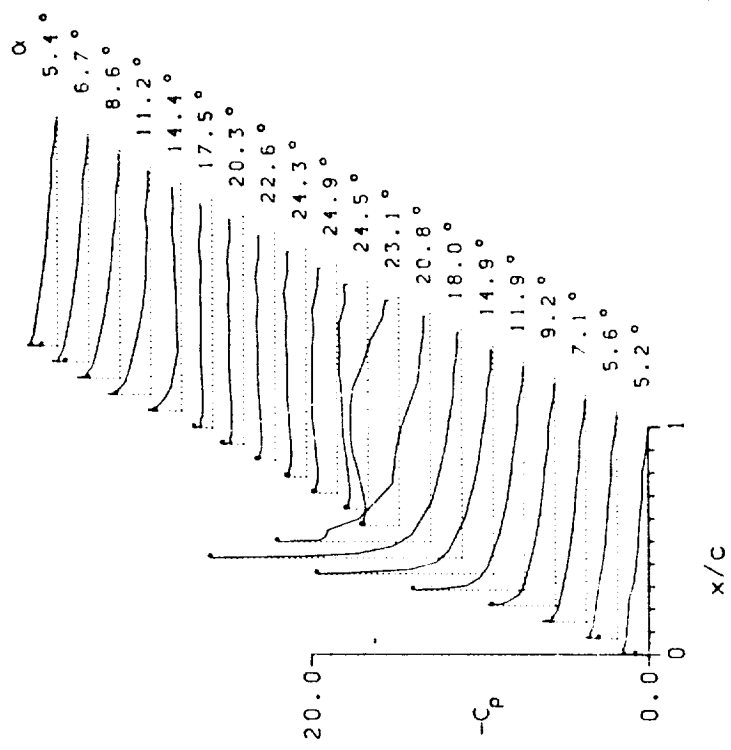
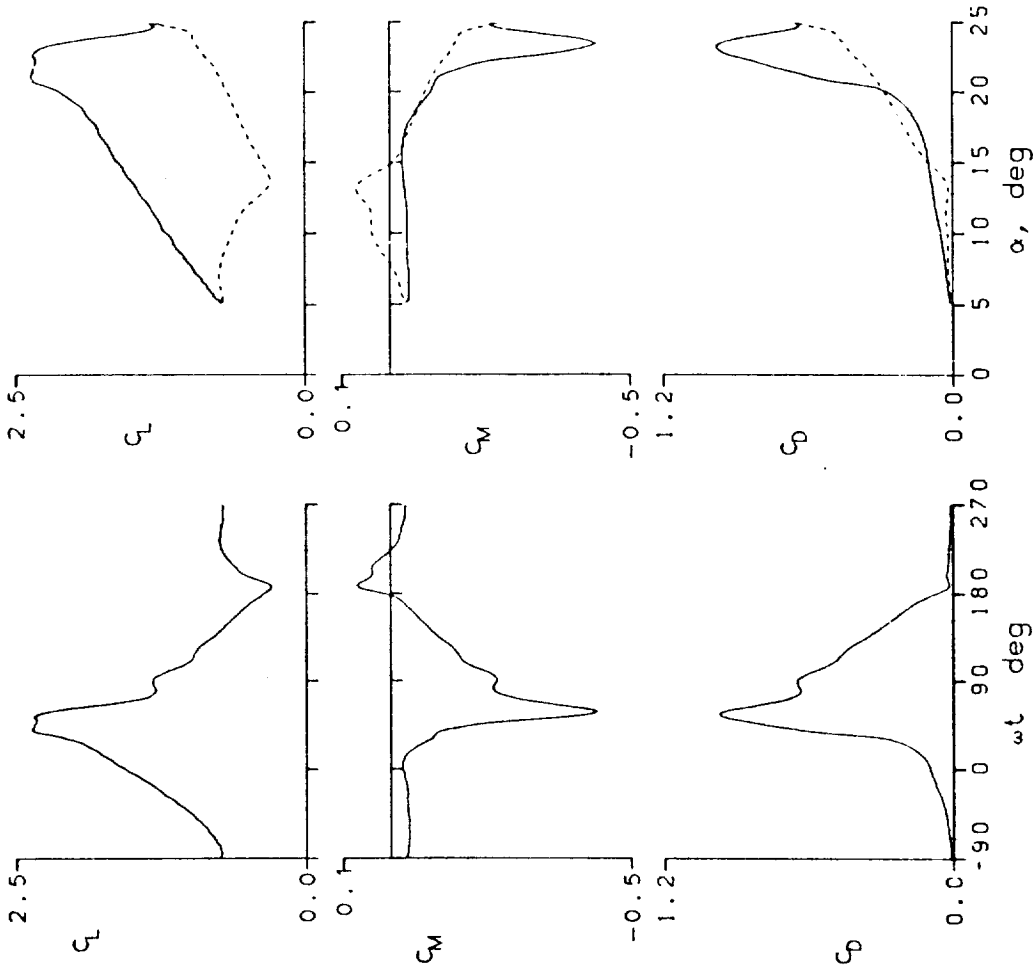


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 16114	A0 = 14.80 °	k = 0.098
Re = 1.46 E6	A1 = 9.90 °	M = 0.110
$C_{Lmax} = 2.48$	$C_{Mmin} = -0.44$	$C_{Dmax} = 1.02$
$\alpha_{Lmax} = 22.8 °$	$\xi = 0.294$	$M_{max} = 0.539$
$\alpha_{Cmin} = 14.3 °$	$-C_{Pmax} = 20.3$	$\alpha_{Mmax} = 20.8 °$

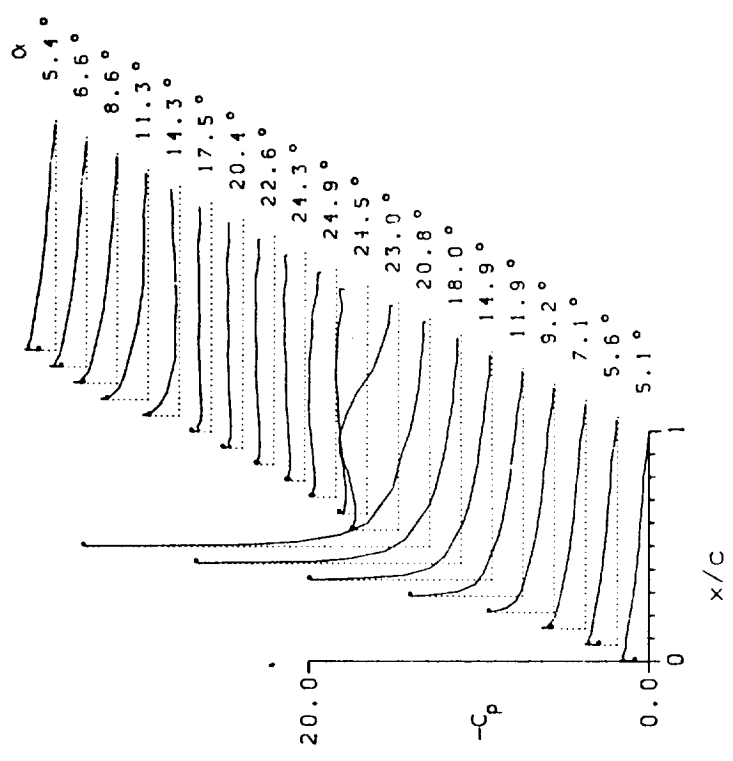
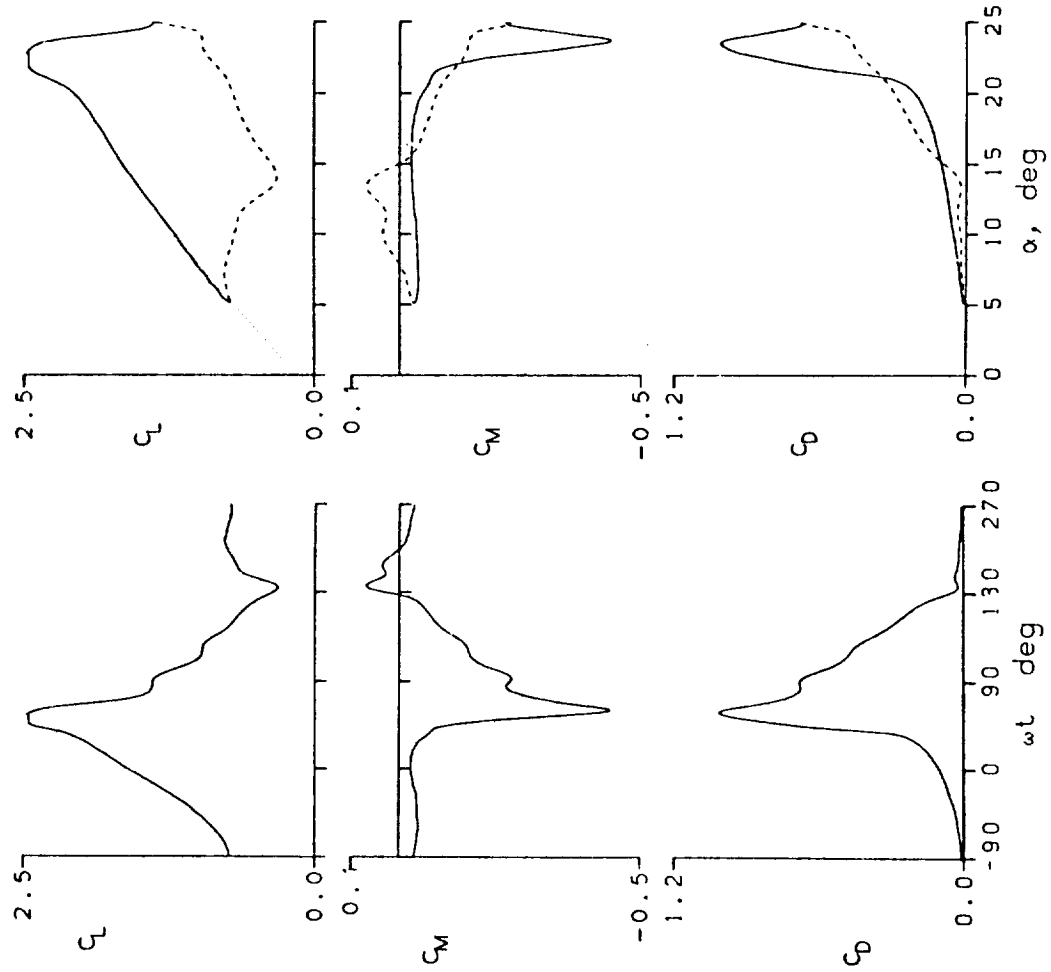


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 16200 A0 = 14.80° k = 0.098
 Re = 2.43 E6 A1 = 9.90° M = 0.185
 CLmax = 2.43 CMmin = -0.40 CDmax = 0.93
 αLmax = 21.8° ζ = 0.310 Mmax = 1.071
 αCmin = 14.3° -CPmax = 21.0 αMmax = 20.3°

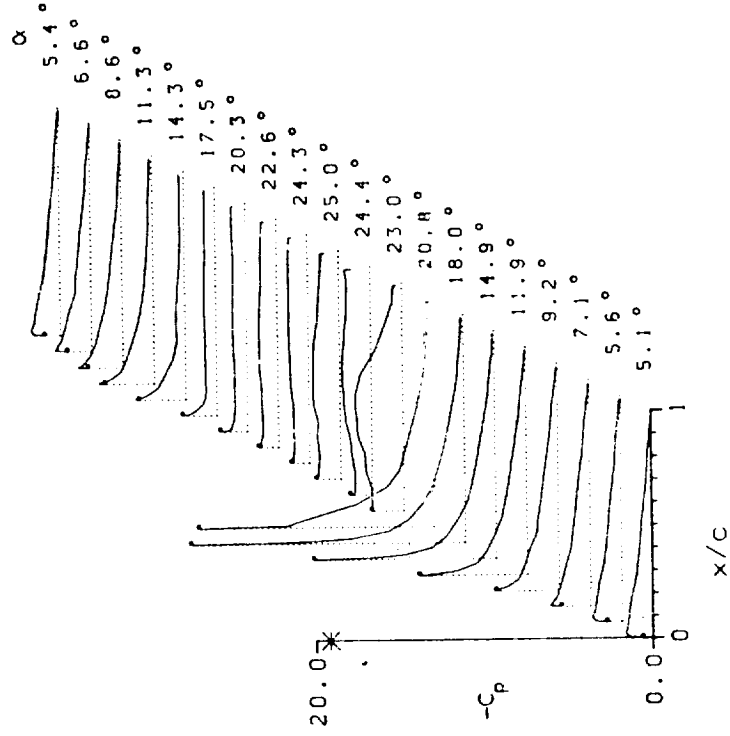
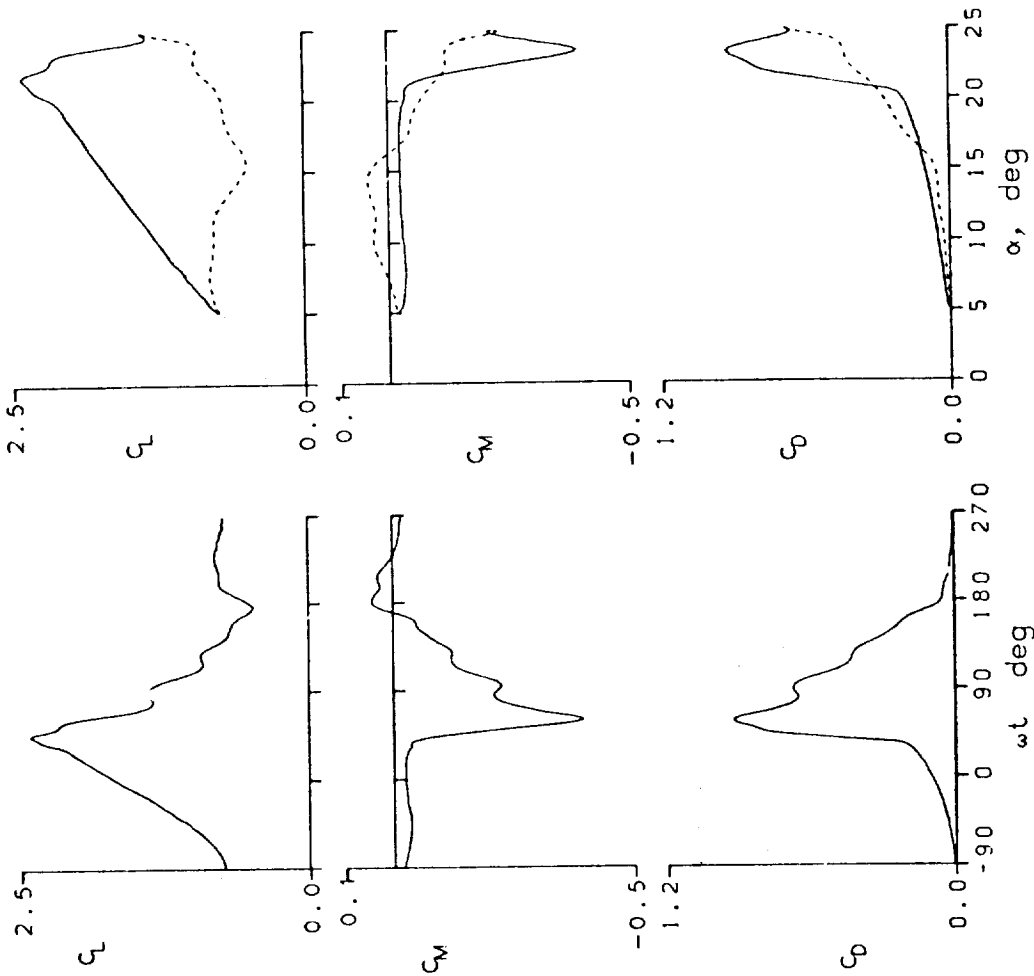


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 16213 A0 = 6.34° k = 0.050
 Re = 2.50 E6 A1 = 10.01° M = 0.184
 CLmax = 1.78 CMmin = -0.04 CDmax = 0.12
 αLmax = 16.3° ζ = 0.107 Mmax = 0.824
 αCmin = 5.8° -CPmax = 14.5 αMmax = 16.4°

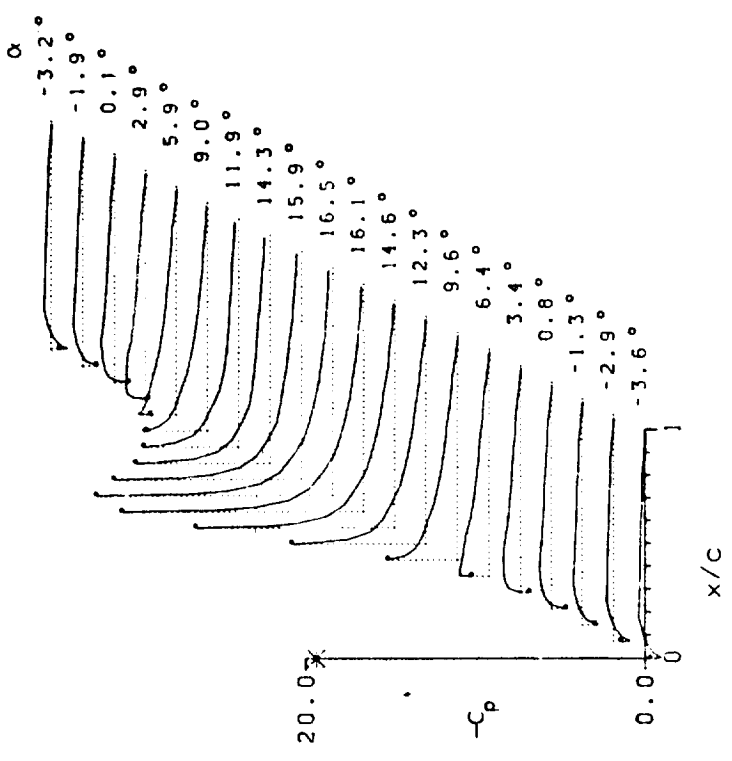
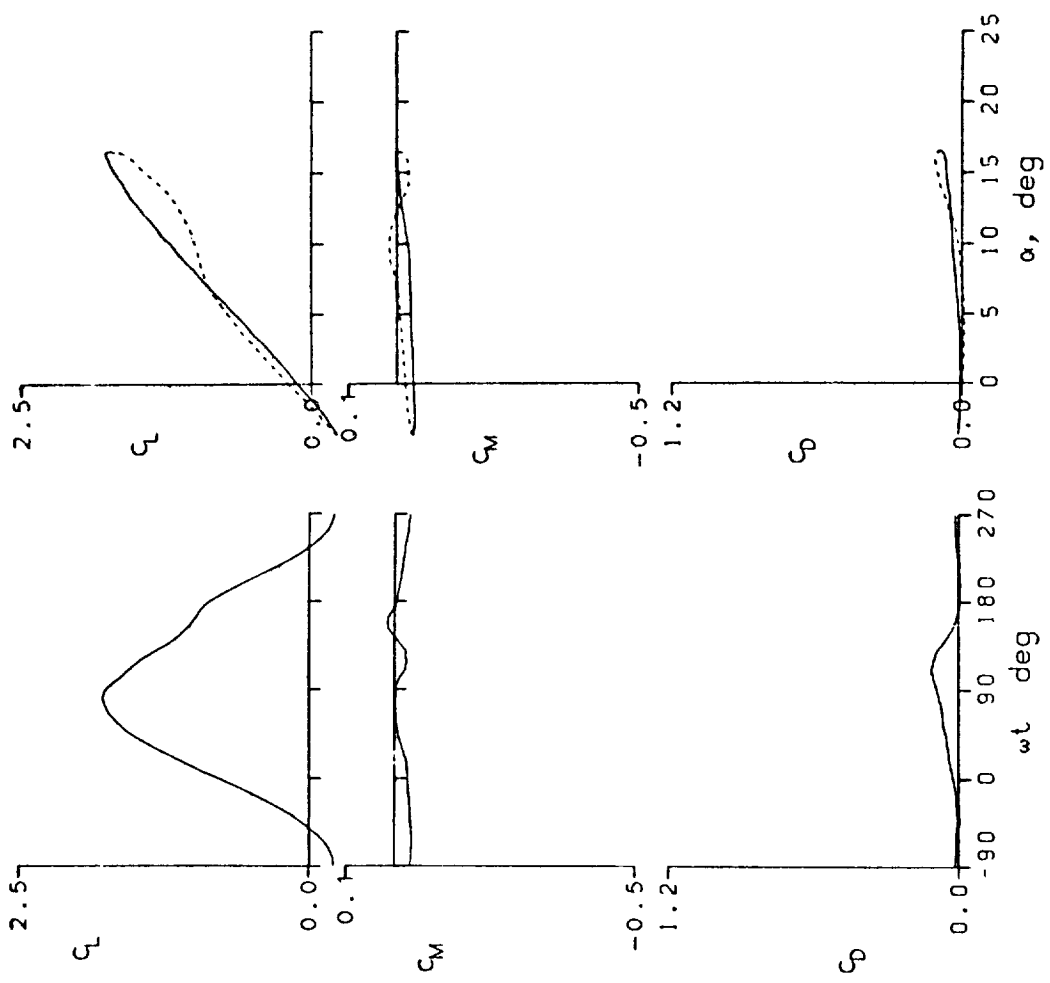


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 16215 AC = 6.33° k = 0.200
 Re = 2.49 E6 A1 = 10.01° M = 0.184
 $C_{Lmax} = 1.79$ $C_{Mmin} = -0.07$ $C_{Dmax} = 0.12$
 $\alpha_{Lmax} = 16.5^\circ$ $\zeta = 0.600$ $M_{max} = 0.842$
 $\alpha_{Cmin} = 5.8^\circ$ $-C_{Pmax} = 15.0$ $\alpha_{Mmax} = 16.3^\circ$

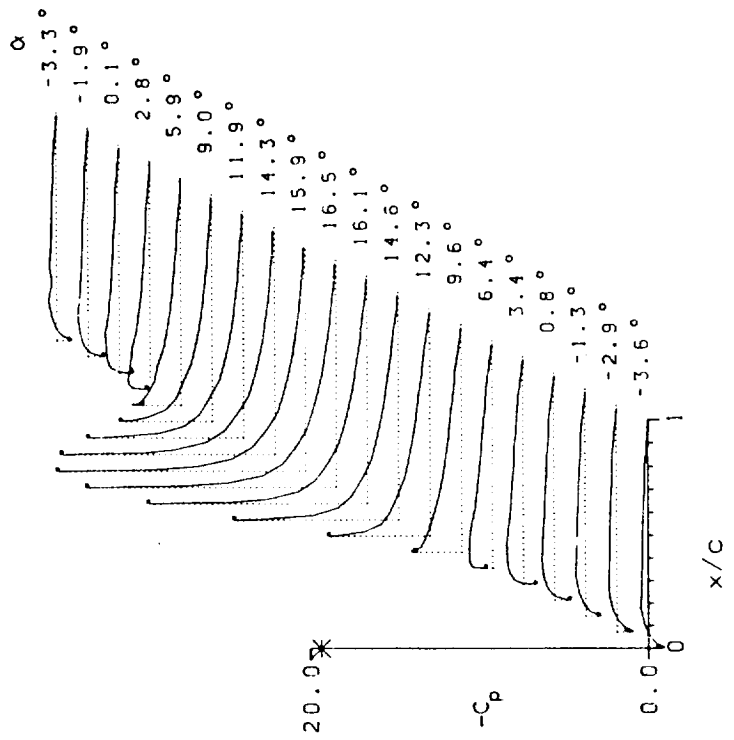
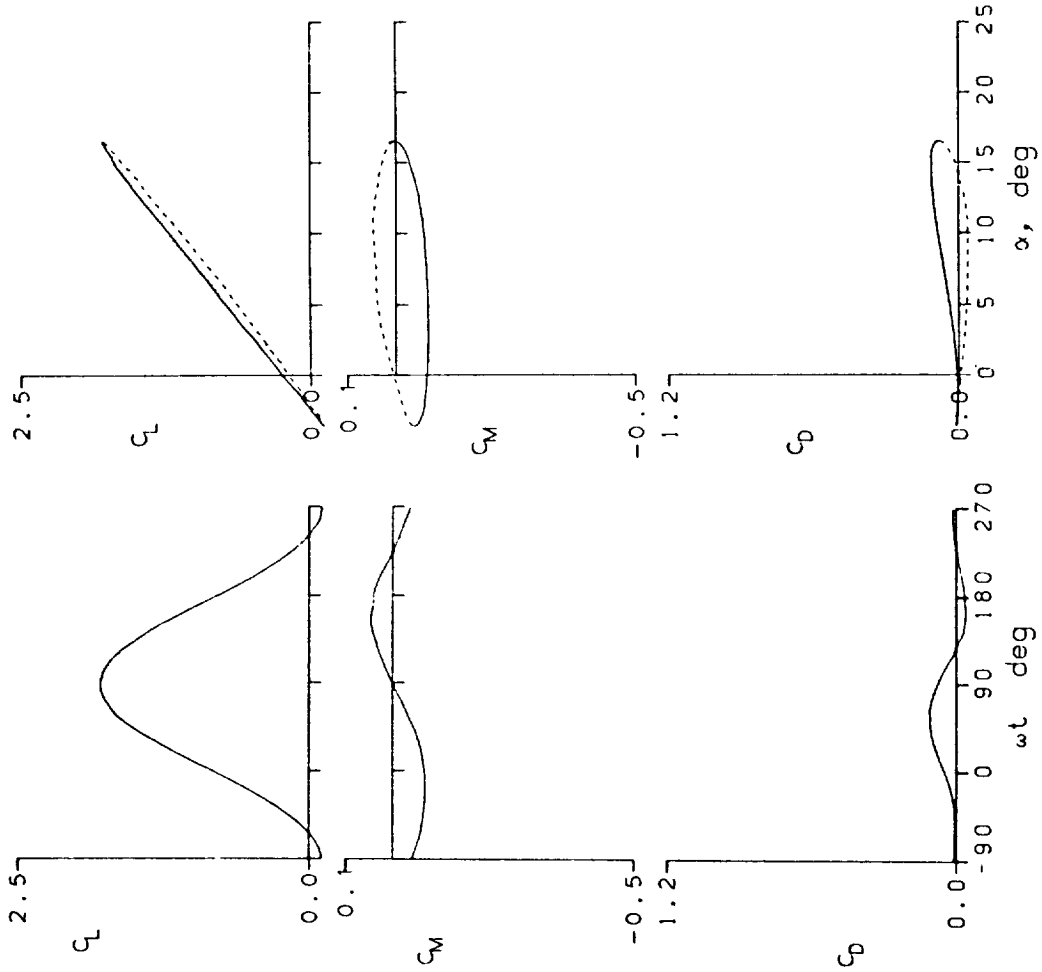


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 16300 A0 = 14.81° k = 0.099
 Re = 2.89 E6 A1 = 9.88° M = 0.220
 CLmax = 2.35 CMmin = -0.44 CDmax = 0.93
 αLmax = 21.5° ζ = 0.421 Mmax = 1.232
 αCmin = 14.4° -CPmax = 17.4 αMmax = 18.6°

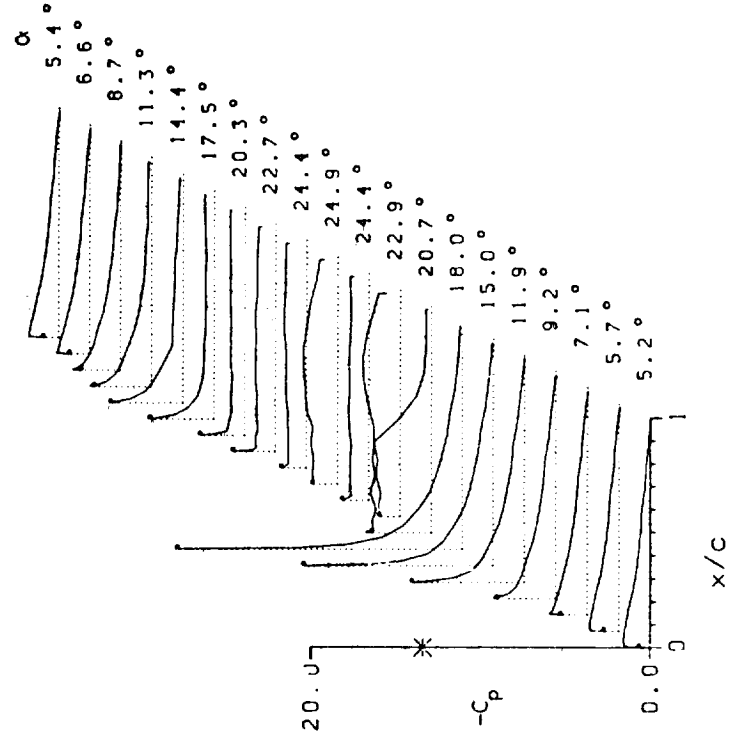
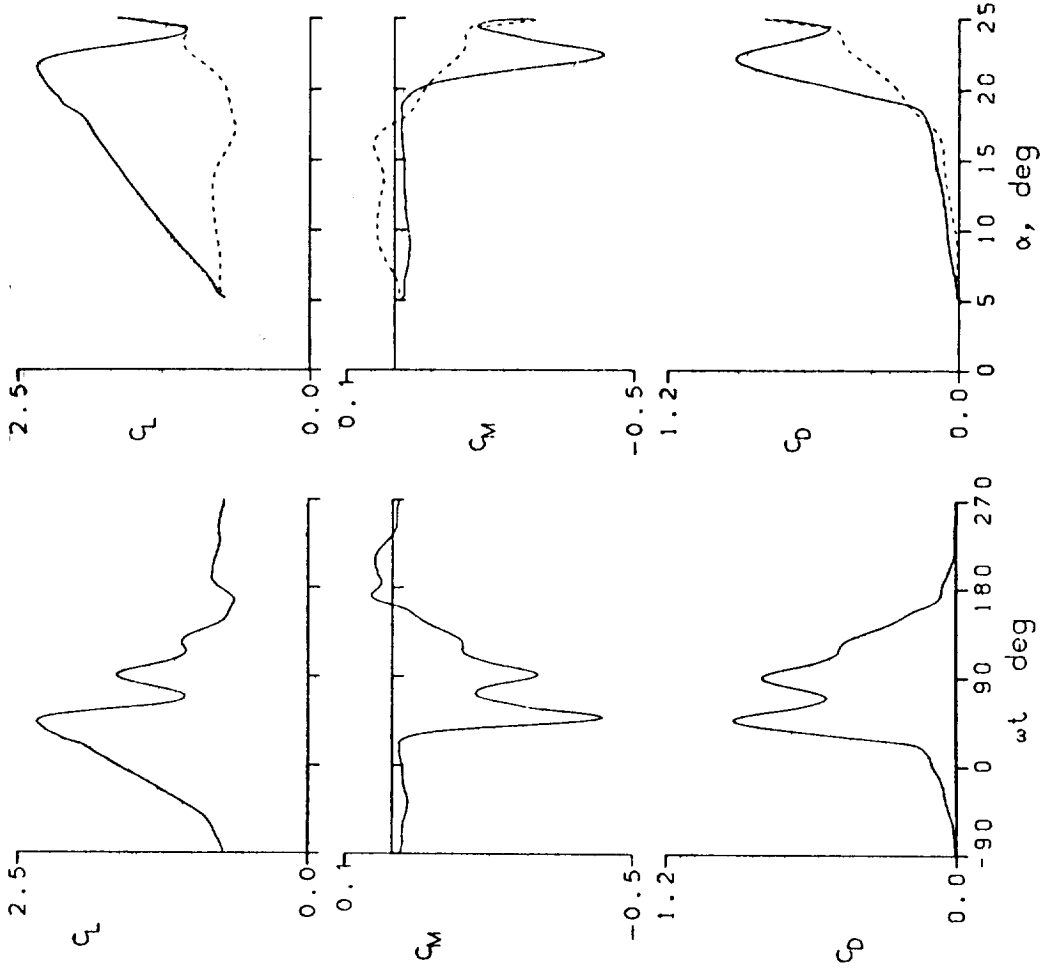


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 16308 A0 = 14.83° k = 0.099
 Re = 3.23 E6 A1 = 9.88° M = 0.249
 CLmax = 2.32 Cdmun = -0.44 CDmax = 0.88
 αLmax = 20.8° ξ = 0.543 Mmax = 1.273
 αCmun = 14.4° -CPmax = 14.0 αMmax = 16.8°

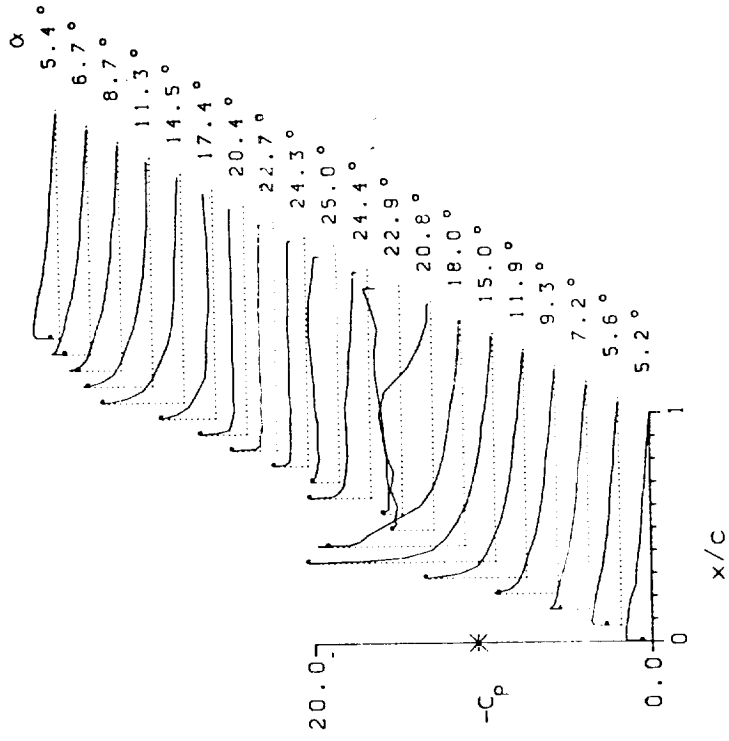
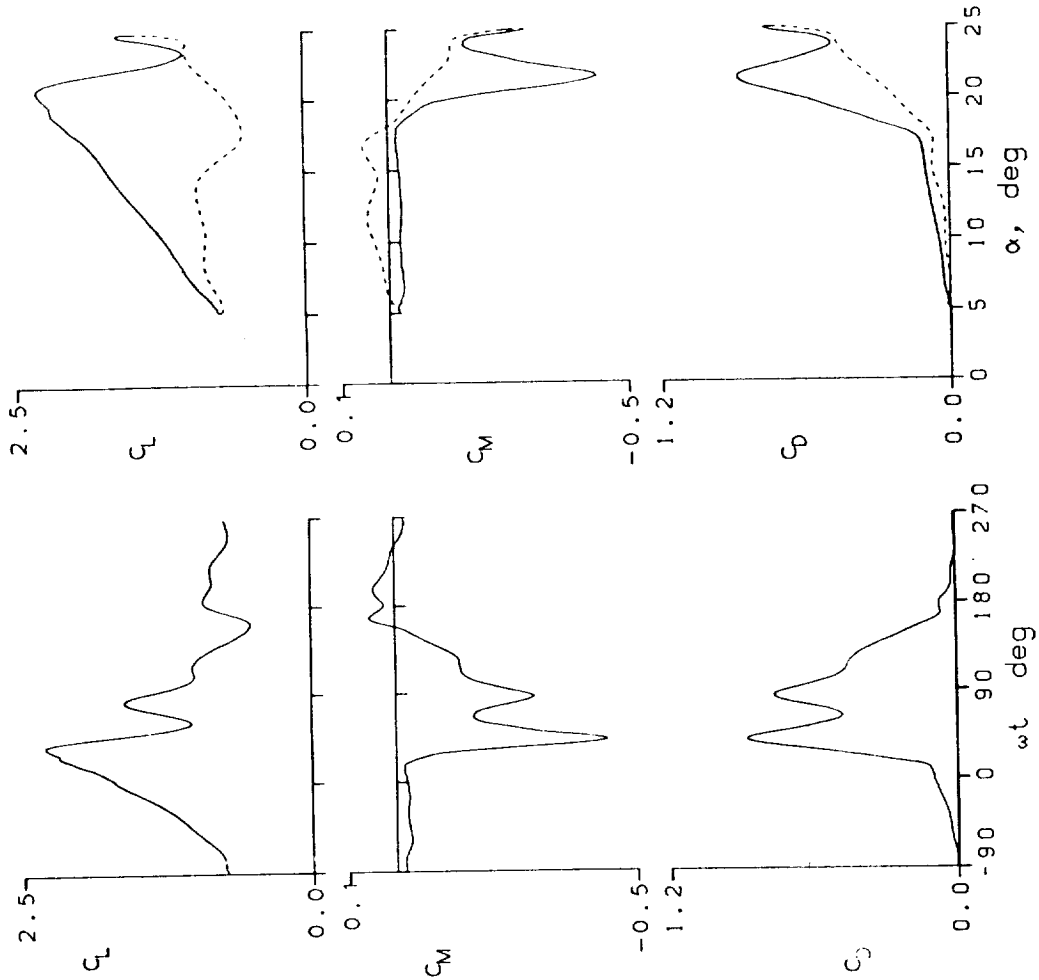


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL TRIP

FRAME : 17100 A0 = 14.81° k = 0.050

Re = 2.46 E6 A1 = 9.88° M = 0.184

C_{Lmax} = 1.88 C_{Mmin} = -0.32 C_{Dmax} = 0.61

α_{Lmax} = 18.9° ζ = 0.306 M_{max} = 0.762

α_{Cmin} = 14.3° $-C_{pmax}$ = 12.8 α_{Mmax} = 16.4°

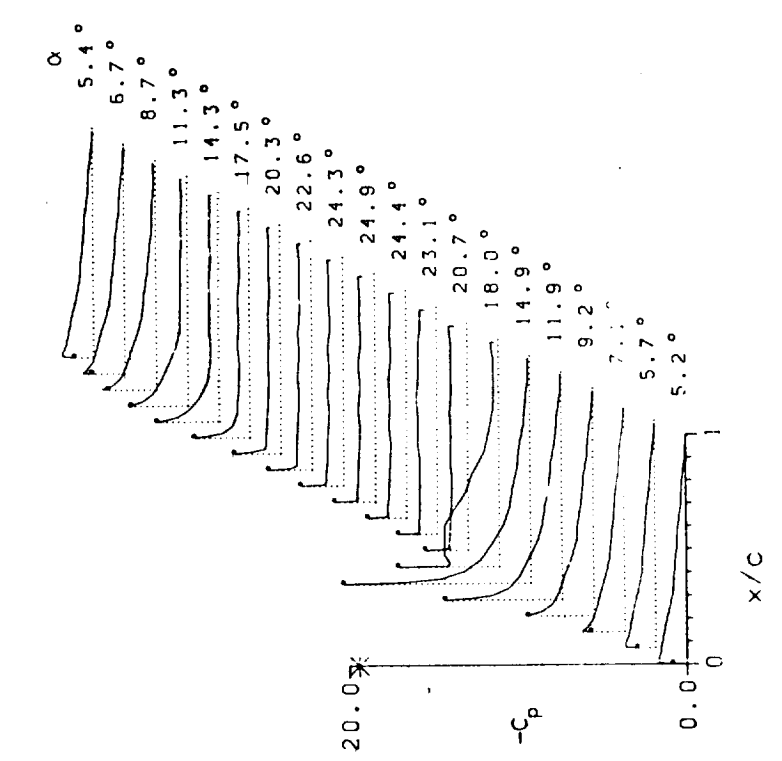
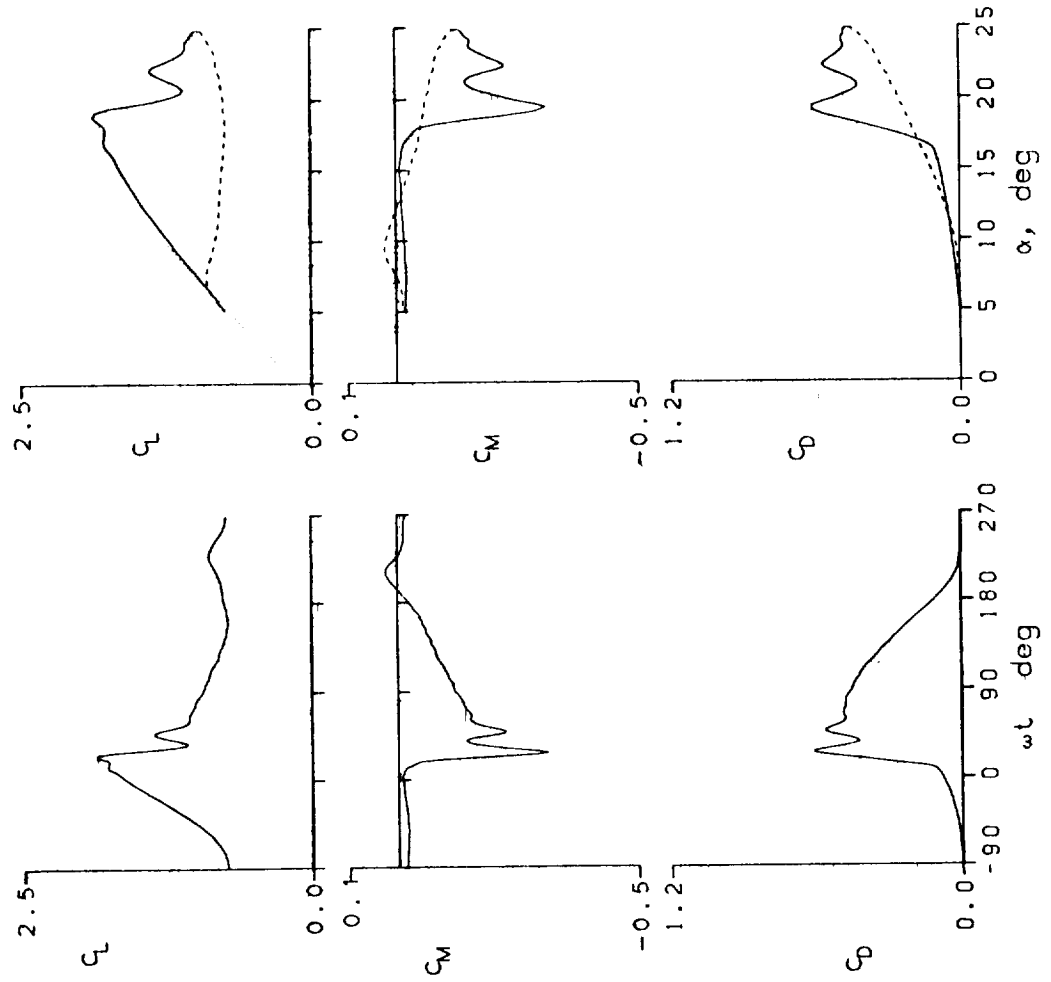


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL TRIP

FRAME : 17103 A0 = 14.81° k = 0.099

Re = 2.45 E6 A1 = 9.90° M = 0.184

$C_{Lmax} = 2.23$ $C_{Mmin} = -0.47$ $C_{Dmax} = 0.91$

$\alpha_{Lmax} = 21.5^\circ$ $\zeta = 0.420$ $M_{max} = 0.794$

$\alpha_{C_{min}} = 14.3^\circ$ $-C_{pmax} = 13.7$ $\alpha_{Mmax} = 17.1^\circ$

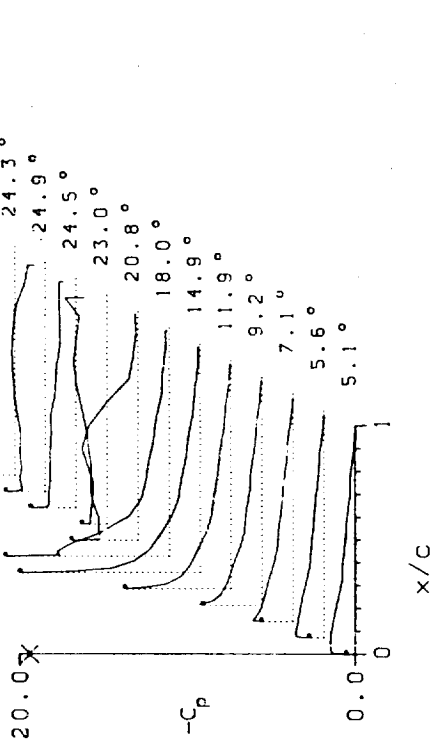
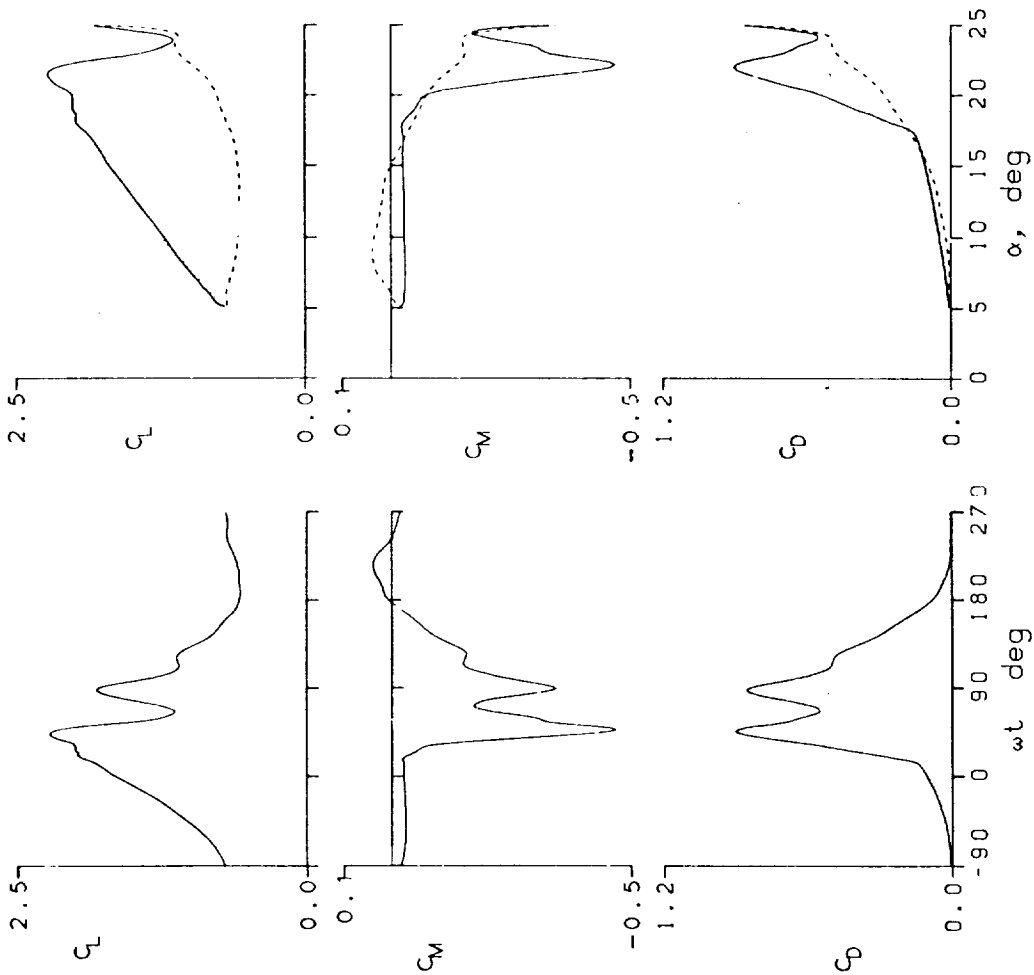


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL TRIP

FRAME : 17109 A0 = 14.80° k = 0.149

Re = 2.45 E6 A1 = 9.89° M = 0.184

C_{Lmax} = 2.37 C_{Mmin} = -0.53 C_{Dmax} = 1.07

α_{Lmax} = 23.6° ξ = 0.175 M_{max} = 0.802

α_{Cmin} = 14.3° $-C_{Pmax}$ = 13.9 α_{Mmax} = 17.7°

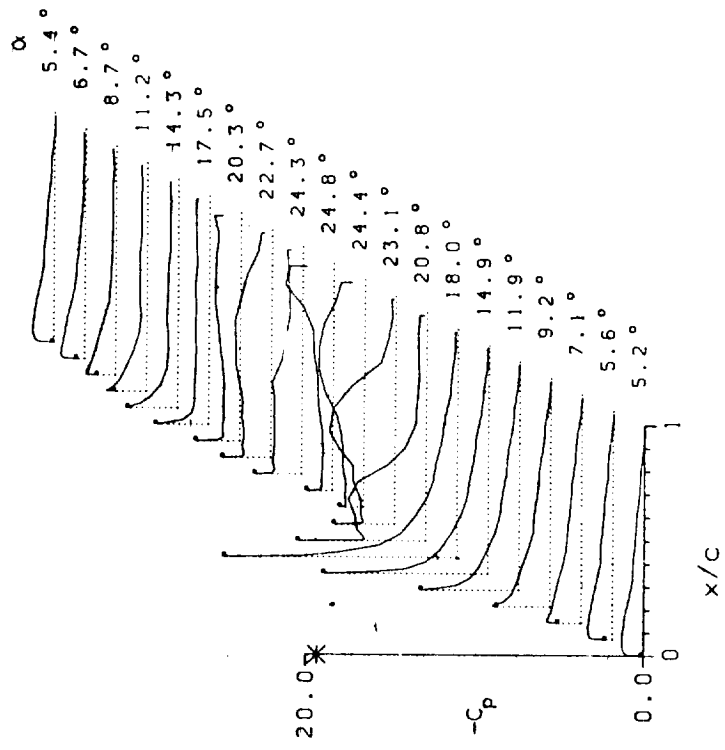
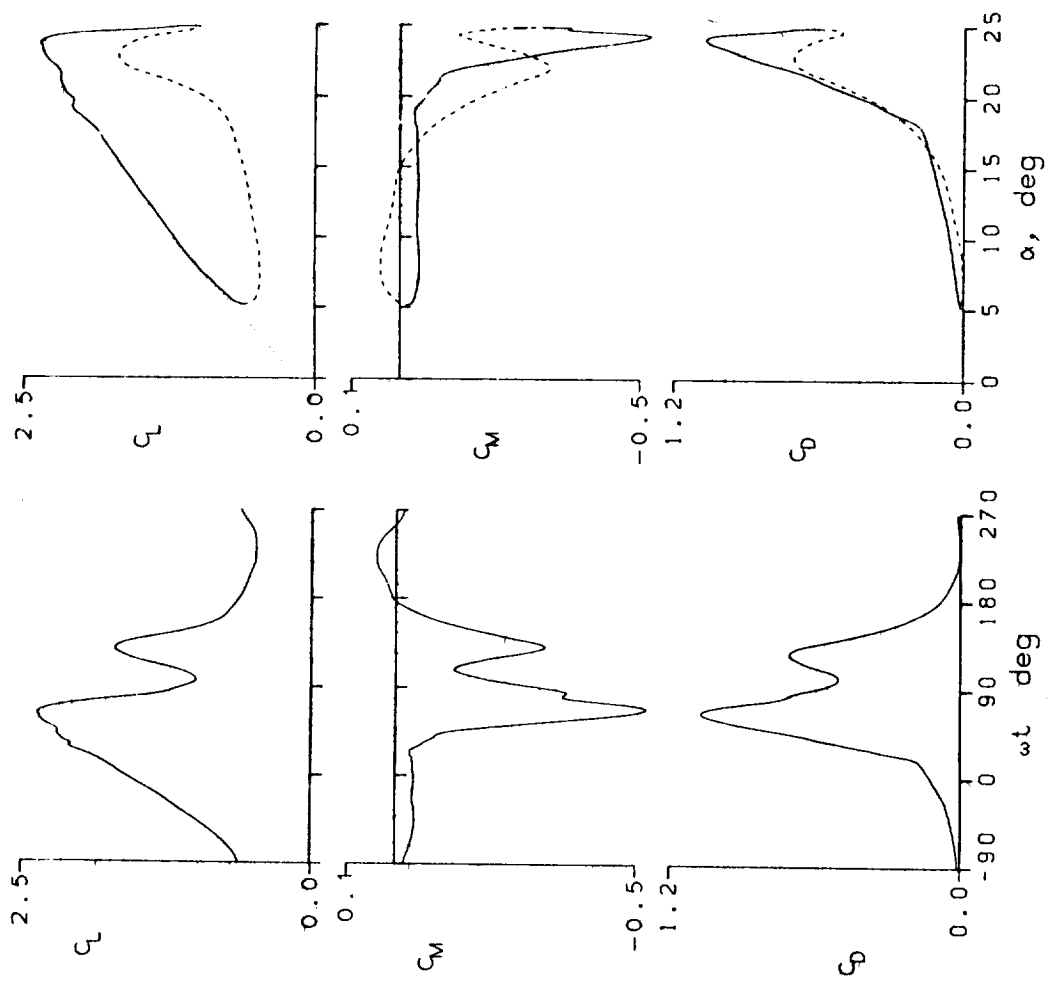


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL TRIP

FRAME : 17117 A0 = 14.84° k = 0.025

Re = 3.77 E6 A1 = 9.89° M = 0.293

C_{Lmax} = 1.57 C_{Mmin} = -0.17 C_{Dmax} = 0.47

α_{Lmax} = 14.4° ξ = 0.174 M_{max} = 1.212

$\alpha_{C_{min}}$ = 14.4° $-C_{pmax}$ = 9.5 $\alpha_{M_{max}}$ = 13.5°

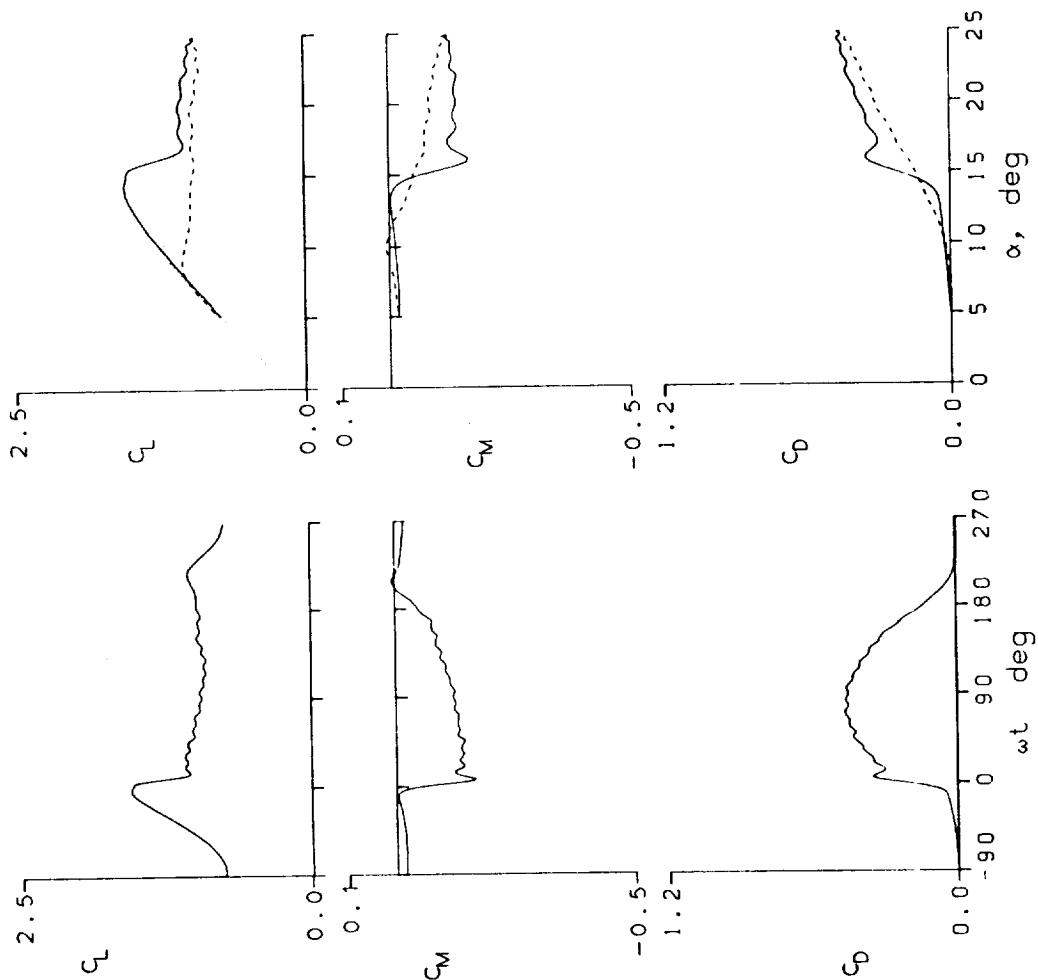


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL TRIP

FRAME : 17119 AO = 14.81° k = 0.050

Re = 3.72 E6 A1 = 9.89° M = 0.291

CLmax = 1.84 CMmin = -0.29 CDmax = 0.54

αLmax = 17.1° ζ = 0.333 Mmax = 1.278

αCmin = 14.3° -Cpmax = 10.2 αMmax = 14.3°

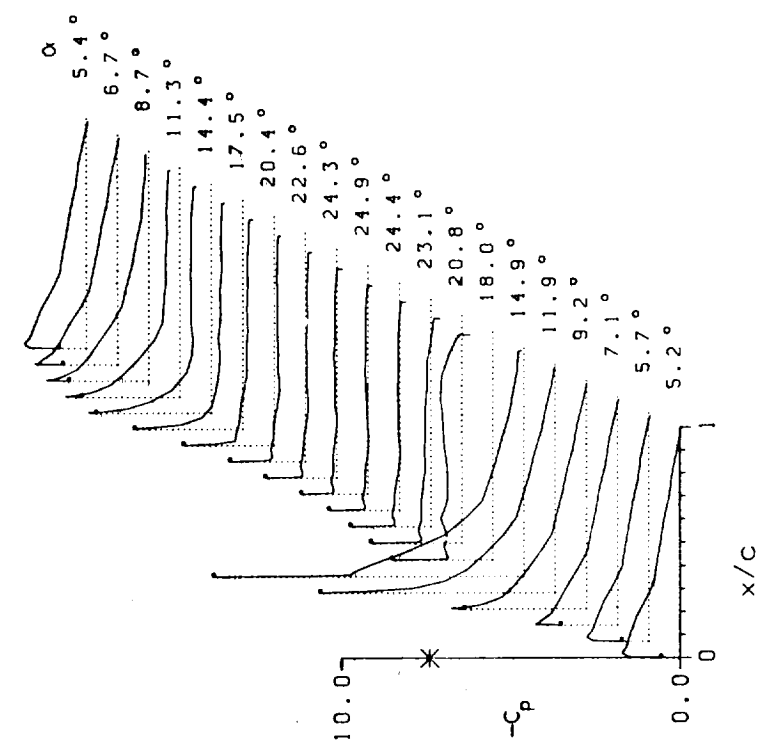
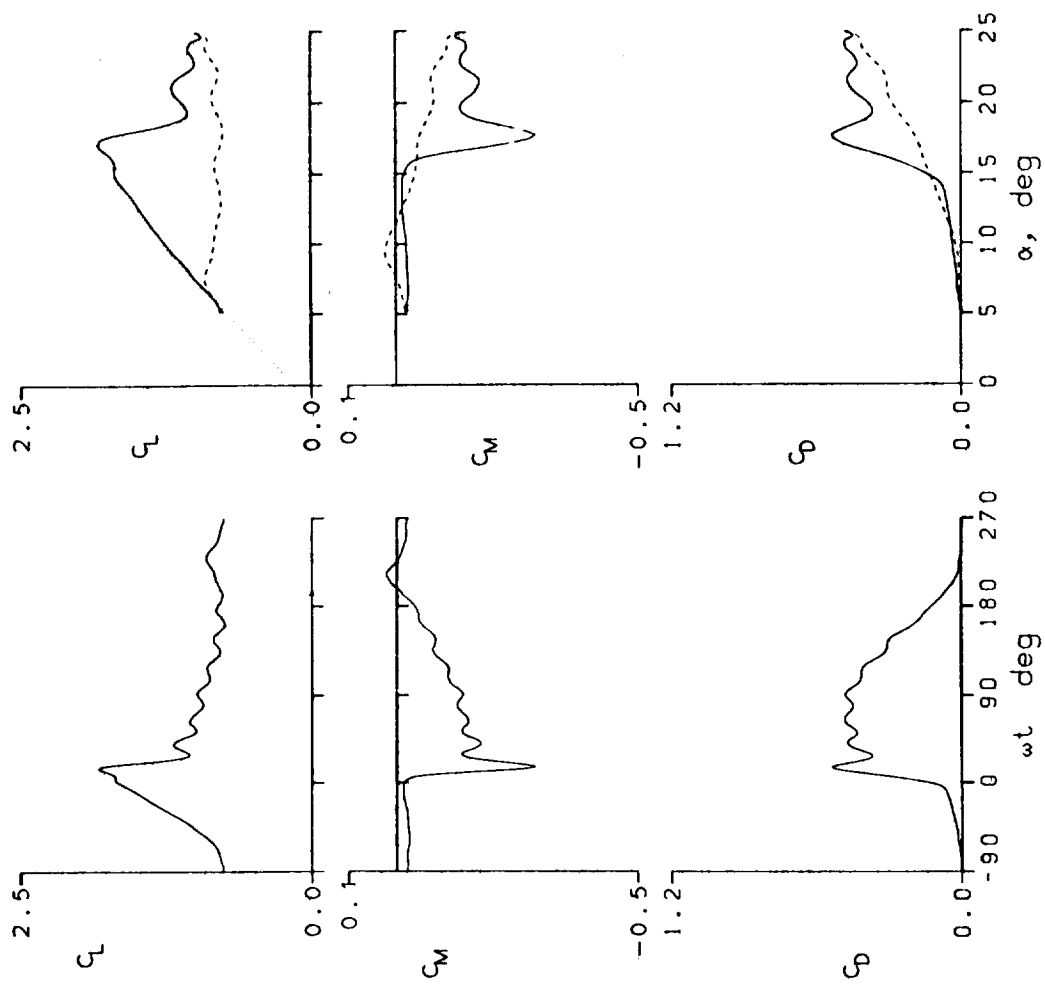


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL TRIP

FRAME : 17200 A0 = 14.81° k = 0.100

Re = 3.70 E6 A1 = 9.88° M = 0.290

$C_{Lmax} = 2.16$ $C_{Mmin} = -0.45$ $C_{Dmax} = 0.82$

$\alpha_{Lmax} = 20.0^\circ$ $\xi = 0.676$ $M_{max} = 1.316$

$\alpha_{Cmin} = 14.4^\circ$ $-C_{Pmax} = 10.7$ $\alpha_{Mmax} = 14.6^\circ$

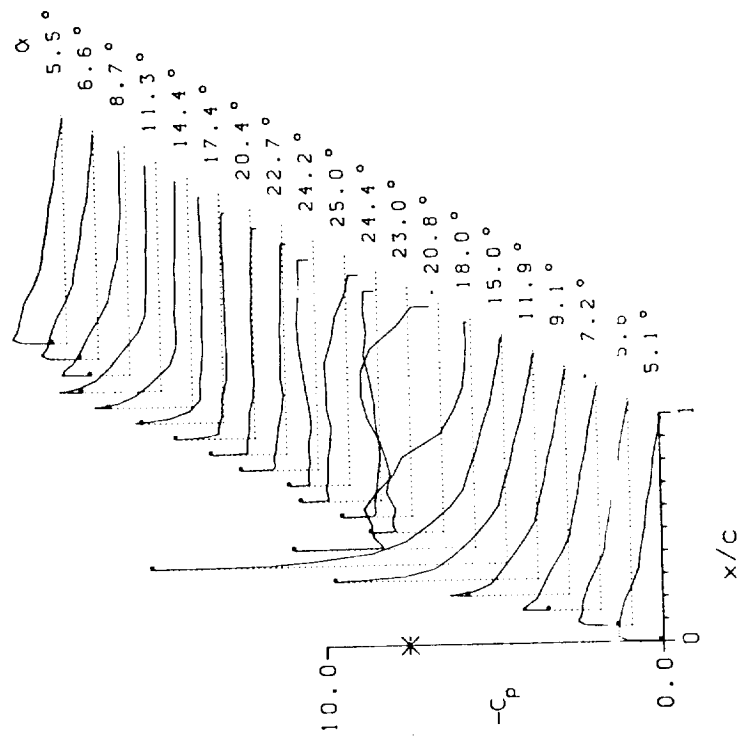
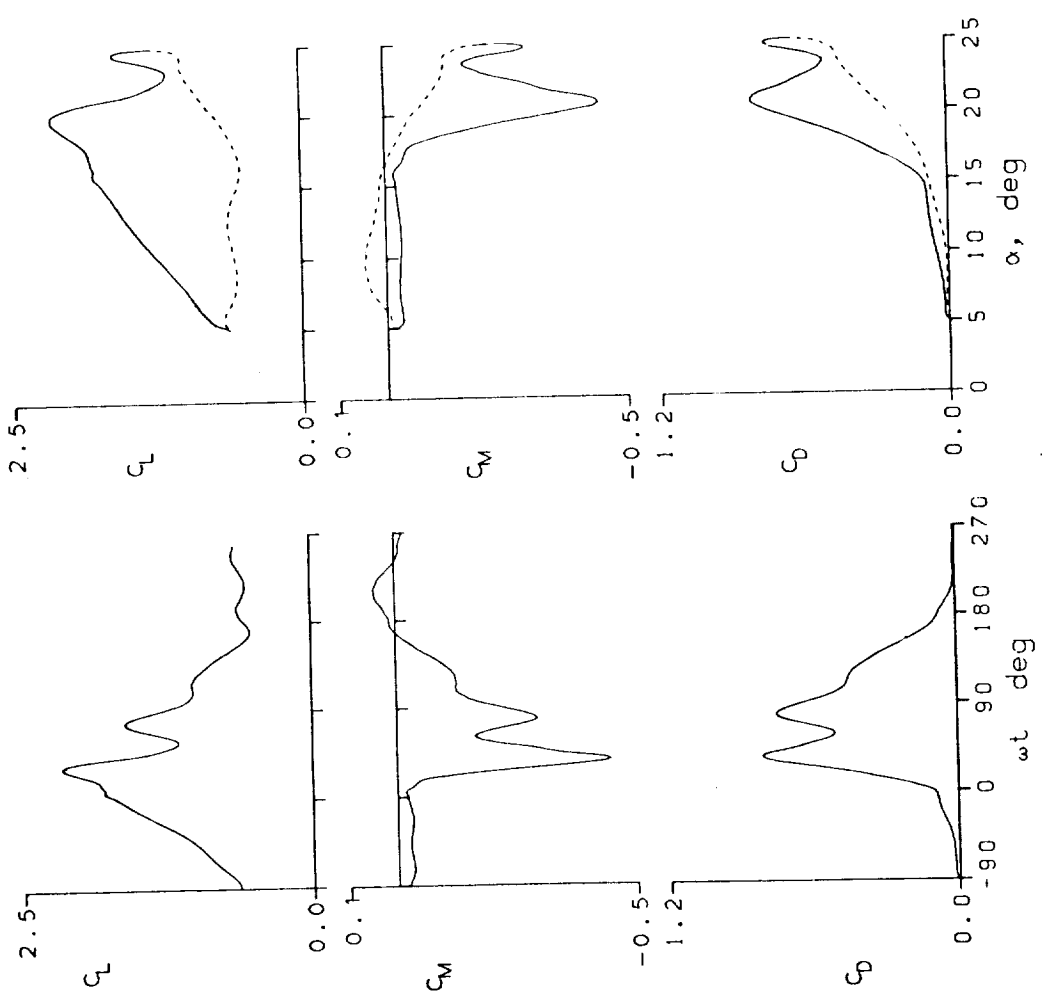


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 21100 A0 = 14.95° k = 0.010
 Re = 3.72 E6 A1 = 9.87° M = 0.291
 CLmax = 1.52 CMmin = -0.12 CDmax = 0.43
 α Lmax = 13.7° ζ = 0.010 Mmax = 1.245
 α Cmin = 14.7° -CPmax = 10.0 α Mmax = 14.1°

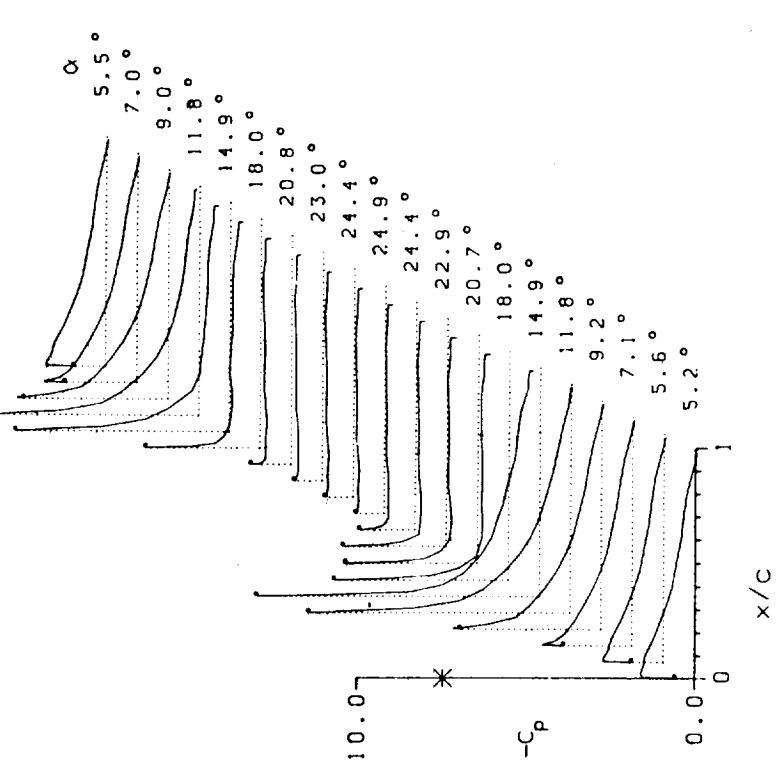
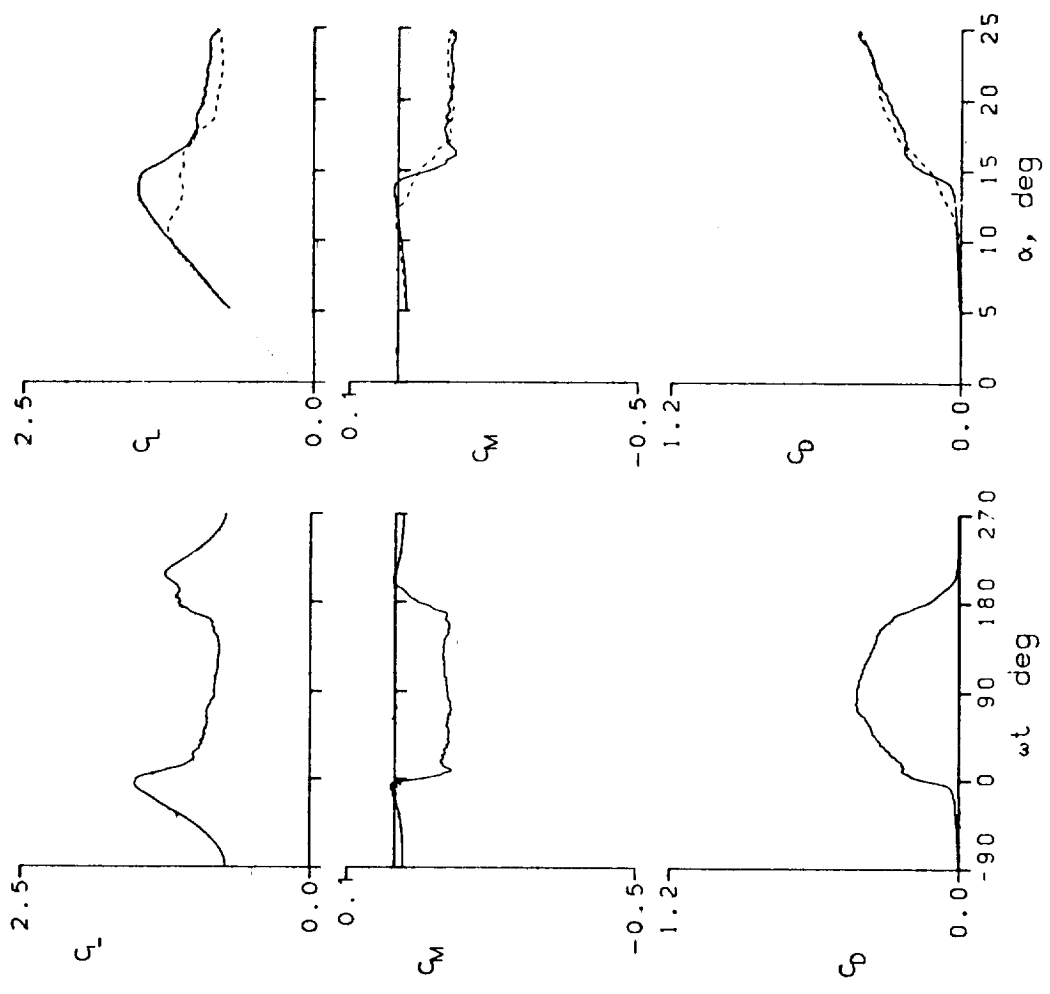


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 21107 A0 = 9.78 ° k = 0.010
 Re = 3.79 E6 A1 = 9.94 ° M = 0.299
 $C_{Lmax} = 1.50$ $C_{Mmin} = -0.11$ $C_{Dmax} = 0.28$
 $\alpha_{Lmax} = 13.3^\circ$ $\zeta = 0.026$ $M_{max} = 1.262$
 $\alpha_{C_{min}} = 9.3^\circ$ $-C_{Pmax} = 9.5$ $\alpha_{Mmax} = 13.6^\circ$

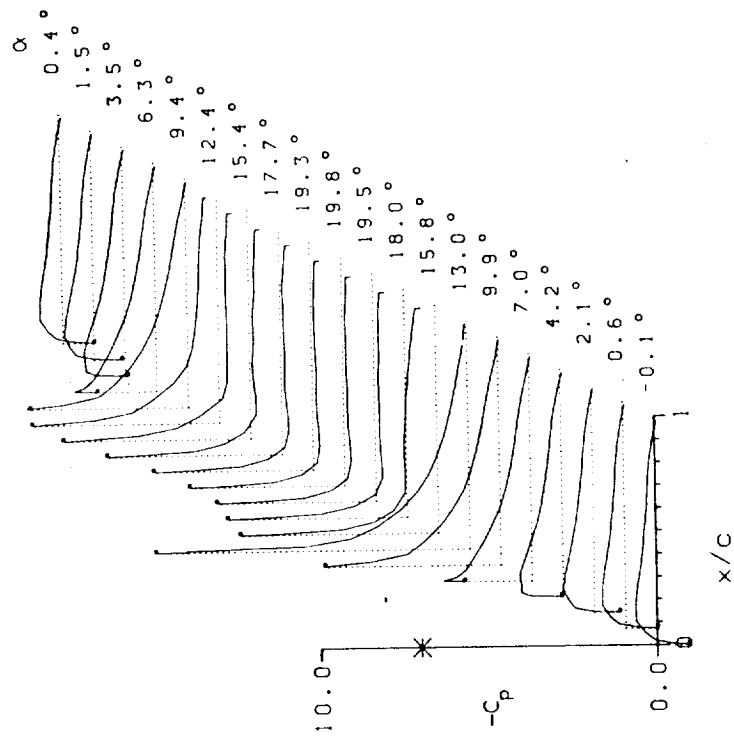
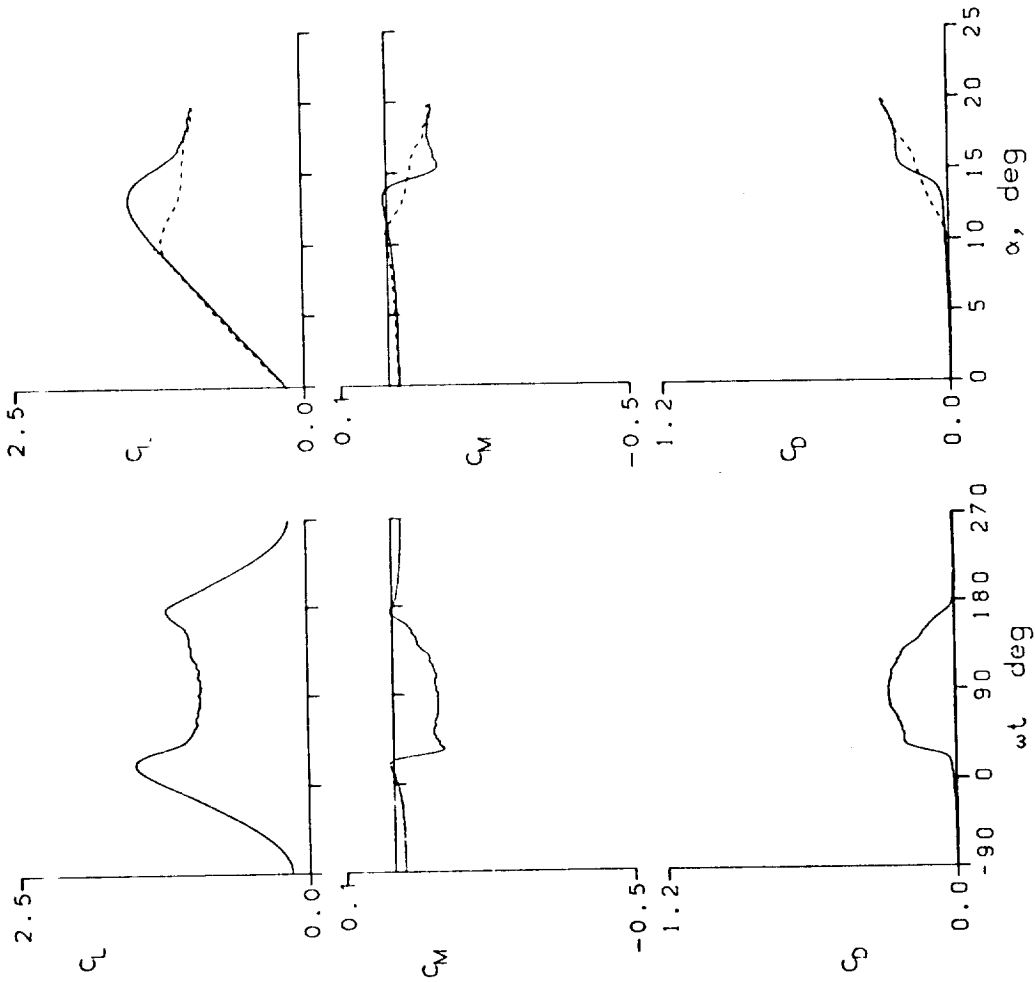


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 21112 $A_0 = 14.97^\circ$ $k = 0.010$
 $Re = 3.94 \times 10^6$ $A_1 = 4.89^\circ$ $M = 0.301$
 $C_{Lmax} = 1.48$ $C_{Mmin} = -0.10$ $C_{Dmax} = 0.25$
 $\alpha_{Lmax} = 13.7^\circ$ $\xi = -0.104$ $M_{max} = 1.250$
 $\alpha_{Cmin} = 14.8^\circ$ $-C_{Pmax} = 9.3$ $\alpha_{Mmax} = 14.1^\circ$

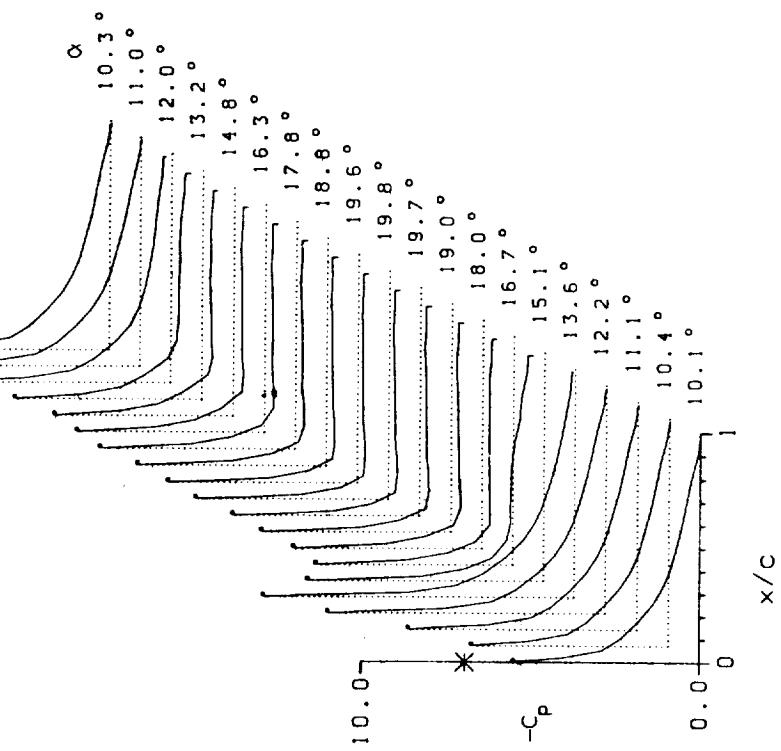
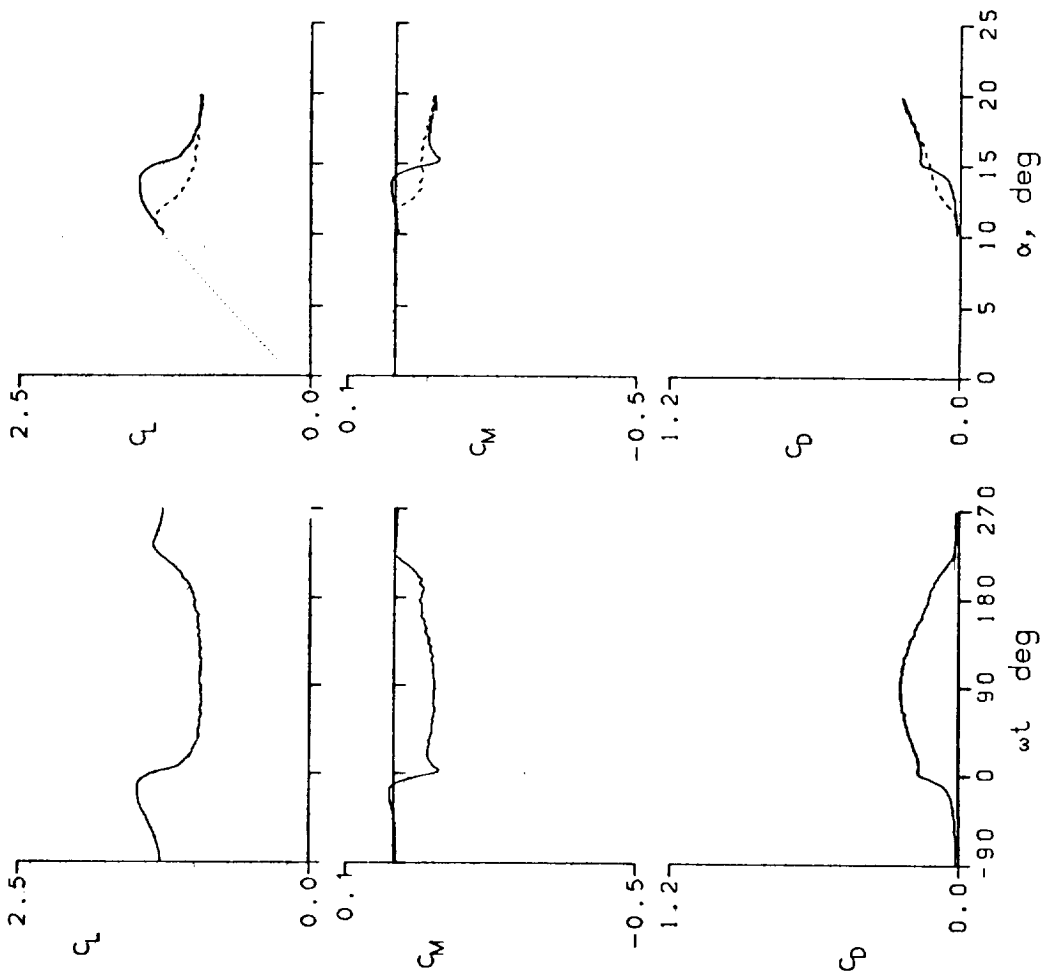


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 21200 A0 = 9.94° k = 0.010
 Re = 3.93 E6 A1 = 4.89° M = 0.301
 CLmax = 1.49 CMmin = -0.07 CDmax = 0.14
 αLmax = 14.0° ζ = -0.136 Mmax = 1.258
 αCmin = 9.8° -CDmax = 9.4 αMmax = 14.0°

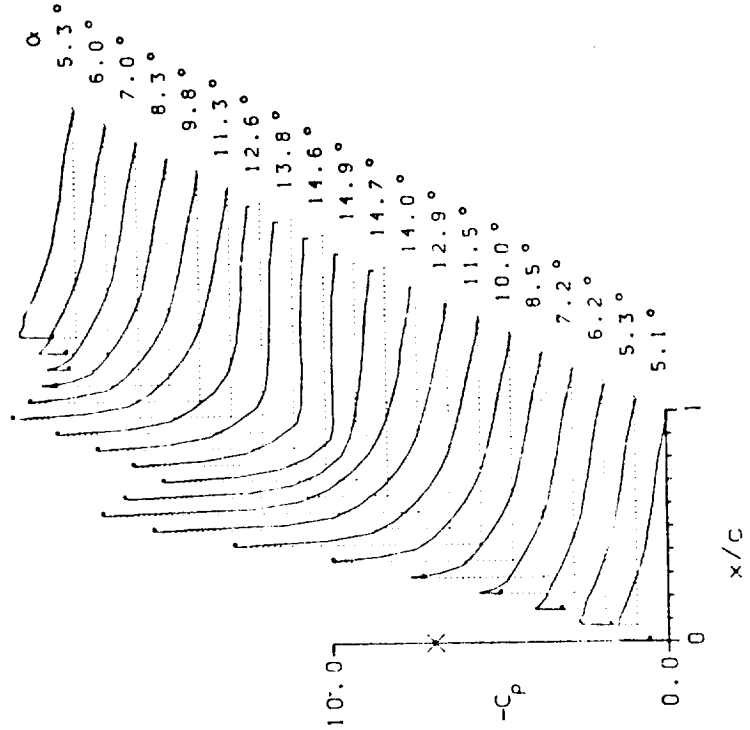
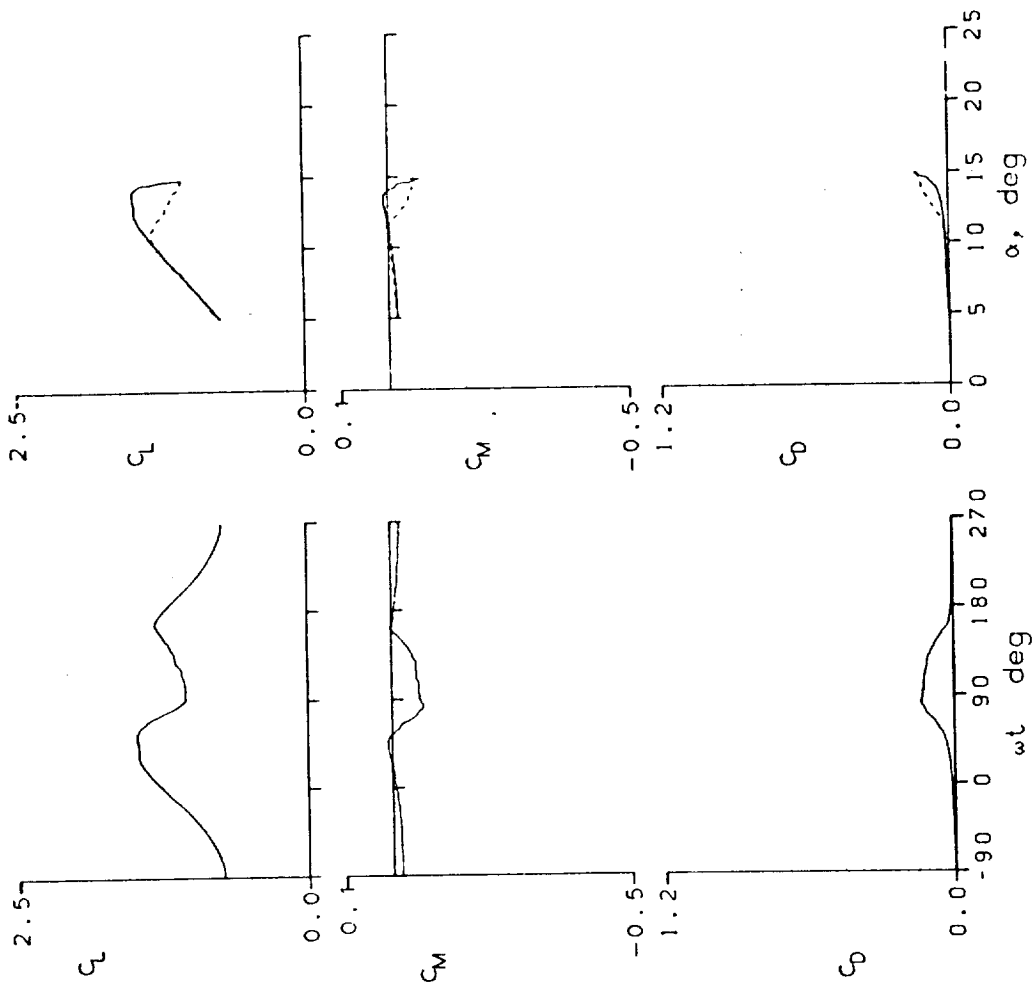


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL

FRAME : 21208 A0 = 3.16° k = 0.010
 Re = 3.90 E6 A1 = 10.16° M = 0.302
 CLmax = 1.50 CMmin = -0.04 CDmax = 0.06
 α Lmax = 12.8° ζ = 0.022 Mmax = 1.224
 α Cmin = 2.8° -Cpmax = 9.0 α Mmax = 13.4°

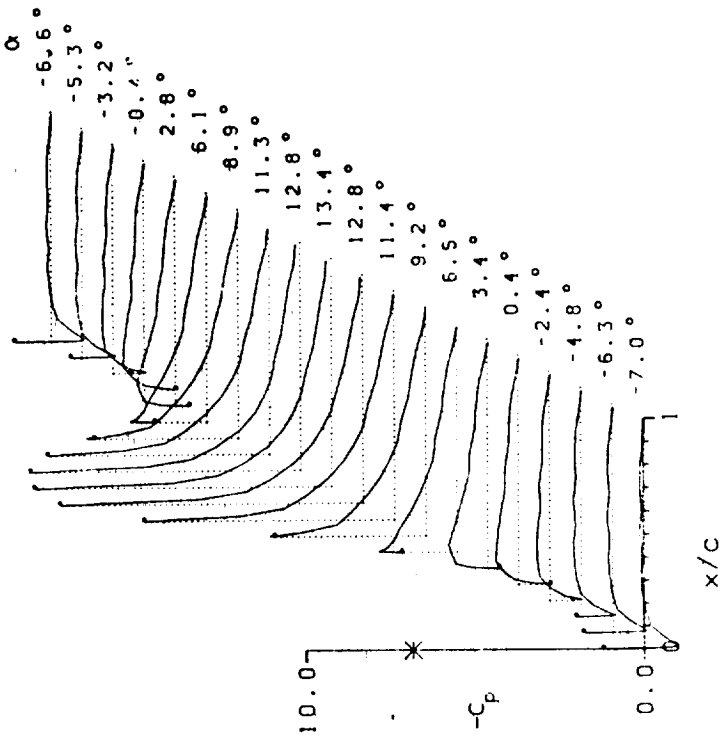
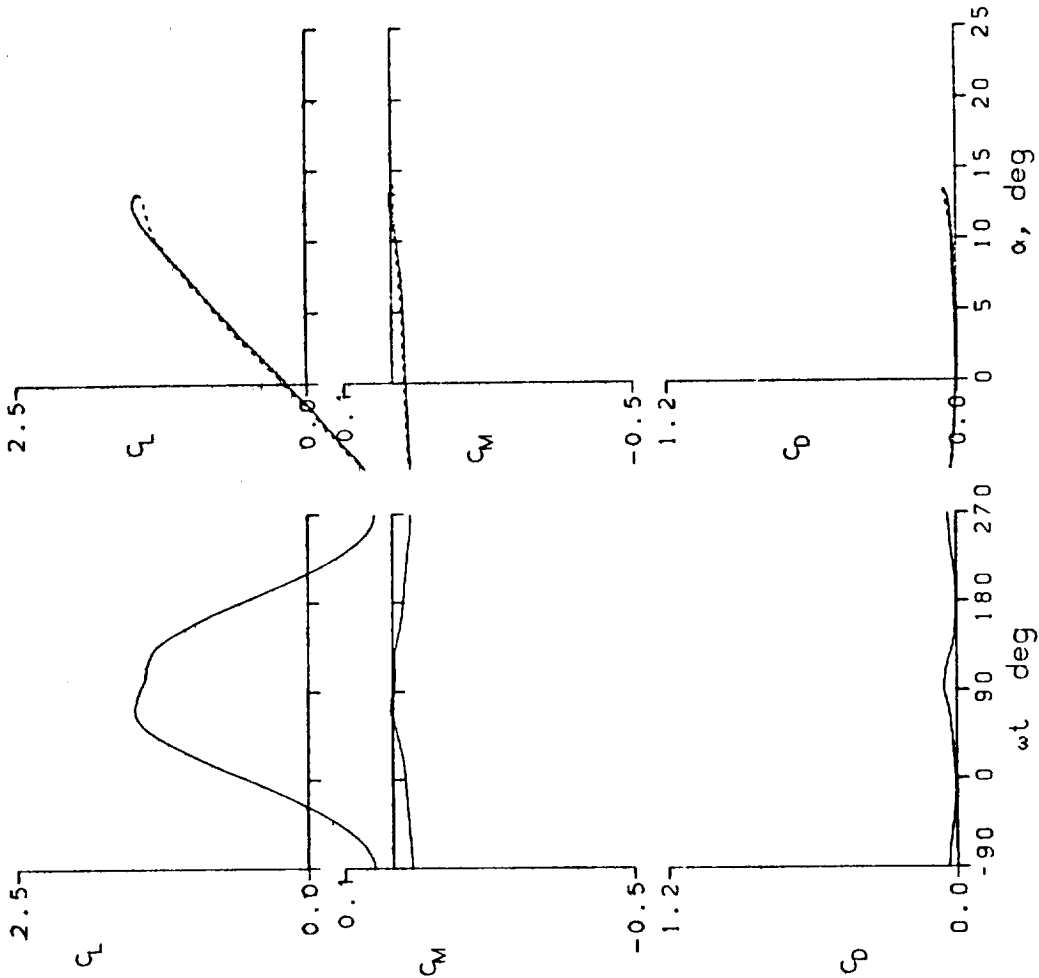


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 21219 A0 = 6.38° k = 0.010
 Re = 2.46 E6 A1 = 10.00° M = 0.184
 CLmax = 1.54 CMmin = -0.09 CDmax = 0.19
 αLmax = 14.8° ζ = -0.018 Mmax = 0.398
 αCmin = 5.9° -Cpmax = 11.0 αMmax = 15.1°

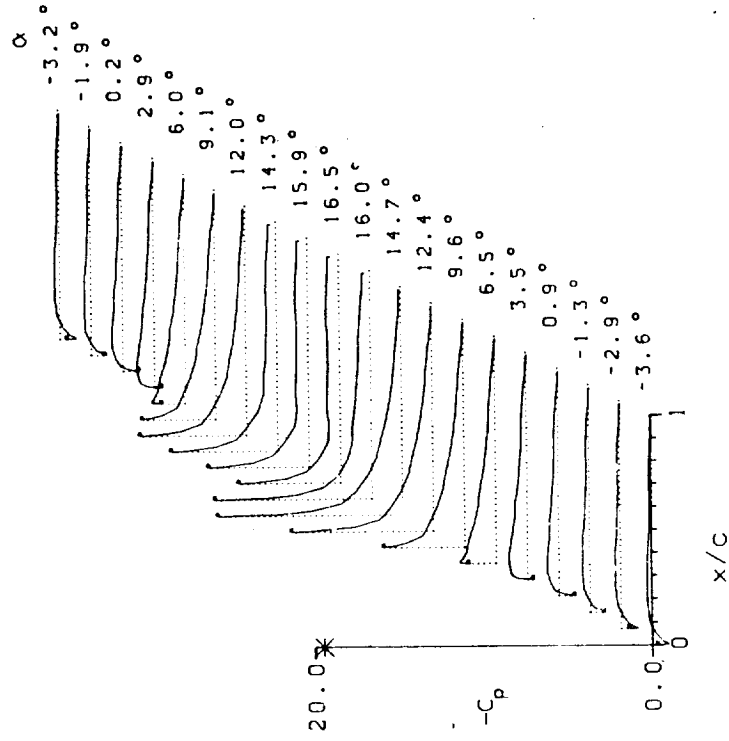
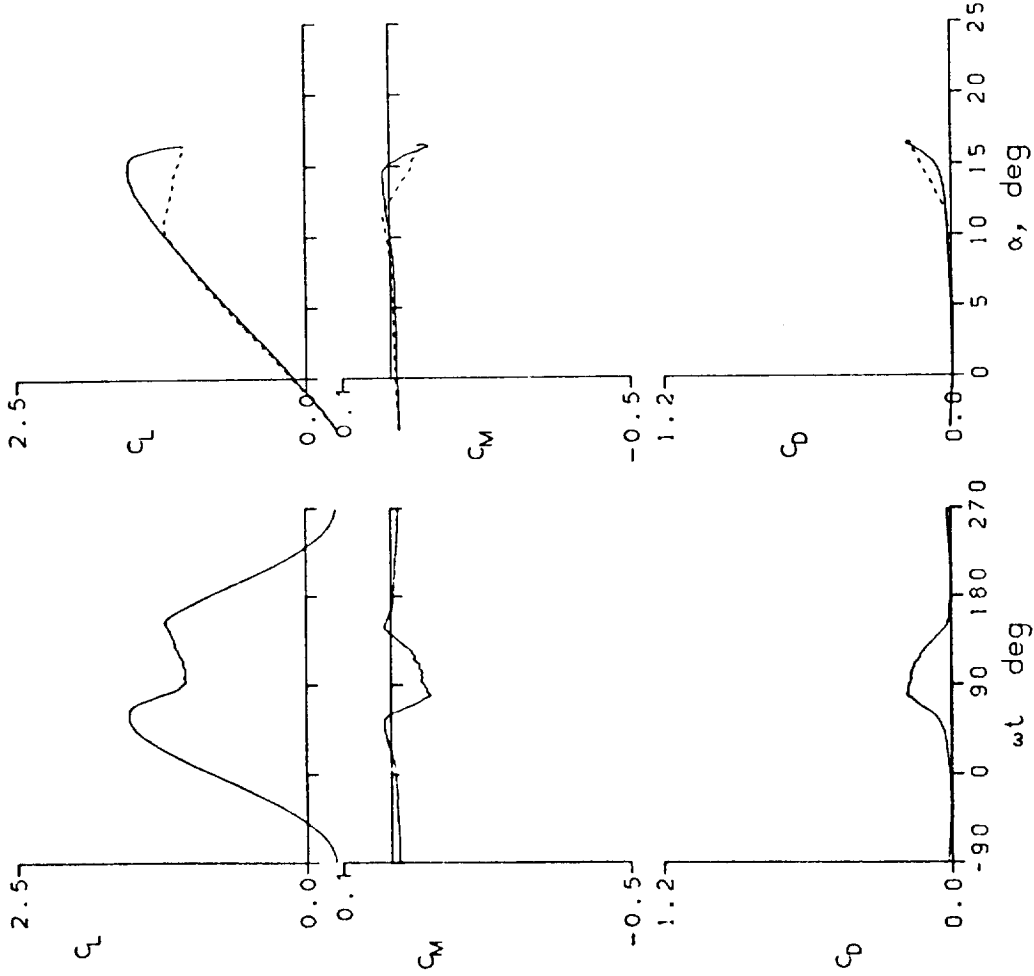


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 22023 A0 = 11.84 ° k = 0.025
 Re = 3.73 E6 A1 = 9.90 ° M = 0.293
 CLmax = 1.58 CMmin = -0.17 CDmax = 0.47
 αLmax = 14.4 ° ζ = 0.202 Mmax = 1.224
 αCmin = 14.4 ° -CPmax = 9.6 αMmax = 13.8 °

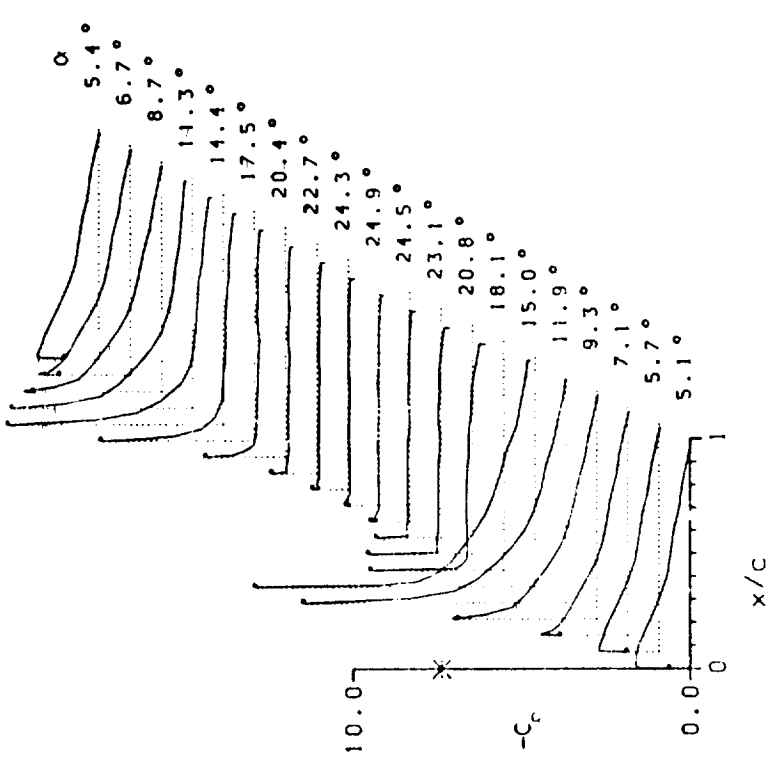
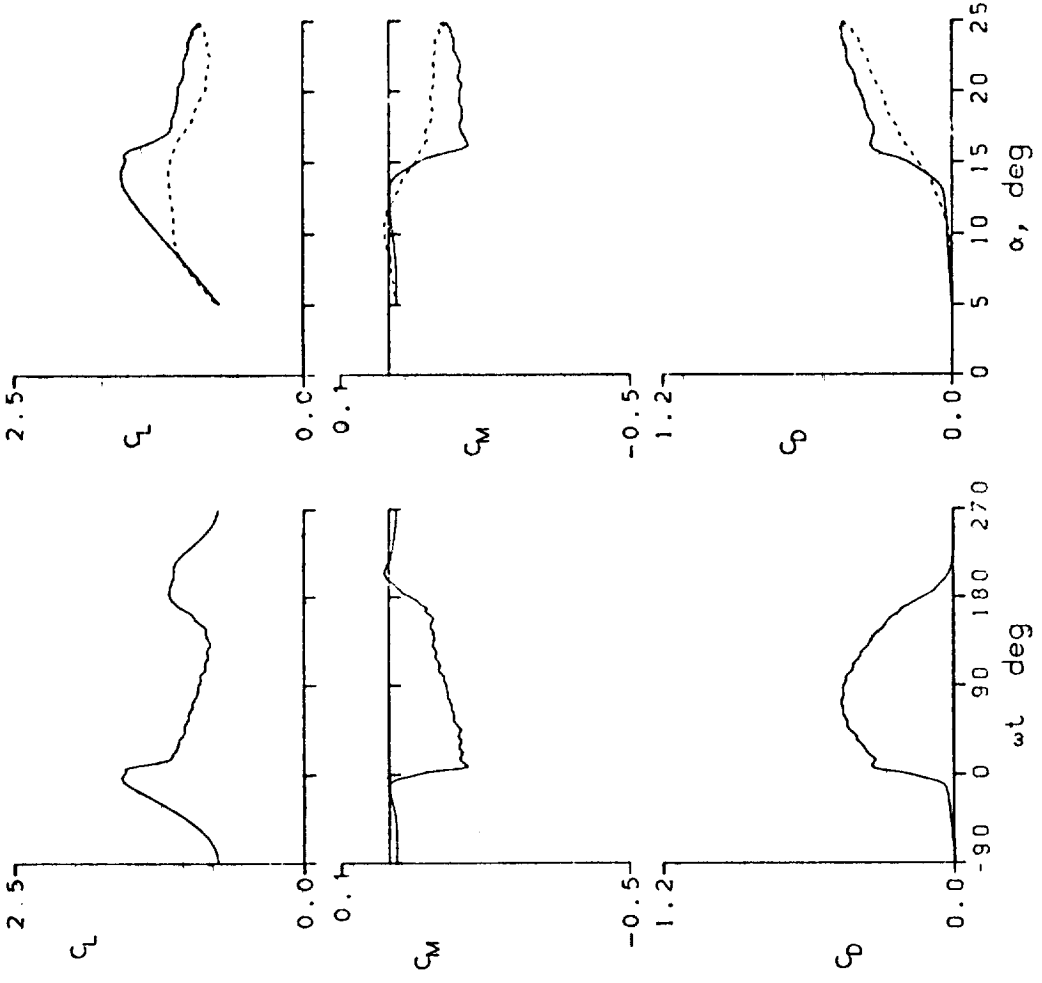


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 22103 A0 = 14.82° k = 0.049
 Re = 3.75 E6 A1 = 9.90° M = 0.294
 C_{Lmax} = 1.82 C_{Mmin} = -0.28 C_{Dmax} = 0.53
 α_{Lmax} = 17.1° ζ = 0.368 Mmax = 1.348
 α_{Cmin} = 14.3° -C_{Pmax} = 10.6 α_{Mmax} = 14.6°

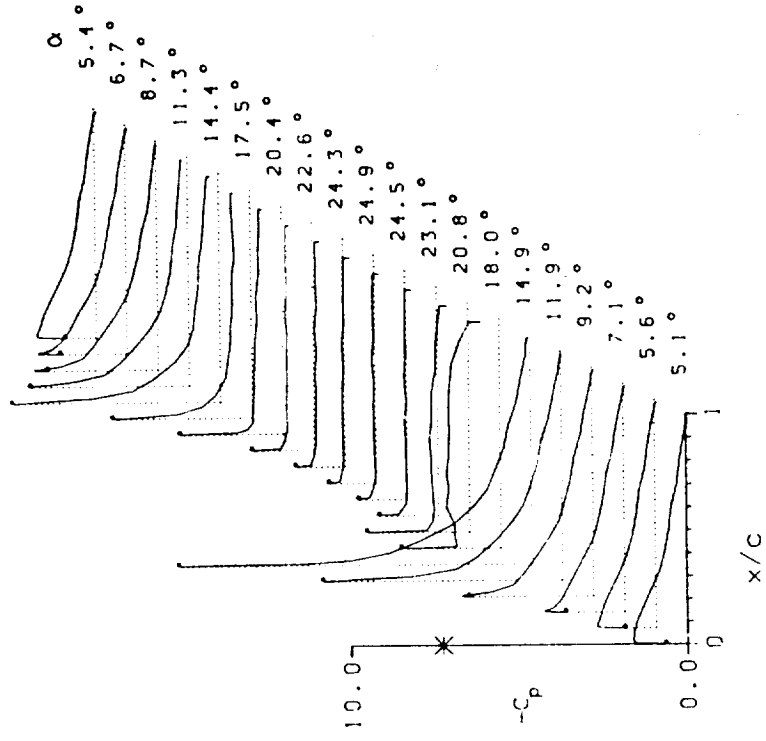
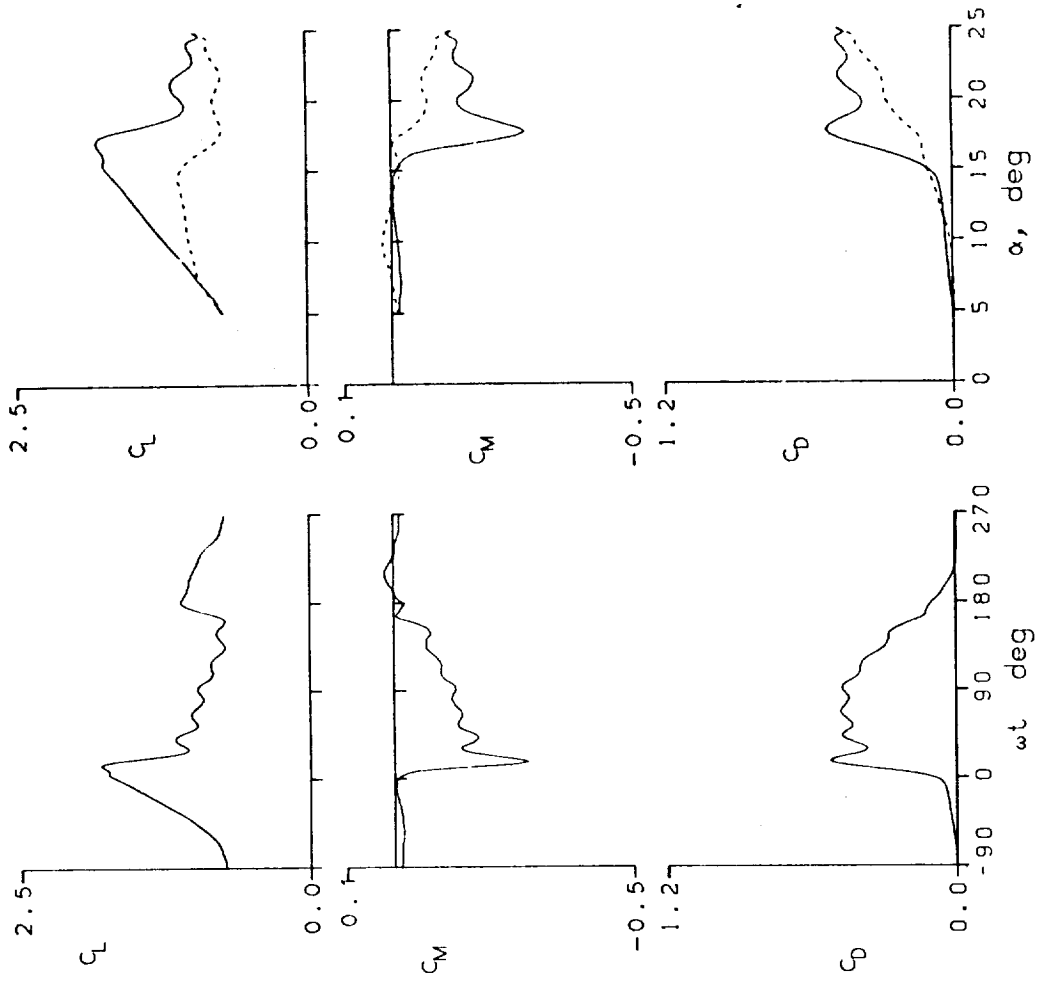


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 22201 $A_0 = 14.79^\circ$ $k = 0.101$

$Re = 3.55 E6$ $A_1 = 9.91^\circ$ $M = 0.285$

$C_{Lmax} = 2.15$ $C_{Mmin} = -0.42$ $C_{Dmax} = 0.81$

$\alpha_{Lmax} = 20.3^\circ$ $\zeta = 0.650$ $M_{max} = 1.354$

$\alpha_{Cmin} = 14.3^\circ$ $-C_{Pmax} = 11.4$ $\alpha_{Mmax} = 15.5^\circ$

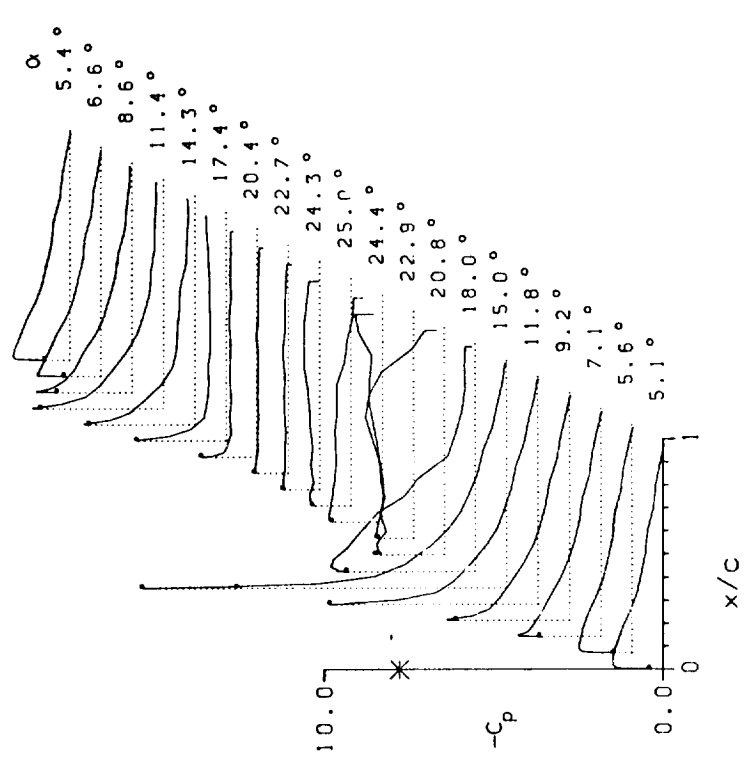
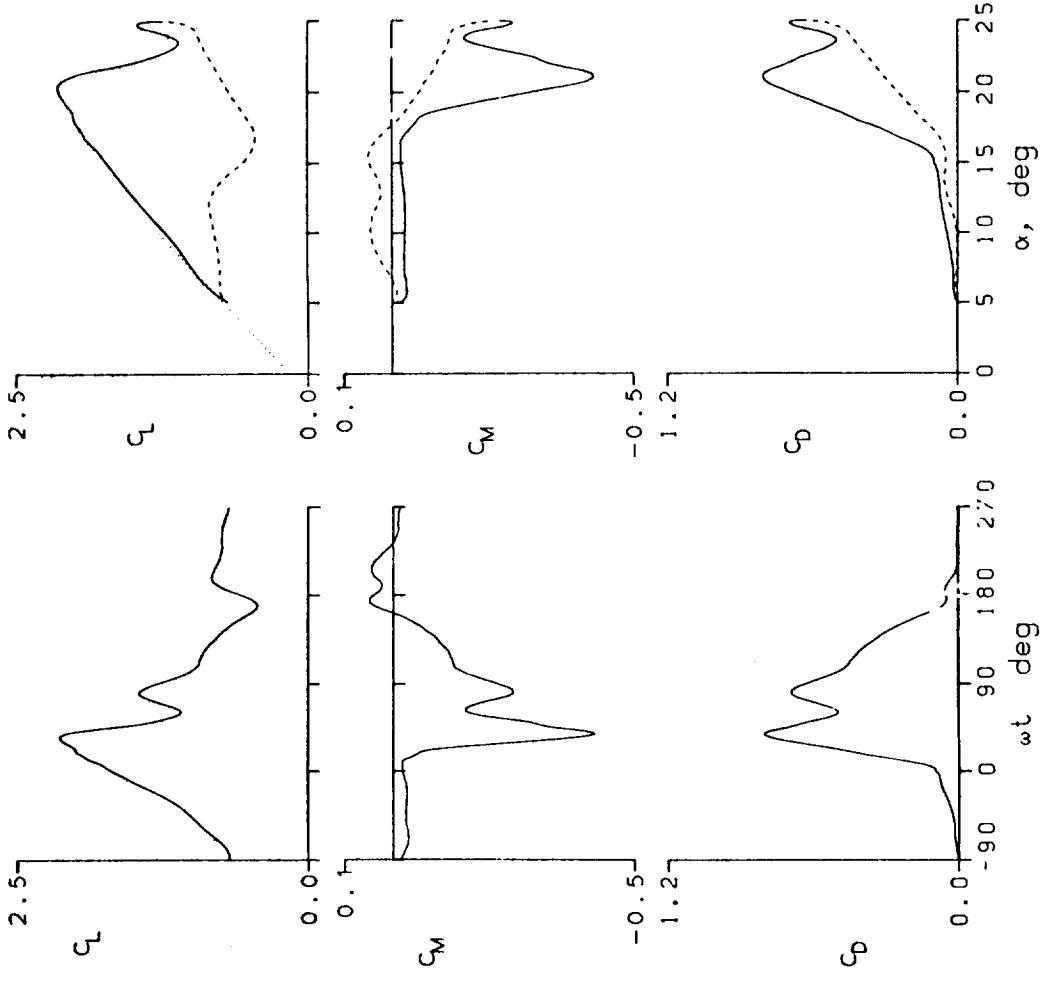


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 22206 A0 = 14.87° k = 0.154
 Re = 3.48 E6 A1 = 9.88° M = 0.279
 CLmax = 2.23 CMmin = -0.49 CDmax = 1.00
 α Lmax = 22.6° ζ = 0.431 Mmax = 1.348
 α Cmin = 14.5° -CPmax = 11.8 α Mmax = 16.5°

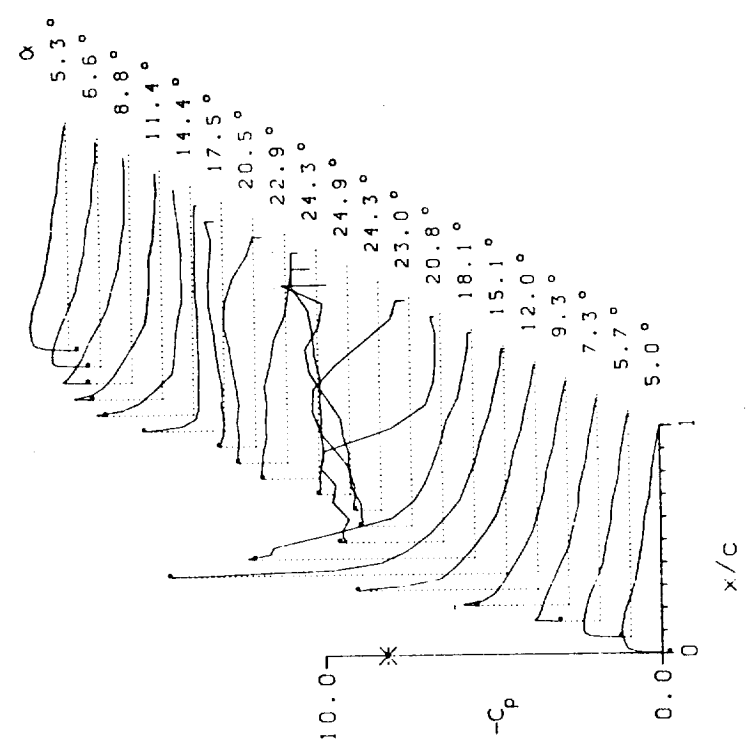
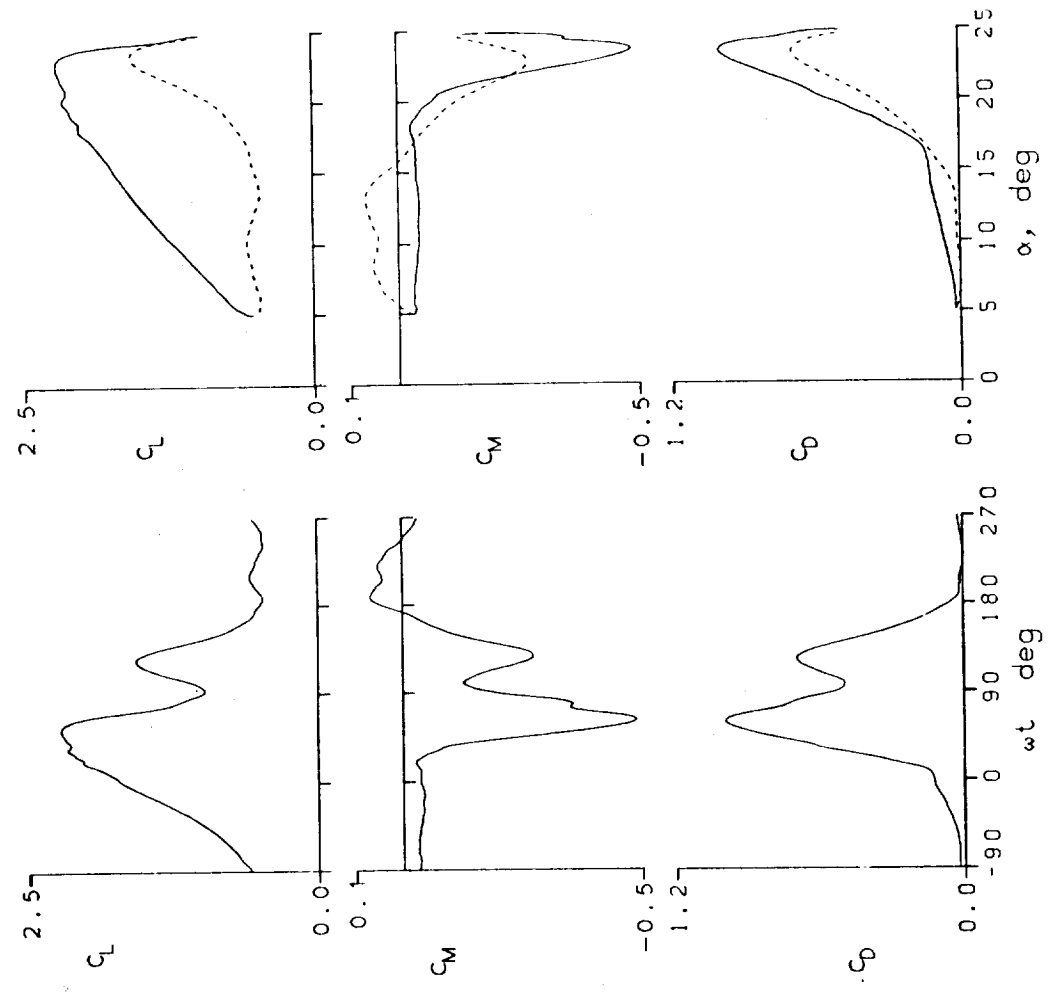


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 22208 A0 = 14.81° k = 0.097
 Re = 3.48 E6 A1 = 9.88° M = 0.281
 CLmax = 2.24 CMmin = -0.45 CDmax = 0.85
 αLmax = 20.6° ζ = 0.607 Mmax = 1.351
 αCmin = 14.3° -CPmax = 11.7 αMmax = 15.5°

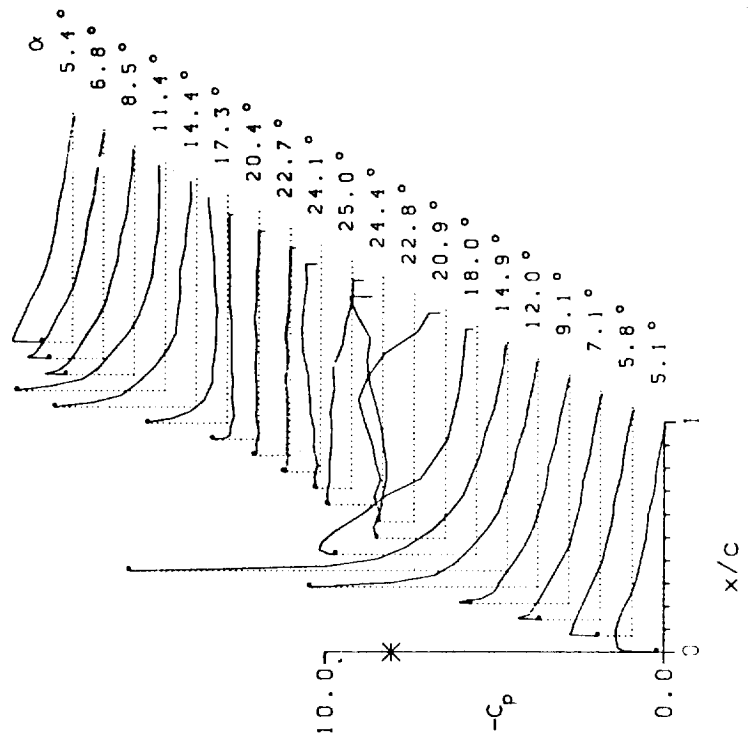
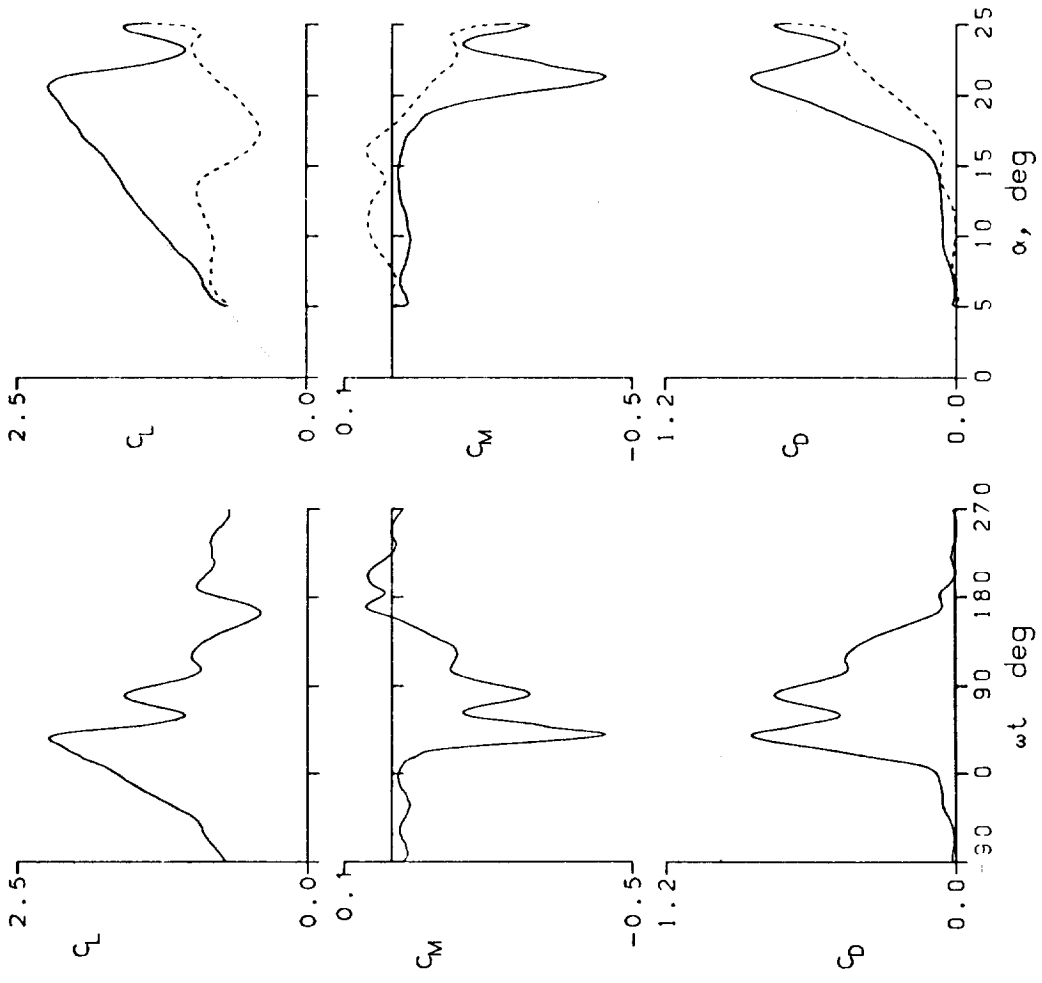


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 22216 A0 = 9.81° k = 0.024
 Re = 3.73 E6 A1 = 9.90° M = 0.302
 C_{Lmax} = 1.60 C_{Mmin} = -0.13 C_{Dmax} = 0.32
 α_{Lmax} = 15.0° ζ = 0.086 M_{max} = 1.365
 α_{Cmin} = 9.3° -C_{Pmax} = 10.2 α_{Mmax} = 14.2°

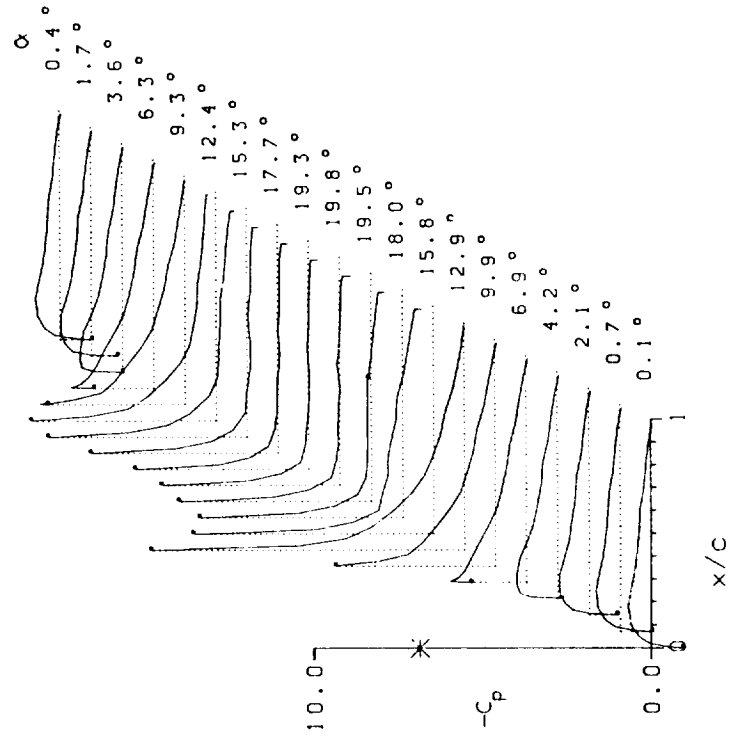
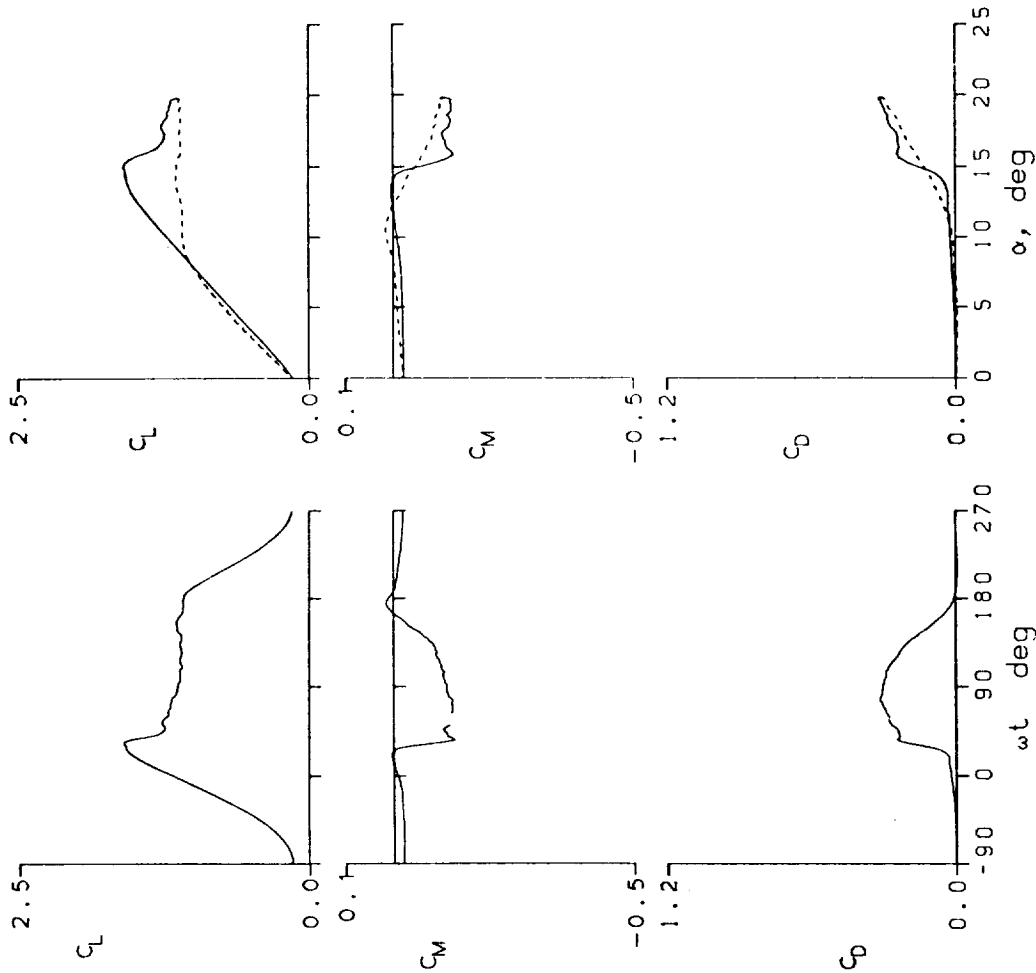


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL
 FRAME : 22217 $A_0 = 9.79^\circ$ $k = 0.049$
 $Re = 3.72 E6$ $A_1 = 9.91^\circ$ $M = 0.302$
 $C_{Lmax} = 1.79$ $C_{Mmin} = -0.22$ $C_{Dmax} = 0.46$
 $\alpha_{Lmax} = 16.3^\circ$ $\xi = 0.159$ $M_{max} = 1.362$
 $\alpha_{Cmin} = 9.3^\circ$ $-C_{pmax} = 10.2$ $\alpha_{Mmax} = 14.2^\circ$

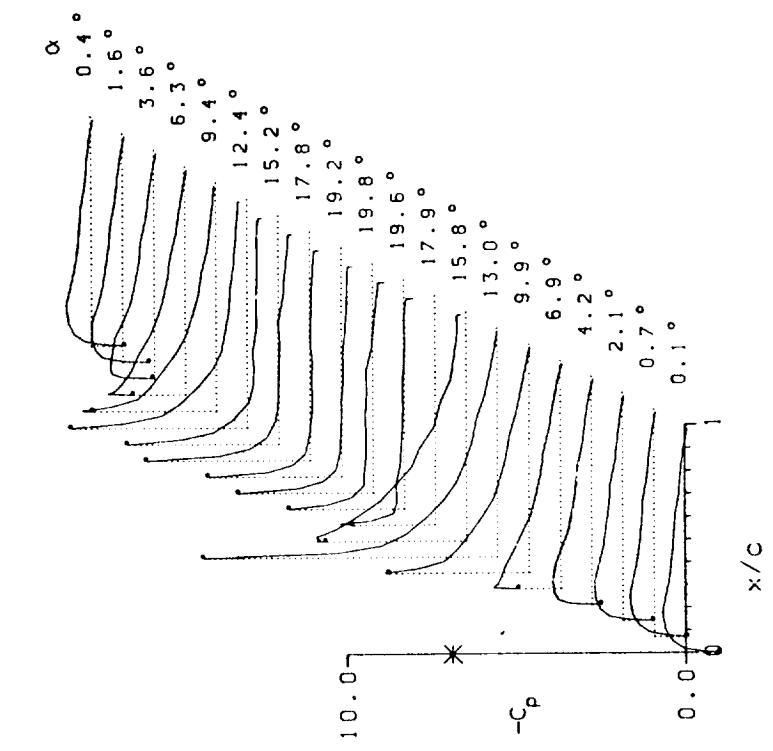
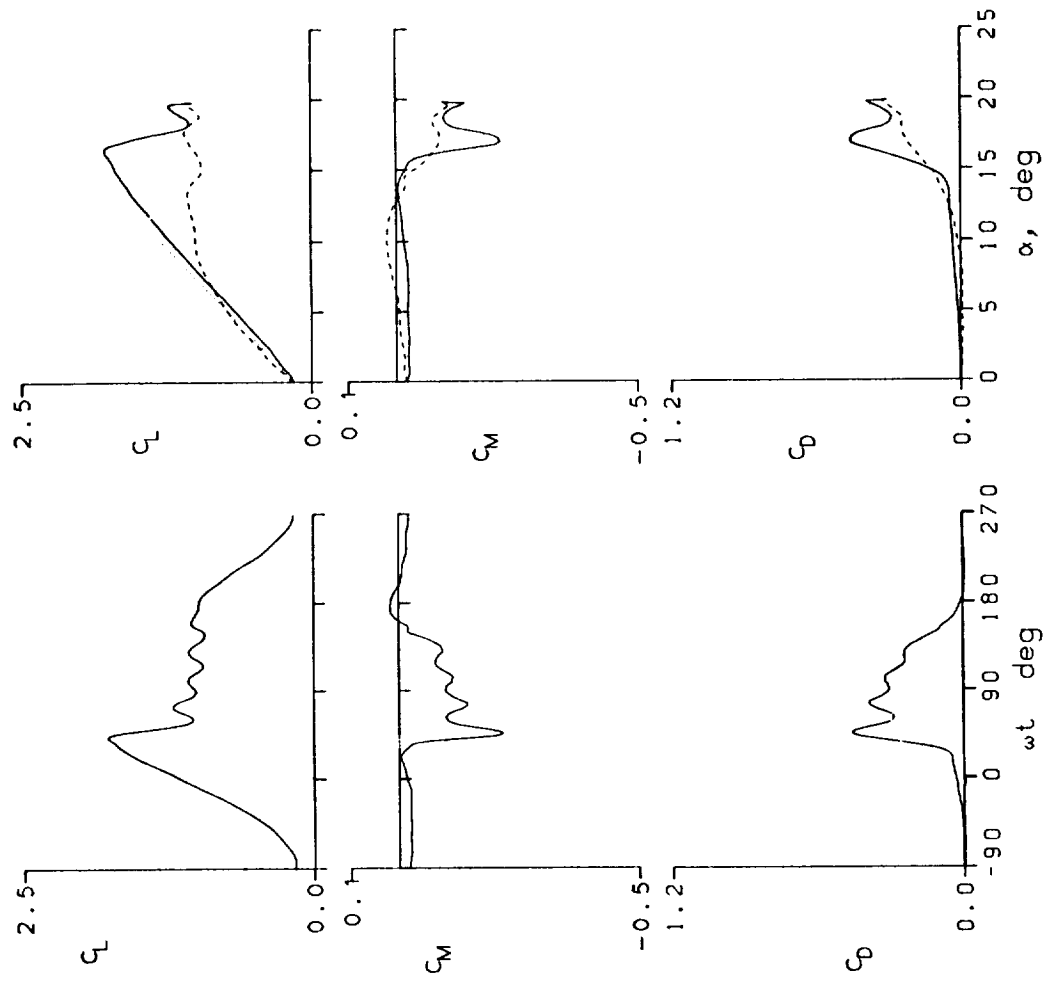


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 22218 AC = 9.81° k = 0.098
 Re = 3.68 E6 A1 = 9.86° M = 0.300
 C_{Lmax} = 2.01 C_{Mmin} = -0.34 C_{Dmax} = 0.63
 α_{Lmax} = 18.2° ζ = 0.371 M_{max} = 1.362
 α_{Cmin} = 9.3° -C_{pmax} = 10.3 α_{Mmax} = 14.7°

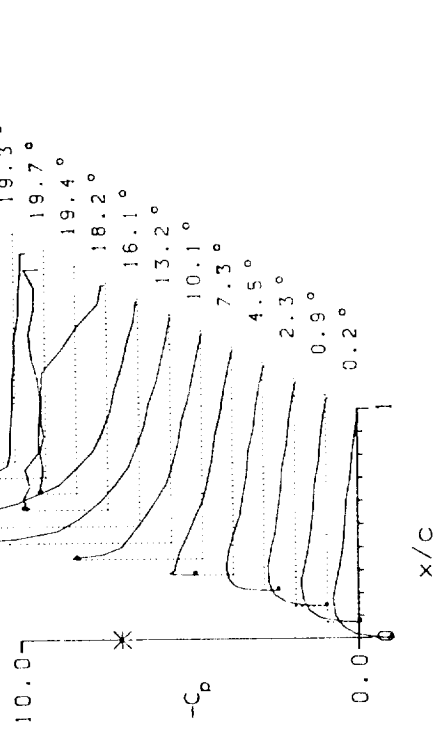
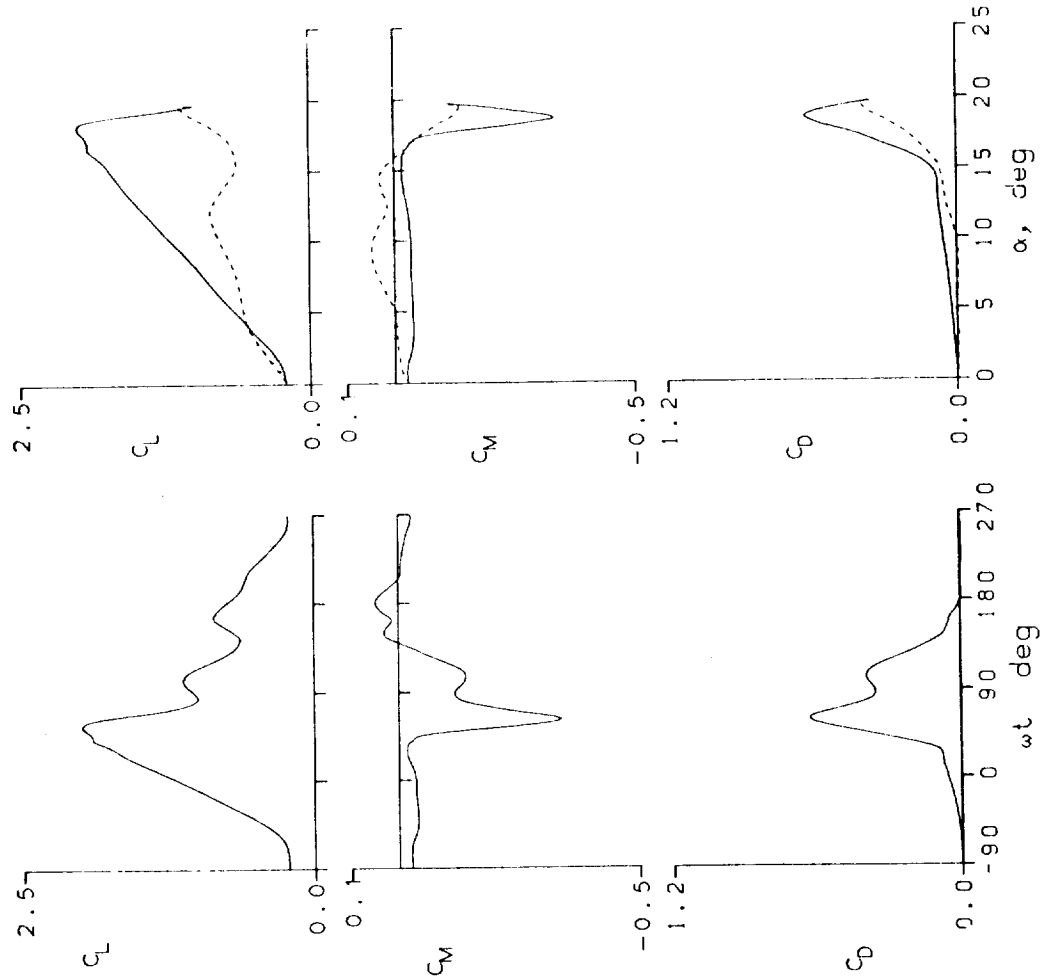


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL
 FRAME : 22219 $A_0 = 9.93^\circ$ $k = 0.149$
 $Re = 3.62 E6$ $A_1 = 9.90^\circ$ $M = 0.294$
 $C_{Lmax} = 2.10$ $C_{Mmin} = -0.40$ $C_{Dmax} = 0.73$
 $\alpha_{Lmax} = 19.6^\circ$ $\xi = 0.300$ $M_{max} = 1.379$
 $\alpha_{Cmin} = 9.5^\circ$ $-C_{pmax} = 10.8$ $\alpha_{Mmax} = 15.8^\circ$

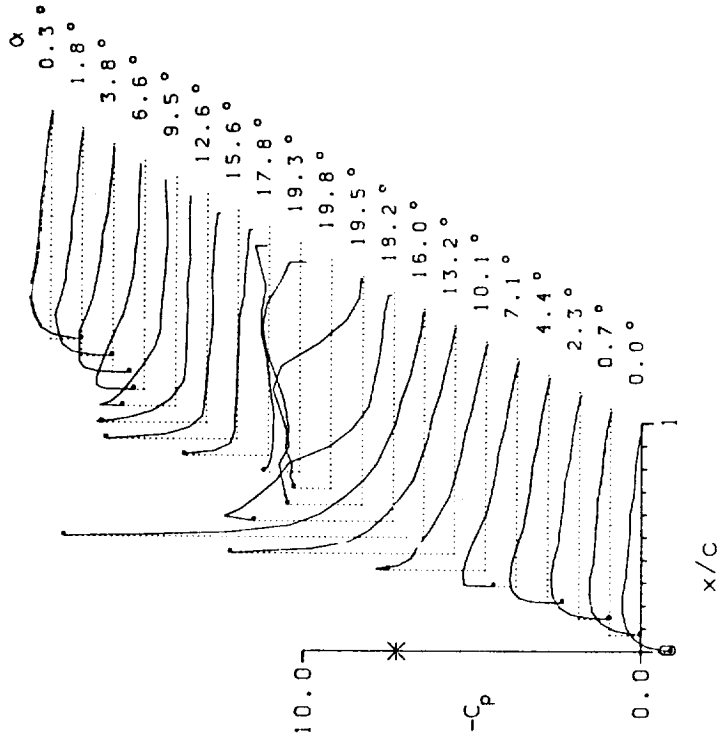
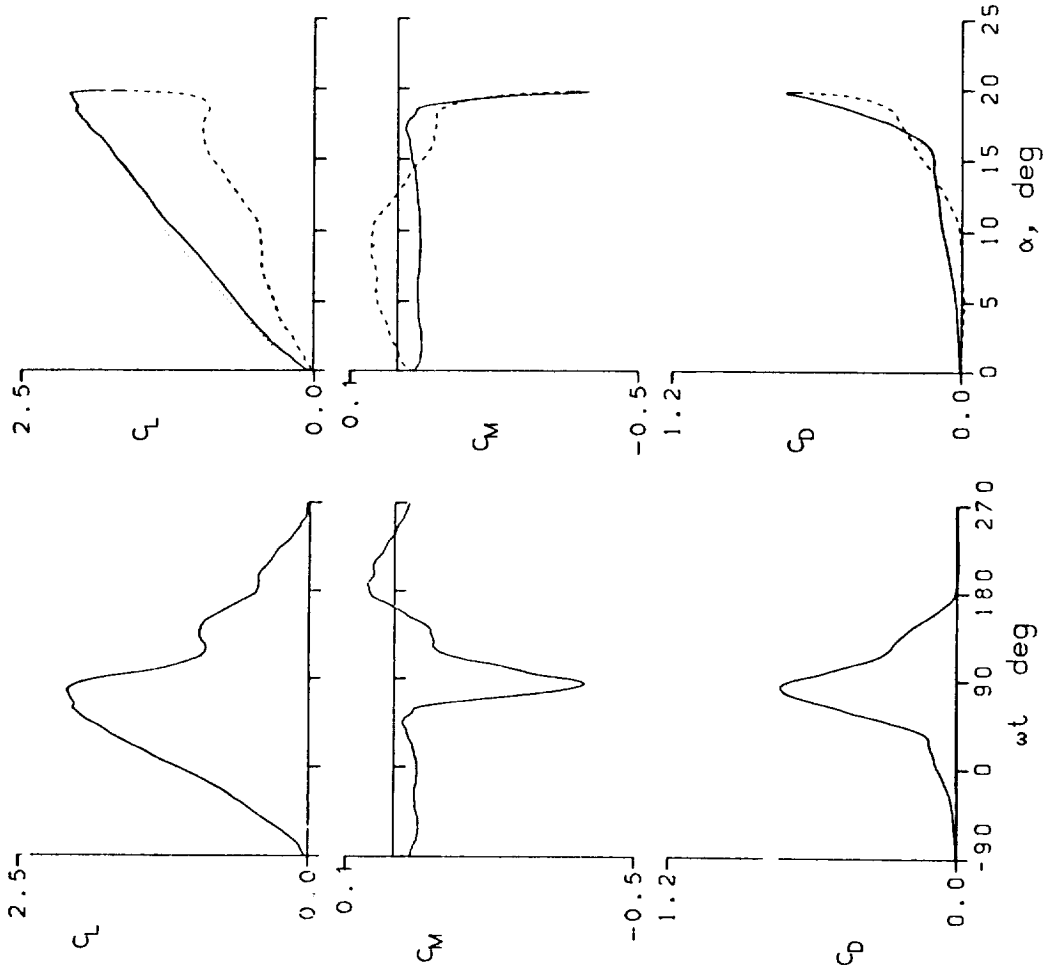


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL
 FRAME : 22307 $A_0 = 9.95^\circ$ $k = 0.025$
 $Re = 3.85 E6$ $A_1 = 4.90^\circ$ $M = 0.301$
 $C_{Lmax} = 1.53$ $C_{Dmin} = 0.08$ $C_{Dmax} = 0.15$
 $\alpha_{Lmax} = 13.8^\circ$ $\zeta = -0.108$ $M_{max} = 1.330$
 $\alpha_{Cmin} = 9.8^\circ$ $-C_{pmax} = 9.9$ $\alpha_{Mmax} = 13.9^\circ$

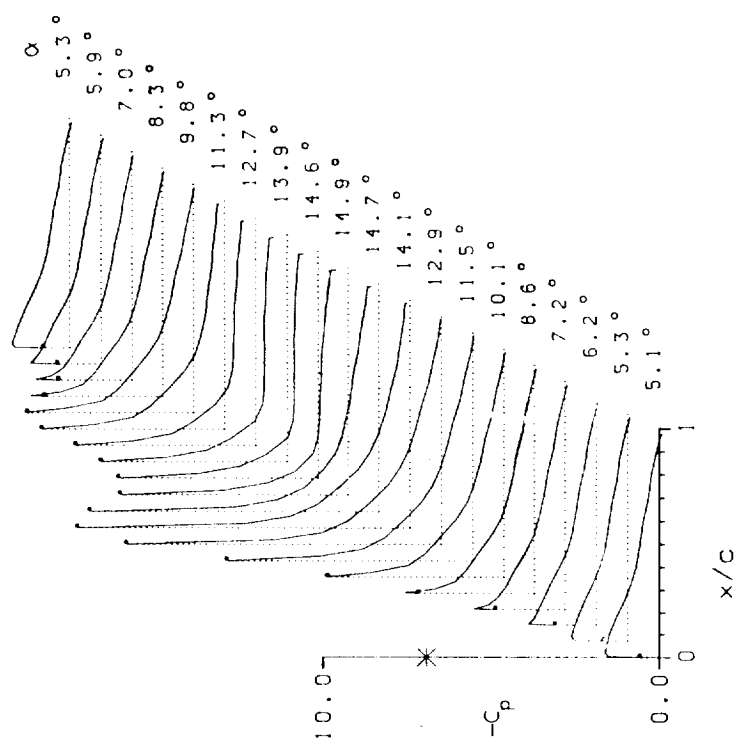
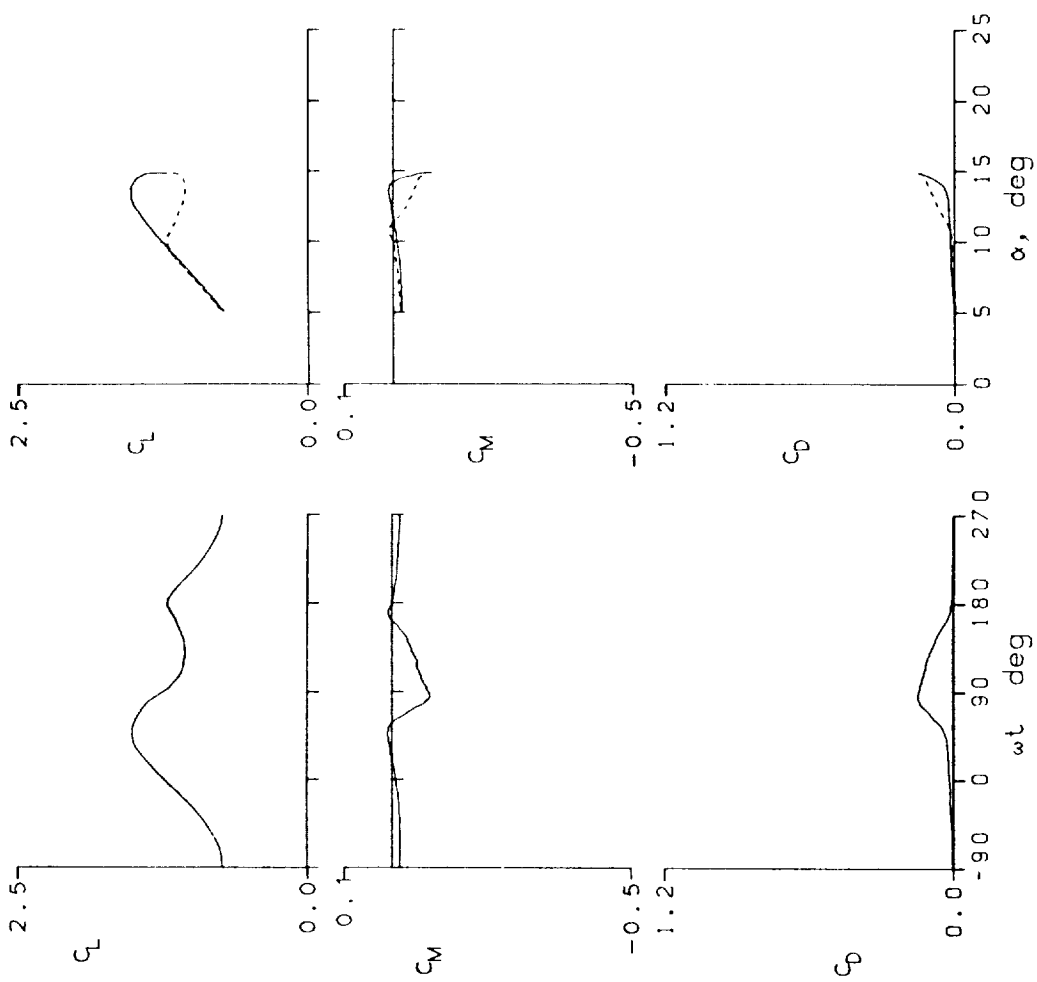


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 22308 AC = 9.95 ° k = 0.049
 Re = 3.85 E6 A' = 4.90 ° M = 0.303
 C_{Lmax} = 1.60 C_{Mmin} = -0.16 C_{Dmax} = 0.30
 α_{Lmax} = 13.9 ° ξ = 0.043 M_{max} = 1.370
 α_{Cmin} = 9.8 ° -C_{Pmax} = 10.2 α_{Mmax} = 13.9 °

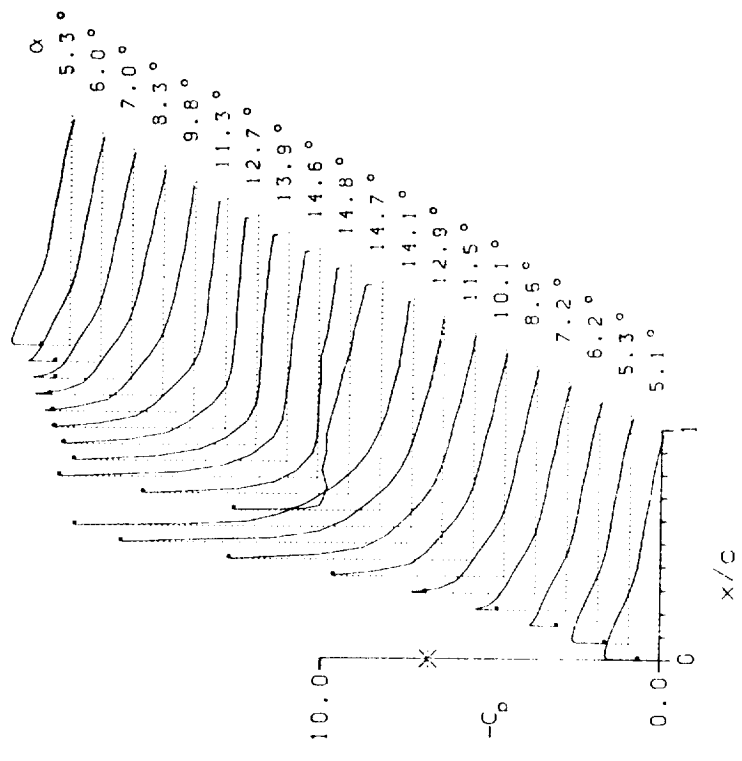
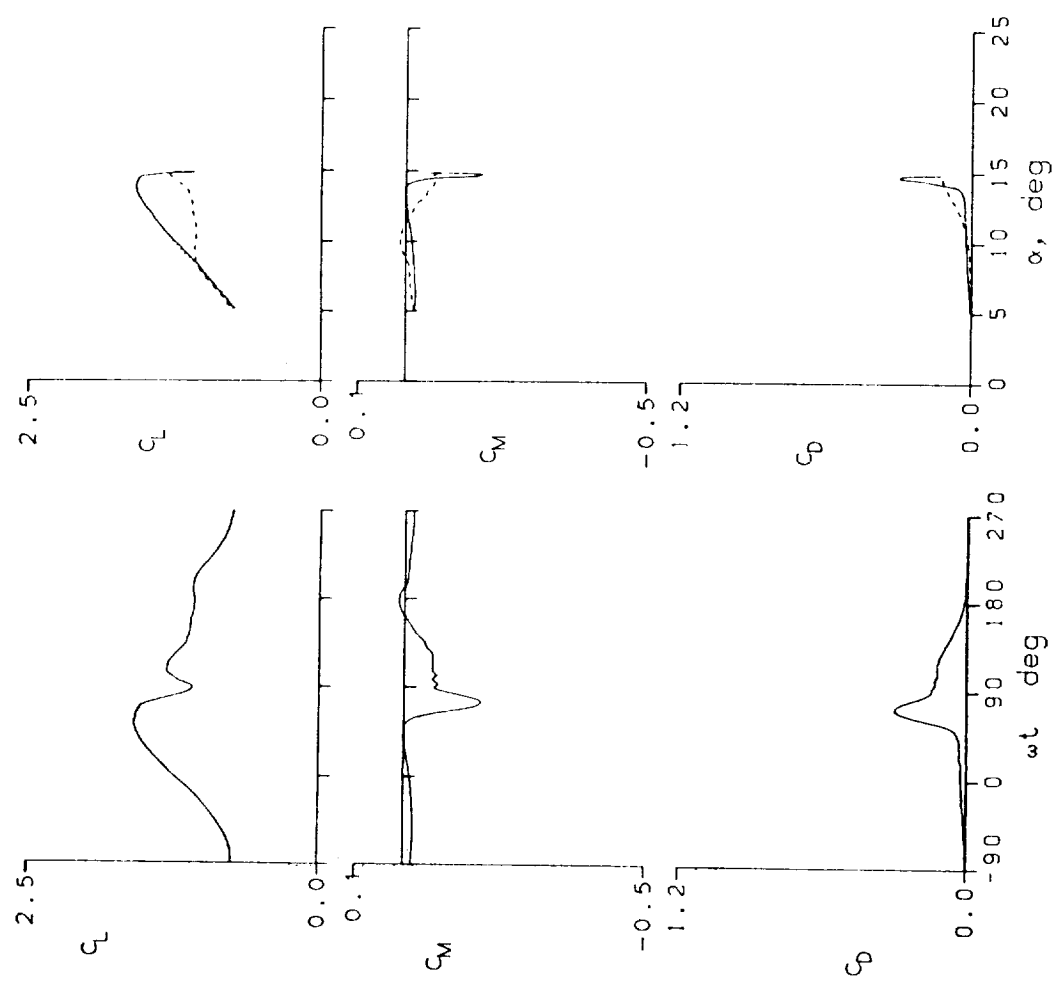


Figure 14.- Continued.

WOPTMANN FX 69-H-098 AIRFOIL
 FRAME : 22309 A0 = 9.97° k = 0.098
 Re = 3.85 E6 A1 = 4.90° M = 0.303
 C_{Lmax} = 1.75 C_{Mmax} = 0.15 C_{Dmax} = 0.39
 α_{Lmax} = 14.4° ξ = 0.200 Mmax = 1.397
 α_{Crit} = 9.8° -C_{pmax} = 10.4 α_{Mmax} = 14.1°

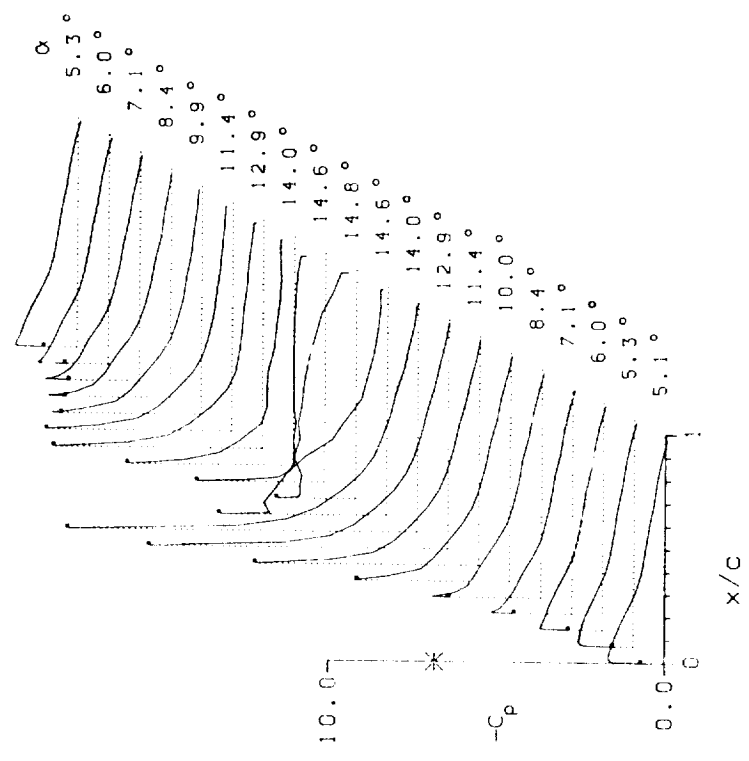
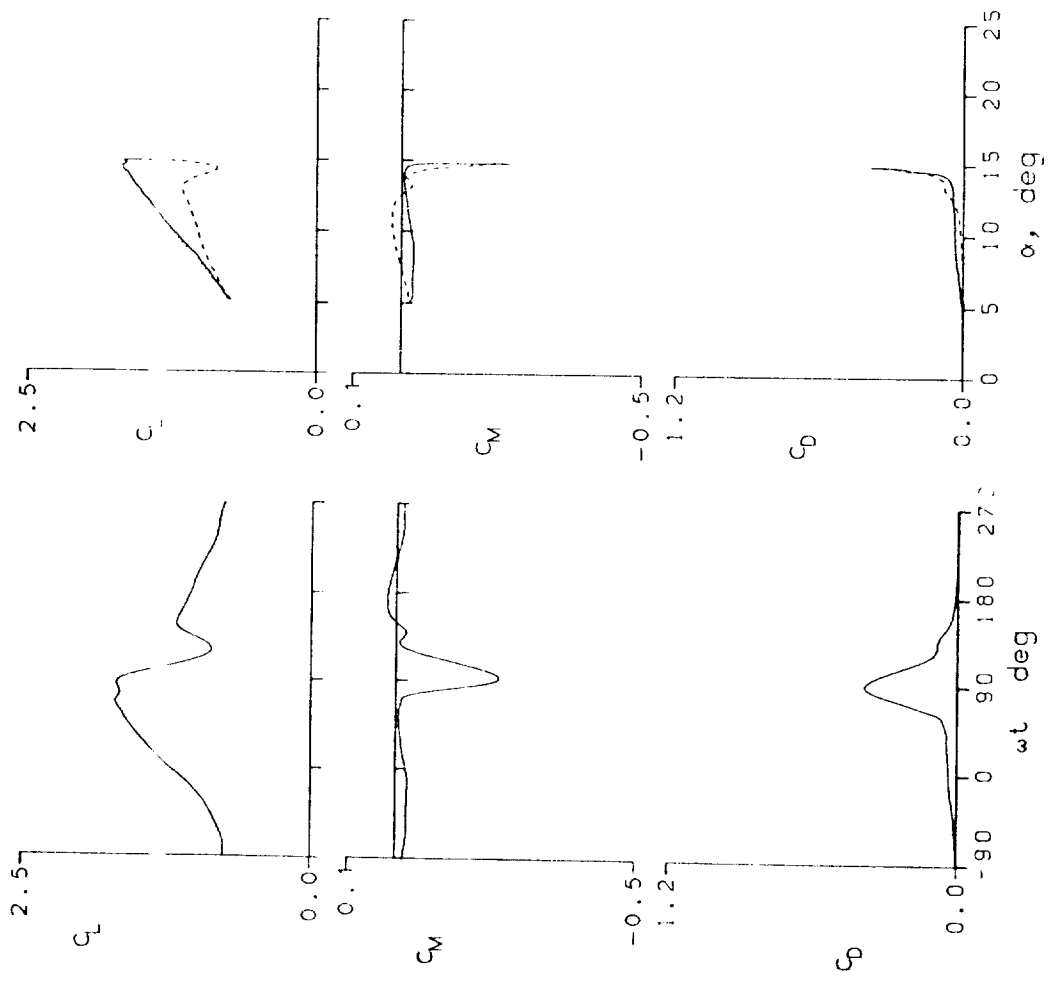


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 22311 A0 = 9.98 ° k = 0.148
 Re = 3.85 E6 A1 = 4.91 ° M = 0.302
 CLmax = 1.74 CMmin = -0.26 CDmax = 0.41
 α Lmax = 14.6 ° ζ = 0.057 Mmax = 1.399
 α Cmin = 9.8 ° -CPmax = 10.4 α Mmax = 14.1 °

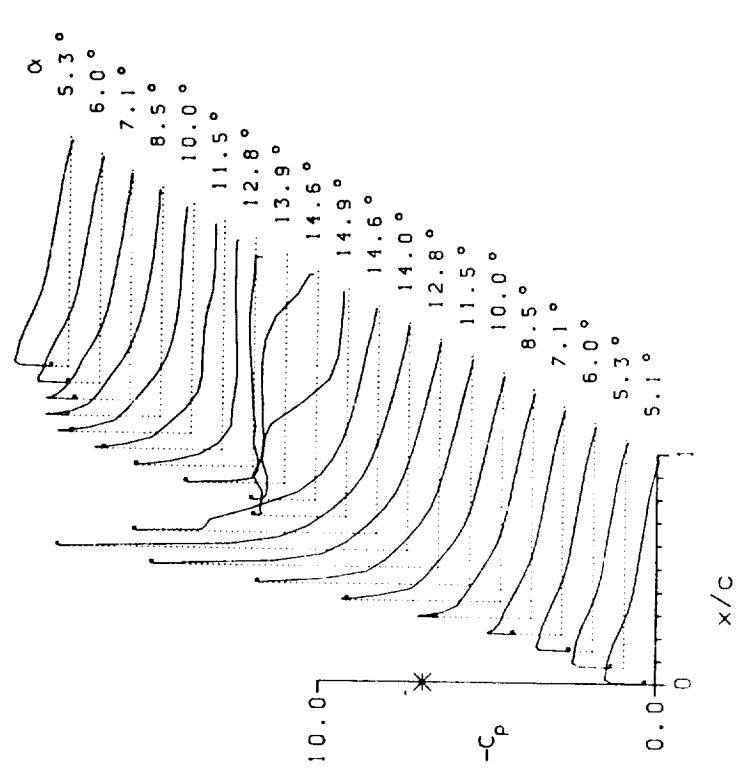
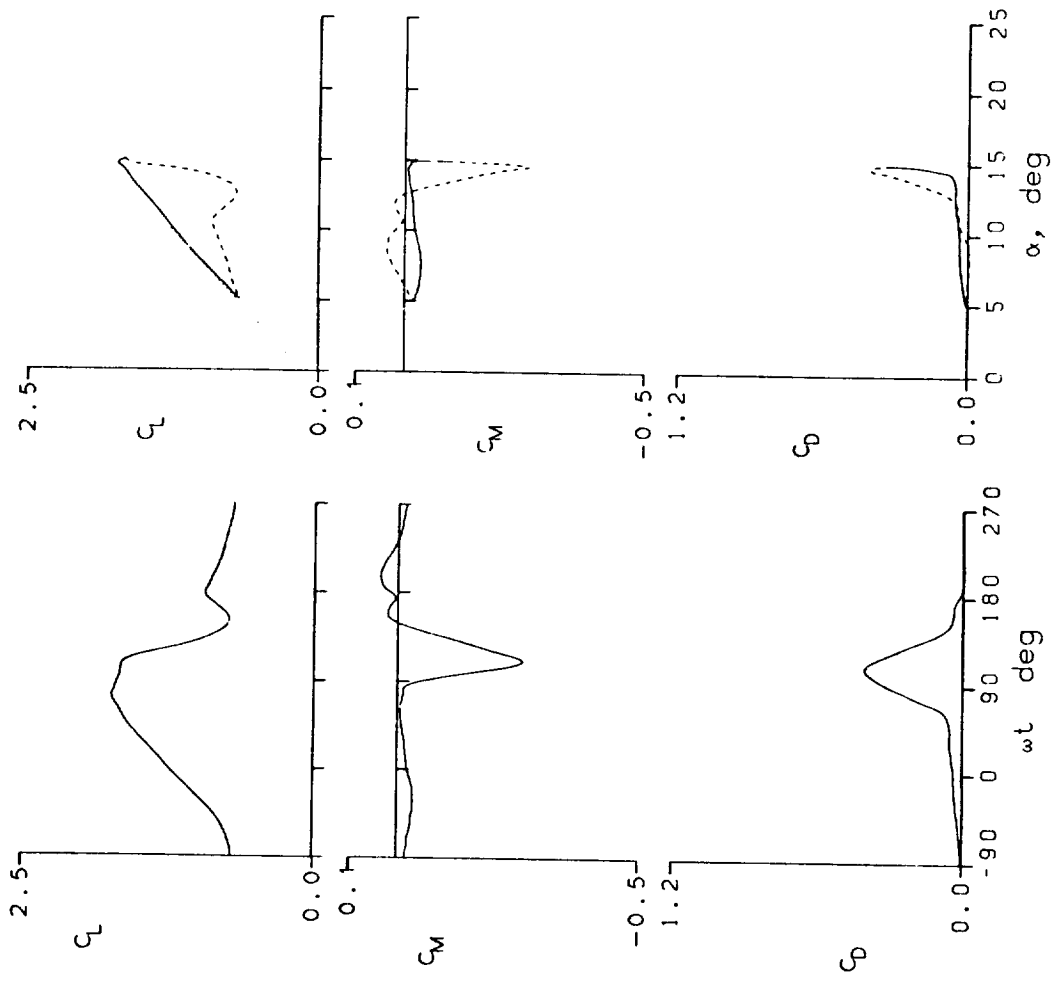


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL
 FRAME : 22312 A0 = 9.92° k = 0.196
 Re = 3.85 E6 A1 = 4.92° M = 0.303
 CLmax = 1.84 CMmin = -0.31 CDmax = 0.45
 αLmax = 14.6° ξ = -0.005 Mmax = 1.386
 αCMmin = 9.7° -CPmax = 10.3 αMmax = 13.9°

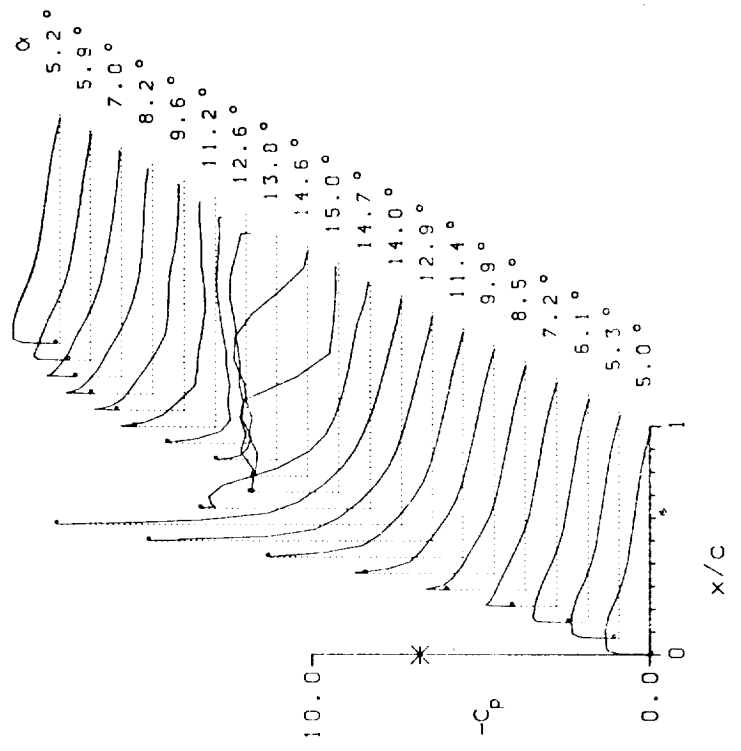
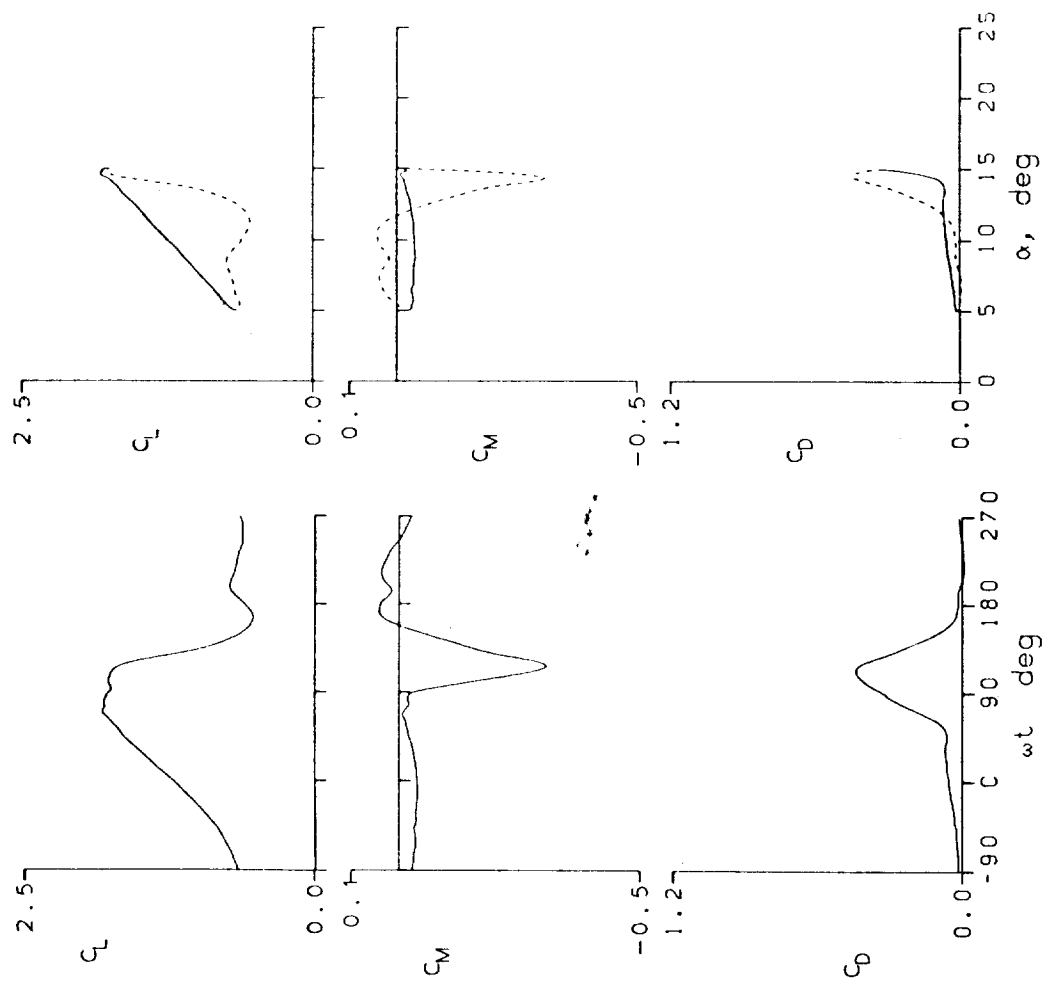


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 23021 A0 = 14.95° k = 0.025
 Re = 3.79 E6 A1 = 4.90° M = 0.298
 CLmax = 1.55 CMmin = -0.14 CDmax = 0.32
 α Lmax = 14.0° ξ = 0.134 Mmax = 1.316
 α Cmin = 14.7° -CPmax = 10.0 α Mmax = 14.0°

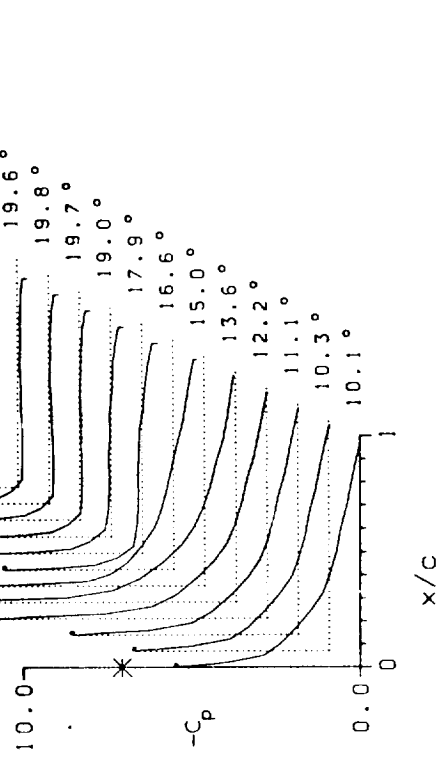
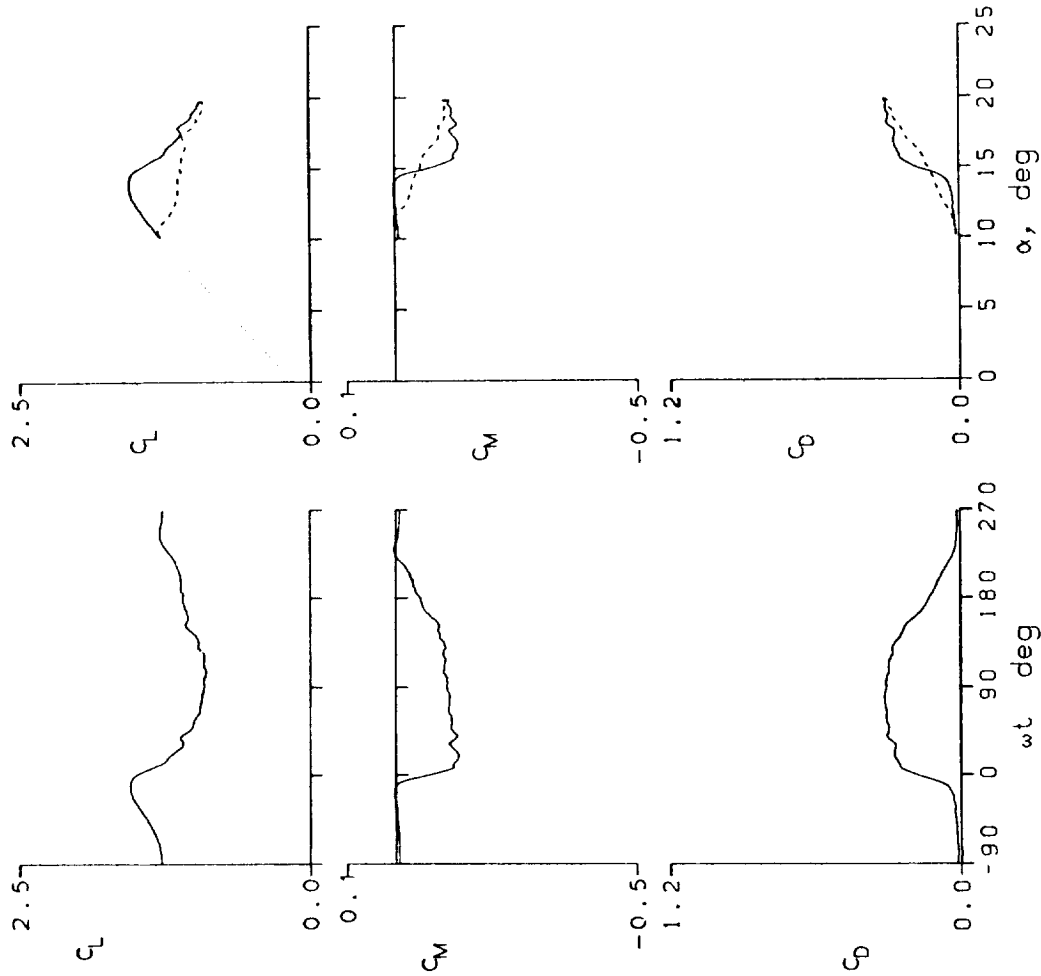


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL

$z_{FAVE} = 23022$ $AO = 14.94^\circ$ $k = 0.050$
 $Re = 3.75 \text{ E}6$ $AI = 4.91^\circ$ $M = 0.297$
 $C_{Lmax} = 1.57$ $C_{Mmin} = -0.21$ $CDmax = 0.43$
 $\alpha_{CLmax} = 15.2^\circ$ $\alpha_{CMmin} = 0.347$ $Mmax = 1.354$
 $\alpha_{CDmin} = 14.7^\circ$ $-CDmin = 10.4$ $\alpha_{Mmax} = 14.0^\circ$

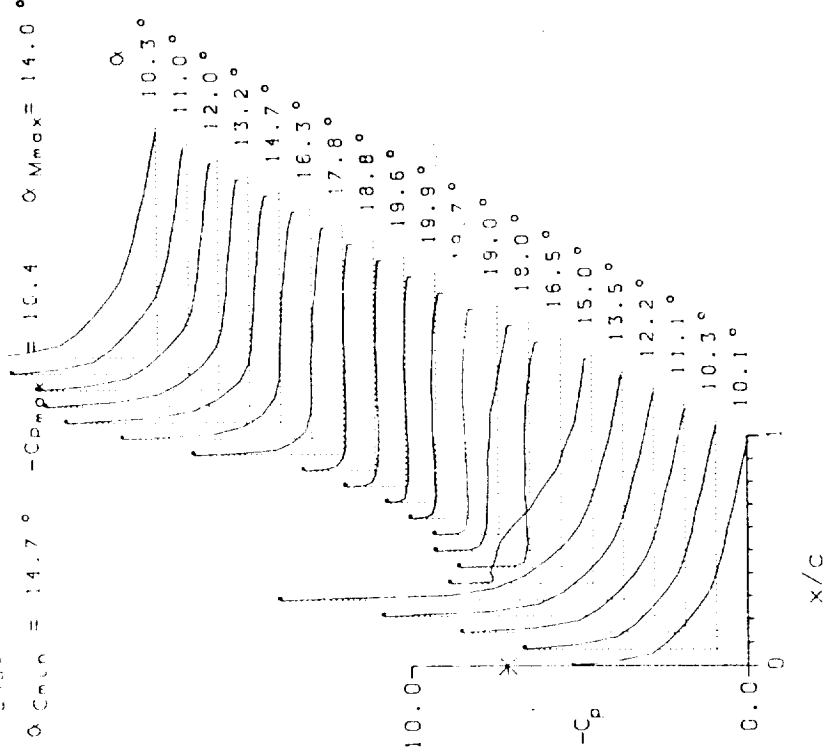
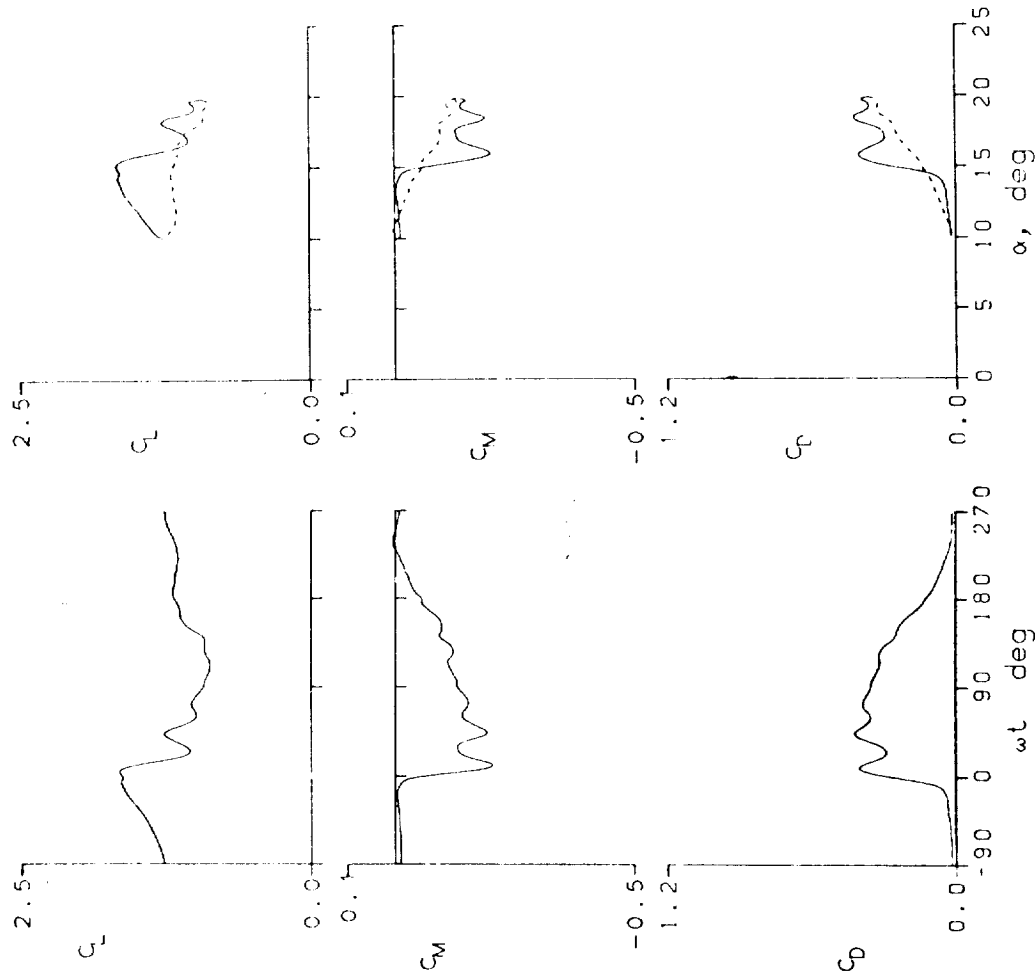


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 23023 A0 = 14.94° k = 0.100
 RC = 3.72 E6 A1 = 4.90° M = 0.295
 C_{Lmax} = 1.87 C_{Mmin} = -0.33 C_{Dmax} = 0.57
 α_{Lmax} = 17.0° ξ = 0.742 M_{max} = 1.376
 α_{Crit} = 14.8° -C_{Dmax} = 10.8 α_{Mmax} = 14.5°

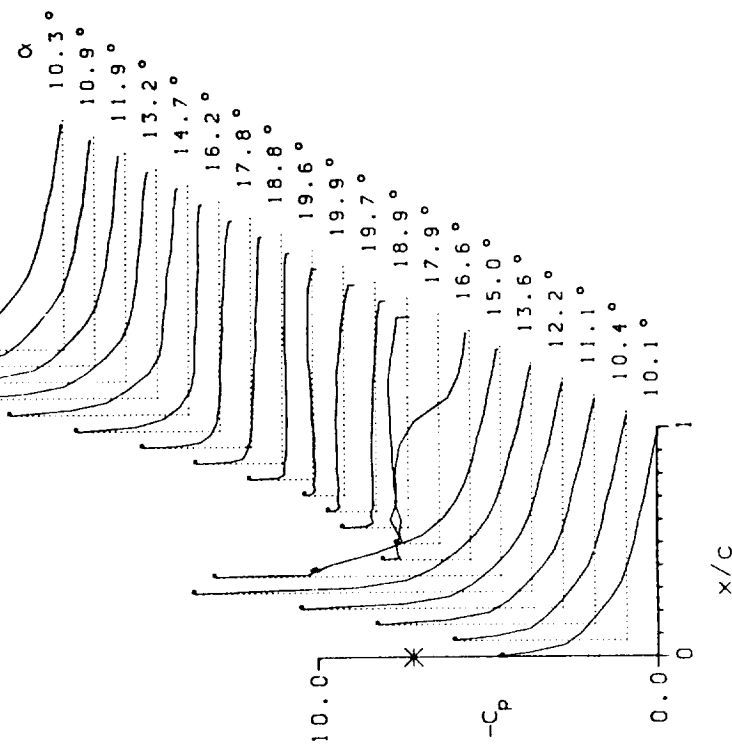
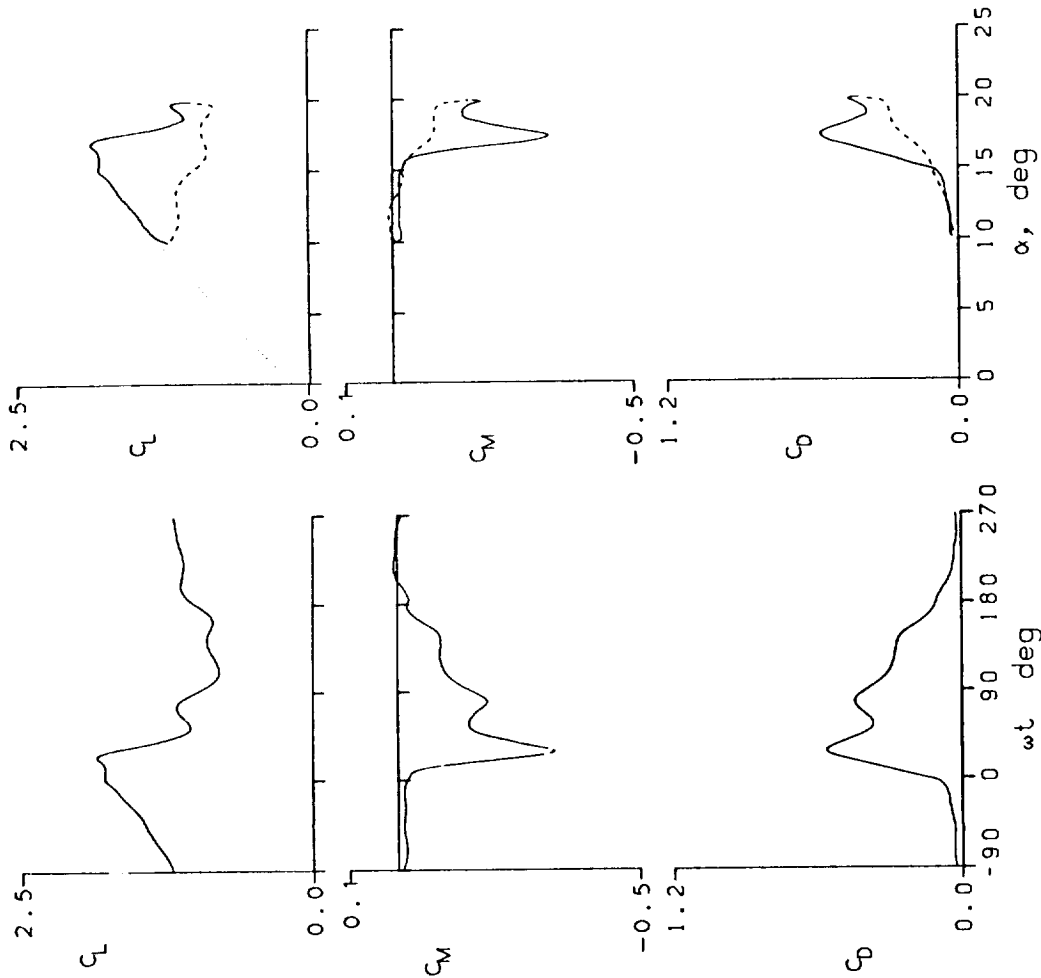


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 23100 $\Lambda_0 = 14.93^\circ$ $k = 0.152$
 $Re = 3.67 \text{ E}6$ $A_1 = 4.92^\circ$ $M = 0.292$
 $C_{Lmax} = 2.00$ $C_{Mmin} = -0.38$ $C_{Dmax} = 0.67$
 $\alpha_{Lmax} = 18.3^\circ$ $\xi = 0.848$ $M_{max} = 1.376$
 $\alpha_{Crin} = 14.8^\circ$ $-C_{Dmax} = 11.0$ $\alpha_{Mmax} = 14.9^\circ$

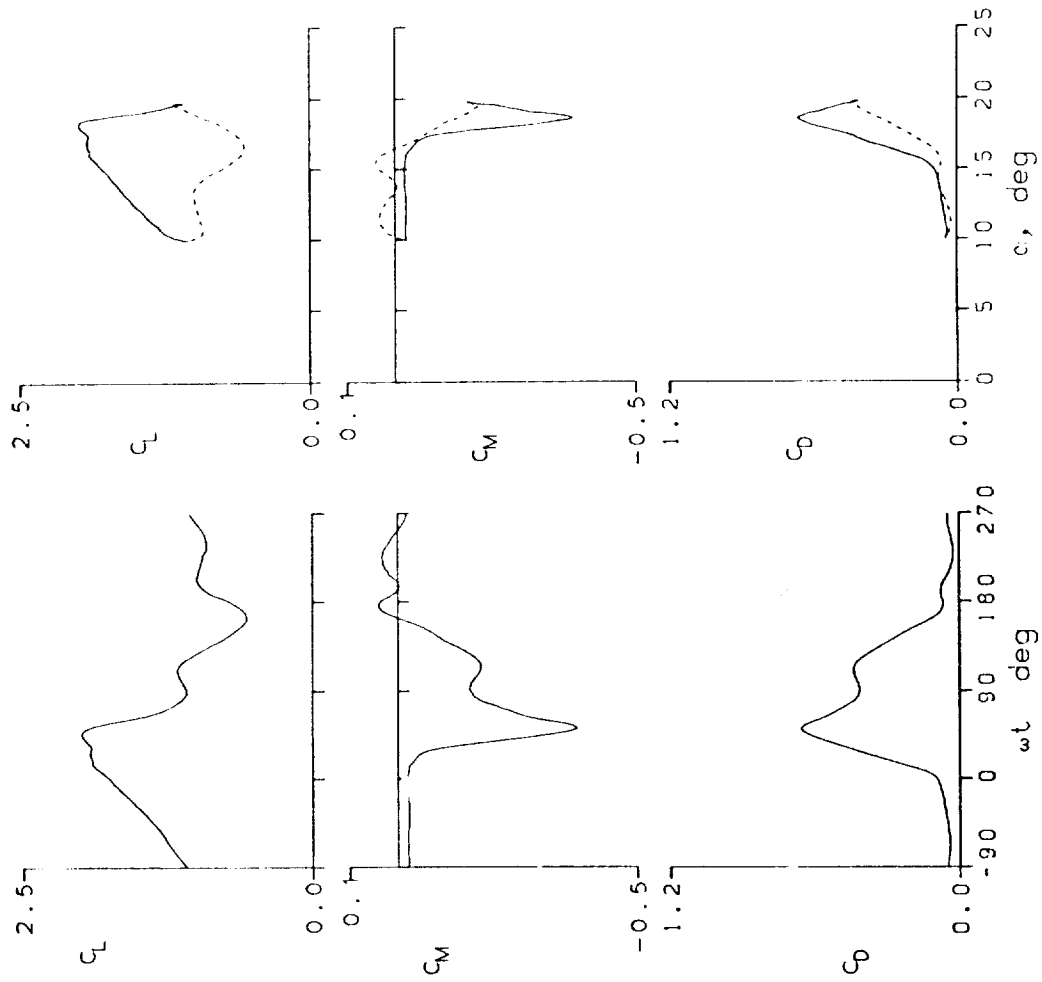


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL
 FRAME : 23101 A0 = 14.94 ° k = 0.205
 Re = 3.52 E6 A1 = 4.87 ° M = 0.287
 C_{Lmax} = 2.18 C_{Mmin} = -0.44 C_{Dmax} = 0.76
 α_{Lmax} = 19.4 ° ζ = -0.012 M_{max} = 1.364
 α_{Cmin} = 14.7 ° -C_{Dmax} = 11.3 α_{Mmax} = 15.7 °

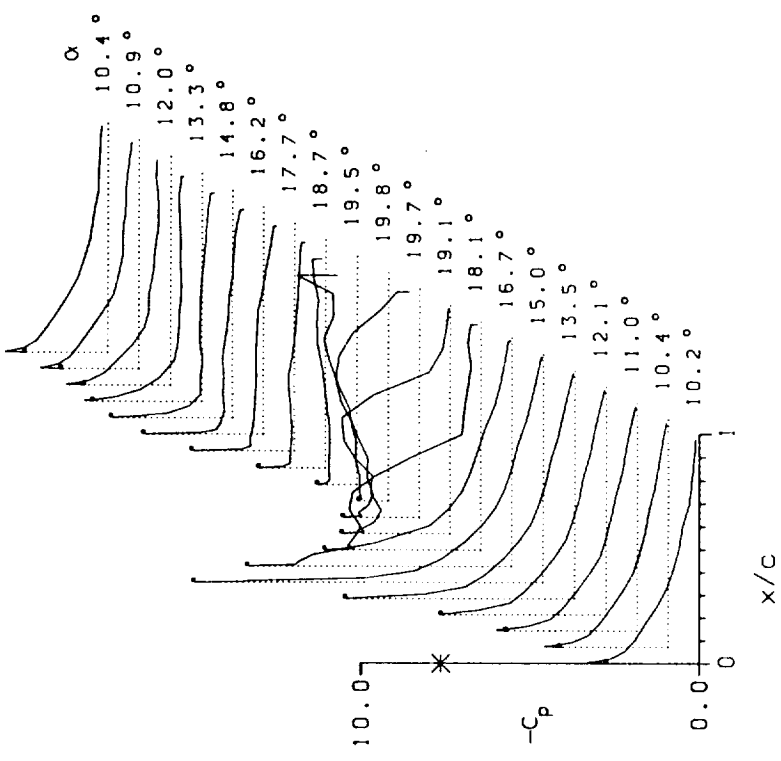
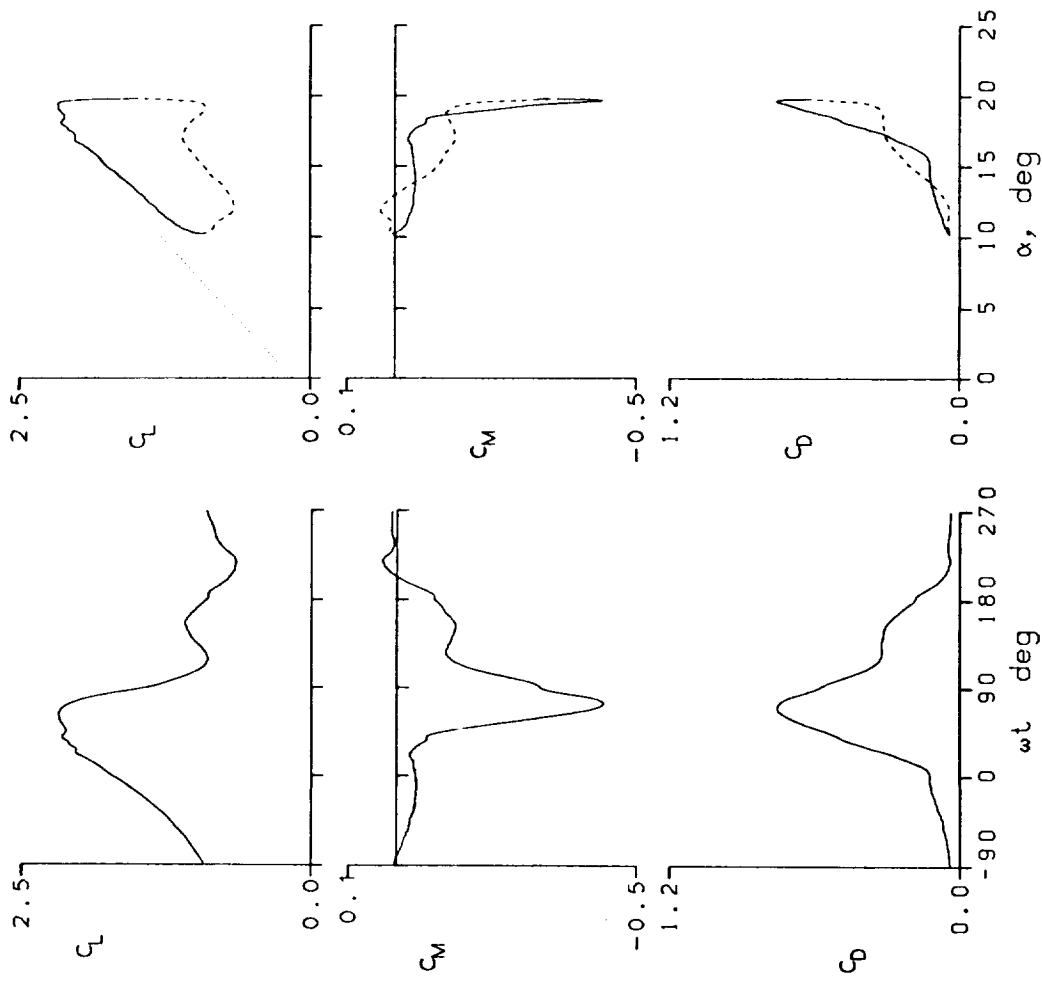


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 23107 A0 = 4.95° k = 0.099
 Re = 3.80 E6 A1 = 5.00° M = 0.300
 C_{Lmax} = 1.25 C_{Mmin} = -0.04 C_{Dmax} = 0.03
 α_{Lmax} = 9.9° ζ = 0.287 M_{max} = 0.829
 α_{Cmin} = 4.7° -C_{pmax} = 5.1 α_{Mmax} = 9.9°

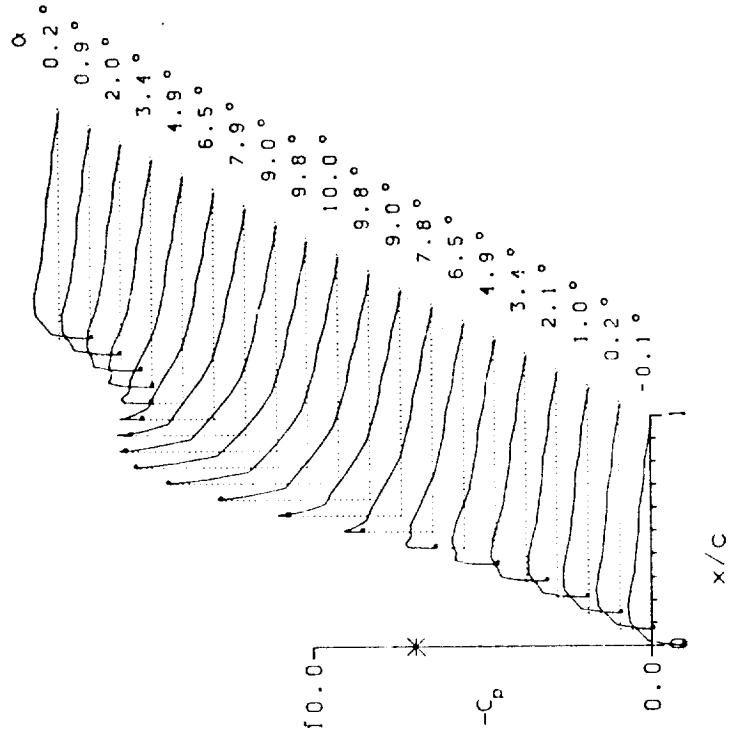
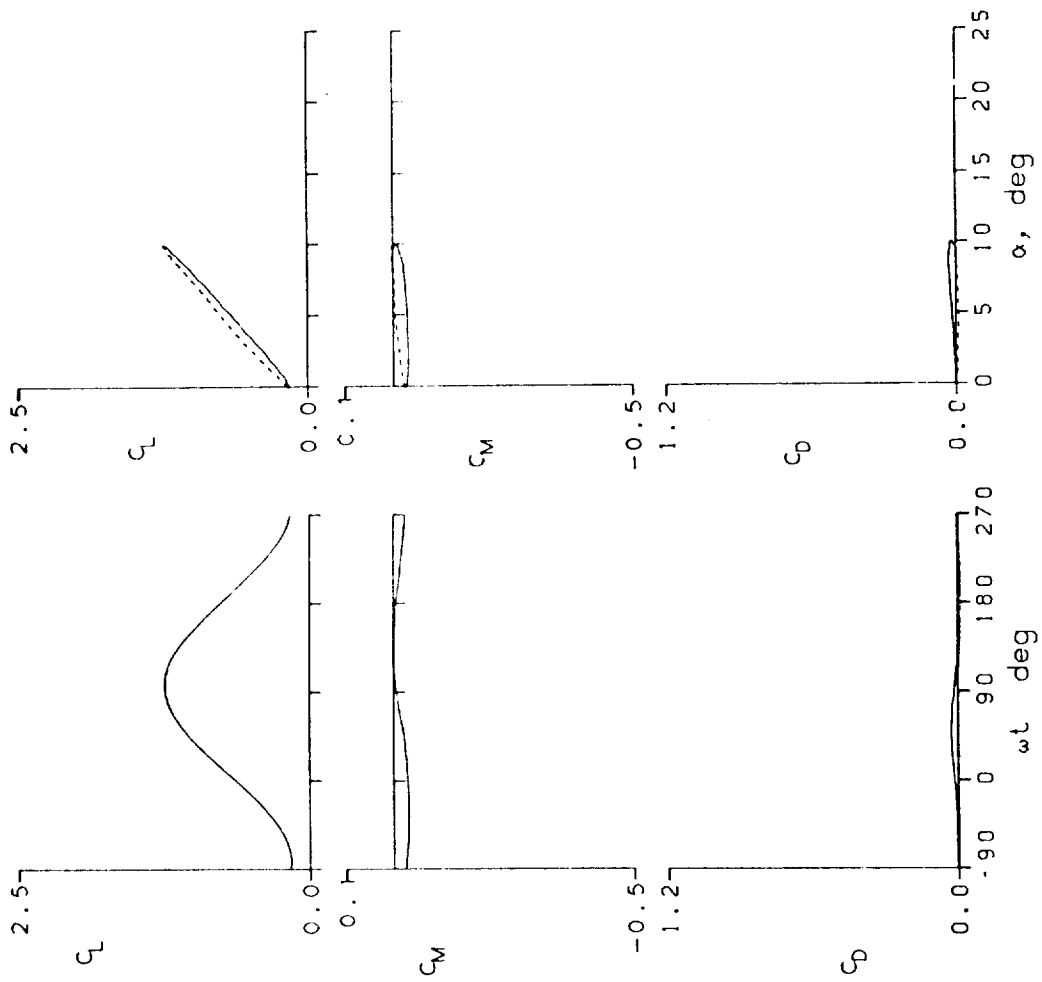


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL

FRAME : 23109 A0 = 4.97° k = 0.197
 Re = 3.79 E6 A1 = 5.01° M = 0.300
 $C_{Lmax} = 1.27$ $C_{Mmin} = -0.05$ $C_{Dmax} = 0.04$
 $\alpha_{Lmax} = 10.0^\circ$ $\zeta = 0.660$ $M_{max} = 0.868$
 $\alpha_{Cmin} = 4.7^\circ$ $-C_{pmax} = 5.5$ $\alpha_{Mmax} = 9.9^\circ$

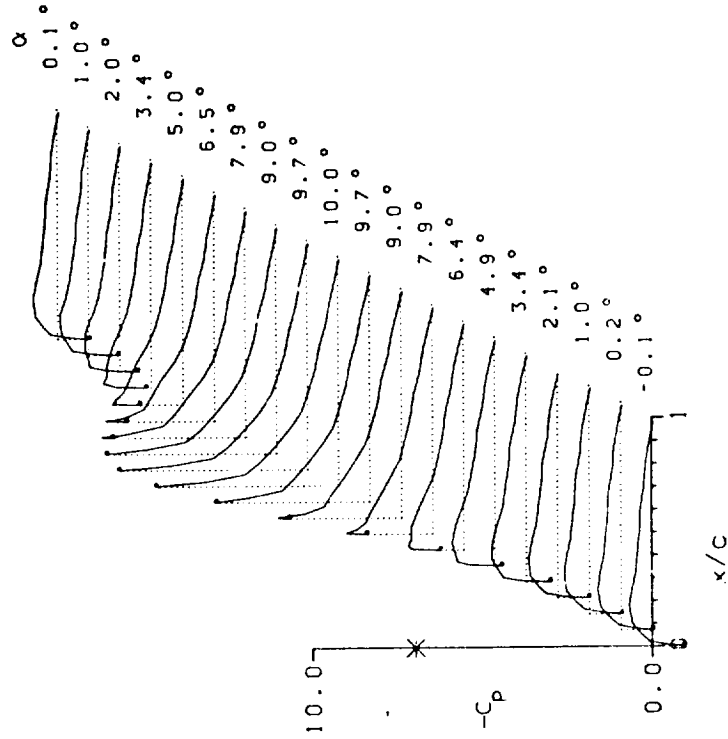
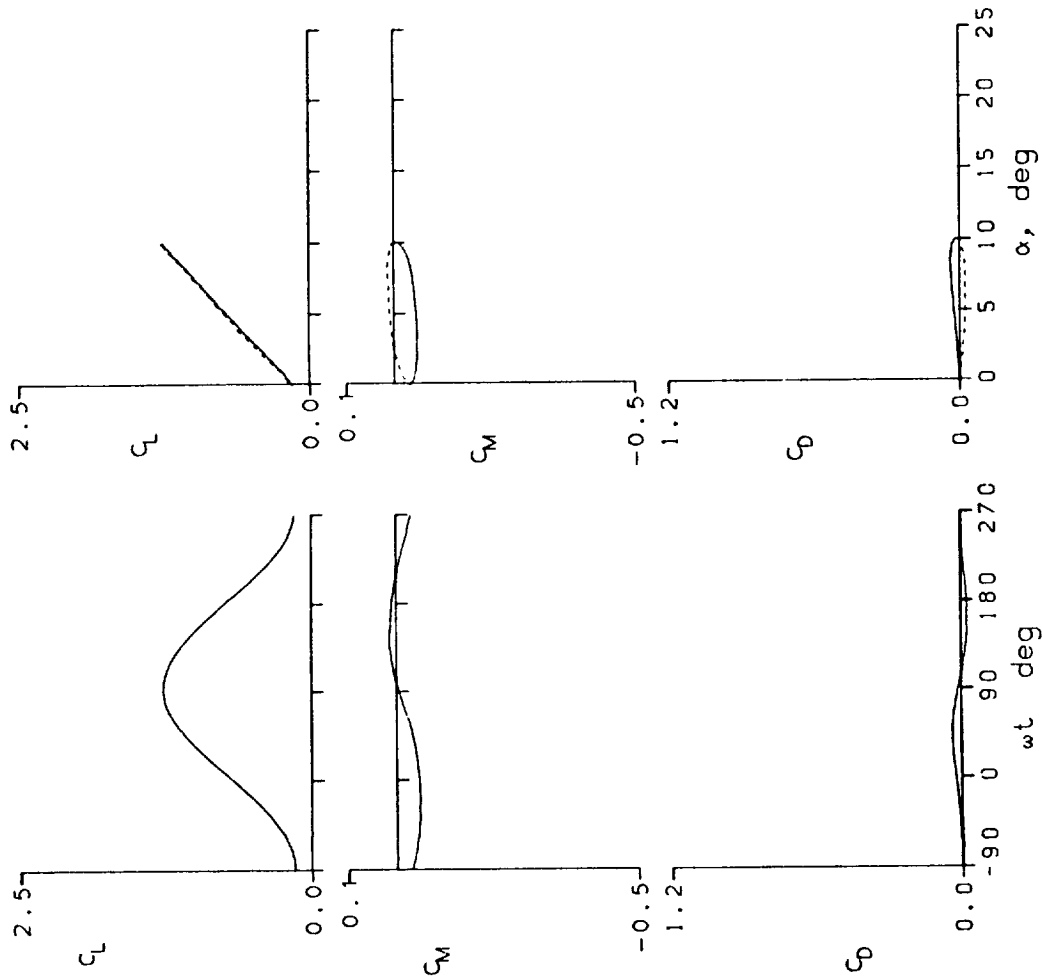


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 23117 A0 = 4.84° k = 0.098
 Re = 3.80 E6 A1 = 10.05° M = 0.300
 CLmax = 1.74 CMmin = -0.19 CDmax = 0.32
 αLmax = 14.9° ζ = 0.226 Mmax = 1.387
 αCmin = 4.4° -CPmax = 10.4 αMmax = 14.4°

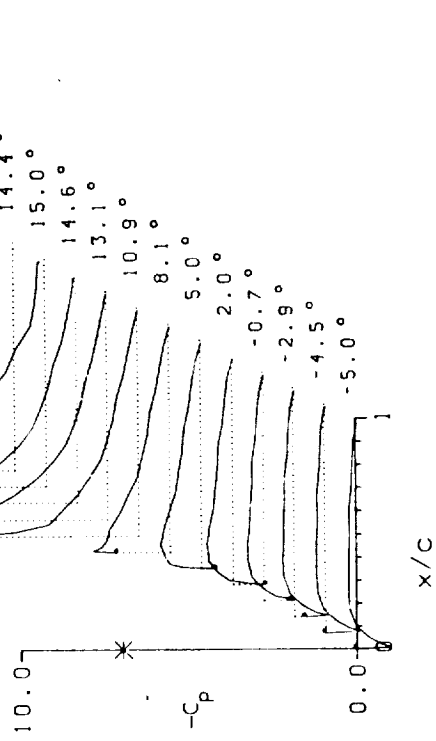
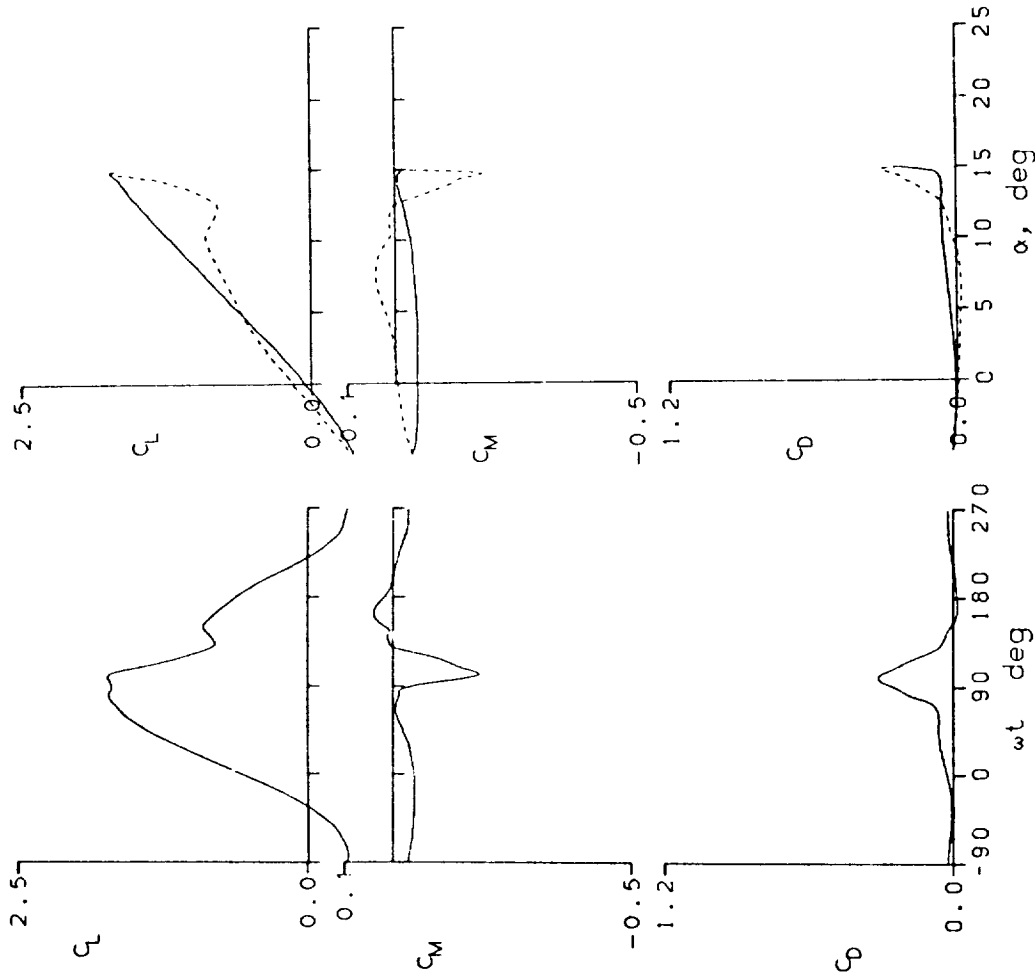


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 23201 A0 = 3.66° k = 0.100
 Re = 3.95 E6 A1 = 10.10° M = 0.299
 CLmax = 1.69 CMmin = -0.05 CDmax = 0.07
 αLmax = 13.9° ζ = 0.275 Mmax = 1.396
 αCMmin = 3.2° -CPmax = 10.6 αMmax = 13.9°

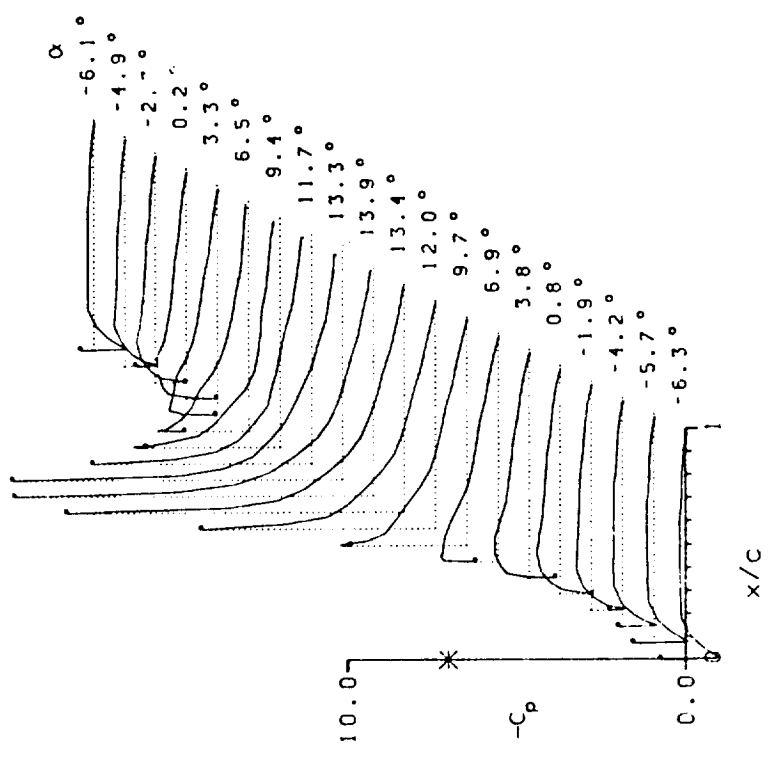
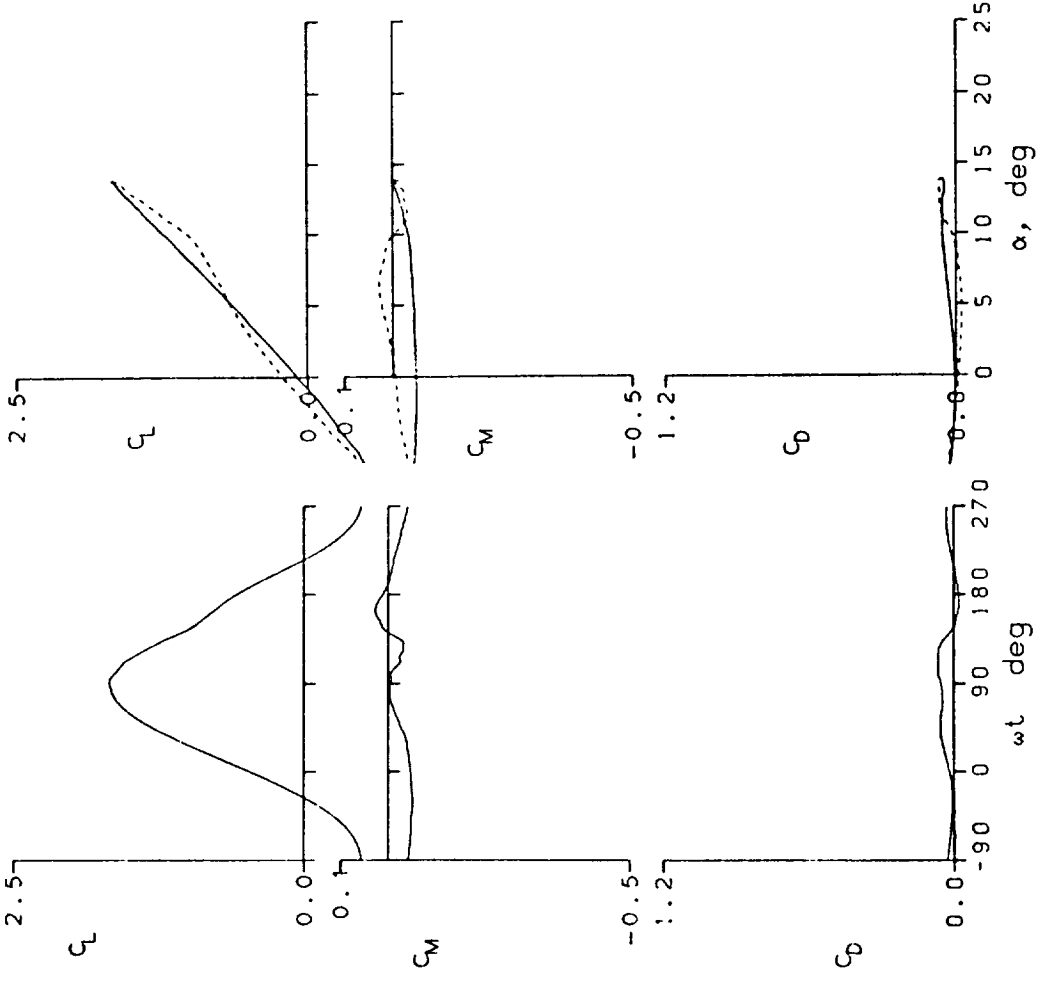


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 23206 A0 = 3.07 ° k = 0.050
 Re = 3.92 E6 A1 = 10.19 ° M = 0.299
 C_{Lmax} = 1.62 C_{Mmin} = -0.05 C_{Dmax} = 0.04
 α_{Lmax} = 13.2 ° ζ = 0.147 Mmax = 1.356
 α_{Cmin} = 2.6 ° -C_{pmax} = 10.3 α_{Mmax} = 13.4 °

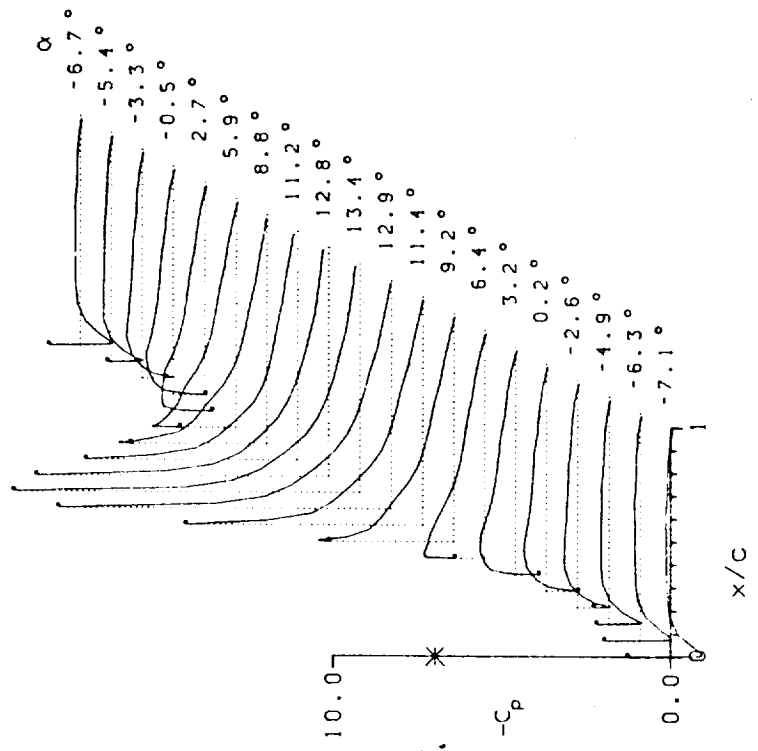
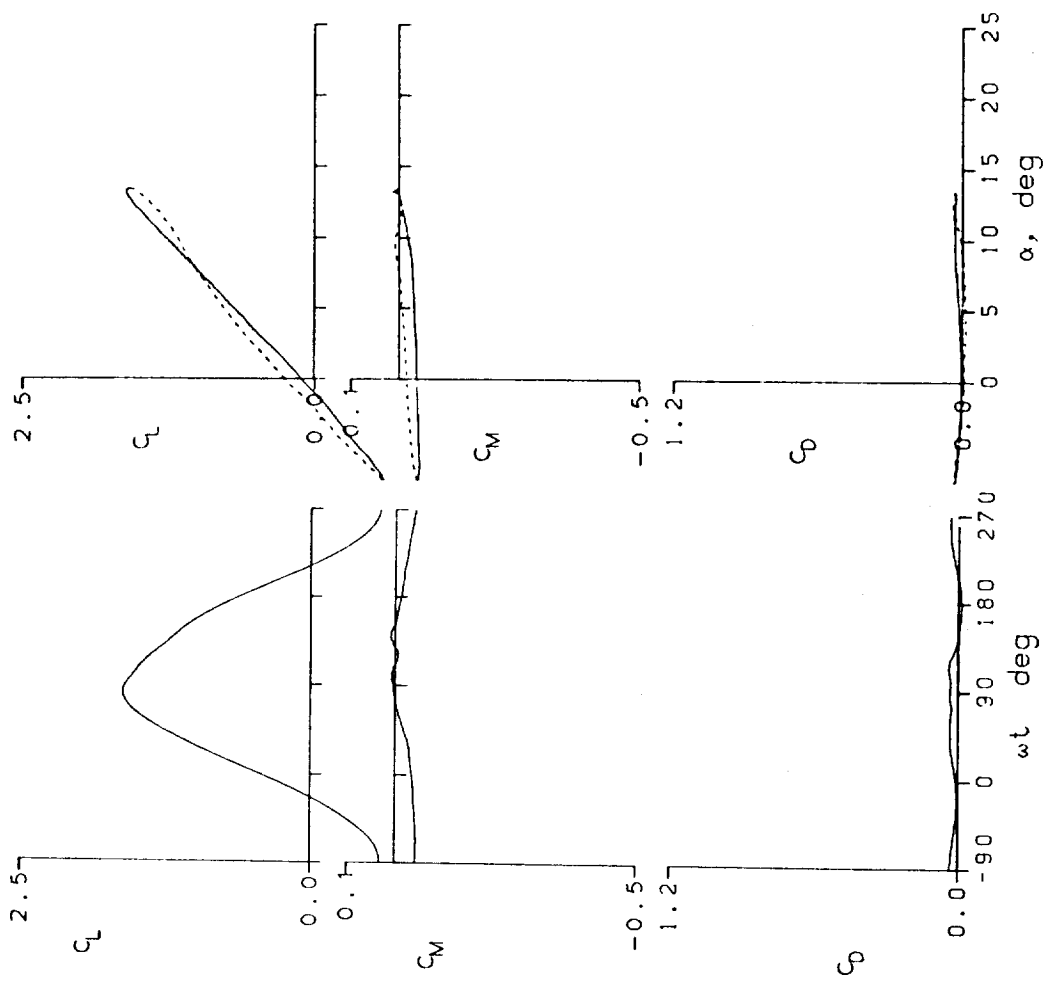


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 23208	A0 = 3.15°	k = 0.100
Re = 3.91 E6	A1 = 10.16°	M = 0.300
C _{Lmax} = 1.65	C _{Mmin} = -0.06	C _{Dmax} = 0.06
α _{Lmax} = 13.4°	ξ = 0.319	M _{max} = 1.383
α _{Cmin} = 2.7°	-C _{pmax} = 10.4	α _{Mmax} = 13.4°

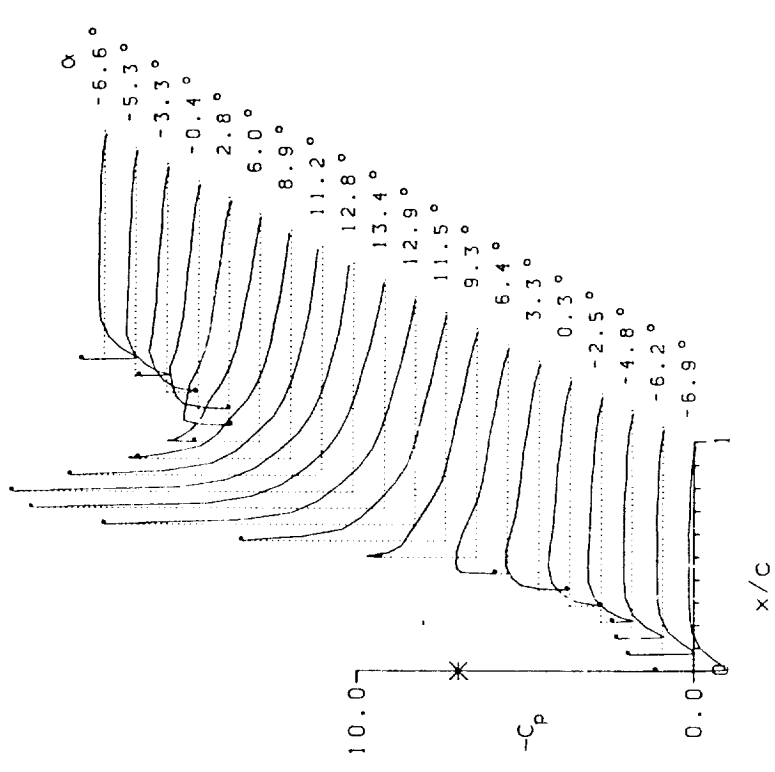
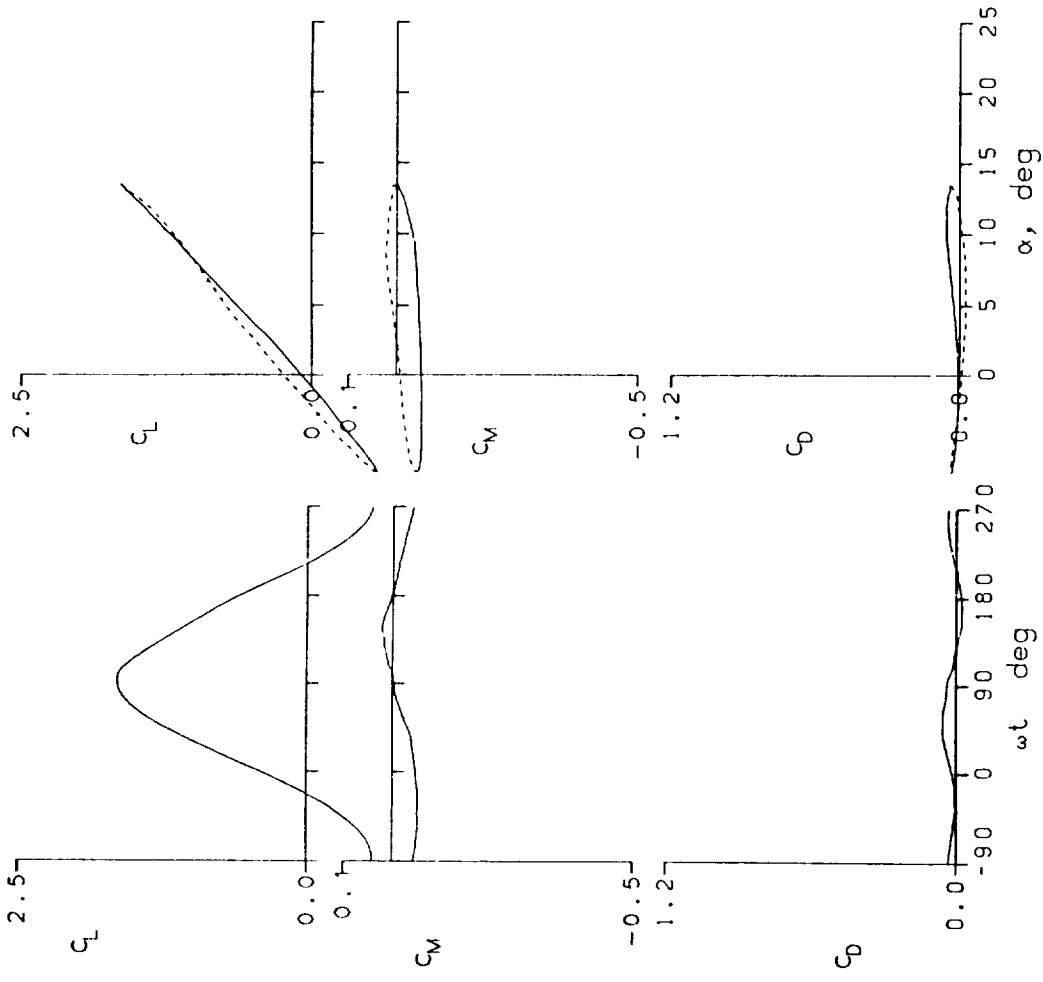


Figure 14.- Continued.

WORTMANN FX 69-H-098 AIRFOIL

FRAME : 23211 A0 = 3.06° k = 0.149
 Re = 3.90 E6 A1 = 10.17° M = 0.300
 $C_{Lmax} = 1.66$ $C_{Mmin} = -0.07$ $C_{Dmax} = 0.08$
 $\alpha_{Lmax} = 13.1^\circ$ $\xi = 0.497$ $M_{max} = 1.406$
 $\alpha_{Cmin} = 2.7^\circ$ $-C_{Pmax} = 10.6$ $\alpha_{Mmax} = 13.1^\circ$

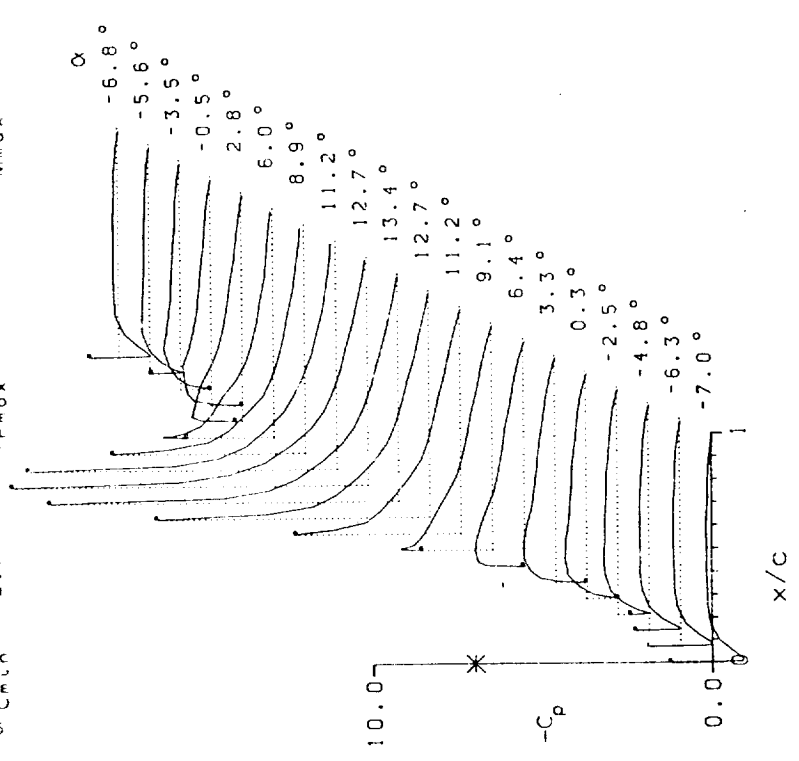
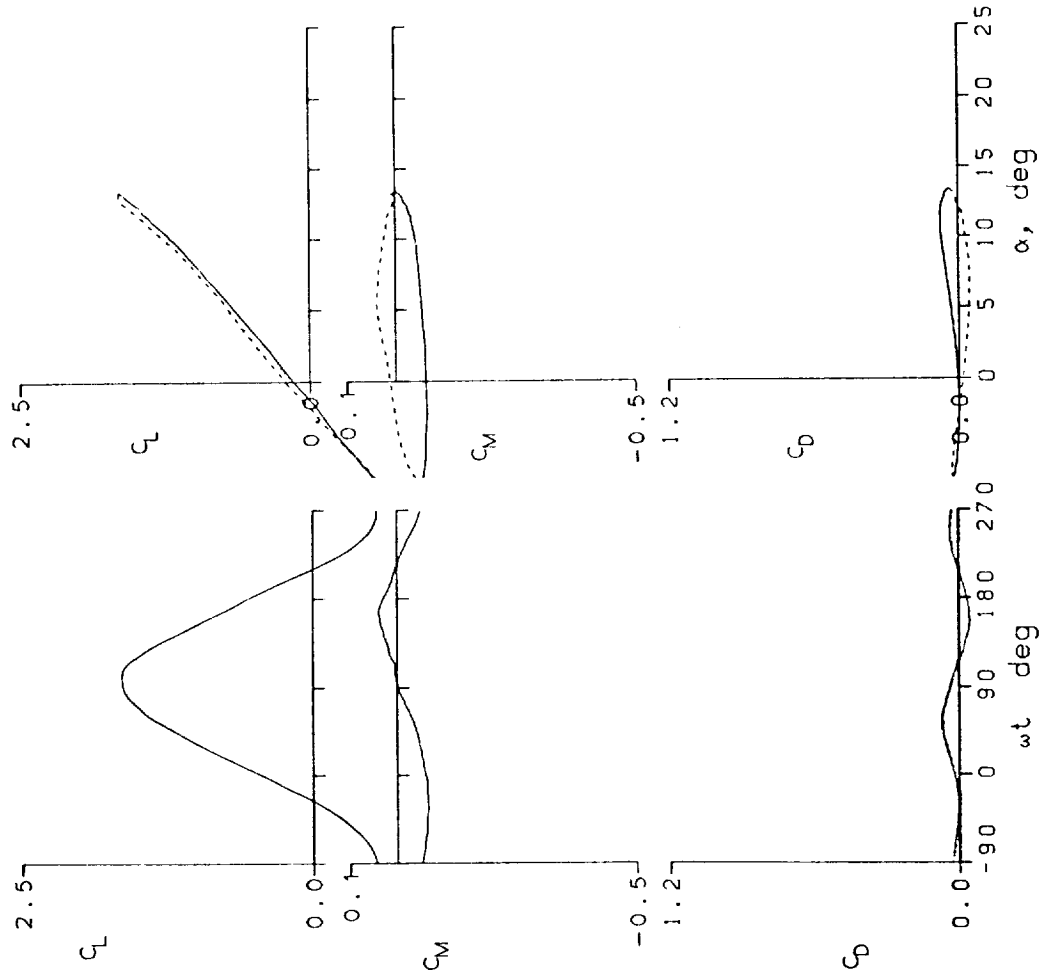


Figure 14.- Continued.

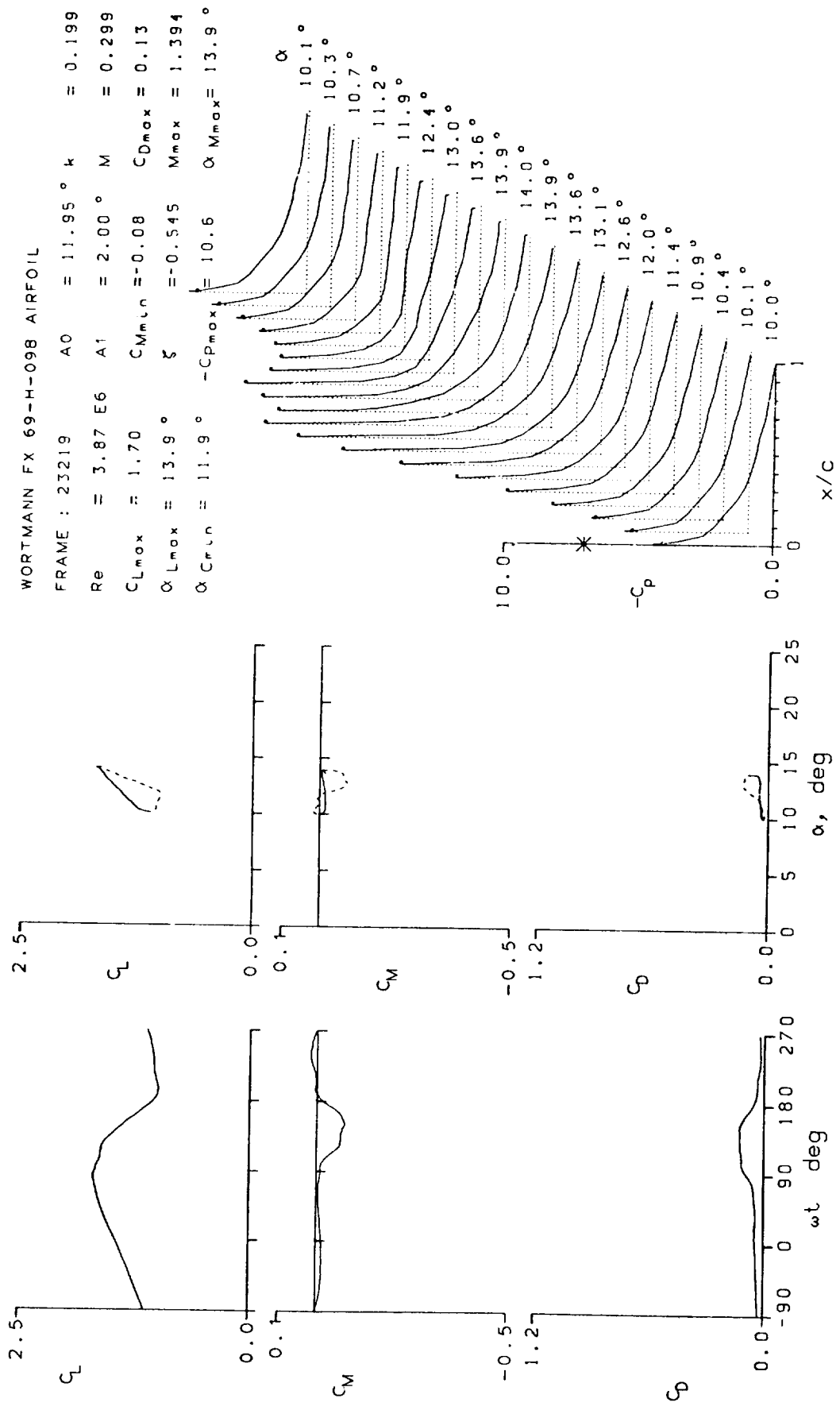
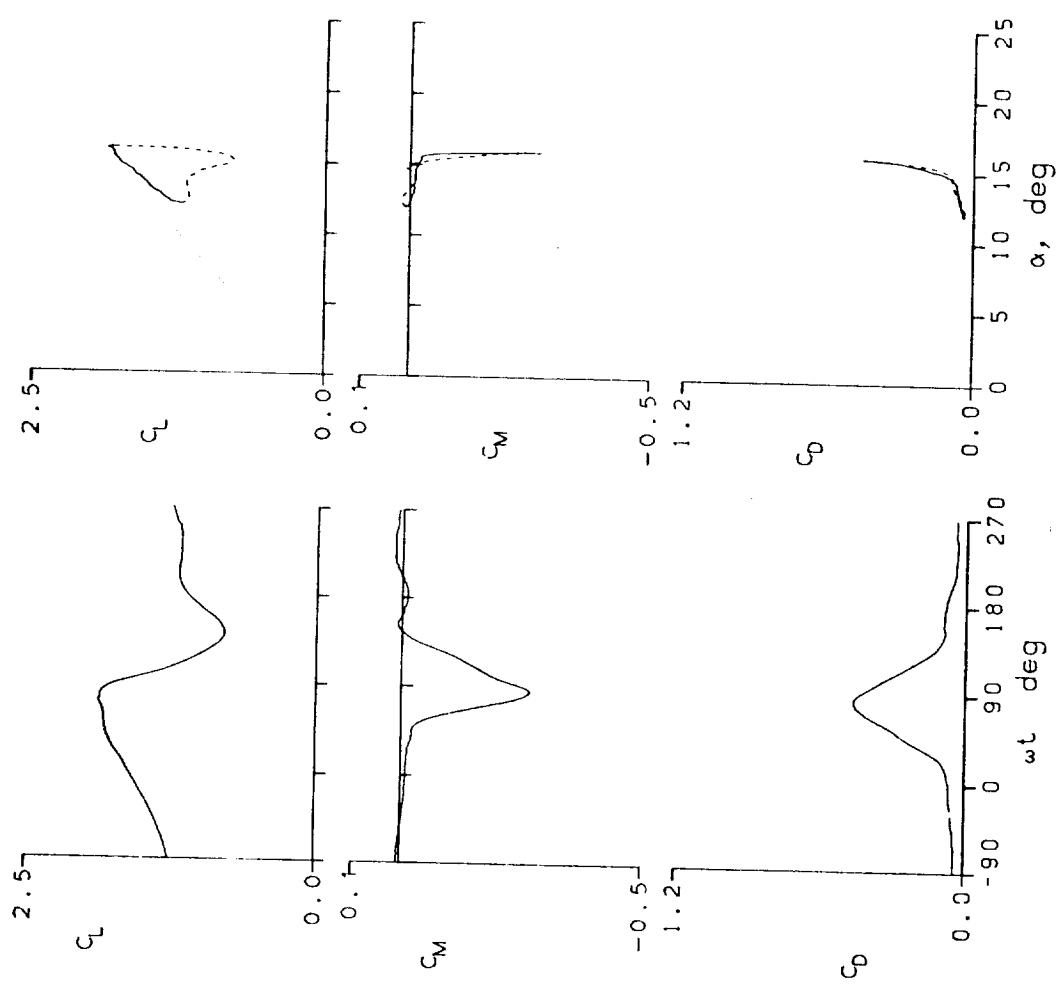


Figure 14.- Continued.



WORTMANN FX 69-H-098 AIRFOIL
 FRAME : 23305 A0 = 13.98° k = 0.200
 Re = 3.83 E6 A1 = 1.98° M = 0.298
 CLmax = 1.88 CMmin = -0.27 CDmax = 0.47
 αLmax = 15.9° ξ = -0.141 Mmax = 1.385
 αCmin = 13.9° -CPmax = 10.5 αMmax = 14.6°

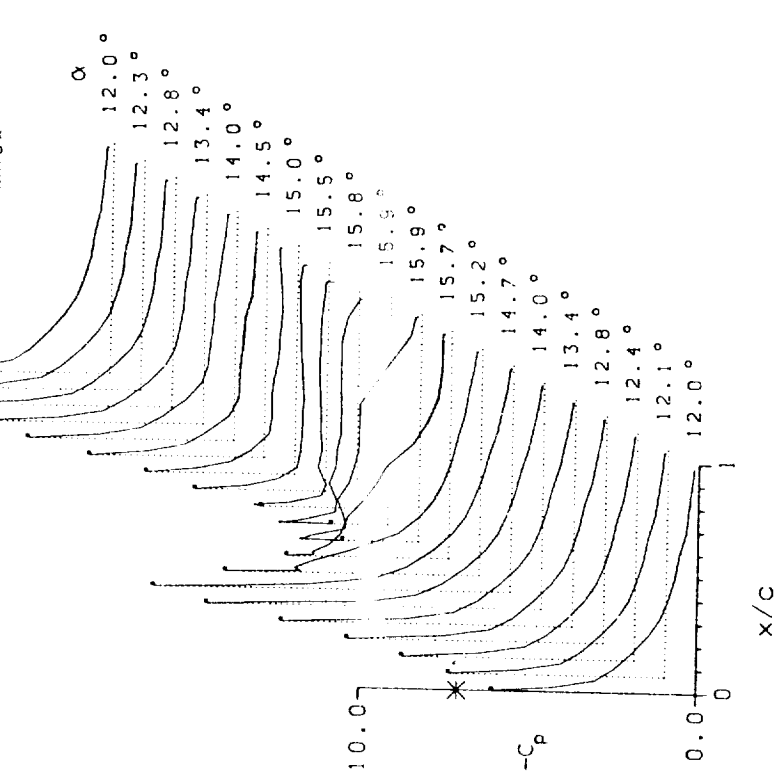


Figure 14.- Continued.

WORTMANN FX 69-H-09B AIRFOIL
 FRAME : 23310 A0 = 16.01° k = 0.201
 Re = 3.77 E6 A1 = 1.98° M = 0.294
 $C_{Lmax} = 1.77$ $C_{Mmin} = -0.25$ $C_{Dmax} = 0.47$
 $\alpha_{Lmax} = 17.3^\circ$ $\zeta = 1.154$ $M_{max} = 1.258$
 $\alpha_{C_{min}} = 16.0^\circ$ $-C_{pmax} = 9.8$ $\alpha_{Mmax} = 15.9^\circ$

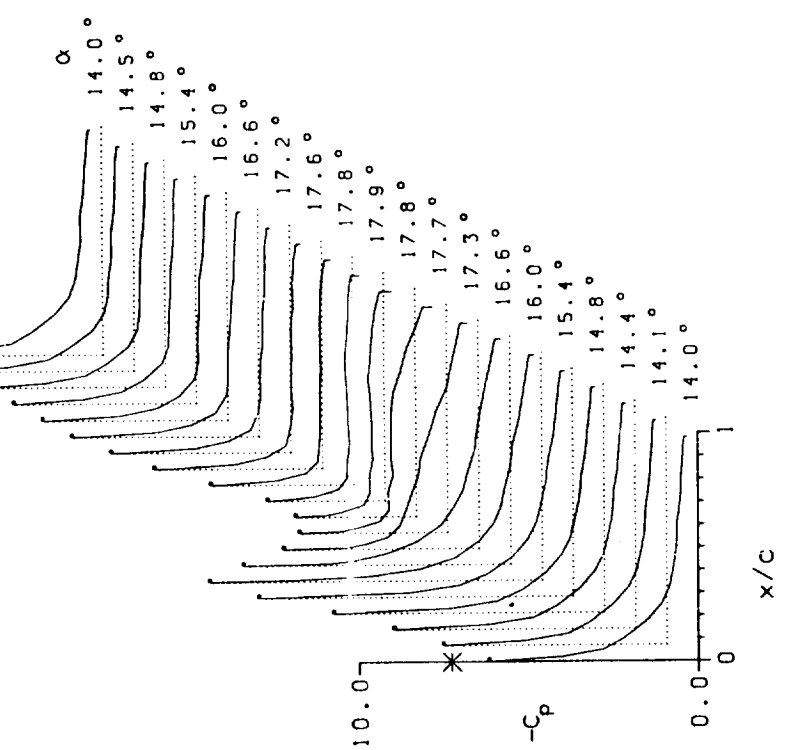
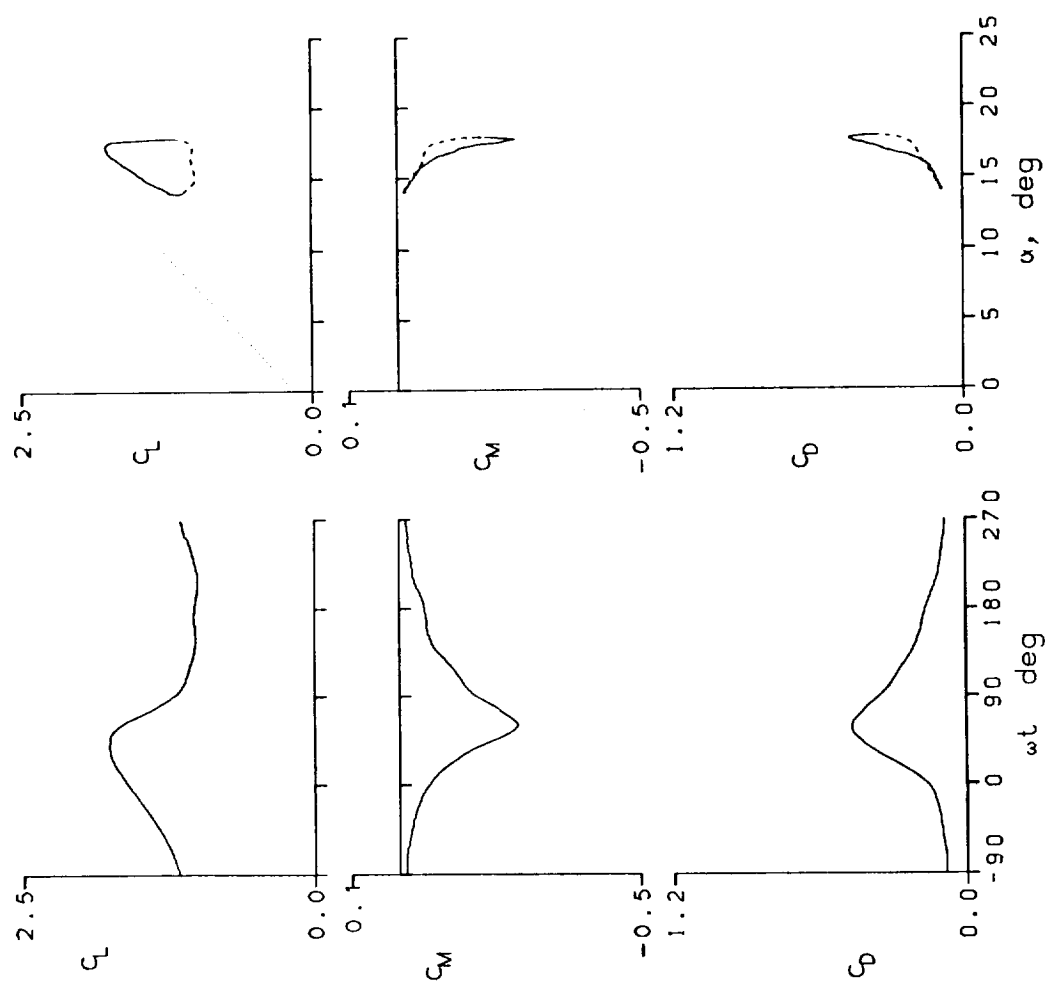


Figure 14.- Concluded.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 33022 $A_0 = 14.82^\circ$ $k = 0.099$
 $Re = 0.98 E6$ $A^* = 9.88^\circ$ $M = 0.073$
 $C_{Lmax} = 2.52$ $C_{Mmin} = -0.49$ $C_{Dmax} = 1.05$
 $\alpha_{Lmax} = 22.8^\circ$ $\xi = 0.156$ $M_{max} = 0.299$
 $\alpha_{Cmin} = 14.4^\circ$ $-C_{Pmax} = 15.4$ $\alpha_{Mmax} = 20.8^\circ$

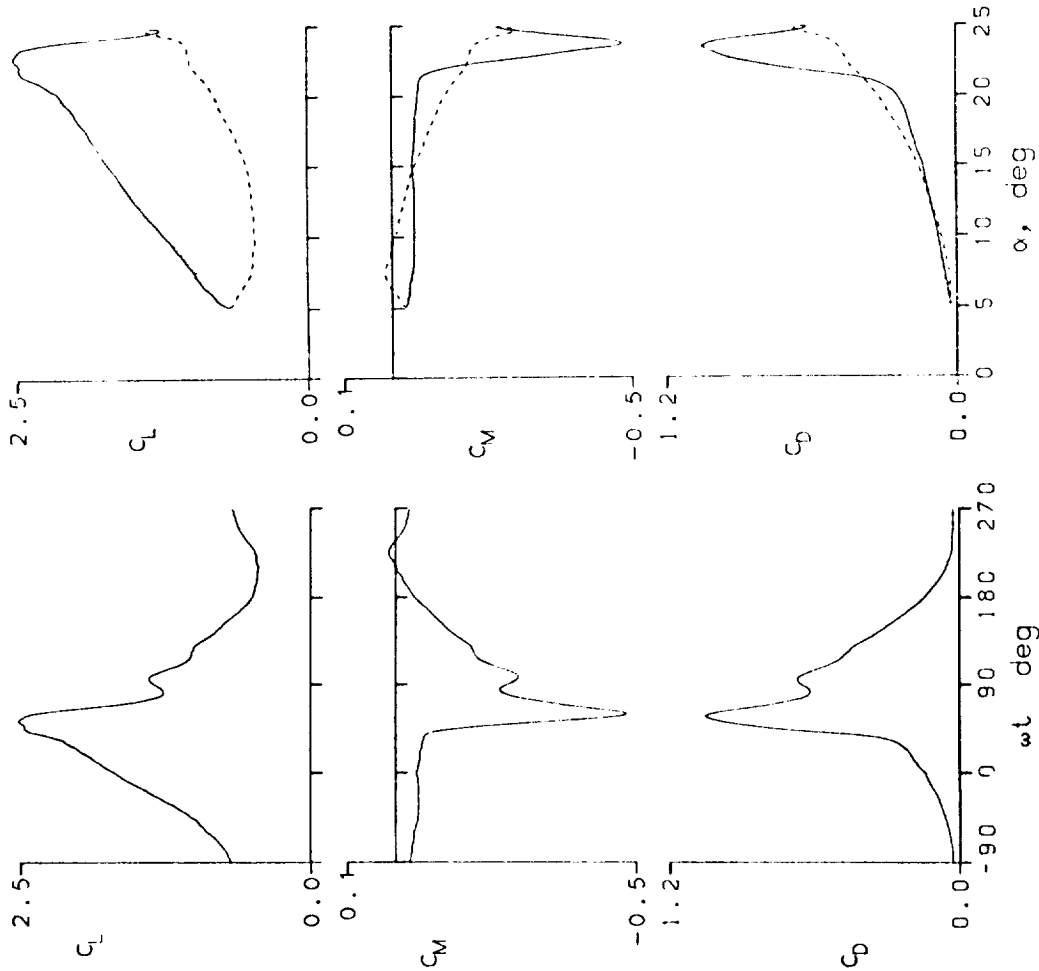


Figure 15.- Dynamic data for Sikorsky SC-1095 airfoil.

SIKORSKY SC-1095 AIRFOIL

FRAME : 33100 $A_0 = 14.82^\circ$ $k = 0.098$
 $Re = 1.46 \text{ E}6$ $A_1 = 9.88^\circ$ $M = 0.110$
 $C_{Lmax} = 2.50$ $C_{Mmin} = -0.49$ $C_{Dmax} = 1.05$
 $\alpha_{Lmax} = 23.3^\circ$ $\xi = 0.215$ $M_{max} = 0.478$
 $\alpha_{Cmin} = 14.4^\circ$ $-C_{pmax} = 16.3$ $\alpha_{Mmax} = 21.1^\circ$

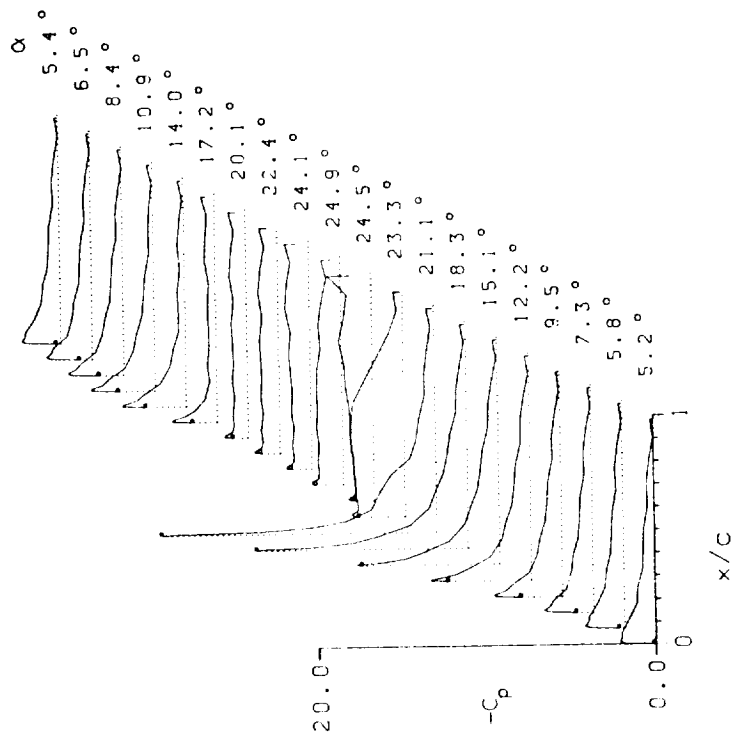
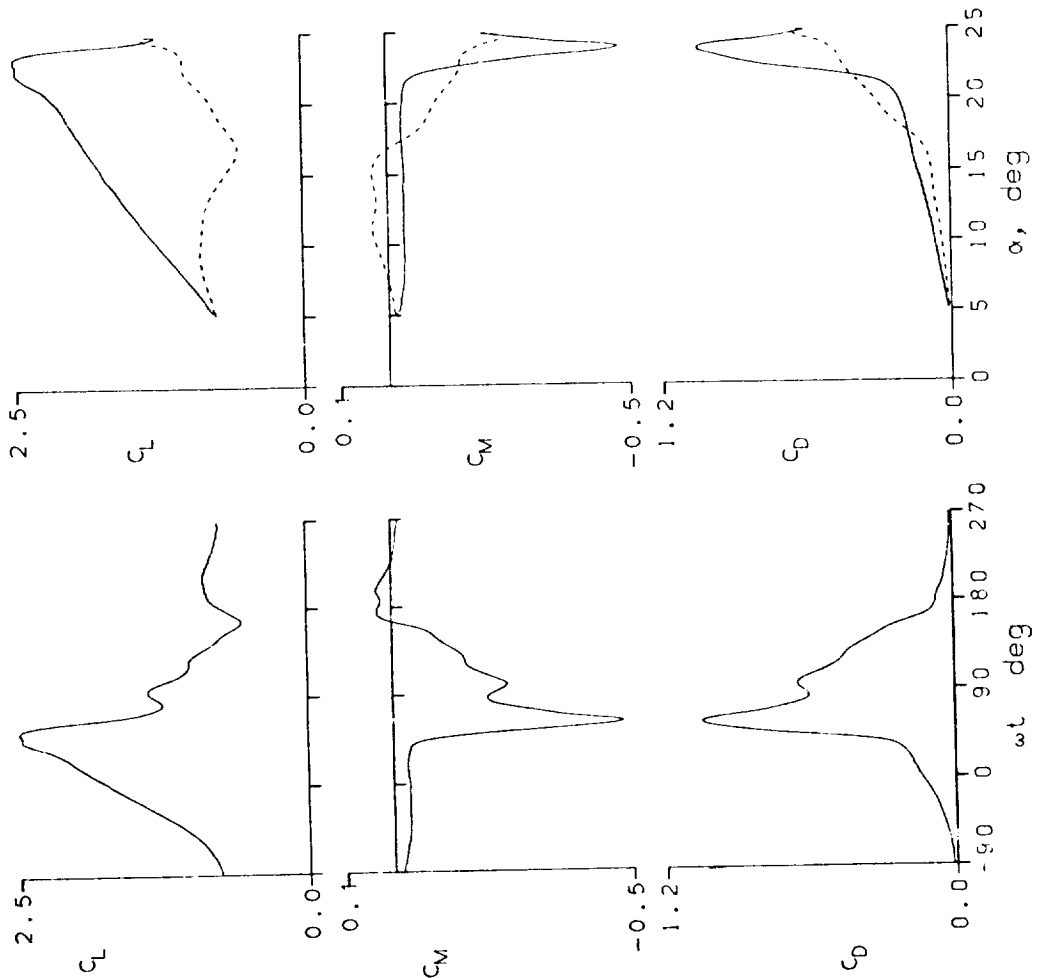


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 33110 A0 = 14.81° k = 0.099
 Re = 2.40 E6 A1 = 9.92° M = 0.183
 CLmax = 2.58 CMmin = -0.50 CDmax = 1.07
 αLmax = 22.9° ζ = 0.272 Mmax = 0.904
 αCMmin = 14.4° -CPmax = 16.9 αMmax = 20.9°

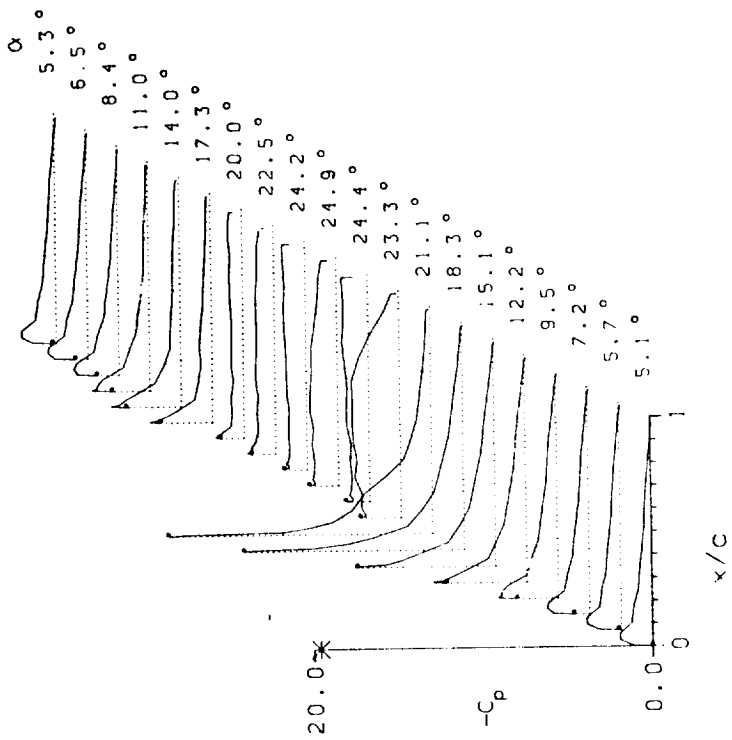
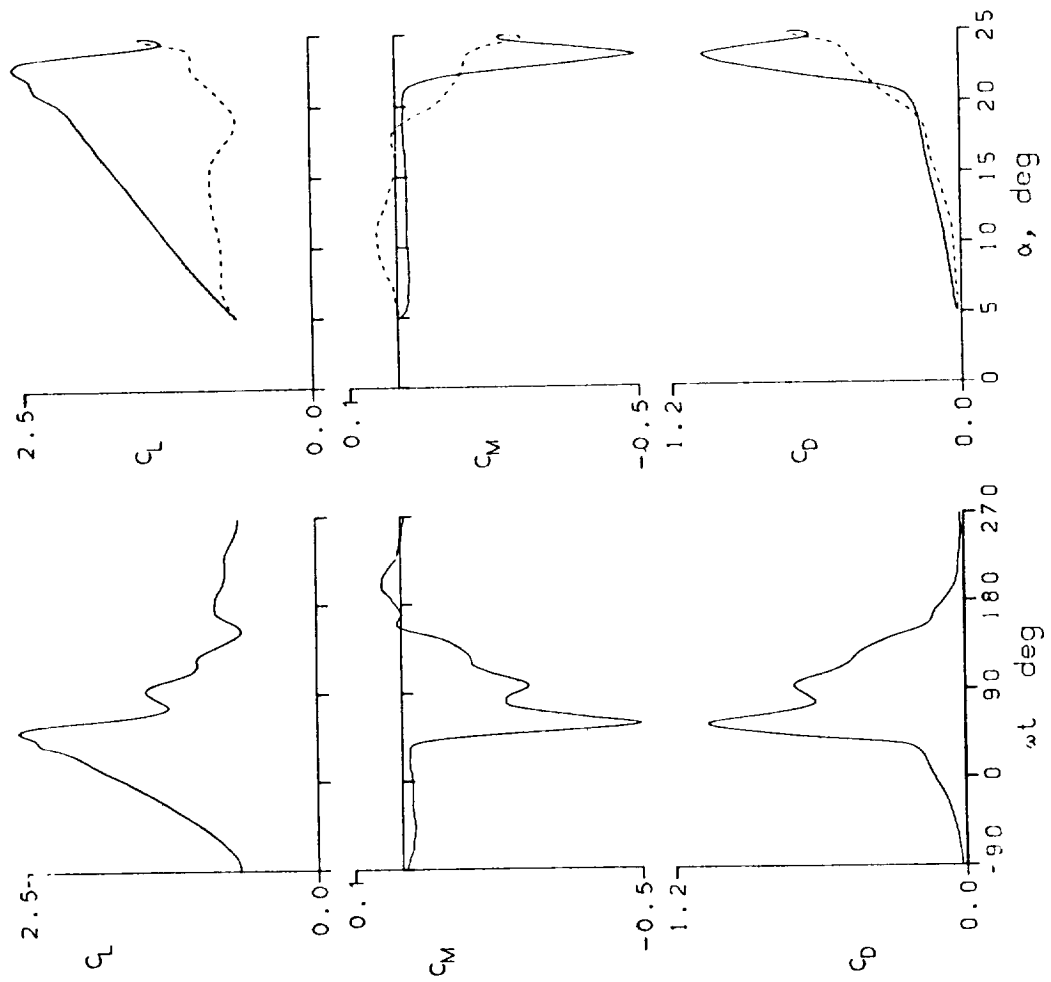


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 33118 A0 = 5.97° k = 0.050
 Re = 2.39 E6 A1 = 10.05° M = 0.182
 $C_{Lmax} = 1.74$ $C_{Mmin} = -0.06$ $C_{Dmax} = 0.15$
 $\alpha_{Lmax} = 15.2^\circ$ $\xi = 0.083$ $M_{max} = 0.685$
 $\alpha_{Cmin} = 5.4^\circ$ $-C_{pmax} = 10.9$ $\alpha_{Mmax} = 16.2^\circ$

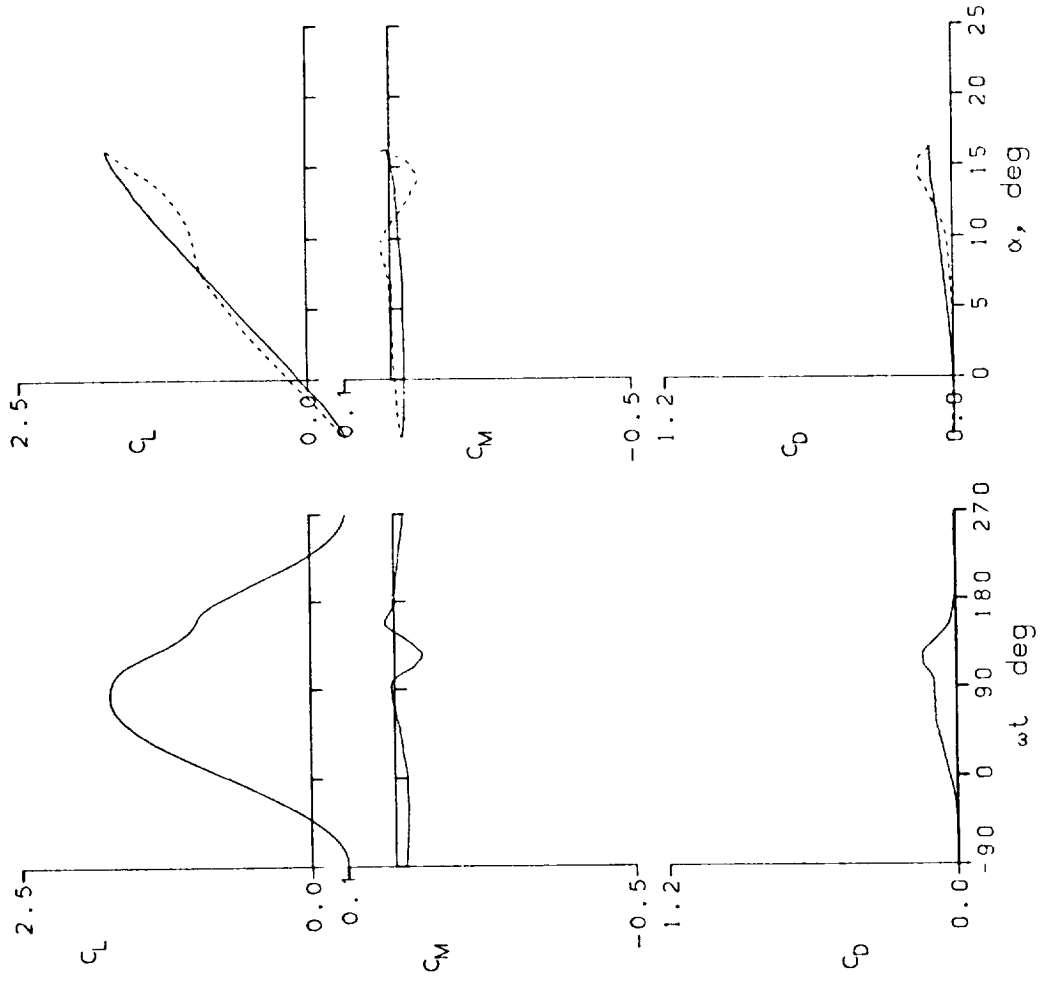


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 33121 A0 = 6.03° k = 0.198
 Re = 2.41 E6 A1 = 10.00° M = 0.184
 CLmax = 1.74 CMmin = -0.07 CDmax = 0.14
 αLmax = 16.2° ζ = 0.634 Mmax = 0.690
 αCMmin = 5.4° -CPmax = 10.8 αMmax = 16.1°

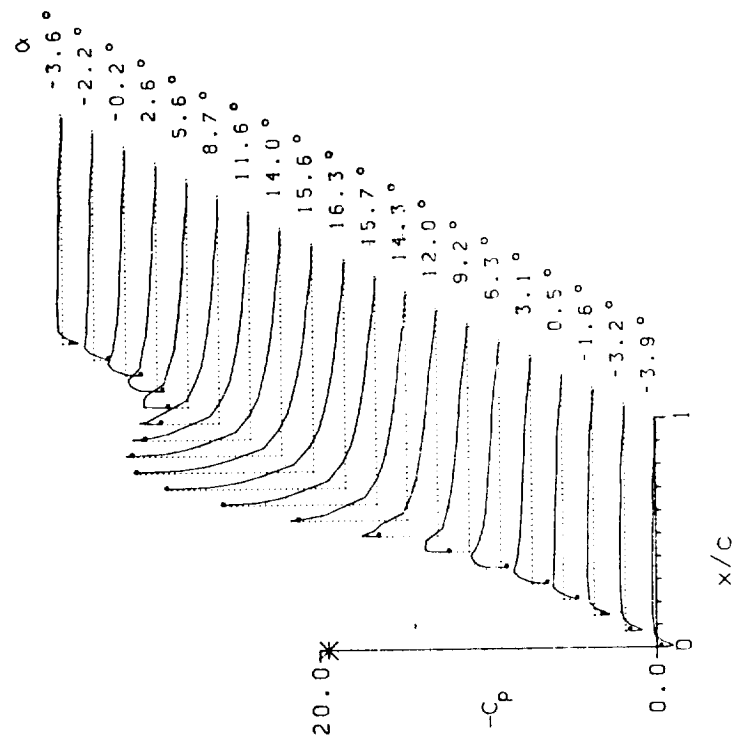
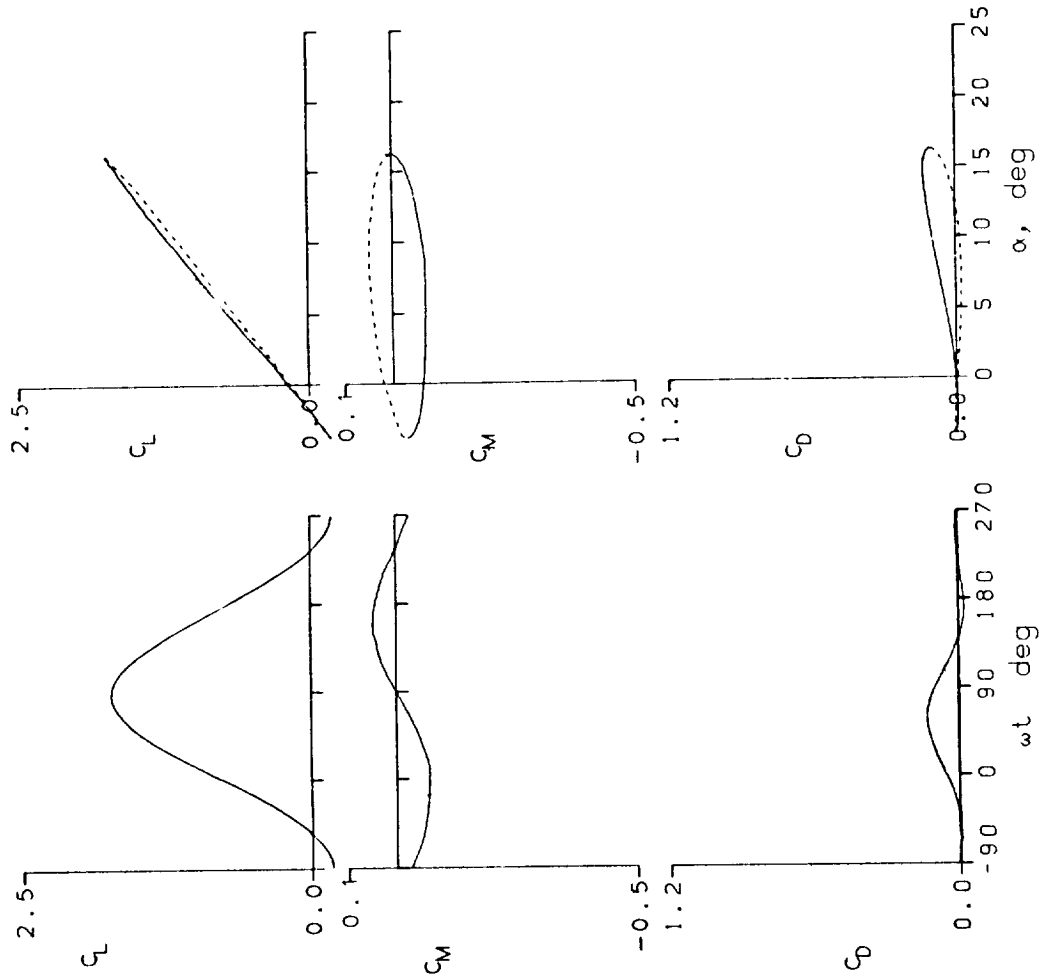


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 33205 $A_0 = 14.80^\circ$ $\mu = 0.099$
 $Re = 2.84 E6$ $A_1 = 9.84^\circ$ $M = 0.219$
 $C_{Lmax} = 2.44$ $C_{Mmin} = -0.48$ $C_{Dmax} = 0.99$
 $\alpha_{Lmax} = 22.3^\circ$ $\zeta = 0.353$ $Mmax = 1.100$
 $\alpha_{Cmin} = 14.3^\circ$ $-C_{Pmax} = 15.4$ $\alpha_{Mmax} = 20.0^\circ$

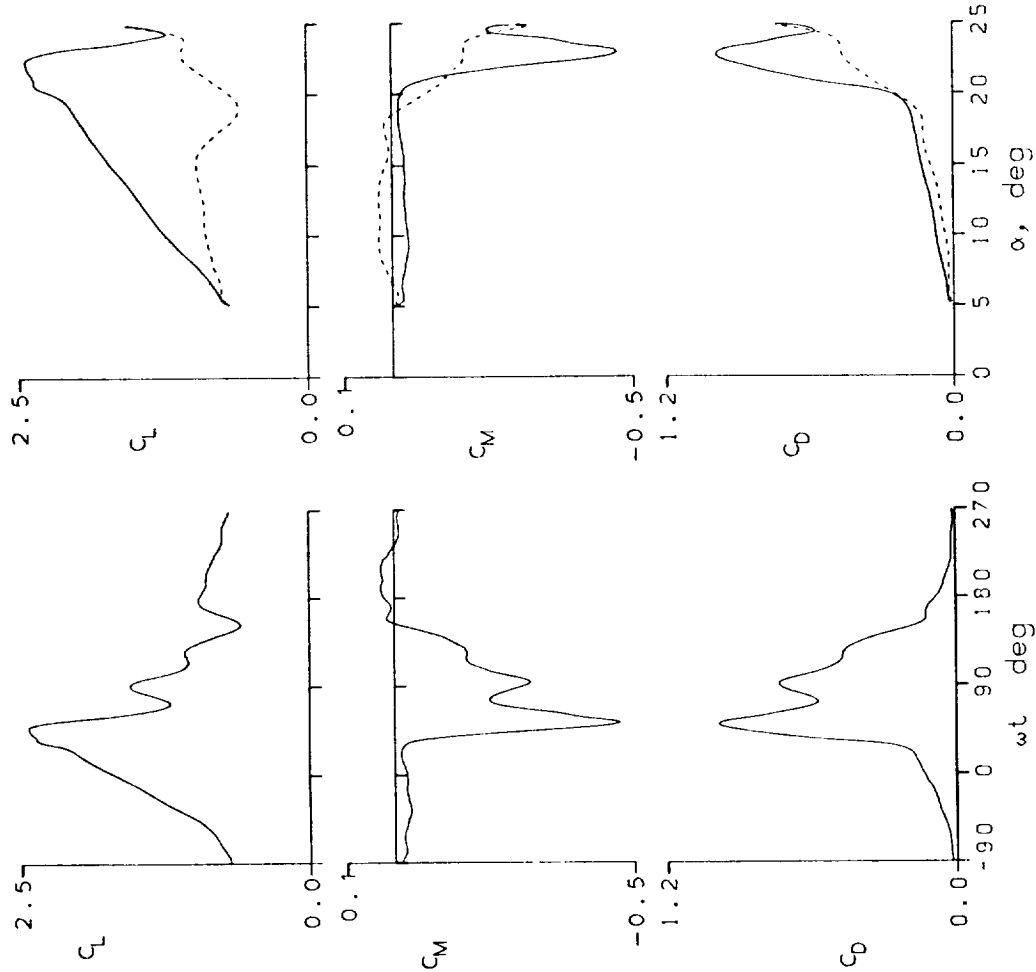


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 33207 $A_0 = 14.83^\circ$ $k = 0.098$
 $Re = 3.19 \text{ E}6$ $A_1 = 9.86^\circ$ $M = 0.249$
 $C_{Lmax} = 2.40$ $C_{Mmin} = -0.46$ $C_{Dmax} = 0.93$
 $\alpha_{Lmax} = 21.6^\circ$ $\zeta = 0.470$ $M_{max} = 1.208$
 $\alpha_{Cmin} = 14.4^\circ$ $-C_{Pmax} = 13.3$ $\alpha_{Mmax} = 18.6^\circ$

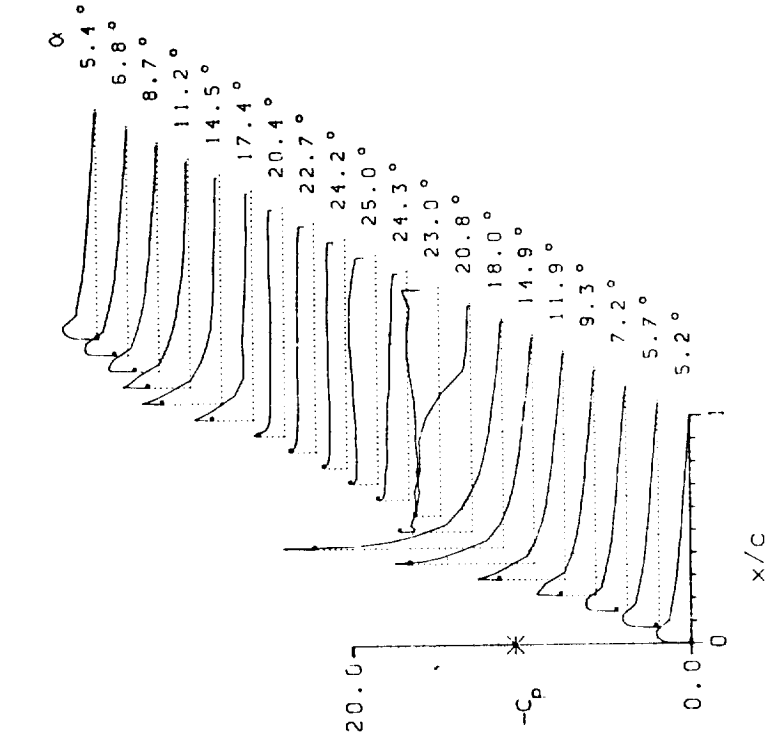
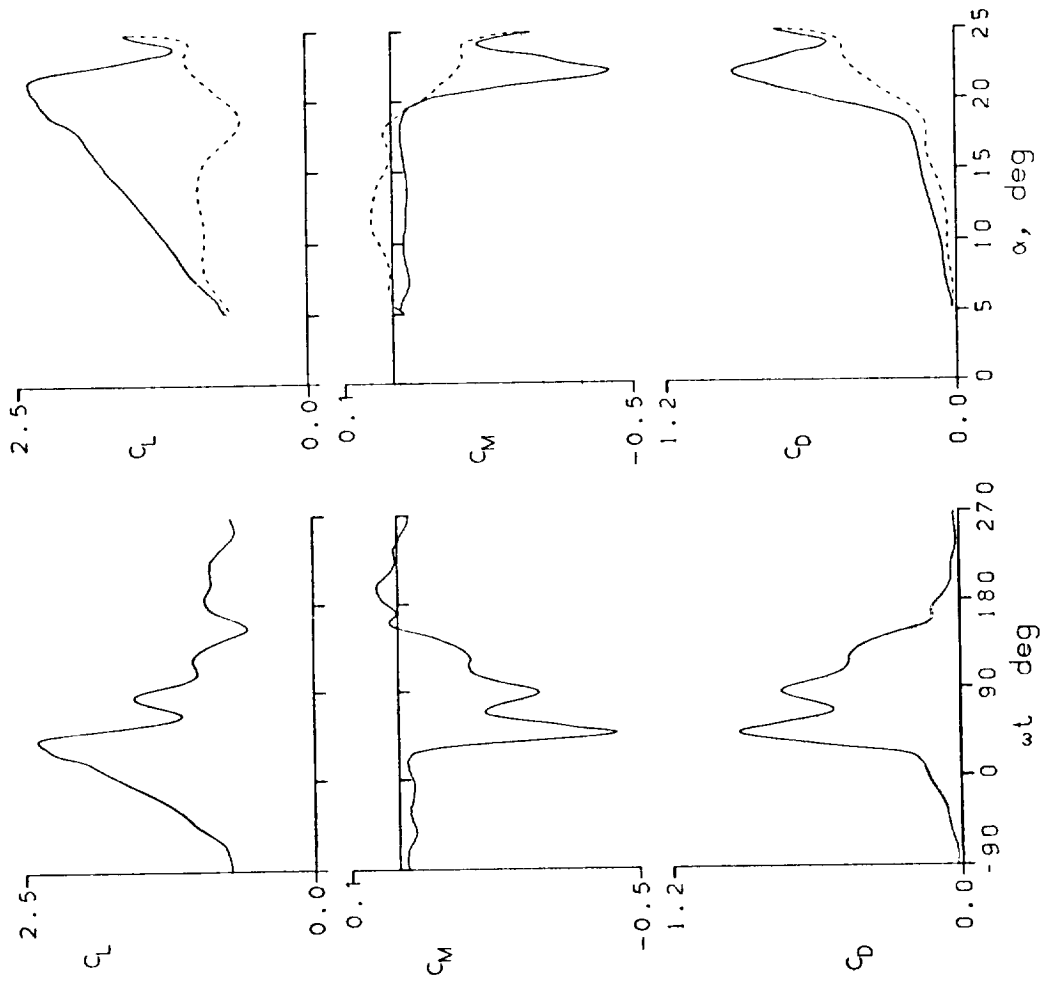


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 33215 A0 = 14.85° k = 0.100
 Re = 3.74 E6 A1 = 9.87° M = 0.279
 CLmax = 2.40 CMmin = -0.44 CDmax = 0.88
 αLmax = 20.4° ζ = 0.485 Mmax = 1.346
 αCMmin = 14.5° -CPmax = 11.8 αMmax = 17.8°

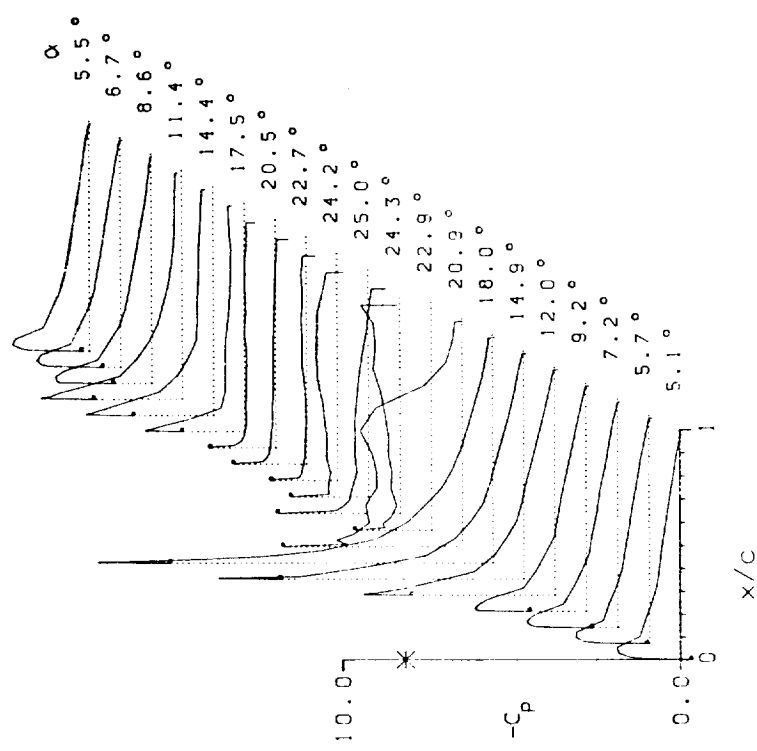
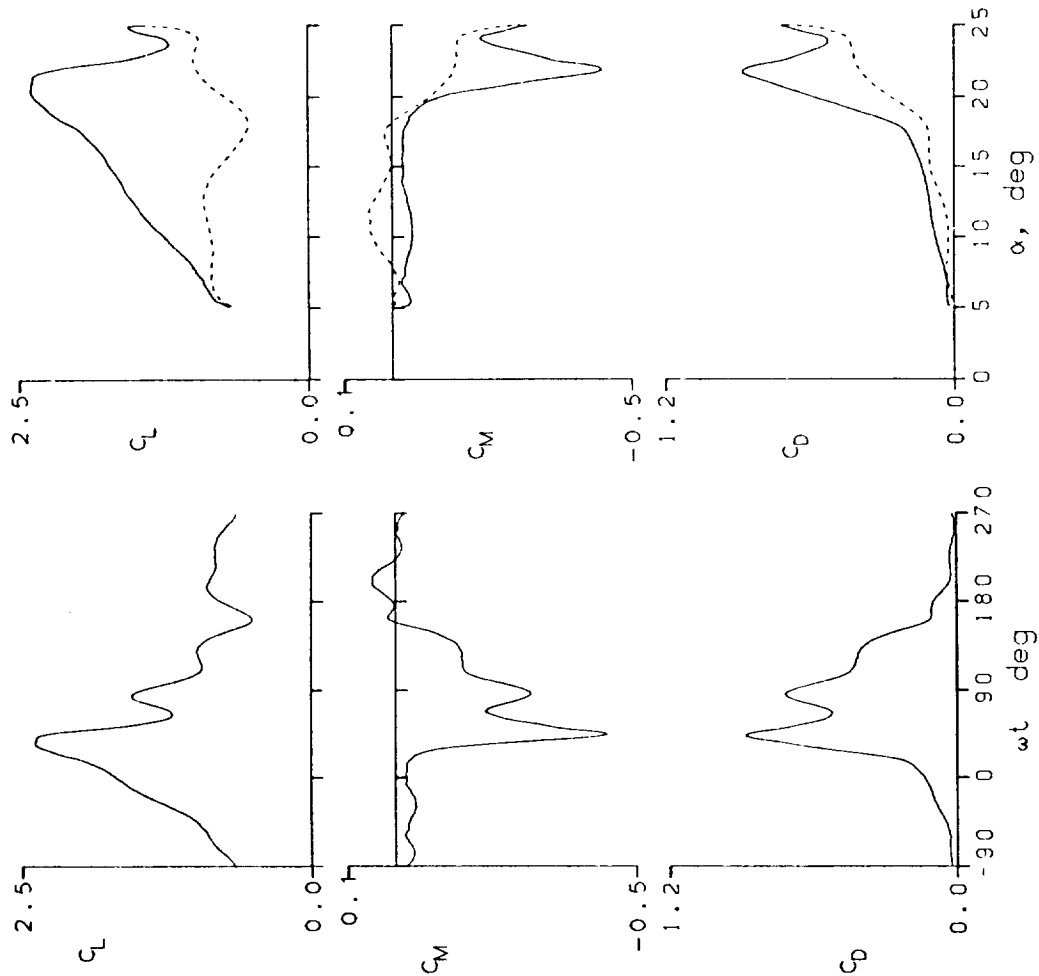


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 33217 $\Lambda_0 = 14.87^\circ$ $k = 0.025$
 $Re = 3.92 \times 10^6$ $A1 = 9.88^\circ$ $M = 0.297$
 $C_{Lmax} = 1.91$ $C_{Mmin} = -0.22$ $C_{Dmax} = 0.45$
 $\alpha_{Lmax} = 16.3^\circ$ $\zeta = 0.102$ $M_{max} = 1.354$
 $\alpha_{C_{min}} = 14.5^\circ$ $-C_{pmax} = 10.5$ $\alpha_{Mmax} = 15.7^\circ$

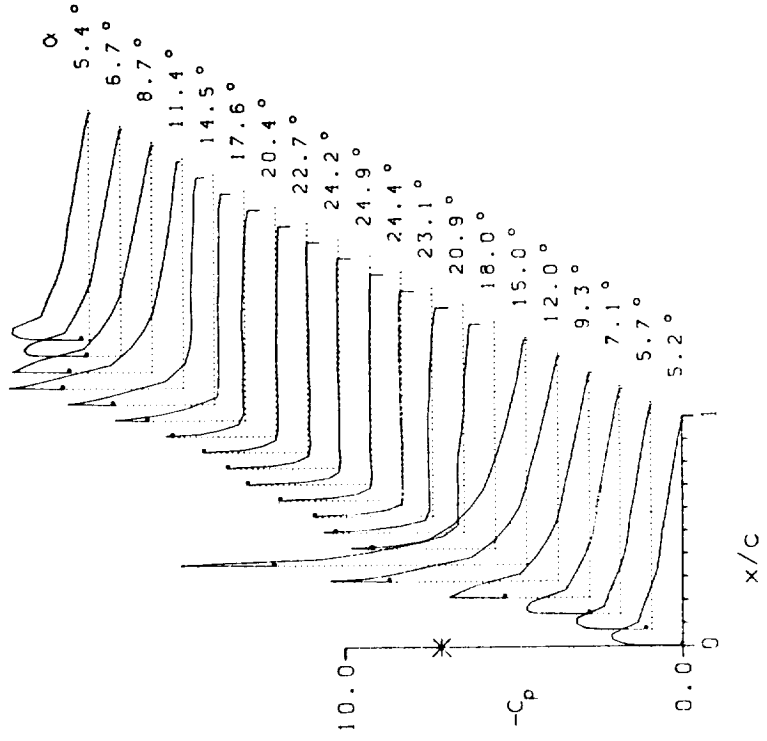
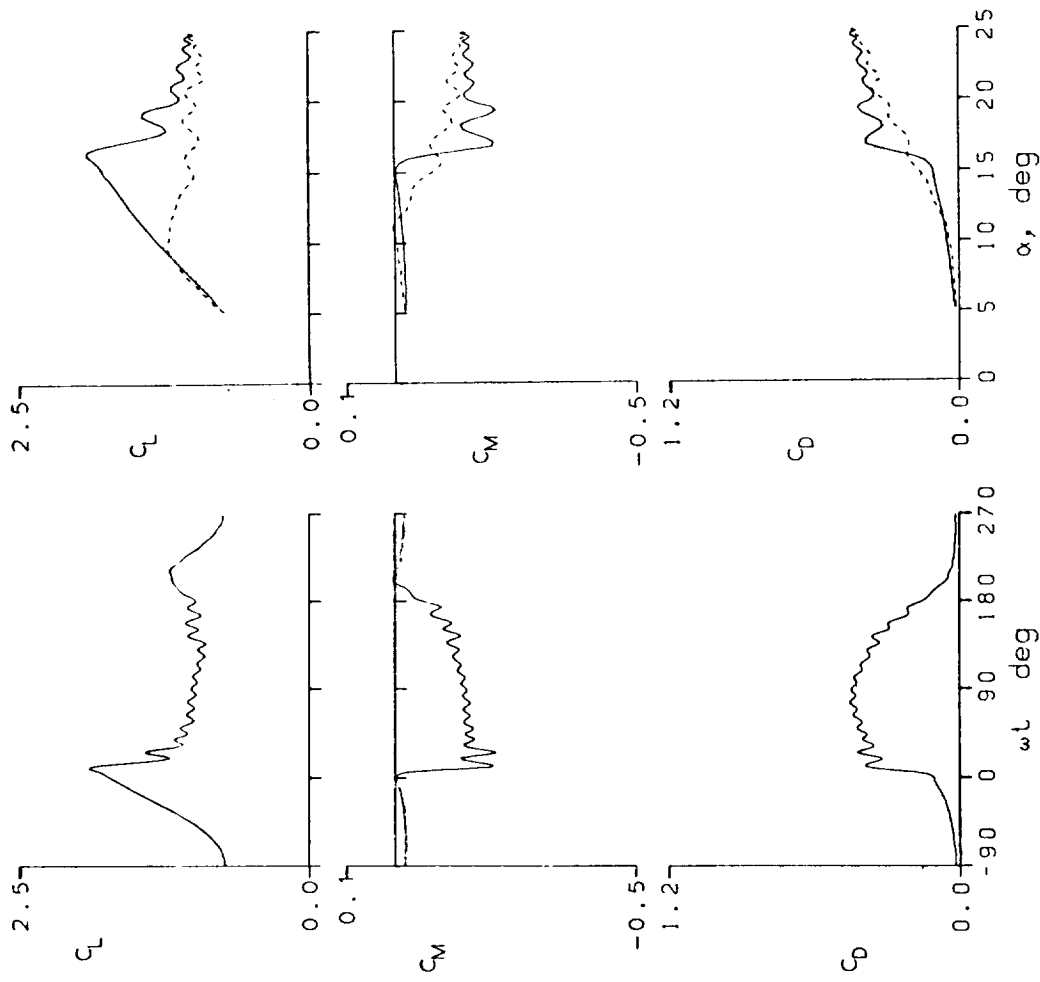


Figure 15.- Continued.

SIKORSKY SC-1045 AIRFOIL

FRAME : 33222 A0 = 14.82° k = 0.049
 Re = 3.89 E6 A1 = 9.91° M = 0.296
 C_{Lmax} = 2.10 C_{Mmin} = -0.29 C_{Dmax} = 0.53
 α_{Lmax} = 18.1° ζ = 0.216 M_{max} = 1.389
 α_{C_{Mmin}} = 14.4° -C_{pmax} = 10.8 α_{Mmax} = 16.2°

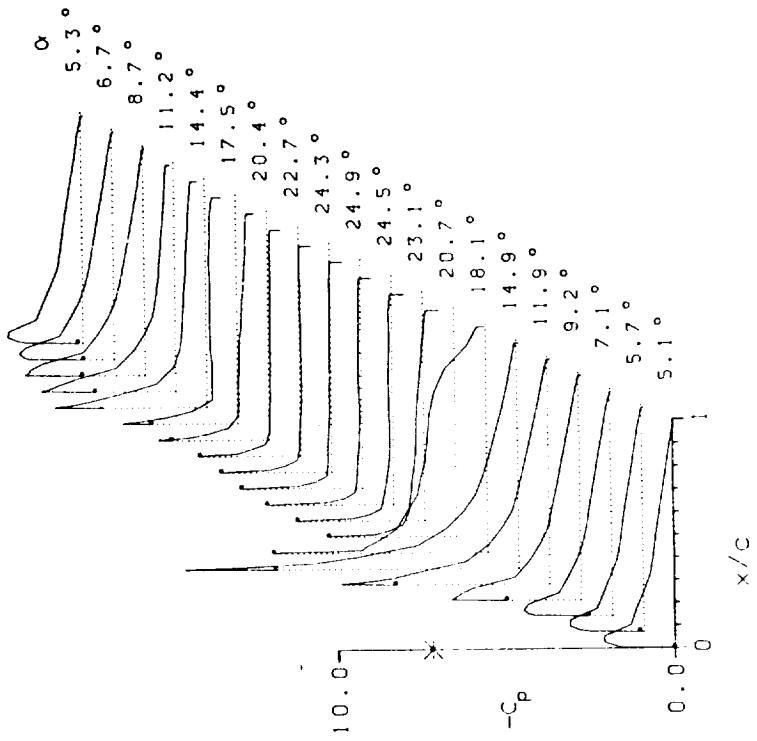
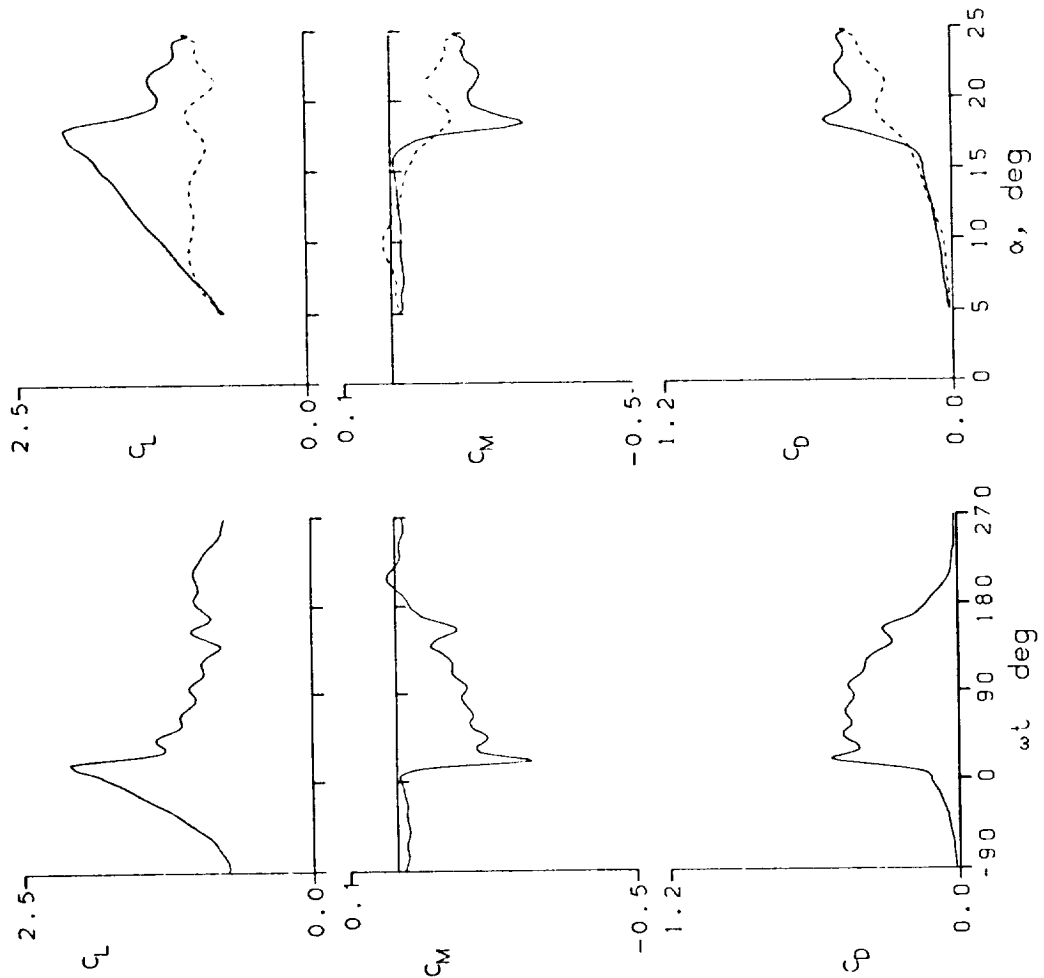


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 33300 A0 = 14.83° k = 0.100
 Re = 3.82 E6 A1 = 9.87° M = 0.292
 CLmax = 2.31 CMmin = -0.41 CDmax = 0.79
 αLmax = 20.5° ζ = 0.544 Mmax = 1.391
 αCMmin = 14.6° -CDmax = 11.1 αMmax = 16.8°

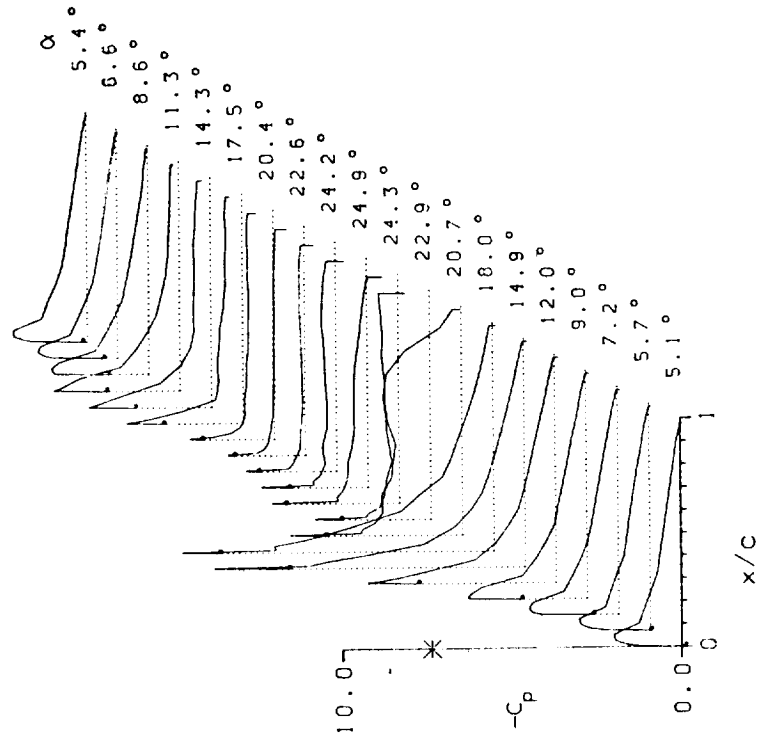
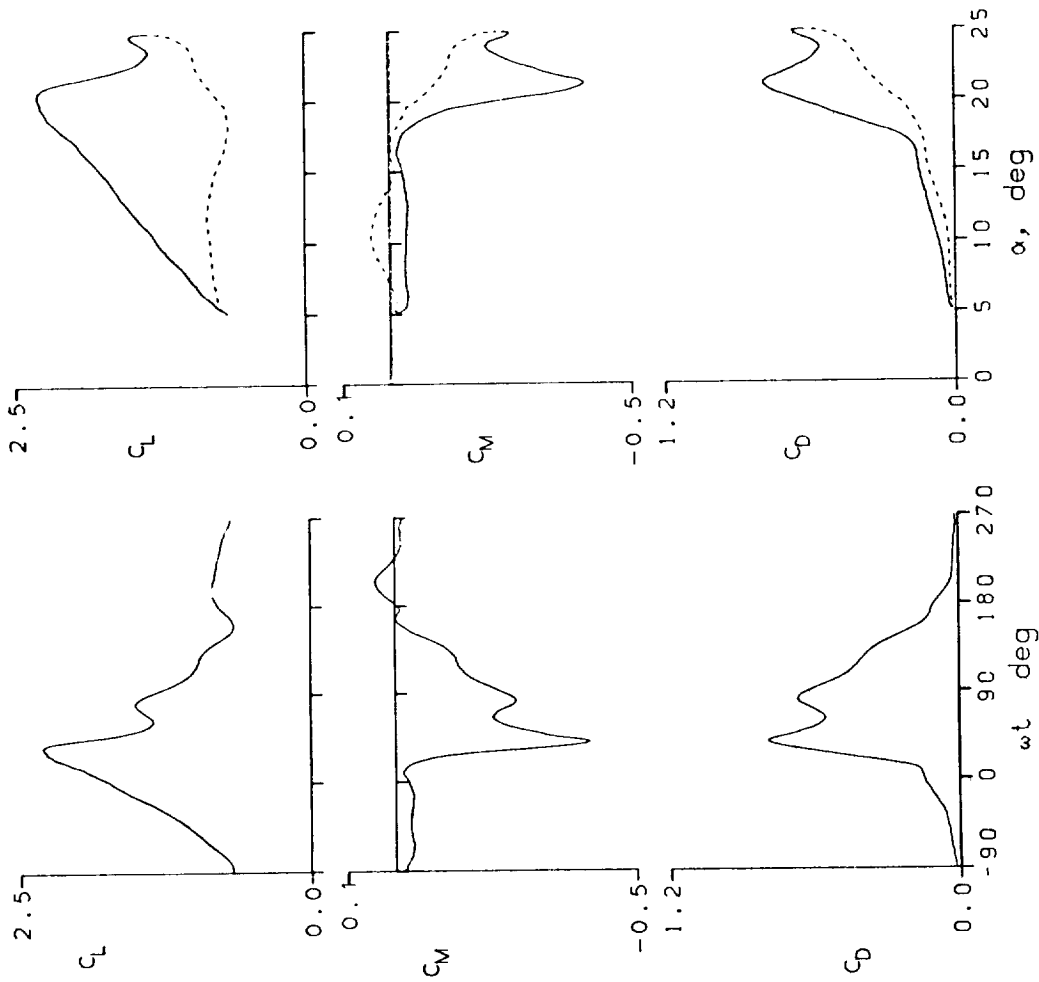


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL TRIP

FRAME : 34306 A0 = 14.81 ° k = 0.050

Re = 3.88 E6 A1 = 9.91 ° M = 0.292

C_{Lmax} = 2.05 C_{Mmin} = -0.25 C_{Dmax} = 0.50

α_{Lmax} = 17.2 ° ζ = 0.290 M_{max} = 1.256

α_{Cmin} = 14.4 ° -C_{Pmax} = 10.0 α_{Mmax} = 15.6 °

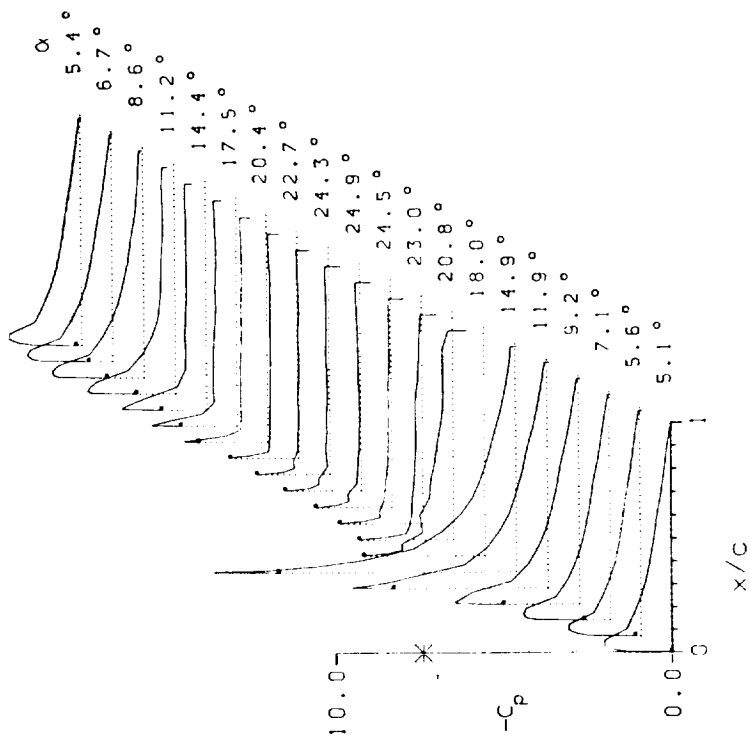
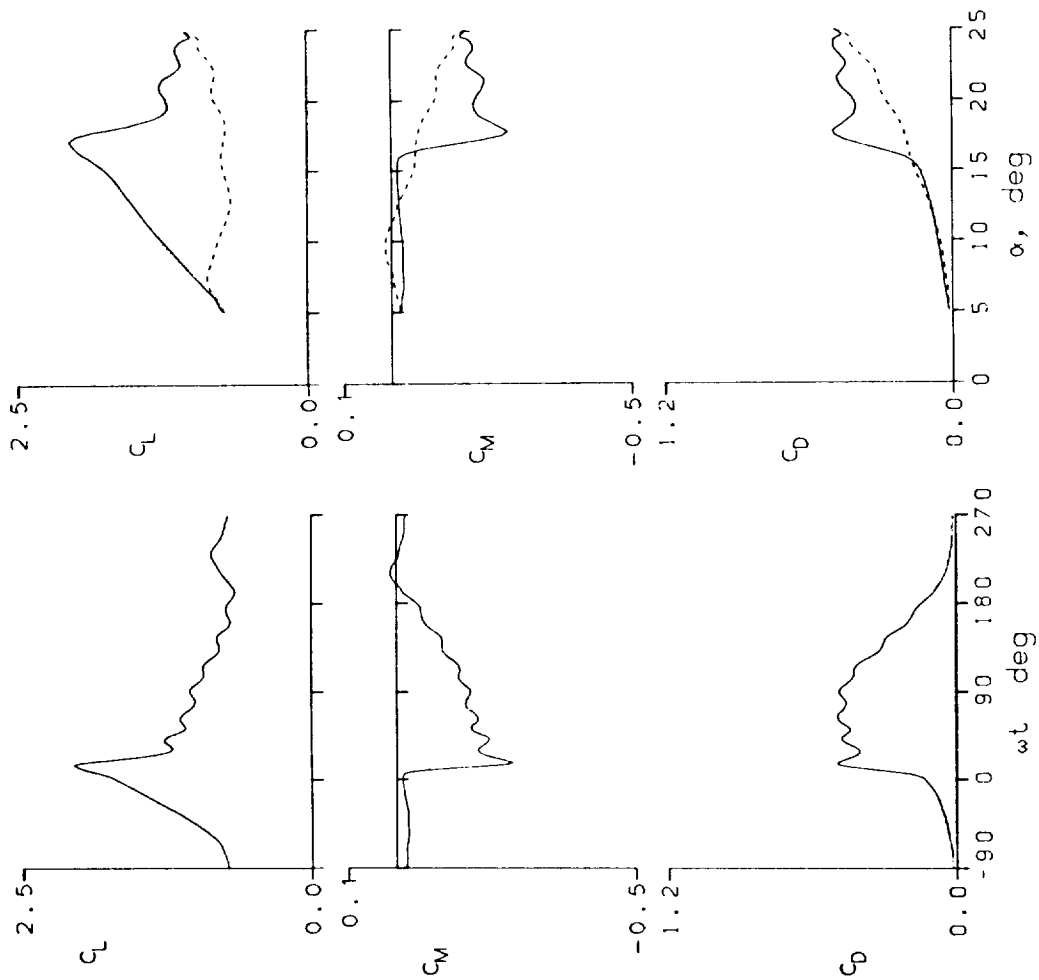


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL TRIP

FRAME : 34308 A0 = 14.82° k = 0.102

Re = 3.80 E6 A1 = 9.89° M = 0.288

CLmax = 2.38 CMmin = -0.41 CDmax = 0.80

αLmax = 20.3° ζ = 0.526 Vmax = 1.329

αCmin = 14.4° -CDmax = 10.9 αMmax = 17.2°

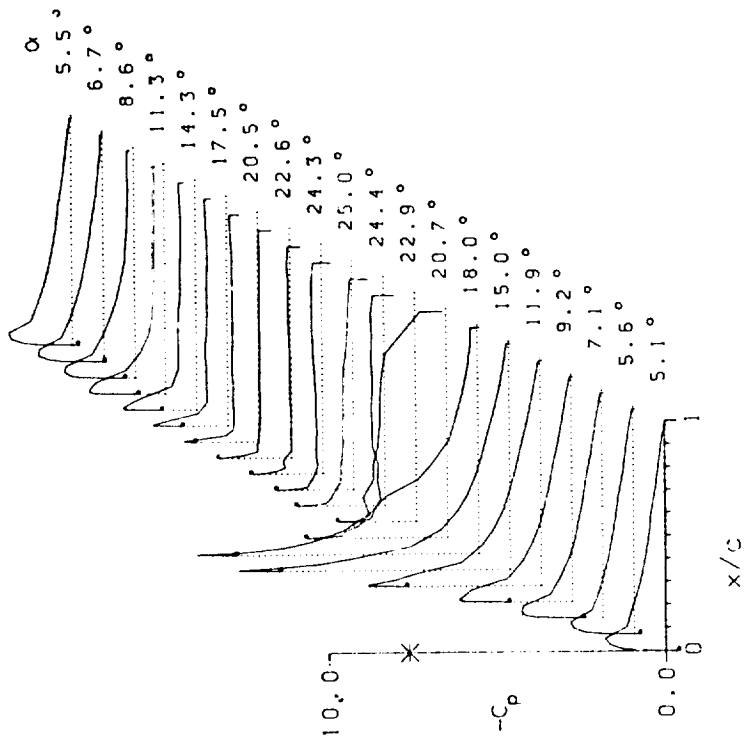
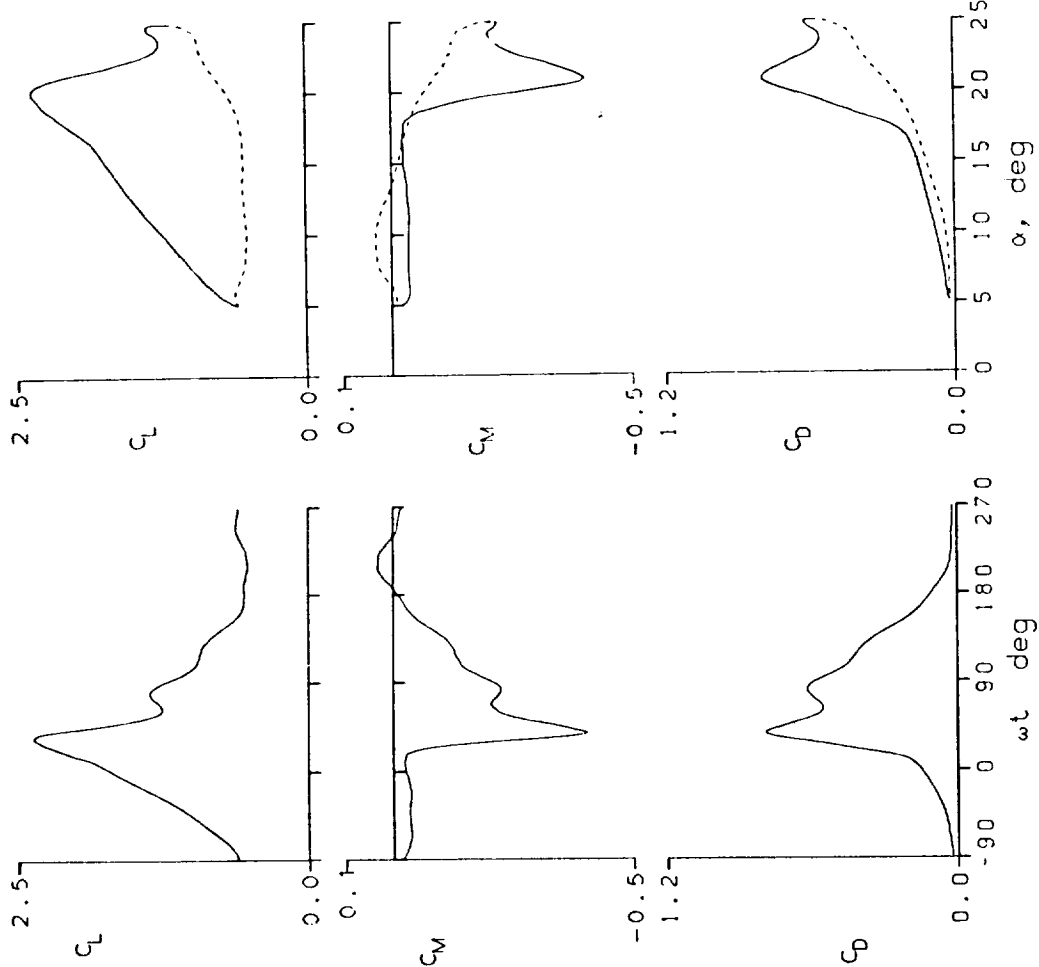


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL TRIP
 FRAME : 34318 A0 = 14.81 ° k = 0.050
 Re = 2.48 E6 A1 = 9.91 ° M = 0.184
 CLmax = 2.15 CMmin = -0.32 CDmax = 0.64
 αLmax = 18.9 ° ζ = 0.255 Mmax = 0.702
 αCmin = 14.4 ° -CPmax = 11.2 αMmax = 17.2 °

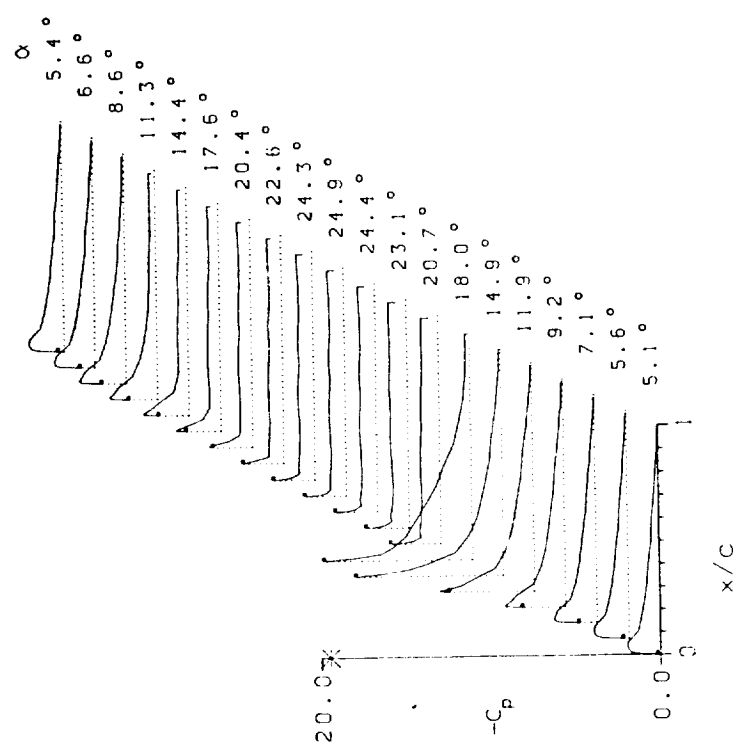
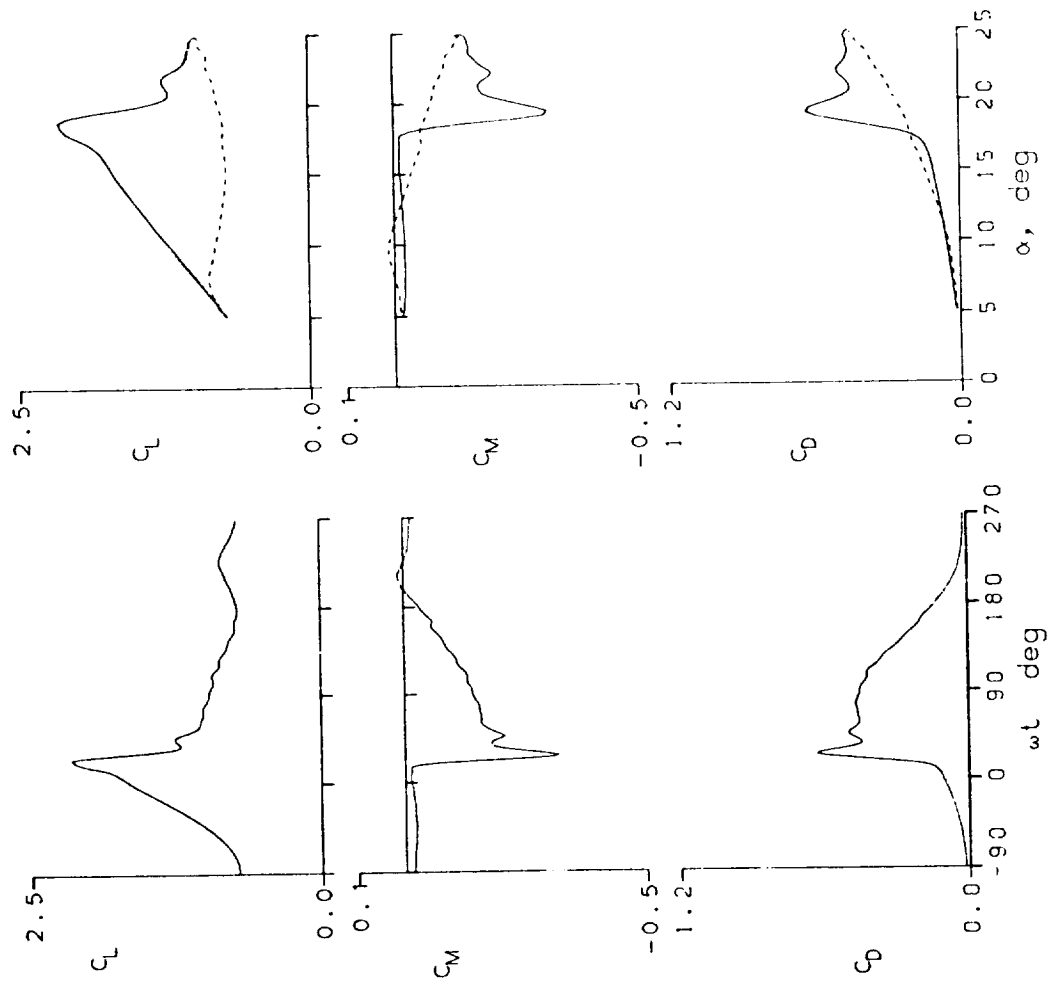


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL TRIP

FRAME : 34321 A0 = 14.79° k = 0.100

Re = 2.48 E6 A1 = 9.93° M = 0.184

C_{Lmax} = 2.44 C_{Mmin} = -0.45 C_{Dmax} = 0.91

α_{Lmax} = 21.3° ξ = 0.387 M_{max} = 0.754

α_{Cmin} = 14.4° $-C_{pmax}$ = 12.6 α_{Mmax} = 18.5°

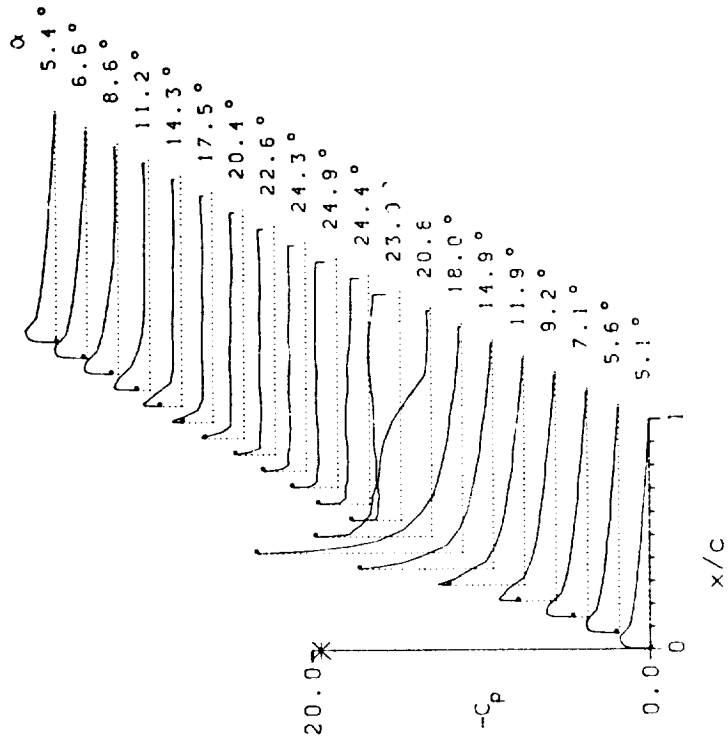
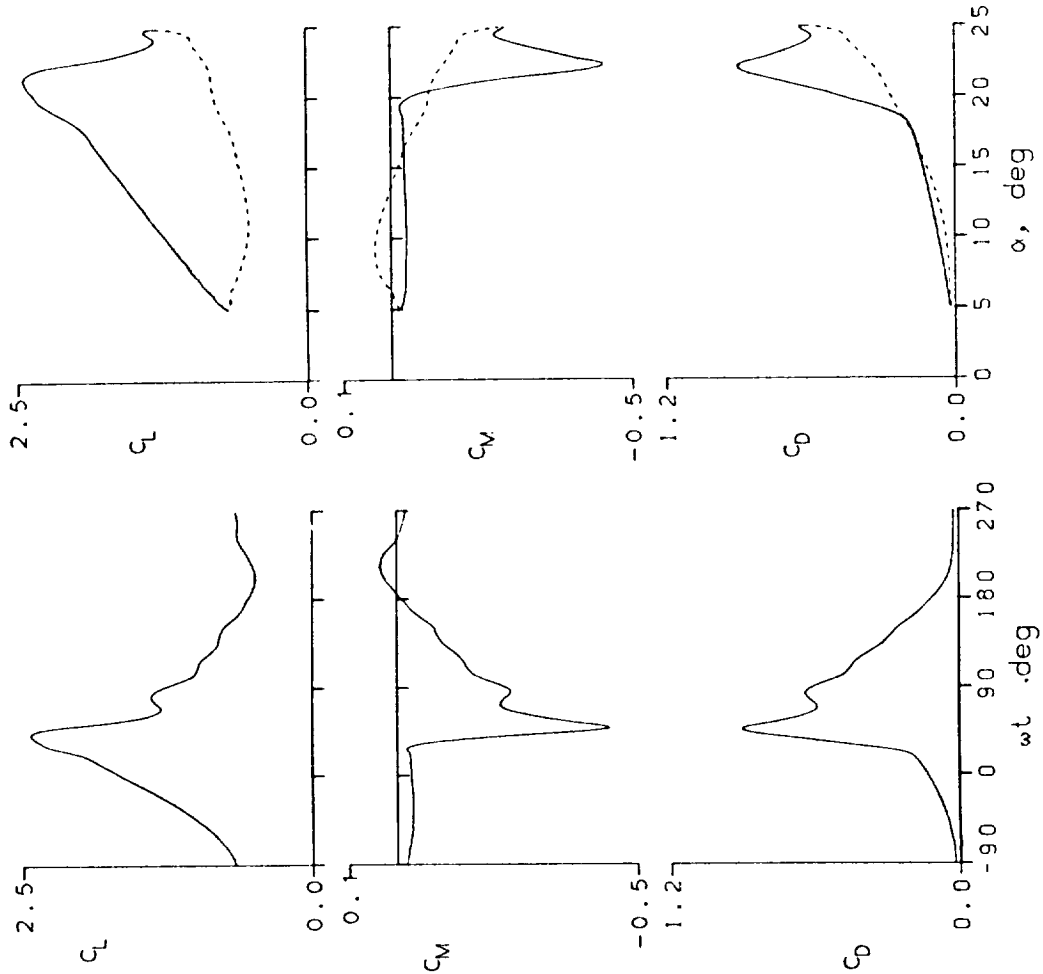


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL TRIP
 FRAME : 34327 $\Lambda_0 = 14.81^\circ$ $k = 0.150$
 $Re = 2.47 \text{ E}6$ $A1 = 9.90^\circ$ $M = 0.184$
 $C_{Lmax} = 2.58$ $C_{Mmin} = -0.51$ $C_{Dmax} = 1.08$
 $\alpha_{Lmax} = 23.1^\circ$ $\zeta = 0.208$ $M_{max} = 0.784$
 $\alpha_{Cmin} = 14.4^\circ$ $-C_{Dmax} = 13.4$ $\alpha_{Mmax} = 19.7^\circ$

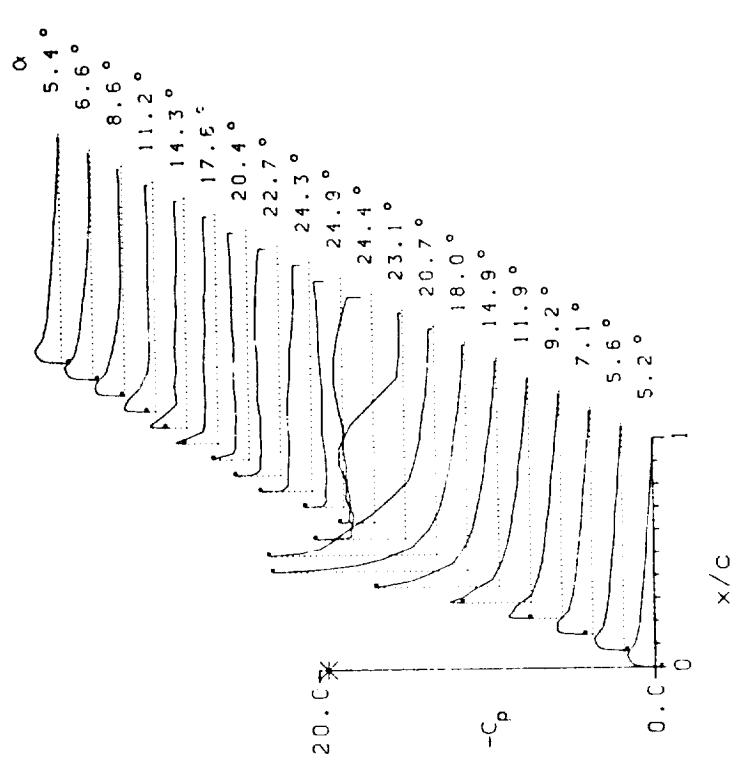
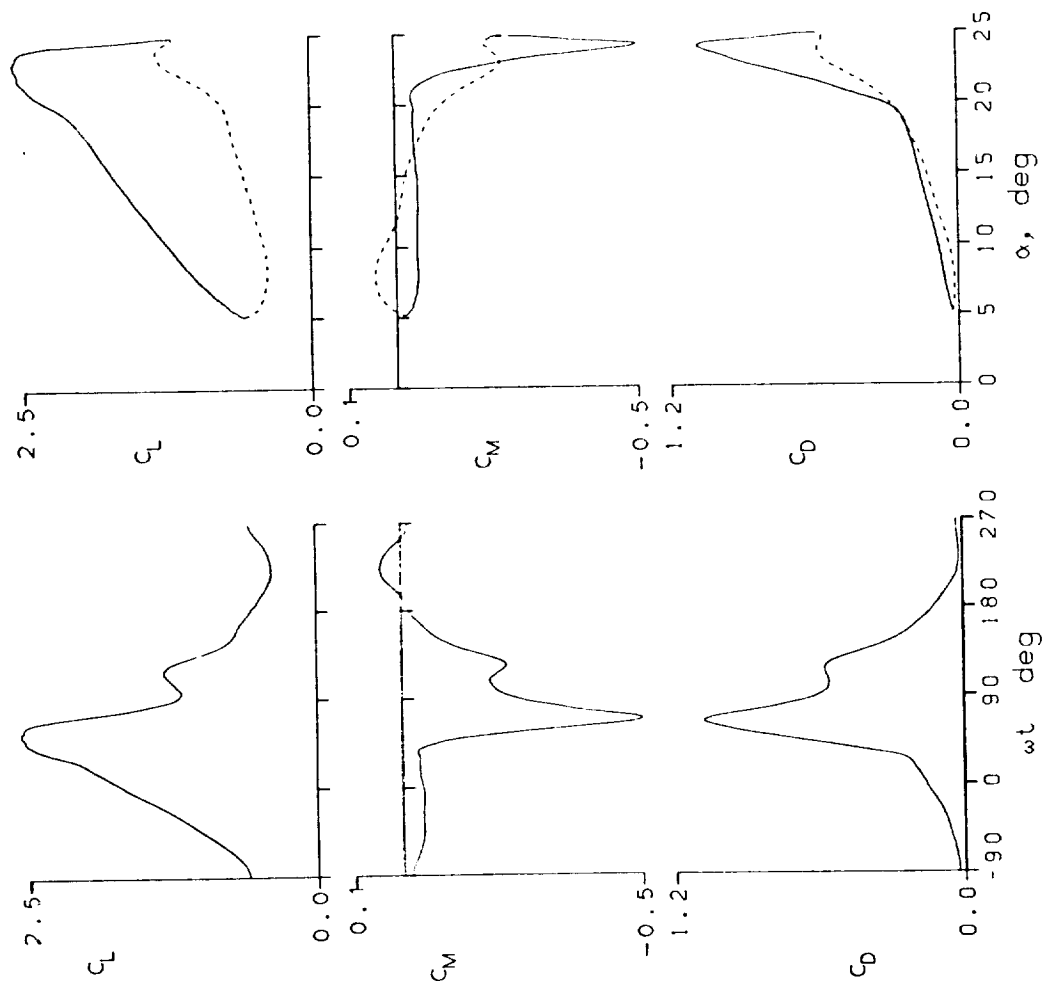


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 34409 A0 = 14.91° k = 0.156

Re = 3.60 E6 A1 = 9.87° M = 0.279

$C_{Lmax} = 2.45$ $C_{Mmin} = -0.47$ $C_{Dmax} = 0.96$

$\alpha_{Lmax} = 21.4^\circ$ $\zeta = 0.452$ $M_{max} = 1.287$

$\alpha_{Cmin} = 14.6^\circ$ $-C_{pmax} = 11.2$ $\alpha_{Mmax} = 18.4^\circ$

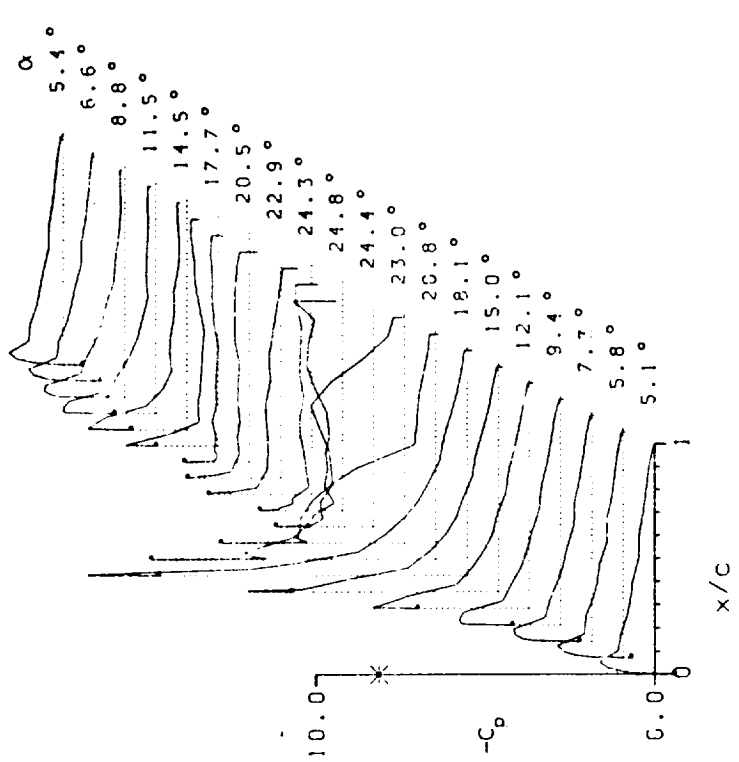
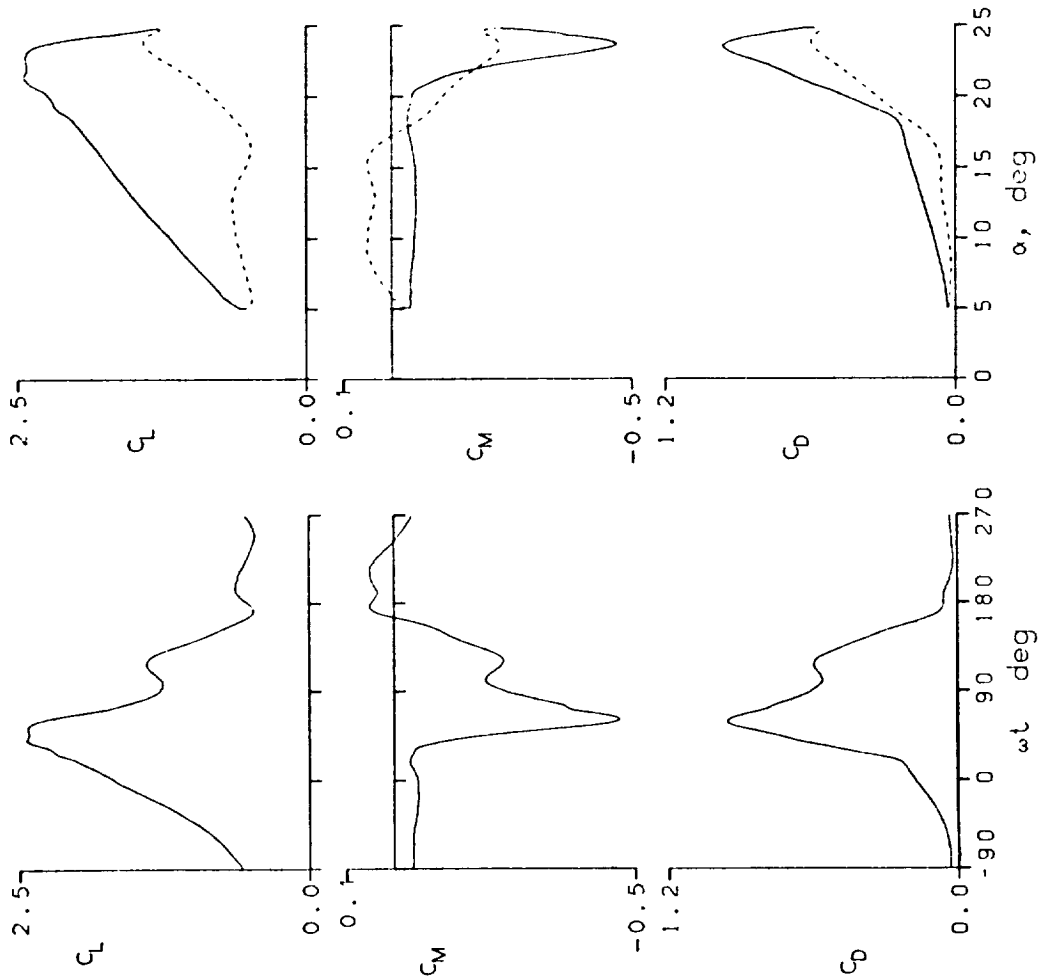


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 34418 A0 = 4.25° k = 0.098
 Re = 3.86 E6 A1 = 10.11° M = 0.302
 C_{Lmax} = 1.69 C_{Mmin} = -0.07 C_{Dmax} = 0.13
 α_{Lmax} = 14.5° ξ = 0.246 M_{max} = 1.296
 α_{Cmin} = 3.6° -C_{Pmax} = 9.7 α_{Mmax} = 14.5°

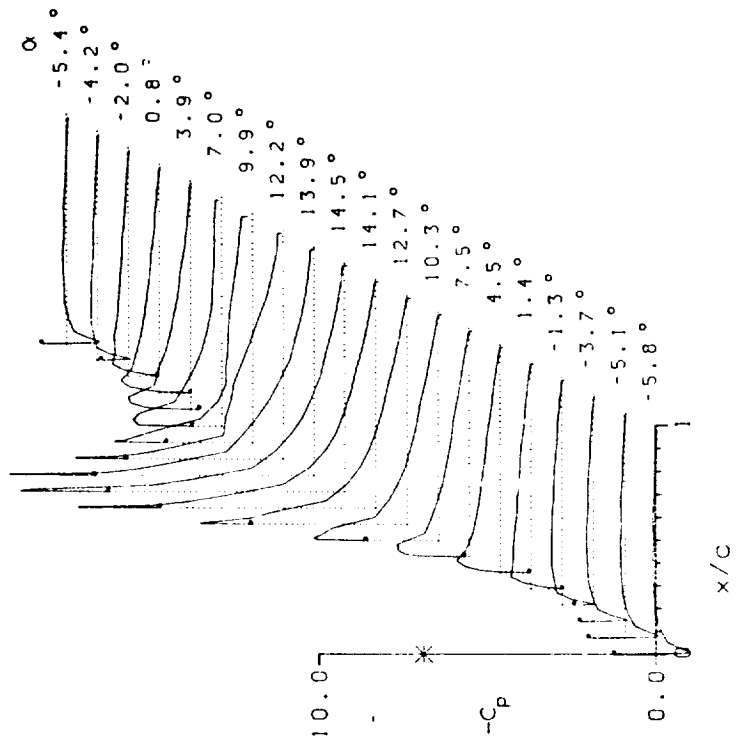
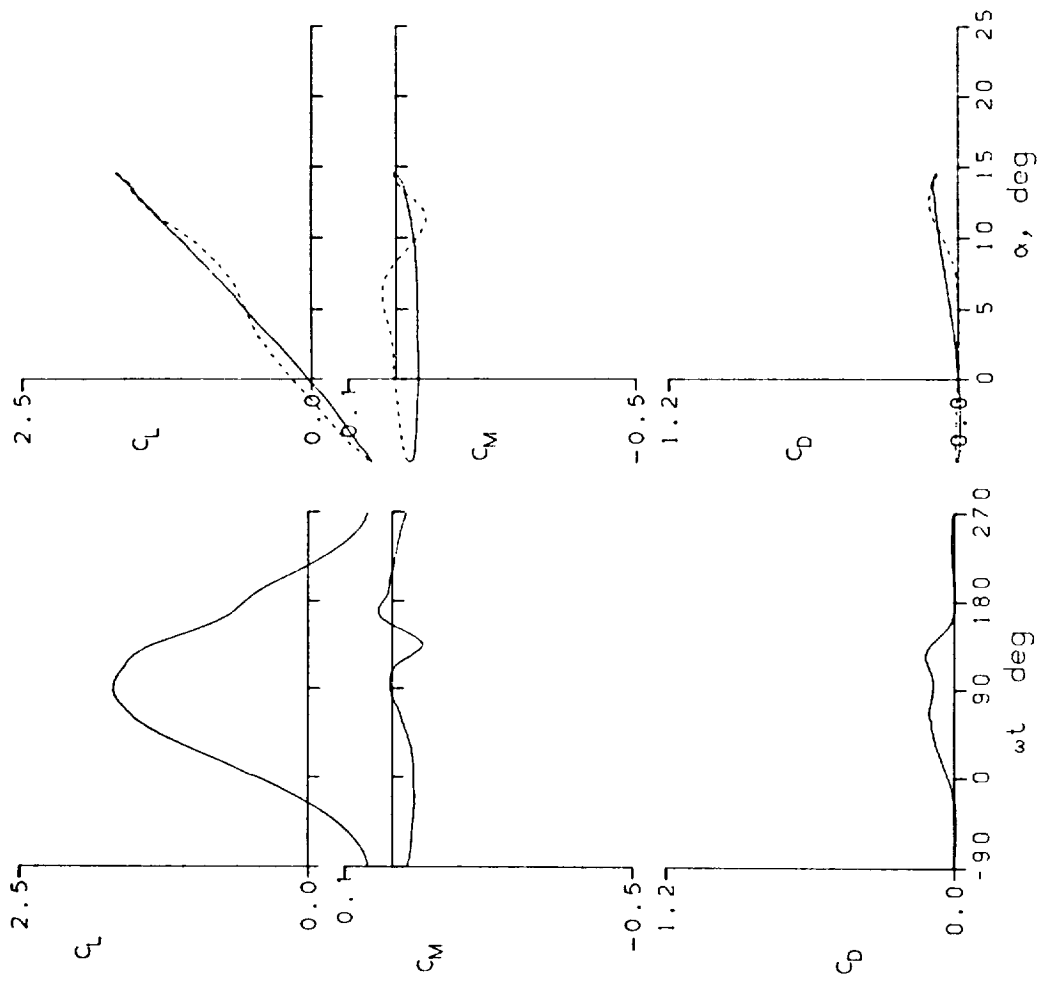


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37023 A0 = 9.73° k = 0.025
 Re = 3.94 E6 A1 = 9.95° M = 0.300
 CLmax = 1.83 CMmin = -0.21 CDmax = 0.35
 α Lmax = 15.6° ζ = 0.041 Mmax = 1.309
 α Cmin = 9.2° -CPmax = 9.9 α Mmax = 15.0°

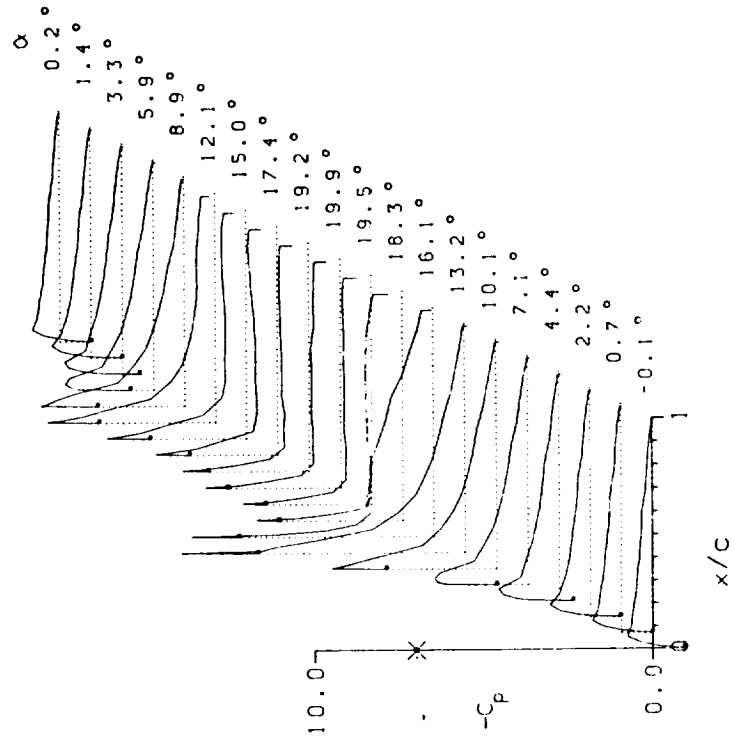
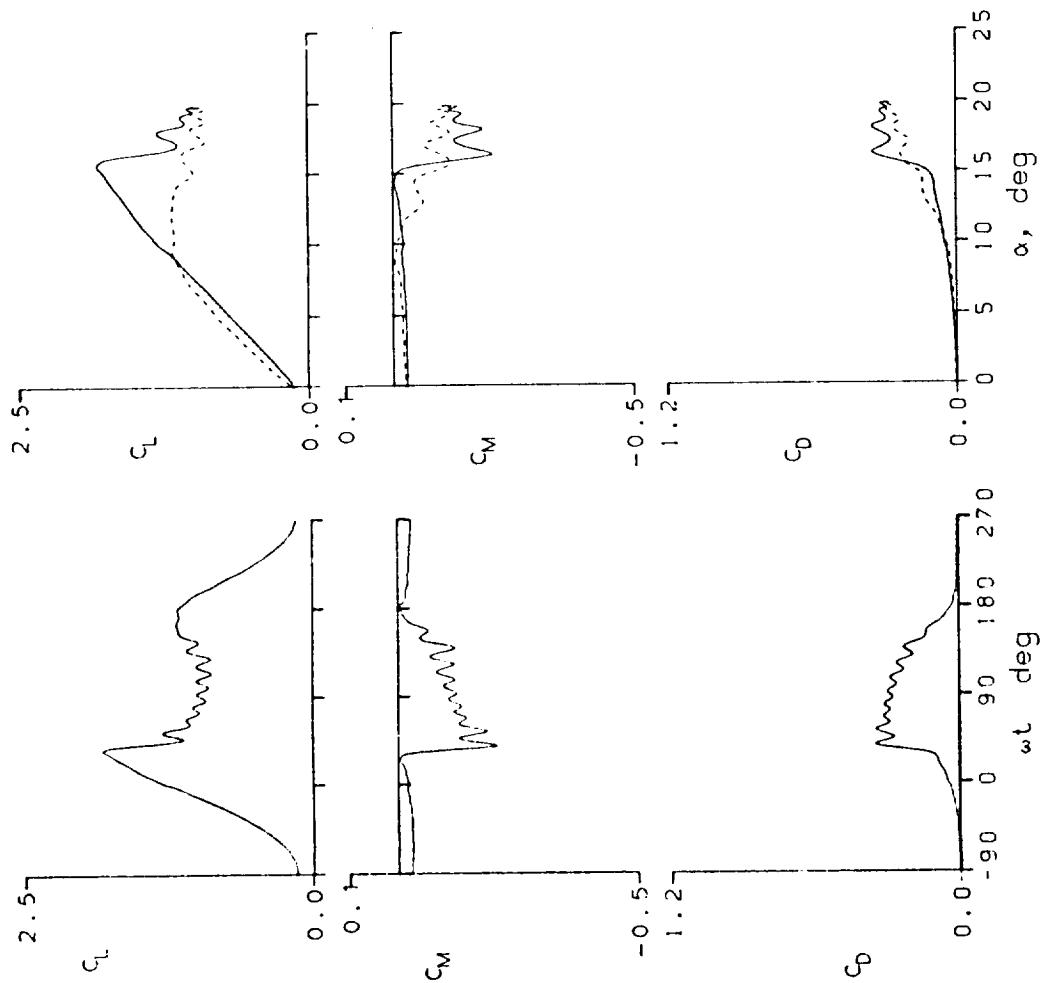


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37101	A0 = 9.77°	k = 0.050
Re = 5.93 E6	A1 = 9.93°	M = 0.301
CLmax = 2.04	CMmin = -0.28	CDmax = 0.47
OLmax = 17.1°	ξ = 0.121	Mmax = 1.369
OCmin = 9.3°	-CDmax = 10.3	αMmax = 15.8°

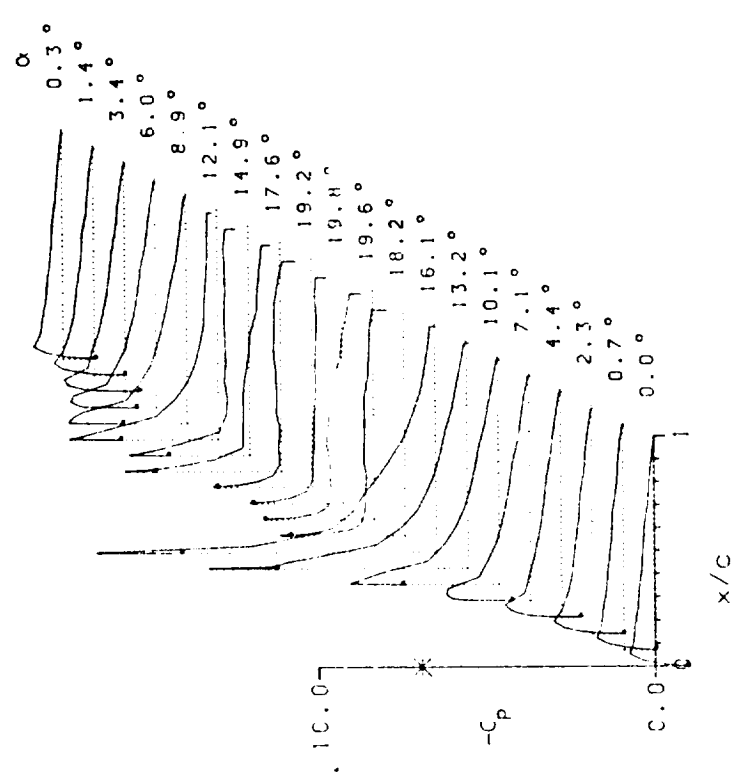
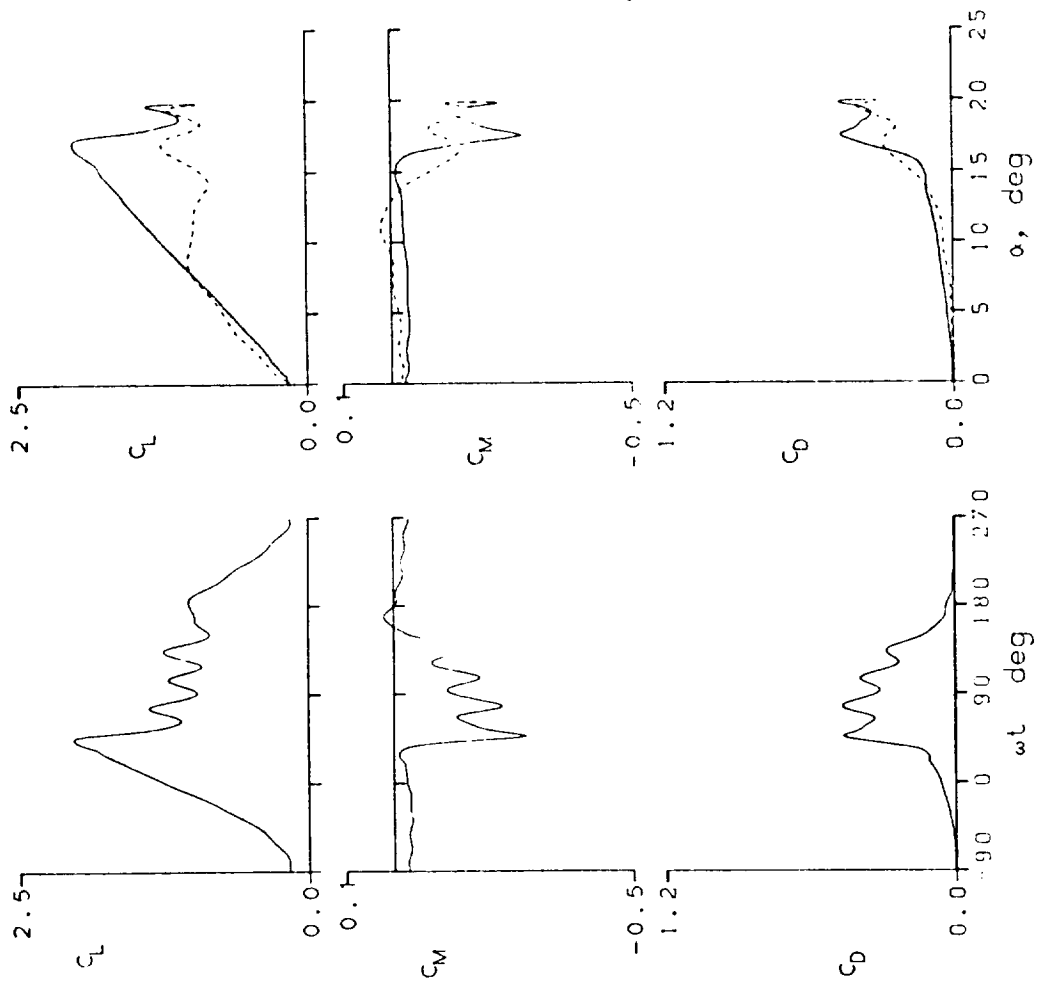


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37107 A0 = 9.78 ° k = 0.099
 Re = 3.92 E6 A1 = 9.90 ° M = 0.302
 CLmax = 2.18 CMmin = -0.36 CDmax = 11.54
 αLmax = 18.7 ° ζ = 0.275 Mmax = 1.412
 αCMmin = 9.3 ° -Cpmax = 10.5 αMmax = 16.4 °

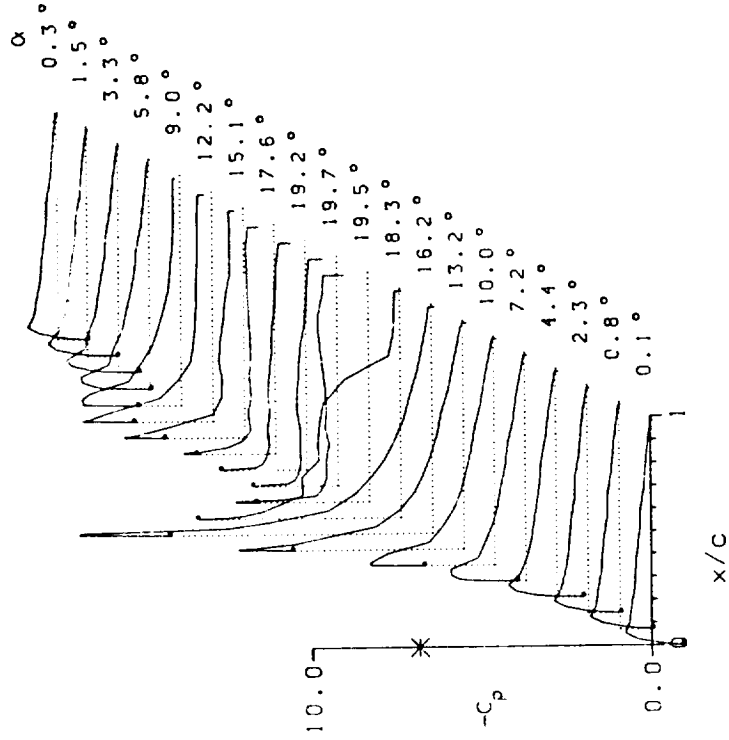
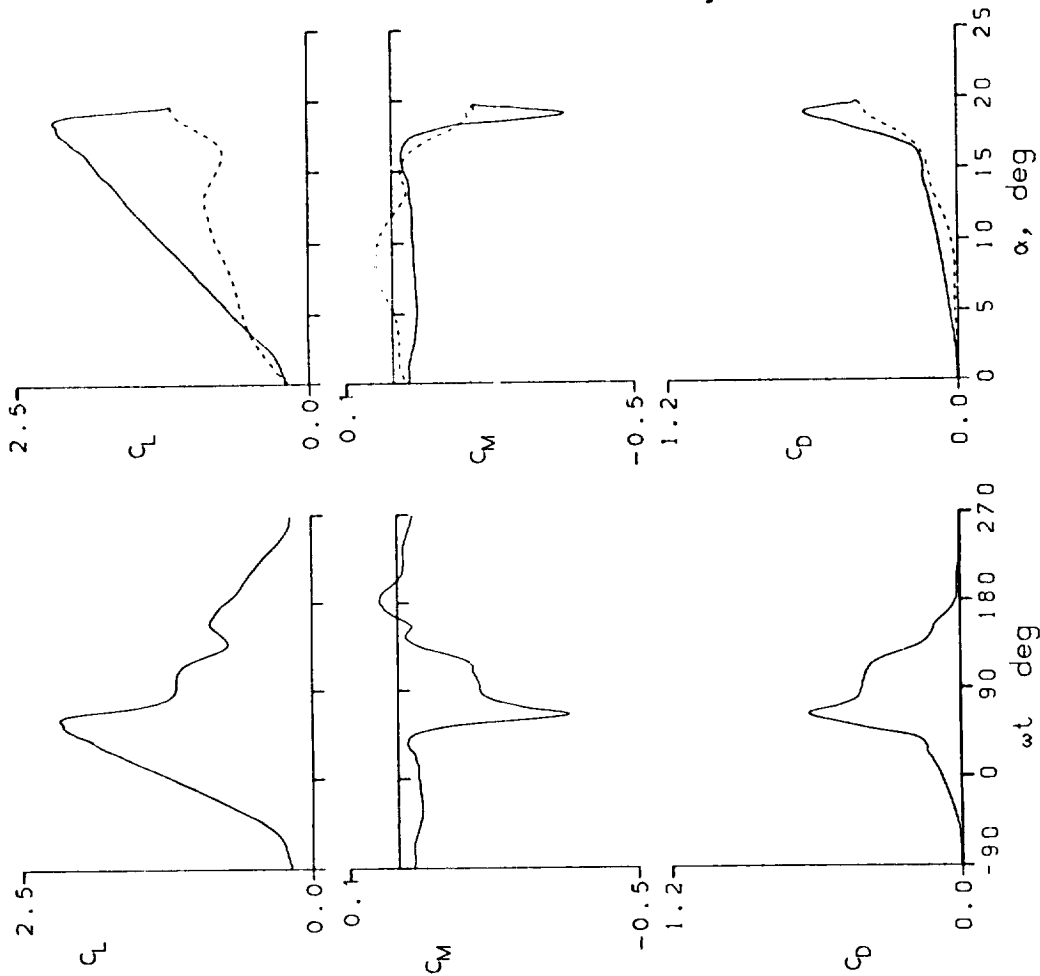


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 37109 A0 = 9.92° k = 0.148
 Re = 3.89 E6 A1 = 9.90° M = 0.302
 $C_{Lmax} = 2.23$ $C_{Mmin} = -0.40$ $C_{Dmax} = 0.71$
 $\alpha_{Lmax} = 19.6^\circ$ $\zeta = 0.238$ $M_{max} = 1.427$
 $\alpha_{Cmin} = 9.4^\circ$ $-C_{Pmax} = 10.6$ $\alpha_{Mmax} = 17.2^\circ$

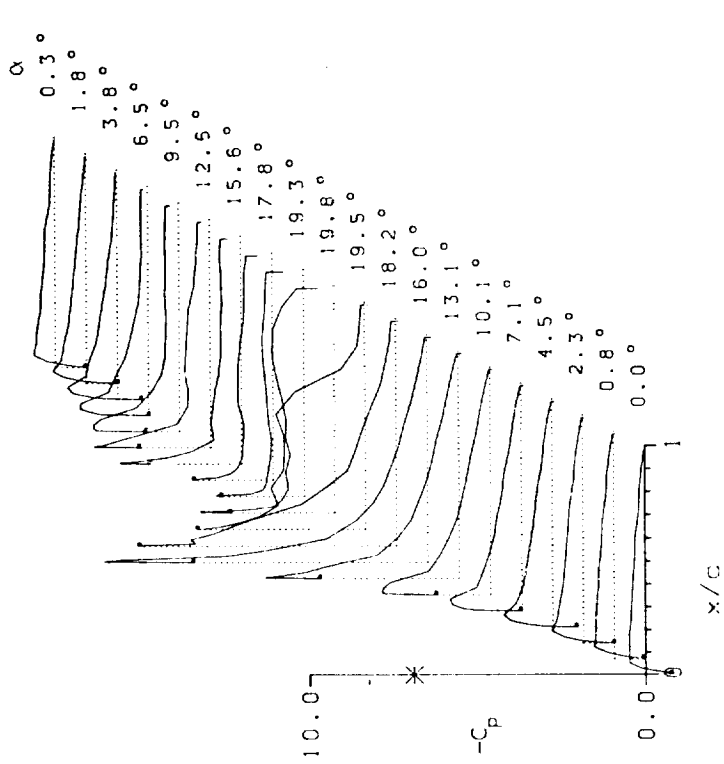
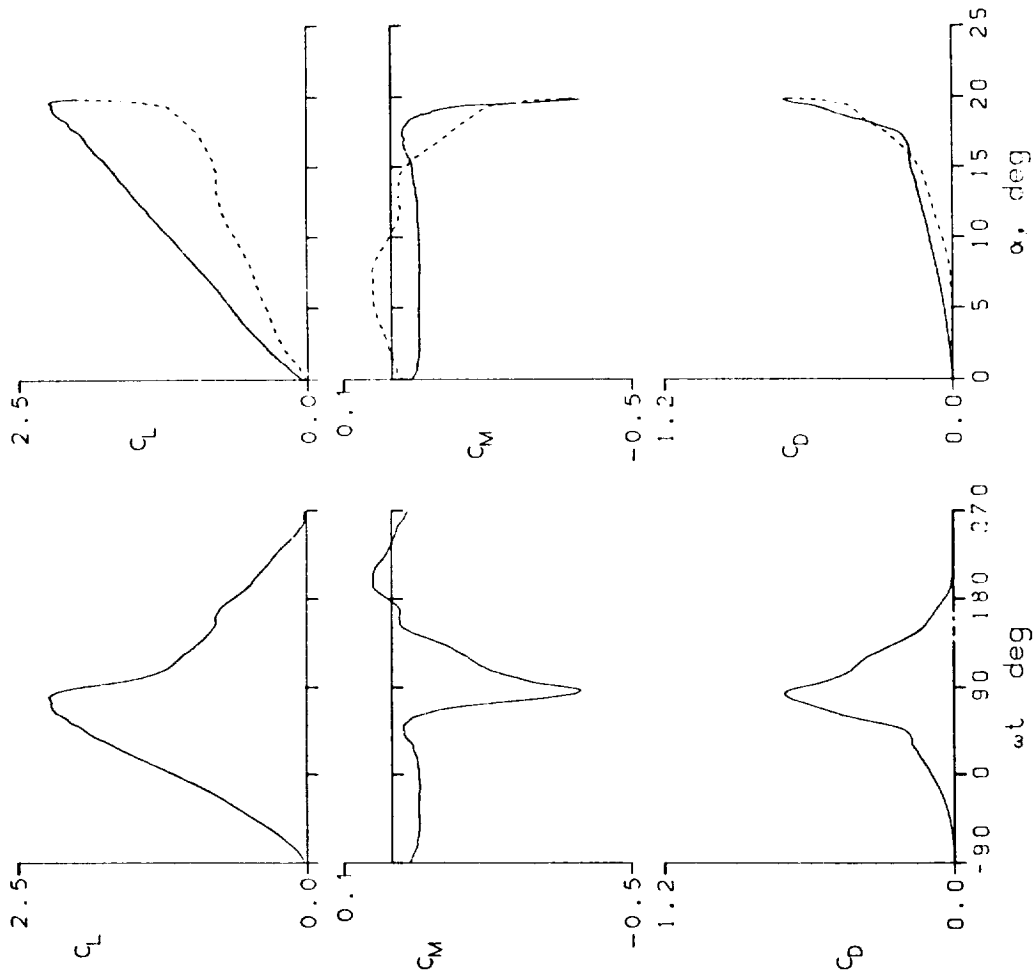


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37119 A0 = 3.90° k = 0.049
 Re = 3.87 E6 A1 = 10.13° M = 0.302
 C_{Lmax} = 1.65 C_{Mmin} = -0.08 C_{Dmax} = 0.14
 α_{Lmax} = 14.1° ζ = 0.114 M_{max} = 1.276
 $\alpha_{C_{min}}$ = 3.4° $-C_{pmax}$ = 9.5 α_{Mmax} = 14.2°

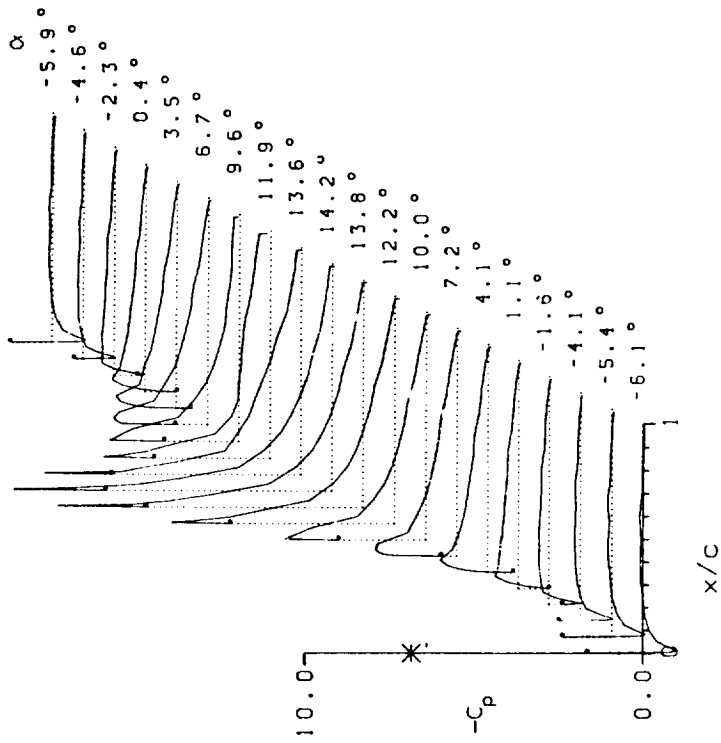
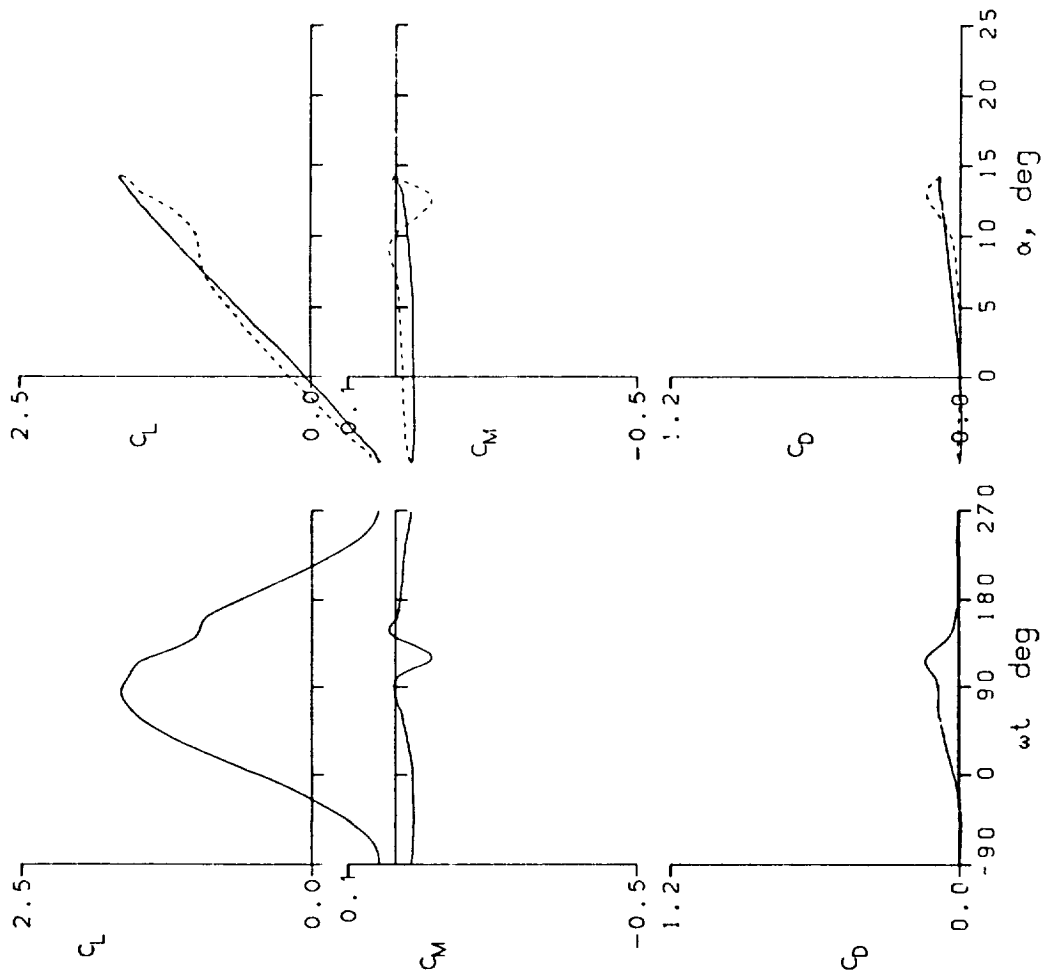


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37121 A0 = 3.93° k = 0.098
 Re = 3.86 E6 A1 = 10.11° M = 0.303
 CLmax = 1.68 Cxmin = -0.06 CDmax = 0.11
 α Lmax = 14.2° ξ = 0.313 Mmax = 1.304
 α Cmin = 3.3° -Cpmax = 9.6 α Mmax = 14.2°

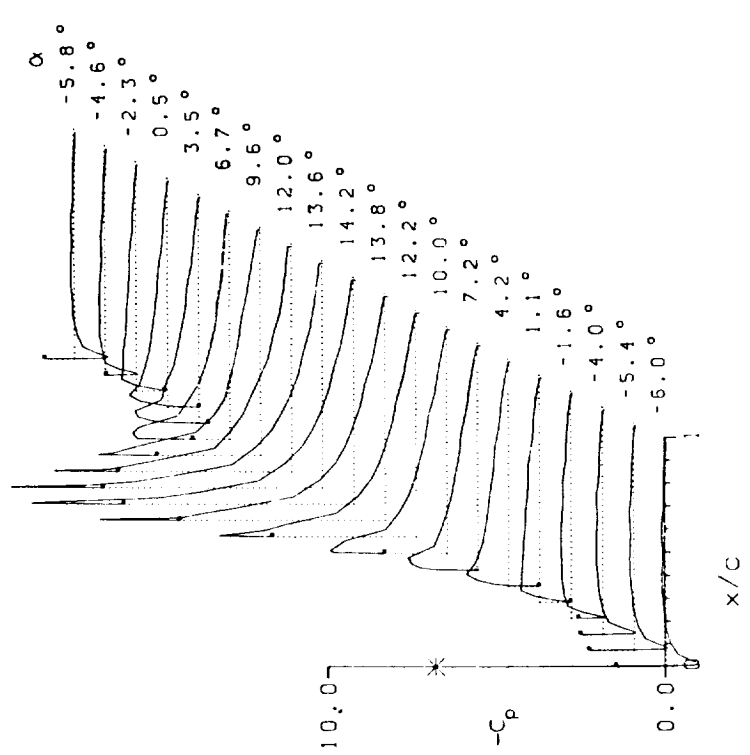
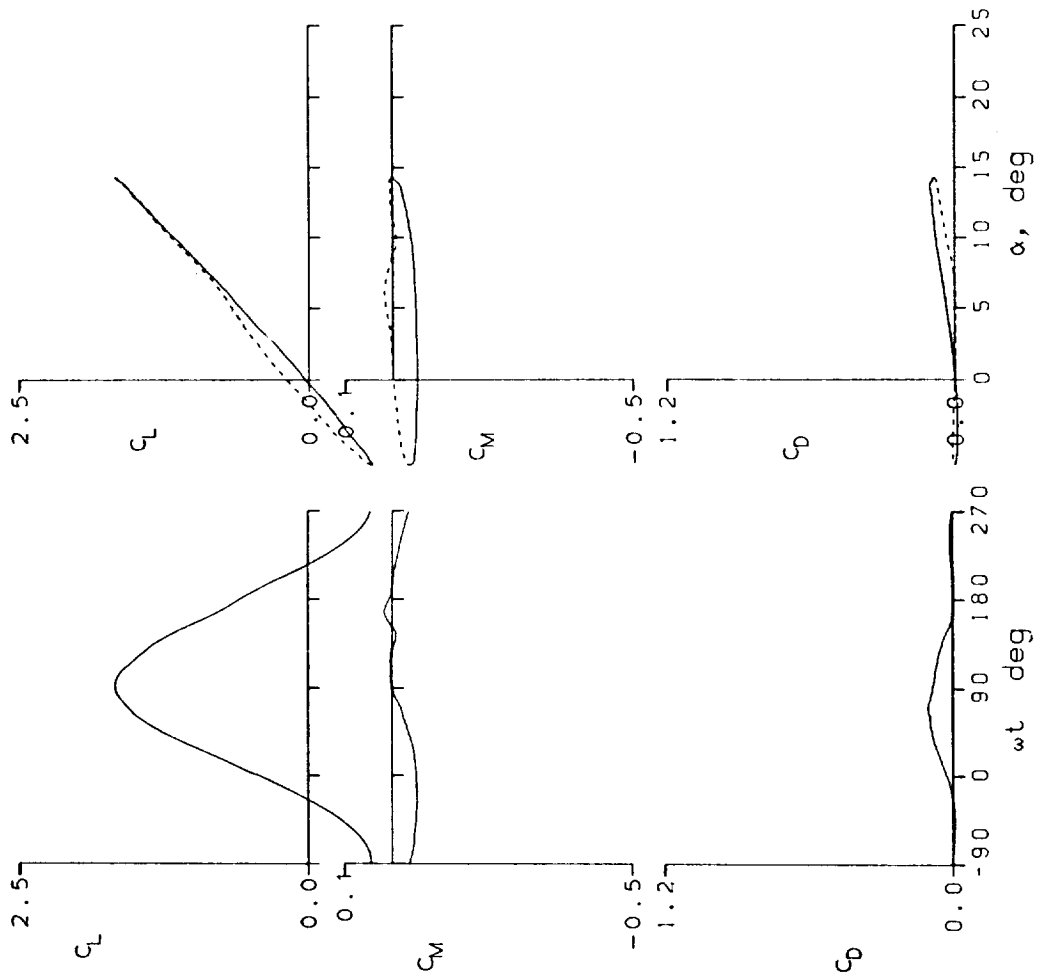


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37123 A0 = 3.88° k = 0.147
 Re = 3.84 E6 A1 = 10.11° M = 0.302
 $C_{Lmax} = 1.70$ $C_{Mmin} = -0.07$ $C_{Dmax} = 0.12$
 $\alpha_{Lmax} = 14.1^\circ$ $\zeta = 0.508$ $M_{max} = 1.327$
 $\alpha_{C_{min}} = 3.4^\circ$ $-C_{Pmax} = 9.9$ $\alpha_{Mmax} = 13.8^\circ$

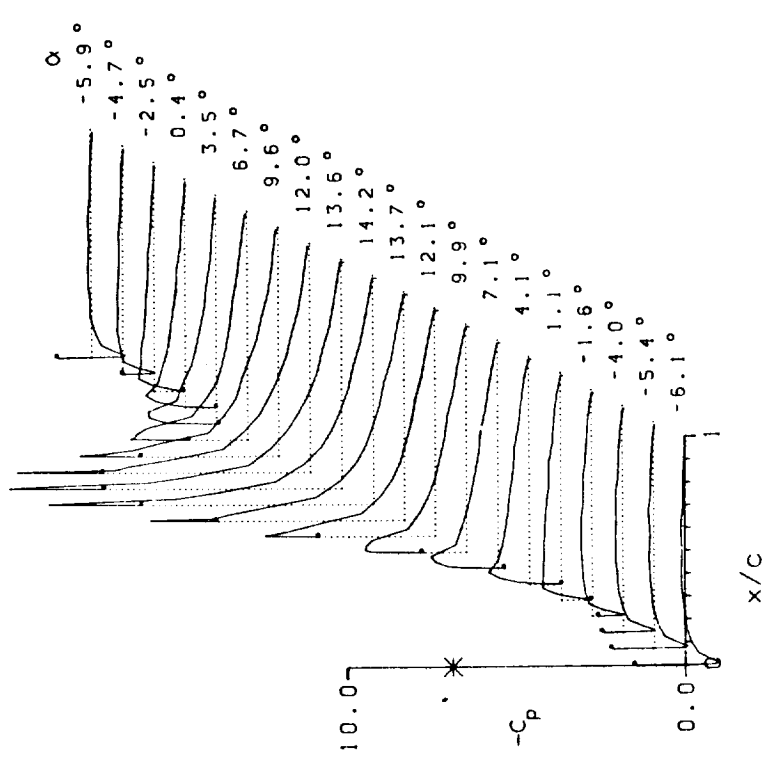
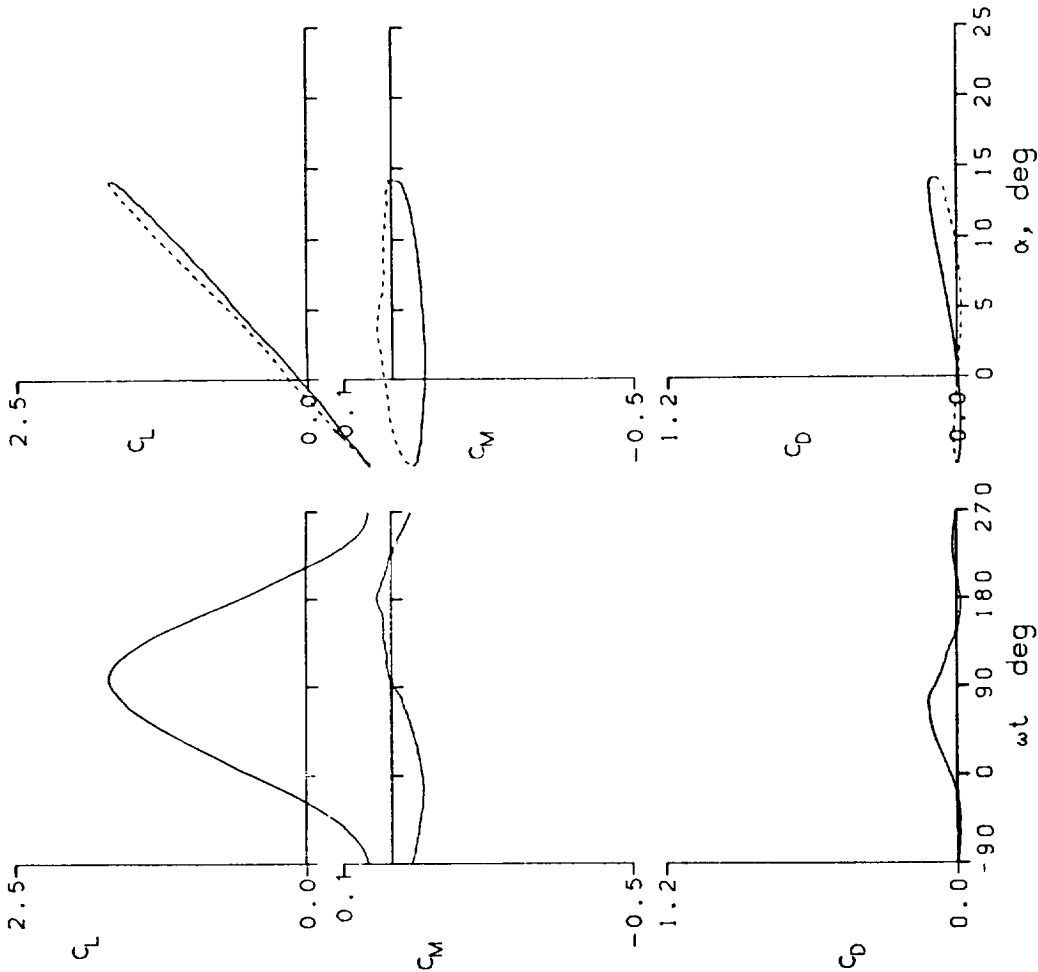


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 37207 A0 = 9.94° k = 0.024
 Re = 3.78 E6 A1 = 4.90° M = 0.302
 CLmax = 1.61 CMmin = -0.14 CDmax = 0.24
 αLmax = 14.3° ζ = -0.241 Mmax = 1.247
 αCMmin = 9.7° -CPmax = 9.2 αMmax = 14.2°

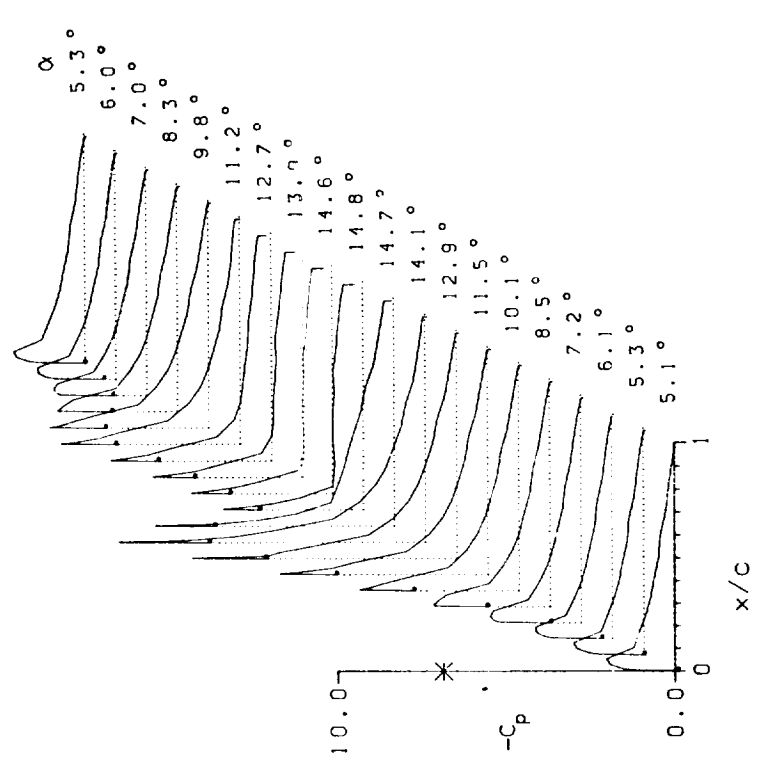
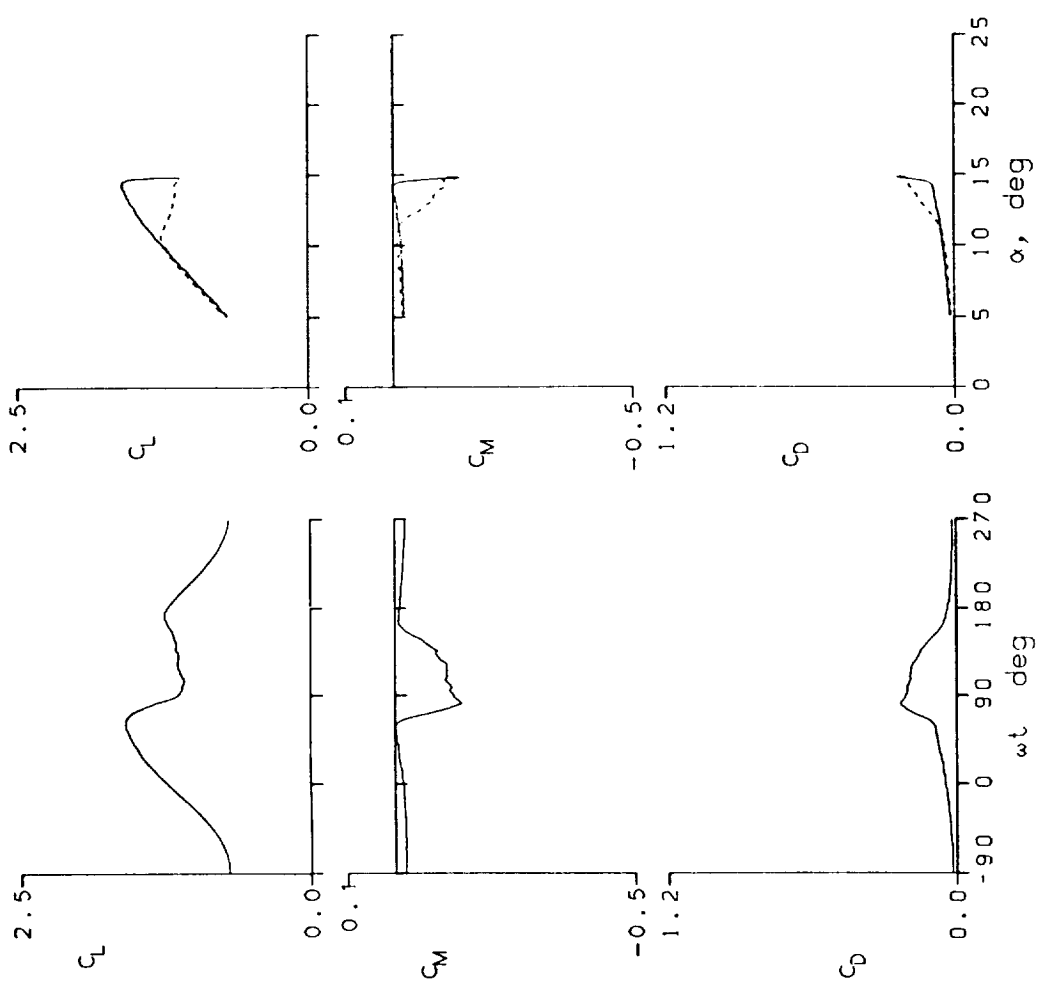


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 37208 AO = 9.93° k = 0.049
 Re = 3.75 E6 A1 = 4.91° M = 0.301
 CLmax = 1.67 CMmin = -0.16 CDmax = 0.26
 α Lmax = 14.7° ζ = -0.152 Mmax = 1.287
 α Cmin = 9.7° -CPmax = 9.6 α Mmax = 14.6°

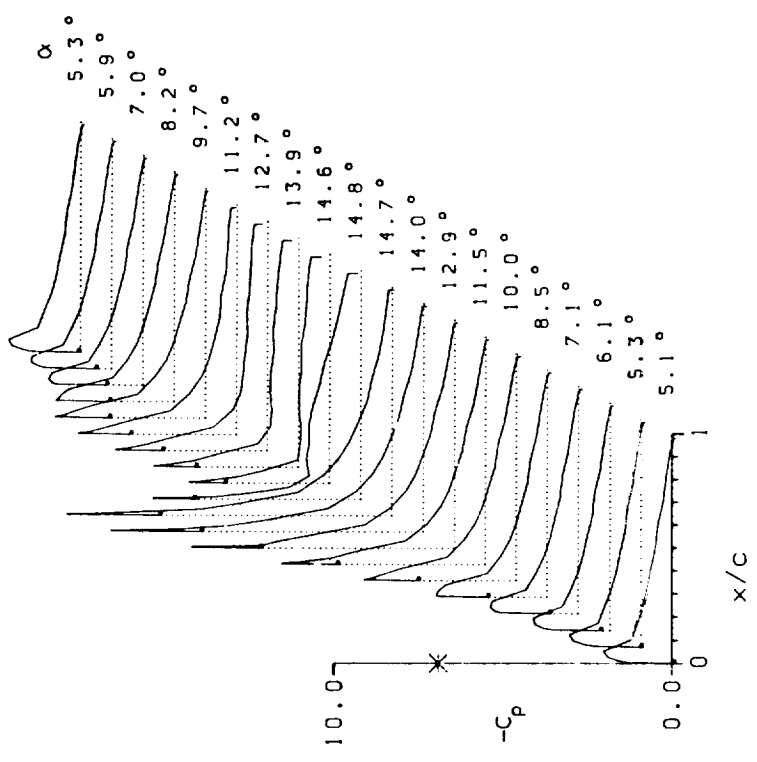
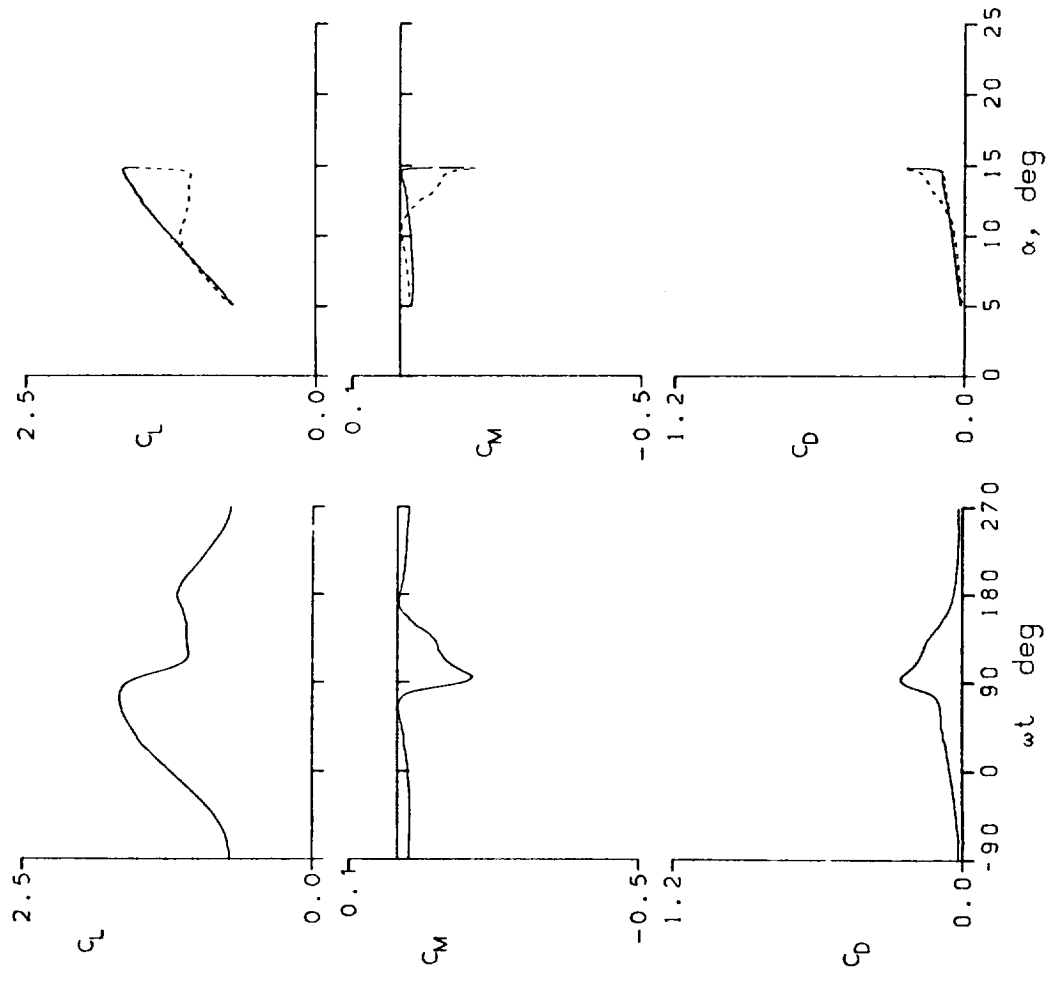


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37210 A0 = 9.92° k = 0.097
 Re = 3.76 E6 A1 = 4.91° M = 0.302
 CLmax = 1.73 CMmin = -0.16 CDmax = 0.27
 αLmax = 14.8° ζ = -0.039 Mmax = 1.332
 αCmin = 9.7° -CPmax = 9.9 αMmax = 14.8°

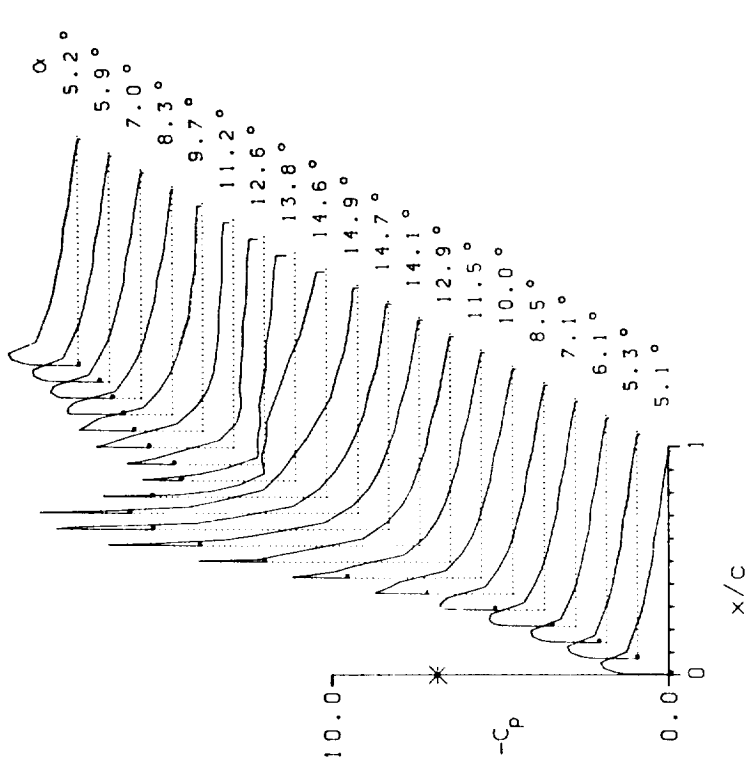
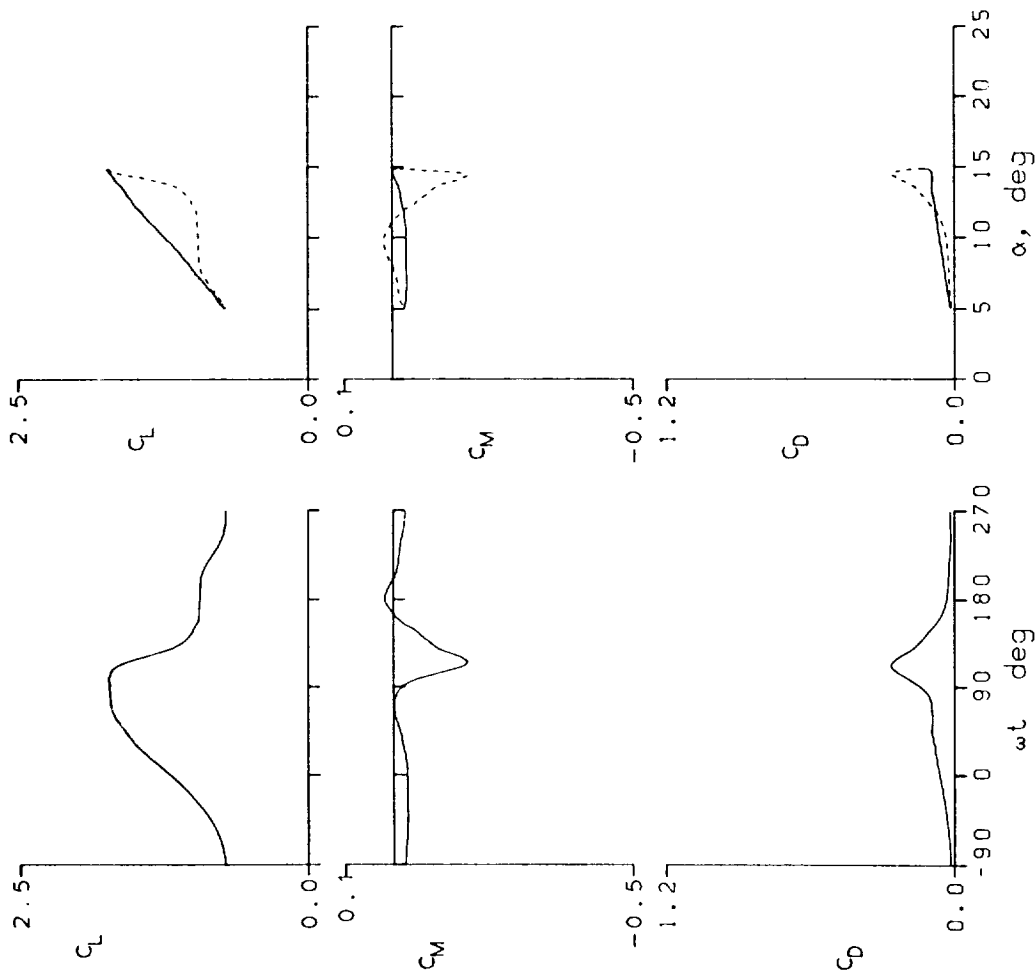


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 37213 A0 = 9.93° k = 0.145
 Re = 3.78 E6 A1 = 4.90° M = 0.303
 CLmax = 1.77 CMmin = -0.17 CDmax = 0.27
 α Lmax = 14.8° ξ = -0.037 Mmax = 1.371
 α Cmin = 9.8° -CPmax = 10.1 α Mmax = 14.9°

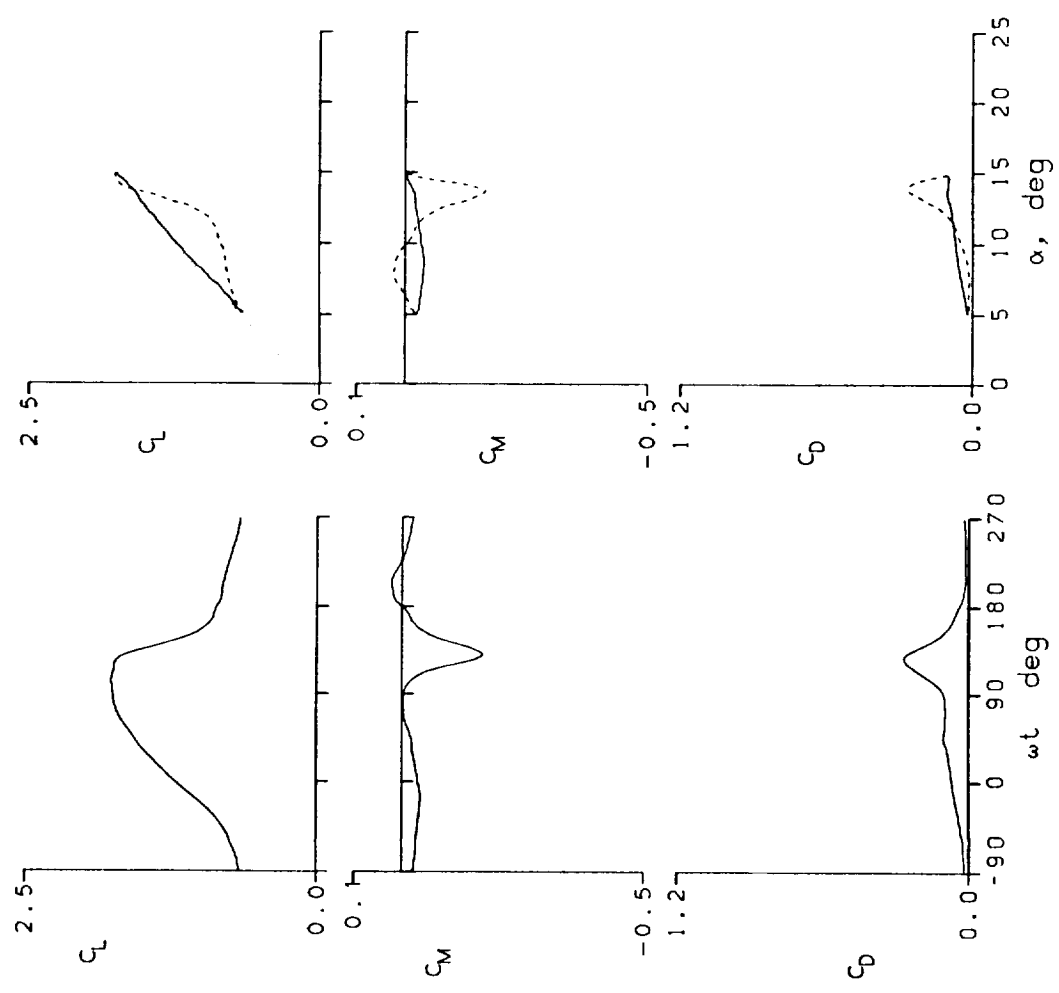


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37215	A0 = 9.89 °	k = 0.194
Re = 3.76 E6	A1 = 4.91 °	M = 0.303
CLmax = 1.89	CMmin = -0.22	CDmax = 0.31
α Lmax = 14.8 °	ζ = -0.045	Mmax = 1.394
α Crln = 9.7 °	-CDmax = 10.3	α Mmax = 14.9 °

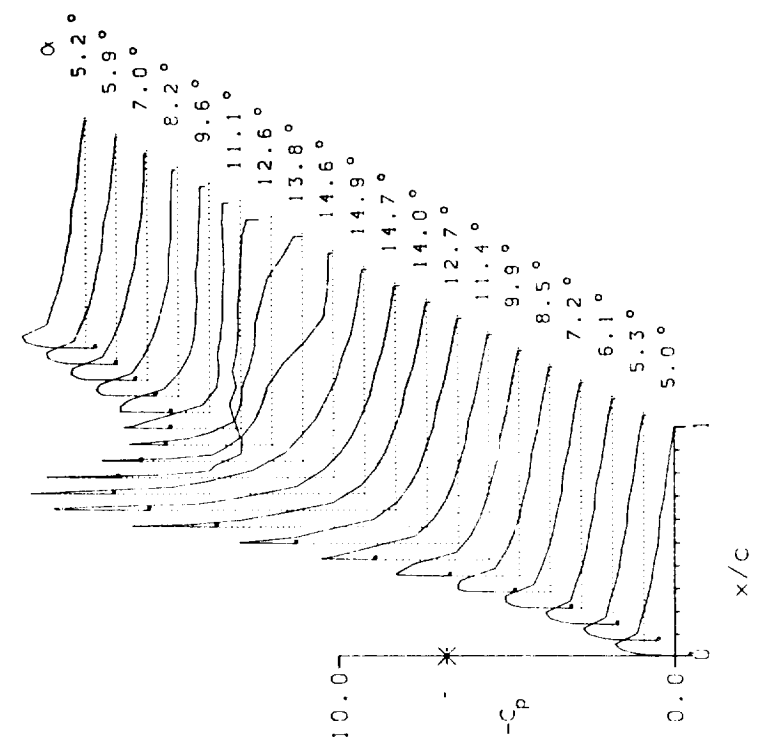
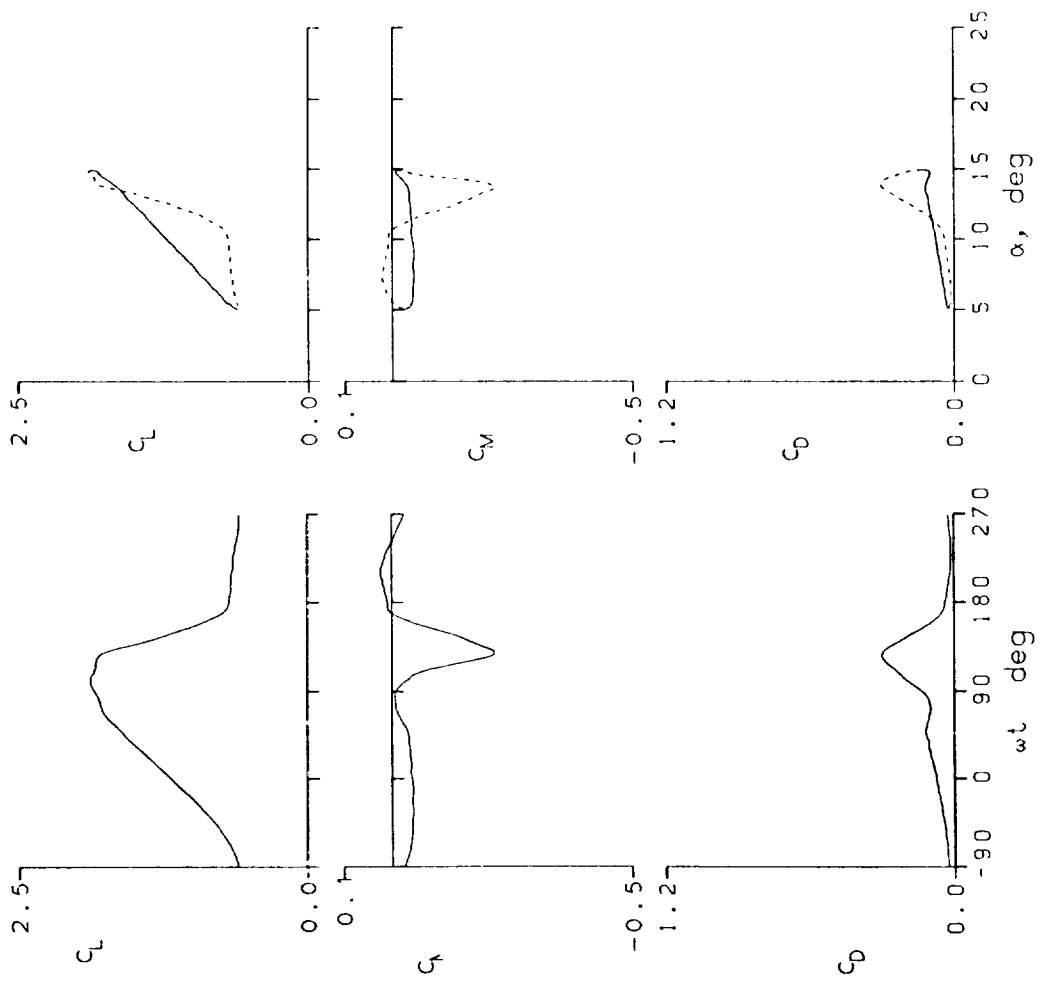


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 37219 A0 = 10.93° k = 0.049
 Re = 3.75 E6 A1 = 4.91° M = 0.301
 CLmax = 1.72 CMmin = -0.19 CDmax = 0.32
 αLmax = 15.5° ζ = -0.191 Mmax = 1.305
 αCMmin = 10.7° -CPmax = 9.8 αMmax = 14.9°

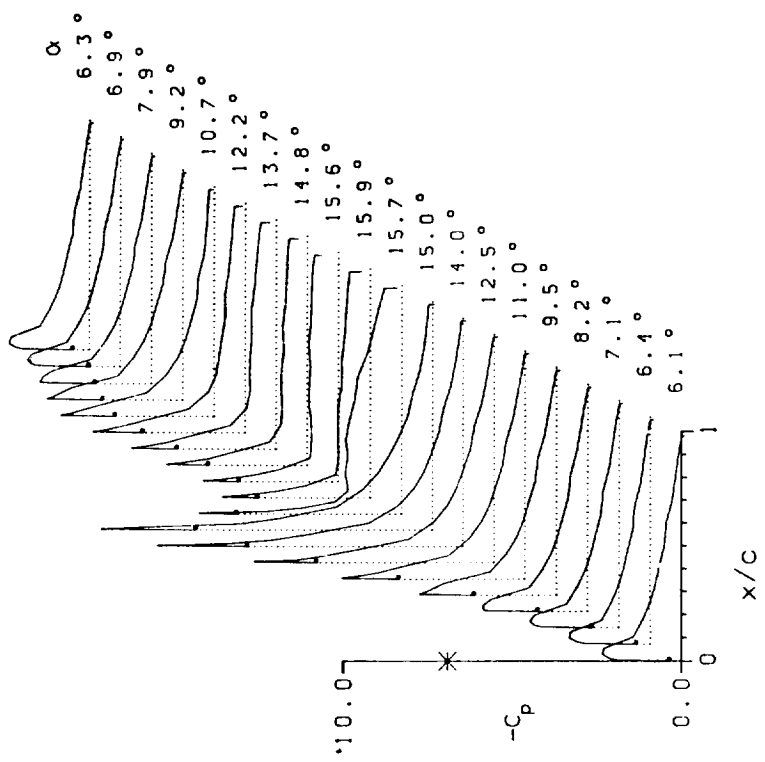
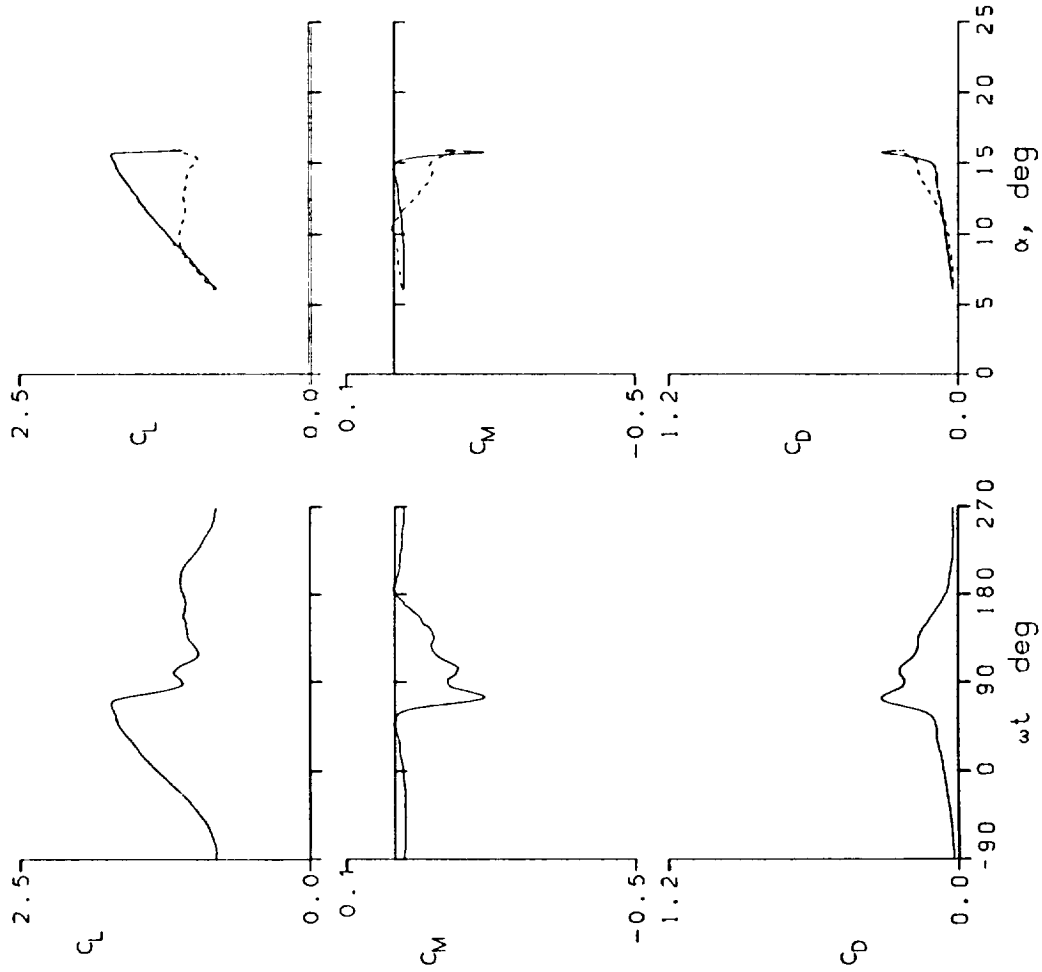


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 37221 A0 = 10.93° k = 0.097
 Re = 3.75 E6 A1 = 4.89° M = 0.302
 CLmax = 1.88 CMmin = -0.24 CDmax = 0.39
 α Lmax = 15.9° ζ = -0.087 Mmax = 1.354
 α Cmin = 10.7° -CPmax = 10.1 α Mmax = 15.5°

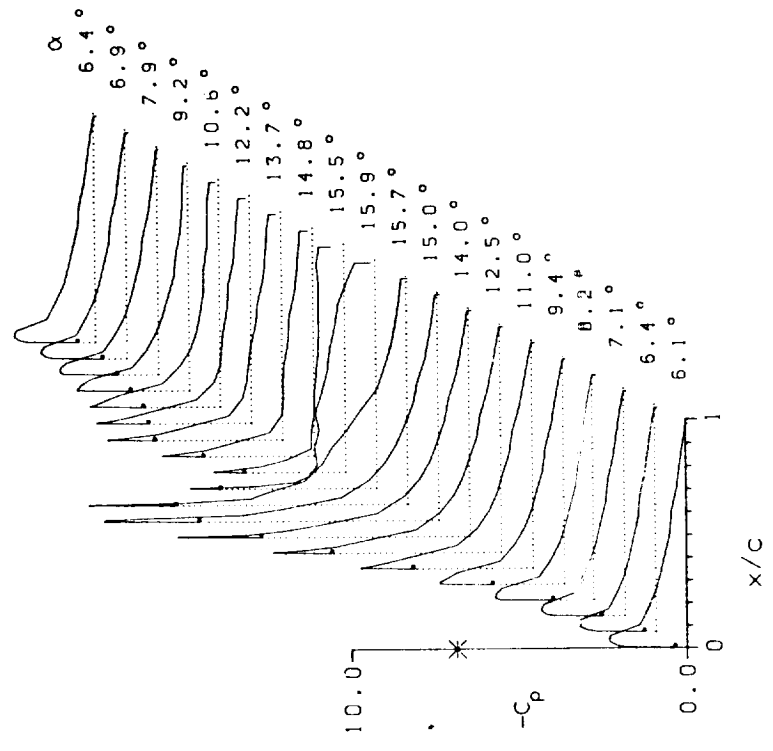
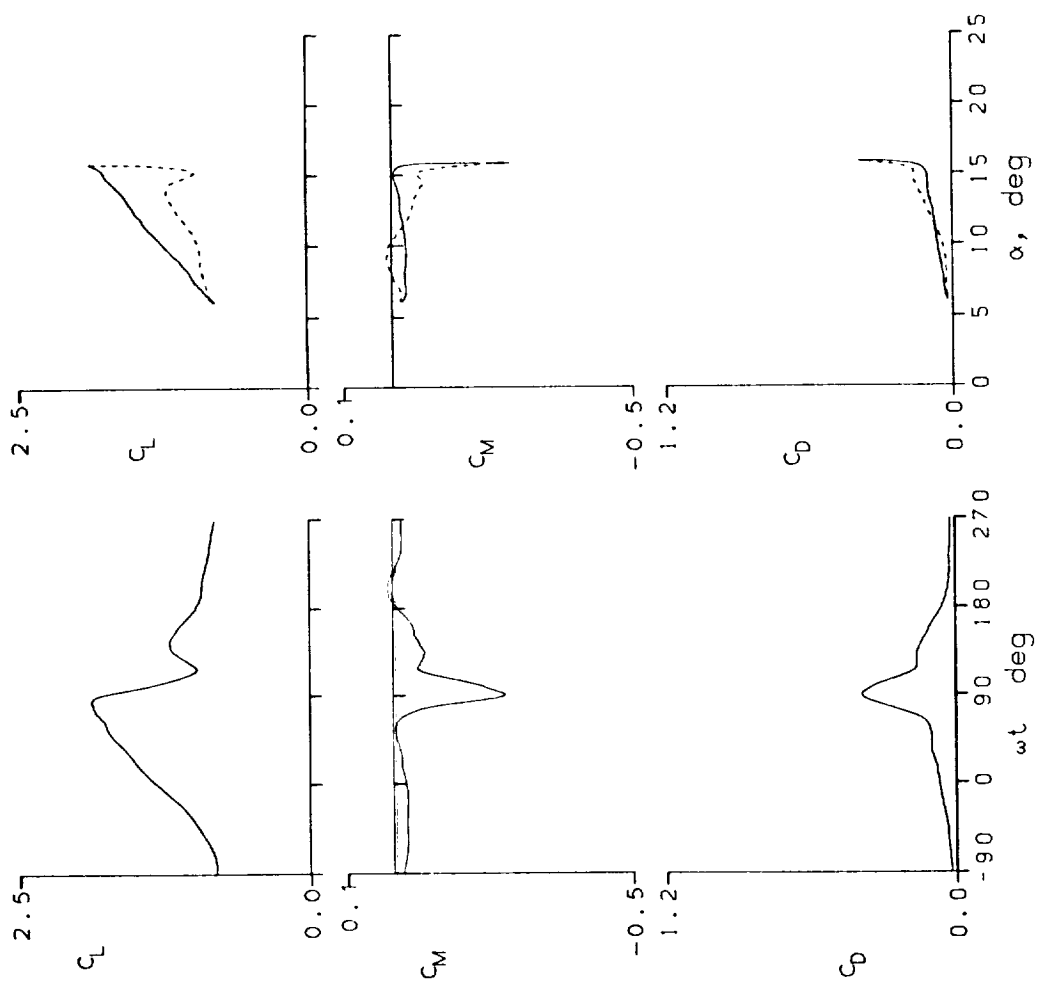


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37304 A0 = 11.88 ° k = 0.050
 Re = 4.00 E6 A1 = 7.90 ° M = 0.301
 $C_{Lmax} = 1.97$ $C_{Mmin} = -0.26$ $C_{Dmax} = 0.47$
 $\alpha_{Lmax} = 16.7^\circ$ $\zeta = 0.098$ $M_{max} = 1.363$
 $\alpha_{Cmin} = 11.4^\circ$ $-C_{pmax} = 10.2$ $\alpha_{Mmax} = 15.7^\circ$

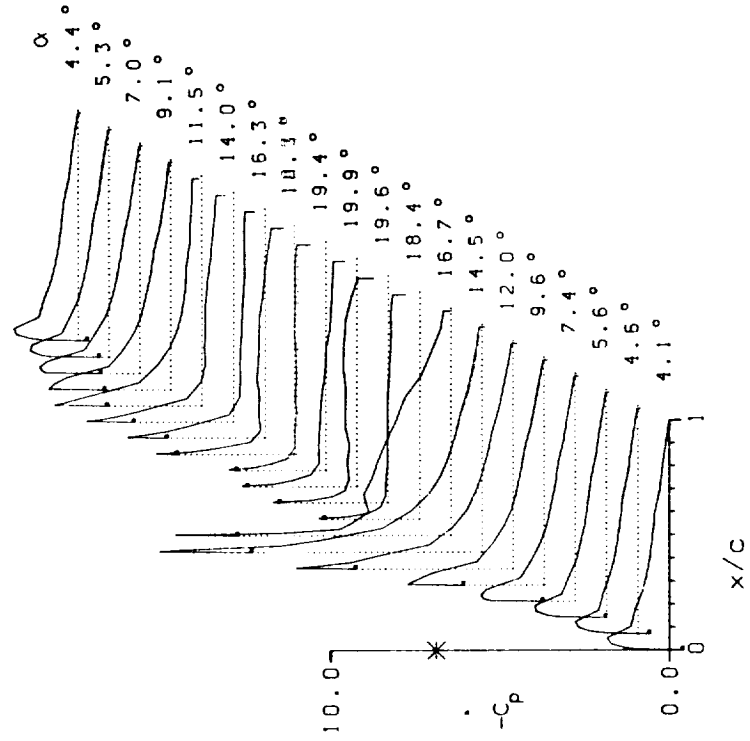
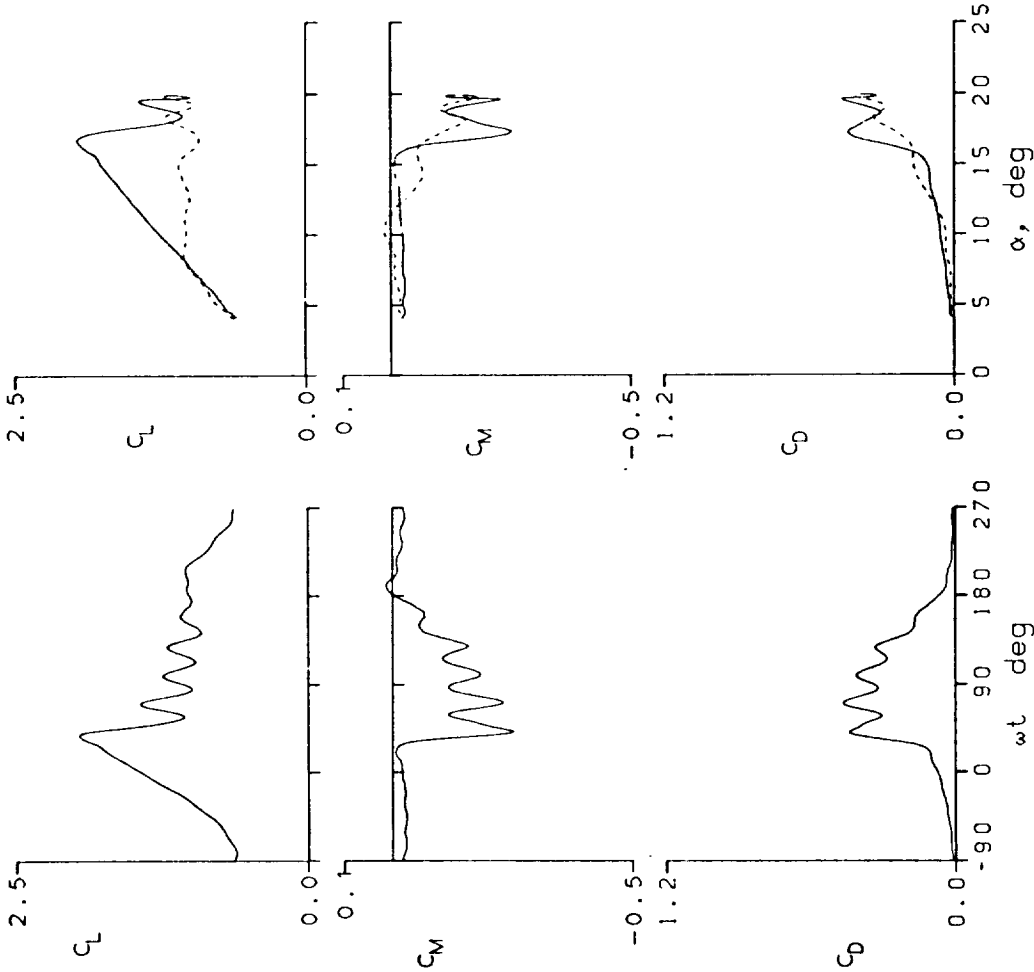


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 37305 A0 = 11.86° k = 0.100
 Rc = 3.98 E6 A1 = 7.90° M = 0.301
 CLmax = 2.12 CMmin = -0.34 CDmax = 0.57
 αLmax = 17.7° ζ = 0.249 Mmax = 1.409
 αCMmin = 11.4° -CPmax = 10.6 αMmax = 16.2°

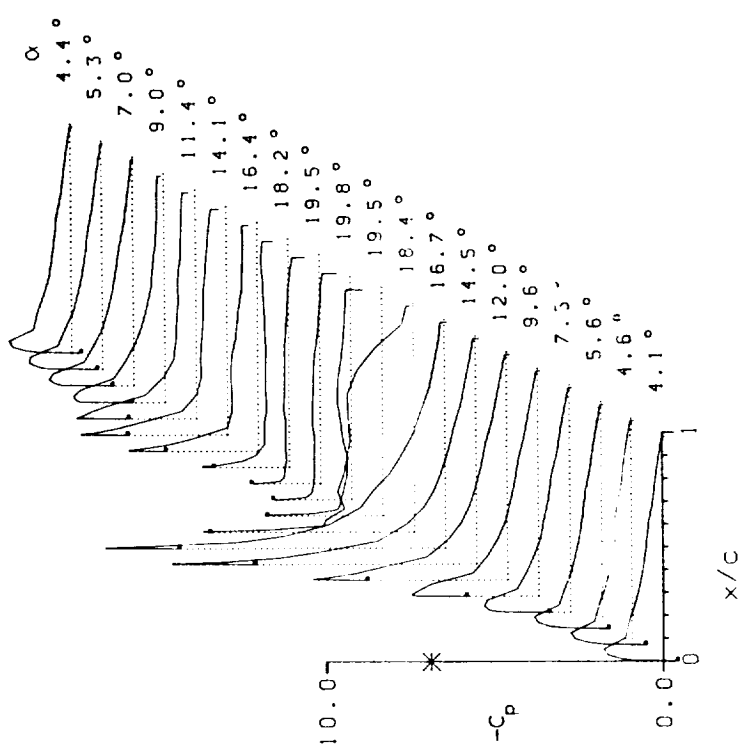
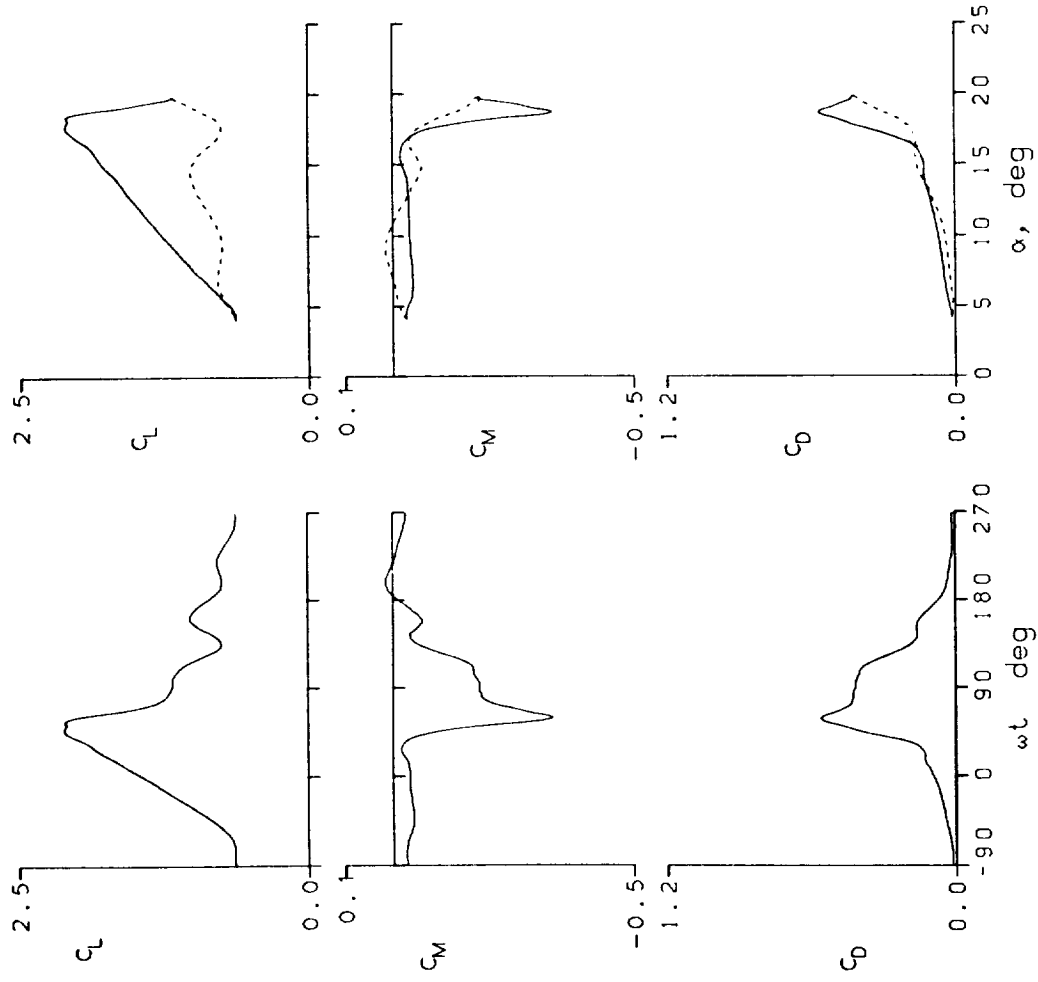


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 37306 A0 = 11.91° k = 0.127
 Re = 3.97 E6 A1 = 7.89° M = 0.301
 CLmax = 2.25 CMmin = -0.39 CDmax = 0.69
 αLmax = 18.7° ξ = 0.158 Mmax = 1.412
 αCMmin = 11.6° -CPmax = 10.6 αMmax = 17.0°

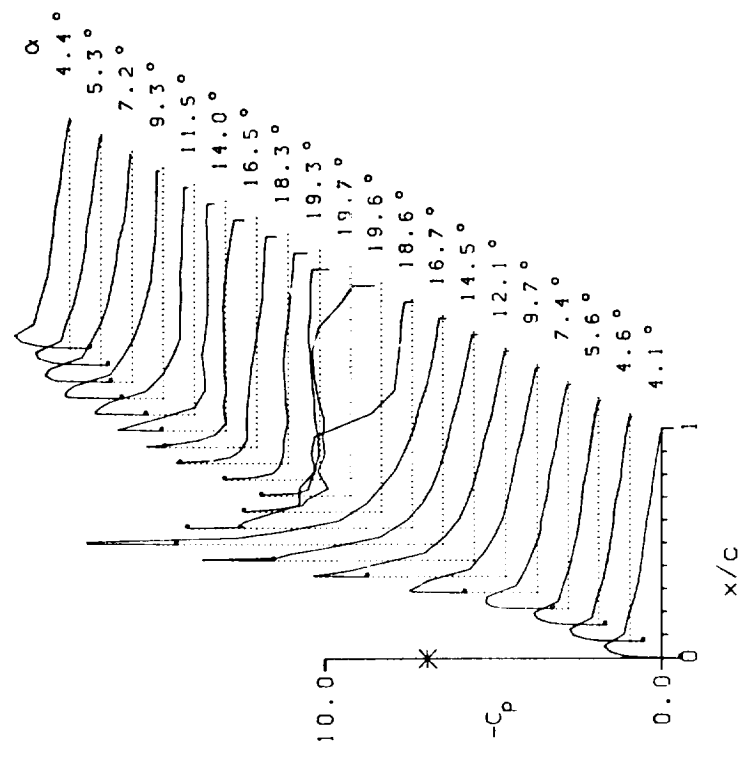
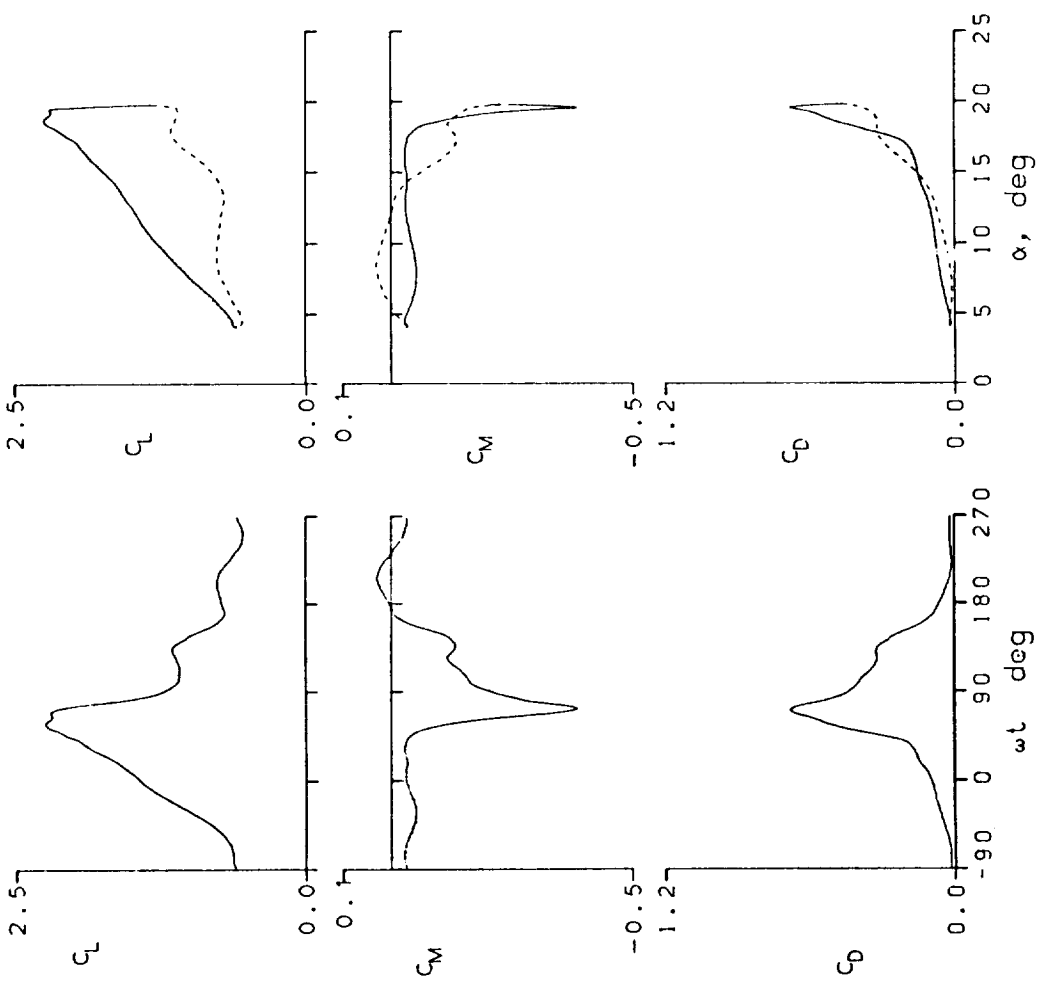


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 38021 $A_0 = 14.98^\circ$ $k = 0.025$
 $Re = 3.95 E6$ $A_1 = 4.90^\circ$ $M = 0.302$
 $C_{Lmax} = 1.74$ $C_{Mmin} = -0.19$ $CDmax = 0.31$
 $C_{Lmax} = 15.2^\circ$ $\xi = -0.050$ $Mmax = 1.282$
 $\alpha_{Cmin} = 14.8^\circ$ $-CDmax = 9.5$ $\alpha_{Mmax} = 14.7^\circ$

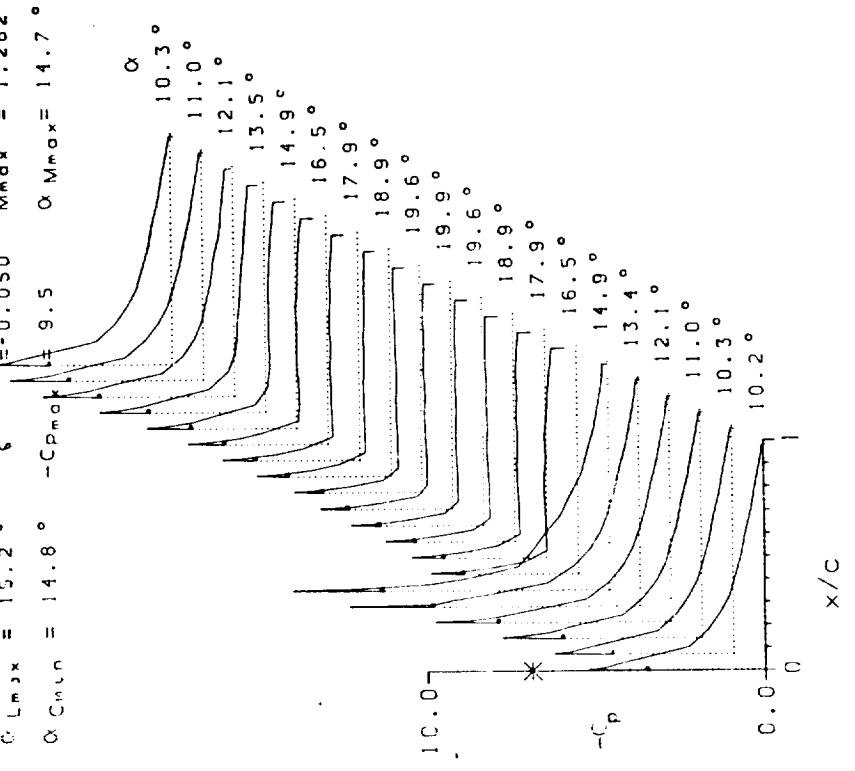
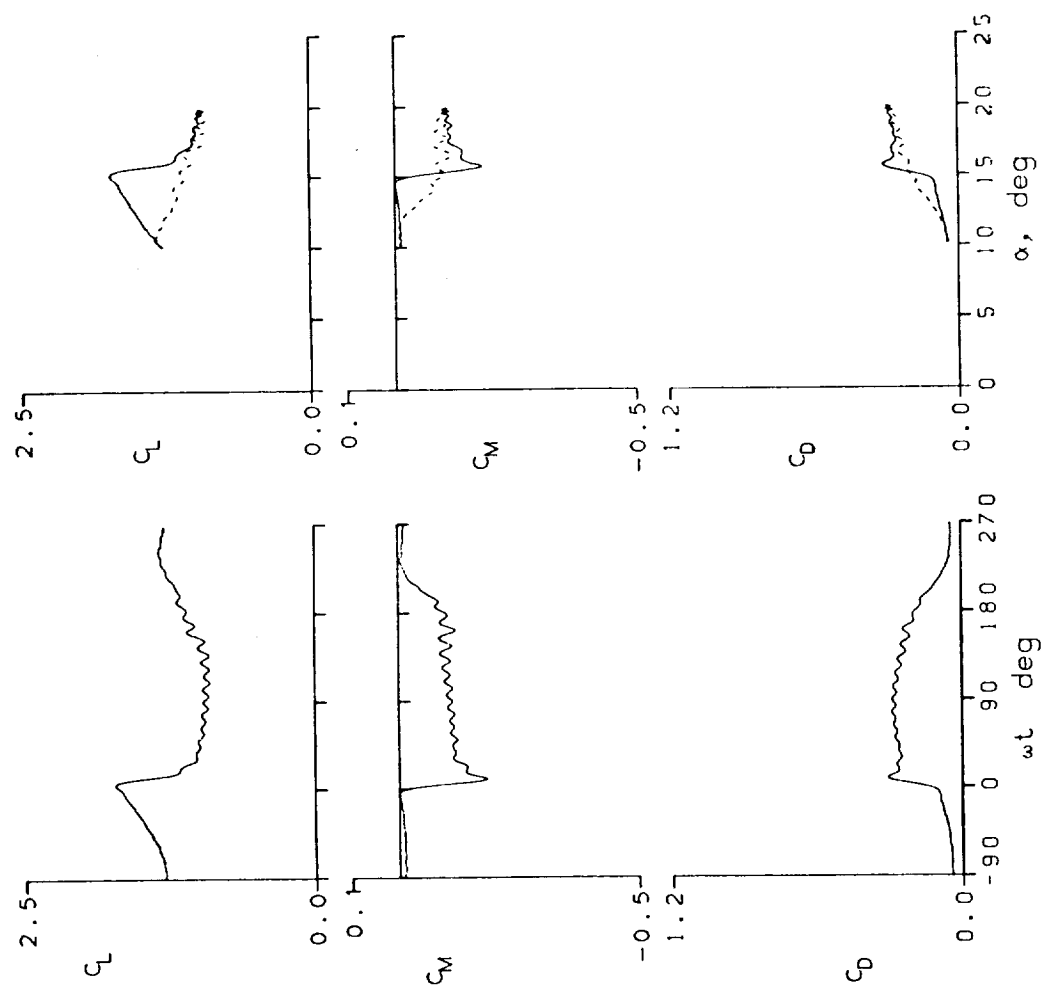


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 38022 A0 = 14.98° k = 0.050
 Re = 3.89 E6 A1 = 4.90° M = 0.299
 $C_{Lmax} = 1.89$ $C_{Mmin} = -0.23$ $C_{Dmax} = 0.40$
 $\alpha_{Lmax} = 16.2^\circ$ $\zeta = 0.195$ $M_{max} = 1.316$
 $\alpha_{C_{min}} = 14.8^\circ$ $-C_{Pmax} = 10.0$ $\alpha_{Mmax} = 15.2^\circ$

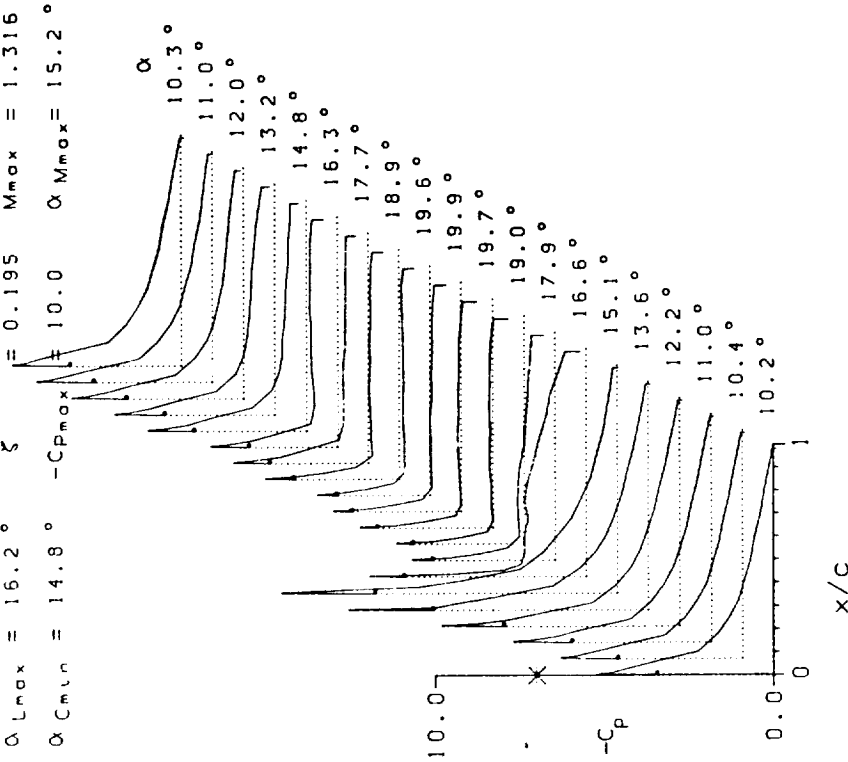
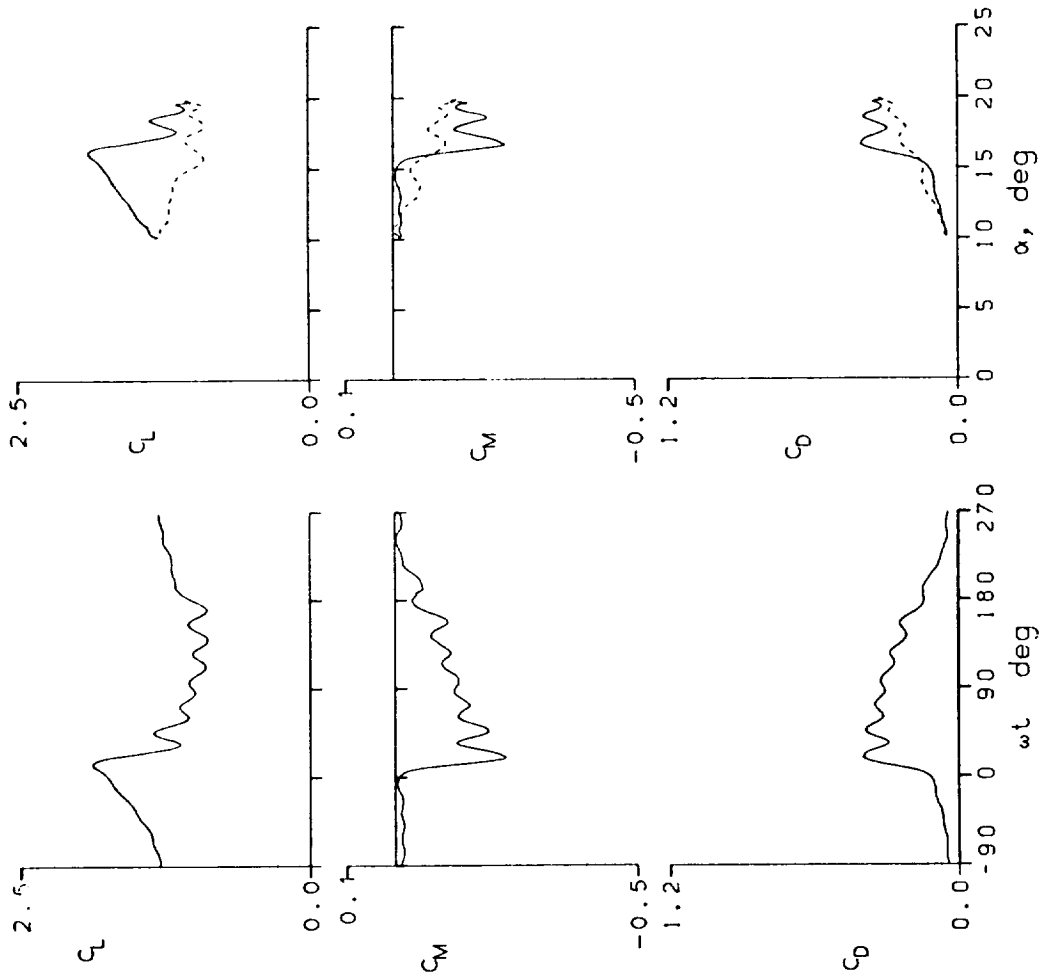


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 38102 A0 = 14.97 ° k = 0.101
 Re = 3.78 E6 A1 = 4.90 ° M = 0.294
 CLmax = 2.07 CMmin = -0.29 CDmax = 0.50
 α Lmax = 17.7 ° ζ = 0.258 Mmax = 1.356
 α Cmin = 14.8 ° -CPmax = 10.7 α Mmax = 16.2 °

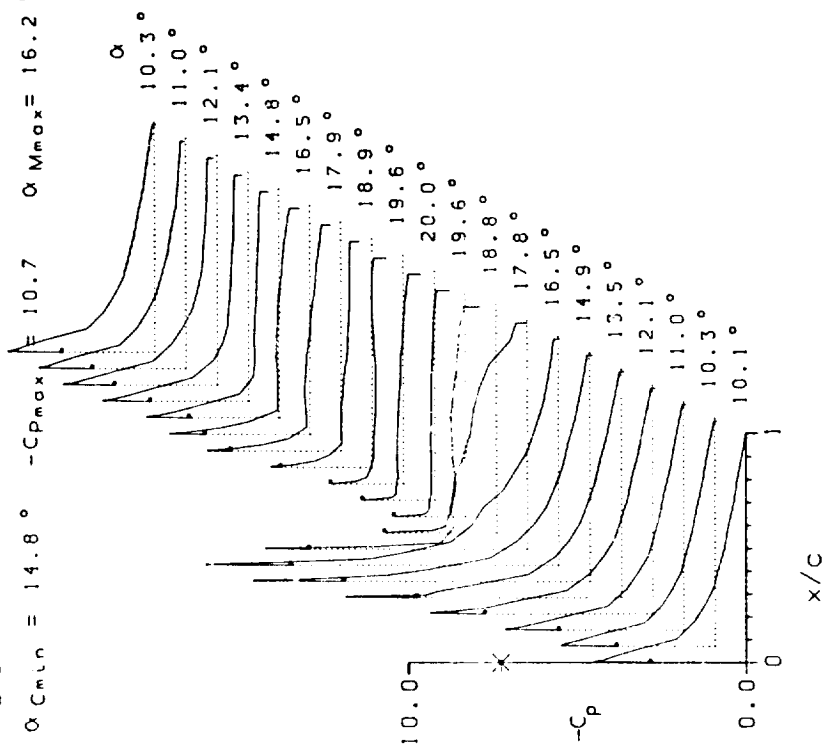
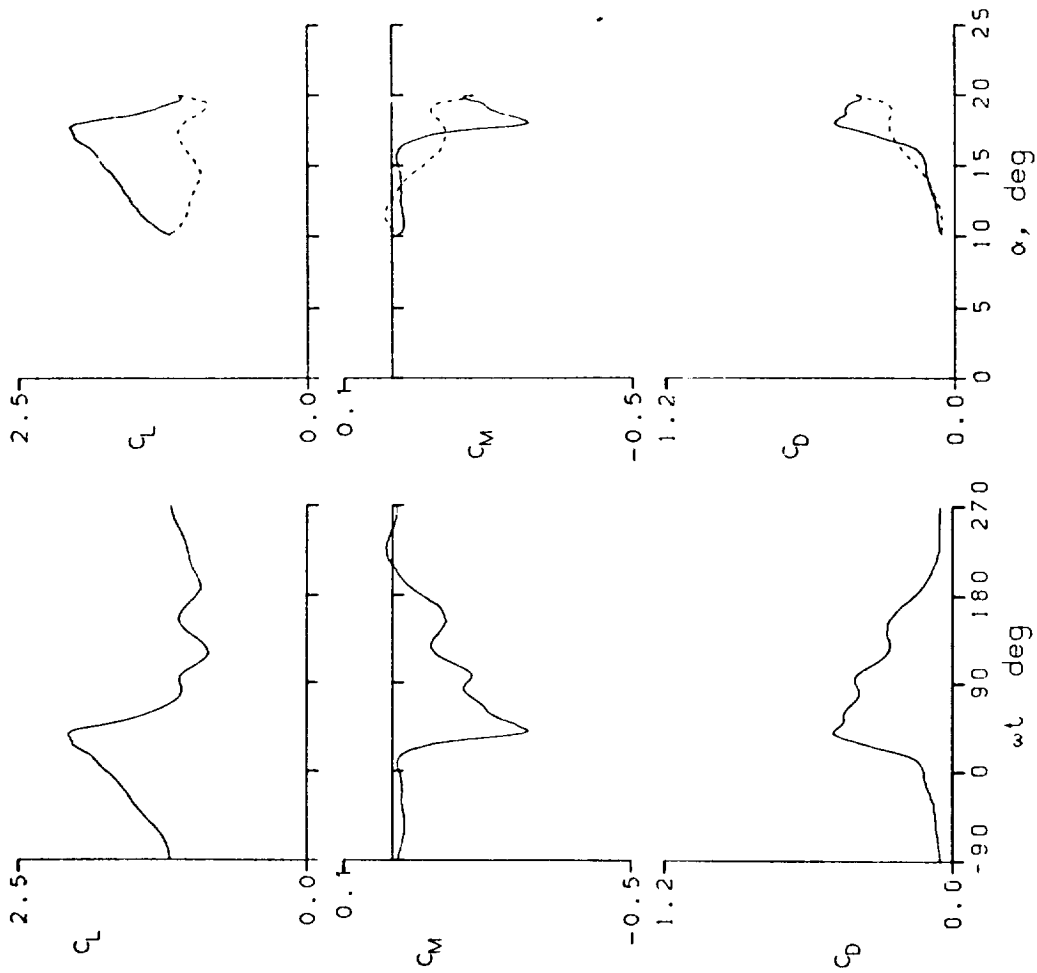


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 38103 A0 = 14.94 ° k = 0.152

Re = 3.75 E6 A1 = 4.91 ° M = 0.293

CLmax = 2.16 CMmin = -0.34 CDmax = 0.62

αLmax = 18.7 ° ζ = 0.404 Mmax = 1.370

αCmin = 14.8 ° -CPmax = 10.9 αMmax = 16.5 °

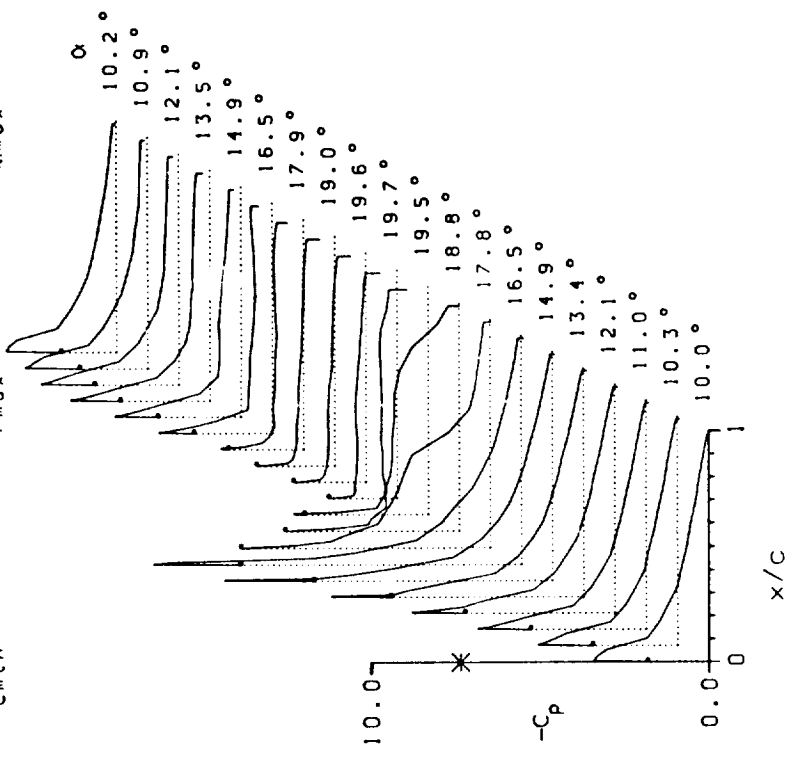
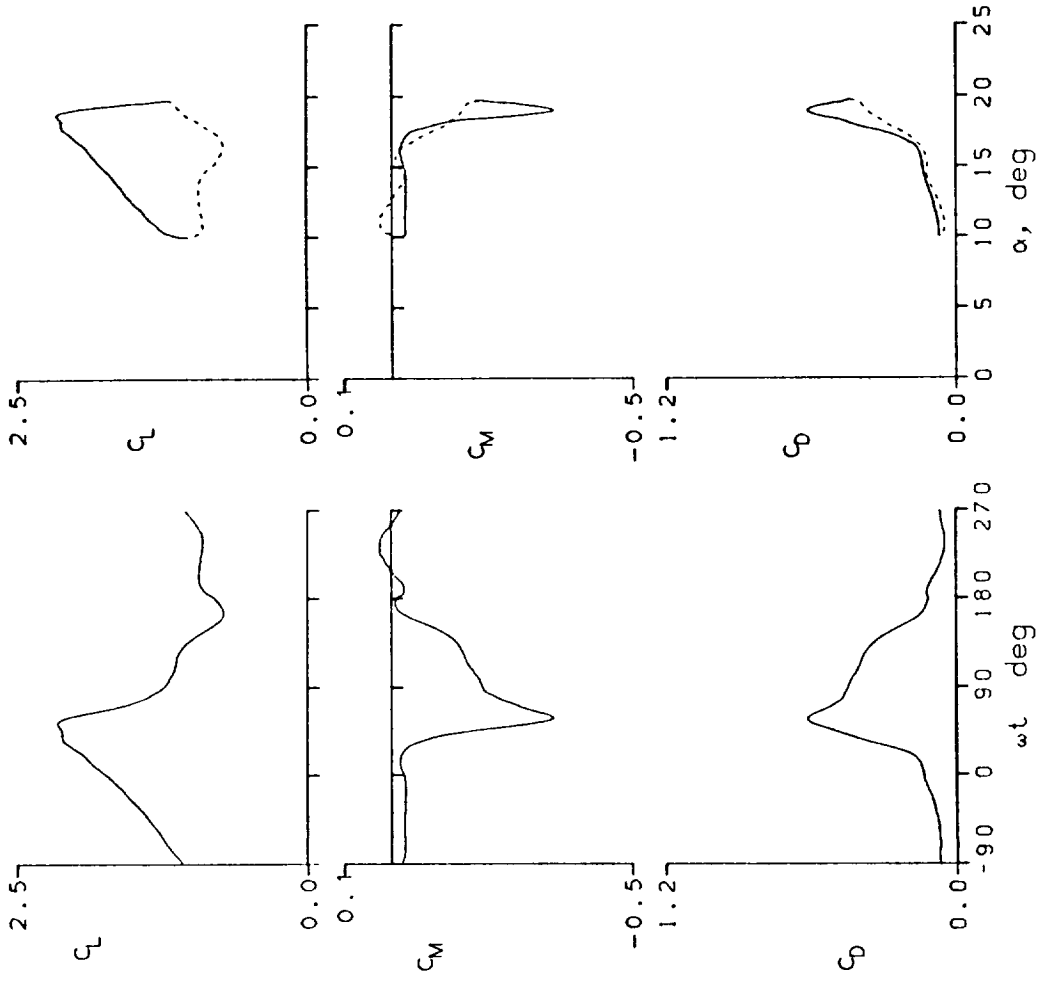


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 38104 A0 = 14.95° k = 0.205

Re = 3.69 E6 A1 = 4.87° M = 0.289

CLmax = 2.30 CMmin = -0.43 CDmax = 0.75

αLmax = 19.0° ξ = -0.062 Mmax = 1.354

αCmin = 14.7° -CPmax = 11.1 αMmax = 17.0°

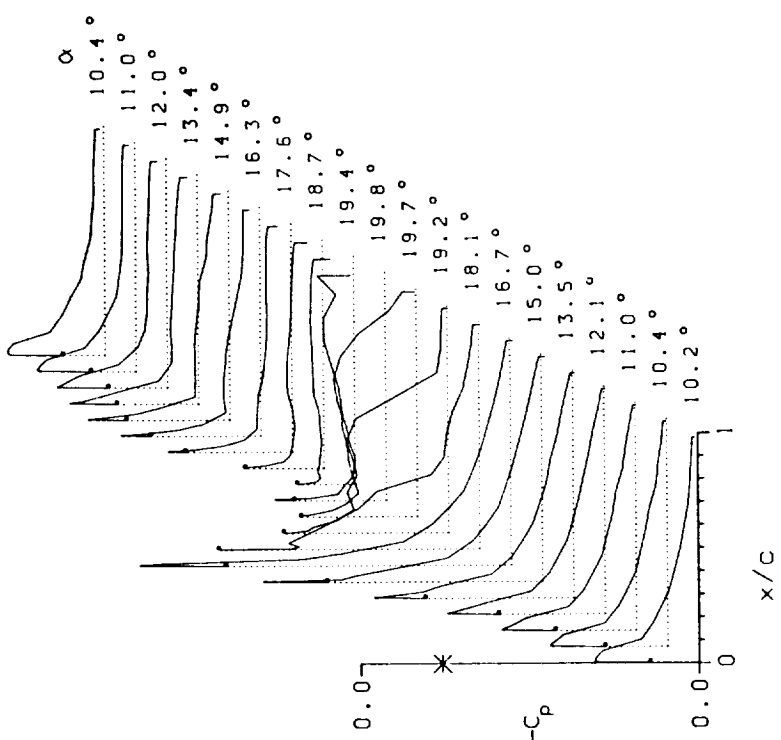
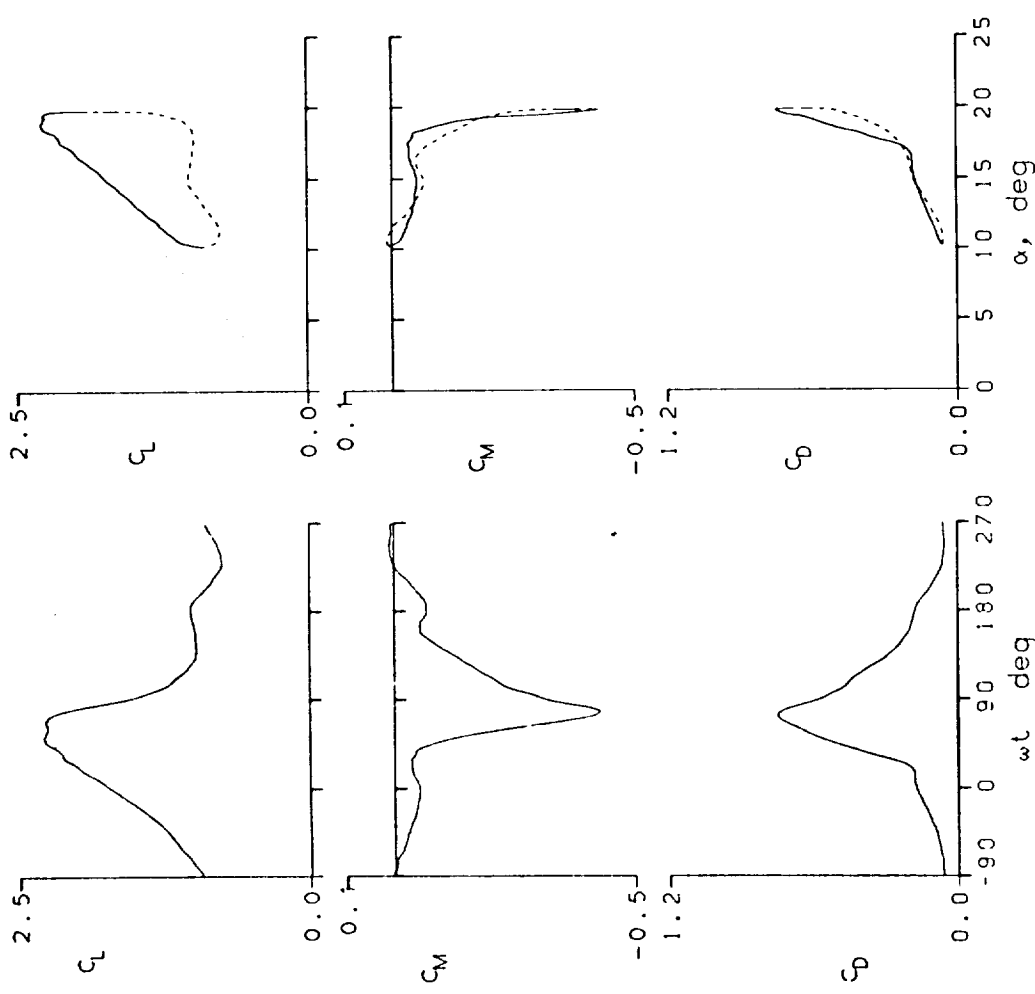


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 38110 A0 = 16.01° k = 0.202
 Re = 3.75 E6 A1 = 1.98° M = 0.293
 CLmax = 1.86 CMmin = -0.26 CDmax = 0.46
 αLmax = 17.6° ζ = -0.590 Mmax = 1.157
 αCmin = 15.9° -CPmax = 9.0 αMmax = 16.9°

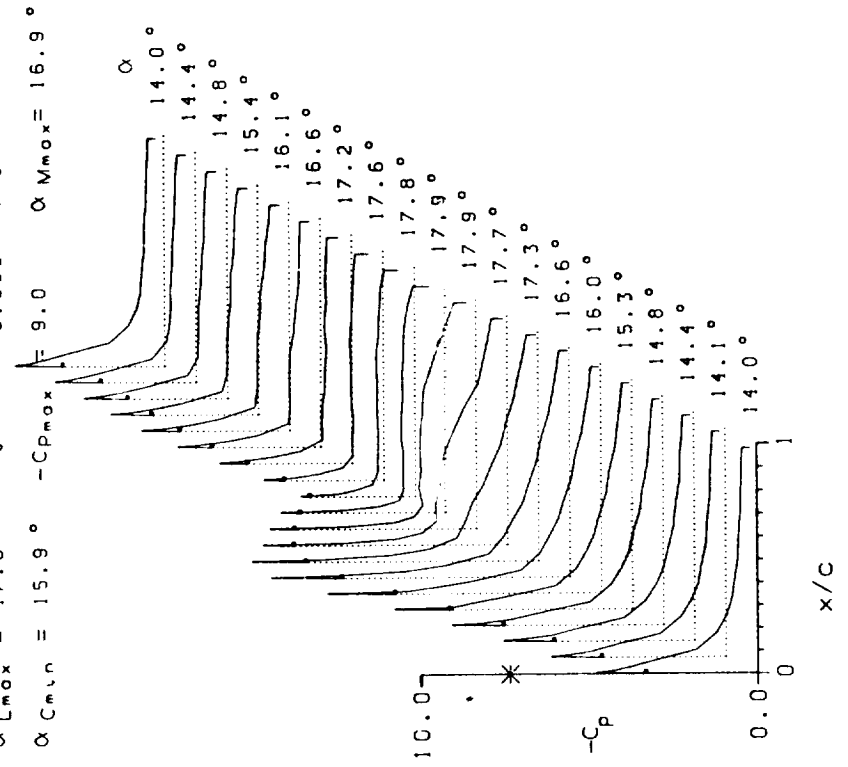
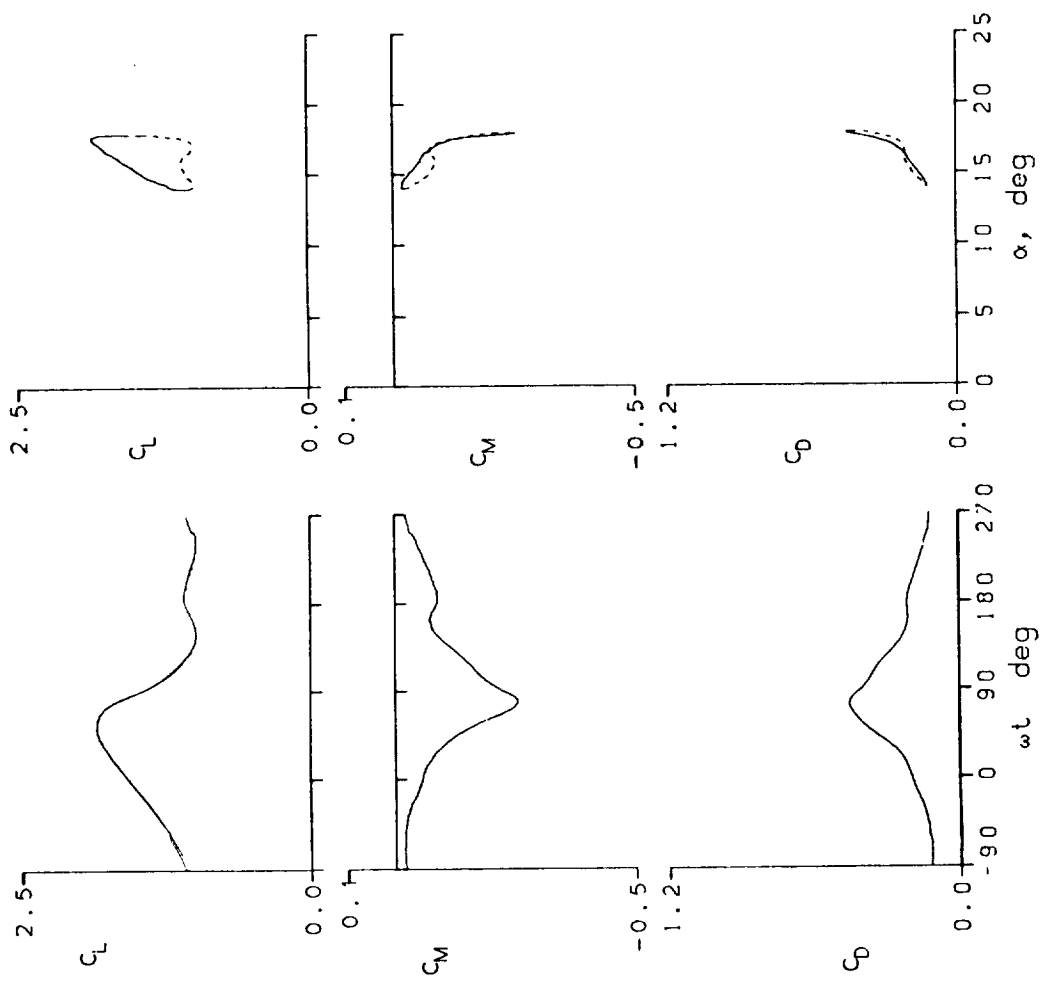


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 38119 A0 = 13.93° k = 0.198
 Re = 3.85 E6 A1 = 2.00° M = 0.300
 CLmax = 1.97 CMmin = -0.25 CDmax = 0.40
 αLmax = 16.0° ζ = -1.898 Mmax = 1.368
 αCMmin = 13.8° -CPmax = 10.3 αMmax = 15.6°

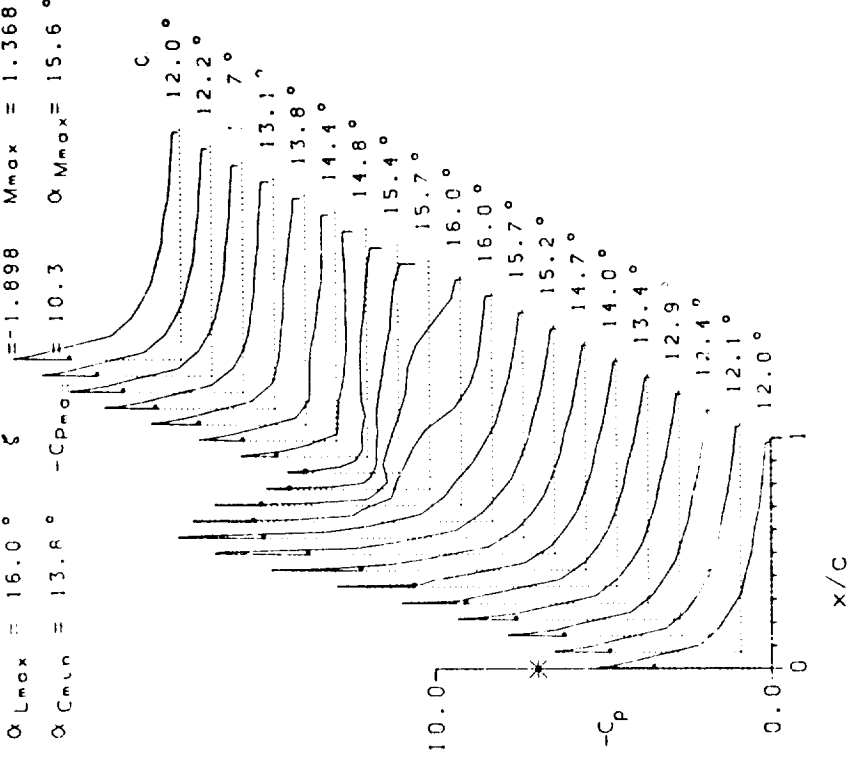
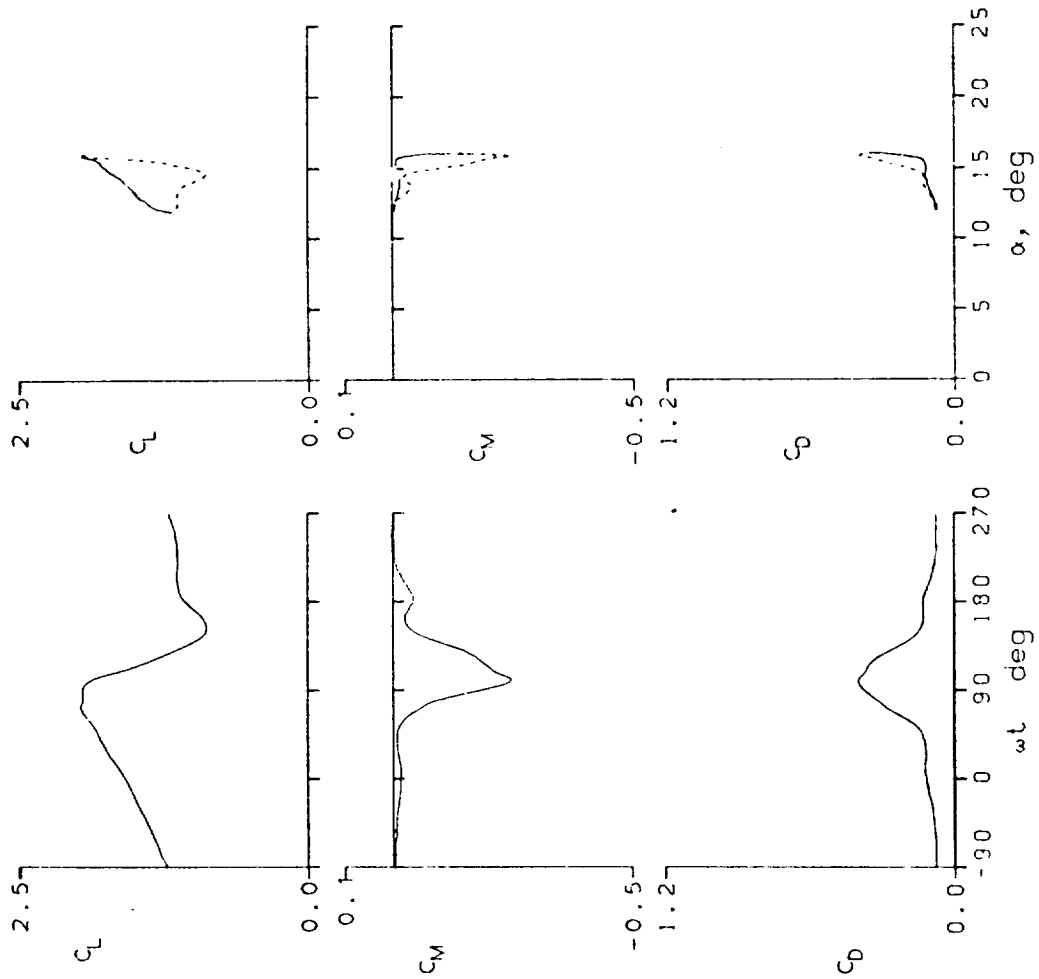


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 38201 $\Lambda_0 = 12.28^\circ$ $k = 0.197$
 $Re = 3.88 E6$ $A1 = 2.00^\circ$ $M = 0.301$
 $C_{Lmax} = 1.67$ $C_{Mmin} = -0.06$ $C_{Dmax} = 0.11$
 $\alpha_{Lmax} = 14.3^\circ$ $\xi = -0.487$ $M_{max} = 1.292$
 $\alpha_{C_{min}} = 12.2^\circ$ $-C_{pmax} = 9.6$ $\alpha_{Mmax} = 14.3^\circ$

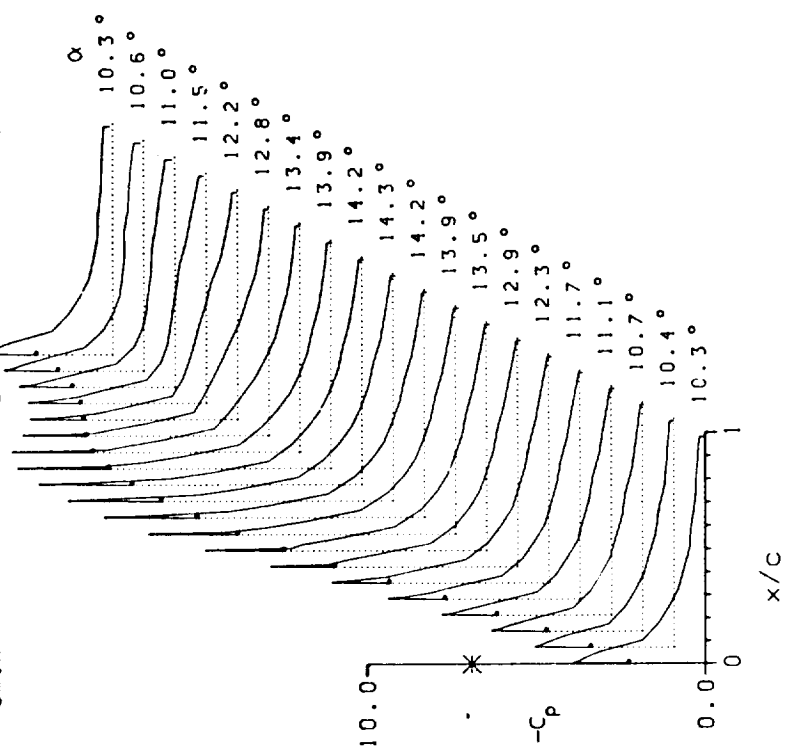
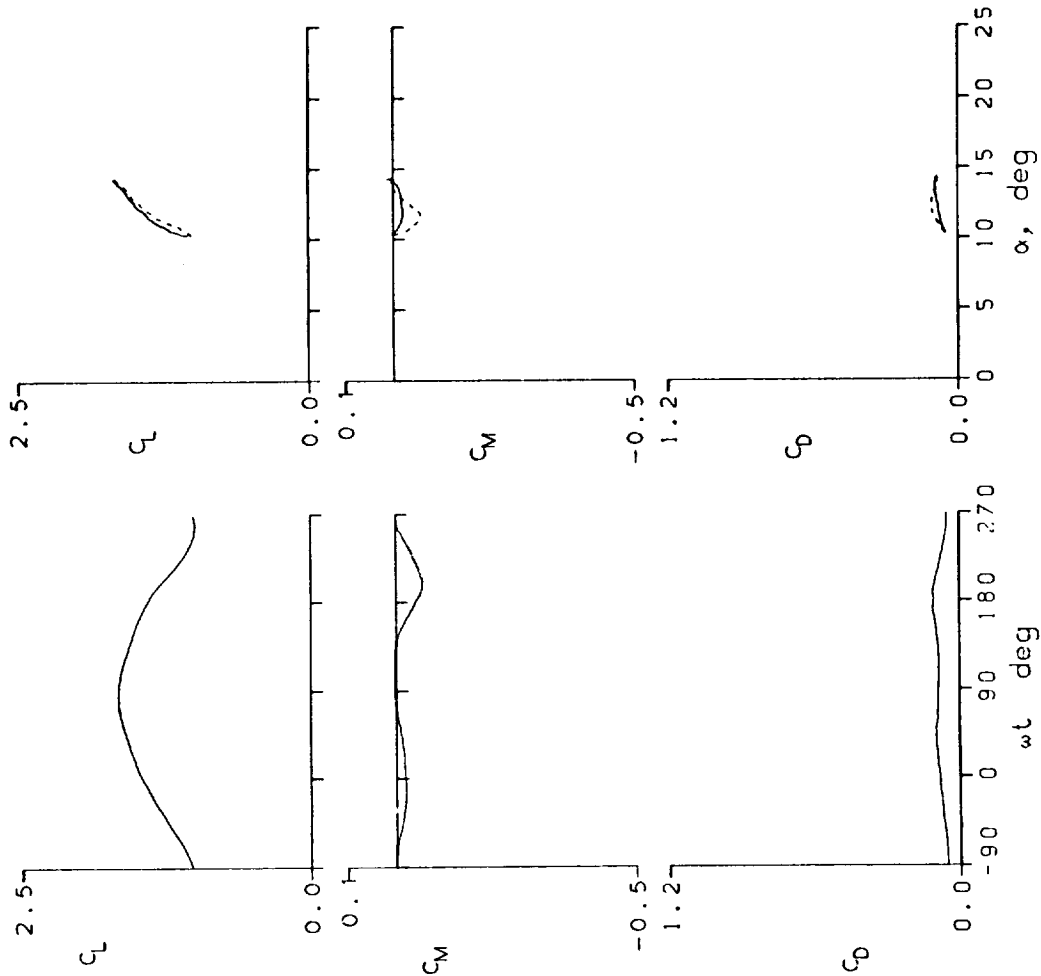


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 38216 A0 = 6.02° k = 0.010
 Re = 2.47 E6 A1 = 10.02° M = 0.183
 CLmax = 1.70 CMmin = -0.14 CDmax = 0.24
 αLmax = 15.4° ζ = -0.075 Mmax = 0.654
 αCMmin = 5.5° -CPmax = 9.9 αMmax = 15.2°

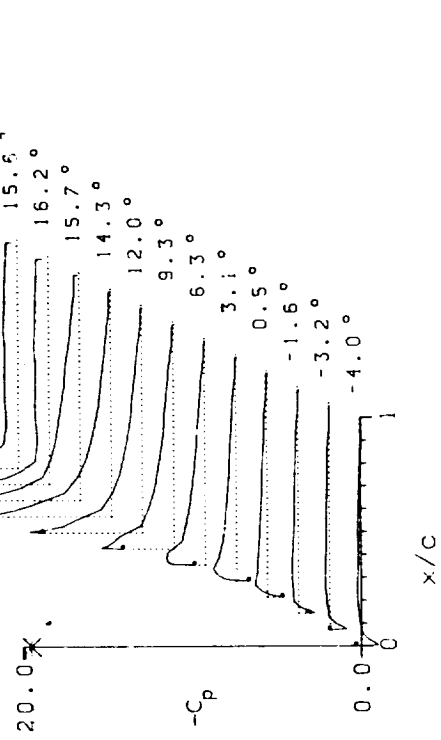
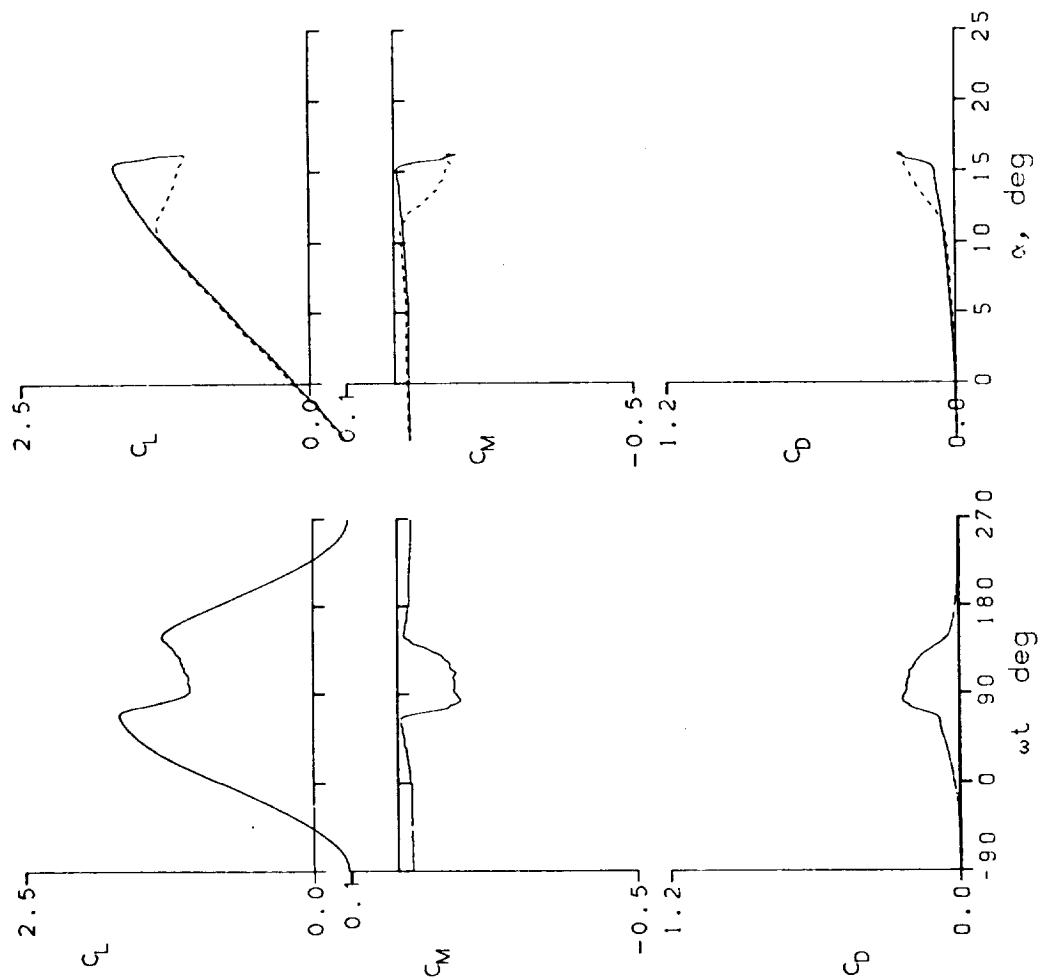


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 38300 A0 = 14.86° k = 0.010
 Re = 3.95 E6 A1 = 9.93° M = 0.298
 CLmax = 1.68 CMmin = -0.18 CDmax = 0.42
 αLmax = 14.7° ζ = 0.007 Mmax = 1.227
 αCMmin = 14.7° -CDmax = 9.3 αMmax = 14.4°

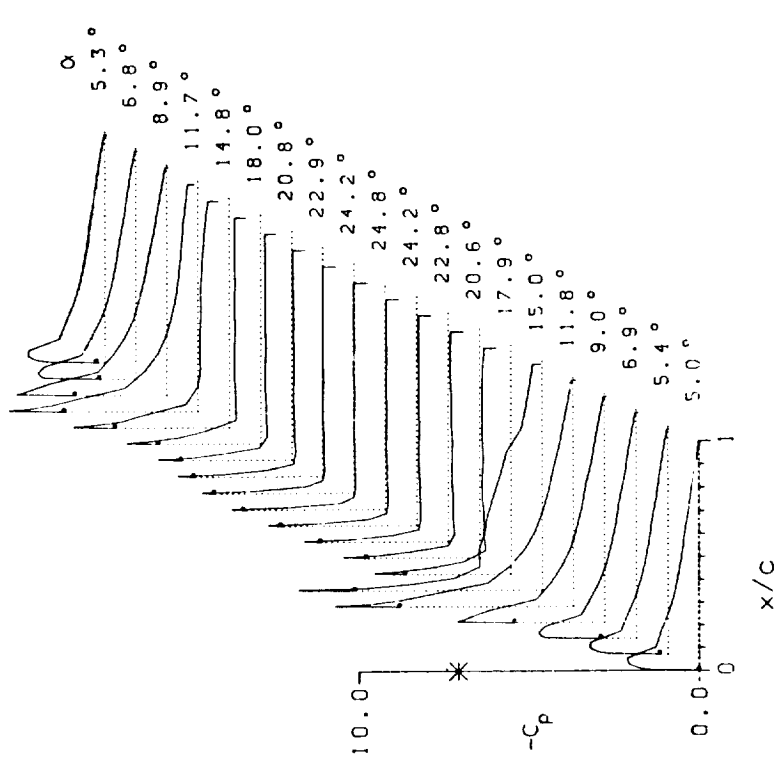
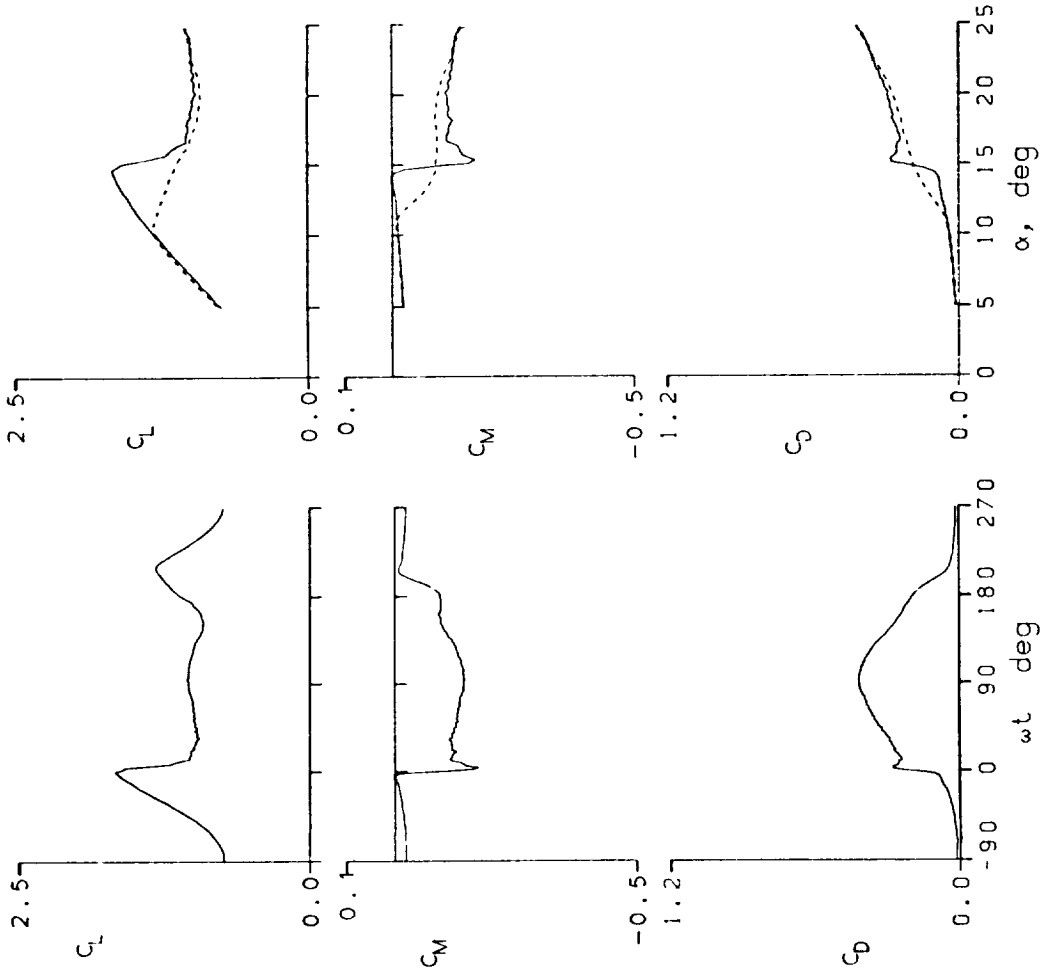


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 38306 A0 = 9.86° k = 0.010
 Re = 3.93 E6 A1 = 9.86° M = 0.299
 CLmax = 1.66 CMmin = -0.16 CDmax = 0.29
 α Lmax = 14.5° ζ = -0.009 Mmax = 1.229
 α Cmin = 9.4° -CPmax = 9.3 α Mmax = 14.3°

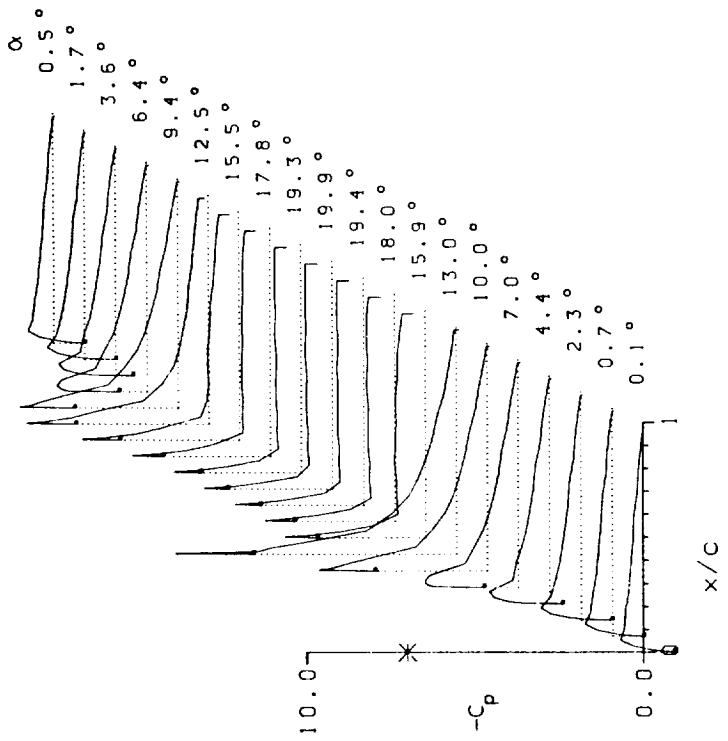
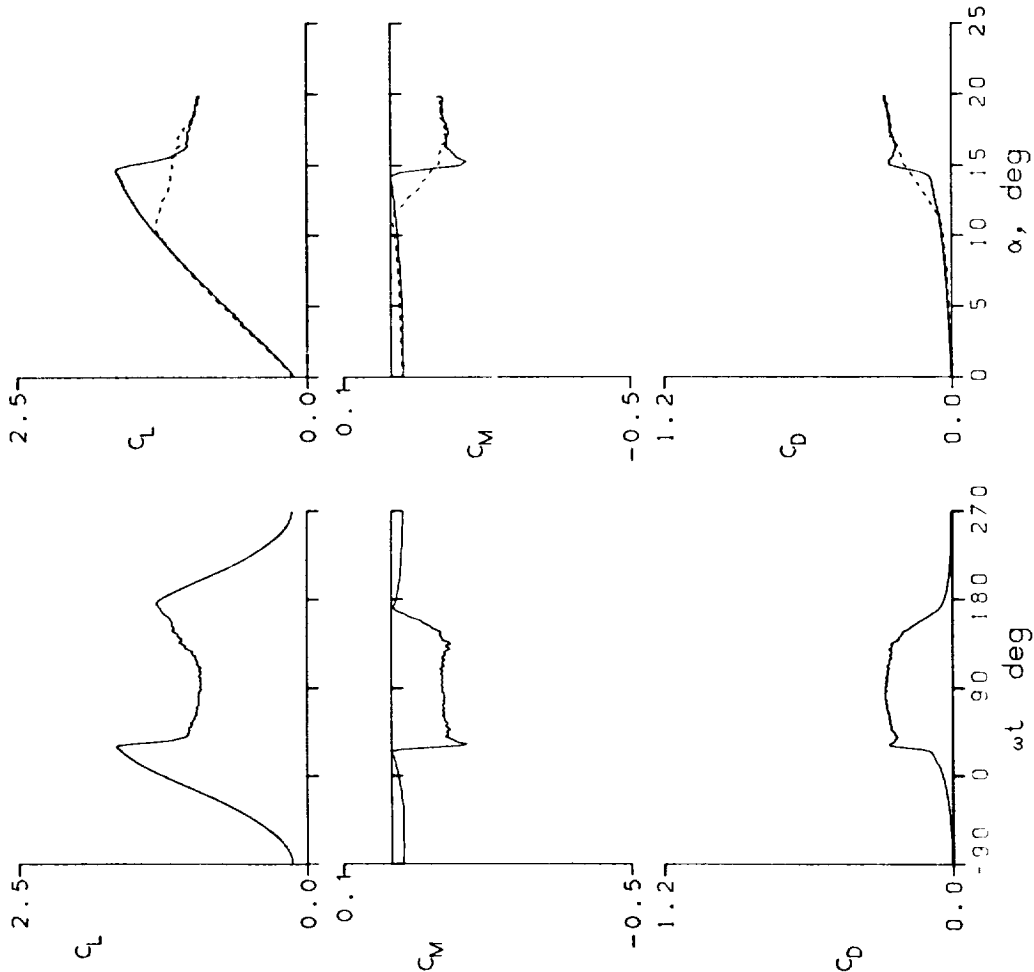


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 39021 A0 = 4.05° k = 0.010
 Re = 3.81 E6 A1 = 10.08° M = 0.300
 $C_{Lmax} = 1.58$ $C_{Mmin} = -0.12$ $C_{Dmax} = 0.20$
 $\alpha_{Lmax} = 13.5^\circ$ $\xi = -0.018$ $M_{max} = 1.161$
 $\alpha_{C_{min}} = 3.5^\circ$ $-C_{pmax} = 8.6$ $\alpha_{Mmax} = 13.5^\circ$

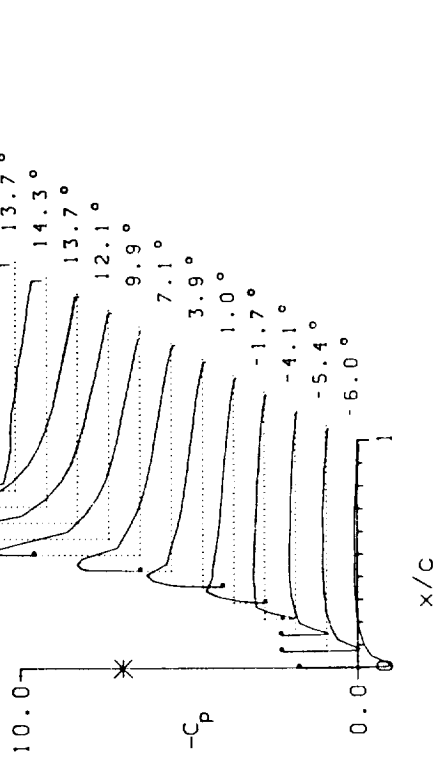
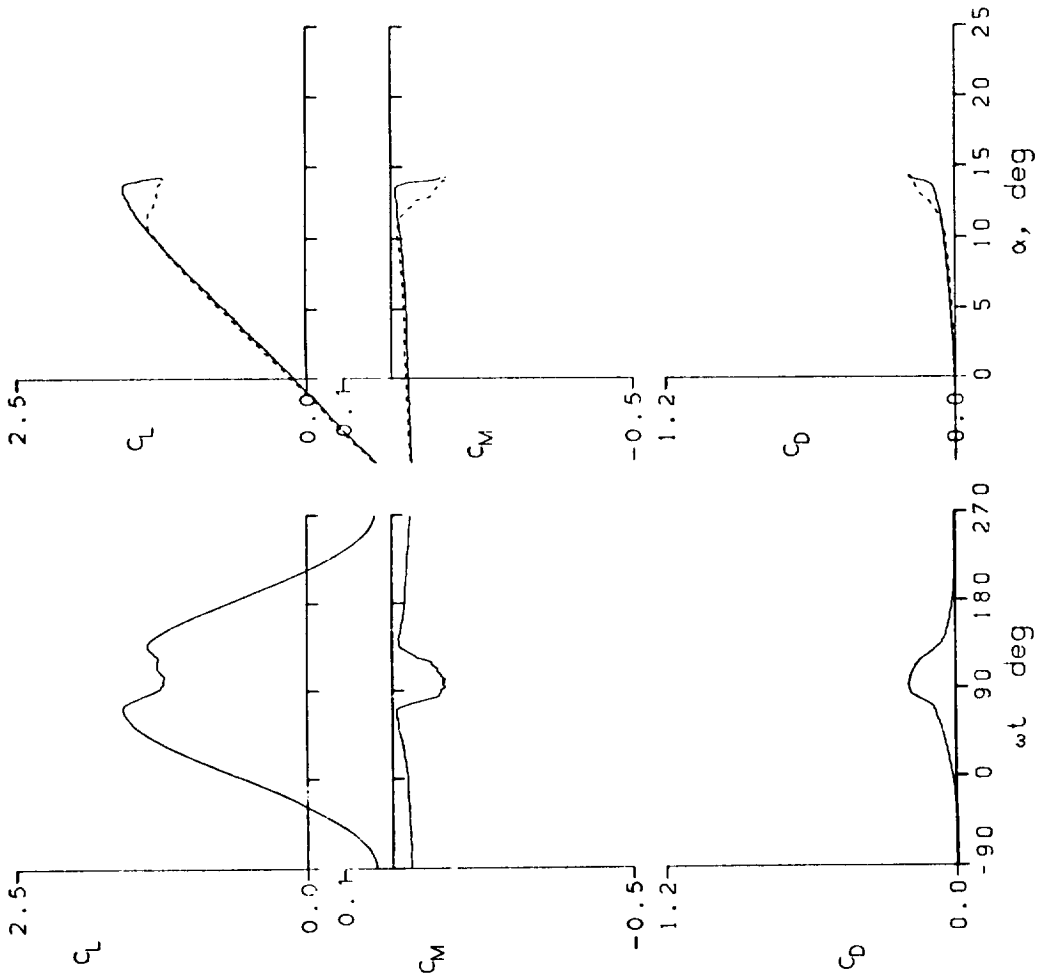


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 39104 A0 = 14.96 ° k = 0.010
 Re = 3.93 E6 A1 = 4.89 ° M = 0.297
 CLmax = 1.65 CMmin = -0.16 CDmax = 0.29
 α Lmax = 14.5 ° ζ = -0.197 Mmax = 1.230
 α Cmin = 14.8 ° -CPmax = 9.4 α Mmax = 14.2 °

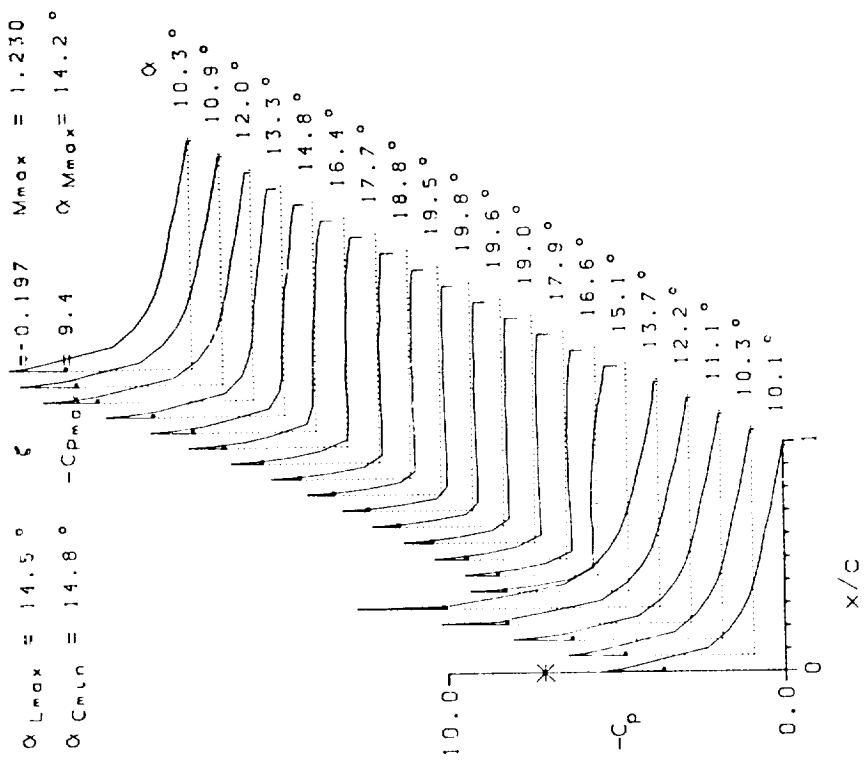
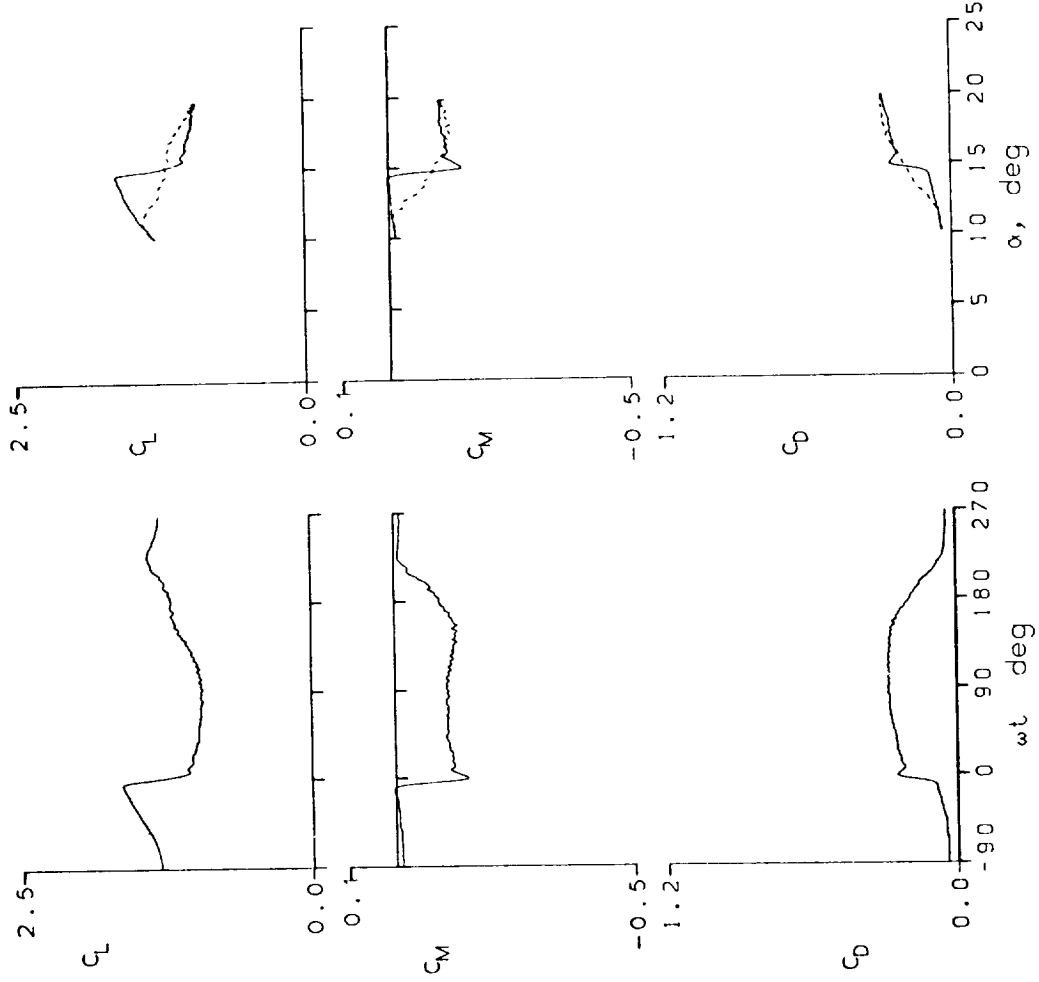


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 39107 $A_0 = 9.94^\circ$ $k = 0.010$
 $Re = 3.94 \text{ E}6$ $A' = 4.91^\circ$ $M = 0.300$
 $C_{Lmax} = 1.62$ $C_{Mmin} = -0.13$ $C_{Dmax} = 0.22$
 $\alpha_{Lmax} = 14.1^\circ$ $\zeta = -0.244$ $M_{max} = 1.232$
 $\alpha_{Cmin} = 9.8^\circ$ $-C_{Pmax} = 9.2$ $\alpha_{Mmax} = 14.1^\circ$

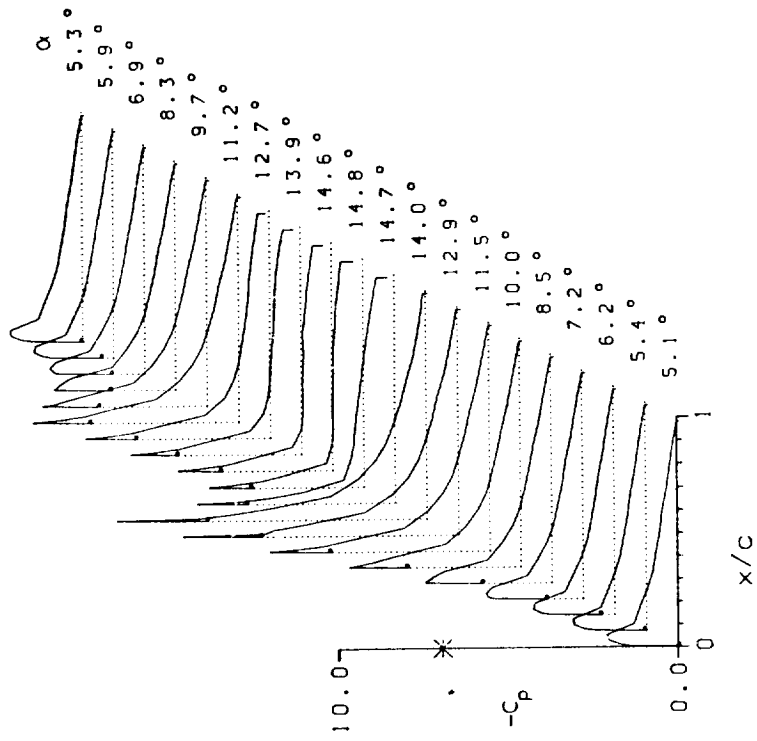
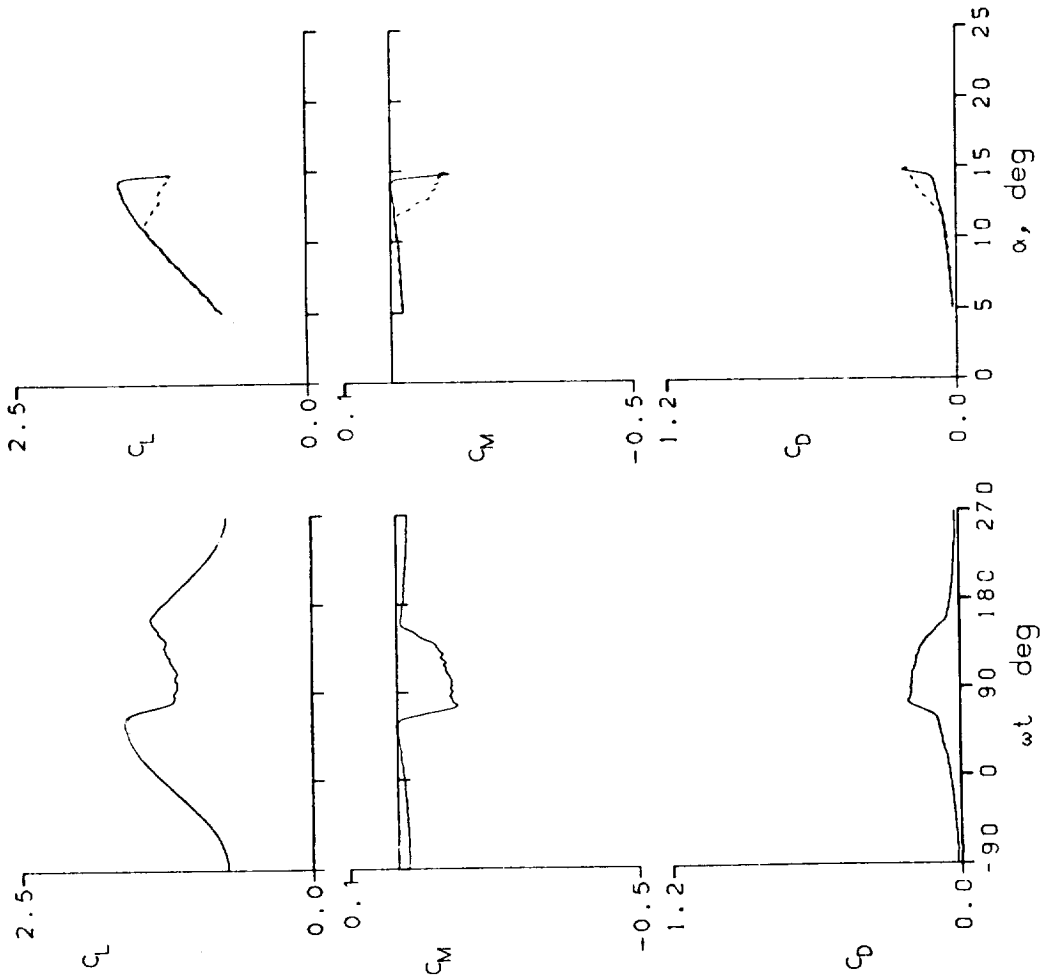


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL
 FRAME : 39110 A0 = 10.90 ° k = 0.010
 Re = 3.90 E6 A1 = 4.92 ° M = 0.299
 C_{Lmax} = 1.60 C_{Mmin} = -0.14 C_{Dmax} = 0.24
 α_{Lmax} = 14.4 ° ζ = -0.196 M_{max} = 1.210
 α_{Cmin} = 10.7 ° -C_{Pmax} = 9.1 α_{Mmax} = 14.0 °

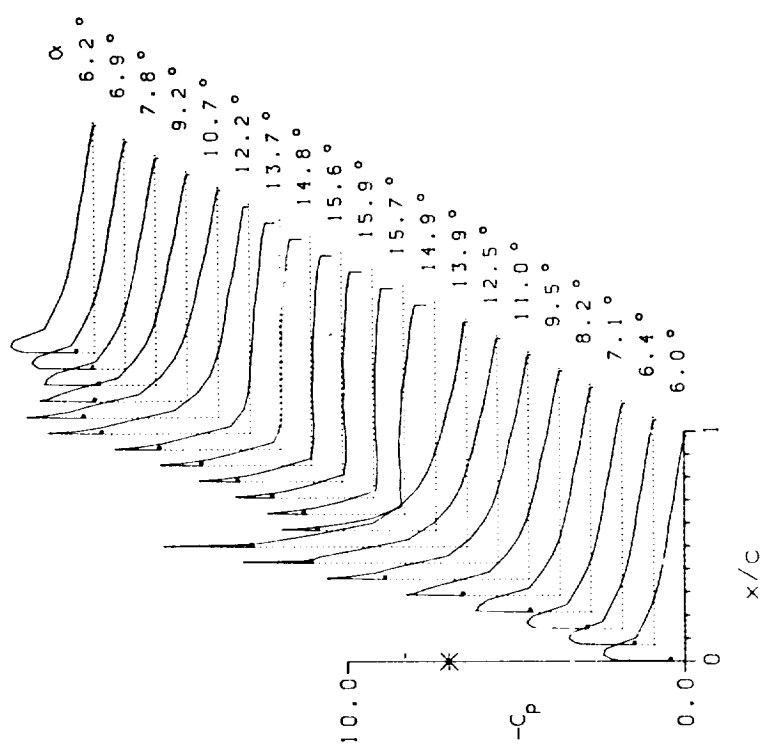
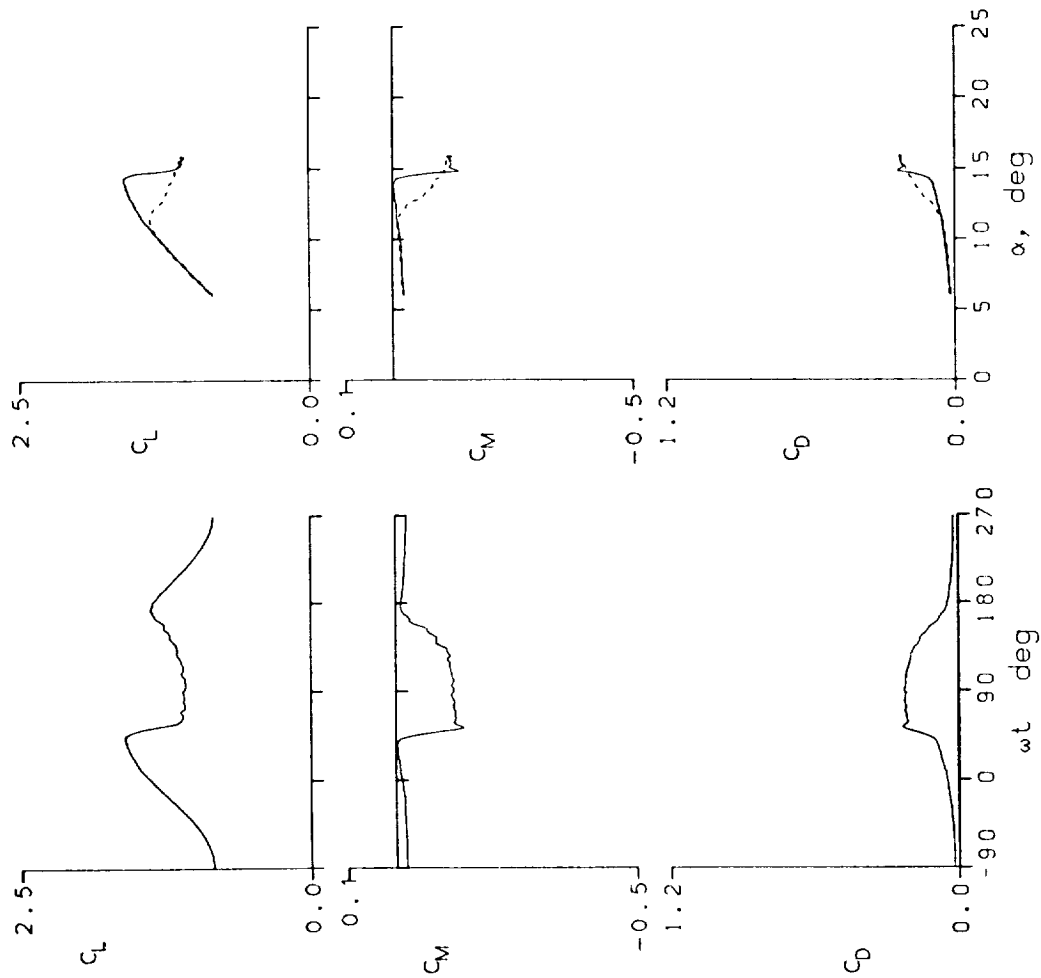


Figure 15.- Continued.

SIKORSKY SC-1095 AIRFOIL

FRAME : 39115 A0 = 14.02° k = 0.010
 Re = 3.84 E6 A1 = 1.99° M = 0.298
 $C_{Lmax} = 1.58$ $C_{Mmin} = -0.13$ $C_{Dmax} = 0.23$
 $\alpha_{Lmax} = 13.8^\circ$ $\xi = -1.160$ $M_{max} = 1.184$
 $\alpha_{Cmin} = 14.0^\circ$ $-C_{Pmax} = 8.9$ $\alpha_{Mmax} = 13.7^\circ$

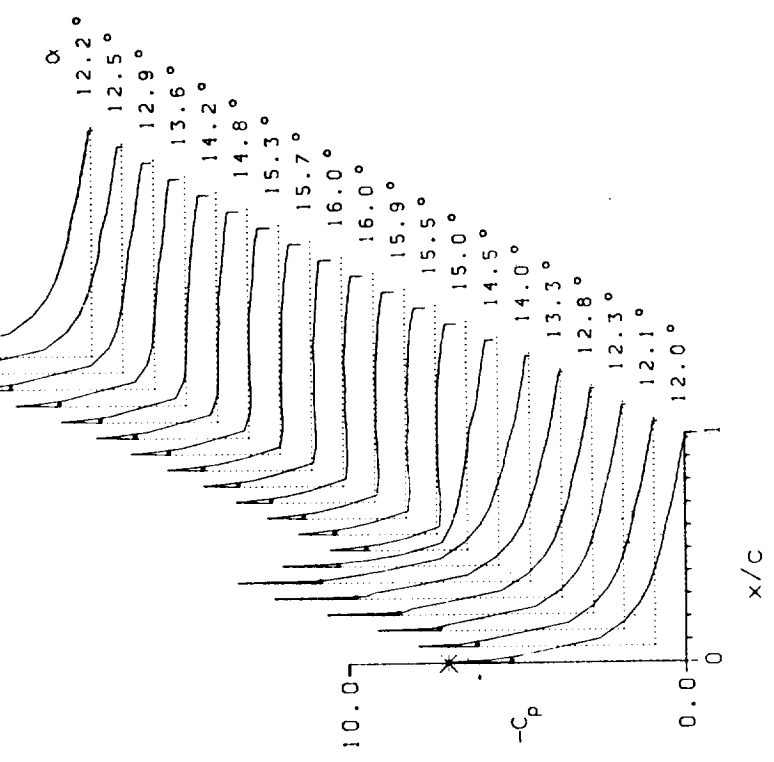
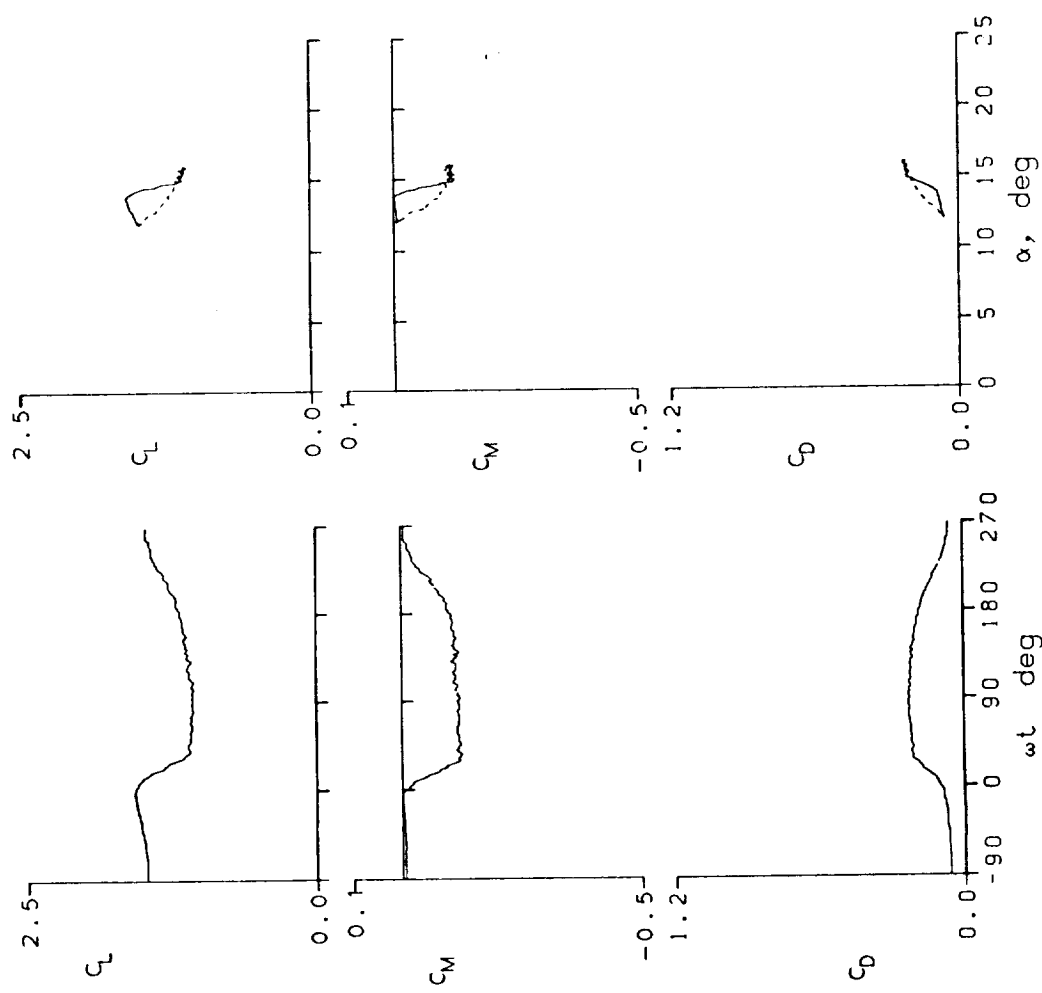


Figure 15.- Concluded.

HUGHES HH-02 - WITH TAB- AIRFOIL TRIP

FRAME : 42019 A0 = 14.89 ° k = 0.025

Re = 3.96 E6 A1 = 9.88 ° M = 0.292

C_{Lmax} = 1.72 C_{Mmin} = -0.21 C_{Dmax} = 0.49

α_{Lmax} = 15.4 ° ζ = 0.164 M_{max} = 1.003

α_{Cmin} = 14.6 ° $-C_{pmax}$ = 7.4 α_{Mmax} = 13.3 °

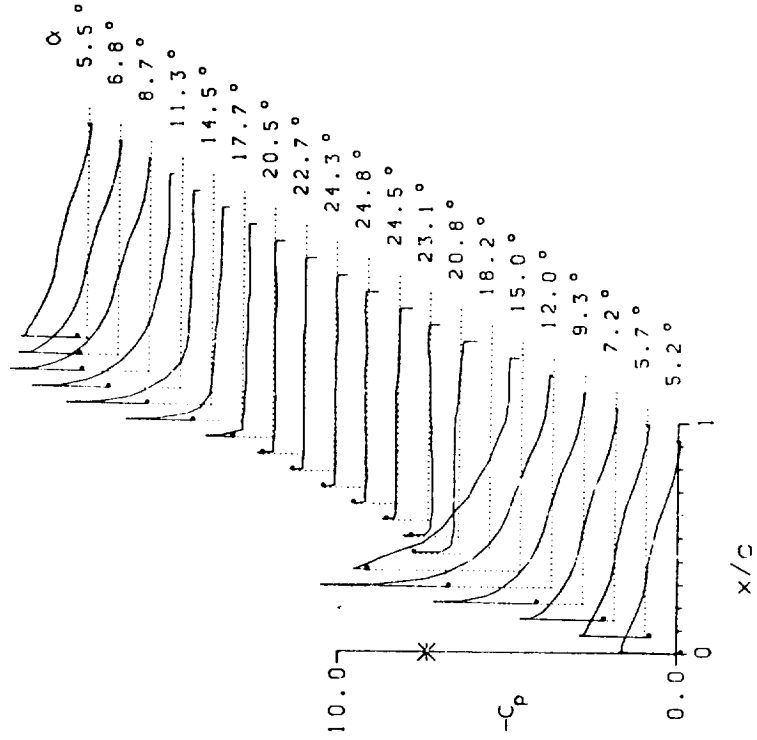
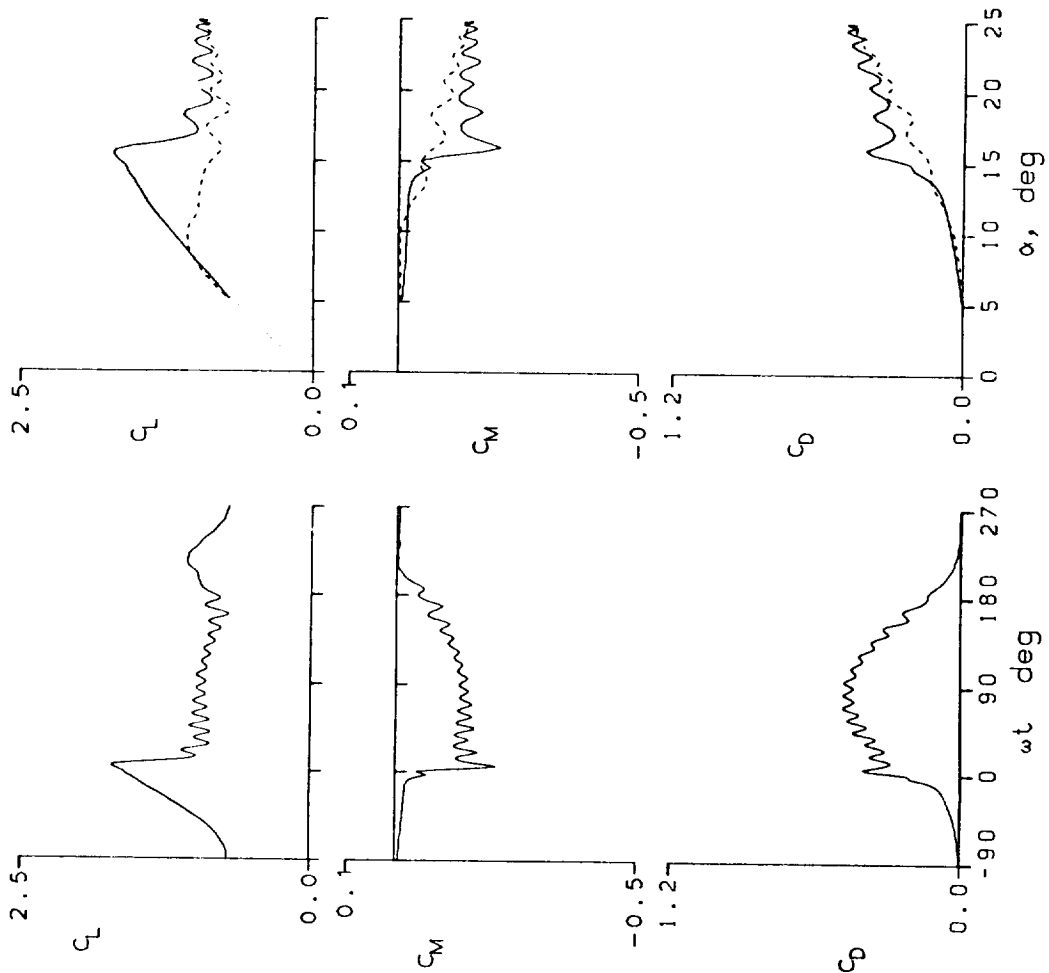


Figure 16.- Dynamic data for Hughes HH-02 airfoil.

HUGHES HH-02 -WITH TAB- AIRFOIL TRIP
 FRAME : 42021 A0 = 14.85° k = 0.051
 Re = 3.68 E6 A1 = 9.99° M = 0.289
 CLmax = 1.98 CMmin = -0.30 CDmax = 0.59
 αLmax = 17.5° ζ = 0.365 Mmax = 1.049
 αCmin = 14.5° -CPmax = 8.1 αMmax = 14.5°

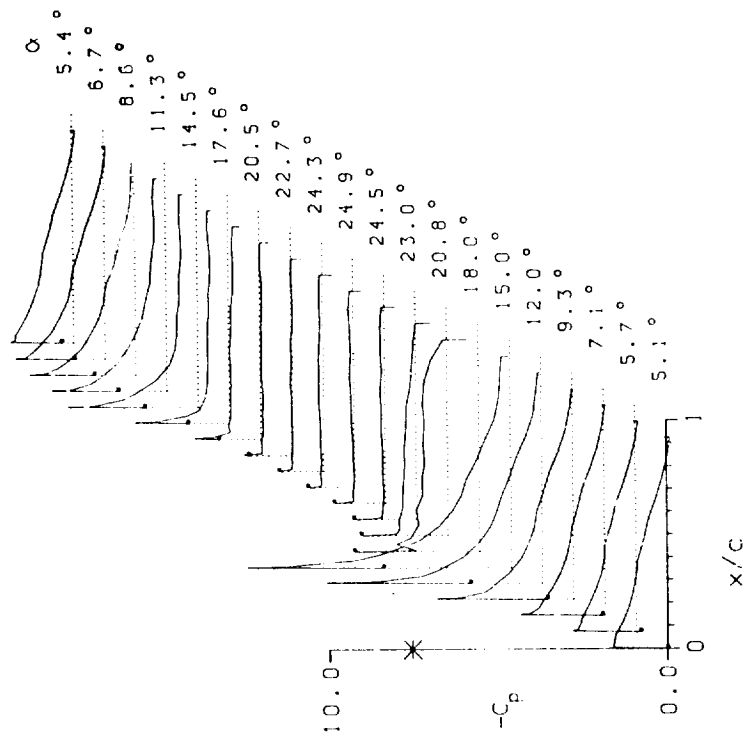
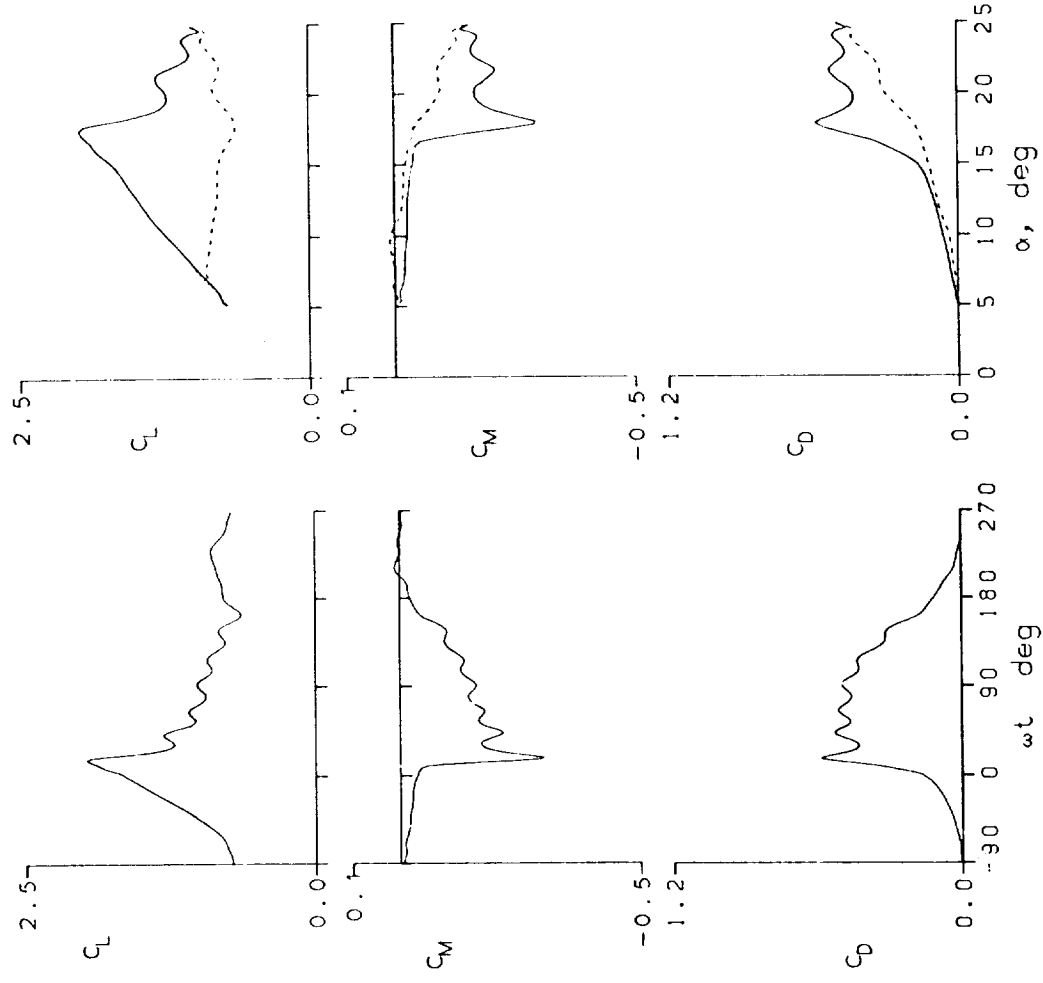


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL TRIP

FRAME : 42100 A0 = 14.83° k = 0.104

Re = 3.79 E6 A1 = 9.89° M = 0.283

CLmax = 2.25 CMmin = -0.42 CDmax = 0.86

αLmax = 20.5° ζ = 0.521 Mmax = 1.084

αCmin = 14.6° -CPmax = 8.8 αMmax = 15.9°

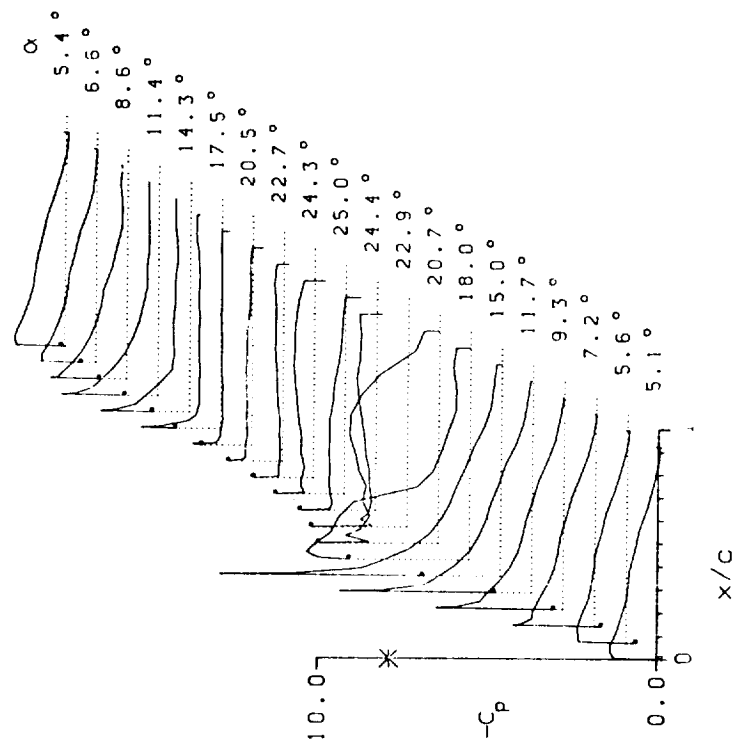
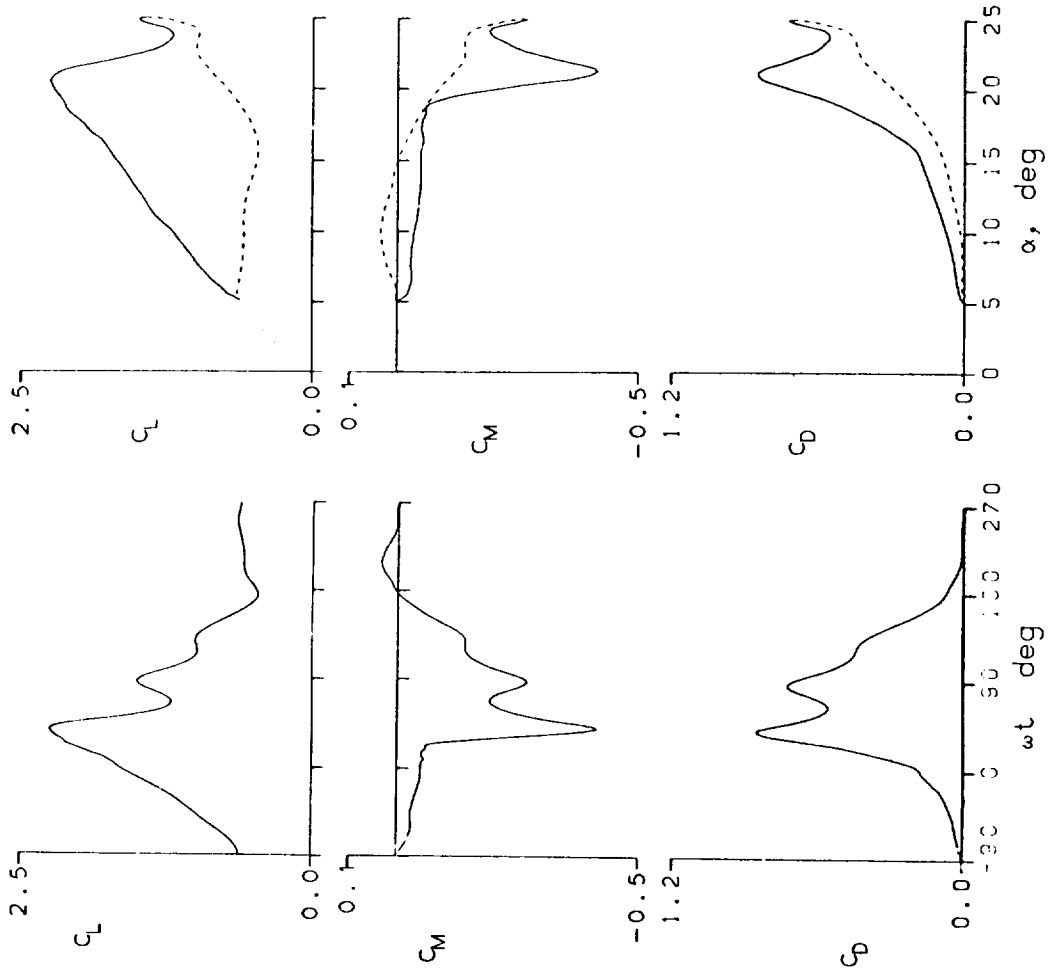


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB - AIRFOIL TRIP

FRAME : 42108 A0 = 14.83° k = 0.051

Re = 2.53 E6 A1 = 9.89° M = 0.183

CLmax = 2.07 CMmin = -0.31 CDmax = 0.67

αLmax = 13.2° ζ = 0.285 Mmax = 0.699

αCmin = 14.5° -CPmax = 11.2 αMmax = 18.0°

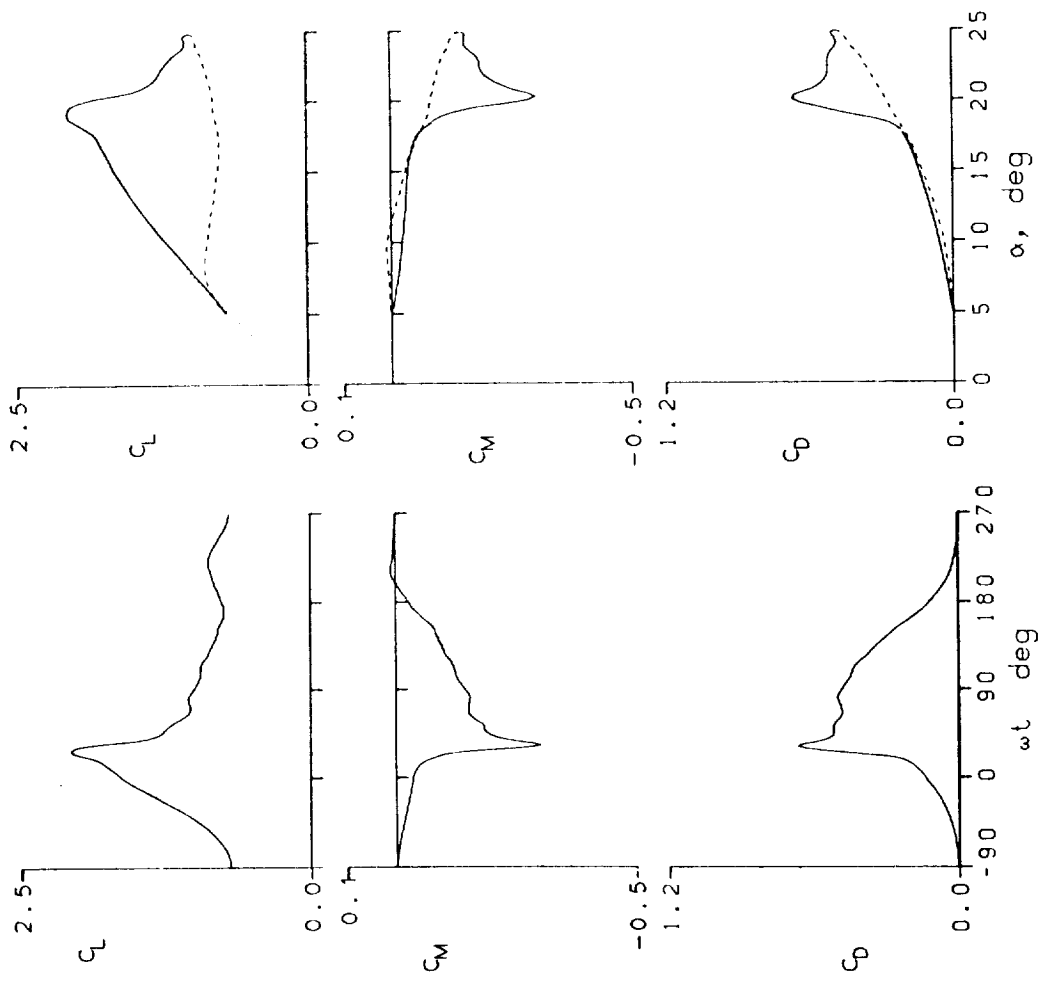


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL TRIP

FRAME : 42110 A0 = 14.82° k = 0.101

Re = 2.53 E6 A1 = 9.91° M = 0.183

$C_{Lmax} = 2.39$ $C_{Mmin} = -0.40$ $C_{Dmax} = 0.91$

$\alpha_{Lmax} = 20.8^\circ$ $\zeta = 0.404$ $M_{max} = 0.713$

$\alpha_{C_{min}} = 14.5^\circ$ $-C_{Pmax} = 11.6$ $\alpha_{Mmax} = 18.9^\circ$

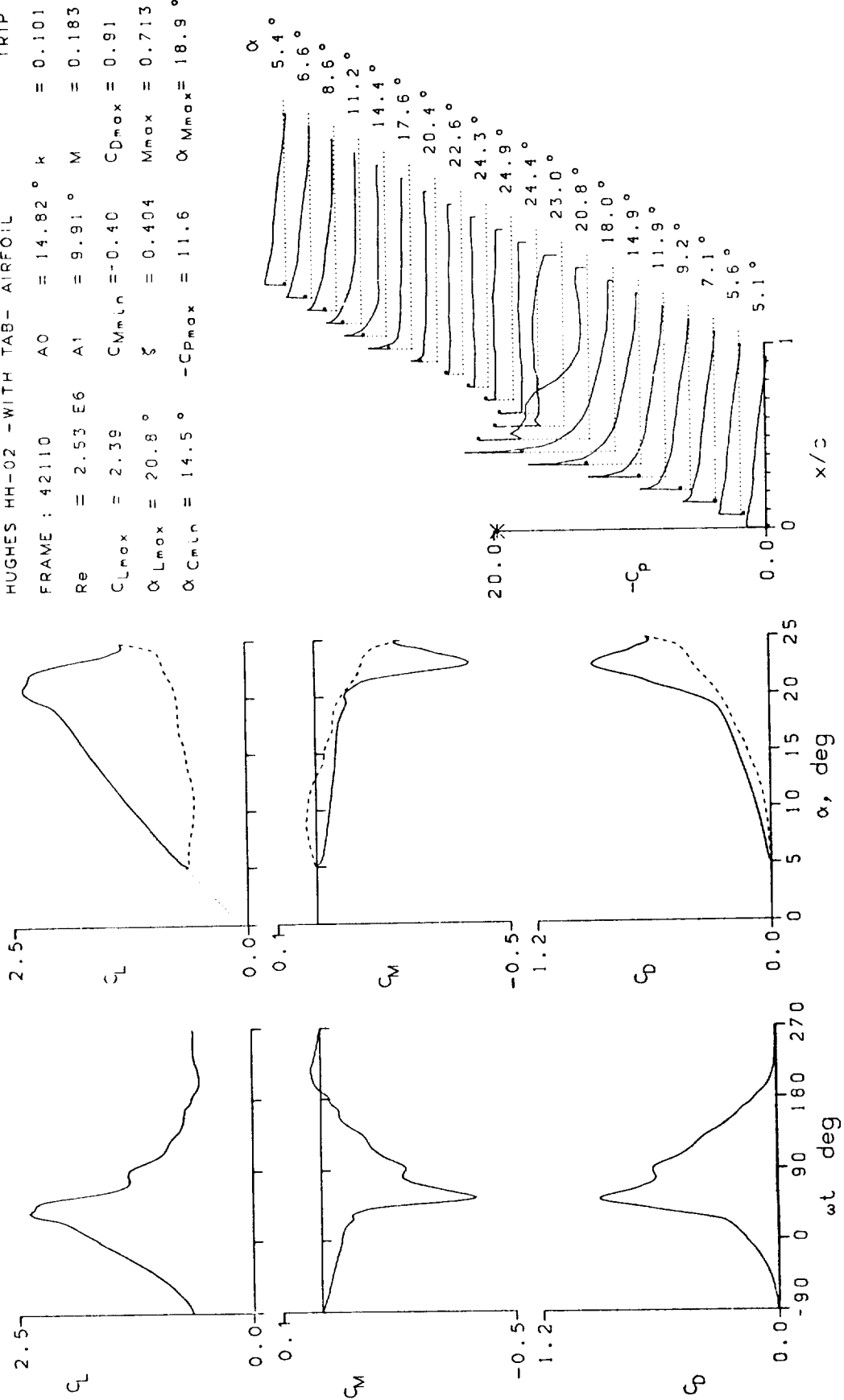


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB - AIRFOIL TRIP
 FRAME : 42113 AC = 14.84° k = 0.152
 Re = 2.53 E6 A1 = 9.88° M = 0.183
 CLmax = 2.61 CMmin = -0.46 CDmax = 1.09
 αLmax = 22.4° ζ = 0.286 Mmax = 0.724
 αCMmin = 14.5° -CPmax = 11.9 αMmax = 19.5°

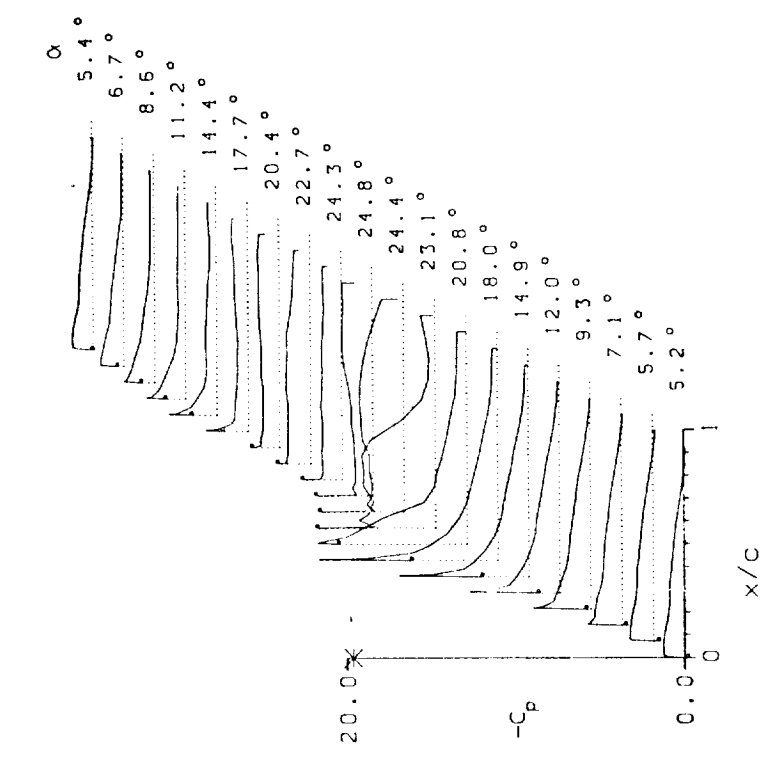
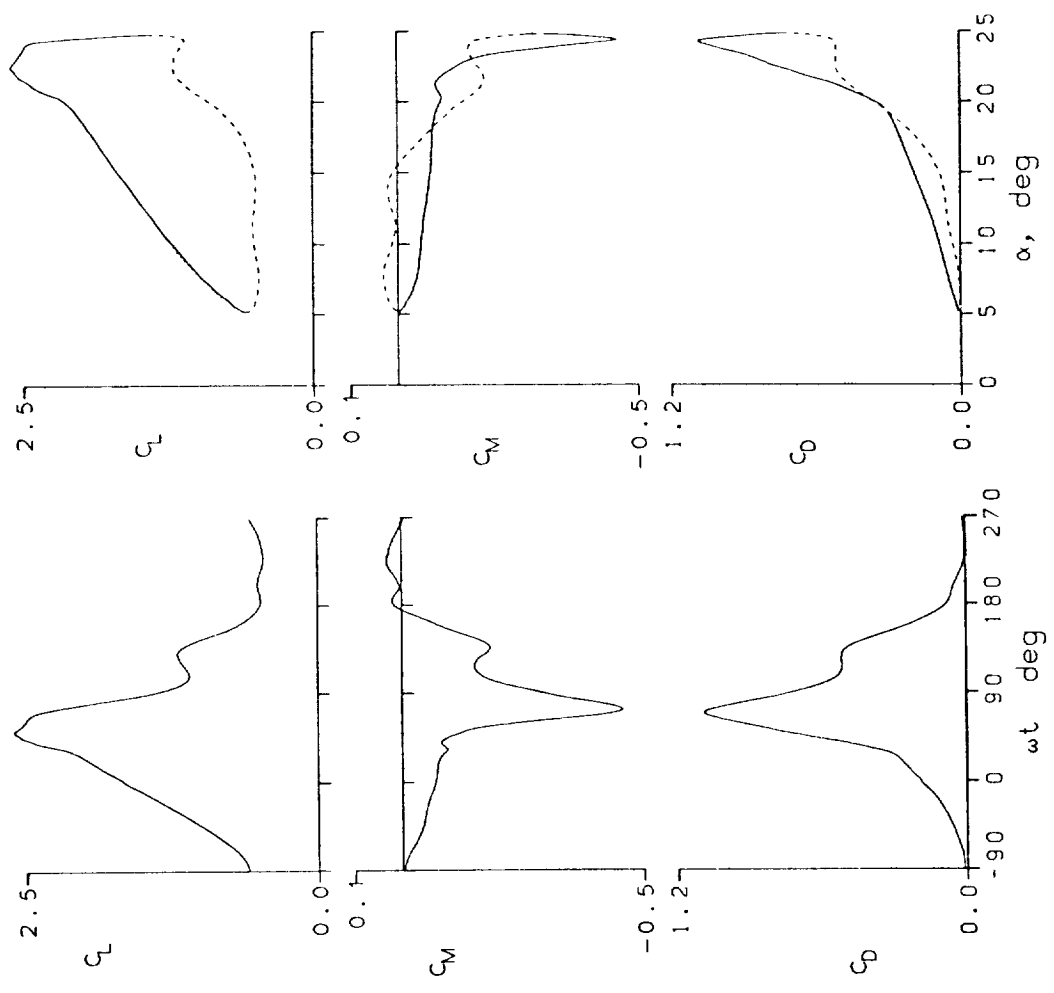


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 42121 AC = 14.82° k = 0.101
 Re = 1.03 E6 A1 = 9.89° M = 0.072
 CLmax = 2.47 CMmin = -0.43 CDmax = 1.03
 αLmax = 22.8° ζ = 0.389 Mmax = 0.312
 αCmin = 14.4° -CPmax = 16.9 αMmax = 21.3°

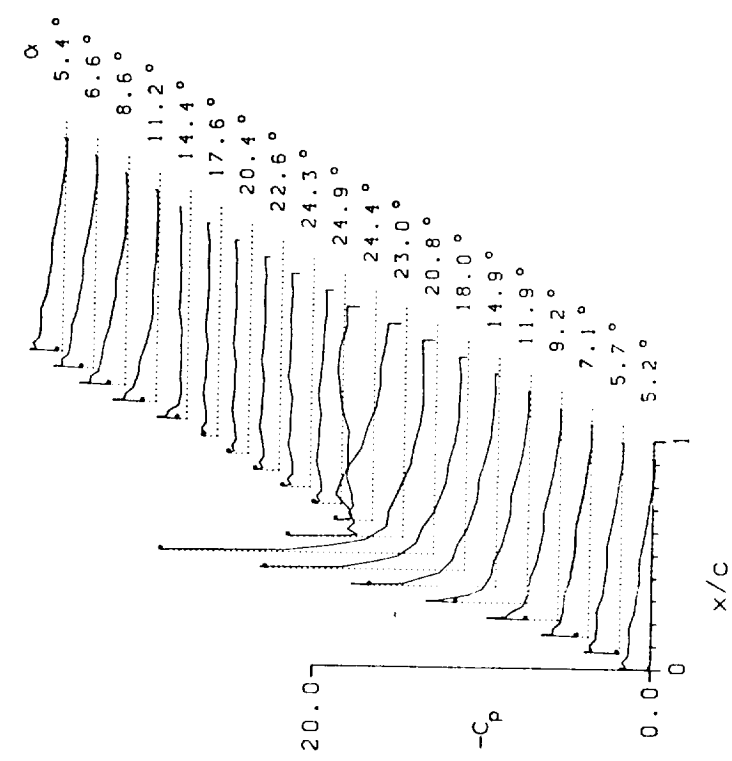
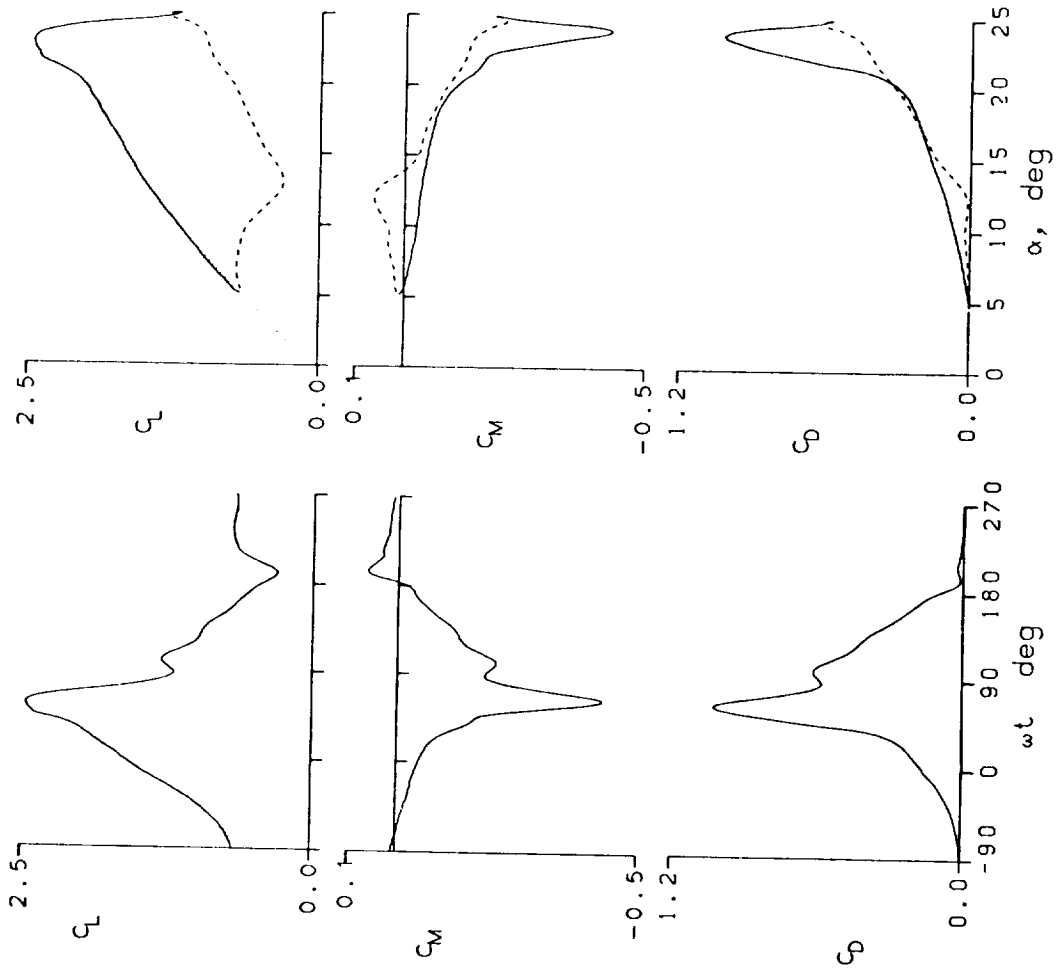


Figure 16.- Continued.

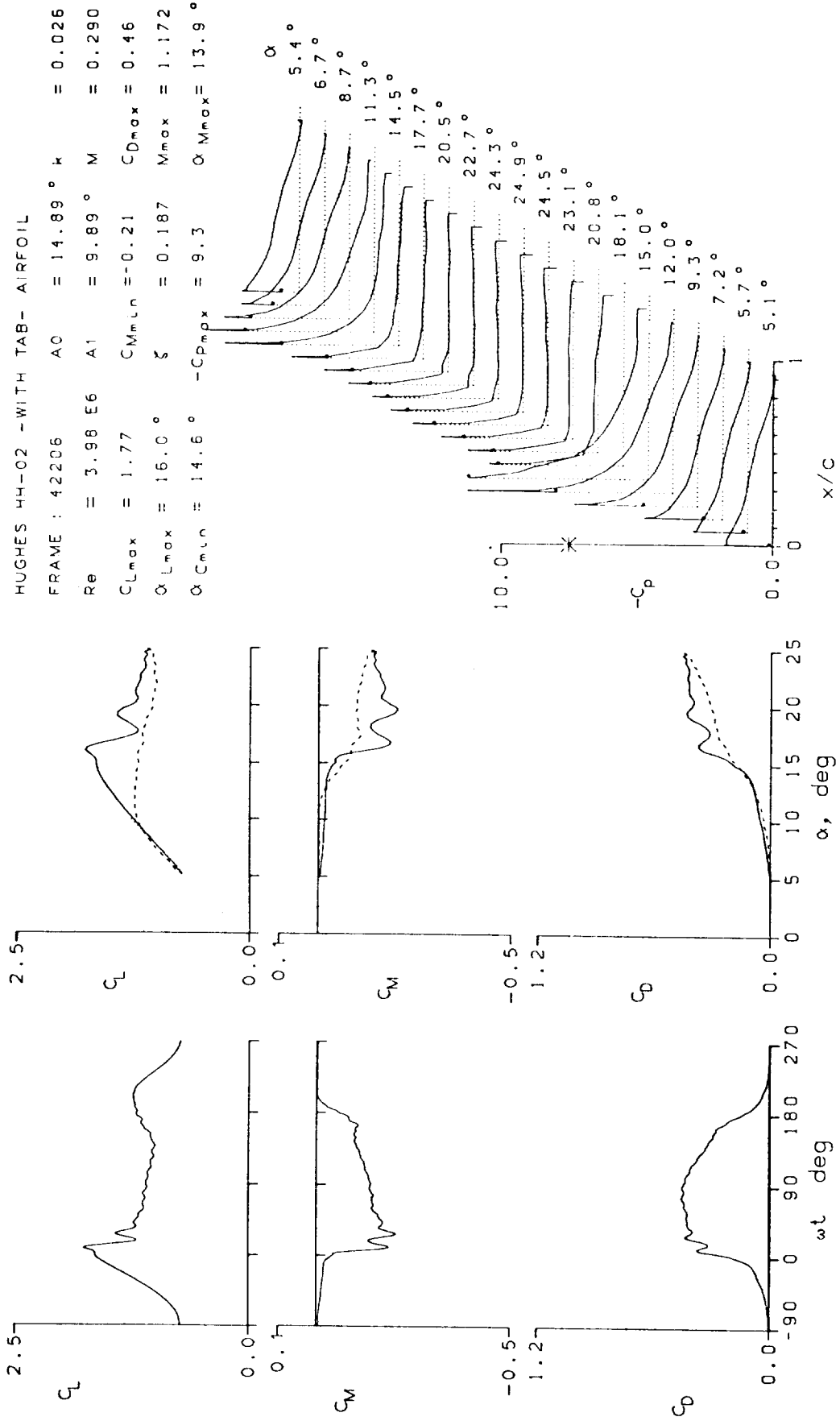


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 42208 A0 = 14.85 ° k = 0.051
 Re = 3.98 E6 A1 = 9.89 ° M = 0.292
 CLmax = 1.95 CMmin = -0.25 CDmax = 0.49
 α Lmax = 17.5 ° ξ = 0.289 Mmax = 1.169
 α CMin = 14.5 ° -CPmax = 9.2 α Mmax = 14.2 °

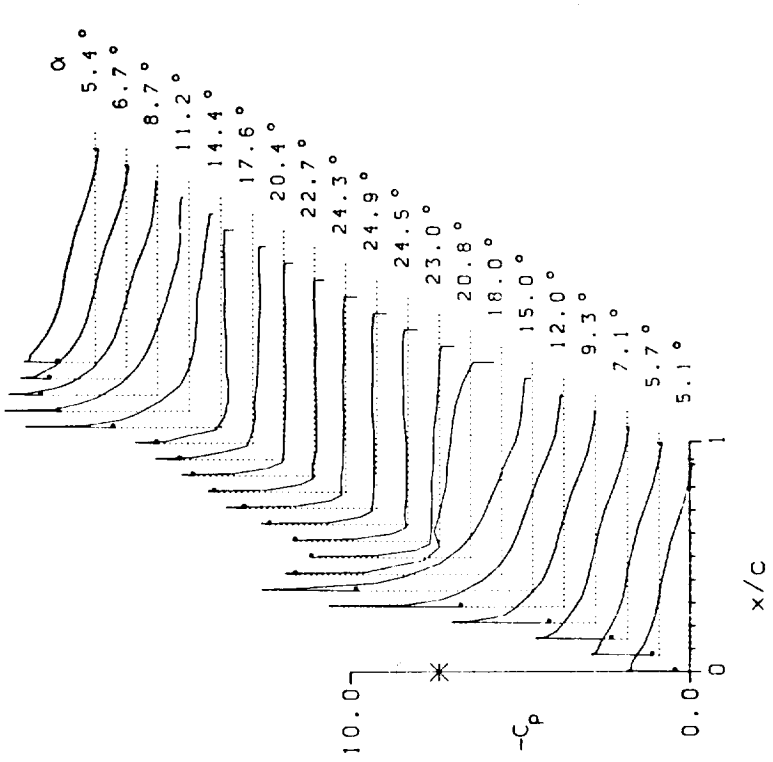
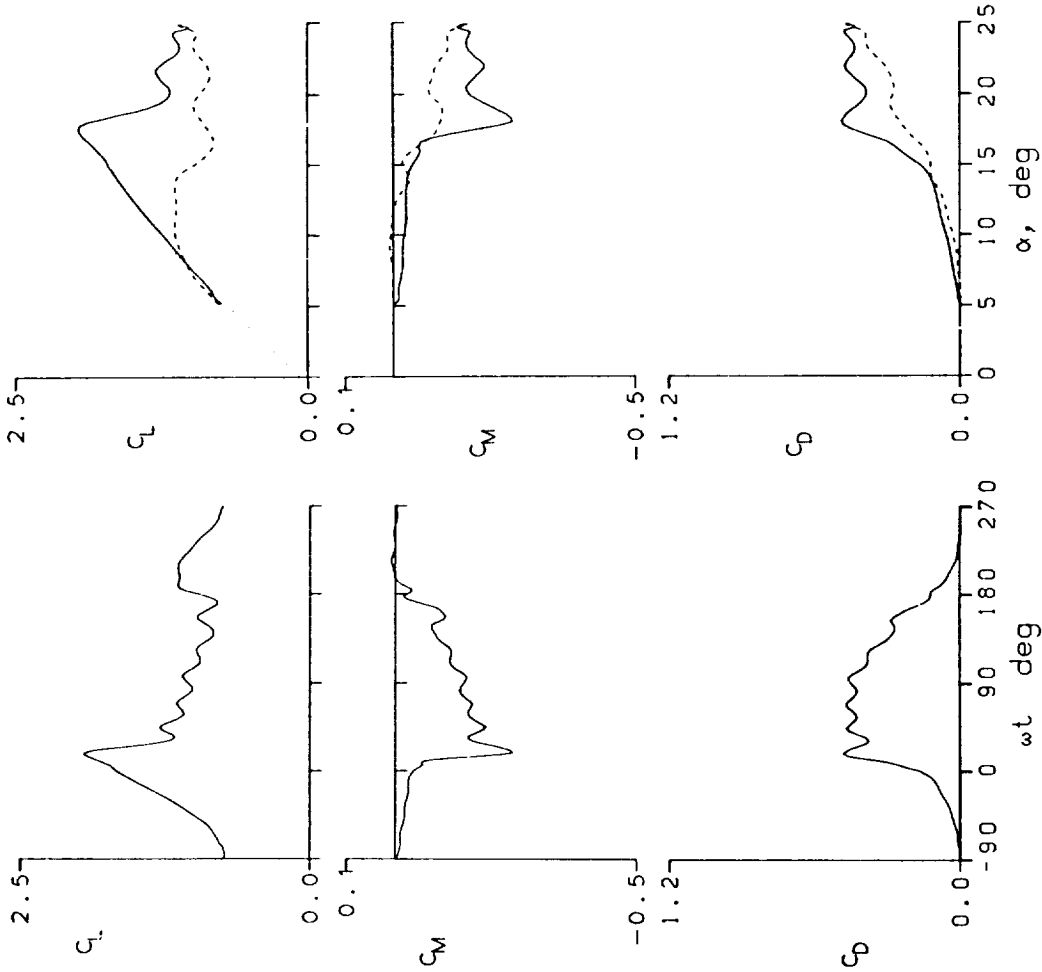


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRAME : 42210 $A_0 = 14.83^\circ$ $k = 0.103$

$Re = 3.91 E6$ $A_1 = 9.95^\circ$ $M = 0.288$

$C_{Lmax} = 2.25$ $C_{Mmin} = -0.36$ $C_{Dmax} = 0.78$

$\alpha_{Lmax} = 20.3^\circ$ $\zeta = 0.543$ $M_{max} = 1.202$

$\alpha_{Crln} = 14.6^\circ$ $-C_{Pmax} = 9.7$ $\alpha_{Mmax} = 15.2^\circ$

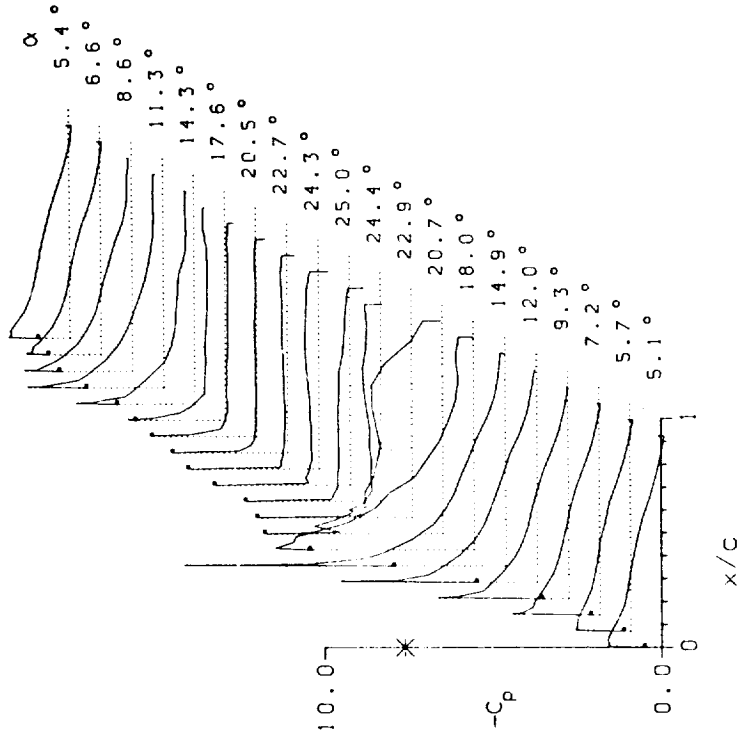
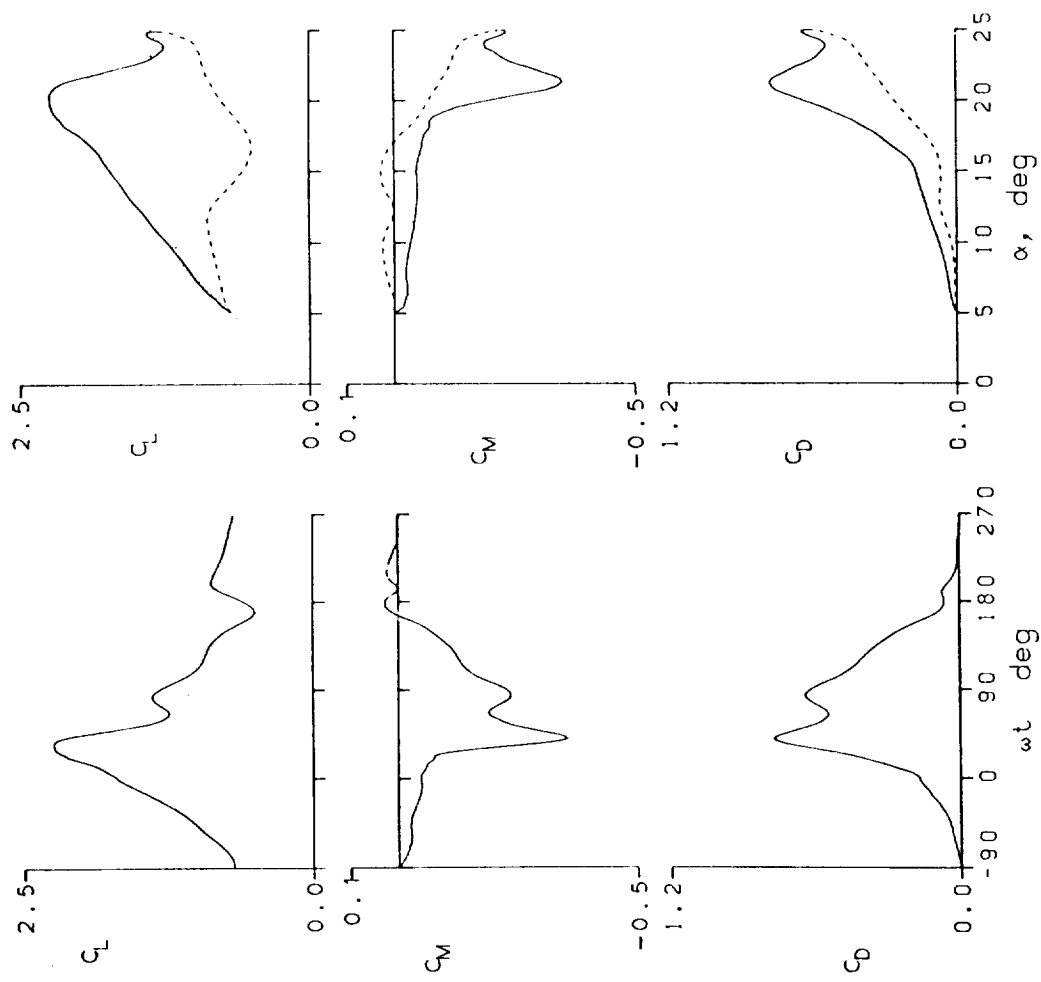


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 42212 A0 = 14.90° k = 0.156
 Re = 3.83 E6 A1 = 9.87° M = 0.283
 CLmax = 2.37 CMmin = -0.43 CDmax = 0.98
 αLmax = 21.7° ζ = 0.472 Mmax = 1.194
 αCmin = 14.7° -CPmax = 10.0 αMmax = 16.6°

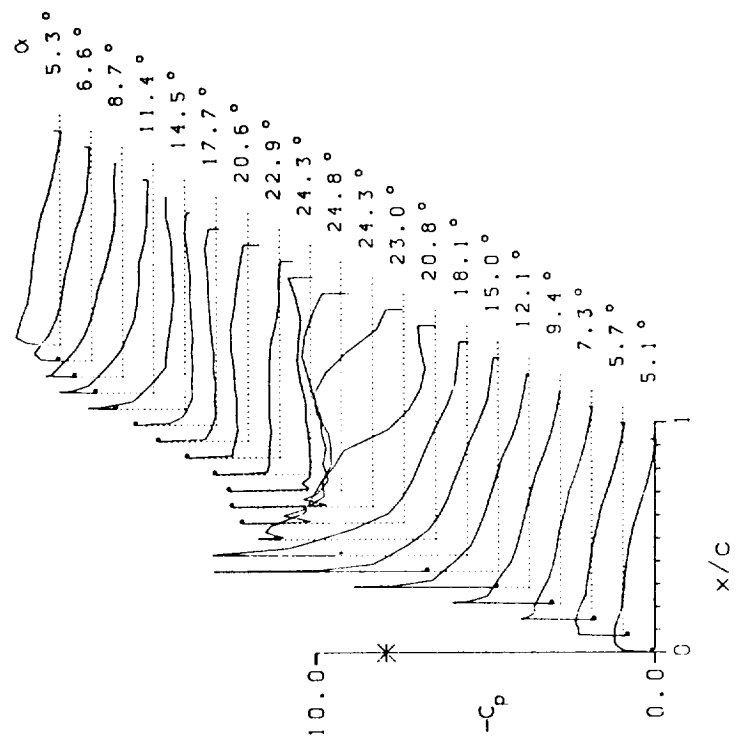
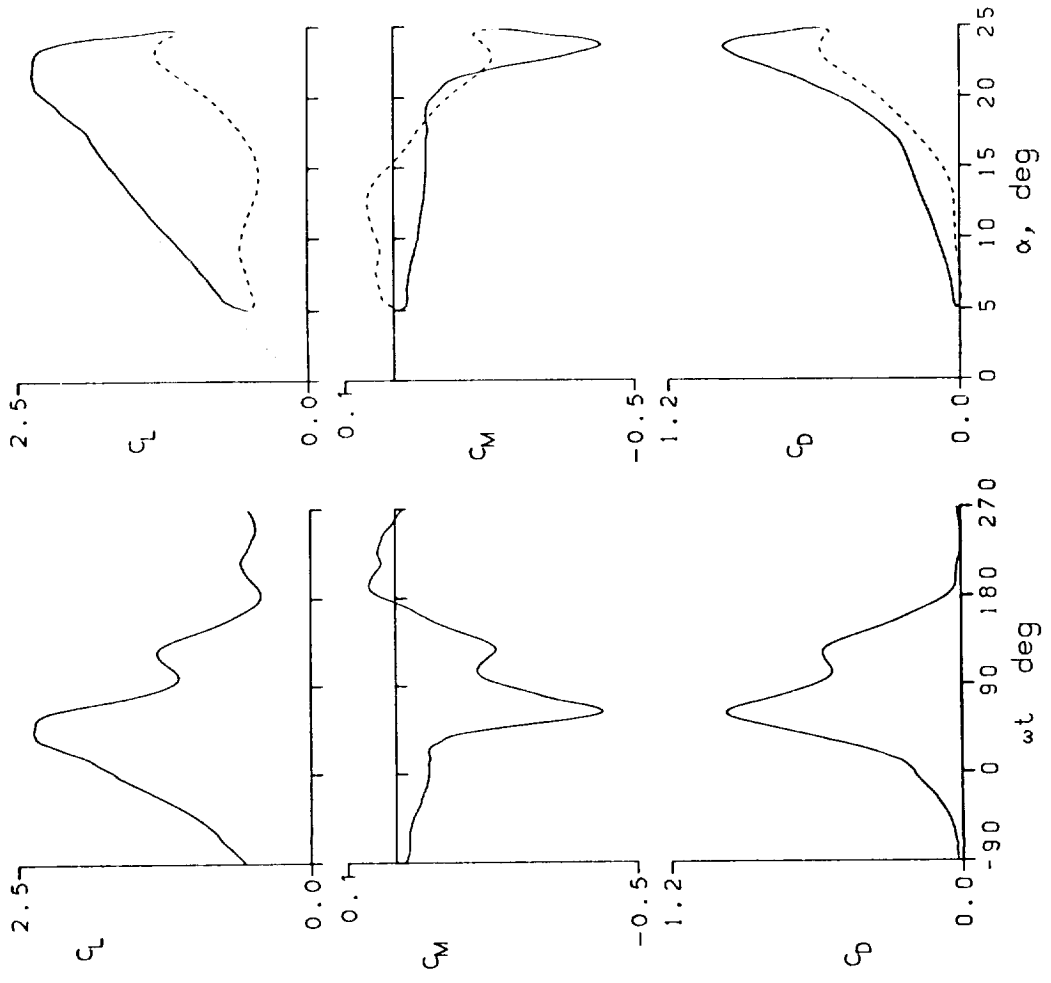


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL
 FRAME : 42217 A0 = 14.90 ° k = 0.156
 Re = 3.83 E6 A1 = 9.87 ° M = 0.283
 CLmax = 2.37 CMmin = -0.44 CDmax = 0.99
 α Lmax = 22.0 ° ξ = 0.466 Mmax = 1.191
 α CMmin = 14.7 ° -CPmax = 10.0 α Mmax = 16.6 °

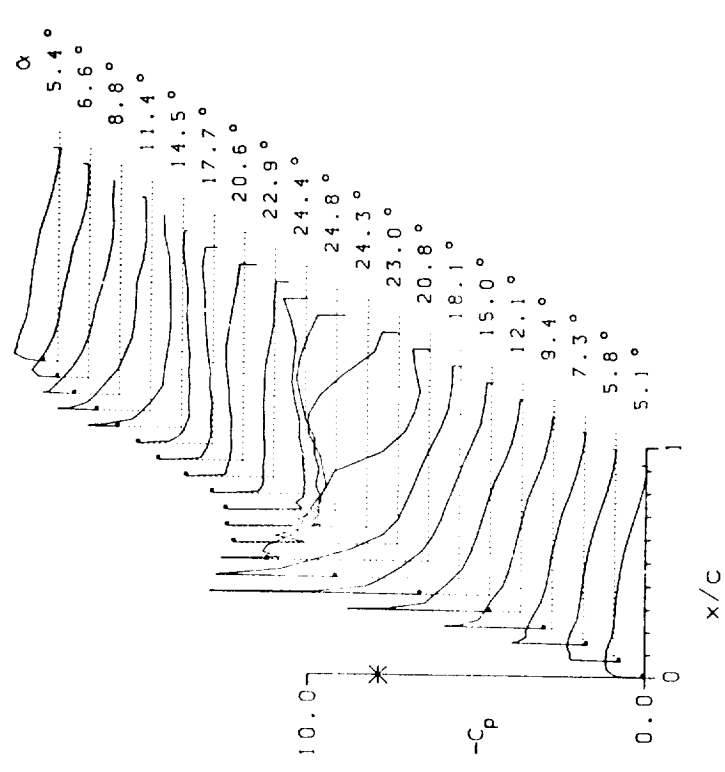
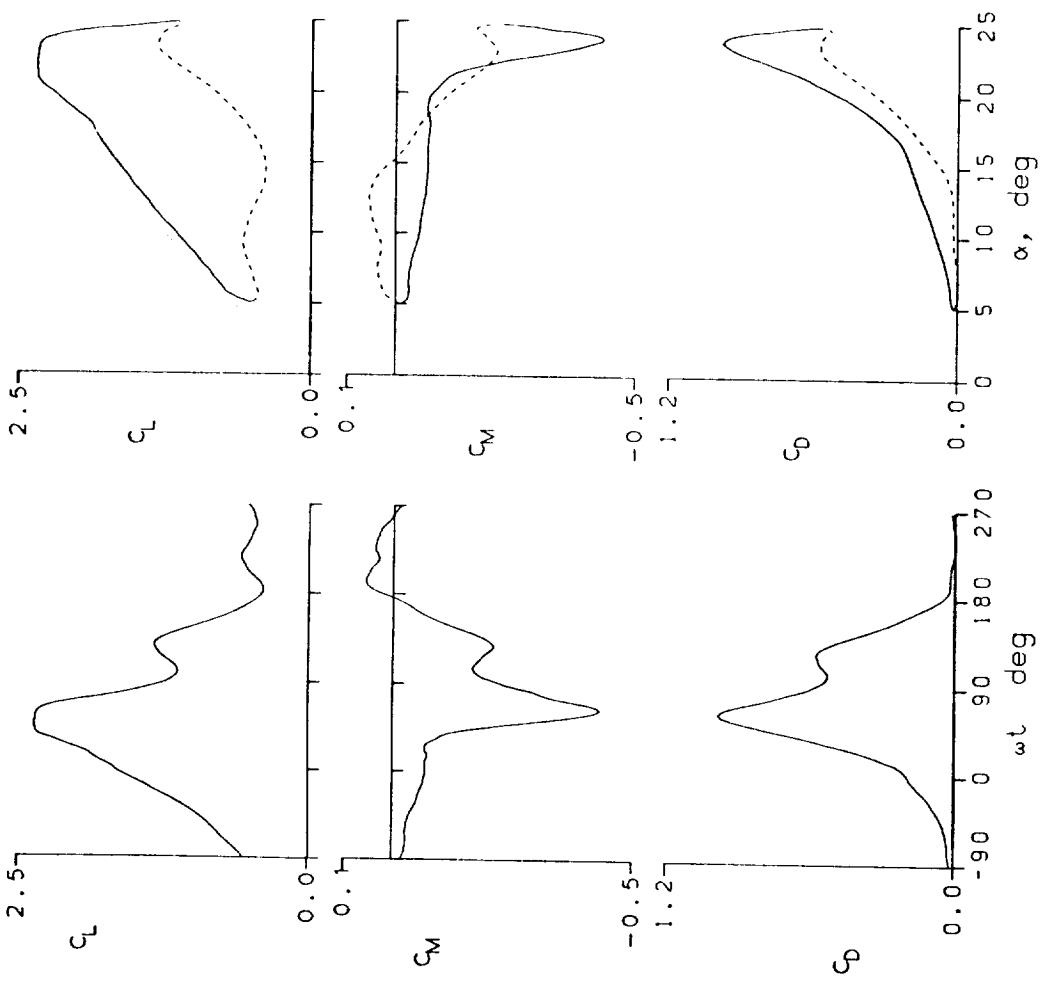


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 42218 A0 = 14.85° k = 0.101
 Re = 3.76 E6 A1 = 9.87° M = 0.278
 CLmax = 2.28 CMmin = -0.37 CDmax = 0.81
 α Lmax = 20.8° ξ = 0.521 Mmax = 1.181
 α Cmin = 14.6° -CPmax = 10.3 α Mmax = 15.6°

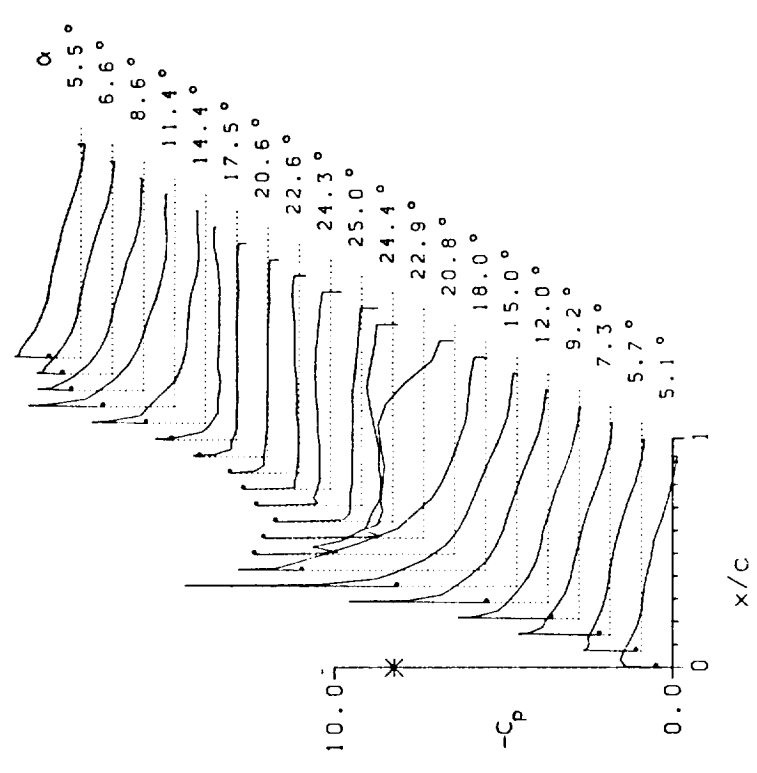
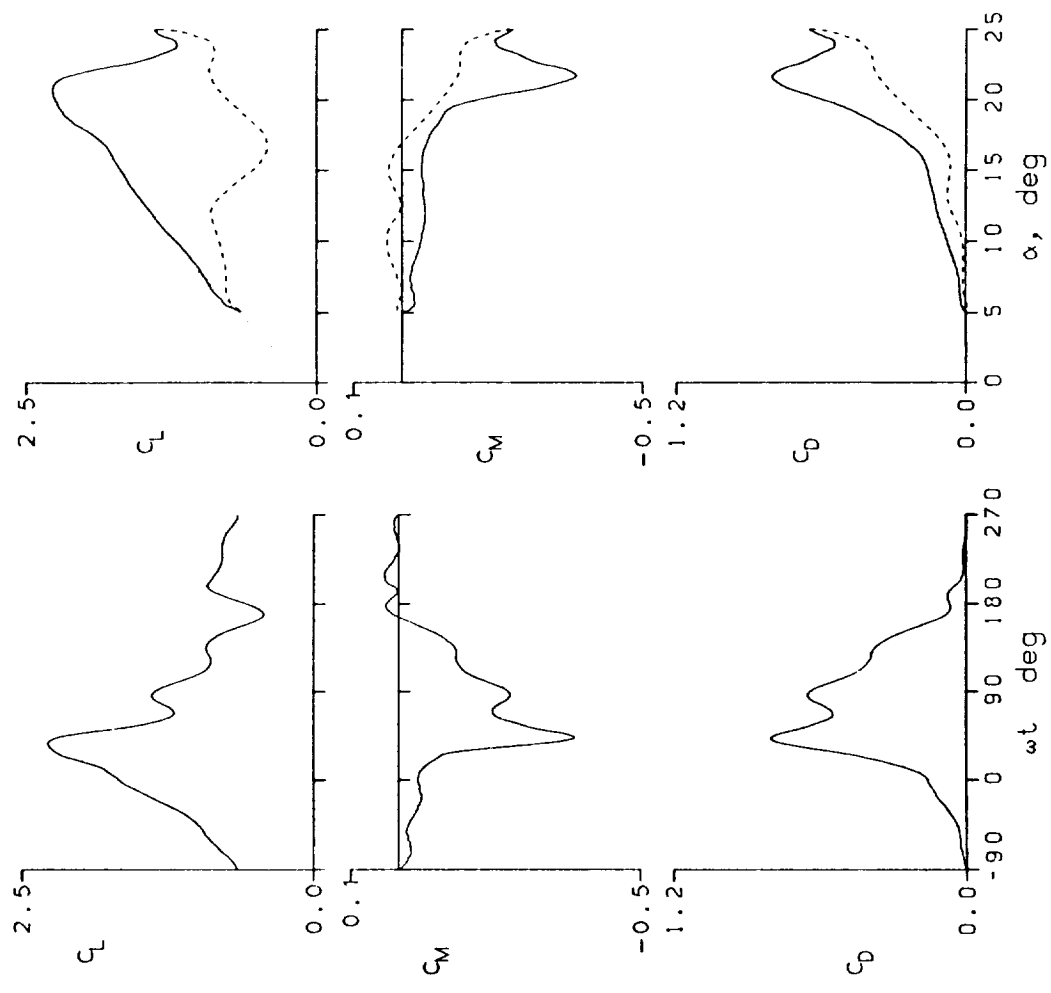


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 42302 $A_0 = 14.84^\circ$ $k = 0.101$
 $Re = 2.53 E6$ $A_1 = 9.89^\circ$ $M = 0.183$
 $C_{Lmax} = 2.55$ $C_{Mmin} = -0.38$ $C_{Dmax} = 0.95$
 $\alpha_{Lmax} = 22.9^\circ$ $\xi = 0.299$ $M_{max} = 0.902$
 $\alpha_{Cmin} = 14.5^\circ$ $-C_{Pmax} = 16.9$ $\alpha_{Mmax} = 20.8^\circ$

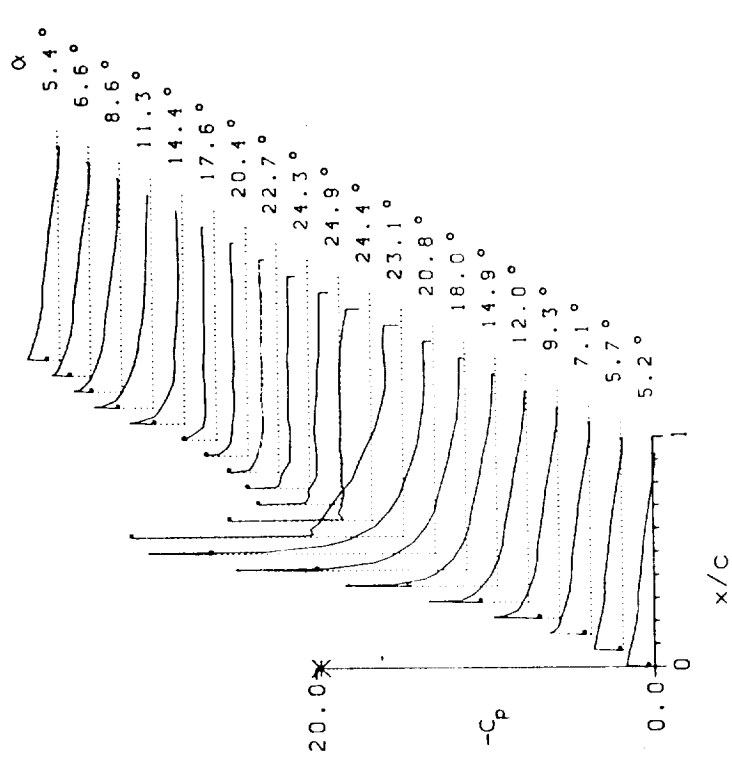
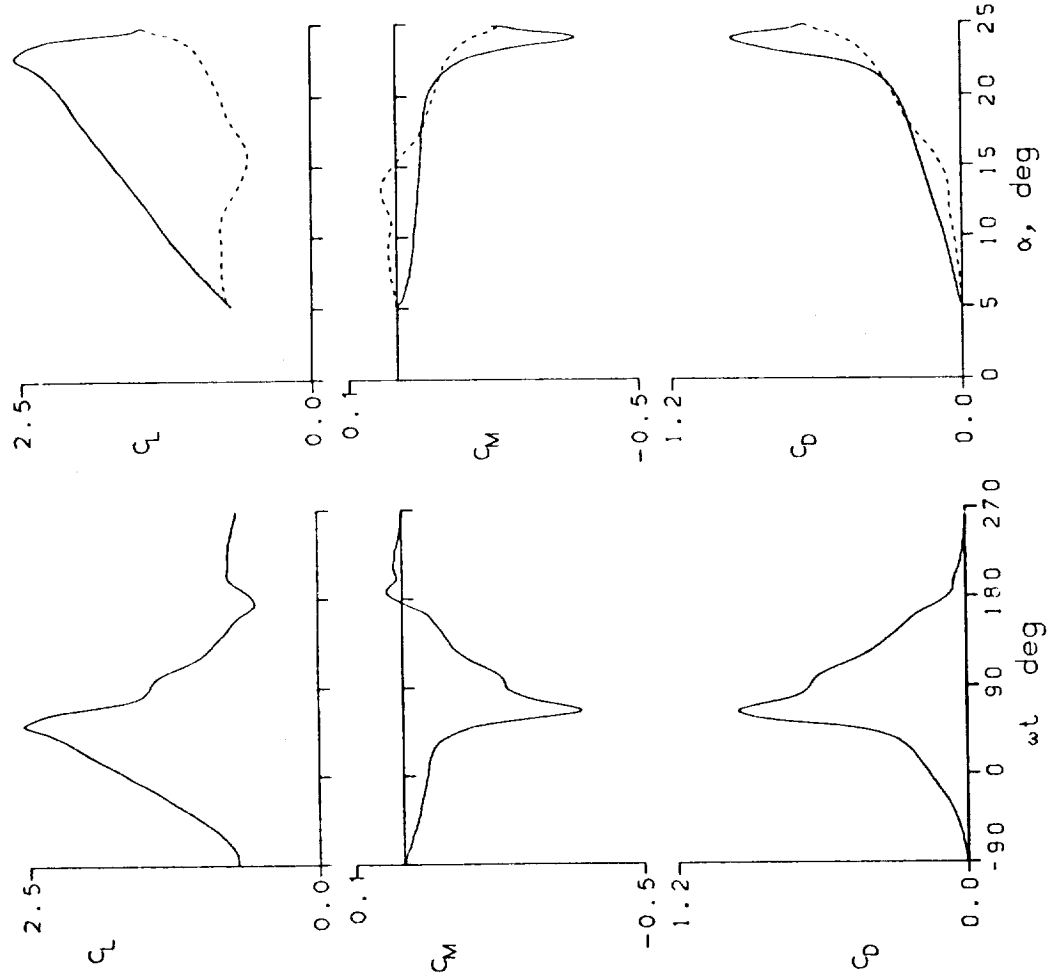


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL
 FRAME : 42309 $A0 = 14.84^\circ$ $k = 0.101$
 $Rc = 2.98 [6$ $A1 = 9.88^\circ$ $M = 0.218$
 $C_{Lmax} = 2.41$ $C_{Mmin} = -0.39$ $C_{Dmax} = 0.92$
 $\alpha_{Lmax} = 21.3^\circ$ $\zeta = 0.466$ $M_{max} = 1.083$
 $\alpha_{Cmin} = 14.6^\circ$ $-C_{Pmax} = 15.3$ $\alpha_{Mmax} = 18.9^\circ$

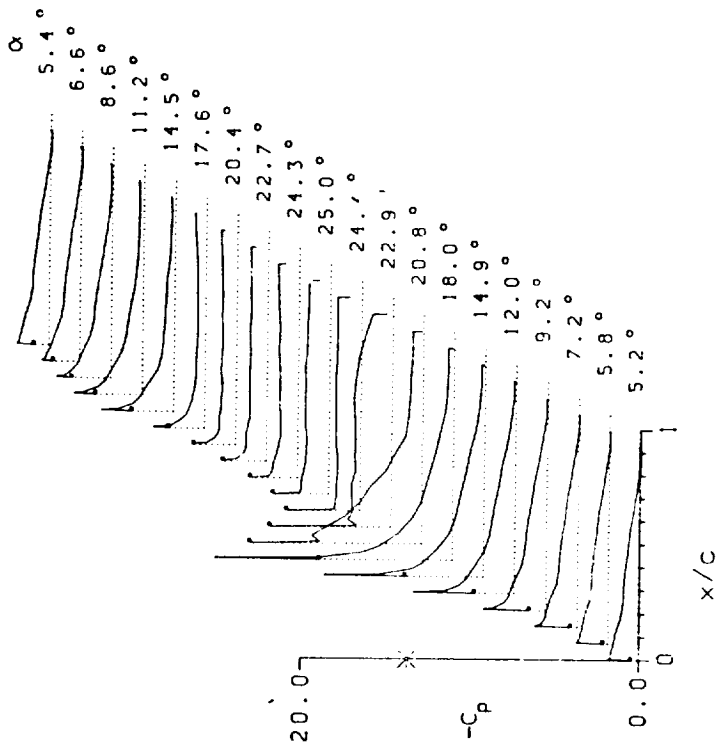
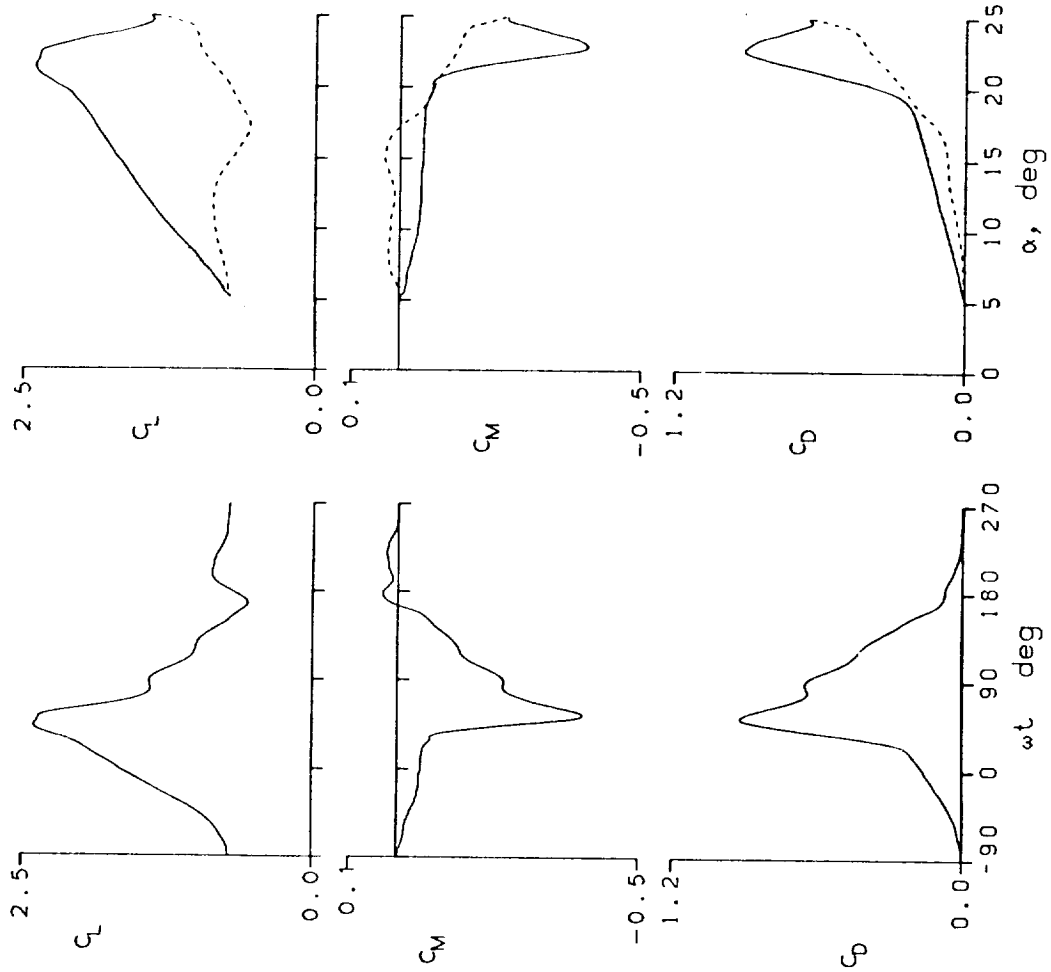


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 42313 $A_0 = 14.86^\circ$ $k = 0.101$
 $Re = 3.33 E6$ $A_1 = 9.86^\circ$ $M = 0.246$
 $C_{Lmax} = 2.30$ $C_{Mmin} = -0.38$ $C_{Dmax} = 0.86$
 $\alpha_{Lmax} = 20.1^\circ$ $\xi = 0.487$ $M_{max} = 1.109$
 $\alpha_{Cmin} = 14.5^\circ$ $-C_{Pmax} = 12.2$ $\alpha_{Mmax} = 17.5^\circ$

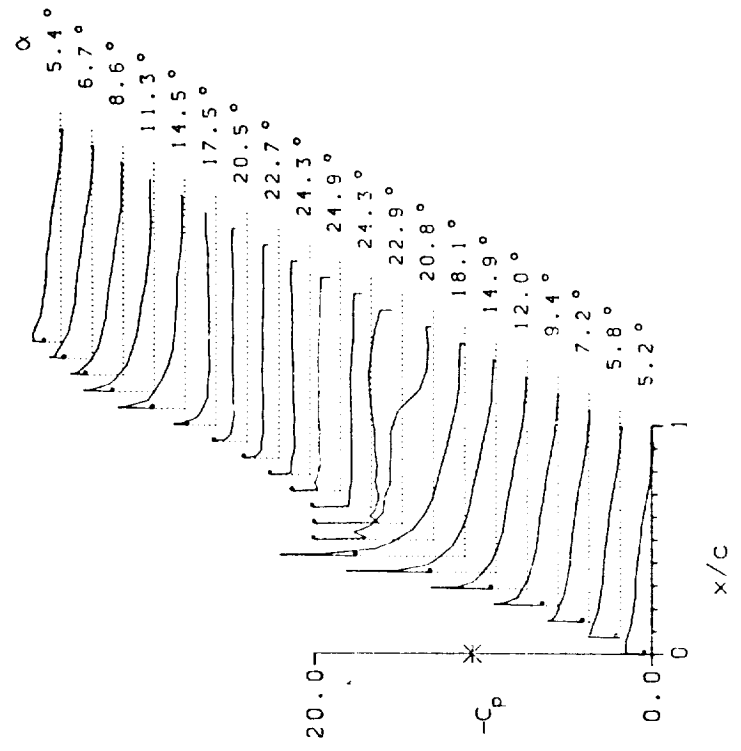
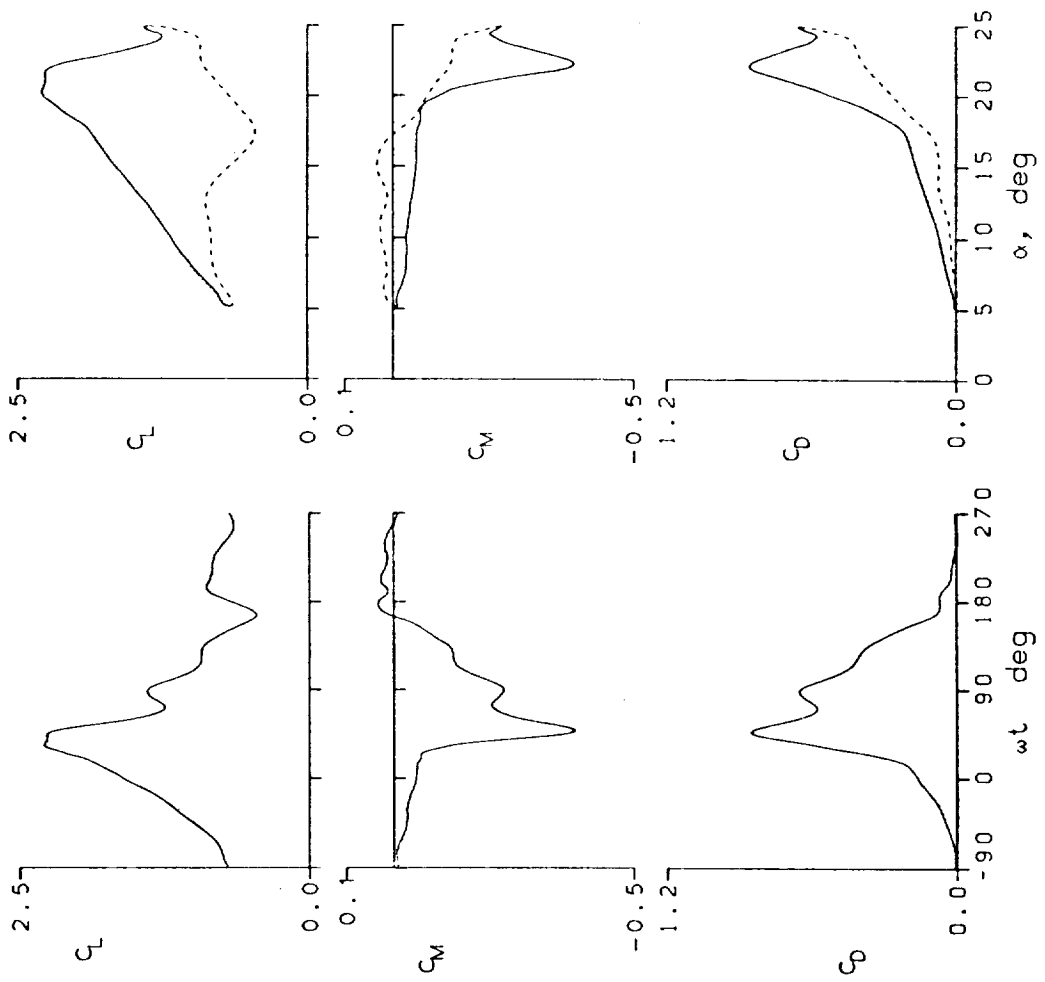
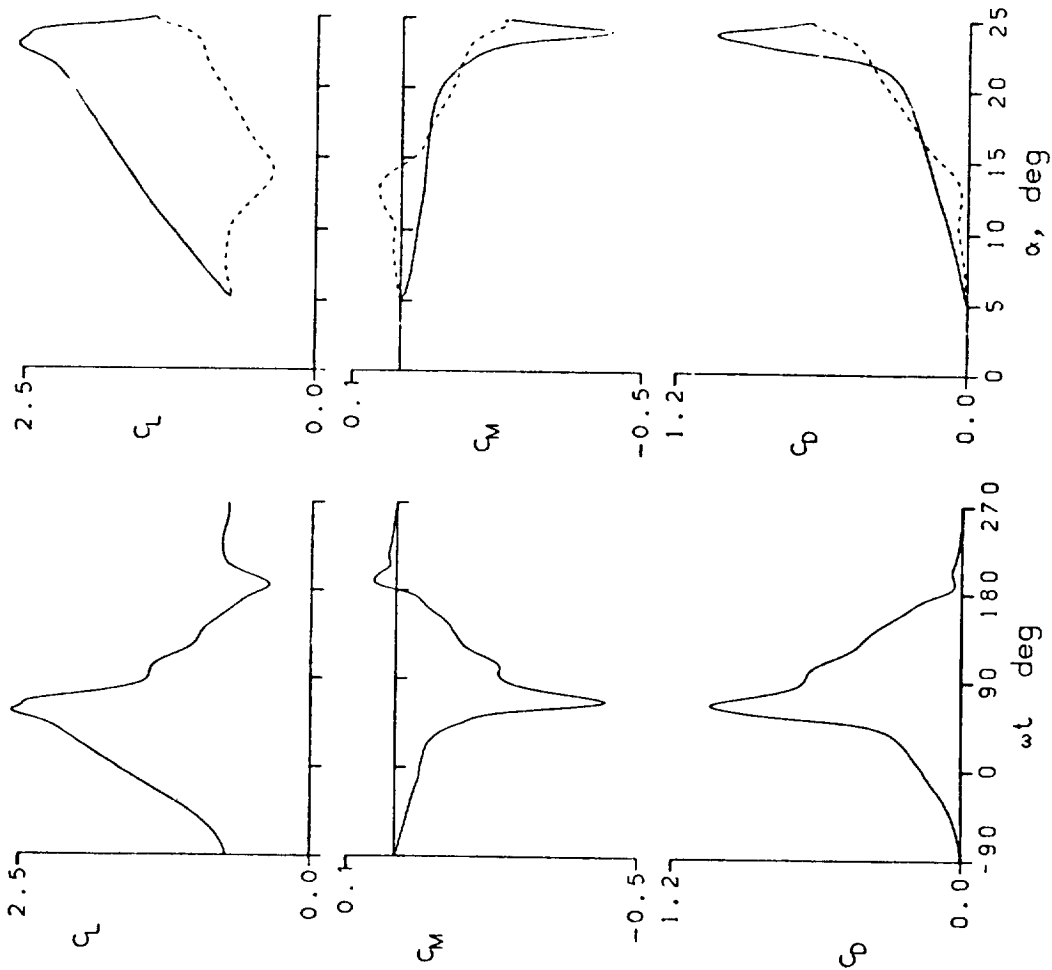


Figure 16.- Continued.



HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 42321 $A_0 = 14.82^\circ$ $k = 0.101$
 $Re = 1.51 E6$ $A_1 = 9.84^\circ$ $M = 0.108$
 $C_{Lmax} = 2.58$ $C_{Mmin} = -0.44$ $C_{Dmax} = 1.05$
 $\alpha_{Lmax} = 22.8^\circ$ $\xi = 0.288$ $M_{max} = 0.502$
 $\alpha_{Cmin} = 14.4^\circ$ $-C_{pmax} = 18.5$ $\alpha_{Mmax} = 22.3^\circ$

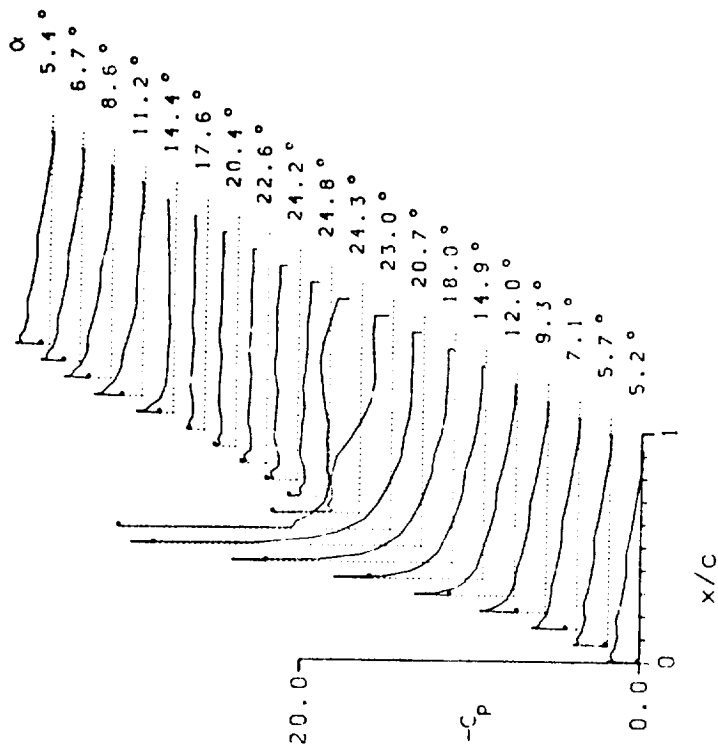


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 43019 A0 = 9.57 ° k = 0.010
 Re = 3.90 E6 A1 = 10.04 ° M = 0.297
 $C_{Lmax} = 1.53$ $C_{Mmin} = -0.12$ $C_{Dmax} = 0.30$
 $\alpha_{Lmax} = 12.8^\circ$ $\zeta = 0.042$ $M_{max} = 1.177$
 $\alpha_{Cmin} = 9.1^\circ$ $-C_{pmax} = 8.9$ $\alpha_{Mmax} = 13.2^\circ$

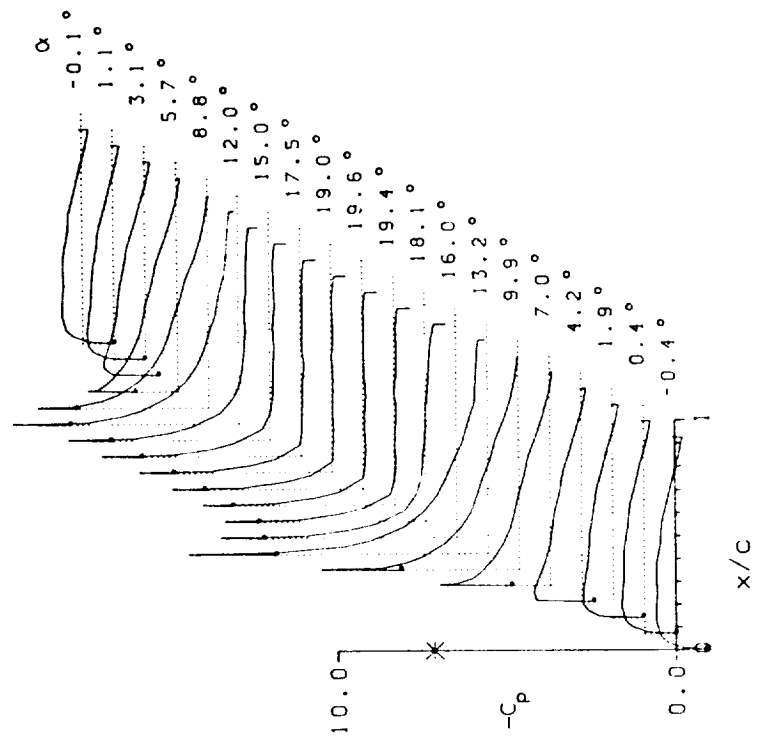
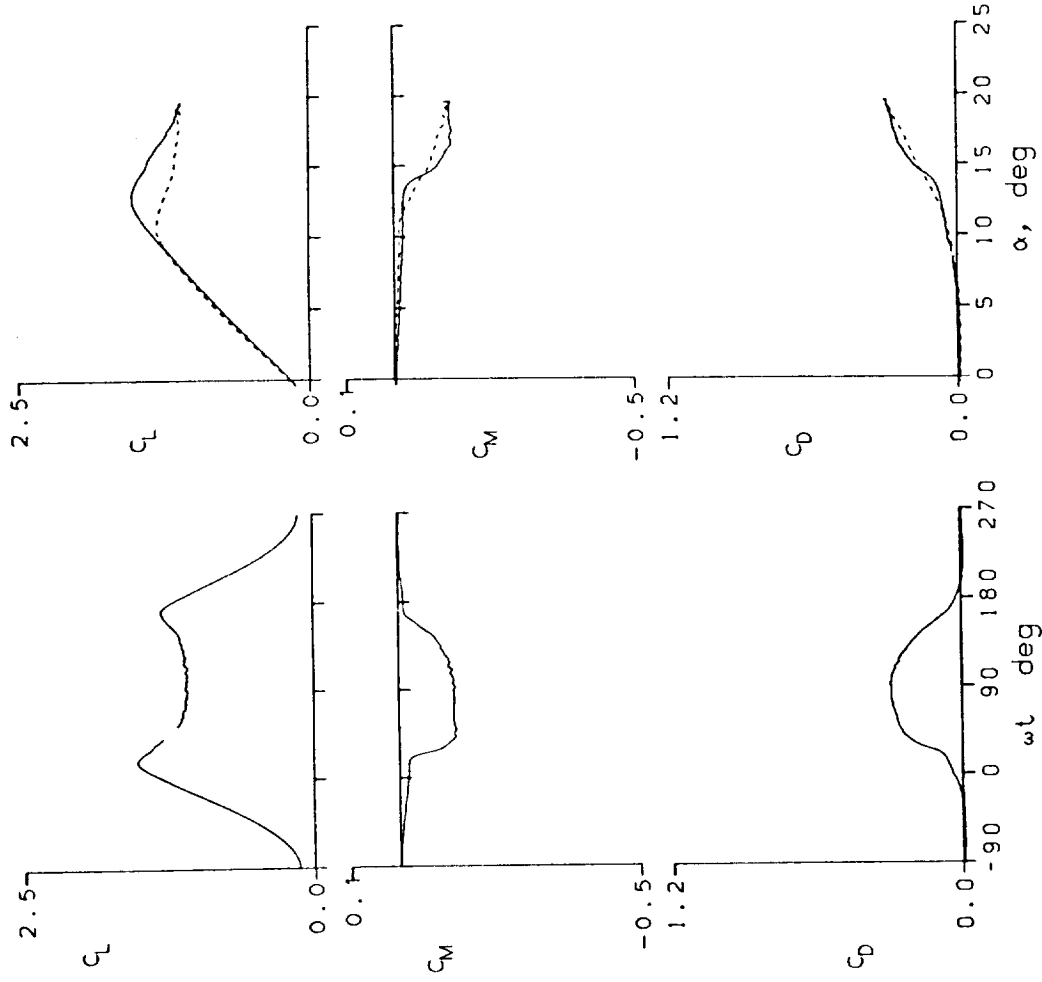


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRAME : 43106 A0 = 9.78 ° k = 0.025

Re = 3.93 E6 A1 = 9.90 ° M = 0.301

C_{Lmax} = 1.64 C_{Mmin} = -0.19 C_{Dmax} = 0.41

α_{Lmax} = 15.6 ° ζ = 0.088 M_{max} = 1.206

α_{Cmin} = 9.2 ° $-C_{pmax}$ = 8.9 α_{Mmax} = 13.5 °

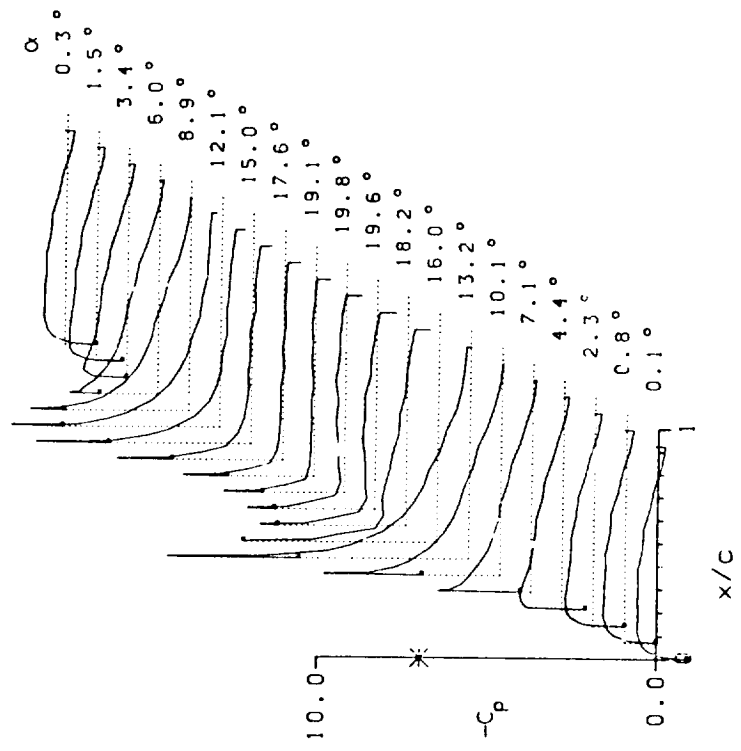
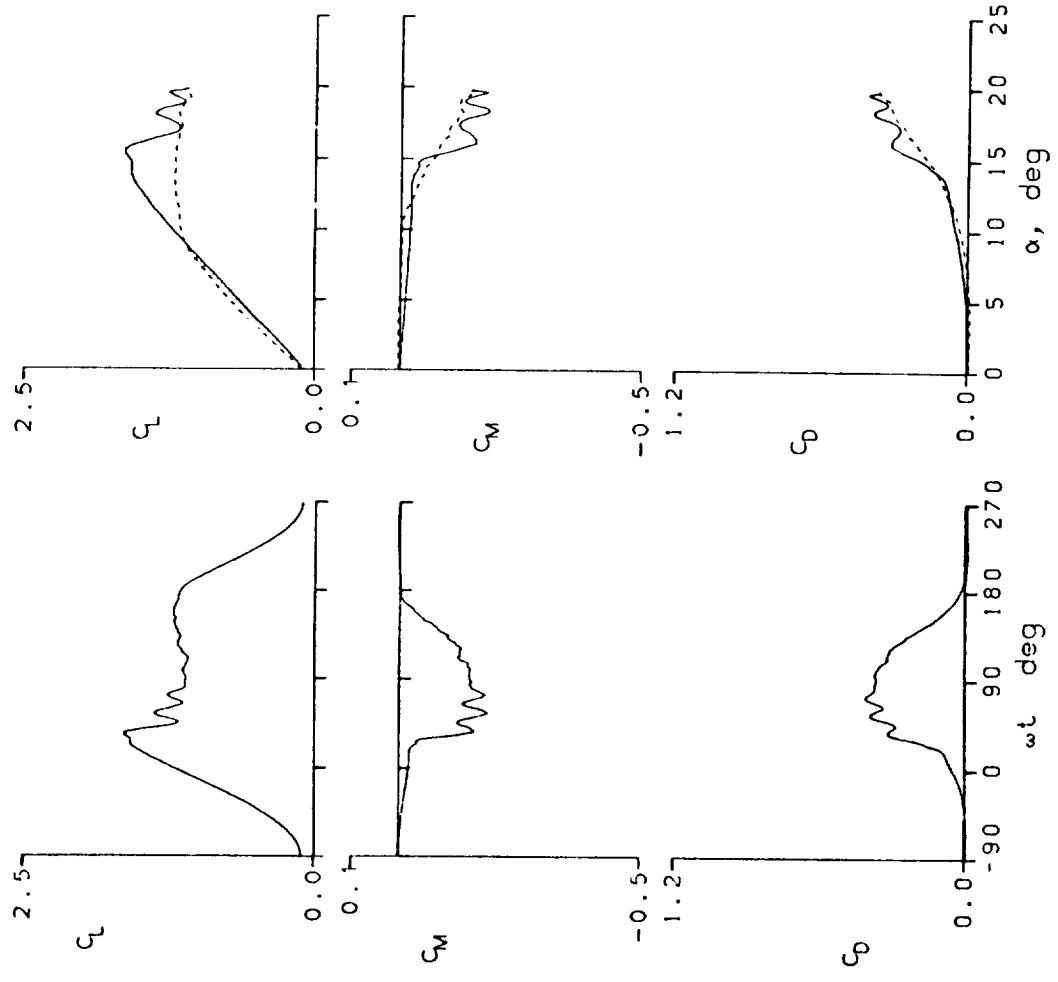


Figure 16.- Continued.

HUGHES HM-02 - WITH TAB - AIRFOIL
 FRAME : 43108 A0 = 9.76° k = 0.050
 Re = 3.93 E6 A1 = 9.91° M = 0.302
 C_{Lmax} = 1.92 C_{Mmin} = -0.27 C_{Dmax} = 0.47
 α_{Lmax} = 15.8° ζ = 0.160 M_{max} = 1.208
 α_{Cmin} = 3.2° -C_{pmax} = 8.9 α_{Mmax} = 13.8°

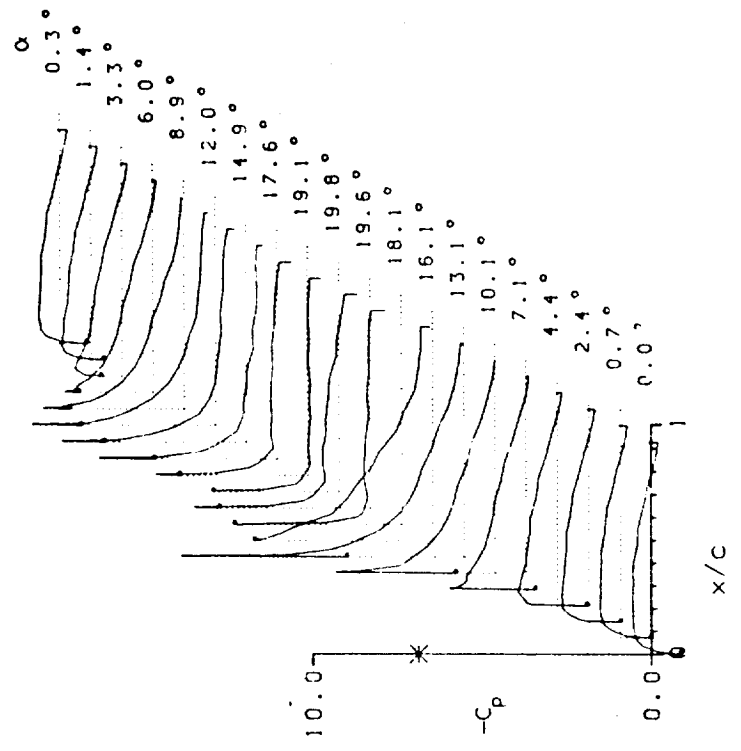
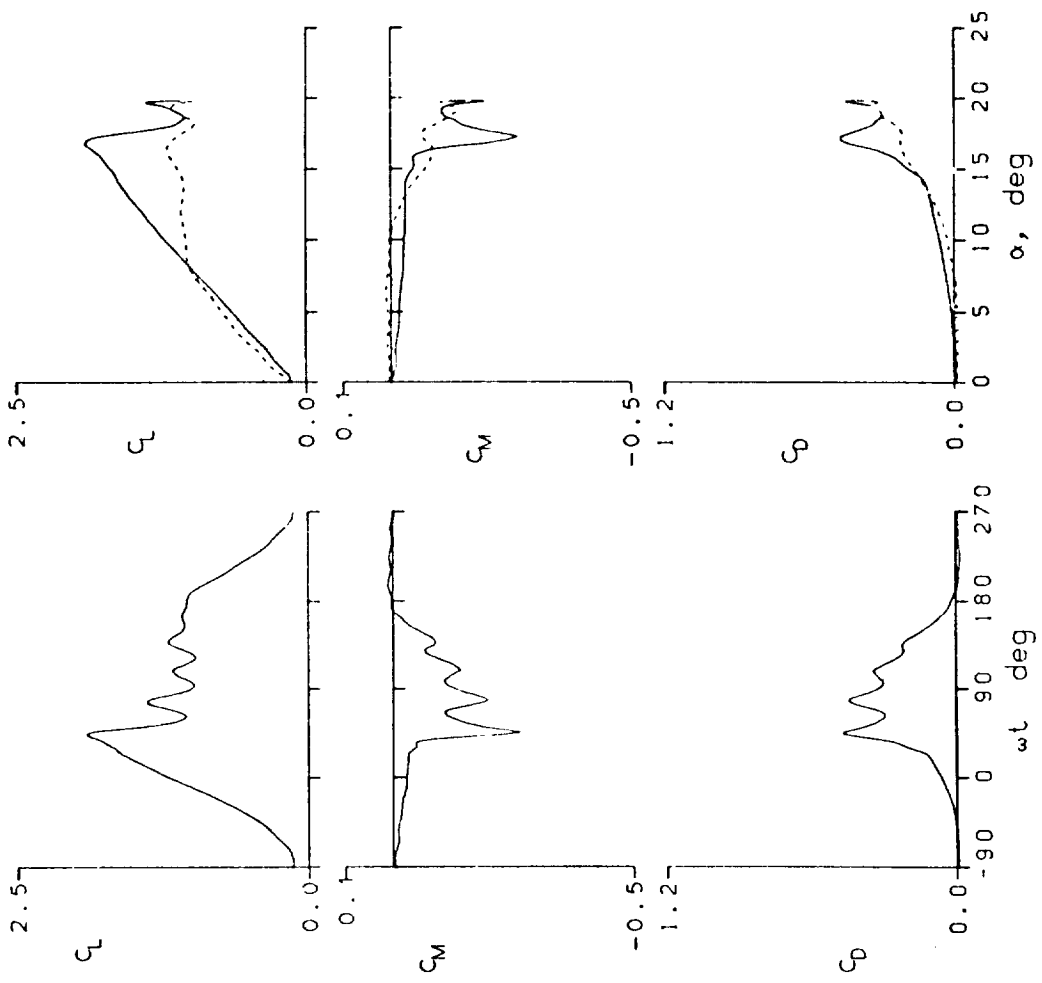


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 43112 A0 = 9.78 ° k = 0.099

Re = 3.95 E6 A1 = 9.87 ° M = 0.302

$C_{Lmax} = 2.13$ $C_{Mmin} = -0.33$ $C_{Dmax} = 0.64$

$\alpha_{Lmax} = 18.4^\circ$ $\xi = 0.314$ $M_{max} = 1.217$

$\alpha_{Cmin} = 9.3^\circ$ $-C_{pmax} = 9.0$ $\alpha_{Mmax} = 14.7^\circ$

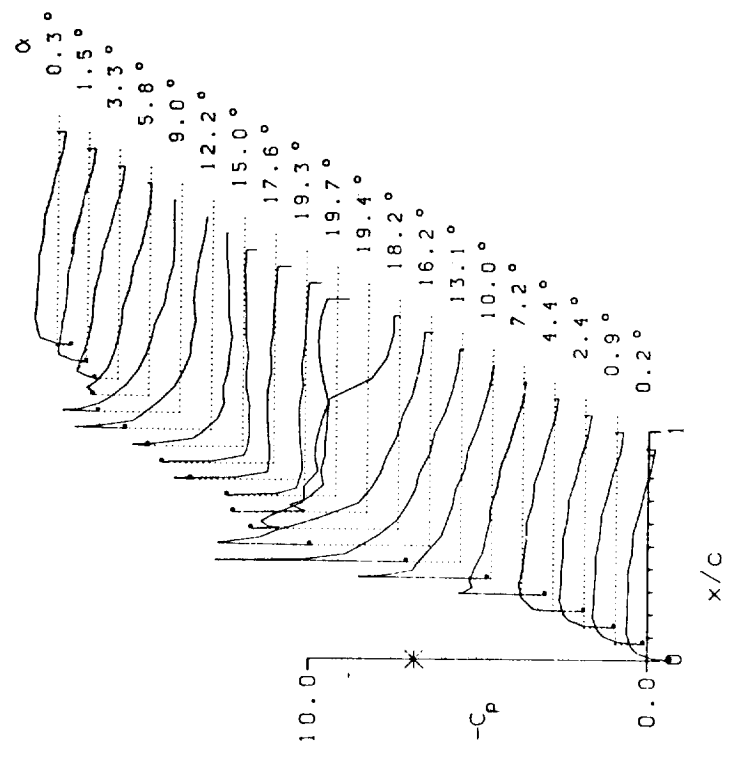
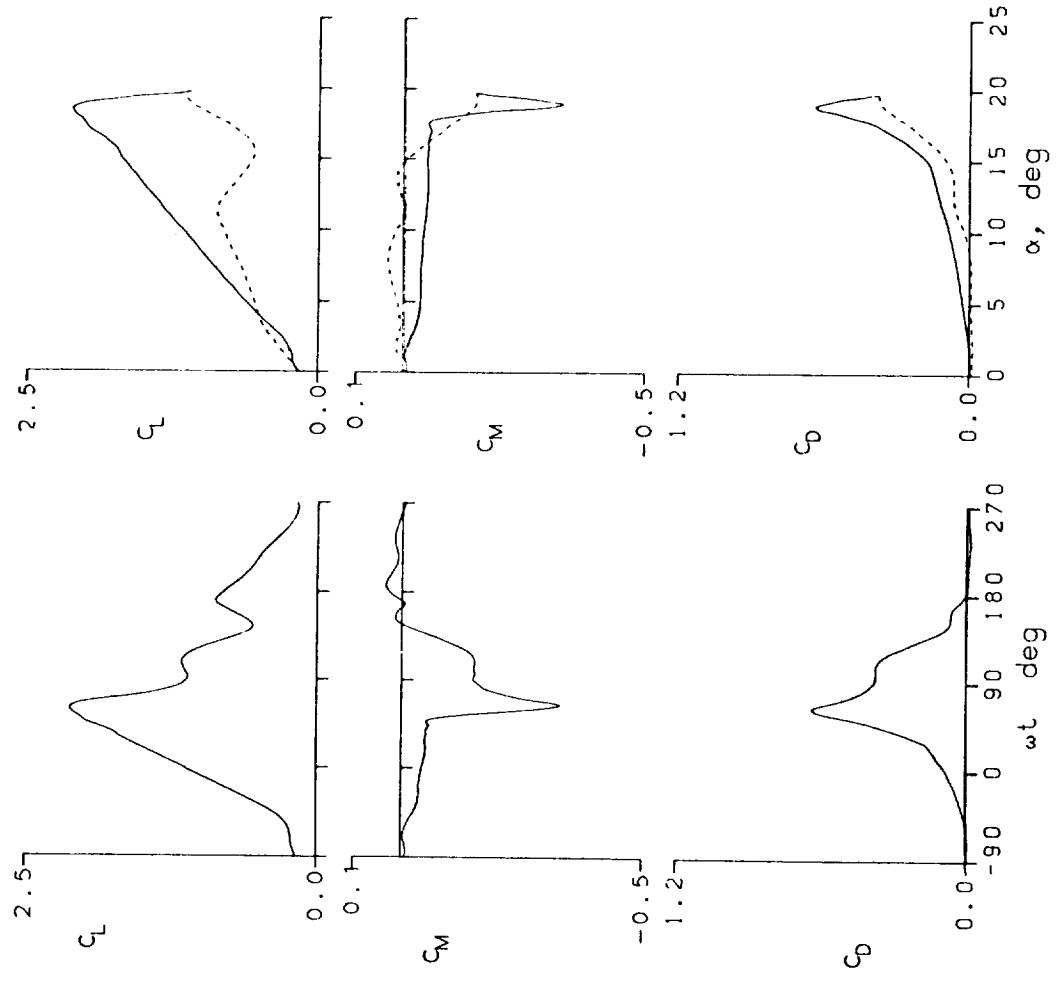


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRAME : 43114	A0 = 9.92 °	k = 0.150
Re = 3.90 E6	A1 = 9.91 °	M = 0.299
CLmax = 2.18	CMmin = -0.35	CDmax = 0.70
α Lmax = 19.5 °	ζ = 0.299	Mmax = 1.214
α Cmin = 9.4 °	-CPmax = 9.1	α Mmax = 15.8 °

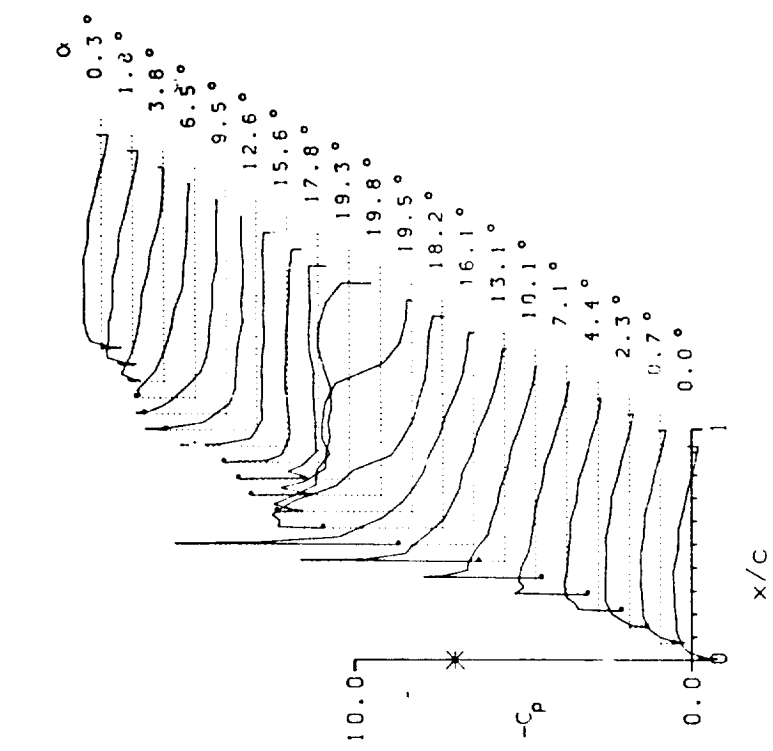
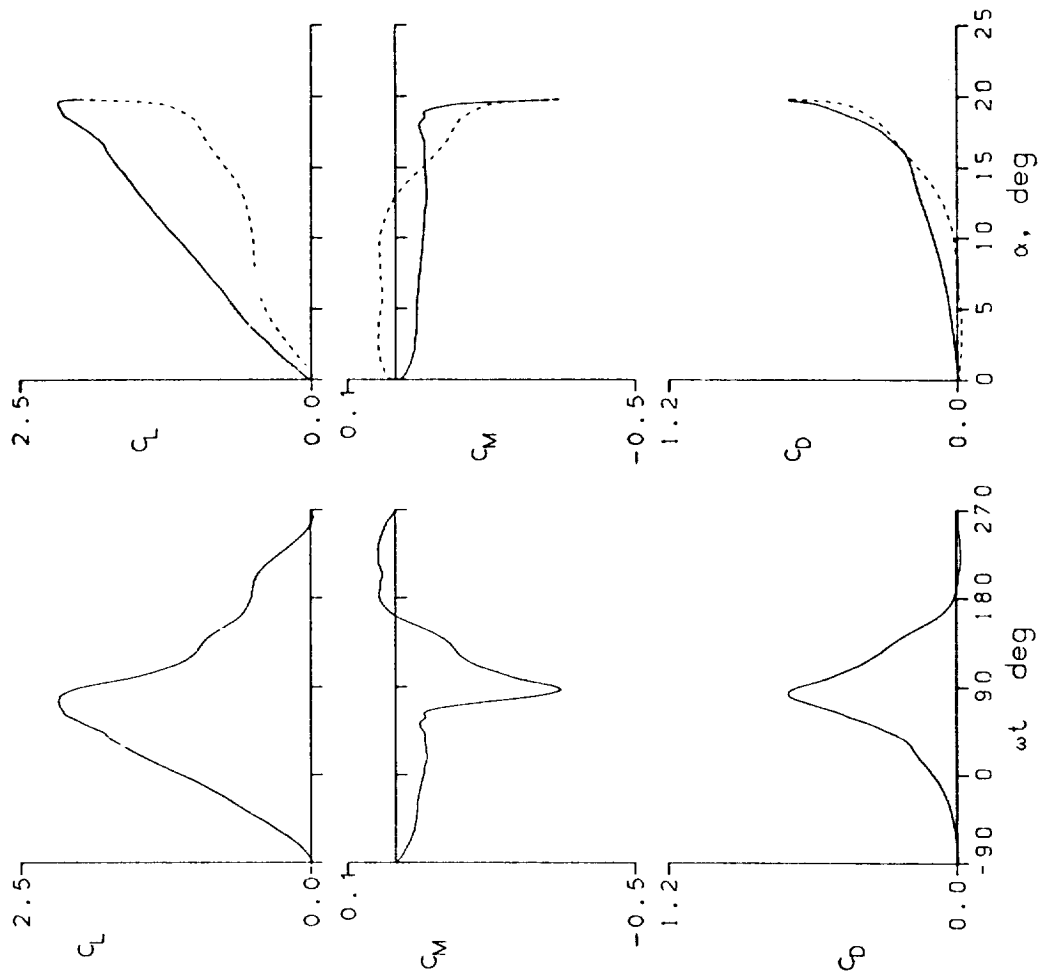


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL
 FRAME : 43117 $A_0 = 9.93^\circ$ $k = 0.151$
 $Re = 3.89 E6$ $A1 = 9.90^\circ$ $M = 0.297$
 $C_{Lmax} = 2.19$ $C_{Mmin} = -0.35$ $C_{Dmax} = 0.70$
 $\alpha_{Lmax} = 19.5^\circ$ $\xi = 0.319$ $M_{max} = 1.214$
 $\alpha_{C_{min}} = 9.4^\circ$ $-C_{Pmax} = 9.2$ $\alpha_{Mmax} = 15.8^\circ$

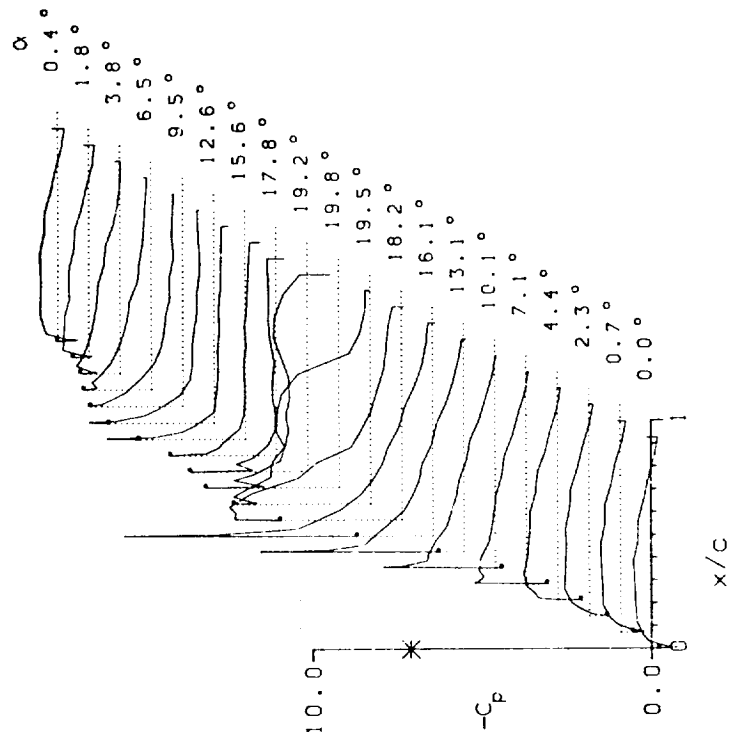
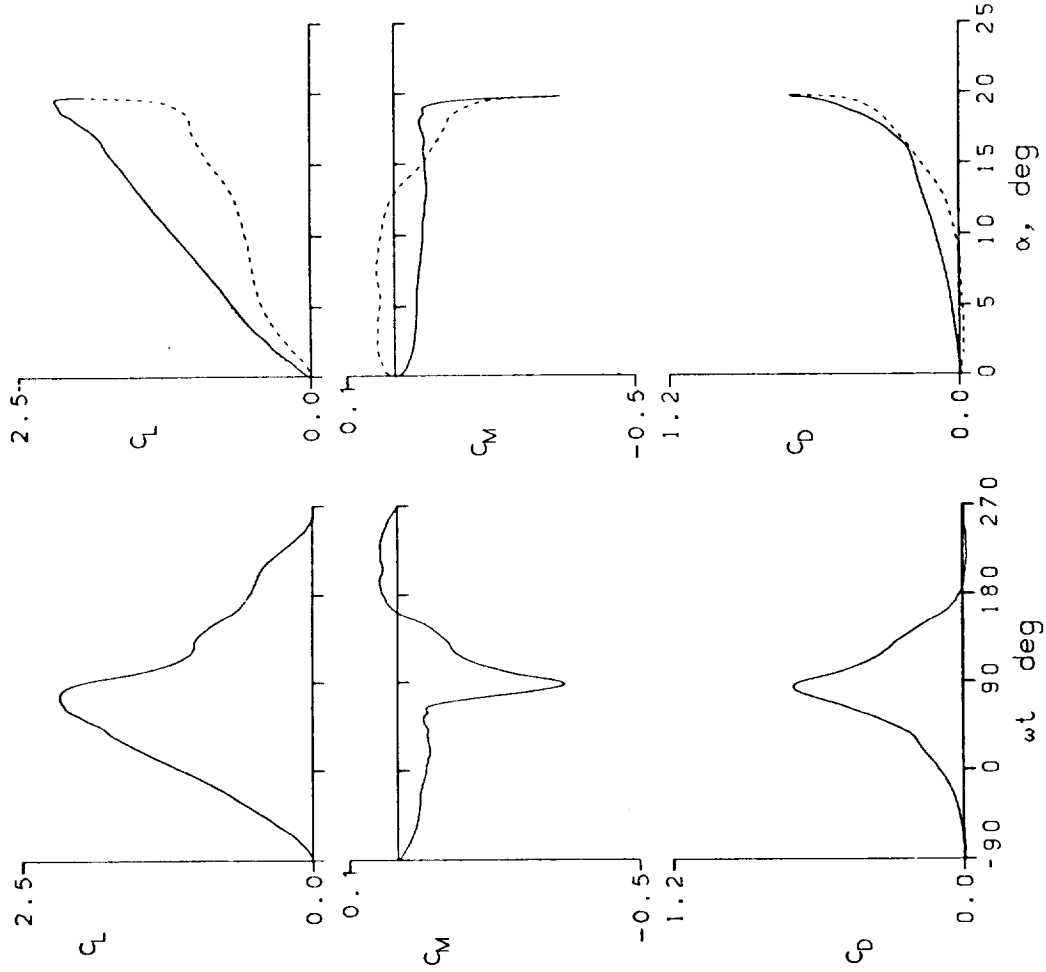


Figure 16.- Continued.

HUGHES H-H-02 - WITH TAB - AIRFOIL

FRAME : 43202 A0 = 3.61° k = 0.025
 Re = 3.97 E6 A1 = 10.13° M = 0.301
 $C_{Lmax} = 1.52$ $C_{Mmin} = -0.05$ $C_{Dmax} = 0.12$
 $\alpha_{Lmax} = 13.1^\circ$ $\zeta = 0.075$ $M_{max} = 1.212$
 $\alpha_{C_{Lmin}} = 3.1^\circ$ $-C_{Dmax} = 8.9$ $\alpha_{M_{max}} = 13.6^\circ$

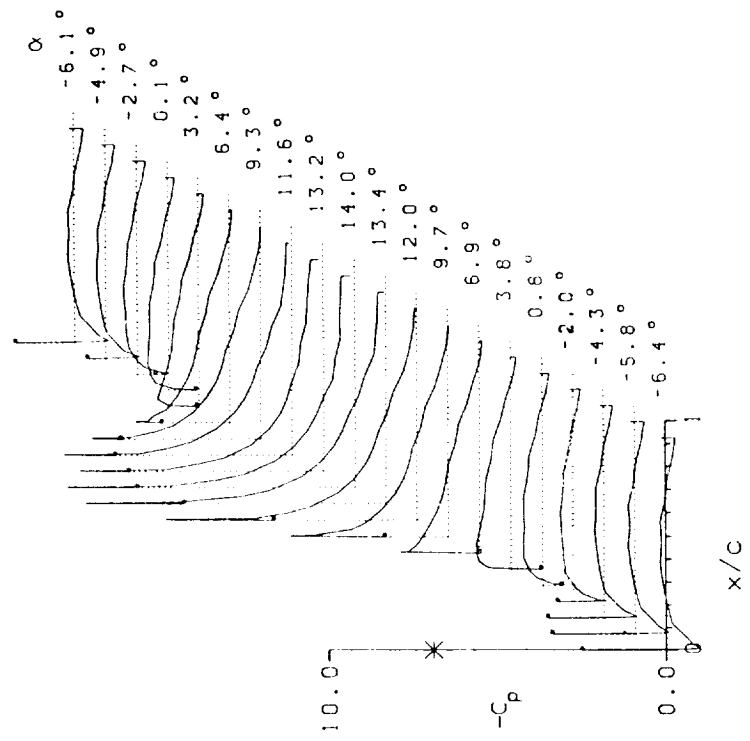
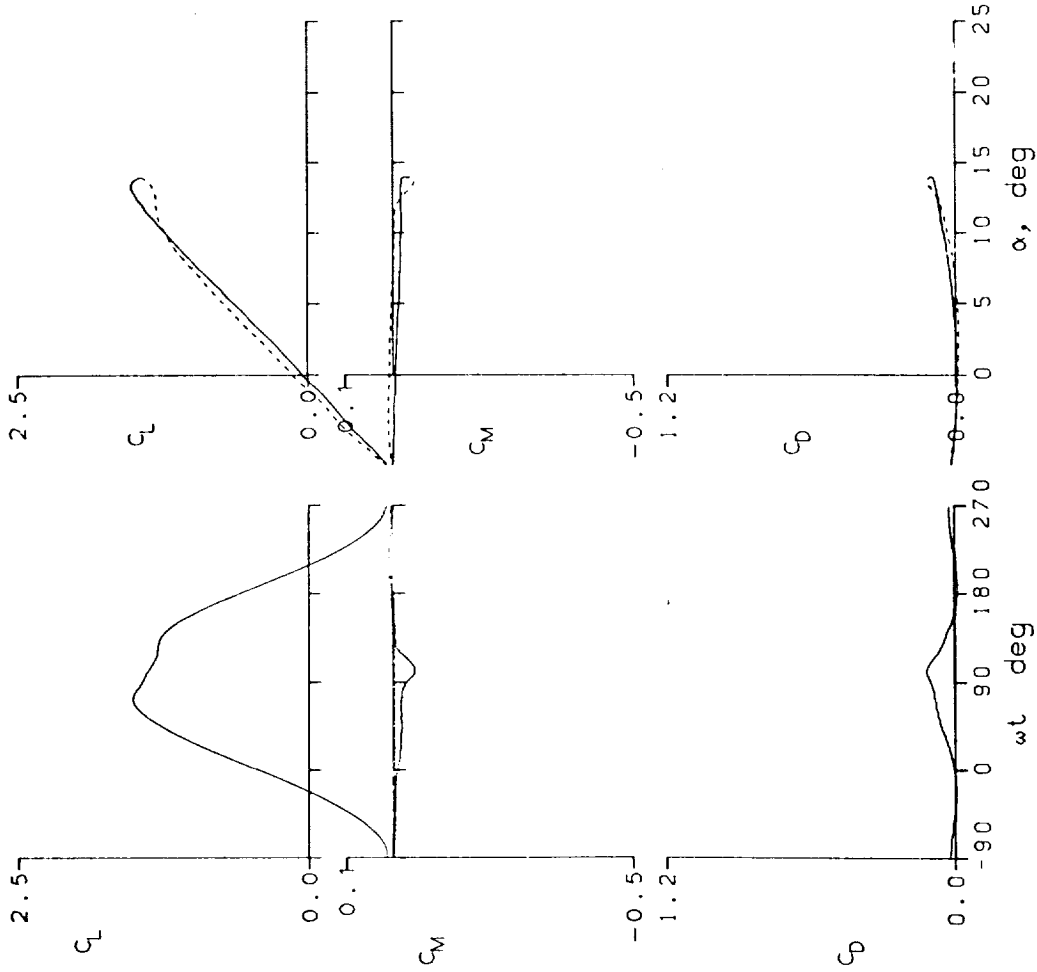


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 43204 $A_0 = 3.62^\circ$ $k = 0.050$
 $Re = 3.96 E6$ $A_1 = 10.12^\circ$ $M = 0.302$
 $C_{Lmax} = 1.58$ $C_{Mmin} = -0.03$ $C_{Dmax} = 0.11$
 $\alpha_{Lmax} = 13.7^\circ$ $\xi = 0.154$ $M_{max} = 1.218$
 $\alpha_{Cmin} = 3.1^\circ$ $-C_{Pmax} = 9.0$ $\alpha_{Mmax} = 13.6^\circ$

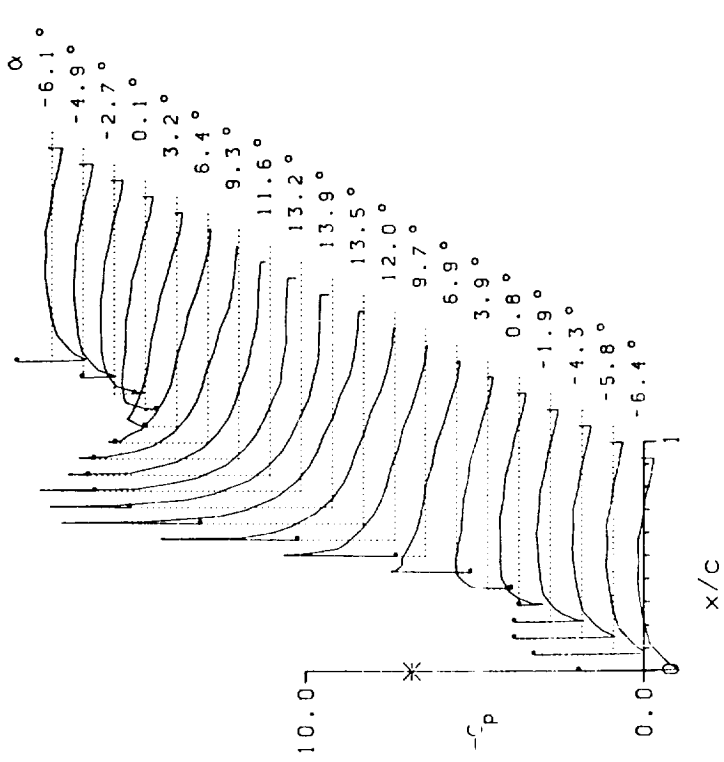
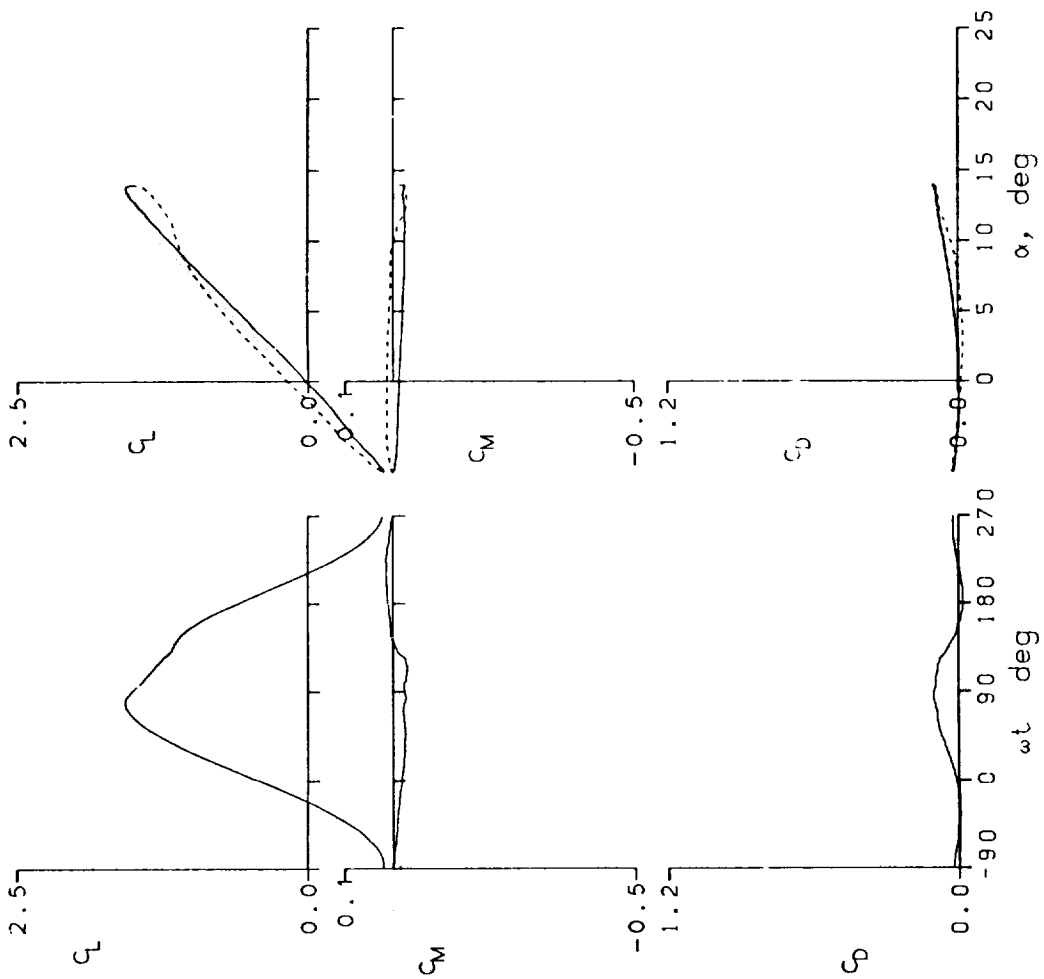


Figure 16.- Continued.

HUGHES -H-02 -WITH TAB- AIRFOIL
 FRAME : 43206 A0 = 3.66° k = 0.099
 Re = 3.96 E6 A1 = 10.10° M = 0.302
 C_{Lmax} = 1.61 C_{Mmin} = -0.04 C_{Dmax} = 0.13
 α_{Lmax} = 14.0° ζ = 0.337 M_{max} = 1.223
 α_{Cmin} = 3.2° -C_{pmax} = 9.0 α_{Mmax} = 13.9°

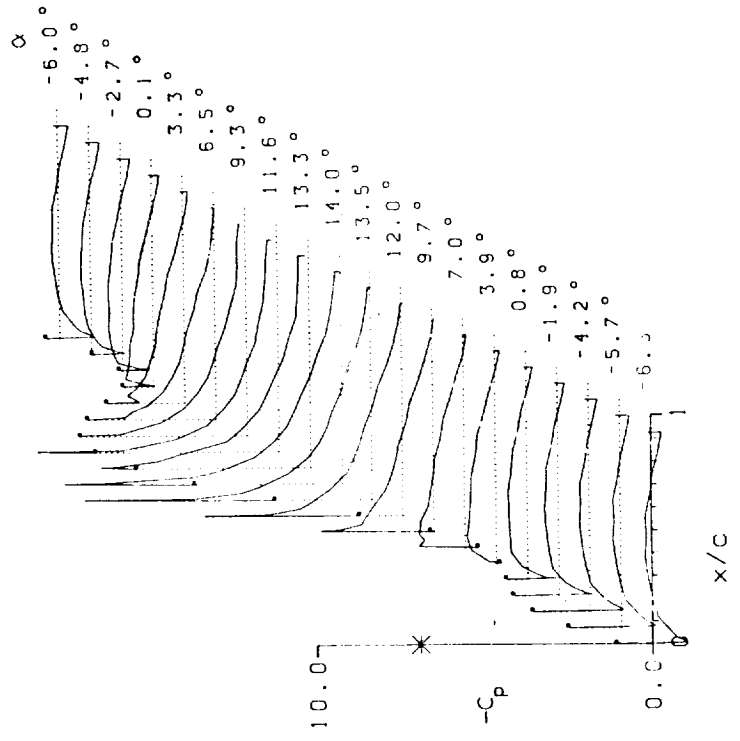
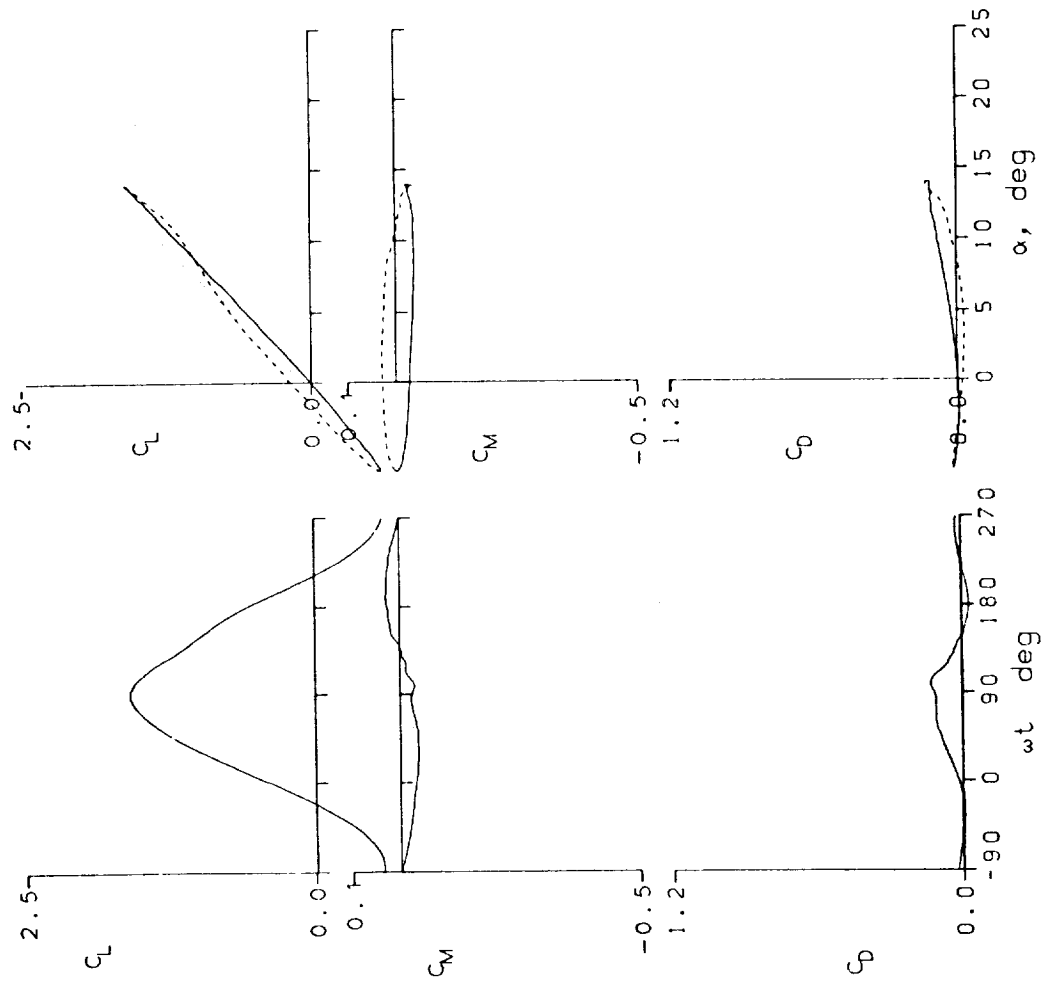


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 43209 A0 = 3.62° k = 0.149

Re = 3.96 E6 A1 = 10.11° M = 0.302

$C_{Lmax} = 1.62$ $C_{Mmin} = -0.06$ $C_{Dmax} = 0.13$

$\alpha_{Lmax} = 13.9^\circ$ $\zeta = 0.514$ $M_{max} = 1.224$

$\alpha_{Cmin} = 3.1^\circ$ $-C_{Pmax} = 9.0$ $\alpha_{Mmax} = 13.9^\circ$

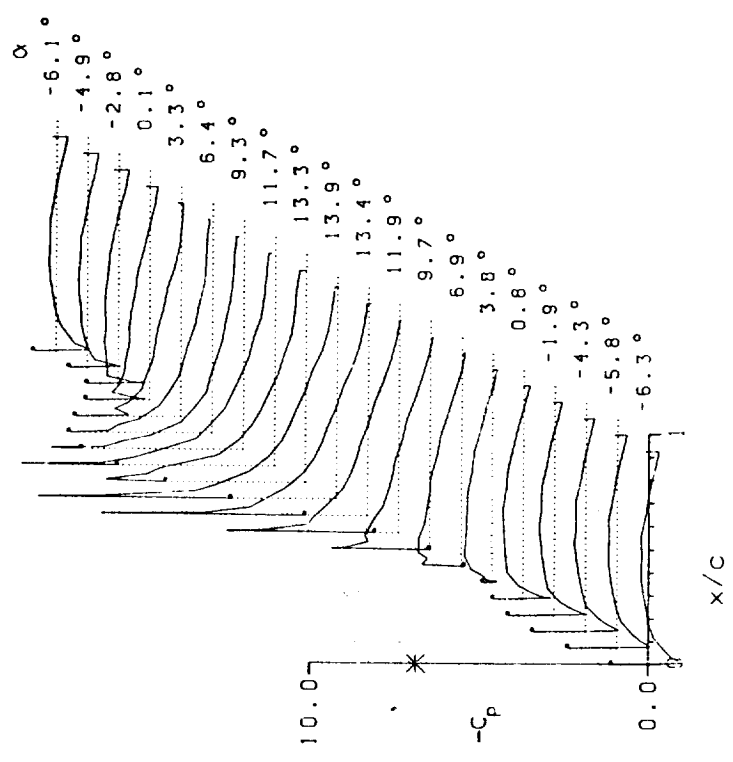
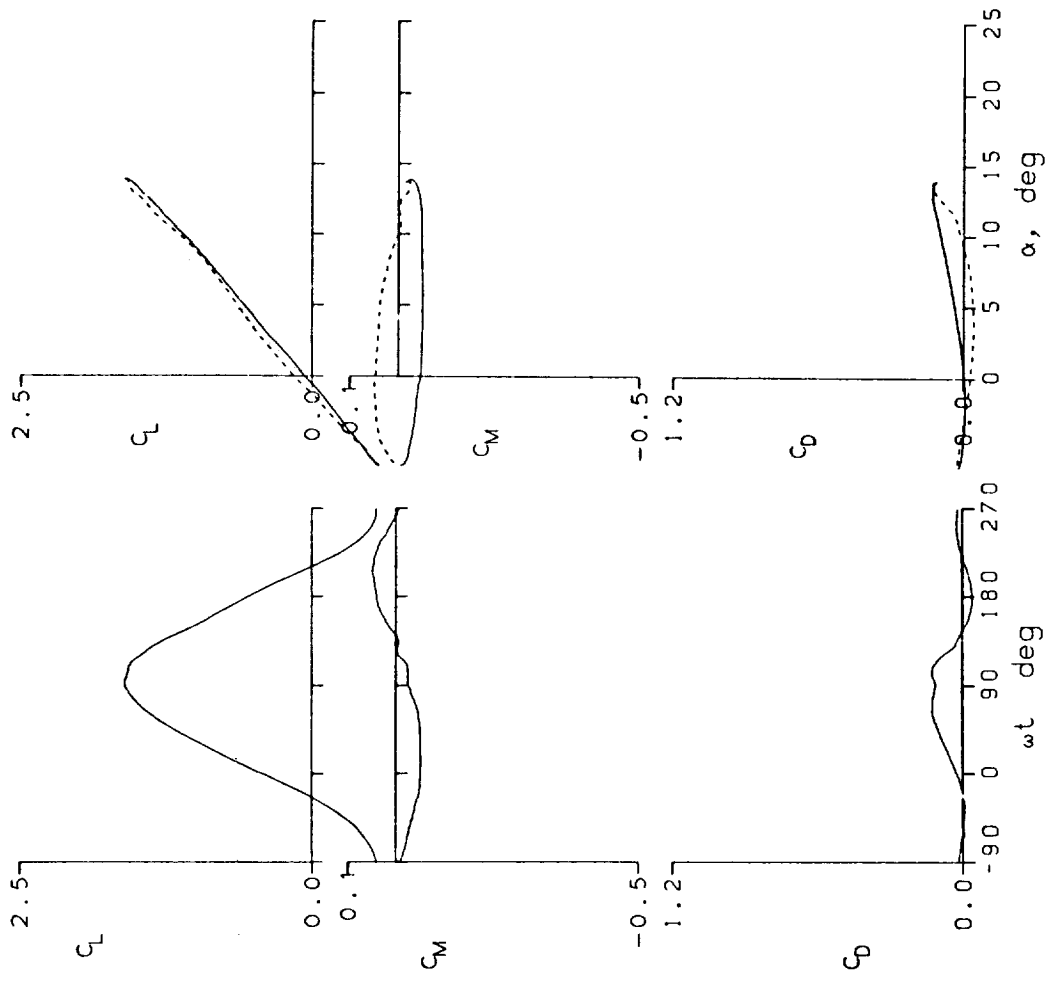


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 43215 A0 = 3.62 ° k = 0.010
 Re = 4.06 E6 A1 = 10.13 ° M = 0.302
 C_{Lmax} = 1.51 C_{Mmin} = -0.06 C_{Dmax} = 0.13
 α_{Lmax} = 13.0 ° ζ = 0.029 M_{max} = 1.214
 α_{Cmin} = 3.1 ° $-C_{Dmax}$ = 8.9 α_{Mmax} = 13.5 °

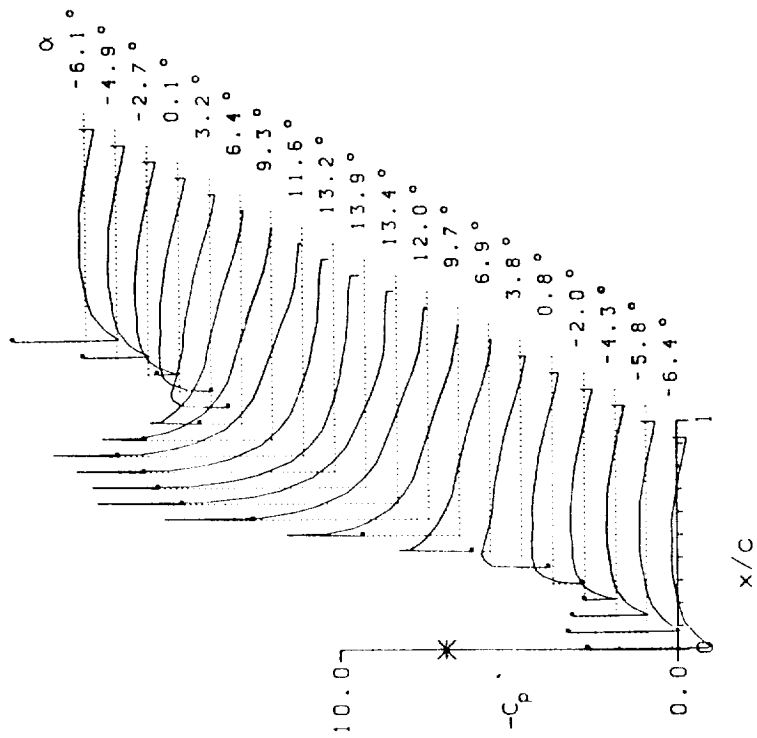
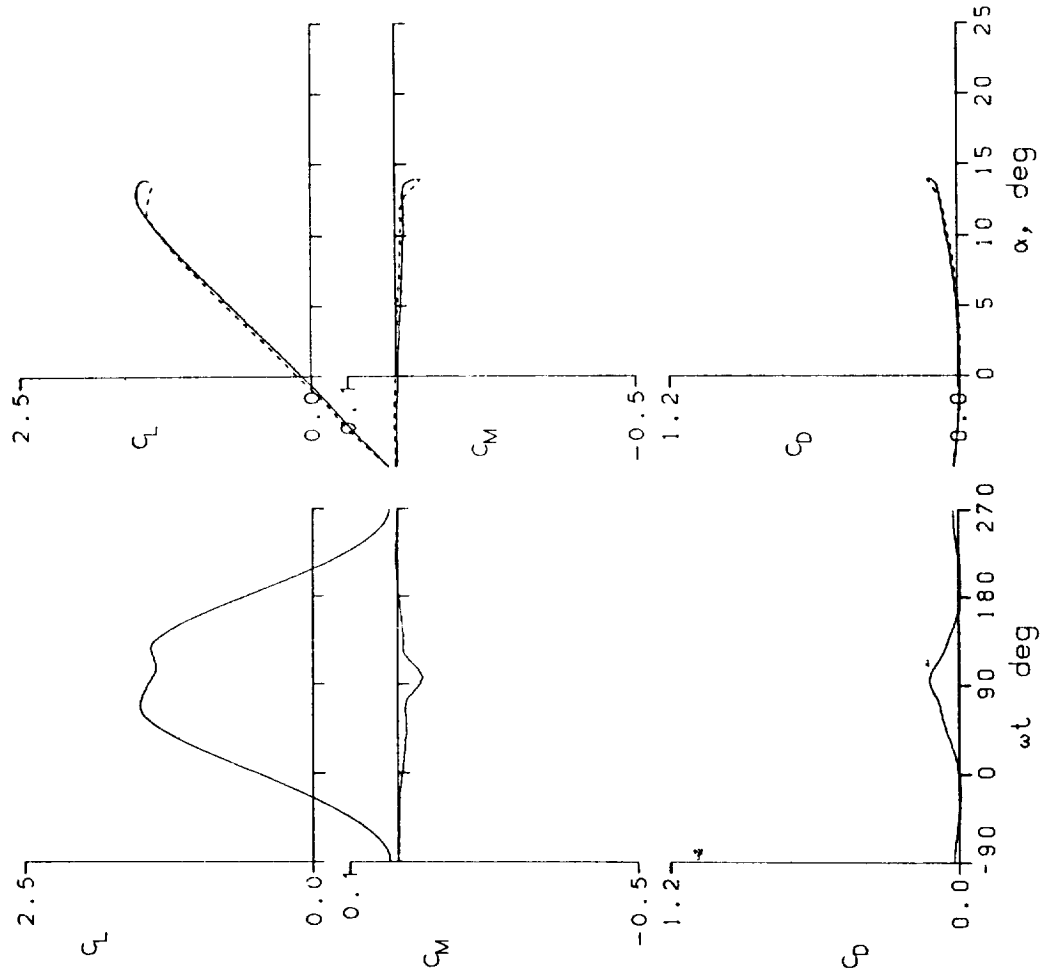


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 43219 $\Lambda_0 = 3.84^\circ$ $k = 0.100$
 $Re = 4.05 E6$ $A1 = 10.12^\circ$ $M = 0.303$
 $C_{Lmax} = 1.65$ $C_{Mmin} = -0.06$ $C_{Dmax} = 0.16$
 $\alpha_{Lmax} = 14.1^\circ$ $\xi = 0.300$ $M_{max} = 1.241$
 $\alpha_{C_{Lmin}} = 3.3^\circ$ $-C_{Dmax} = 9.1$ $\alpha_{Mmax} = 13.9^\circ$

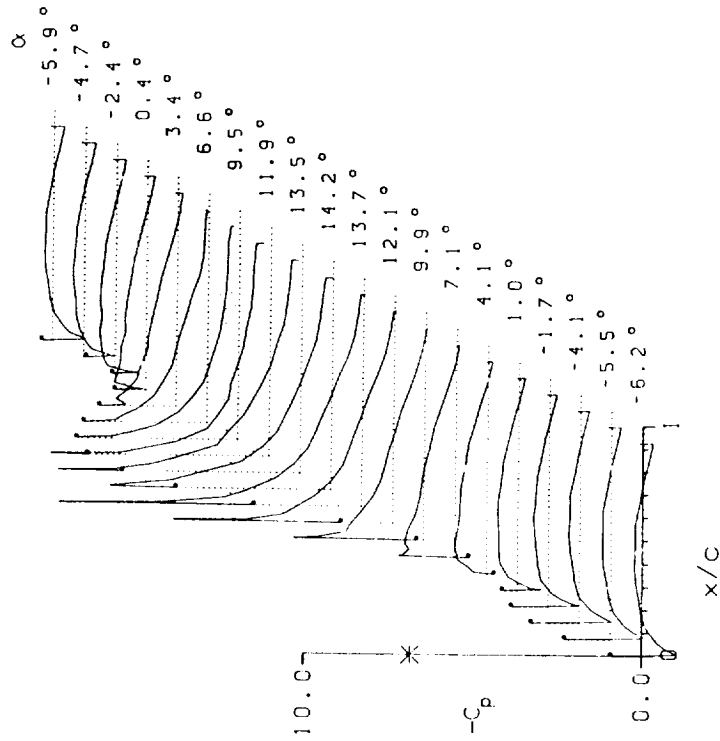
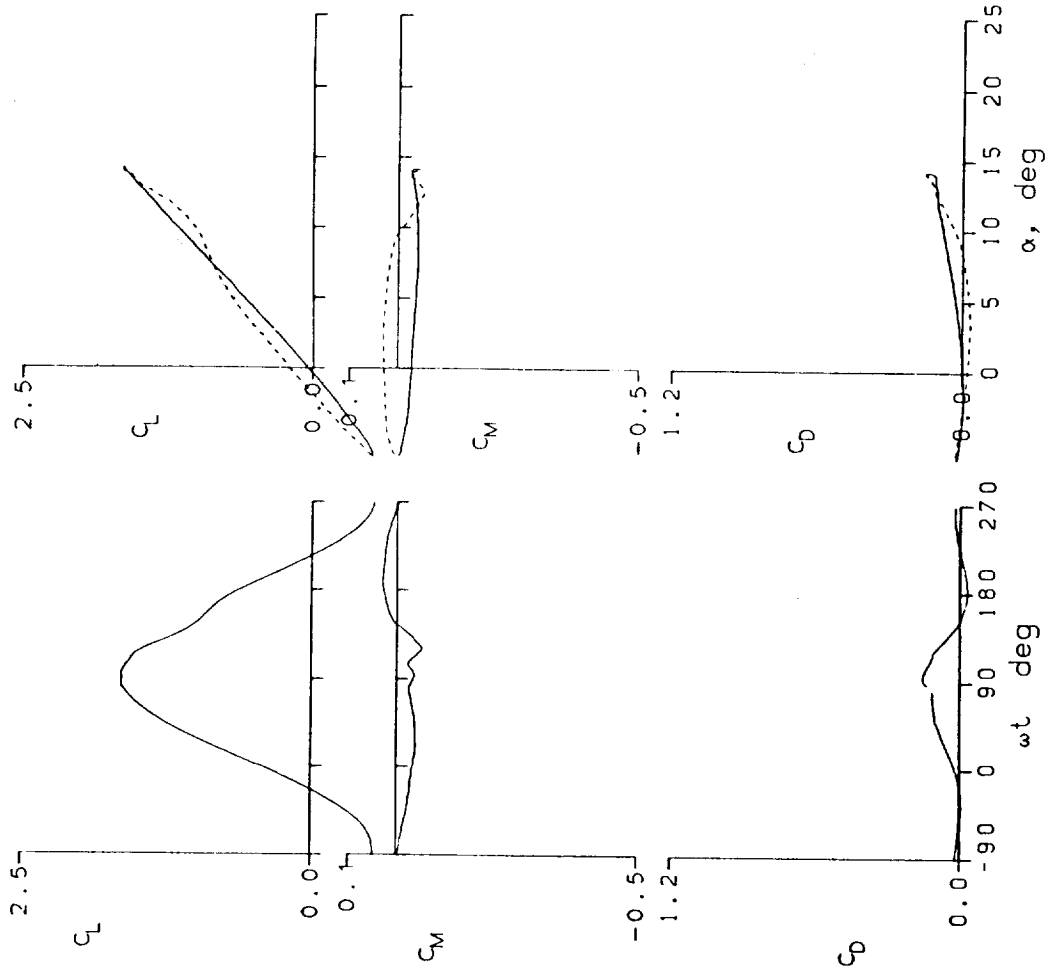


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRAME : 43303 A0 = 14.96° k = 0.025

Re = 3.92 E6 A1 = 4.88° M = 0.296

$C_{Lmax} = 1.54$ $C_{Mmin} = -0.13$ $C_{Dmax} = 0.31$

$\alpha_{Lmax} = 13.9^\circ$ $\xi = 0.104$ $M_{max} = 1.210$

$\alpha_{Cmin} = 14.8^\circ$ $-C_{pmp} = 9.2$ $\alpha_{Mmax} = 14.1^\circ$

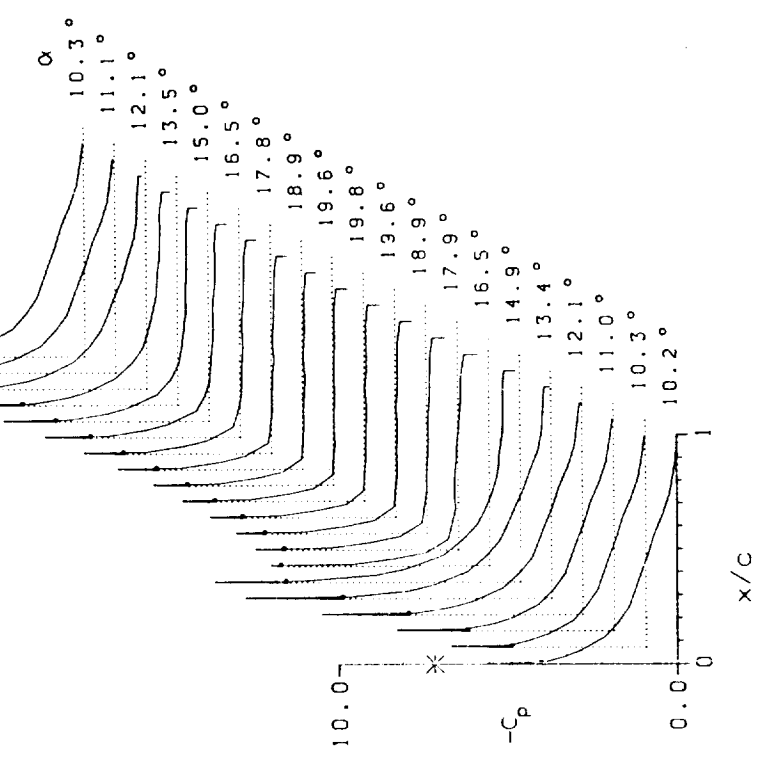
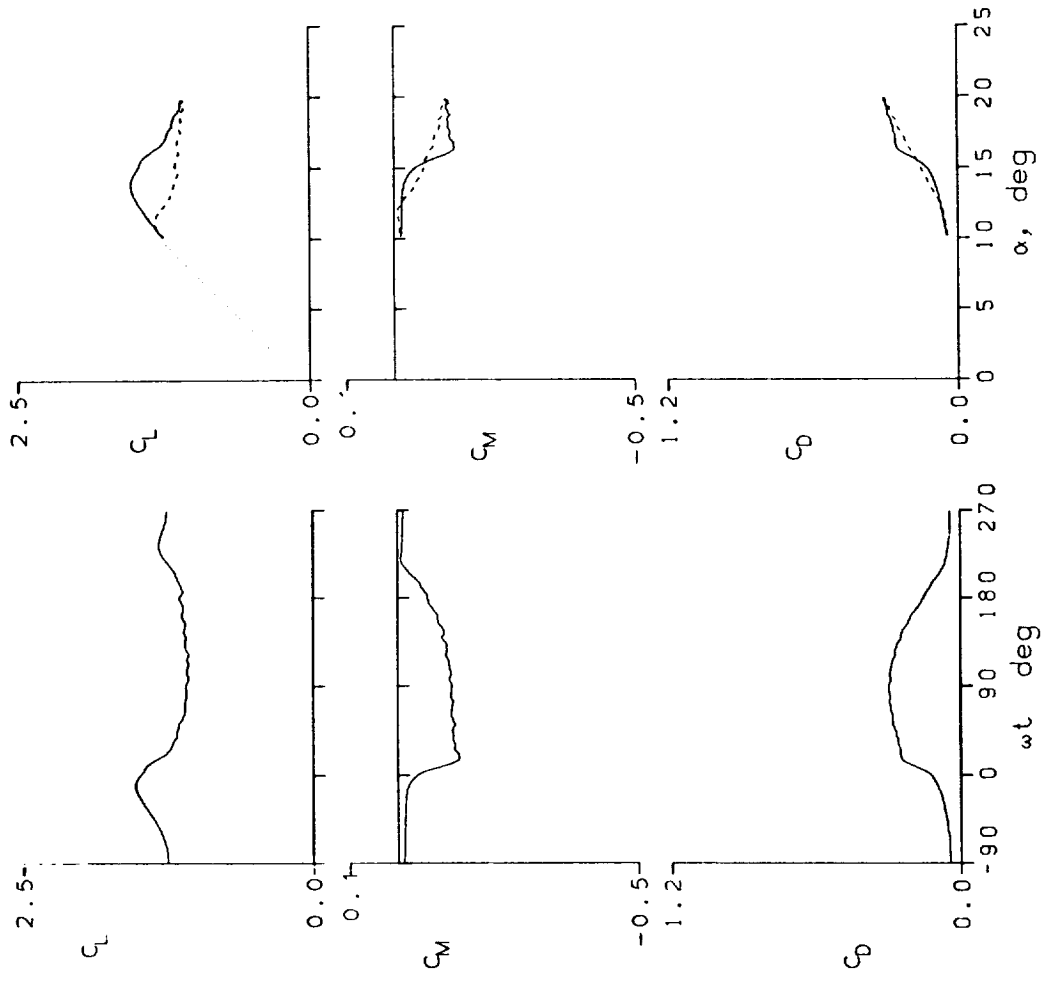
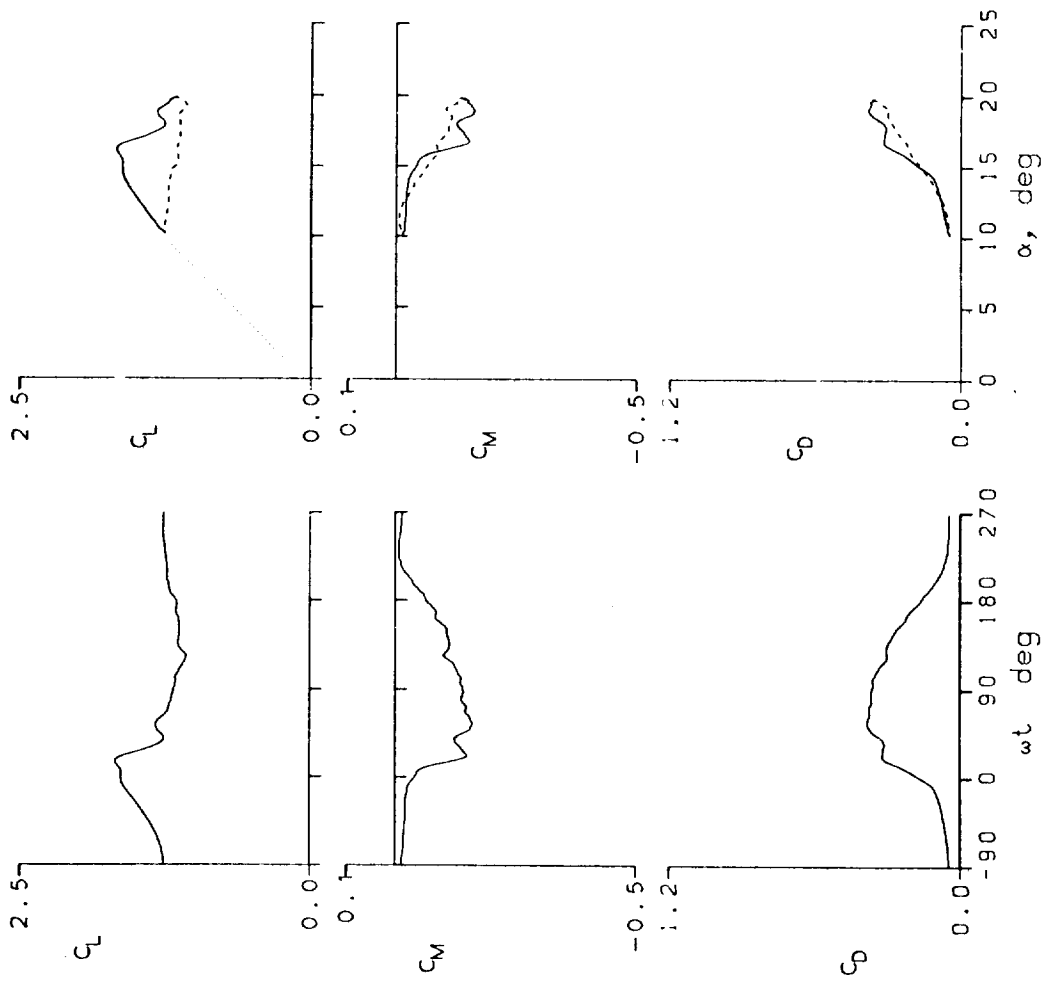


Figure 16.- Continued.



HUGHES HH-02 --WITH TAB-- AIRFOIL
 FRAME : 43304 $A_0 = 14.96^\circ$ $k = 0.051$
 $Re = 3.84 \text{ E}6$ $A_1 = 4.88^\circ$ $M = 0.292$
 $C_{Lmax} = 1.68$ $C_{Mmin} = -0.17$ $C_{Dmax} = 0.39$
 $\alpha_{Lmax} = 16.2^\circ$ $\xi = 0.144$ $M_{max} = 1.201$
 $\alpha_{Cmin} = 14.8^\circ$ $-C_{pmax} = 9.5$ $\alpha_{Mmax} = 14.0^\circ$

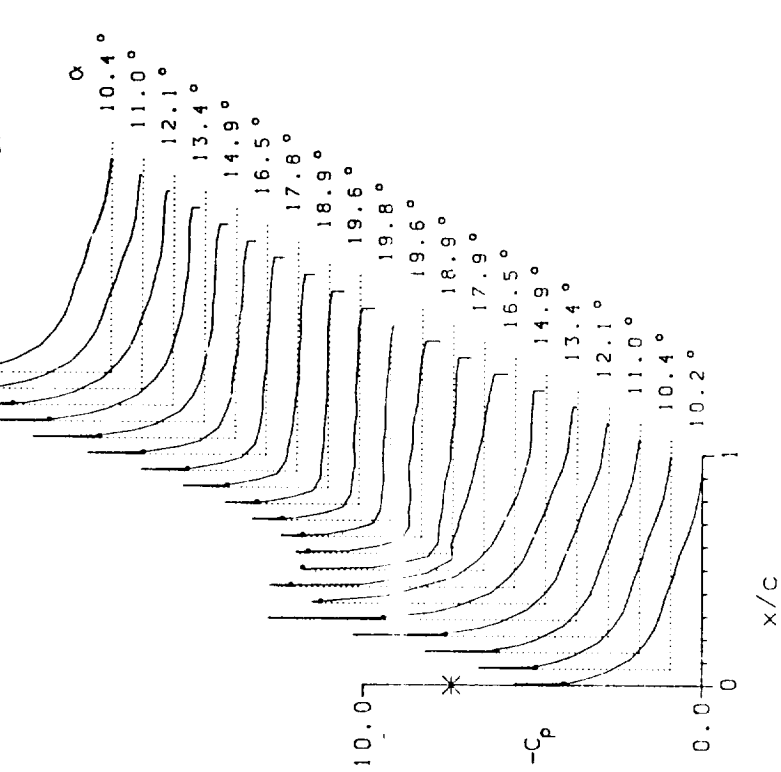


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 43305 A0 = 14.94° k = 0.103
 R0 = 3.82 E6 A1 = 4.89° M = 0.291
 CLmax = 1.95 CMmin = -0.25 CDmax = 0.51
 α Lmax = 17.5° ξ = 0.287 Mmax = 1.212
 α Cmin = 14.8° -CPmax = 9.6 α Mmax = 14.3°

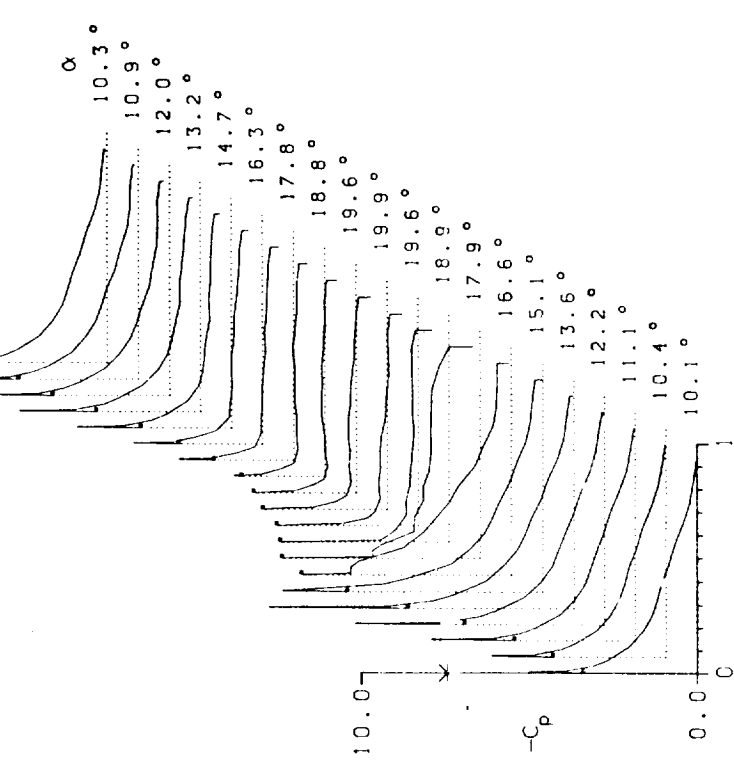
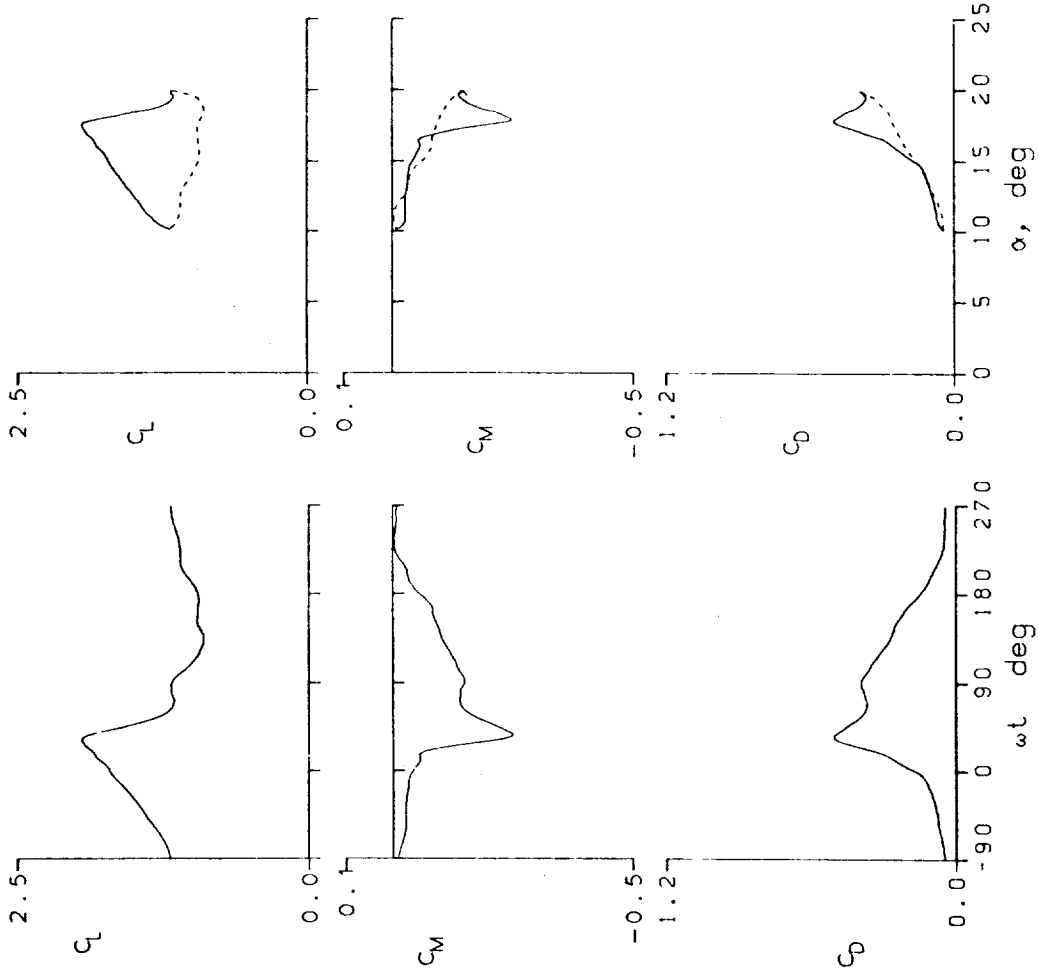


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB - AIRFOIL

FRAME : 43308 $A0 = 14.91^\circ$ $k = 0.135$

$Re = 3.81 E6$ $A1 = 4.90^\circ$ $M = 0.290$

$C_{Lmax} = 2.09$ $C_{Mmin} = -0.31$ $C_{Dmax} = 0.61$

$\alpha_{Lmax} = 18.4^\circ$ $\xi = 0.511$ $M_{max} = 1.209$

$\alpha_{Cmin} = 14.8^\circ$ $-C_{Pmax} = 9.6$ $\alpha_{Mmax} = 14.7^\circ$

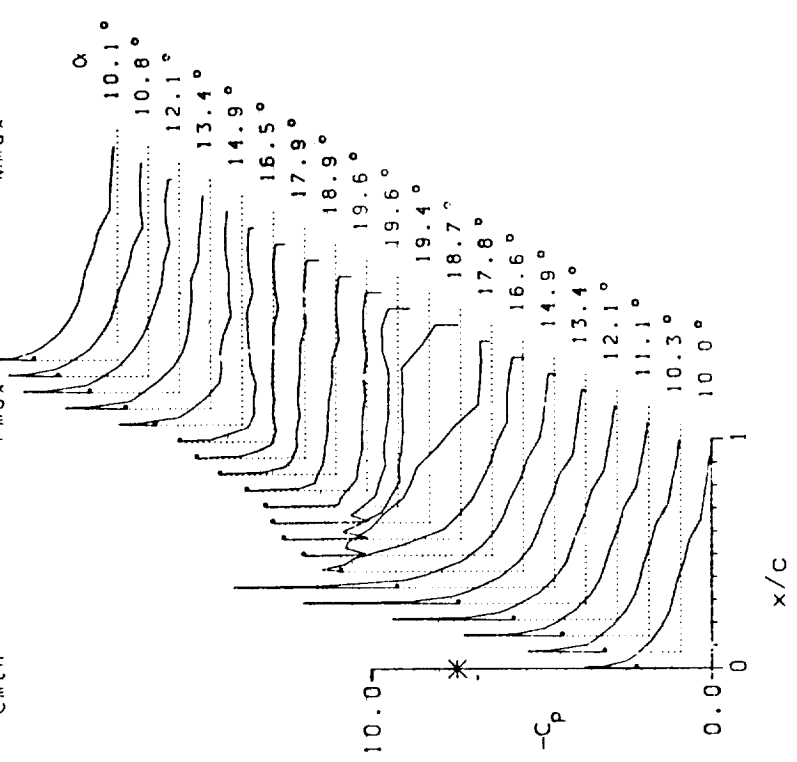
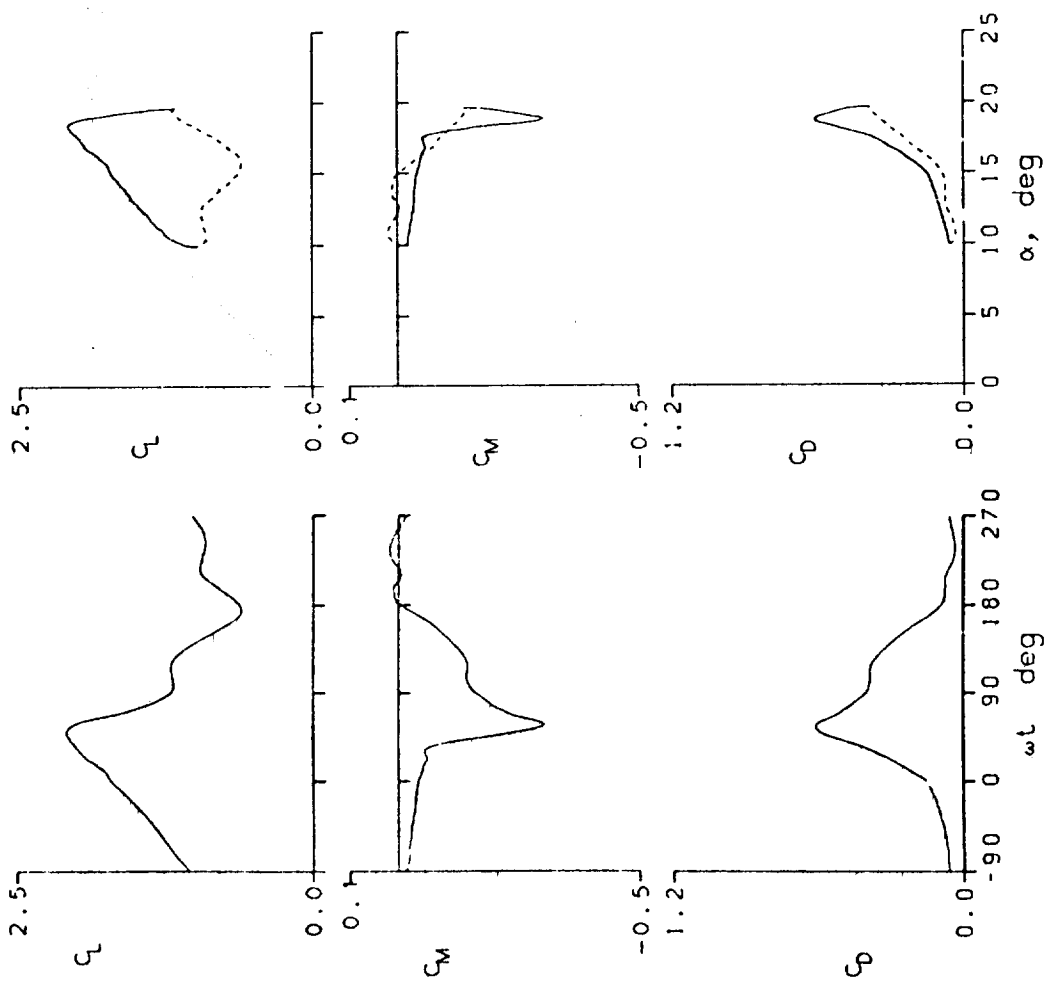


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 43309 A0 = 14.94° k = 0.207
 Re = 3.78 E6 A1 = 4.88° M = 0.289
 CLmax = 2.36 CMmin = -0.39 CDmax = 1.76
 αLmax = 19.3° ξ = 0.173 Mmax = 1.198
 αCmin = 14.7° -CPmax = 9.6 αMmax = 15.9°

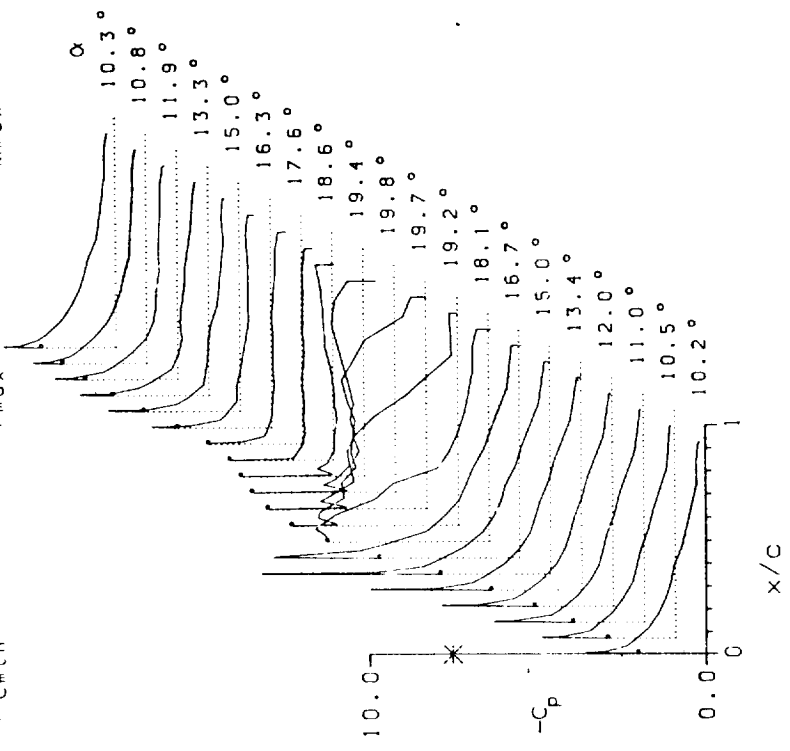
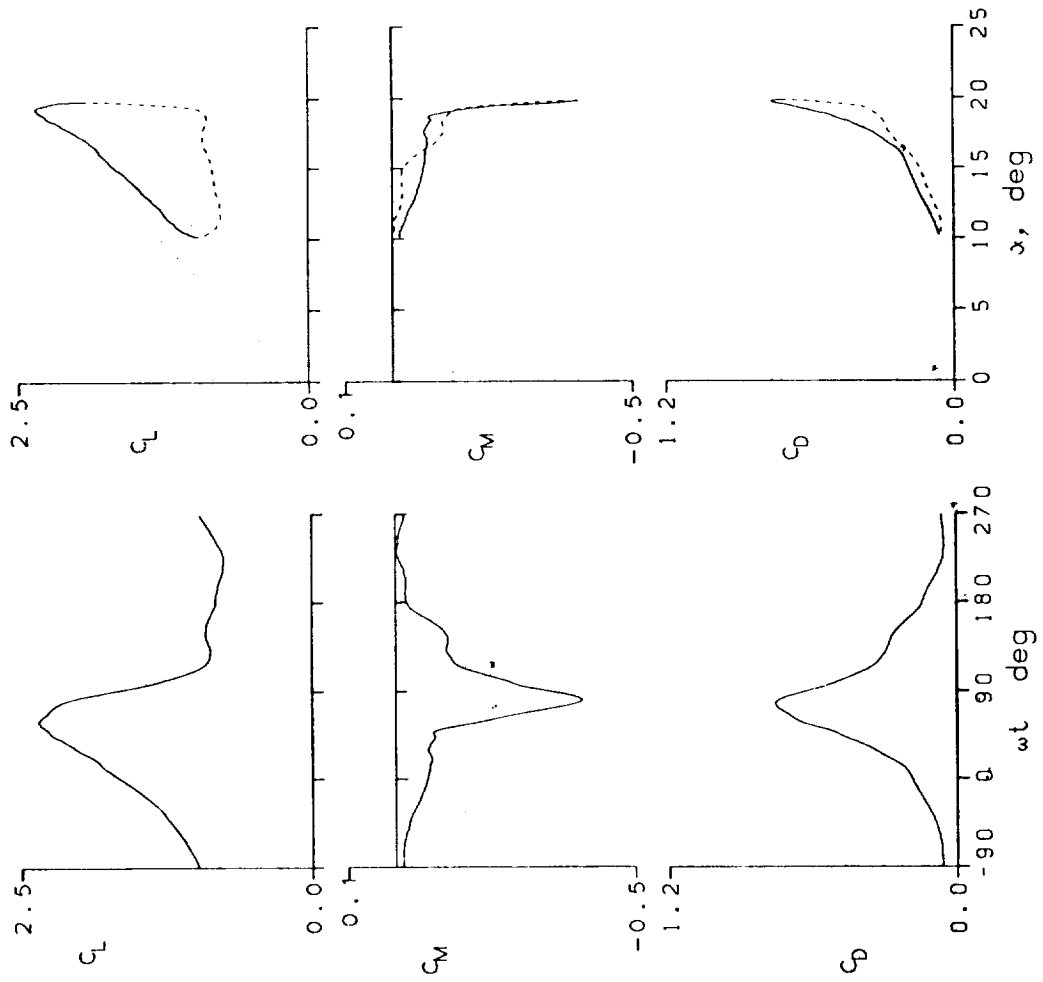
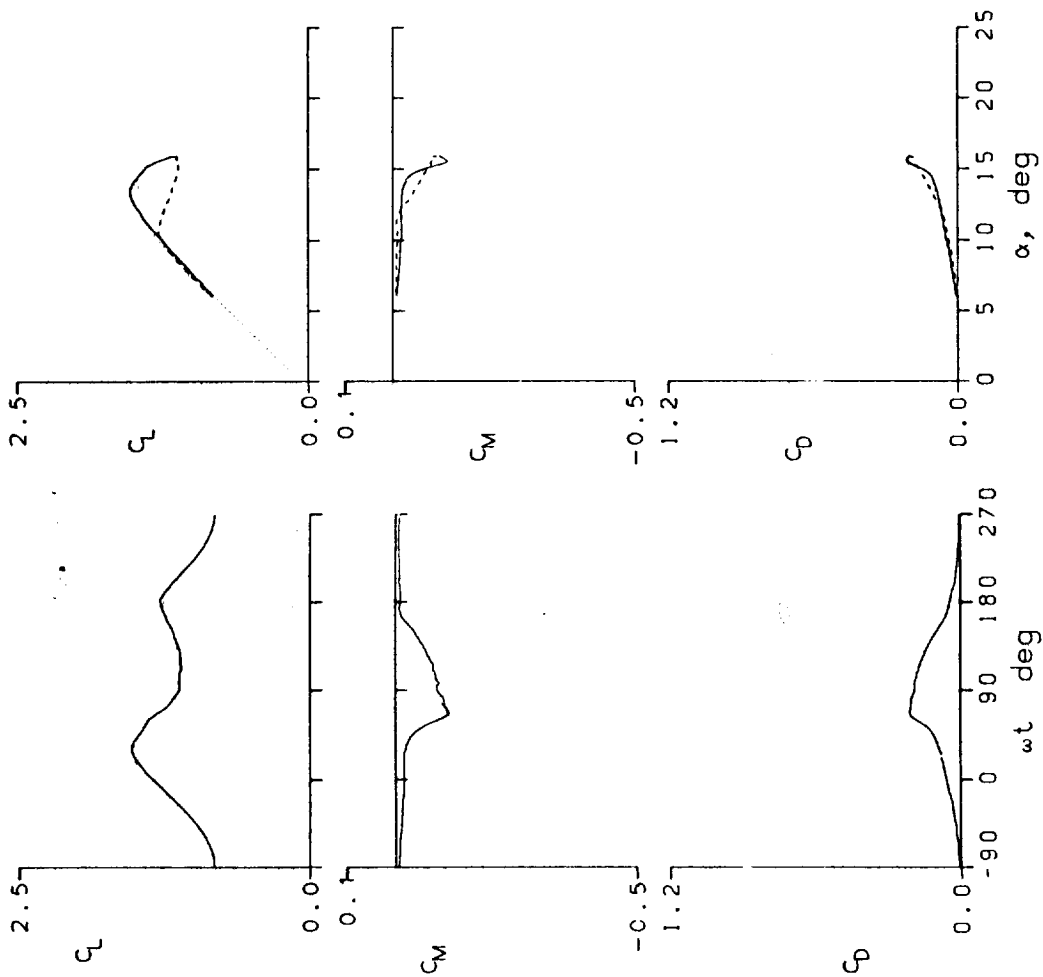


Figure 16.- Continued.



HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 43314 $A_0 = 10.89^\circ$ $k = 0.025$
 $Re = 3.93 E6$ $A_1 = 4.89^\circ$ $M = 0.302$
 $C_{Lmax} = 1.54$ $C_{Mmin} = -0.12$ $C_{Dmax} = 0.22$
 $\alpha_{Lmax} = 13.5^\circ$ $\xi = 0.000$ $M_{max} = 1.221$
 $\alpha_{Cmin} = 10.6^\circ$ $-C_{Pmax} = 9.0$ $M_{max} = 13.8^\circ$

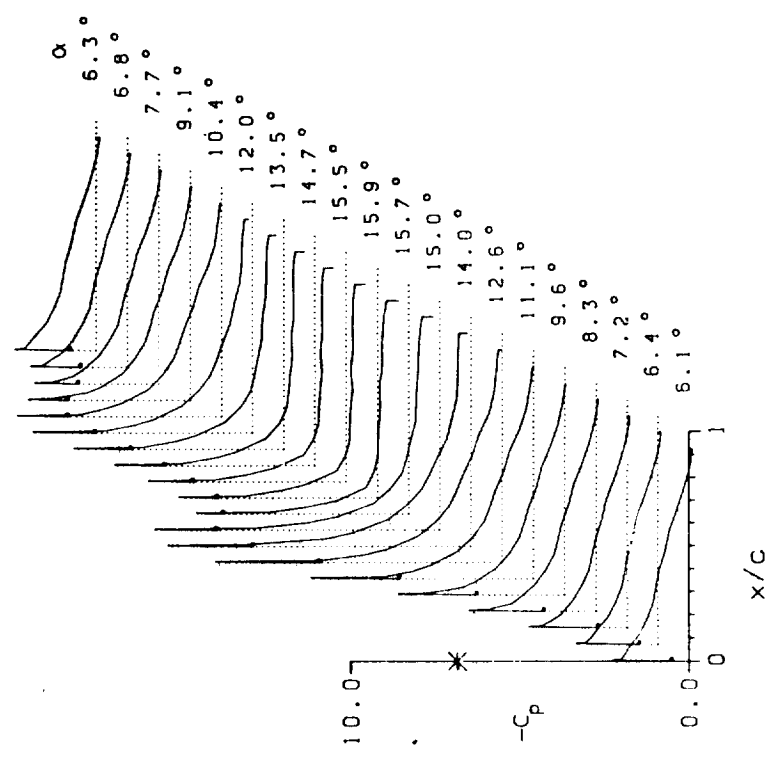


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 43315 A0 = 10.90 ° k = 0.049
 Re = 3.92 E6 A1 = 4.91 ° M = 0.302
 CLmax = 1.59 CMmin = -0.12 CDmax = 0.26
 α Lmax = 13.9 ° ξ = 0.071 Mmax = 1.209
 α C-Ln = 10.0 ° -CPmax = 8.9 α Mmax = 13.3 °

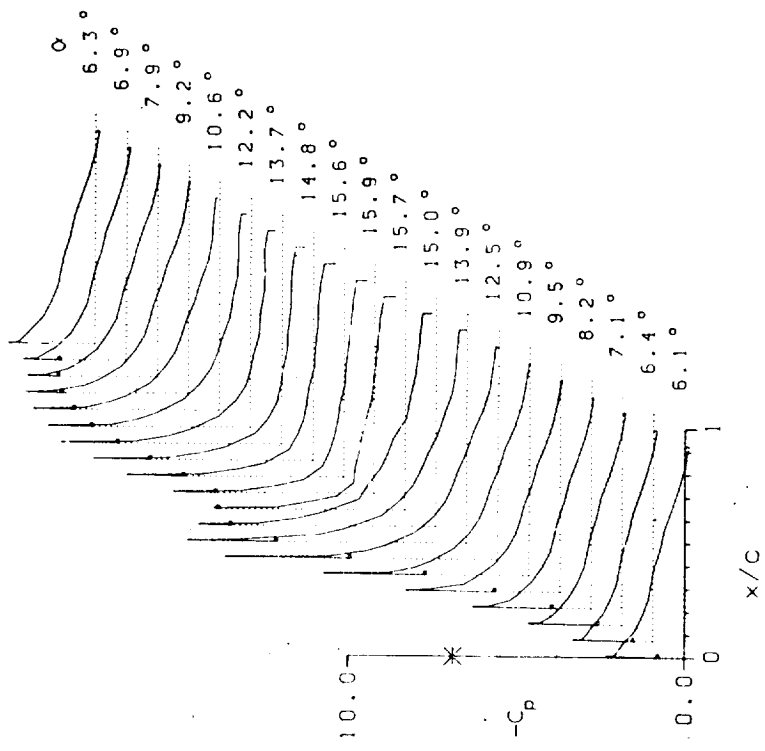
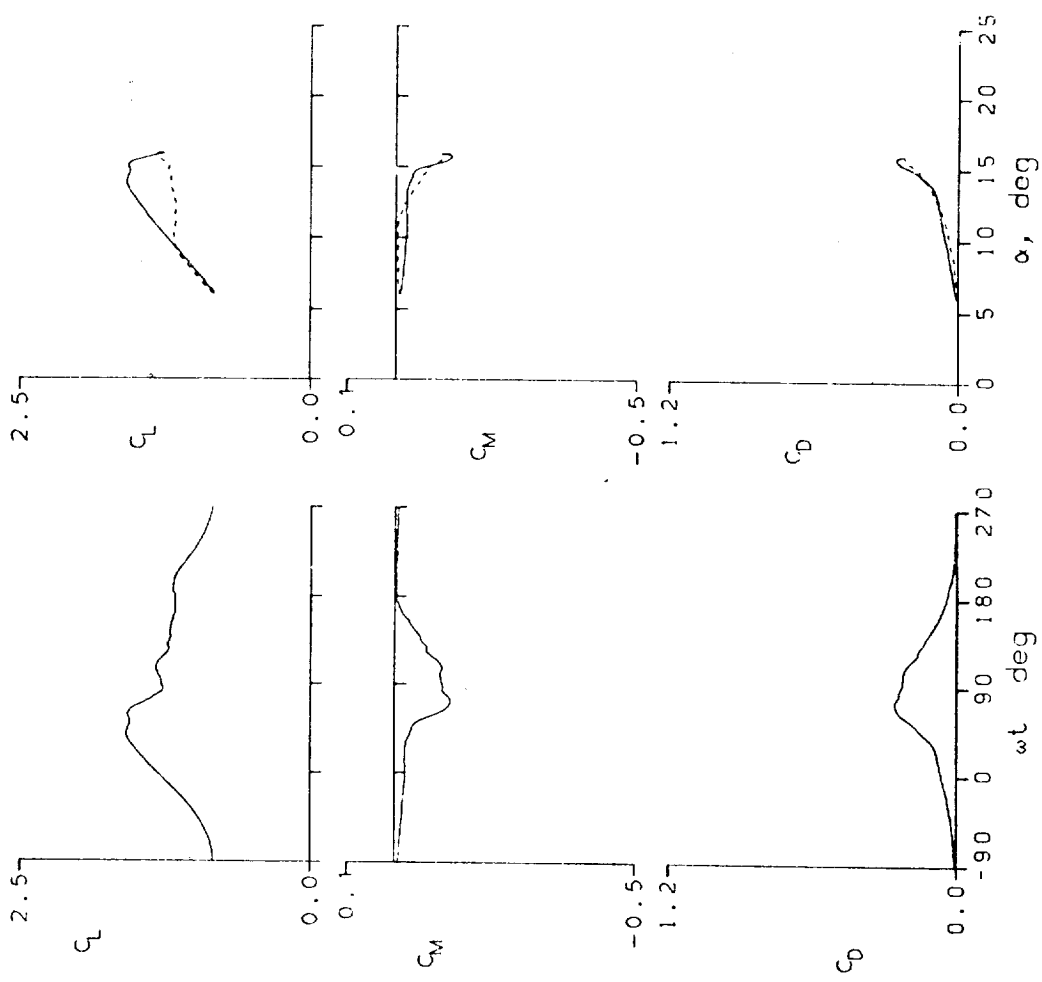
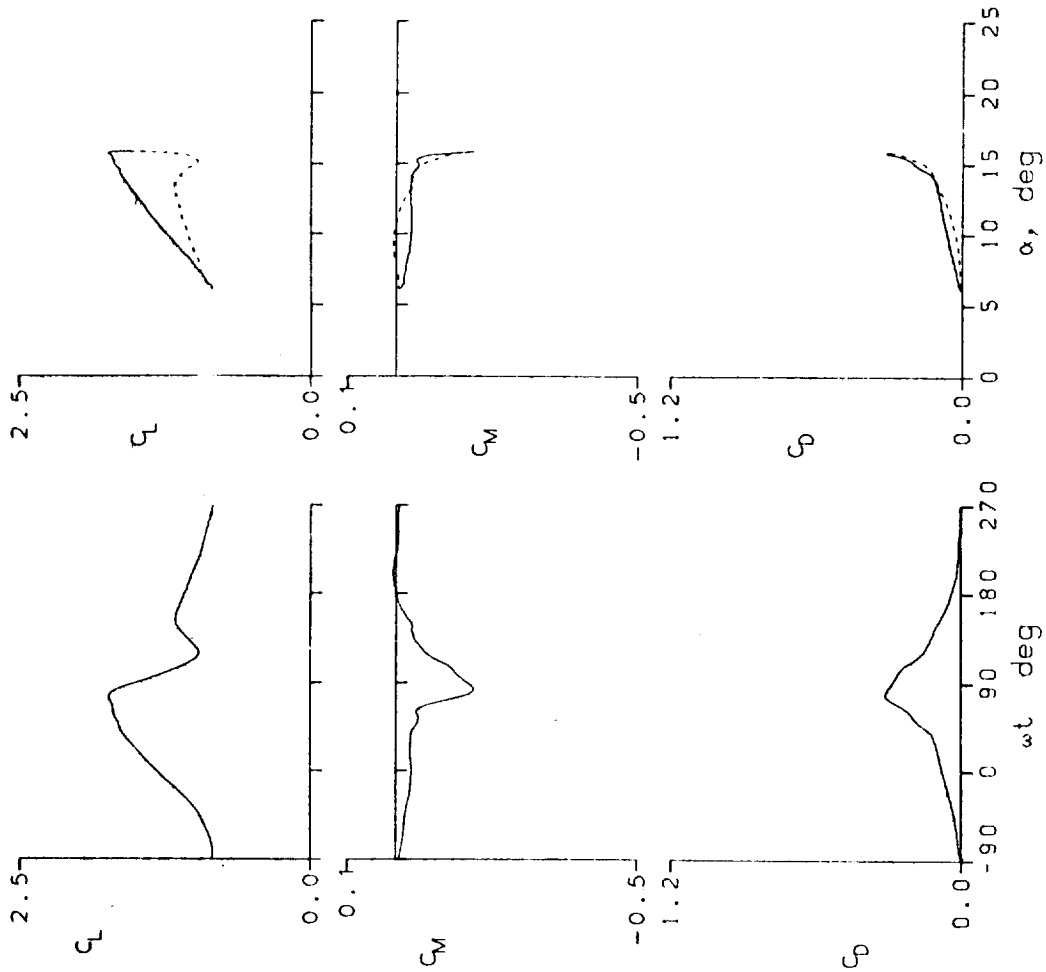


Figure 16.- Continued.



HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 43316 AC = 10.91° k = 0.099
 Re = 3.91 E6 A1 = 4.89° M = 0.302
 C_{Lmax} = 1.75 C_{Mmin} = -0.17 C_{Dmax} = 0.32
 α_{Lmax} = 15.7° ζ = 0.201 M_{max} = 1.221
 α_{Cmin} = 10.6° $-C_{pmax}$ = 9.0 α_{Mmax} = 13.8°

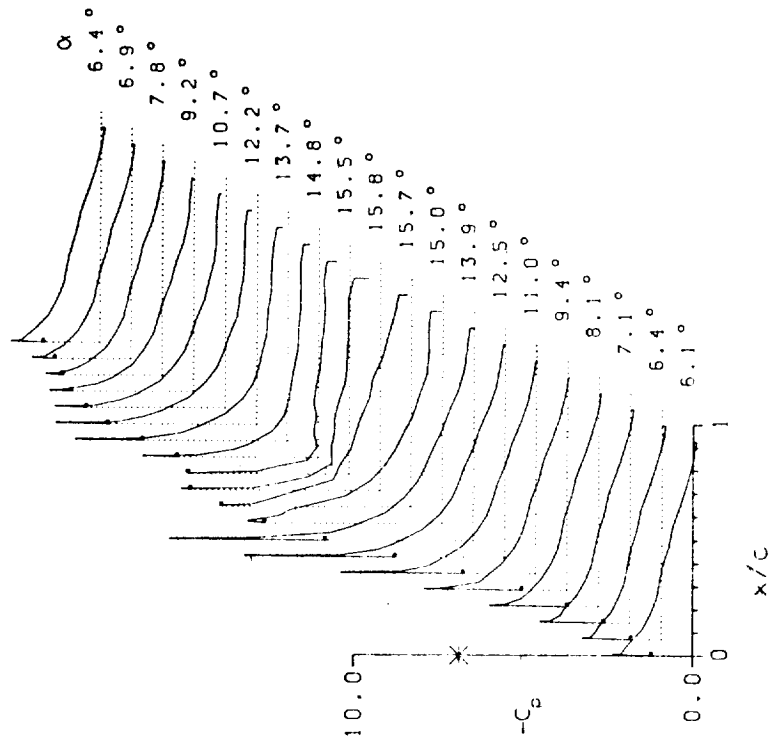


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRAME : 44019 AC = 9.55° k = 0.010
 Re = 3.96 E6 A1 = 5.09° M = 0.301
 C_{Lmax} = 1.46 C_{Mmin} = -0.09 C_{Dmax} = 0.17
 α_{Lmax} = 13.1° ξ = -0.076 M_{max} = 1.173
 α_{Cmin} = 9.4° $-C_{Pmax}$ = 9.5 α_{Mmax} = 13.3°

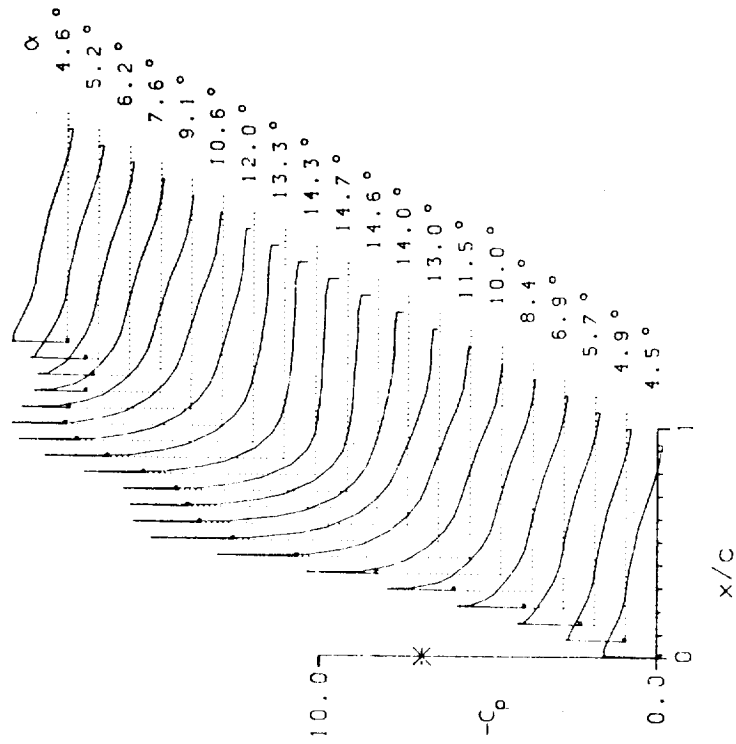
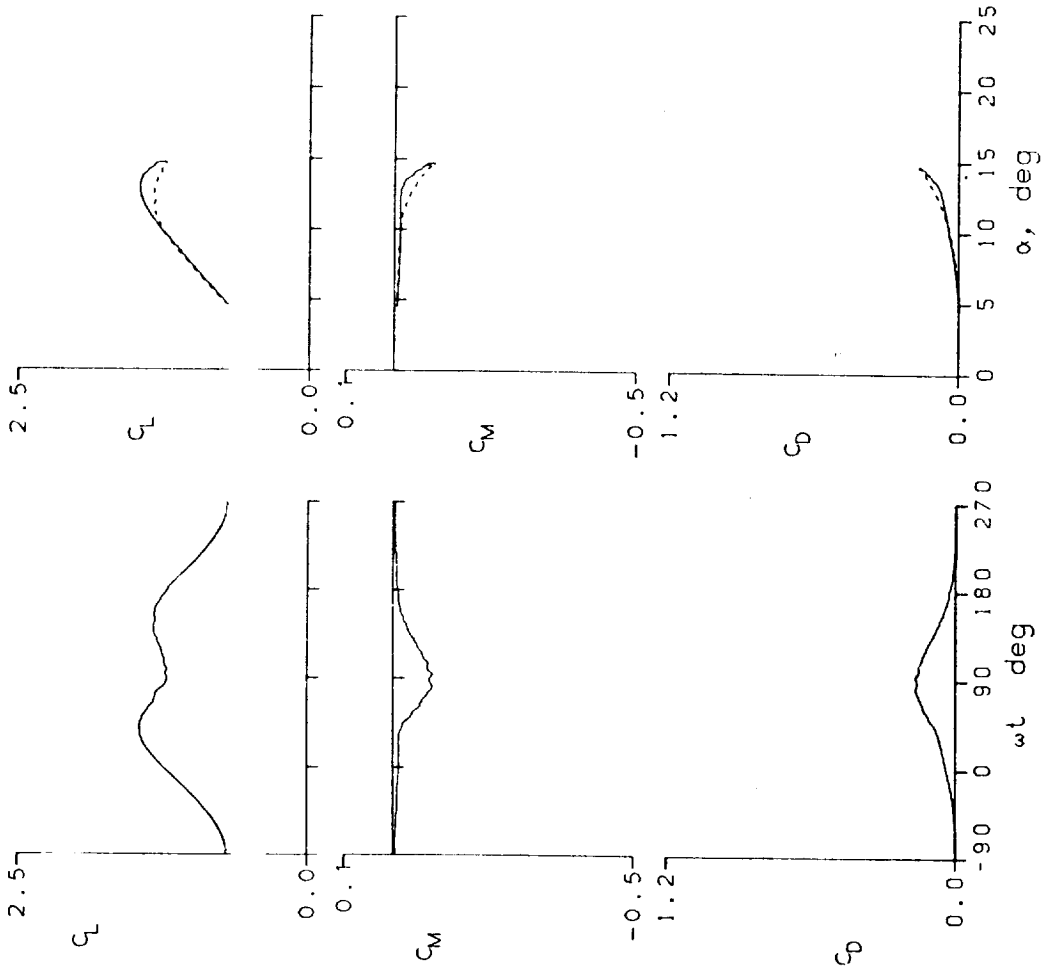


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 44021 A0 = 9.92° k = 0.025

Re = 3.95 E6 A1 = 4.91° M = 0.302

$C_{Lmax} = 1.53$ $C_{Mmin} = -0.09$ $C_{Dmax} = 0.18$

$\alpha_{Lmax} = 13.4^\circ$ $\xi = -0.010$ $M_{max} = 1.217$

$\alpha_{Cmin} = 9.7^\circ$ $-C_{Pmax} = 8.9$ $\alpha_{Mmax} = 13.8^\circ$

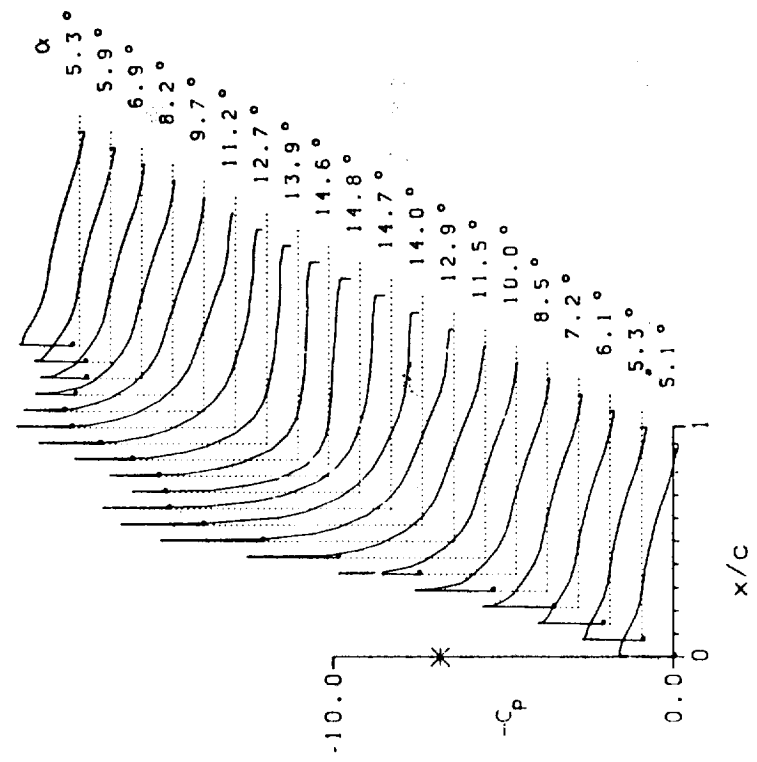
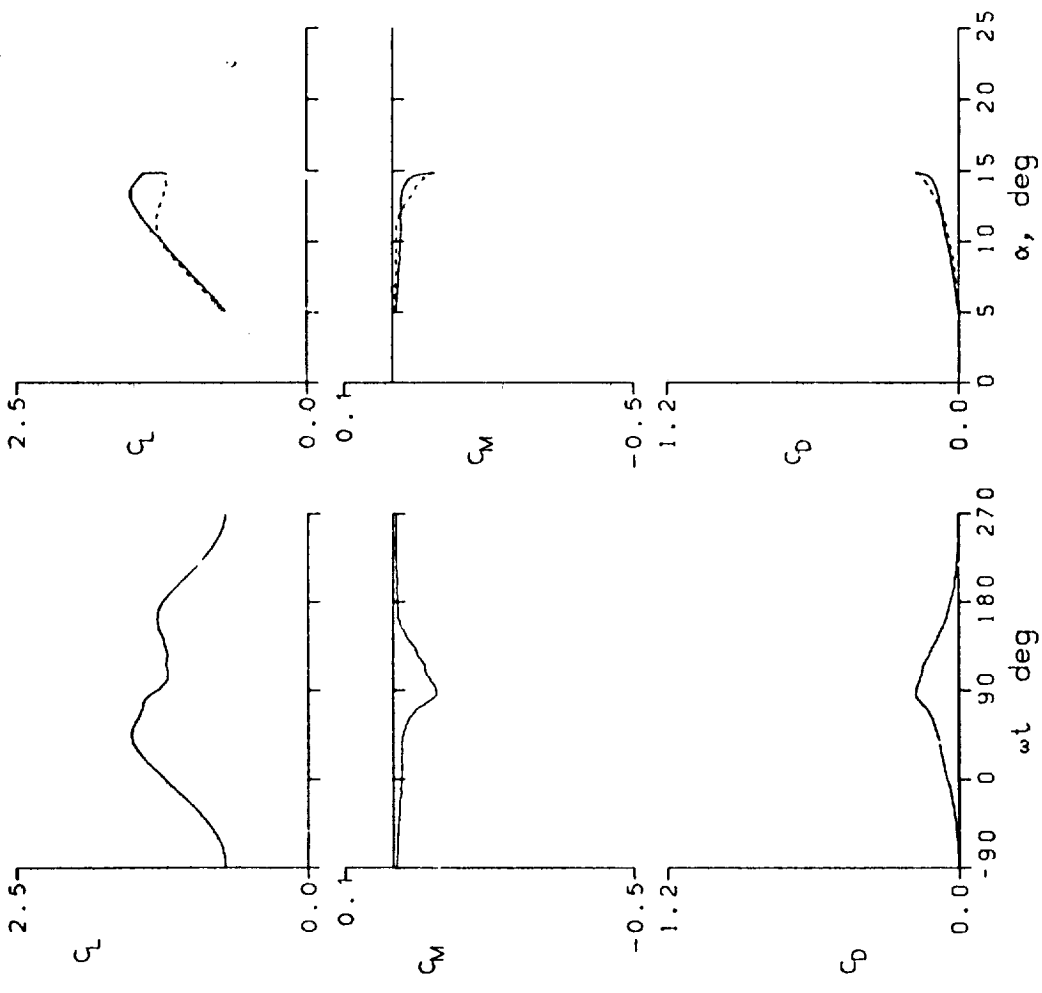


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 44023 $A_0 = 9.90^\circ$ $k = 0.050$
 $Re = 3.94 E6$ $A_1 = 4.92^\circ$ $M = 0.302$
 $C_{Lmax} = 1.58$ $C_{Mmin} = -0.08$ $C_{Dmax} = 0.19$
 $\alpha_{Lmax} = 13.6^\circ$ $\xi = 0.081$ $M_{max} = 1.116$
 $\alpha_{Cmin} = 9.7^\circ$ $-C_{Pmax} = 8.9$ $\alpha_{Mmax} = 13.5^\circ$

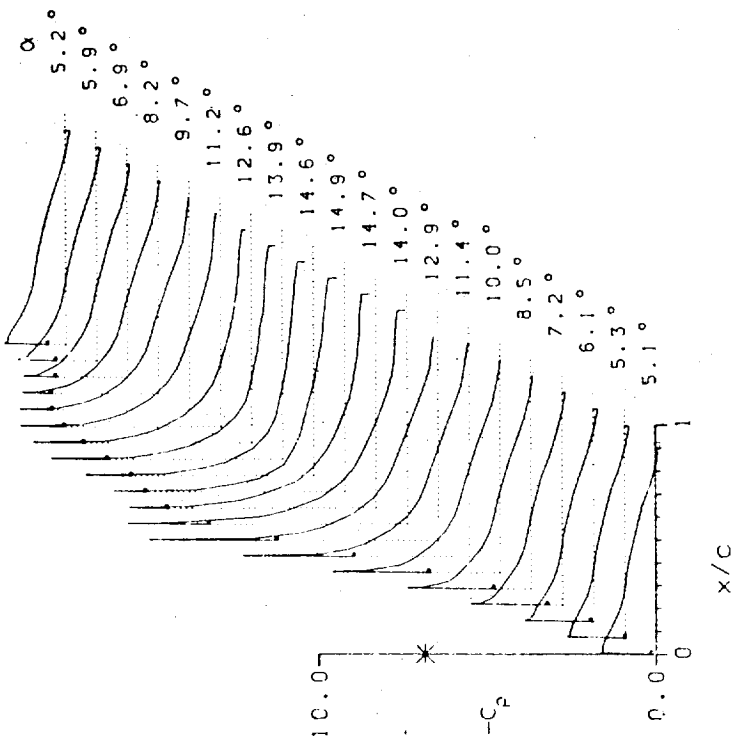
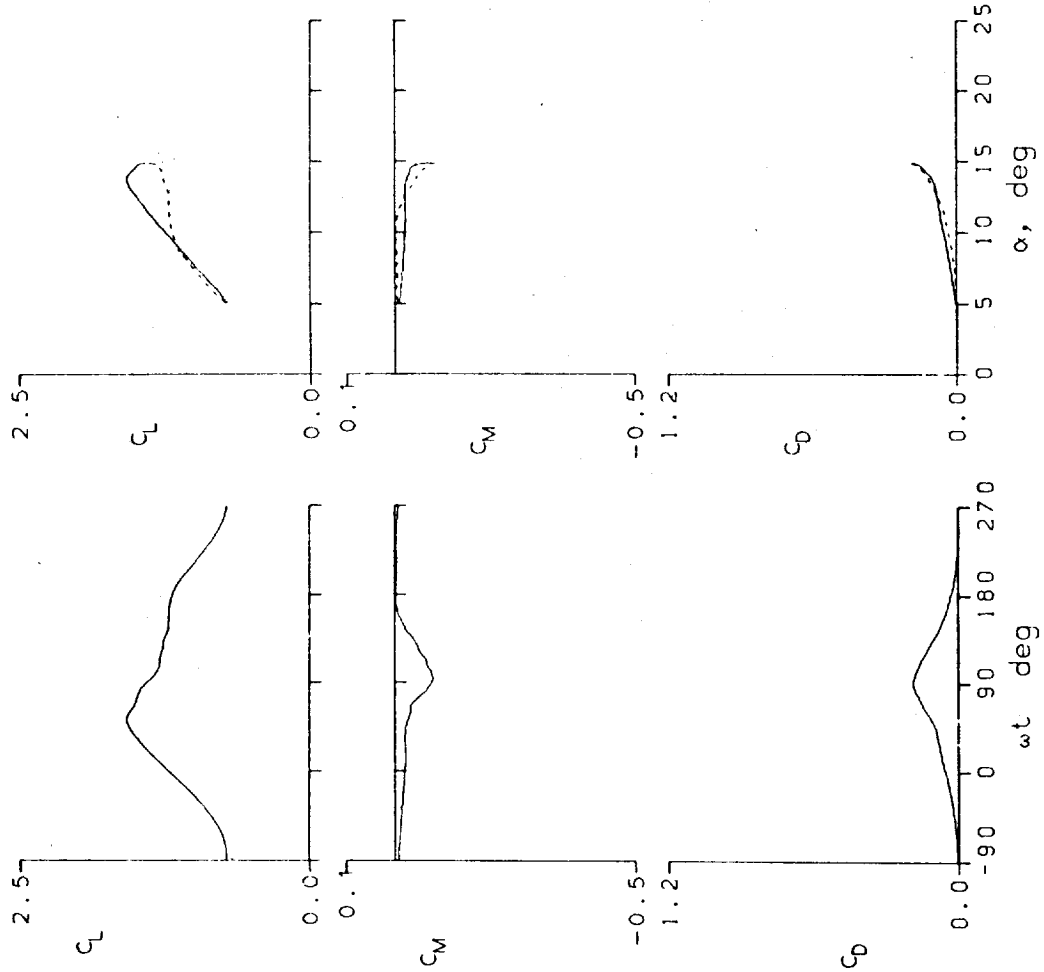


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB - AIRFOIL

FRAME : 44104	A0 = 9.90 °	k = 0.099
Re = 4.00 E6	A1 = 4.90 °	M = 0.303
CLmax = 1.65	CMmin = -0.13	CDmax = 0.25
αLmax = 14.9 °	ξ = 0.104	Mmax = 1.225
αCMmin = 9.6 °	-CPmax = 9.0	αMmax = 13.8 °

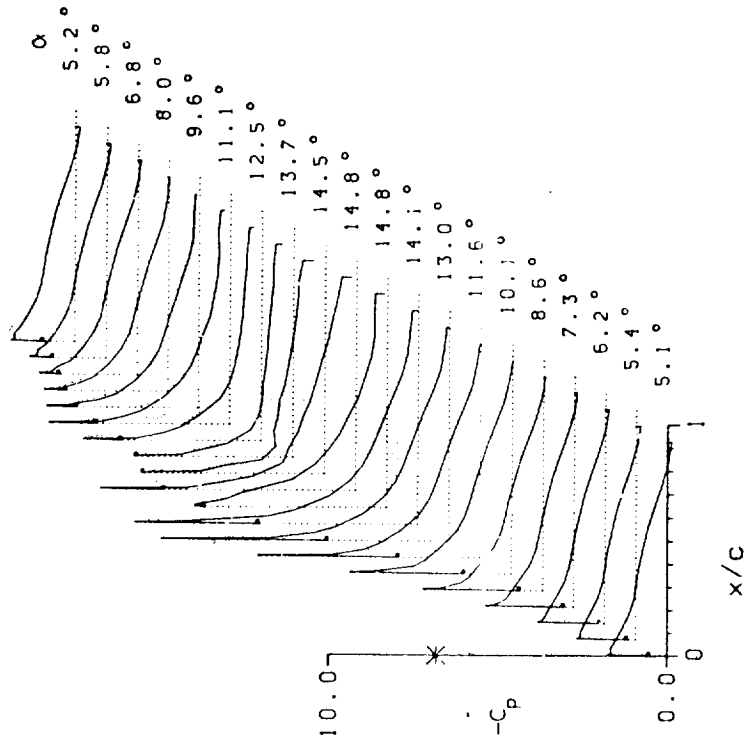
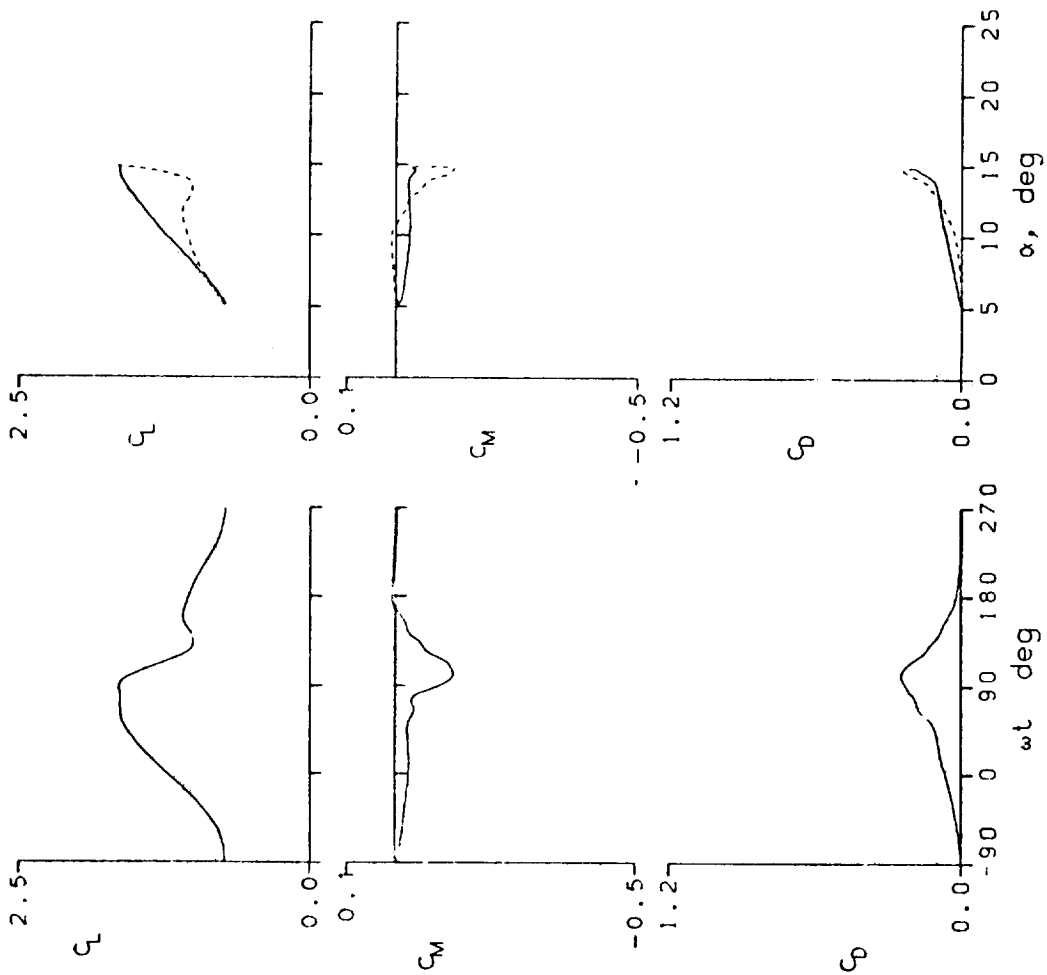


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRAME : 44106 $A_0 = 9.93^\circ$ $k = 0.149$
 $Re = 3.99 E6$ $A_1 = 4.91^\circ$ $M = 0.303$
 $C_{Lmax} = 1.72$ $C_{Mmin} = -0.15$ $C_{Dmax} = 0.26$
 $\alpha_{Lmax} = 14.9^\circ$ $\zeta = 0.093$ $M_{max} = 1.227$
 $\alpha_{C_{Lmin}} = 9.7^\circ$ $-C_{Dmax} = 9.0$ $\alpha_{Mmax} = 14.0^\circ$

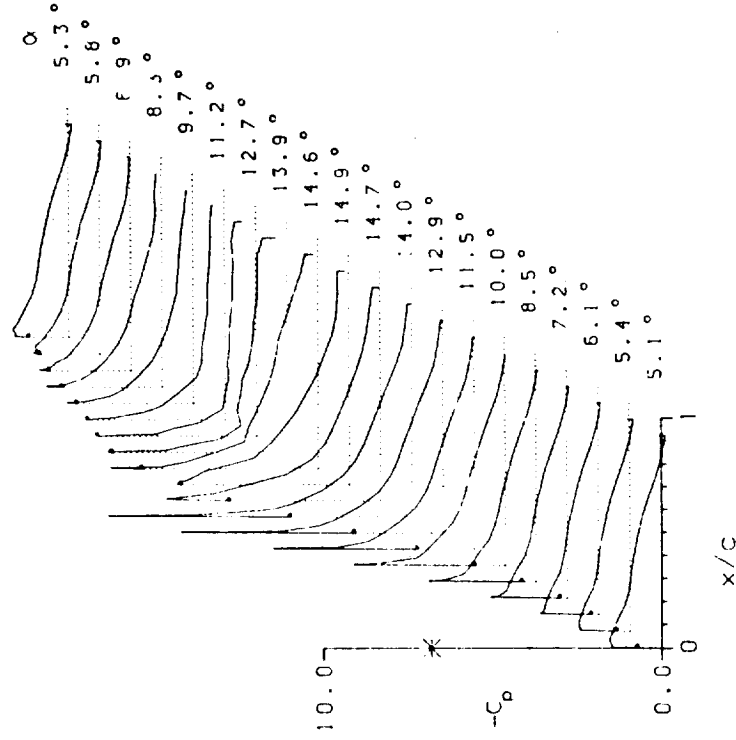
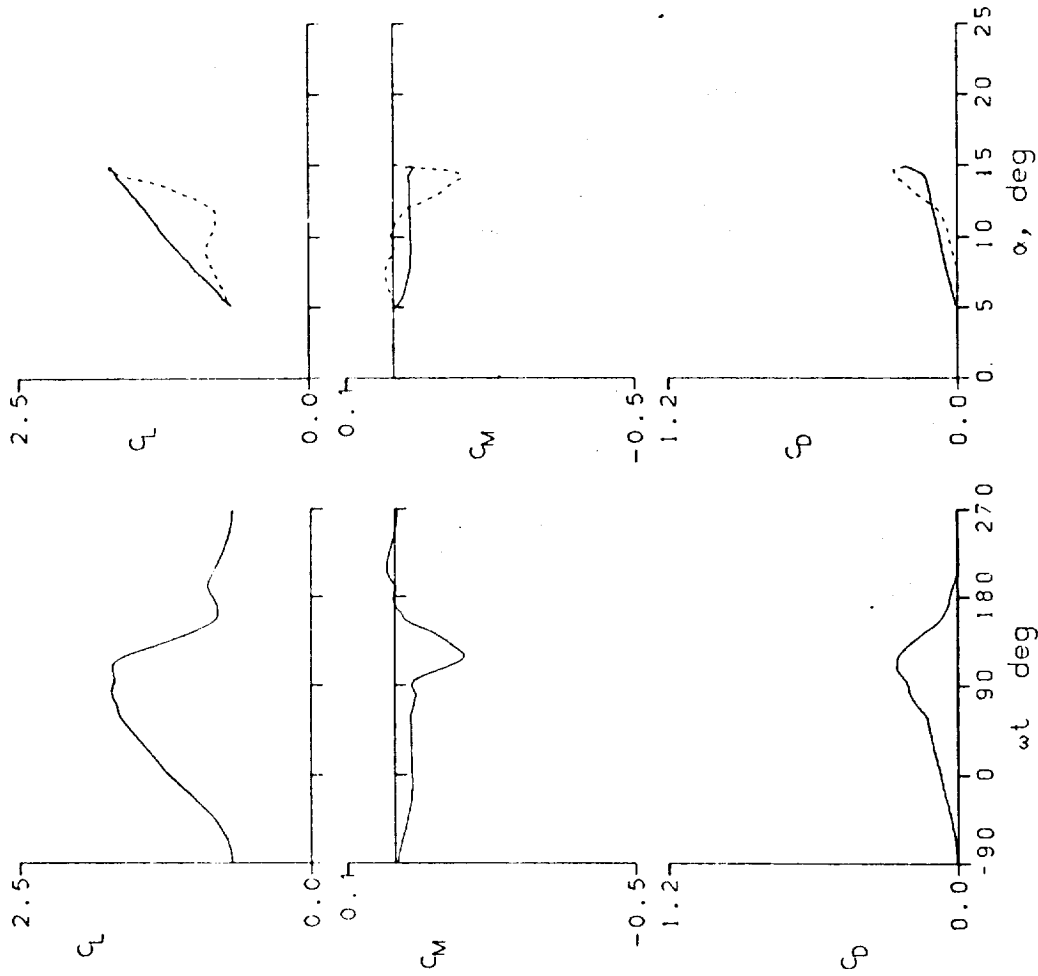


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 44112 A0 = 9.85° k = 0.199
 Re = 4.00 E6 A1 = 4.90° M = 0.303
 CLmax = 1.84 CMmin = -0.21 CDmax = 0.32
 α Lmax = 14.9° ξ = -0.010 Mmax = 1.221
 α Cmin = 9.6° -CPmax = 8.9 α Mmax = 14.0°

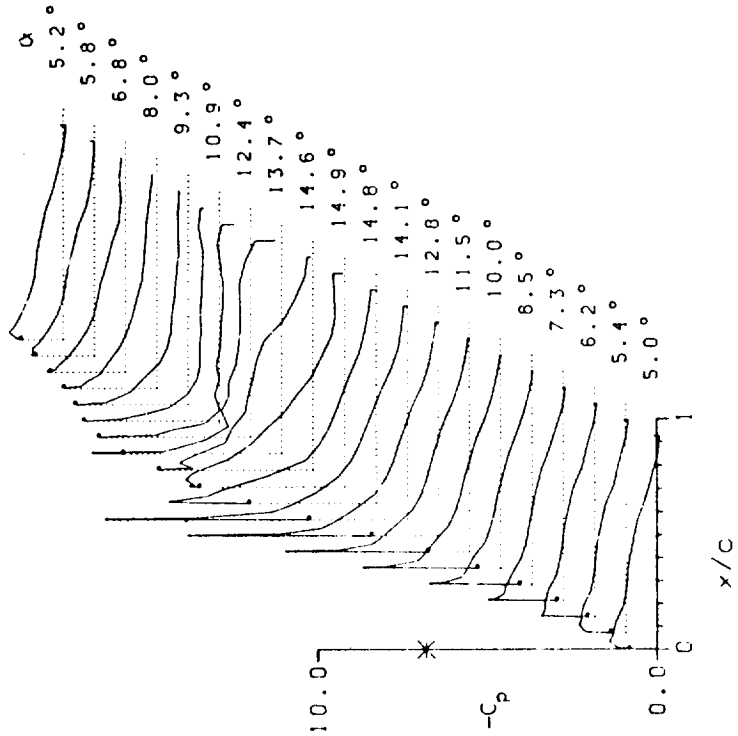
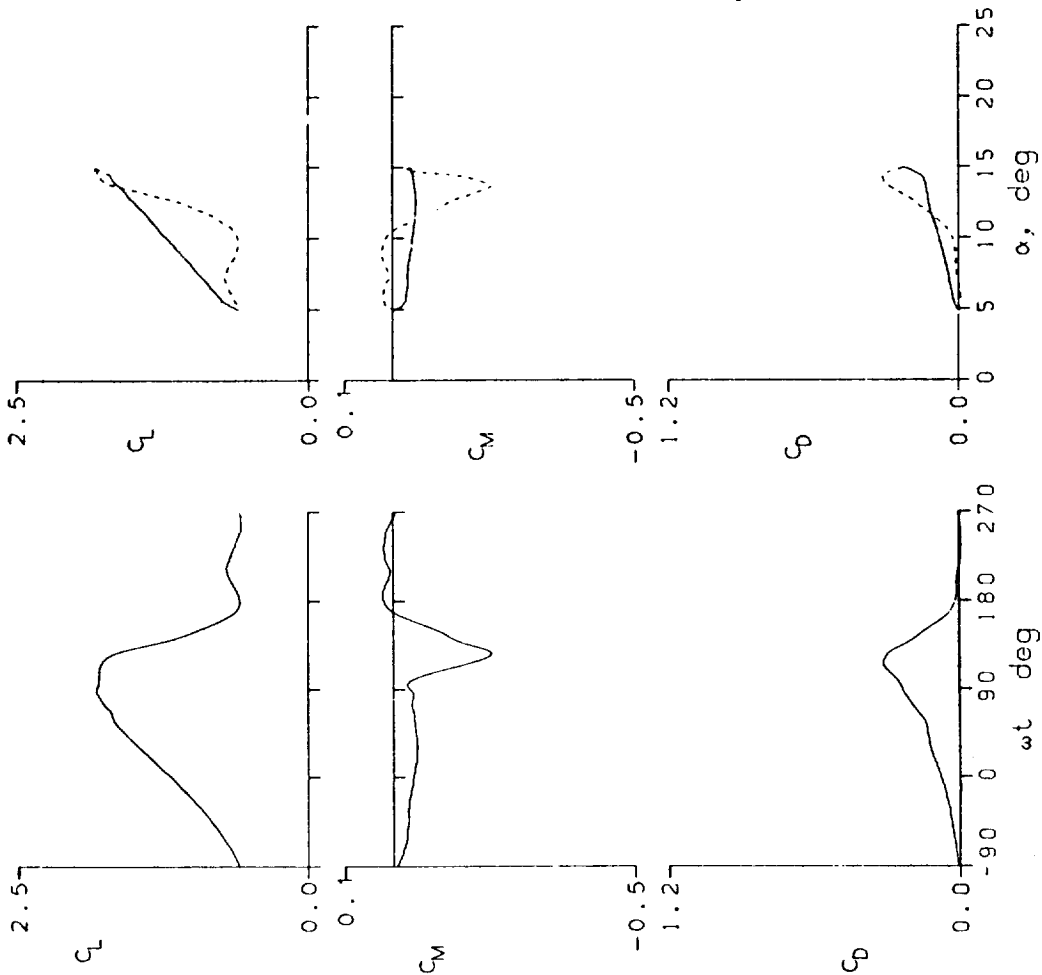


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRAME : 44118 $A_0 = 9.89^\circ$ $k = 0.100$

$Re = 4.04 \text{ E}6$ $A_1 = 4.89^\circ$ $M = 0.302$

$C_{Lmax} = 1.67$ $C_{Mmin} = -0.12$ $C_{Dmax} = 0.24$

$\alpha_{Lmax} = 14.9^\circ$ $\zeta = 0.179$ $M_{max} = 1.241$

$\alpha_{C_{min}} = 9.7^\circ$ $-C_{pmax} = 9.2$ $\alpha_{Mmax} = 13.8^\circ$

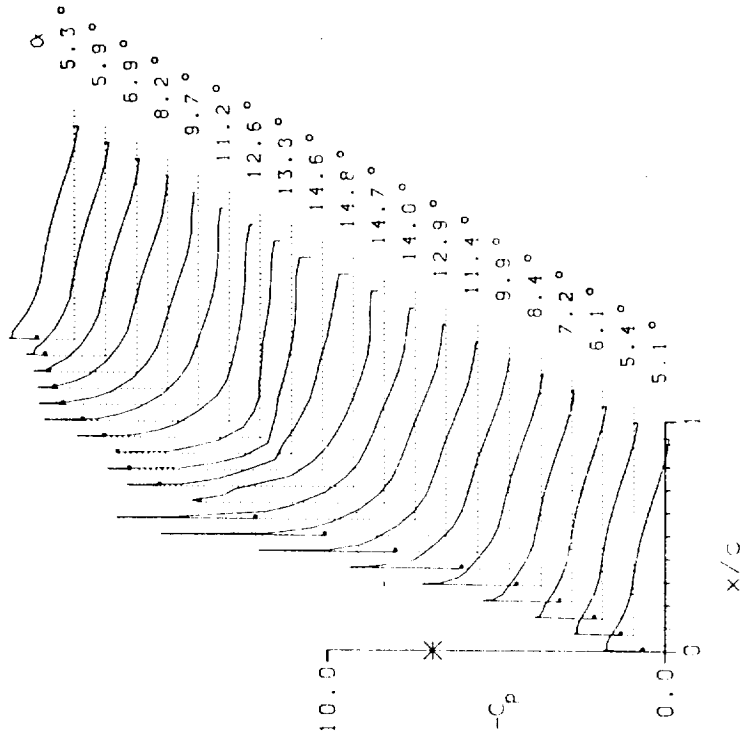
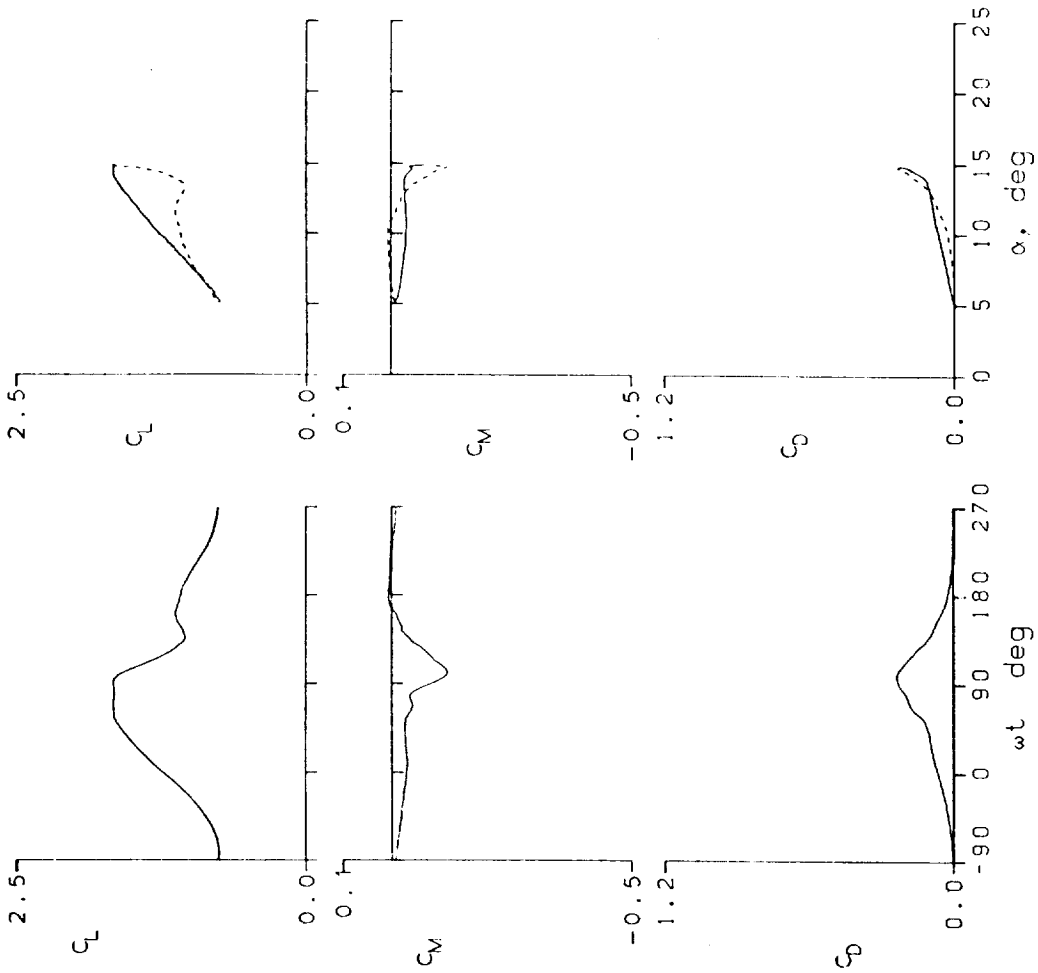


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRATE : 44119	A0 = 9.89 °	k = 0.025
Re = 4.02 E6	A1 = 4.91 °	M = 0.302
CLmax = 1.55	CMmin = -0.10	CDmax = 0.19
α Lmax = 13.2 °	ξ = 0.000	Mmax = 1.229
α Cmin = 9.6 °	-CDmax = 9.1	α Mmax = 13.8 °

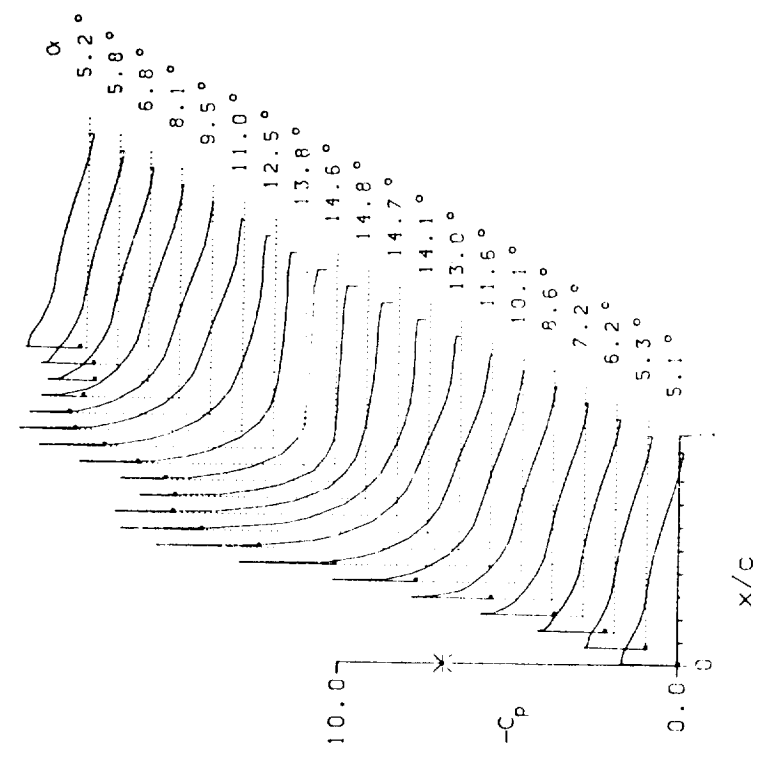
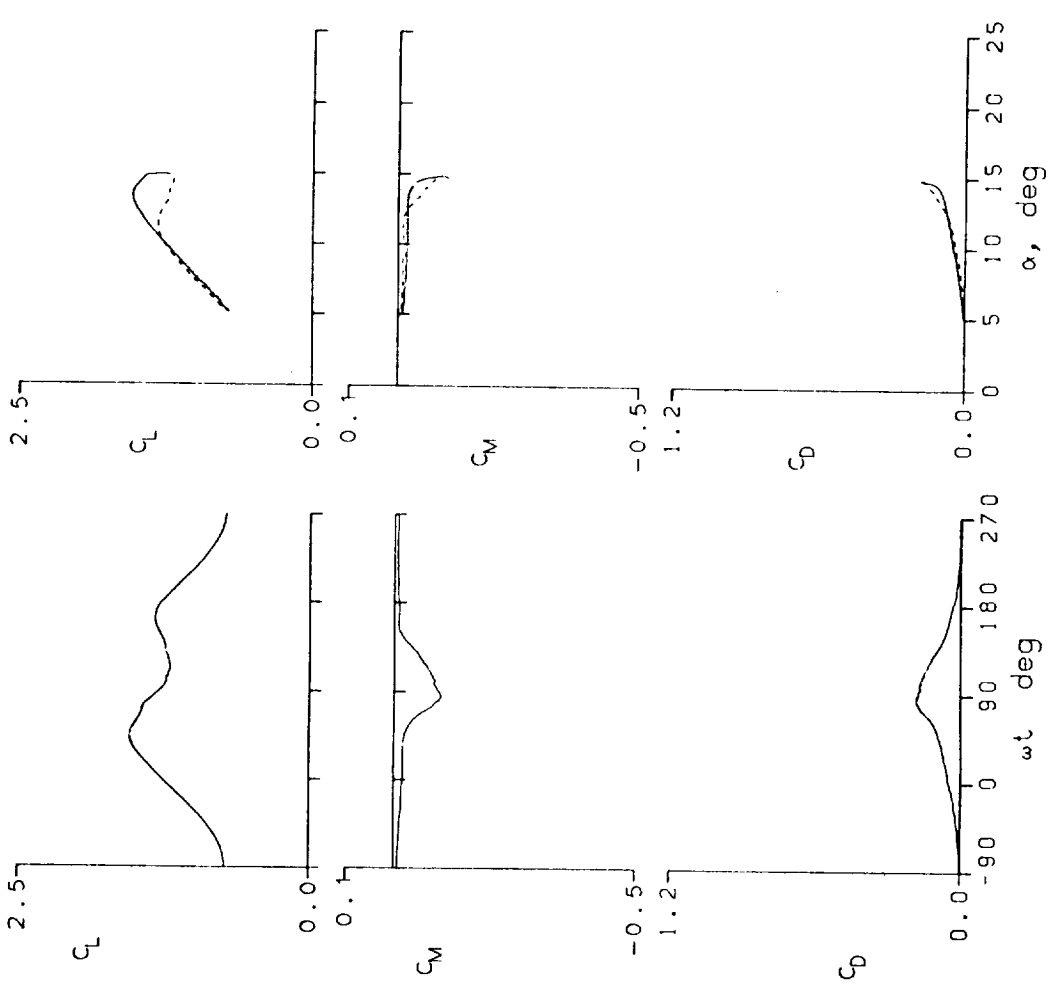


Figure 16.- Continued.

HUGHES HM-02 - WITH TAB - AIRFOIL
 FRAME : 44120 A0 = 9.84° k = 0.200
 Re = 4.01 E6 A1 = 4.91° M = 0.302
 CLmax = 1.86 CMmin = -0.21 CDmax = 0.33
 αLmax = 14.9° ζ = 0.065 Mmax = 1.228
 αCMmin = 9.6° -CPmax = 9.1 αMmax = 14.0°

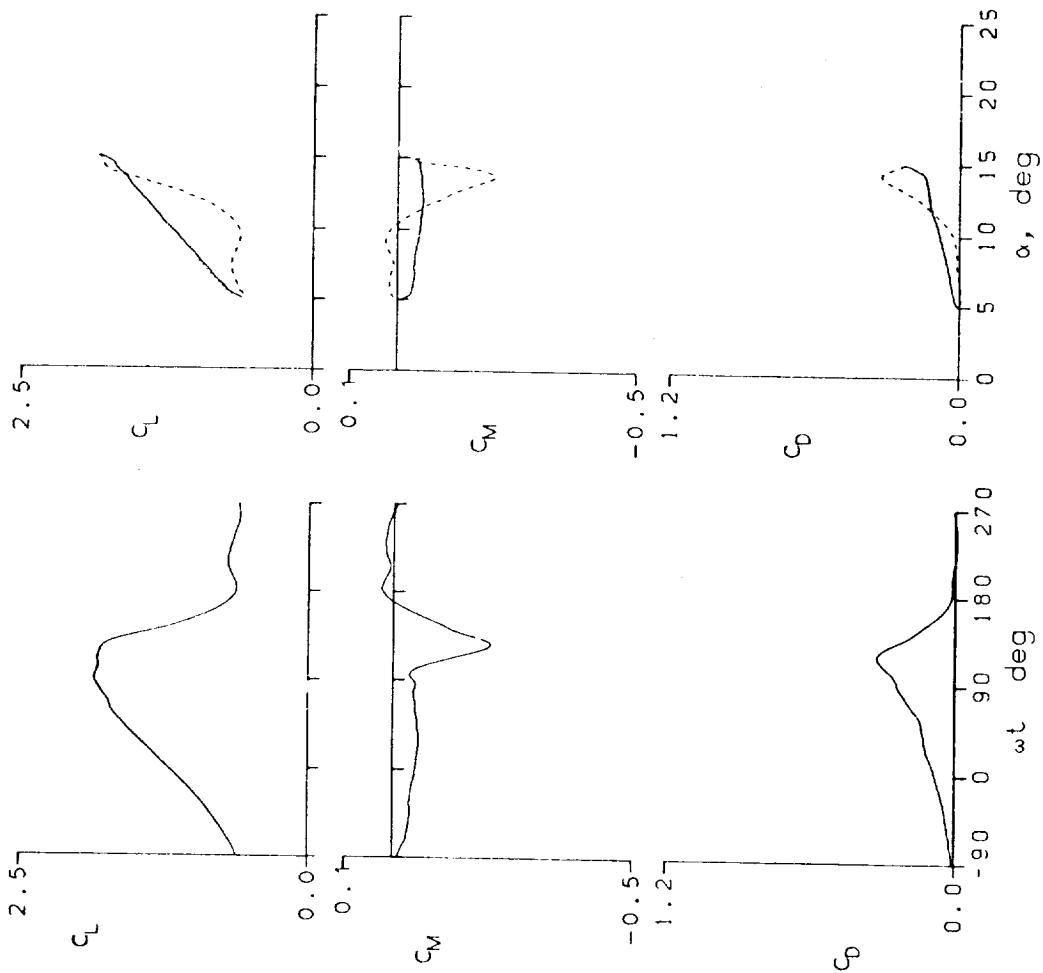


Figure 16.- Continued.

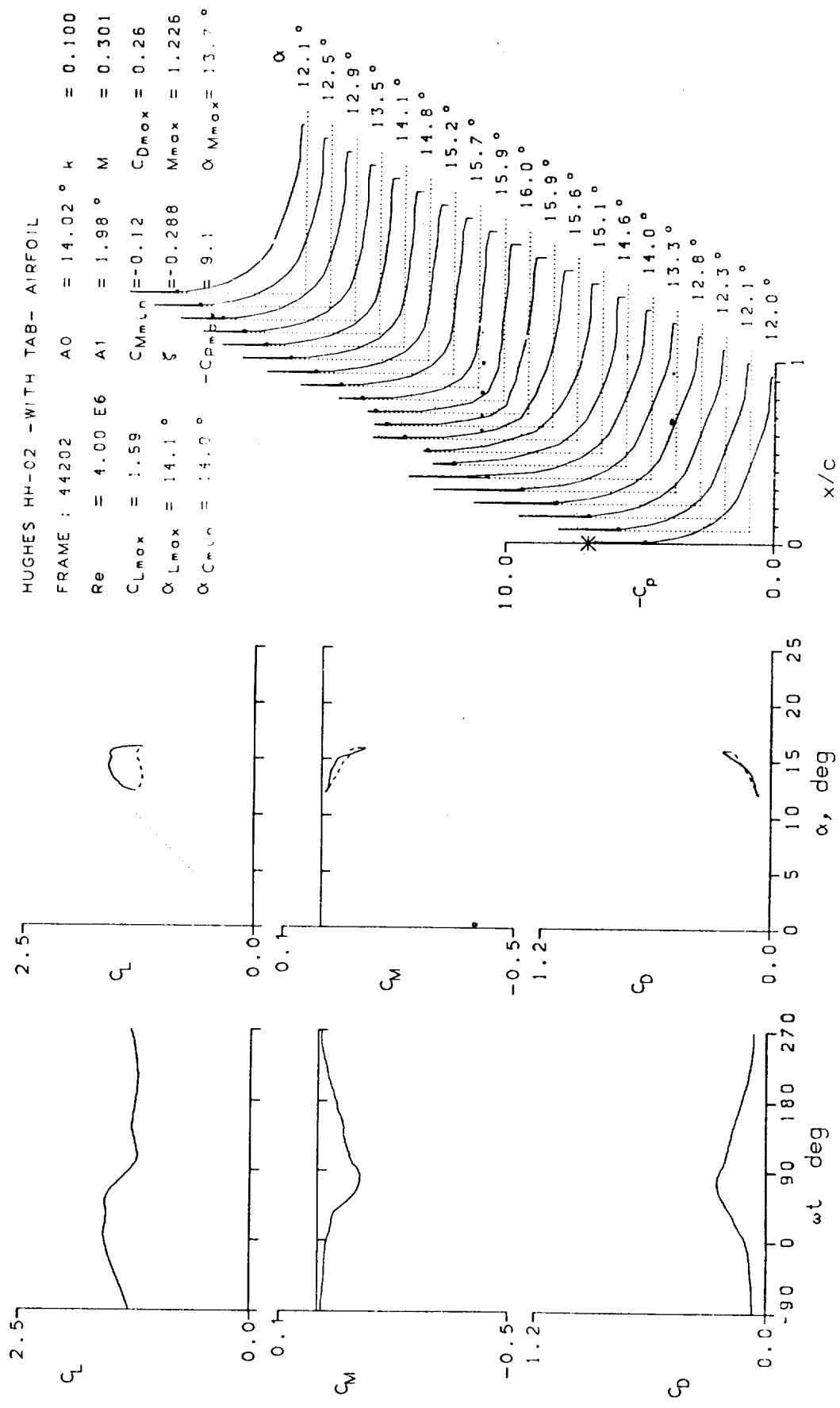


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL

FRAME : 44204 A0 = 13.95° k = 0.200
 Re = 3.99 E6 A1 = 1.99° M = 0.301
 CLmax = 1.88 CMmin = -0.23 CDmax = 0.41
 αLmax = 16.0° ζ = -0.657 Mmax = 1.221
 αCMmin = 13.9° -CPmax = 9.1 αMmax = 14.4°

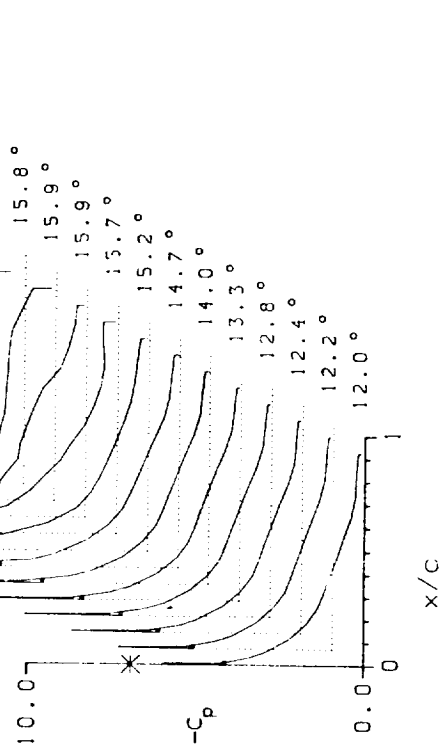
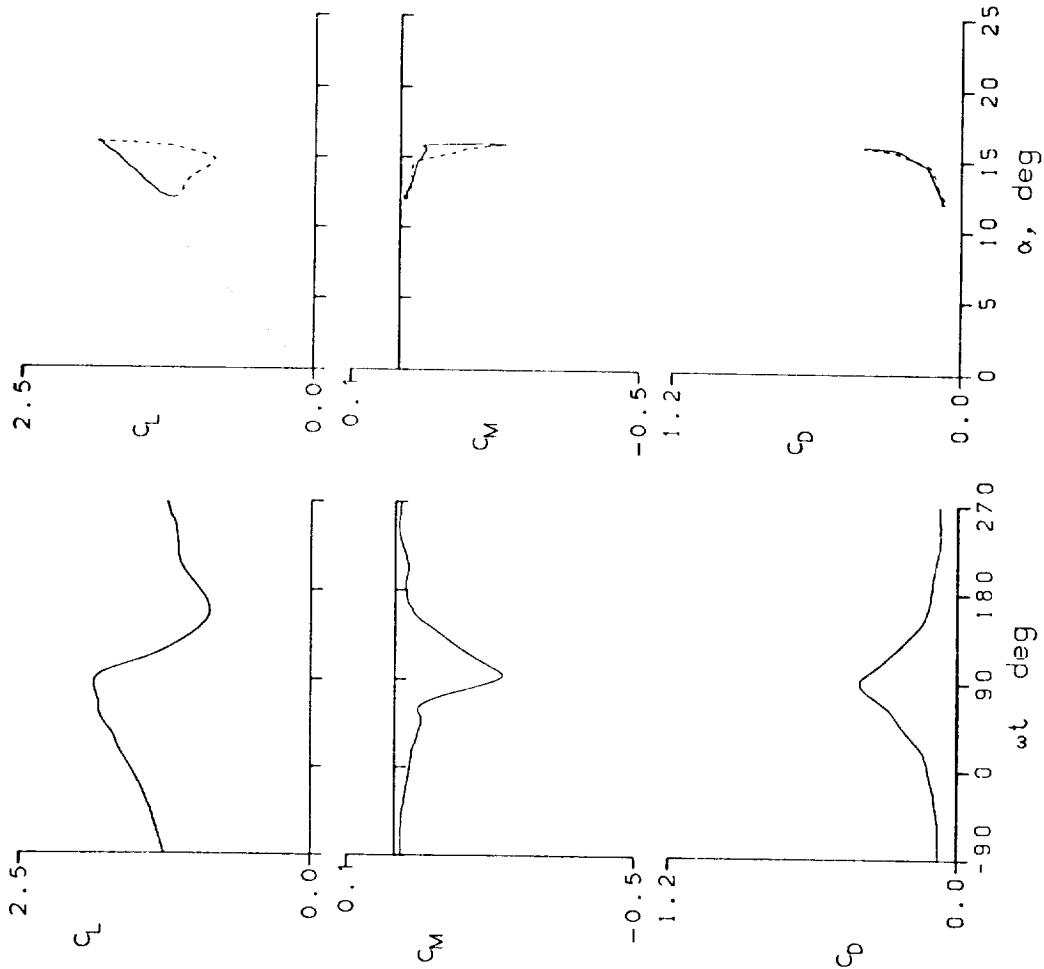
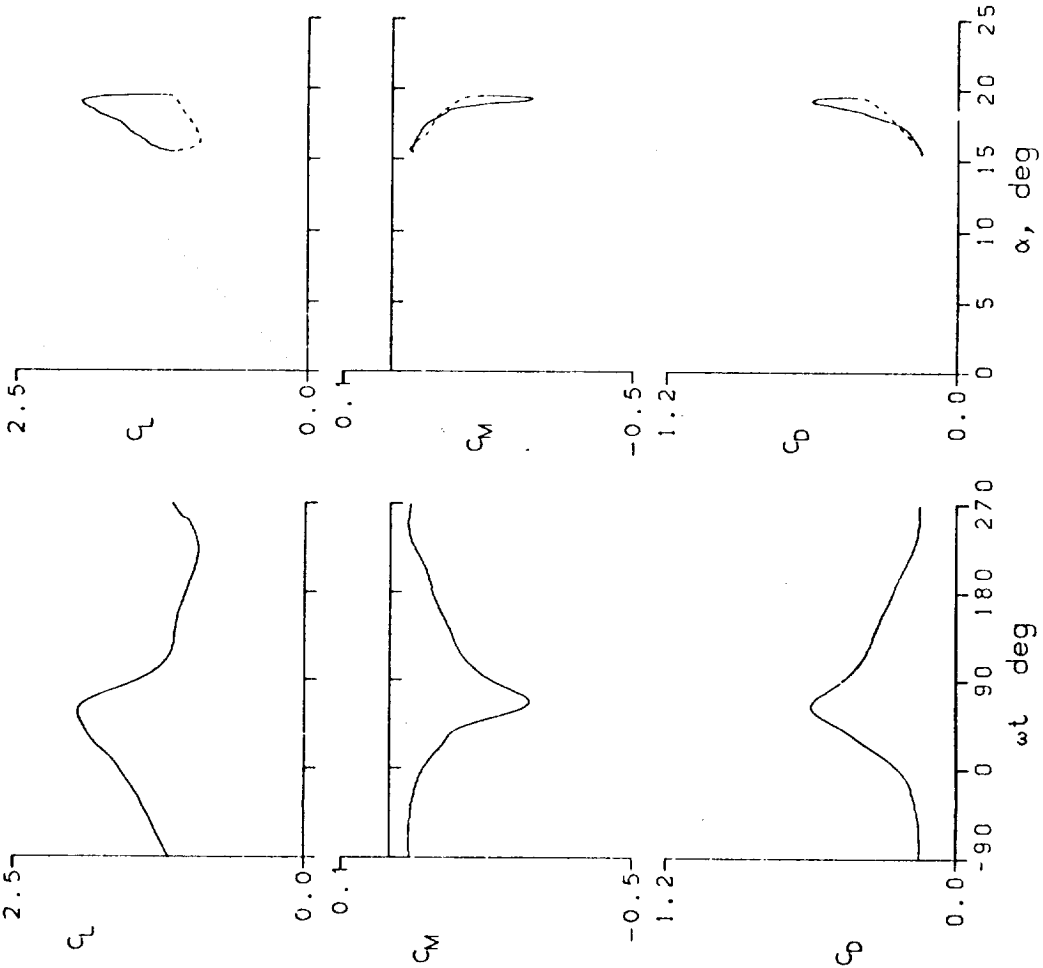


Figure 16.- Continued.



HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 44209 A0 = 17.52° k = 0.213
 Re = 3.76 E6 A1 = 1.99° M = 0.282
 C_{Lmax} = 1.96 C_{Mmin} = -0.29 C_{Dmax} = 0.60
 α_{Lmax} = 19.0° ξ = 0.638 M_{max} = 1.120
 α_{Cmin} = 17.6° $-C_{Dmax}$ = 9.3 α_{Mmax} = 17.0°

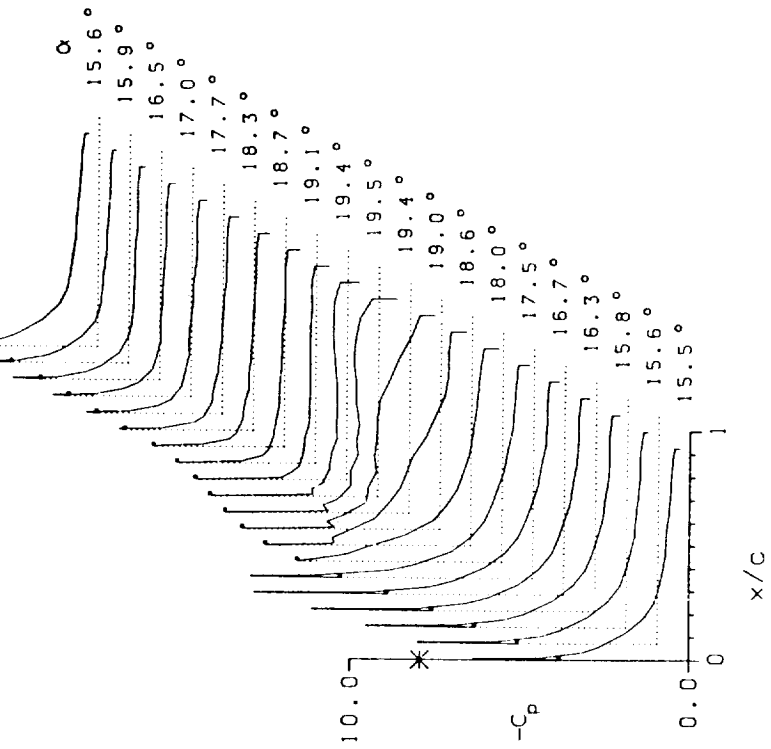


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 14212 $\Delta 0 = 15.47^\circ$ $k = 0.010$

$Re = 3.95 E6$ $A1 = 1.99^\circ$ $M = 0.297$

$C_{Lmax} = 1.45$ $C_{Mmin} = -0.10$ $C_{Dmax} = 0.23$

$\alpha_{Lmax} = 13.5^\circ$ $\zeta = 0.256$ $M_{max} = 1.166$

$\alpha_{Cmin} = 15.3^\circ$ $-C_{pmb} = 8.8$ $\alpha_{Mmax} = 13.6^\circ$

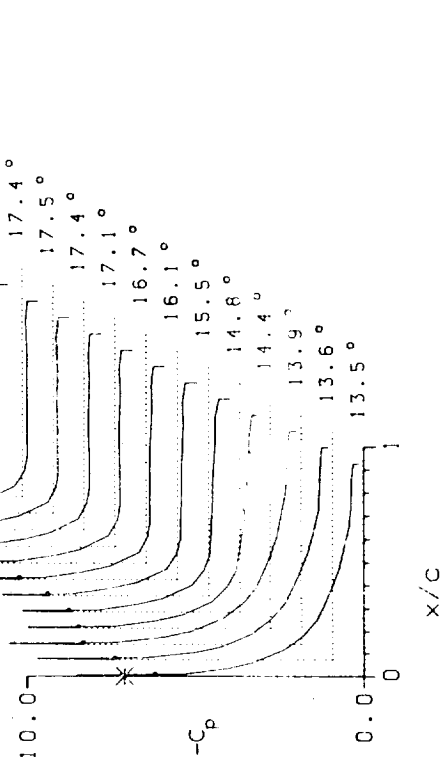
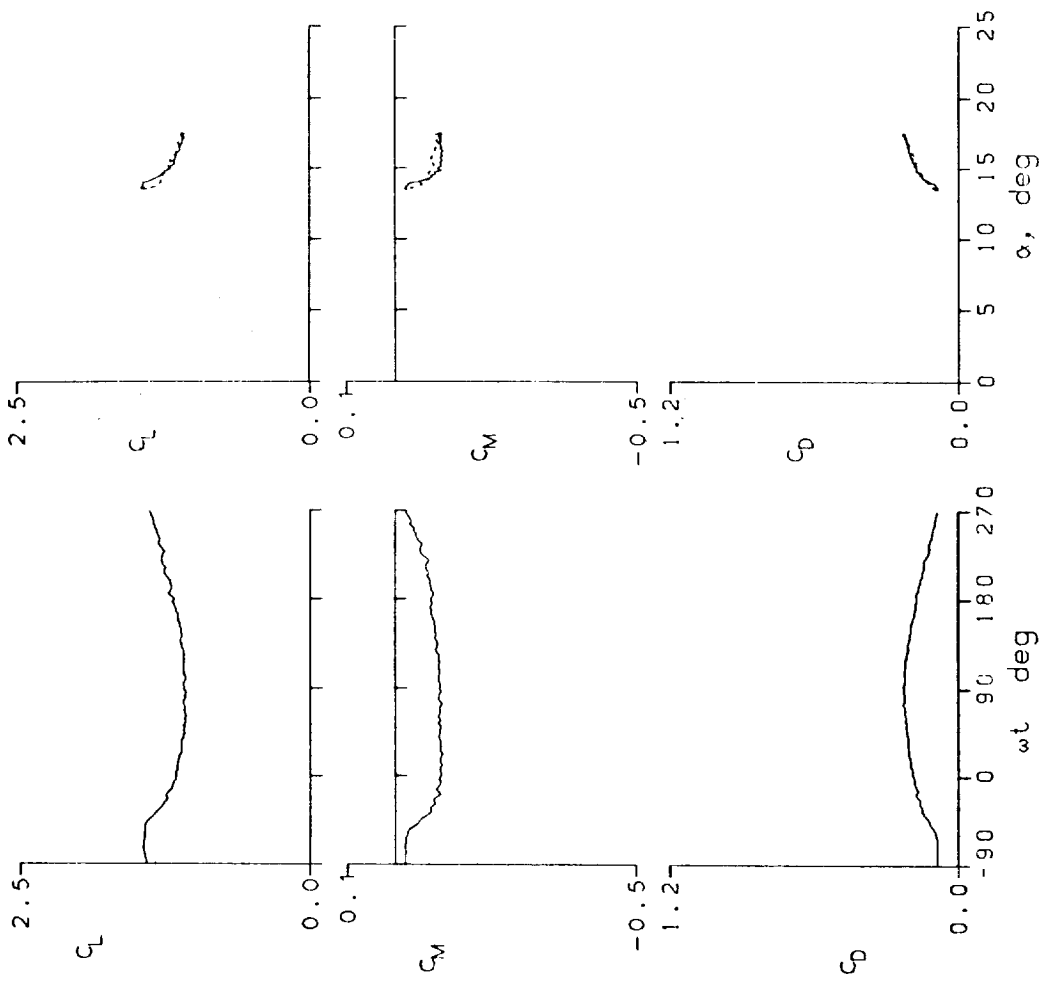


Figure 16.- Continued.

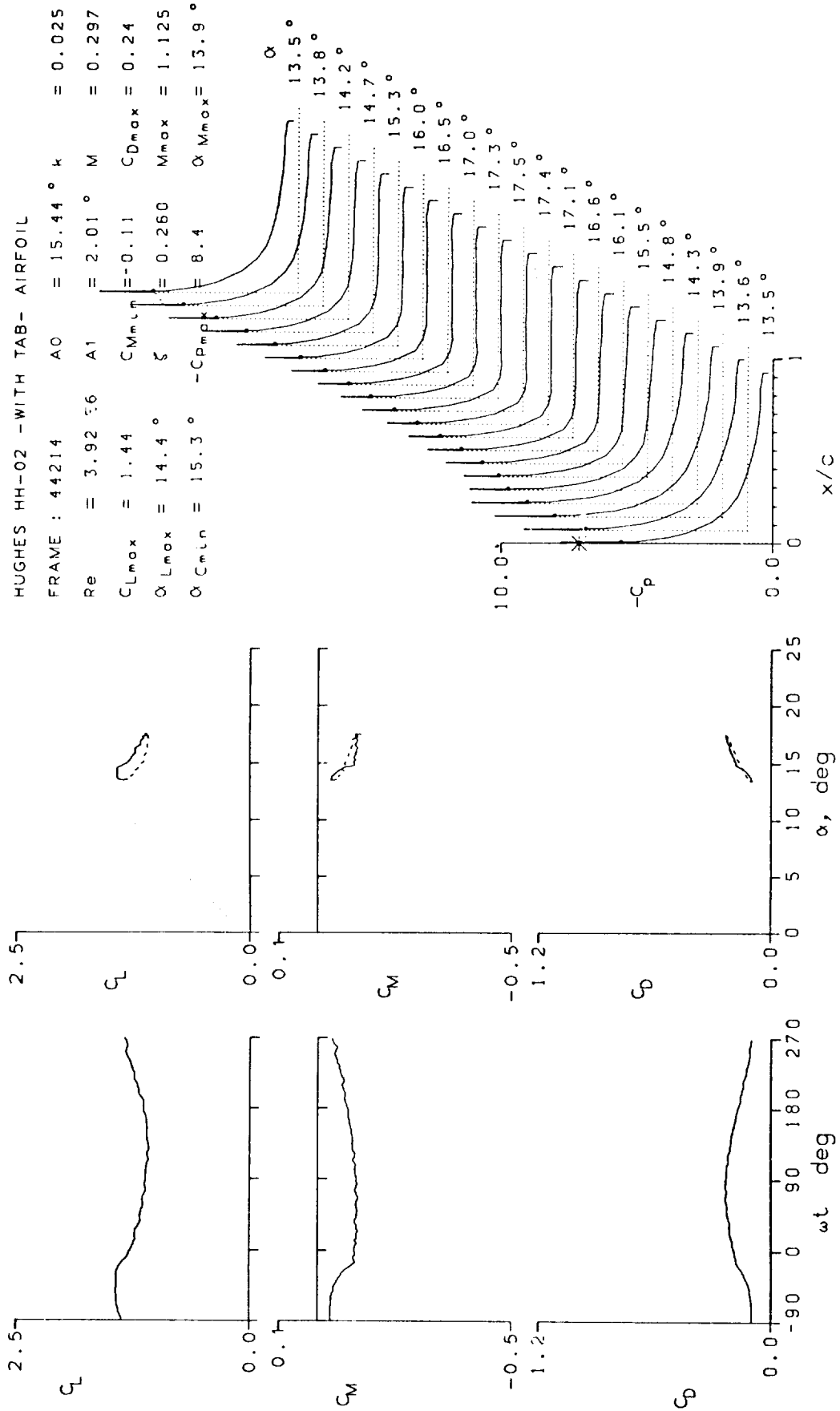


Figure 16.- Continued.

HUGHES H4-02 - WITH TAB - AIRFOIL
 FRAME : 44215 AC = 15.45° k = 0.051
 RC = 3.90 E6 A1 = 2.01° M = 0.296
 CLmax = 1.46 CMmin = -0.12 CDmax = 0.25
 αLmax = 14.6° ζ = 0.533 Mmax = 1.138
 αCmin = 15.3° -CPmax = 8.6 αMmax = 14.3°

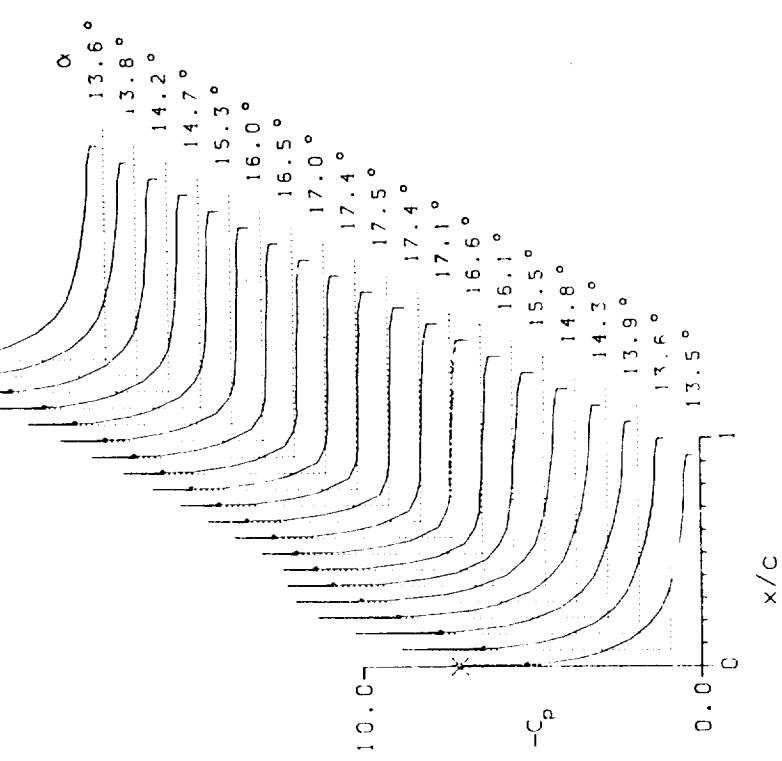
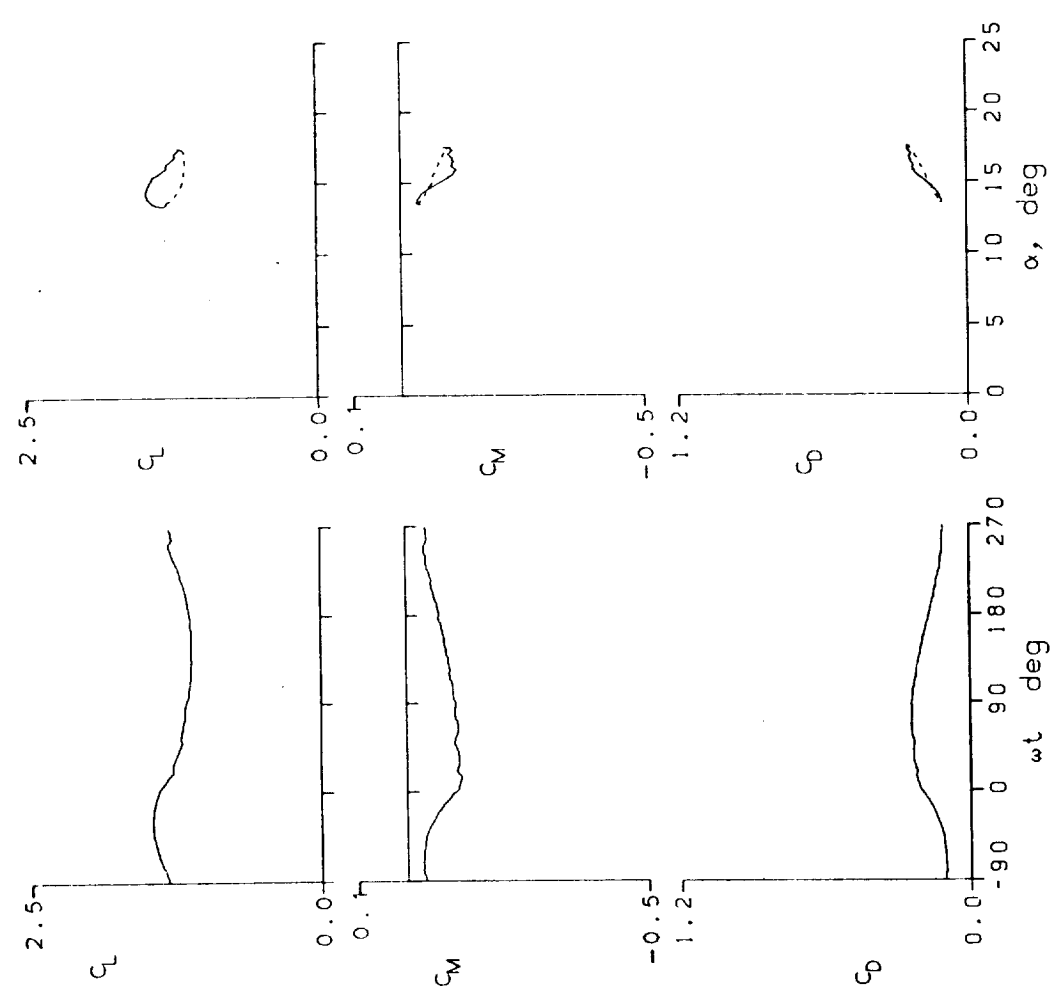


Figure 16.- Continued.

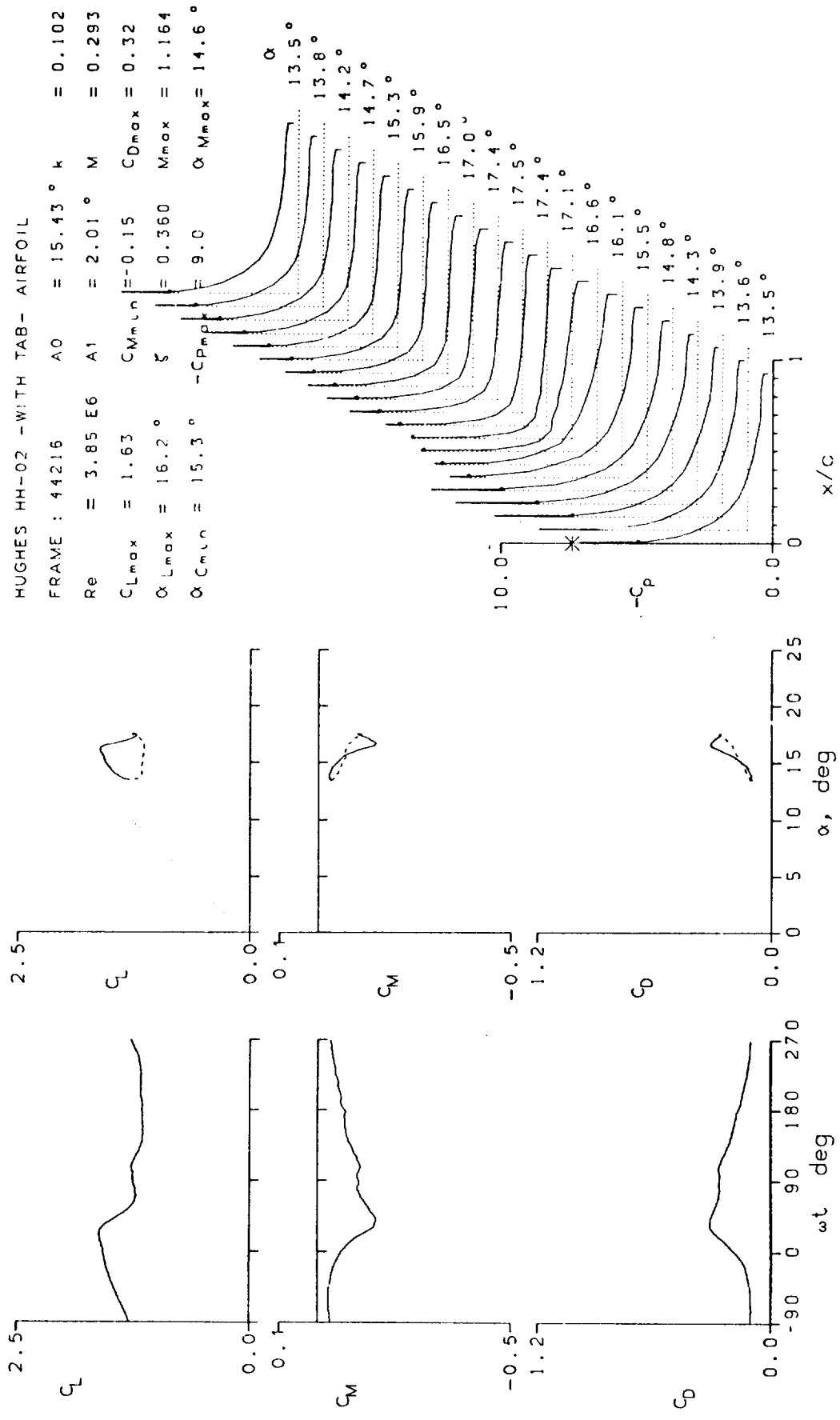


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB - AIRFOIL
 FRAME : 44217 A0 = 15.44° k = 0.154
 Re = 3.83 E6 A1 = 2.01° M = 0.291
 CLmax = 1.77 CMmin = -0.20 CDmax = 0.39
 αLmax = 16.7° ζ = 0.326 Mmax = 1.170
 αCMmin = 15.3° -CPmax = 9.2 αMmax = 14.8°

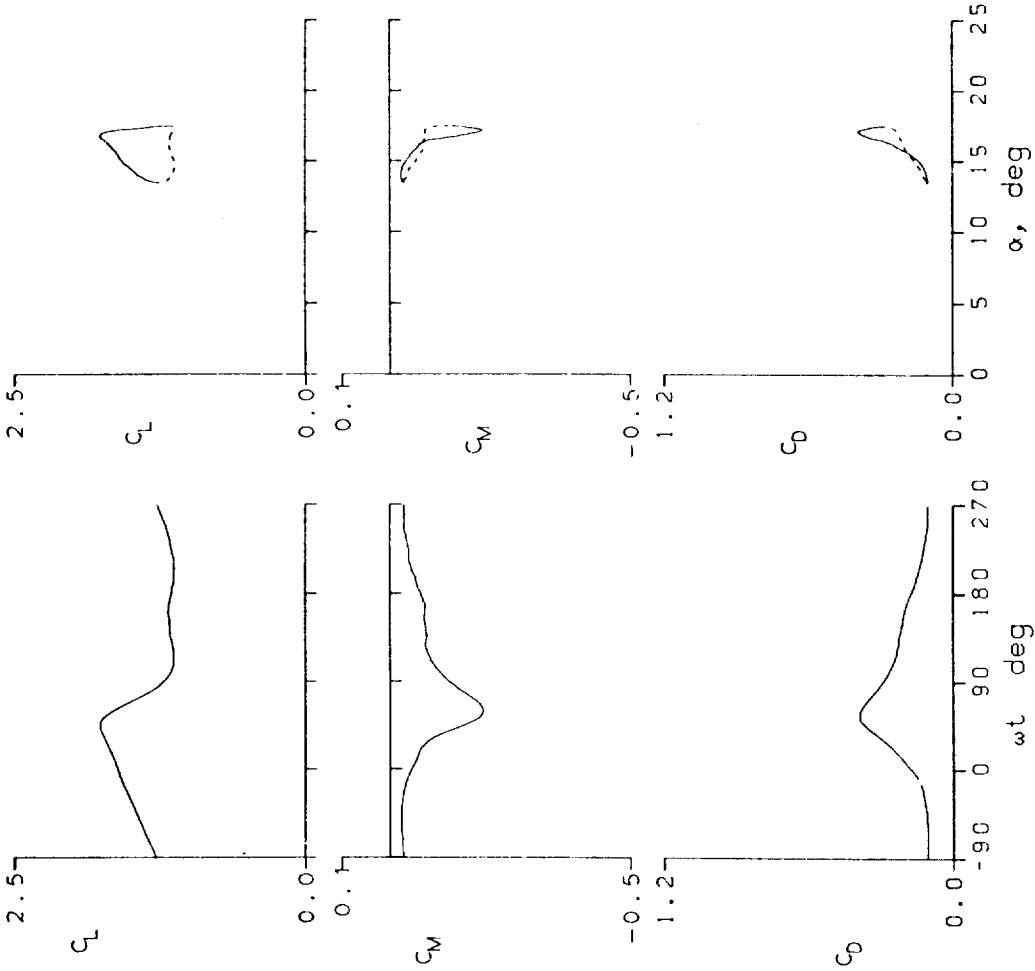
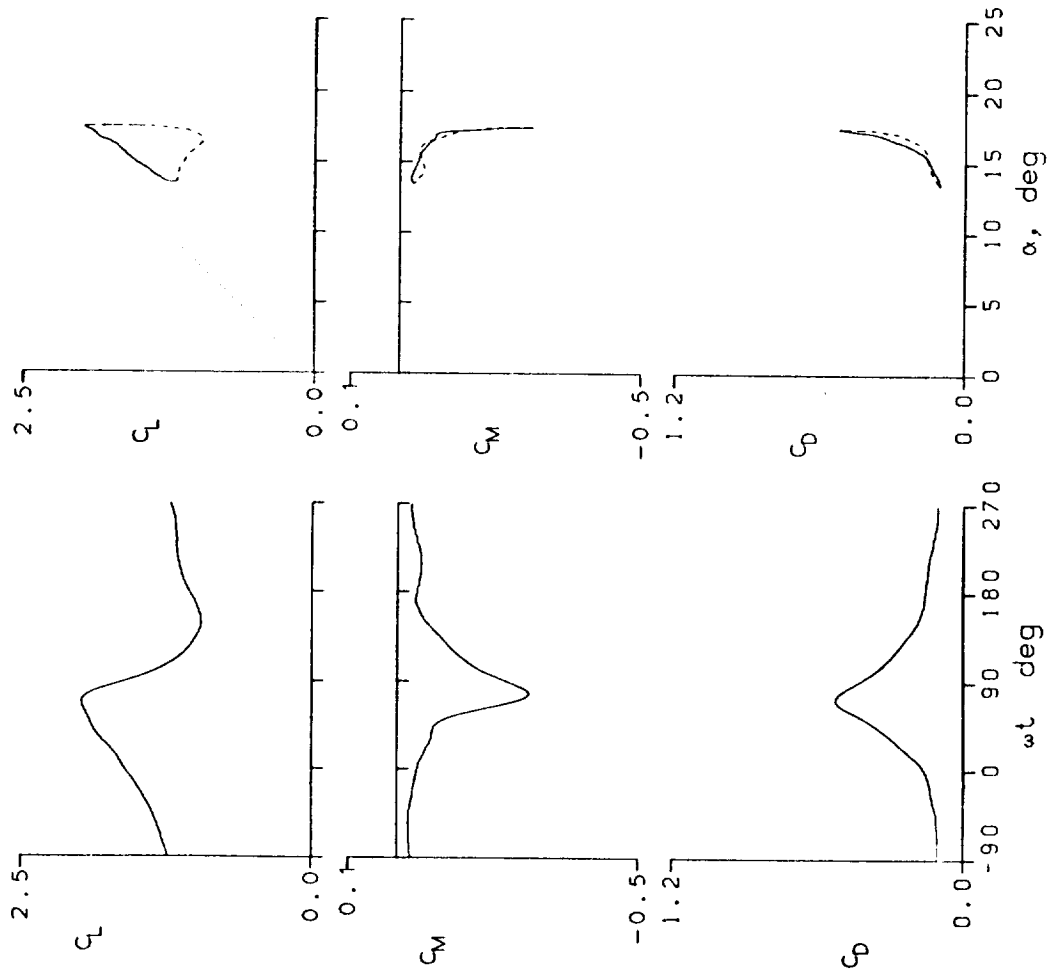


Figure 16.- Continued.



HUGHES HH-02 -WITH TAB- AIRFOIL

FRAME : 44218 A0 = 15.46 ° k = 0.205
 Re = 3.83 E6 A1 = 1.99 ° M = 0.292
 CLmax = 1.99 CMmin = -0.28 CDmax = 0.53
 alpha Lmax = 17.4 ° zeta = -0.250 Mmax = 1.180
 alpha Cmin = 15.3 ° -CDmax = 9.3 alpha Mmax = 15.3 °

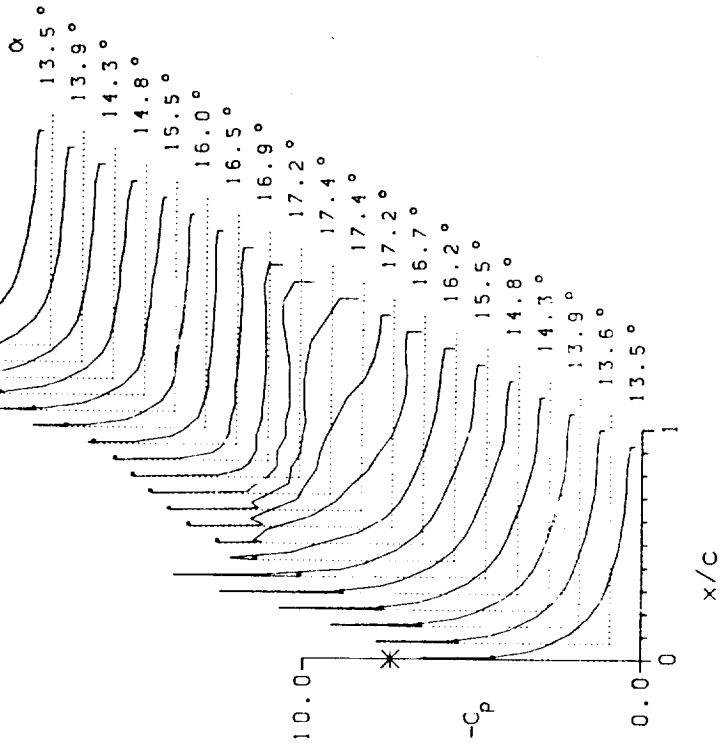


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 44221 A0 = 12.43° k = 0.010
 Re = 3.96 E6 A1 = 1.98° M = 0.301
 $C_{Lmax} = 1.48$ $C_{Mmin} = -0.08$ $C_{Dmax} = 0.16$
 $\alpha_{Lmax} = 13.3^\circ$ $\xi = -0.161$ $M_{max} = 1.189$
 $\alpha_{C_{min}} = 12.3^\circ$ $-C_{pmax} = 8.8$ $\alpha_{Mmax} = 13.4^\circ$

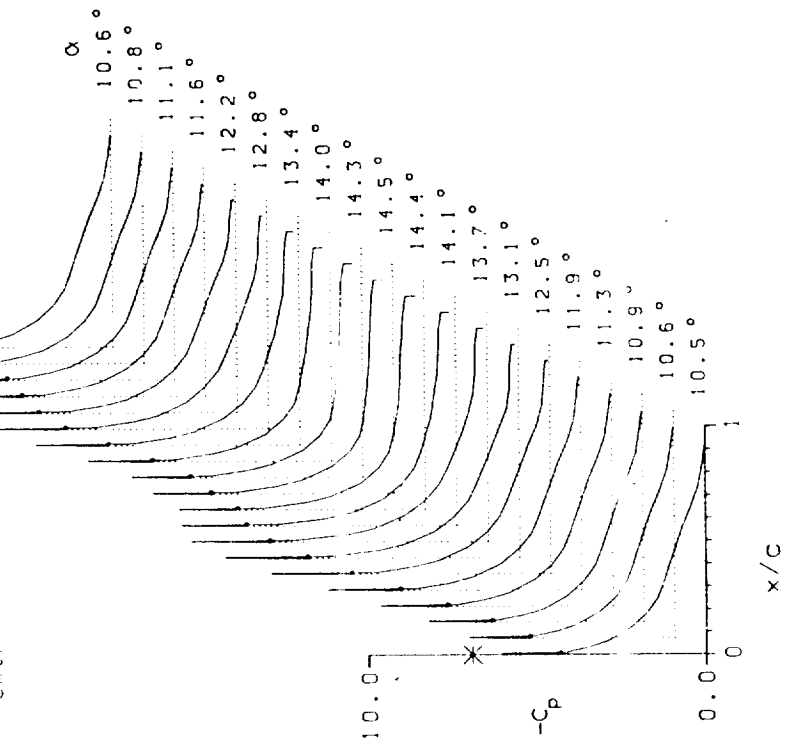
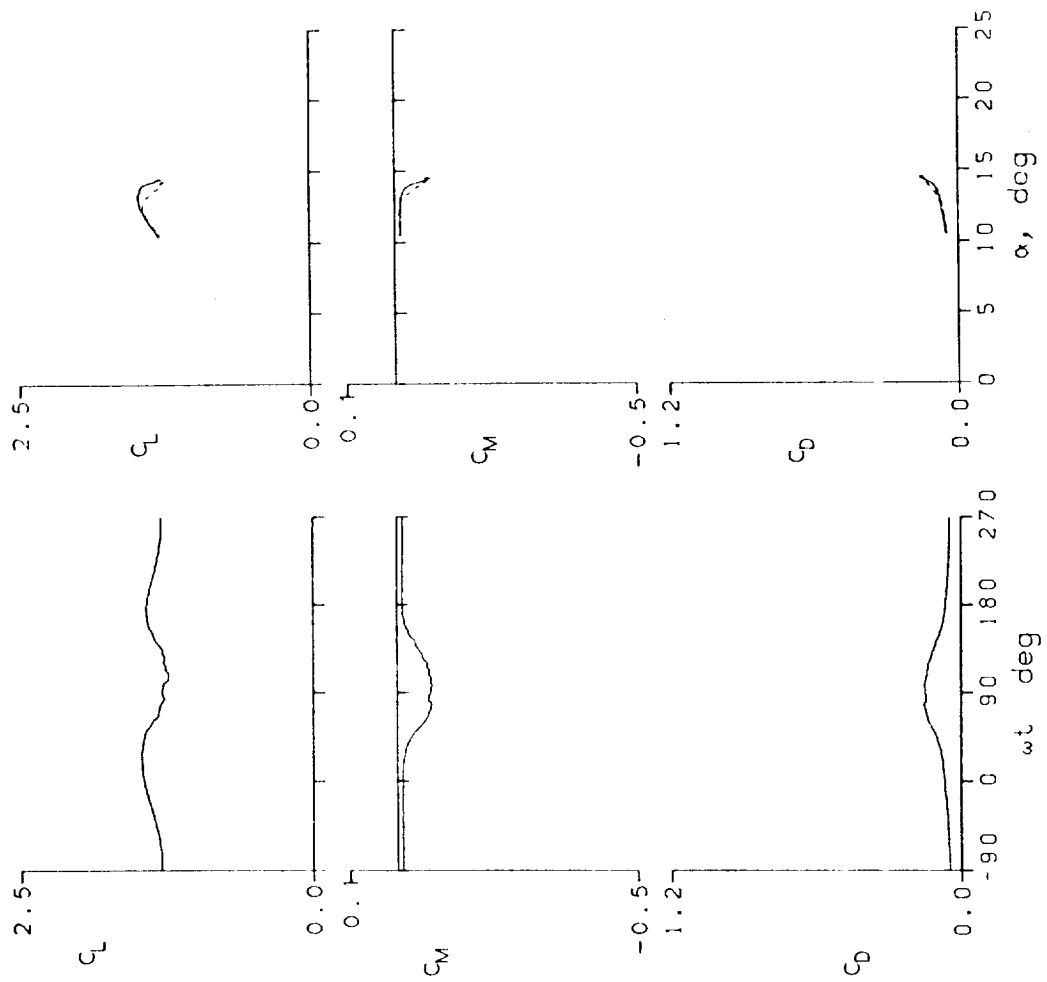


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 44222 A0 = 12.44° k = 0.025
 Re = 3.95 E6 A1 = 2.01° M = 0.302
 CLmax = 1.50 CMmin = -0.08 CDmax = 0.16
 α Lmax = 13.1° ζ = -0.247 Mmax = 1.208
 α Cmin = 12.3° -Cpmax = 8.9 α Mmax = 13.6°

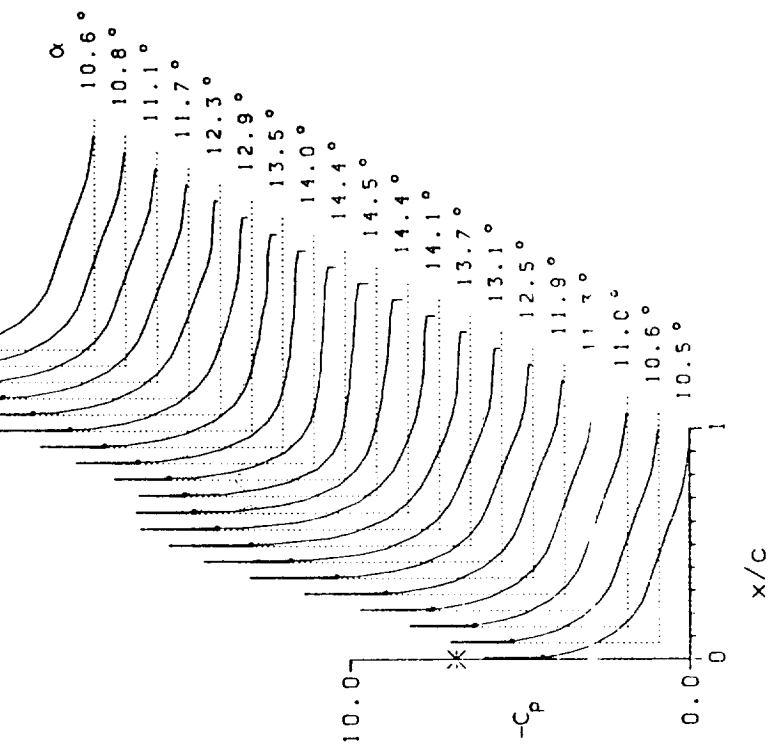
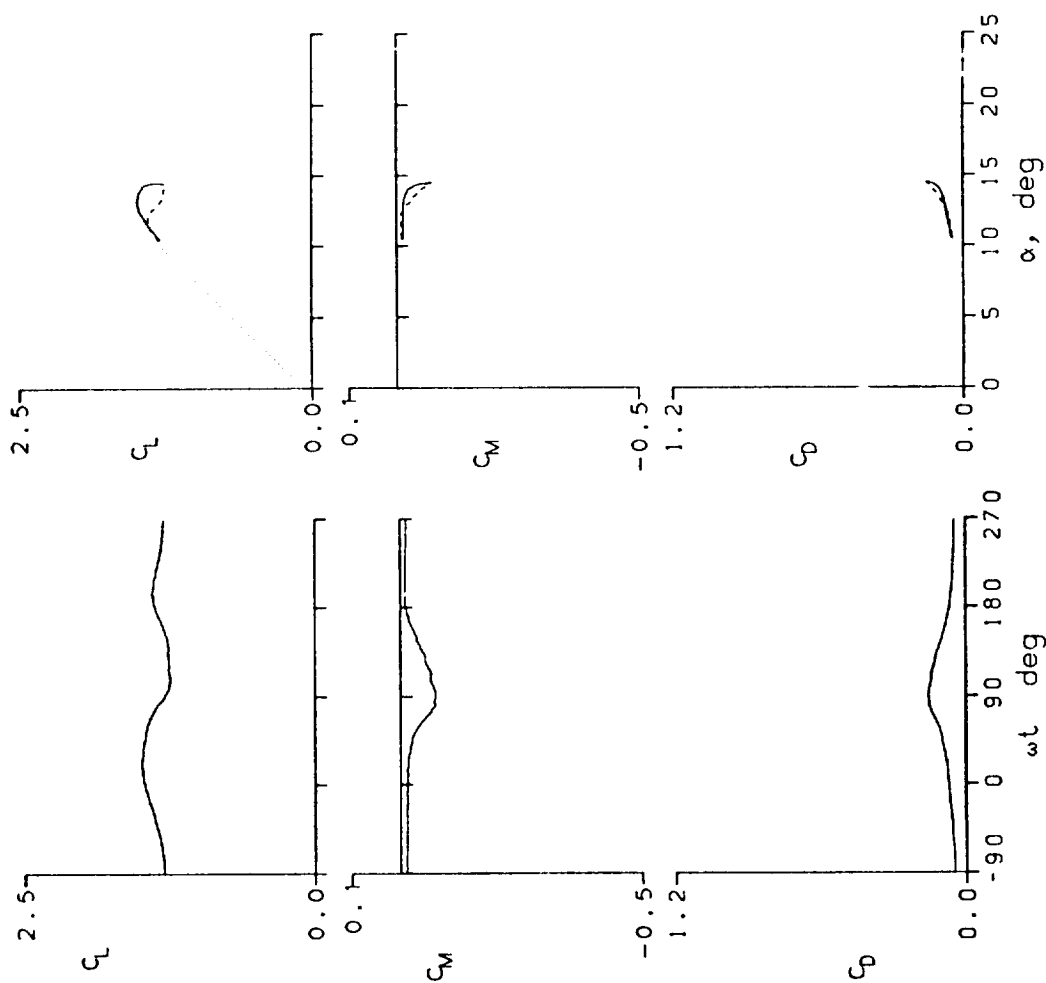


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 44223 AC = 12.45 ° k = 0.050
 Re = 3.93 E6 A1 = 2.01 ° M = 0.301
 CLmax = 1.53 CMmin = -0.07 CDmax = 0.15
 αLmax = 13.6 ° ξ = -0.304 Mmax = 1.214
 αCmin = 12.3 ° -CPmax = 9.0 αMmax = 13.9 °

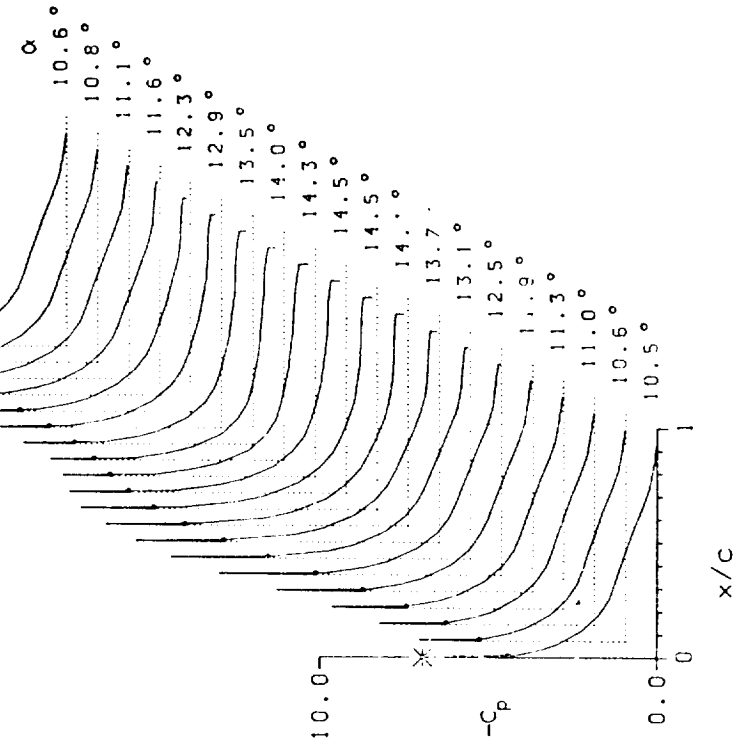
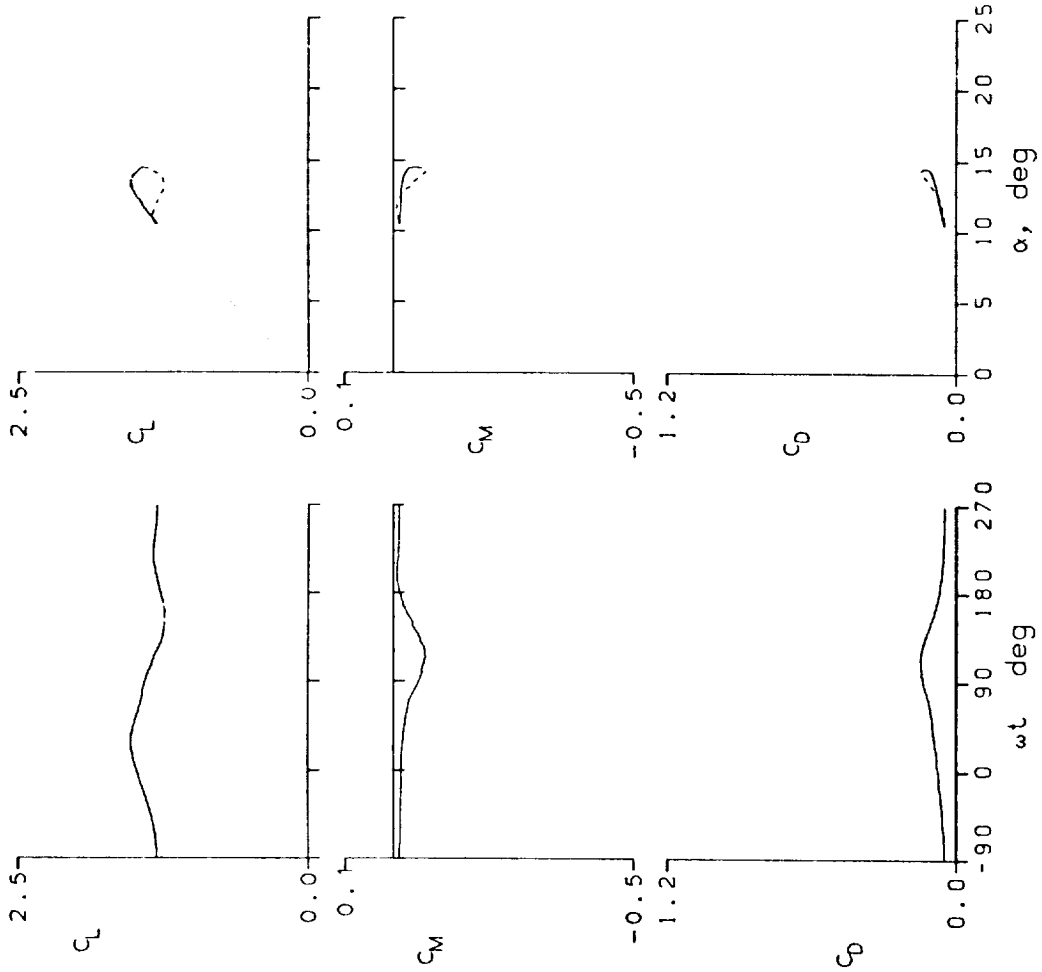


Figure 16.- Continued.

HUGHES HH-02 -WITH TAB- AIRFOIL
 FRAME : 44300 AC = 12.44 ° k = 0.099
 Re = 3.93 E6 A1 = 2.01 ° M = 0.301
 CLmax = 1.59 CMmin = -0.06 CDmax = 0.14
 α Lmax = 13.9 ° ζ = -0.124 Mmax = 1.220
 α Cmin = 12.3 ° -CPmpk = 9.0 α Mmax = 13.6 °

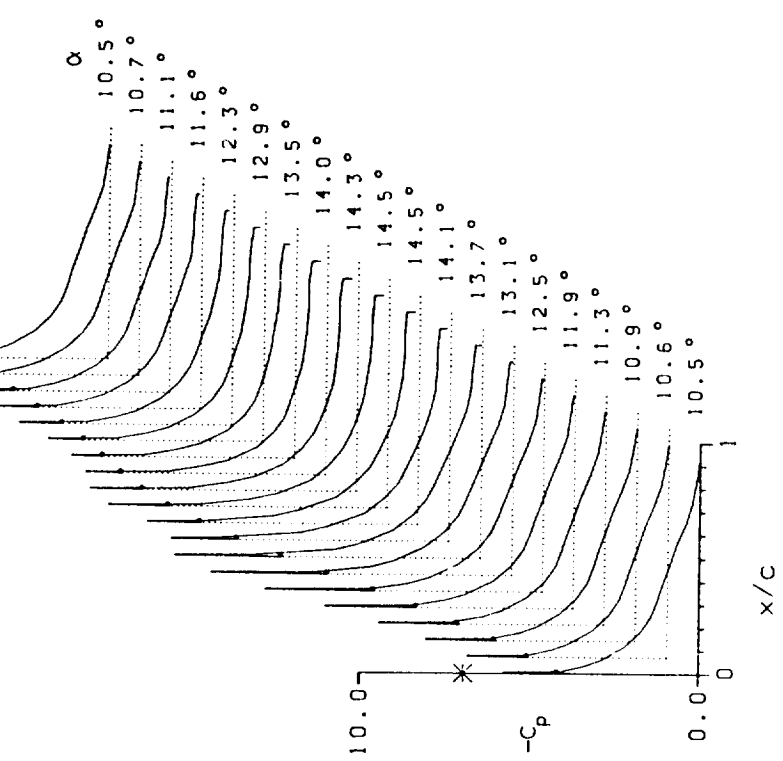
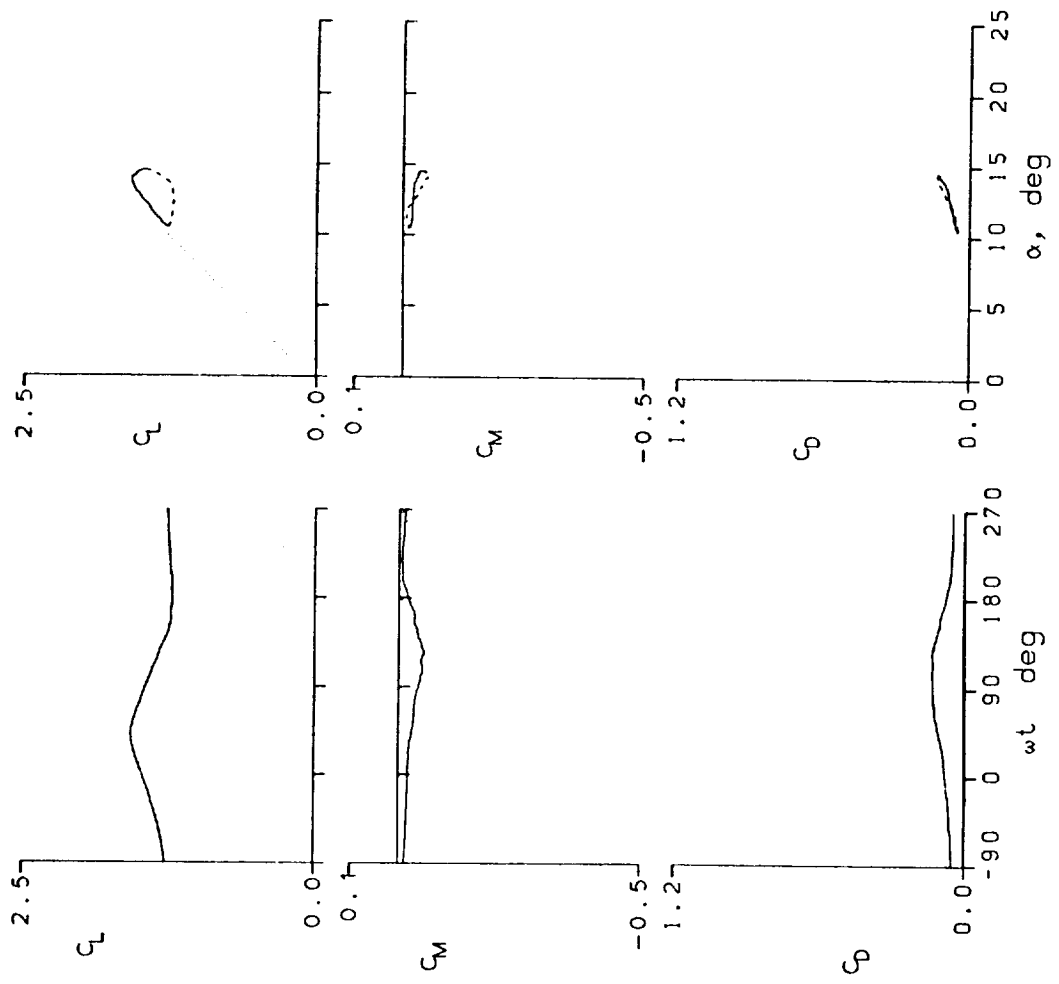


Figure 16.- Continued.

HUGHES HH-02 - WITH TAB- AIRFOIL
 FRAME : 44303 $A_0 = 12.43^\circ$ $k = 0.149$
 $Re = 3.95 \times 10^6$ $A_1 = 2.01^\circ$ $M = 0.302$
 $C_{Lmax} = 1.61$ $C_{Mmin} = -0.07$ $C_{Dmax} = 0.17$
 $\alpha_{Lmax} = 14.0^\circ$ $\zeta = -0.194$ $M_{max} = 1.221$
 $\alpha_{Cmin} = 12.3^\circ$ $-C_{Dmin} = 9.0$ $\alpha_{Mmax} = 13.6^\circ$

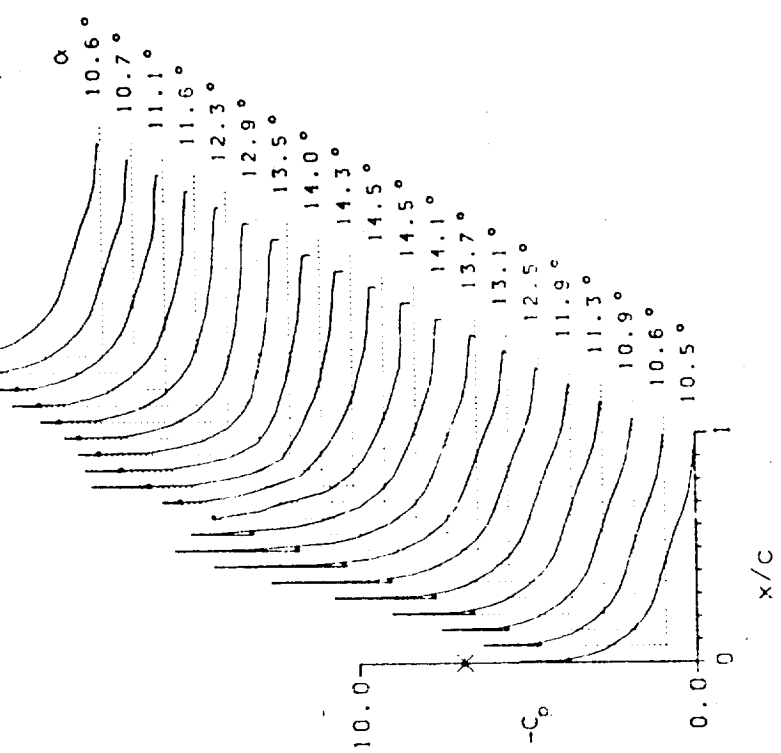
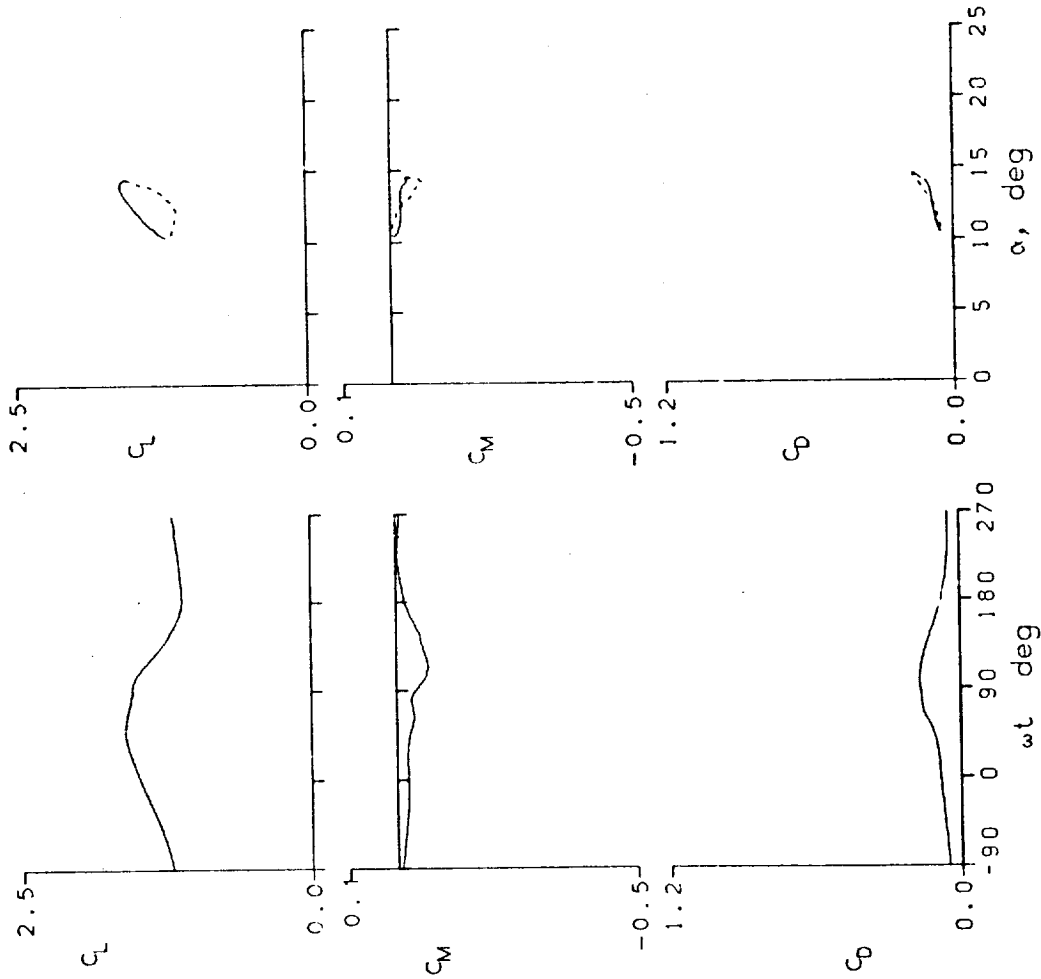


Figure 16.- Continued.

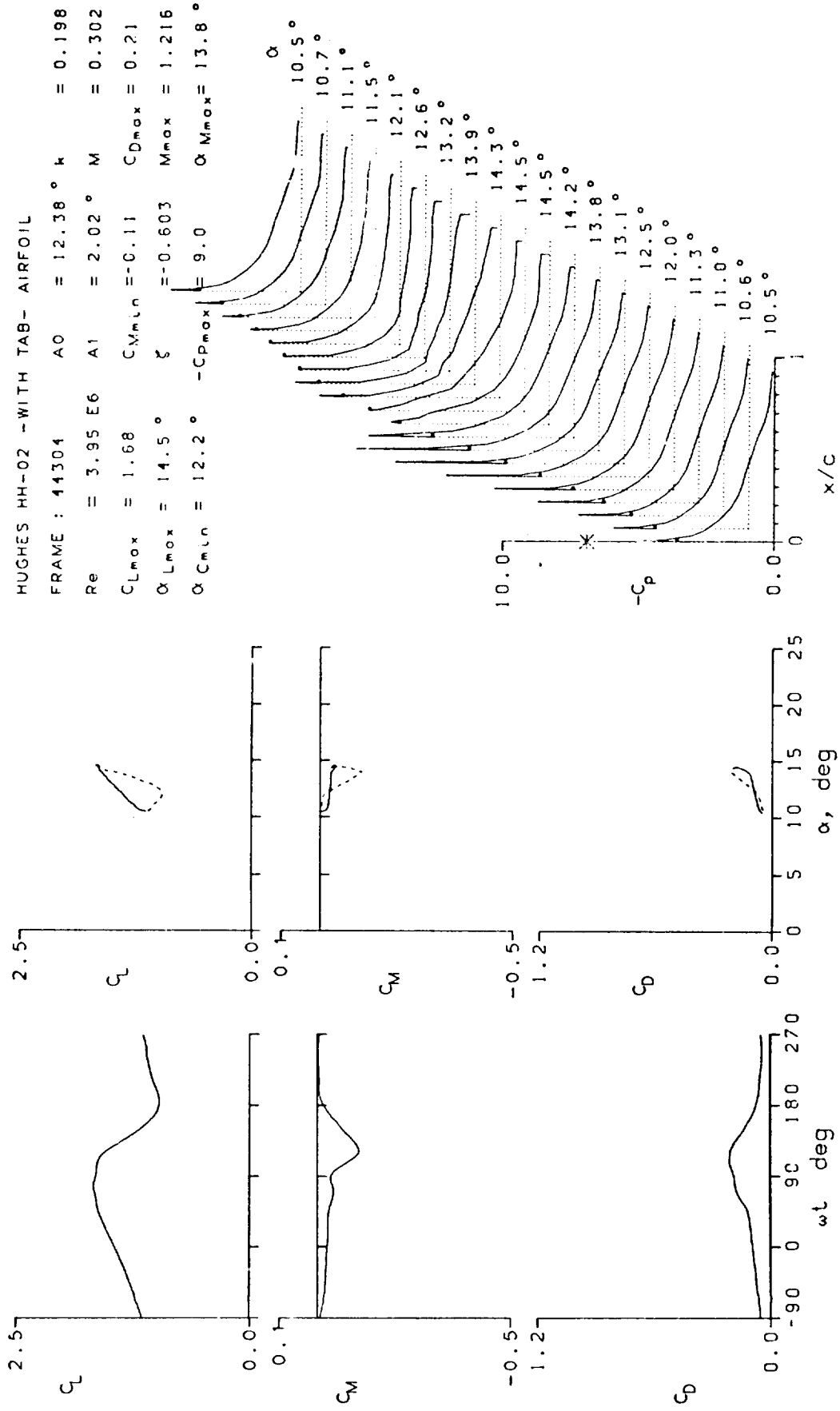


Figure 16.- Concluded.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 45019 A0 = 14.83° k = 0.025
 Re = 4.06 E6 A1 = 9.93° M = 0.300
 CLmax = 1.82 CMmin = -0.23 CDmax = 0.43
 α Lmax = 16.3° ζ = 0.234 Mmax = 1.326
 α CMmin = 14.5° -CPmax = 10.0 α Mmax = 16.0°

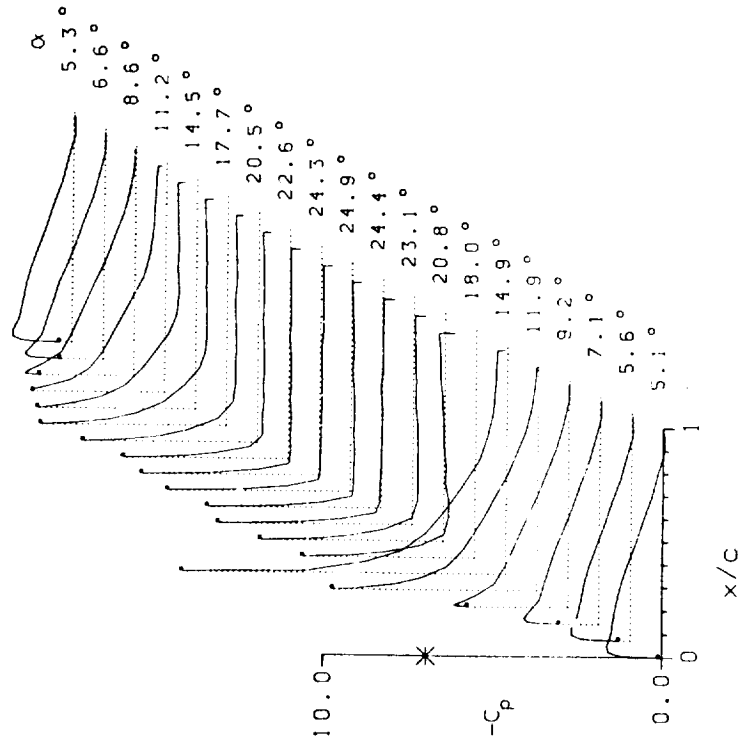
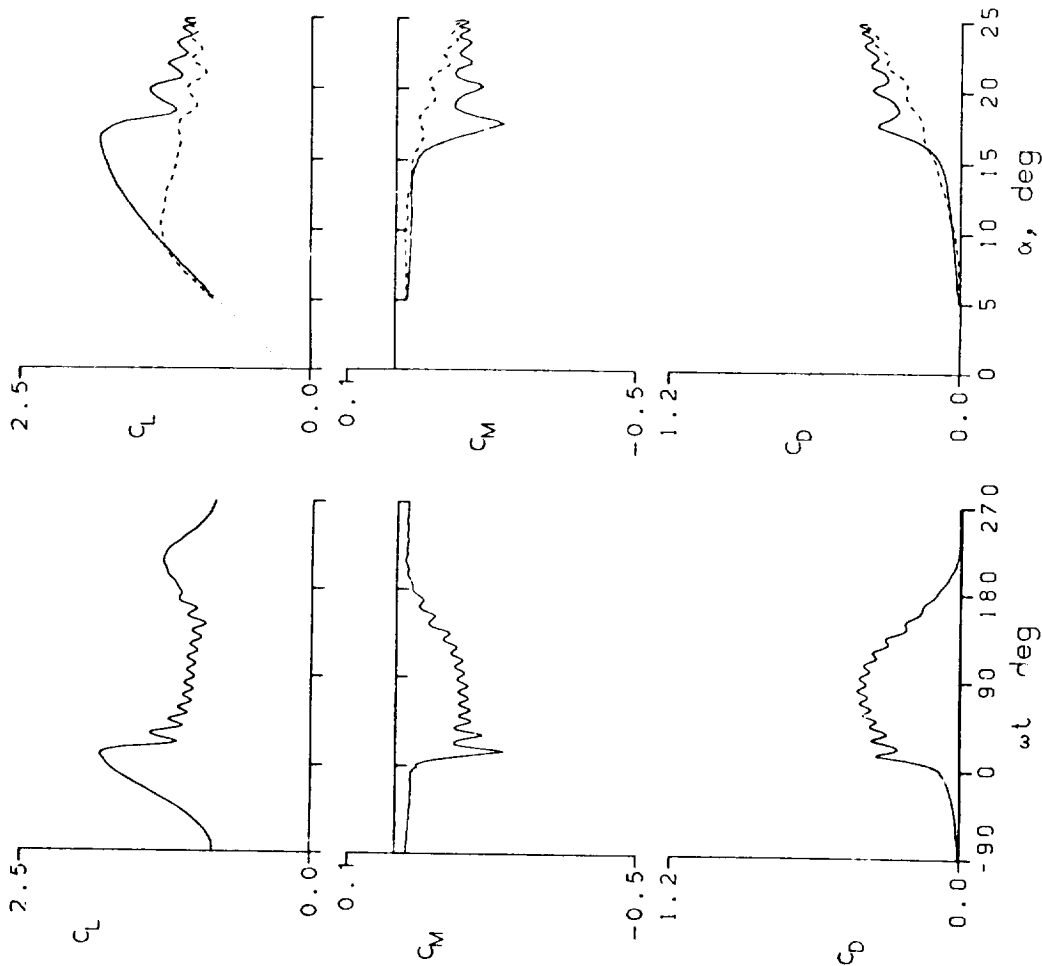


Figure 17.- Dynamic data for Vertol VR-7 airfoil.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 4502: A0 = 14.84 ° k = 0.051
 Re = 3.94 E6 A1 = 9.90 ° M = 0.292
 CLmax = 2.11 CMmin = -0.25 CDmax = 0.46
 αLmax = 18.1 ° ζ = 0.278 Mmax = 1.473
 αCMmin = 14.5 ° -CPmax = 11.7 αMmax = 17.8 °

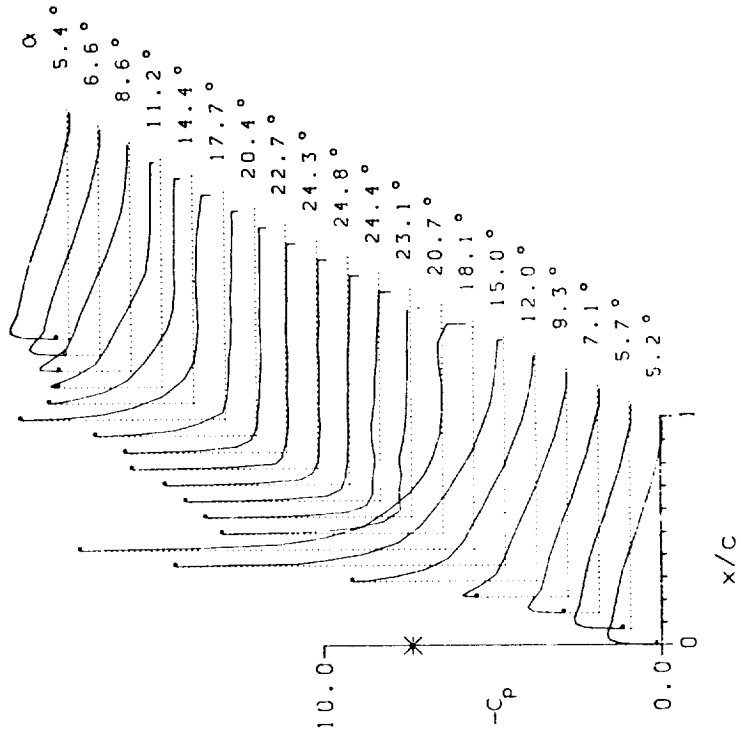
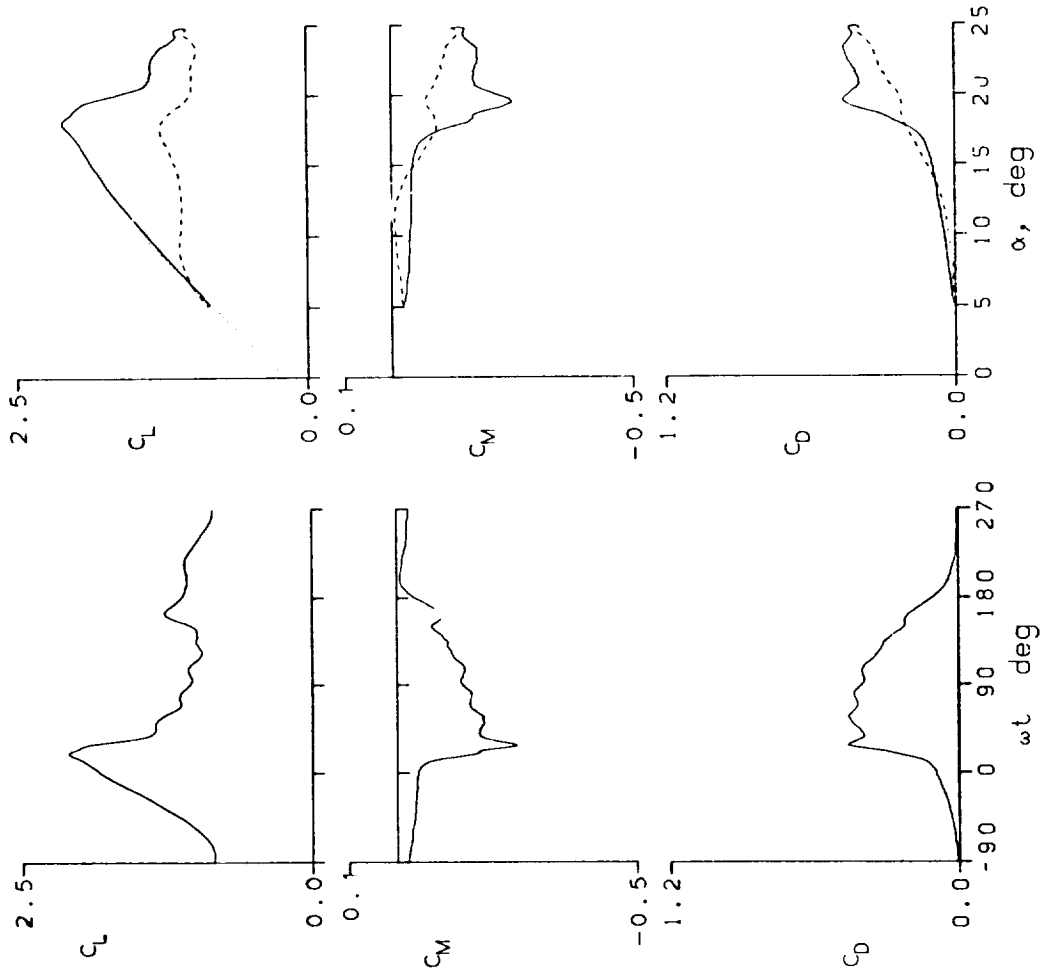


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 45023 A0 = 14.82° k = 0.101
 Re = 3.93 E6 A1 = 9.86° M = 0.293
 CLmax = 2.33 CMmin = -0.40 CDmax = 0.82
 αLmax = 20.9° ζ = 0.496 Mmax = 1.502
 αCmin = 14.7° -CPmax = 11.8 αMmax = 18.0°

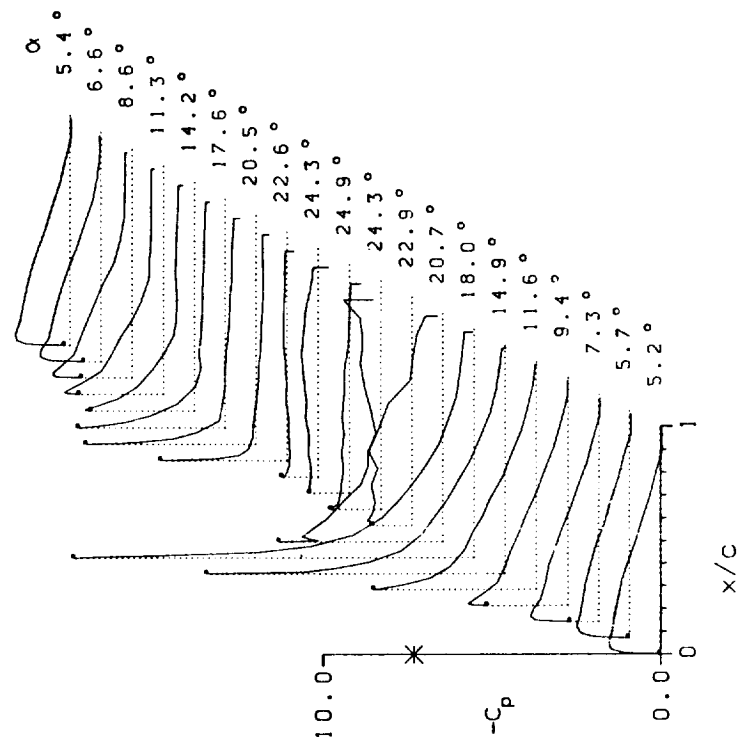
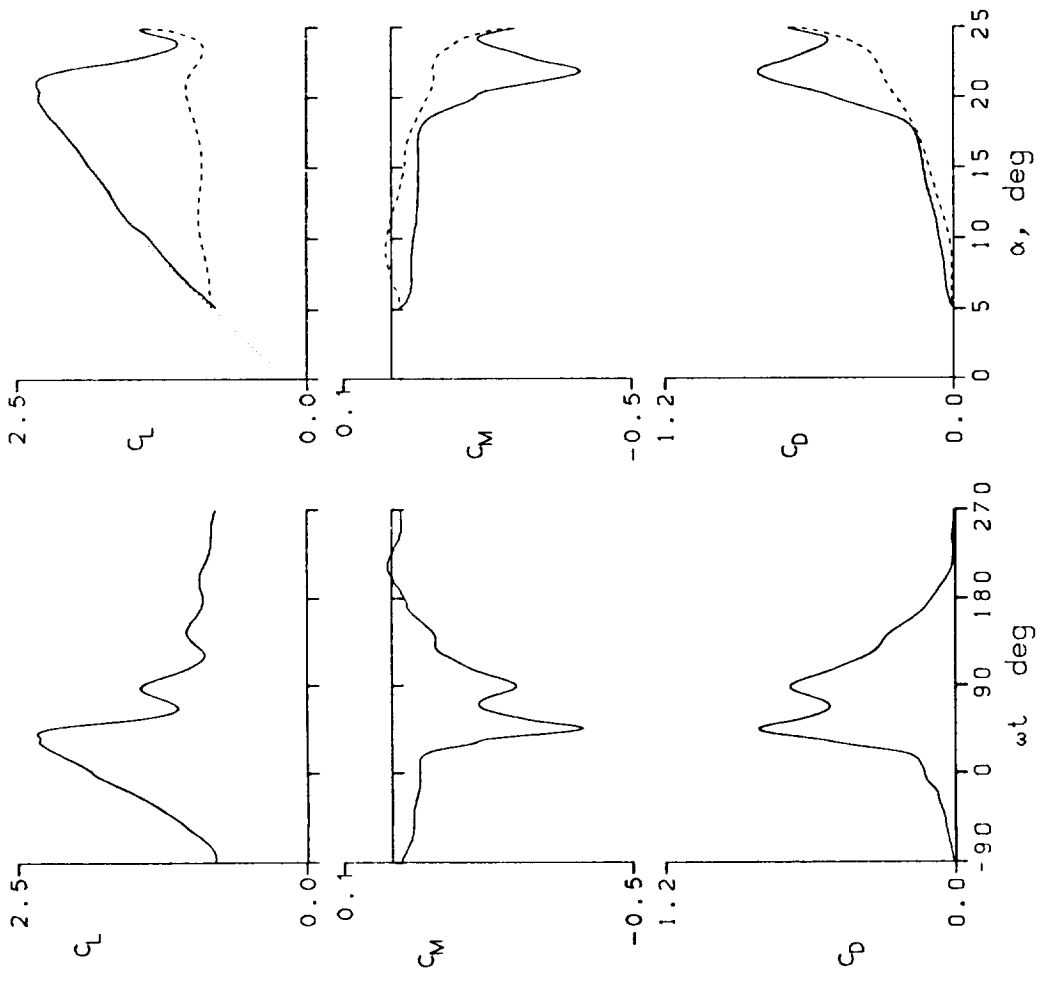


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45101 A0 = 14.89° k = 0.155

Re = 3.82 E6 A1 = 9.85° M = 0.285

CLmax = 2.49 CMmin = -0.50 CDmax = 1.04

αLmax = 23.0° ζ = 0.450 Mmax = 1.489

αCMln = 14.7° -CDmax = 12.4 αMmax = 18.9°

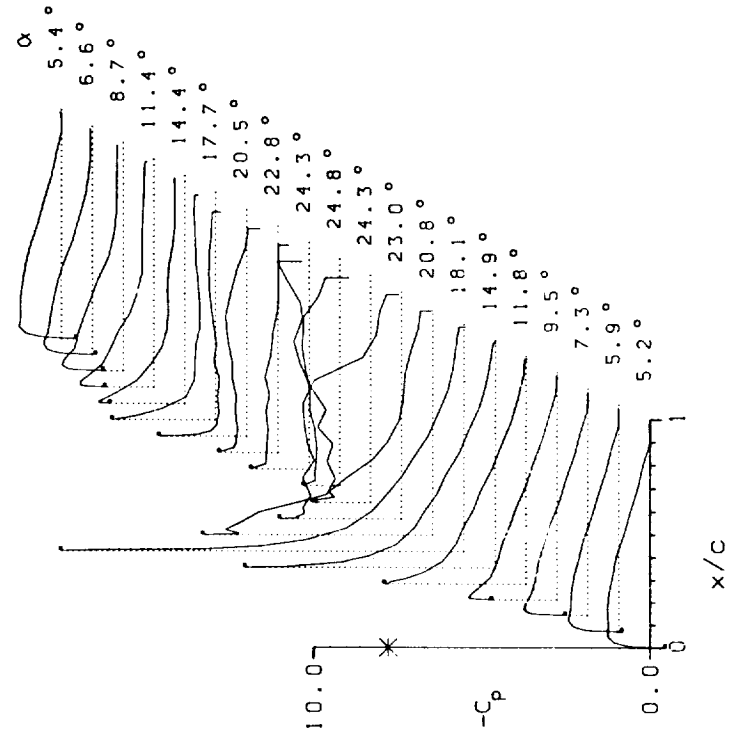
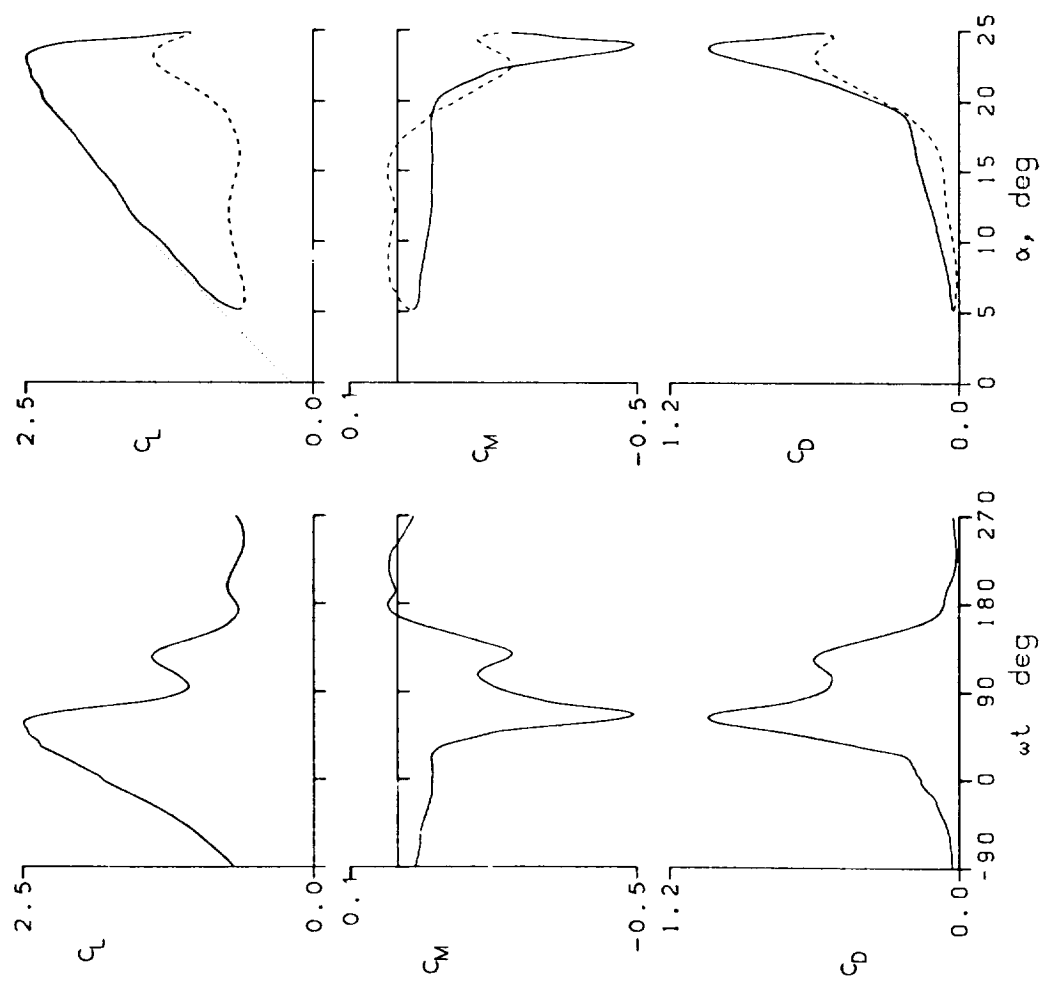


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45109 A0 = 9.91° k = 0.010
 Re = 4.03 E6 A1 = 9.89° M = 0.301
 C_{Lmax} = 1.66 C_{Mmin} = -0.11 C_{Dmax} = 0.26
 α_{Lmax} = 14.1° ξ = 0.043 M_{max} = 1.151
 α_{Cmin} = 9.4° $-C_{Pmax}$ = 8.4 α_{Mmax} = 14.4°

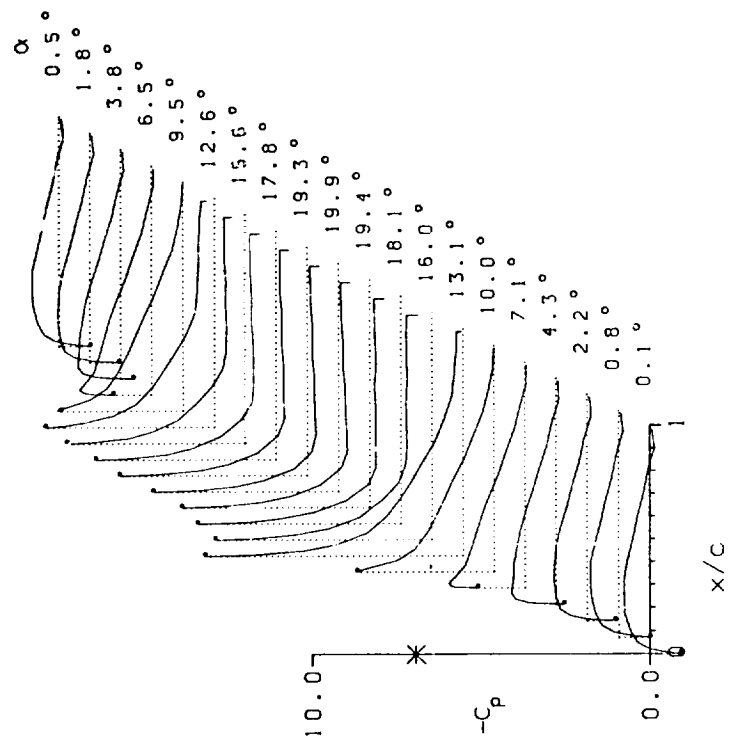
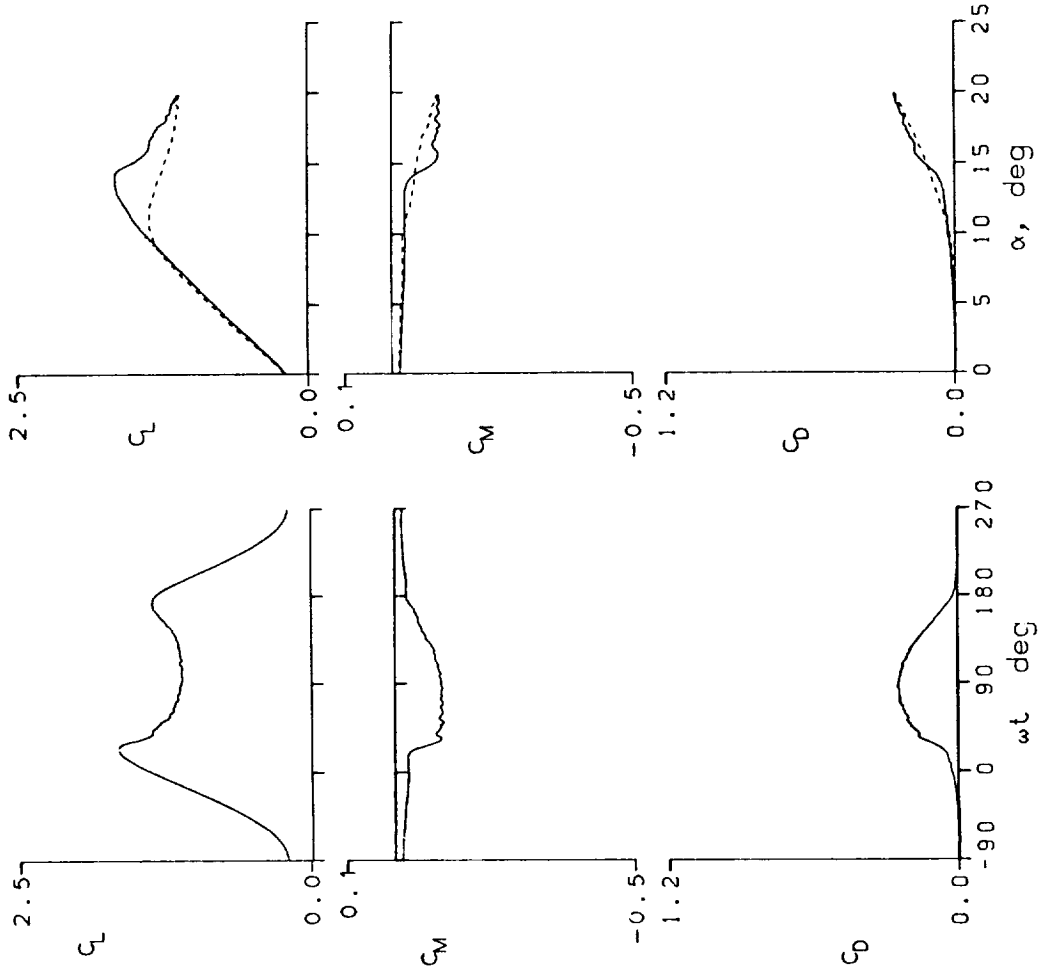


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 451111 A0 = 9.76° k = 0.025
 Re = 4.01 E6 A1 = 9.91° M = 0.301
 CLmax = 1.78 CMmin = -0.20 CDmax = 0.30
 αLmax = 15.8° ζ = 0.146 Mmax = 1.304
 αCmin = 9.2° -CPmax = 9.8 αMmax = 15.8°

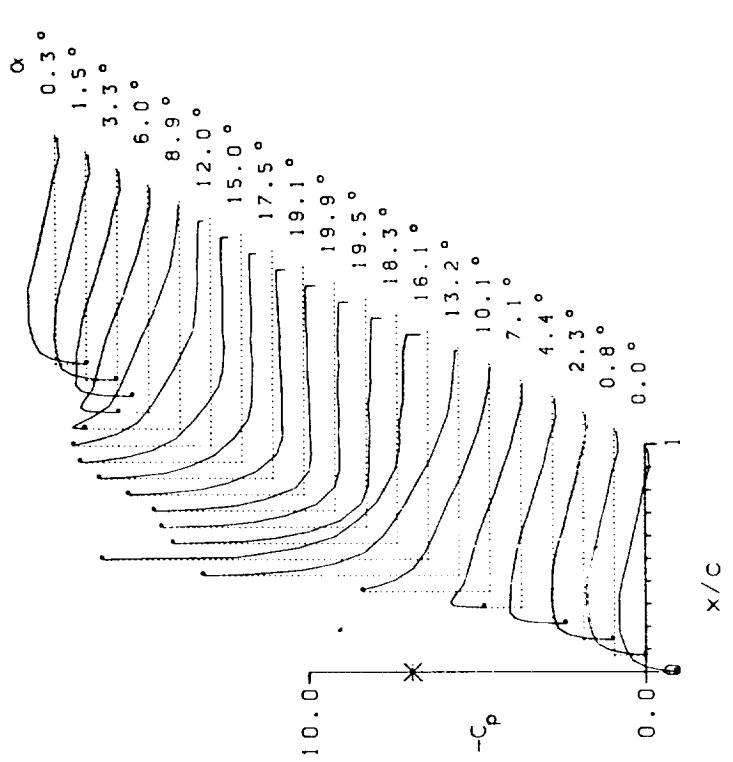
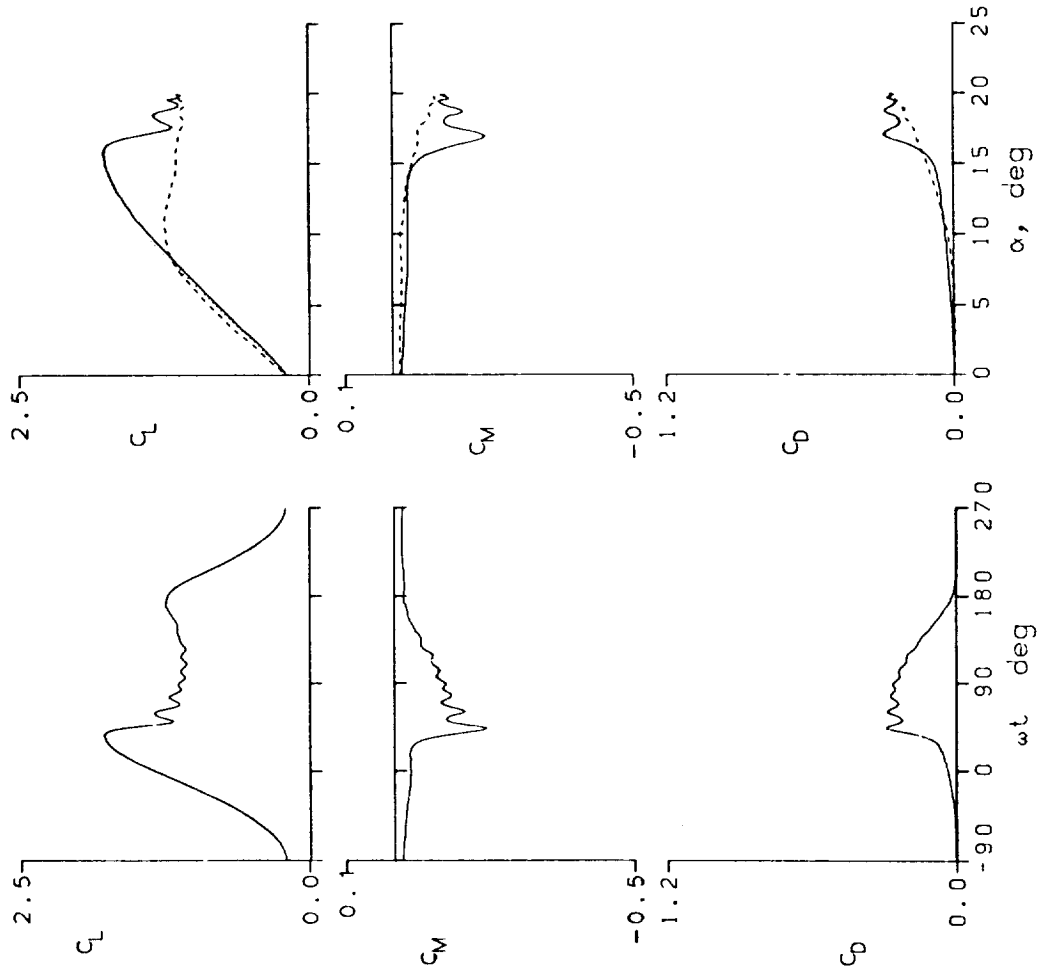


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45113 A0 = 9.72° k = 0.050
 Re = 4.01 E6 A1 = 9.92° M = 0.301
 CLmax = 2.01 CMmin = -0.21 CDmax = 0.36
 α Lmax = 17.3° ζ = 0.157 Mmax = 1.449
 α Cmin = 9.1° -CPmax = 10.8 α Mmax = 17.0°

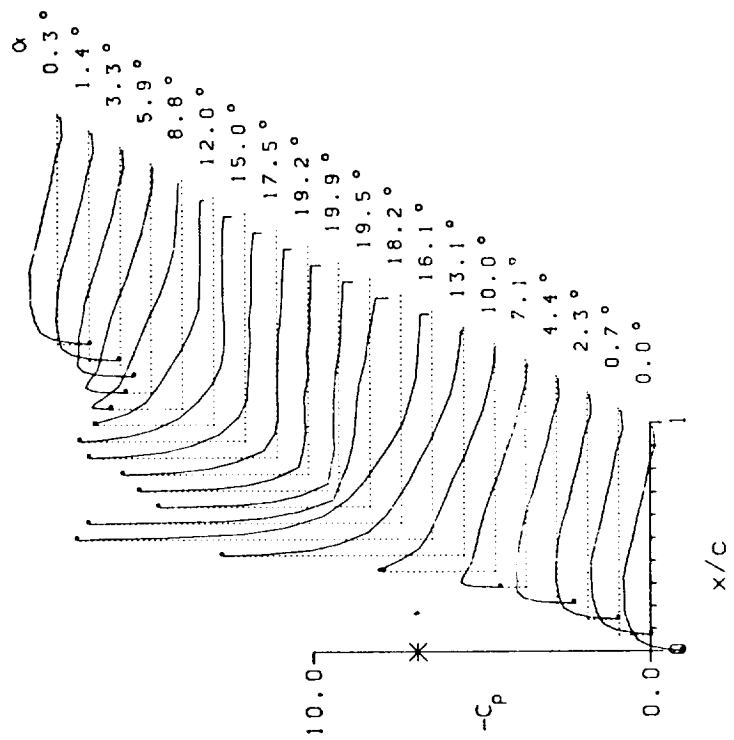
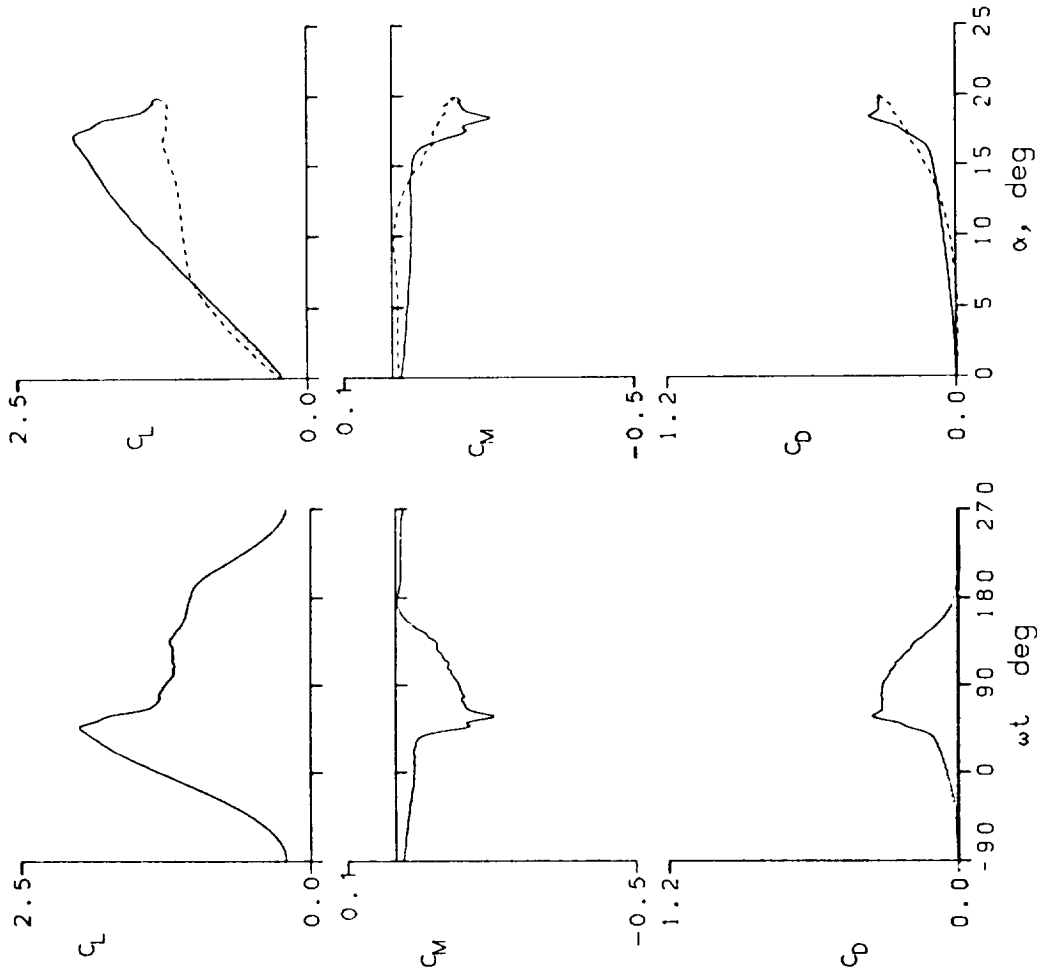


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45117 A0 = 9.75° k = 0.100
 Re = 4.02 E6 A1 = 9.88° M = 0.301
 CLmax = 2.21 CMmin = -0.33 CDmax = 0.65
 αLmax = 18.5° ζ = 0.228 Mmax = 1.489
 αCMmin = 9.1° -CPmax = 11.1 αMmax = 17.3°

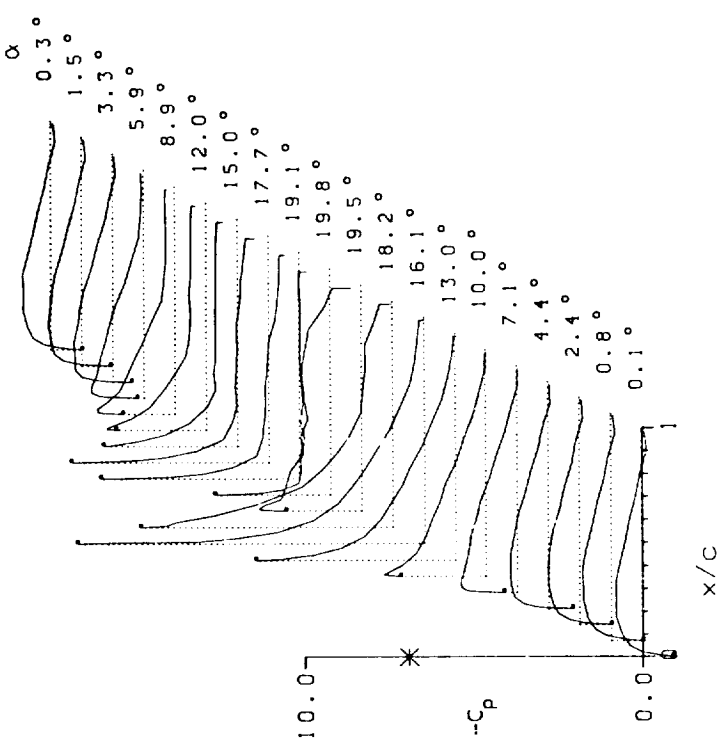
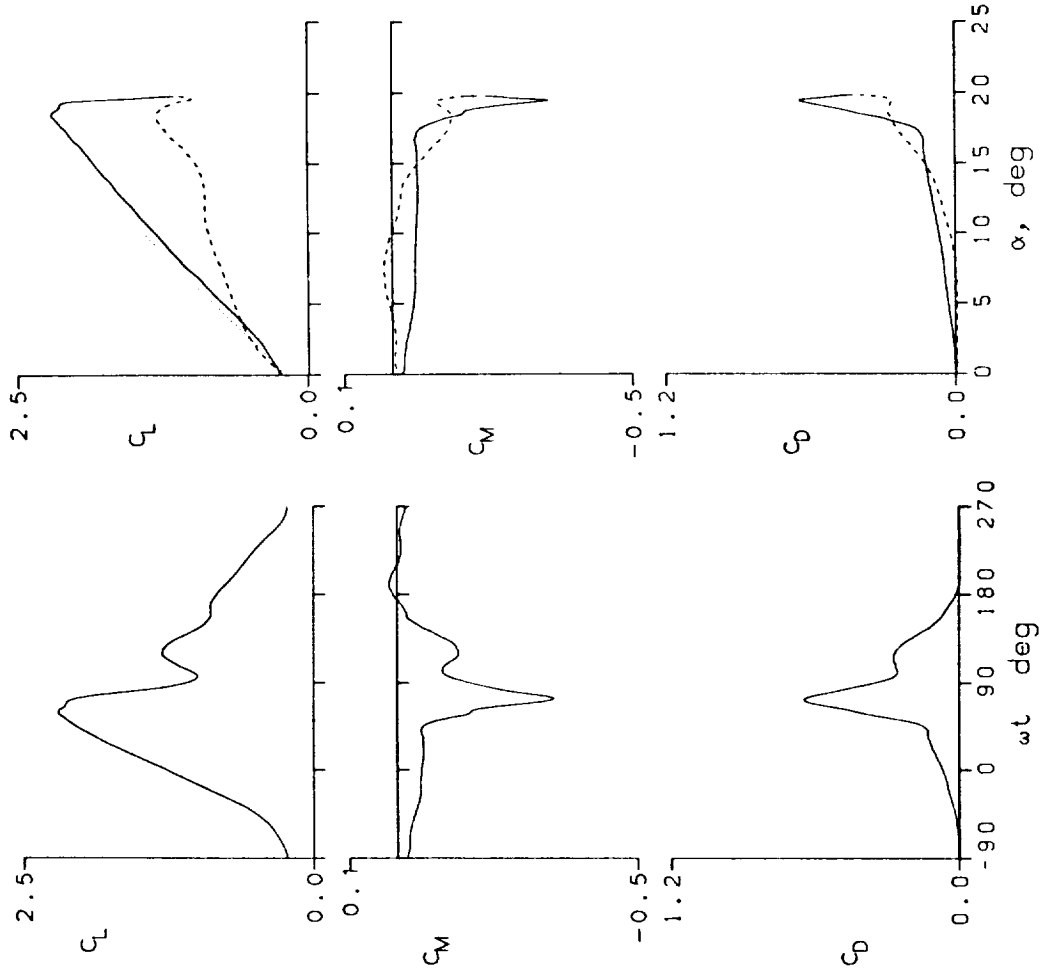


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 451:9 A0 = 9.81 ° k = 0.150
 Re = 4.02 E6 A1 = 9.91 ° M = 0.302
 CLmax = 2.30 CMmin = -0.40 CDmax = 0.76
 α Lmax = 19.4 ° ζ = 0.259 Mmax = 1.495
 α Cmin = 9.2 ° -CPmax = 11.1 α Mmax = 17.9 °

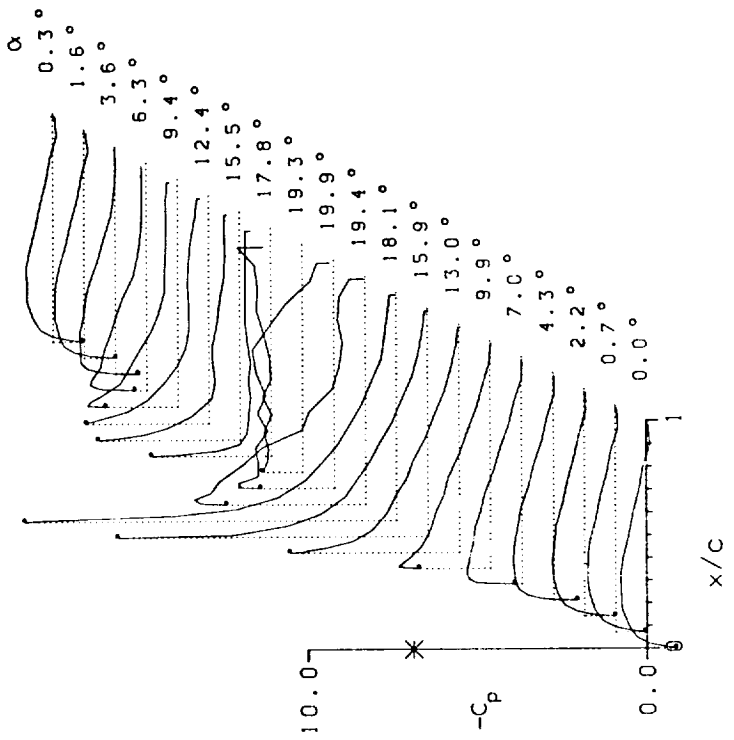
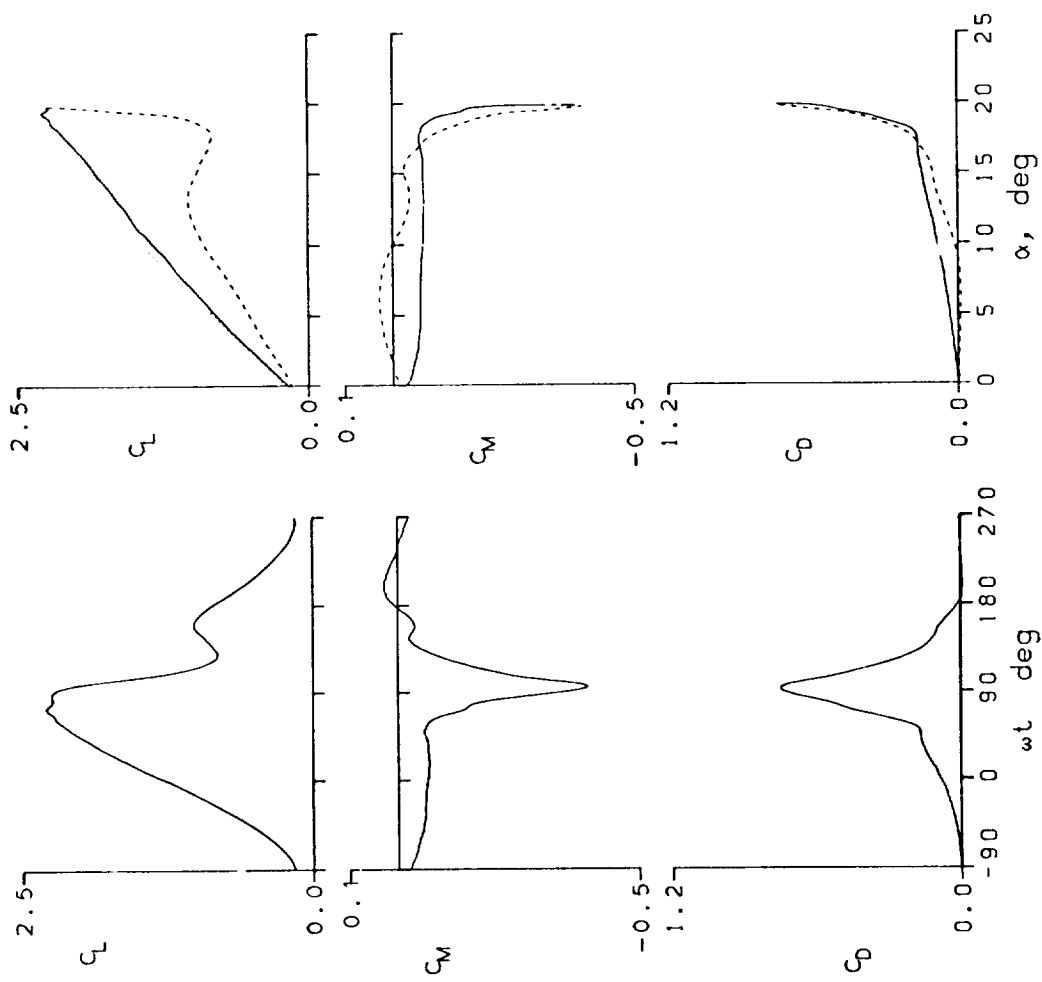


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45203 $A_0 = 14.65^\circ$ $k = 0.010$
 $Re = 4.02 \text{ E}6$ $A_1 = 5.05^\circ$ $M = 0.300$
 $C_{Lmax} = 1.60$ $C_{Mmin} = -0.11$ $C_{Dmax} = 0.25$
 $\alpha_{Lmax} = 12.7^\circ$ $\xi = 0.077$ $M_{max} = 1.034$
 $\alpha_{Cmin} = 14.6^\circ$ $-C_{Pmax} = 7.3$ $\alpha_{Mmax} = 13.4^\circ$

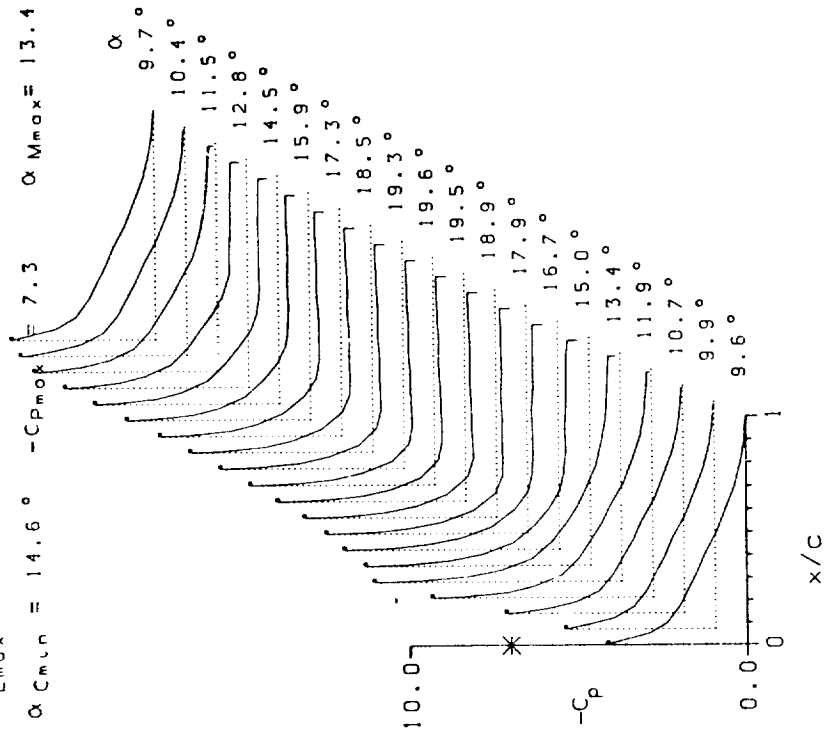
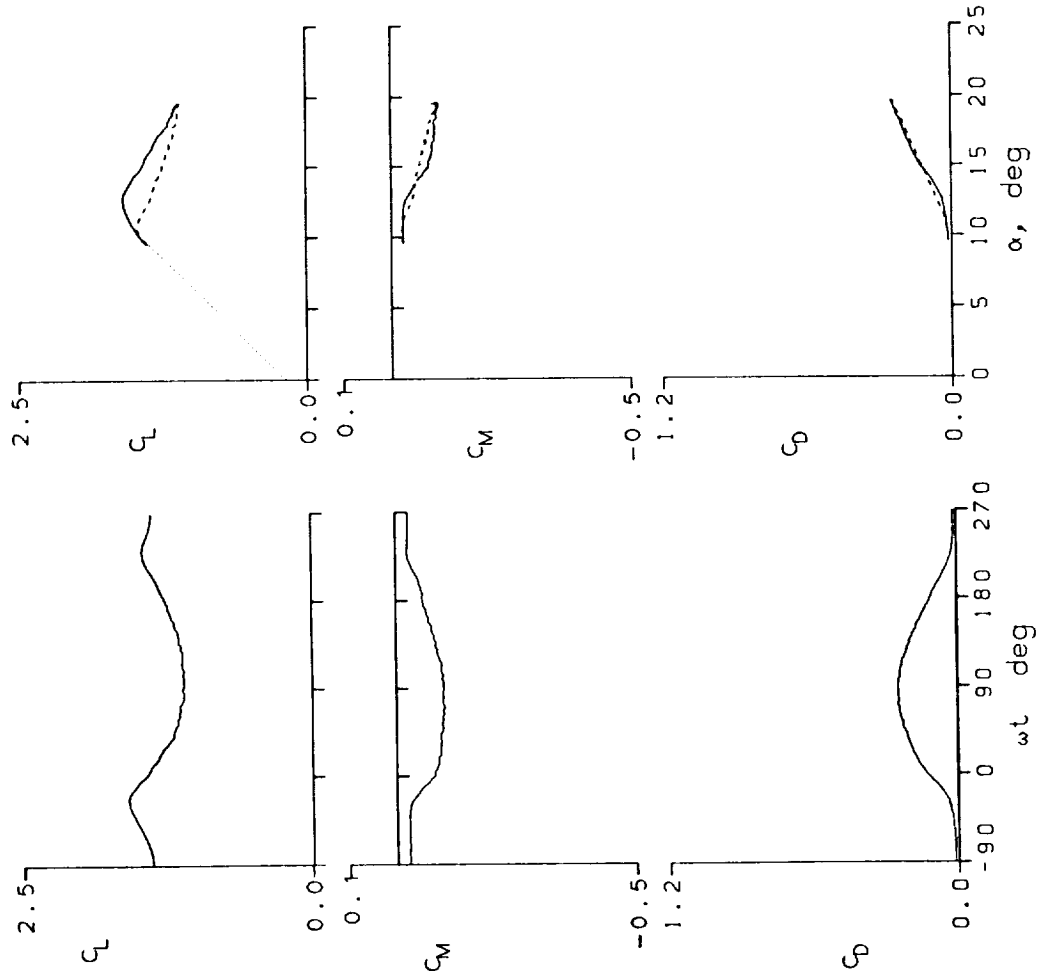


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45205 A0 = 14.96 ° k = 0.025
 Re = 4.01 E6 A1 = 4.88 ° M = 0.301
 CLmax = 1.68 CMmin = -0.13 CDmax = 0.76
 αLmax = 14.5 ° ζ = 0.207 Mmax = 1.190
 αCmin = 14.8 ° -CPmax = 8.8 αMmax = 14.9 °

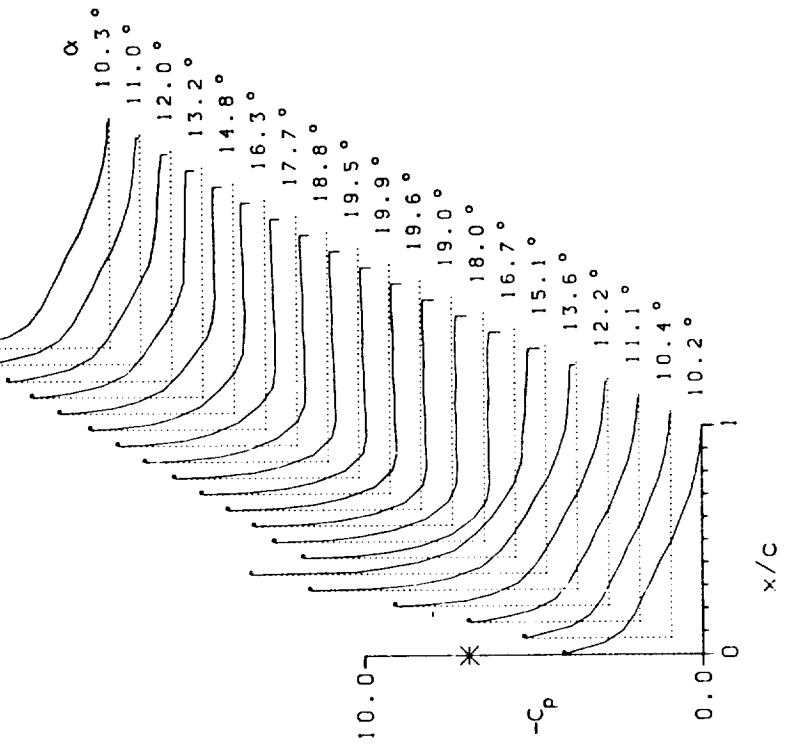
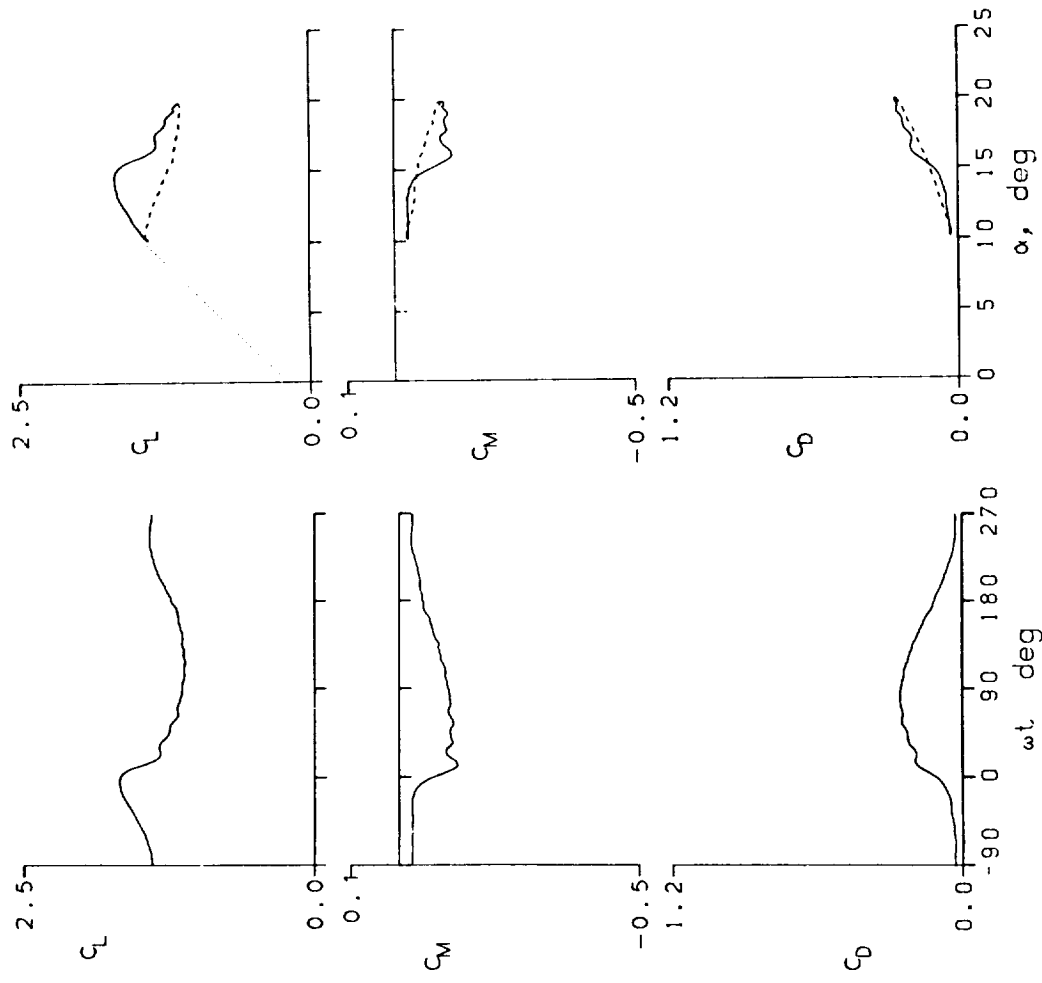


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TA3- AIRFOIL

FRAME : 45207 A0 = 14.98 ° k = 0.050

Re = 4.01 E6 A1 = 4.89 ° M = 0.301

C_{Lmax} = 1.82 C_{Mmin} = -0.22 C_{Dmax} = 0.34

α_{Lmax} = 16.3 ° ξ = 0.515 M_{max} = 1.326

α_{Cmin} = 14.8 ° $-C_{Pmax}$ = 9.9 α_{Mmax} = 16.1 °

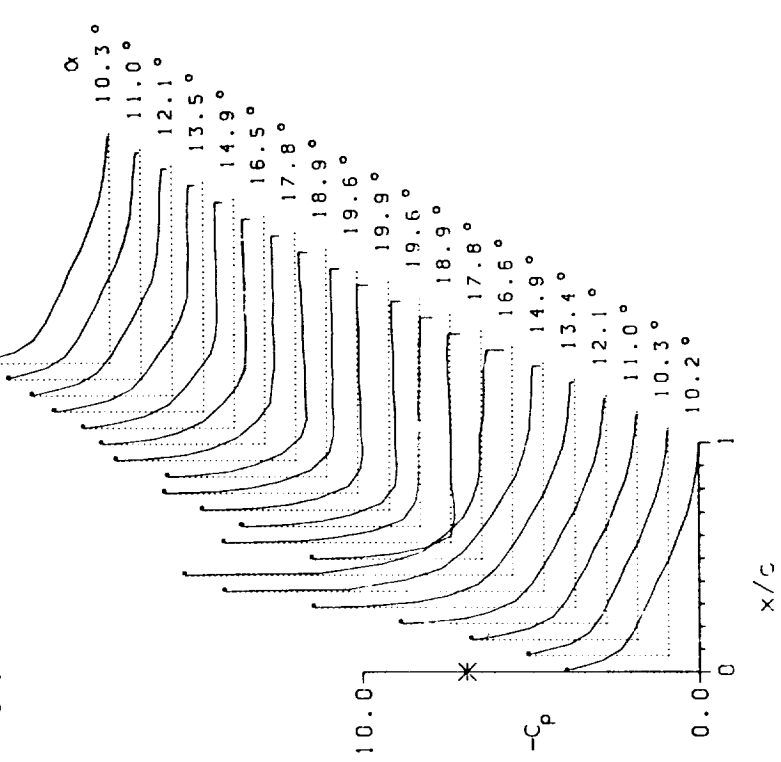
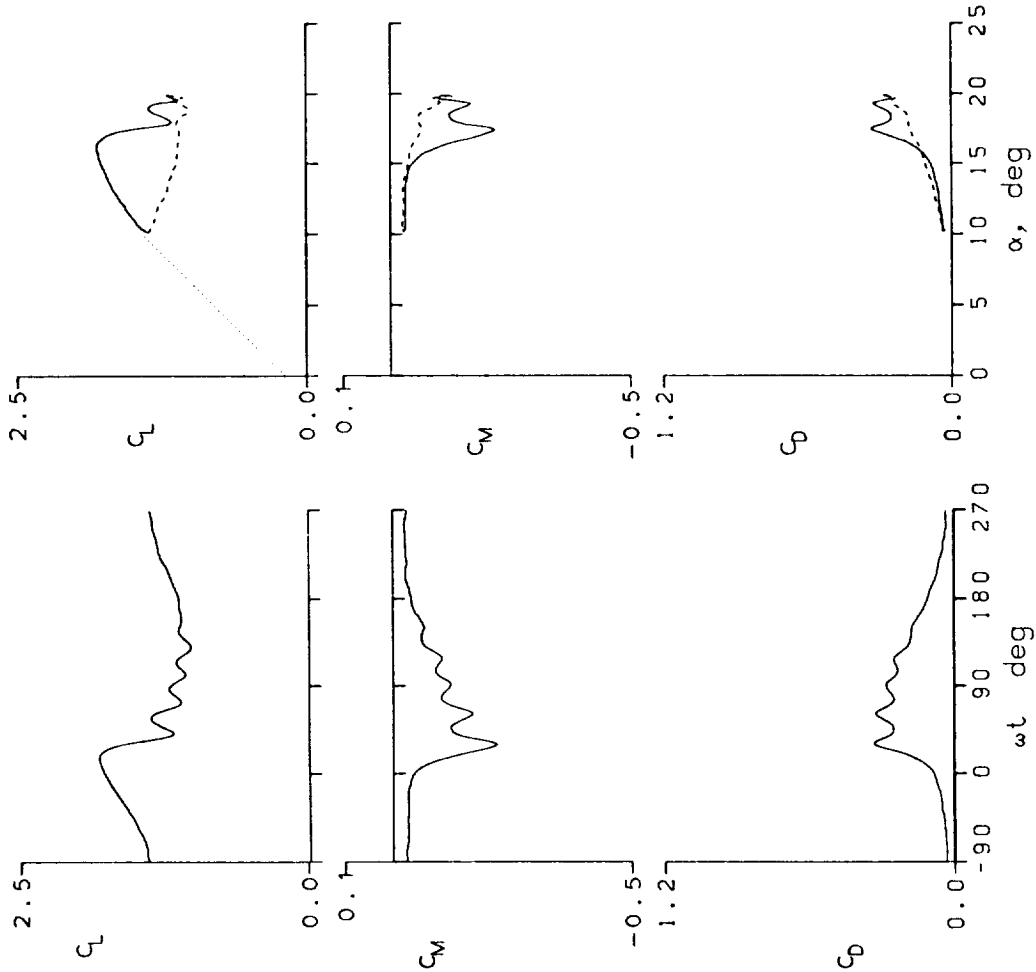


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45209 A0 = 14.96° k = 0.100
 Re = 3.99 E6 A1 = 4.89° M = 0.300
 CLmax = 2.07 CMmin = -0.25 CDmax = 0.44
 αLmax = 17.6° ζ = 0.339 Mmax = 1.460
 αCmin = 14.8° -CPmax = 11.0 αMmax = 17.5°

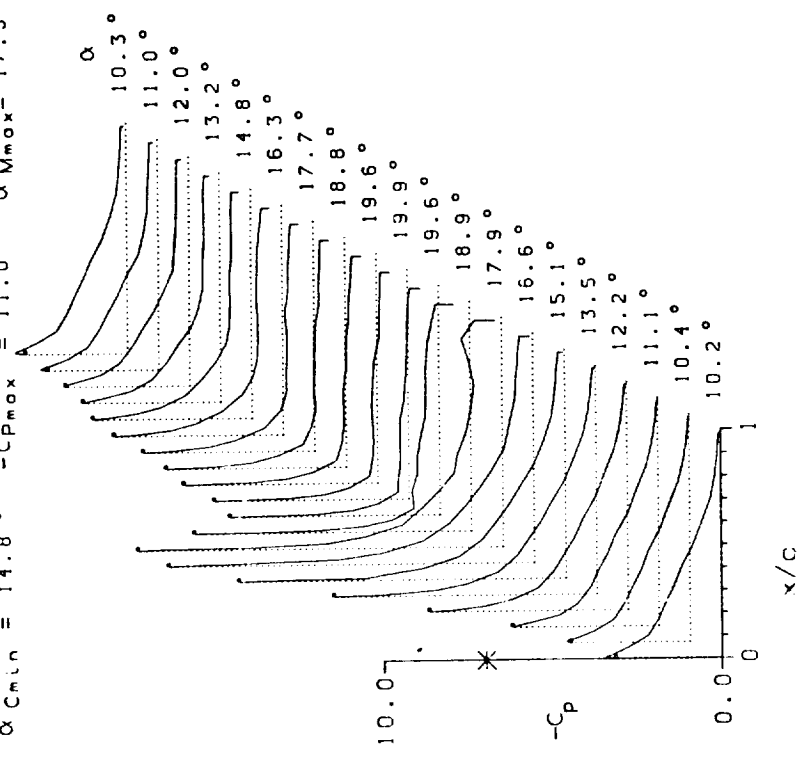
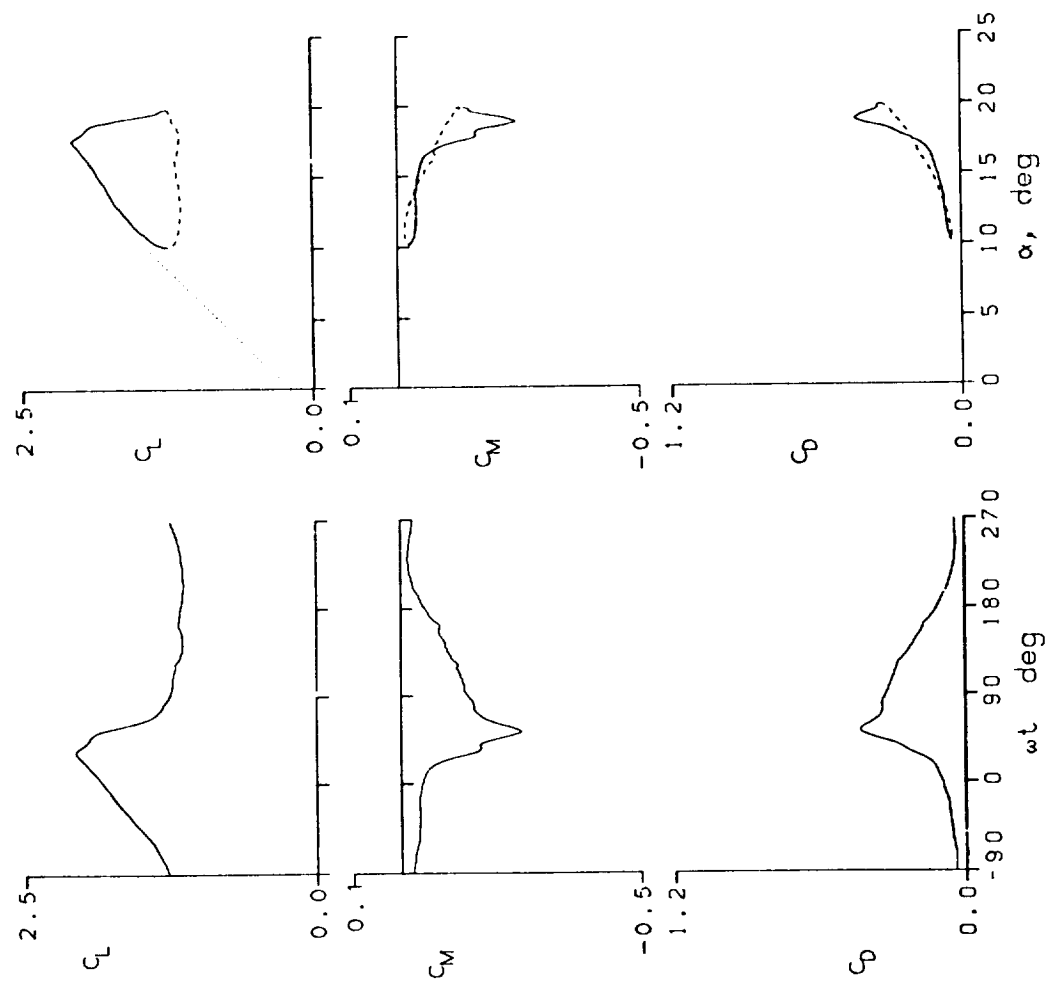


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 45211 A0 = 14.94 ° k = 0.151
 Re = 3.96 E6 A1 = 4.89 ° M = 0.298
 CLmax = 2.21 CMmin = -0.33 CDmax = 0.65
 αLmax = 18.5 ° ζ = 0.297 Mmax = 1.482
 αCMmin = 14.8 ° -CPmax = 11.3 αMmax = 17.6 °

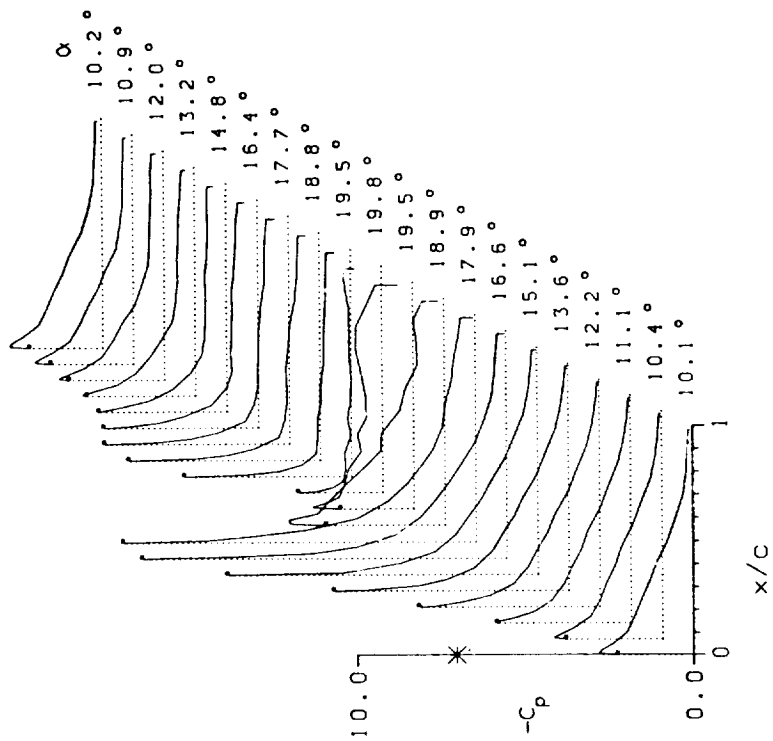
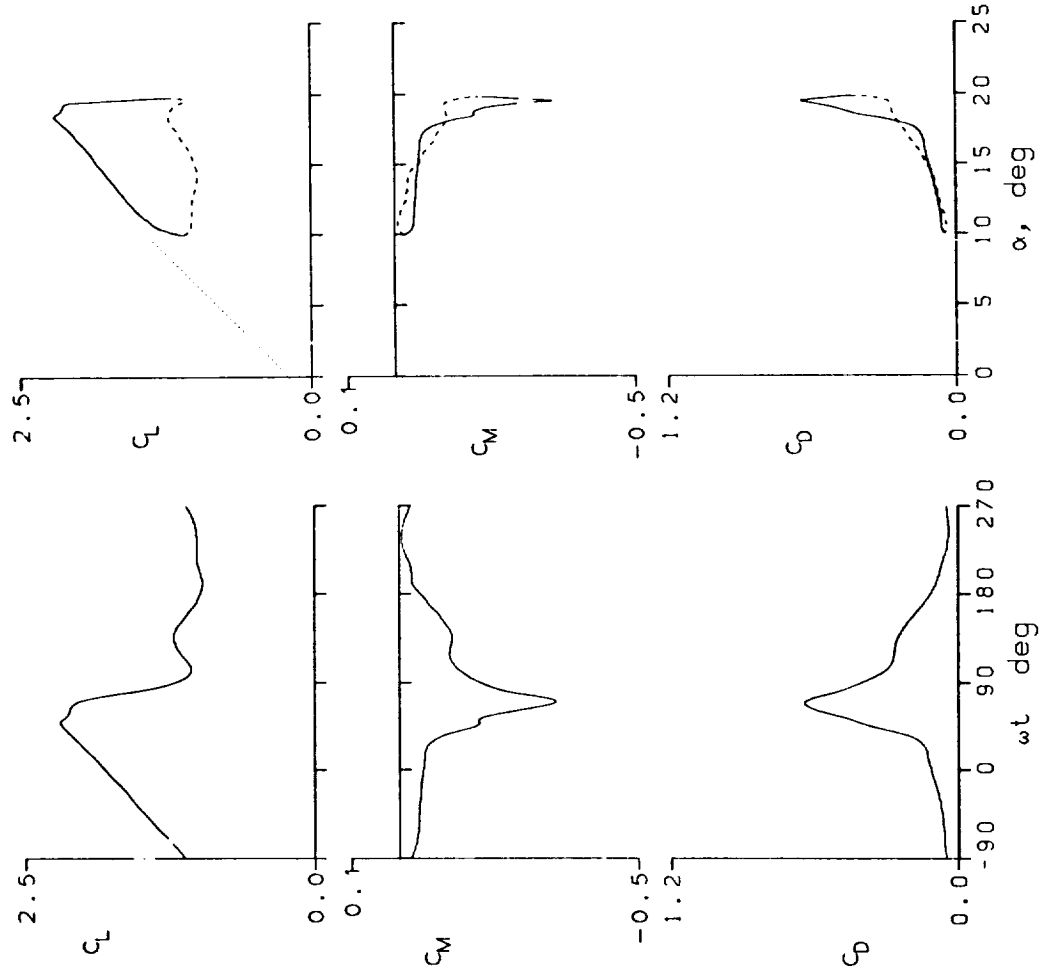


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45213 A0 = 14.98 ° k = 0.204

Re = 3.91 E6 A1 = 4.88 ° M = 0.295

CLmax = 2.53 CMmin = -0.42 CDmax = 0.77

α Lmax = 18.9 ° ζ = 0.240 Mmax = 1.484

α Cmin = 14.8 ° -CPmax = 11.6 α Mmax = 17.5 °

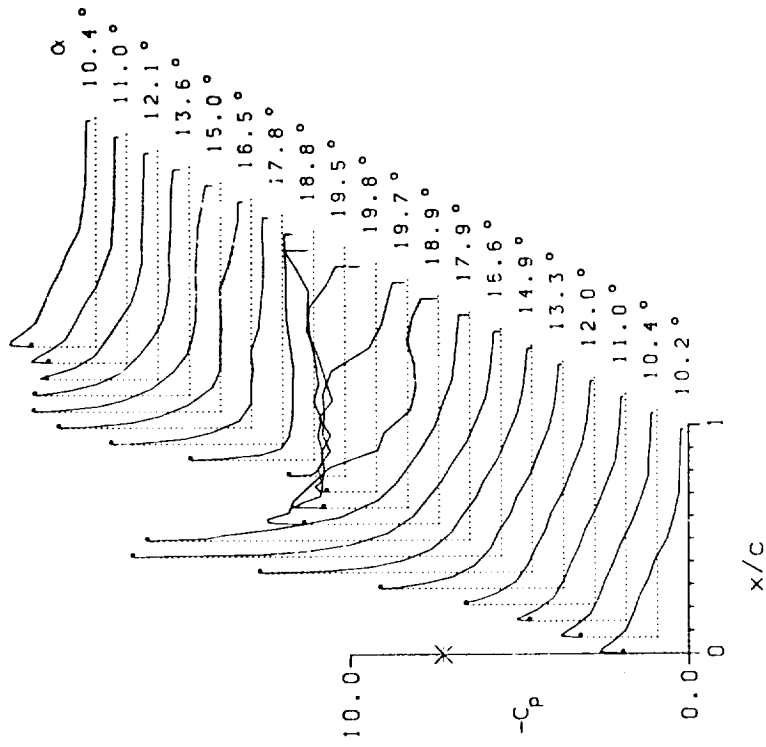
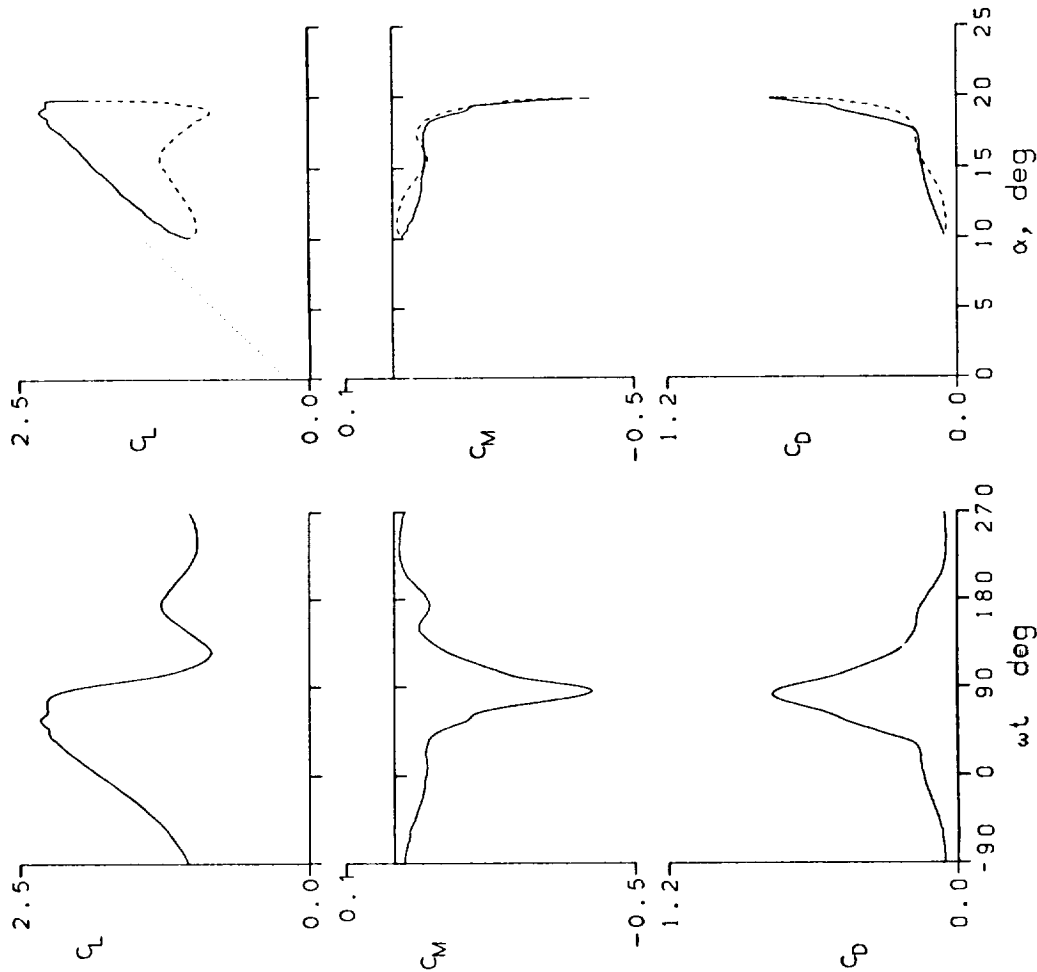


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45221 A0 = 9.90° k = 0.025
 Re = 4.05 E6 A1 = 4.91° M = 0.302
 CLmax = 1.65 CMmin = -0.09 CDmax = 0.14
 αLmax = 13.8° ζ = 0.008 Mmax = 1.134
 αCmin = 9.6° -Cpmax = 8.2 αMmax = 14.2°

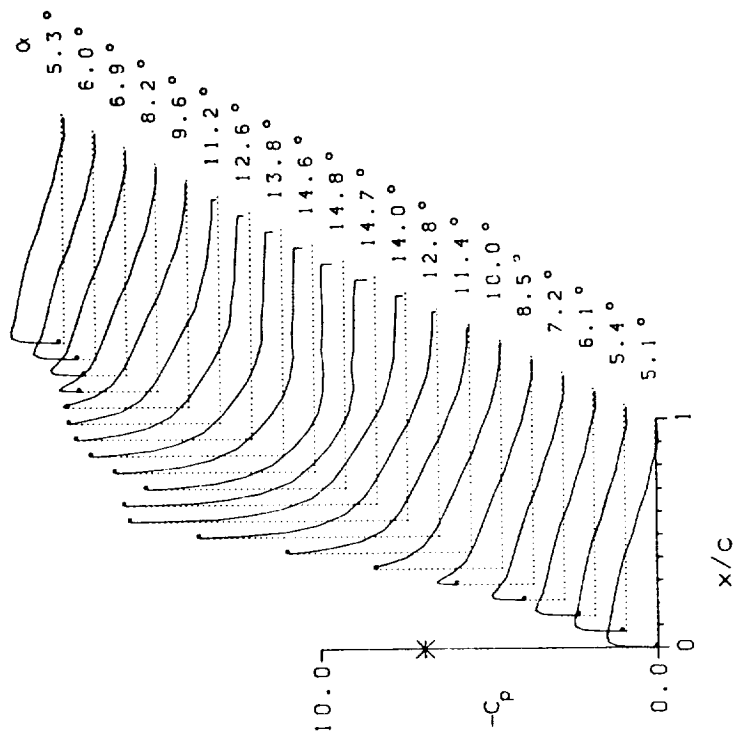
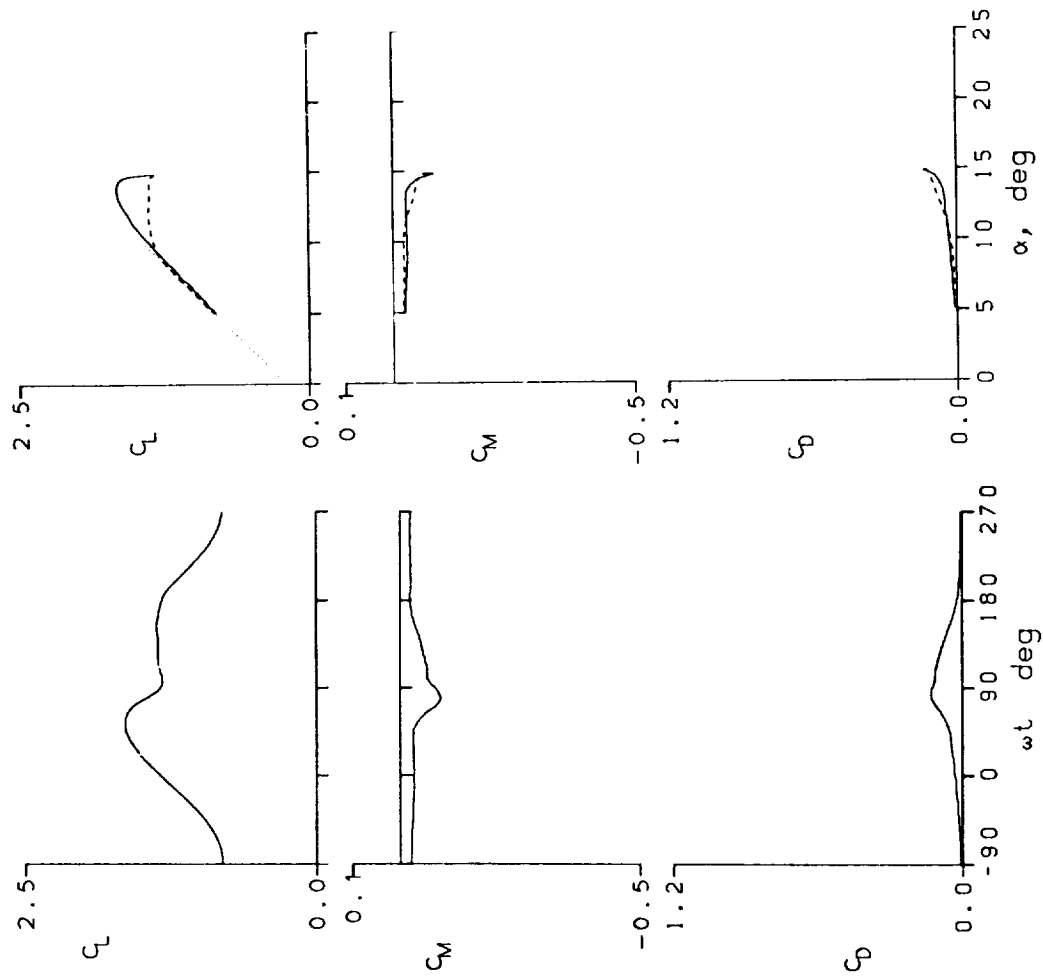


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45223 A0 = 9.89° k = 0.050
 Re = 4.03 E6 A1 = 4.91° M = 0.301
 CLmax = 1.70 CMmin = -0.10 CDmax = 0.14
 αLmax = 14.3° ζ = 0.070 Mmax = 1.219
 αCmin = 9.6° -CPmax = 9.0 αMmax = 14.7°

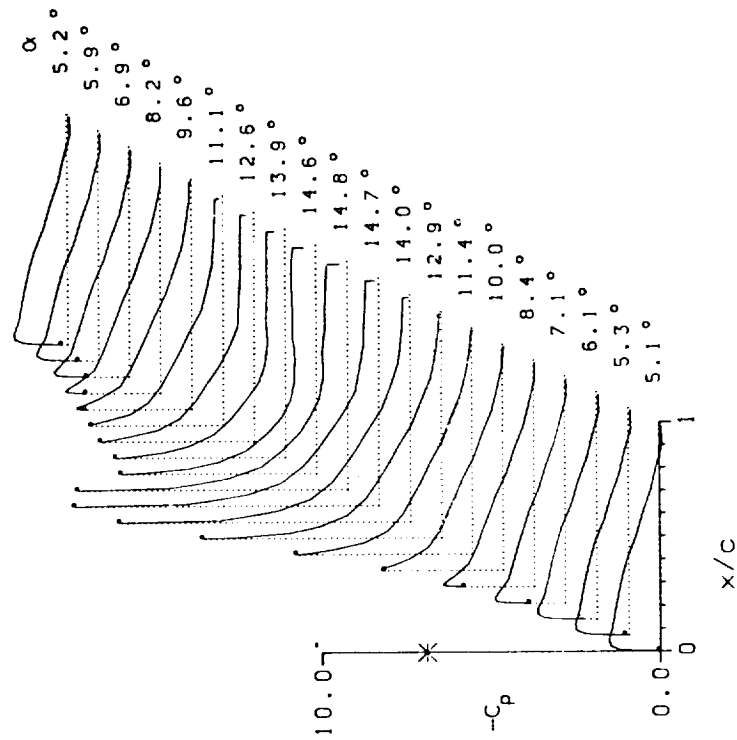
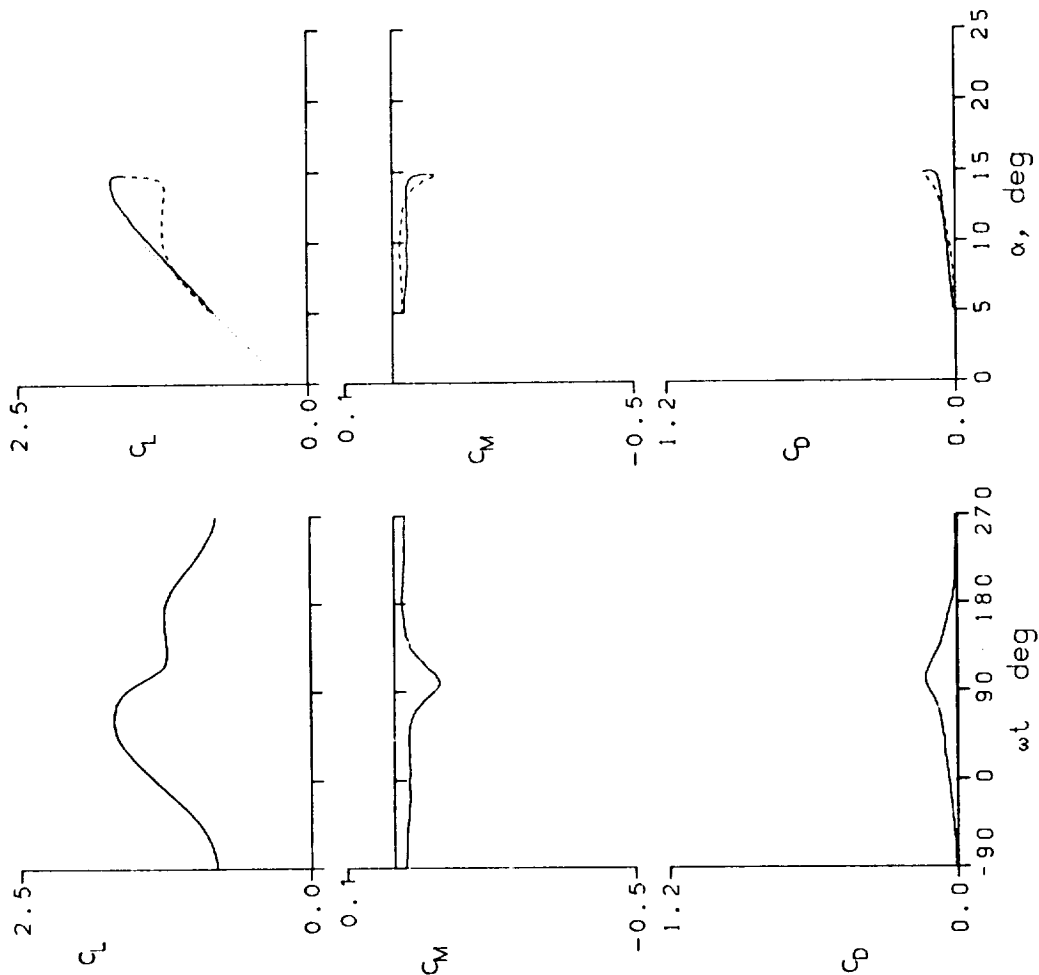


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45300	A0 = 9.89 °	k = 0.100
Re = 4.03 E6	A1 = 4.91 °	M = 0.301
CLmax = 1.78	CMmin = -0.08	CDmax = 0.10
α Lmax = 14.7 °	ζ = 0.084	Mmax = 1.296
α Cmin = 9.6 °	-CPmax = 9.7	α Mmax = 14.8 °

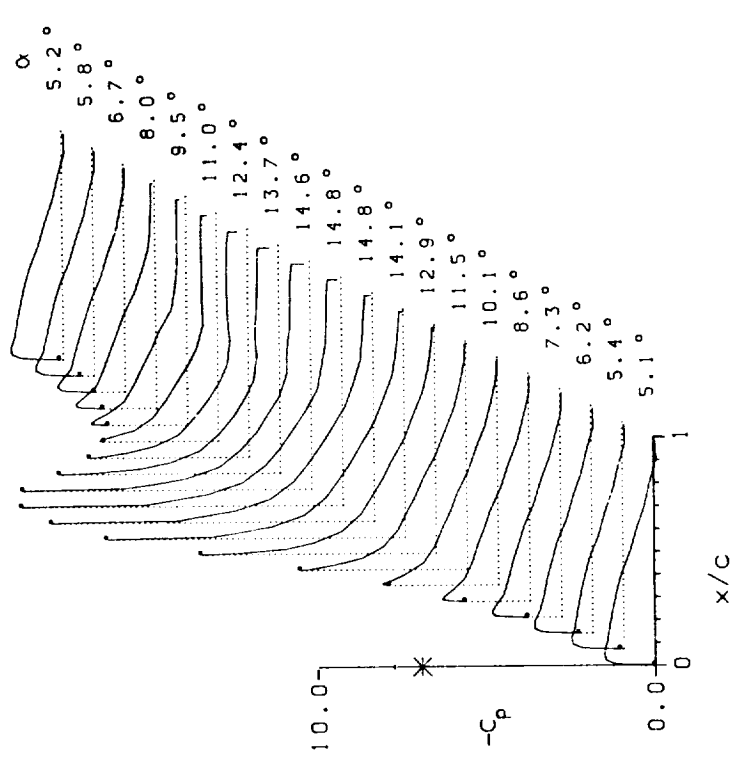
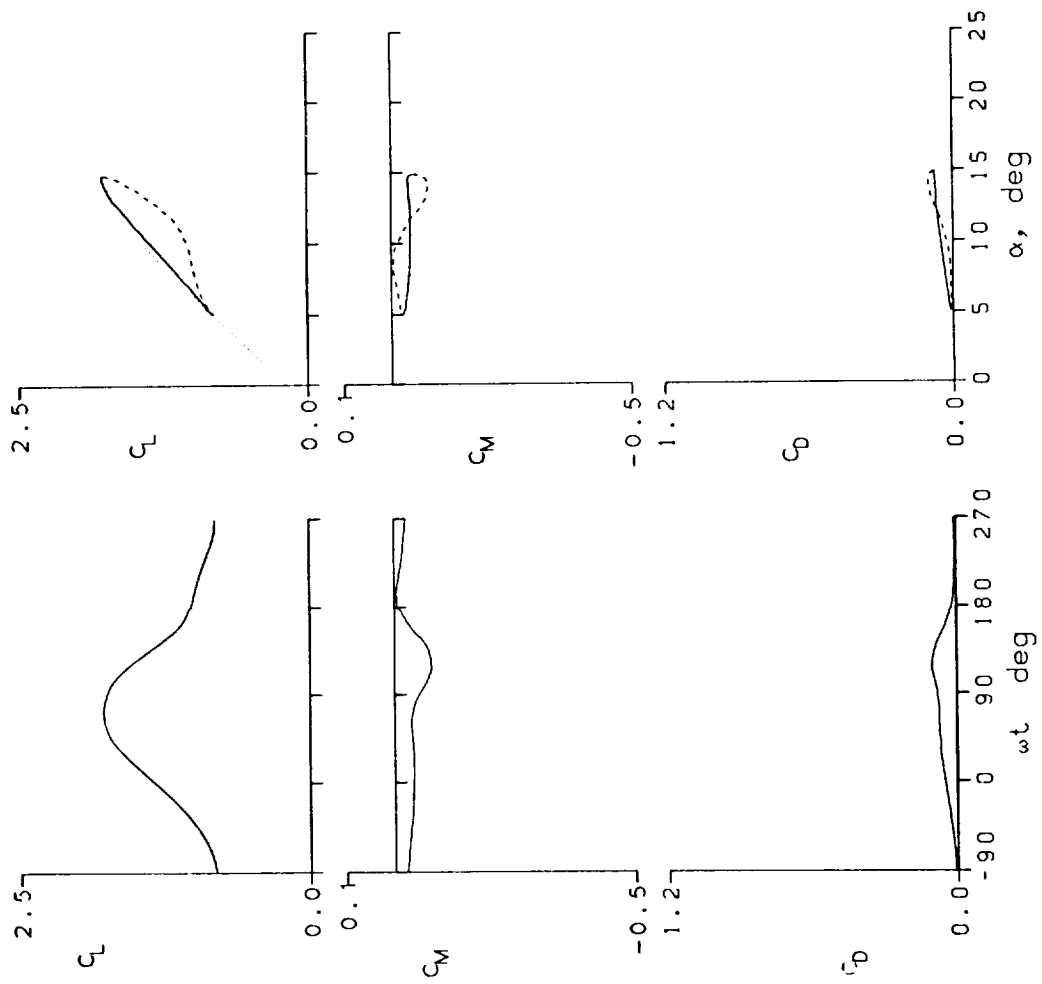


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 45302 A0 = 9.90° k = 0.150
 Re = 4.03 E6 A1 = 4.90° M = 0.302
 CLmax = 1.83 CMmin = -0.06 CDmax = 0.08
 αLmax = 14.8° ξ = 0.230 Mmax = 1.346
 αCmin = 9.6° -CPmax = 10.1 αMmax = 14.8°

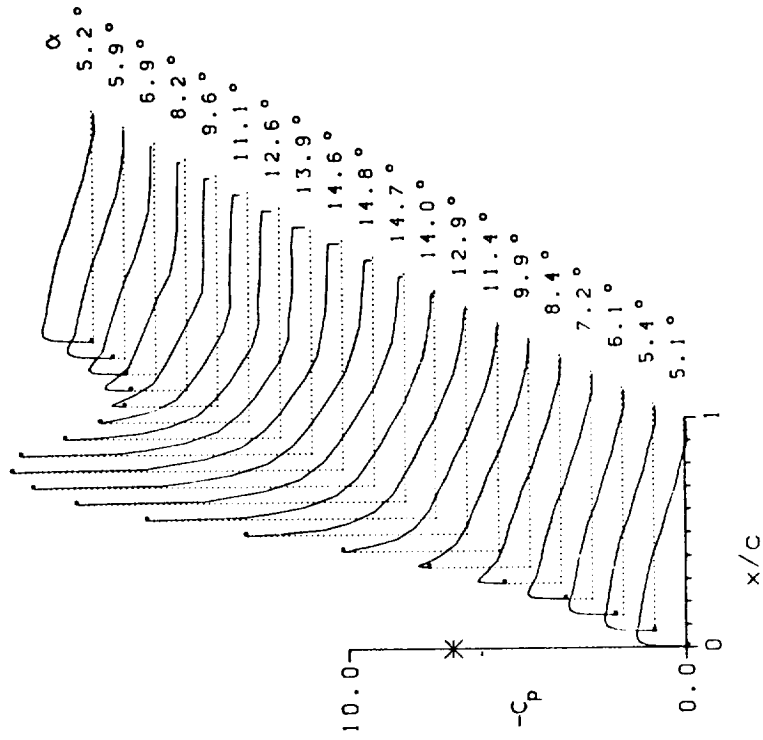
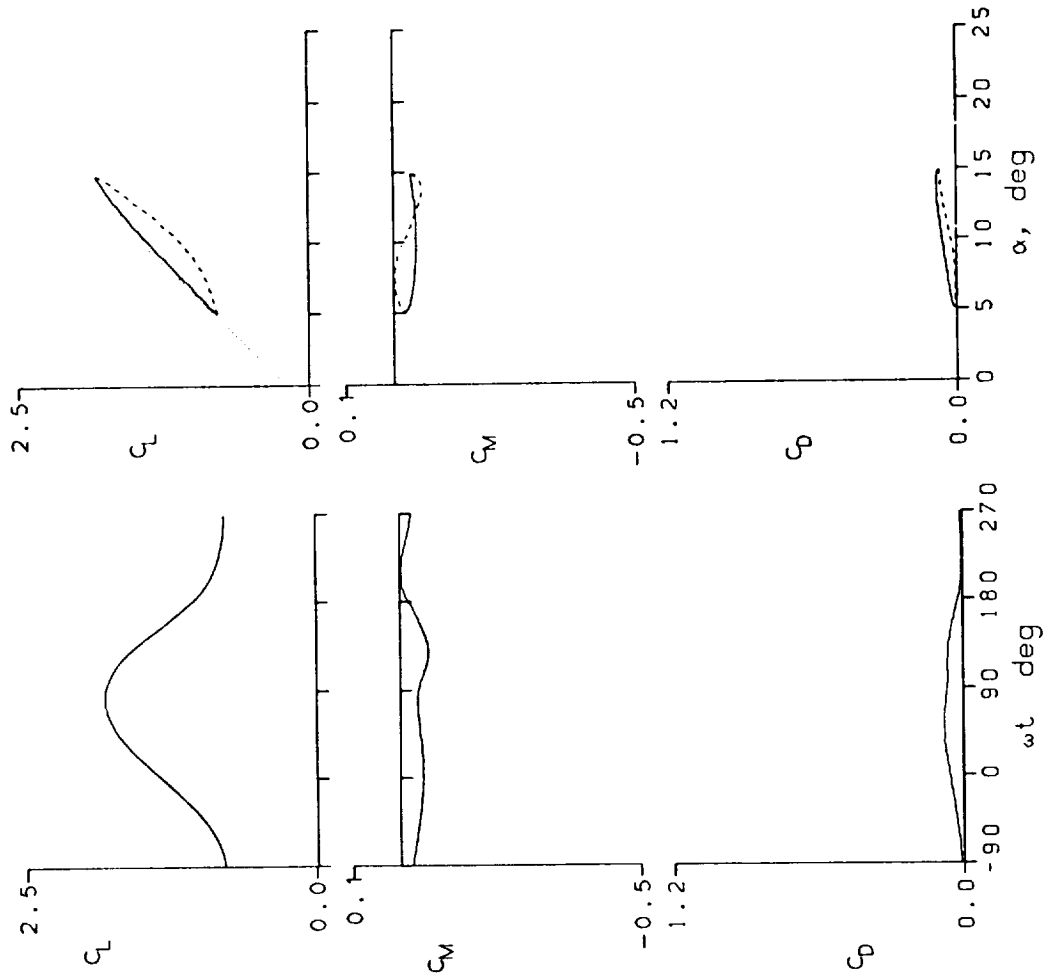


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 45303 A0 = 9.90° k = 0.200
 Re = 4.03 E6 A1 = 4.90° M = 0.301
 CLmax = 1.88 CMmin = -0.06 CDmax = 0.09
 αLmax = 14.9° ζ = 0.419 Mmax = 1.395
 αCmin = 9.6° -CPmax = 10.4 αMmax = 14.8°

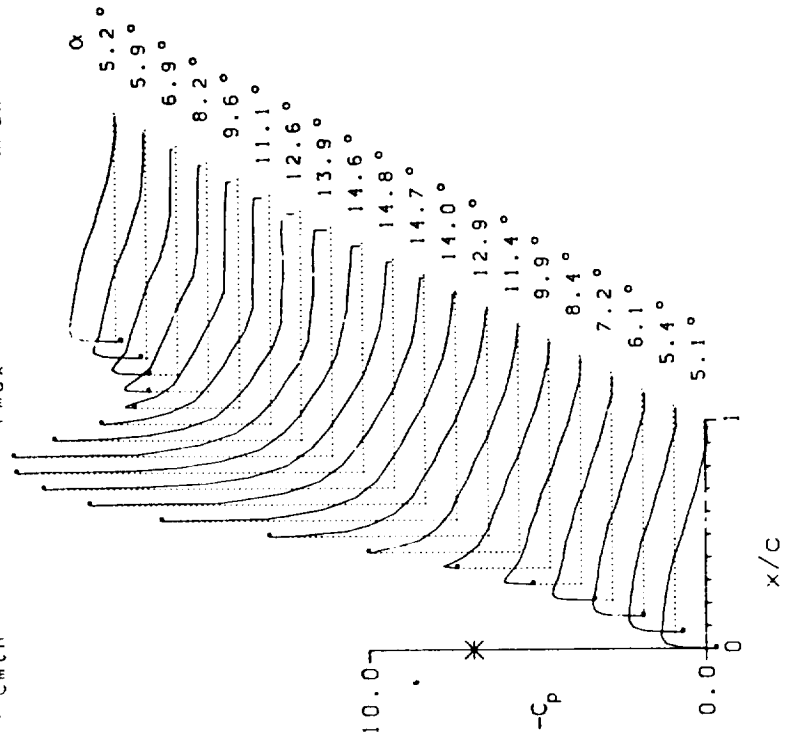
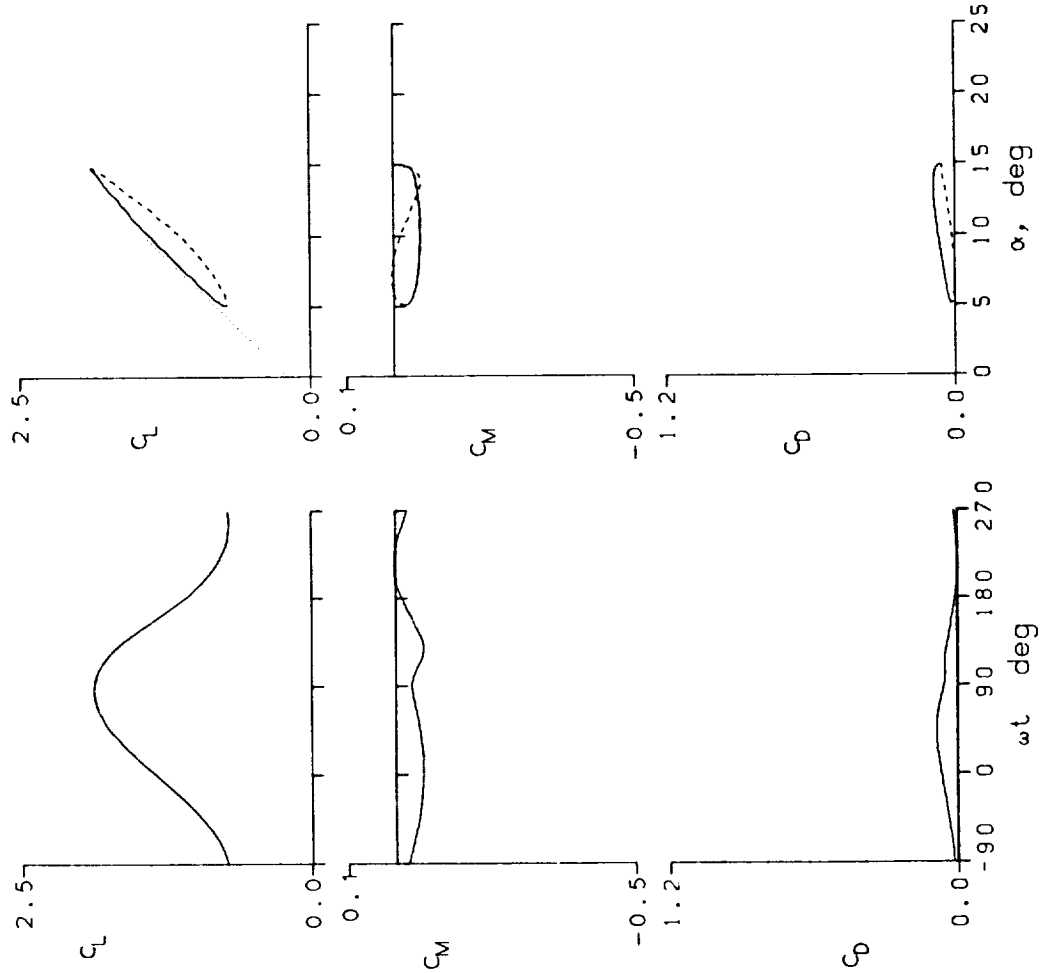


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL TRIP

FRAME : 47020 A0 = 14.81° k = 0.025

Re = 4.06 E6 A1 = 9.88° M = 0.299

CLmax = 1.66 CMmin = -0.20 CDmax = 0.47

αLmax = 14.9° ζ = 0.2:1 Mmax = 1.061

αCMmin = 14.5° -CPmax = 7.6 αMmax = 15.2°

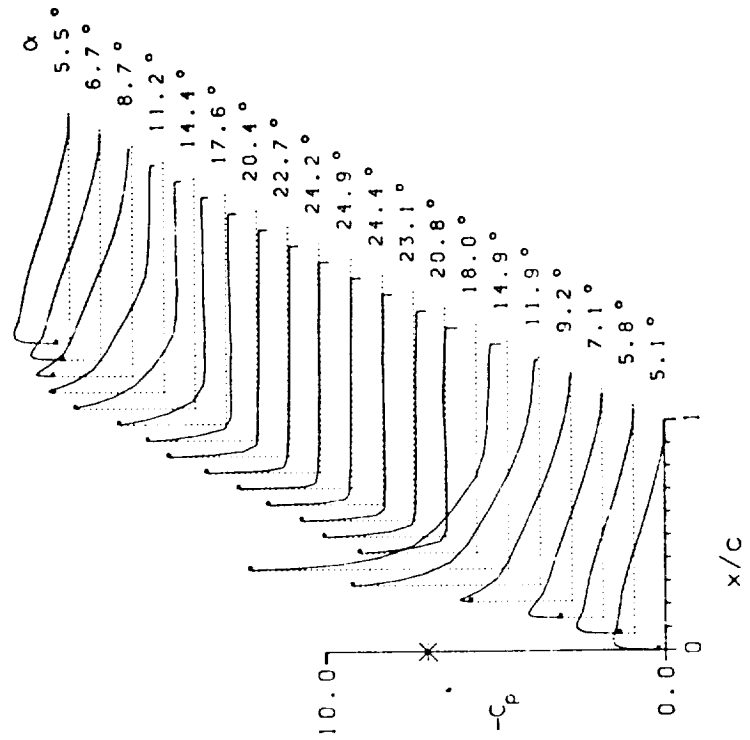
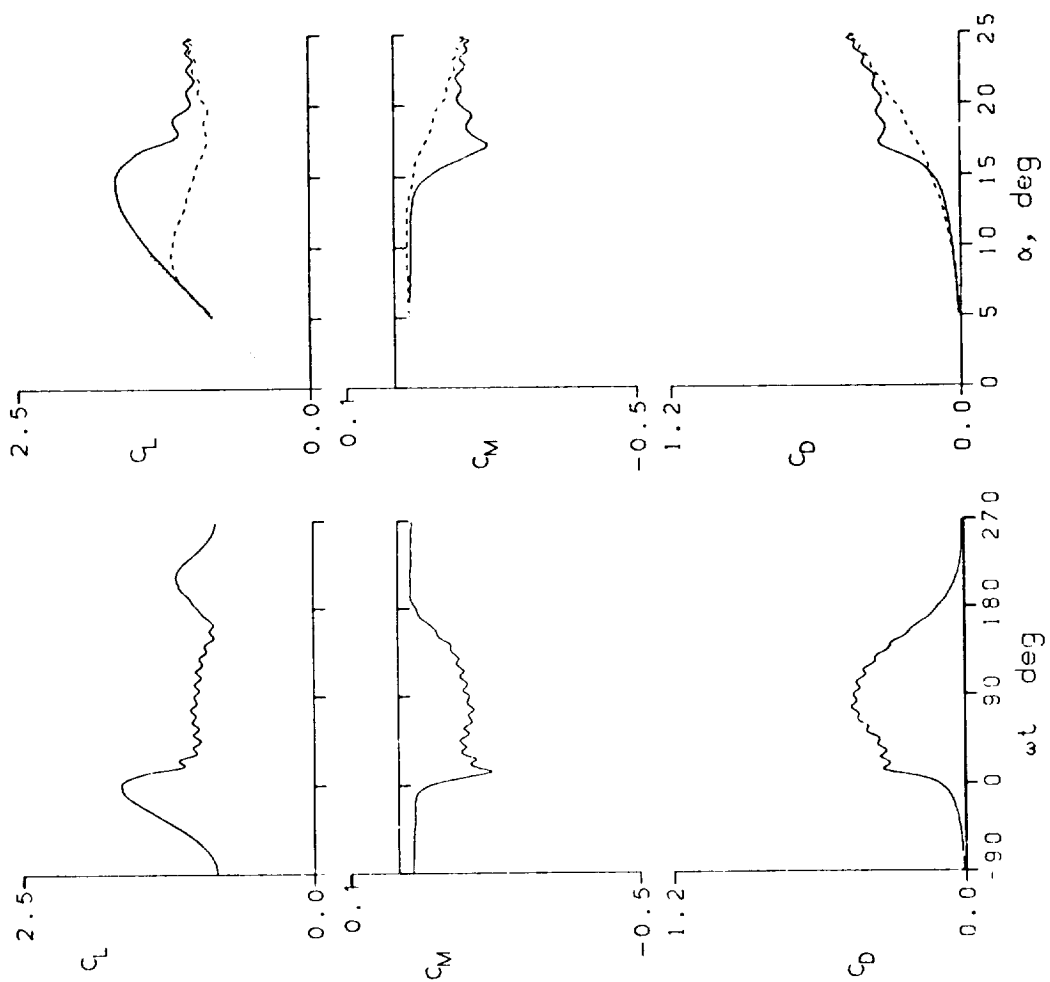


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL TRIP
 FRAME : 47022 A0 = 14.81° k = 0.050
 Re = 3.99 E6 A1 = 9.89° M = 0.296
 CLmax = 1.91 CMmin = -0.26 CDmax = 0.50
 α Lmax = 17.4° ζ = 0.369 Mmax = 1.291
 α Cmin = 14.5° -CPmax = 10.0 α Mmax = 17.4°

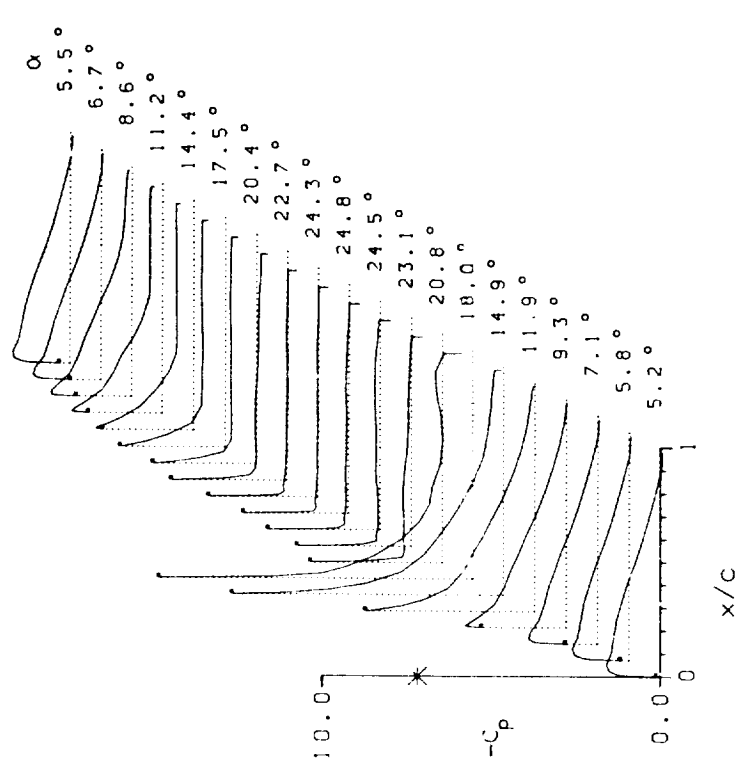
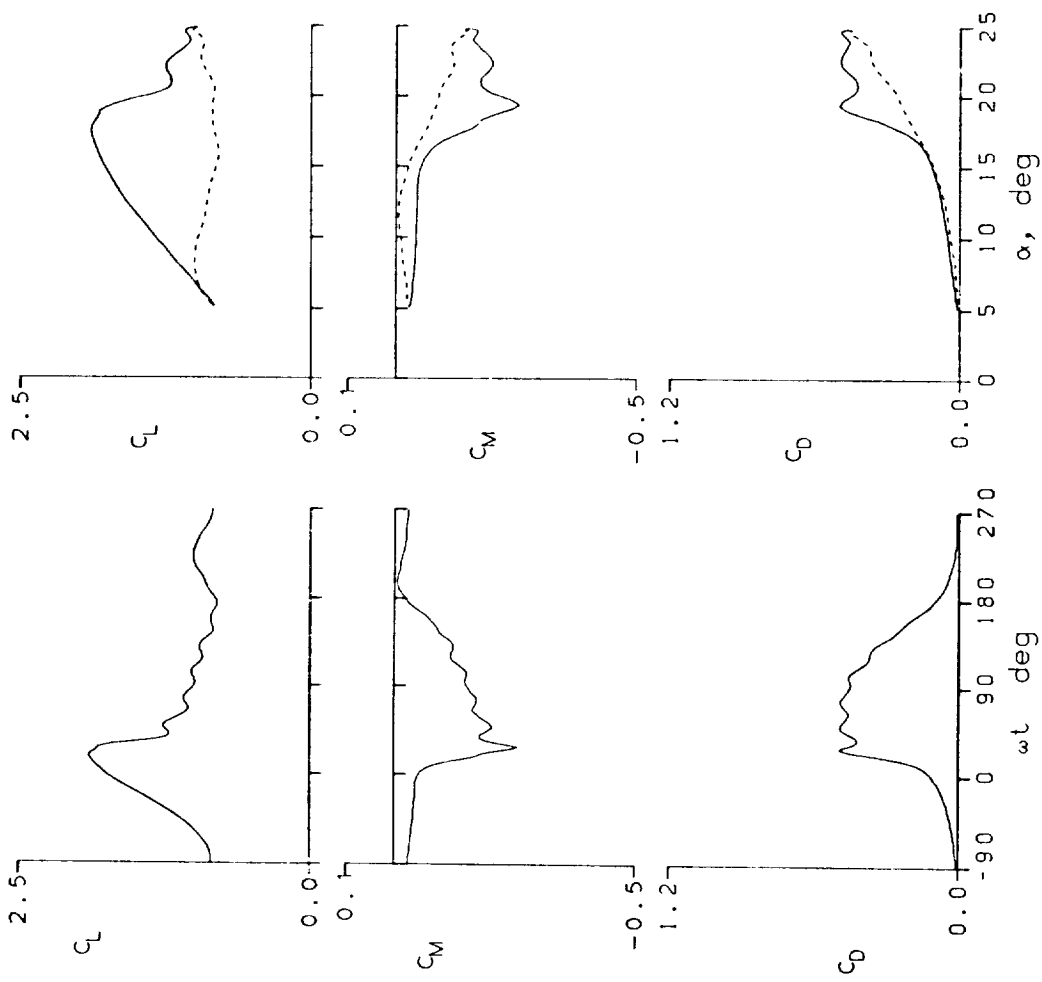


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL TRIP

FRAME : 47:00 A0 = 14.82° k = 0.101

Re = 3.93 E6 At = 9.88° M = 0.292

CLmax = 2.34 CMmin = -0.40 CDmax = 0.84

αLmax = 21.0° ζ = 0.558 Mmax = 1.412

αCMmin = 14.4° -CPmax = 11.3 αMmax = 18.6°

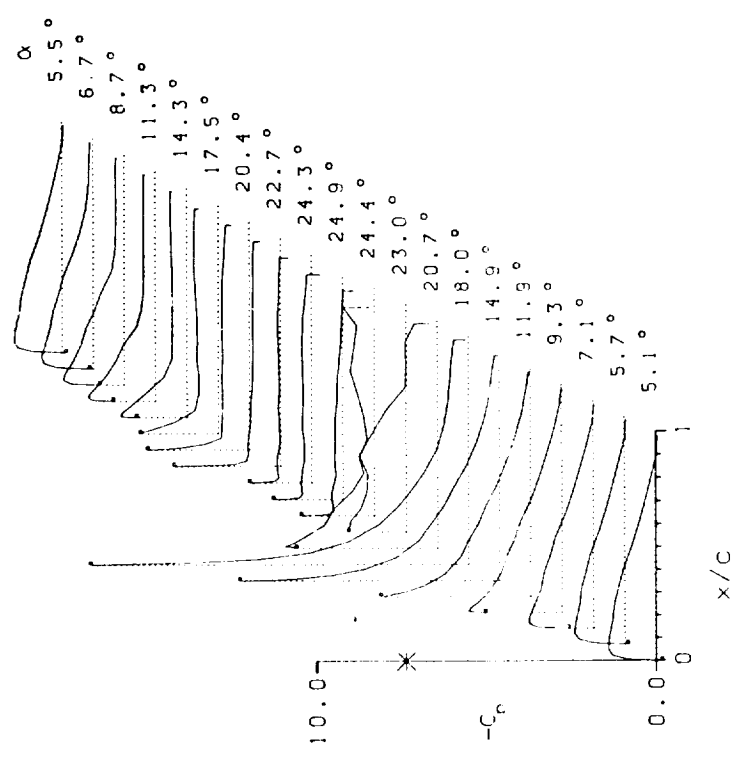
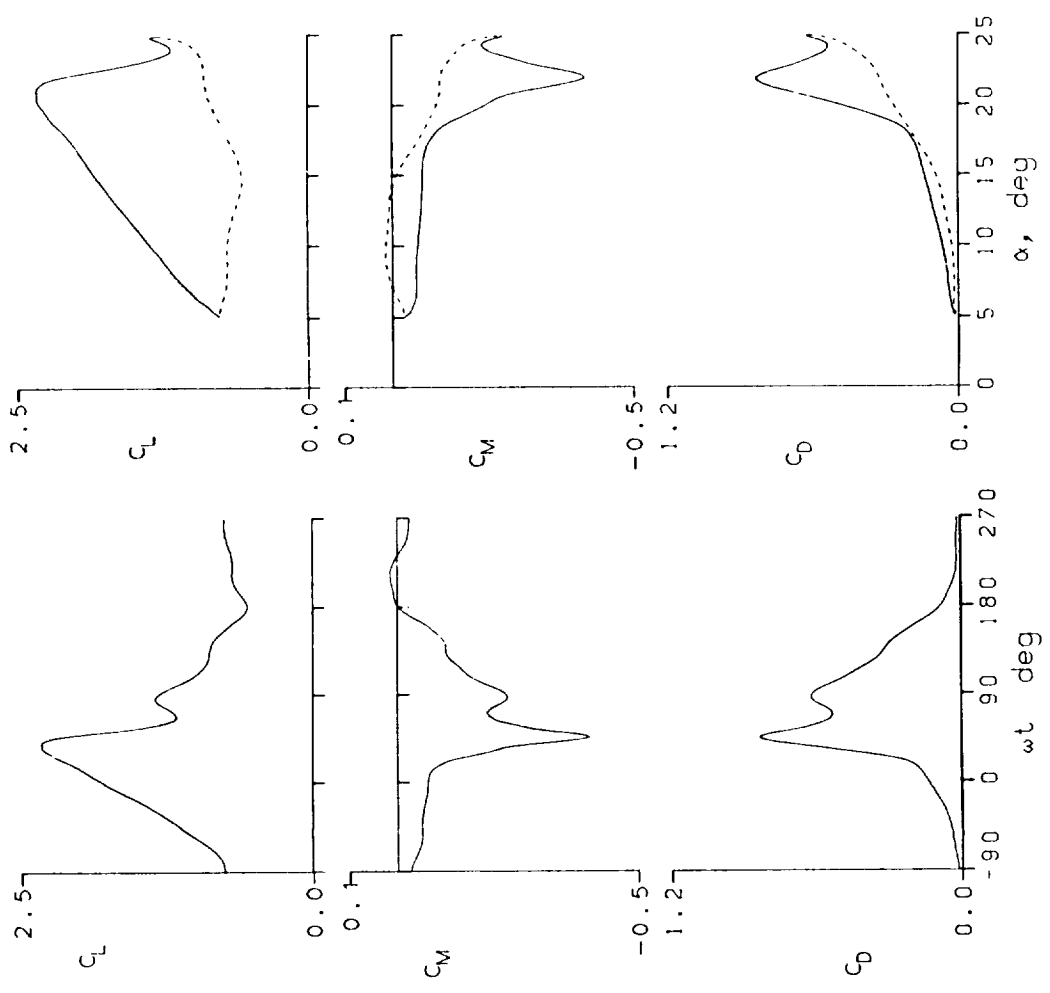


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL TRIP

FRAME : 47110 A0 = 14.81° k = 0.051

Re = 2.58 E6 At = 9.88° M = 0.184

C_{Lmax} = 1.84 C_{Mmin} = -0.27 C_{Dmax} = 0.63

α_{Lmax} = 17.7° ζ = 0.355 M_{max} = 0.716

$\alpha_{C_{min}}$ = 14.5° $-C_{Dmax}$ = 11.5 $\alpha_{M_{max}}$ = 18.3°

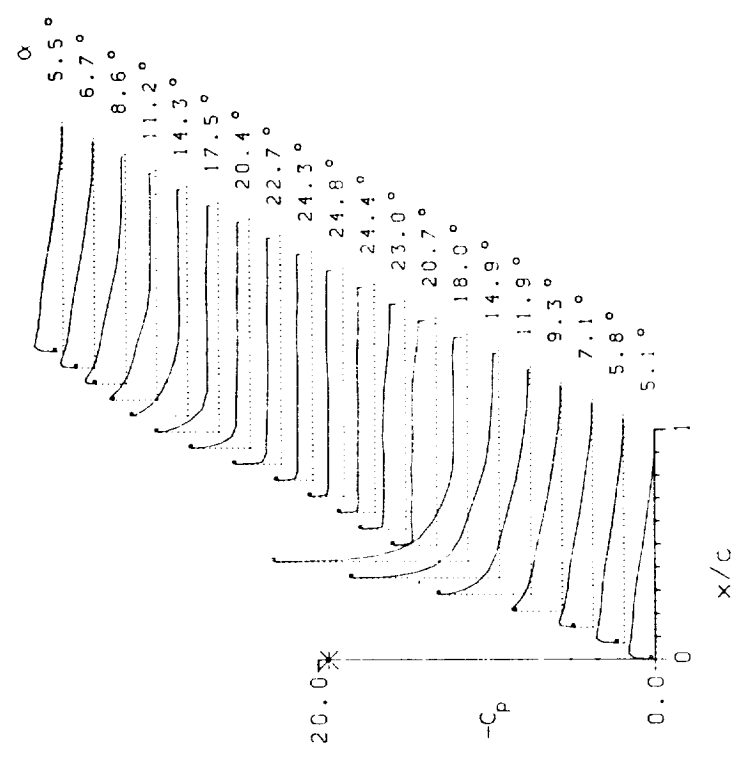
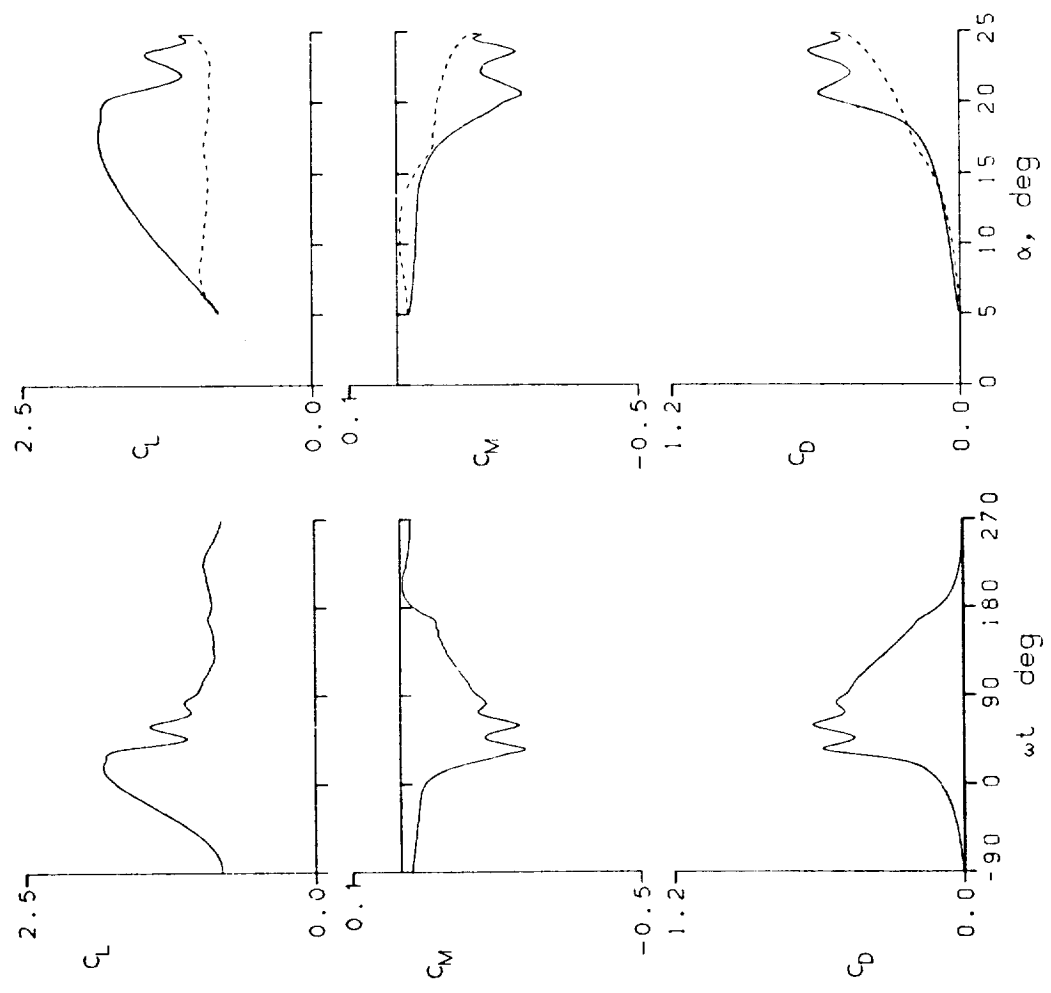


Figure 17.- Continued.

BOEING-VERTCL VR-7 -WITH TAB- AIRFOIL TRIP

FRAME : 47112 AO = 14.83° k = 0.101

Re = 2.59 E6 A1 = 9.88° M = 0.185

CLmax = 2.26 CMmin = -0.37 CDmax = 0.86

αLmax = 22.2° ζ = 0.377 Mmax = 0.888

αCmin = 14.5° -CPmax = 16.1 αMmax = 21.1°

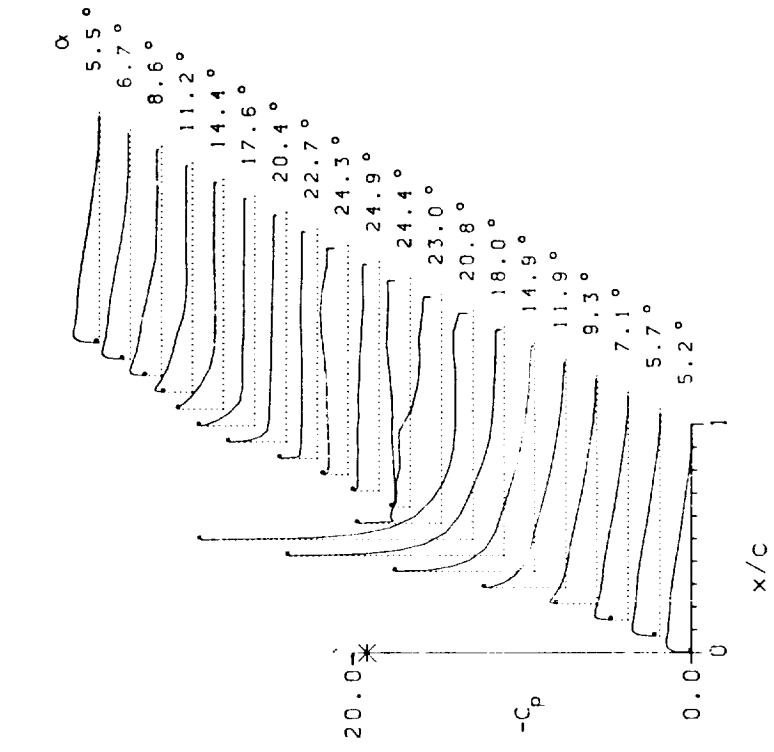
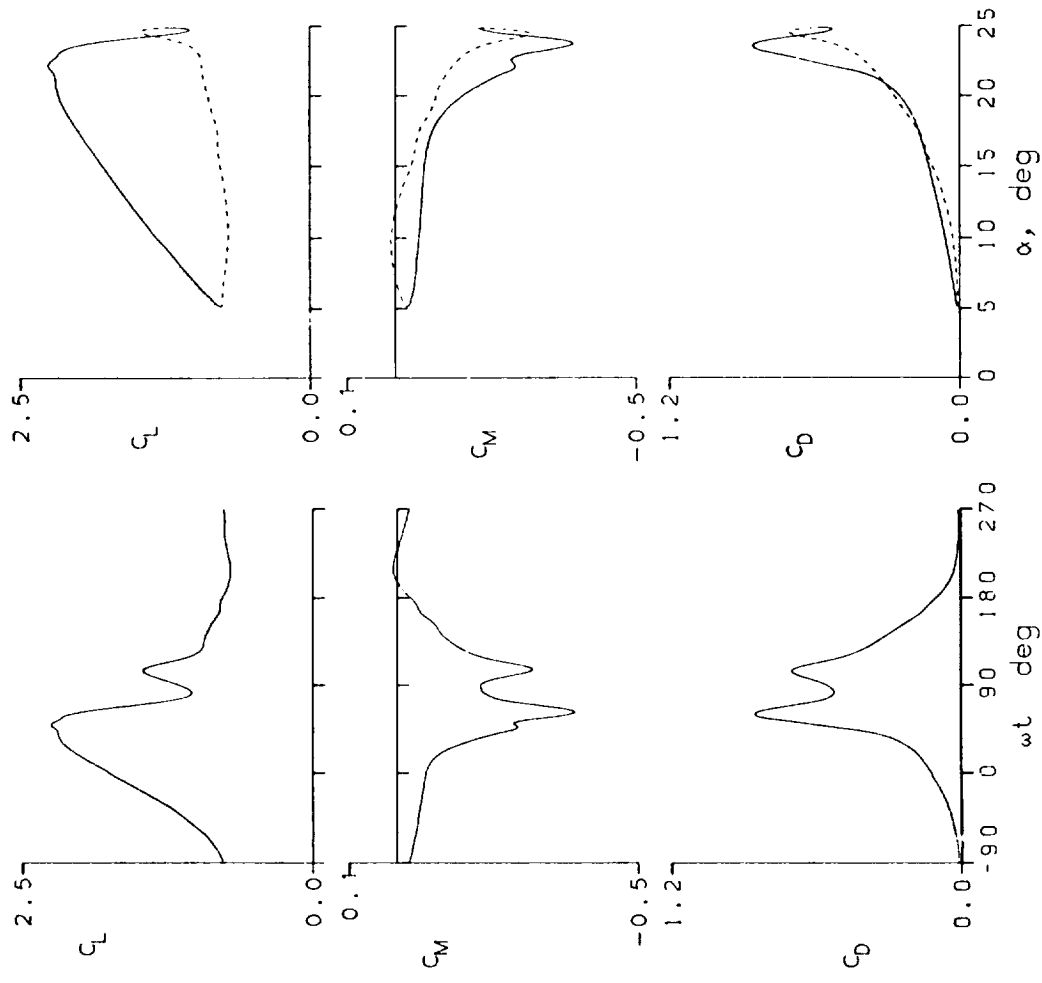


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL TRIP

FRAME : 47114 A0 = 14.82° k = 0.151

Re = 2.58 E6 A1 = 9.88° M = 0.185

$C_{L,max}$ = 2.61 $C_{M,min}$ = -0.44 $C_{D,max}$ = 1.05

$\alpha_{L,max}$ = 23.2° ζ = 0.273 M_{max} = 1.014

$\alpha_{C_{min}}$ = 14.5° $-C_{P,max}$ = 19.5 $\alpha_{M_{max}}$ = 22.6°

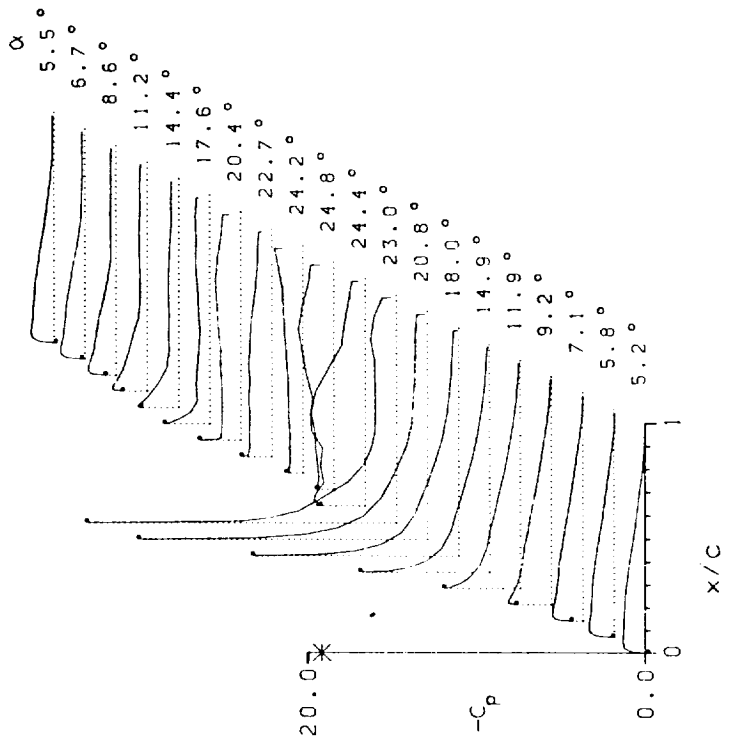
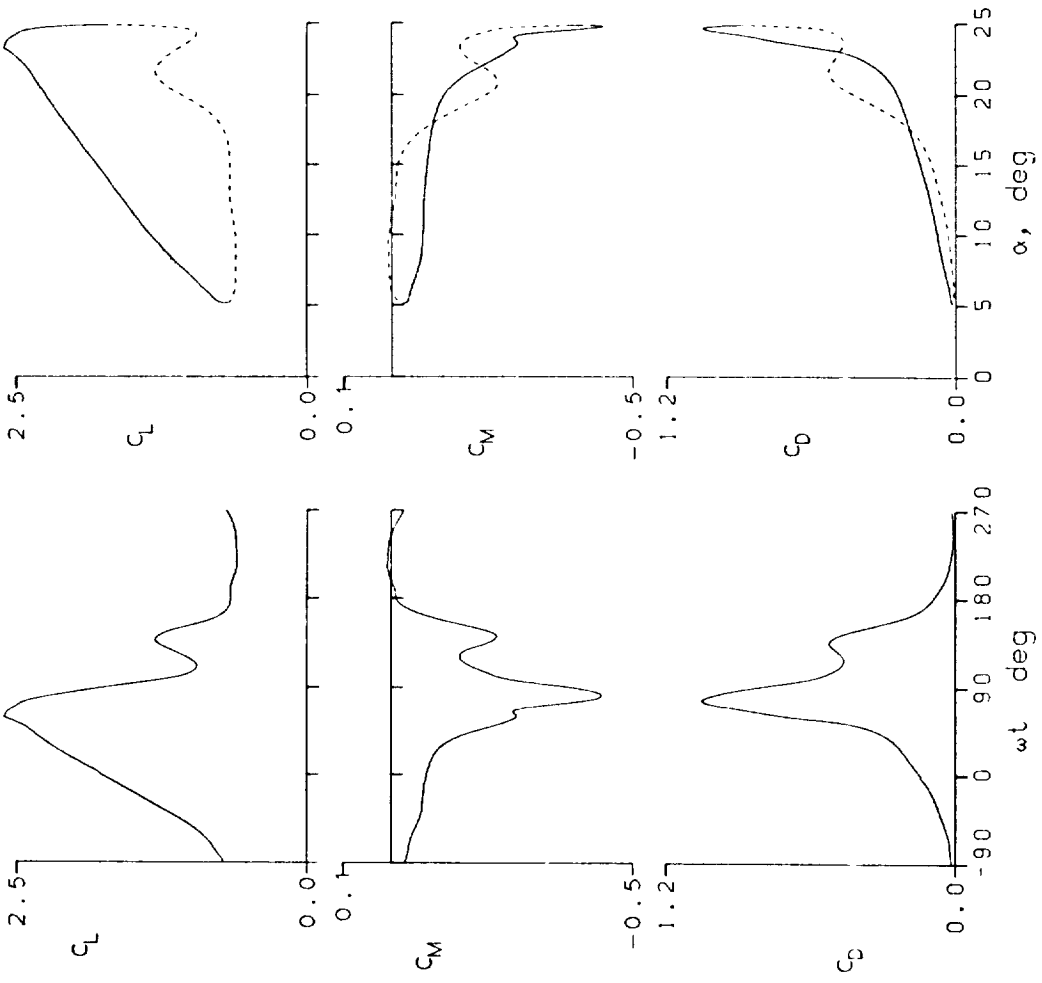


Figure 17.- Continued.

BOEING-VERTCL VR-7 -WITH TAB- AIRFOIL
 FRAME : 47123 A0 = 14.82° k = 0.101
 Re = 1.03 E6 A1 = 9.88° M = 0.073
 CLmax = 2.48 CMmin = -0.37 CDmax = 0.82
 αLmax = 21.9° ζ = 0.565 Mmax = 0.299
 αCMmin = 14.5° -CPmax = 15.2 αMmax = 20.8°

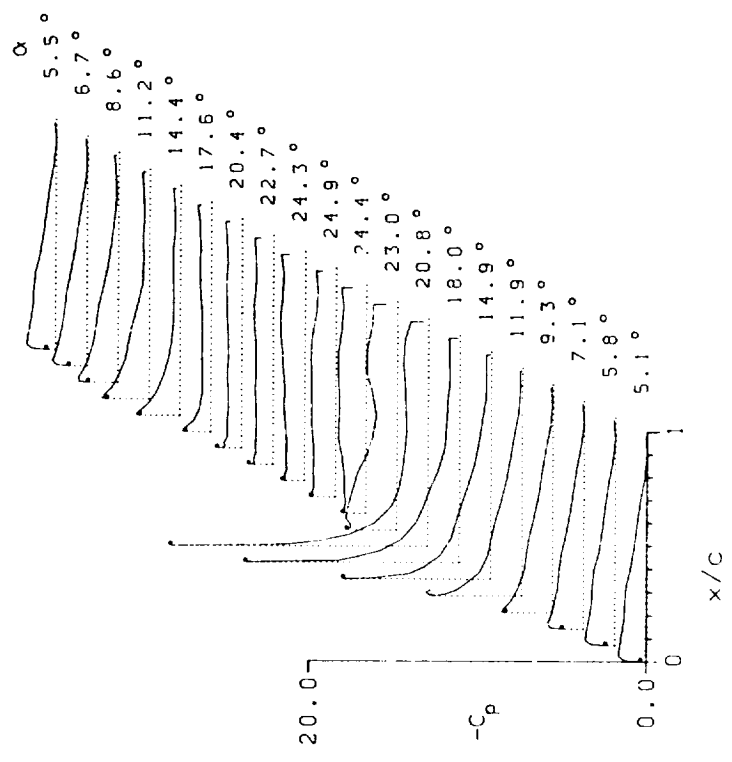
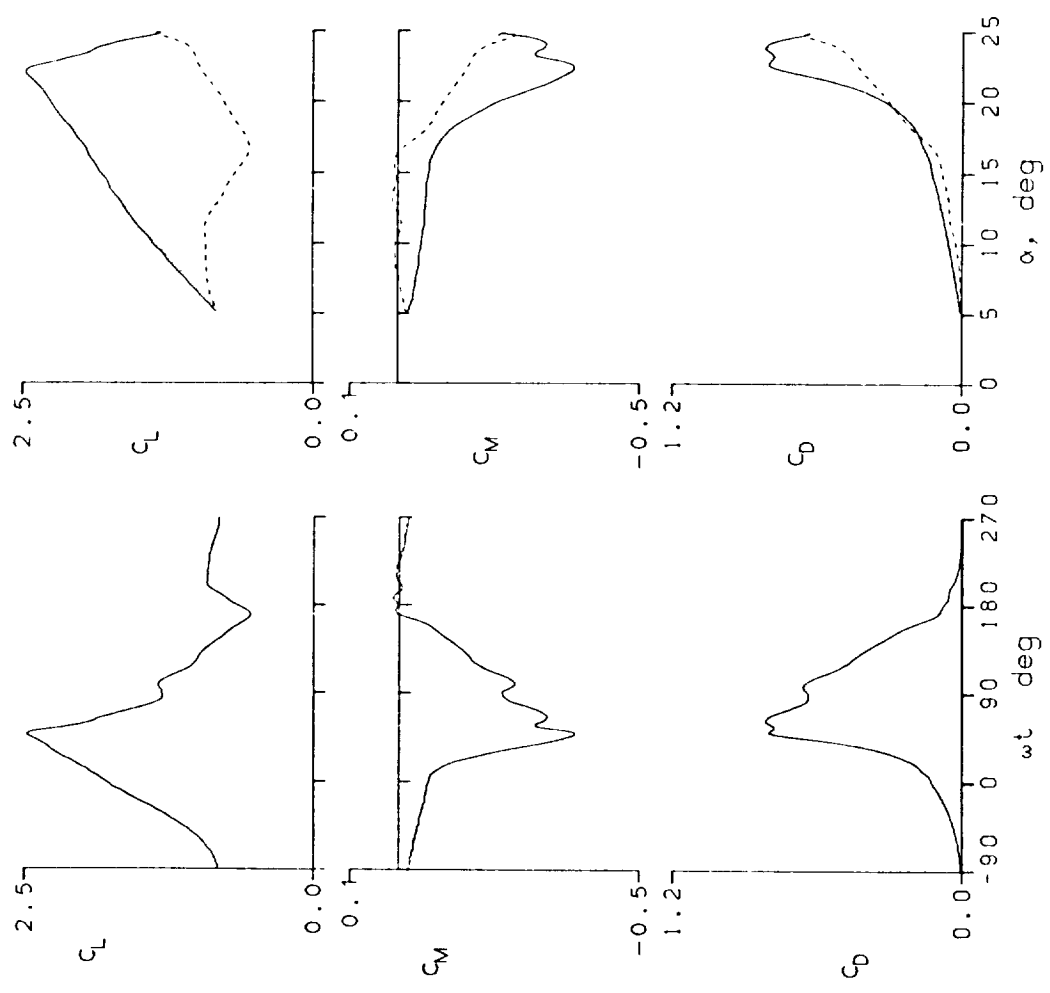


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 47206	A0 = 14.83°	k = 0.101
Re = 1.55 E6	A1 = 9.88°	M = 0.110
CLmax = 2.42	CMmin = -0.41	CDmax = 0.94
αLmax = 22.8°	ξ = 0.464	Mmax = 0.460
αCmin = 14.5°	-CPmax = 16.3	αMmax = 21.0°

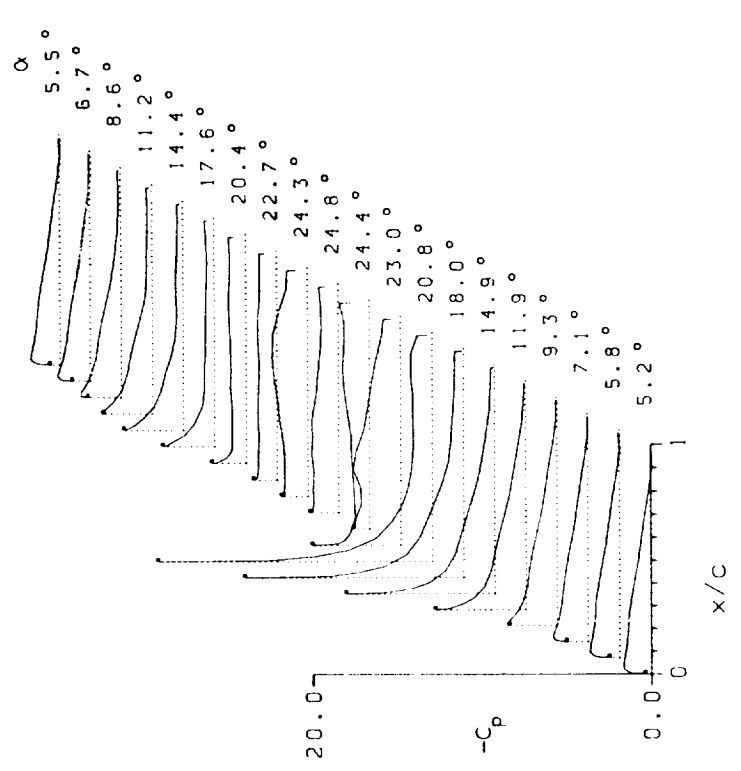
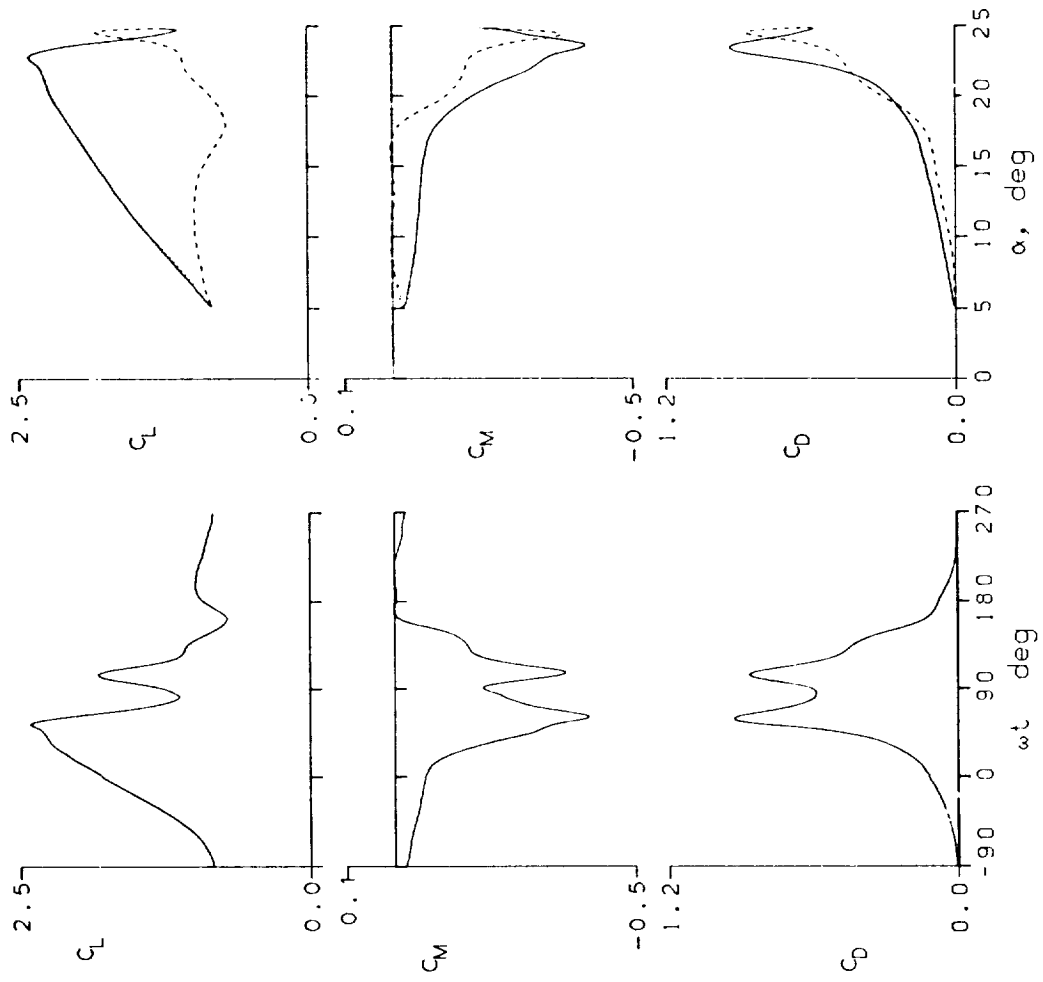


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 47213 A0 = 14.83 ° k = 0.102
 Re = 2.61 E6 A1 = 9.87 ° M = 0.185
 CLmax = 2.37 CMmin = -0.43 CDmax = 0.98
 α Lmax = 23.2 ° ζ = 0.327 Mmax = 0.963
 α Cmin = 14.5 ° -CPmax = 18.2 α Mmax = 21.8 °

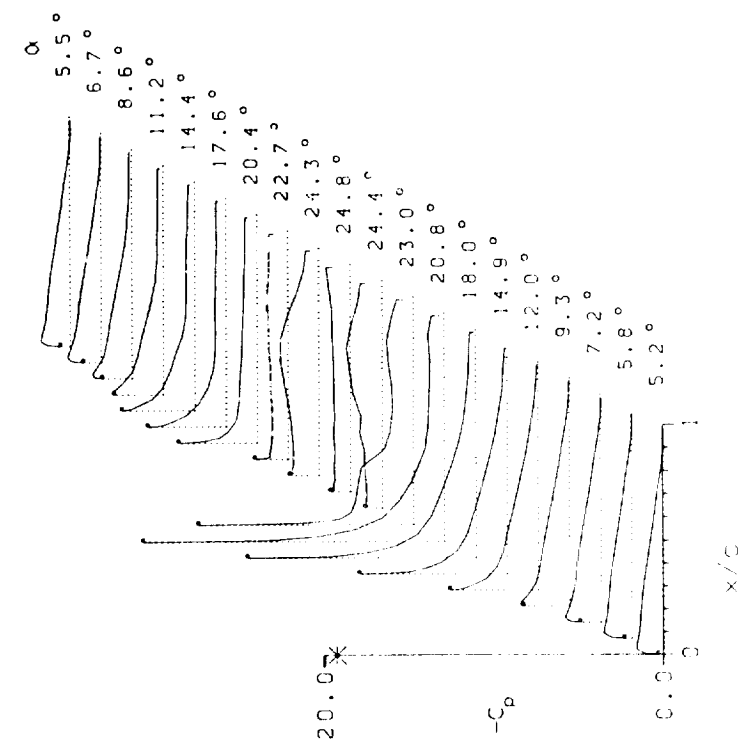
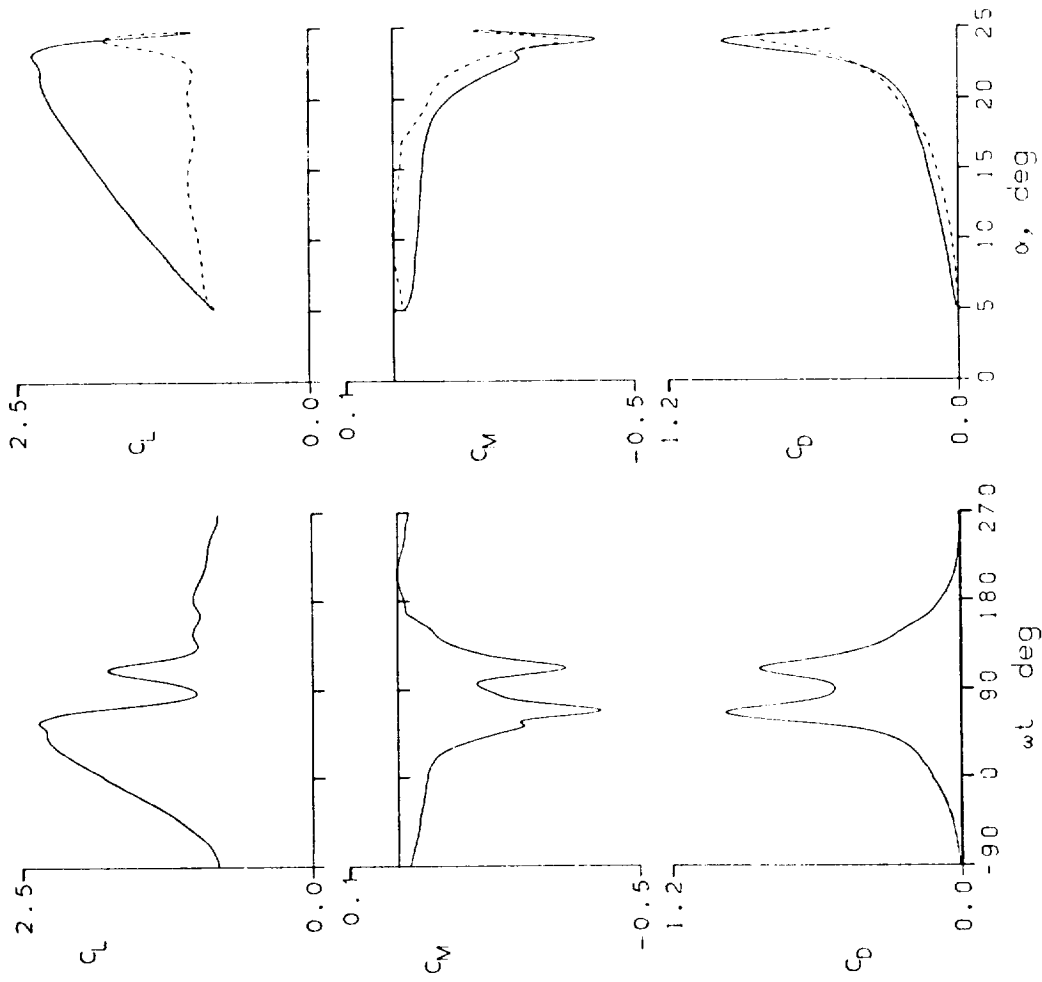


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 47217 A0 = 14.83° k = 0.101
 Re = 3.04 E6 A1 = 9.88° M = 0.221
 CLmax = 2.48 CMmin = -0.42 CDmax = 0.96
 αLmax = 21.7° ζ = 0.360 Mmax = 1.207
 αCMmin = 14.5° -CPmax = 17.0 αMmax = 20.8°

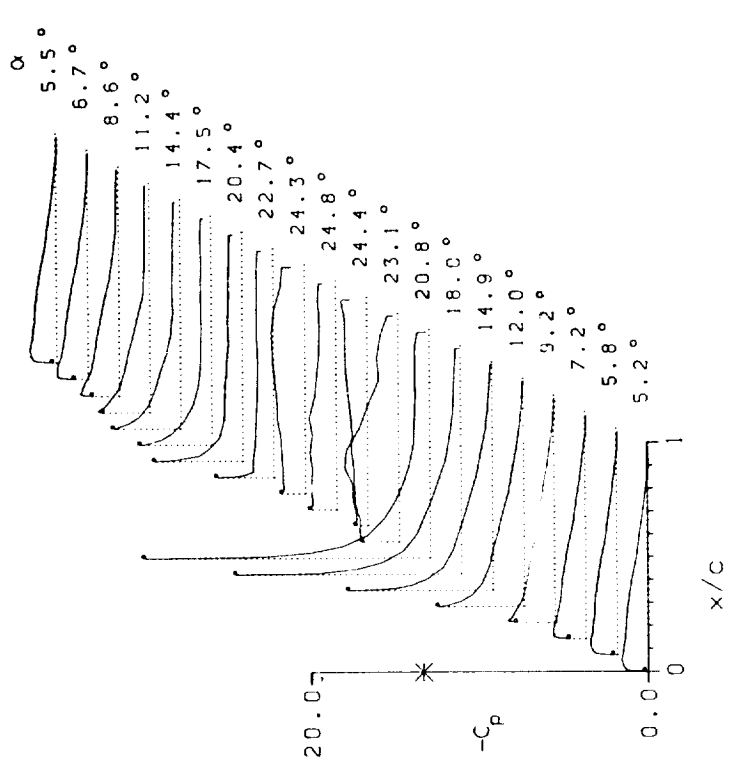
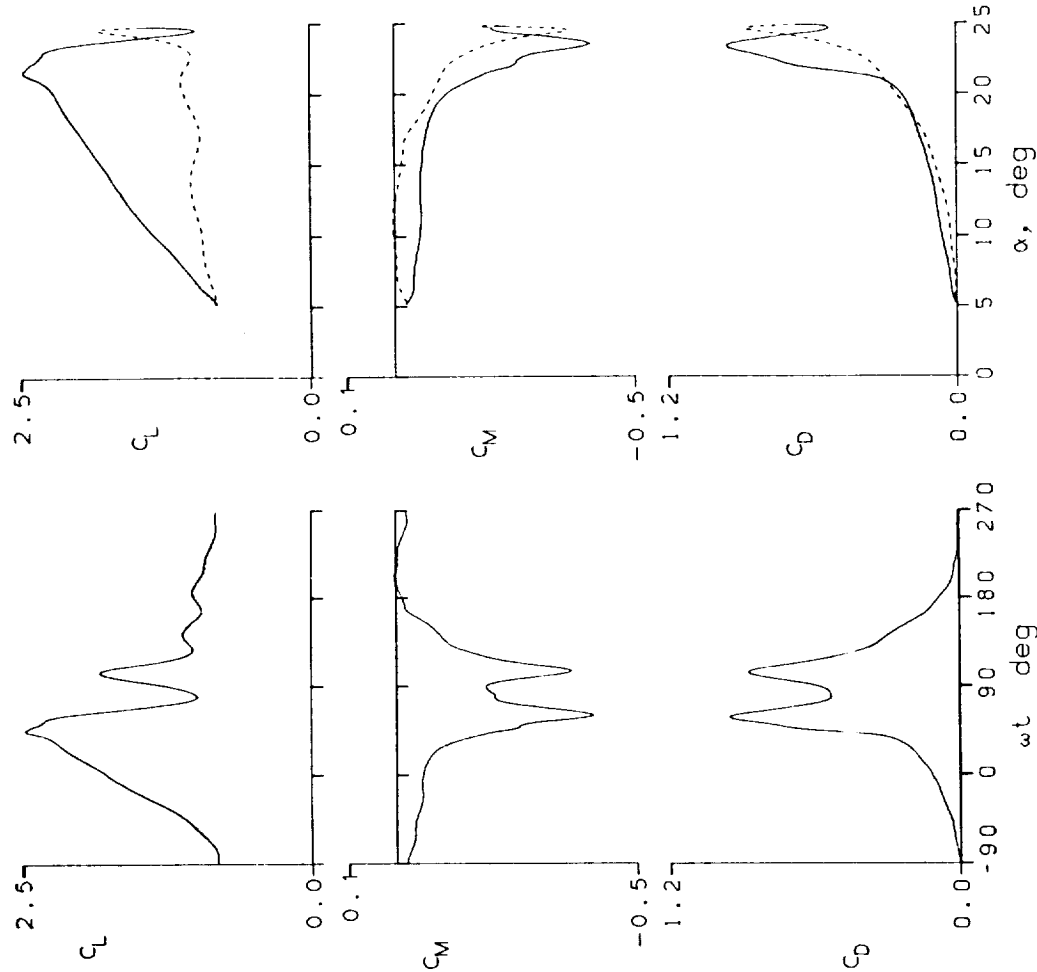


Figure 17.- Continued.

BOEING-VERTOL VR-7 - WITH TAB- AIRFOIL
 FRAME : 47301 $\Lambda_0 = 14.87^\circ$ $k = 0.101$
 $Re = 3.41 E6$ $A1 = 9.87^\circ$ $M = 0.250$
 $C_{Lmax} = 2.39$ $C_{Mmin} = -0.43$ $C_{Dmax} = 0.93$
 $\alpha_{Lmax} = 20.3^\circ$ $\xi = 0.424$ $Mmax = 1.318$
 $\alpha_{Cmin} = 14.5^\circ$ $-C_{Pmax} = 14.5$ $\alpha_{Mmax} = 19.4^\circ$

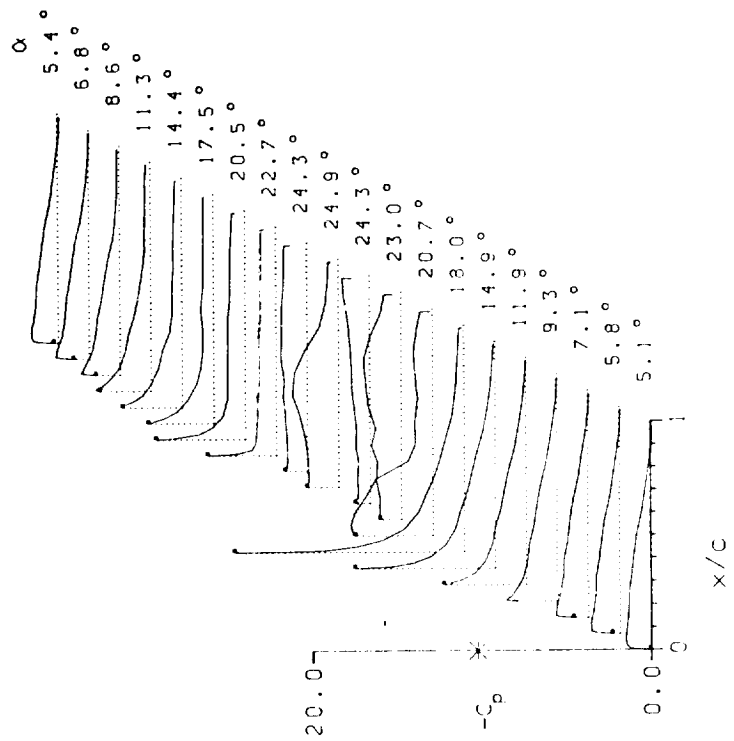
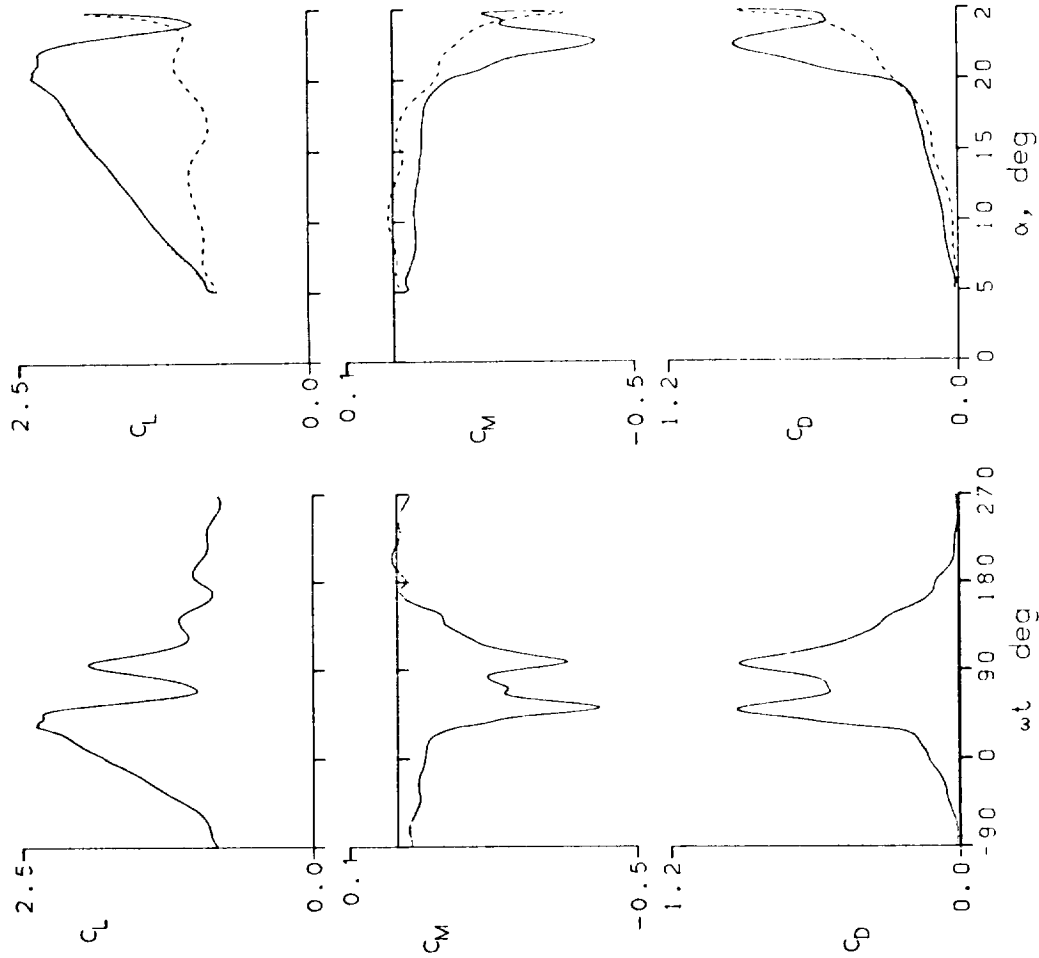


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 47305 A0 = 14.84° k = 0.100
 Re = 3.78 E6 A1 = 9.88° M = 0.281
 CLmax = 2.37 CMmin = -0.46 CDmax = 0.95
 α Lmax = 20.3° ζ = 0.410 Mmax = 1.434
 α Cmin = 14.6° -CPmax = 12.4 α Mmax = 18.6°

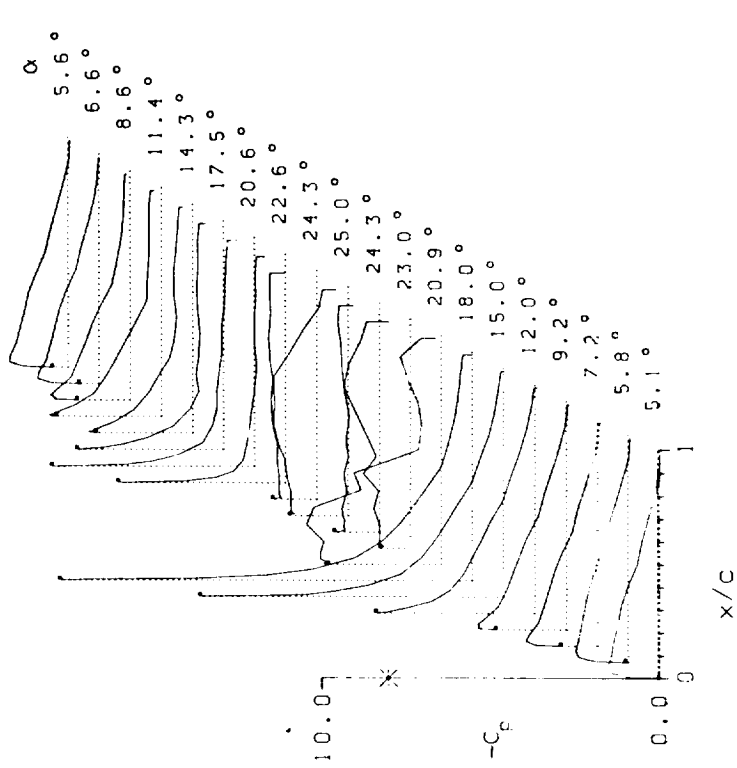
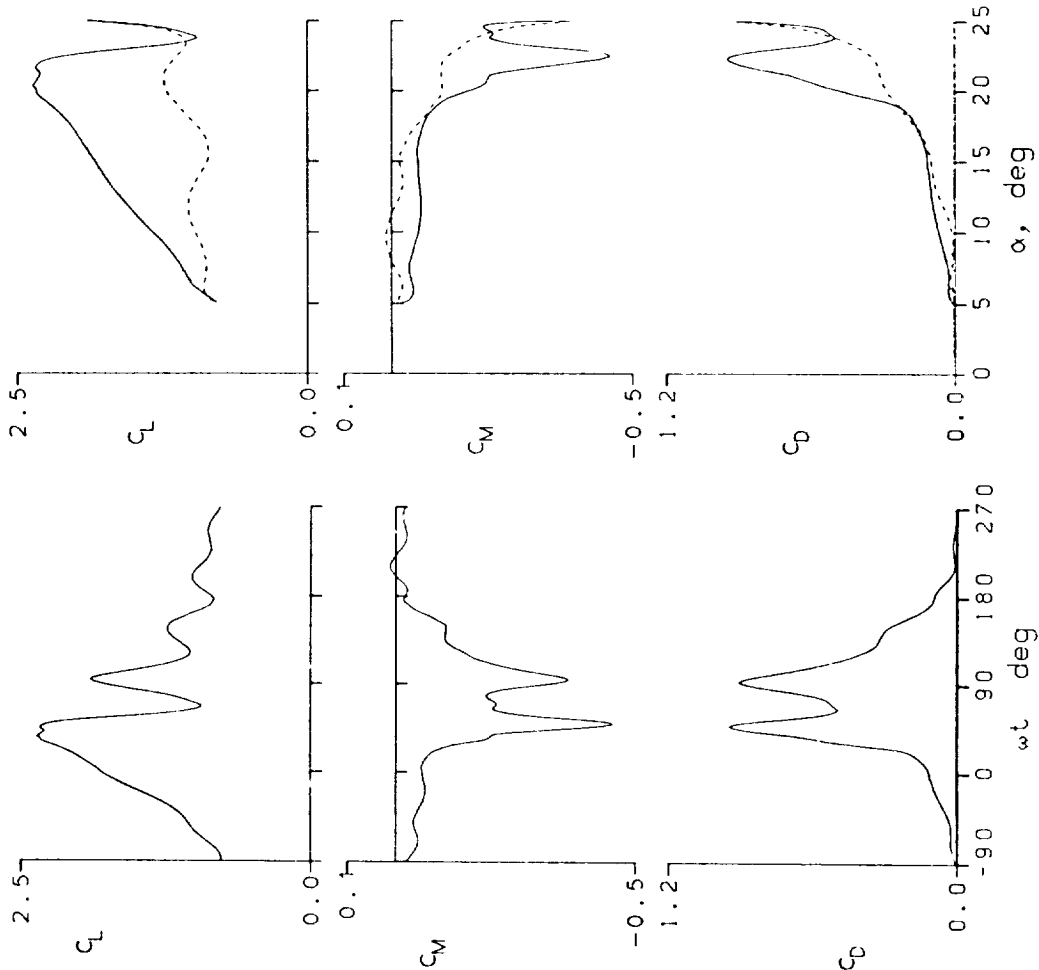


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 48019 A0 = 3.95° k = 0.010
 Re = 4.22 E6 A1 = 10.10° M = 0.299
 CLmax = 1.63 CMmin = -0.07 CDmax = 0.11
 αLmax = 13.4° ζ = 0.021 Mmax = 1.068
 αCMmin = 3.5° -CPmax = 7.7 αMmax = 13.7°

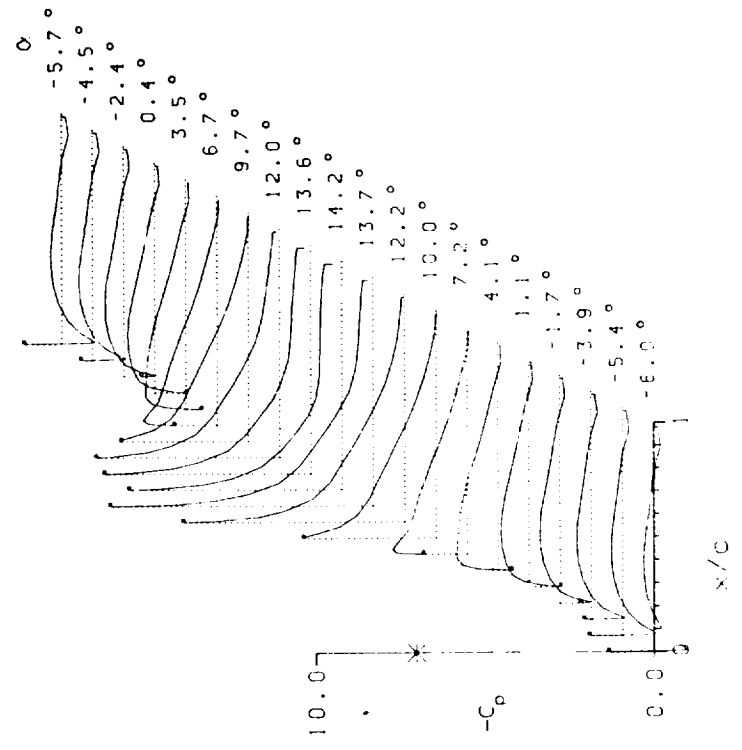
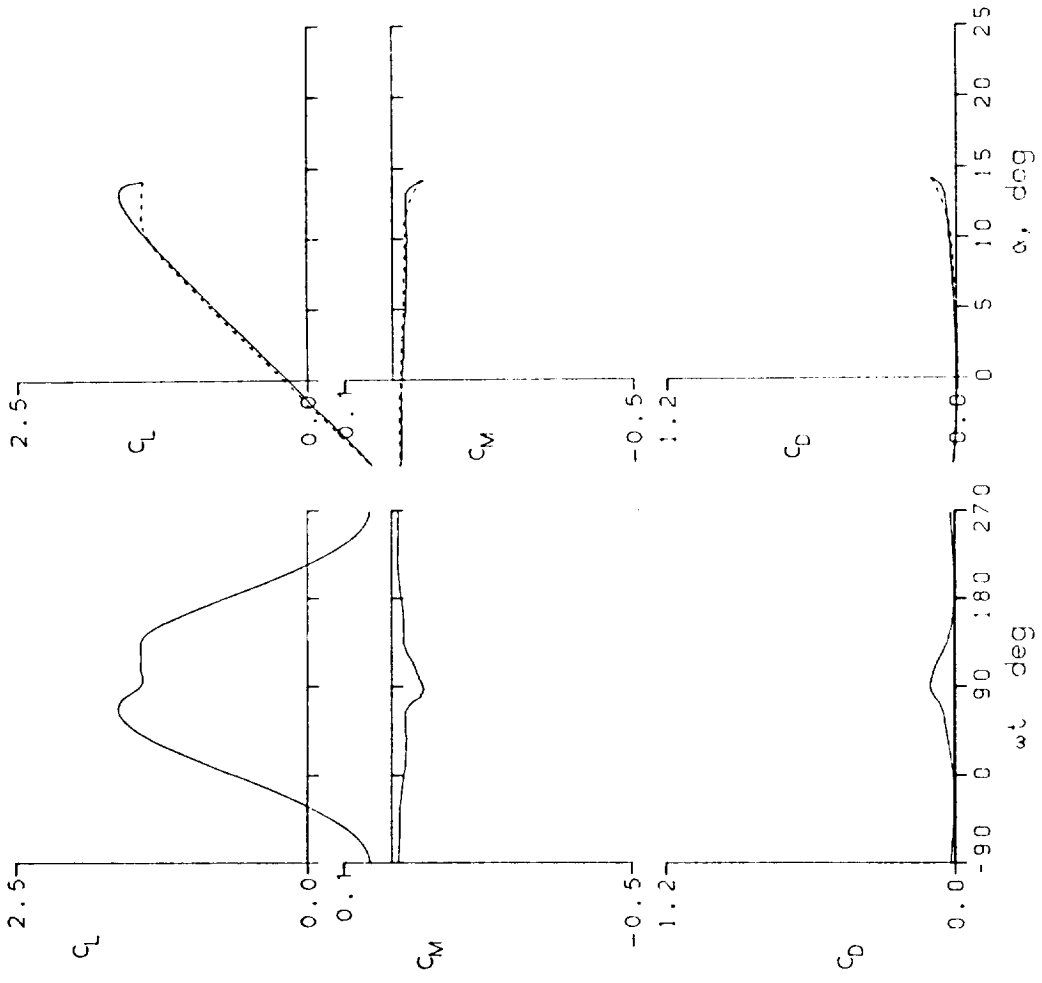


Figure 17.- Continued.

BOEING-VERTOL VR-7 - WITH TAB - AIRFOIL

FRAME : 48023	A0 = 3.95°	k = 0.025
Re = 4.19 E6	A1 = 10.10°	M = 0.300
CLmax = 1.68	CMmin = -0.07	CDmax = 0.10
αLmax = 13.7°	ξ = 0.058	Mmax = 1.146
αCmin = 3.5°	-CPmax = 8.4	αMmax = 14.0°

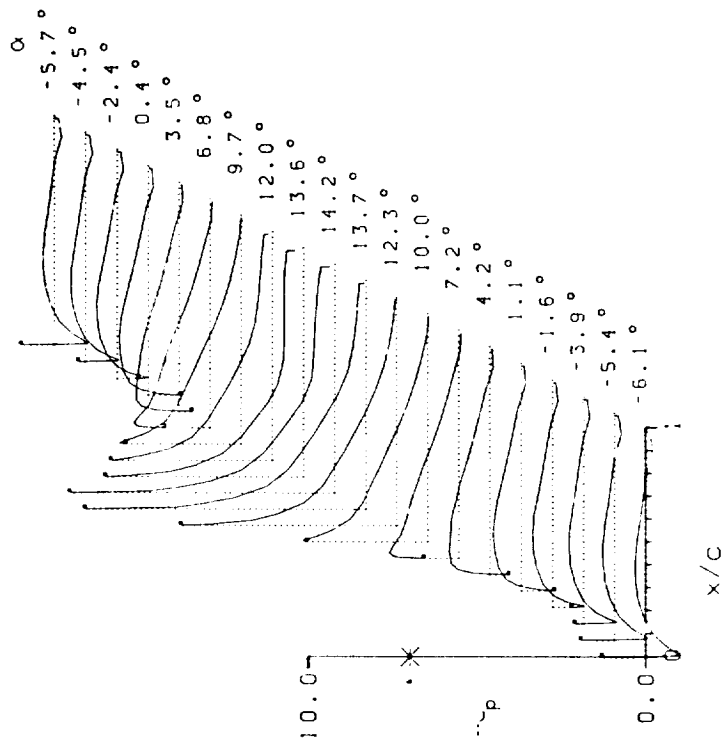
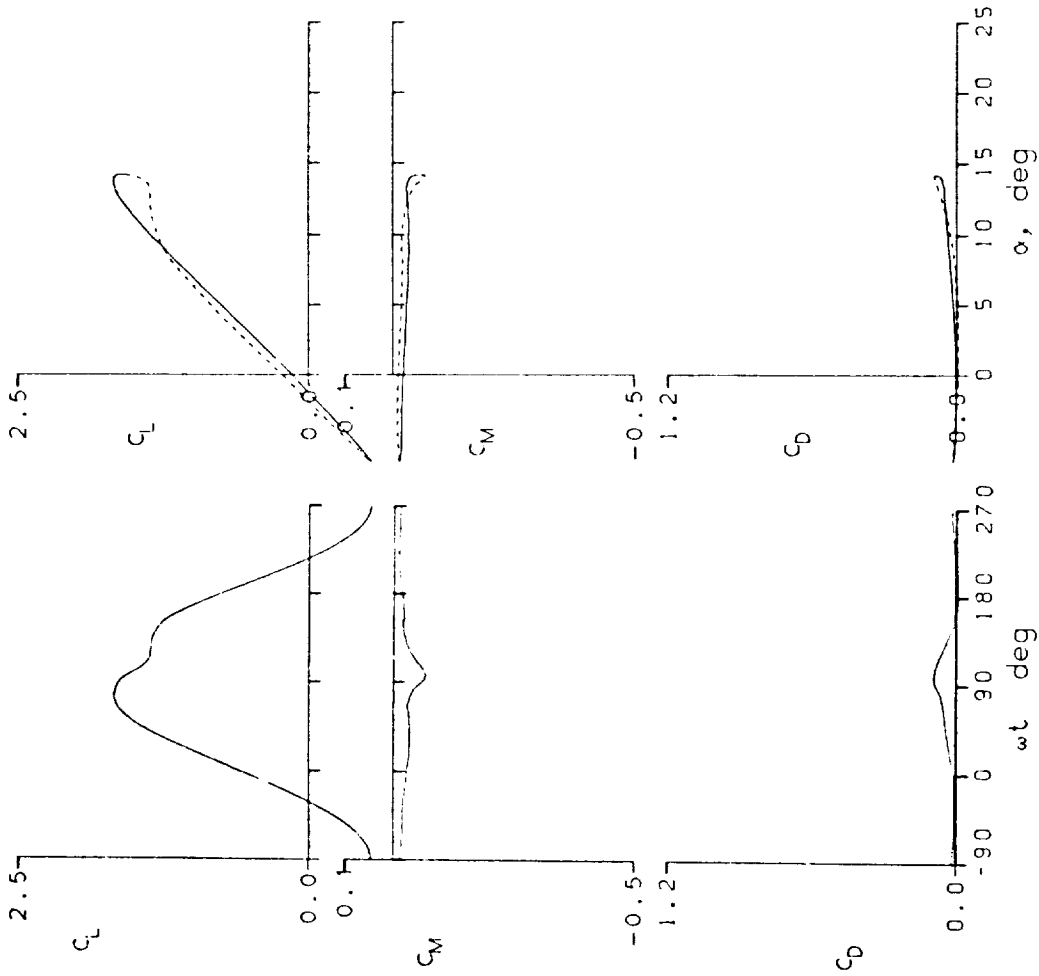


Figure 17.- Continued.

BOEING-VERTOL VR-7 - WITH TAB- AIRFOIL

FRAME : 48101 A0 = 3.95° h = 0.051
 Re = 4.15 E6 A1 = 10.10° M = 0.299
 CLmax = 1.73 CMmin = -0.05 CDmax = 0.07
 αLmax = 14.0° ζ = 0.130 Mmax = 1.216
 αCMmin = 3.5° -CPmax = 9.1 αMmax = 14.2°

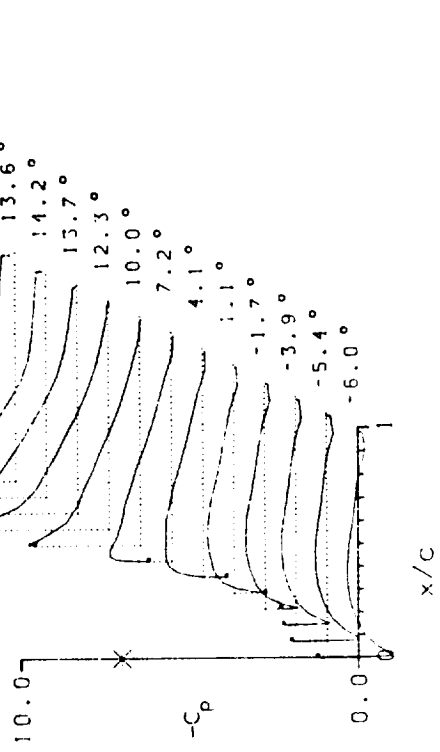
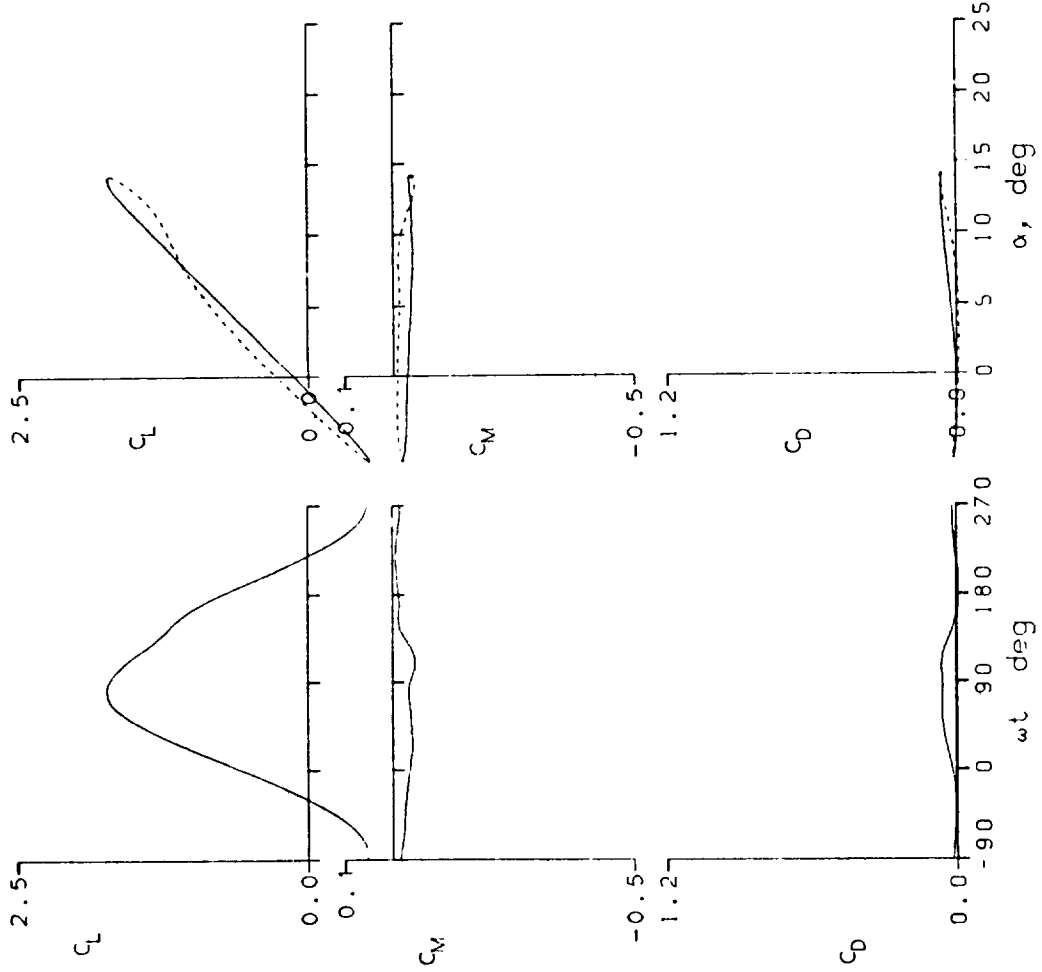


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 48103 $A_0 = 3.95^\circ$ $k = 0.102$
 $Re = 4.15 \text{ E}6$ $A_1 = 10.10^\circ$ $M = 0.300$
 $C_{Lmax} = 1.78$ $C_{Mmin} = -0.06$ $C_{Dmax} = 0.09$
 $\alpha_{Lmax} = 14.2^\circ$ $\zeta = 0.307$ $M_{max} = 1.271$
 $\alpha_{Cmin} = 3.5^\circ$ $-C_{Pmax} = 9.5$ $\alpha_{Mmax} = 14.1^\circ$

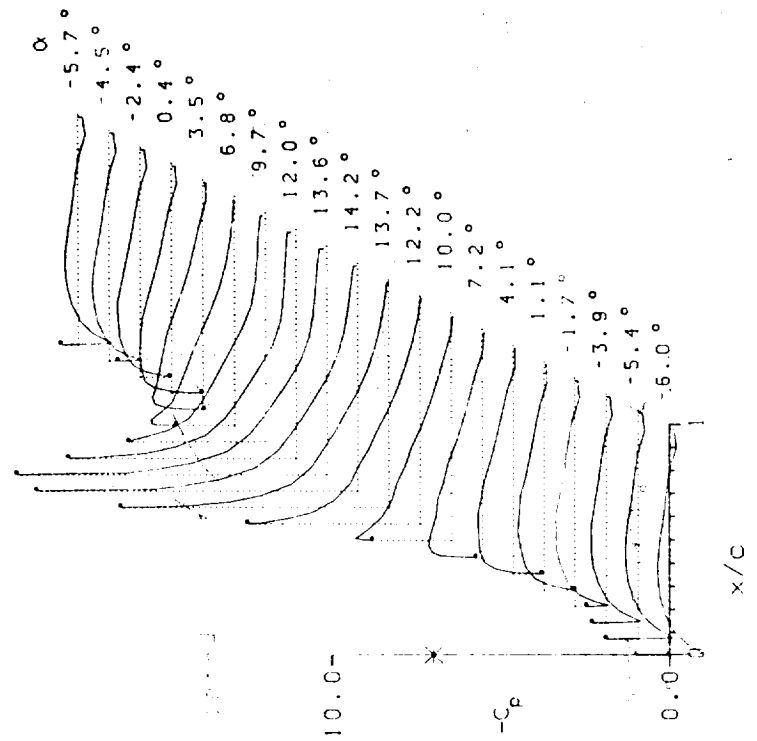
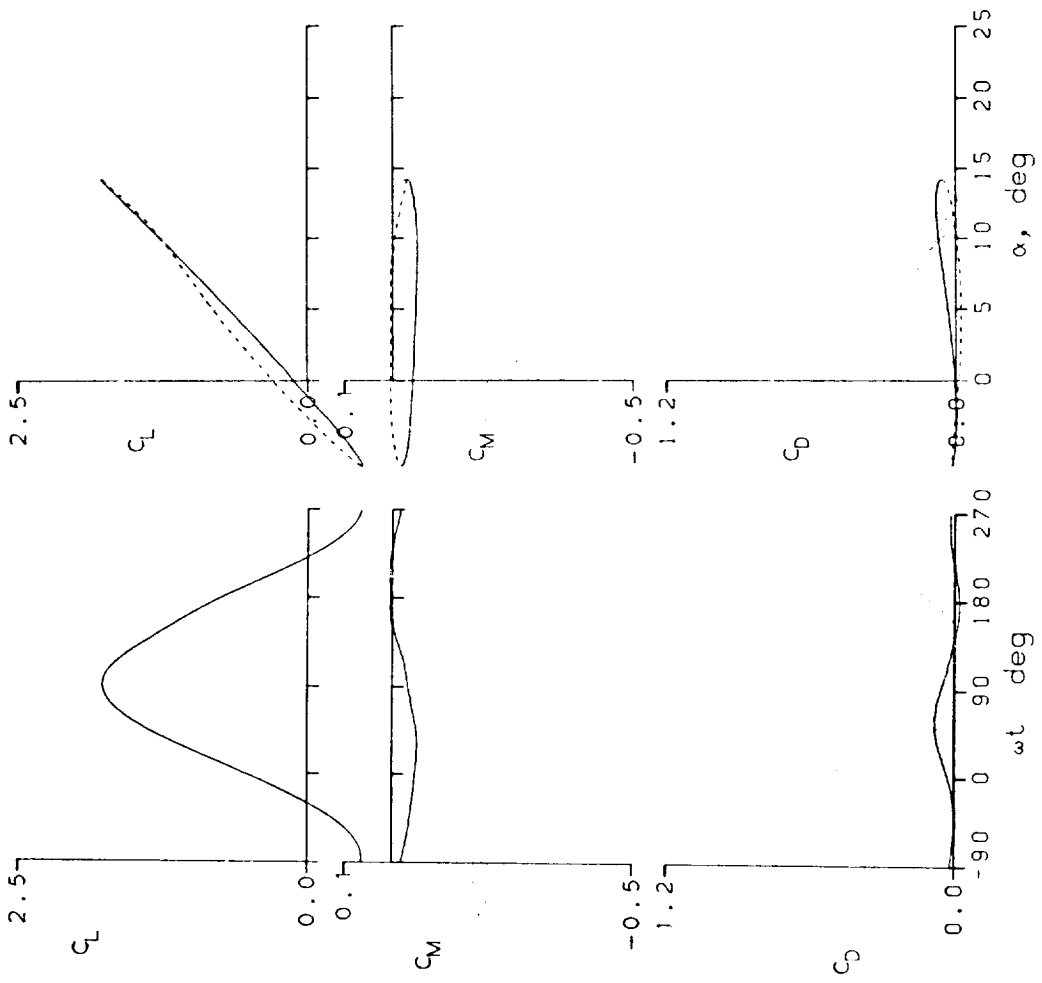


Figure 17.- Continued.

BOEING-VERTOL VR-7 - WITH TAB- AIRFOIL

FRAME : 48116 A0 = 13.00 ° k = 0.025

Re = 4.08 E6 A1 = 2.00 ° M = 0.299

CLmax = 1.63 CMmin = -0.08 CDmax = 0.13

αLmax = 13.5 ° ξ = -0.151 Mmax = 1.070

αCmin = 12.9 ° -CPmax = 7.7 αMmax = 13.9 °

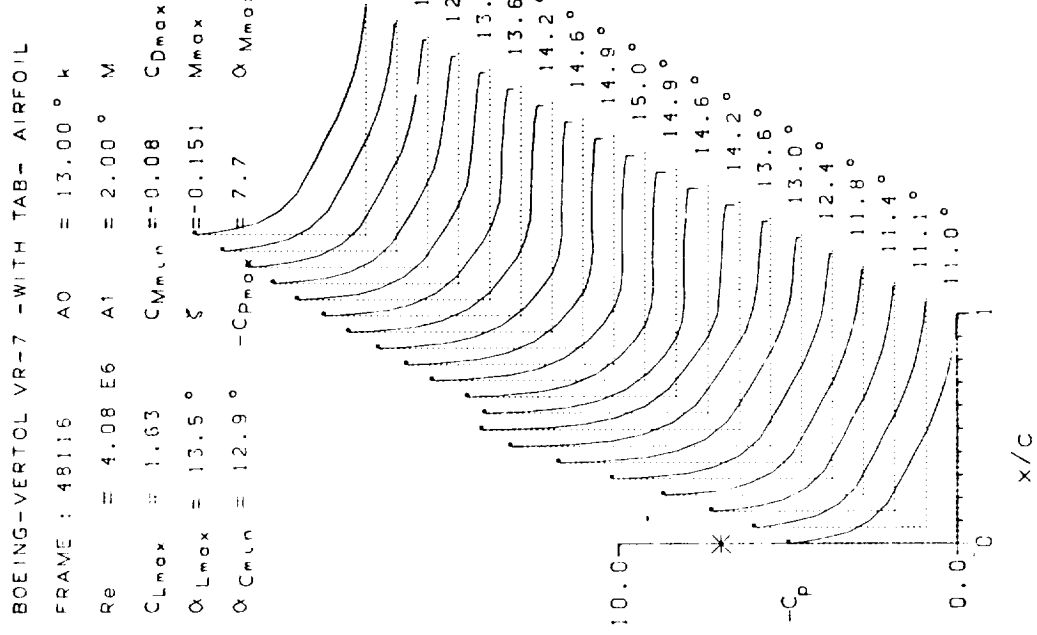
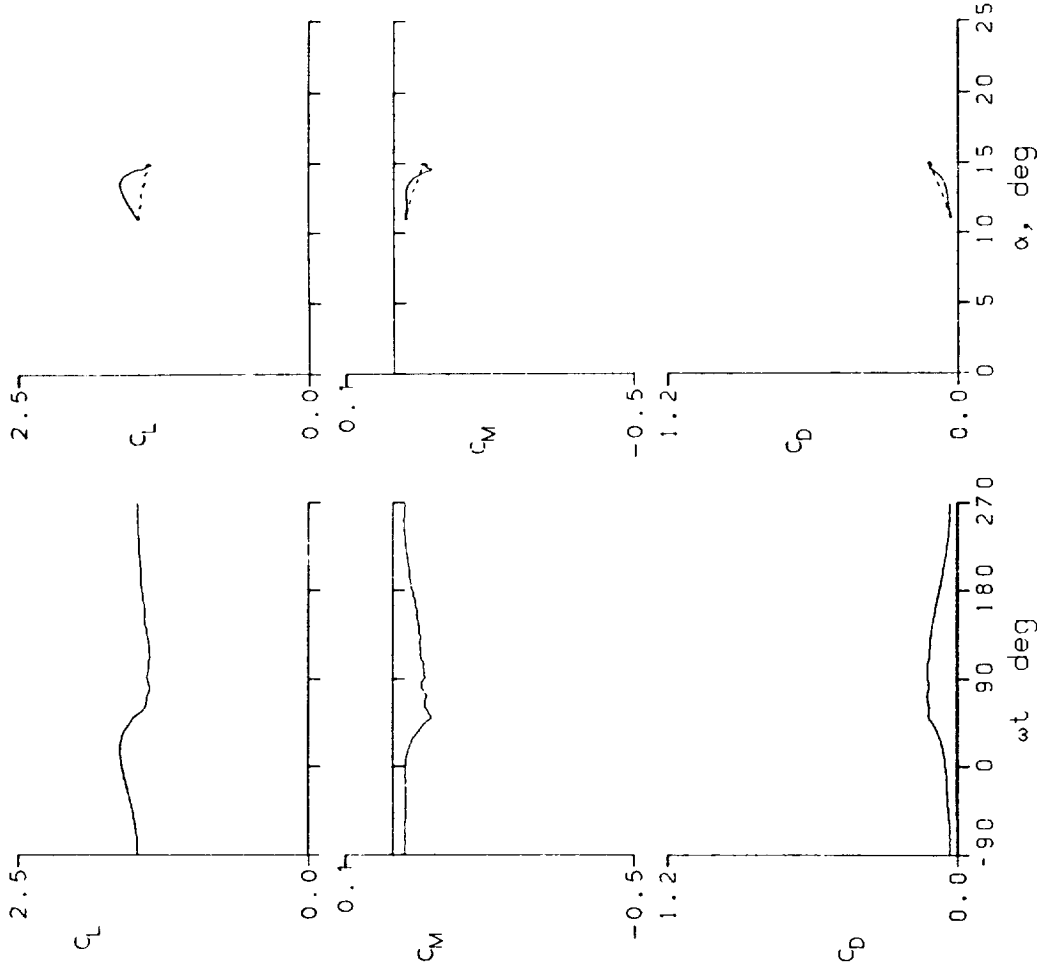


Figure 17.- Continued.

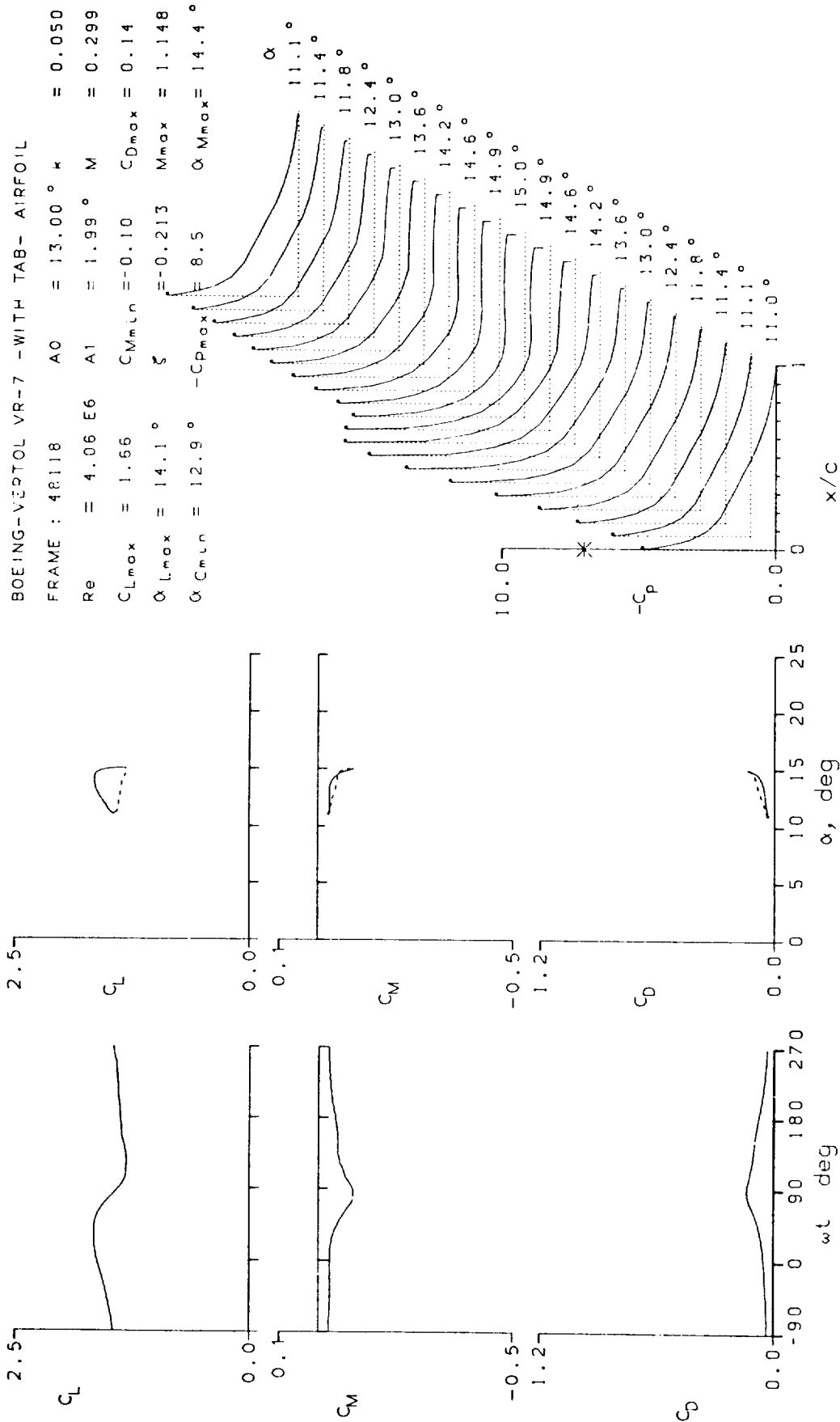


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 48122 A0 = 12.99 ° k = 0.101
 Re = 4.06 E6 A1 = 2.00 ° M = 0.299
 $C_{Lmax} = 1.73$ $C_{Mmin} = -0.10$ $C_{Dmax} = 0.14$
 $\alpha_{Lmax} = 14.5^\circ$ $\zeta = -0.339$ $M_{max} = 1.234$
 $\alpha_{Cmin} = 12.9^\circ$ $-C_{Pmax} = 9.3$ $\alpha_{Mmax} = 14.8^\circ$

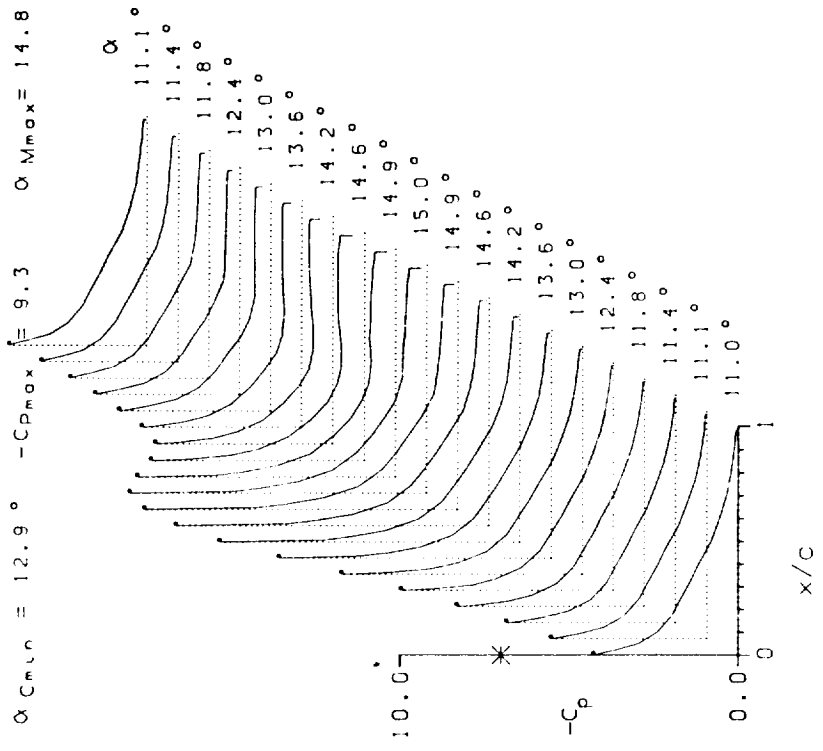
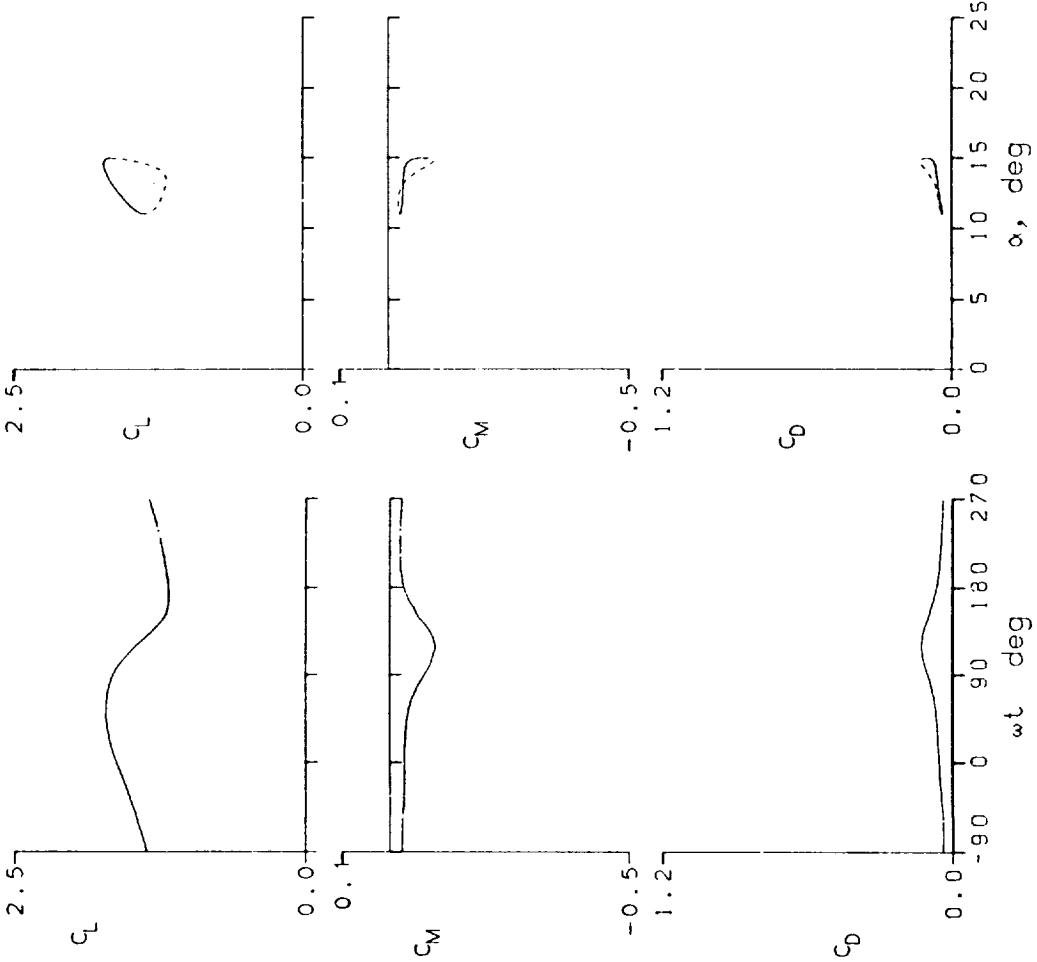


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 48209 A0 = 15.96° k = 0.203
 Re = 4.06 E6 A1 = 2.00° M = 0.298
 CLmax = 1.87 CMmin = -0.31 CDmax = 0.46
 αLmax = 17.9° ζ = 0.060 Mmax = 1.359
 αCmin = 15.8° -CPmax = 10.4 αMmax = 17.6°

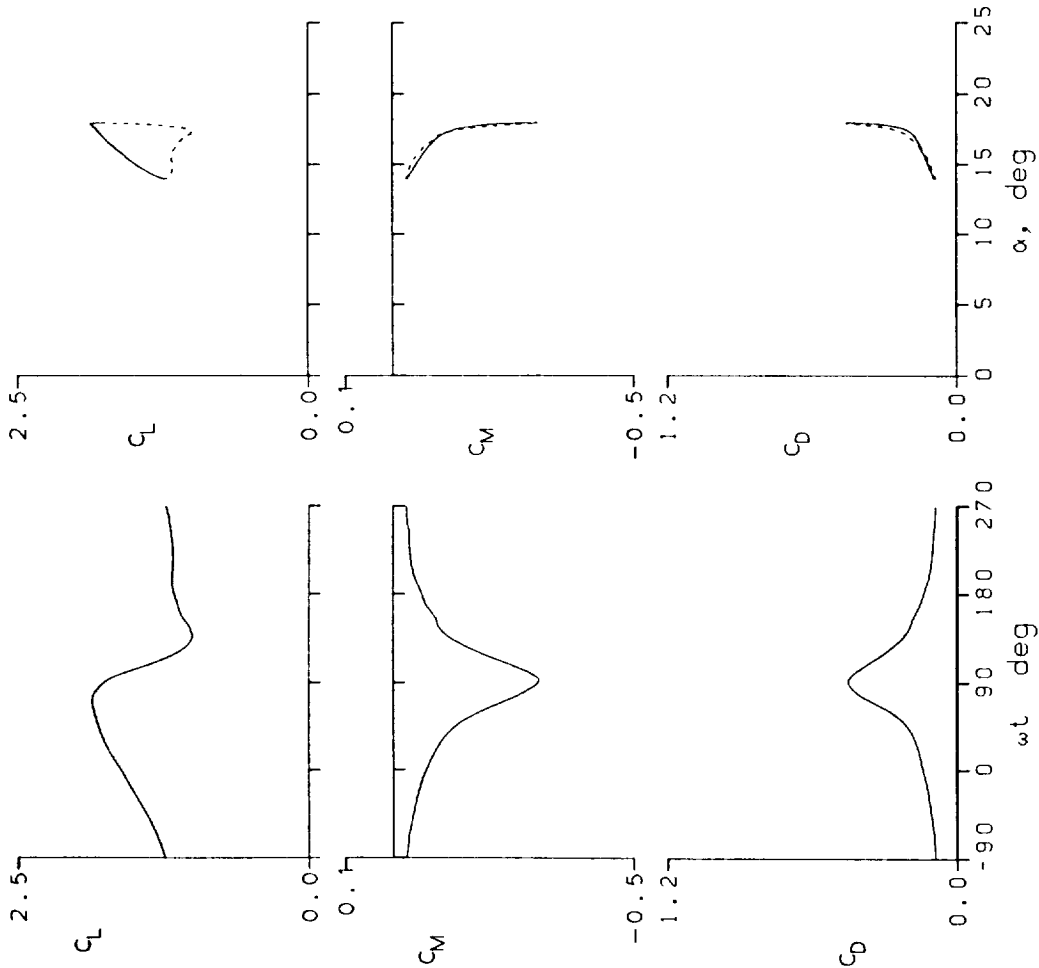


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 49215 $A_0 = 13.98^\circ$ $k = 0.050$
 $Re = 4.06 E6$ $A1 = 2.00^\circ$ $M = 0.300$
 $C_{Lmax} = 1.66$ $C_{Mmin} = -0.12$ $C_{Dmax} = 0.18$
 $\alpha_{Lmax} = 14.3^\circ$ $\xi = 0.154$ $M_{max} = 1.117$
 $\alpha_{Cmin} = 13.9^\circ$ $-C_{Pmax} = 8.2$ $\alpha_{Mmax} = 14.6^\circ$

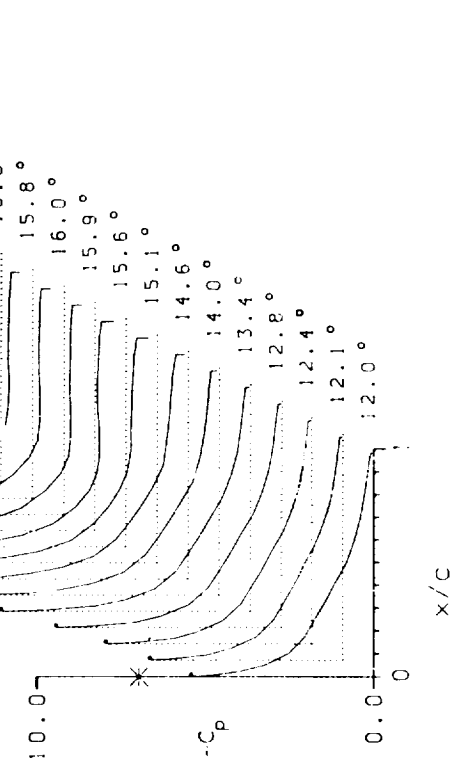
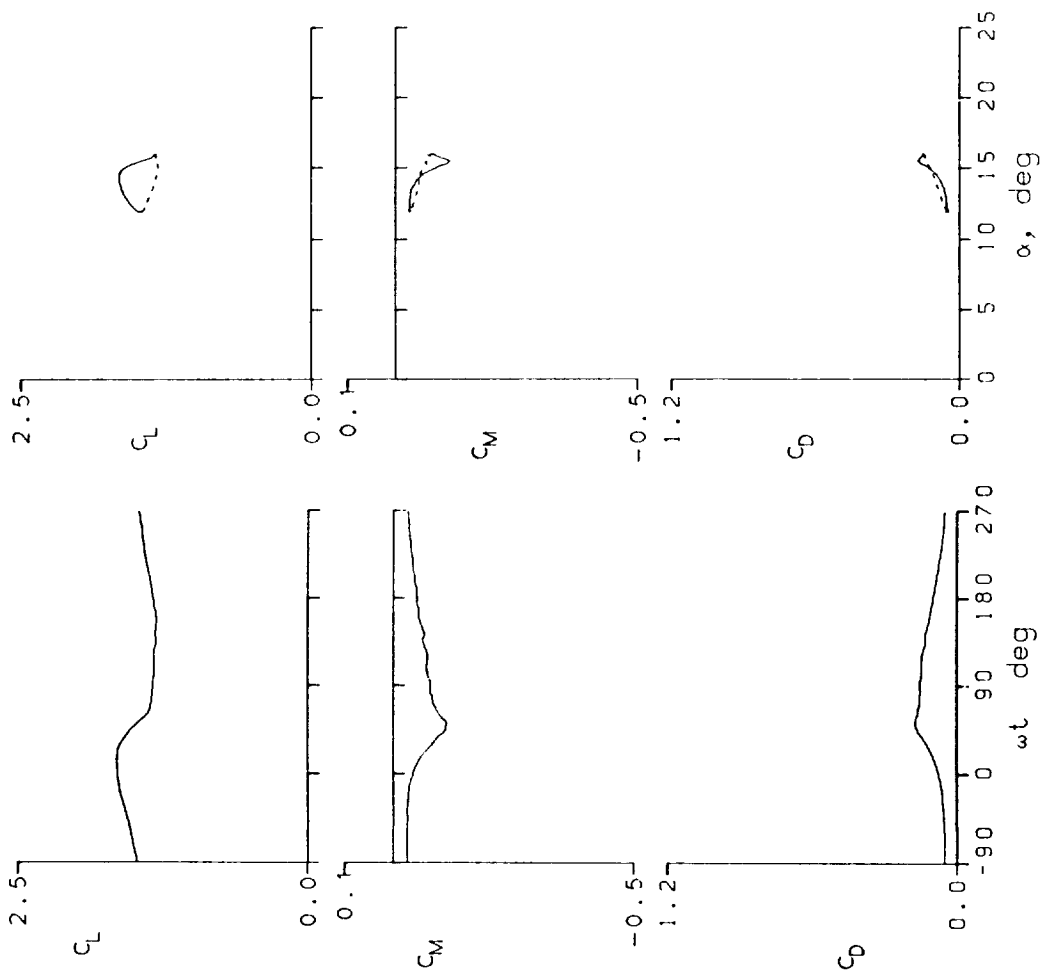


Figure 17.- Continued.

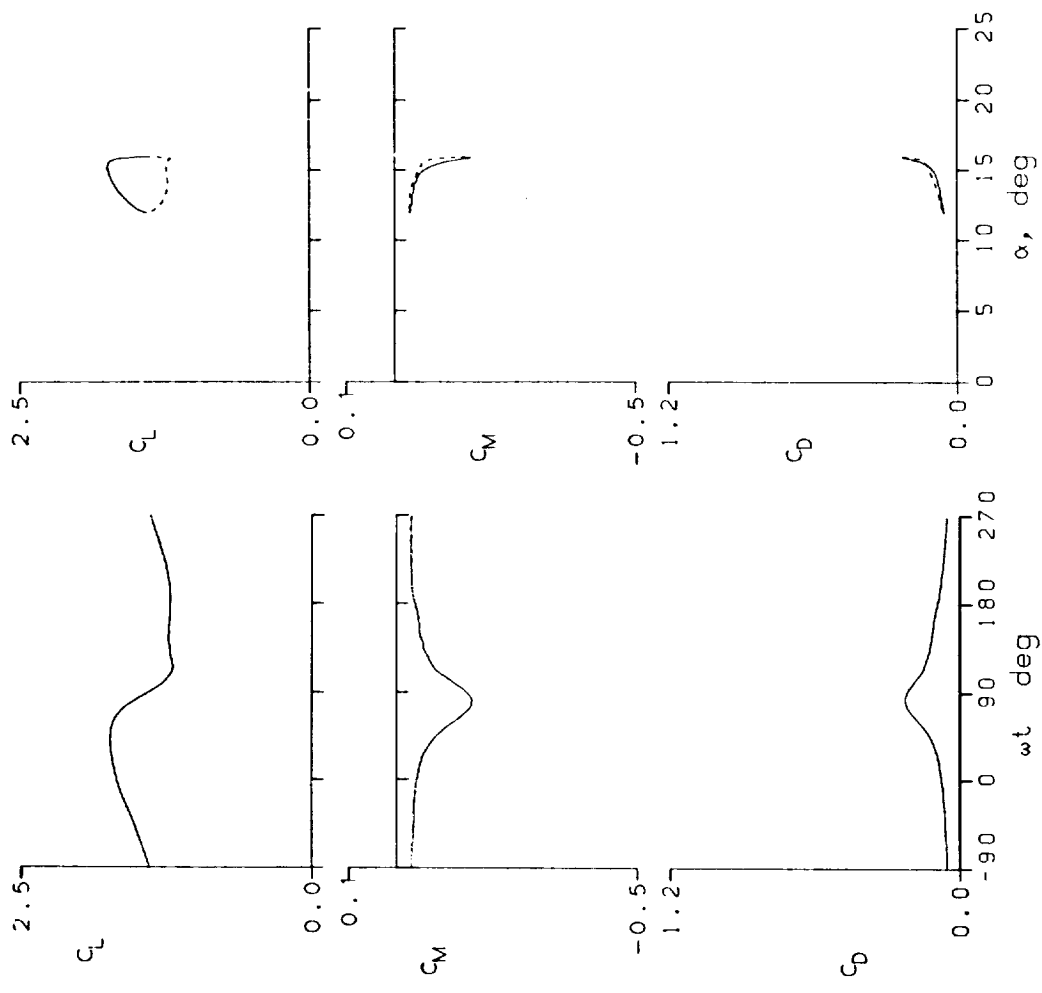
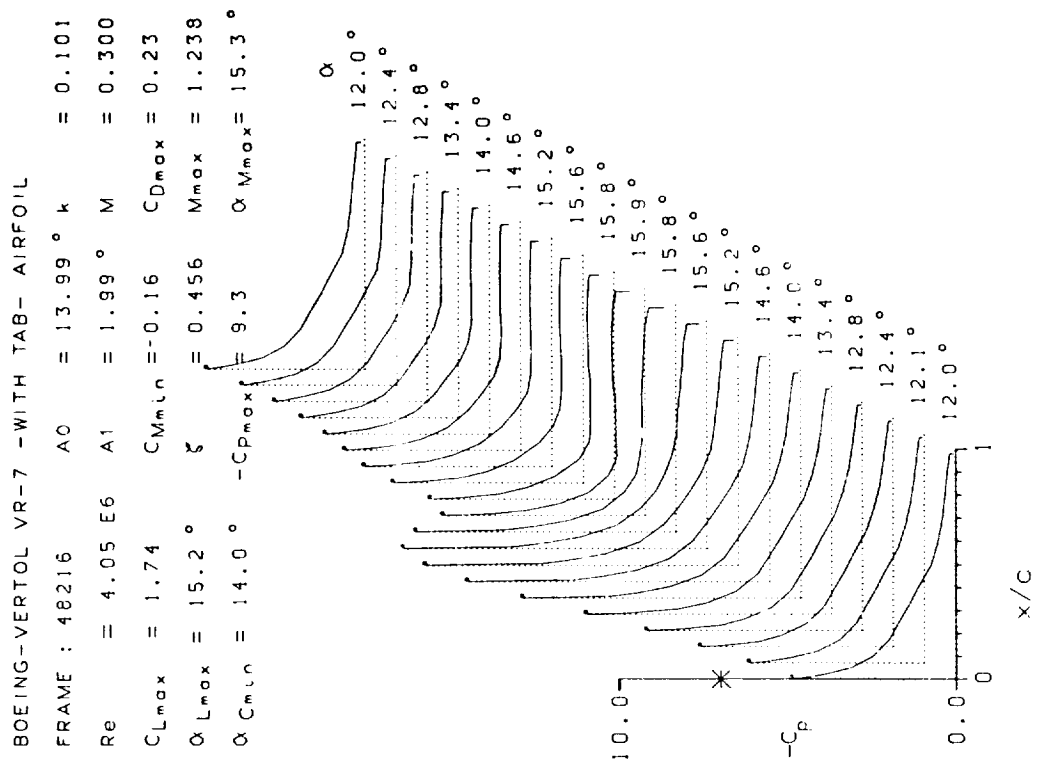


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAVE : 48217 A0 = 13.98 ° k = 0.201
 Re = 4.04 E6 A1 = 2.00 ° M = 0.300
 CLmax = 1.85 CMmin = -0.19 CDmax = 0.25
 α Lmax = 16.0 ° ζ = -1.992 Mmax = 1.374
 α Cmin = 13.9 ° -CPmax = 10.4 α Mmax = 16.0 °

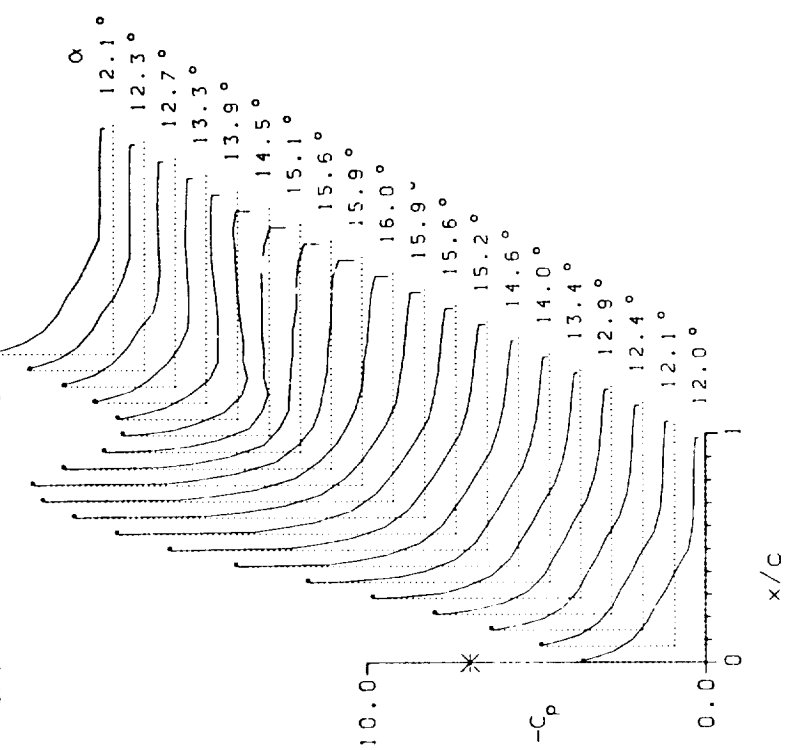
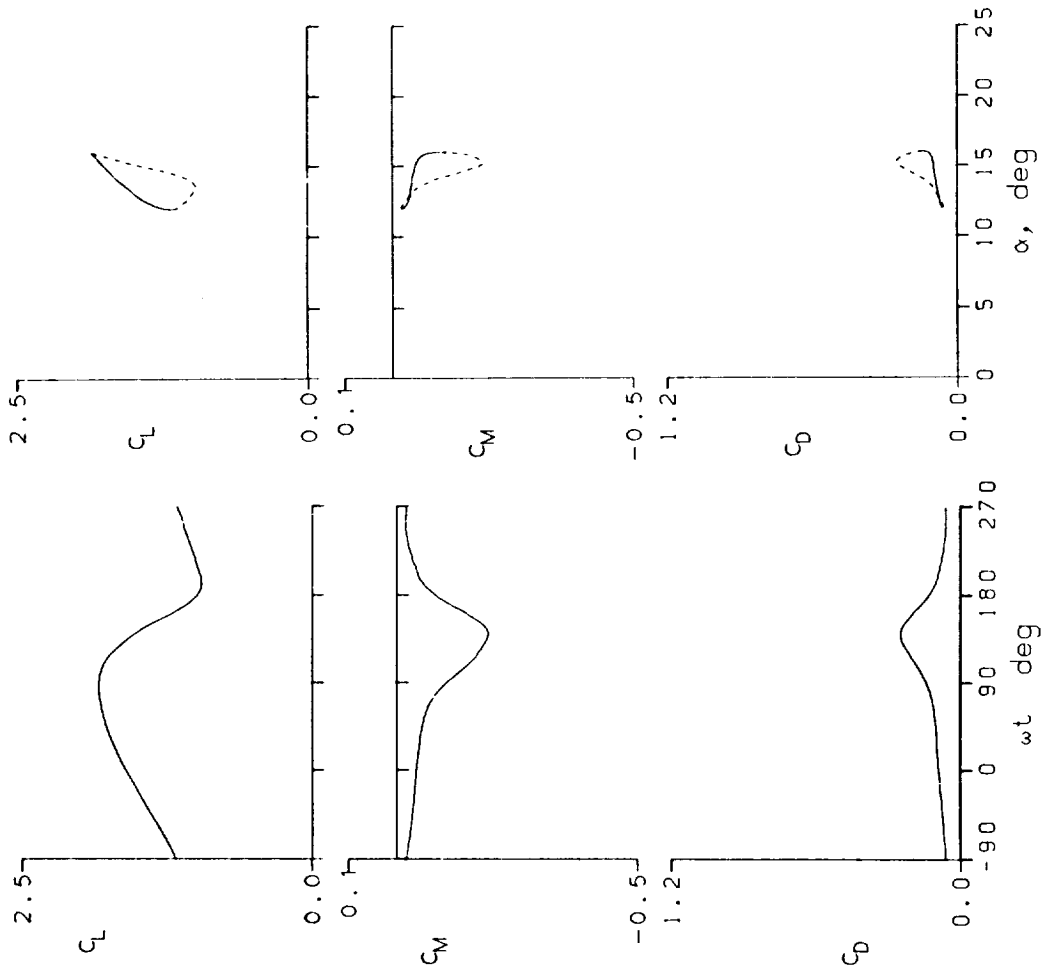


Figure 17.- Continued.

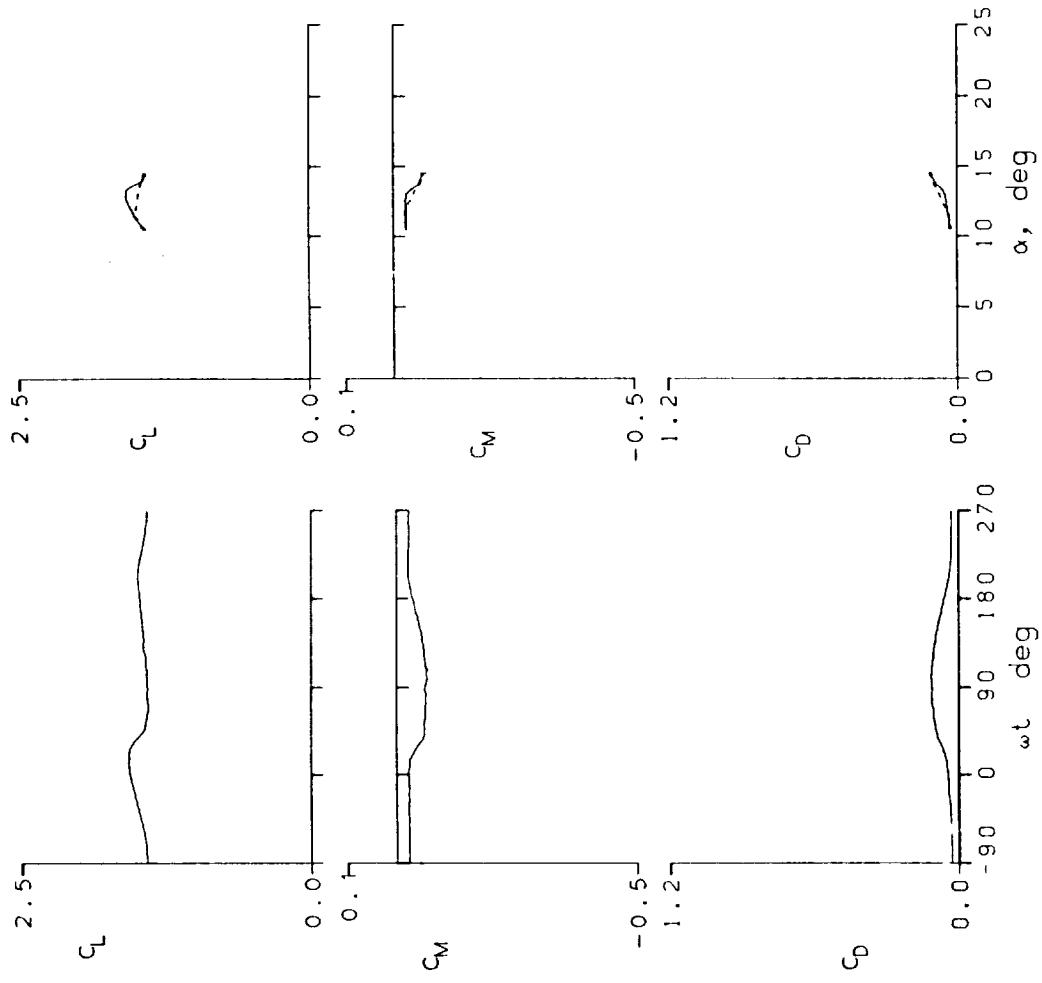
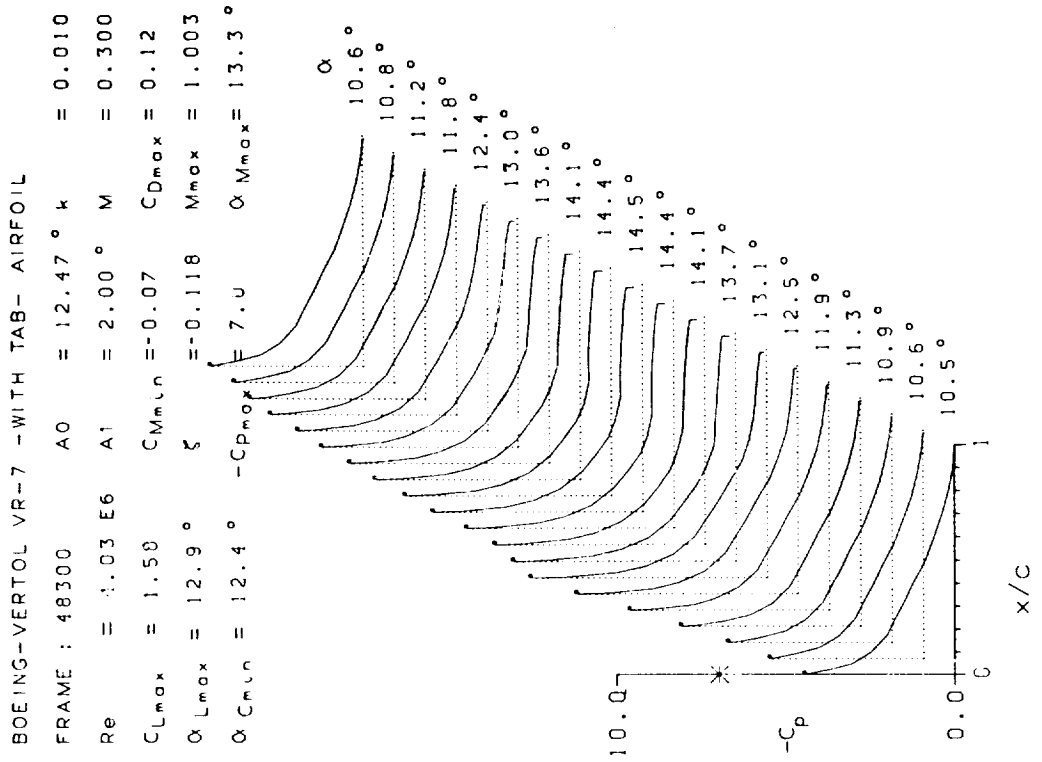


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 48301 A0 = 12.47 ° k = 0.025
 Re = 4.01 E6 A1 = 2.00 ° M = 0.300
 CLmax = 1.62 CMmin = -0.07 CDmax = 0.12
 α Lmax = 13.3 ° ζ = -0.155 Mmax = 1.055
 α Cmin = 12.4 ° -CPmax = 7.5 α Mmax = 13.8 °

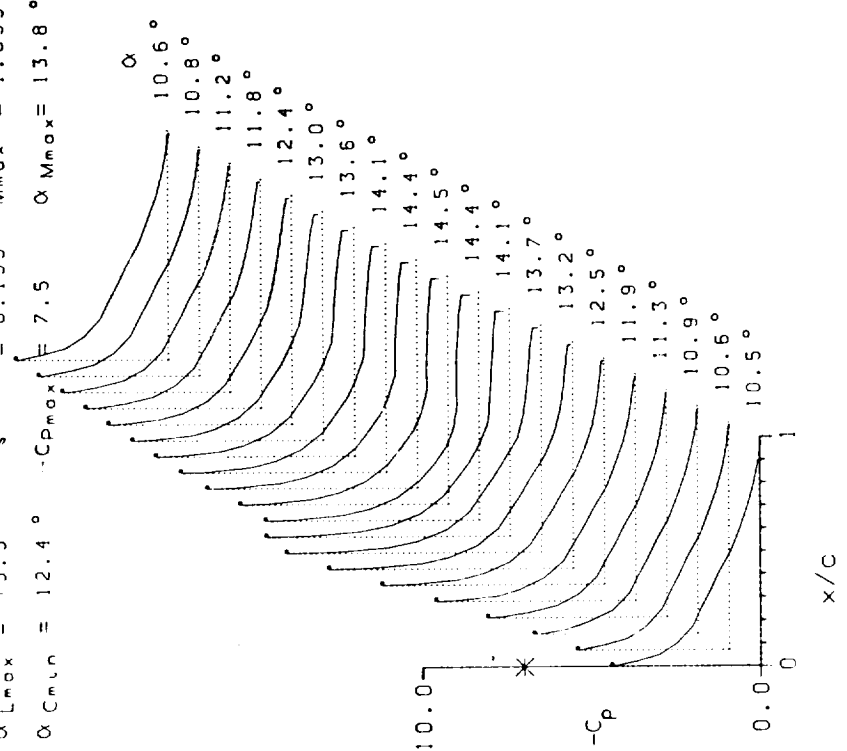
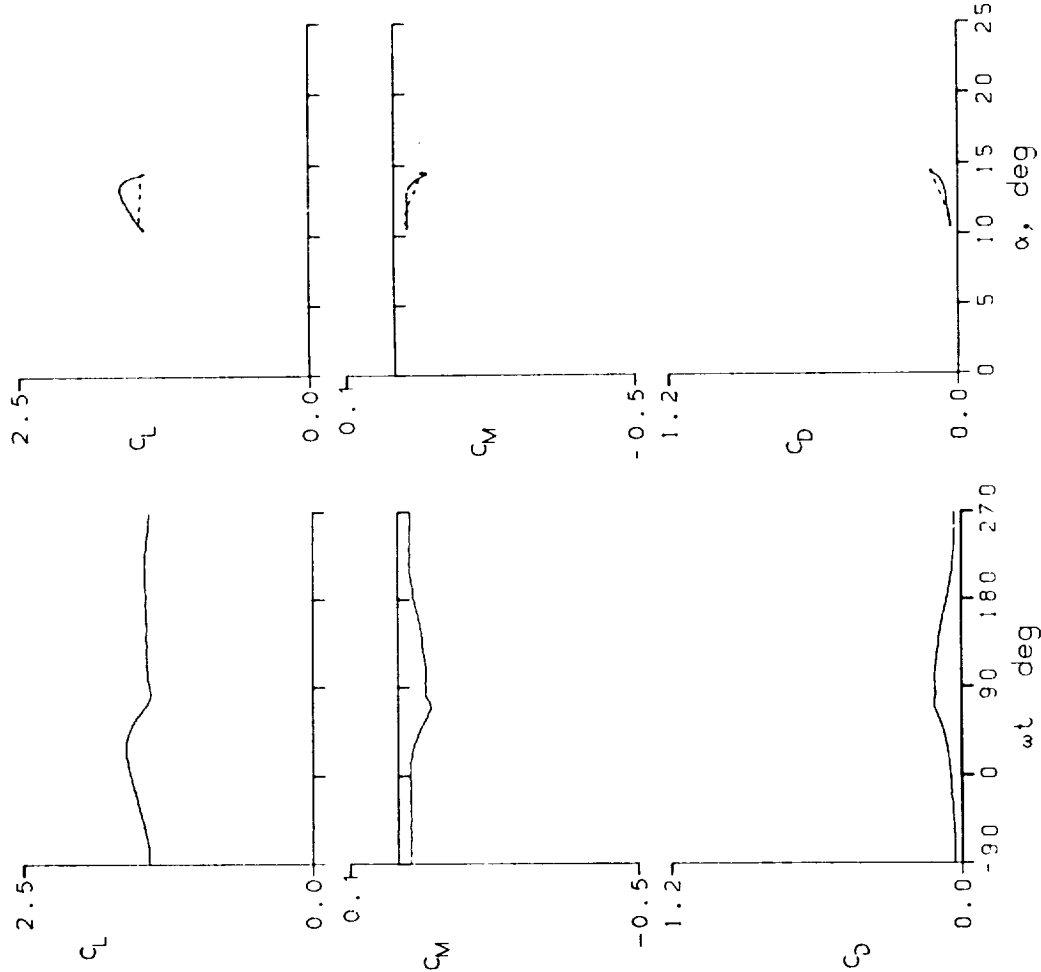
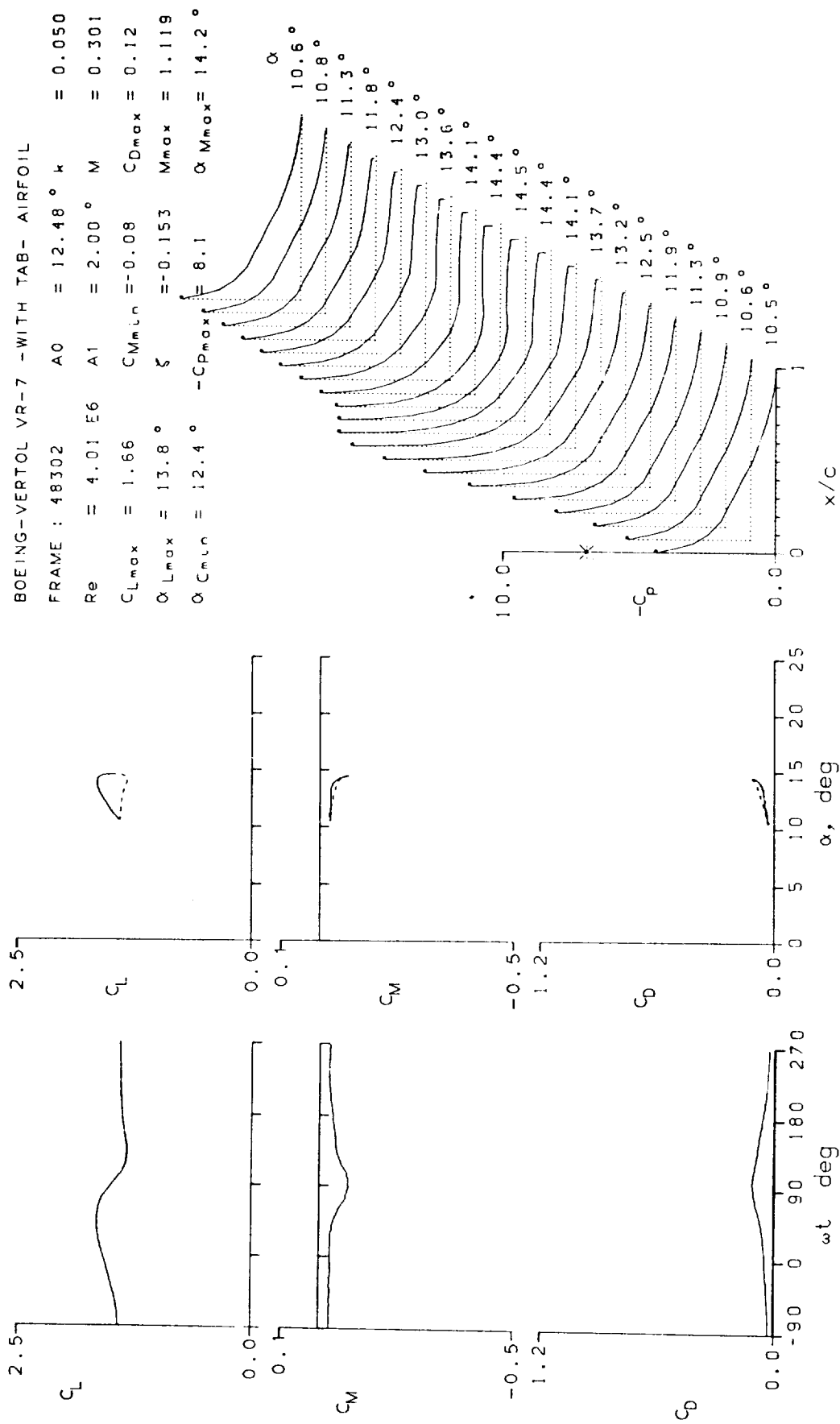


Figure 17.- Continued.



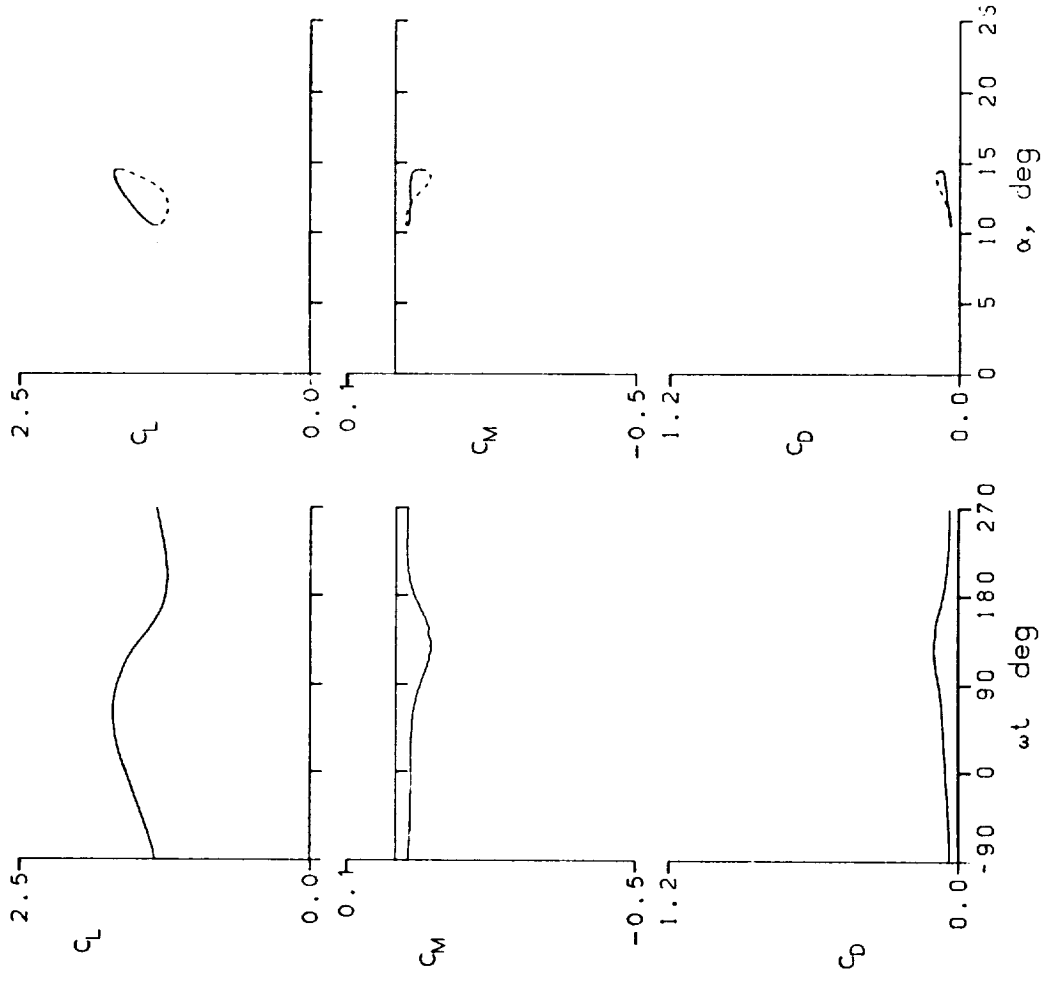
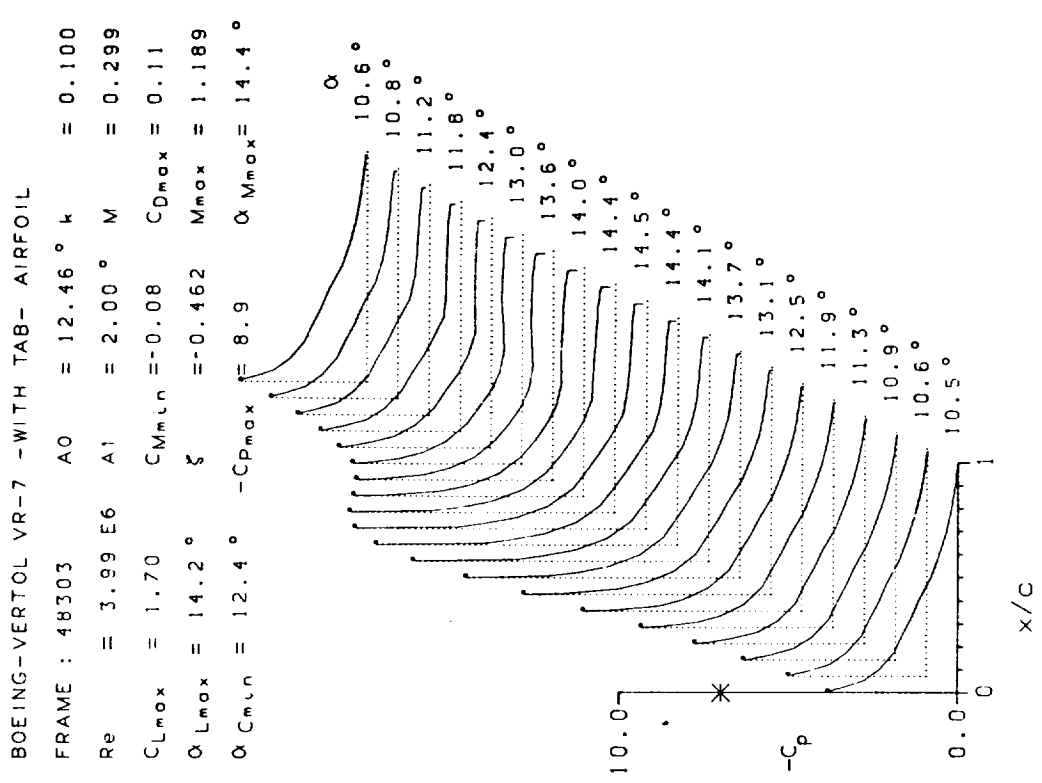


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 48304 A0 = 12.47 ° k = 0.151
 Re = 3.98 E6 A1 = 2.00 ° M = 0.299
 CLmax = 1.73 CMmin = -0.06 CDmax = 0.08
 α Lmax = 14.4 ° ζ = -0.217 Mmax = 1.231
 α Cmin = 12.4 ° -CPmax = 9.3 α Mmax = 14.5 °

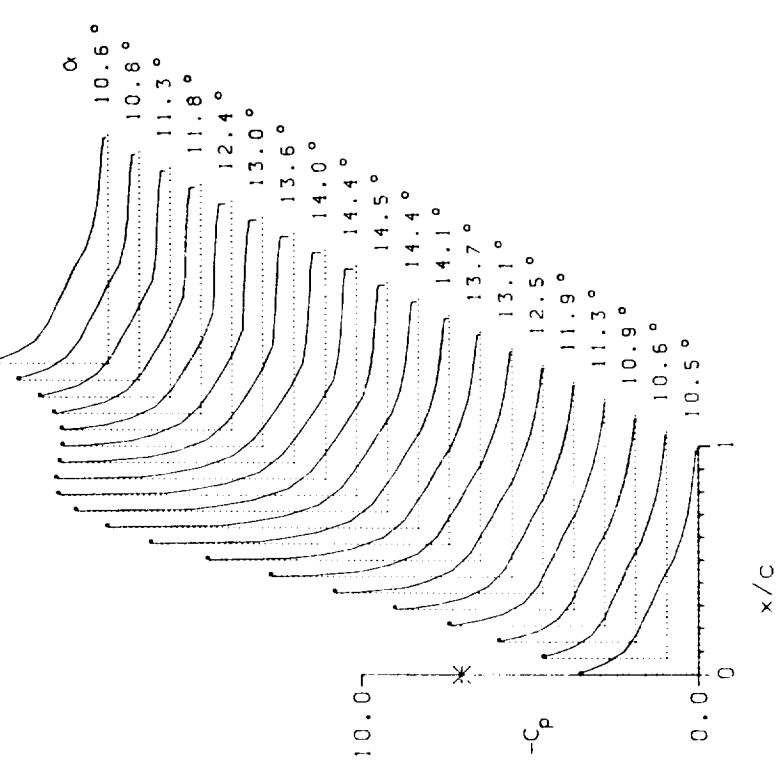
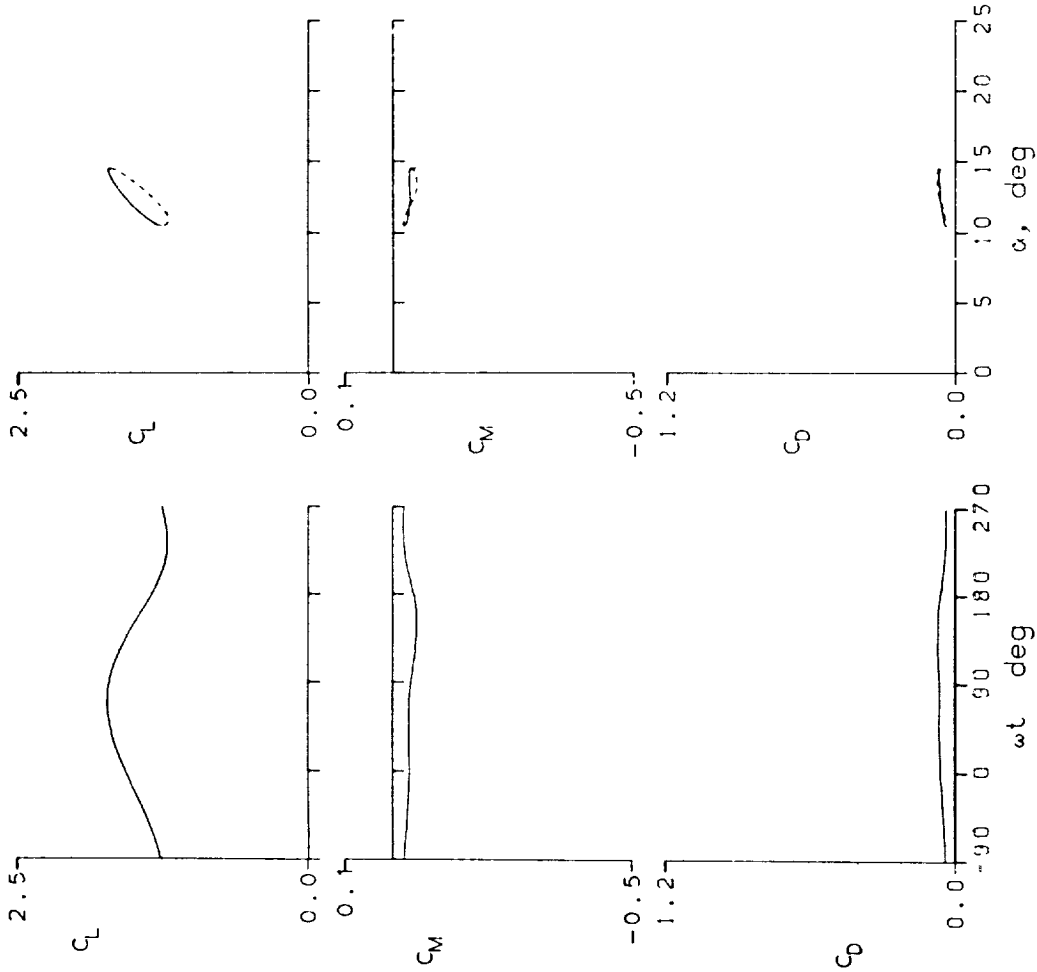


Figure 17.- Continued.

BOEING-VERTOL VR-7 - WITH TAB- AIRFOIL
 FRAME : 48308 A0 = 12.48° k = 0.201
 Re = 4.00 E6 A1 = 2.00° M = 0.300
 CLmax = 1.76 CMmin = -0.05 CDmax = 0.08
 α Lmax = 14.4° ξ = 0.074 Mmax = 1.265
 α Cmin = 12.4° -CPmax = 9.5 α Mmax = 14.5°

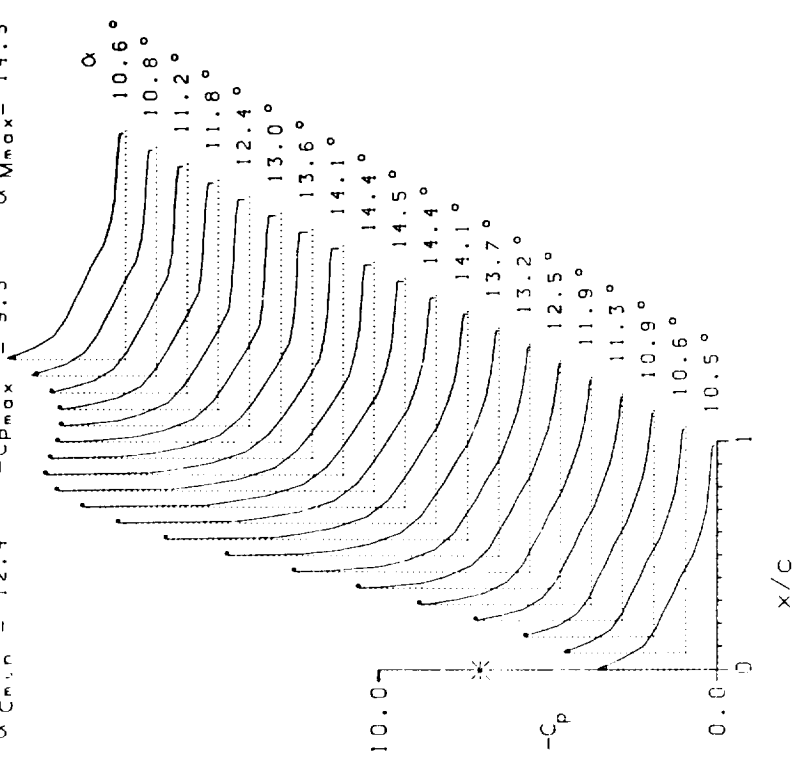
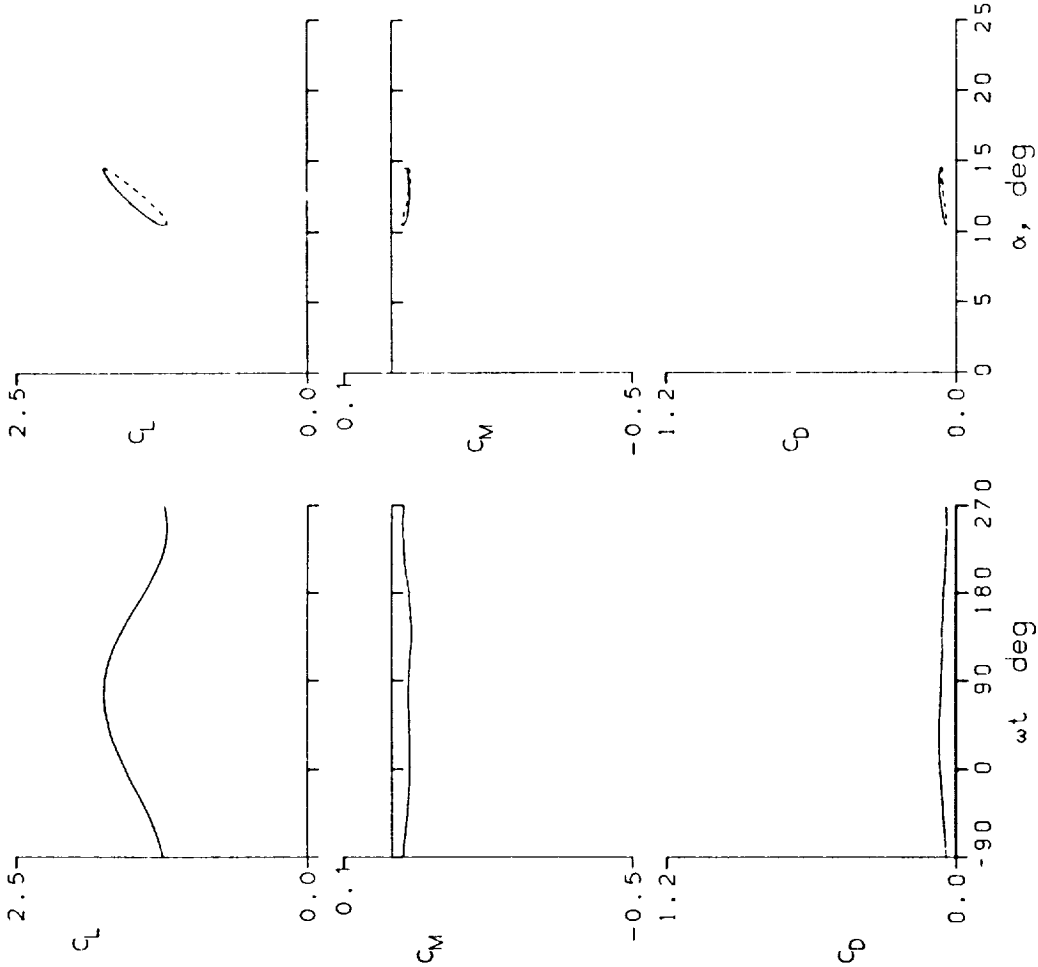


Figure 17.- Continued.

BOEING-VERFOIL VR-7 -WITH TAB- AIRFOIL
 FRAME : 49023 A0 = 14.77 ° k = 0.010
 Re = 2.54 E6 A1 = 9.90 ° M = 0.184
 CLmax = 1.58 CMmin = -0.12 CDmax = 0.36
 αLmax = 13.9 ° ζ = 0.084 Mmax = 0.609
 αCMln = 14.2 ° -CPmax = 8.6 αMmax = 14.9 °

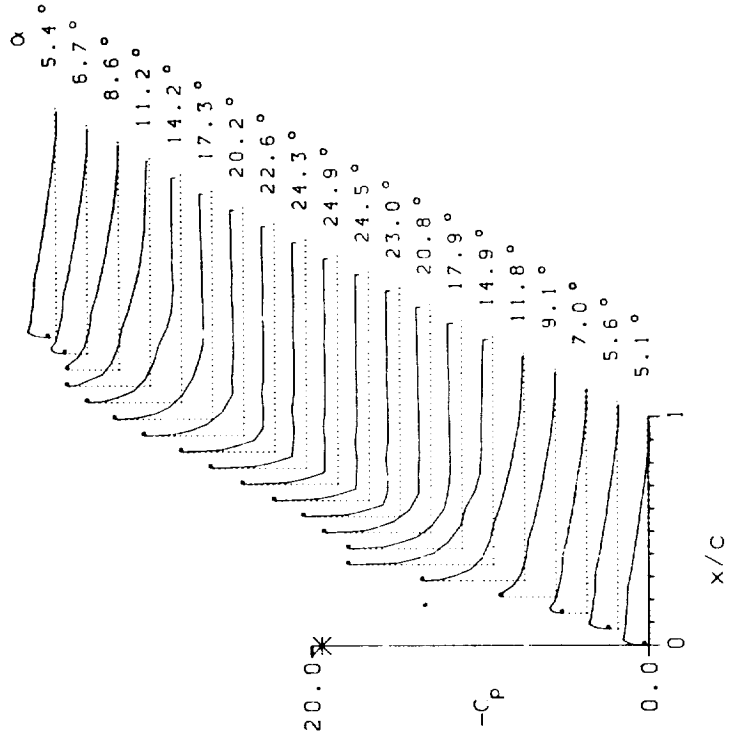
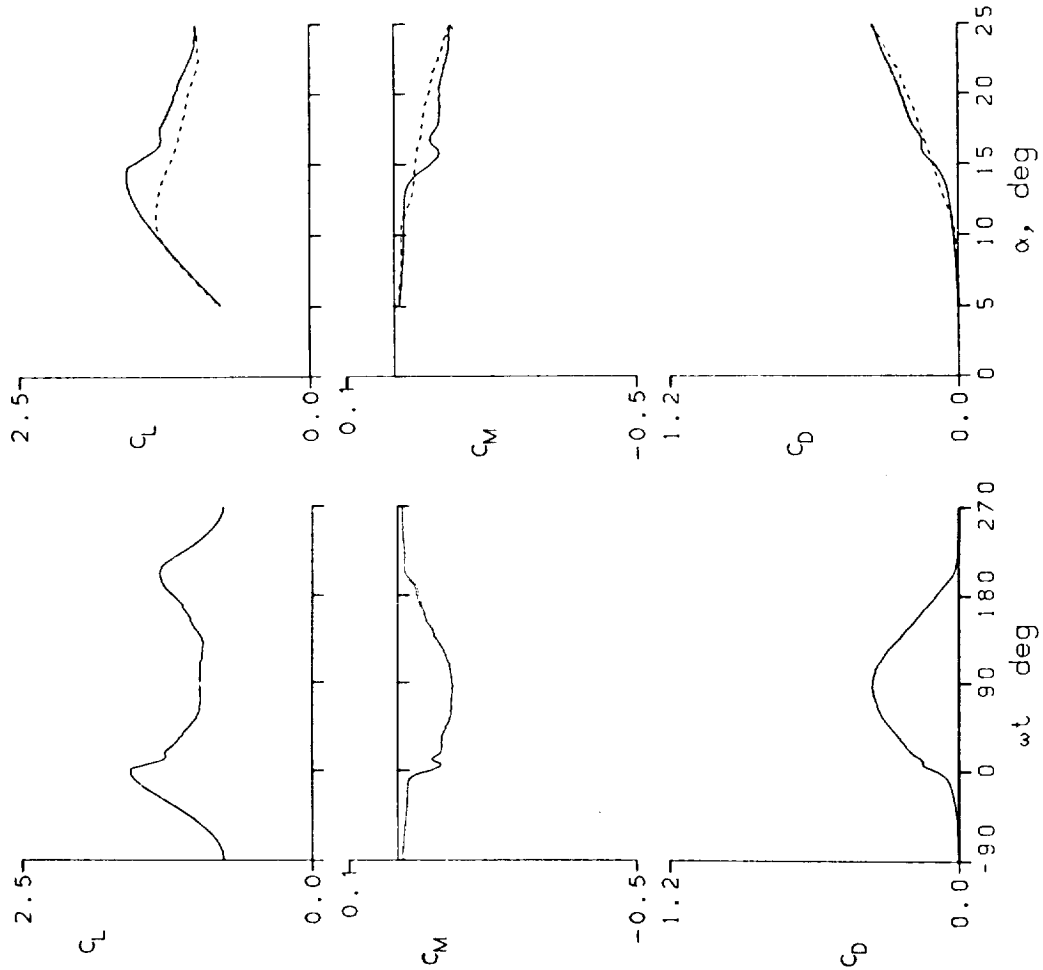


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 49110 A0 = 14.77 ° k = 0.026
 Re = 2.63 E6 A1 = 9.90 ° M = 0.184
 C_{Lmax} = 1.76 C_{Mmin} = -0.22 C_{Dmax} = 0.38
 α_{Lmax} = 16.1 ° ζ = 0.270 M_{max} = 0.681

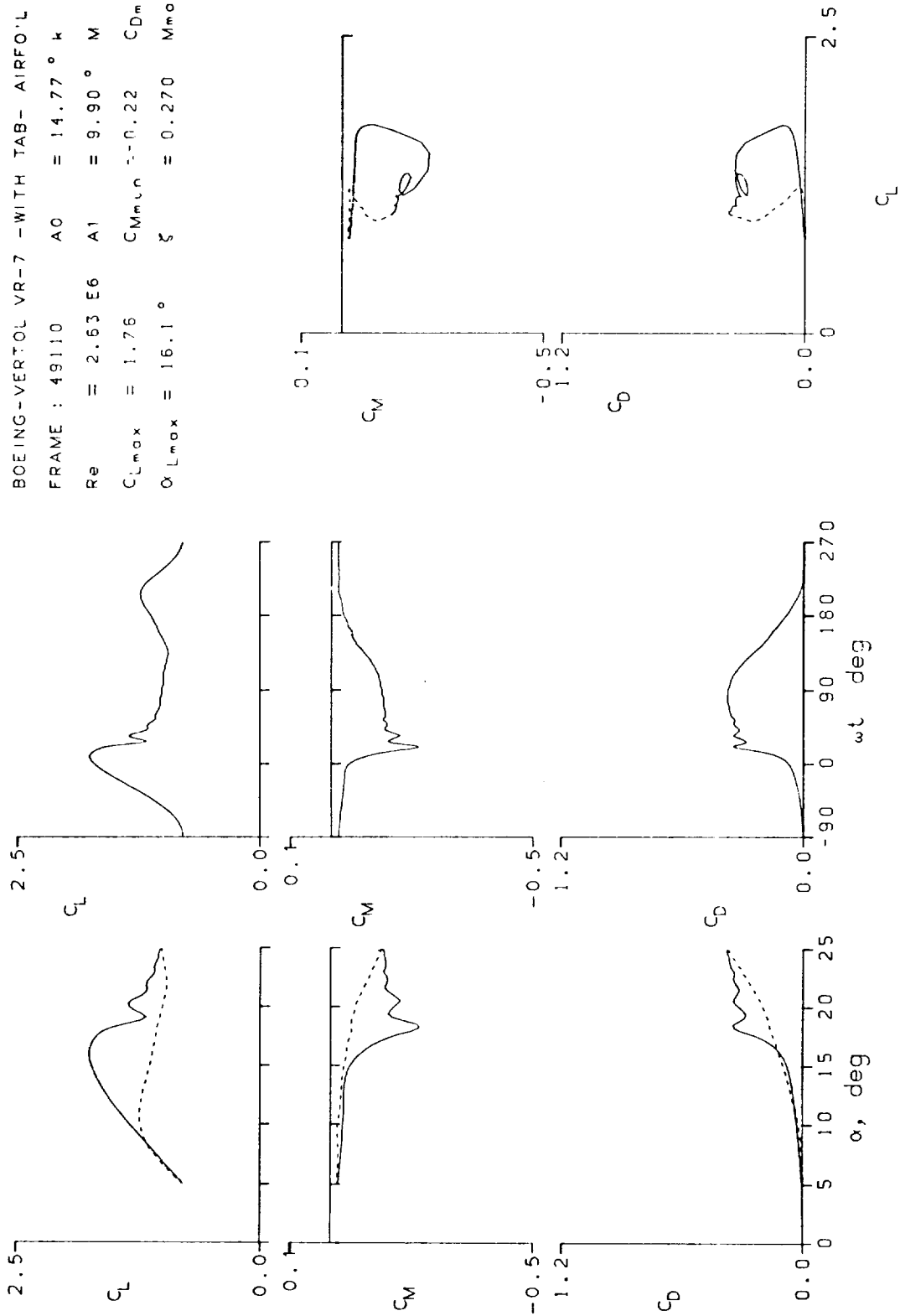


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 49117 A0 = 14.78 ° k = 0.051
 Re = 2.62 E6 A1 = 9.90 ° M = 0.185
 C_{Lmax} = 1.95 C_{Mmin} = -0.33 C_{Dmax} = 0.68
 α_{Lmax} = 17.9 ° ζ = 0.387 M_{max} = 0.792

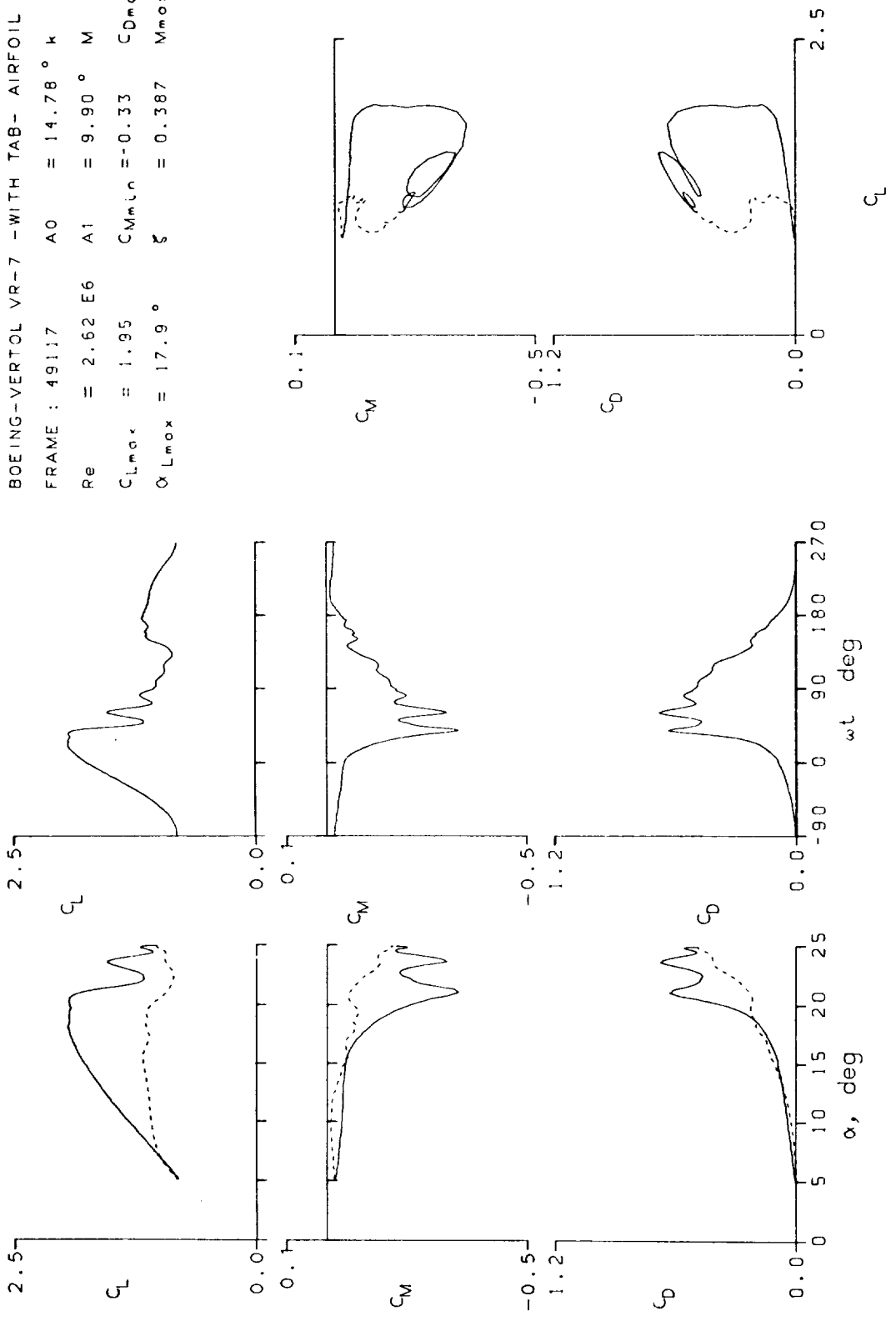


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 49120 A0 = 14.78 ° k = 0.101
 Re = 2.60 E6 A1 = 9.90 ° M = 0.185
 C_{Lmax} = 2.34 C_{Mmin} = -0.42 C_{Dmax} = 0.97
 α_{Lmax} = 23.0 ° ζ = 0.338 M_{max} = 0.959
 α_{Cmin} = 14.3 ° $-C_{Pmax}$ = 18.1 α_{Mmax} = 21.6 °

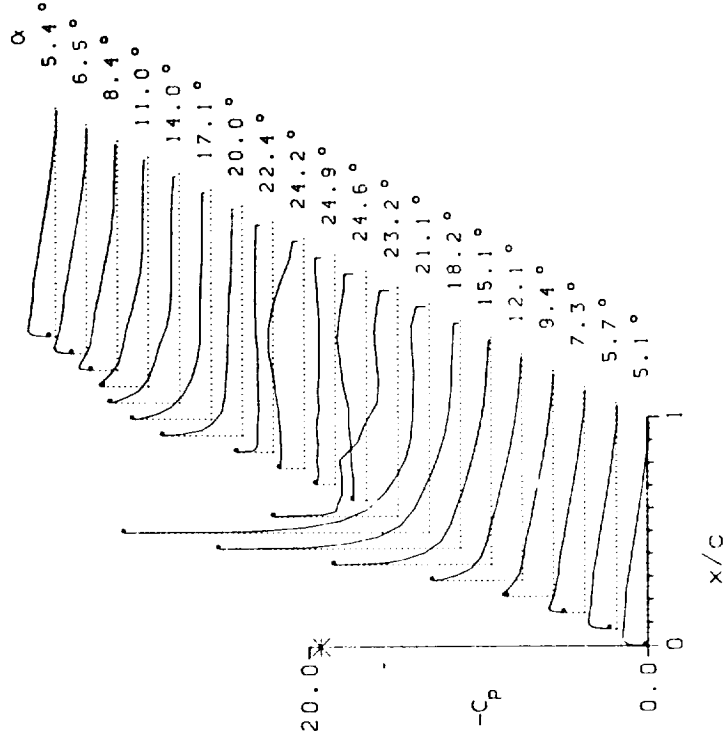
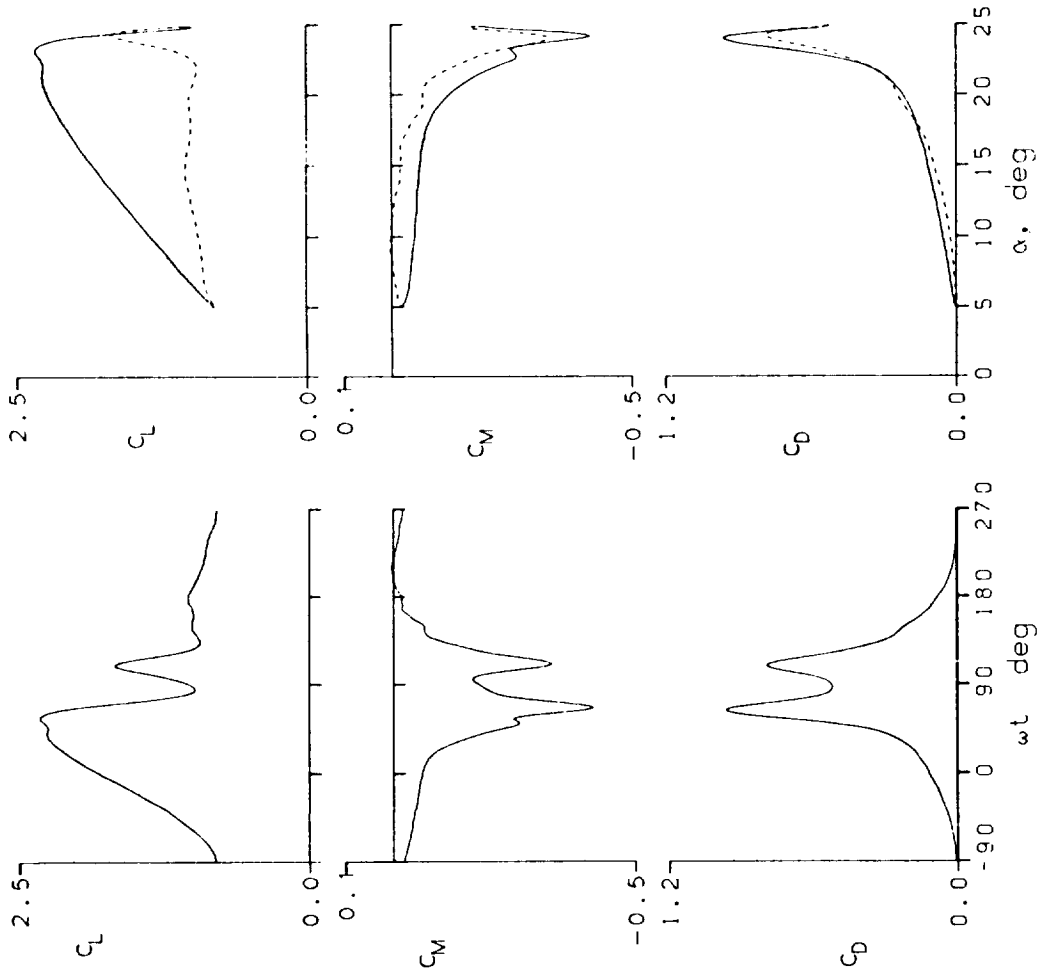


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 49203	A0 = 14.77 °	k = 0.152
Re = 2.59 E6	A1 = 9.90 °	M = 0.185
CLmax = 2.68	CMmin = -0.46	CDmax = 1.10
αLmax = 24.1 °	ξ = 0.215	Mmax = 1.066
αCMmin = 14.3 °	-CPmax = 20.9	αMmax = 23.2 °

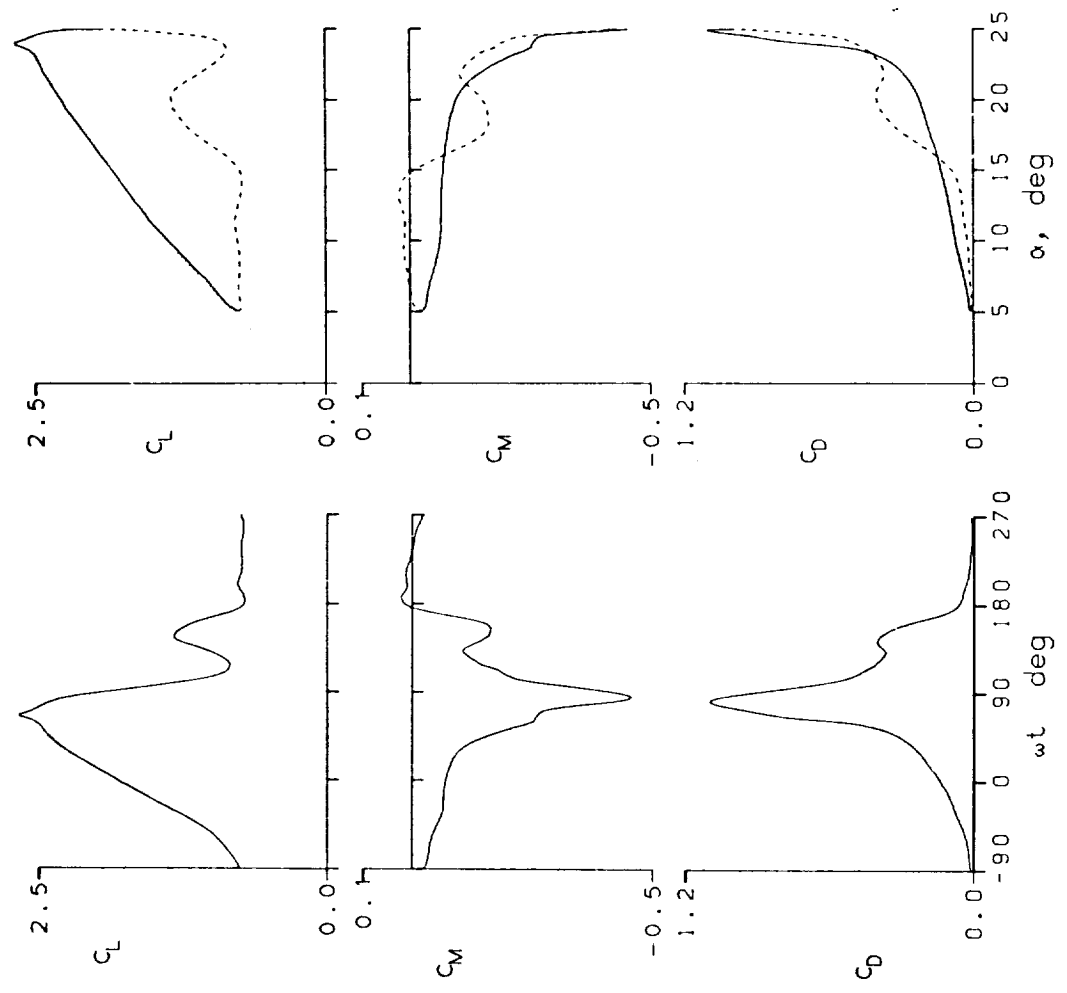


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 4920E A0 = 14.77 ° k = 0.202
 Re = 2.58 E6 A1 = 9.90 ° M = 0.185
 CLmax = 2.90 CMmin = -0.44 CDmax = 1.10
 α Lmax = 24.3 ° ζ = 0.294 Mmax = 1.130
 α Cmin = 14.4 ° -CPmax = 22.5 α Mmax = 23.8 °

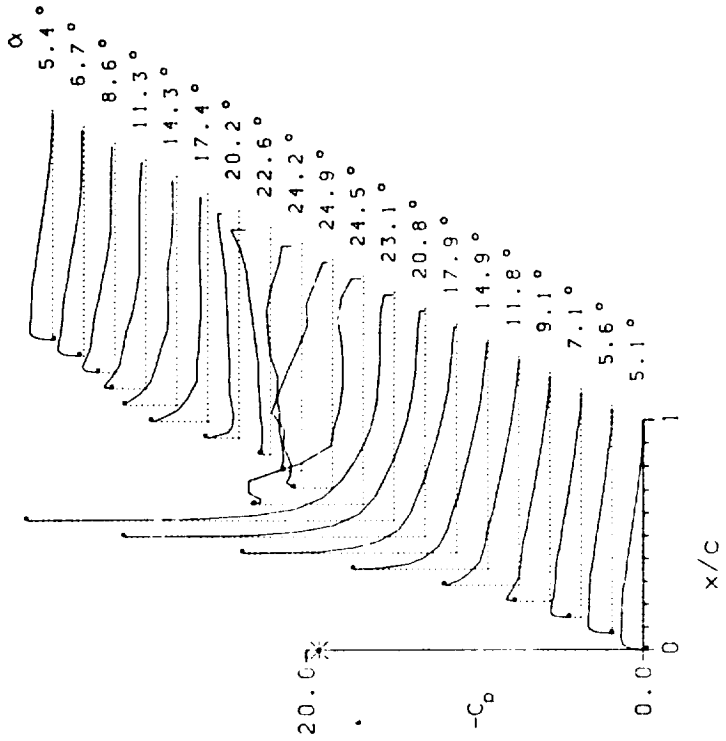
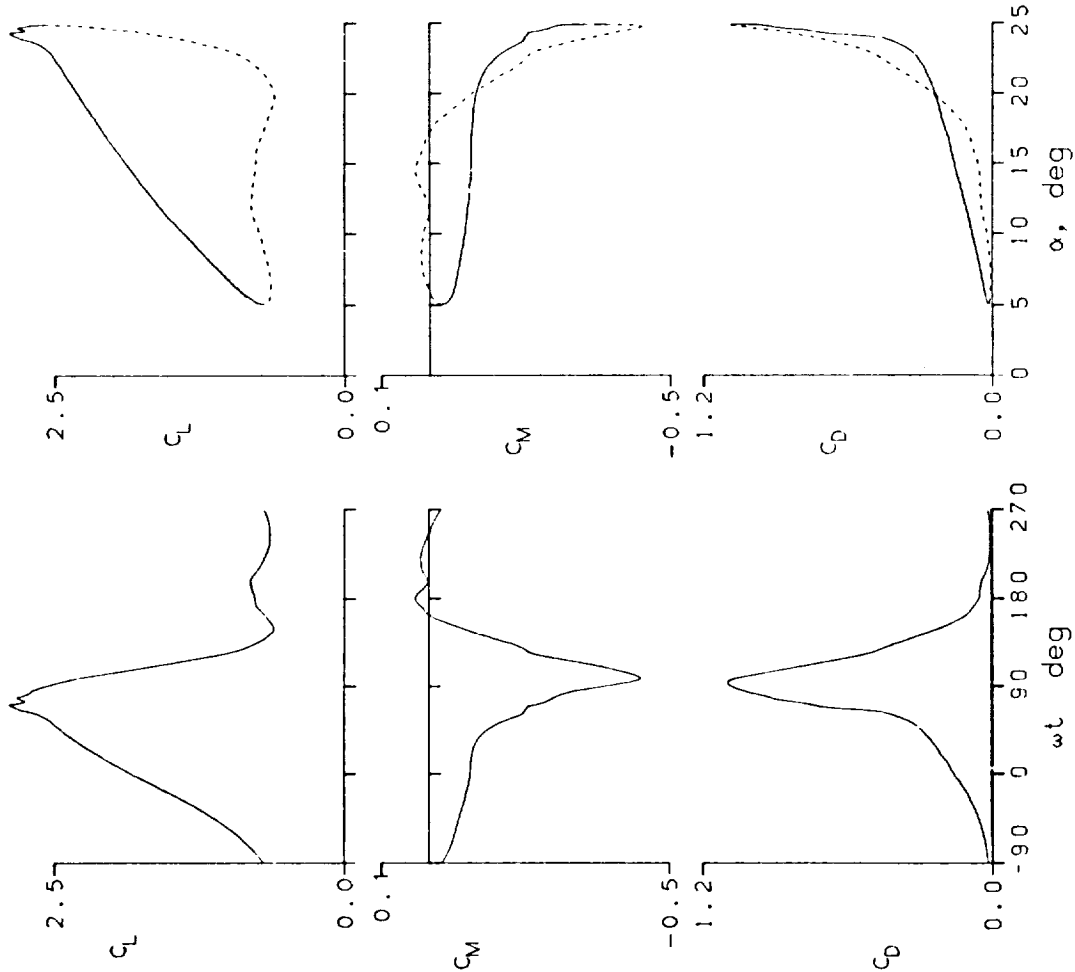


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 49216 A0 = 4.55° k = 0.025
 Re = 2.56 E6 A1 = 10.05° M = 0.184
 CLmax = 1.62 CMmin = -0.09 CDmax = 0.11
 αLmax = 13.9° ζ = 0.058 Mmax = 0.600
 αCmin = 4.1° -CPmax = 8.3 αMmax = 14.3°

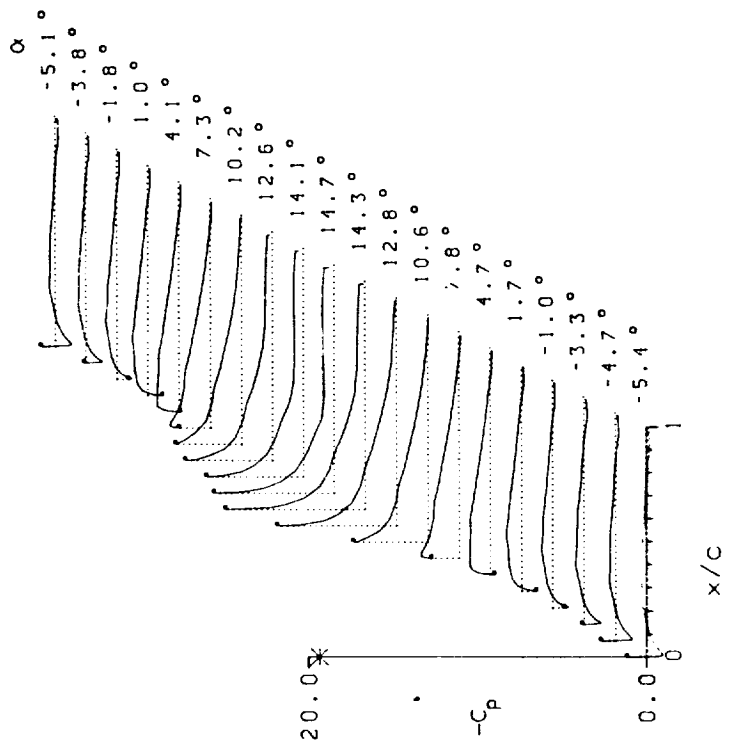
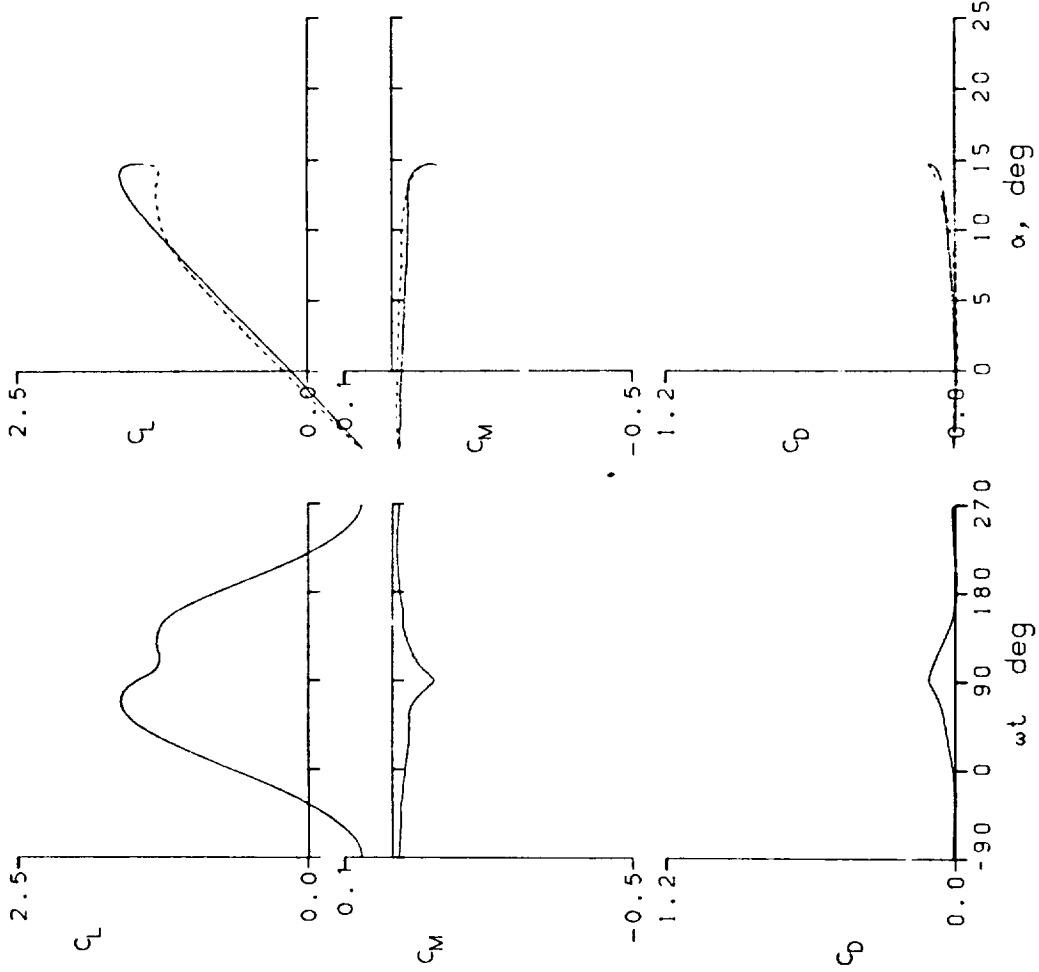


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 49300 A0 = 4.54° k = 0.101
 Re = 2.54 E6 A1 = 10.05° M = 0.184
 $C_{Lmax} = 1.72$ $C_{Mmin} = -0.05$ $C_{Dmax} = 0.09$
 $\alpha_{Lmax} = 14.7^\circ$ $\zeta = 0.260$ $M_{max} = 0.638$
 $\alpha_{Cmin} = 4.1^\circ$ $-C_{Pmax} = 9.3$ $\alpha_{Mmax} = 14.7^\circ$

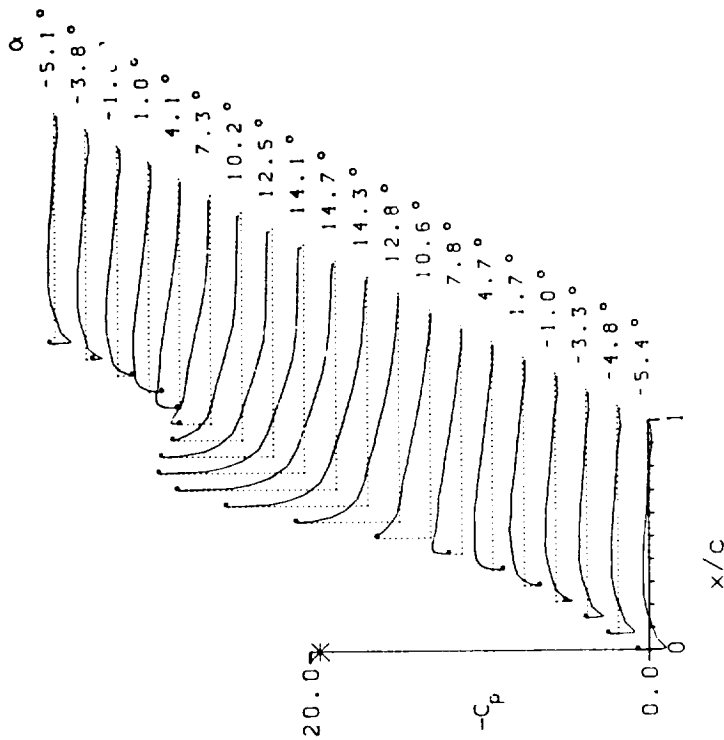
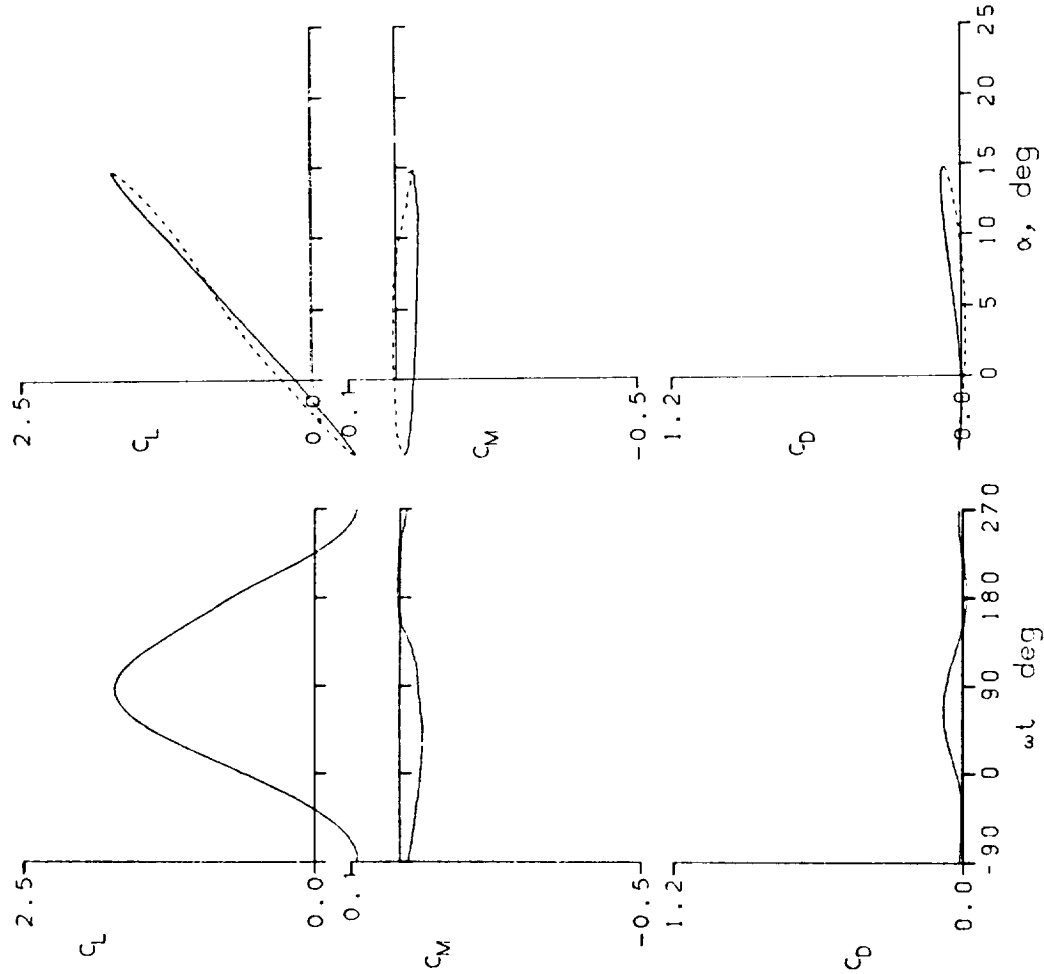


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 49307 A0 = 4.53° k = 0.201
 Re = 2.55 E6 A1 = 10.05° M = 0.185
 CLmax = 1.71 CMmin = -0.07 CDmax = 0.11
 αLmax = 14.7° ζ = 0.578 Mmax = 0.640
 αCmin = 4.1° -CPmax = 9.3 αMmax = 14.6°

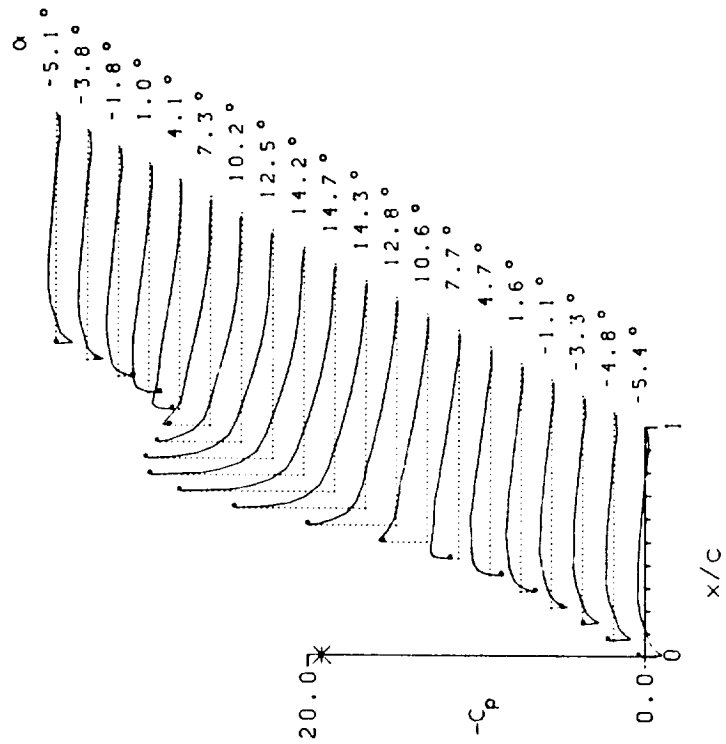
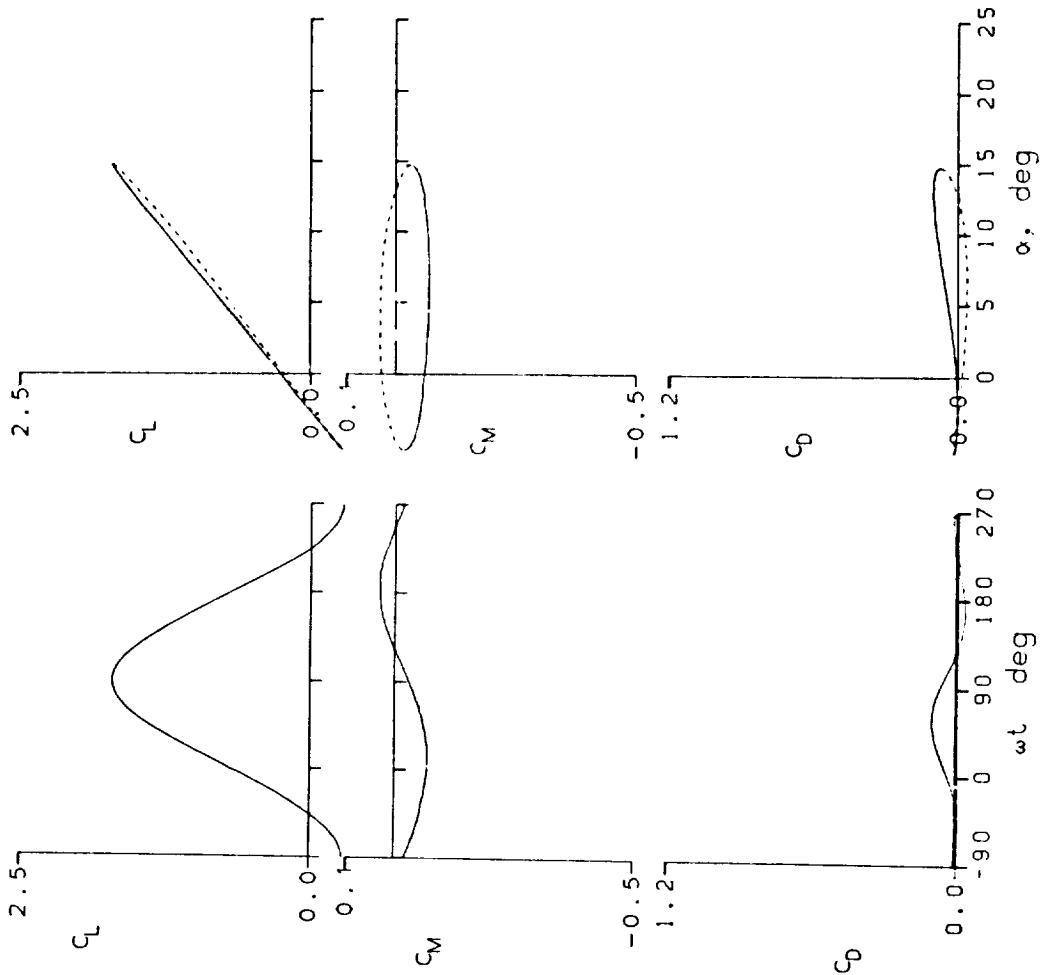


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 49310 A0 = 4.54 ° k = 0.250

Re = 2.54 E6 A1 = 10.05 ° M = 0.185

C_{Lmax} = 1.72 C_{Mmin} = -0.09 C_{Dmax} = 0.12

α_{Lmax} = 14.7 ° ξ = 0.754 M_{max} = 0.643

α_{Cmin} = 4.3 ° $-C_{Pmax}$ = 9.4 α_{Mmax} = 14.3 °

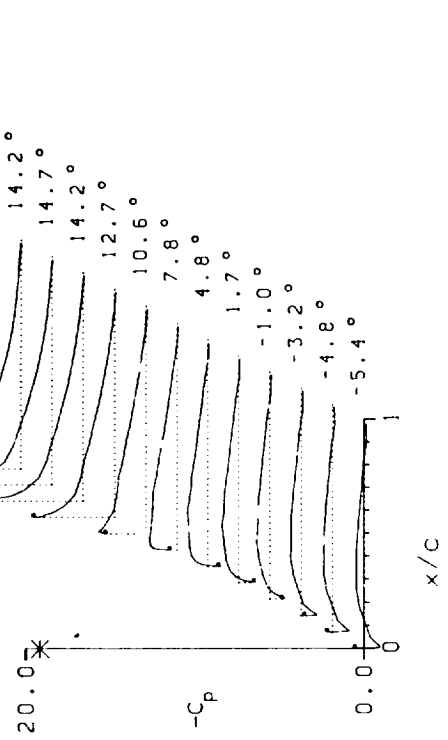
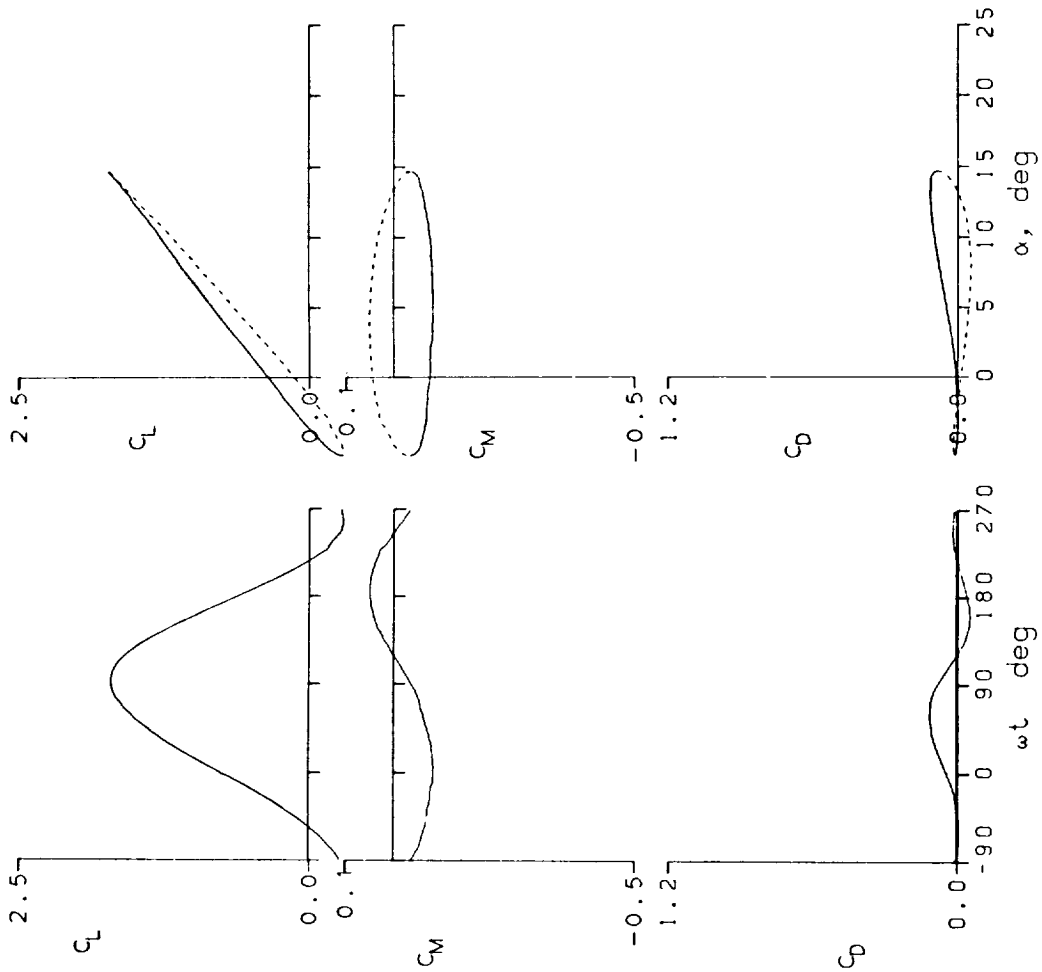


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 50116 A0 = 4.55° k = 0.010
 Re = 2.53 E6 A1 = 10.05° M = 0.183
 CLmax = 1.56 CMmin = -0.07 CDmax = 0.11
 αLmax = 13.4° ζ = 0.023 Mmax = 0.560
 αCmin = 4.1° -CPmax = 7.4 αMmax = 13.7°

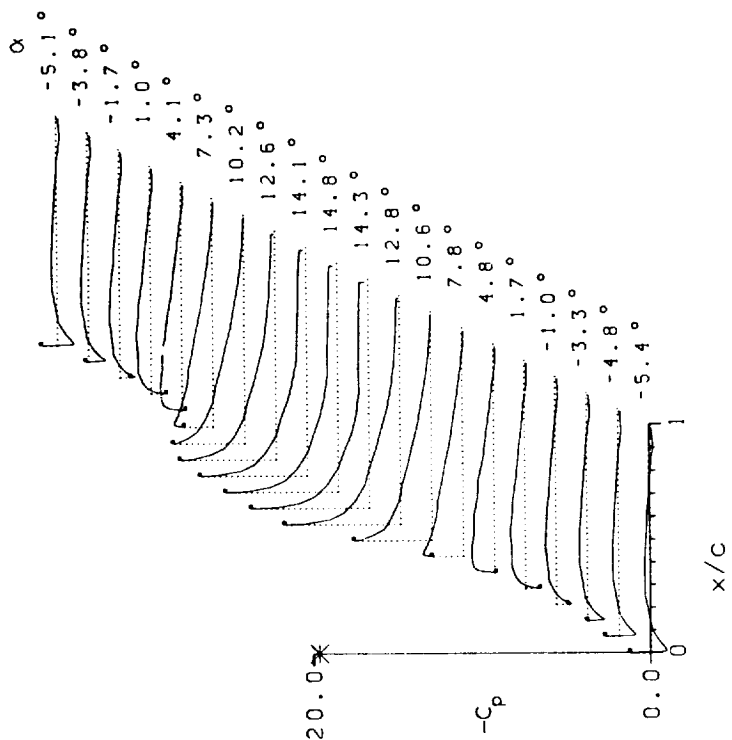
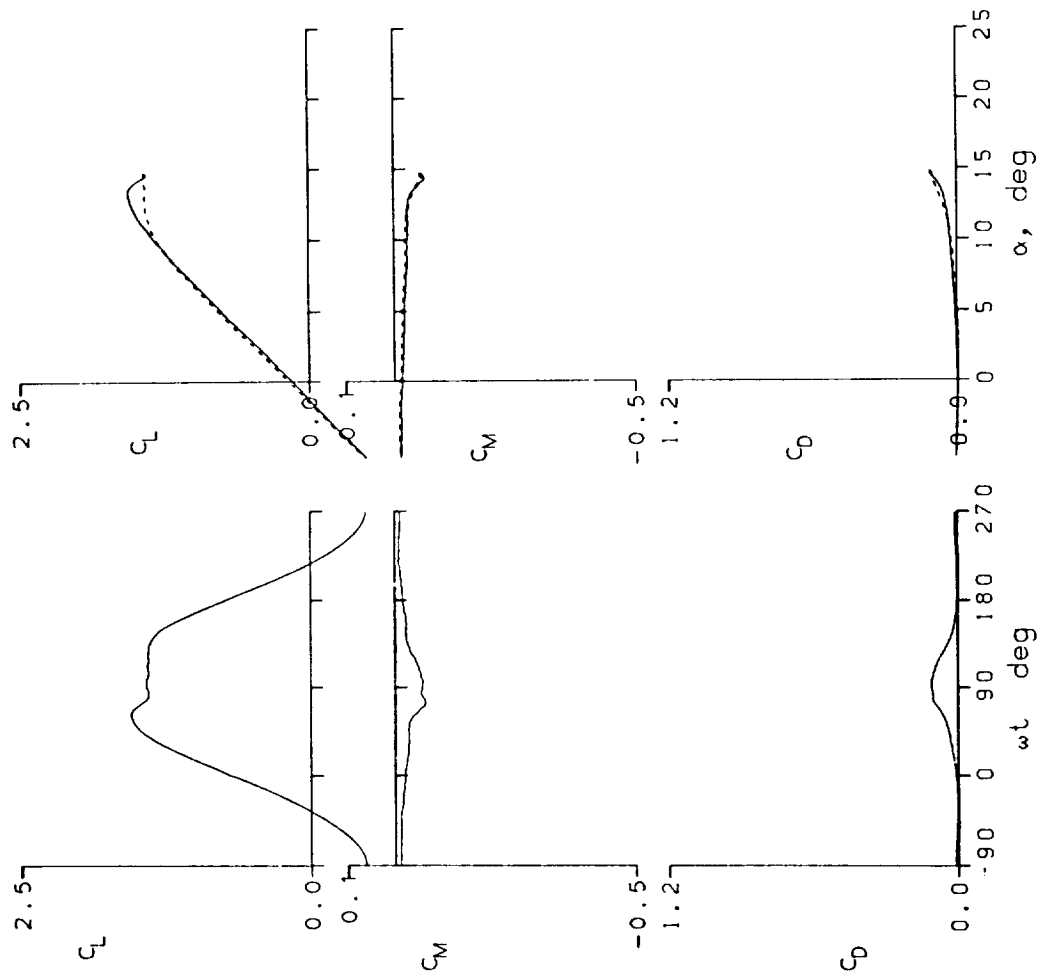


Figure 17.- Continued.

BOEING-VERTOL VR-7 - WITH TAB - AIRFOIL

FRAME : 54019 A0 = 9.82° k = 0.026
 Re = 2.63 E6 A1 = 9.90° M = 0.183
 CLmax = 1.74 CMmin = -0.18 CDmax = 0.28
 αLmax = 15.3° ζ = 0.146 Mmax = 0.659
 αCMmin = 9.3° -CPmax = 10.3 αMmax = 16.1°

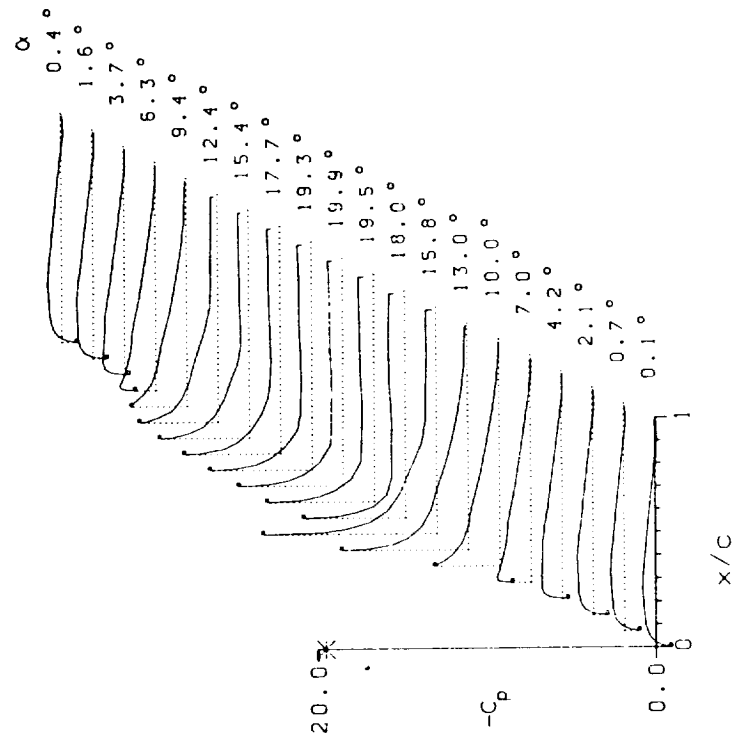
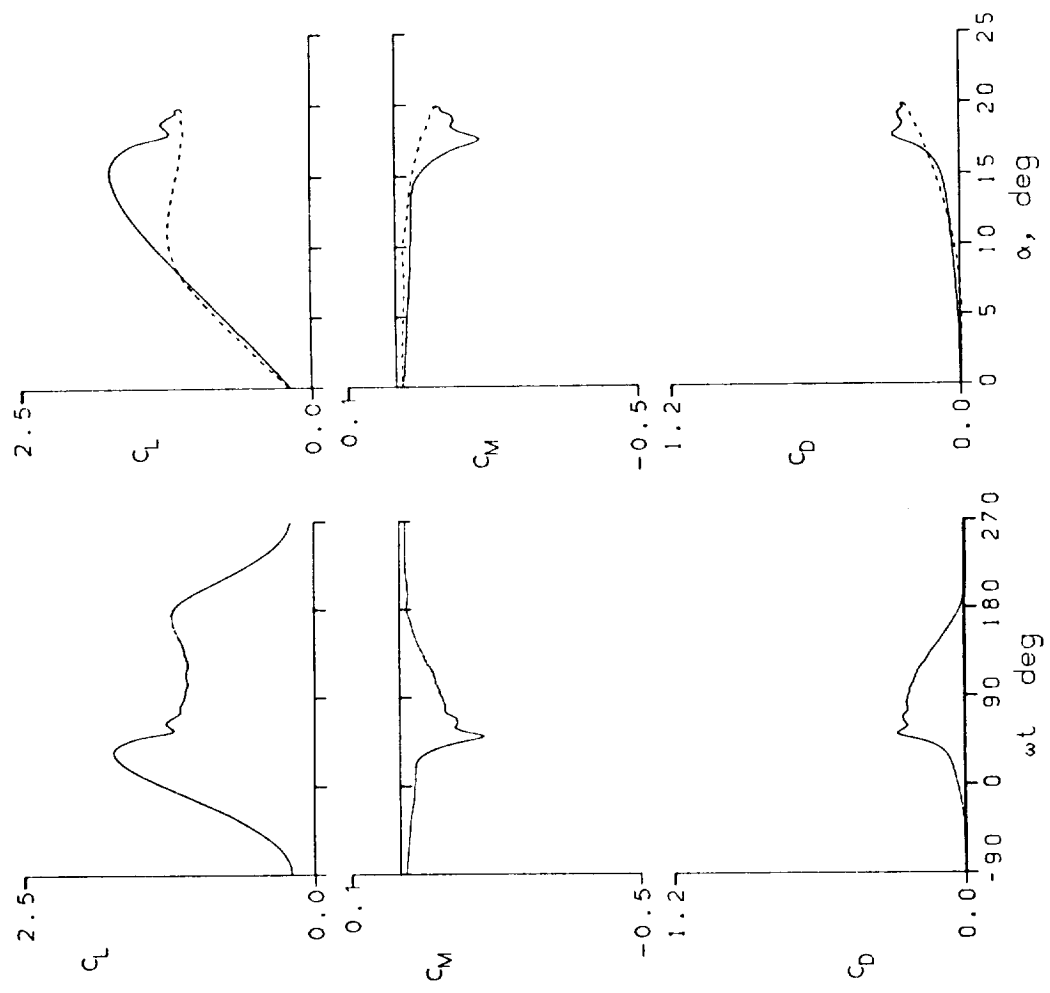


Figure 17.- Continued.

BOEING VERTCL VR-7 -WITH TAB- AIRFOIL

FRAME : 54022 A0 = 9.83° k = 0.051
 Re = 2.62 E6 A1 = 9.90° M = 0.183
 C_{Lmax} = 1.90 C_{Mmin} = -0.28 C_{Dmax} = 0.48
 α_{Lmax} = 17.1° ζ = 0.244 M_{max} = 0.754
 α_{Cmin} = 9.3° $-C_{Pmax}$ = 12.7 α_{Mmax} = 17.9°

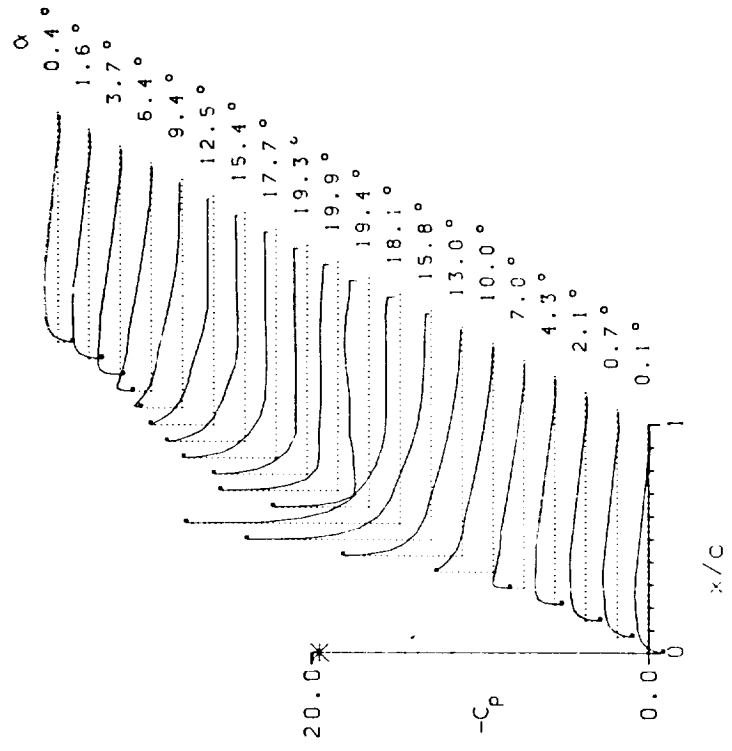
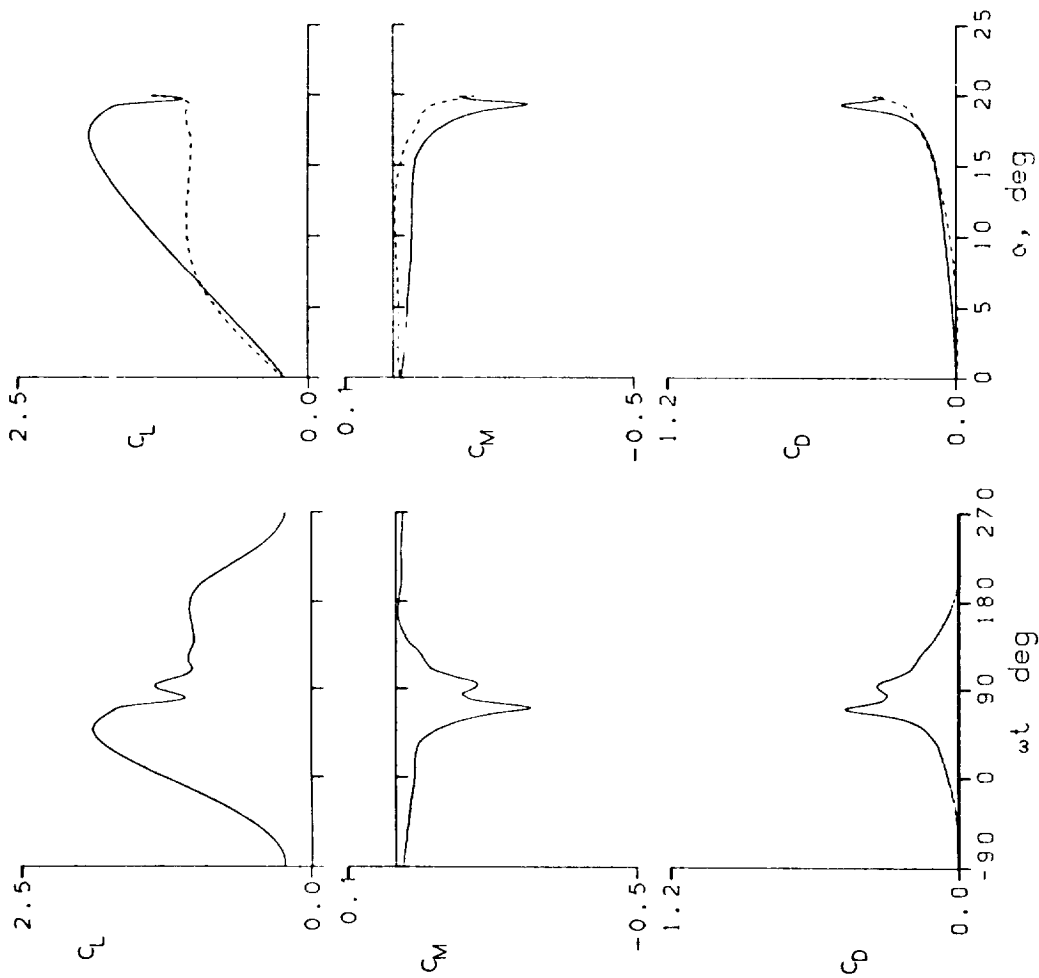


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 54101 A0 = 9.83° k = 0.102
 Re = 2.61 E6 A1 = 9.90° M = 0.183
 CLmax = 2.11 CMmin = -0.29 CDmax = 0.54
 α Lmax = 19.0° ξ = 0.154 Mmax = 0.867
 α Cmin = 9.4° -Cpmax = 15.9 α Mmax = 19.4°

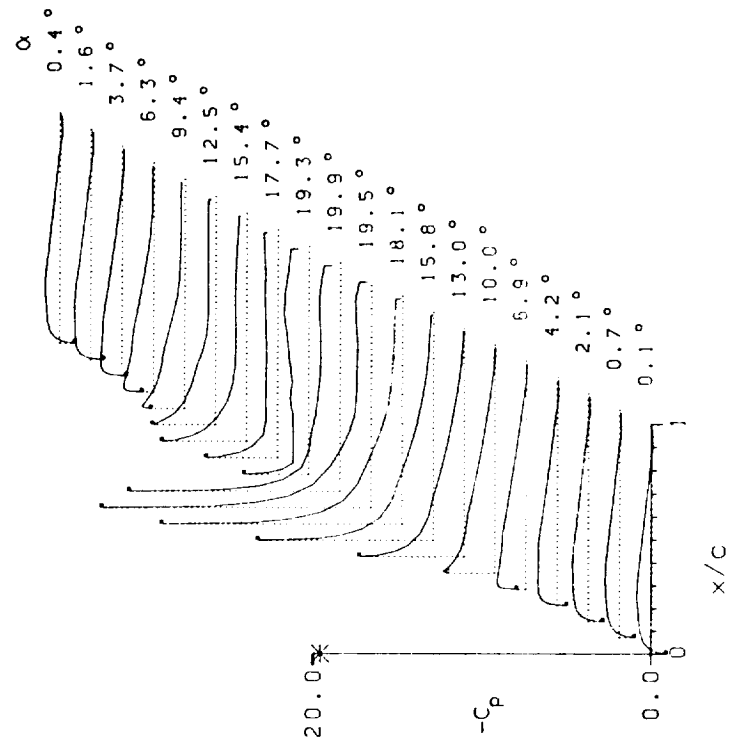
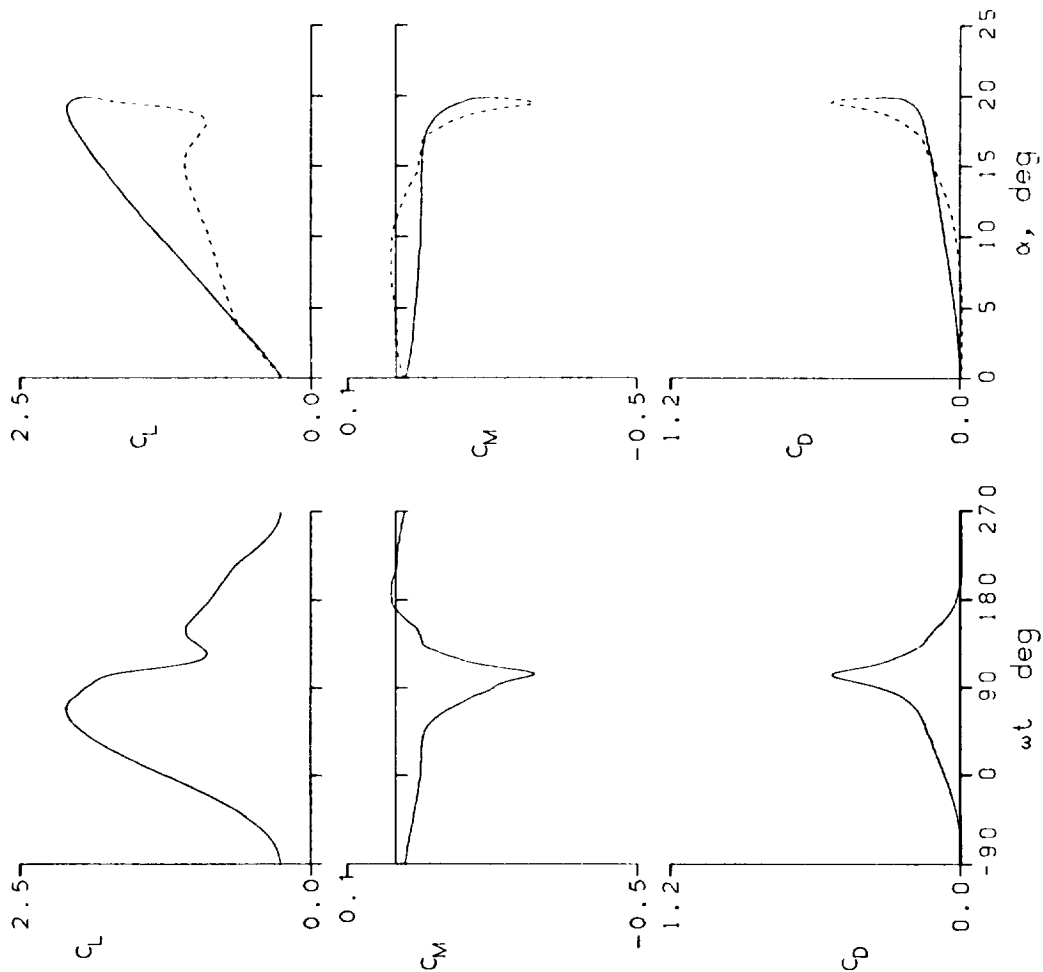


Figure 17.- Continued.

BOEING-VERTOL VR-7 - WITH TAB- AIRFOIL

FRAME : 54110 A0 = 9.82° k = 0.153
 Re = 2.60 E6 A1 = 9.91° M = 0.184
 CLmax = 2.19 CMmin = -0.24 CDmax = 0.39
 αLmax = 19.7° ζ = 0.092 Mmax = 0.923
 αCmin = 9.3° -CPmax = 17.4 αMmax = 19.9°

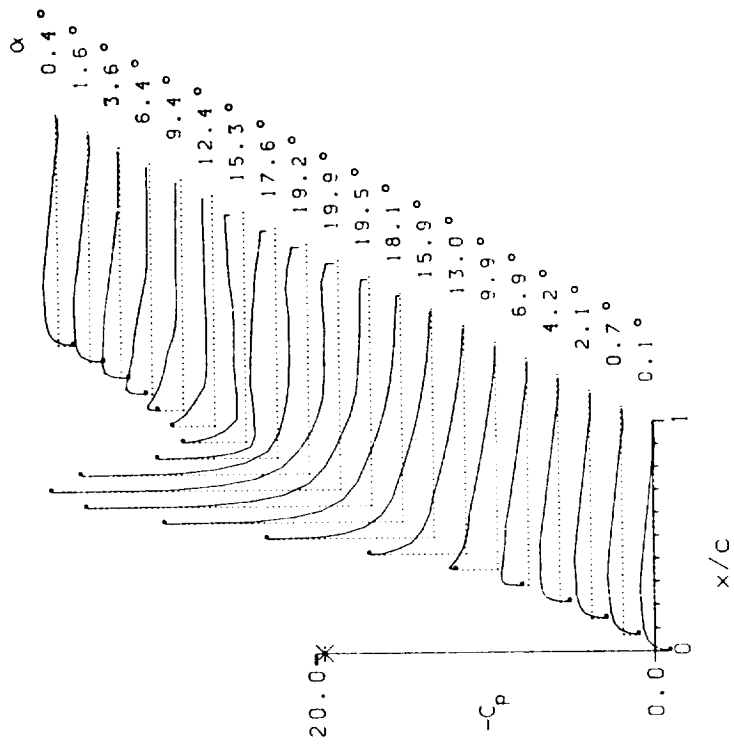
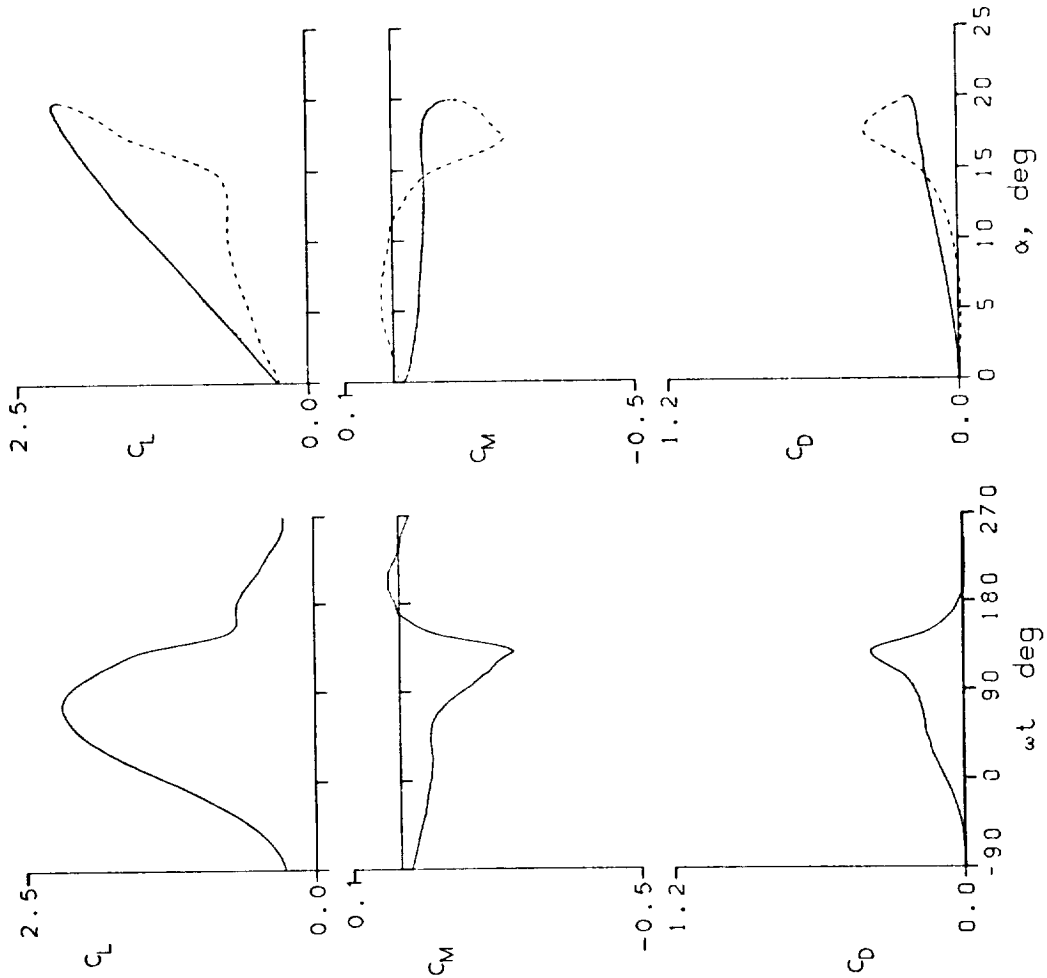


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 54113 AC = 9.81° k = 0.203
 Re = 2.59 E6 A1 = 9.91° M = 0.184
 CLmax = 2.24 CMmin = -0.16 CDmax = 0.20
 α Lmax = 19.8° ζ = 0.177 Mmax = 0.950
 α CrLn = 9.3° -CPmax = 18.1 α Mmax = 19.9°

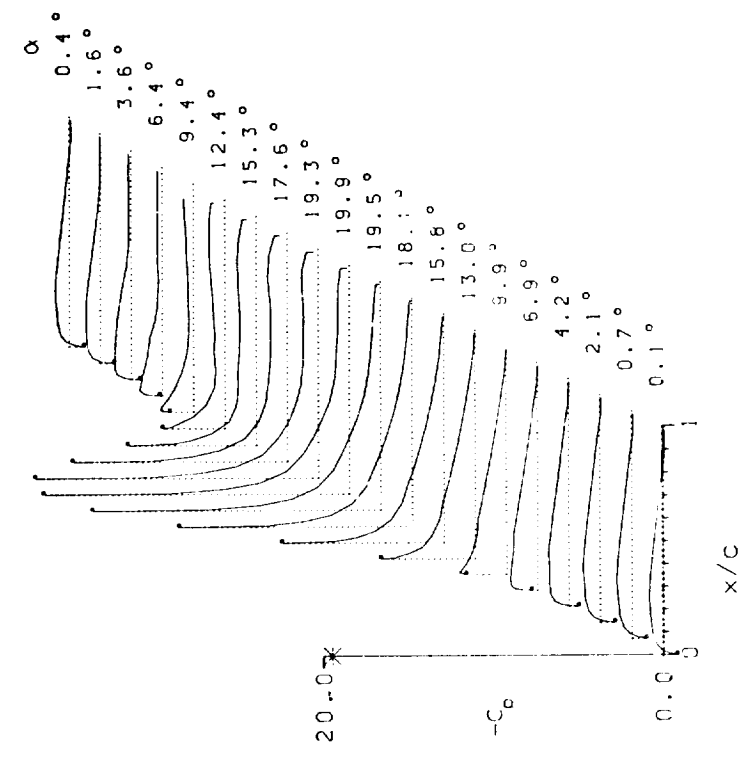
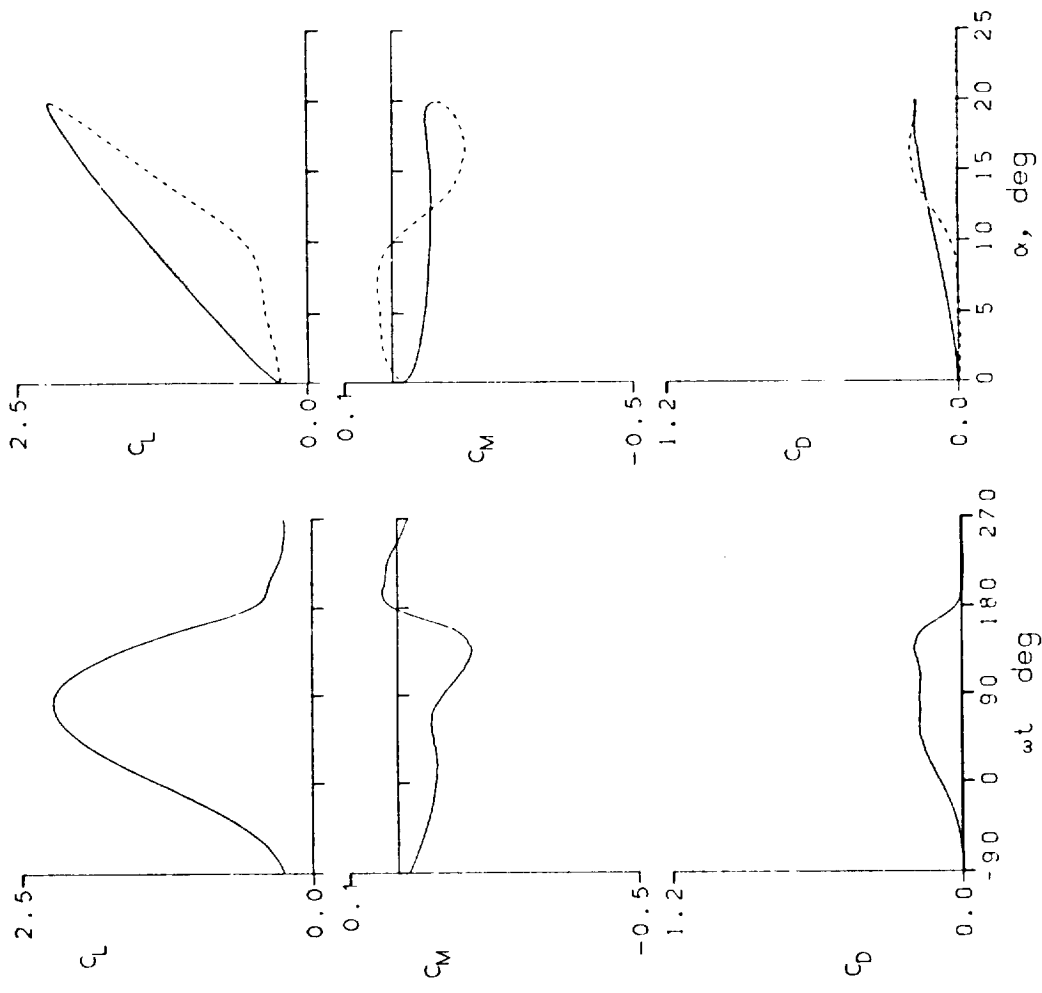


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 54116 A0 = 9.83° k = 0.254
 Re = 2.58 E6 A1 = 9.90° M = 0.184
 CLmax = 2.27 CMmin = -0.11 CDmax = 0.20
 αLmax = 19.9° ζ = 0.348 Mmax = 0.971
 αCMmin = 9.4° -CPmax = 18.7 αMmax = 19.8°

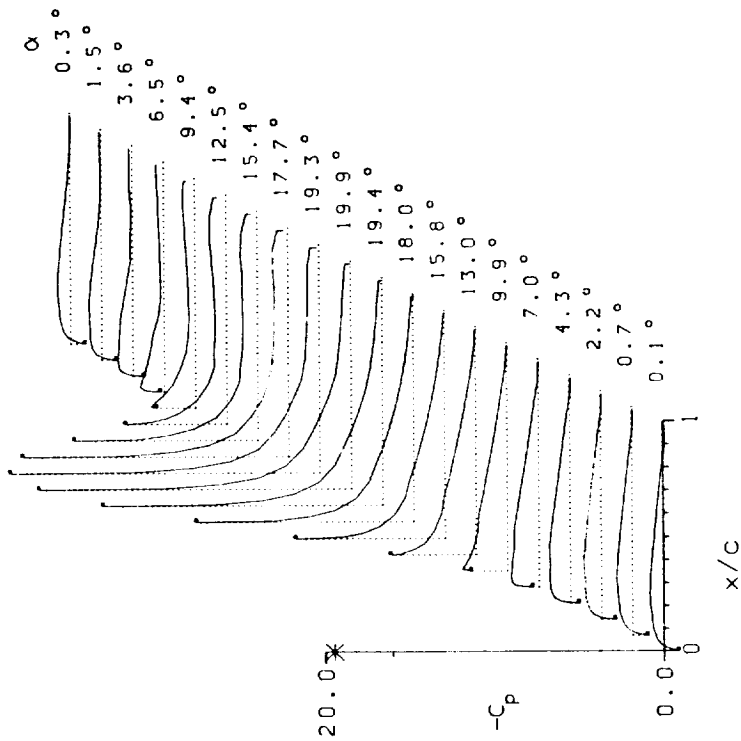
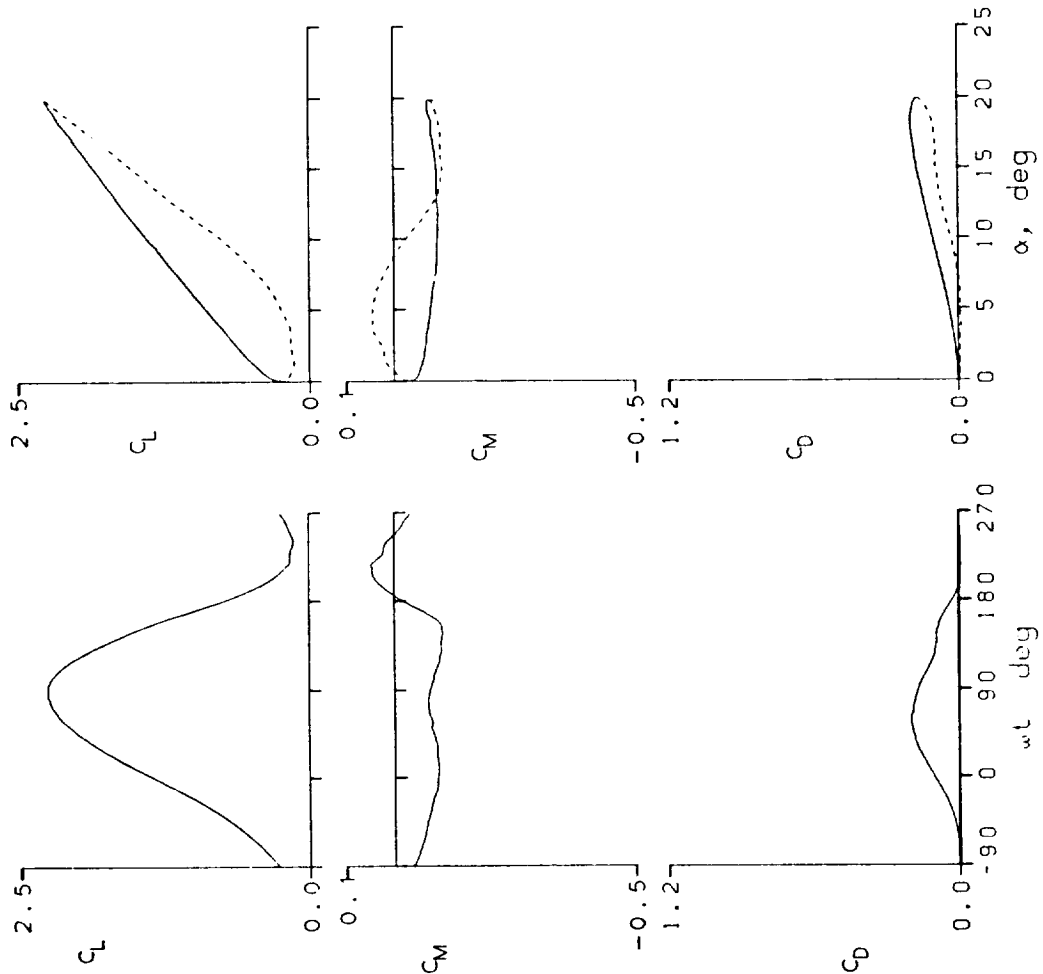


Figure 17.- Continued.

BOFING-VEPTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 54216 A0 = 14.78 ° k = 0.151
 Re = 2.55 E6 A1 = 9.90 ° M = 0.184
 CLmax = 2.65 CMmin = -0.46 CDmax = 1.09
 αLmax = 24.0 ° ζ = 0.216 Mmax = 1.048
 αCmin = 14.2 ° -CPmax = 20.7 αMmax = 23.1 °

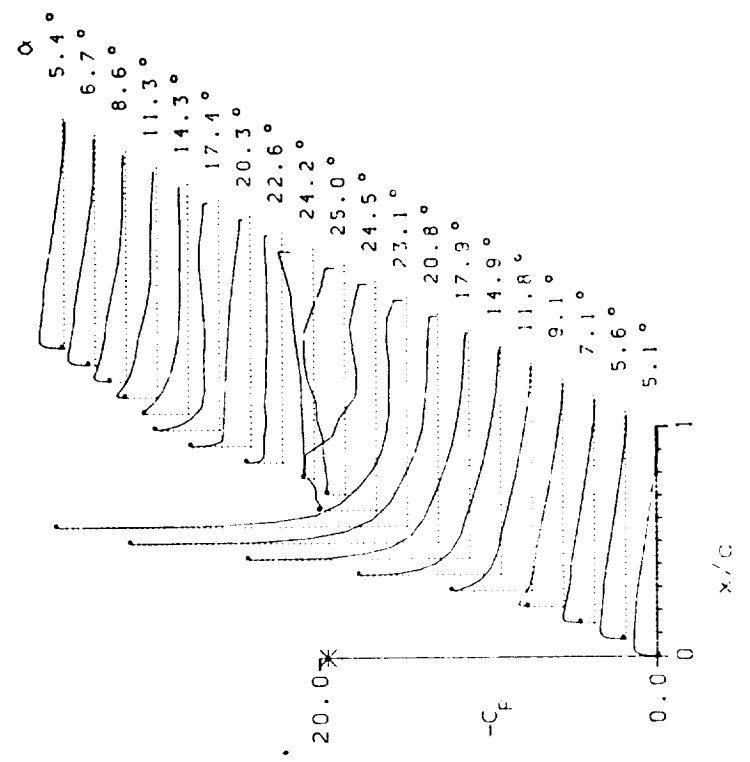
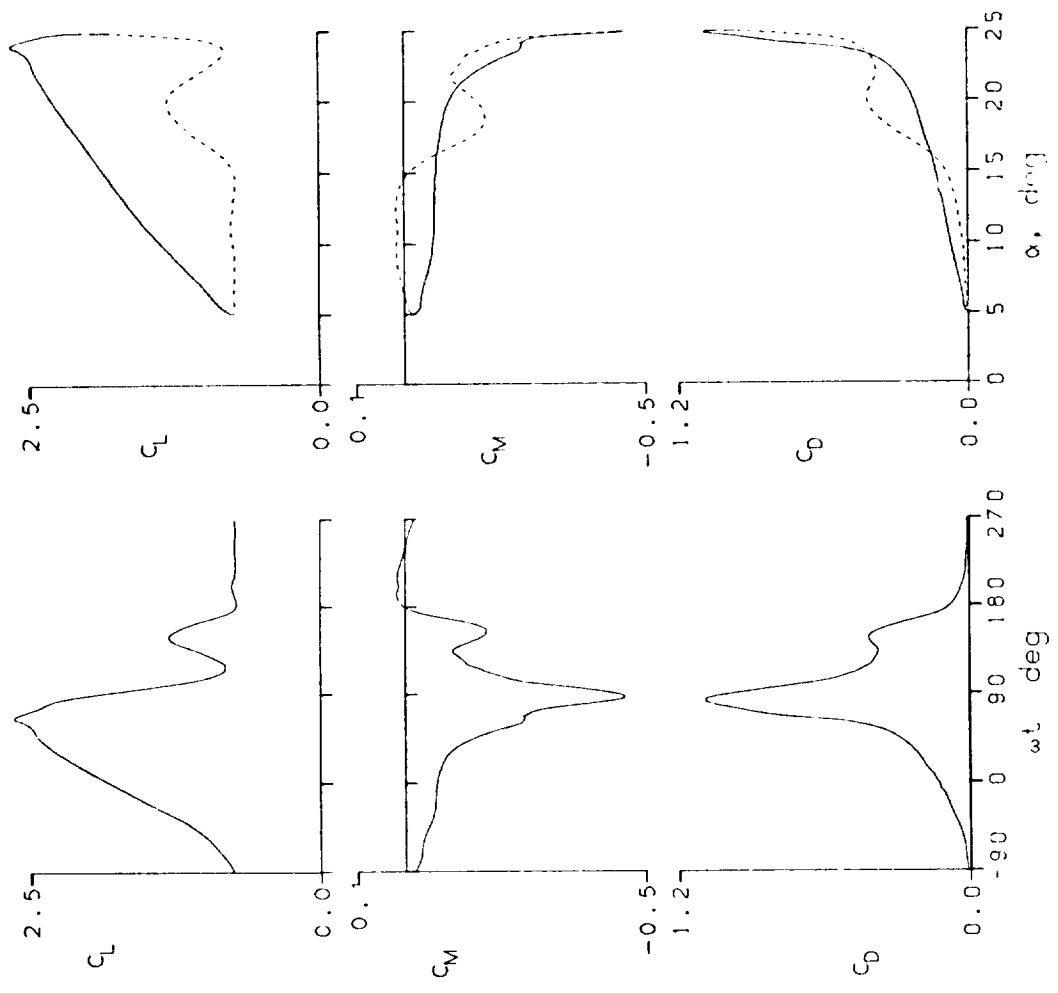


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 57018 A0 = 14.77° k = 0.152
 Re = 2.56 E6 A1 = 9.90° M = 0.184
 $C_{Lmax} = 2.67$ $C_{Mmin} = -0.46$ $C_{Dmax} = 1.06$
 $\alpha_{Lmax} = 24.0^\circ$ $\xi = 0.226$ $M_{max} = 1.056$
 $\alpha_{Cmin} = 14.2^\circ$ $-C_{Pmax} = 20.9$ $\alpha_{Mmax} = 23.2^\circ$

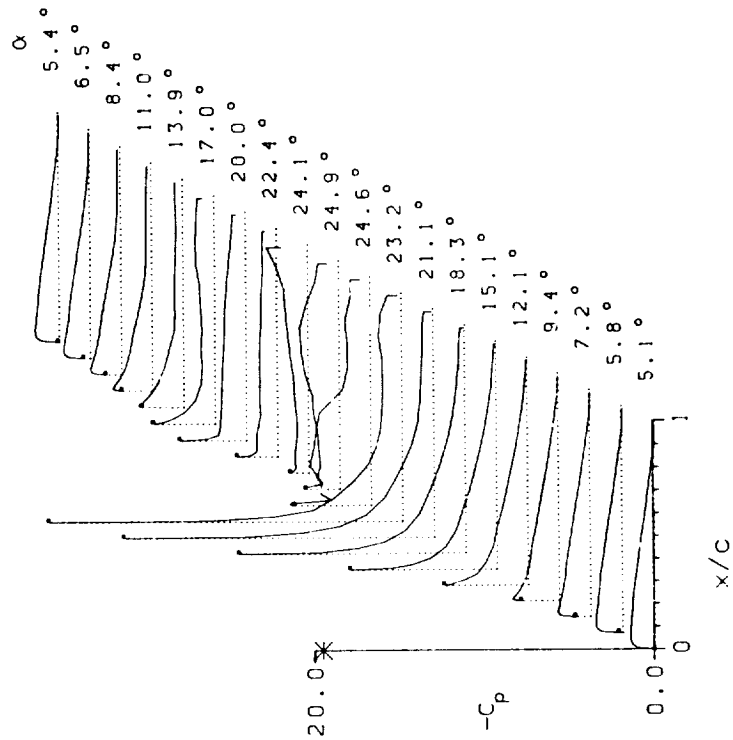
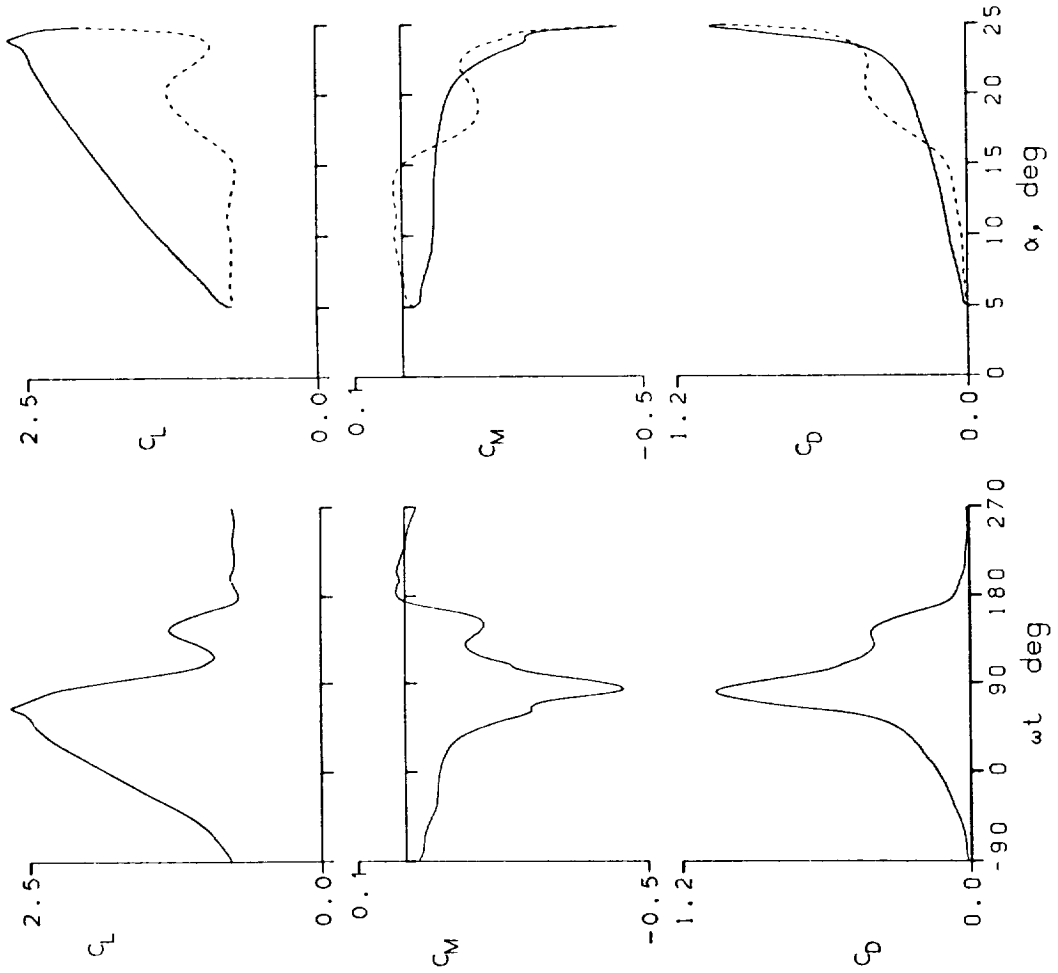


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 58218 A0 = 14.78 ° k = 0.150
 Re = 2.44 E6 A1 = 9.90 ° M = 0.183
 CLmax = 2.70 CMmin = -0.50 CDmax = 1.15
 α Lmax = 24.0 ° ξ = 0.185 Mmax = 1.037
 α CMmin = 14.3 ° -CPmax = 20.6 α Mmax = 23.2 °

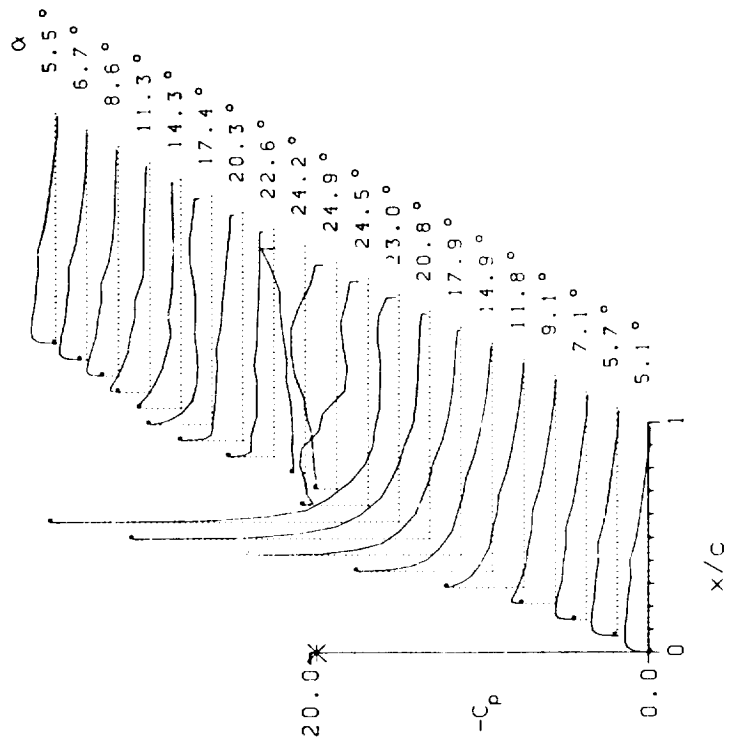
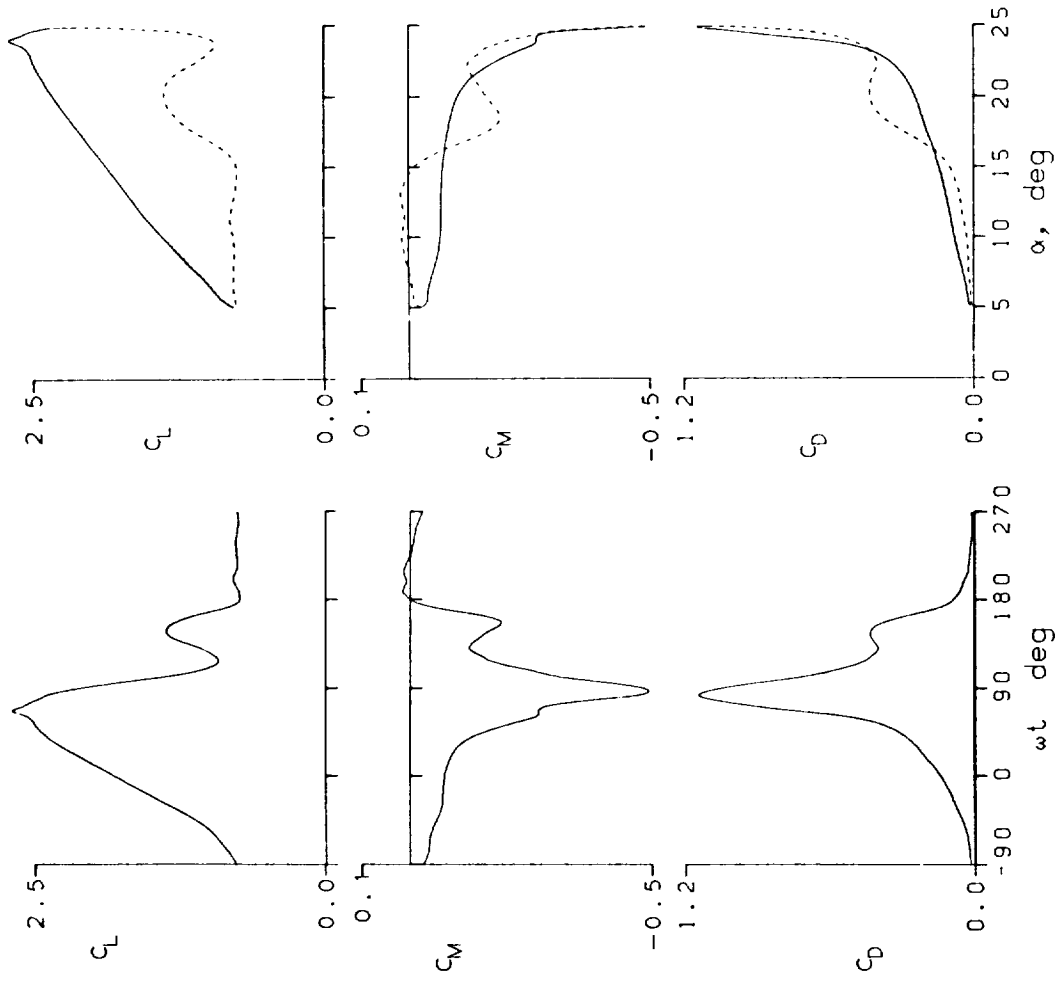


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 58102	A0 = 14.78 °	k = 0.098
Re = 0.50 E6	A1 = 9.90 °	M = 0.037
$C_{Lmax} = 2.37$	$C_{Mmin} = -0.41$	$C_{Dmax} = 0.98$
$\alpha_{Lmax} = 20.8 °$	$\zeta = 0.529$	$M_{max} = 0.134$
$\alpha_{C_{min}} = 14.2 °$	$-C_{pmax} = 12.2$	$\alpha_{Mmax} = 19.7 °$

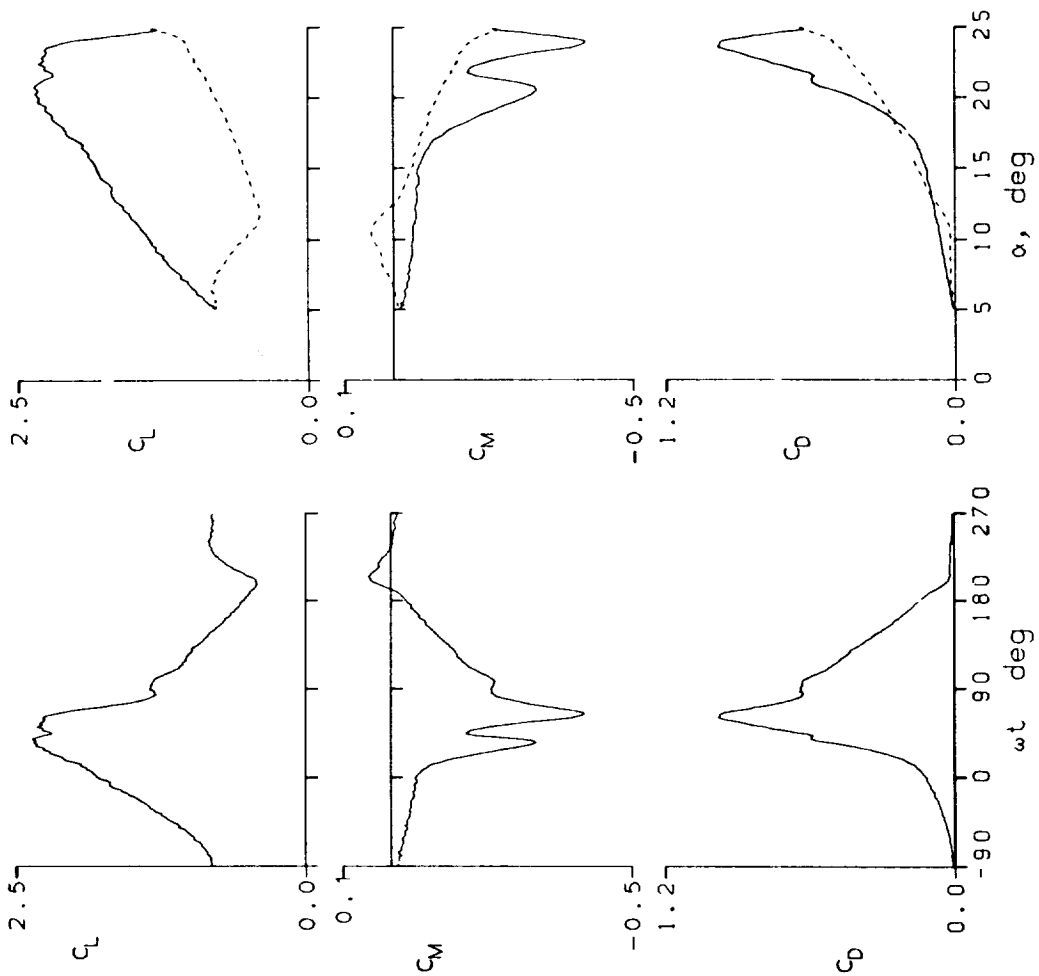


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 58111 A0 = 14.78 ° k = 0.101
 Re = 1.53 E6 A1 = 9.90 ° M = 0.109
 CLmax = 2.44 CMmin = -0.41 CDmax = 0.95
 α Lmax = 22.6 ° ξ = 0.498 Mmax = 0.480
 α Cmin = 14.2 ° -Cpmax = 16.7 α Mmax = 21.1 °

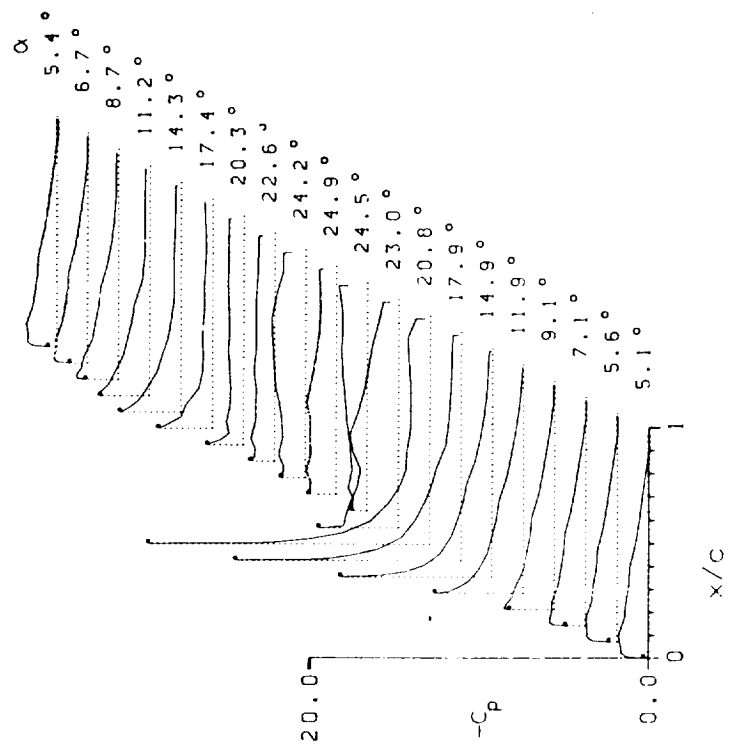
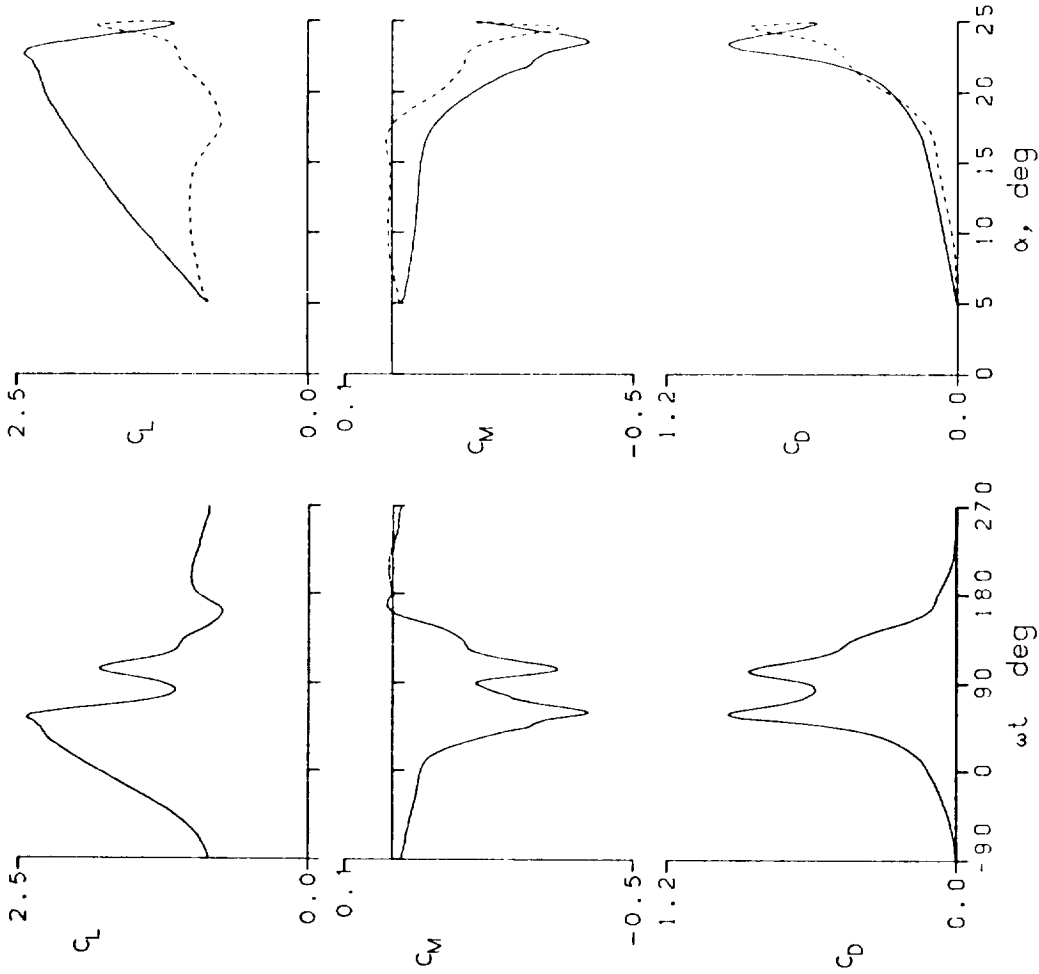


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL
 FRAME : 58120 AO = 14.78 ° k = 0.151
 Re = 2.54 E6 A1 = 9.90 ° M = 0.184
 CLmax = 2.77 CMmin = -0.46 CDmax = 1.13
 α Lmax = 24.1 ° ζ = 0.224 Mmax = 1.071
 α Cmin = 14.3 ° -CPmax = 21.2 α Mmax = 23.2 °

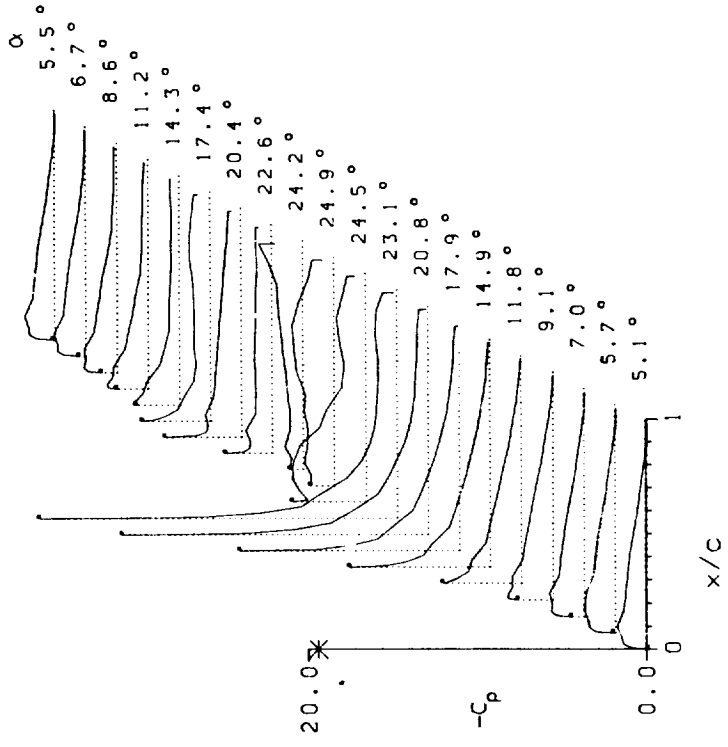
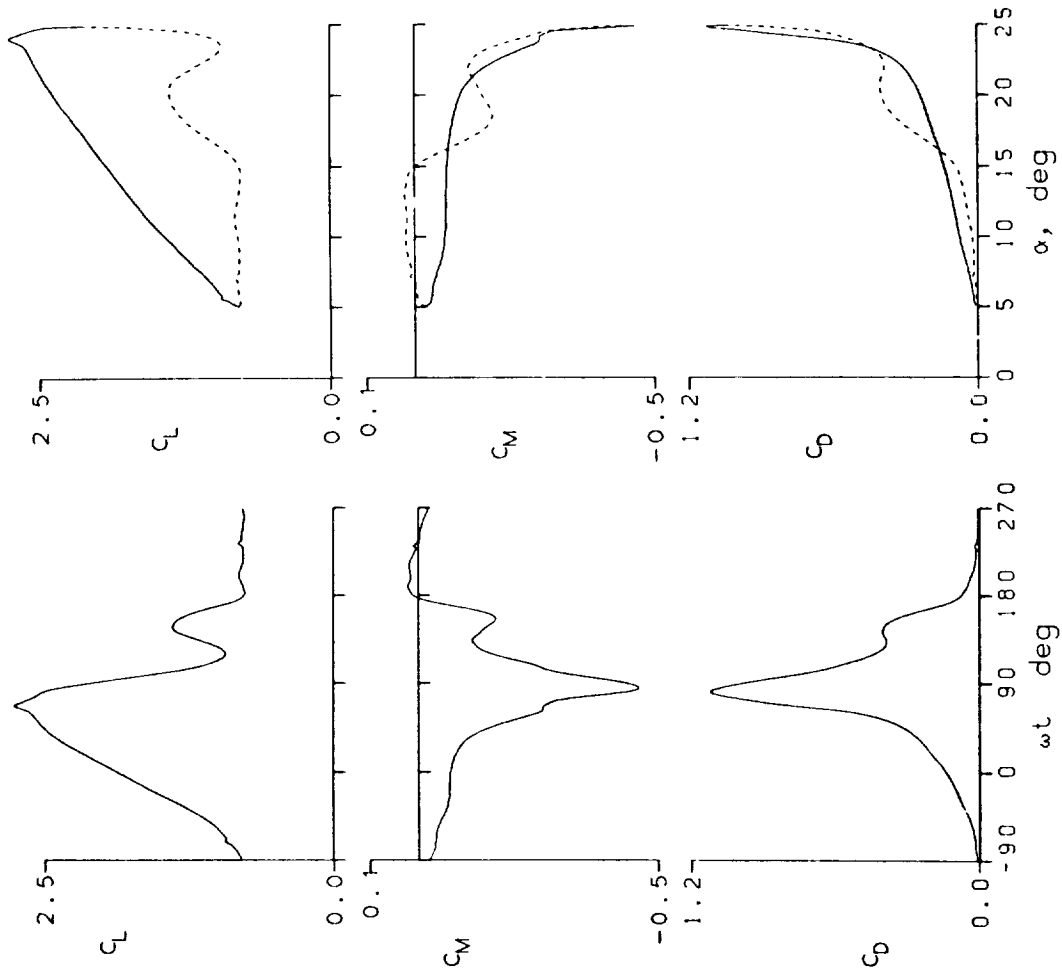


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 58121 AC = 14.79° k = 0.101
 Re = 2.53 E6 A1 = 9.90° M = 0.184
 C_{Lmax} = 2.43 C_{Mmin} = -0.42 C_{Dmax} = 0.98
 α_{Lmax} = 23.1° ξ = 0.391 M_{max} = 0.962
 α_{Cmin} = 14.3° -C_{pmax} = 18.4 α_{Mmax} = 21.8°

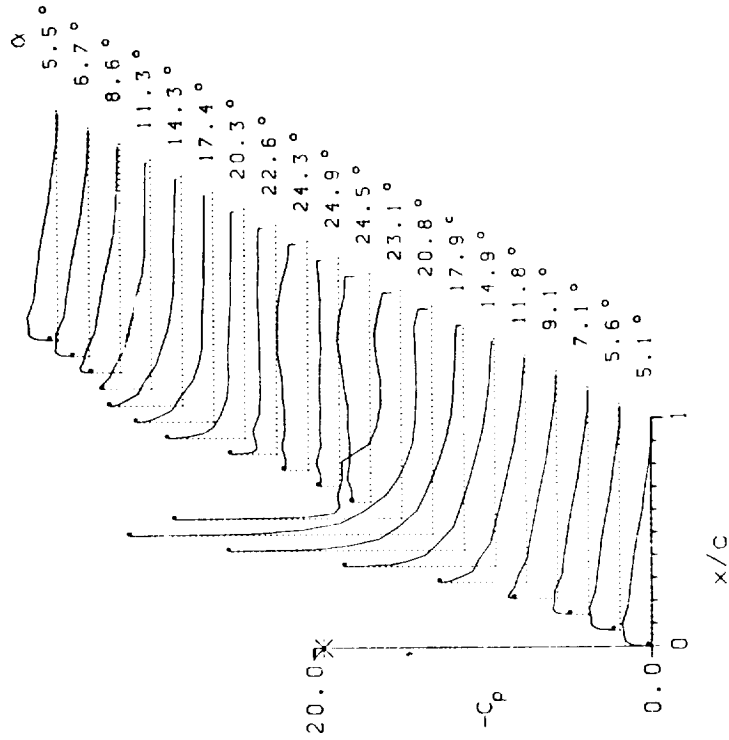
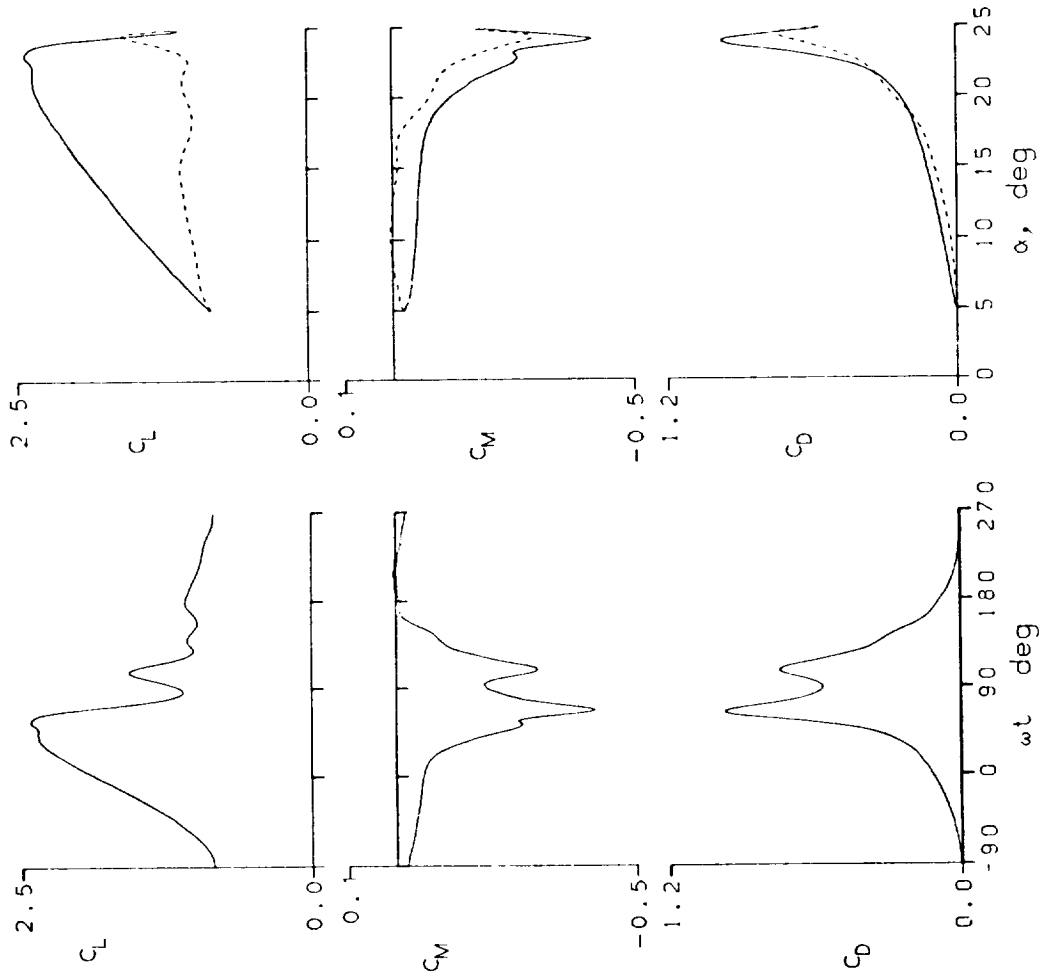


Figure 17.- Continued.

BOEING-VERTOL VR-7 -WITH TAB- AIRFOIL

FRAME : 48200 A0 = 12.99° k = 0.201

Re = 4.06 E6 A1 = 2.00° M = 0.301

CLmax = 1.80 CMmin = -0.08 CDmax = 0.10

αLmax = 14.9° ζ = -0.867 Mmax = 1.316

αCmin = 12.9° -CPmax = 9.9 αMmax = 15.0°

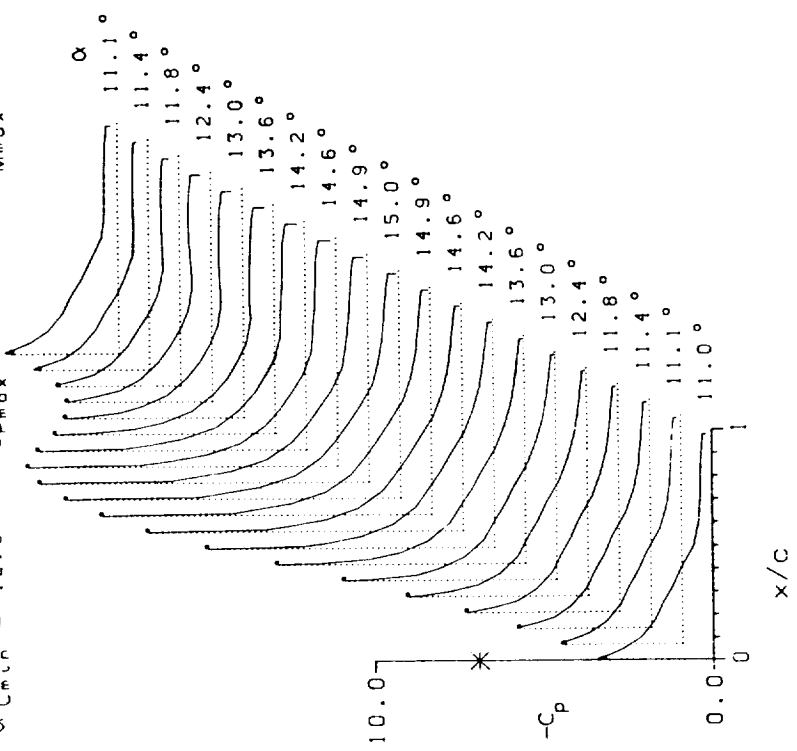
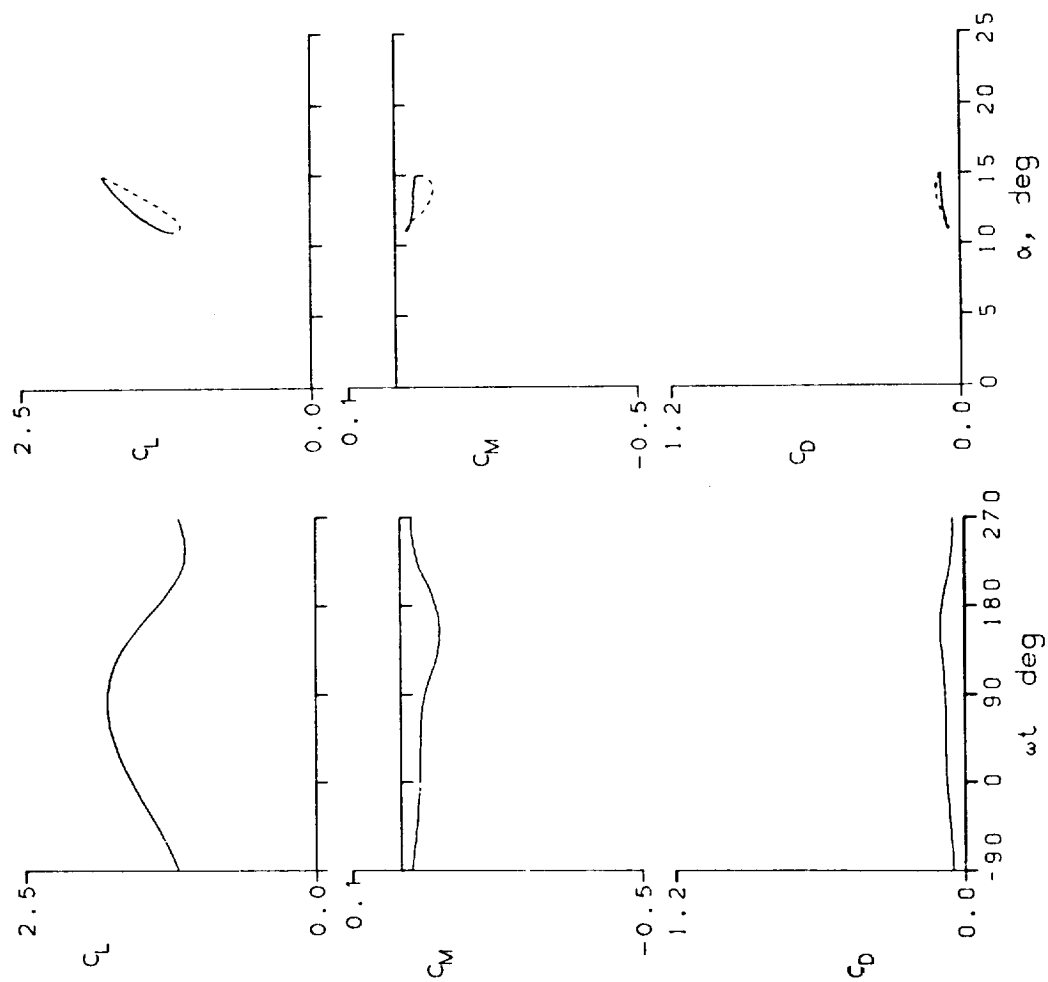


Figure 17.- Concluded.

NLR-1 AIRFOIL

FRAME : 62020	A0 = 14.78 °	k = 0.099
Re = 3.97 E6	A1 = 9.90 °	M = 0.073
C _{Lmax} = 1.97	C _{Mmin} = -0.38	C _{Dmax} = 0.79
α _{Lmax} = 21.1 °	ξ = 0.486	M _{max} = 0.244
α _{Cmin} = 14.2 °	-C _{pmax} = 10.1	α _{Mmax} = 16.1 °

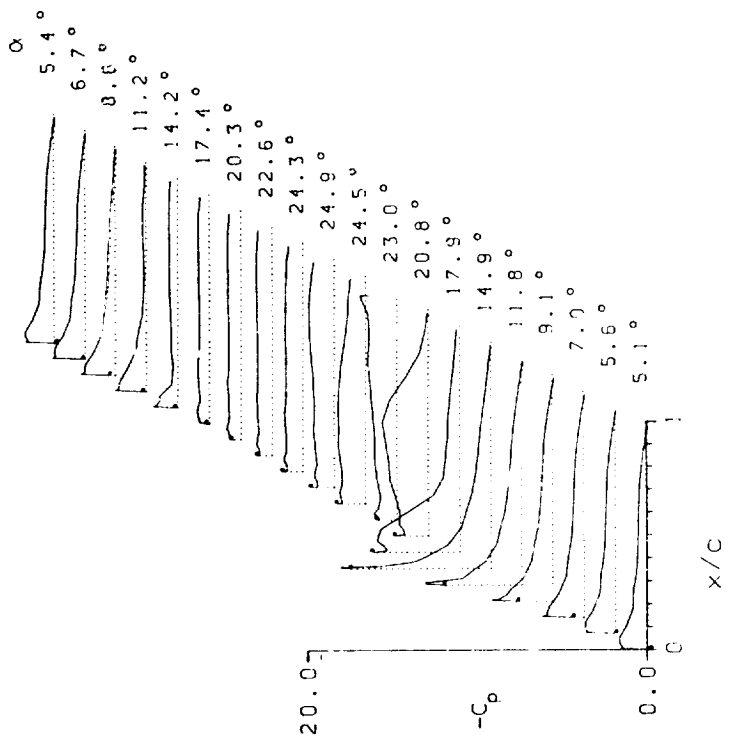
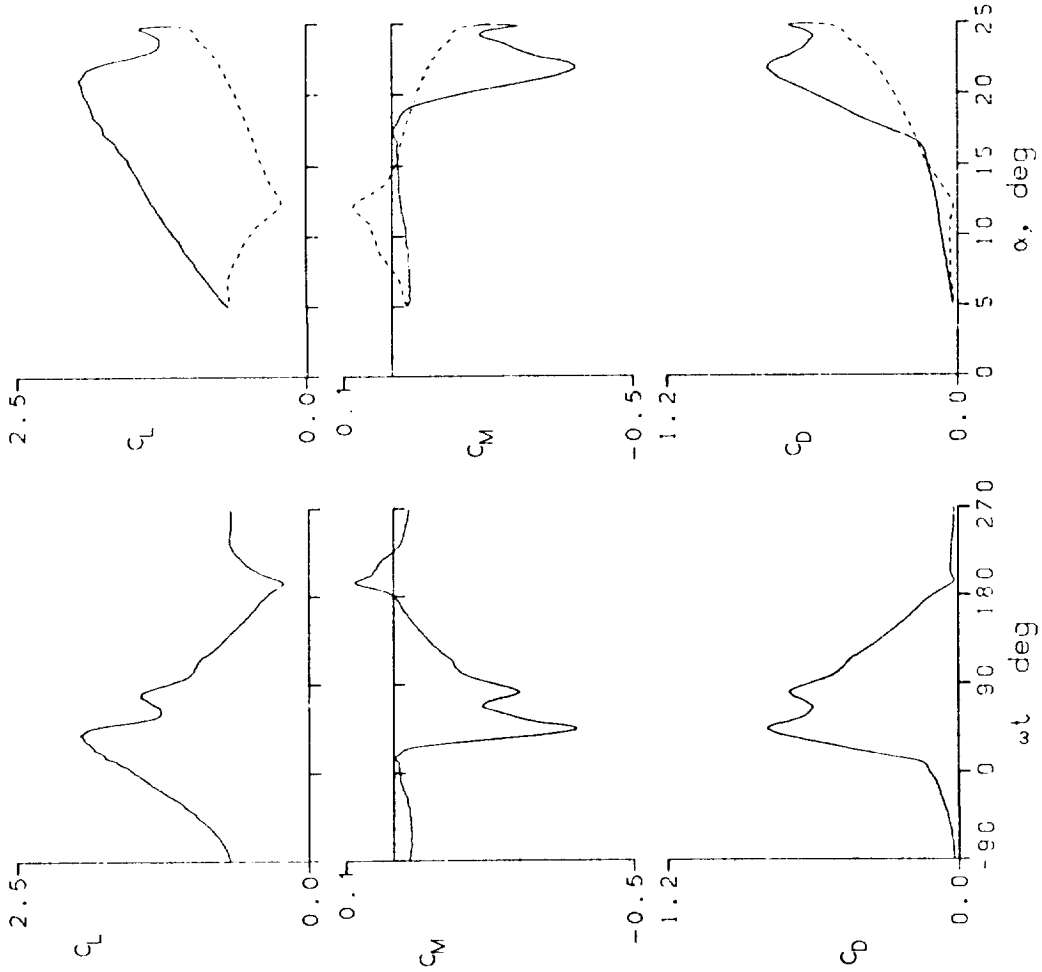


Figure 18.- Dynamic data for NLR-1 airfoil.

NLR-1 AIRFOIL
 FRAME : 62104 A0 = 14.78° k = 0.099
 Re = 1.45 E6 A1 = 9.90° M = 0.109
 CLmax = 2.25 CMmin = -0.44 CDmax = 0.94
 α Lmax = 22.2° ζ = 0.388 Mmax = 0.450
 α CMmin = 14.2° -CDmax = 14.7° α Mmax = 18.5°

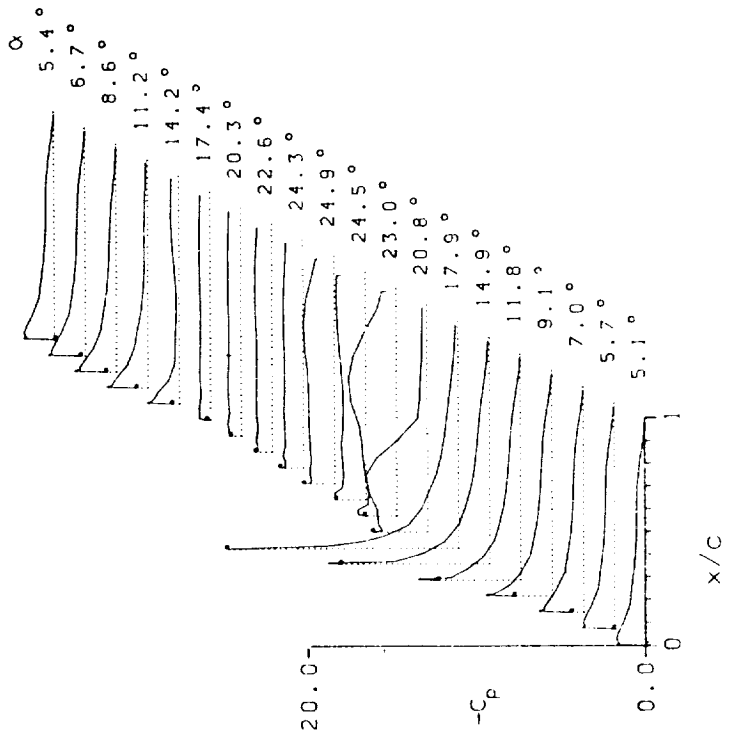
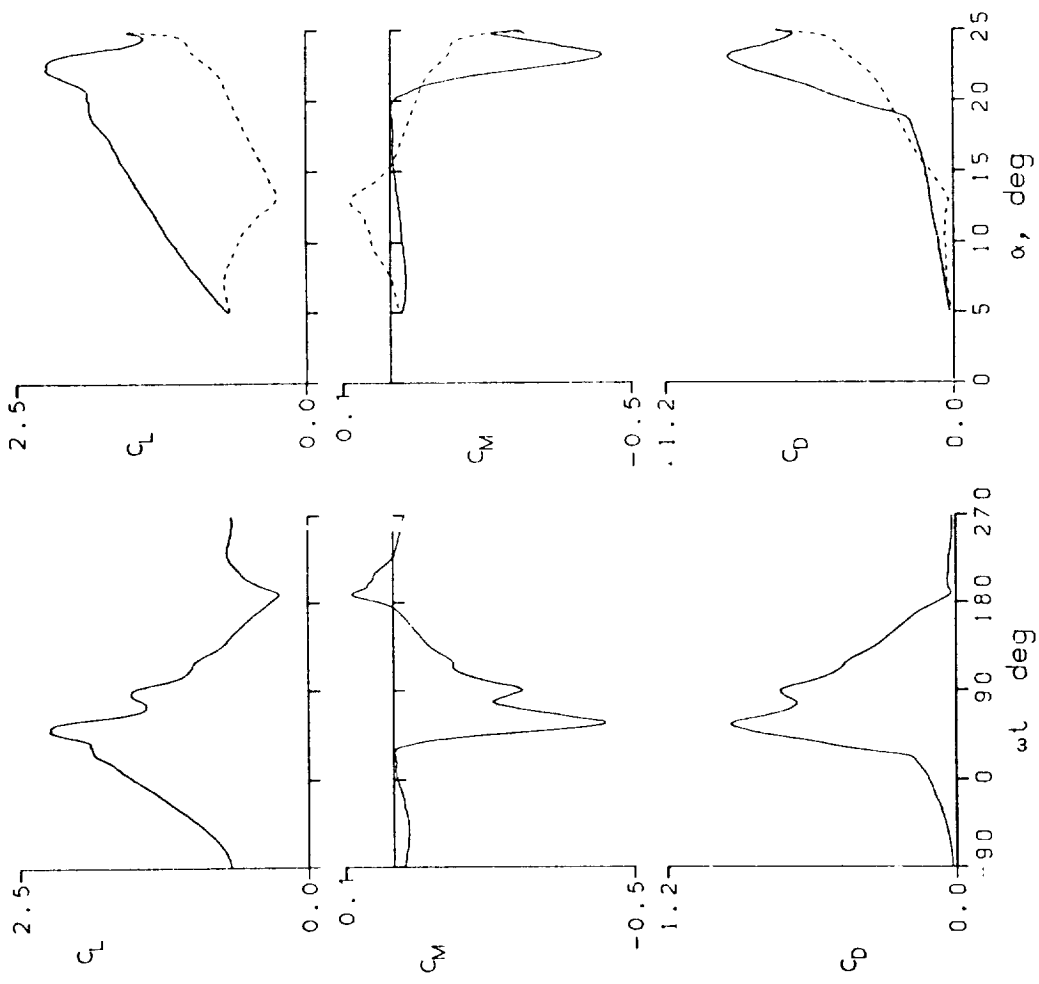


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62112 A0 = 14.79 ° k = 0.100
 Re = 2.51 E6 A1 = 9.90 ° M = 0.184
 CLmax = 2.43 CMmin = -0.42 CDmax = 0.95
 α Lmax = 22.5 ° ζ = 0.344 Mmax = 0.841
 α Cmin = 14.3 ° -CPmax = 15.0 α Mmax = 18.8 °

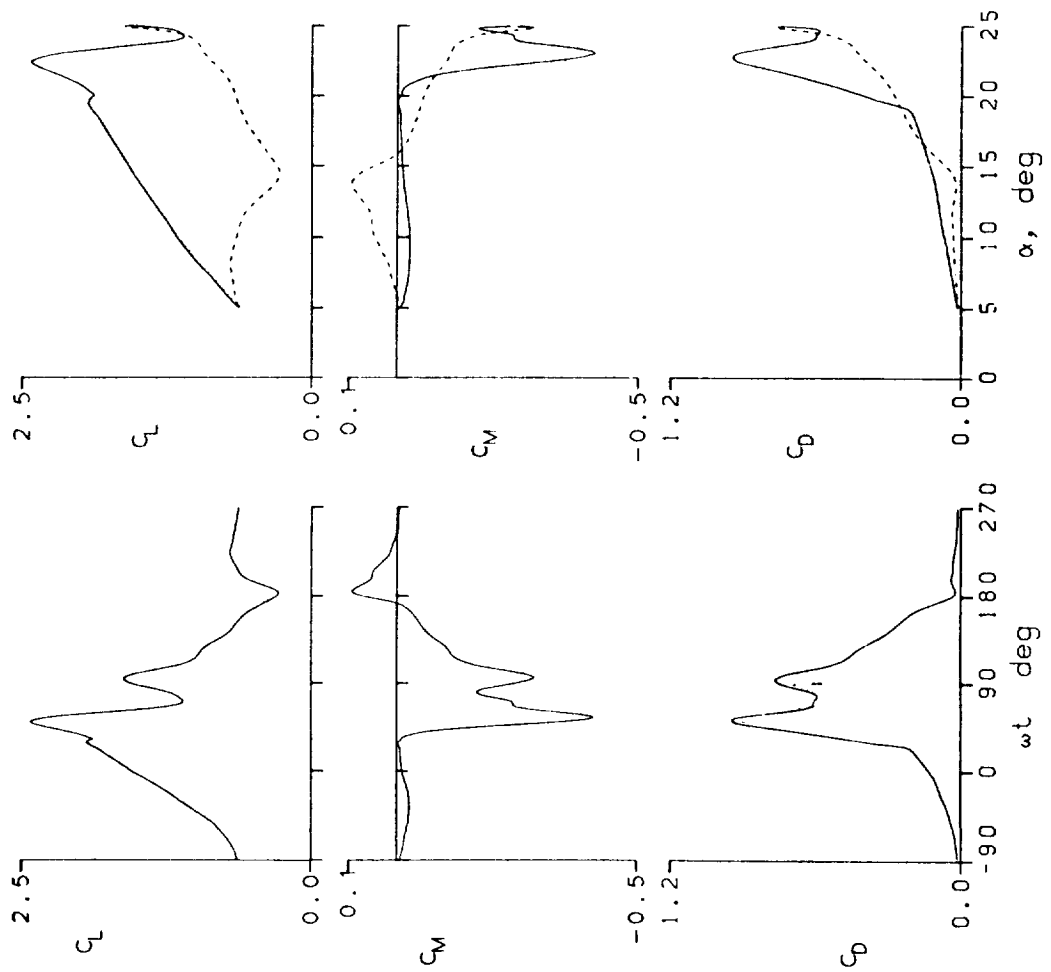


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 52114 A0 = 14.79° k = 0.100
 Re = 2.70 E6 A1 = 9.90° M = 0.199
 C_{Lmax} = 2.41 C_{Mmin} = -0.43 C_{Dmax} = 0.93
 α_{Lmax} = 21.8° ζ = 0.427 M_{max} = 0.856
 α_{Cmin} = 14.3° -C_{pmax} = 13.1 α_{Mmax} = 17.9°

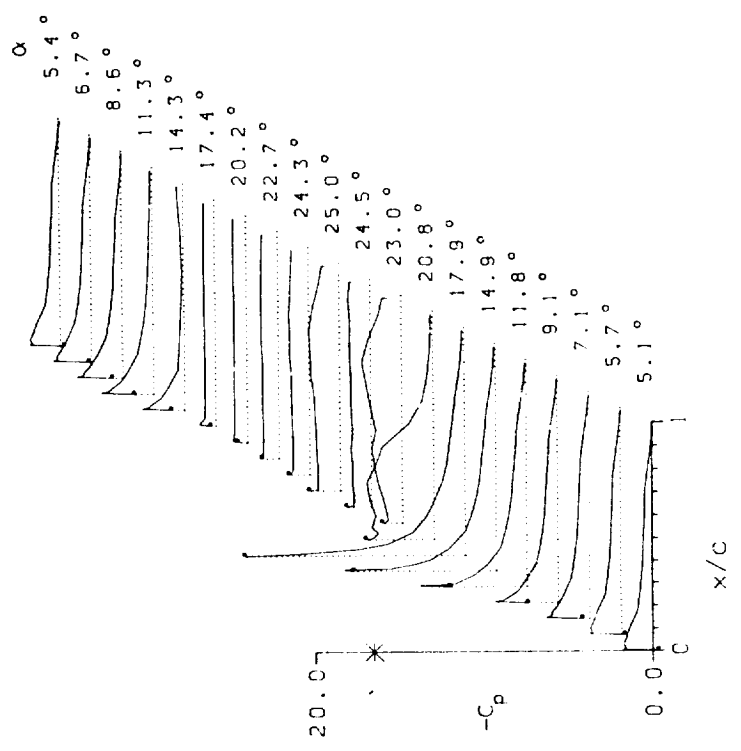
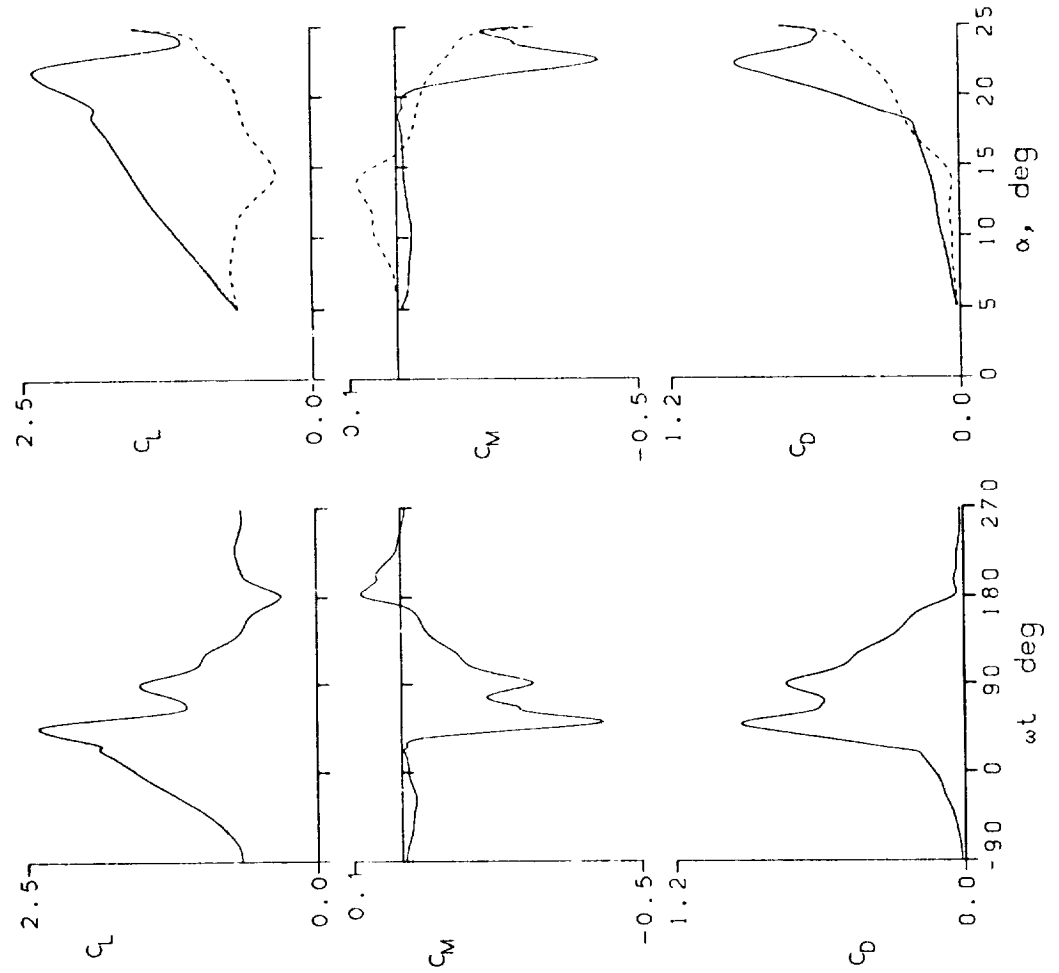


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 62121 A0 = 9.83° k = 0.171
 Re = 2.56 E6 A1 = 9.91° M = 0.200
 C_{Lmax} = 2.26 C_{Mmin} = -0.35 C_{Dmax} = 0.72
 α_{Lmax} = 19.9° ζ = 0.034 M_{max} = 0.855
 α_{Cmin} = 9.4° $-C_{Dmax}$ = 13.0 α_{Mmax} = 18.3°

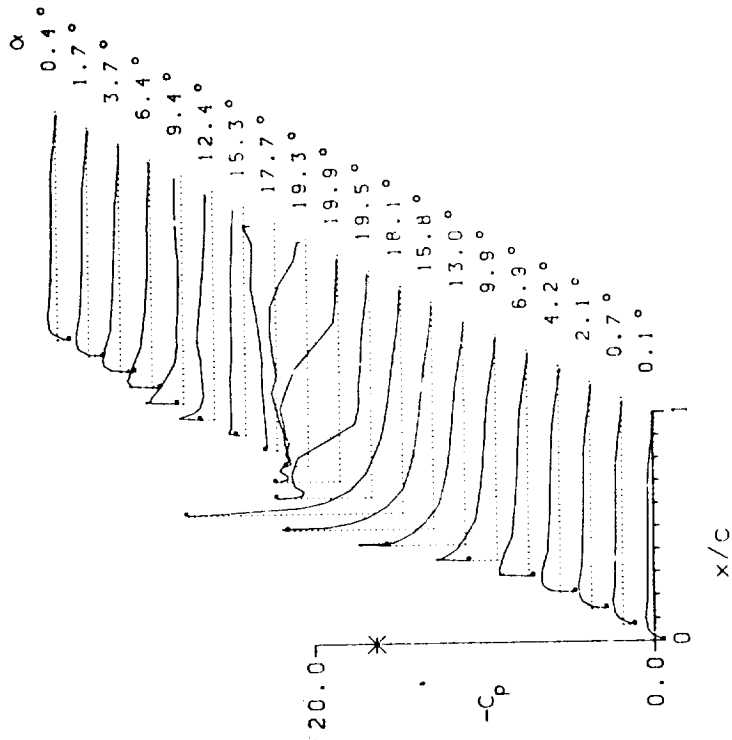
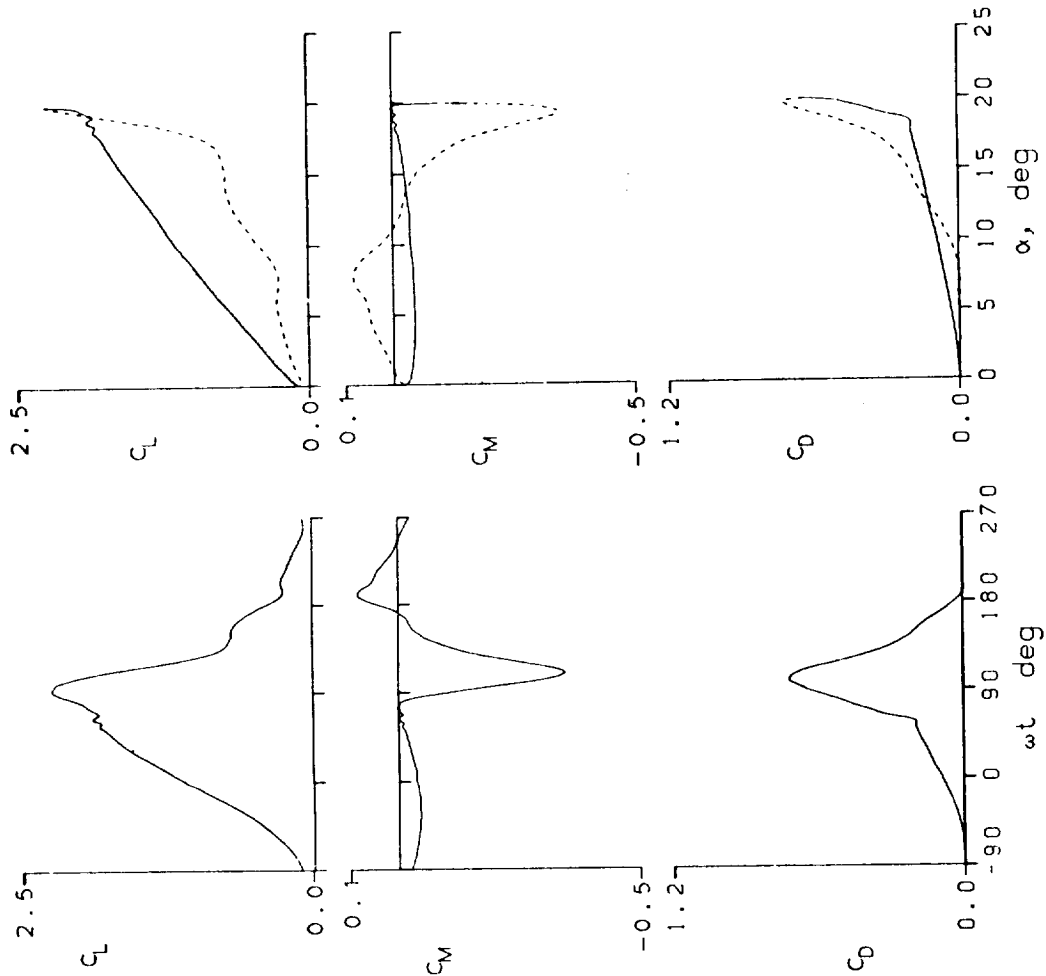


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62201 A0 = 14.95° k = 0.283
 Re = 2.54 E6 A1 = 4.90° M = 0.200
 CLmax = 2.27 CMmin = -0.36 CDmax = 0.72
 αLmax = 19.8° ζ = -1.213 Mmax = 0.854
 αCMmin = 14.8° -CDmax = 12.9 αMmax = 18.2°

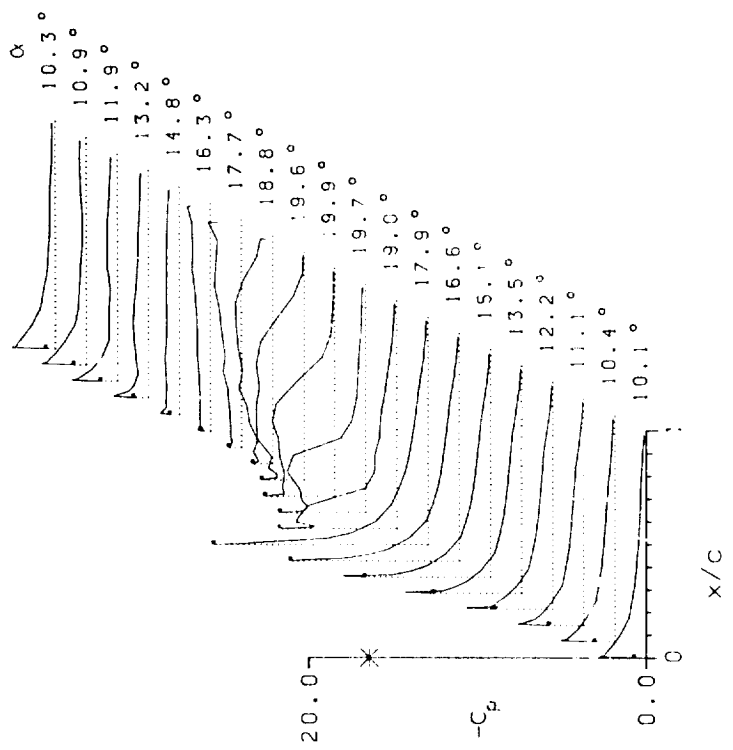
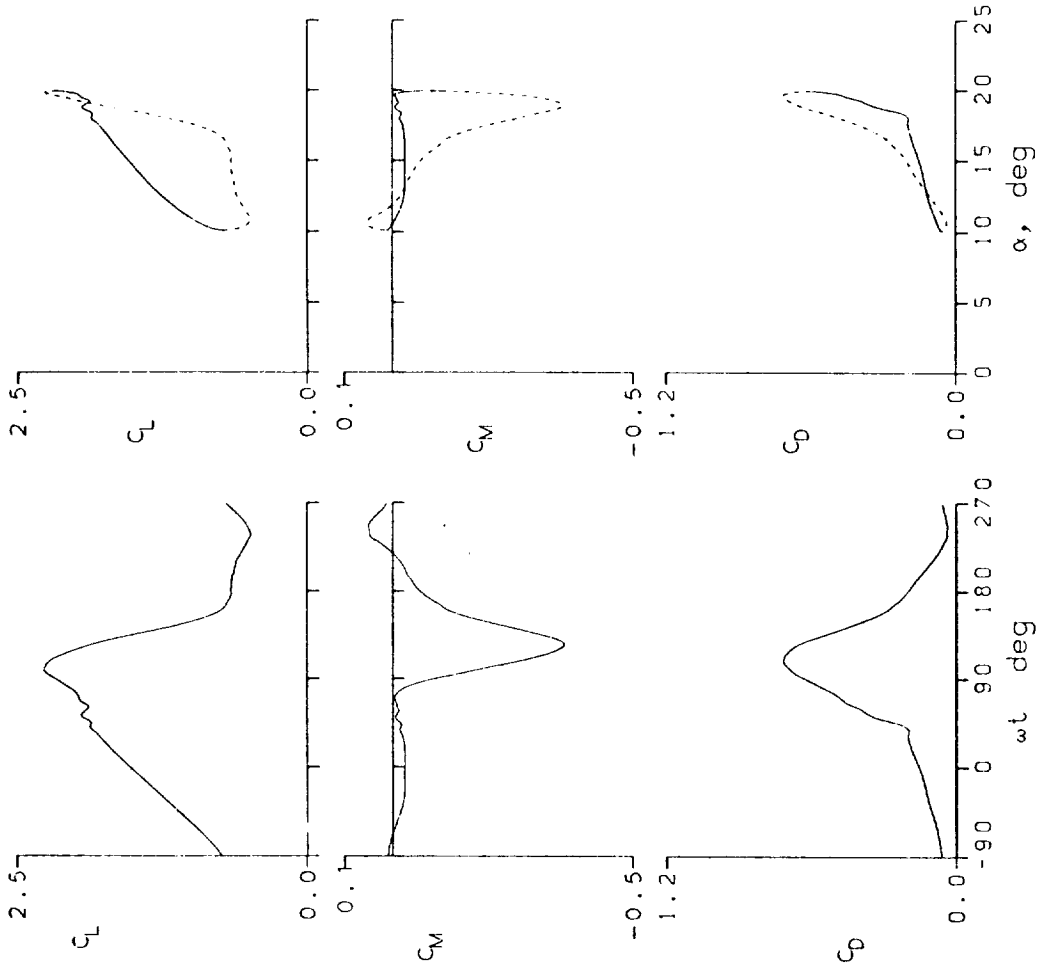


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62202 A0 = 14.97 ° k = 0.171
 Re = 2.53 E6 A' = 4.89 ° M = 0.199
 C_{Lmax} = 2.25 C_{Mmin} = -0.36 C_{Dmax} = 0.75
 α_{Lmax} = 19.8 ° ζ = -0.424 M_{max} = 0.841
 α_{Cmin} = 14.8 ° -C_{Pmax} = 12.7 α_{Mmax} = 17.7 °

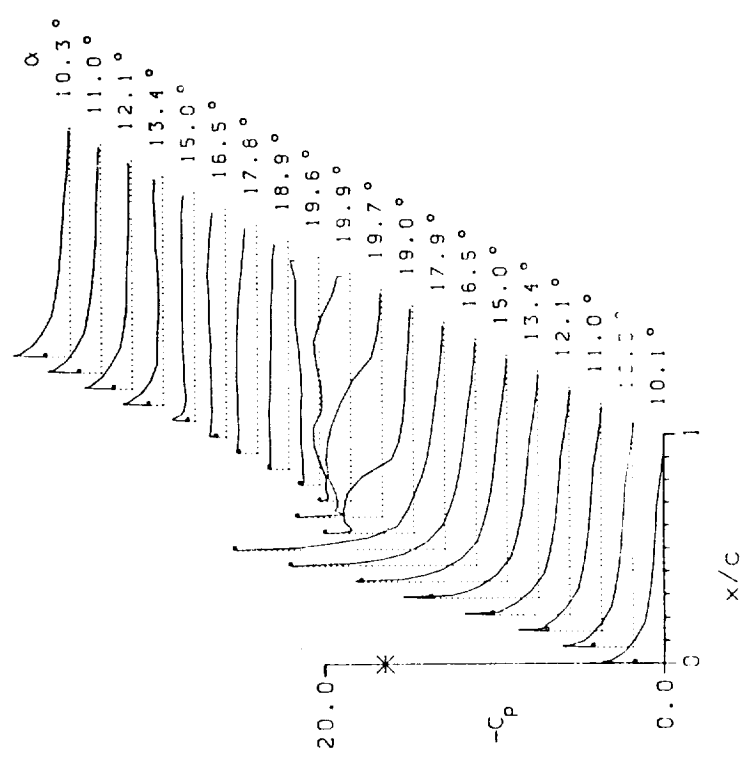
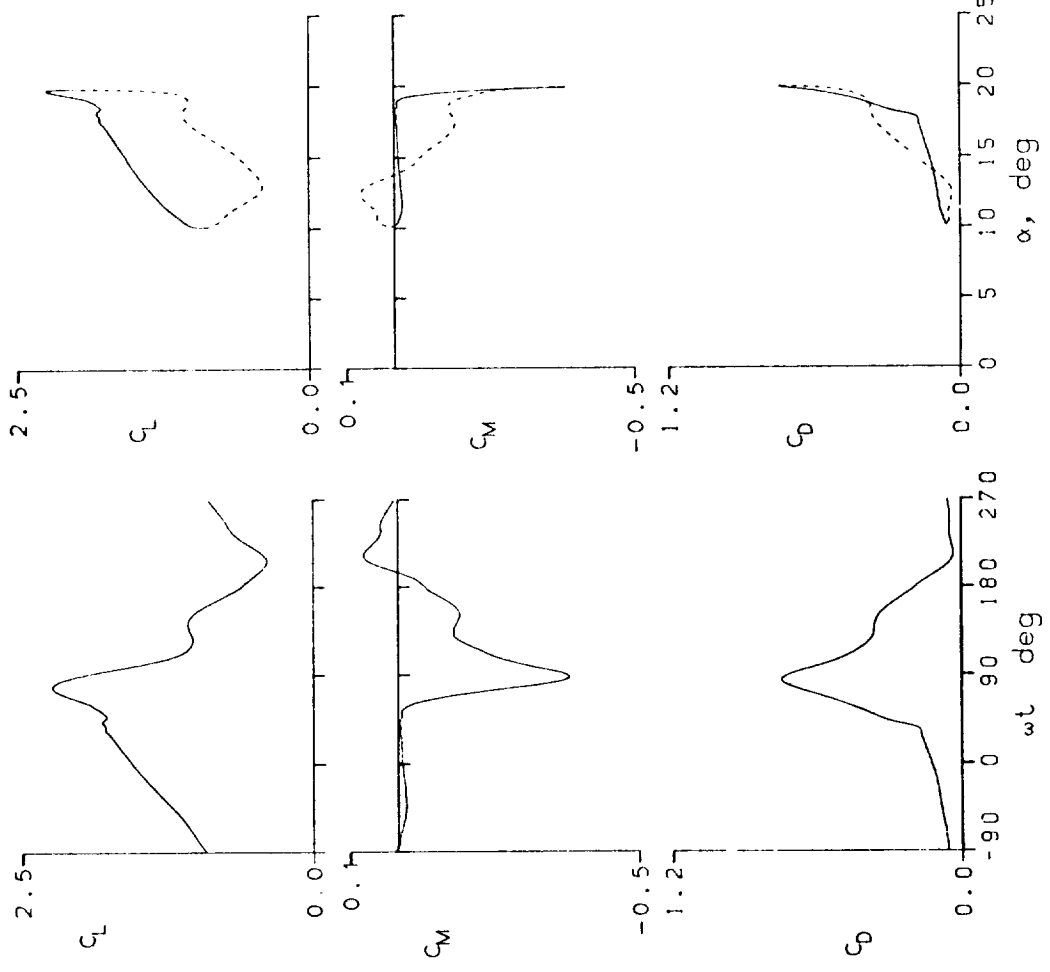


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62208 A0 = 14.78° k = 0.097
 Re = 2.78 E6 A1 = 9.89° M = 0.220
 CLmax = 2.33 CMmin = -0.38 CDmax = 0.84
 α Lmax = 20.7° ξ = 0.514 Mmax = 0.860
 α Cmin = 14.3° -CDmax = 11.7 α Mmax = 16.4°

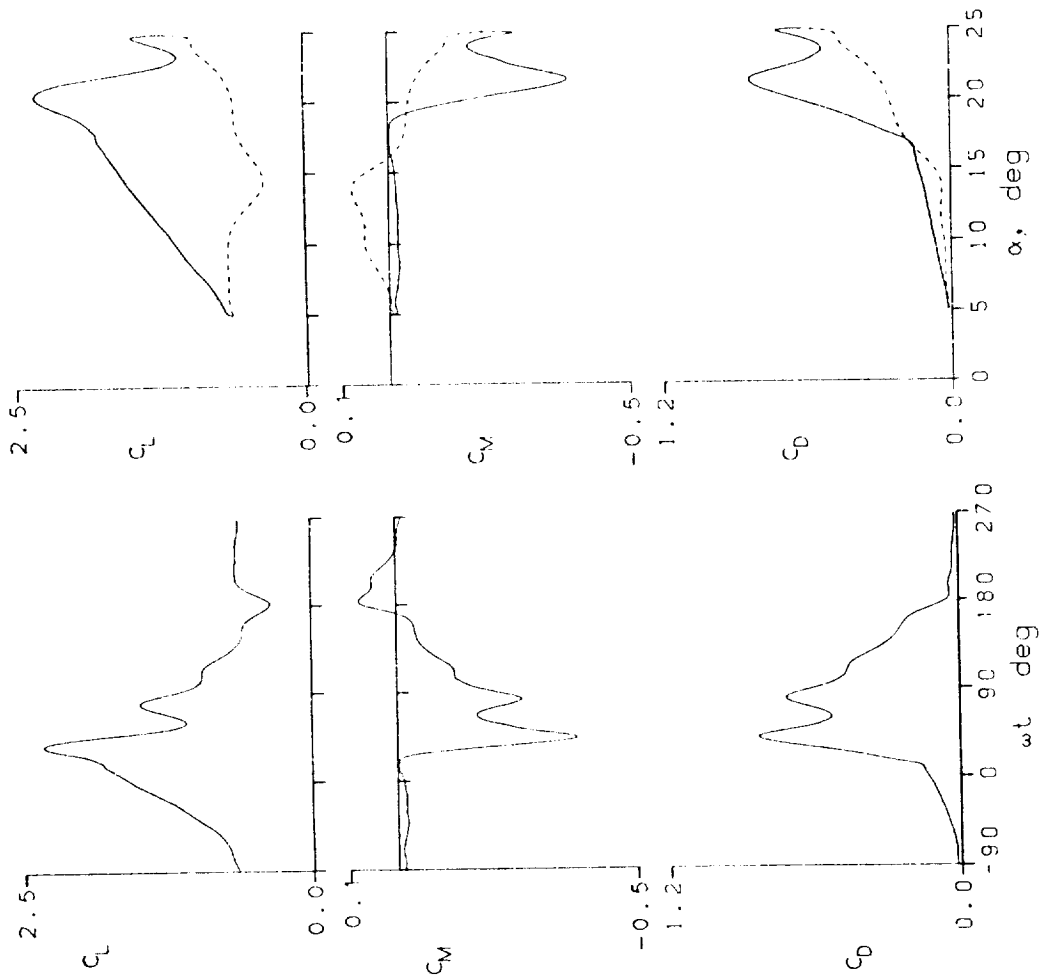


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62210 A0 = 14.78° k = 0.097
 Re = 3.11 E6 A1 = 9.90° M = 0.250
 CLmax = 2.20 CMmin = -0.37 CDmax = 0.77
 αLmax = 20.0° ξ = 0.615 Mmax = 1.010
 αCMmin = 14.3° -CPmax = 10.4 αMmax = 15.5°

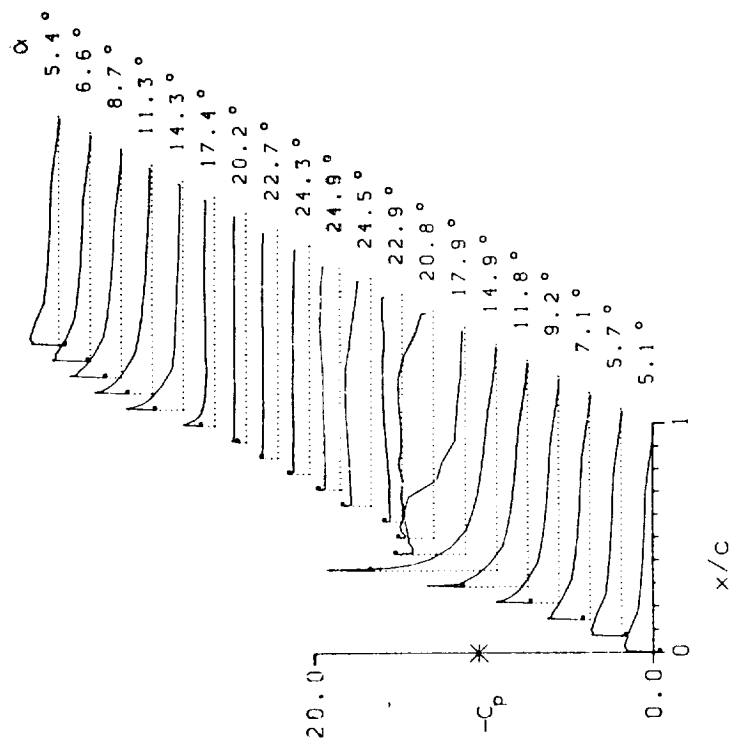
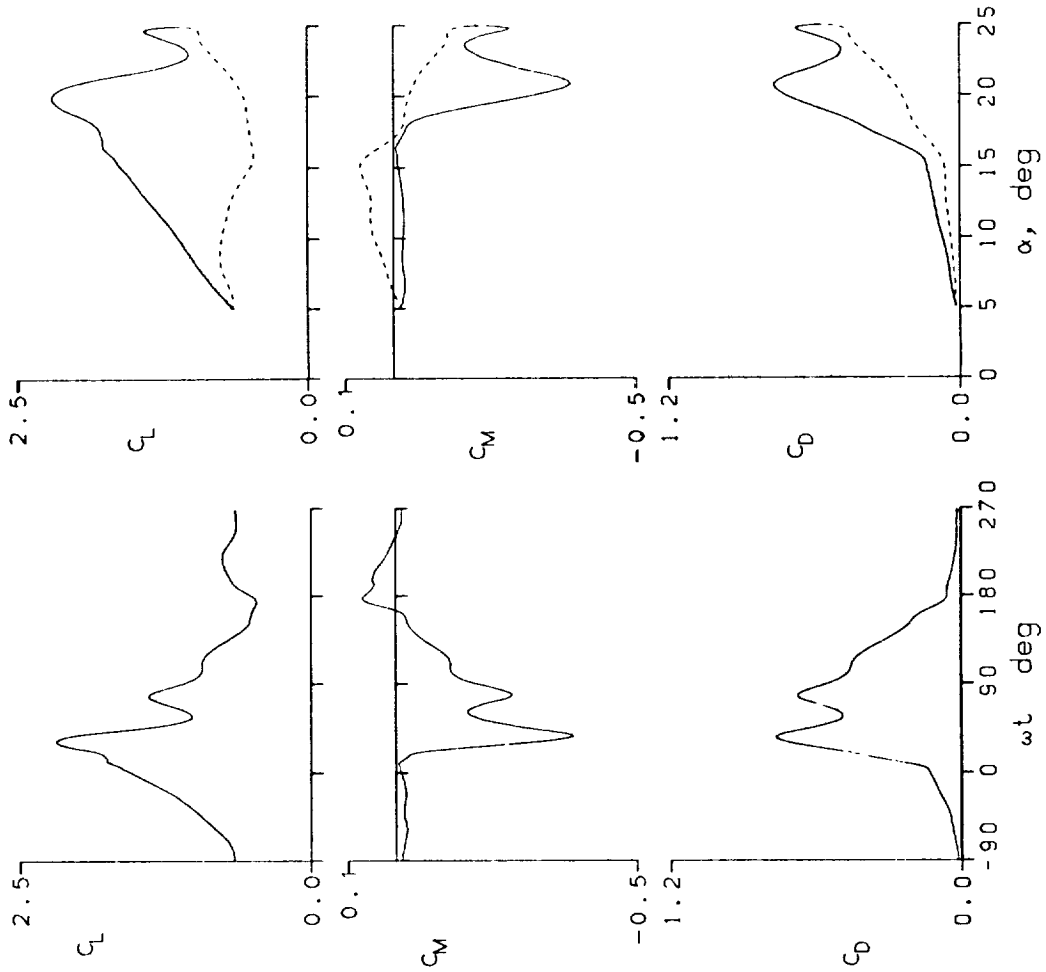


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 62218	A0 = 14.78 °	k = 0.097
Re = 3.44 E6	A1 = 9.90 °	M = 0.280
C _{Lmax} = 2.04	C _{Mmin} = -0.34	C _{Dmax} = 0.68
α _{Lmax} = 19.4 °	ξ = 0.646	M _{max} = 1.117
α _{Cmin} = 14.3 °	-C _{pmax} = 9.4	α _{Mmax} = 14.6 °

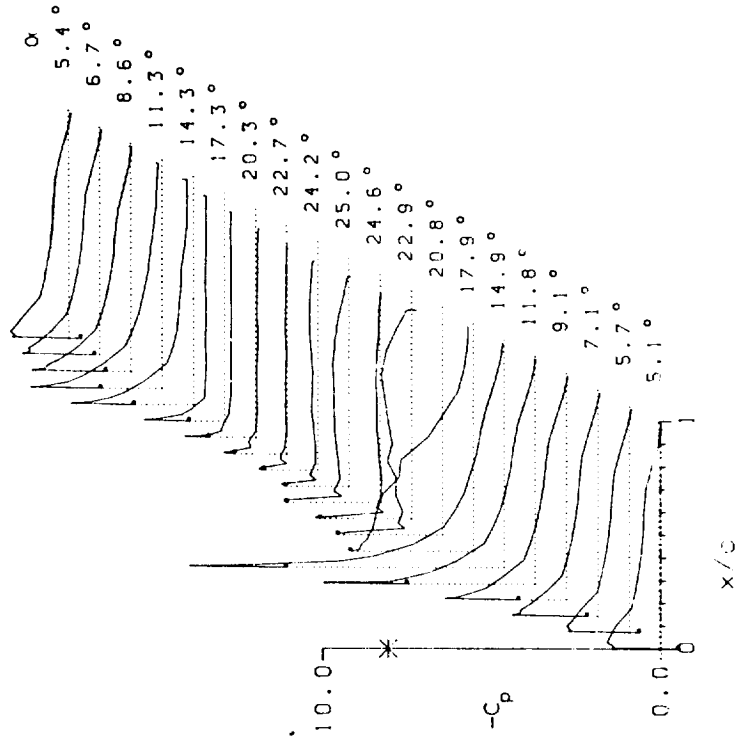
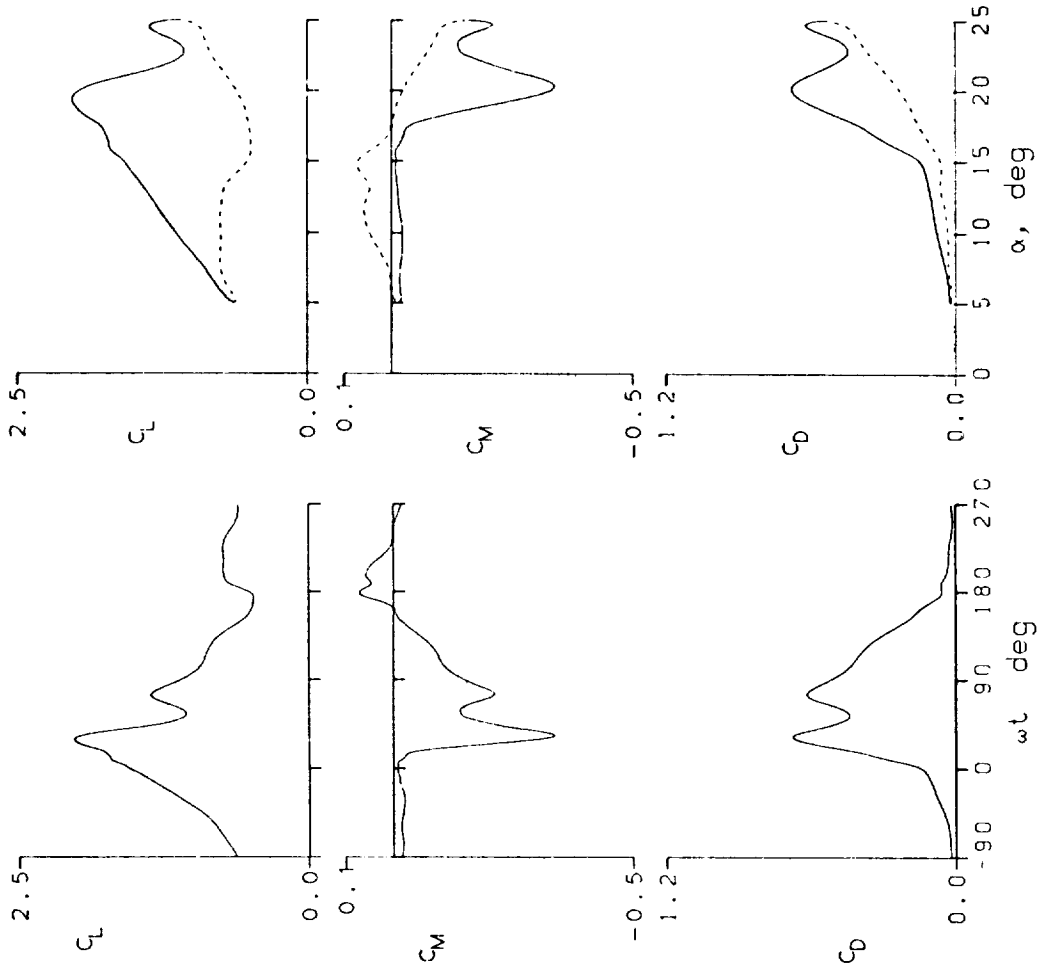


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62302 $A0 = 14.78^\circ$ $k = 0.025$
 $Re = 3.86 E6$ $A1 = 9.90^\circ$ $M = 0.295$
 $C_{Lmax} = 1.51$ $C_{Mmin} = -0.14$ $C_{Dmax} = 0.46$
 $\alpha_{Lmax} = 14.7^\circ$ $\xi = 0.161$ $M_{max} = 1.165$
 $\alpha_{Cmin} = 14.2^\circ$ $-C_{Pmax} = 8.9$ $\alpha_{Mmax} = 13.0^\circ$

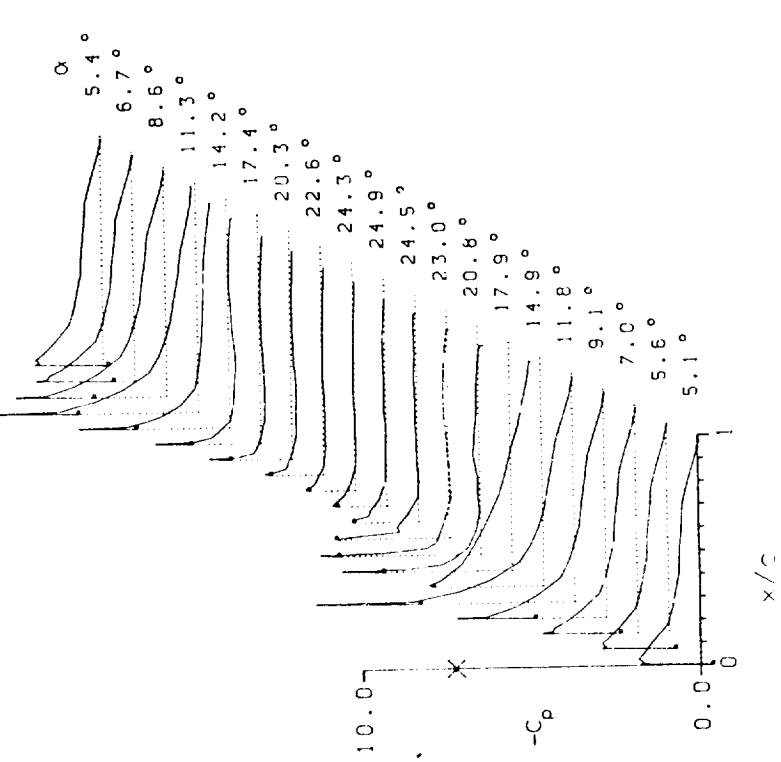
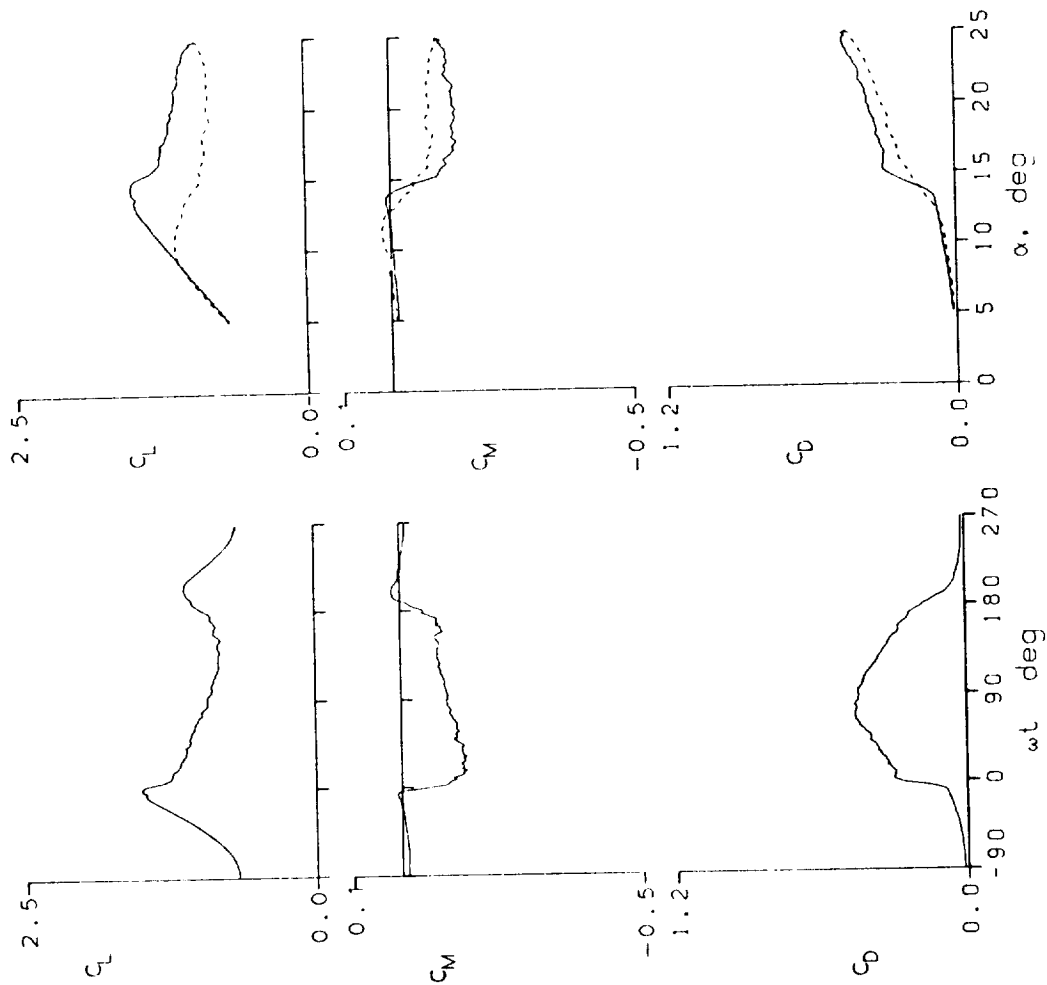


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62304 A0 = 14.78° k = 0.050
 Re = 3.82 E6 A1 = 9.90° M = 0.294
 C_{Lmax} = 1.71 C_{Mmin} = -0.15 C_{Dmax} = 0.46
 α_{Lmax} = 16.1° ζ = 0.256 M_{max} = 1.169
 α_{Cmin} = 14.3° -C_{Dmax} = 9.0 α_{Mmax} = 13.6°

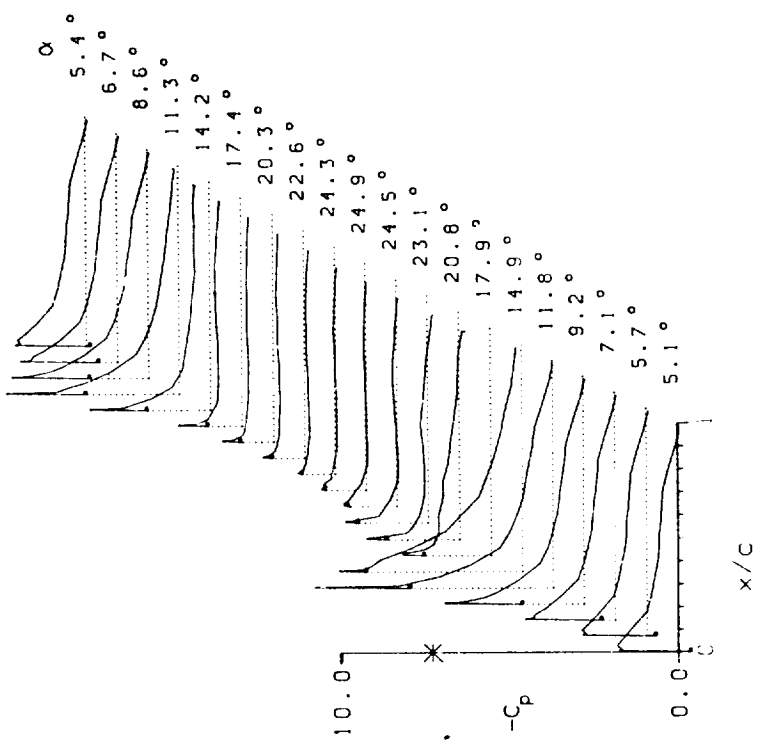
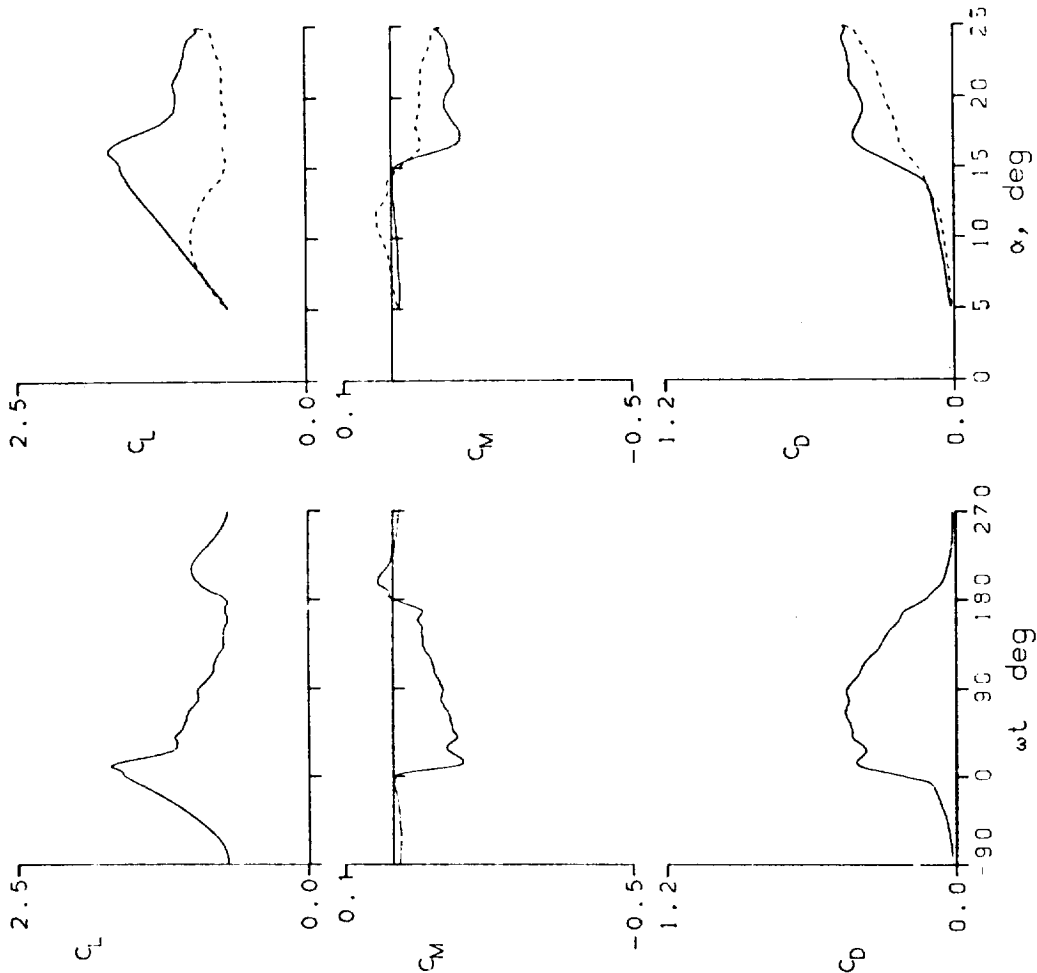


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRATE : 52307 $A_0 = 14.78^\circ$ $k = 0.099$
 $Re = 3.2 \times 10^6$ $A_1 = 9.90^\circ$ $M = 0.294$
 $C_{Lmax} = 2.07$ $C_{Mmin} = -0.32$ $C_{Dmax} = 0.68$
 $\alpha_{Lmax} = 19.1^\circ$ $\xi = 0.633$ $M_{max} = 1.181$
 $\alpha_{C_{Lmin}} = 14.4^\circ$ $-C_{Pmax} = 9.1$ $\alpha_{Mmax} = 14.4^\circ$

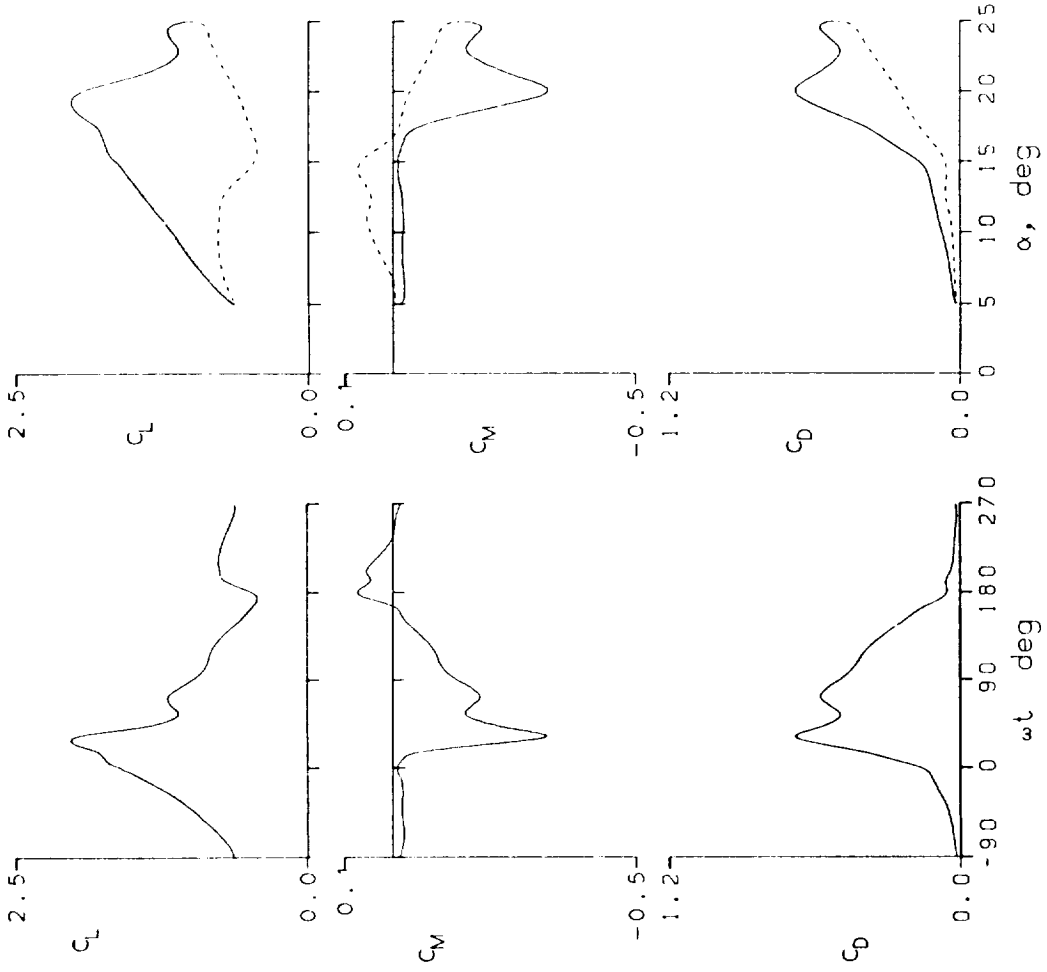


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 52309	A0 = 14.87 °	k = 0.152
Re = 3.70 E6	A1 = 9.89 °	M = 0.287
$C_{Lmax} = 2.24$	$C_{Mmin} = -0.44$	$C_{Dmax} = 0.90$
$\alpha_{Lmax} = 21.8 °$	$\zeta = 0.608$	$M_{max} = 1.160$
$\alpha_{Cmin} = 14.5 °$	$-C_{Pmax} = 9.4$	$\alpha_{Mmax} = 15.3 °$

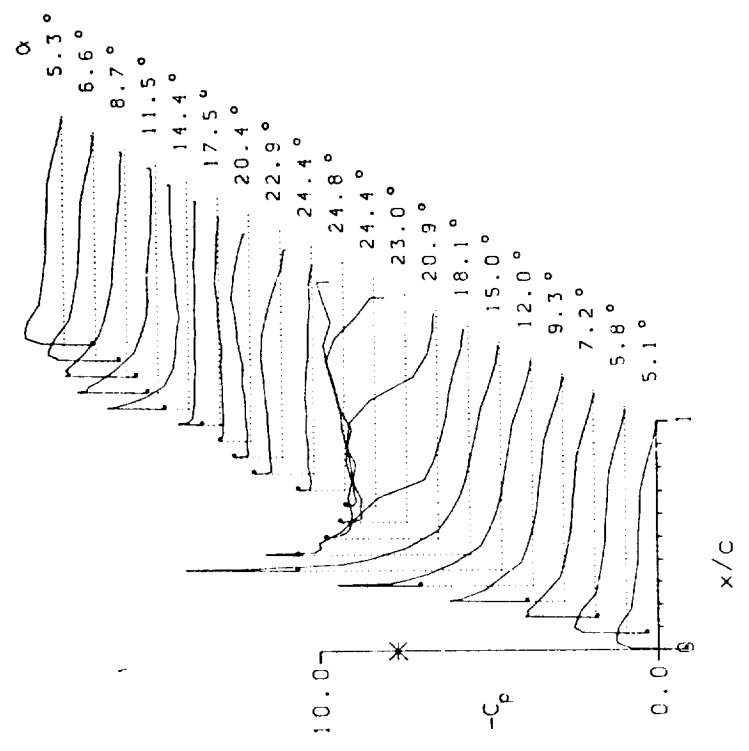
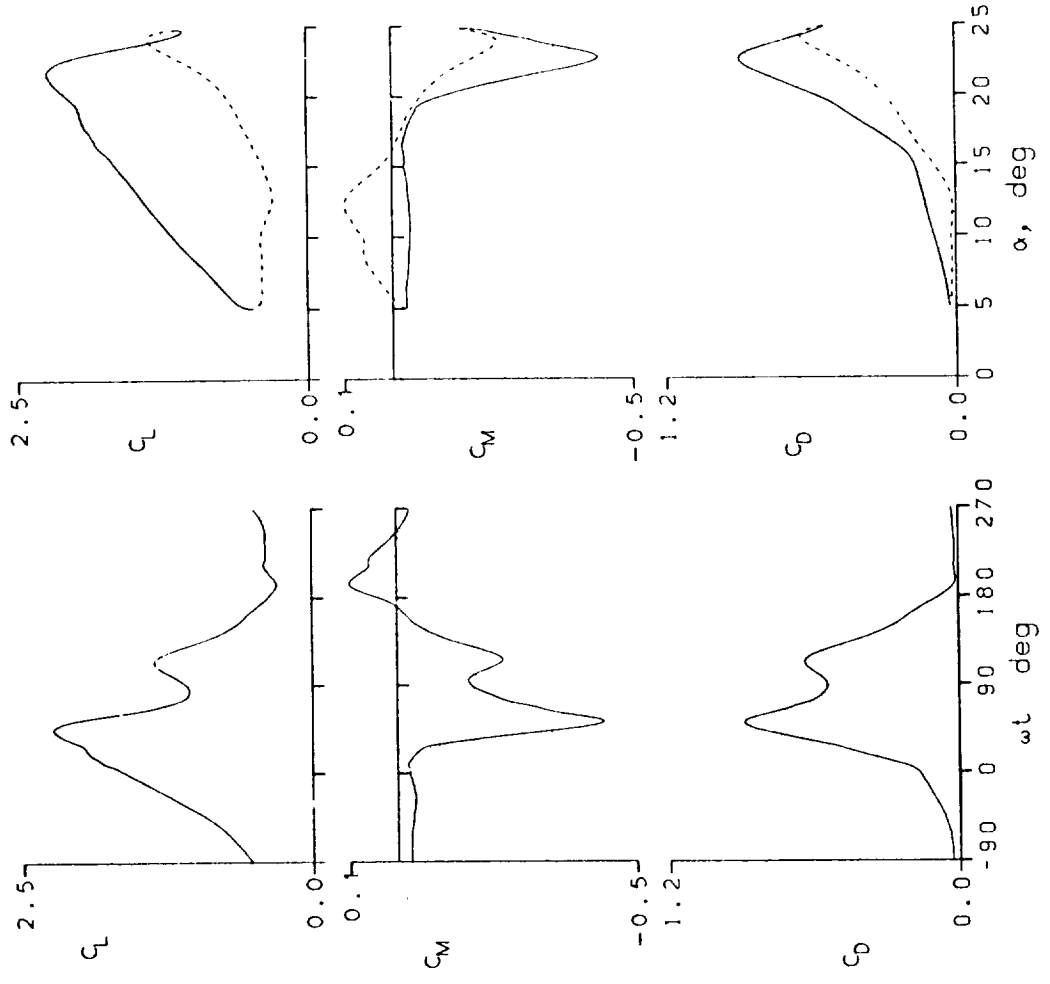


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62317 $\Lambda_0 = 9.84^\circ$ $k = 0.010$
 $Re = 3.73 E6$ $A1 = 9.90^\circ$ $M = 0.301$
 $C_{Lmax} = 1.40$ $C_{Mmin} = -0.11$ $\alpha_{Dmax} = 0.31$
 $\alpha_{Lmax} = 13.3^\circ$ $\xi = 0.043$ $Mmax = 1.148$
 $\alpha_{Cmin} = 9.4^\circ$ $-C_{Pmax} = 8.4$ $\alpha_{Mmax} = 13.0^\circ$

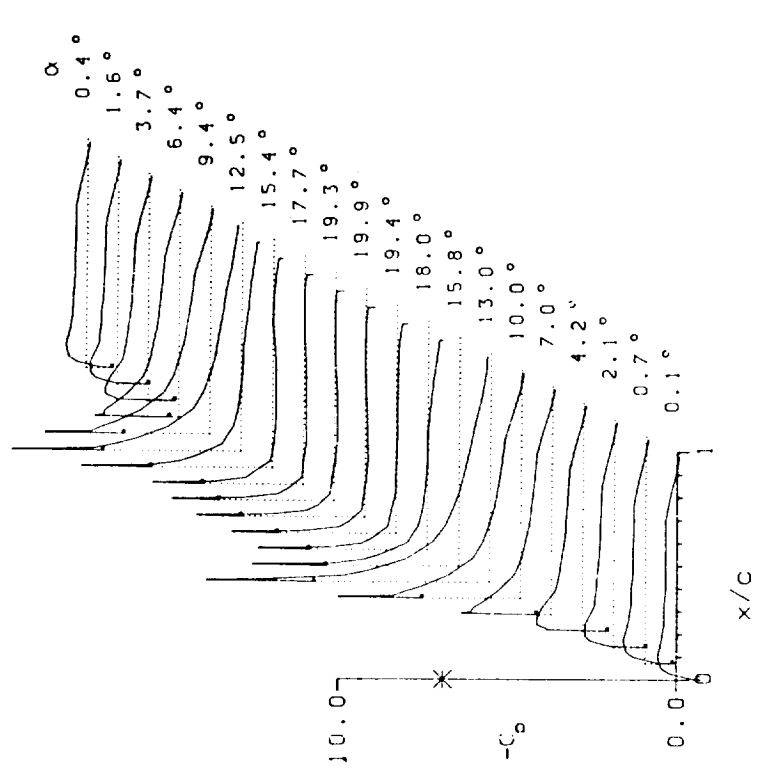
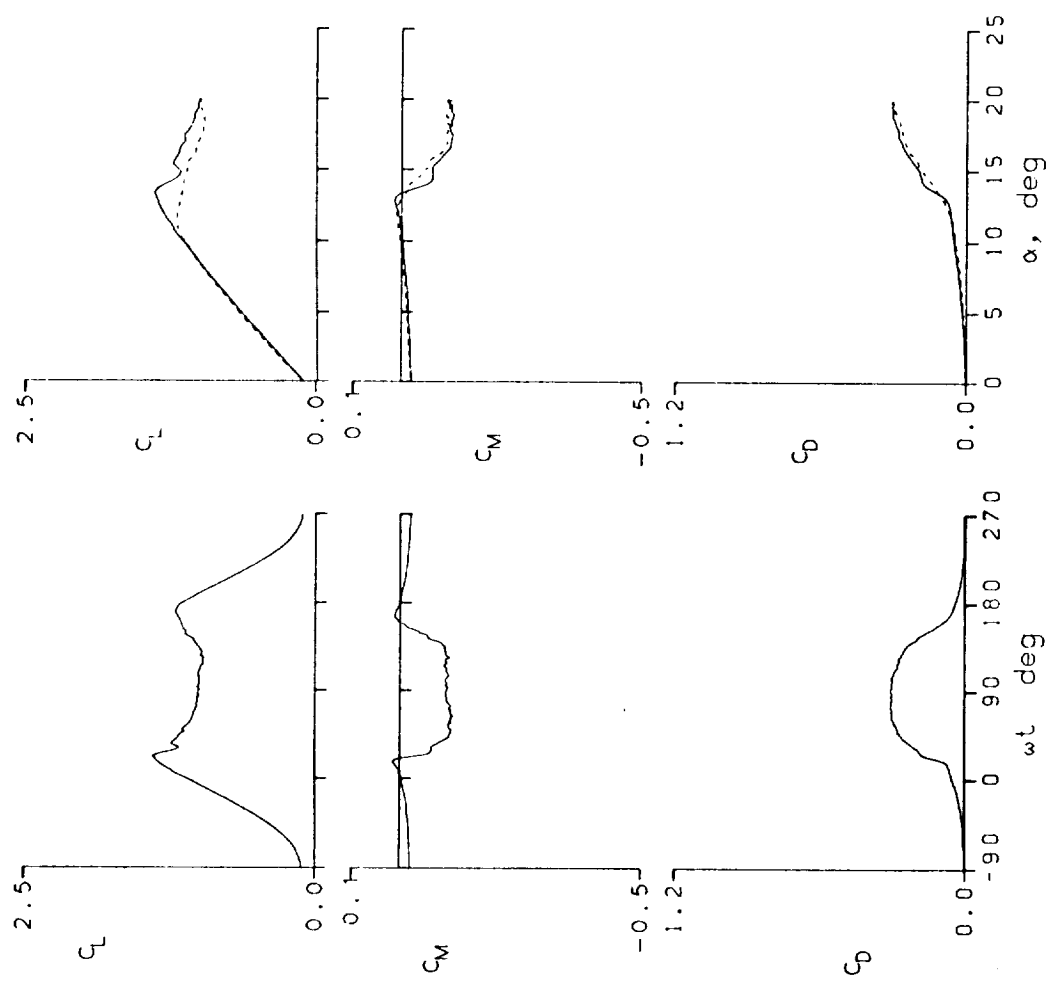


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62320 A0 = 9.83° k = 0.024
 Re = 3.70 E6 A1 = 9.90° M = 0.302
 $C_{Lmax} = 1.51$ $C_{Mmin} = -0.14$ $C_{Dmax} = 0.33$
 $\alpha_{Lmax} = 14.5^\circ$ $\zeta = 0.094$ $M_{max} = 1.163$
 $\alpha_{Cmin} = 9.3^\circ$ $-C_{Pmax} = 8.5$ $\alpha_{Mmax} = 13.0^\circ$

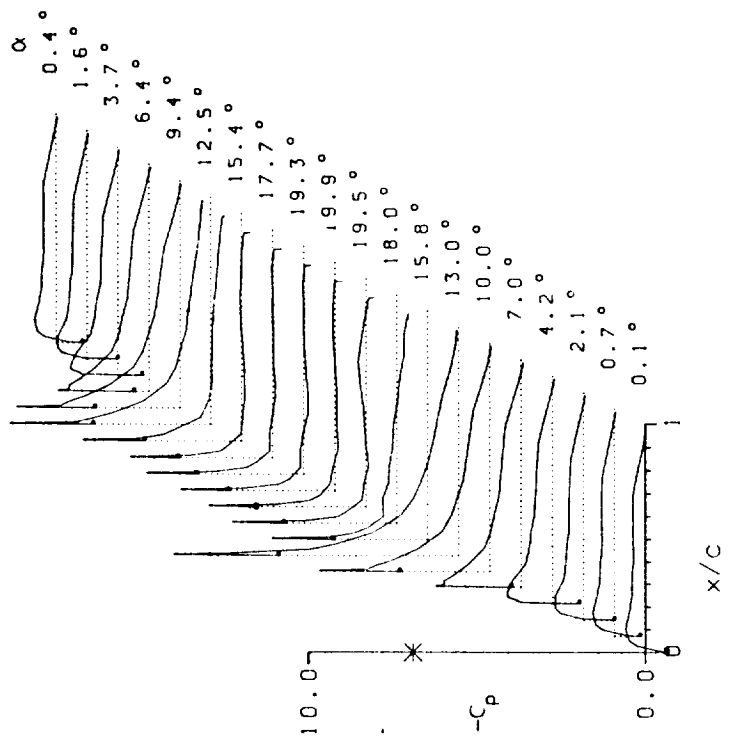
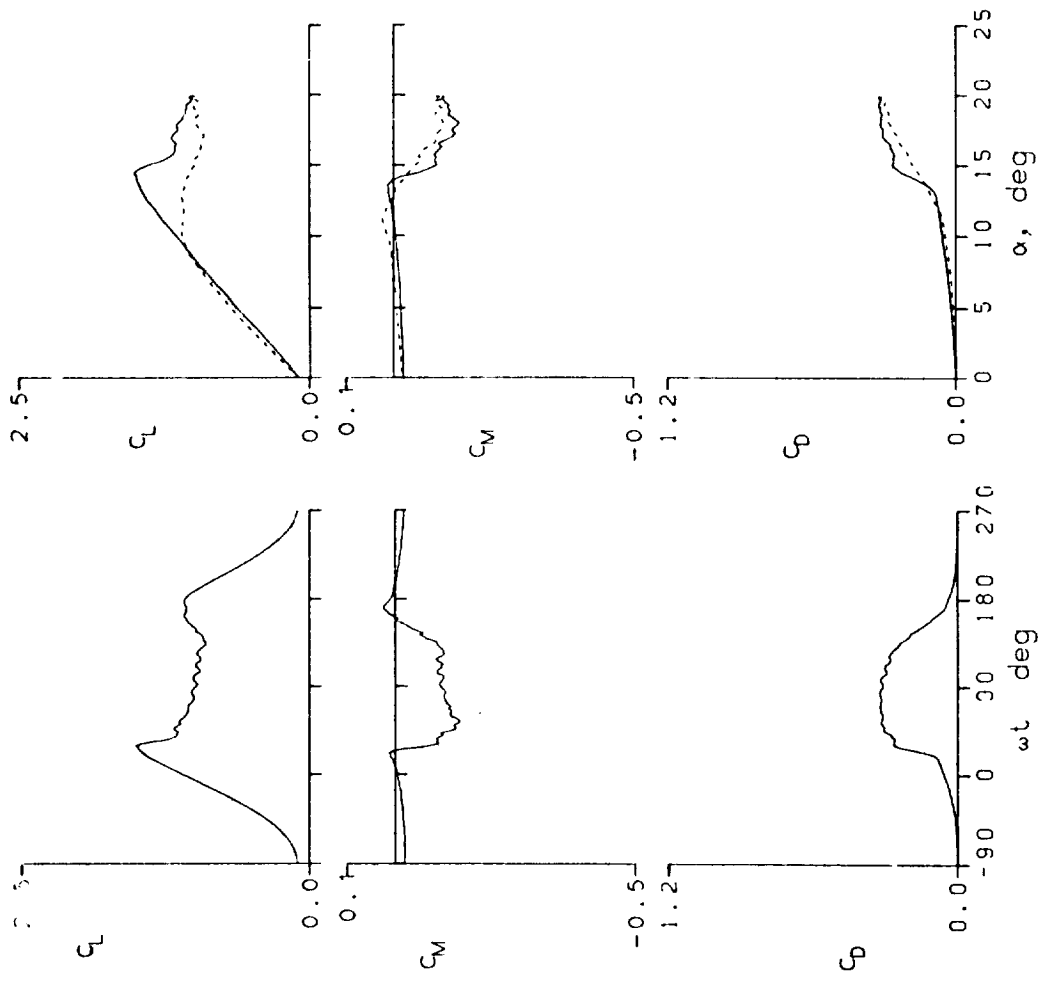


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 52322 A0 = 9.83° k = 0.048
 Re = 3.69 E6 A1 = 9.90° M = 0.301
 CLmax = 1.68 CMmin = -0.17 CDmax = 0.38
 αLmax = 15.6° ζ = 0.194 Mmax = 1.175
 αCMmin = 9.4° -CPmax = 8.6 αMmax = 13.3°

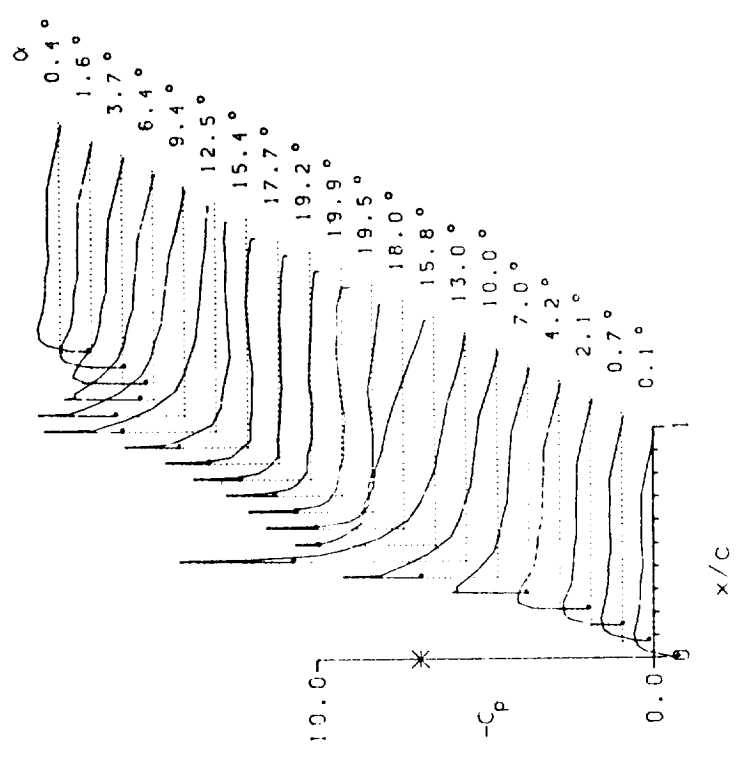
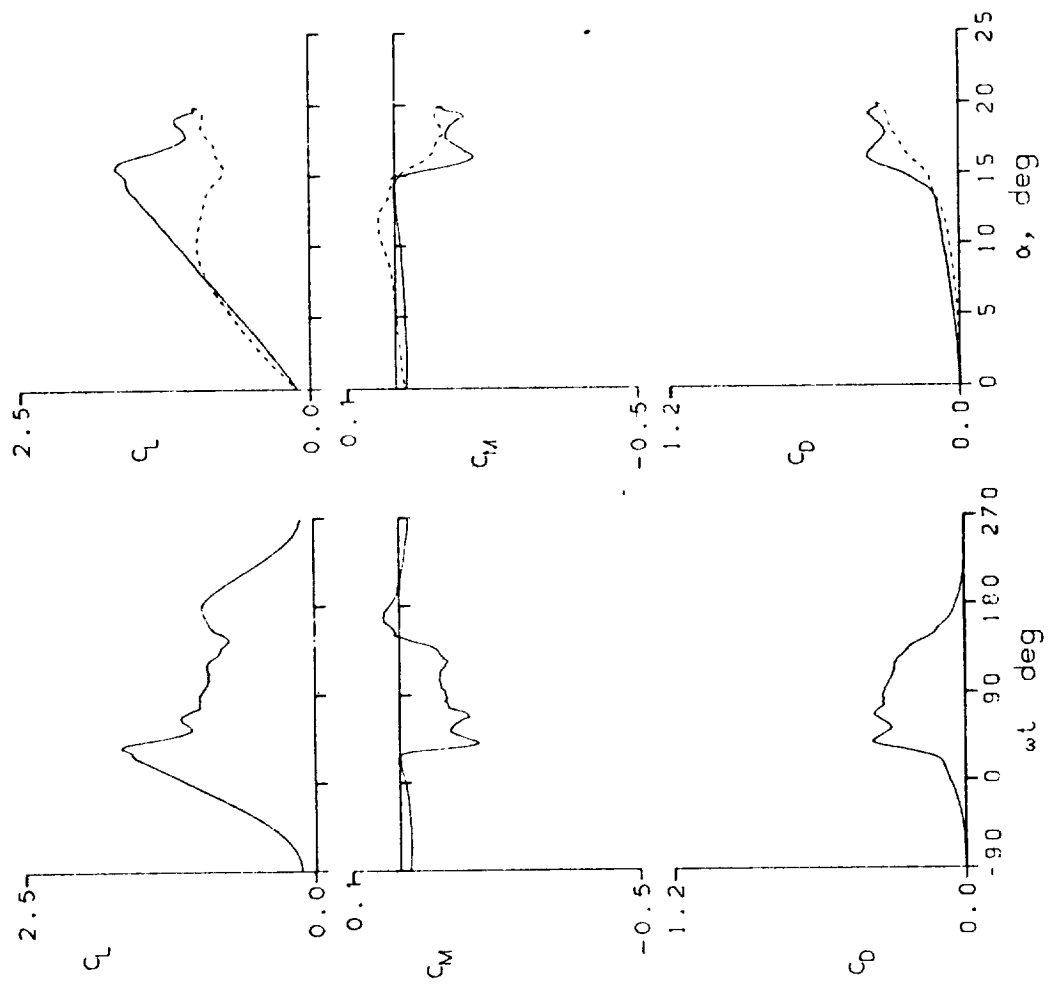


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 62400	A0 = 9.82 °	k = 0.097
Re = 3.69 E6	A1 = 9.89 °	M = 0.302
CLmax = 1.95	CMmin = -0.26	CDmax = 0.55
αLmax = 17.7 °	ζ = 0.342	Mmax = 1.178
αCMln = 9.3 °	-CPmax = 8.5	αMmax = 13.9 °

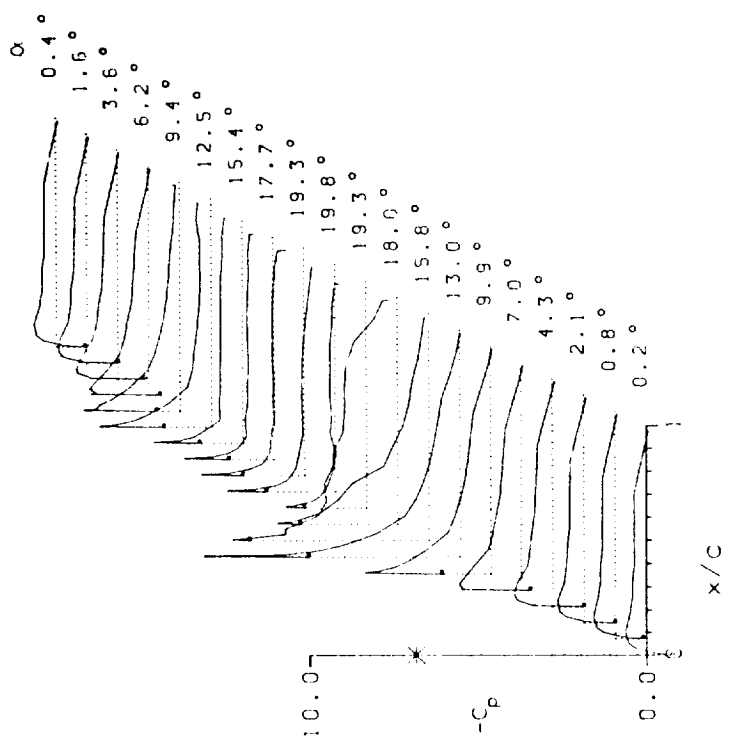
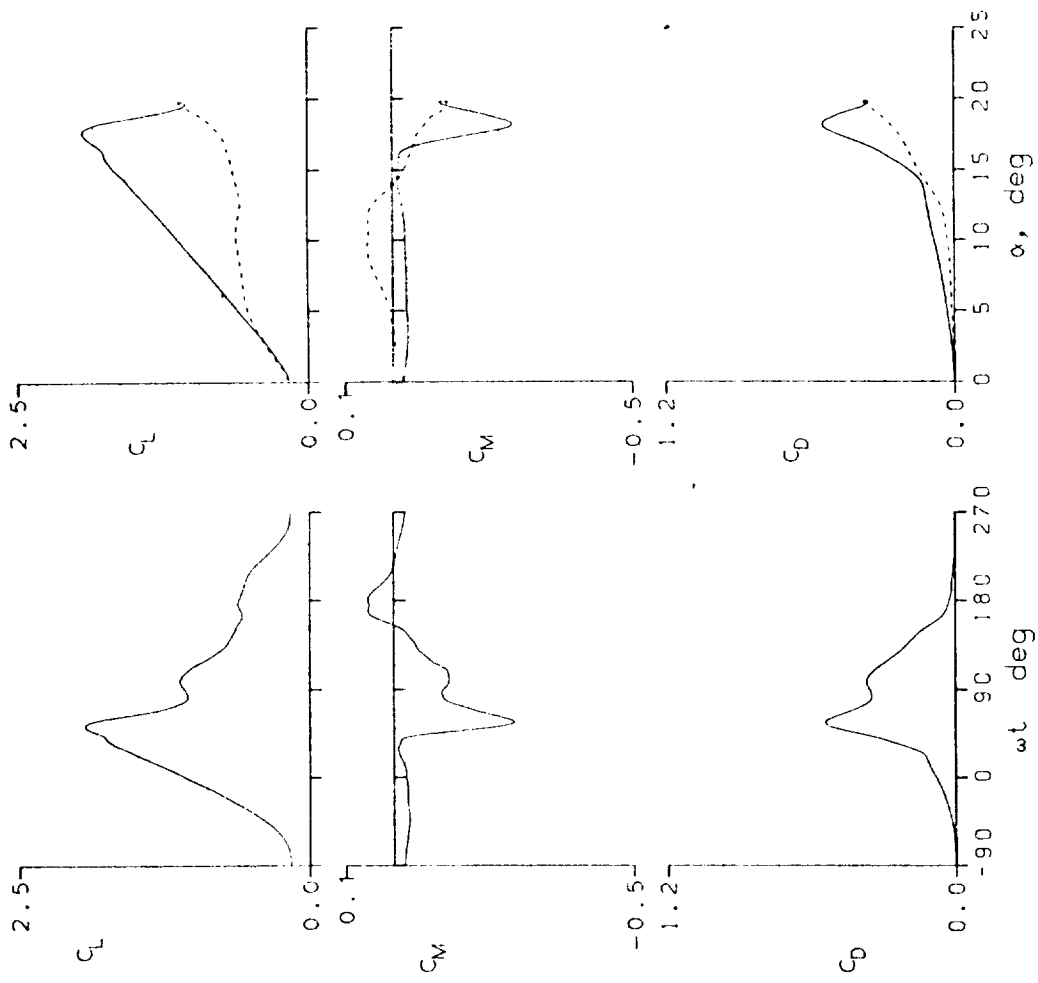


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 52403	A0 = 9.83°	k = 0.116
Re = 3.70 E6	A1 = 9.91°	M = 0.303
CLmax = 2.02	CMmin = -0.30	CDmax = 0.62
α Lmax = 18.5°	ξ = 0.366	Mmax = 1.184
α Cmin = 9.5°	-Cpmax = 8.6	α Mmax = 14.5°

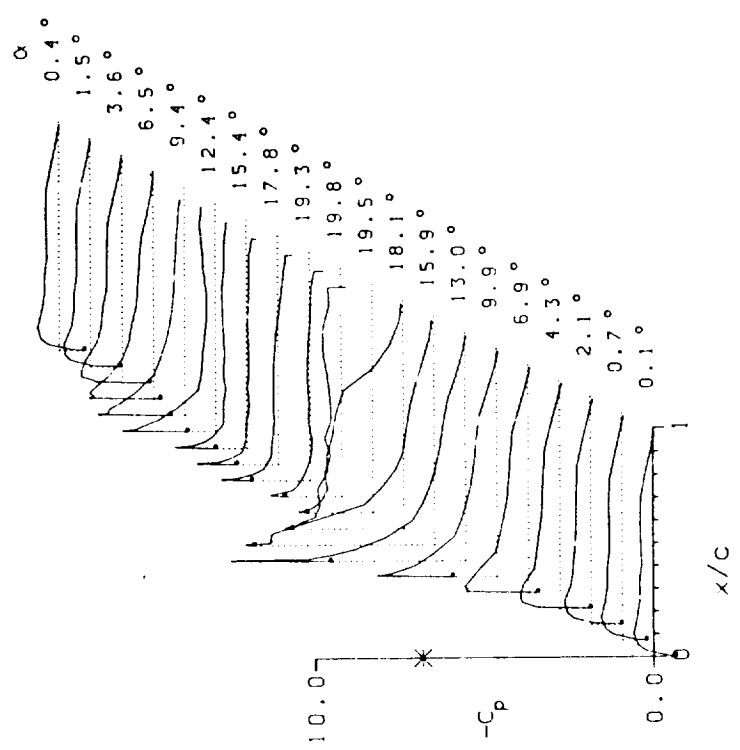
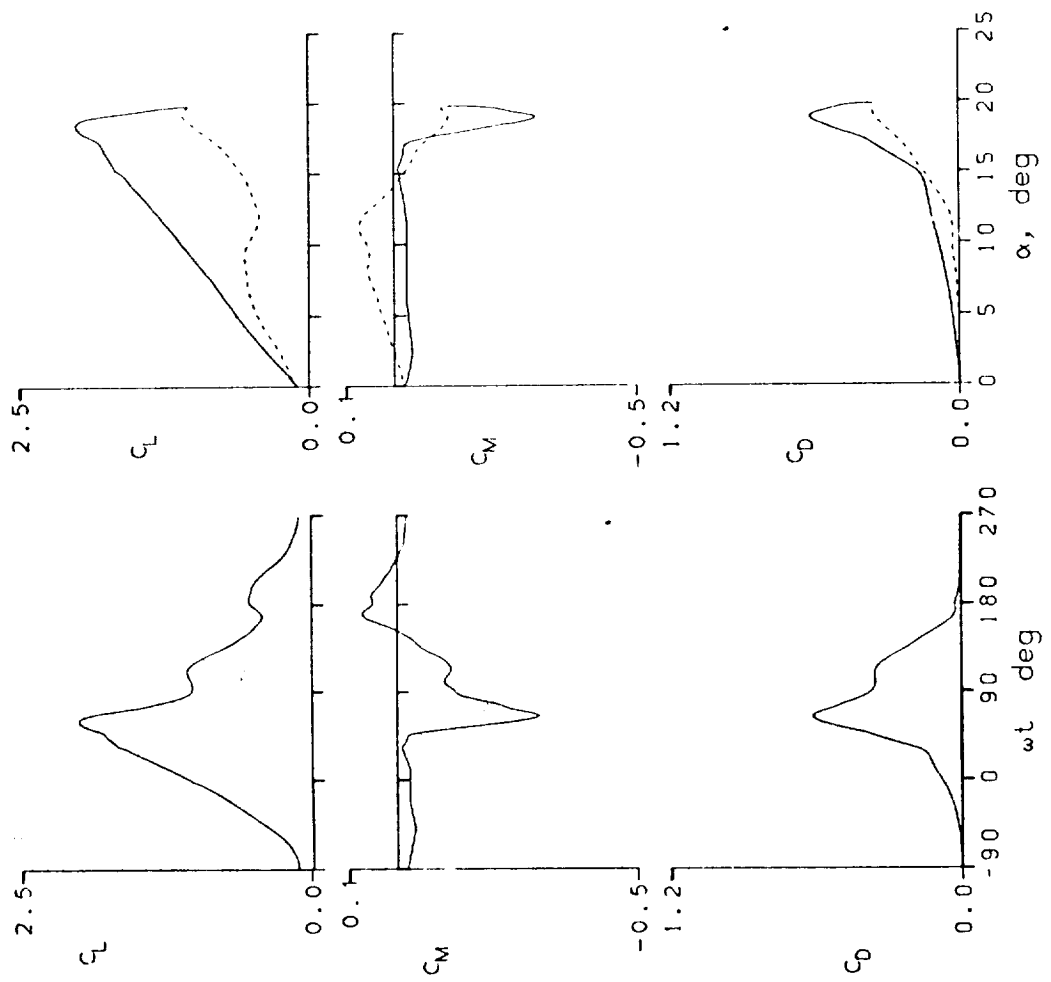


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 62405 A0 = 9.95° k = 0.146
 Re = 3.56 E6 A1 = 9.90° M = 0.300
 CLmax = 1.99 CMmin = -0.29 CDmax = 0.62
 αLmax = 18.9° ζ = 0.353 Mmax = 1.179
 αCmin = 9.7° -CPmax = 8.7 αMmax = 14.7°

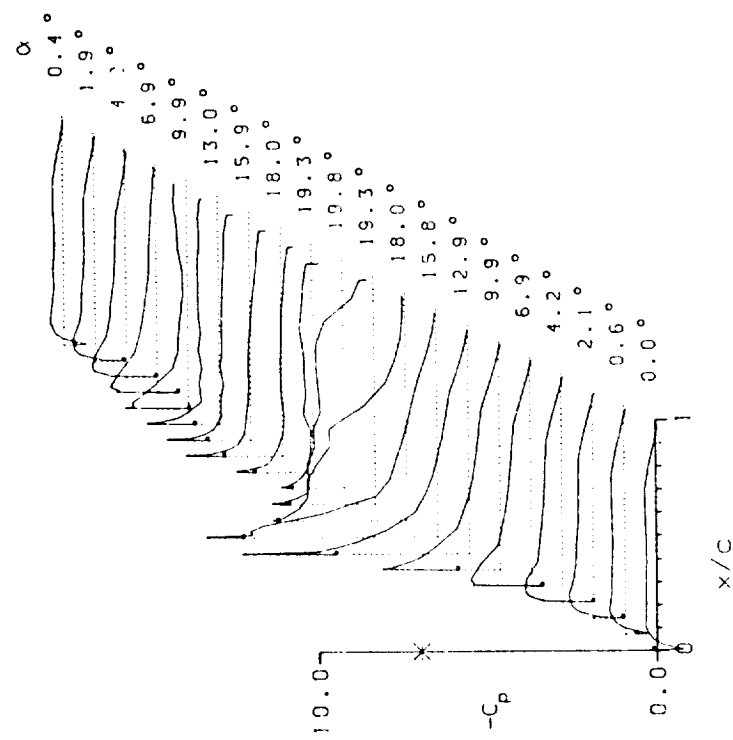
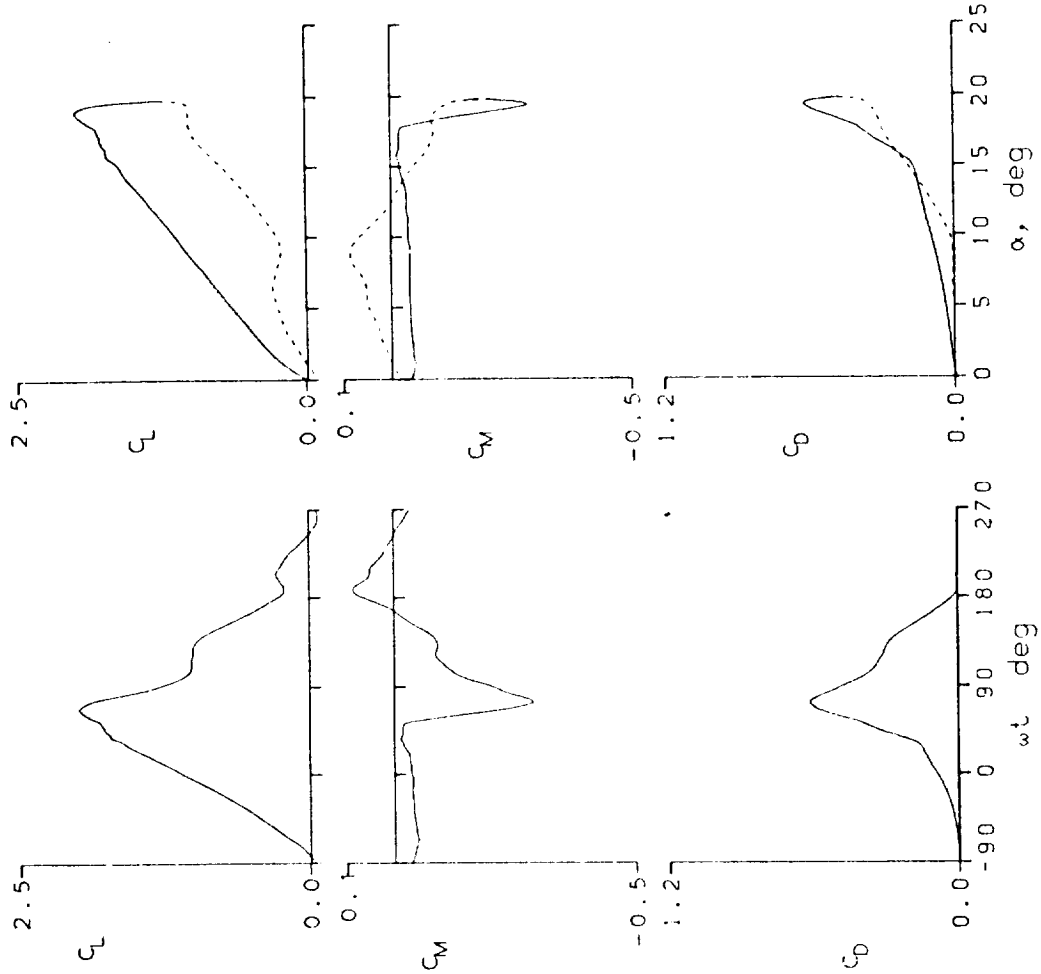


Figure 18.- Continued.

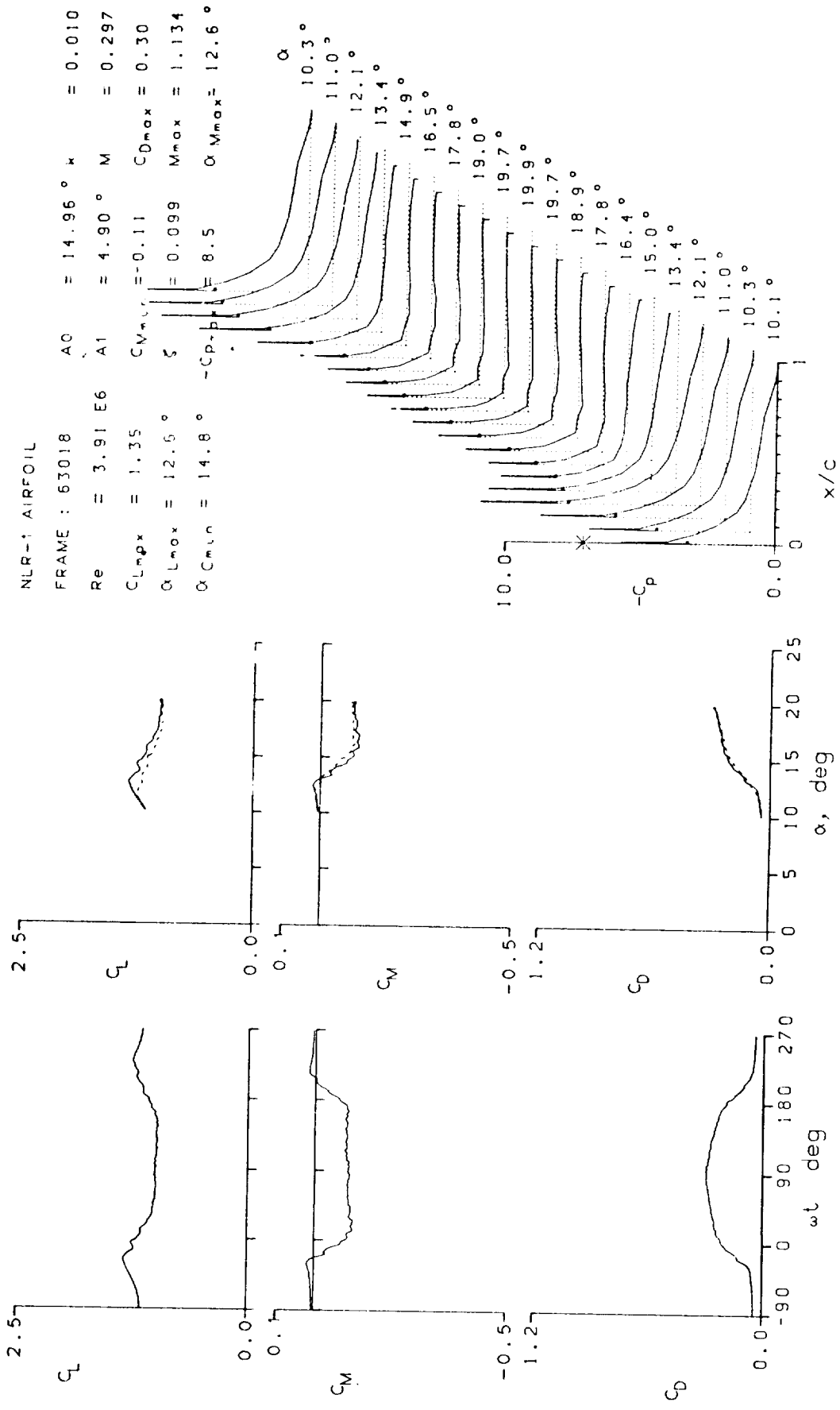


Figure 18.- Continued.

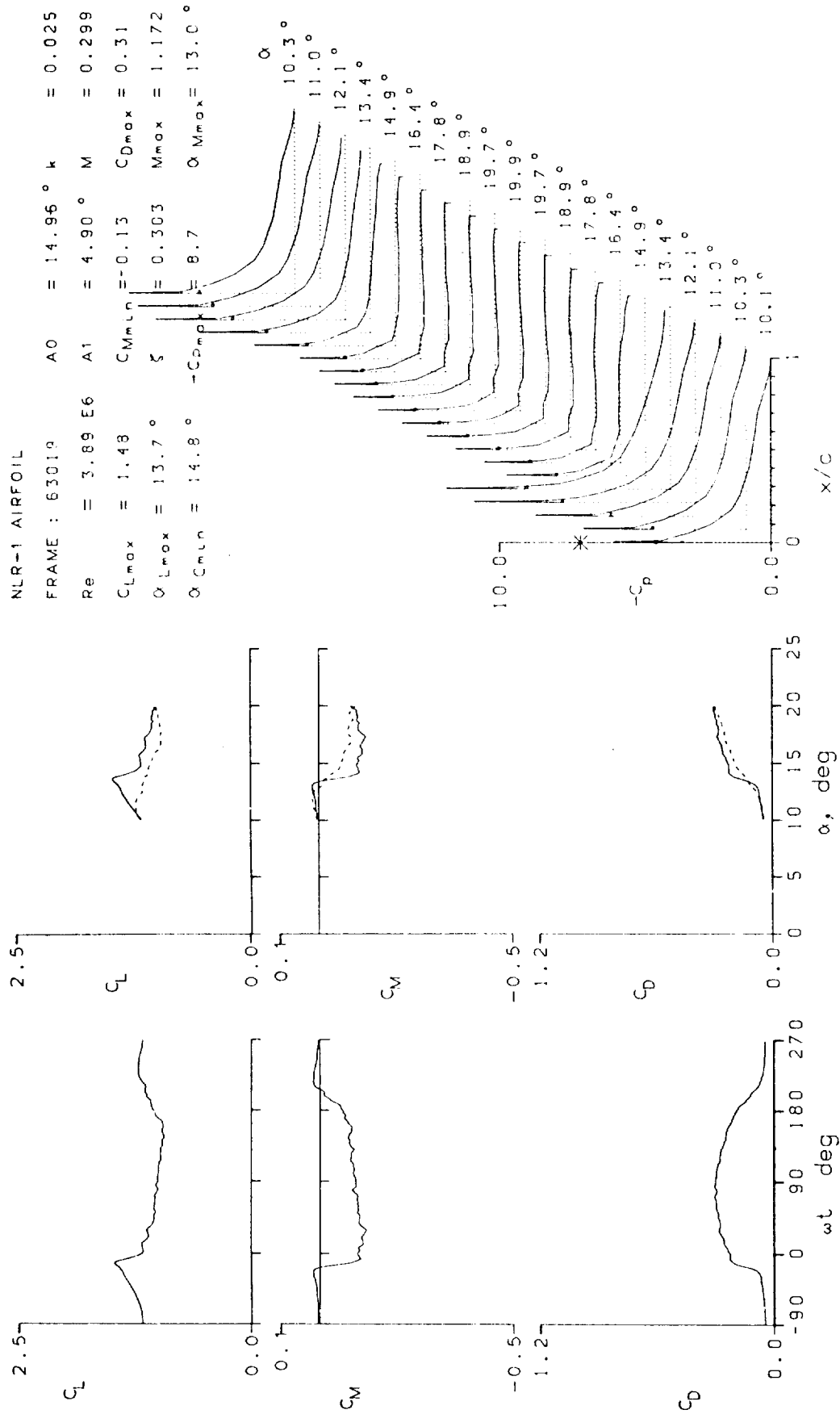


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63020 A0 = 14.96° k = 0.050
 Re = 3.87 E6 A1 = 4.90° M = 0.299
 CLmax = 1.57 CMmin = -0.14 CDmax = 0.33
 α Lmax = 14.5° ξ = 0.440 Vmax = 1.175
 α Cmin = 14.8° -CDmax = 8.8 α Mmax = 13.0°

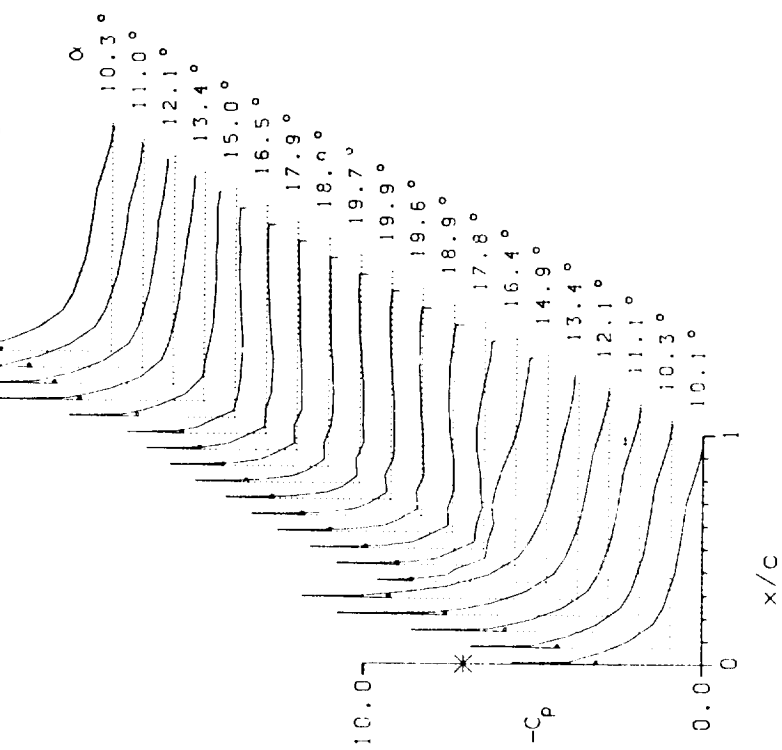
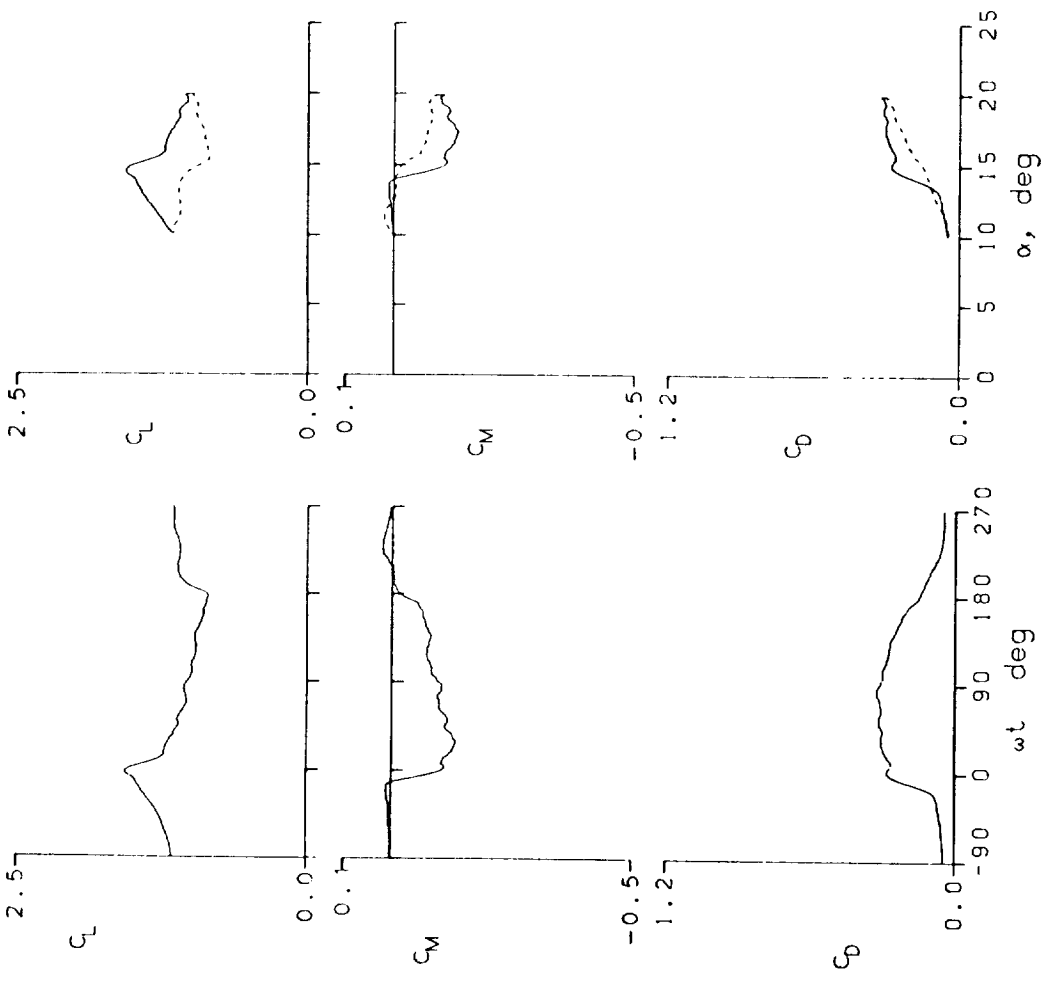


Figure 18.- Continued.

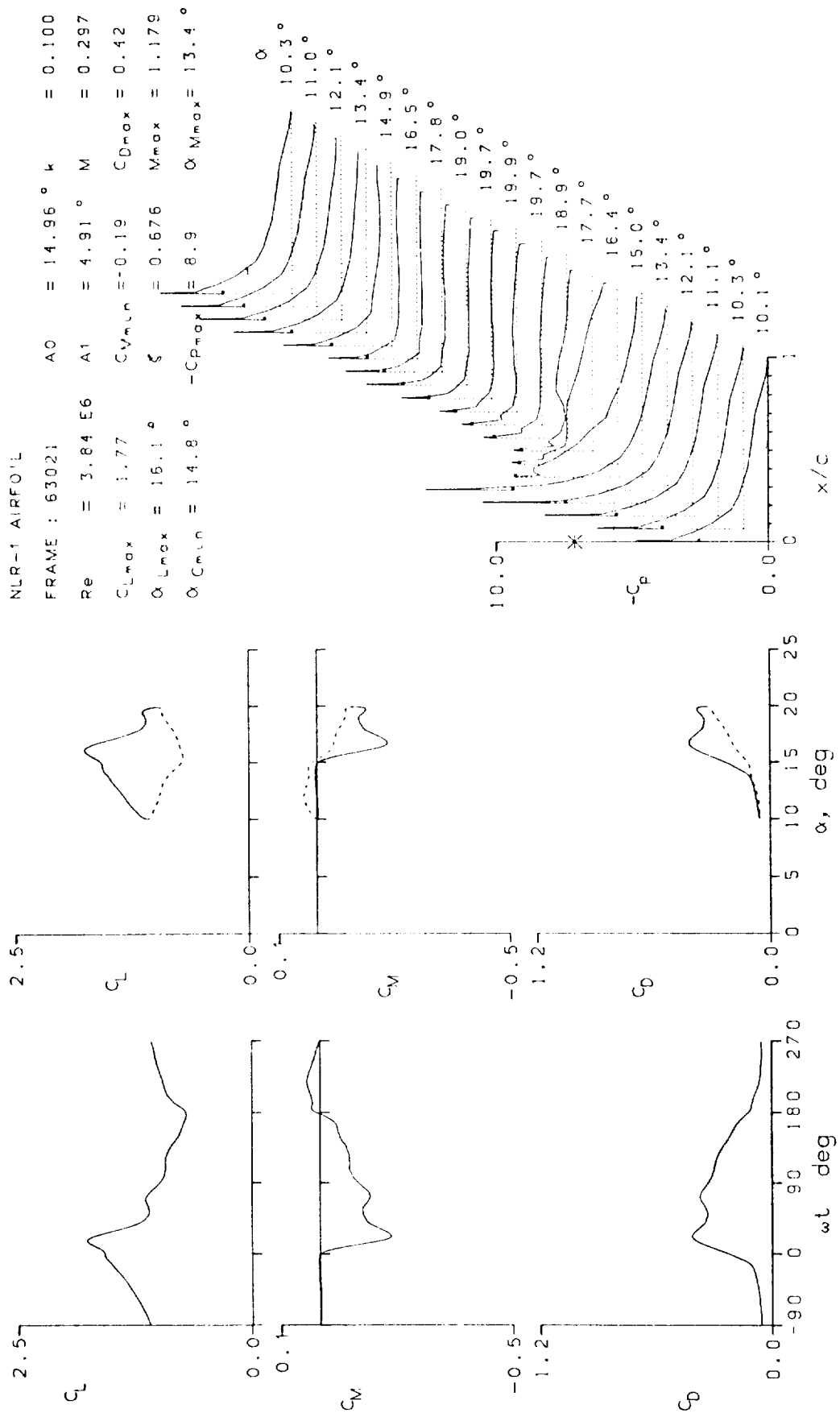


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 63100 A0 = 14.96° k = 0.121

Re = 3.83 E6 A1 = 4.89° M = 0.296

CLmax = 1.80 CMmin = -0.19 CDmax = 0.45

αLmax = 16.6° ζ = 0.643 Mmax = 1.179

αCMmin = 14.9° -CPmax = 9.0 αMmax = 13.7°

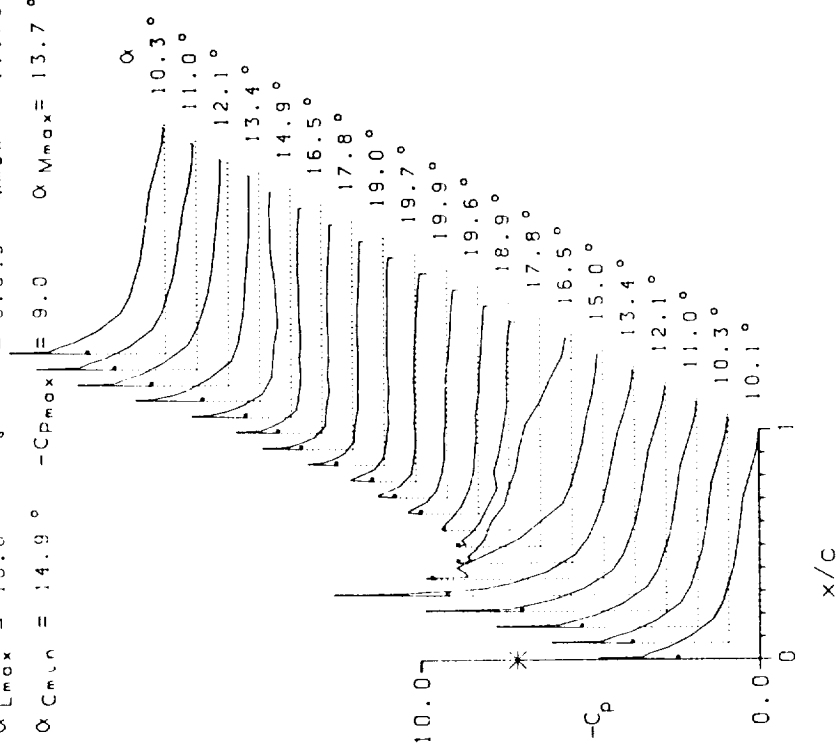
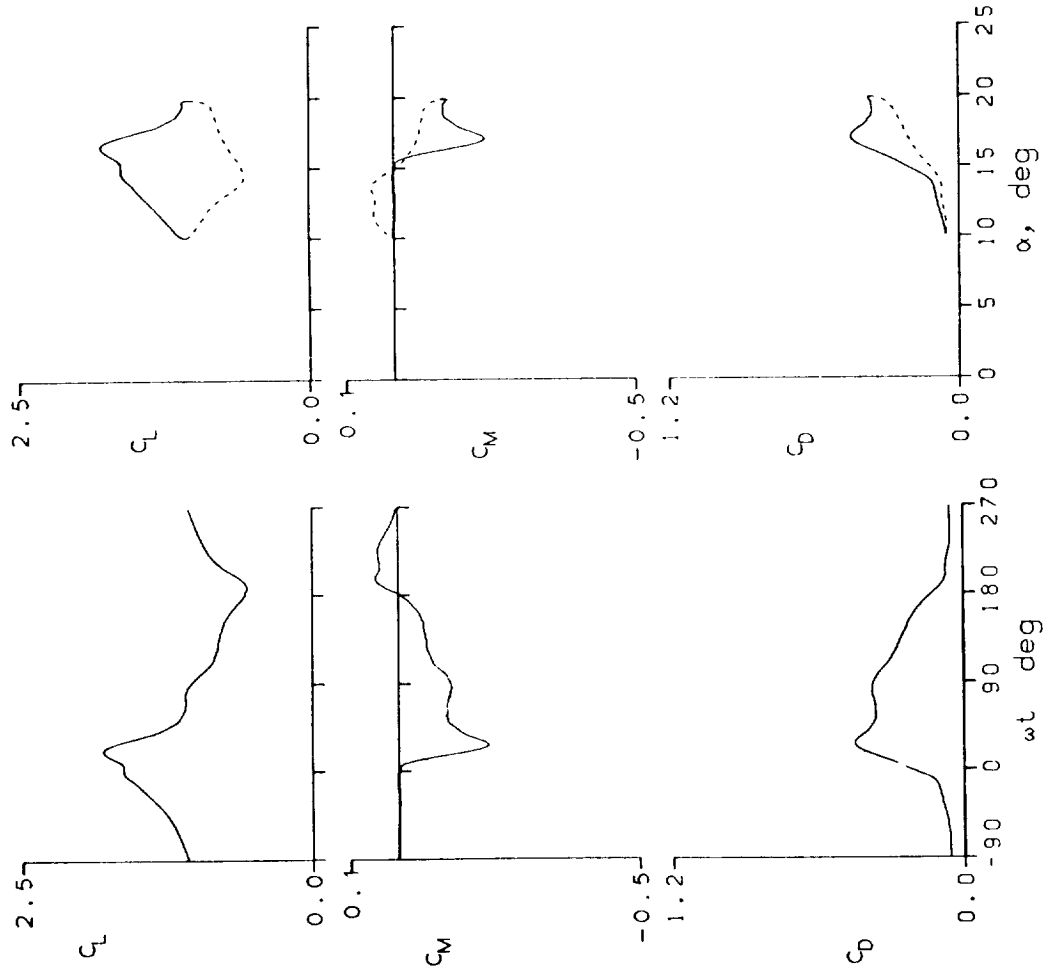


Figure 18.- Continued.

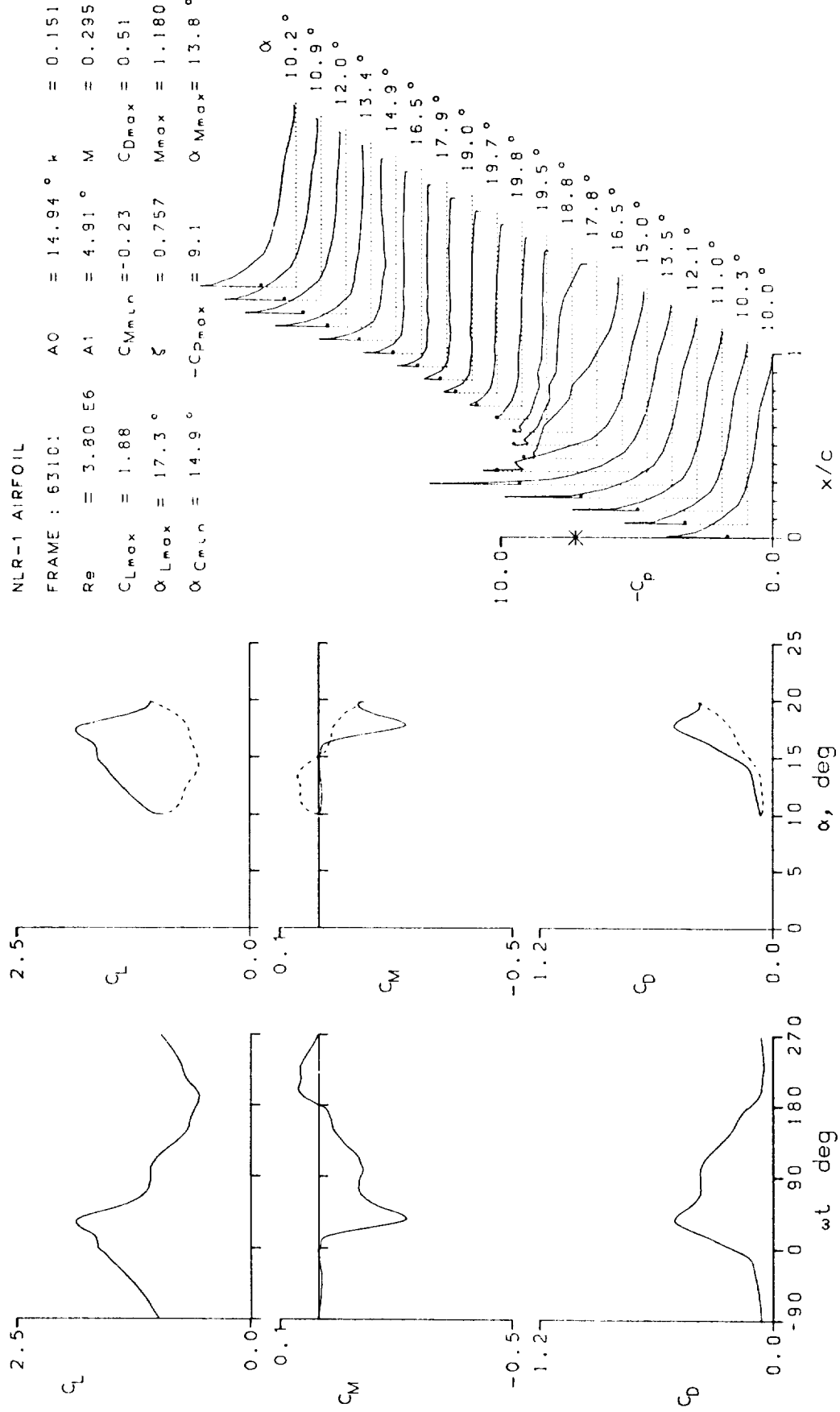


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63102 AC = 14.96° k = 0.205
 Re = 3.73 E6 A1 = 4.86° M = 0.289
 CLmax = 2.11 CMmin = -0.35 CDmax = 0.67
 αLmax = 18.7° ζ = 0.418 Mmax = 1.162
 αCmin = 14.8° -CDmax = 9.2 αMmax = 15.0°

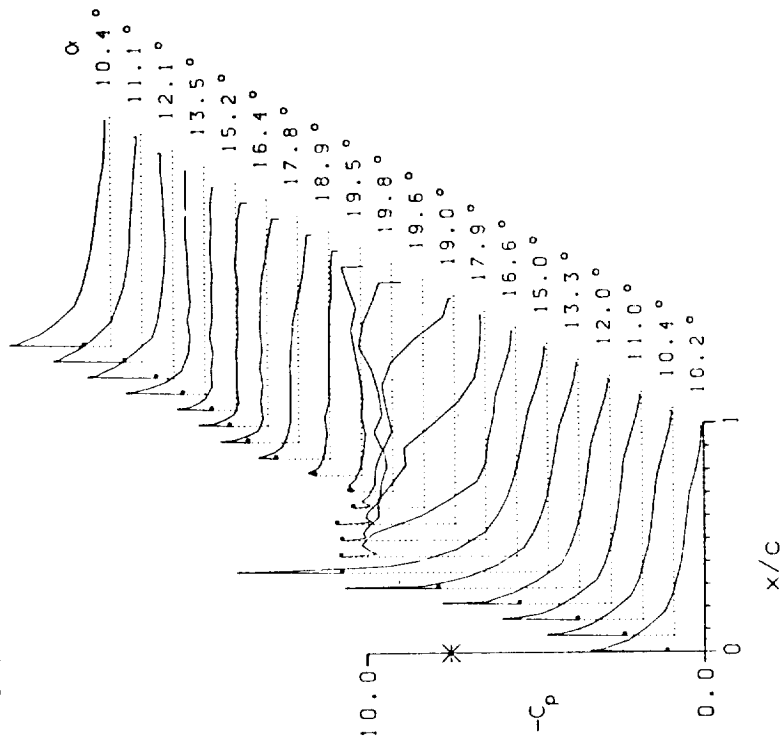
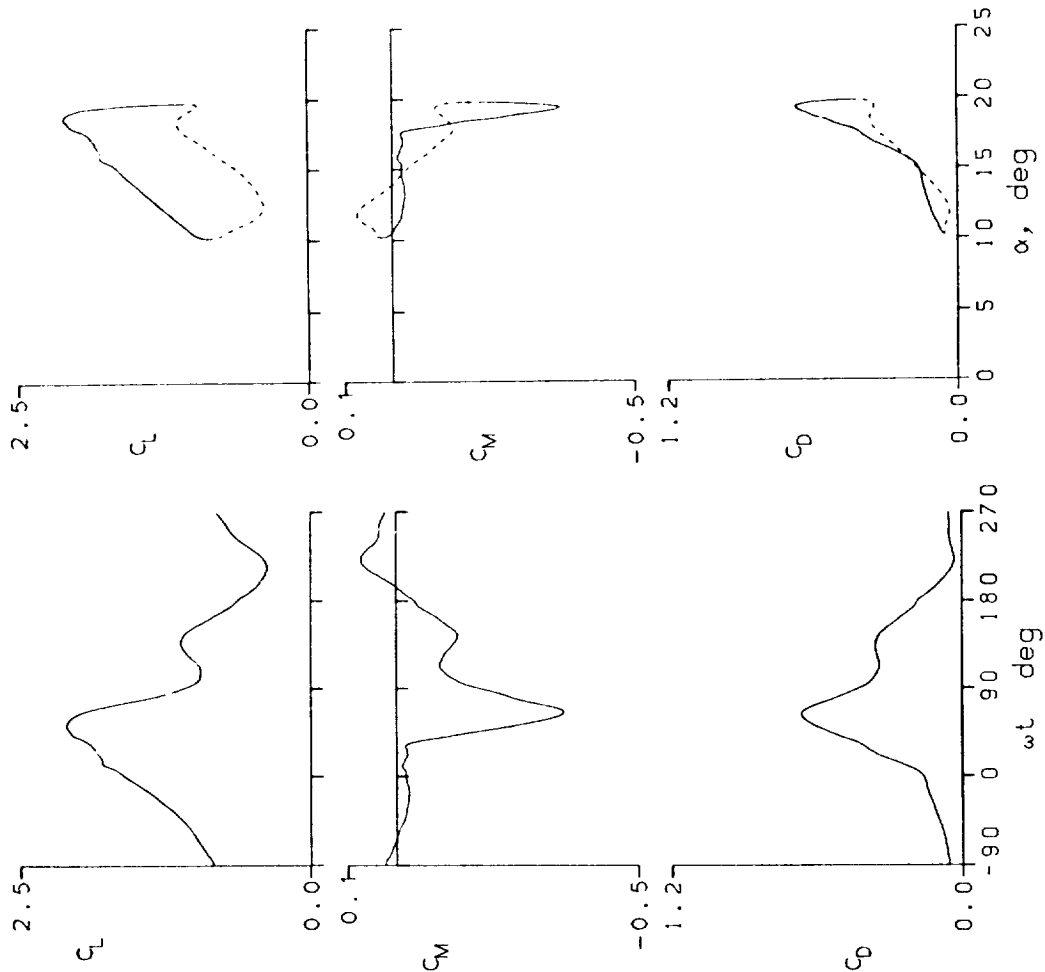
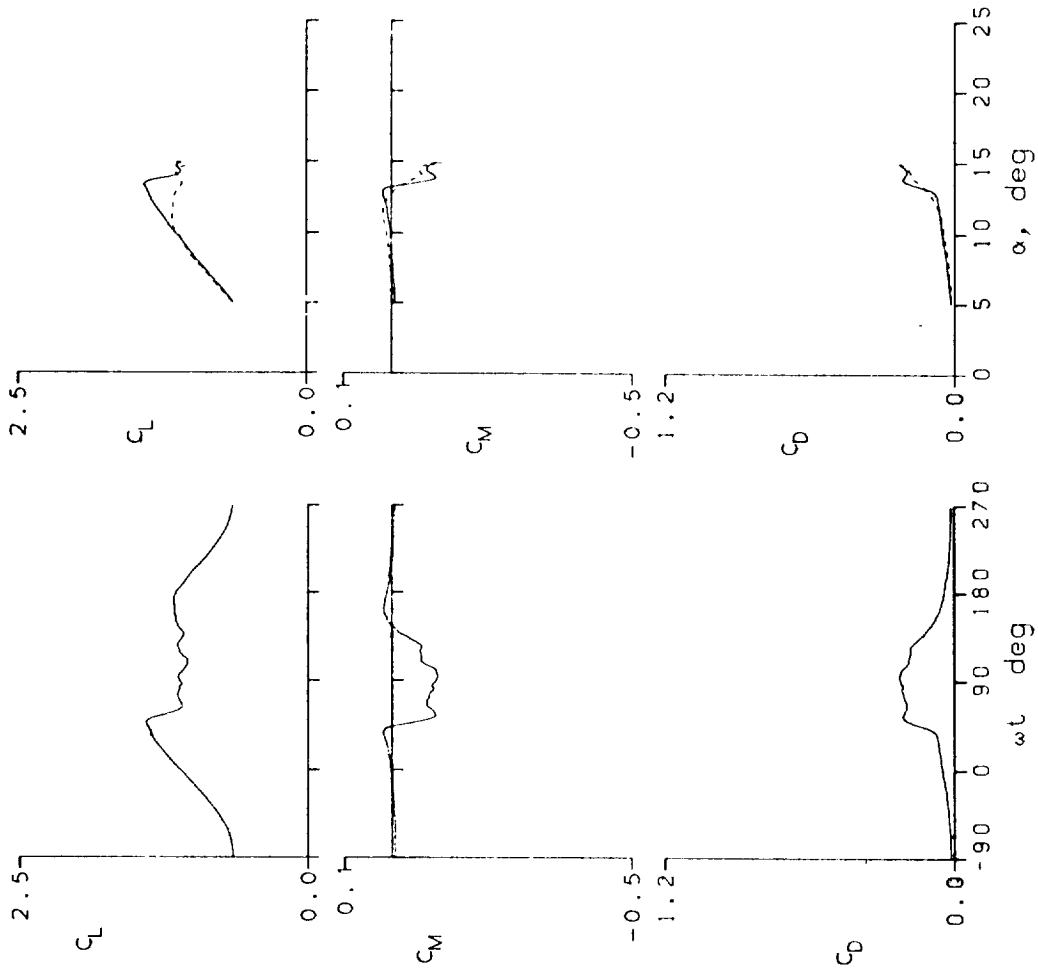


Figure 18.- Continued.



NLR-1 AIRFOIL
 FRAME : 63108 A0 = 9.97 ° k = 0.024
 Re = 3.60 E6 A1 = 4.90 ° M = 0.303
 CLmax = 1.41 CMmin = -0.10 CDmax = 0.23
 alpha Lmax = 13.4 ° zeta = 0.085 Mmax = 1.168
 alpha Cmin = 9.8 ° -CDmax = 8.5 alpha Mmax = 12.8 °

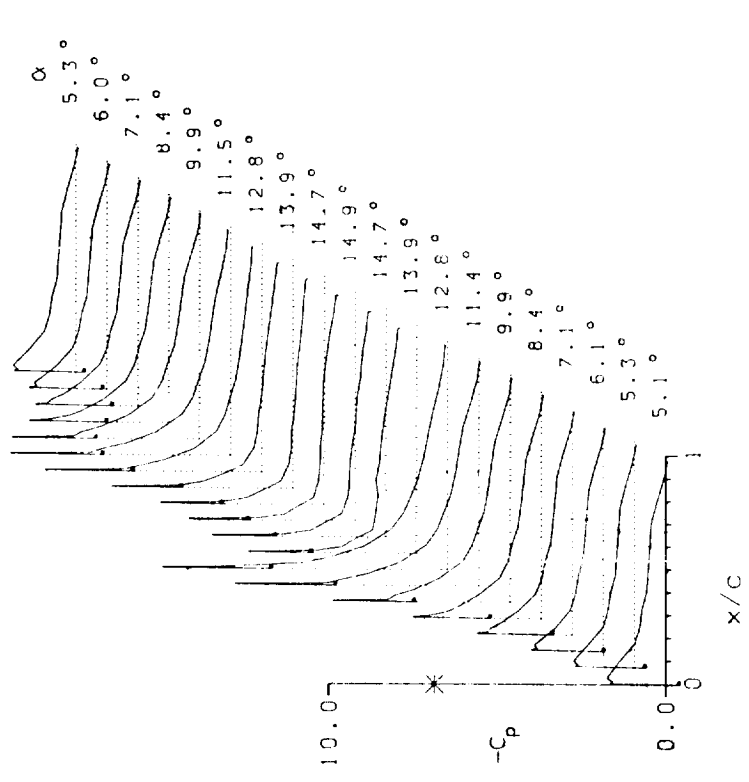


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 53112 A0 = 9.98° k = 0.098
 Re = 3.76 E6 A1 = 4.90° M = 0.301
 CLmax = 1.60 CMmin = -0.13 CDmax = 0.30
 αLmax = 14.7° ζ = 0.163 Mmax = 1.168
 αCMmin = 9.8° -CPmax = 8.6 αMmax = 13.1°

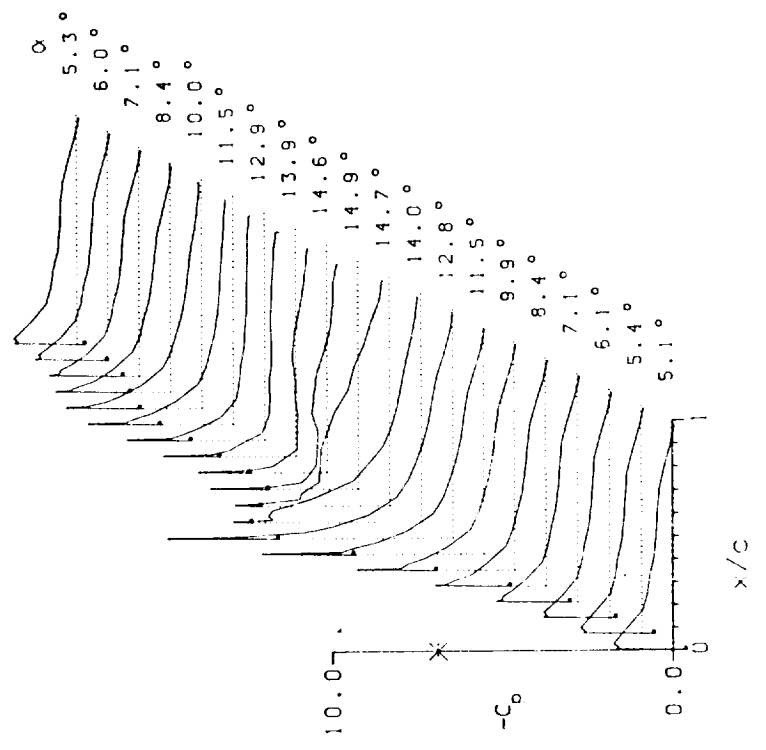
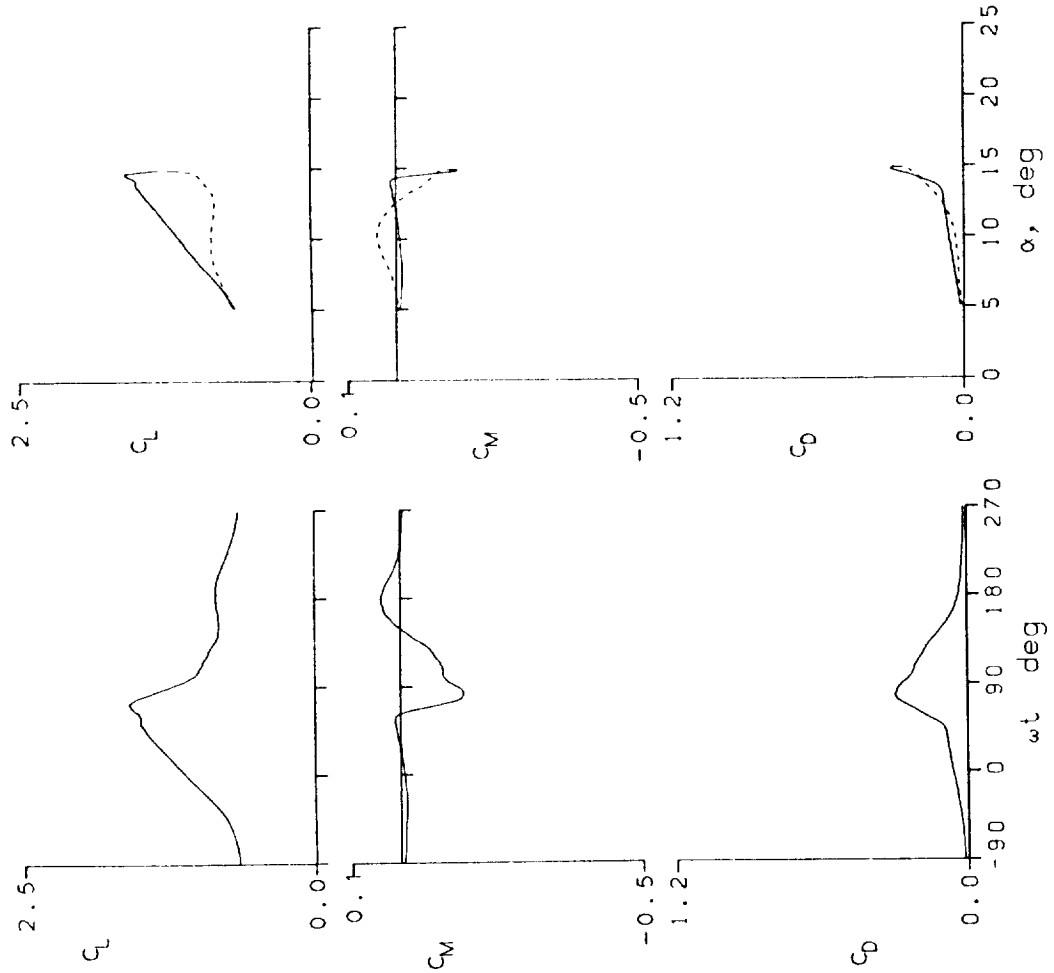


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 63114	A0 = 9.90 °	k = 0.195
Re = 3.75 E6	A1 = 4.91 °	M = 0.302
C _{Lmax} = 1.76	C _{Mmin} = -0.22	C _{Dmax} = 0.38
α _{Lmax} = 14.9 °	ξ = 0.264	M _{max} = 1.172
α _{Cmin} = 9.7 °	-C _{Pmax} = 8.6	α _{Mmax} = 13.3 °

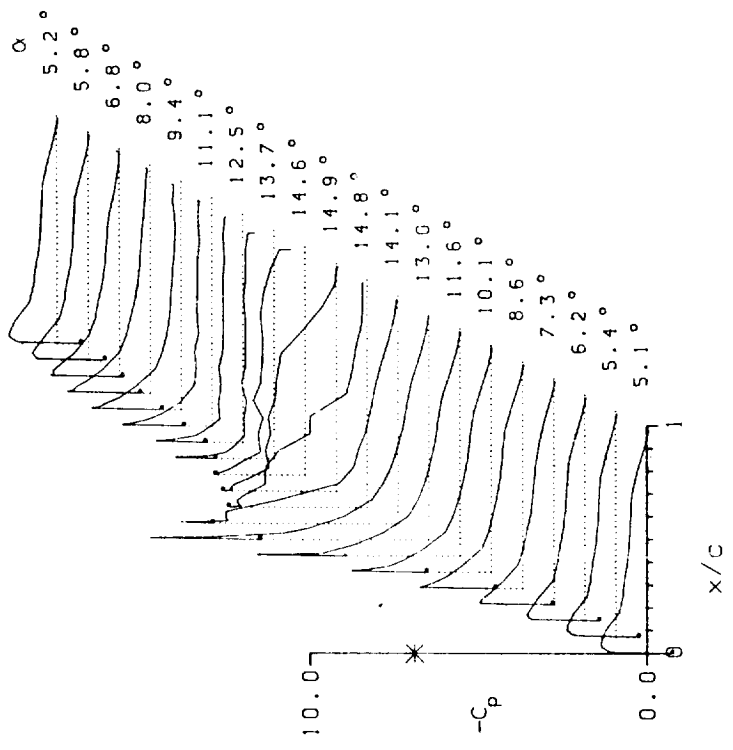
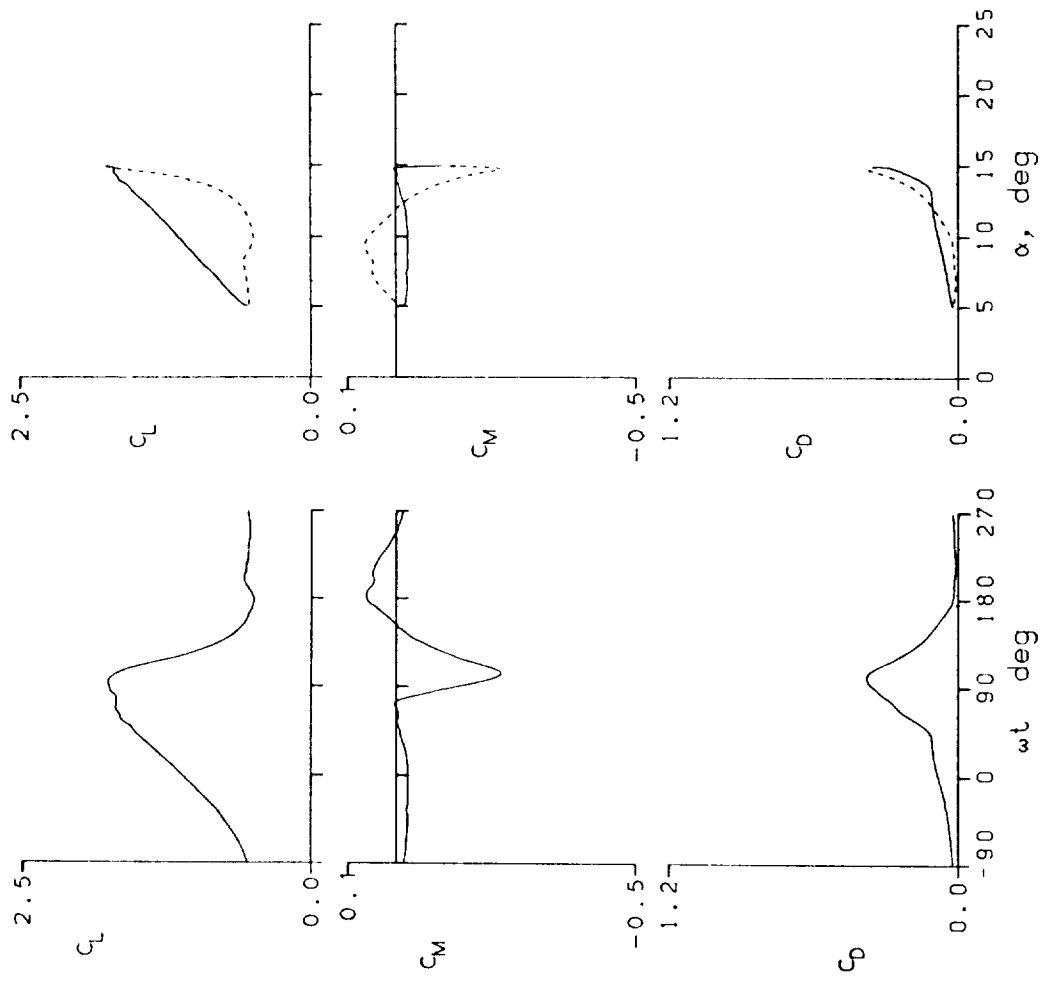


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63122 A0 = 11.91° k = 0.117
 Re = 3.74 E6 A1 = 7.90° M = 0.300
 CLmax = 1.90 CMmin = -0.30 CDmax = 0.59
 α Lmax = 18.1° ζ = 0.445 Mmax = 1.159
 α Cmin = 11.5° -CPmax = 8.5 α Mmax = 14.2°

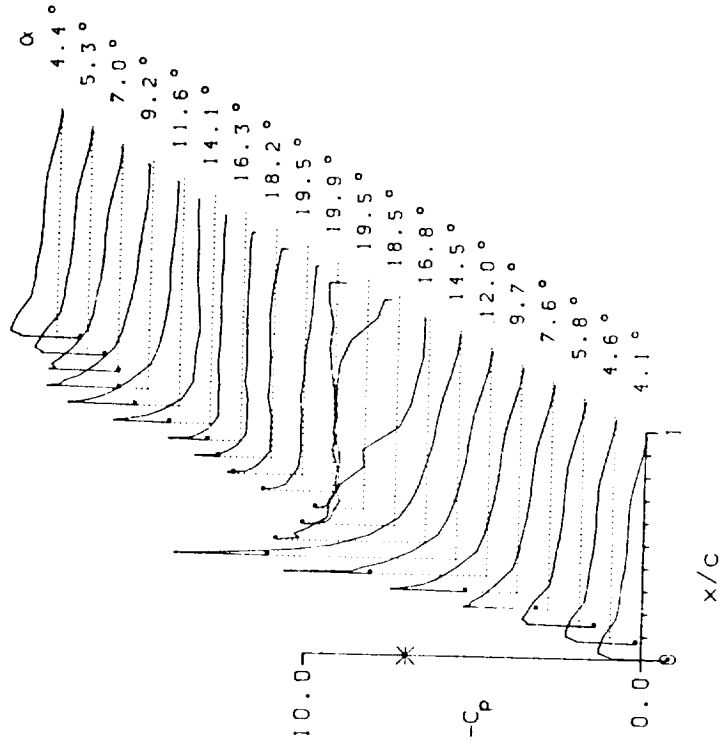
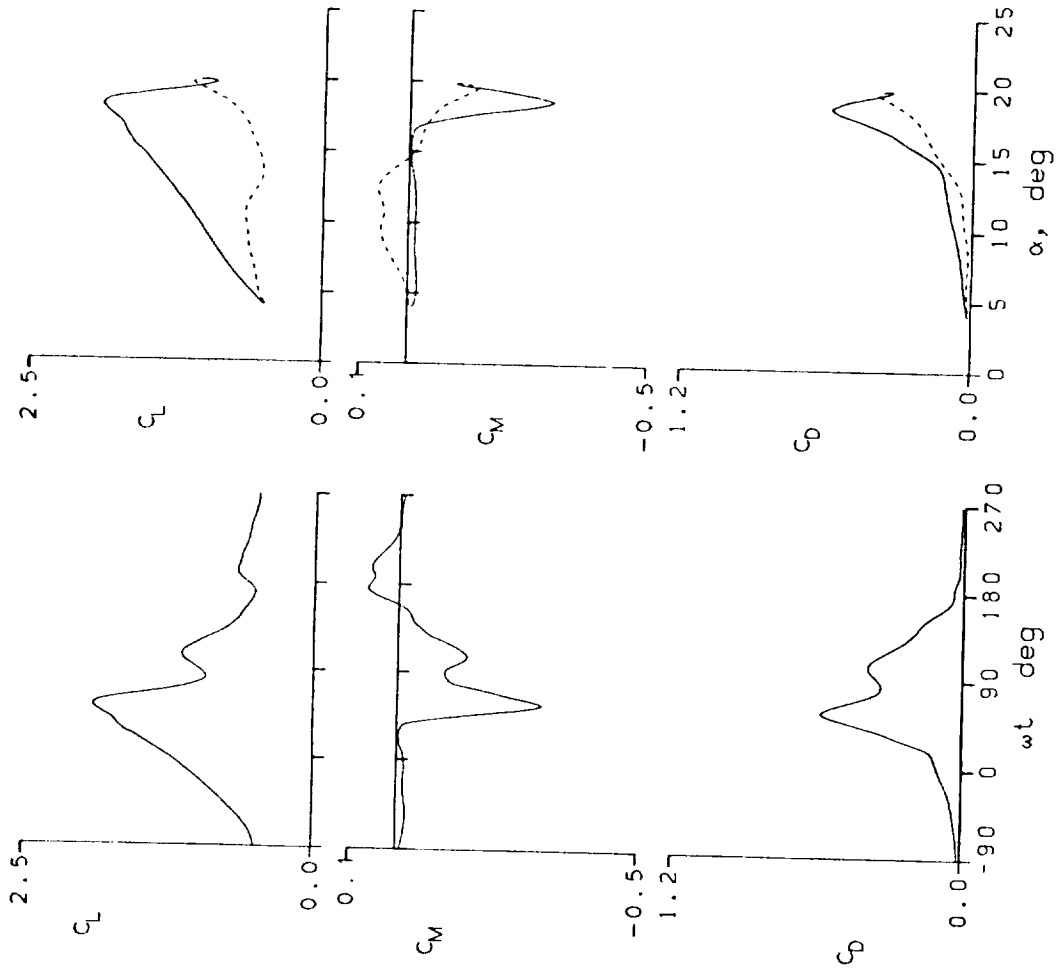


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63208 A0 = 16.41° k = 0.208
 Re = 3.67 E6 A1 = 1.99° M = 0.286
 CLmax = 1.76 CMmin = -0.18 CDmax = 0.48
 αLmax = 17.6° ζ = -1.082 Mmax = 1.122
 αCmin = 16.4° -CPmax = 9.1 αMmax = 15.6°

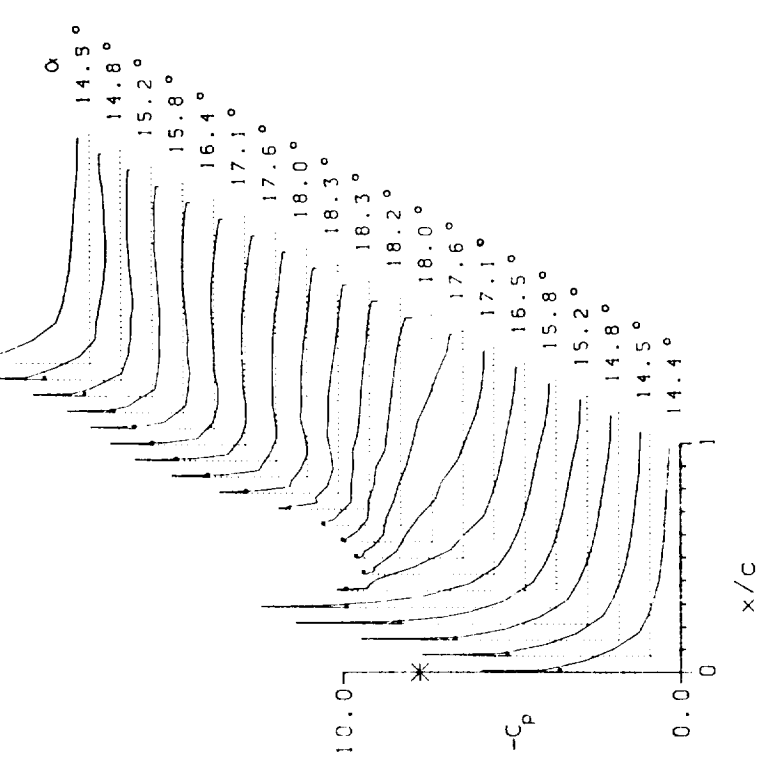
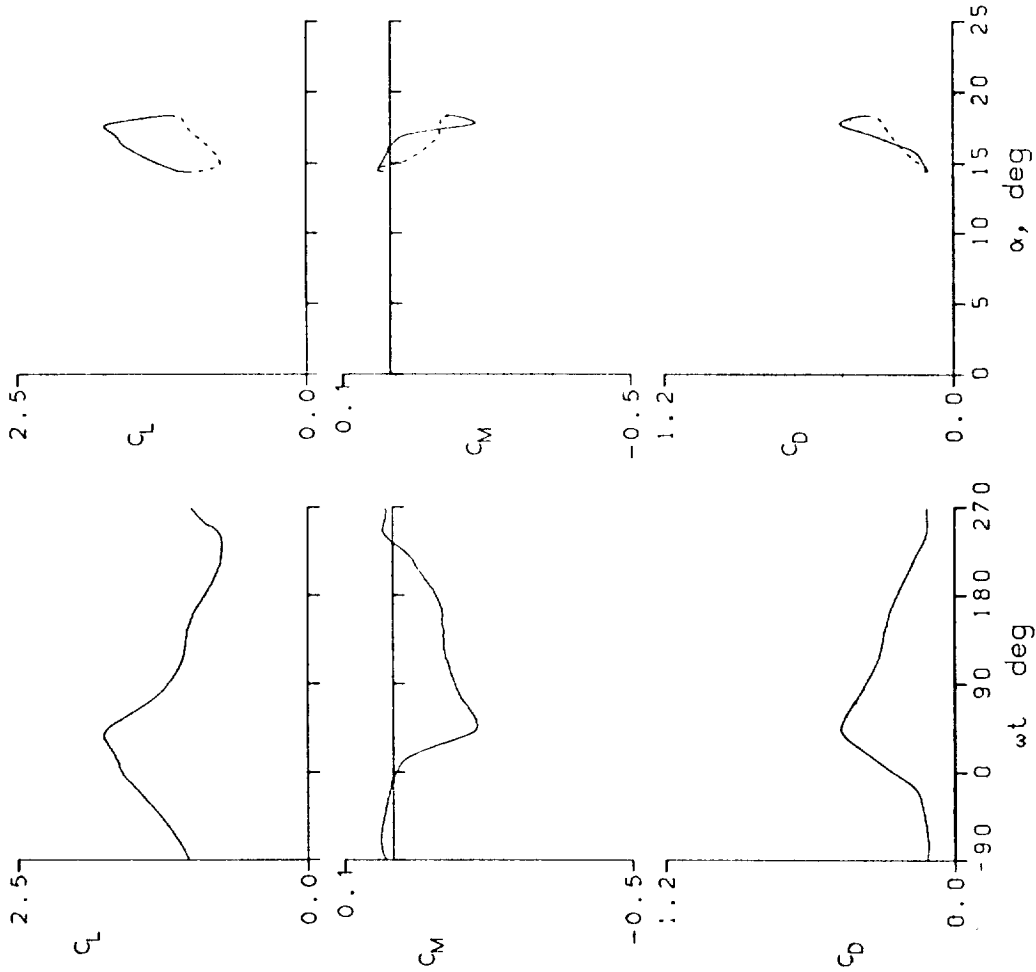


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63213 A0 = 17.00 ° k = 0.052
 Re = 3.65 E6 A1 = 2.00 ° M = 0.286
 CLmax = 1.17 CMmin = -0.12 CDmax = 0.30
 α Lmax = 15.1 ° ξ = 0.998 Mmax = 0.827
 α Cmin = 16.9 ° -CDmax = 5.7 α Mmax = 15.1 °

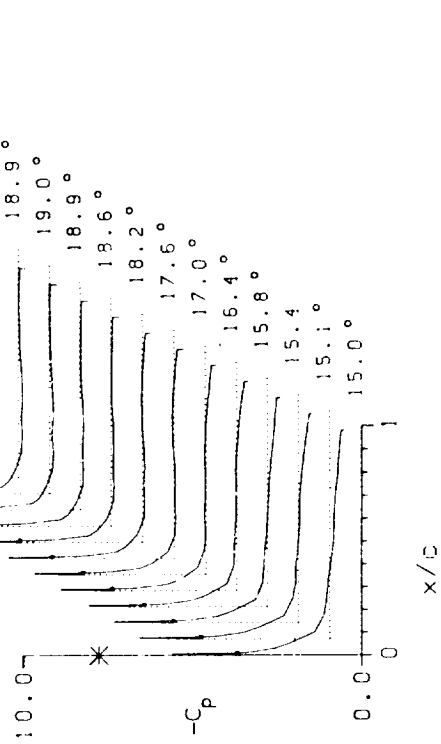
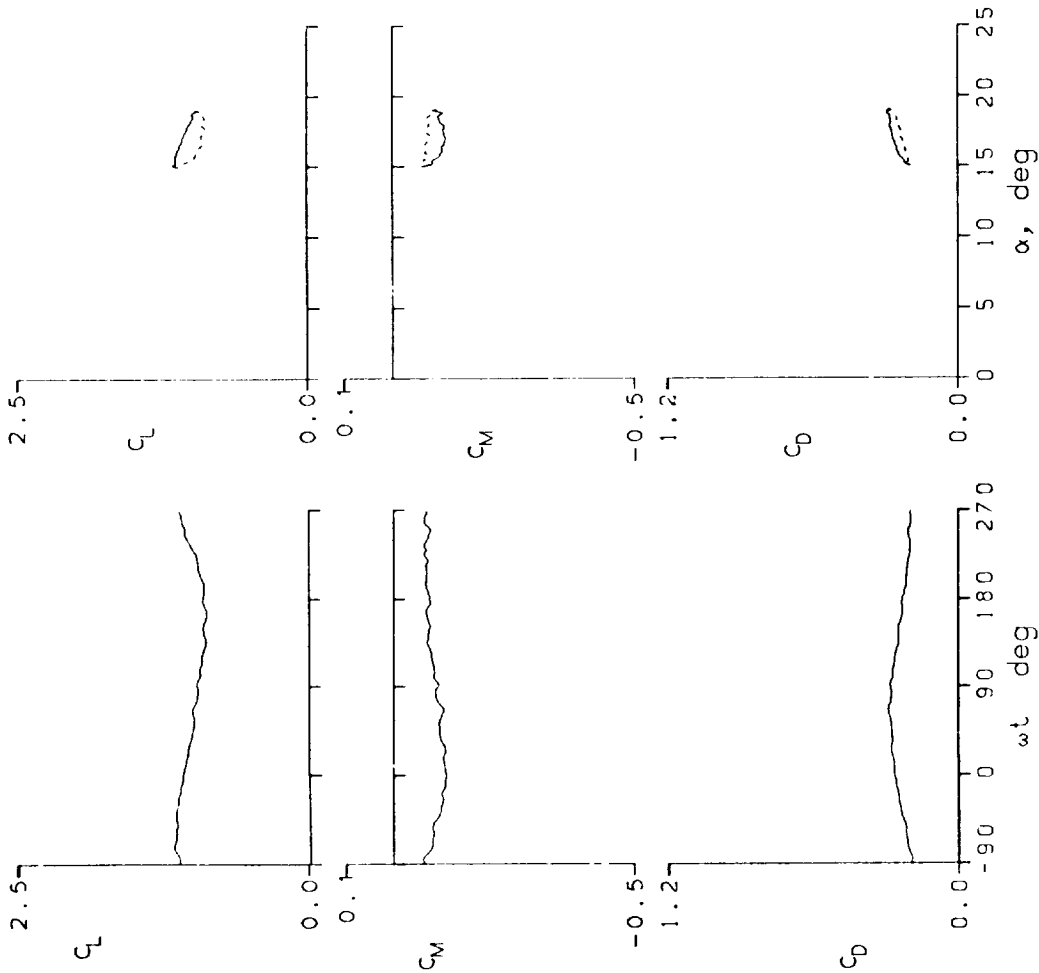


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63215 A0 = 17.00 ° k = 0.187
 Re = 3.61 E6 A1 = 1.99 ° M = 0.284
 CLmax = 1.53 CMmin = -0.16 CDmax = 0.43
 αLmax = 17.6 ° ζ = -0.083 Mmax = 1.055
 αCMmin = 17.0 ° -CPmax = 8.5 αMmax = 15.9 °

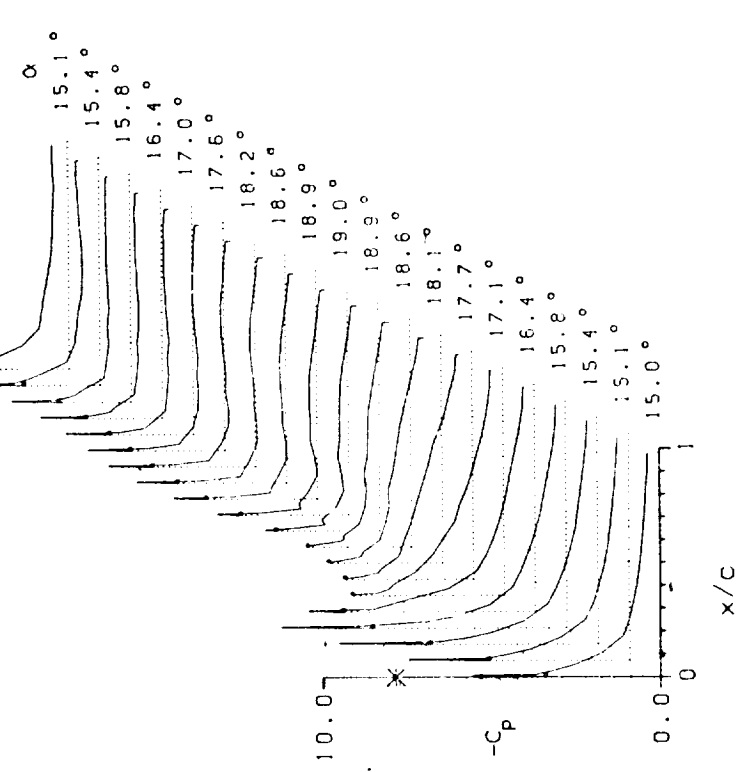
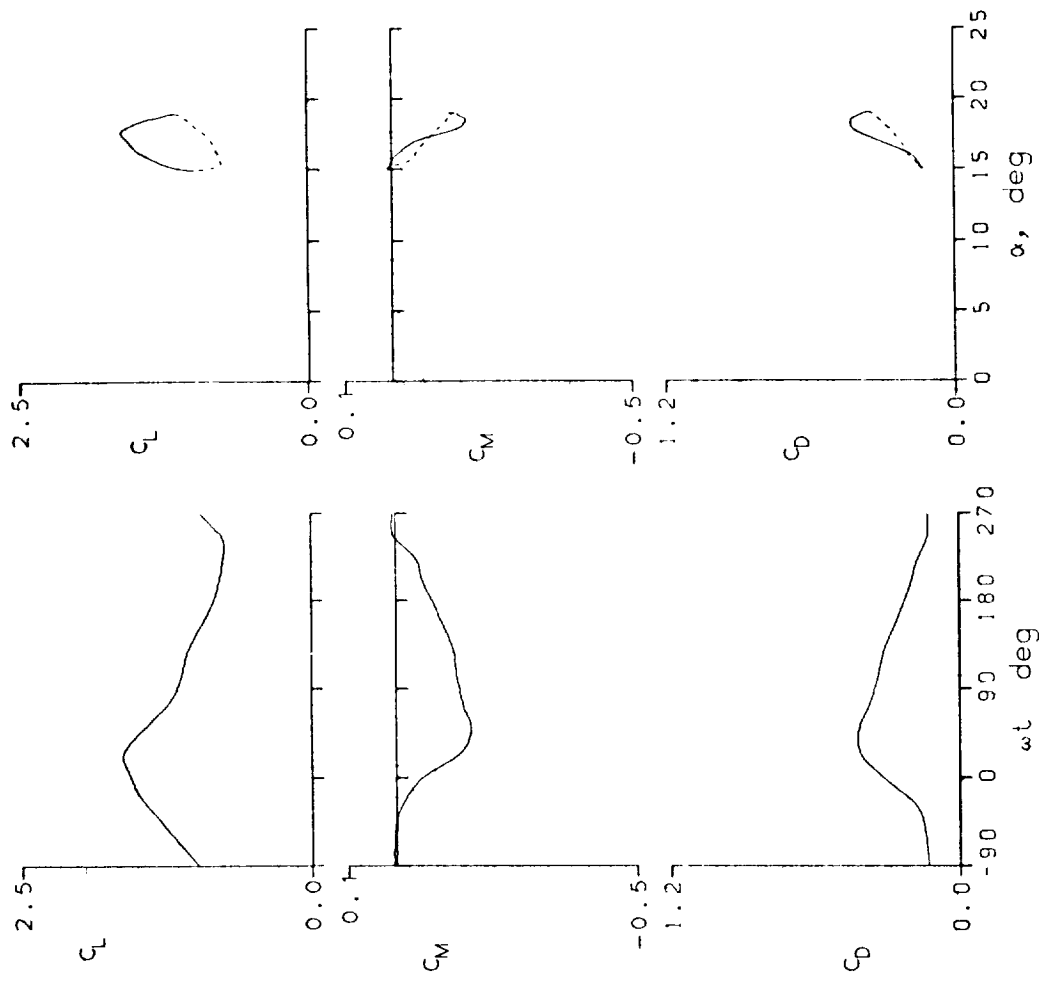


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63220 A0 = 15.00° k = 0.050
 Re = 3.73 E6 A1 = 2.00° M = 0.294
 CLmax = 1.32 CMmin = -0.12 CDmax = 0.27
 αLmax = 13.9° ξ = 0.650 Mmax = 1.018
 αCMmin = 14.9° -CDmax = 7.5 αMmax = 13.3°

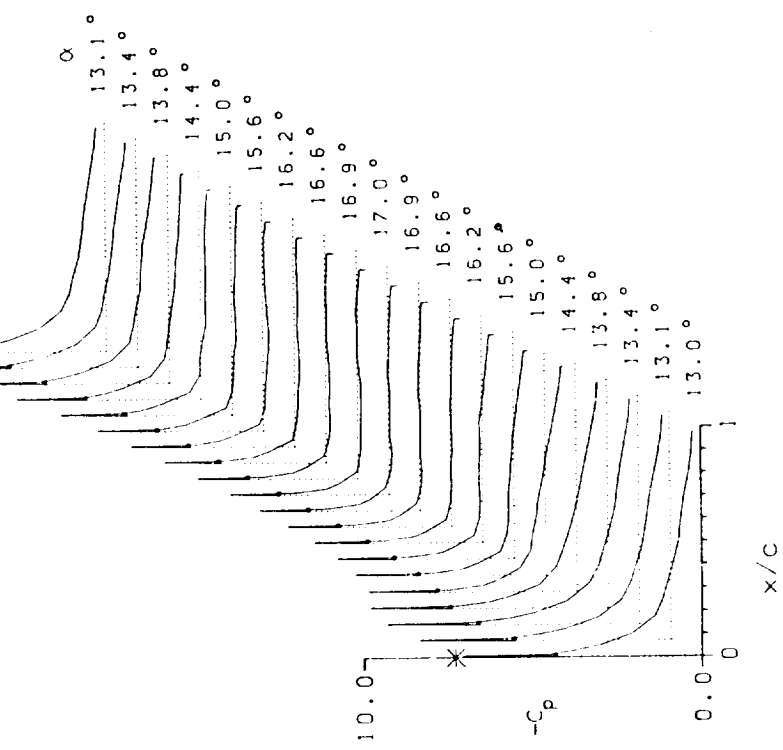
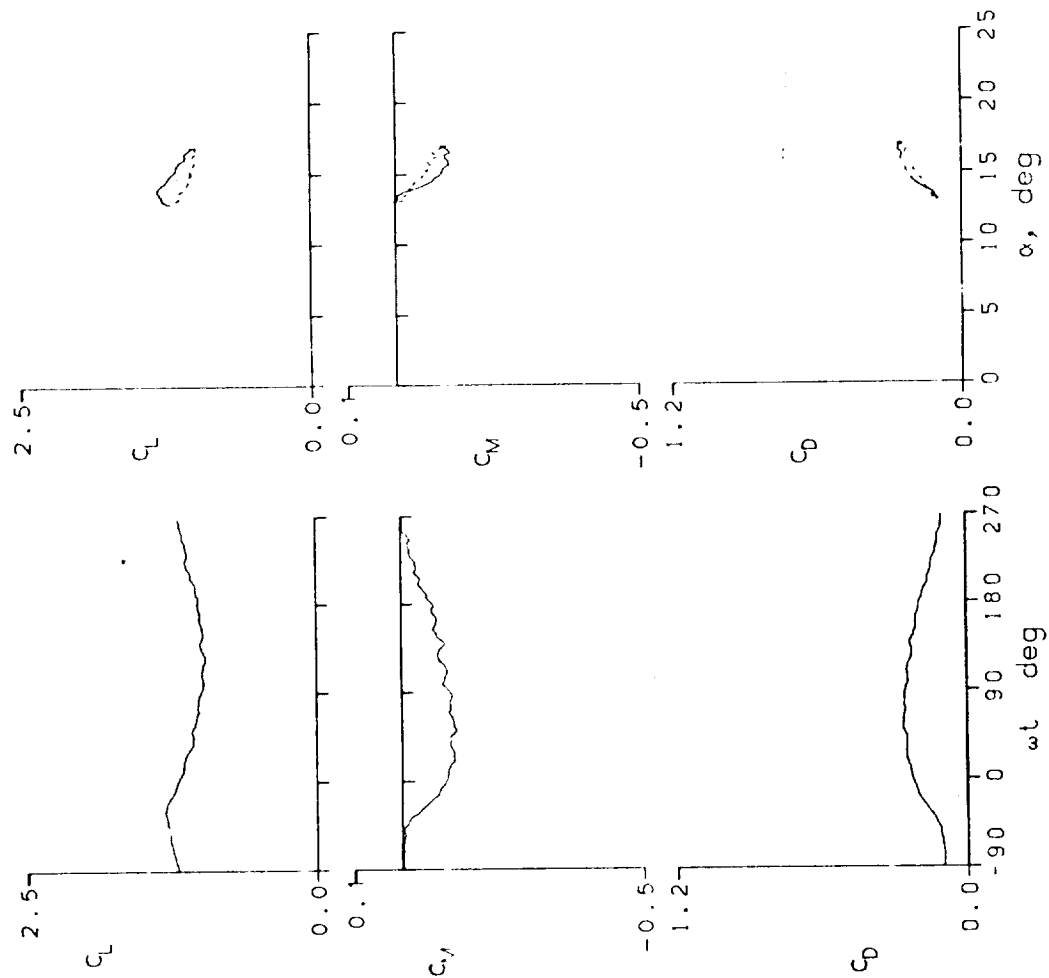


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63222 A0 = 15.02 ° κ = 0.203
 Re = 3.68 E6 A1 = 1.98 ° M = 0.291
 C_{Lmax} = 1.79 C_{Mmin} = -0.21 C_{Dmax} = 0.44
 α_{Lmax} = 16.4 ° ζ = -0.955 M_{max} = 1.145
 α_{Cmin} = 15.0 ° -C_{Pmax} = 9.0 α_{Mmax} = 14.6 °

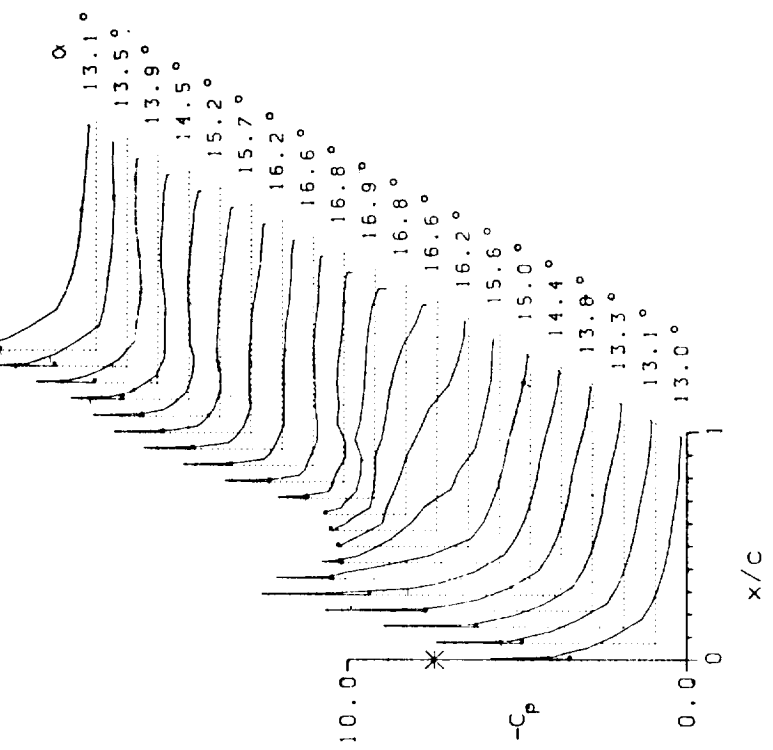
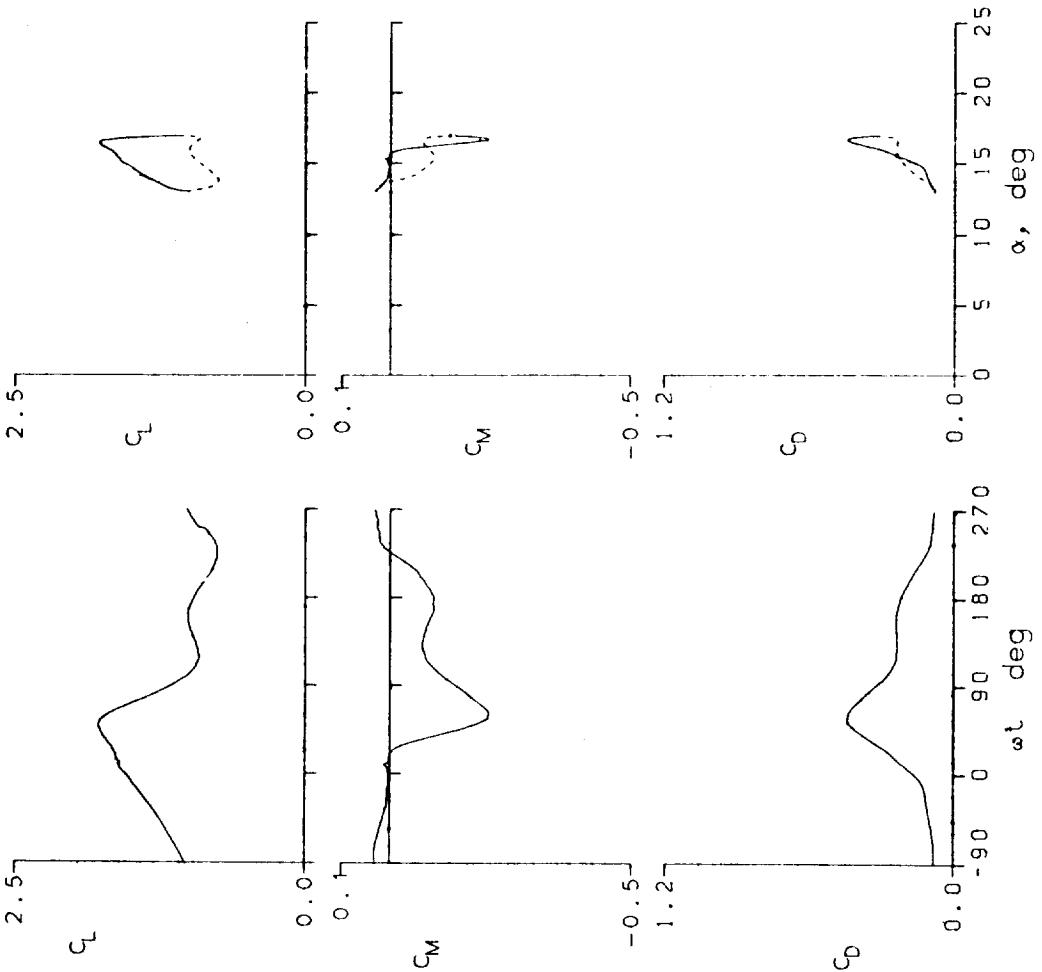


Figure 18.- Continued.

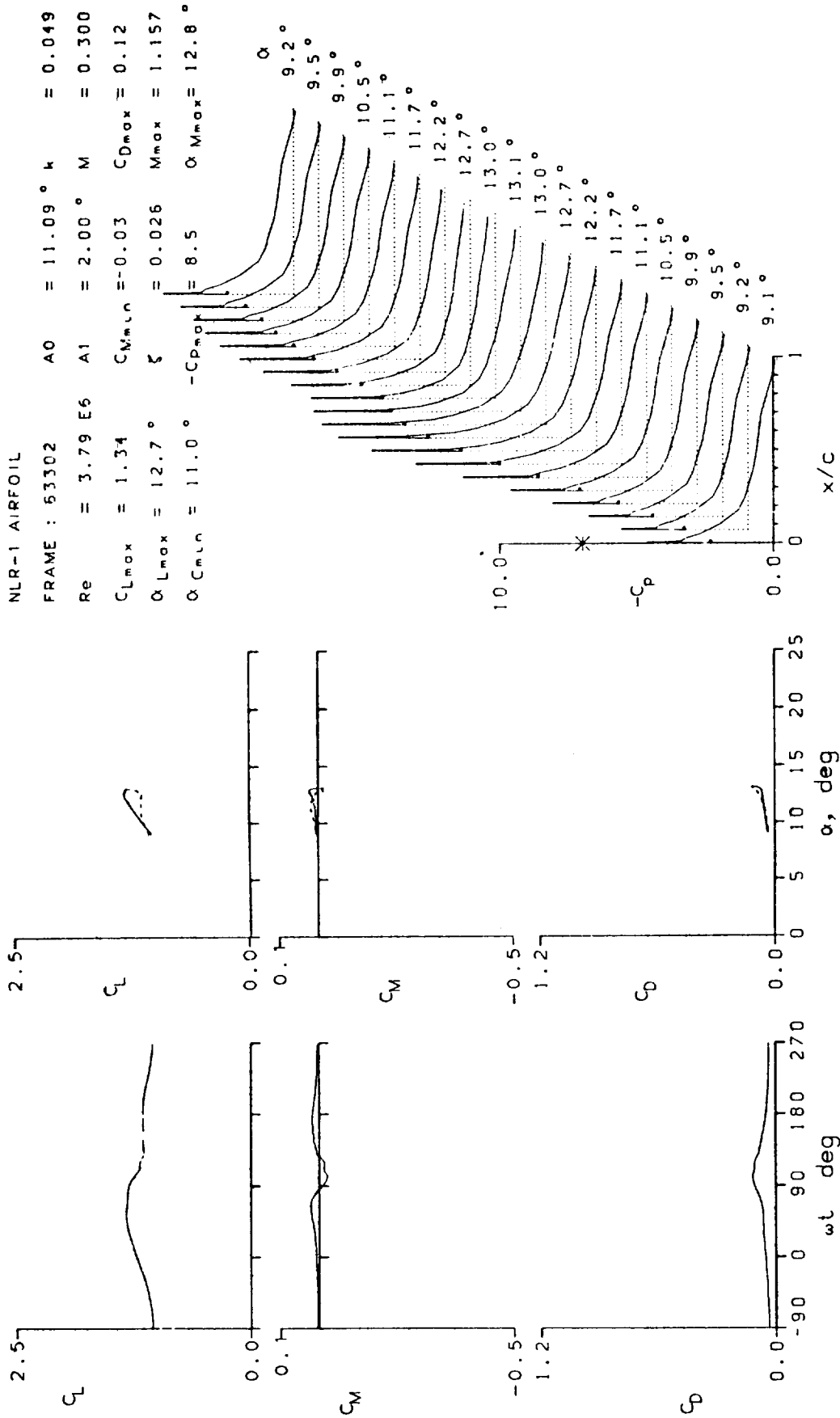


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63304 $A_0 = 11.06^\circ$ $k = 0.195$
 $Re = 3.79 E6$ $A_1 = 2.01^\circ$ $M = 0.302$
 $C_{Lmax} = 1.44$ $C_{Mmin} = -0.04$ $C_{Dmax} = 0.15$
 $\alpha_{Lmax} = 13.1^\circ$ $\xi = -0.364$ $M_{max} = 1.168$
 $\alpha_{Cmin} = 11.0^\circ$ $-C_{Pmax} = 8.5$ $\alpha_{Mmax} = 12.8^\circ$

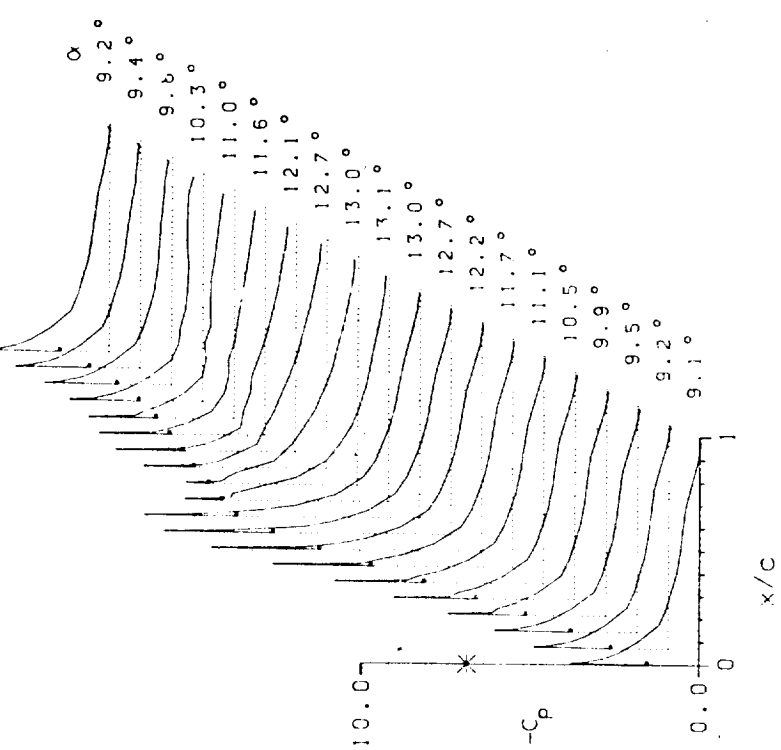
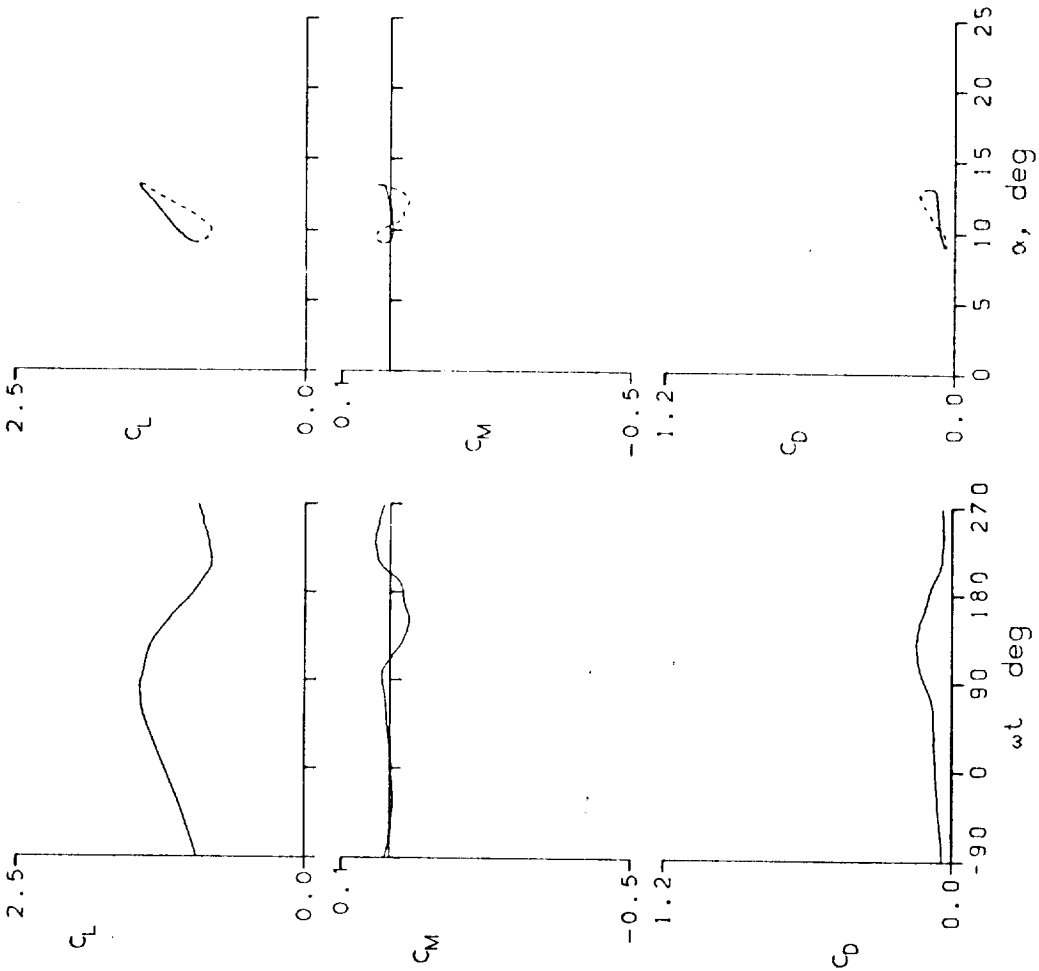


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAM1 : 6.3312 A0 = 2.35° h = 0.010
 Re = 3.76 E6 A1 = 10.14° M = 0.302
 C_{Lmax} = 1.29 C_{Mmin} = -0.05 C_{Dmax} = 0.09
 α_{Lmax} = 12.3° ξ = 0.035 M_{max} = 1.116
 α_{Cmin} = 2.0° -C_{pmax} = 8.0 α_{Mmax} = 12.3°

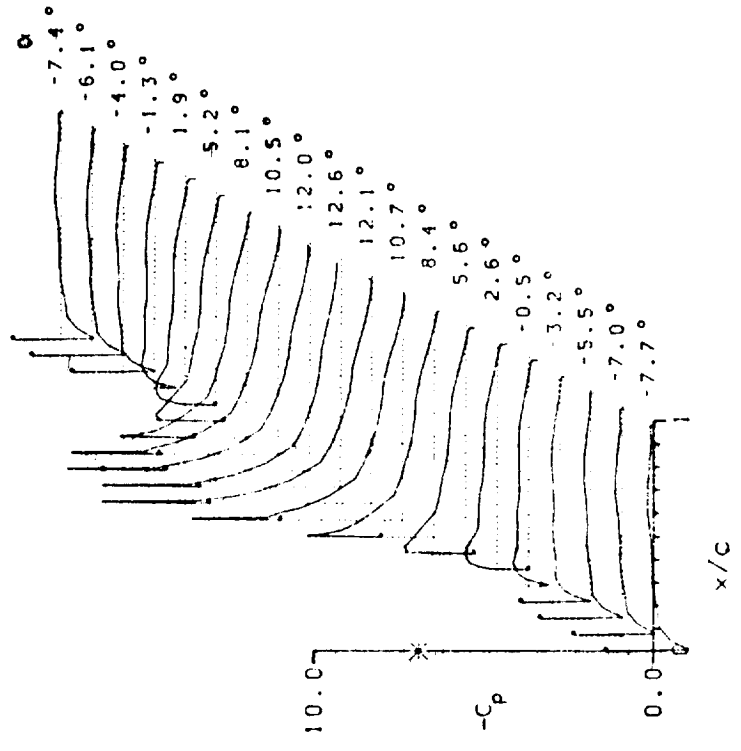
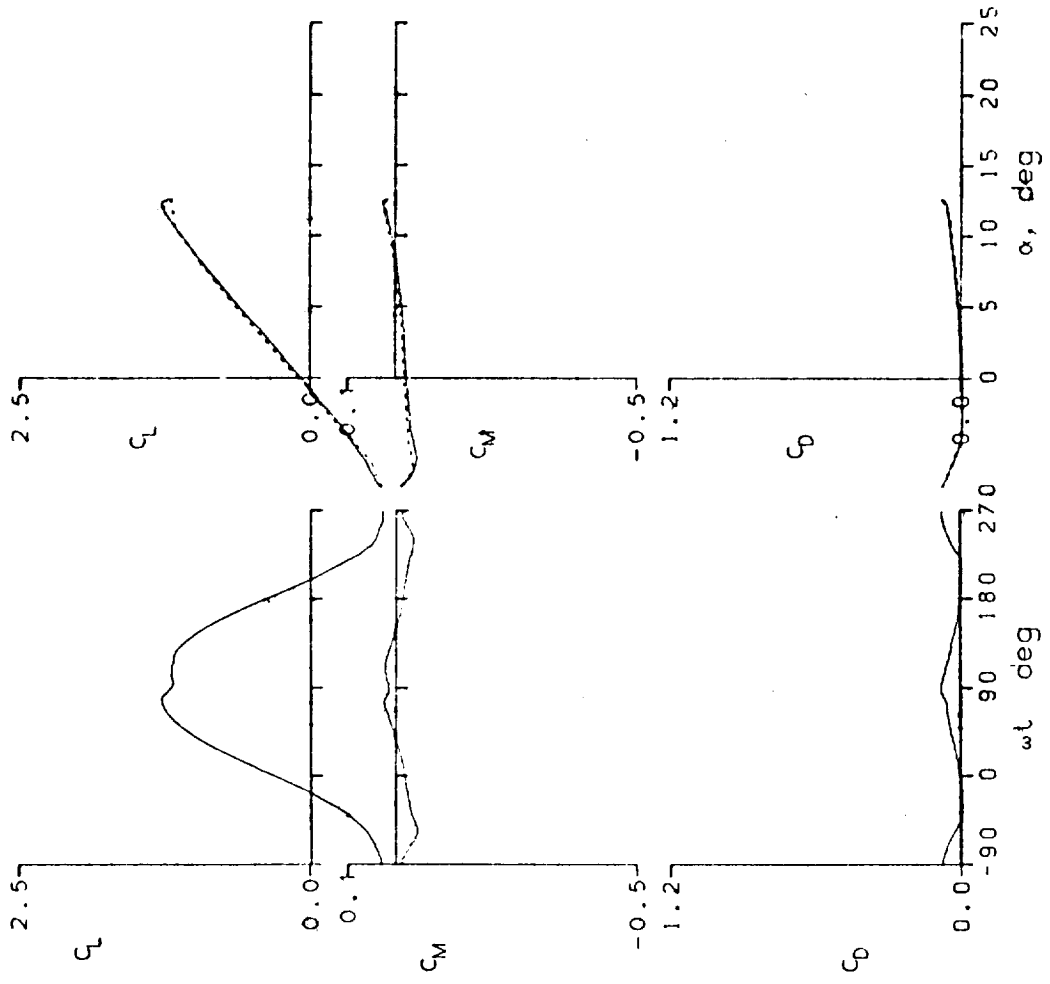


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 63314 A0 = 2.35° k = 0.024

Re = 3.74 E6 A1 = 10.15° M = 0.302

$C_{Lmax} = 1.32$ $C_{Mmin} = -0.05$ $C_{Dmax} = 0.09$

$\alpha_{Lmax} = 12.4^\circ$ $\xi = 0.077$ $M_{max} = 1.143$

$\alpha_{Cmin} = 1.9^\circ$ $-C_{pmax} = 8.3$ $\alpha_{Mmax} = 12.5^\circ$

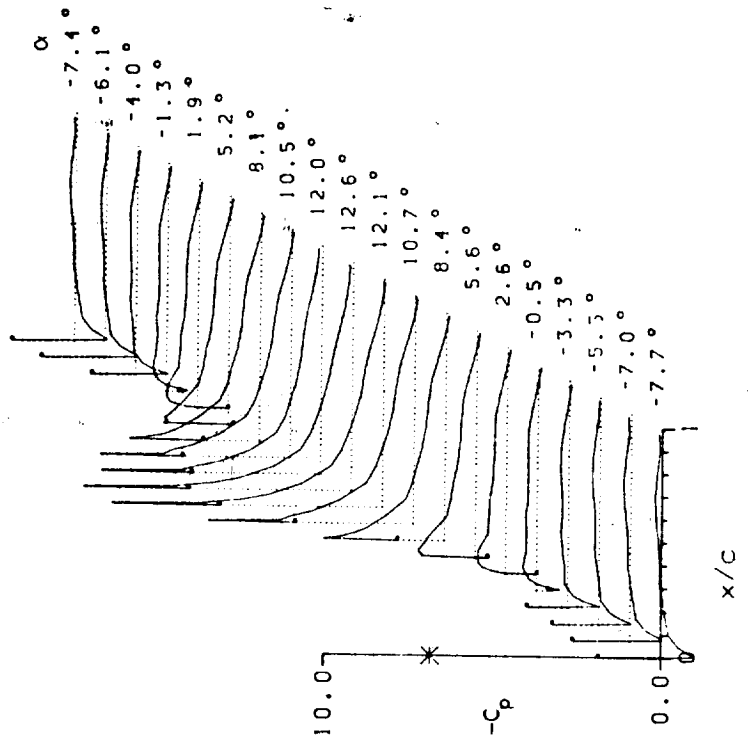
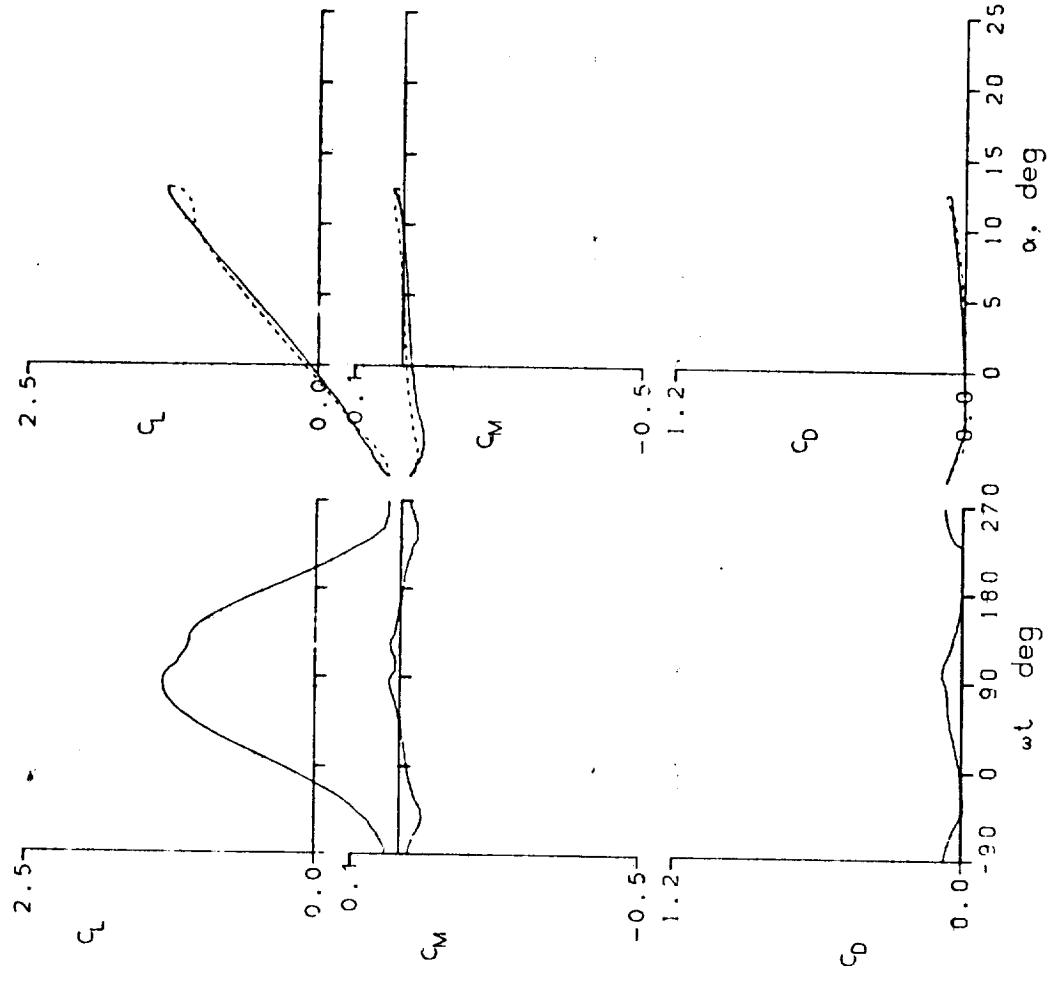


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63318 A0 = 2.35° k = 0.049
 Re = 3.76 E6 A1 = 10.15° M = 0.303
 CLmax = 1.34 CMmin = -0.06 CDmax = 0.09
 αLmax = 12.4° ζ = 0.148 Mmax = 1.151
 αCMmin = 1.9° -CPmax = 8.3 αMmax = 12.6°

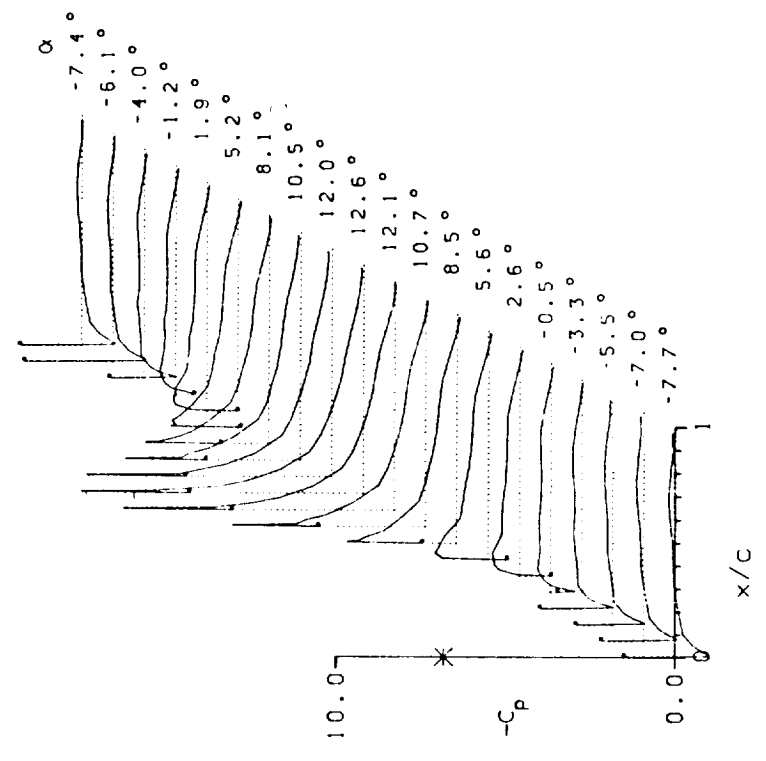
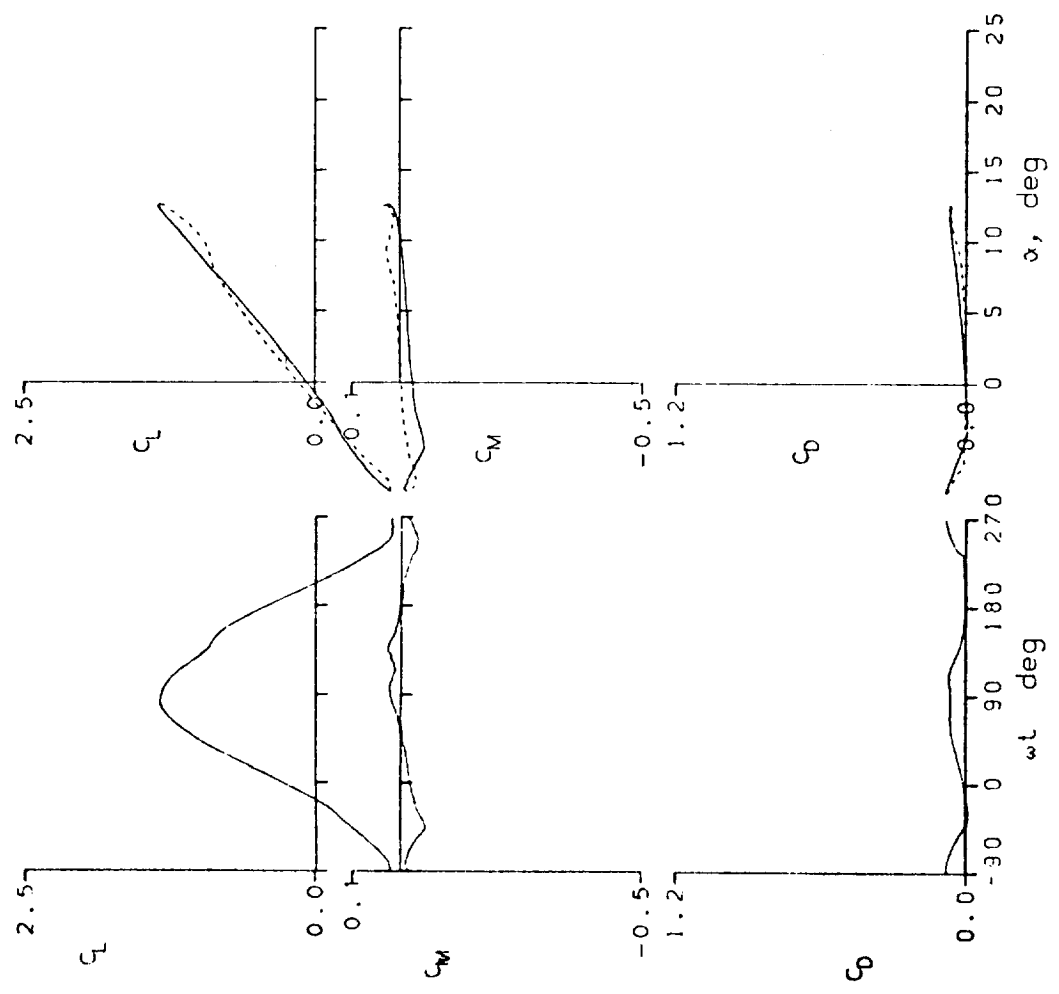


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 63320 A0 = 2.34° h = 0.097
 Re = 3.74 E6 A1 = 10.15° M = 0.303
 CLmax = 1.36 CMmin = -0.07 CDmax = 0.08
 α Lmax = 12.6° ξ = 0.317 Mmax = 1.153
 α Cmin = 0.1° -CDmax = 8.3 α Mmax = 12.5°

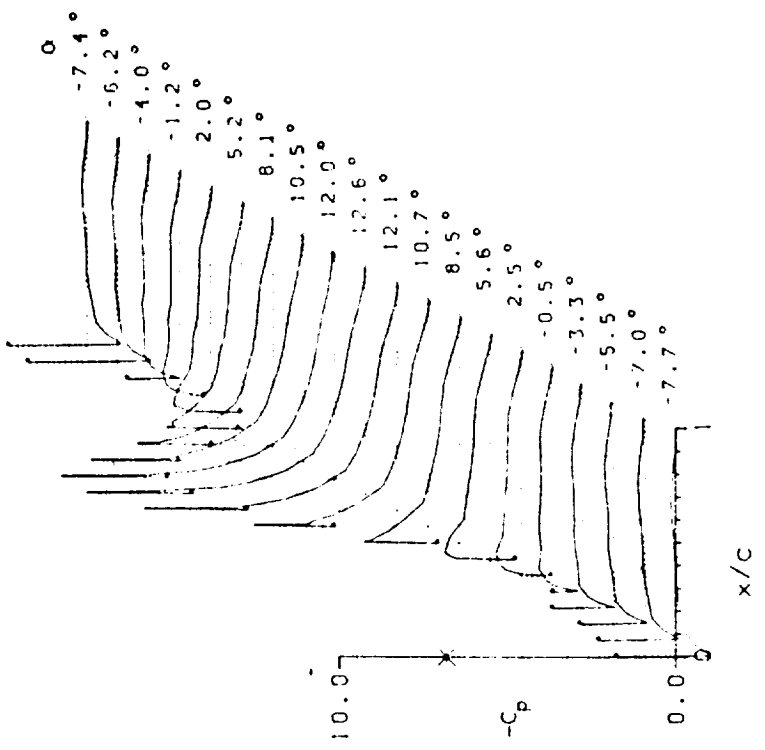
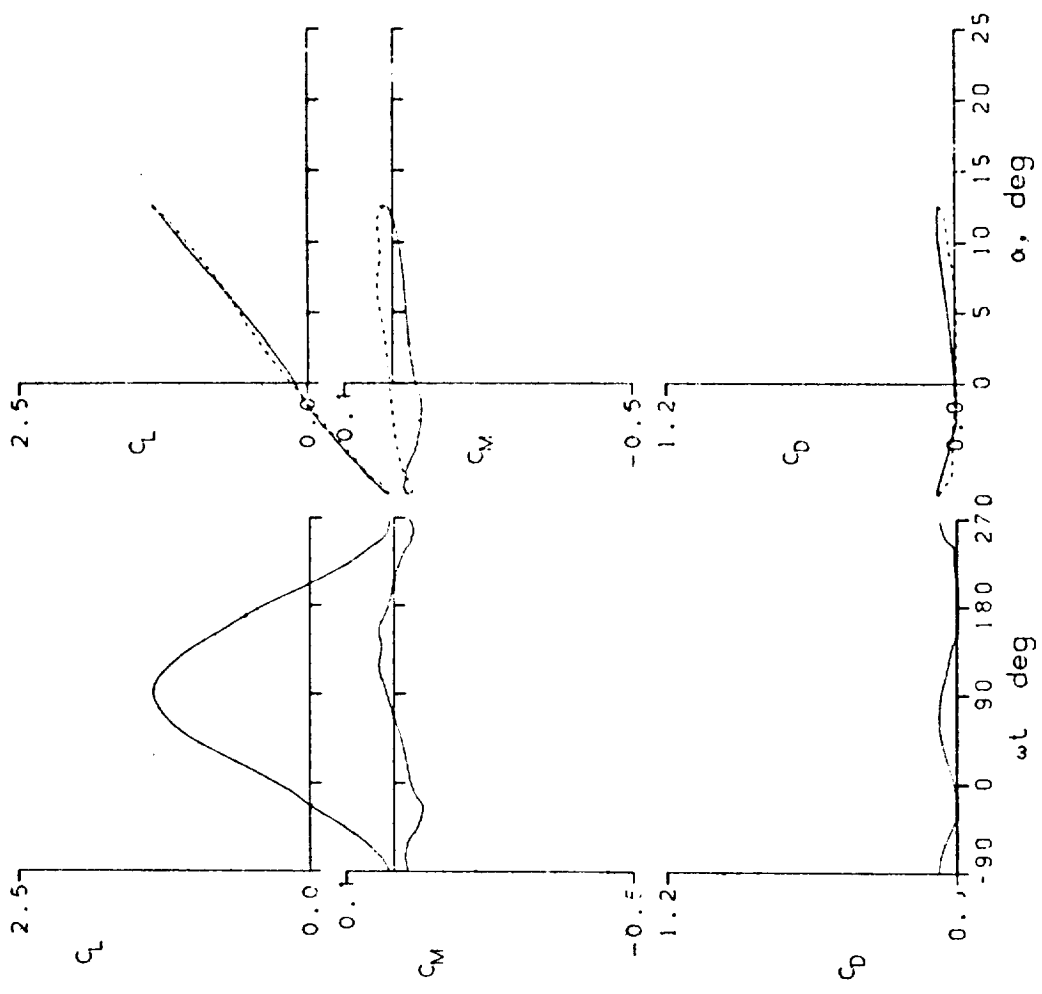
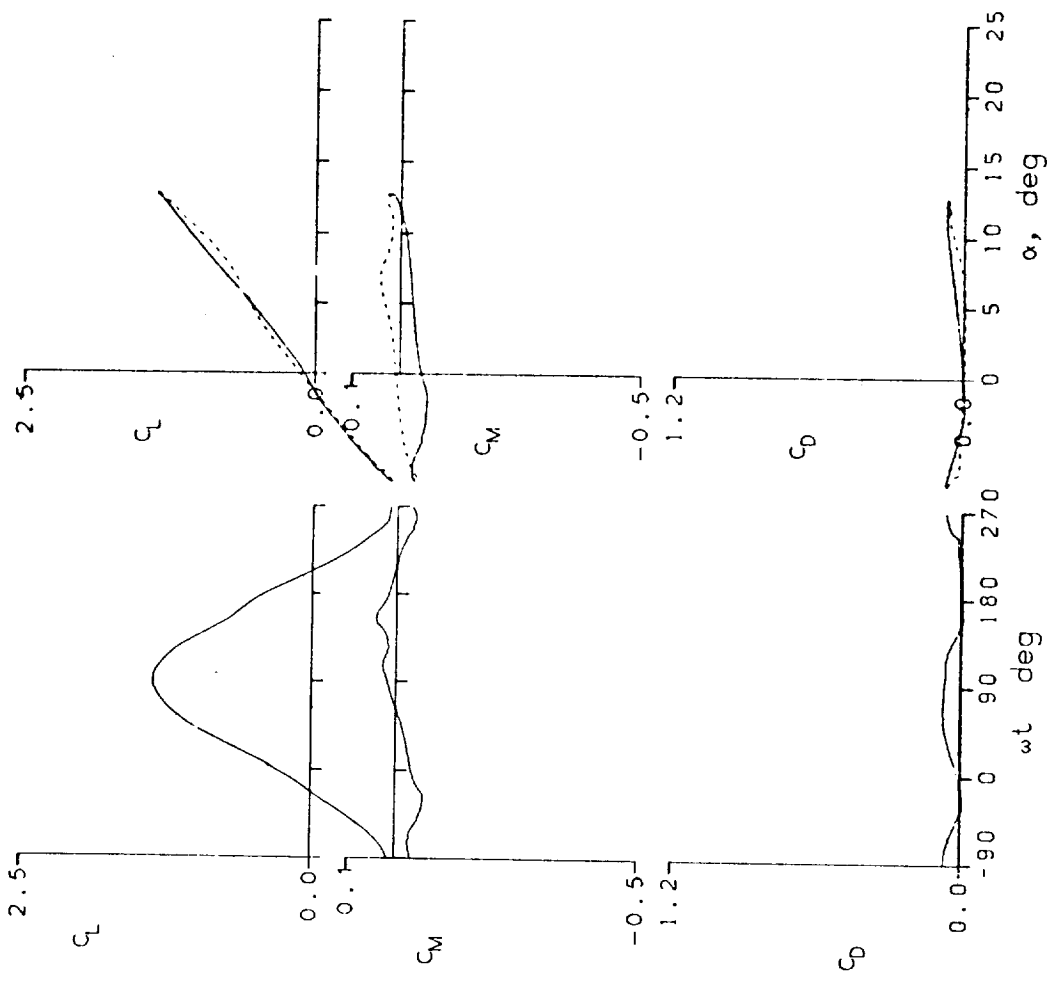


Figure 18.- Continued.



NLR-1 AIRFOIL
 FRAME: 63323 $A_0 = 2.54^\circ$ $k = 0.097$
 $Re = 3.75 \text{ E}6$ $A_1 = 10.15^\circ$ $M = 0.303$
 $C_{Lmax} = 1.37$ $C_{Mmin} = -0.06$ $C_{Dmax} = 0.08$
 $\alpha_{Lmax} = 12.7^\circ$ $\xi = 0.315$ $M_{max} = 1.157$
 $\alpha_{Cmin} = 0.3^\circ$ $-C_{Dmax} = 8.4$ $\alpha_{Mmax} = 12.7^\circ$

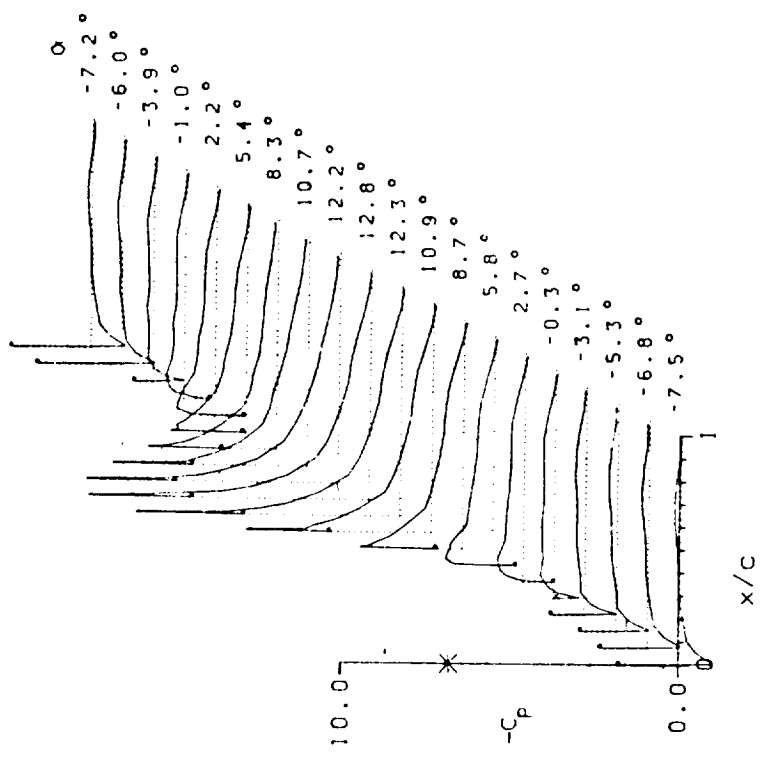


Figure 18.- Continued.

NLR-1 AIRFOIL TRIP
 FRAME : 64019 A0 = 14.77° k = 0.025
 Re = 3.87 E6 A1 = 9.90° M = 0.296
 CLmax = 1.51 CMmin = -0.18 CDmax = 0.44
 αLmax = 14.2° ξ = 0.180 Mmax = 0.976
 αCmin = 14.2° -CDmax = 6.9 αMmax = 12.7°

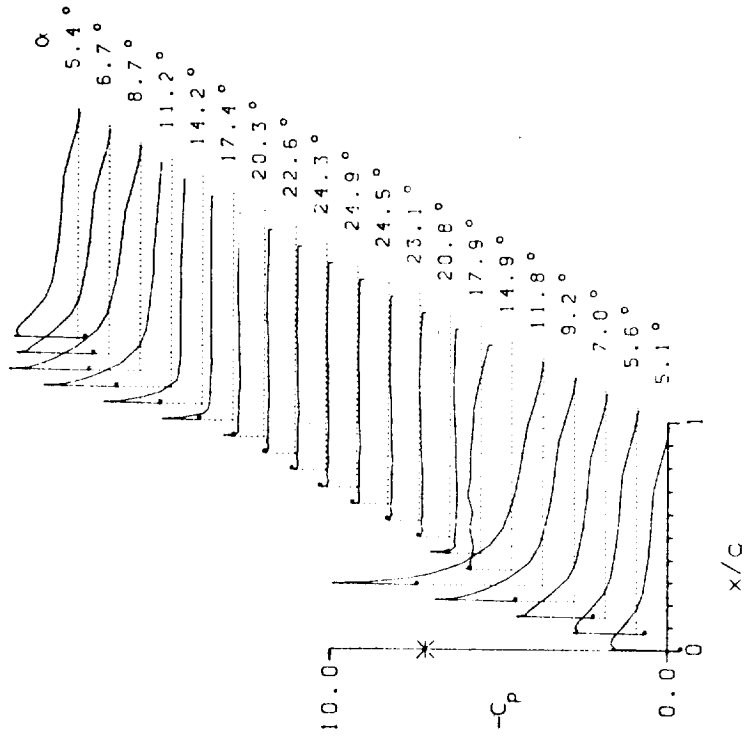
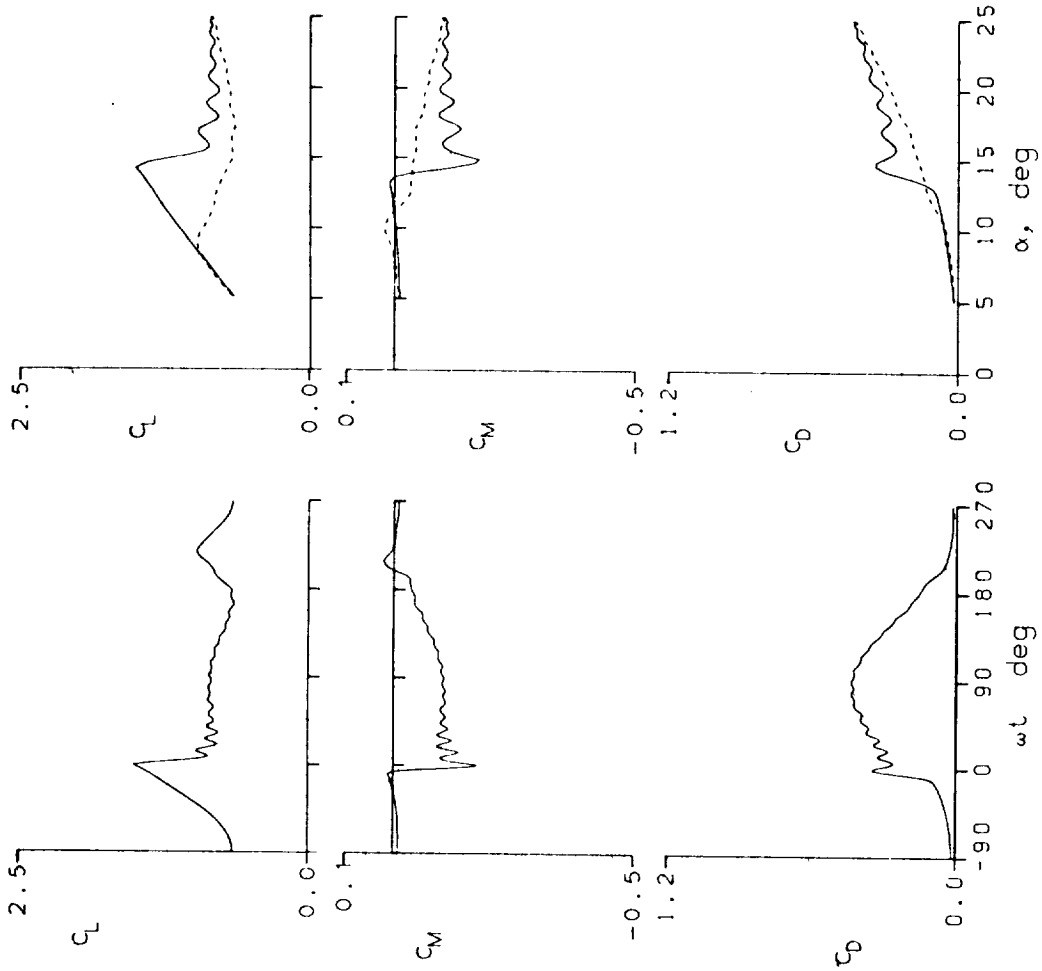


Figure 18.- Continued.

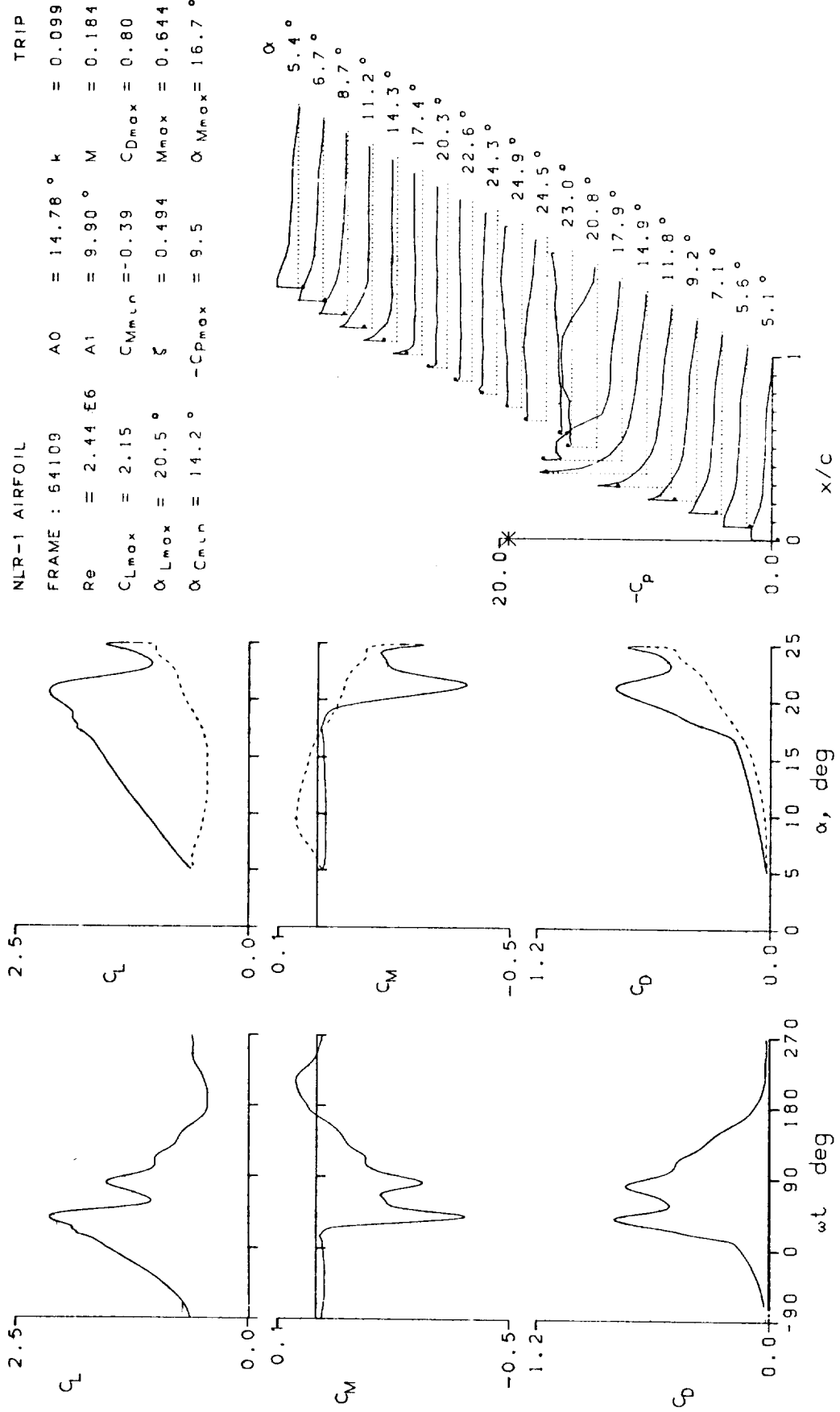


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 64111	A0 = 14.79°	k = 0.148	TRIP
Re = 2.44 E6	A1 = 9.90°	M = 0.185	
CLmax = 2.32	CMmin = -0.44	CDmax = 0.96	
α Lmax = 22.2°	ξ = 0.347	Mmax = 0.657	
α Cmin = 14.3°	-Cpmax = 9.8	α Mmax = 17.7°	

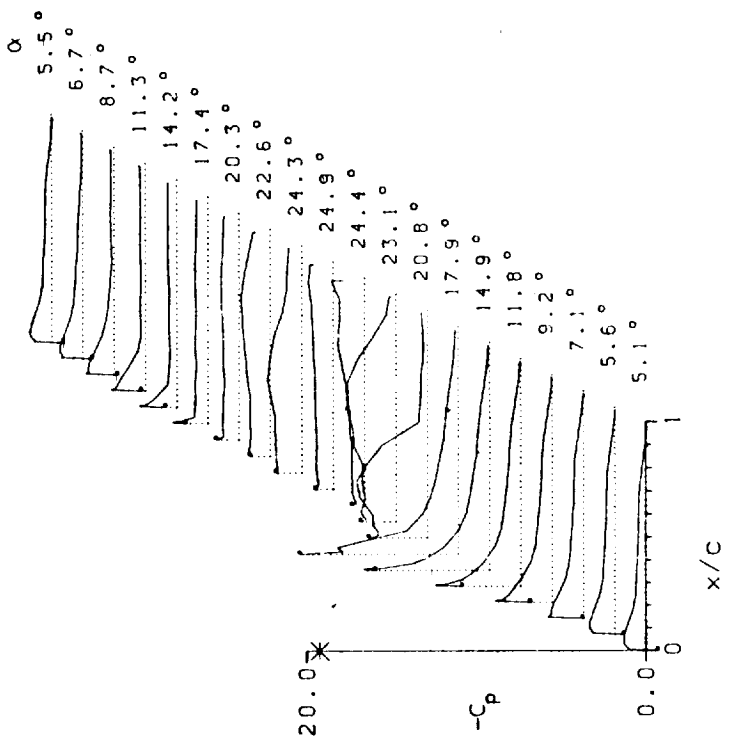
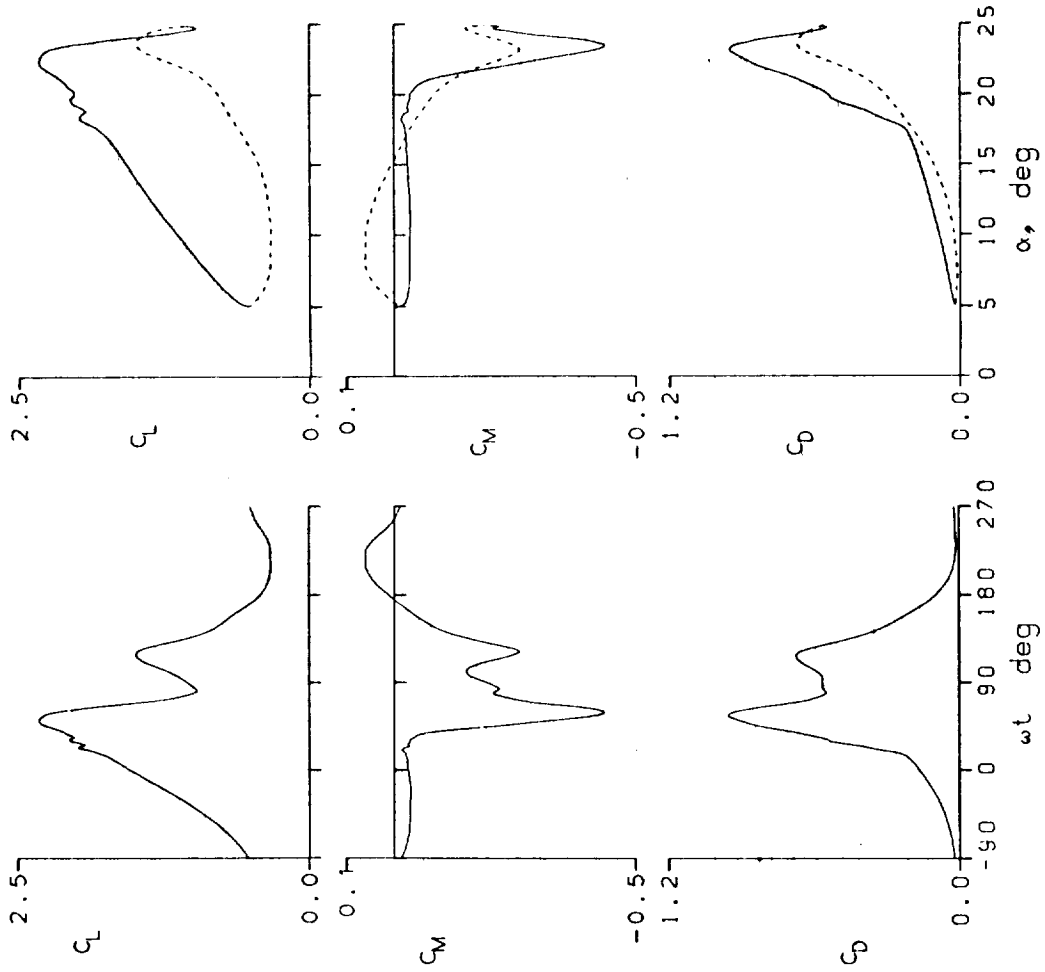


Figure 18.- Continued.

NLR-1 AIRFOIL TRIP

FRAME : 64202 A0 = 2.35° k = 0.049

Re = 3.79 E6 A1 = 10.15° M = 0.303

C_{Lmax} = 1.35 C_{Mmin} = -0.10 C_{Dmax} = 0.21

α_{Lmax} = 12.6° ξ = 0.126 M_{max} = 0.999

α_{Cmin} = 1.9° $-C_{Pmax}$ = 6.8 α_{Mmax} = 12.4°

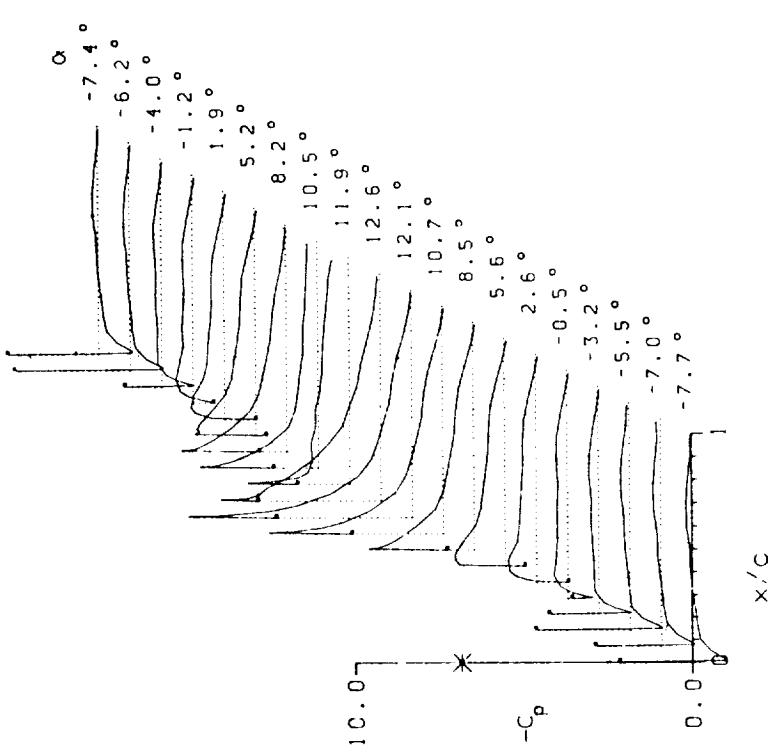
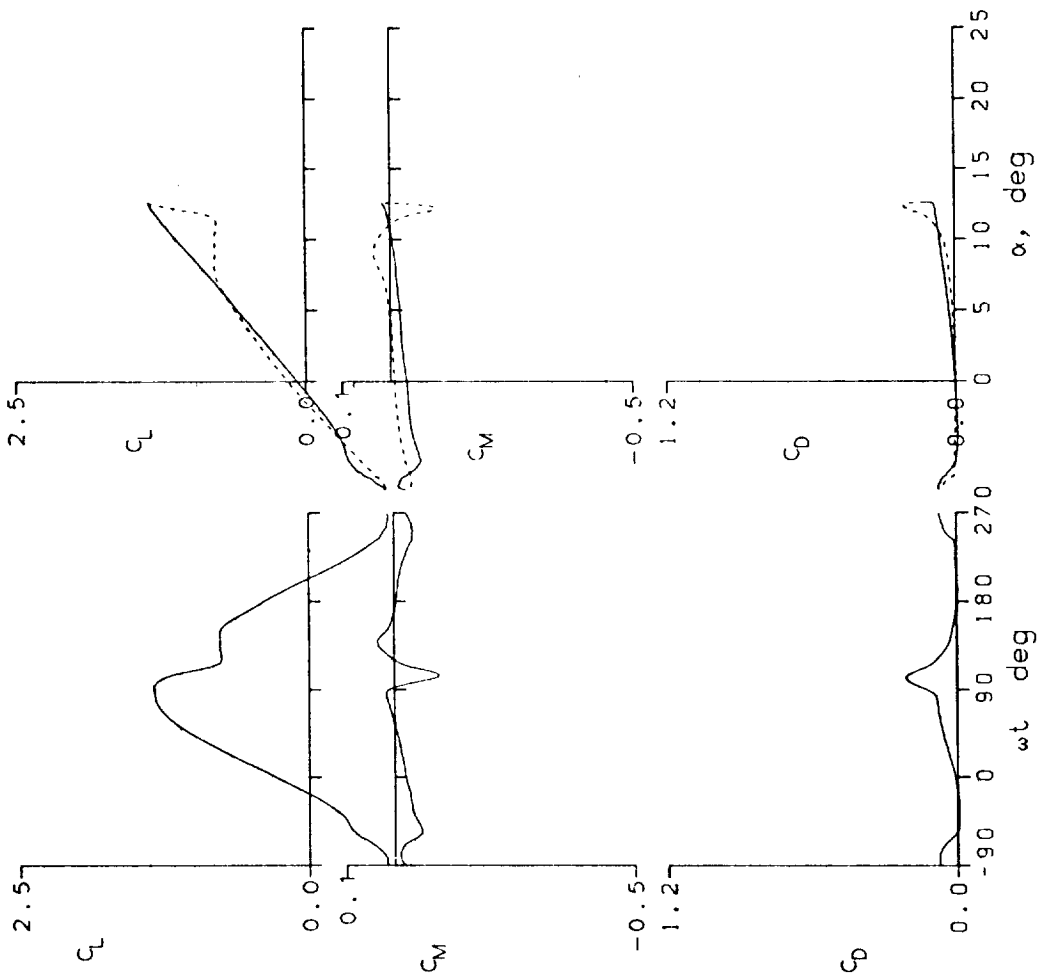


Figure 18.- Continued.

NLR-1 AIRFOIL TRIP

FRAME : 64212 A0 = -2.19 ° k = 0.010

Re = 3.72 E6 A1 = 10.00 ° M = 0.302

CLmax = 0.92 CMmin = -0.05 CDmax = 0.17

αLmax = 8.0 ° ζ = 0.044 Mmax = 0.685

αCmin = -2.7 ° -CDmax = 3.5 αMmax = -6.3 °

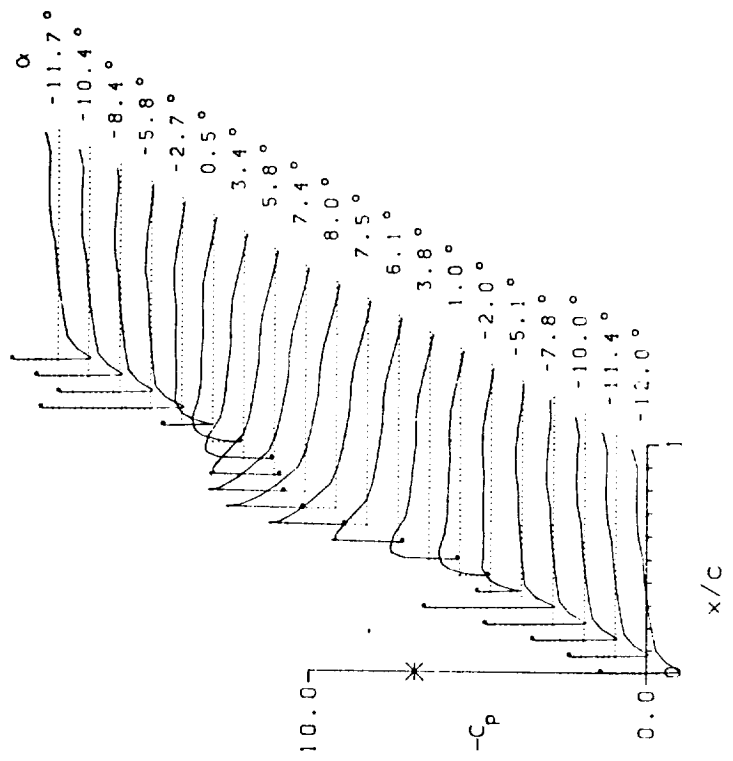
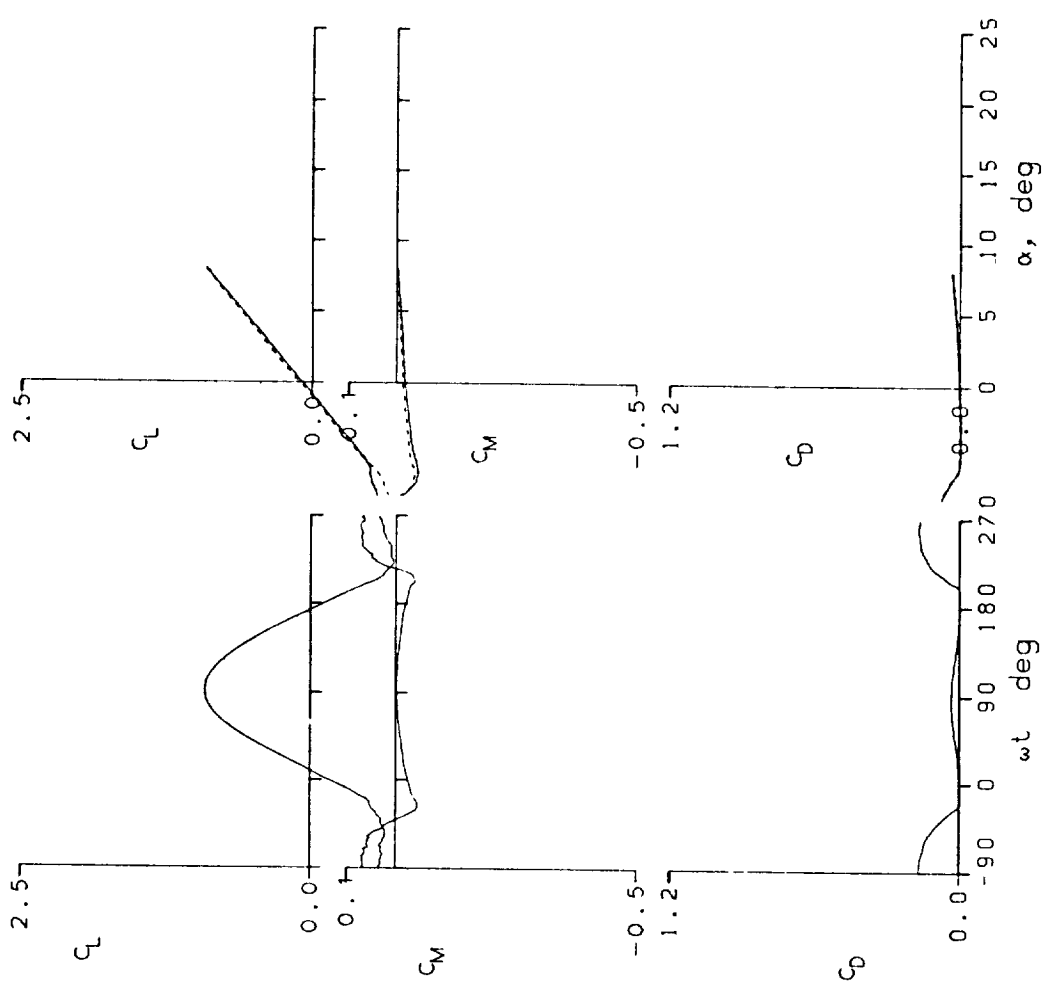


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 65121 A0 = -2.19° k = 0.010
 Re = 3.72 E6 A1 = 10.00° M = 0.300
 C_{Lmax} = 0.94 C_{Mmin} = -0.06 C_{Dmax} = 0.18
 α_{Lmax} = 8.0° ζ = 0.017 M_{max} = 0.675
 α_{Cmin} = -2.7° -C_{pmax} = 3.4 α_{Mmax} = 8.0°

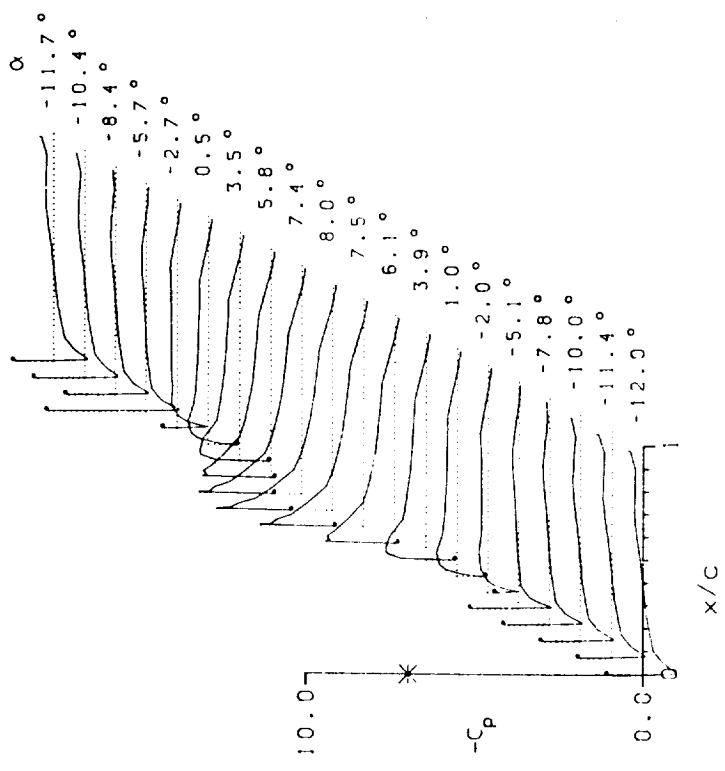
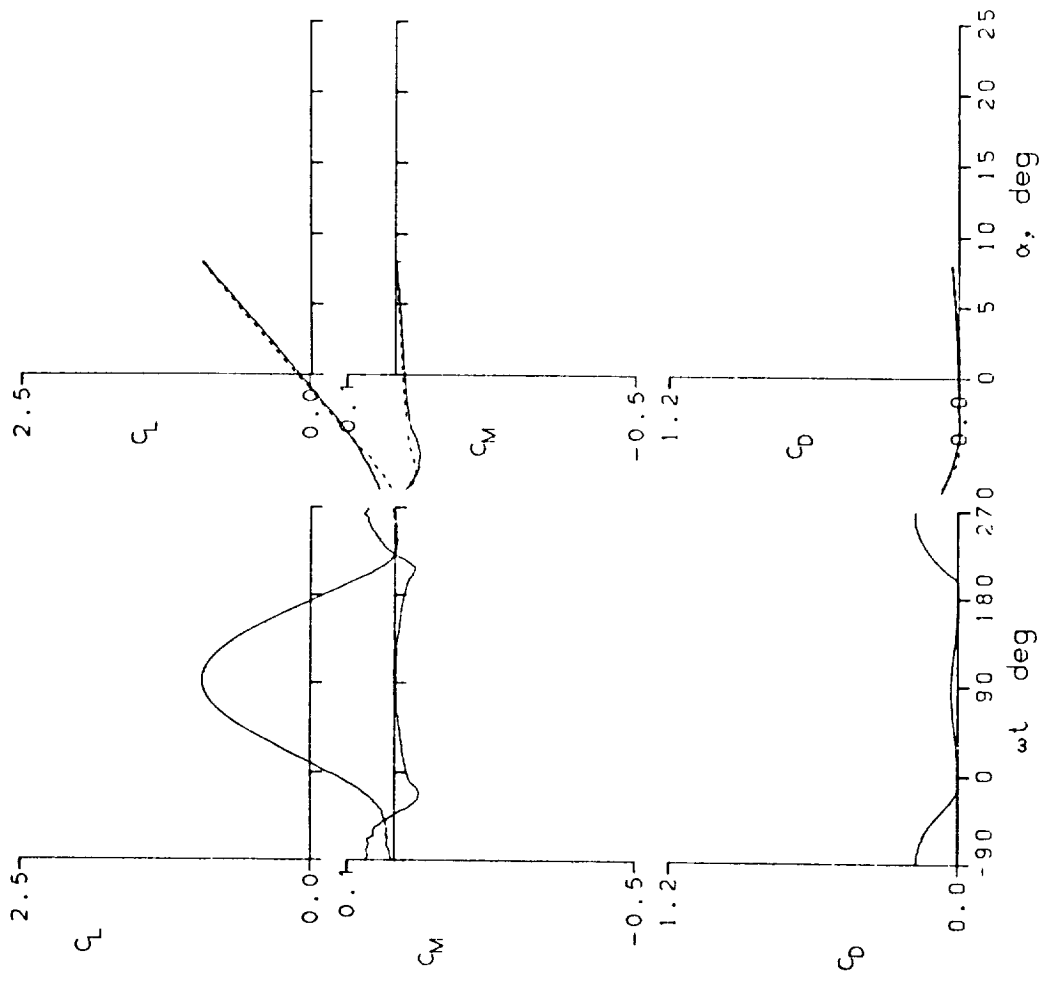


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 65122 A0 = -2.18° k = 0.024
 Re = 3.70 E6 A1 = 10.00° M = 0.301
 C_{Lmax} = 0.95 C_{Mmin} = -0.06 C_{Dmax} = 0.18
 α_{Lmax} = 8.0° ξ = 0.040 M_{max} = 0.680
 $\alpha_{C_{min}}$ = -2.5° $-C_{Pmax}$ = 3.5 α_{Mmax} = 8.0°

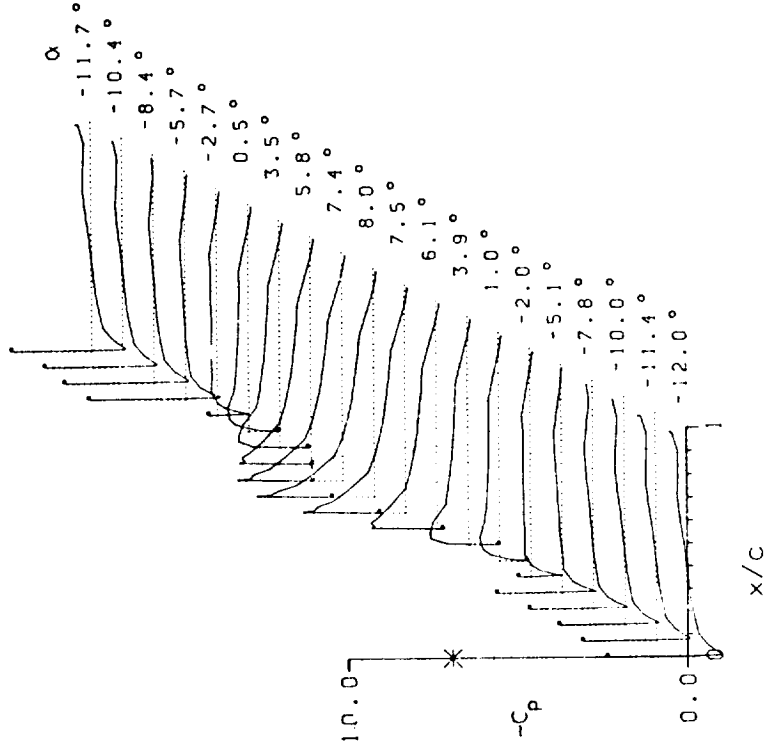
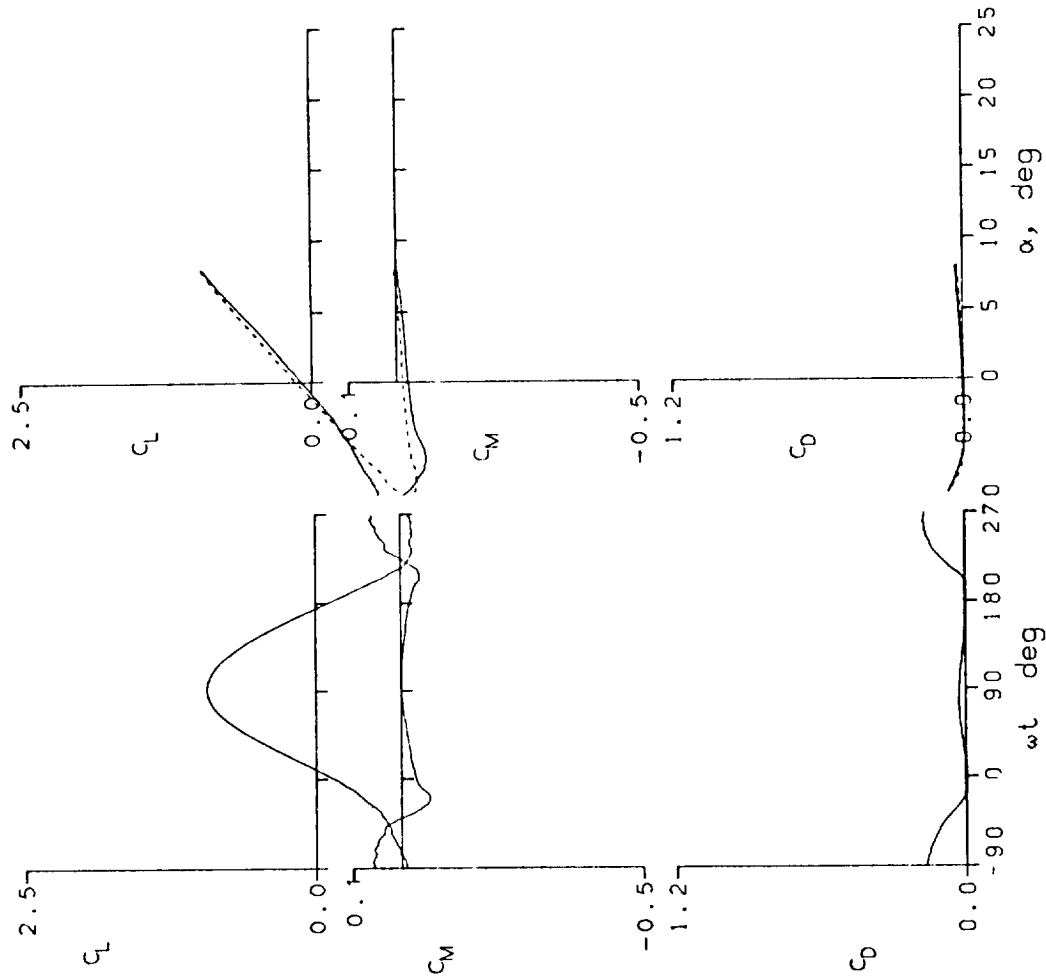


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 65123	A0 = -2.16 °	k = 0.049
Re = 3.69 E6	A1 = 10.00 °	M = 0.301
$C_{Lmax} = 0.94$	$C_{Mmin} = -0.07$	$C_{Dmax} = 0.19$
$\alpha_{Lmax} = 8.0 °$	$\zeta = 0.083$	$M_{max} = 0.715$
$\alpha_{Cmin} = -2.7 °$	$-C_{Pmax} = 3.8$	$\alpha_{Mmax} = -7.5 °$

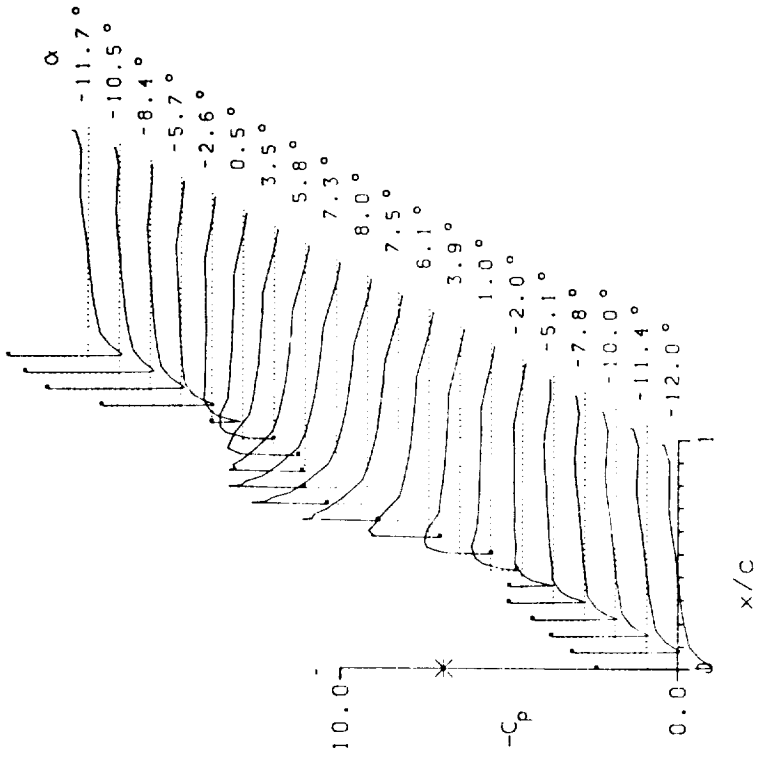
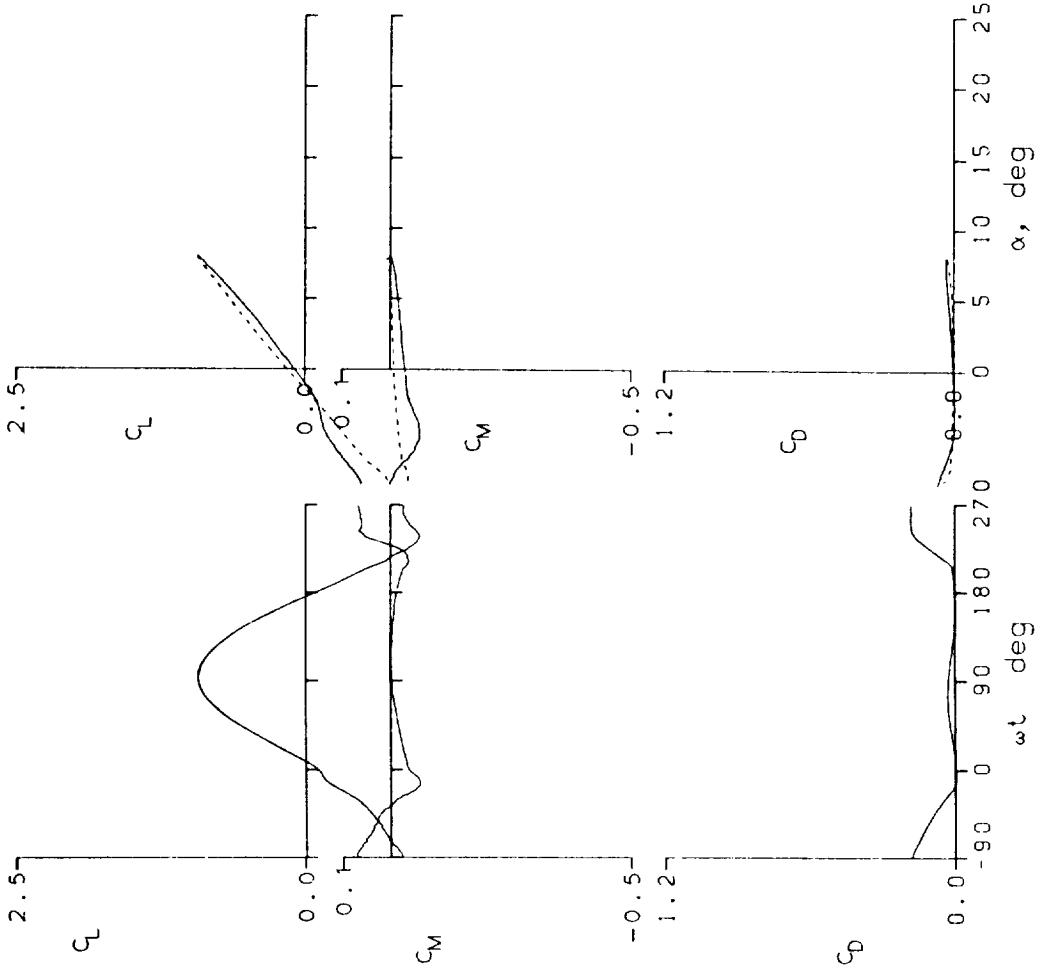


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 65200 A0 = -2.20° k = 0.097
 Re = 3.69 E6 A1 = 10.00° M = 0.302
 CLmax = 0.92 CMmin = -0.08 CDmax = 0.23
 αLmax = 8.0° ζ = 0.188 Mmax = 0.740
 αCMmin = -11.9° -CPmax = 4.1 αMmax = -8.2°

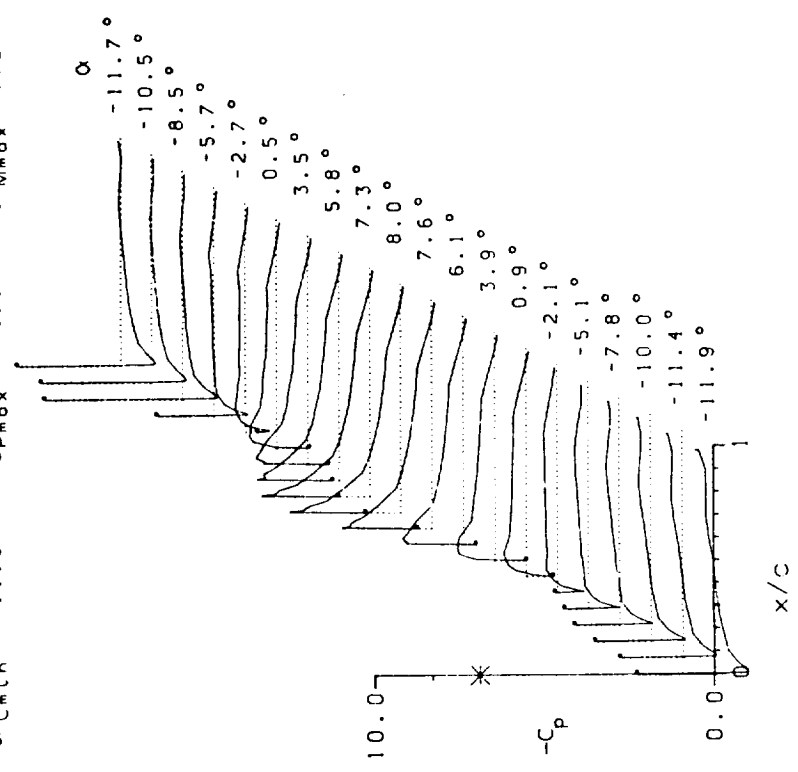
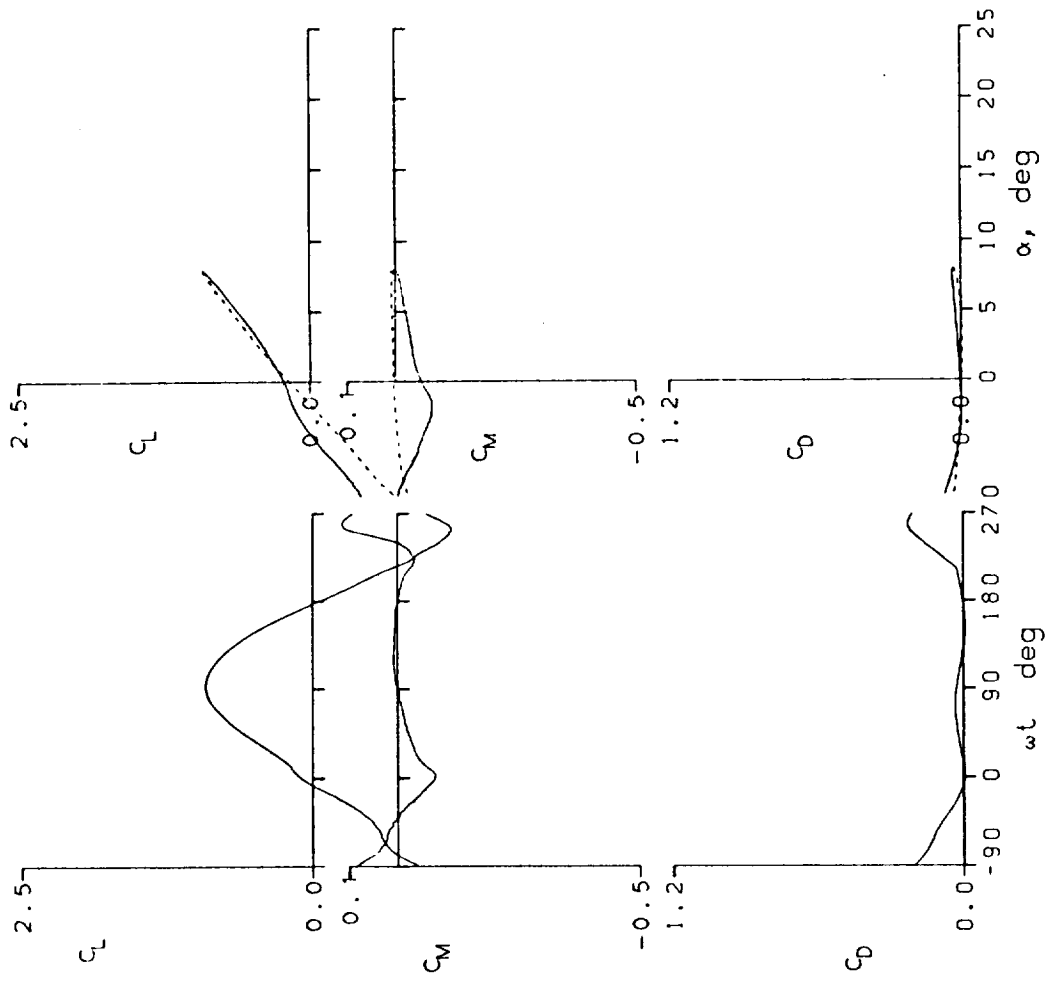


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 65207 A0 = 14.80° k = 0.100
 Re = 2.65 E6 A1 = 9.90° M = 0.199
 CLmax = 2.37 CMmin = -0.36 CDmax = 0.84
 αLmax = 21.6° ζ = 0.398 Mmax = 0.867
 αCMmin = 14.3° -CPmax = 13.4 αMmax = 18.3°

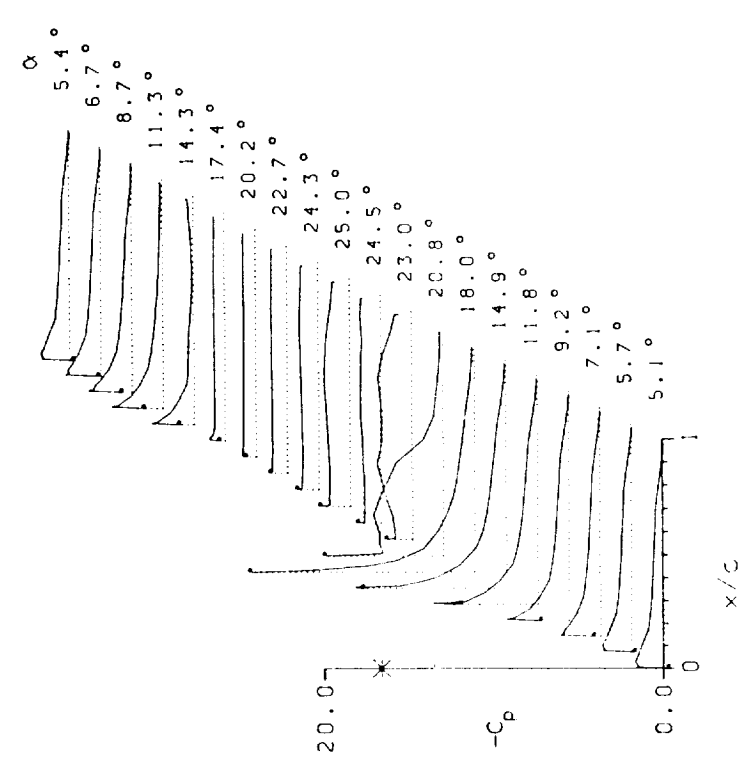
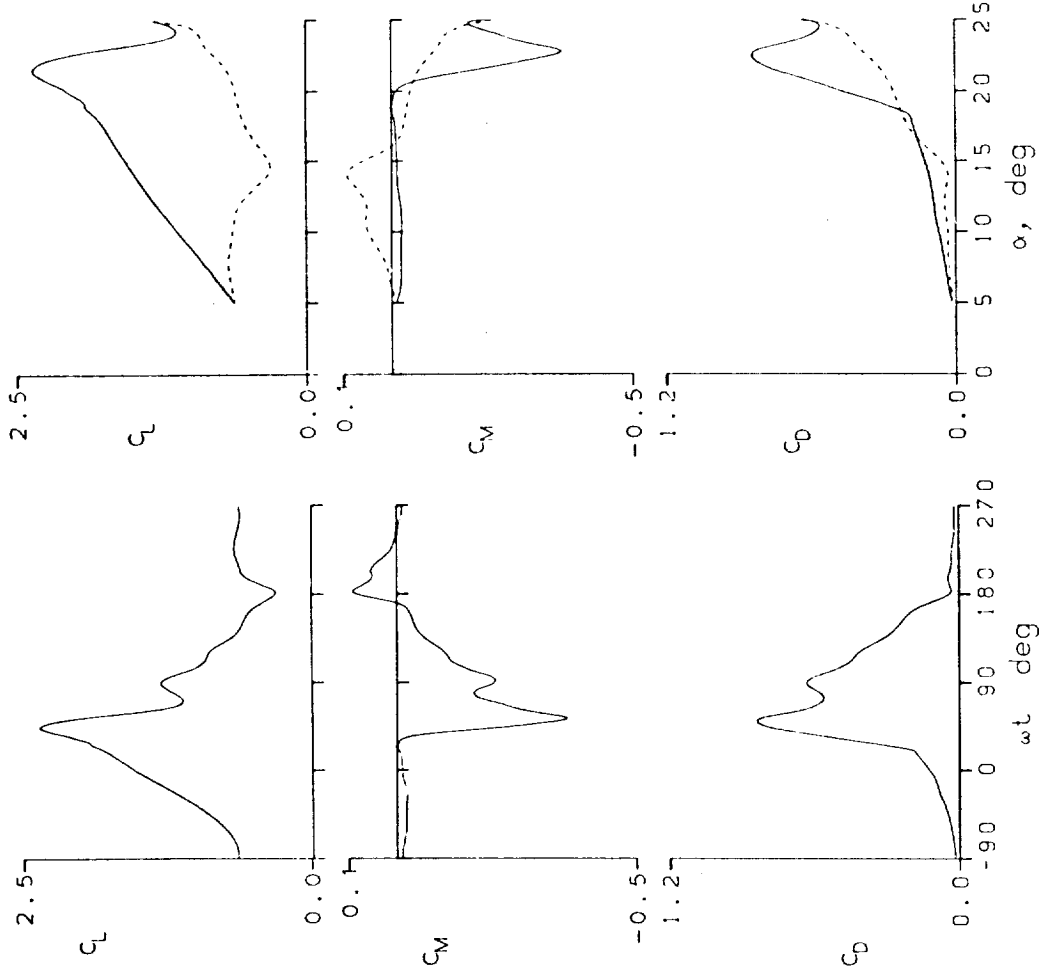


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 65209	A0 = 14.80 °	k = 0.102
Re = 3.78 E6	A1 = 9.91 °	M = 0.292
CLmax = 2.08	CMmin = -0.34	CDmax = 0.71
αLmax = 19.4 °	ξ = 0.611	Mmax = 1.188
αCMmin = 14.4 °	-CPmax = 9.3	αMmax = 14.7 °

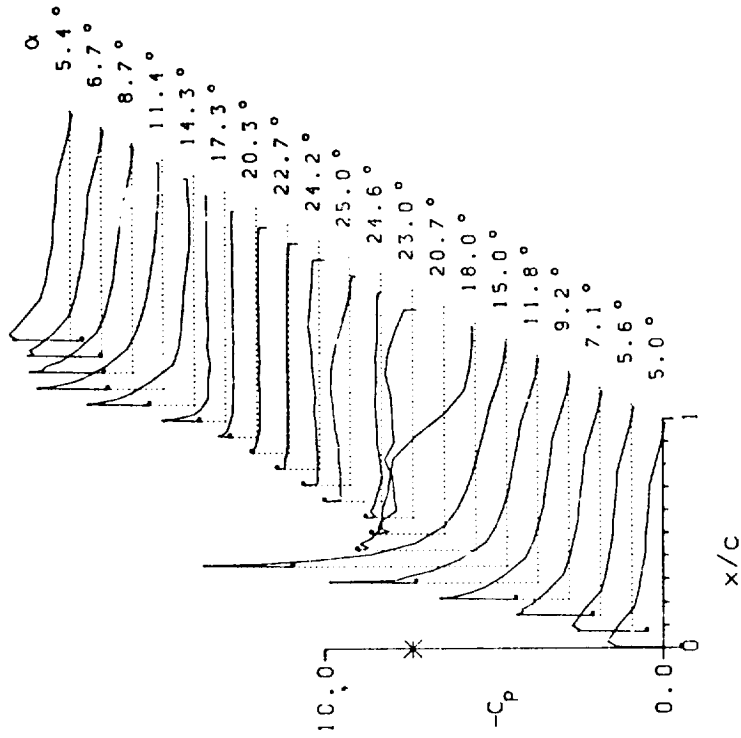
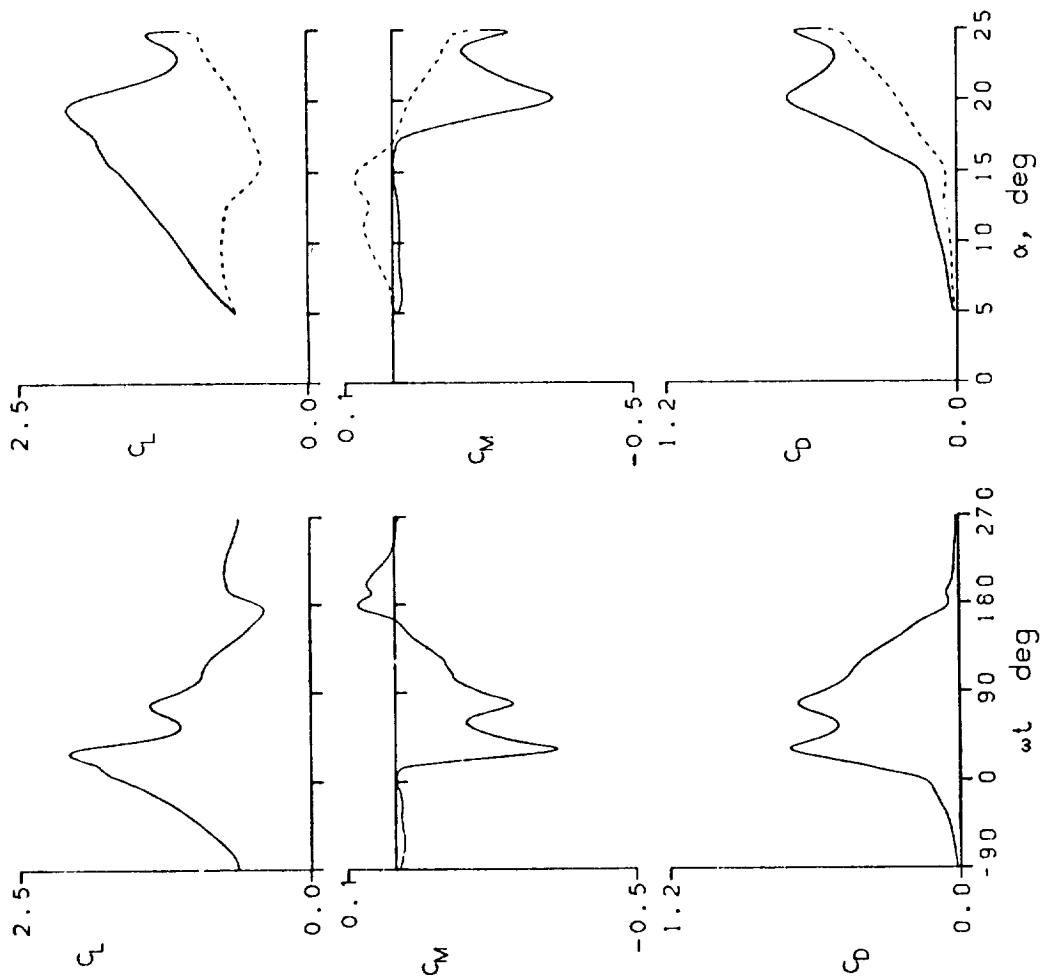


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 65223 A0 = 6.96° k = 0.025
 Re = 1.48 E6 A1 = 4.90° M = 0.109
 C_{Lmax} = 1.30 C_{Mmin} = -0.03 C_{Dmax} = 0.07
 α_{Lmax} = 11.9° ζ = 0.056 M_{max} = 0.311
 α_{Cmin} = 6.8° -C_{pmax} = 6.9 α_{Mmax} = 11.9°

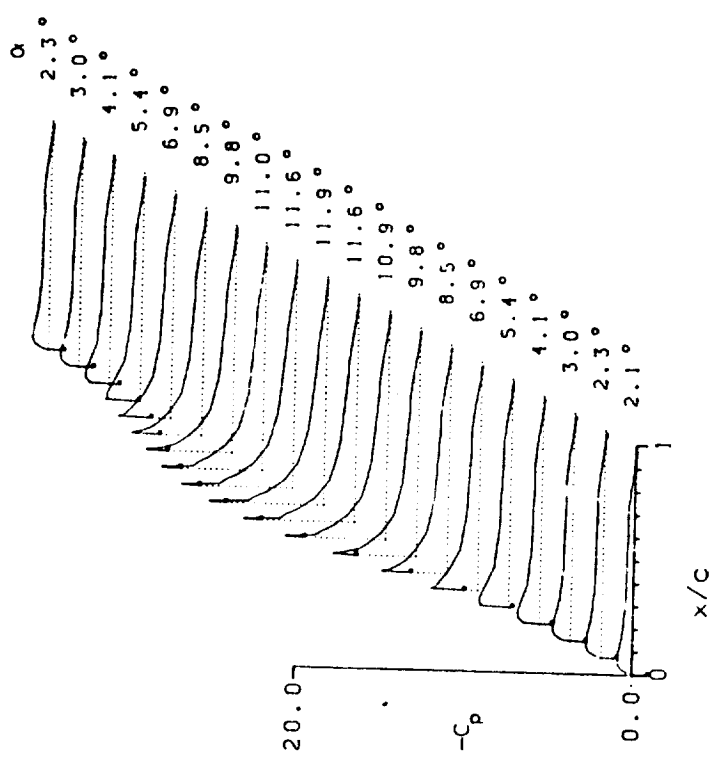
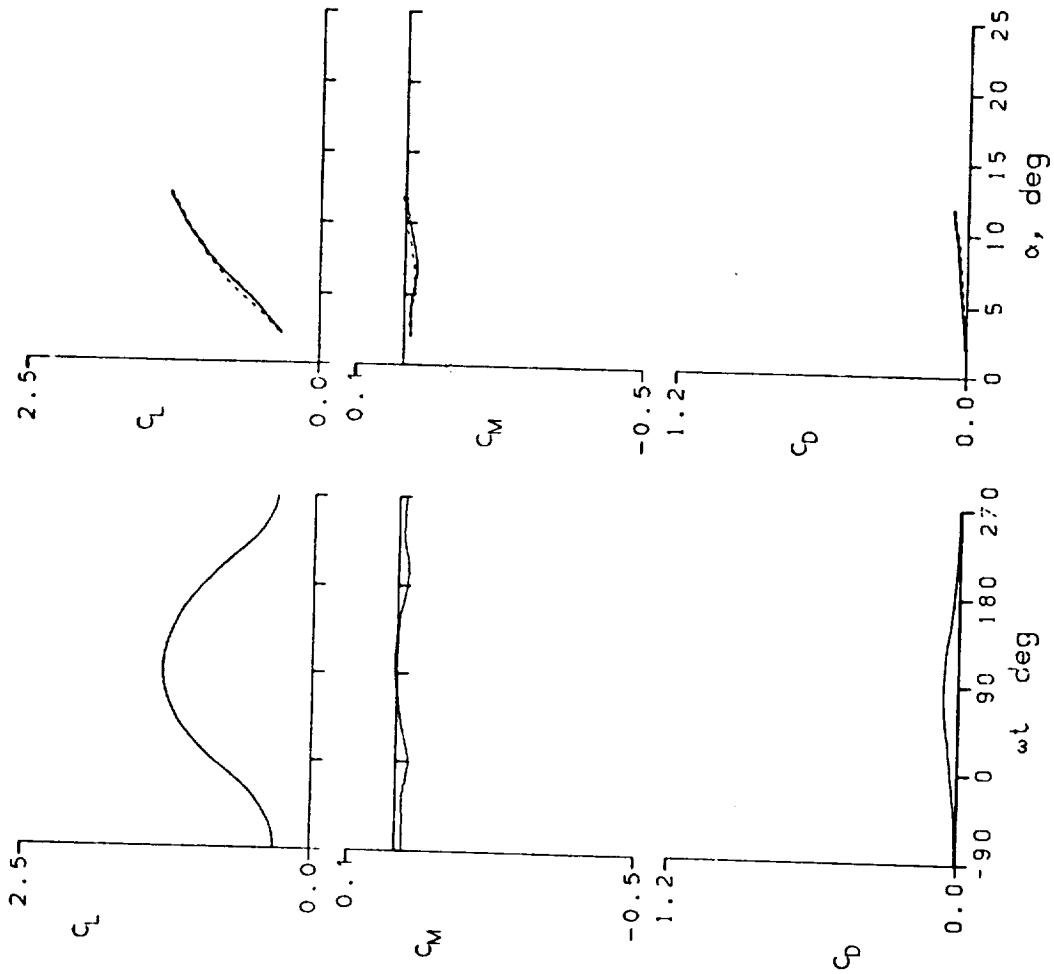


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 653C0 A0 = 6.96 ° k = 0.200
 Re = 1.47 E6 A1 = 4.89 ° M = 0.109
 C_{Lmax} = 1.27 C_{Mmin} = -0.04 C_{Dmax} = 0.08
 α_{Lmax} = 11.9 ° ζ = 0.448 M_{max} = 0.301
 α_{Cmin} = 6.8 ° -C_{Pmax} = 6.4 α_{Mmax} = 11.8 °

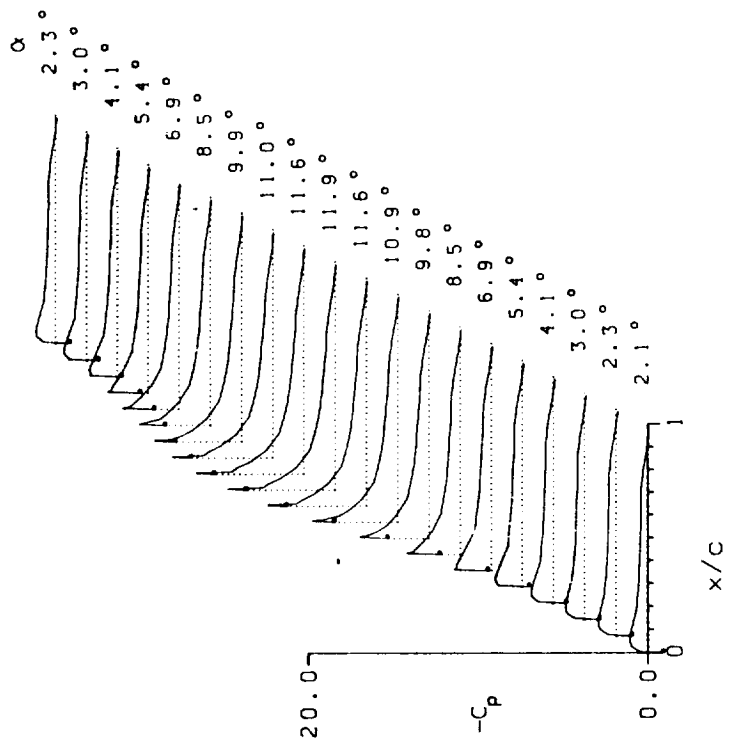
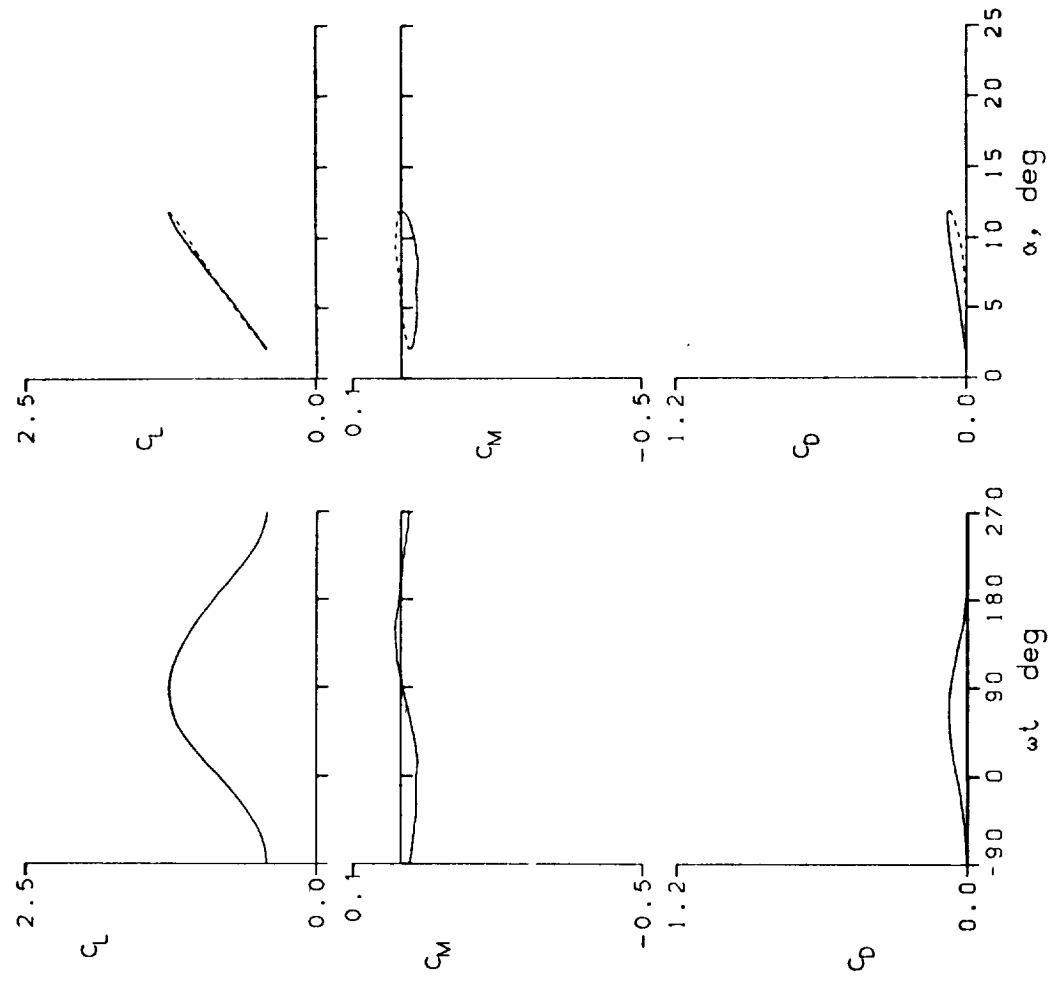


Figure 18.- Continued.

NLR-1 AIRFOIL
 FRAME : 65309 A0 = 6.96° k = 0.010
 Re = 3.89 E6 A1 = 4.89° M = 0.301
 CLmax = 1.30 CMmin = -0.02 CDmax = 0.06
 αLmax = 11.8° ζ = 0.032 Mmax = 1.117
 αCMmin = 6.8° -CPmax = 8.1 αMmax = 11.9°

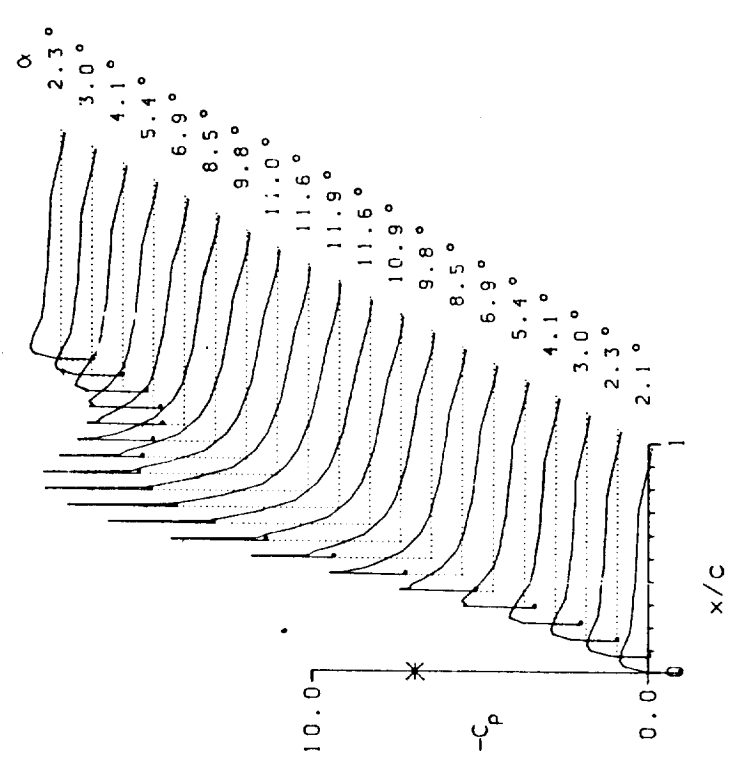
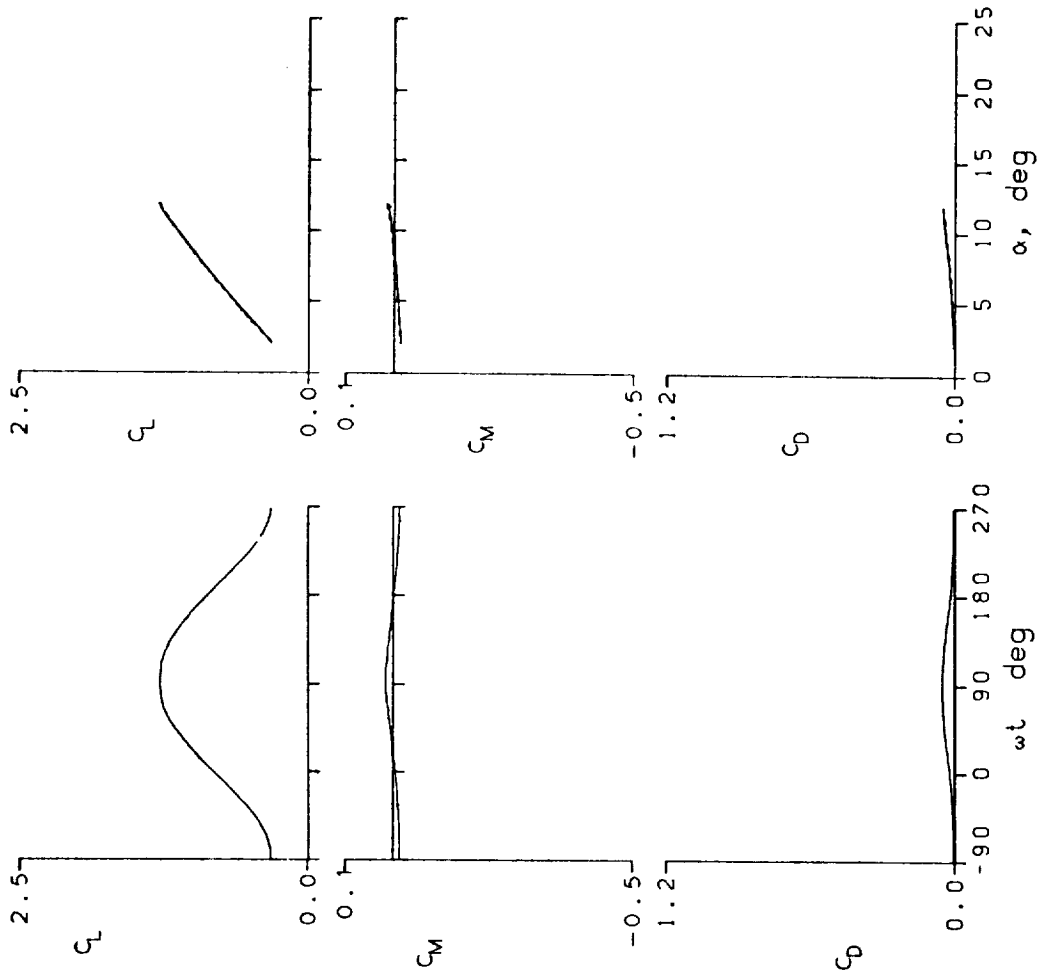


Figure 18.- Continued.

NLR-1 AIRFOIL

FRAME : 65311	A0 = 6.98 °	k = 0.197
Re = 3.86 E6	A1 = 4.90 °	M = 0.301
CLmax = 1.38	CMmin = -0.04	CDmax = 0.07
α Lmax = 11.9 °	ξ = 0.616	Mmax = 1.176
α Cmin = 6.8 °	-CPmax = 8.6	α Mmax = 11.8 °

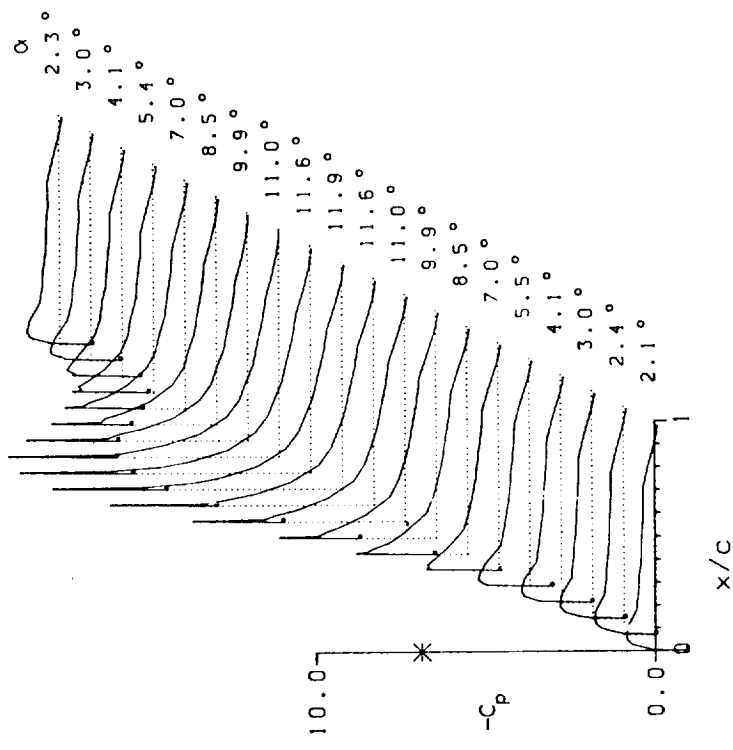
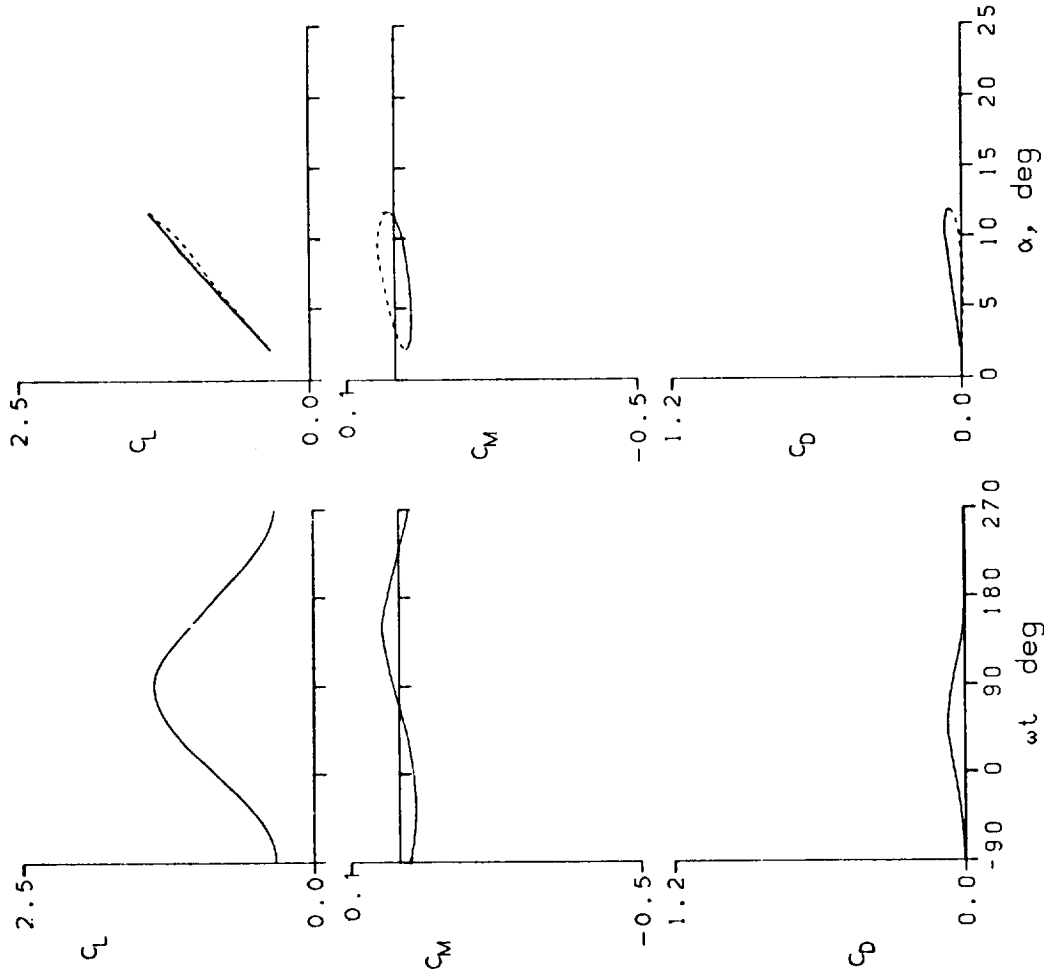


Figure 18.- Concluded.

NLR-7301 AIRFOIL

FRAME : 67021	A0 = 14.80 °	k = 0.099	TRIP
Re = 2.43 E6	A1 = 9.90 °	M = 0.184	
CLmax = 2.31	CMmin = -0.49	CDmax = 0.91	
αLmax = 24.1 °	ξ = 0.060	Mmax = 0.697	
αCmin = 14.2 °	-CPmax = 11.0	αMmax = 21.8 °	

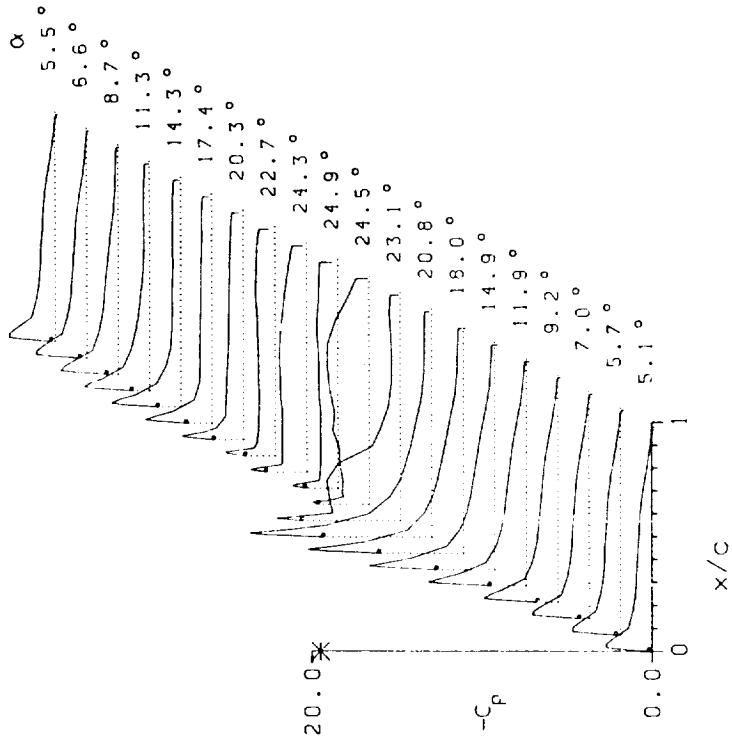
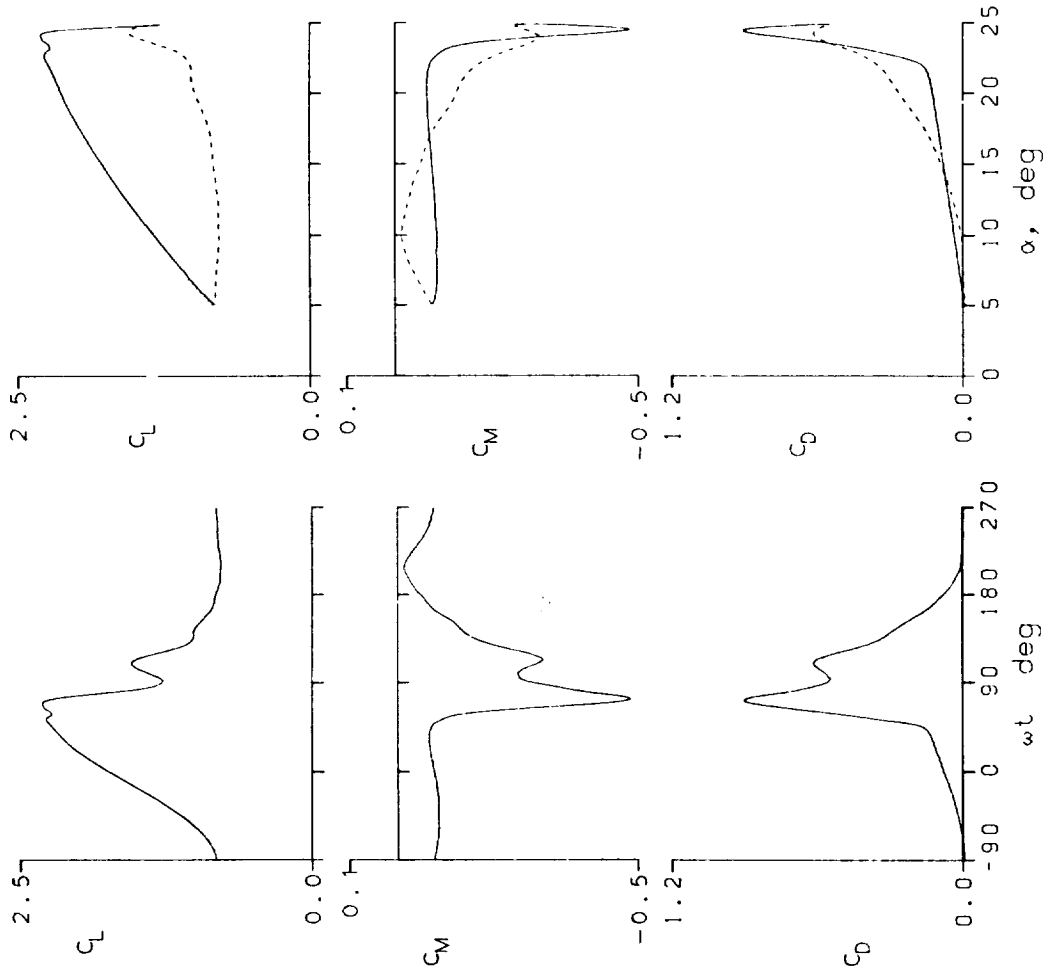


Figure 19.- Continued.

NLR-7301 AIRFOIL TRIP
 FRAME : 67023 A0 = 14.79° k = 0.198
 Re = 2.43 E6 A1 = 9.90° M = 0.183
 CLmax = 2.44 CMmin = -0.50 CDmax = 0.94
 αLmax = 24.2° ξ = -0.289 Mmax = 0.719
 αCmin = 14.3° -CPmax = 11.7 αMmax = 22.9°

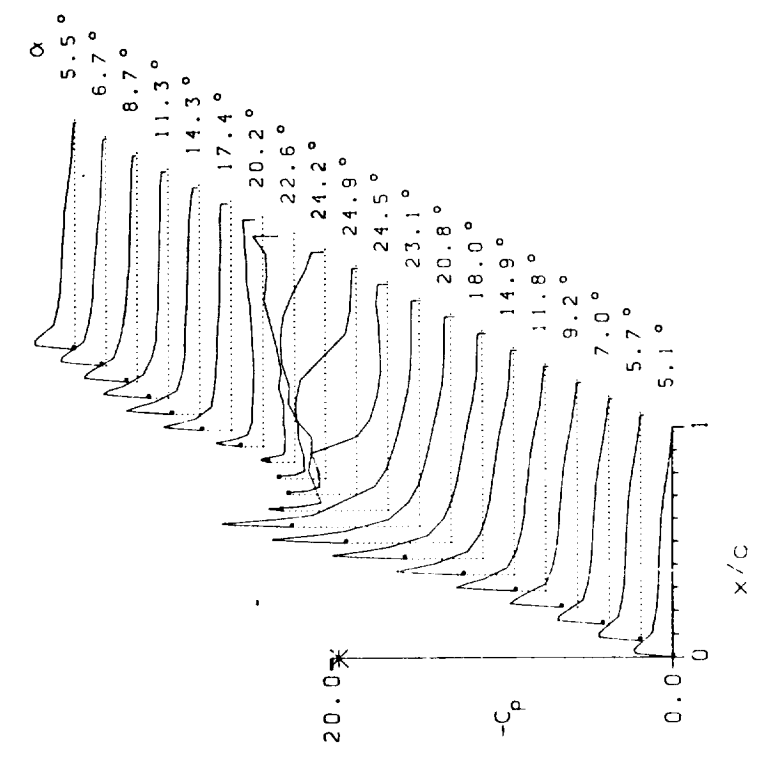
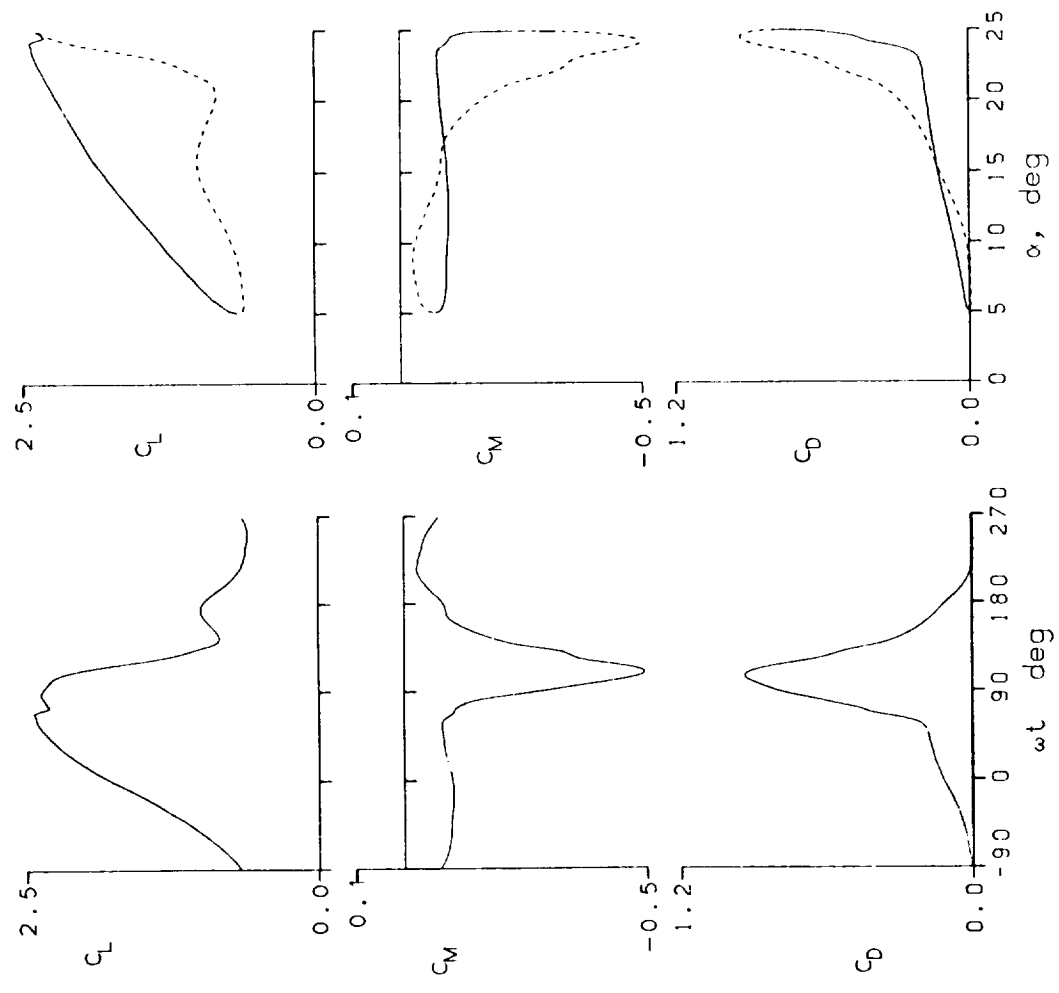


Figure 19.- Continued.

NLR-7301 AIRFOIL TRIP

FRAME : 67108 A0 = 9.98° k = 0.024

Re = 3.81 E6 A1 = 4.90° M = 0.301

C_{Lmax} = 1.58 C_{Mmin} = -0.18 C_{Dmax} = 0.23

α_{Lmax} = 14.5° ζ = -0.217 M_{max} = 1.131

α_{Cmin} = 9.8° $-C_{Dmax}$ = 8.2 α_{Mmax} = 14.5°

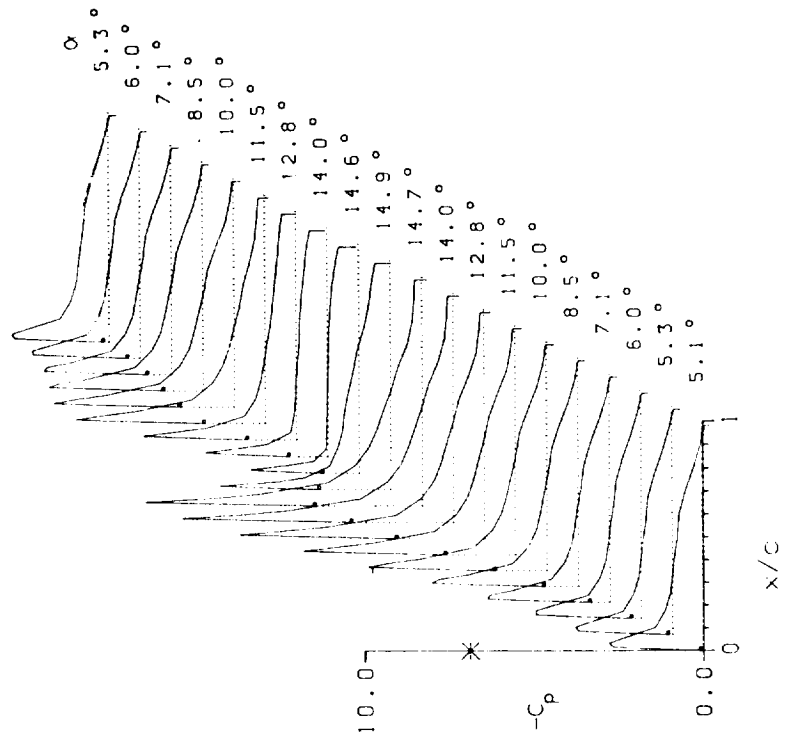
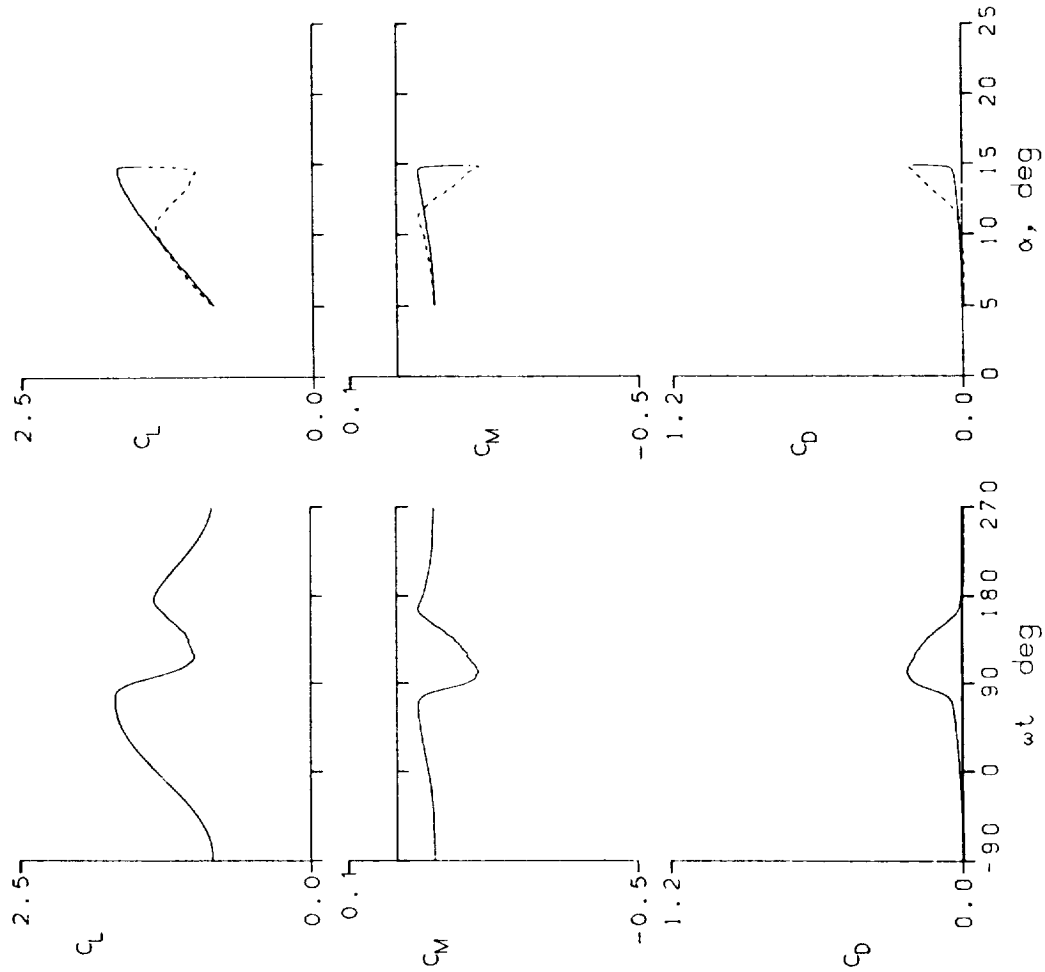


Figure 19.- Continued.

NLR-7301 AIRFOIL TRIP

FRAME : 67110 A0 = 9.98° k = 0.049

Re = 3.75 E6 A1 = 4.90° M = 0.298

C_{Lmax} = 1.72 C_{Mmin} = -0.16 C_{Dmax} = 0.19

α_{Lmax} = 14.7° ζ = -0.158 M_{max} = 1.143

$\alpha_{C_{min}}$ = 9.8° $-C_{pmax}$ = 8.5° α_{Mmax} = 14.9°

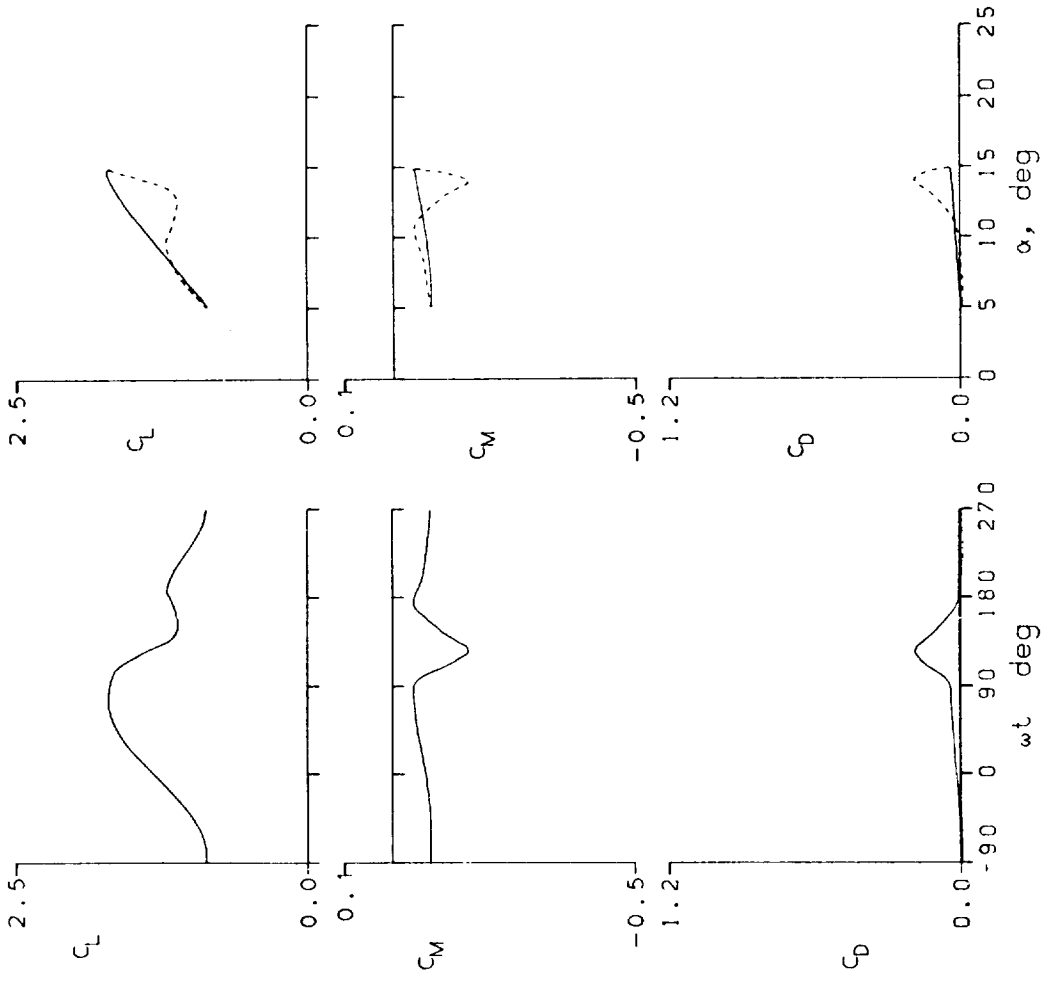


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67120	$\Lambda_0 = 14.79^\circ$	$k = 0.099$
$Re = 1.48 E6$	$A1 = 9.90^\circ$	$M = 0.110$
$C_{Lmax} = 2.31$	$C_{Mmin} = -0.37$	$C_{Dmax} = 0.82$
$\alpha_{Lmax} = 24.7^\circ$	$\xi = -0.221$	$M_{max} = 0.395$
$\alpha_{Cmin} = 14.2^\circ$	$-C_{Pmax} = 11.2$	$\alpha_{Mmax} = 23.4^\circ$

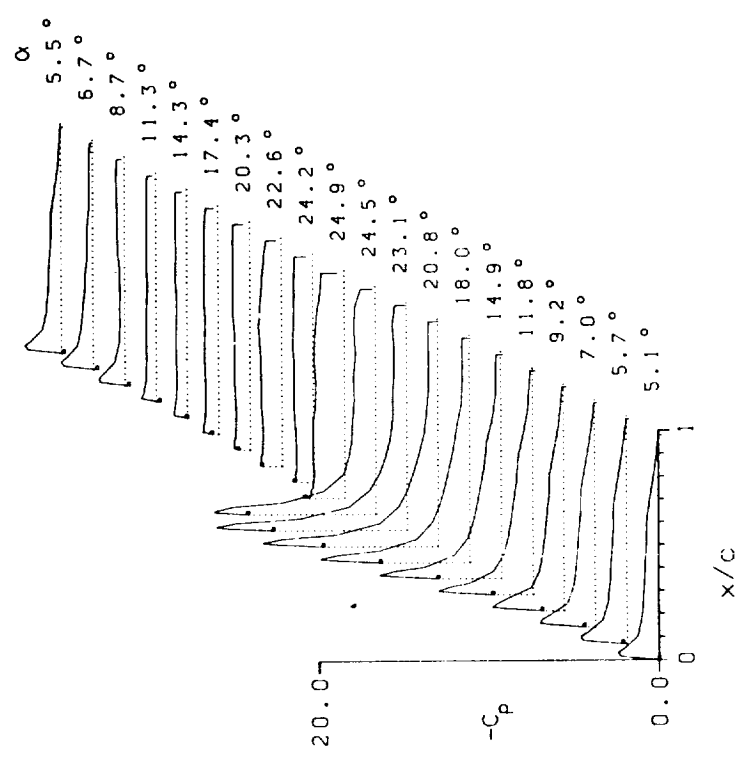
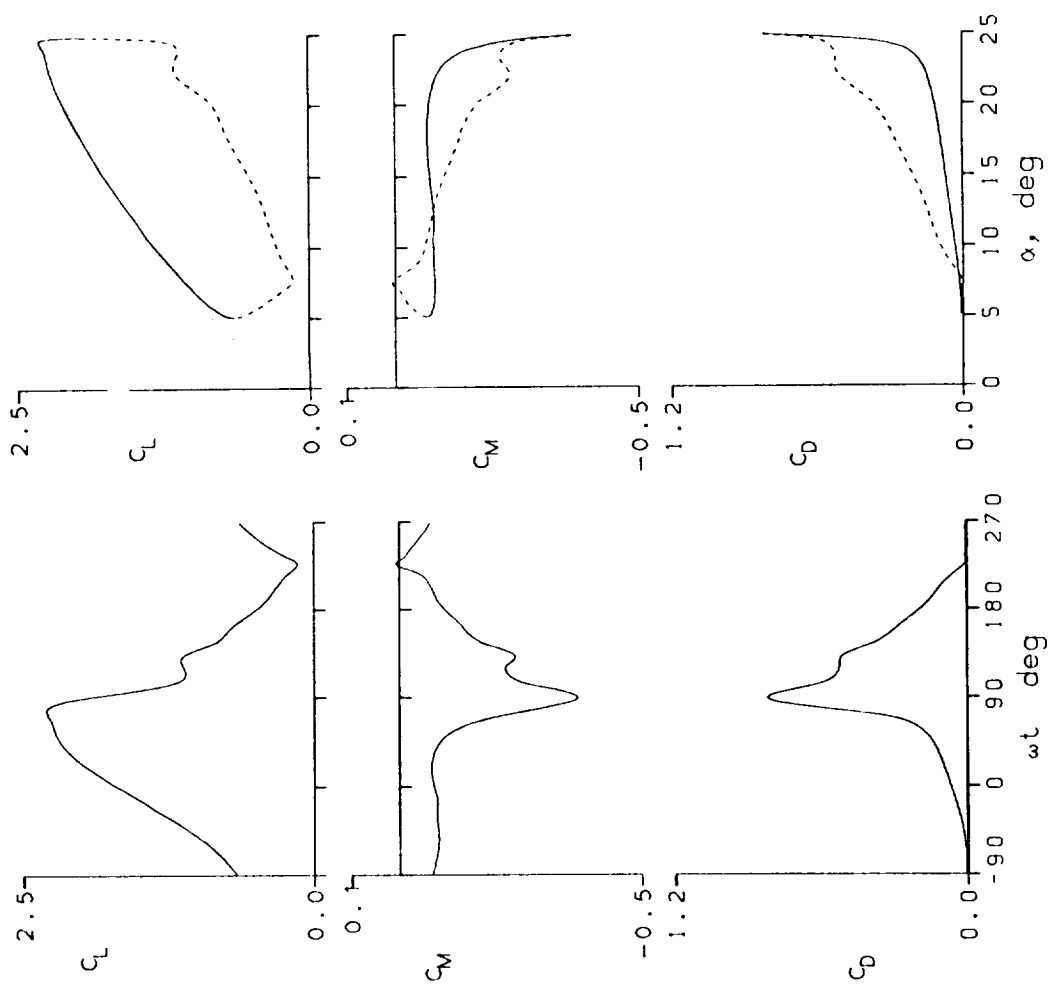


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67201	A0 = 9.80 °	k = 0.099
Re = 1.48 E6	A1 = 9.90 °	M = 0.110
CLmax = 1.99	CMmin = -0.09	CDmax = 0.09
α Lmax = 19.5 °	ξ = 0.227	Mmax = 0.368
α Cmin = 9.3 °	-CPmax = 9.7	α Mmax = 19.8 °

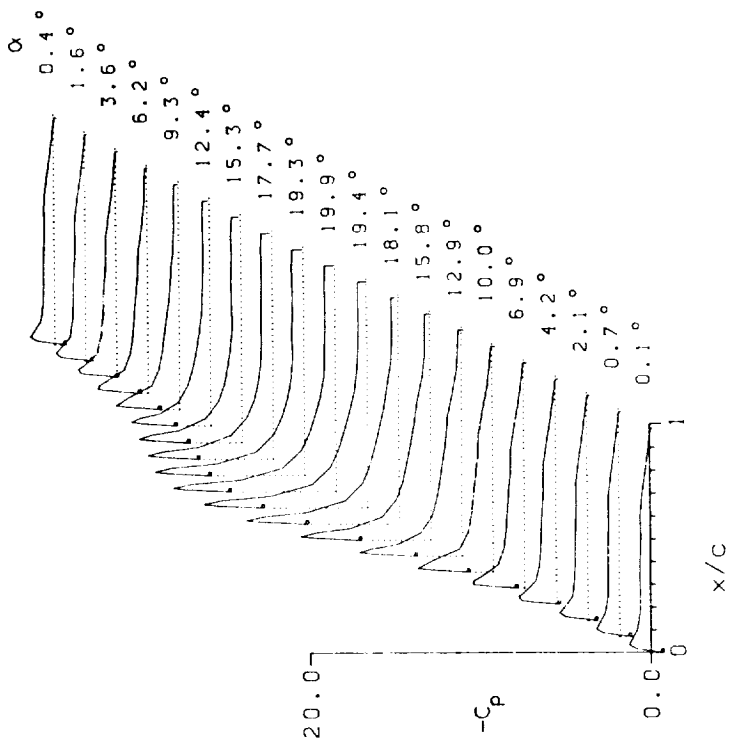
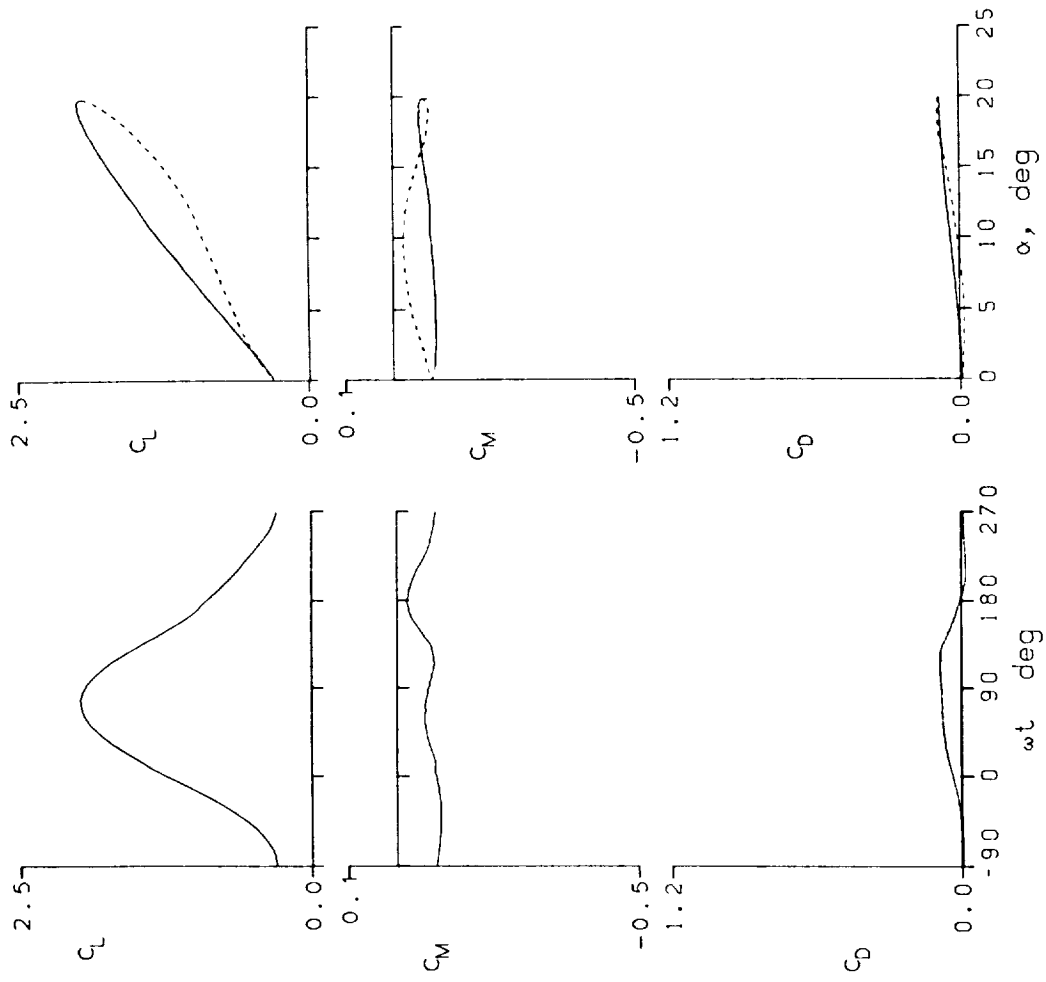


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67208 A0 = 9.81 ° k = 0.025
 Re = 2.46 E6 A1 = 9.90 ° M = 0.184
 C_{Lmax} = 1.90 C_{Mmin} = -0.12 C_{Dmax} = 0.18
 α_{Lmax} = 19.2 ° ζ = 0.002 M_{max} = 0.639
 α_{Cmin} = 9.3 ° -C_{Pmax} = 9.3 α_{Mmax} = 19.4 °

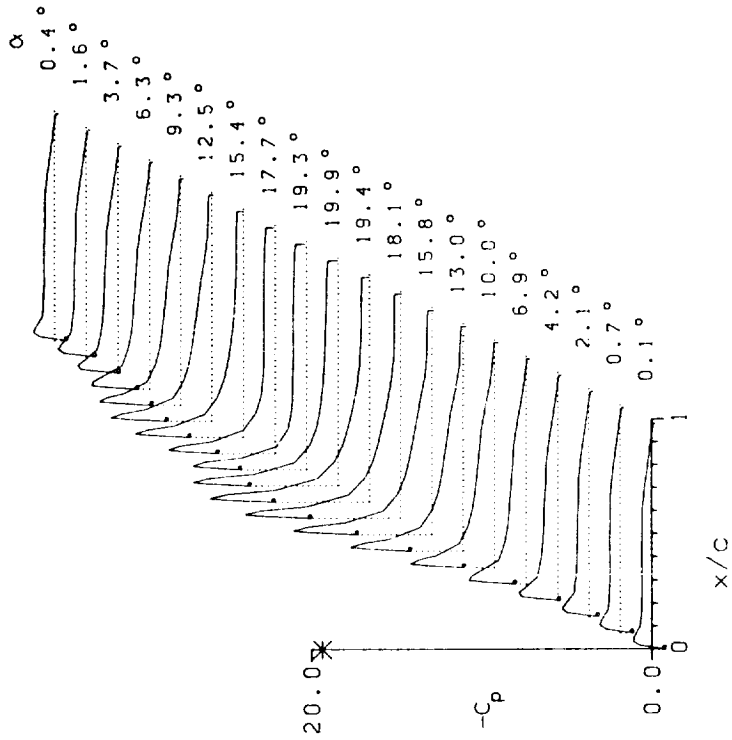
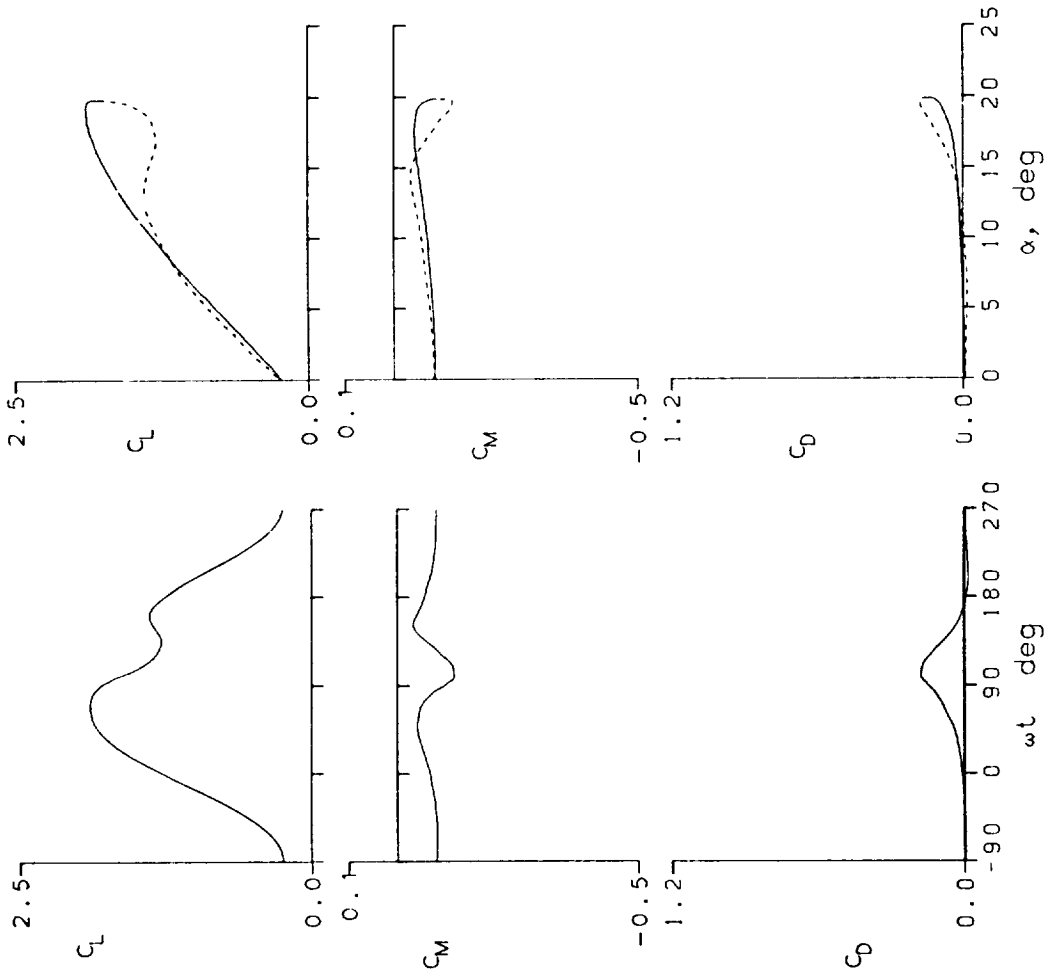


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67210	A0 = 9.80 °	k = 0.099
Re = 2.46 E6	A1 = 9.90 °	M = 0.185
CLmax = 2.10	CMmin = -0.10	CDmax = 0.08
α Lmax = 19.6 °	ξ = 0.237	Mmax = 0.685
α CMmin = 9.3 °	-CPmax = 10.6	α Mmax = 19.8 °

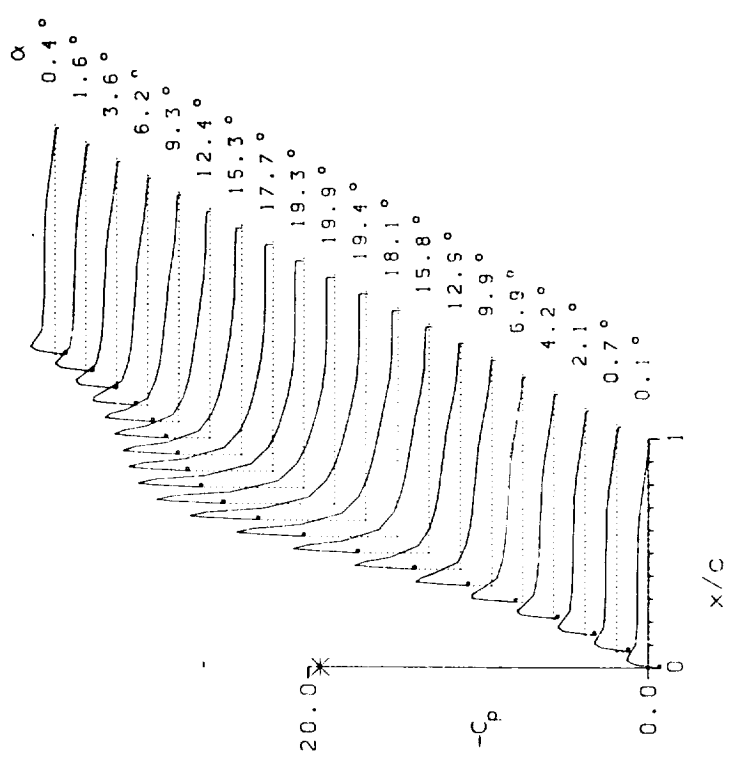
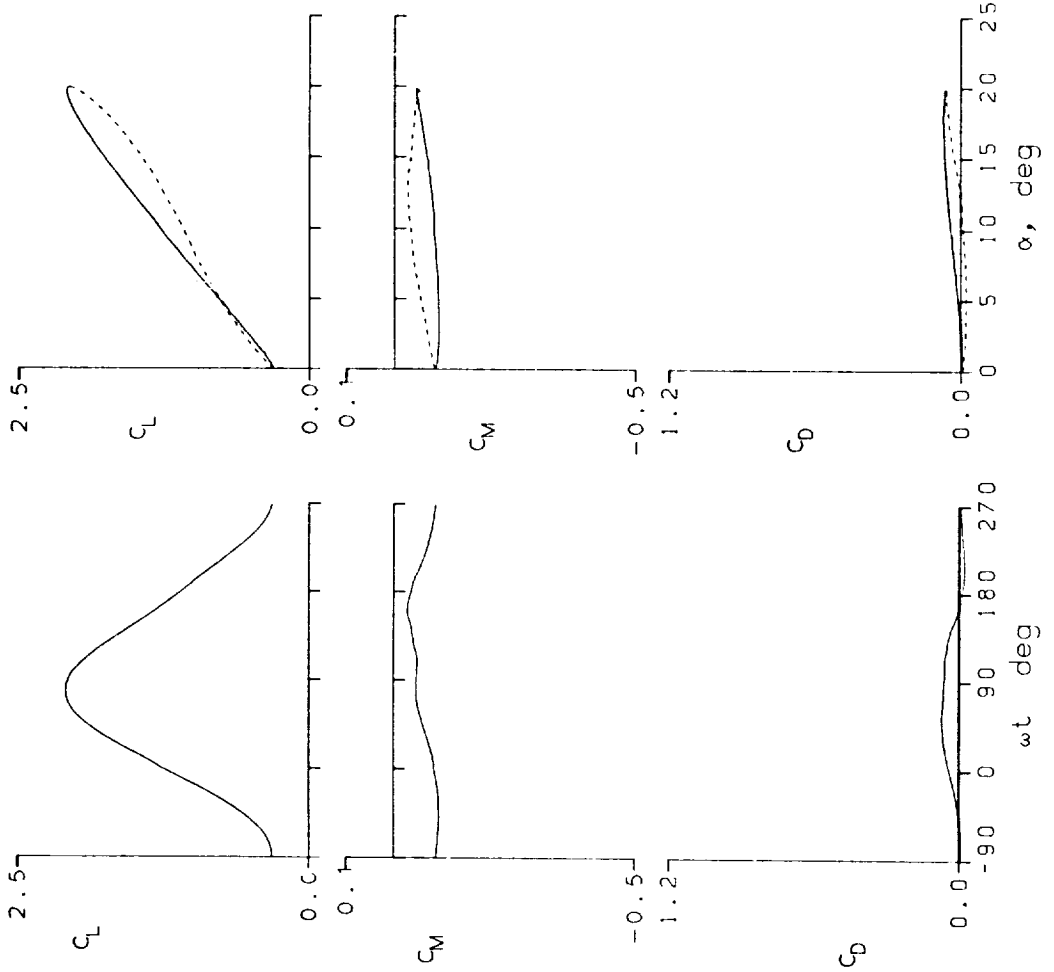


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67212	A0 = 9.79 °	k = 0.198
Re = 2.45 E6	A1 = 9.90 °	M = 0.184
$C_{Lmax} = 2.15$	$C_{Mmin} = -0.12$	$C_{Dmax} = 0.12$
$\alpha_{Lmax} = 19.7 °$	$\zeta = 0.533$	$M_{max} = 0.697$
$\alpha_{Cmin} = 9.3 °$	$-C_{Pmax} = 10.9$	$\alpha_{Mmax} = 19.9 °$

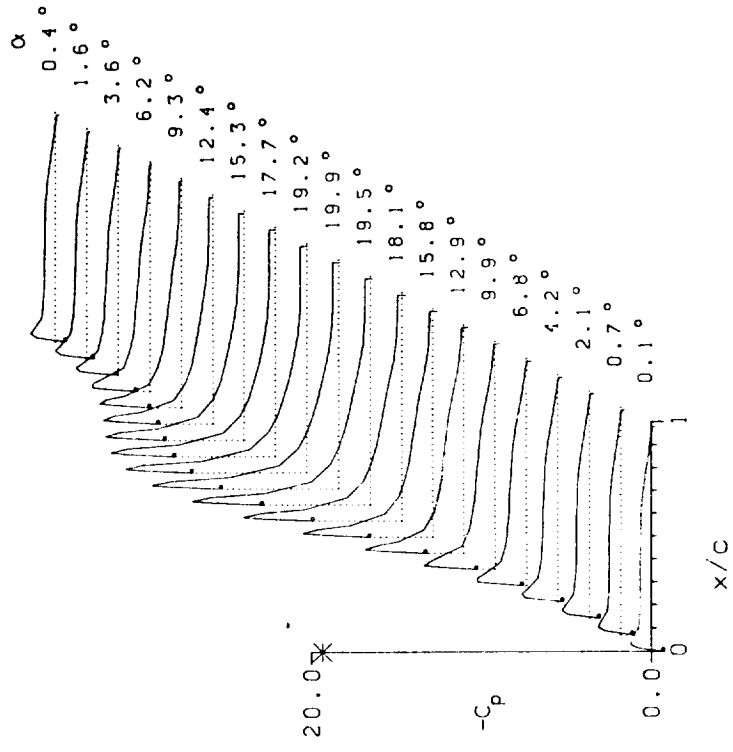
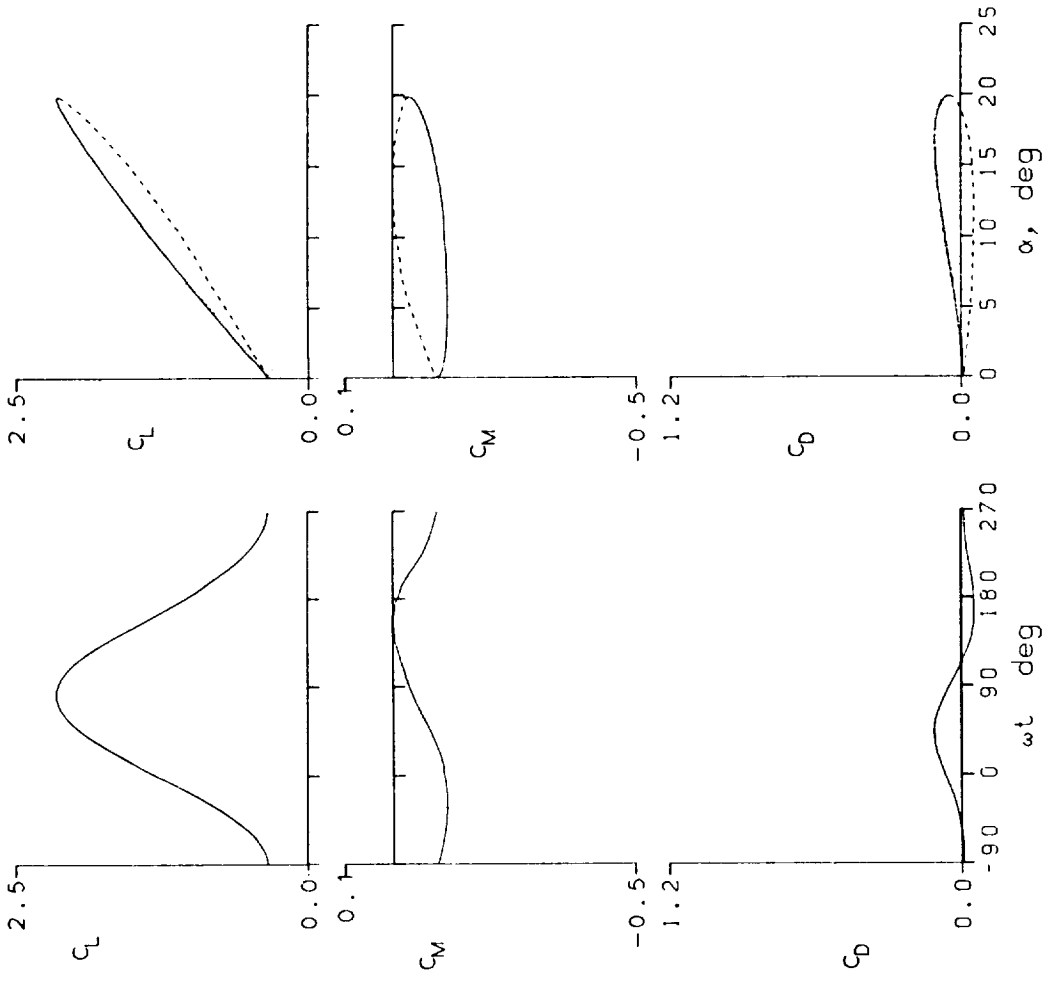


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67218	A0 = 14.79 °	k = 0.025
Re = 2.46 E6	A1 = 9.90 °	M = 0.184
C _{Lmax} = 2.01	C _{Mmin} = -0.26	C _{Dmax} = 0.54
α _{Lmax} = 21.1 °	ξ = -0.214	M _{max} = 0.663
α _{Cmin} = 14.3 °	-C _{pmax} = 10.0	α _{Mmax} = 21.1 °

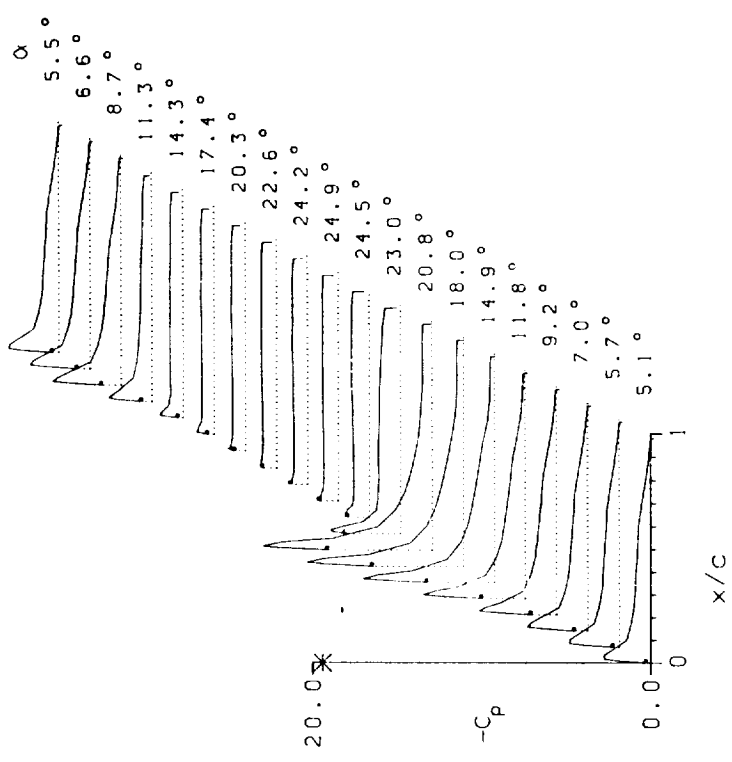
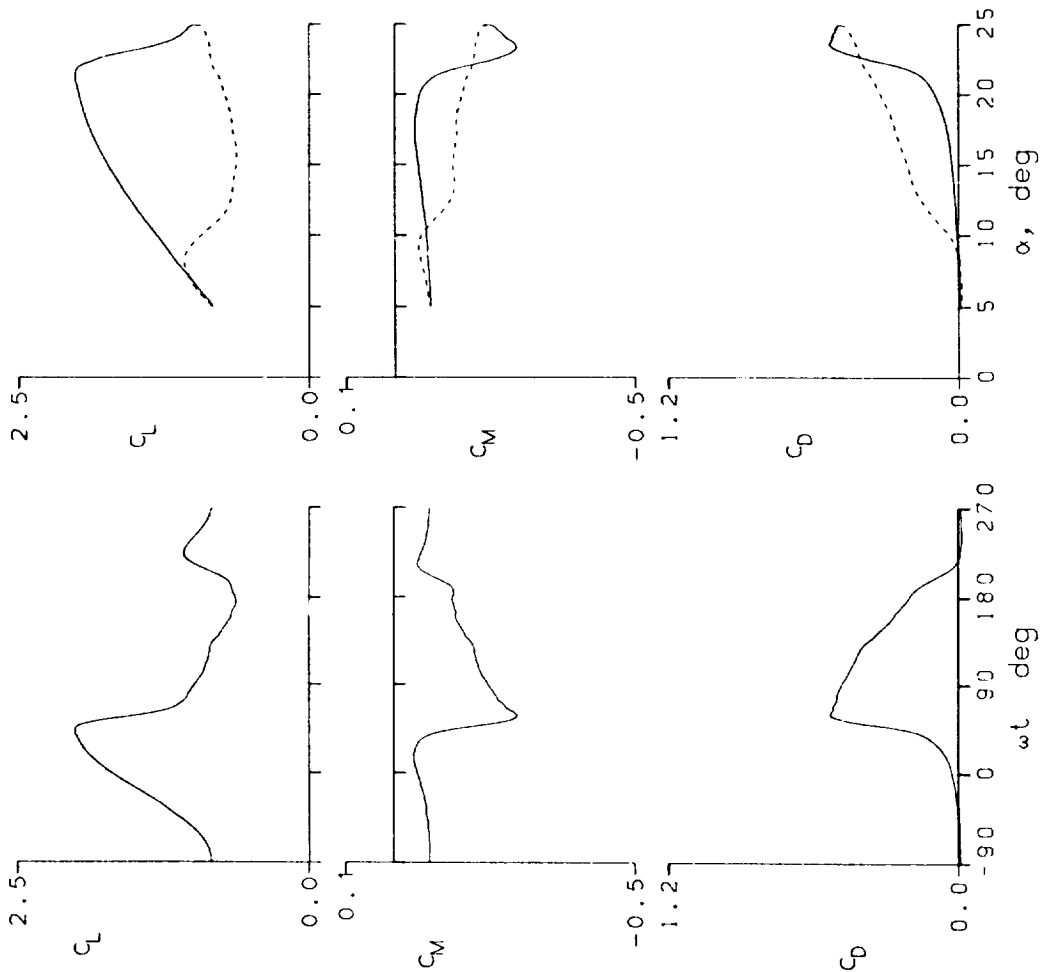


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67220	A0 = 14.80 °	k = 0.099
Re = 2.45 E6	A1 = 9.90 °	M = 0.184
CLmax = 2.36	CMmin = -0.31	CDmax = 0.65
α Lmax = 24.3 °	ξ = -0.384	Mmax = 0.755
α Cmin = 14.2 °	-CPmax = 12.5	α Mmax = 23.9 °

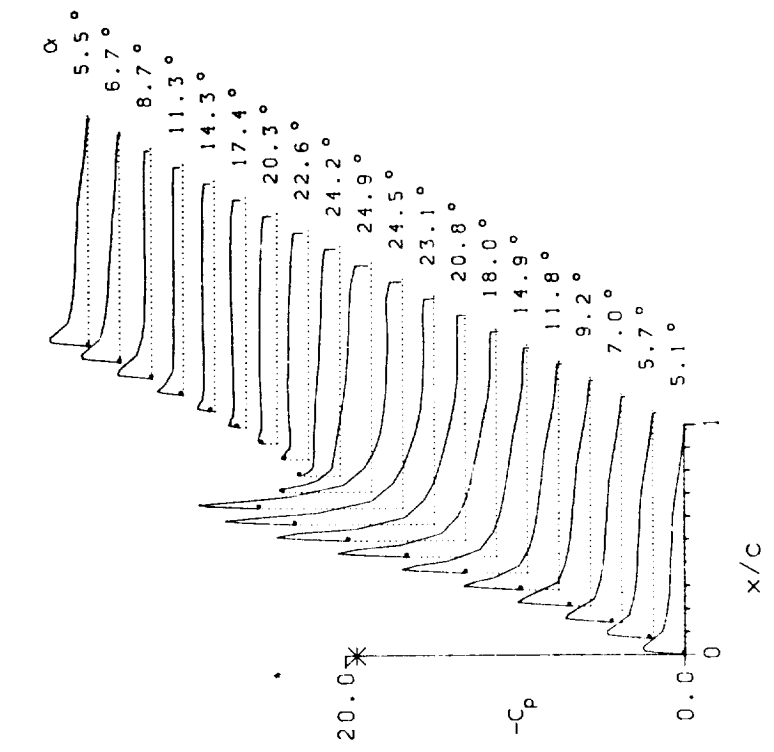
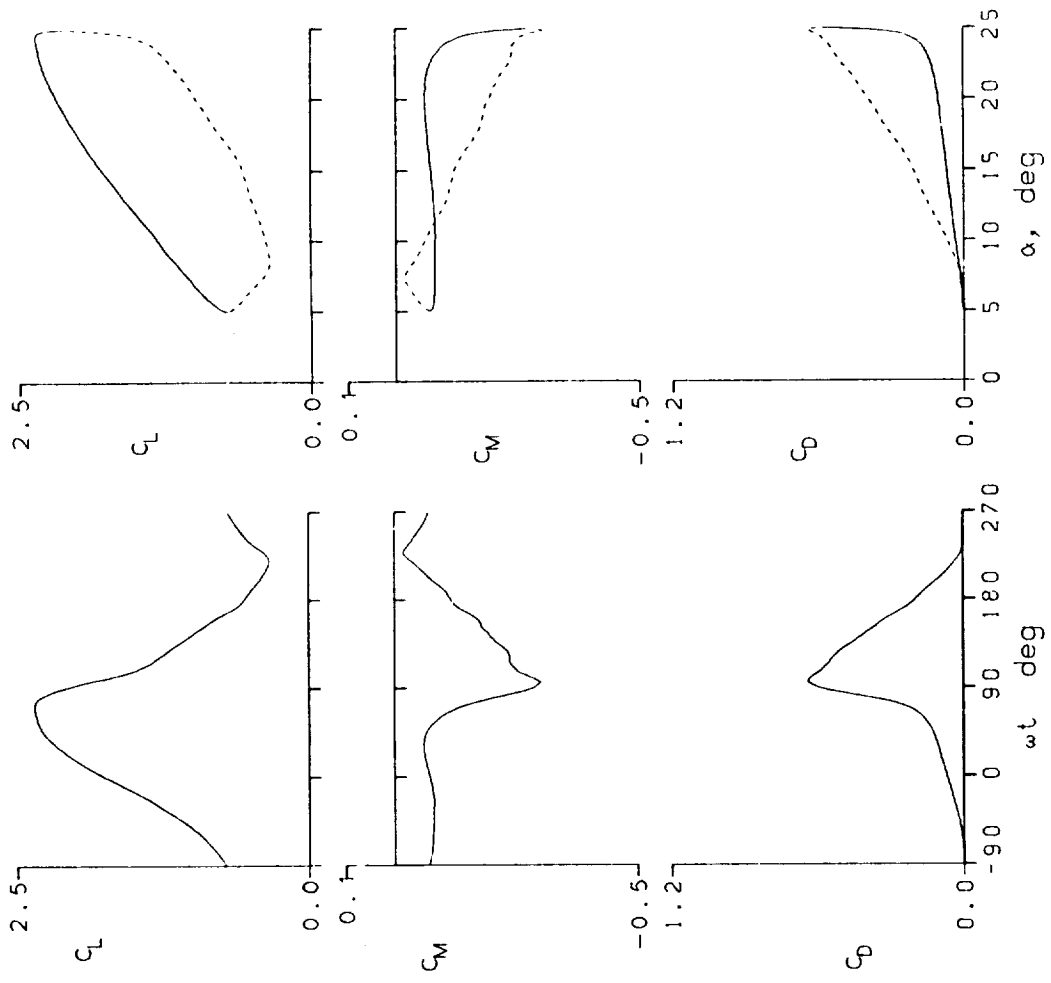


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 67222 A0 = 14.78 ° k = 0.198
 Re = 2.45 E6 A1 = 9.91 ° M = 0.184
 C_{Lmax} = 2.48 C_{Mmin} = -0.25 C_{Dmax} = 0.35
 α_{Lmax} = 24.5 ° ζ = -0.239 M_{max} = 0.805
 α_{Cmin} = 14.3 ° -C_{pmax} = 13.9 α_{Mmax} = 24.9 °

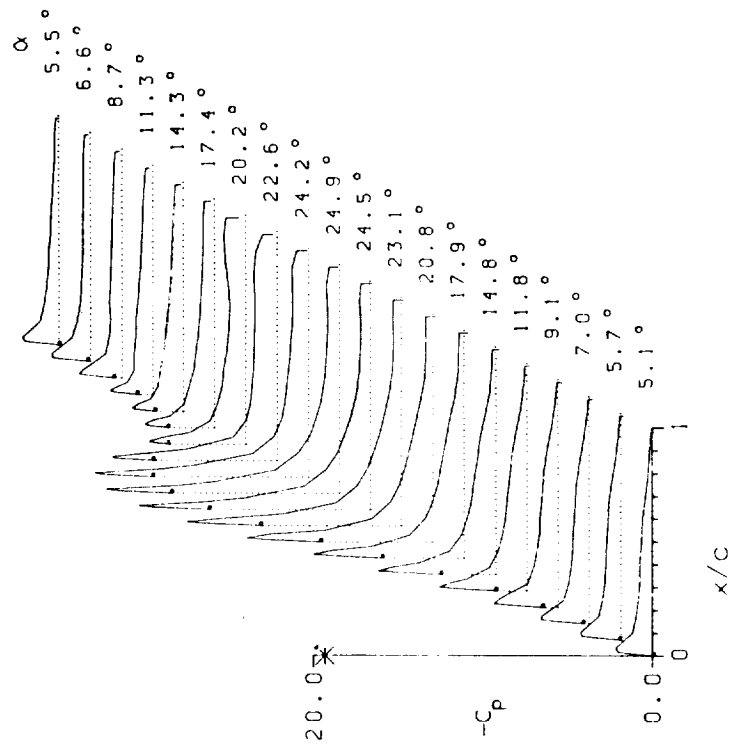
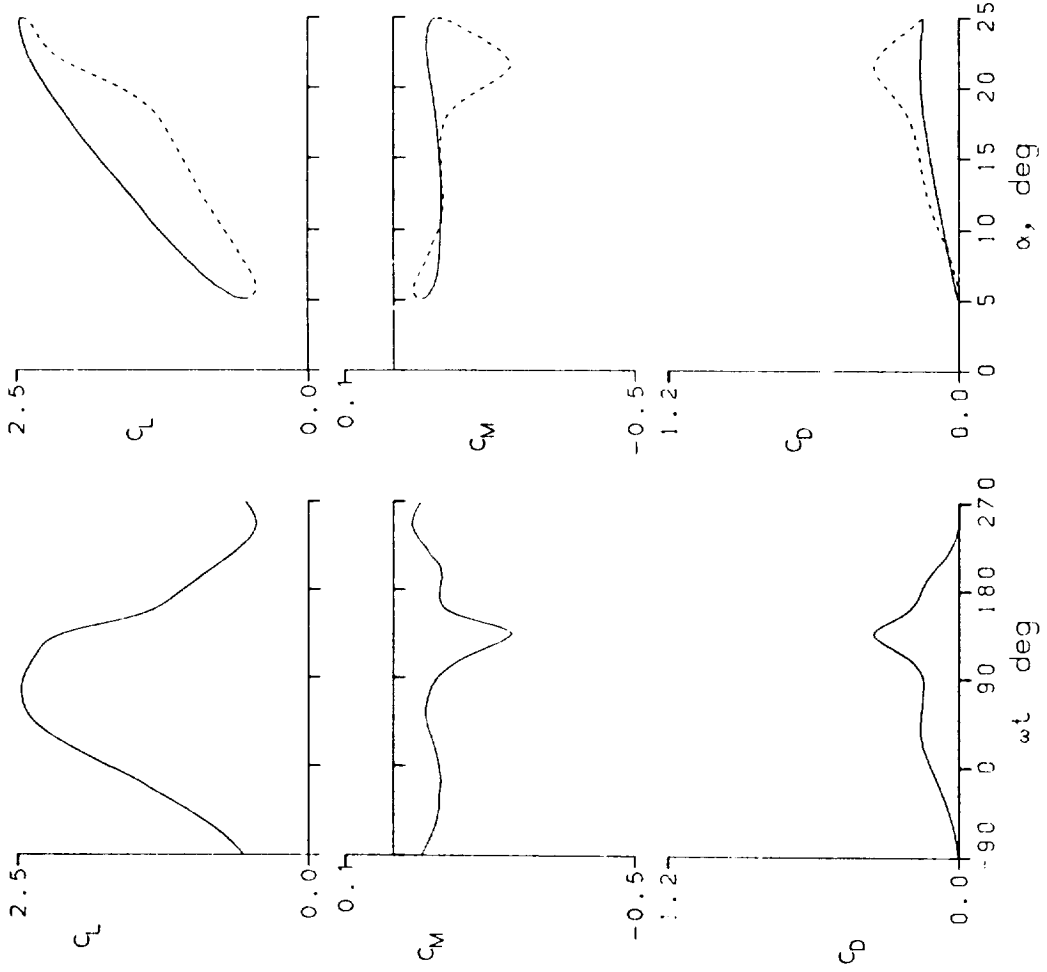


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67305	A0 = 14.81 °	k = 0.099
Re = 3.25 E6	A1 = 9.90 °	M = 0.248
CLmax = 2.37	CMmin = -0.38	CDmax = 0.65
αLmax = 24.3 °	ξ = -0.244	Mmax = 1.206
αCmin = 14.3 °	-CPmax = 13.3	αMmax = 22.7 °

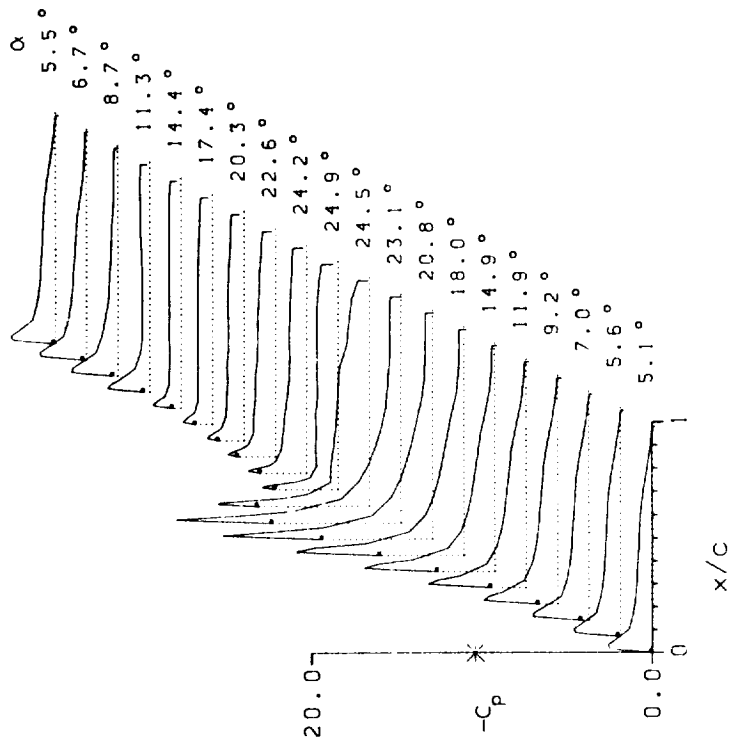
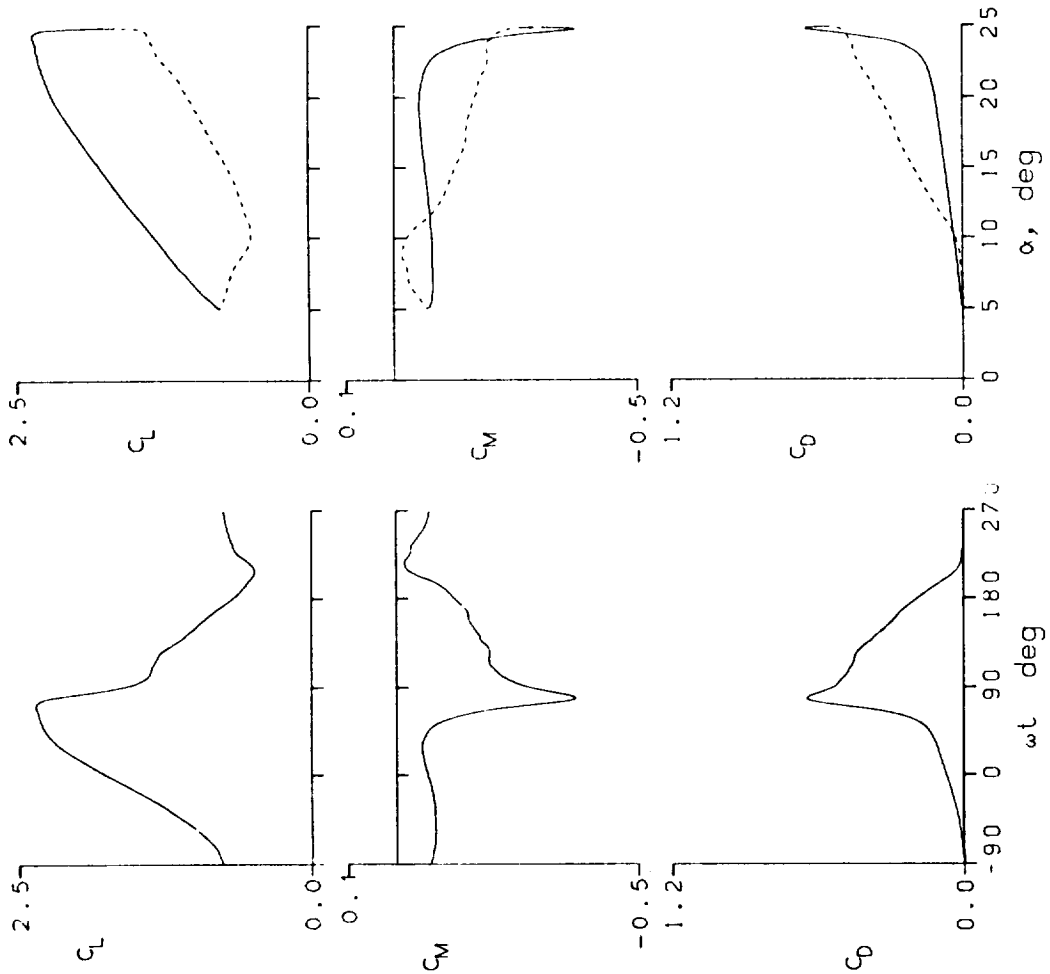


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 67310	A0 = 9.81 °	k = 0.099
Re = 3.26 E6	A1 = 9.90 °	M = 0.250
C _{Lmax} = 2.13	C _{Mmin} = -0.10	C _{Dmax} = 0.08
α _{Lmax} = 19.4 °	ξ = 0.228	M _{max} = 1.101
α _{Cmin} = 9.3 °	-C _{pmax} = 11.8	α _{Mmax} = 19.8 °

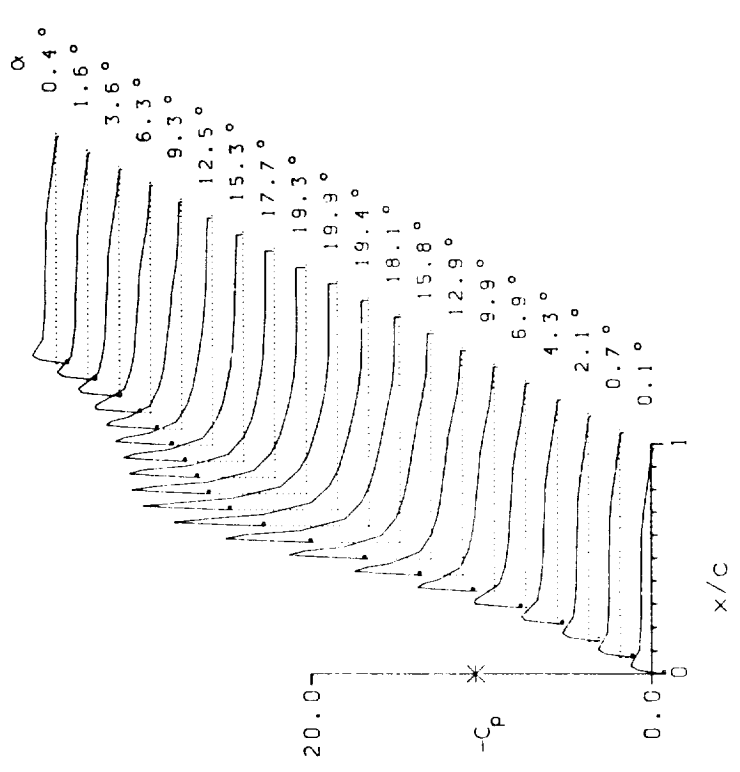
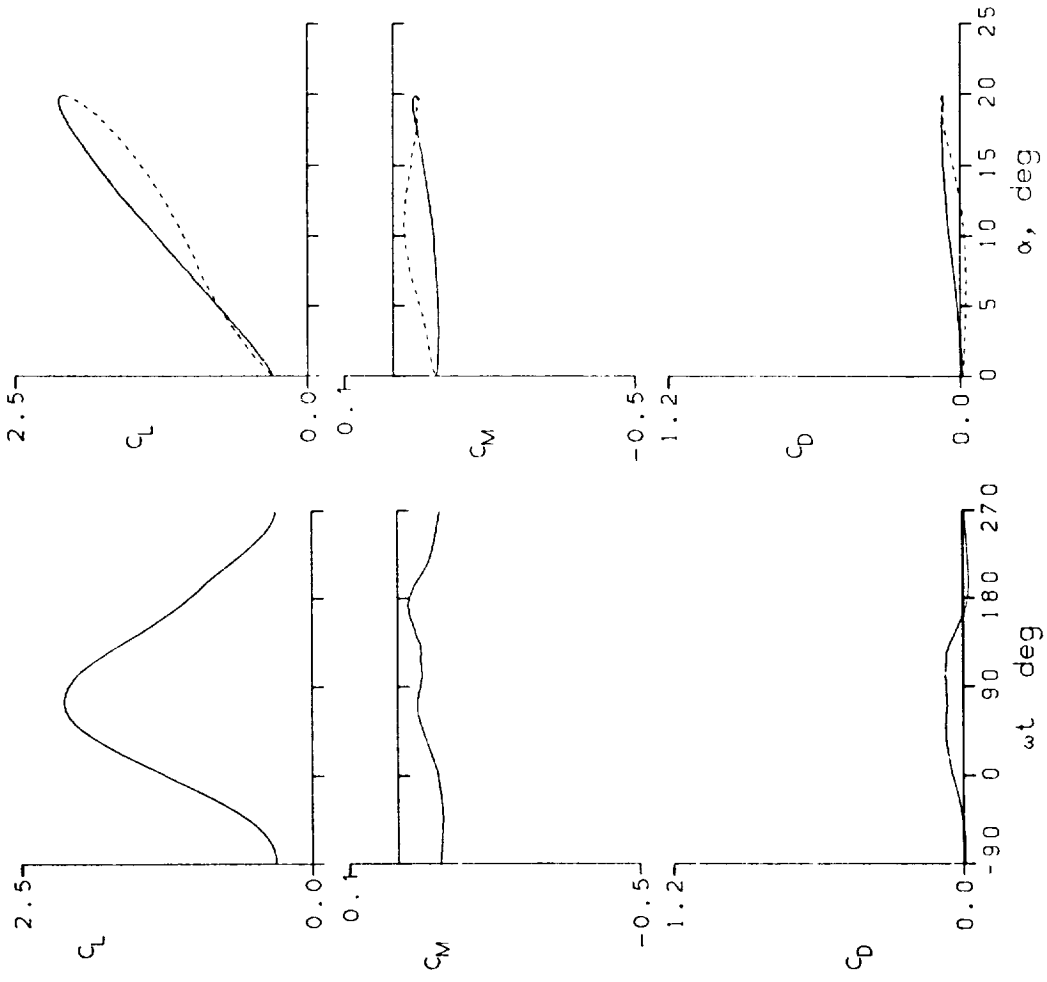


Figure 19.- Continued.

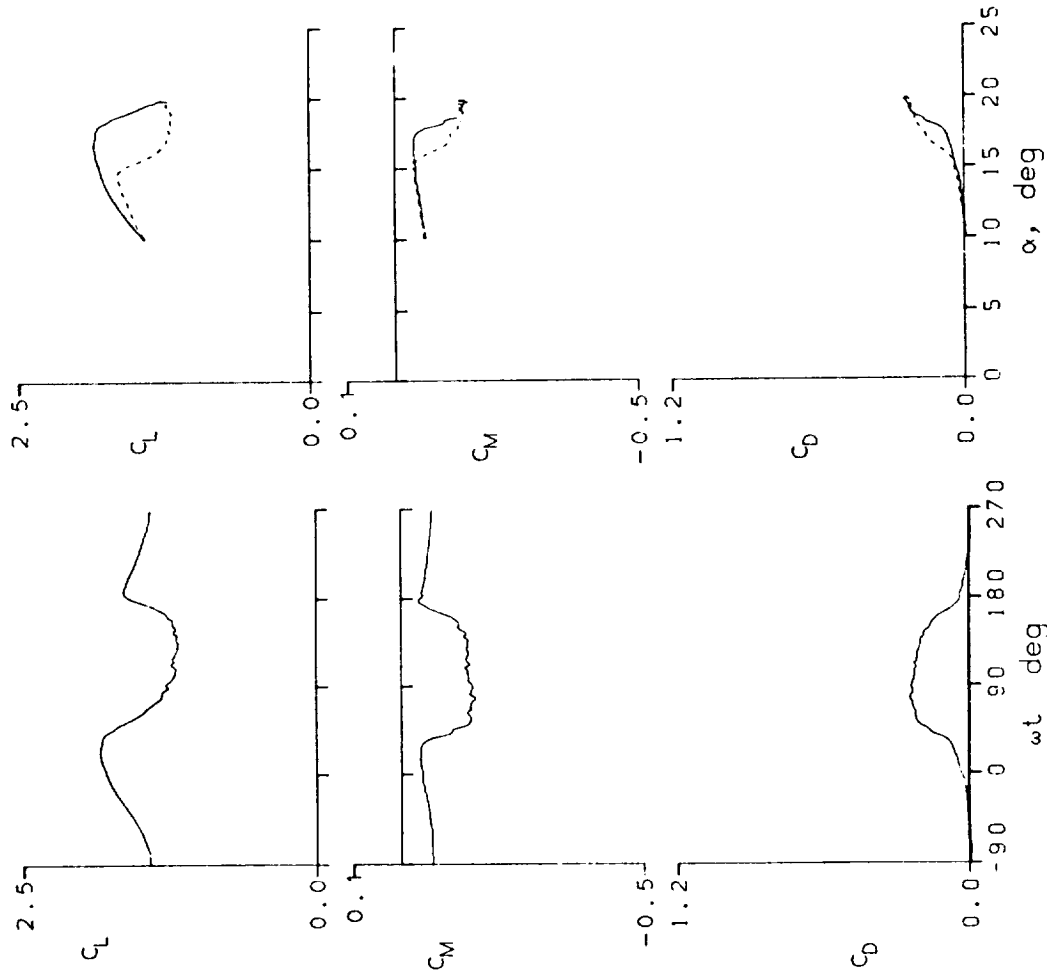
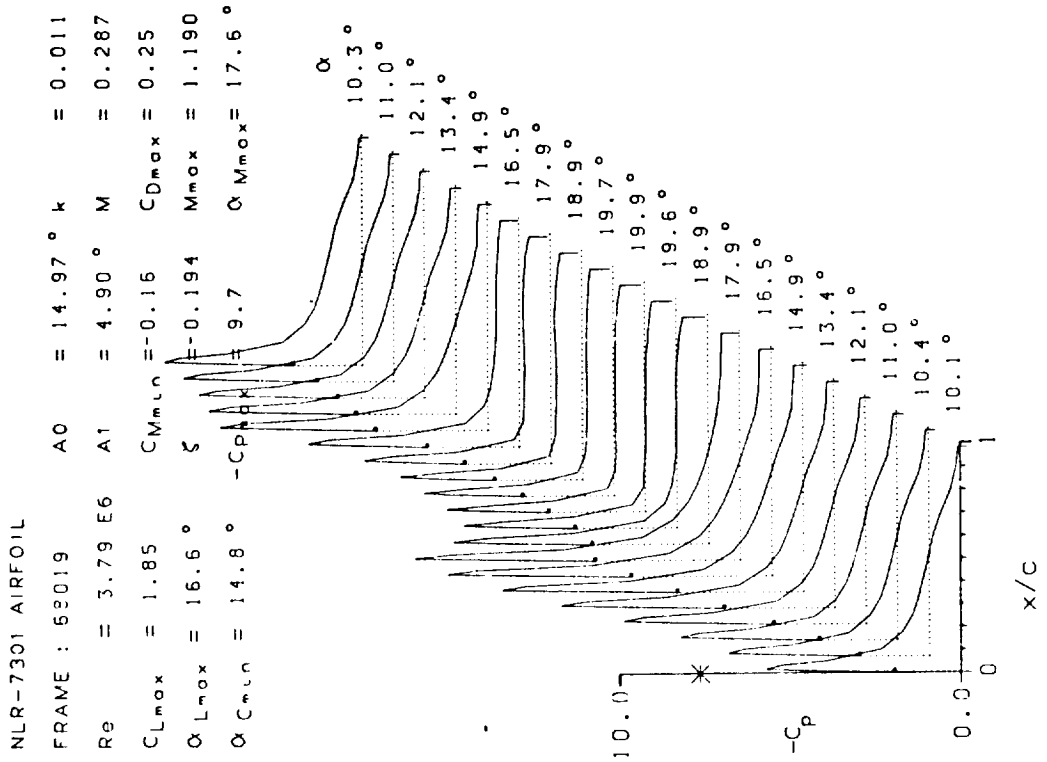


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 68100	A0 = 14.97 °	k = 0.026
Re = 3.77 E6	A1 = 4.90 °	M = 0.288
$C_{Lmax} = 1.84$	$C_{Mmin} = -0.16$	$C_{Dmax} = 0.27$
$\alpha_{Lmax} = 17.5 °$	$\zeta = -0.174$	$M_{max} = 1.193$
$\alpha_{Cmin} = 14.8 °$	$-C_{Pmax} = 9.7$	$\alpha_{Mmax} = 18.0 °$

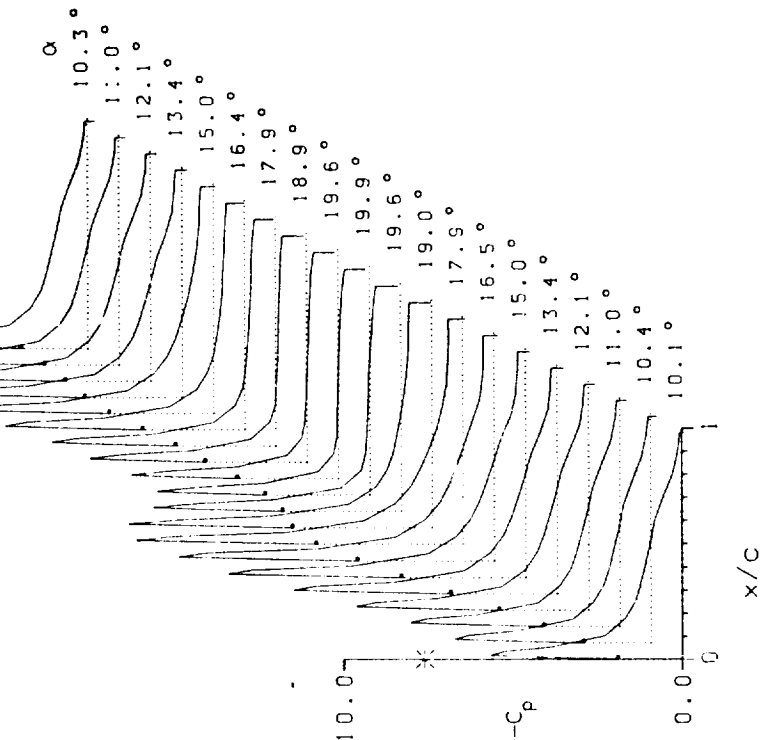
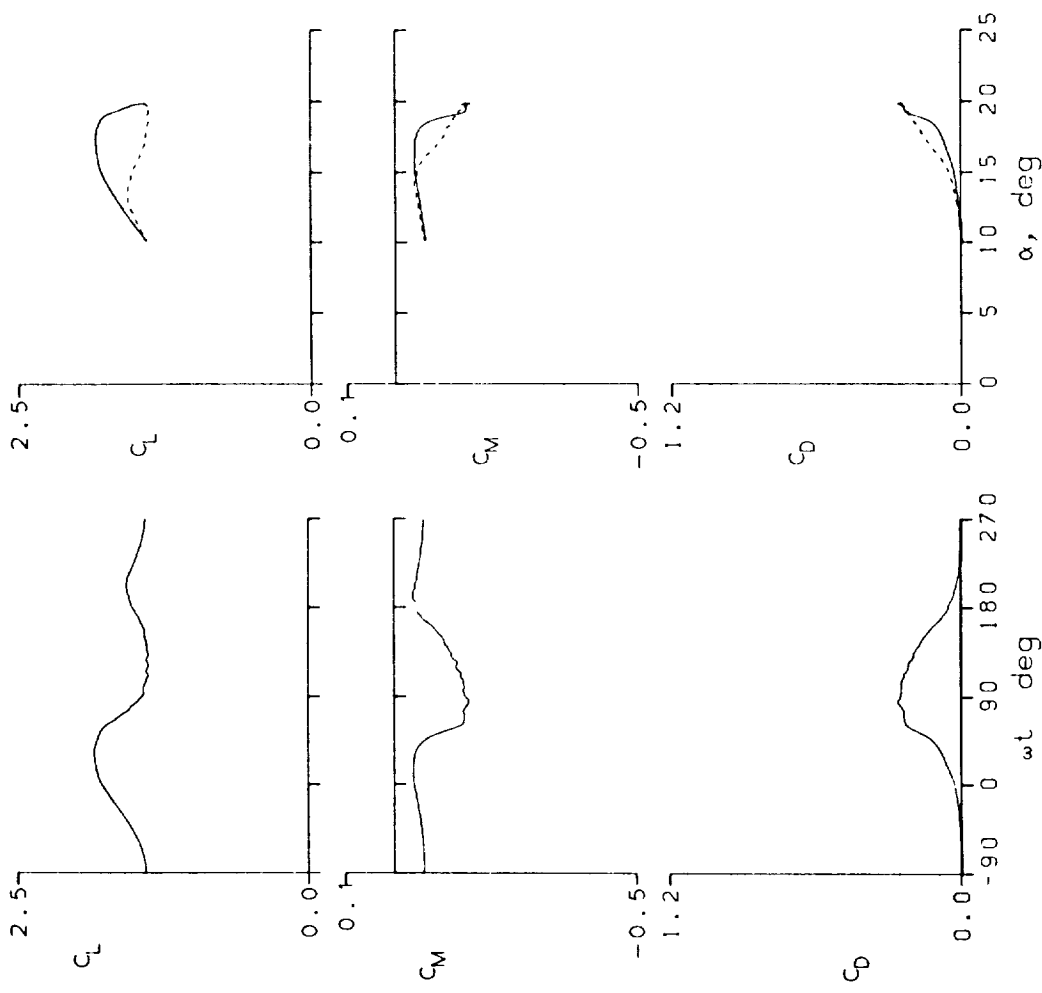


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 68102	A0 = 14.98 °	k = 0.052
Re = 3.73 E6	A1 = 4.90 °	M = 0.286
CLmax = 1.91	CMmin = -0.18	CDmax = 0.29
α Lmax = 17.0 °	ξ = -0.225	Mmax = 1.212
α Cmin = 14.8 °	-CPmax = 10.0	α Mmax = 18.3 °

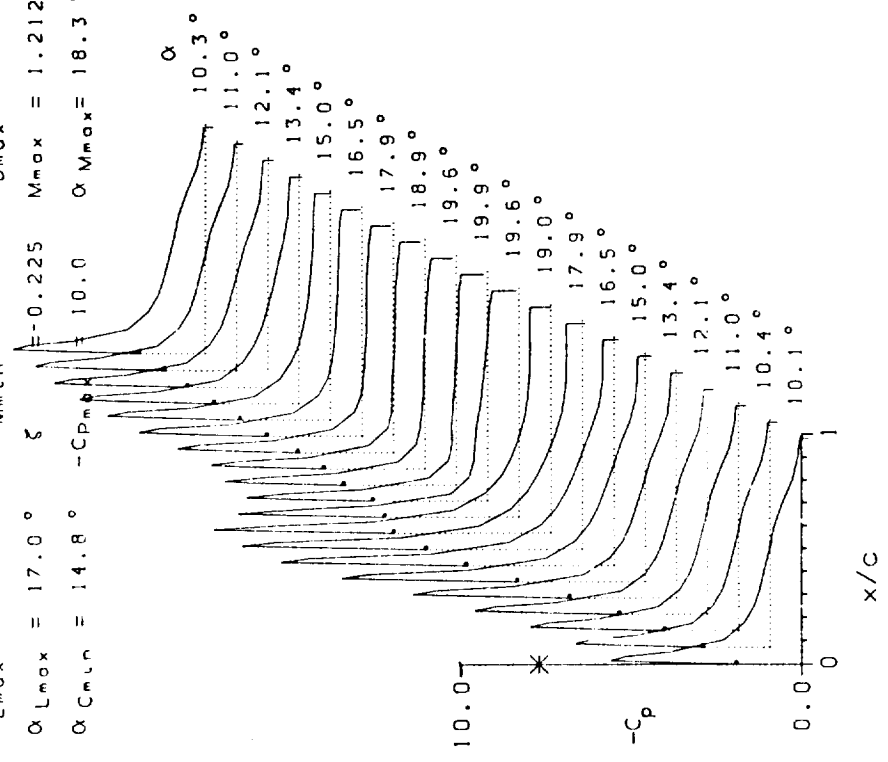
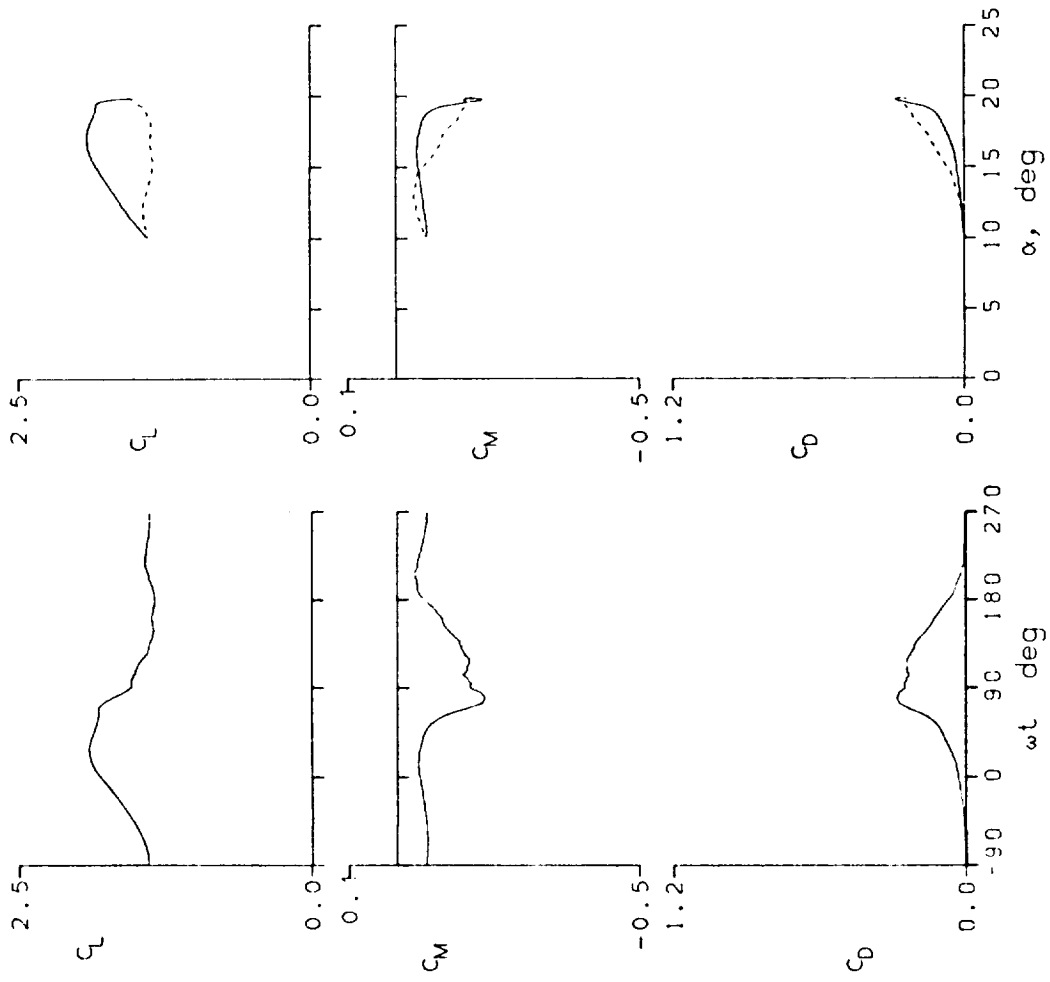
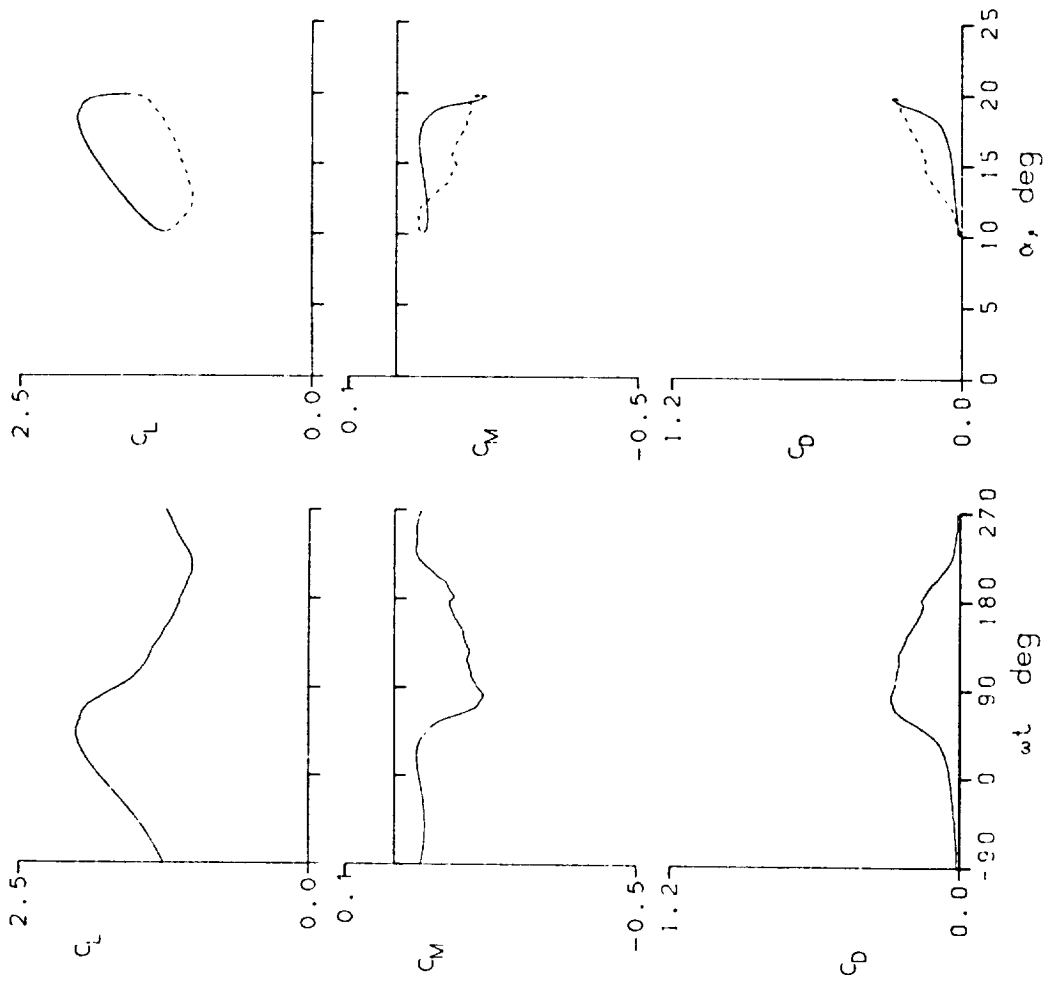


Figure 19.- Continued.



NLR-7301 AIRFOIL

FRAME : 68104 A0 = 14.97° k = 0.104

Re = 3.73 E6 A1 = 4.90° M = 0.287

CLmax = 2.02 CMmin = -0.19 CDmax = 0.29

αLmax = 18.2° ζ = -0.578 Mmax = 1.256

αCmin = 14.8° -CPmax = 10.3 αMmax = 18.0°

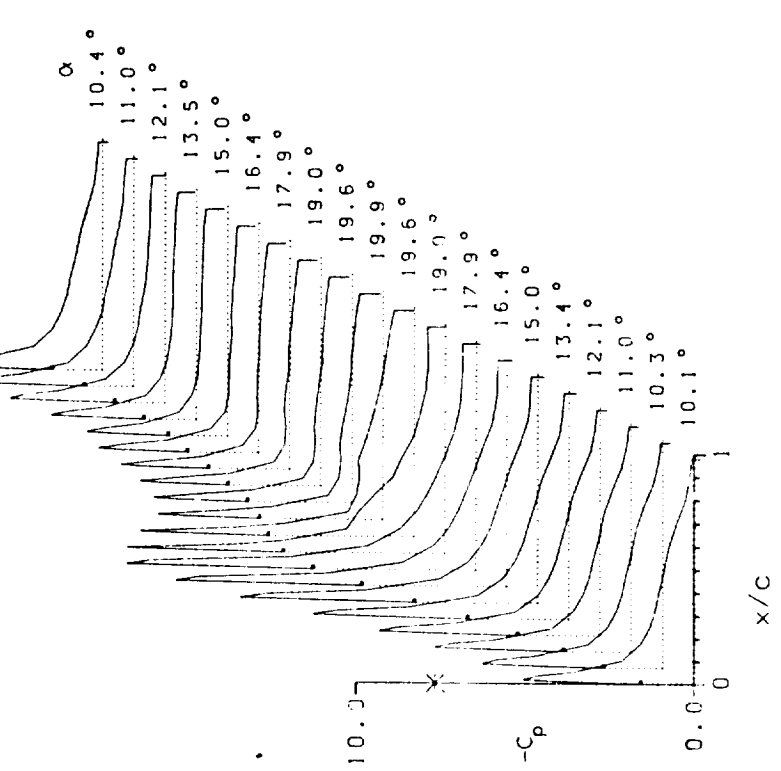


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 68109 A0 = 14.99° k = 0.154
 Re = 3.79 E6 A1 = 4.89° M = 0.291
 CLmax = 2.13 CMmin = -0.21 CDmax = 0.37
 αLmax = 19.3° ζ = -0.687 Mmax = 1.263
 αCmin = 14.8° -CPmax = 10.1° αMmax = 17.9°

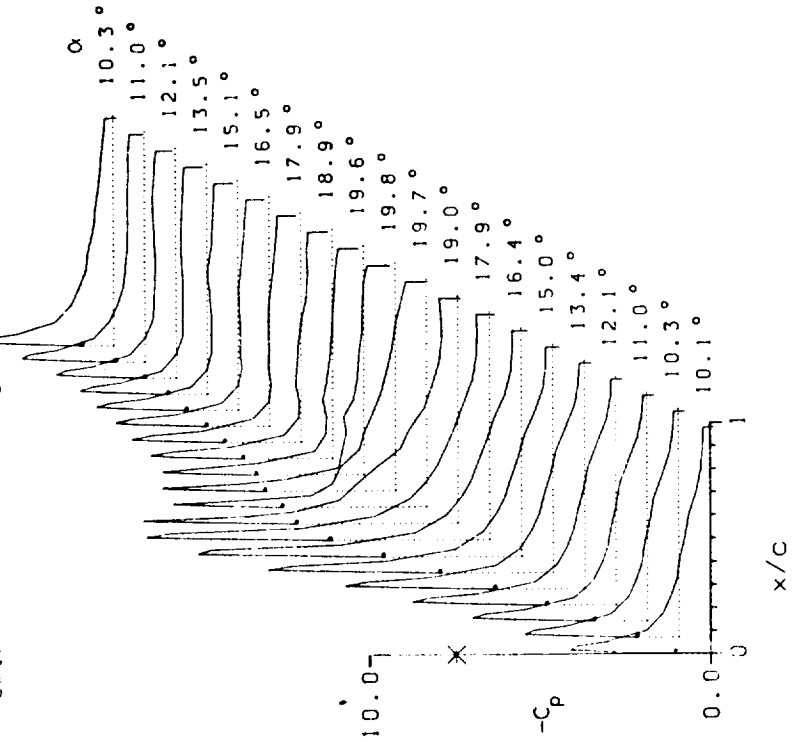
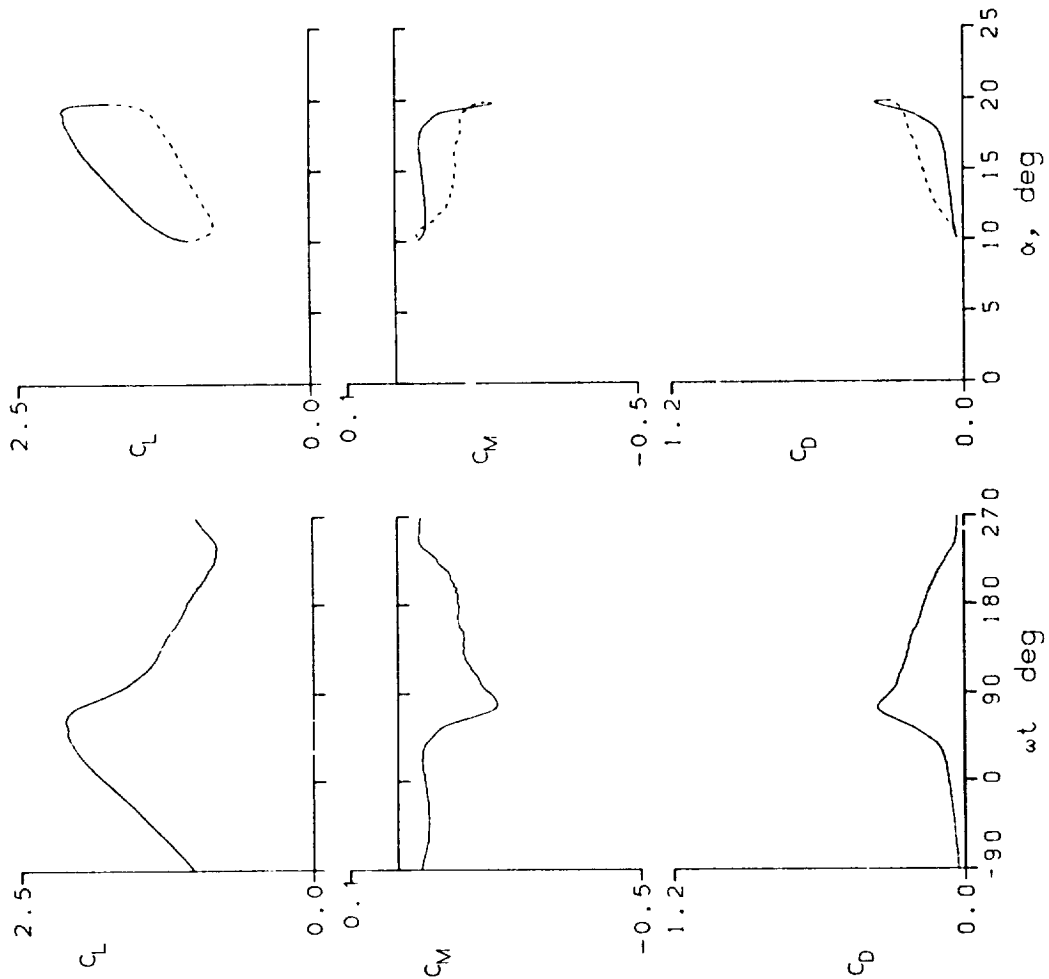


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 68111	A0 = 14.97 °	k = 0.203
Re = 3.79 E6	A1 = 4.90 °	M = 0.293
$C_{Lmax} = 2.21$	$C_{Mmin} = -0.25$	$C_{Dmax} = 0.46$
$\alpha_{Lmax} = 19.7 °$	$\xi = -0.404$	$M_{max} = 1.268$
$\alpha_{Cmin} = 14.8 °$	$-C_{pmax} = 10.0$	$\alpha_{Mmax} = 17.8 °$

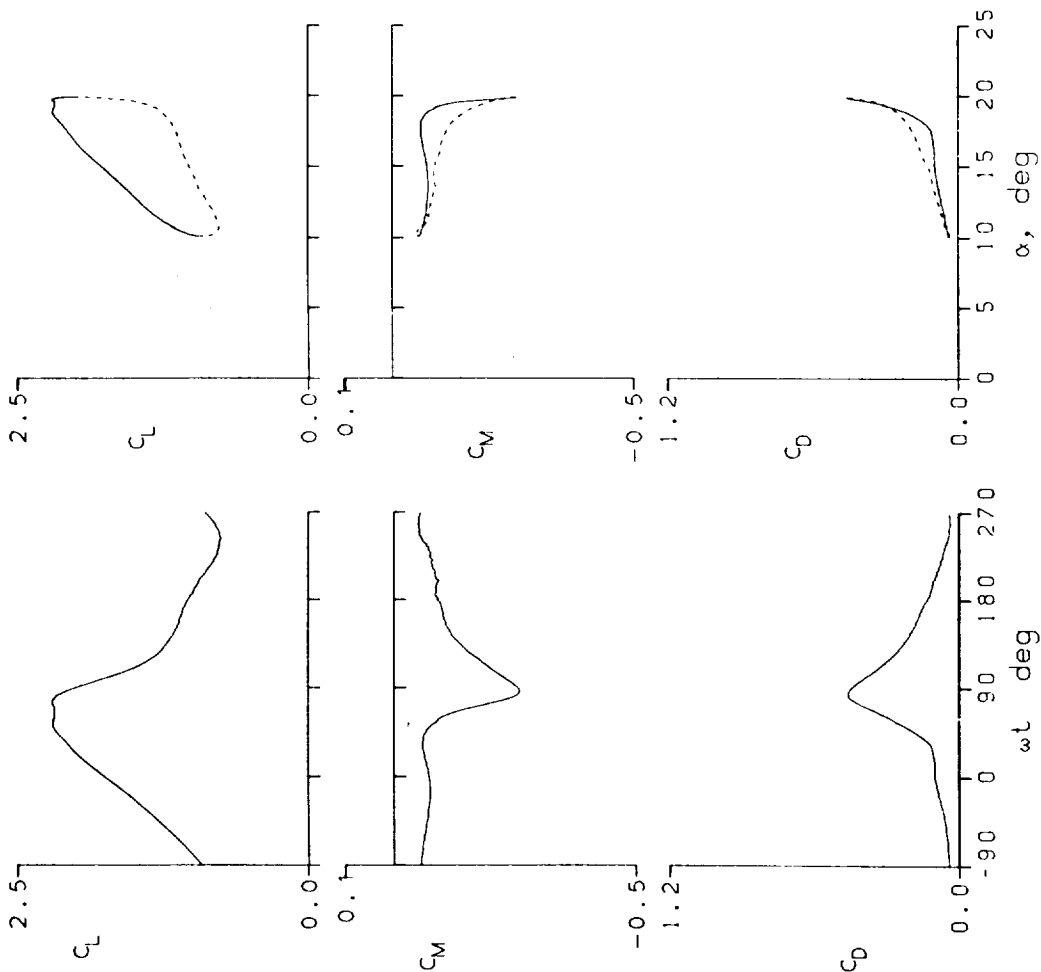


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 68119	A0 = 9.95°	k = 0.010
Re = 3.81 E6	A1 = 4.90°	M = 0.297
$C_{Lmax} = 1.71$	$C_{Mmin} = -0.08$	$C_{Dmax} = 0.04$
$\alpha_{Lmax} = 14.9°$	$\zeta = 0.013$	$M_{max} = 1.117$
$\alpha_{Cmin} = 9.8°$	$-C_{pmax} = 8.3$	$\alpha_{Mmax} = 14.9°$

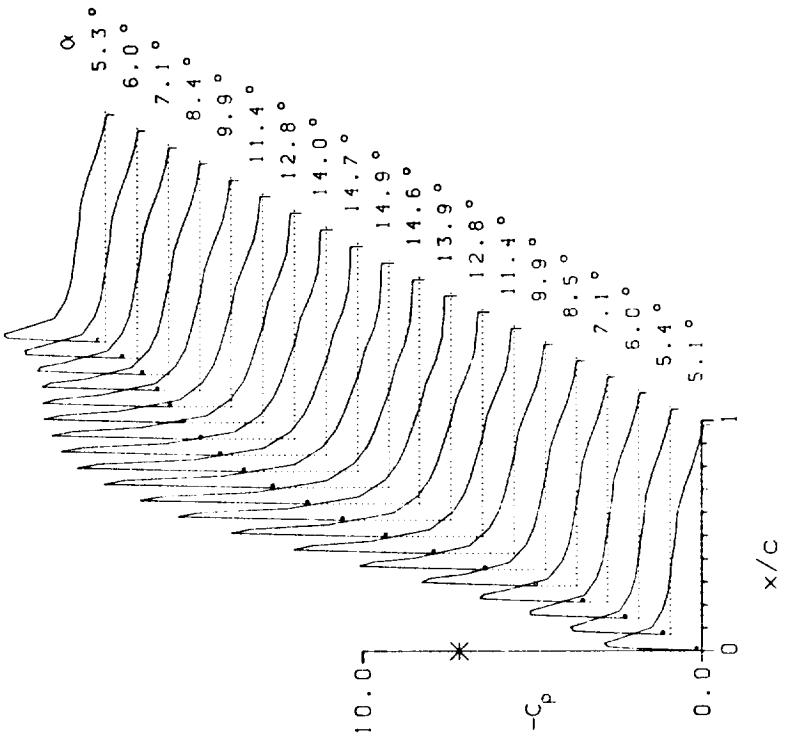
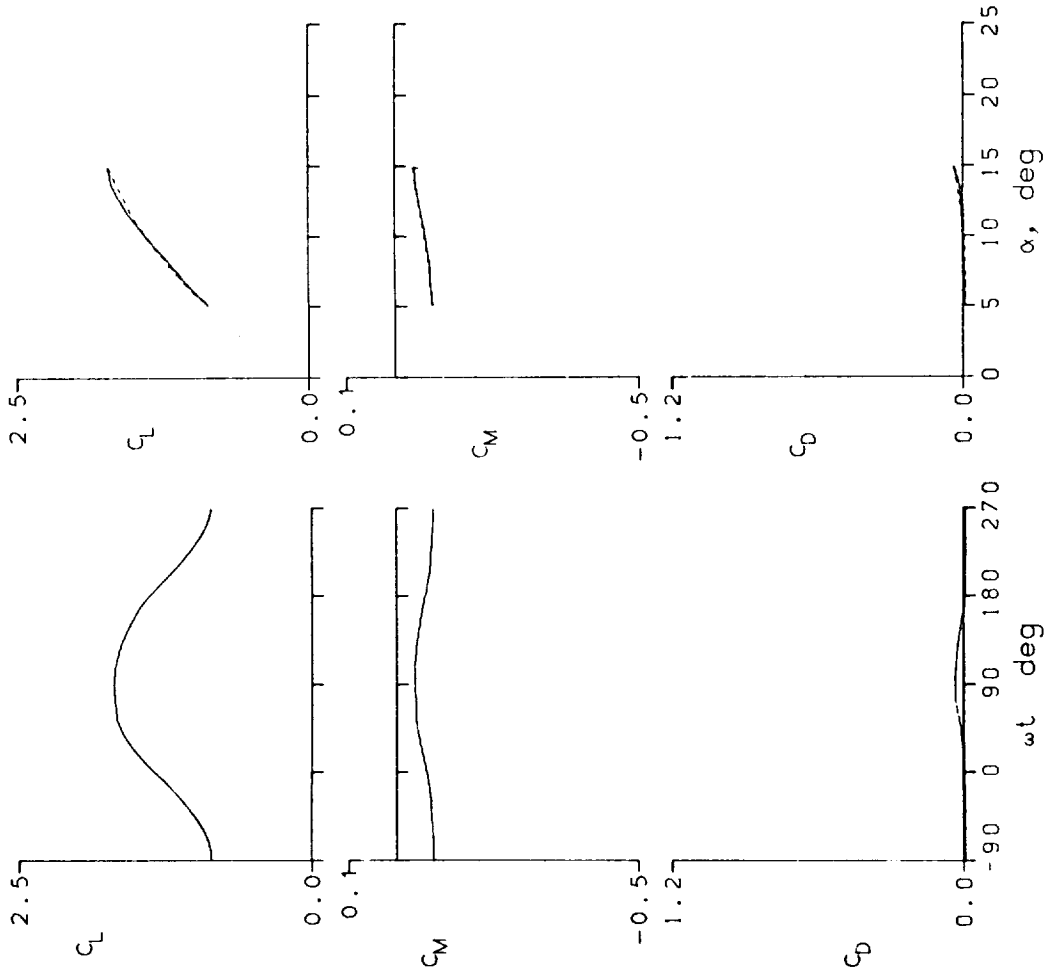


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 68121 A0 = 9.97 ° k = 0.025
 Re = 3.79 E6 A1 = 4.90 ° M = 0.298
 CLmax = 1.72 CMmin = -0.08 CDmax = 0.04
 αLmax = 14.7 ° ζ = 0.044 Mmax = 1.129
 αCMmin = 9.8 ° -CPmax = 8.4 αMmax = 14.6 °

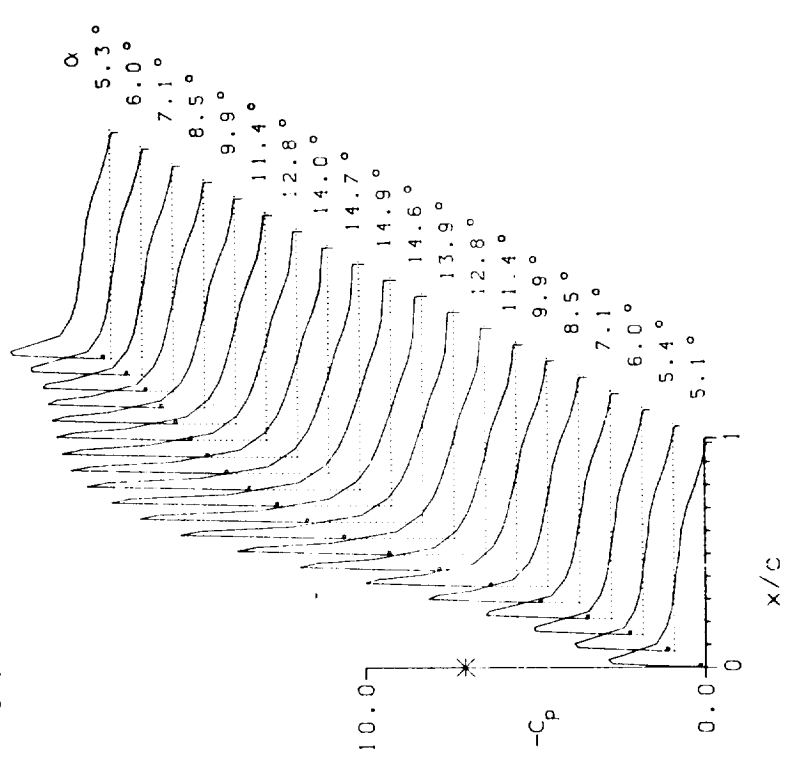
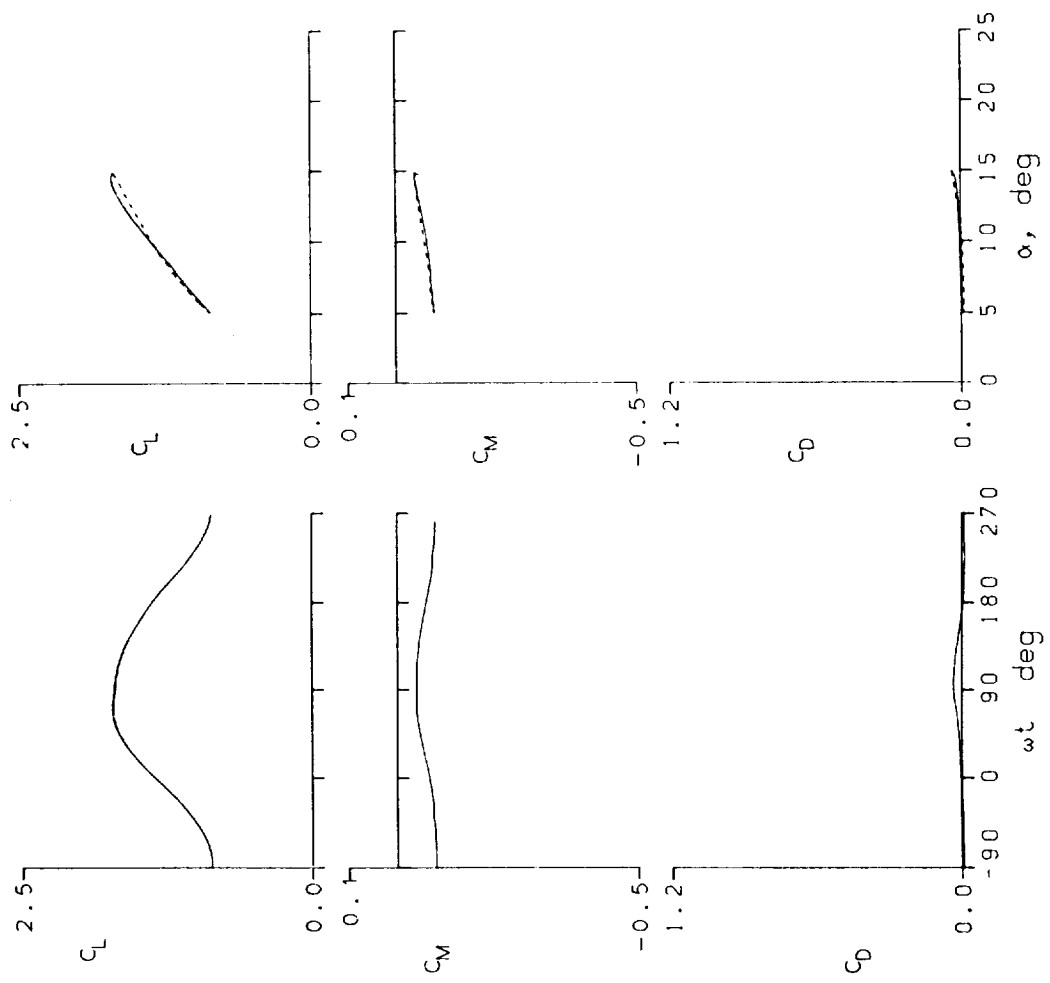


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 68123 A0 = 9.97 ° k = 0.049
 Re = 3.79 E6 A1 = 4.90 ° M = 0.299
 CLmax = 1.76 CMmin = -0.09 CDmax = 0.04
 α Lmax = 14.6 ° ξ = 0.112 Mmax = 1.152
 α Cmin = 9.8 ° -CPmax = 8.6 α Mmax = 14.8 °

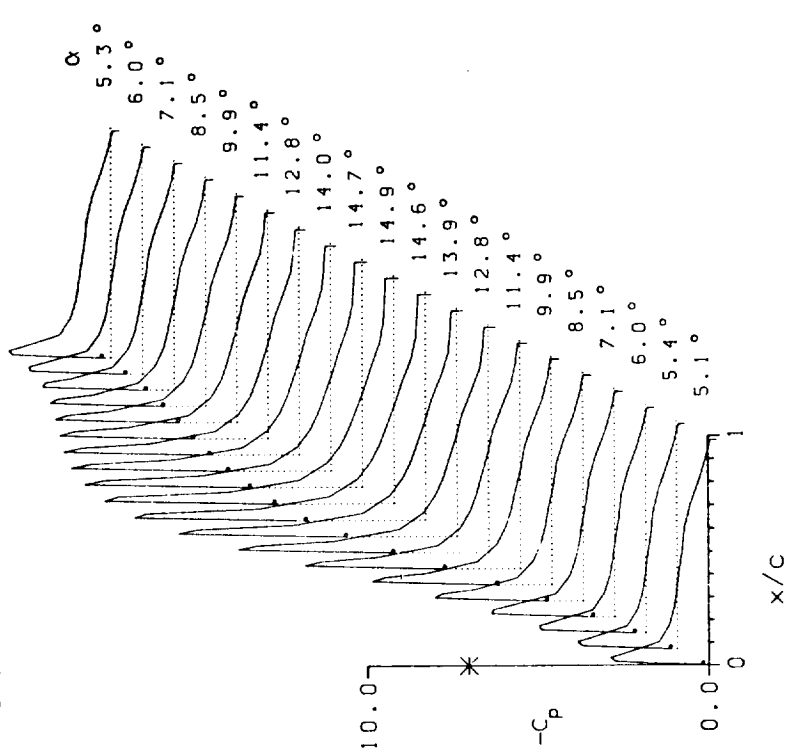
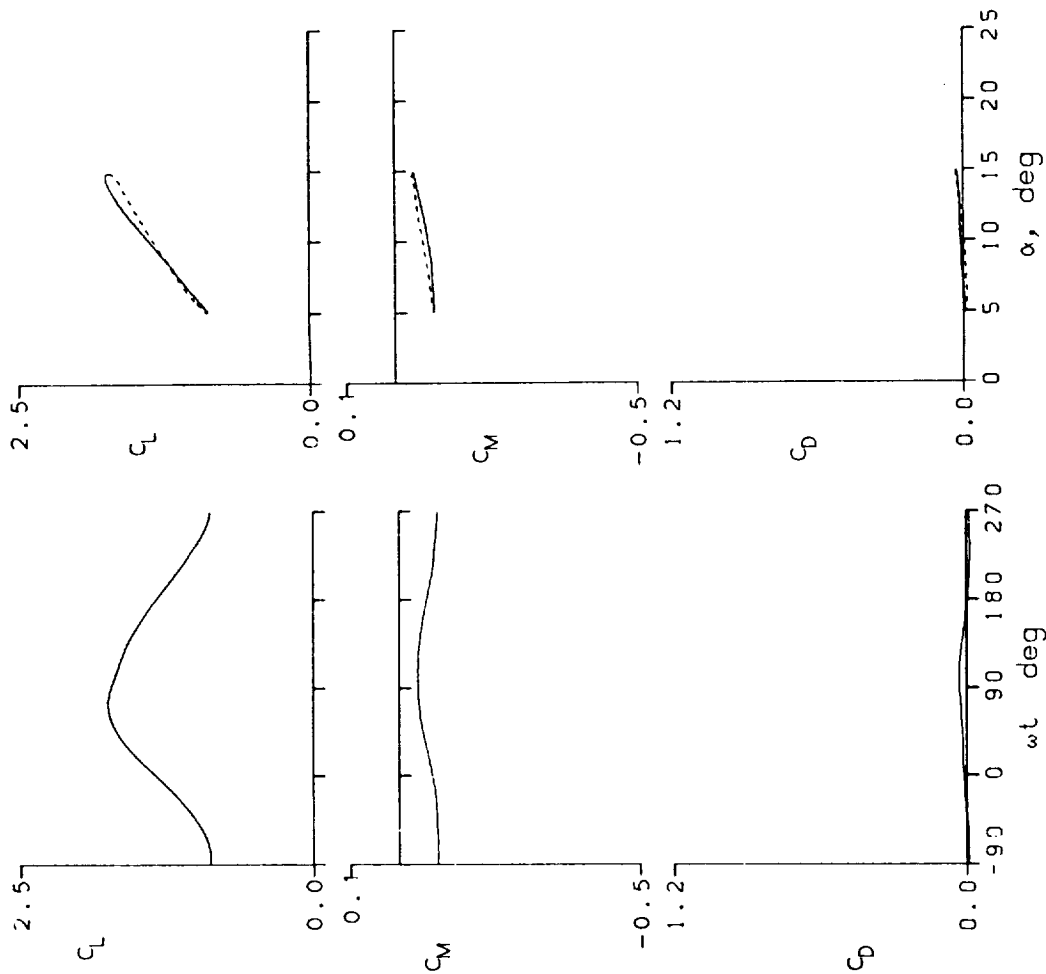


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 6820: A0 = 9.96 ° k = 0.098
 Re = 3.81 E6 A1 = 4.90 ° M = 0.300
 C_{Lmax} = 1.78 C_{Mmin} = -0.09 C_{Dmax} = 0.03
 α_{Lmax} = 14.7 ° ζ = 0.279 M_{max} = 1.177
 α_{Cmin} = 9.8 ° -C_{Pmax} = 8.7 α_{Mmax} = 14.9 °

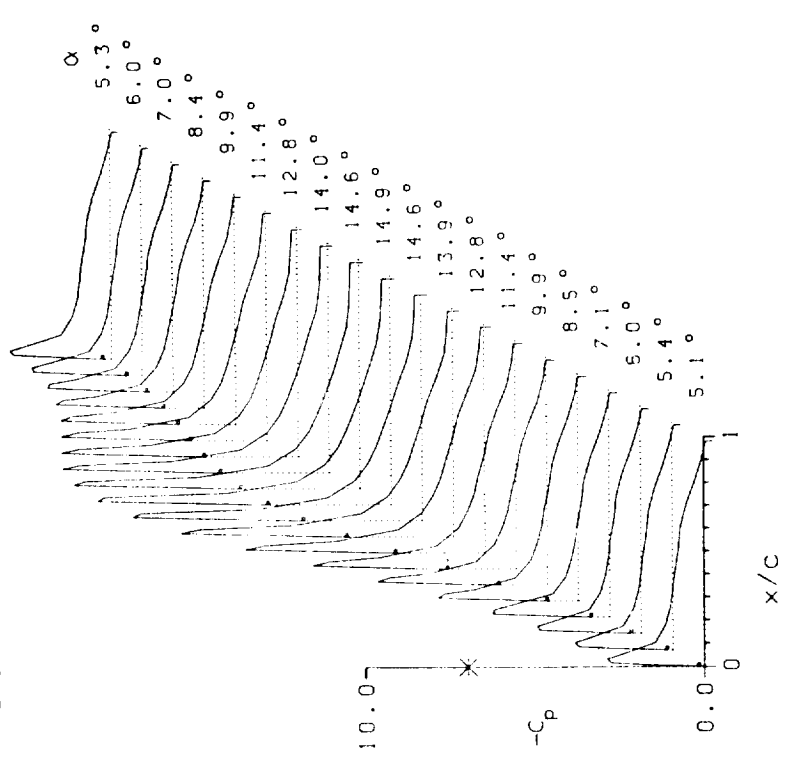
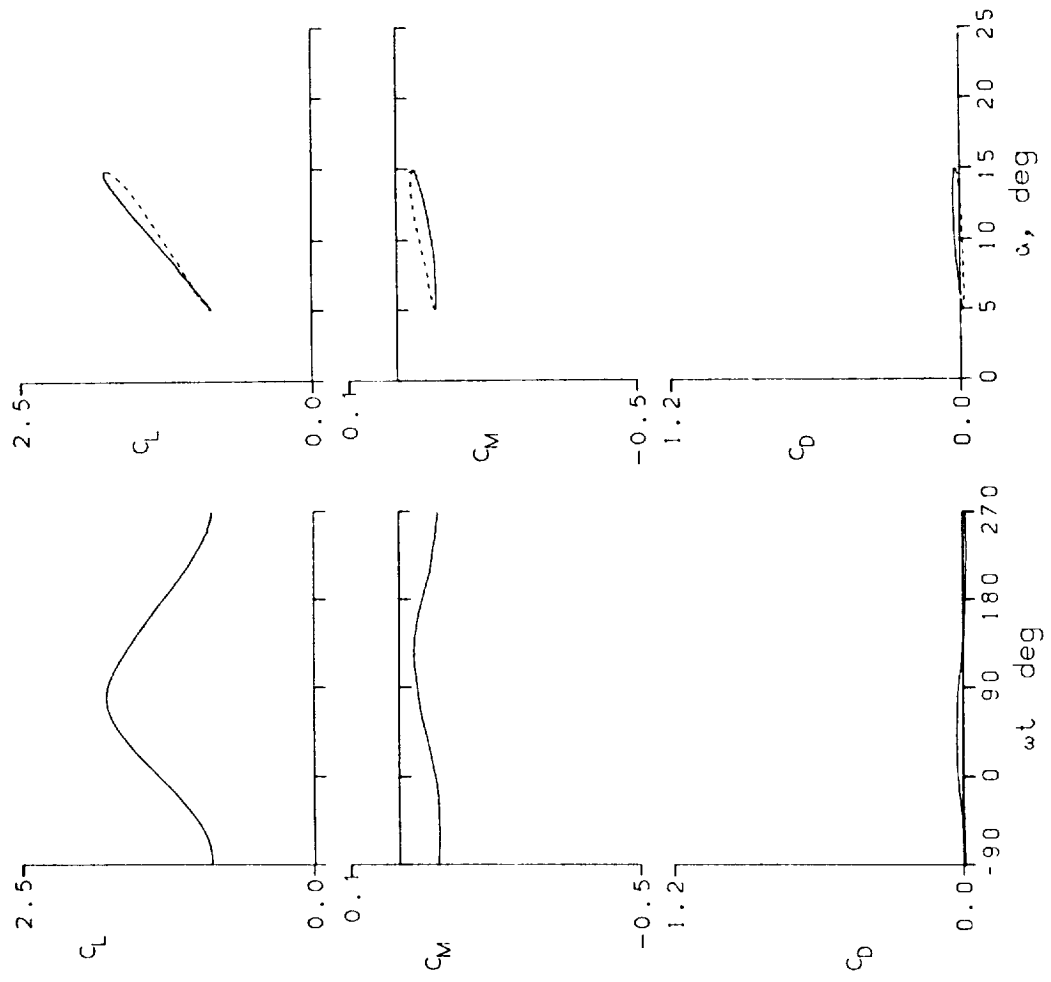


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 68203 A0 = 9.98 ° k = 0.196
 Re = 3.82 E6 A1 = 4.90 ° M = 0.302
 C_{Lmax} = 1.87 C_{Mmin} = -0.10 C_{Dmax} = 0.05
 α_{Lmax} = 14.8 ° ζ = 0.674 M_{max} = 1.228
 α_{Cmin} = 9.8 ° $-C_{Pmax}$ = 9.1 α_{Mmax} = 14.9 °

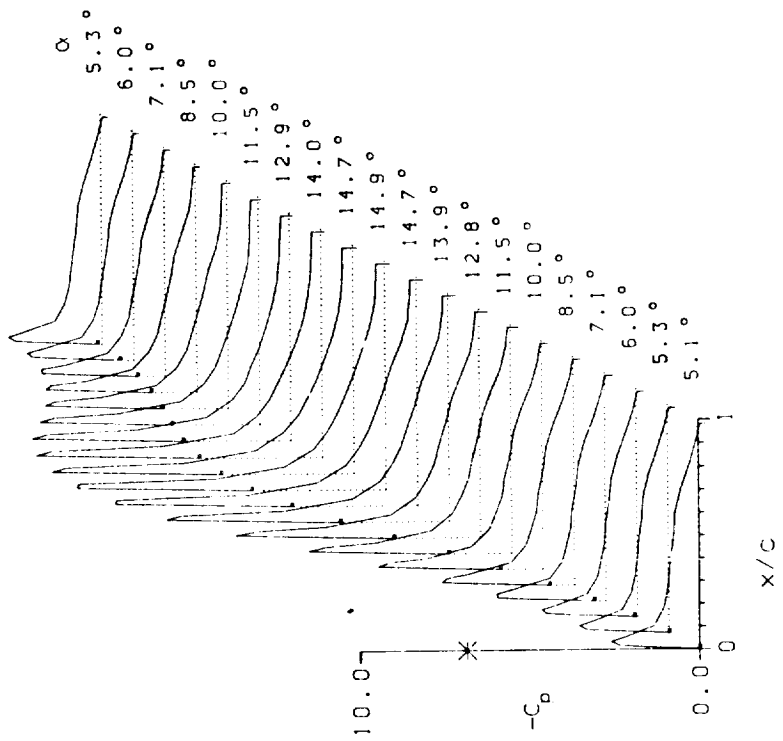
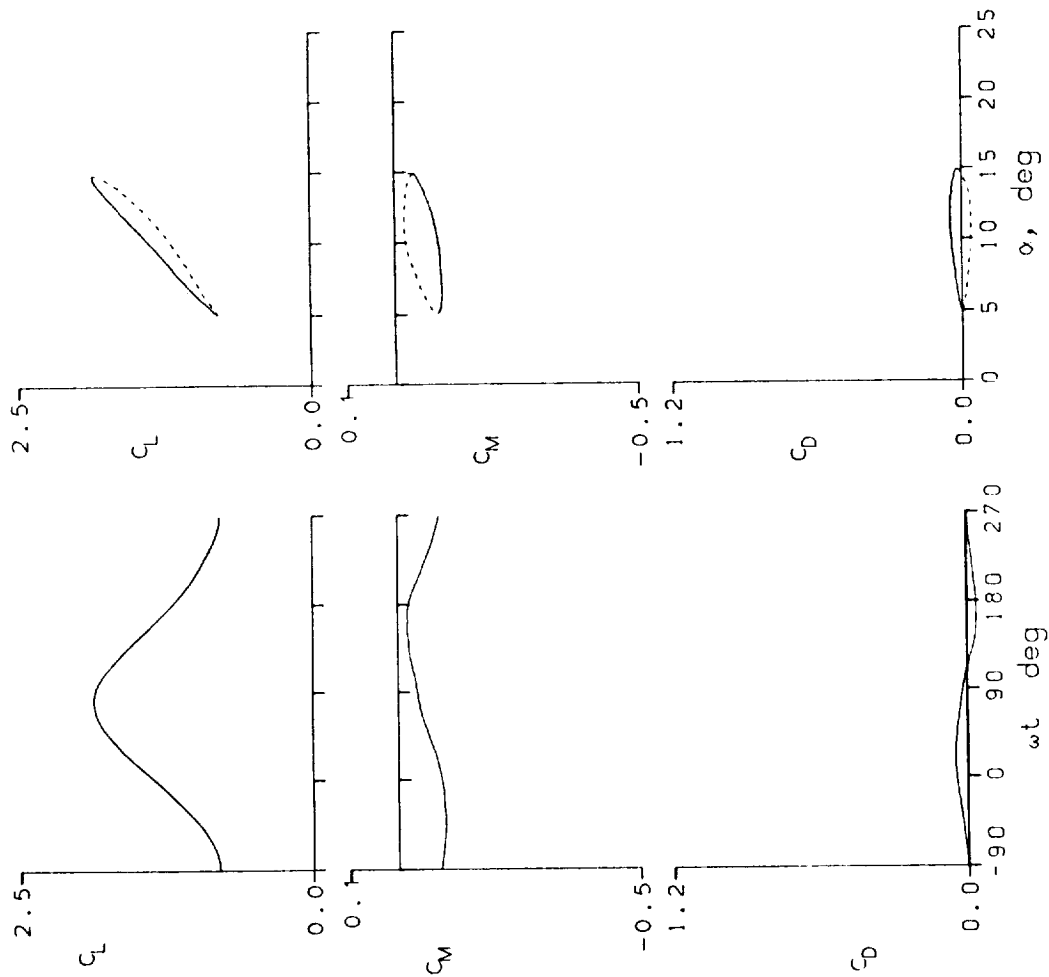


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 68211 A0 = 4.96 ° k = 0.198
 Re = 3.84 E6 A1 = 5.00 ° M = 0.299
 CLmax = 1.36 CMmin = -0.10 CDmax = 0.03
 α Lmax = 10.0 ° ζ = 0.495 Mmax = 0.868
 α Cmin = 4.8 ° -CPmax = 5.6 α Mmax = 9.9 °

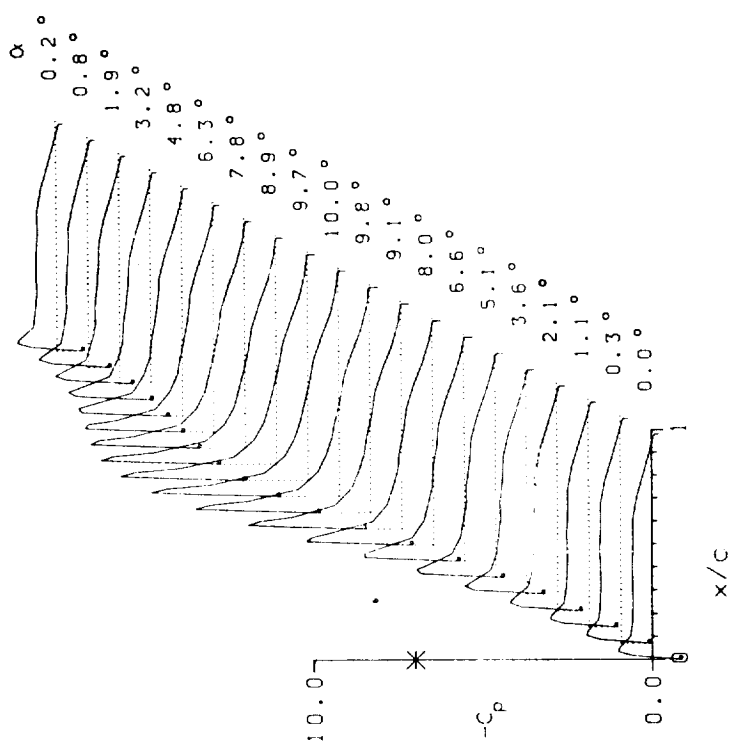
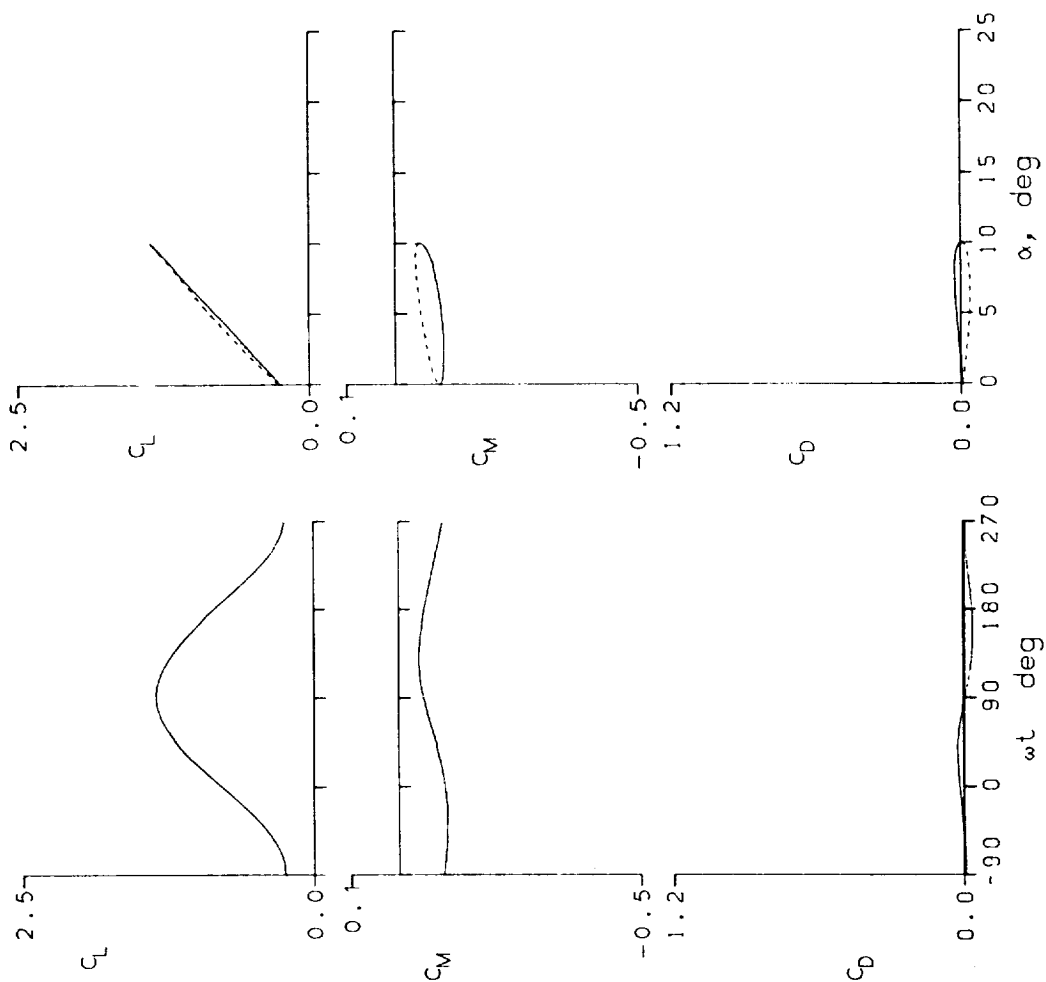


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 68219 A0 = 11.96° k = 0.050
 Re = 3.77 E6 A1 = 2.01° M = 0.295
 CLmax = 1.68 CMmin = -0.07 CDmax = 0.03
 α Lmax = 14.0° ξ = 0.106 γmax = 1.069
 α Cmin = 11.9° -CDmax = 8.0 α Mmax = 14.0°

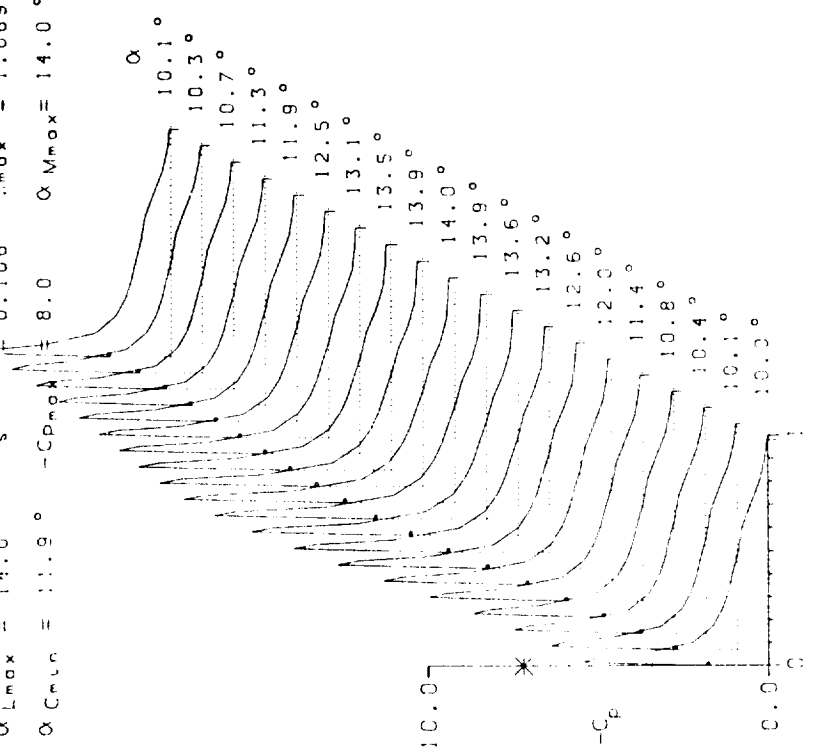
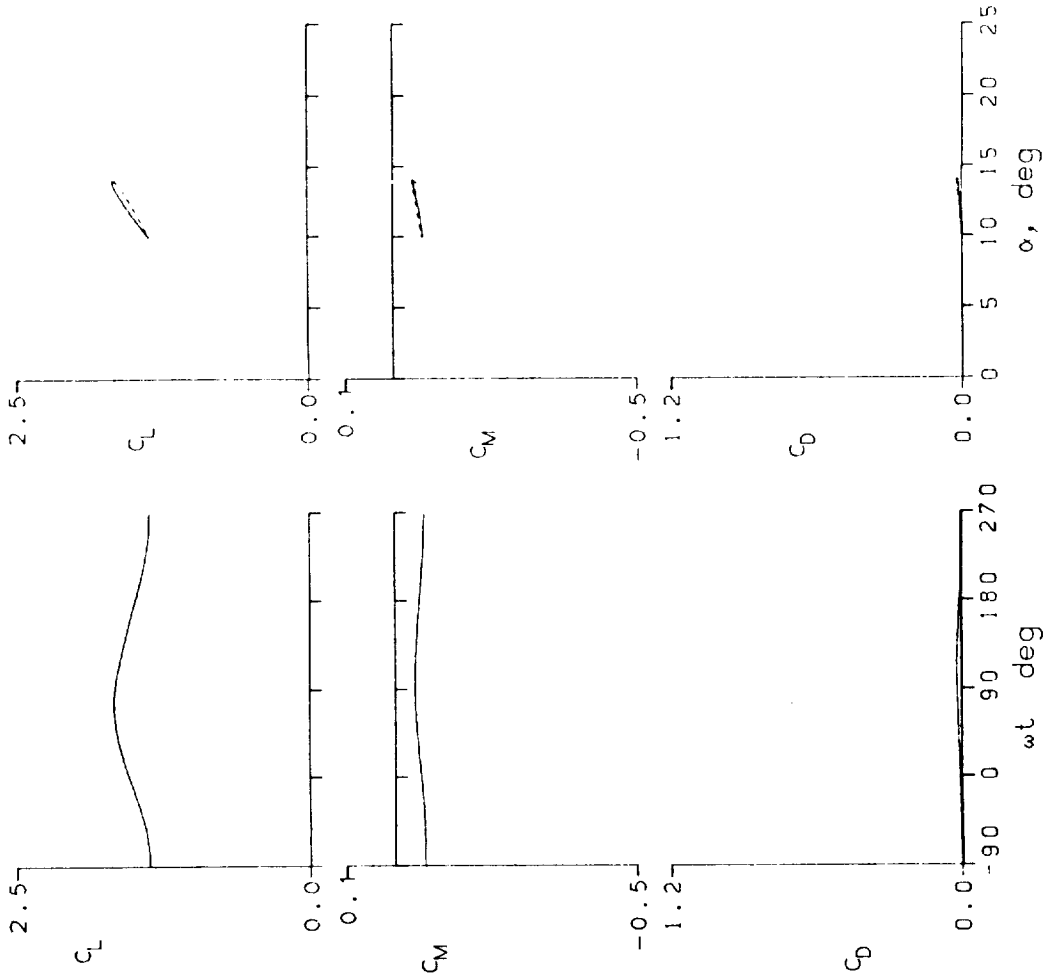


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 68221 A0 = 11.95° k = 0.101
 Re = 3.73 E6 A1 = 2.01° M = 0.293
 CLmax = 1.70 CMmin = -0.07 CDmax = 0.02
 αLmax = 13.9° ξ = 0.307 Mmax = 1.073
 αCmin = 11.9° -CPmax = 8.1 αMmax = 14.0°

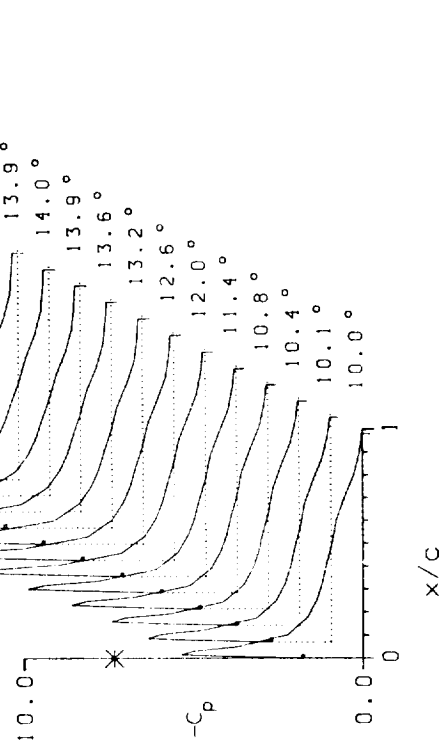
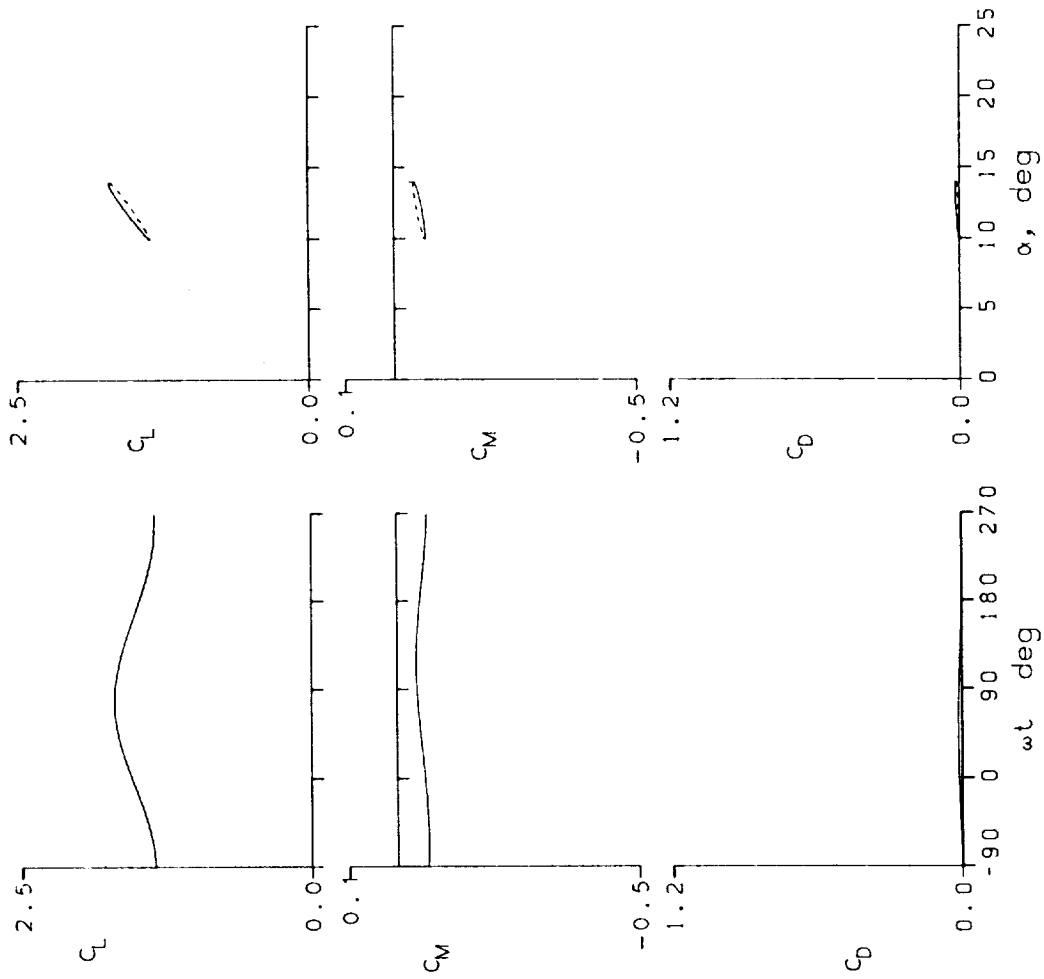


Figure 19.- Continued.

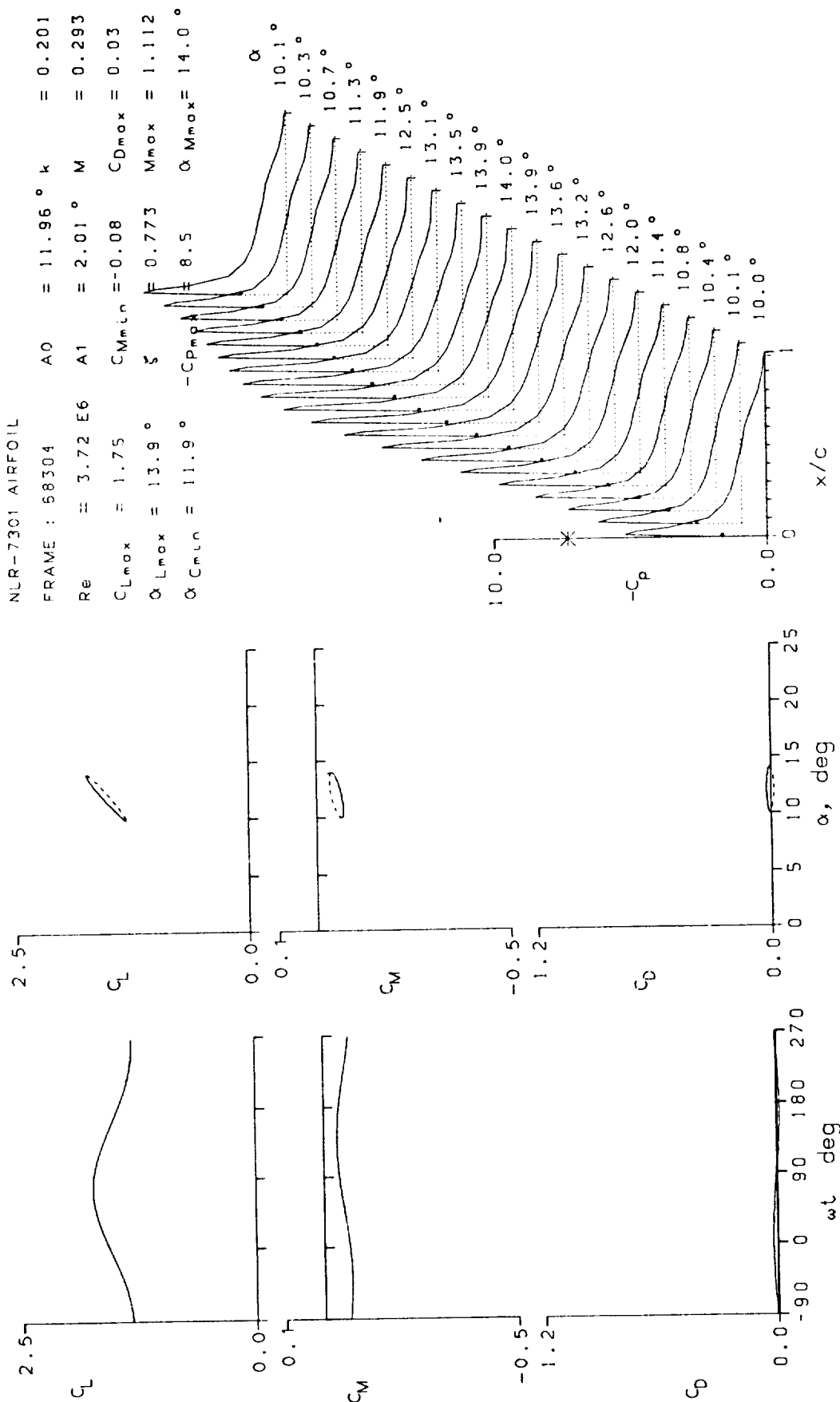


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69019 A0 = 9.80 ° k = 0.010
 Re = 3.95 E6 A1 = 9.90 ° M = 0.299
 CLmax = 1.74 CMmin = -0.15 CDmax = 0.25
 α Lmax = 14.7 ° ζ = 0.003 Mmax = 1.182
 α Cmin = 9.3 ° -CPmax = 8.8 α Mmax = 16.7 °

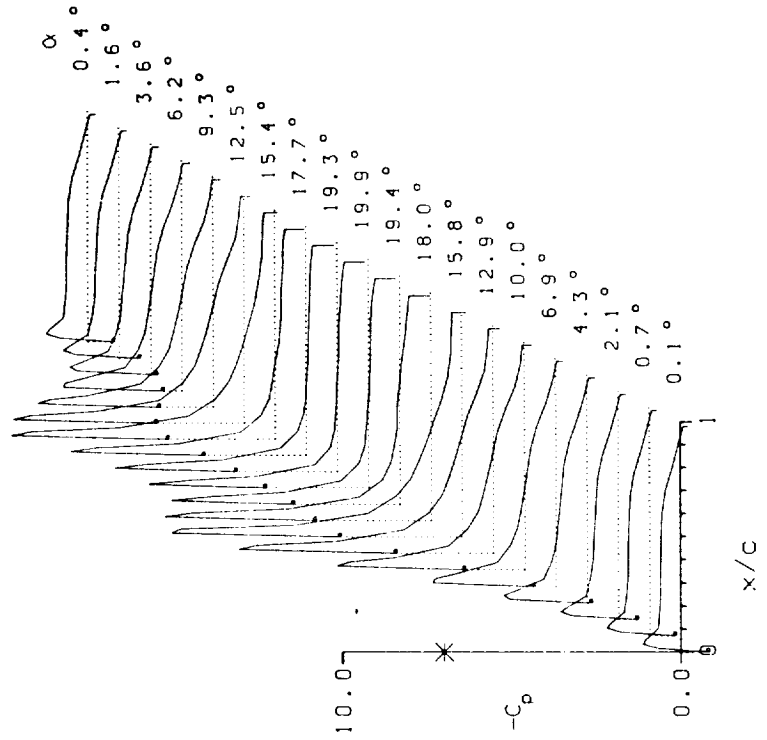
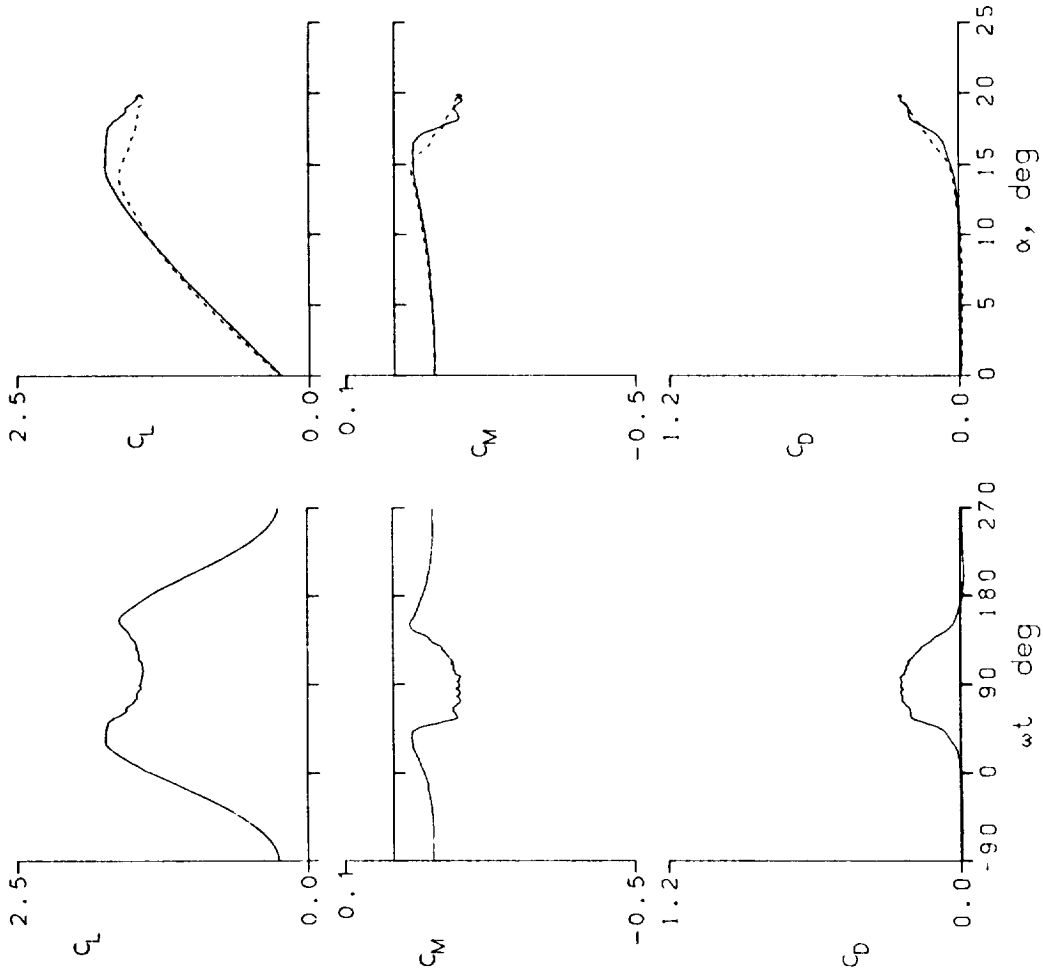


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69100 A0 = 9.81° k = 0.025
 Re = 3.92 E6 A1 = 9.89° M = 0.300
 C_{Lmax} = 1.81 C_{Mmin} = -0.16 C_{Dmax} = 0.25
 α_{Lmax} = 15.8° ζ = 0.016 M_{max} = 1.210
 α_{Cmin} = 9.3° -C_{Dmax} = 9.0 α_{Mmax} = 16.8°

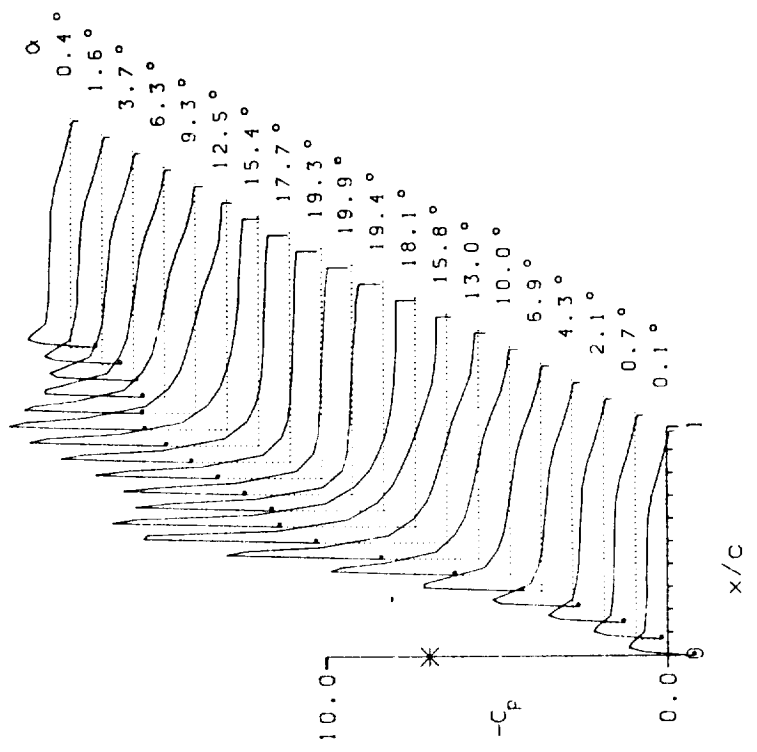
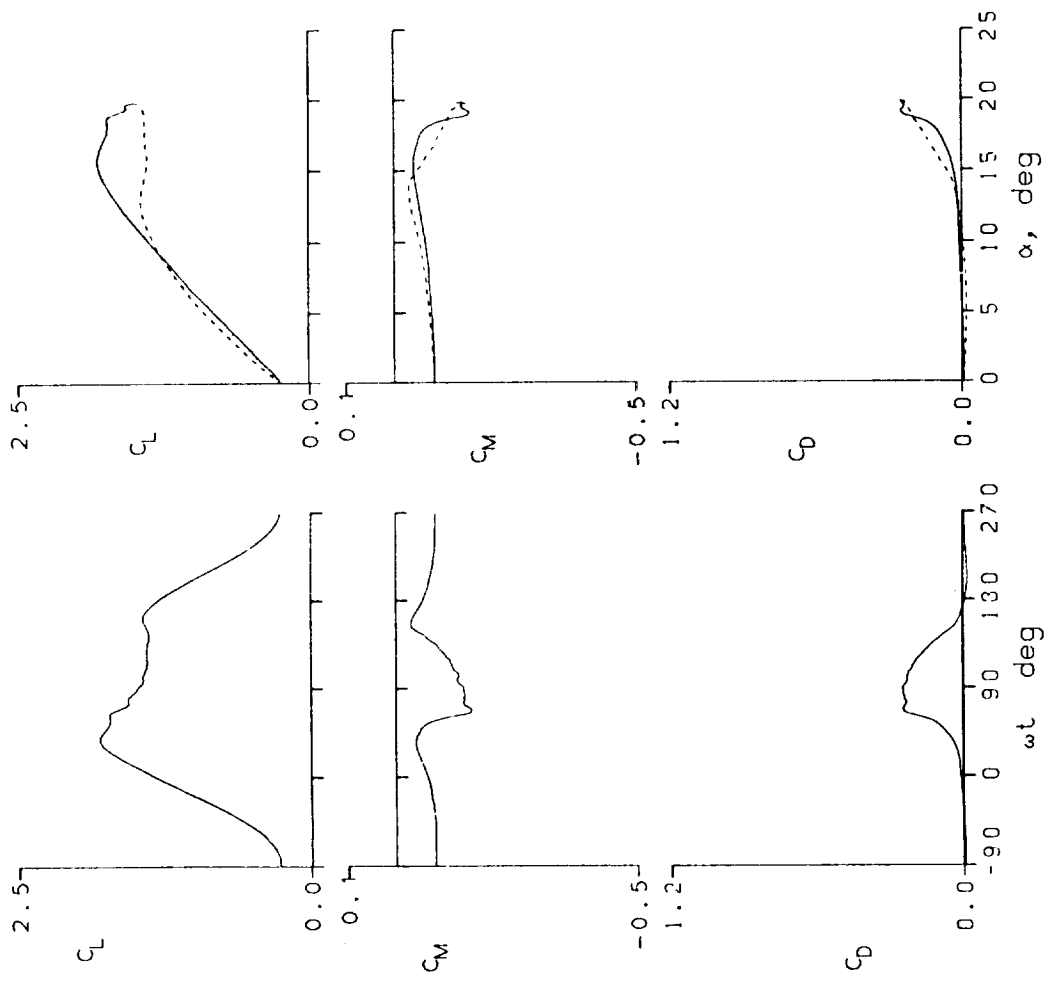


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69102 A0 = 9.82° k = 0.050
 Re = 3.90 E6 A1 = 9.89° M = 0.300
 CLmax = 1.92 CMmin = -0.17 CDmax = 0.28
 αLmax = 16.5° ξ = 0.002 Mmax = 1.238
 αCMmin = 9.3° -CPmax = 9.2 αMmax = 16.5°

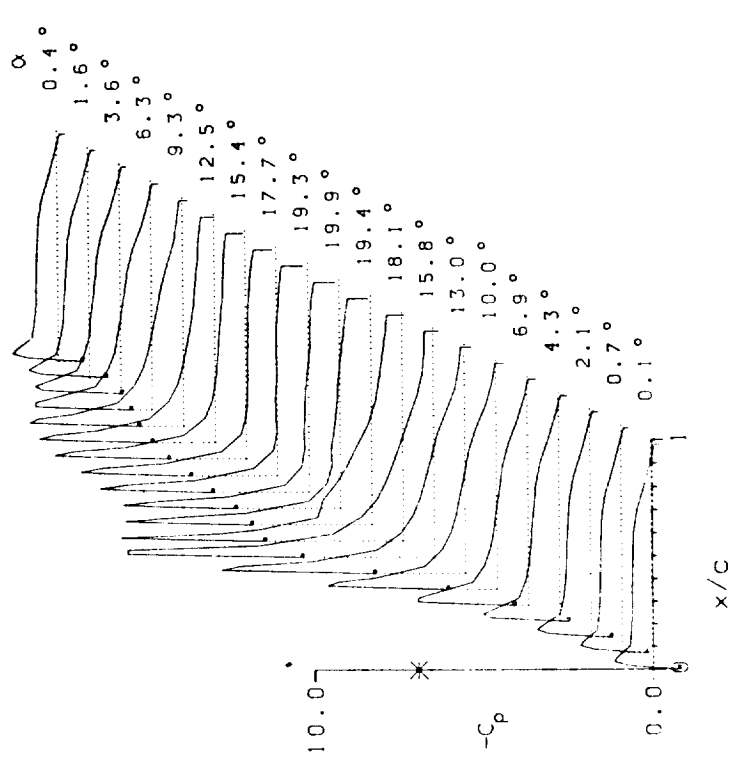
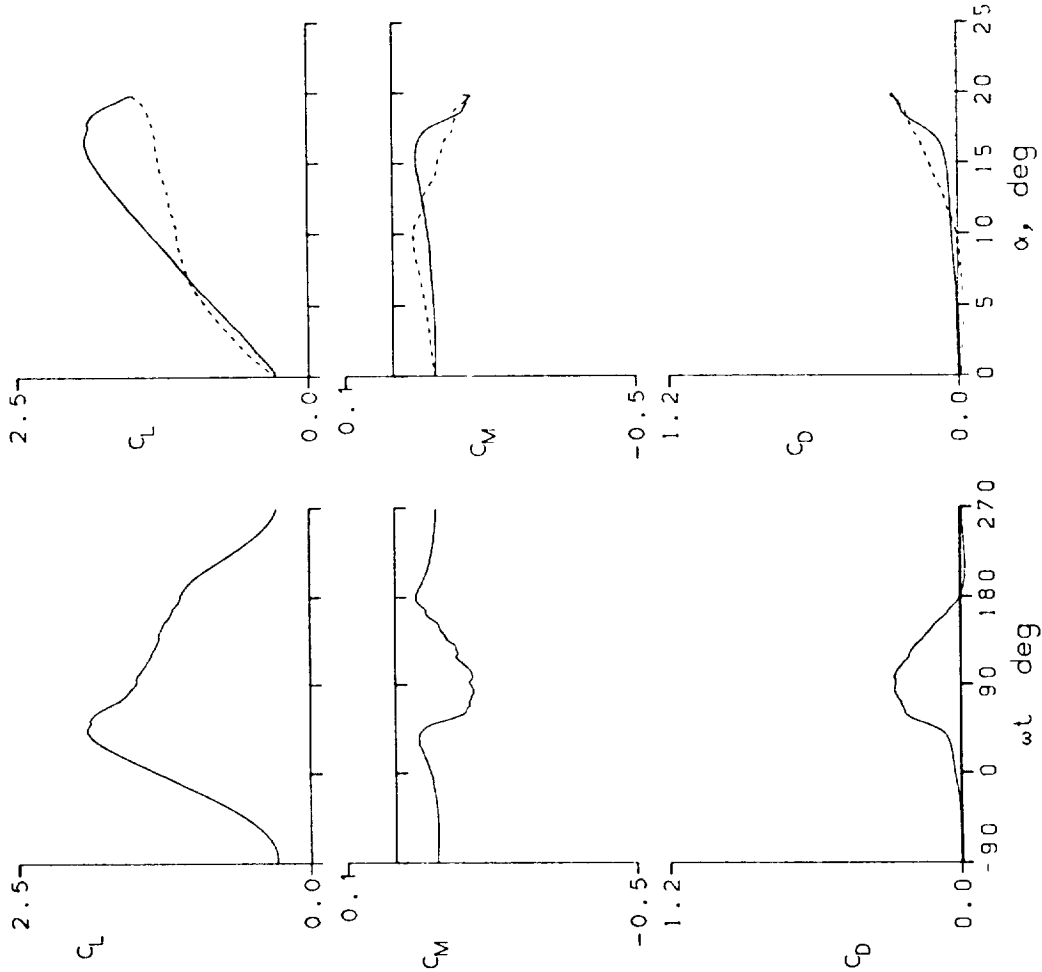


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 69105	A0 = 9.80 °	k = 0.099
Re = 3.90 E6	A1 = 9.90 °	M = 0.301
CLmax = 2.07	CMmin = -0.20	CDmax = 0.32
α Lmax = 18.7 °	ξ = 0.061	Mmax = 1.262
α Cmin = 9.3 °	-CPmax = 9.4	α Mmax = 17.3 °

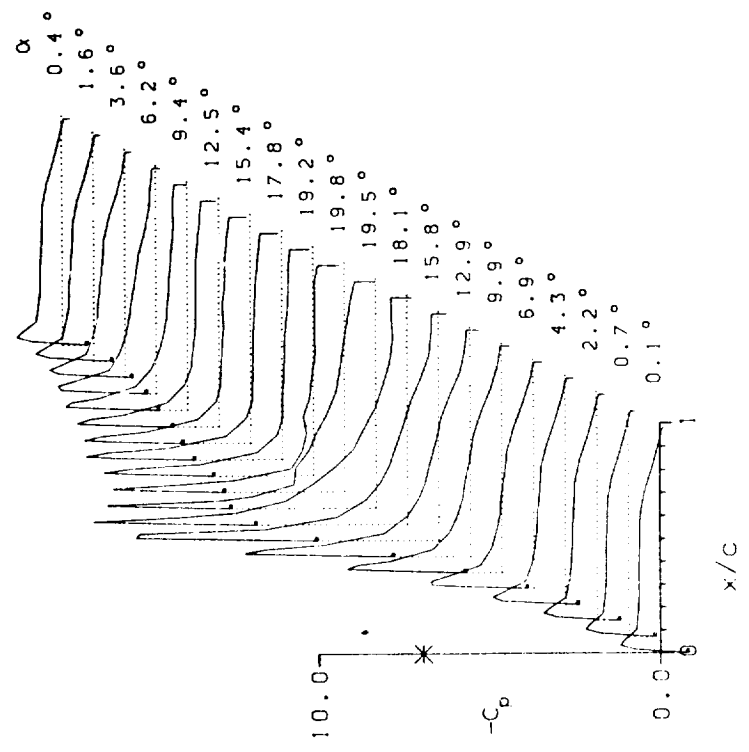
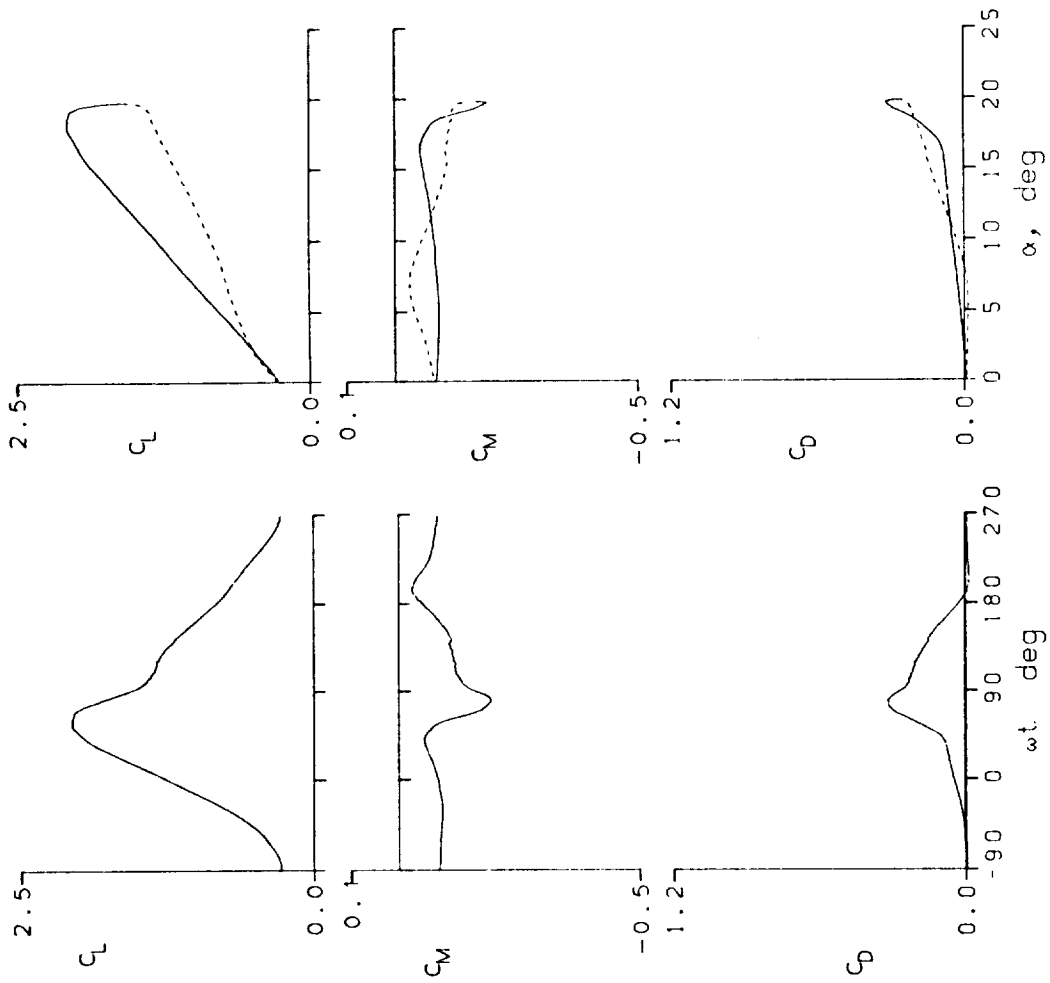


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 69107	A0 = 9.91 °	μ = 0.148
Re = 3.88 E6	A1 = 9.90 °	M = 0.300
$C_{Lmax} = 2.14$	$C_{Mmin} = -0.22$	$C_{Dmax} = 0.35$
$\alpha_{Lmax} = 18.8 °$	$\xi = 0.156$	$M_{max} = 1.271$
$\alpha_{C_{min}} = 9.5 °$	$-C_{pmax} = 9.5$	$\alpha_{Mmax} = 17.8 °$

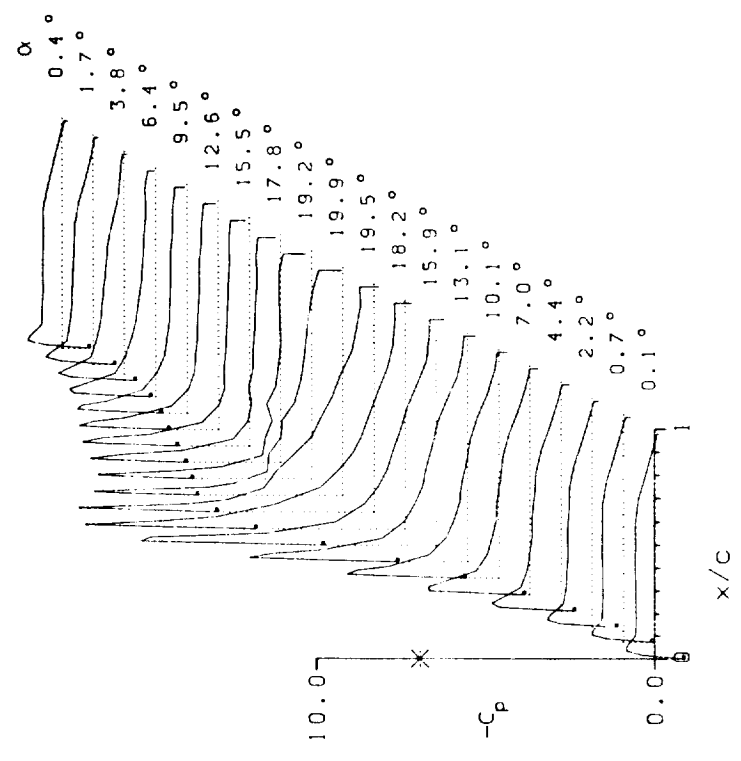
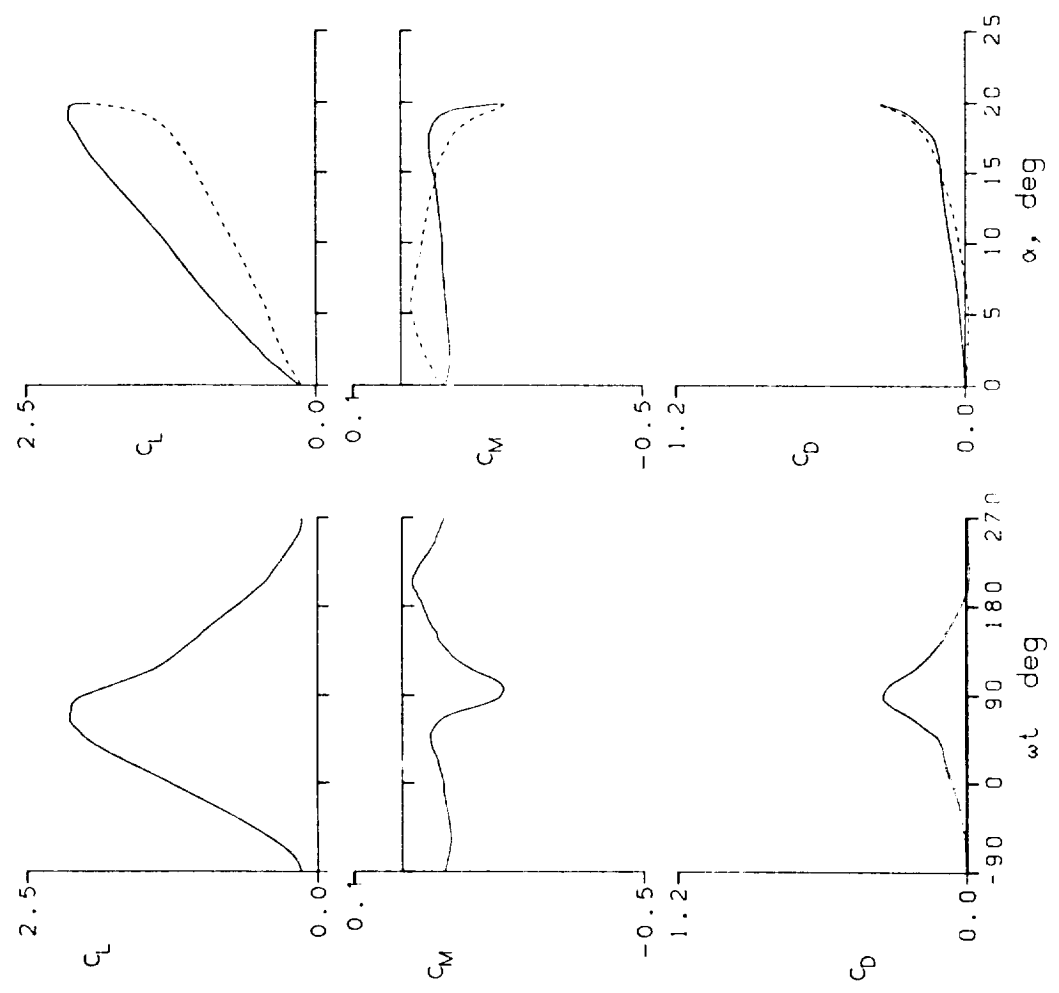


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69119 A0 = 16.79° k = 0.027
 Re = 3.49 E6 A1 = 1.99° M = 0.273
 C_{Lmax} = 1.86 C_{Mmax} = -0.11 C_{Dmax} = 0.16
 α_{Lmax} = 17.6° ζ = -0.943 M_{max} = 1.094
 α_{Cmin} = 16.7° -C_{Pmax} = 9.6 α_{Mmax} = 18.2°

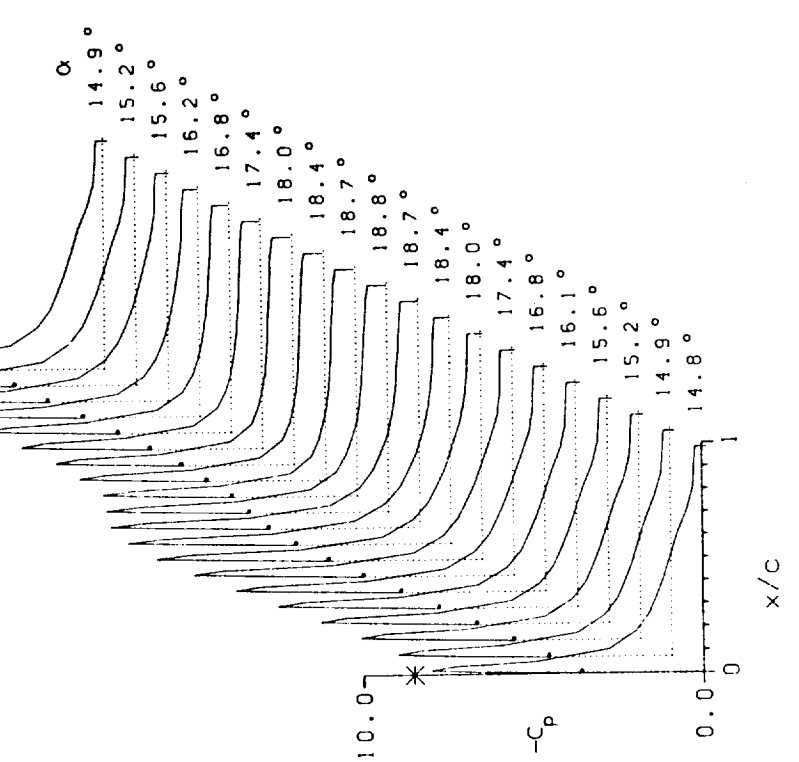
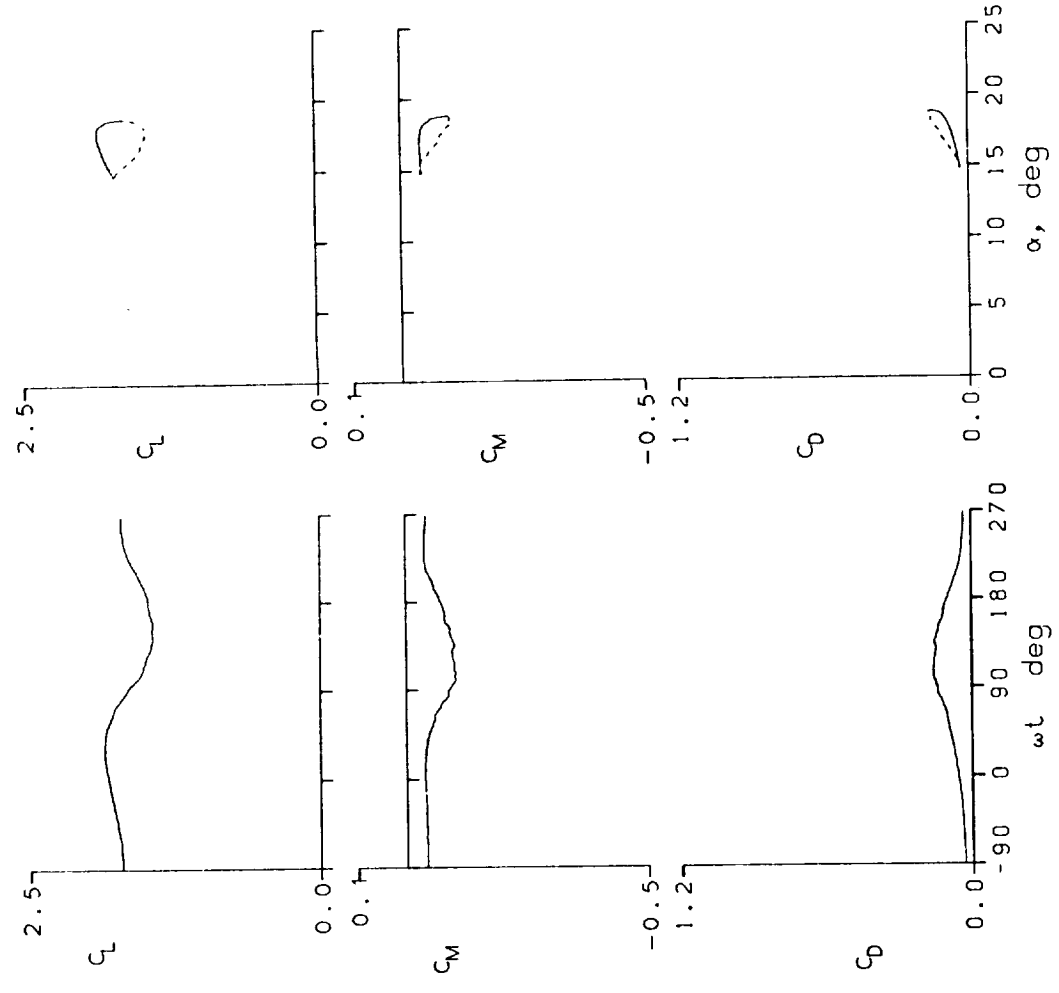


Figure 19.- Continued.

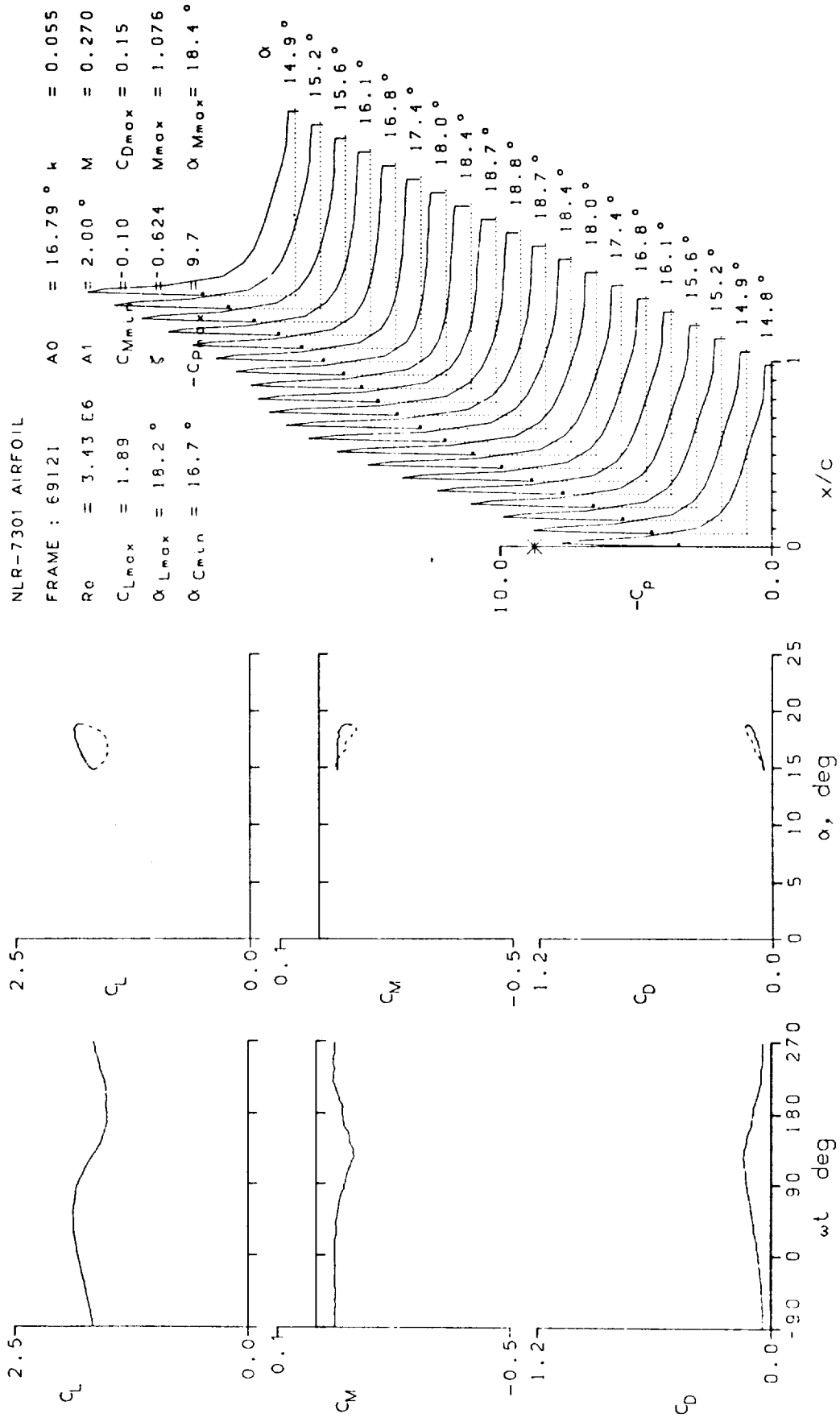


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69123 A0 = 16.78 ° k = 0.110
 Re = 3.40 E6 A1 = 2.00 ° M = 0.268
 CLmax = 1.93 CMmin = -0.08 CDmax = 0.11
 αLmax = 18.2 ° ζ = -0.441 Mmax = 1.091
 αCmin = 16.7 ° -CPmax = 10.0 αMmax = 18.4 °

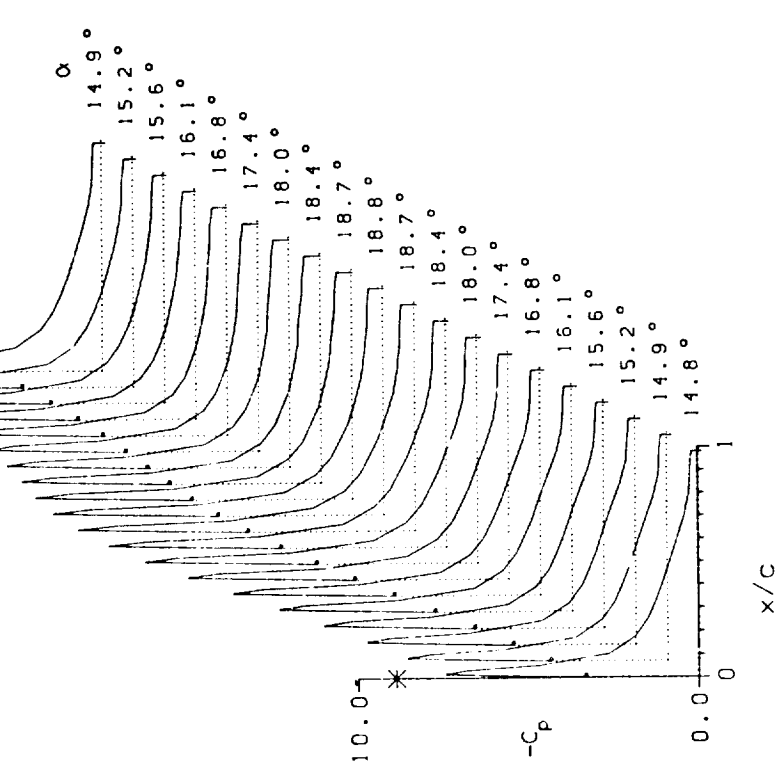
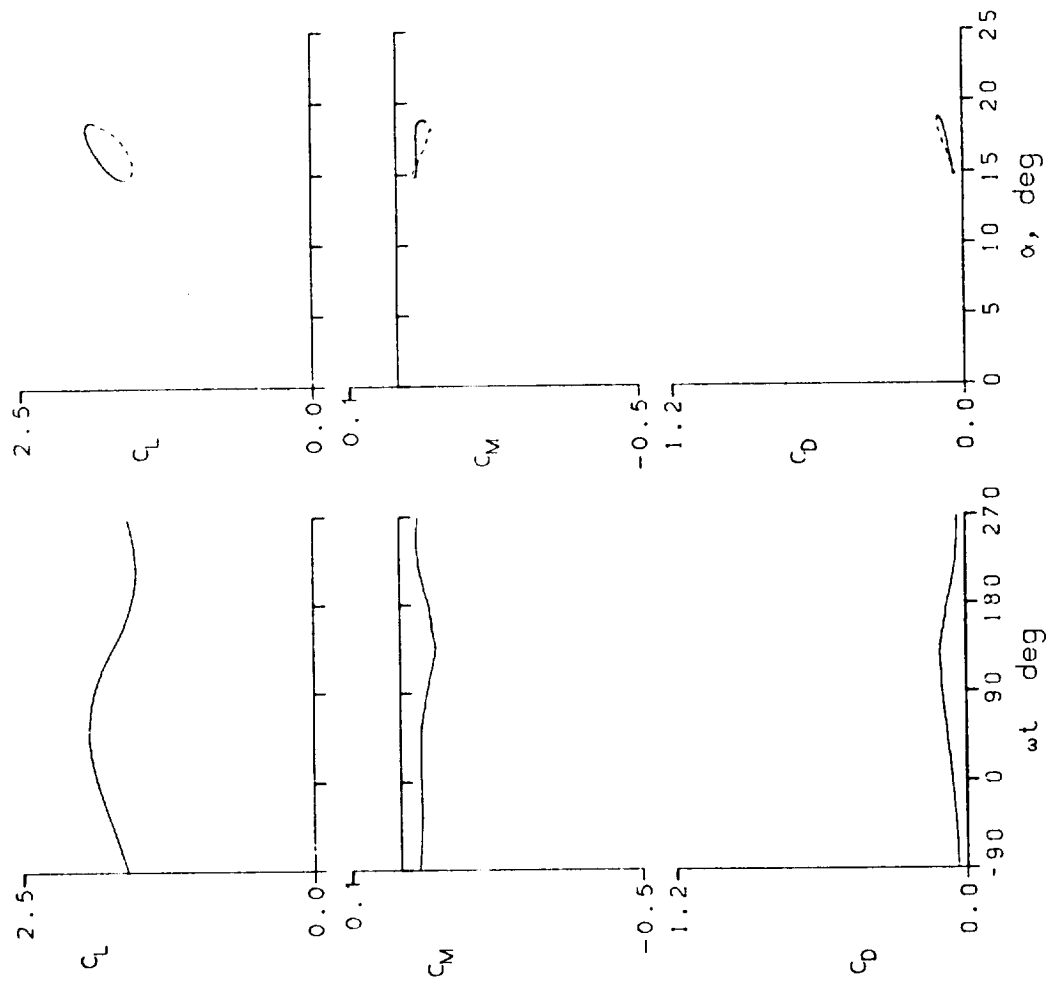


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69201 A0 = 16.79° k = 0.221
 Re = 3.37 E6 A1 = 2.00° M = 0.267
 CLmax = 2.02 CMmin = -0.05 CDmax = 0.08
 αLmax = 18.6° ζ = -0.004 Mmax = 1.154
 αCmin = 16.7° αCmax = 10.9° αMmax = 18.7°

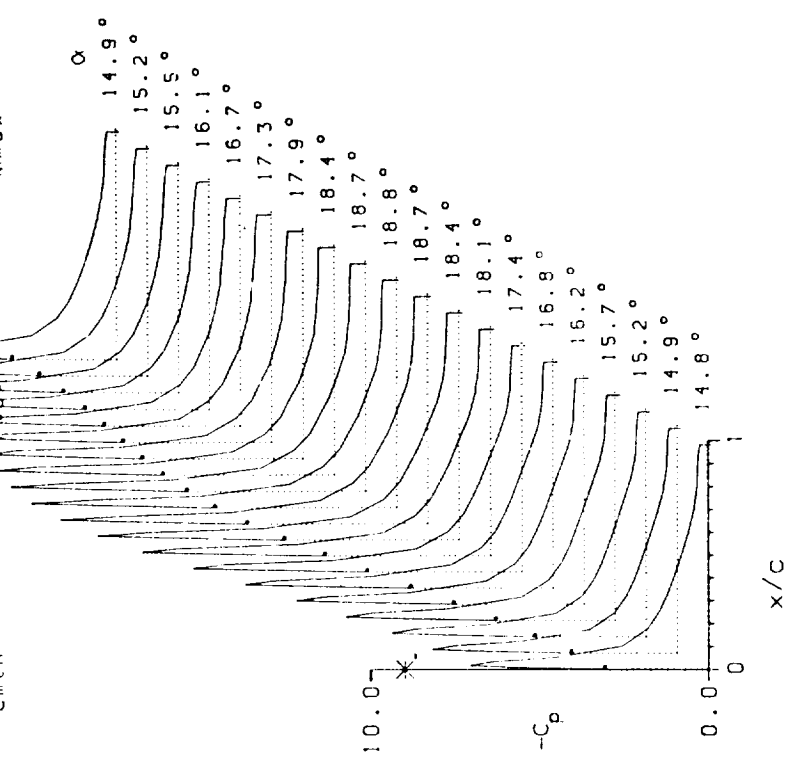
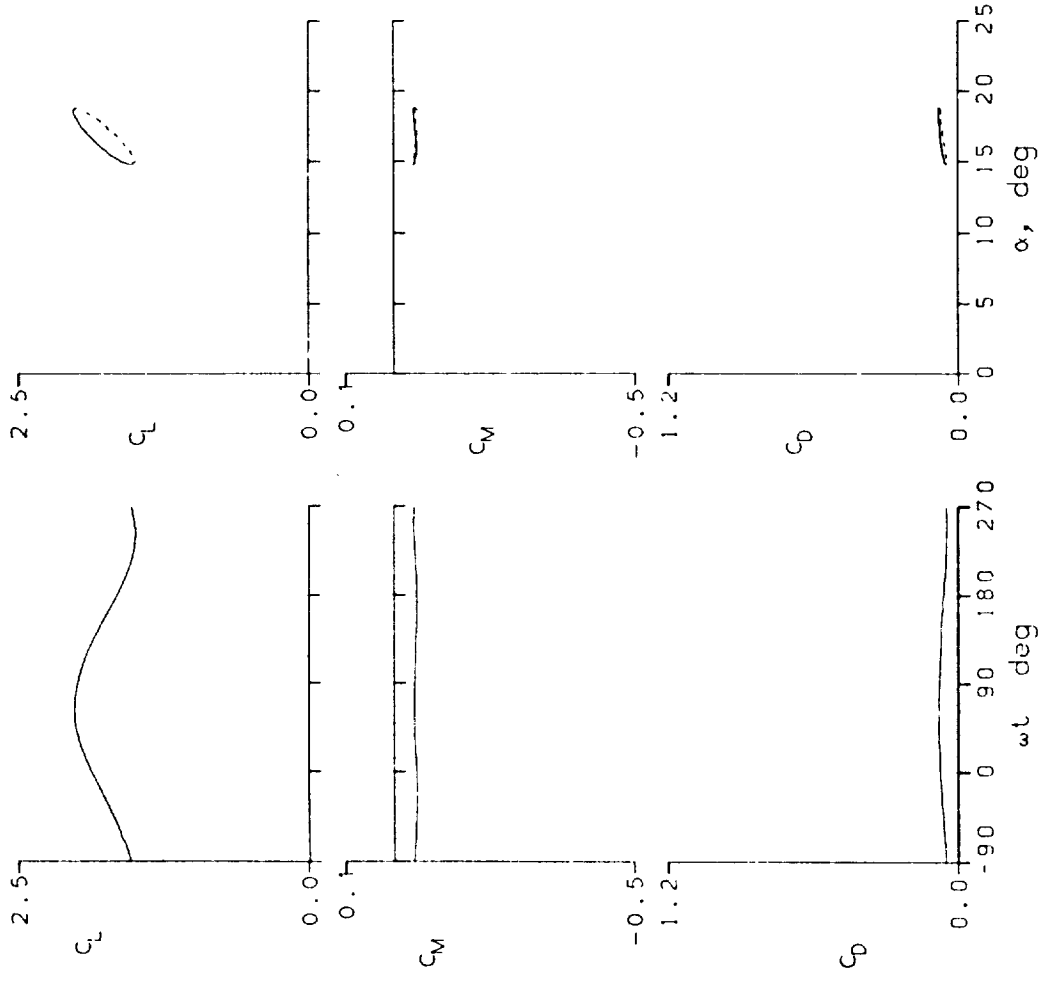


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69206 A0 = 17.21° k = 0.027
 Re = 3.46 E6 A1 = 1.99° M = 0.275
 CLmax = 1.79 CMmax = -0.14 CDmax = 0.23
 α Lmax = 17.8° ζ = -0.950 Mmax = 1.047
 α Cmin = 17.2° -CPmb = 9.0 α Mmax = 18.2°

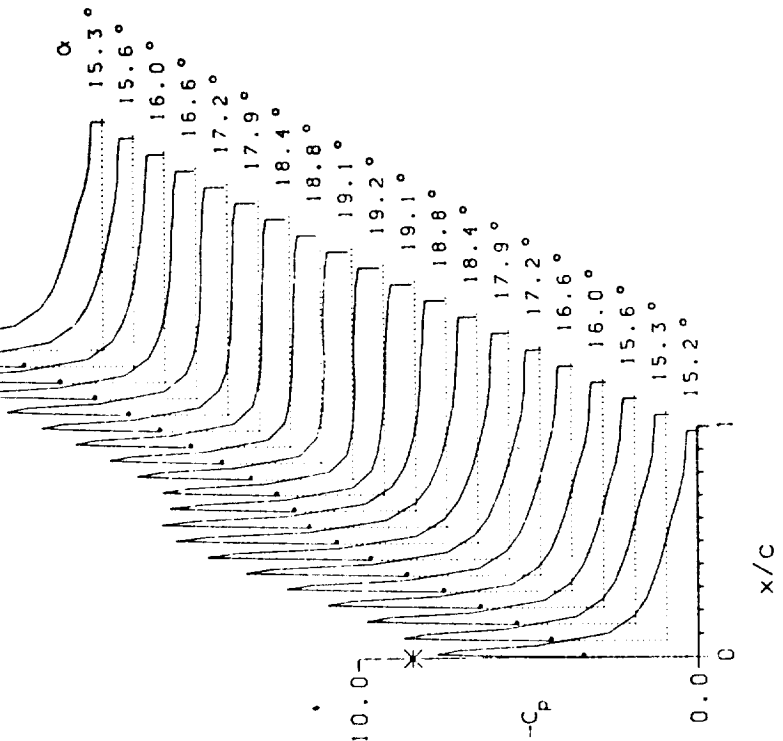
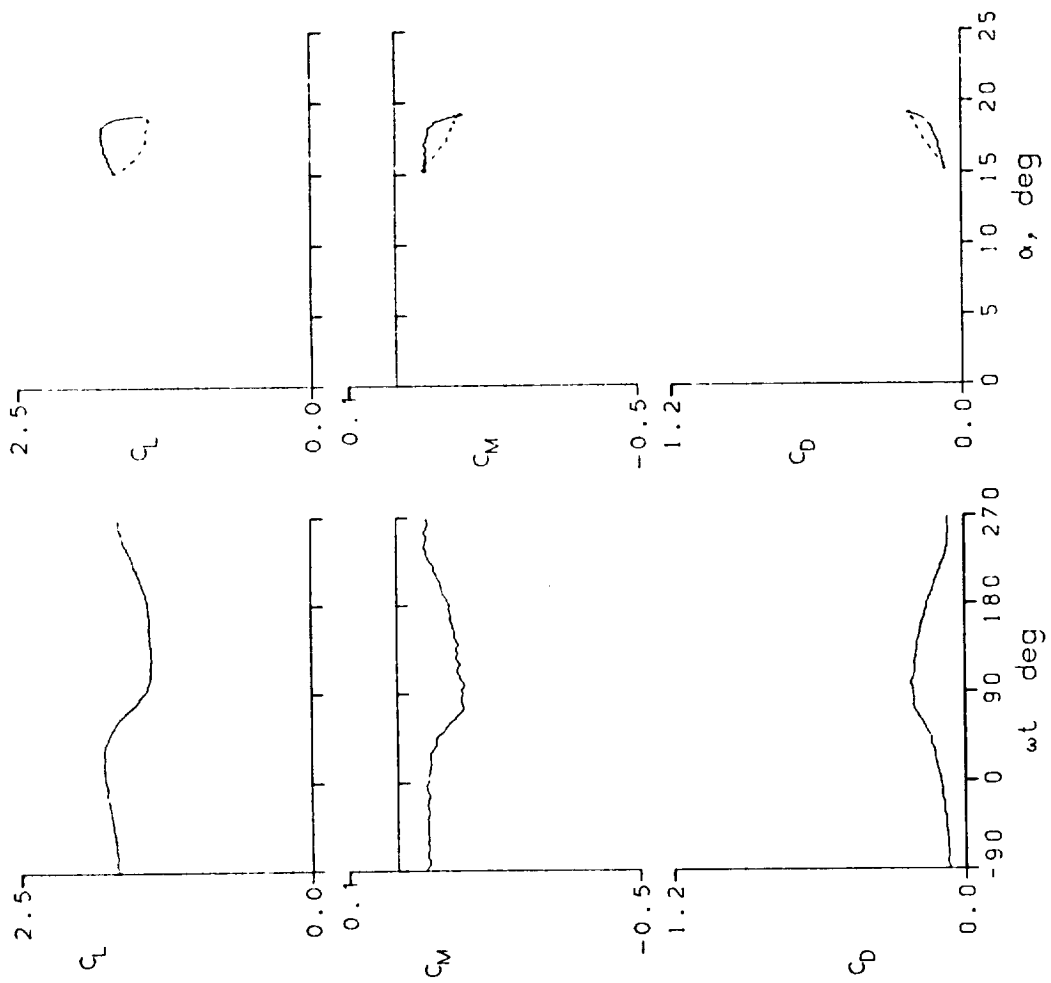


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69208 A0 = 17.21° k = 0.053
 Re = 3.47 E6 A1 = 1.99° M = 0.277
 CLmax = 1.63 CMmin = -0.16 CDmax = 0.28
 αLmax = 18.8° ζ = 0.196 Mmax = 0.907
 αCmin = 17.2° -CDmax = 7.1 αMmax = 19.1°

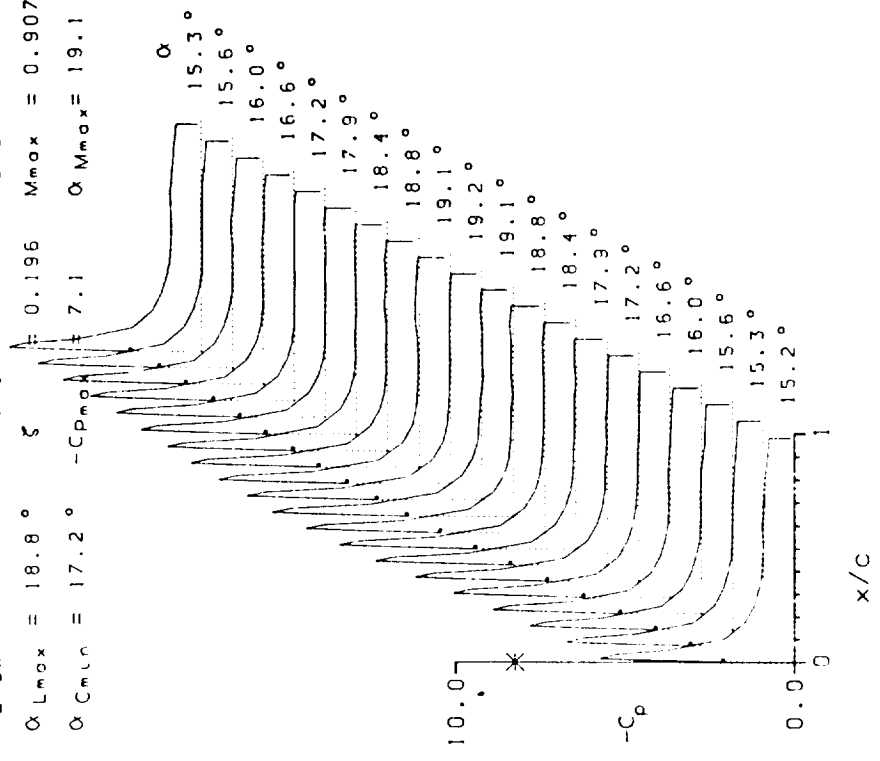
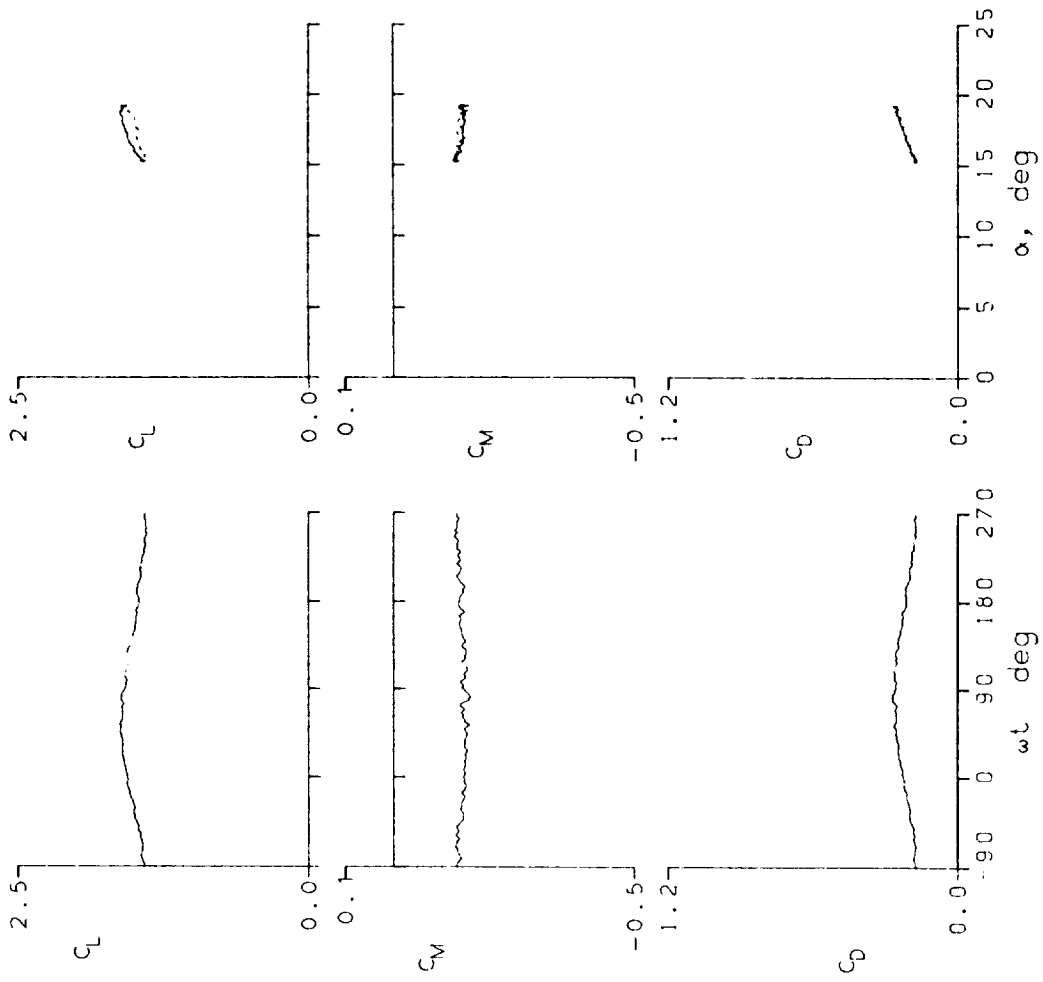


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 69211	A0 = 17.20 °	k = 0.109
Re = 3.37 E6	A1 = 2.00 °	M = 0.270
C _{Lmax} = 1.94	C _{Mmin} = -0.10	C _{Dmax} = 0.15
α _{Lmax} = 18.7 °	ξ = -1.152	M _{max} = 1.124
α _{Cmin} = 17.1 °	-C _{Pmax} = 10.2	α _{Mmax} = 18.9 °

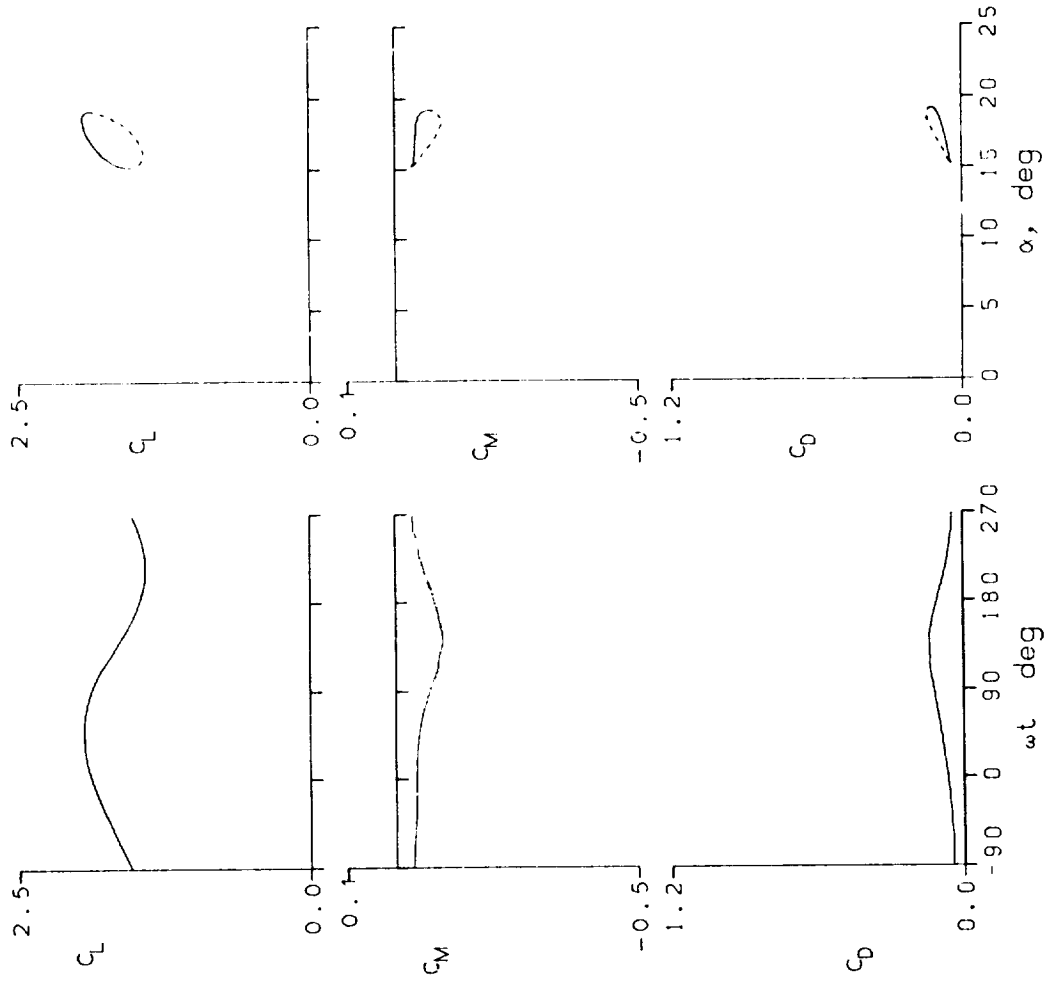
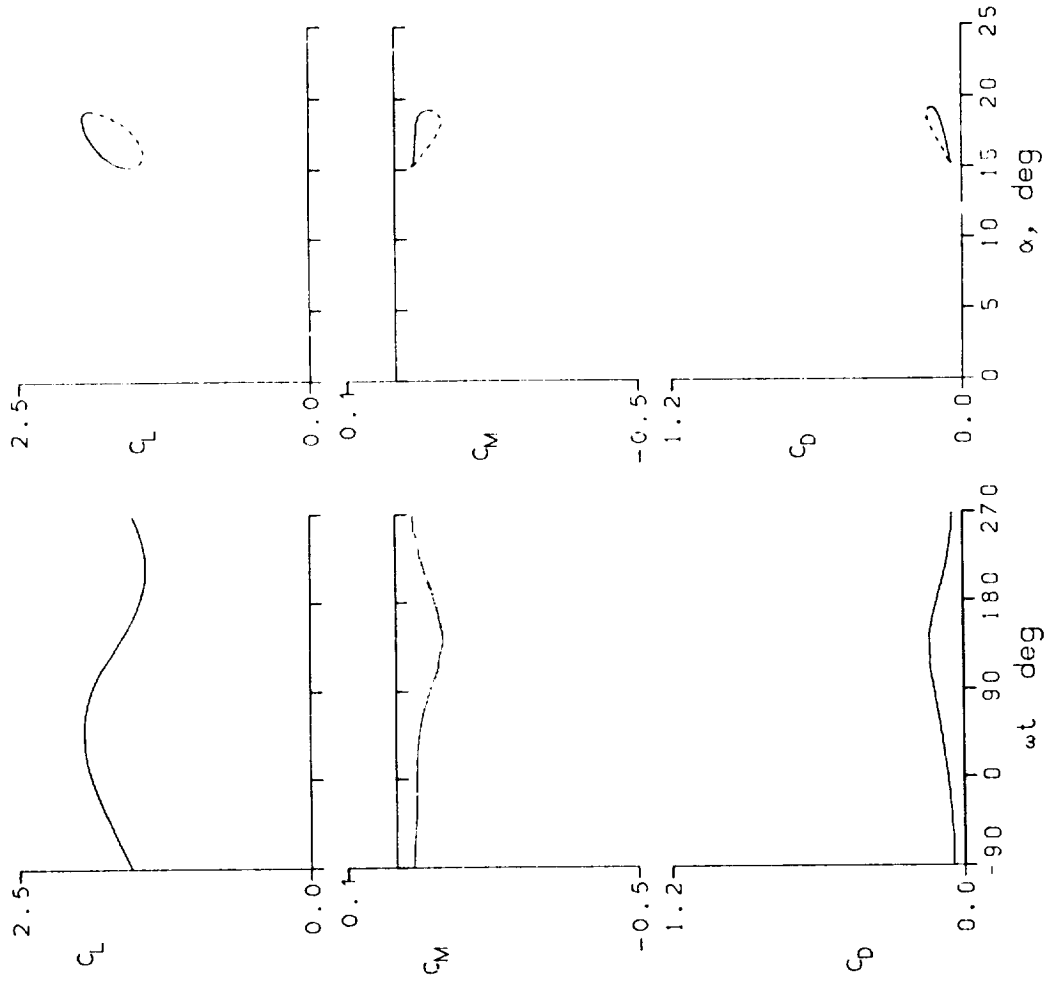


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 69213	A0 = 17.19°	k = 0.162
Re = 3.39 E6	A1 = 2.00°	M = 0.272
$C_{Lmax} = 0.99$	$C_{Mmin} = -0.21$	$C_{Dmax} = 0.38$
$\alpha_{Lmax} = 18.5^\circ$	$\zeta = 1.062$	$M_{max} = 0.418$
$\alpha_{Cmin} = 17.2^\circ$	$-C_{Pmax} = 1.3$	$\alpha_{Mmax} = 19.2^\circ$

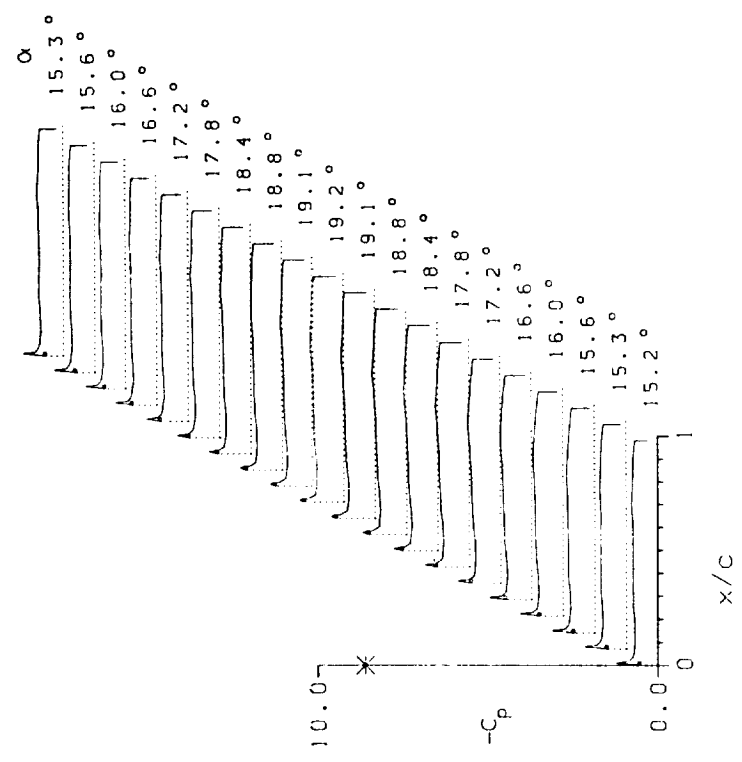
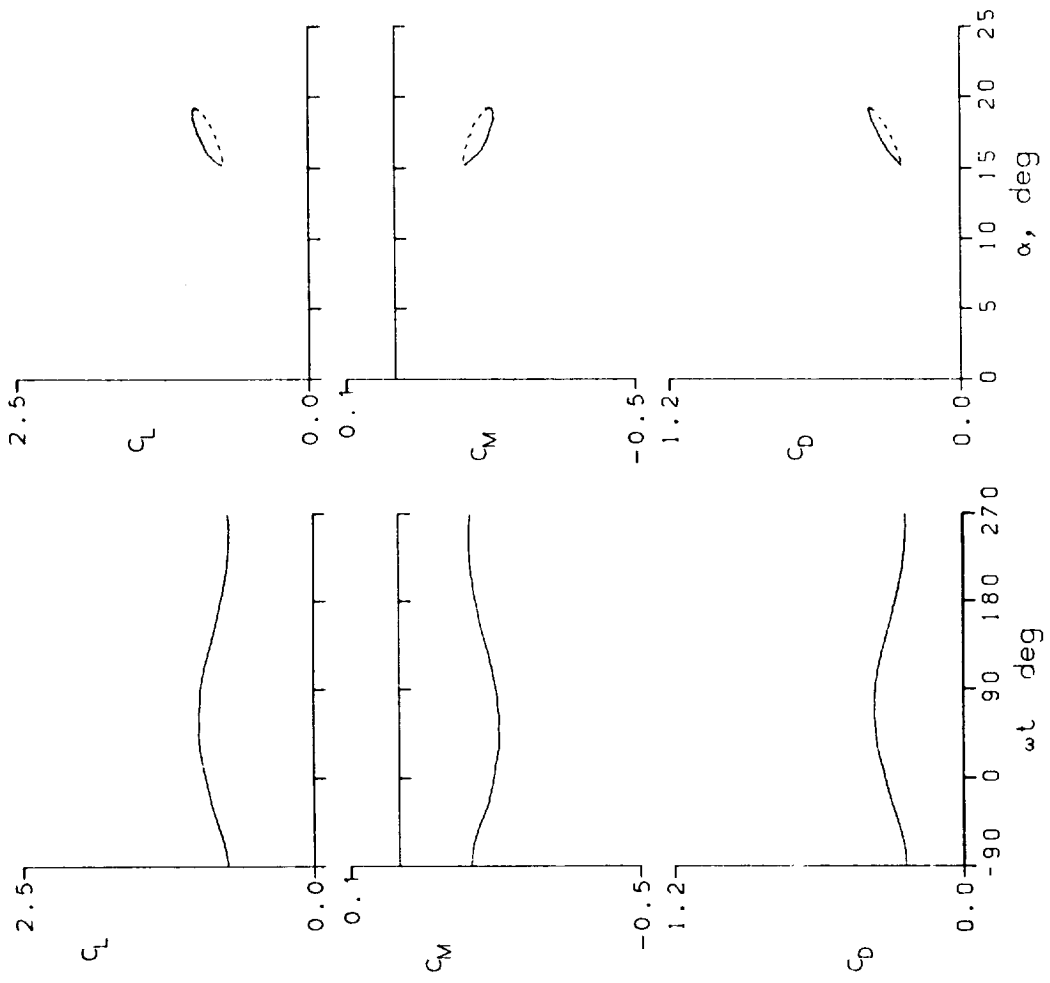


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 63215 A0 = 17.21° k = 0.210
 Re = 3.46 E6 A1 = 1.99° M = 0.279
 CLmax = 1.52 CMmin = -0.21 CDmax = 0.30
 αLmax = 17.4° ζ = 1.001 Mmax = 0.825
 αCMmin = 17.2° -CPmax = 6.0 αMmax = 19.2°

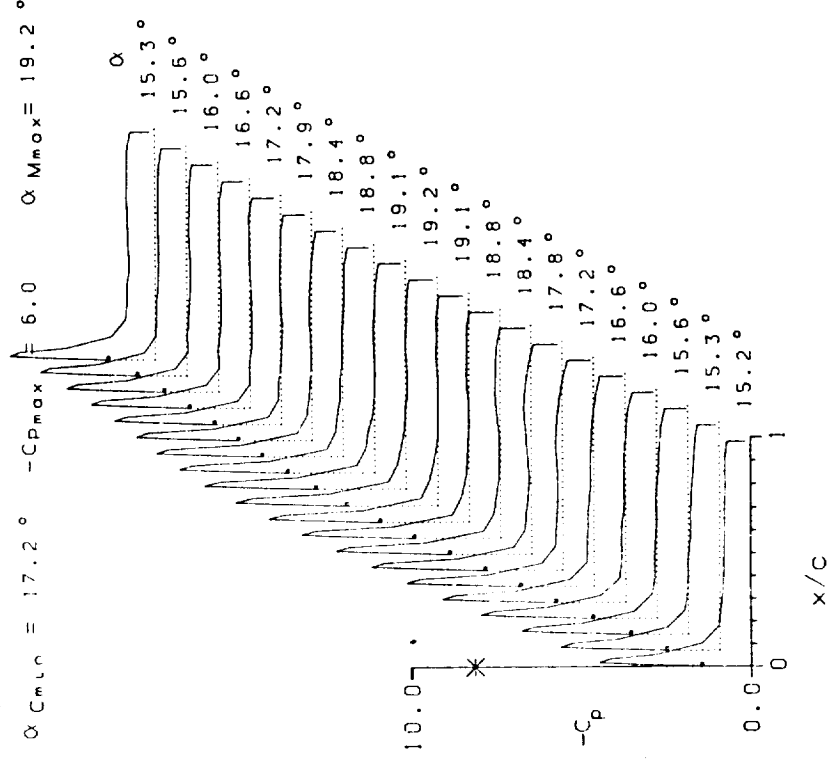
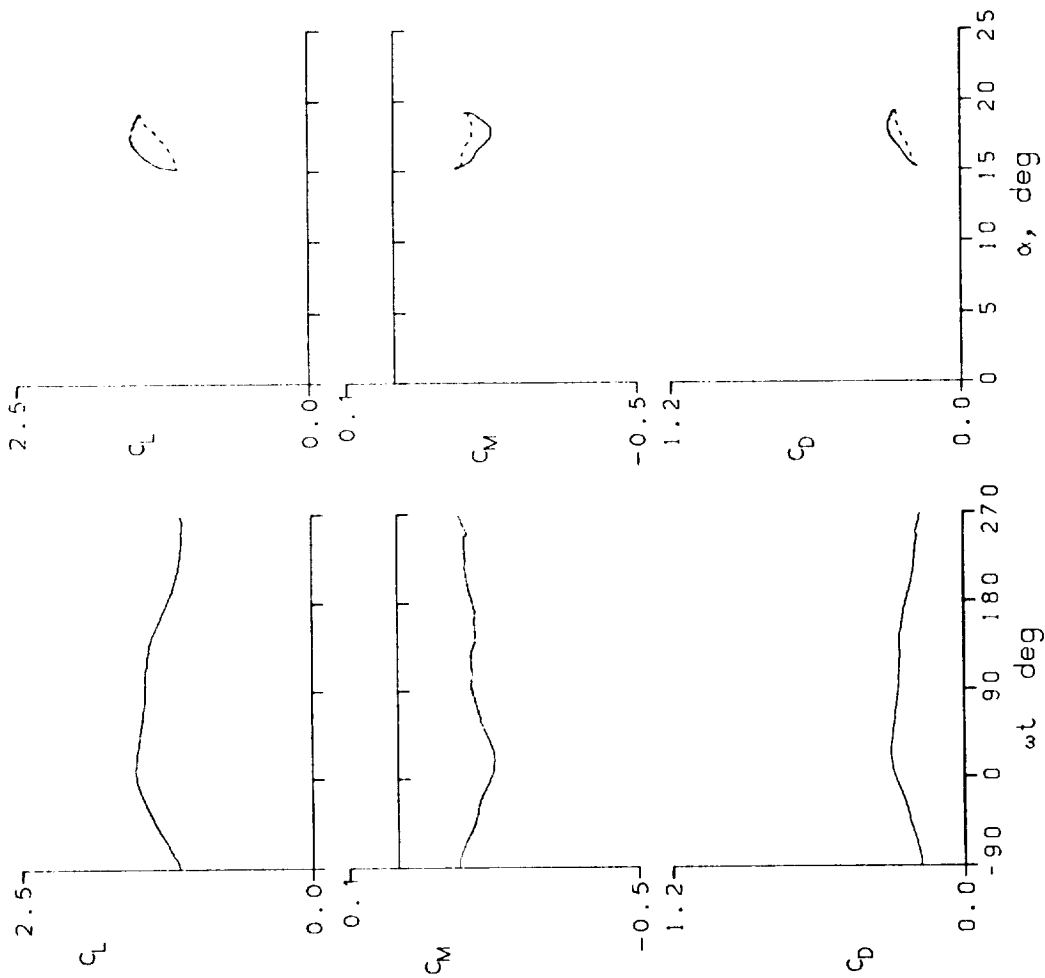


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 59221 A0 = 17.48 ° k = 0.054
 Re = 3.40 E6 A1 = 2.00 ° M = 0.273
 CLmax = 1.88 CMmin = -0.14 CDmax = 0.21
 α Lmax = 18.6 ° ζ = -1.340 Mmax = 1.112
 α Cmin = 17.4 ° -CPmin = 9.8 α Mmax = 18.7 °

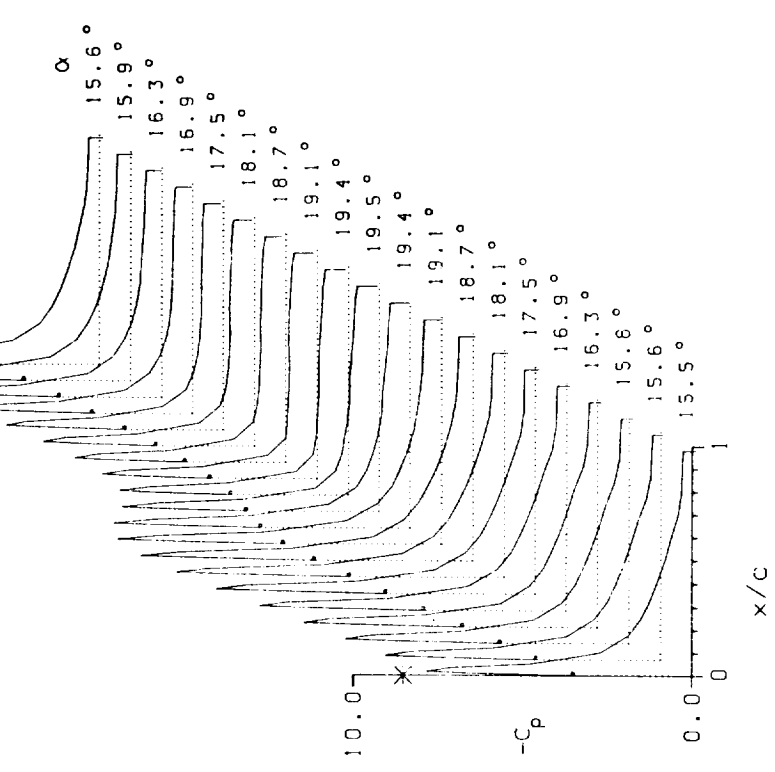
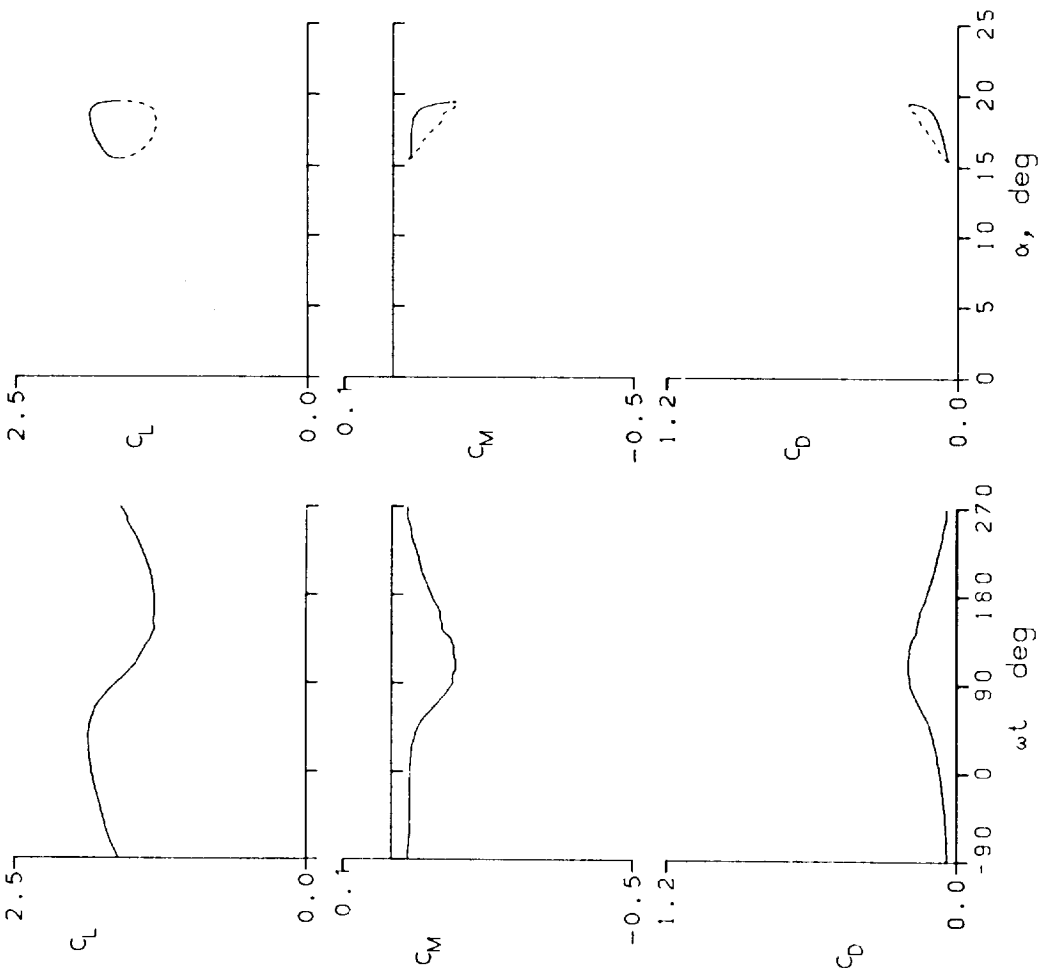


Figure 19.- Continued.

NLR-73C1 AIRFOIL

FRAME : 69223 A0 = 17.48° k = 0.221
 Re = 3.29 E6 A1 = 2.00° M = 0.265
 CLmax = 1.00 CMmin = -0.21 CDmax = 0.38
 αLmax = 19.4° ζ = 0.813 Mmax = 0.404
 αCmin = 17.5° -CPmax = 1.3 αMmax = 19.5°

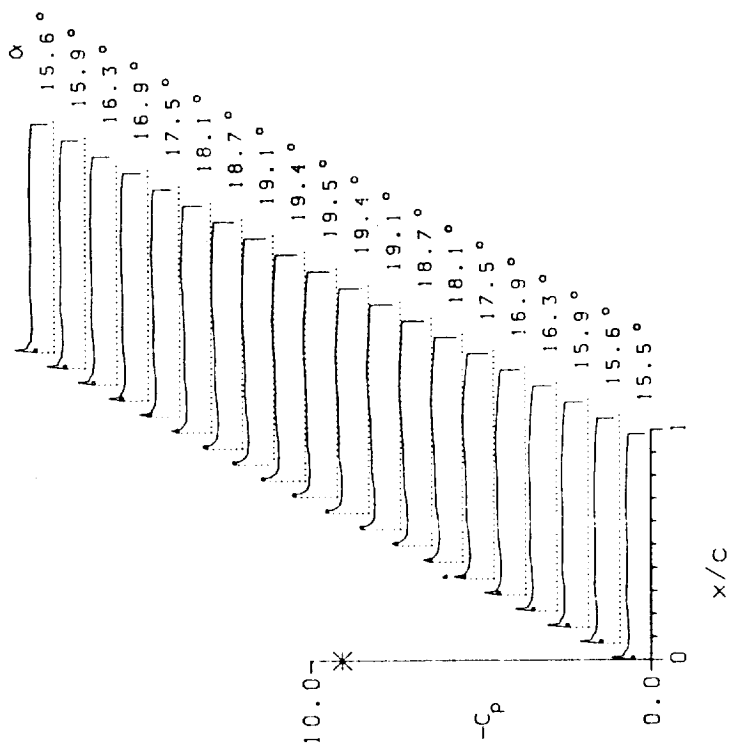
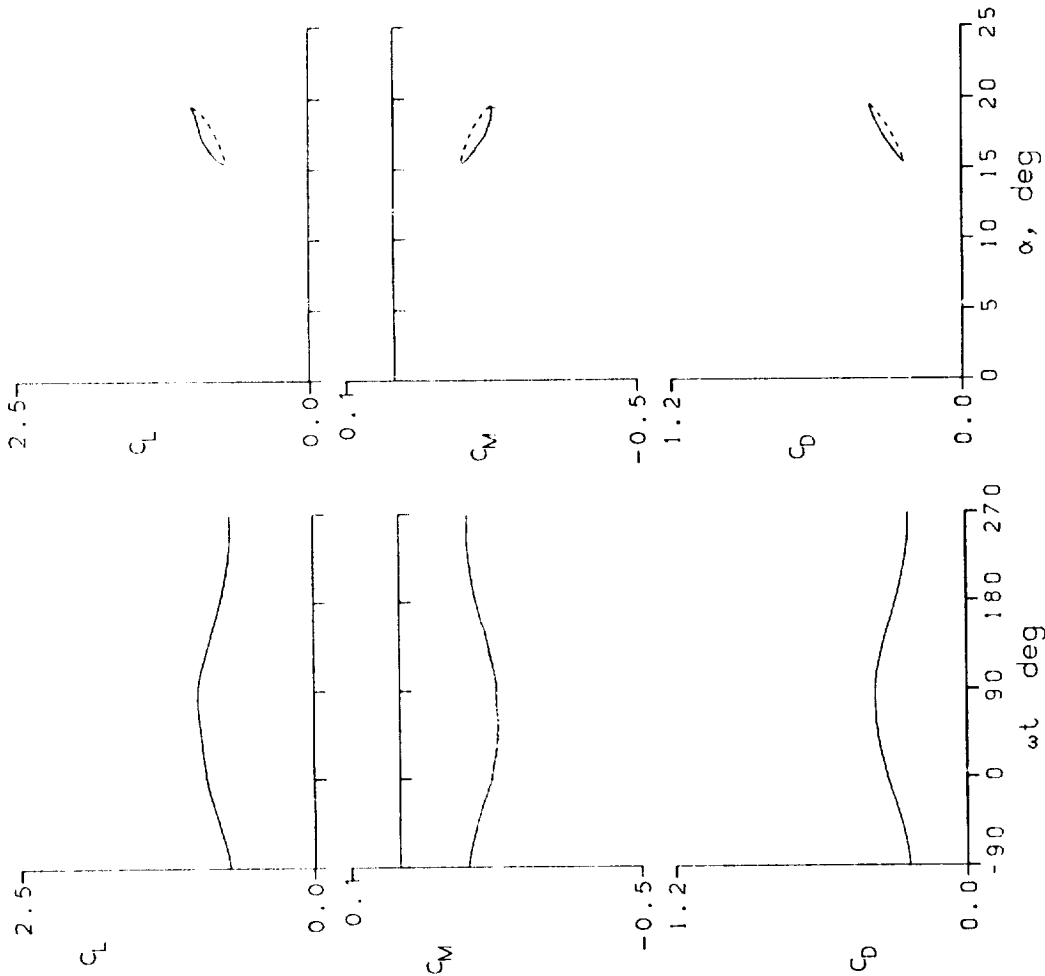


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 69304	A0 = 18.48°	k = 0.055
Re = 3.29 E6	A1 = 2.01°	M = 0.266
CLmax = 0.93	CMmin = -0.19	CDmax = 0.37
αLmax = 20.5°	ξ = 0.617	Mmax = 0.417
αCmin = 18.5°	-CPmax = 1.4	αMmax = 20.1°

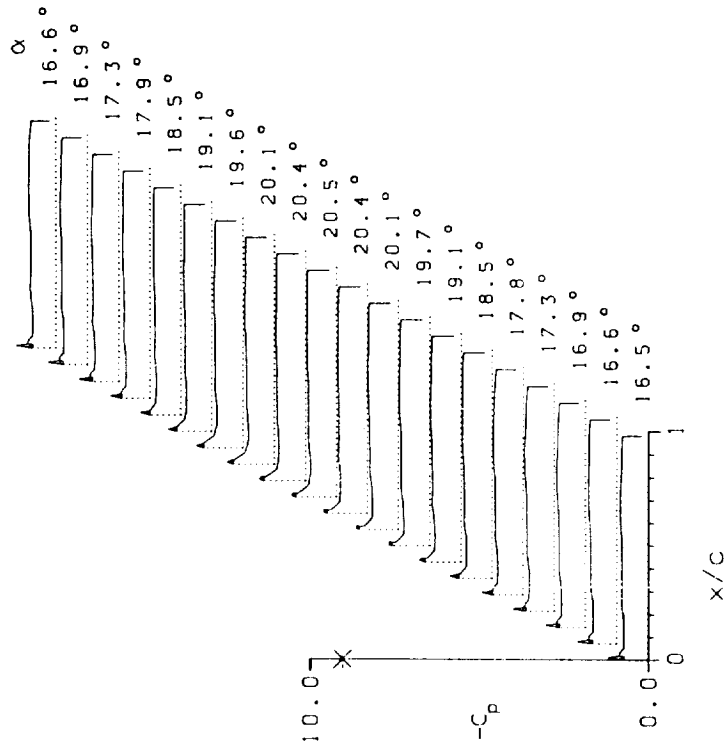
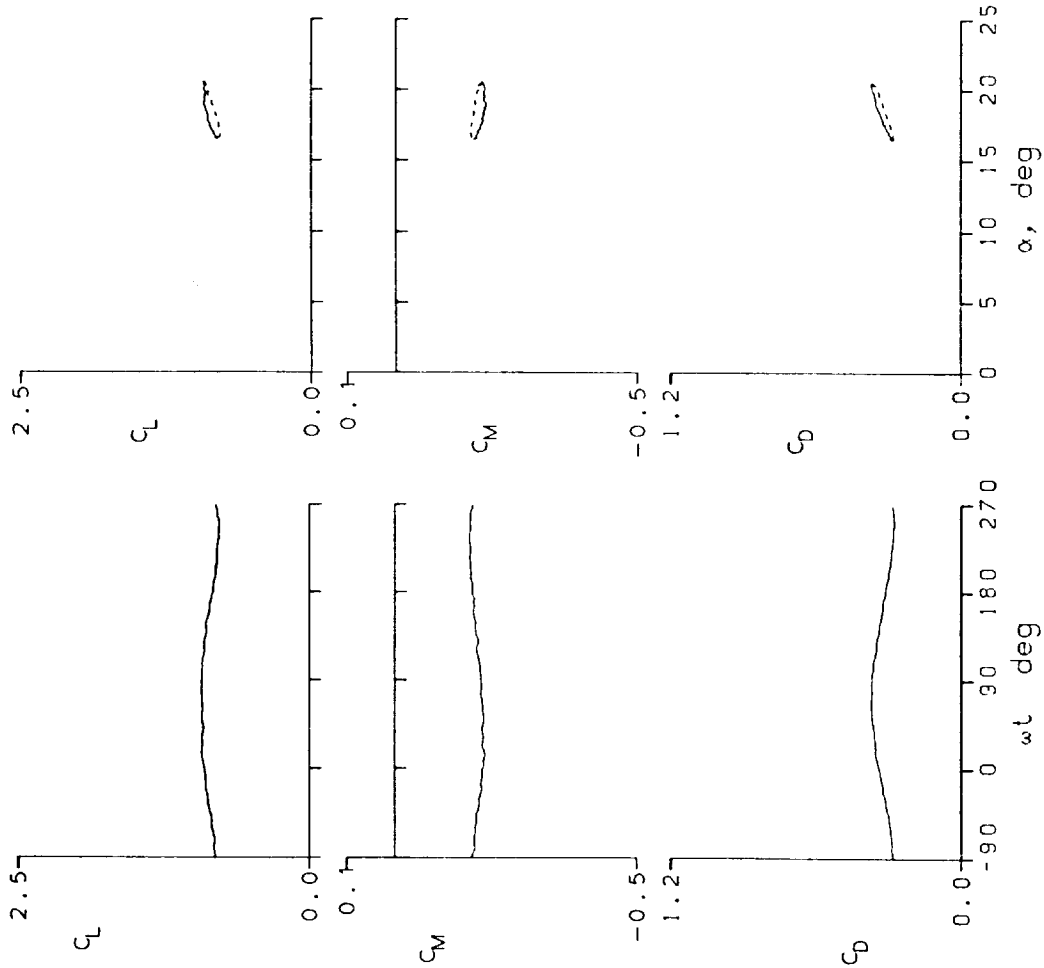


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 69310
 Re = 3.22 E6 A0 = 16.47 ° k = 0.055
 A1 = 2.00 ° M = 0.262
 CLmax = 1.87 CMmin = -0.07 CDmax = 0.11
 α Lmax = 18.1 ° ζ = -0.103 Mmax = 1.012
 α Cmin = 16.4 ° -CPmax = 9.4 α Mmax = 18.1 °

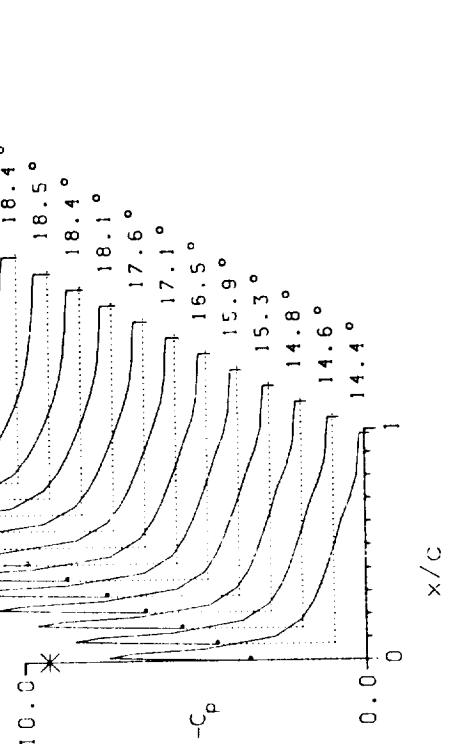
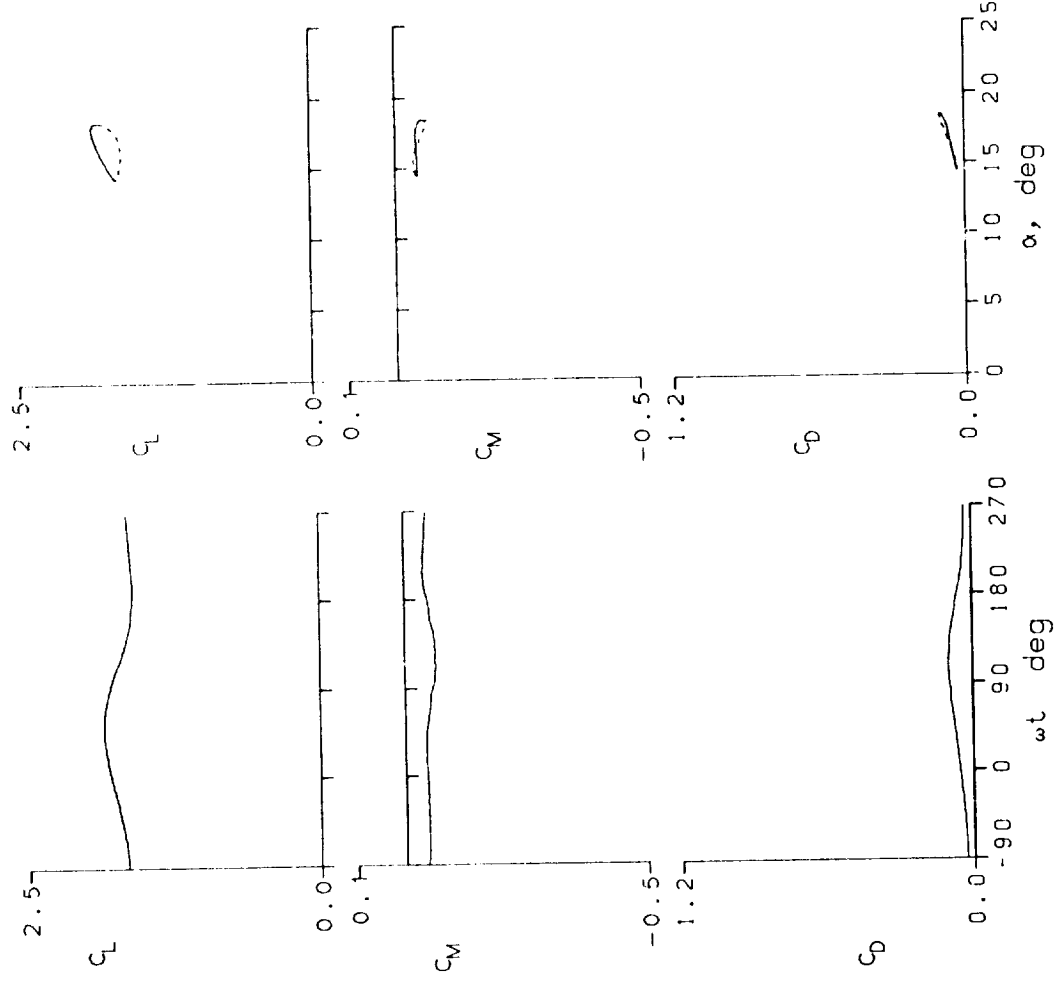


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 70019 A0 = 9.22 ° k = 9.024
 Re = 2.34 E6 A1 = 9.94 ° M = 0.185
 $C_{Lmax} = 1.88$ $C_{Mmin} = -0.11$ $C_{Dmax} = 0.15$
 $\alpha_{Lmax} = 18.8^\circ$ $\zeta = 0.009$ $M_{max} = 0.633$
 $\alpha_{Cmin} = 8.7^\circ$ $-C_{Pmax} = 9.1$ $\alpha_{Mmax} = 19.1^\circ$

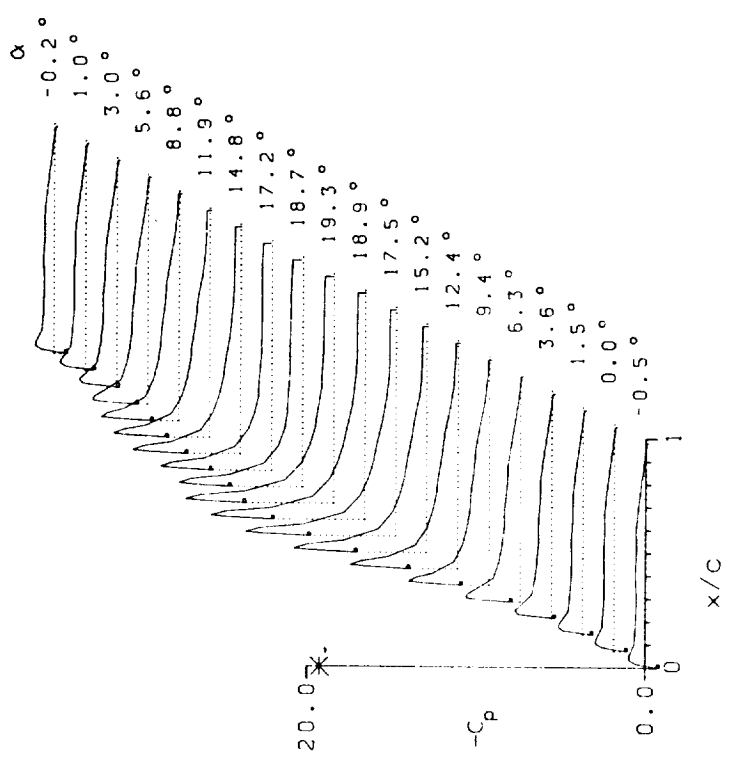
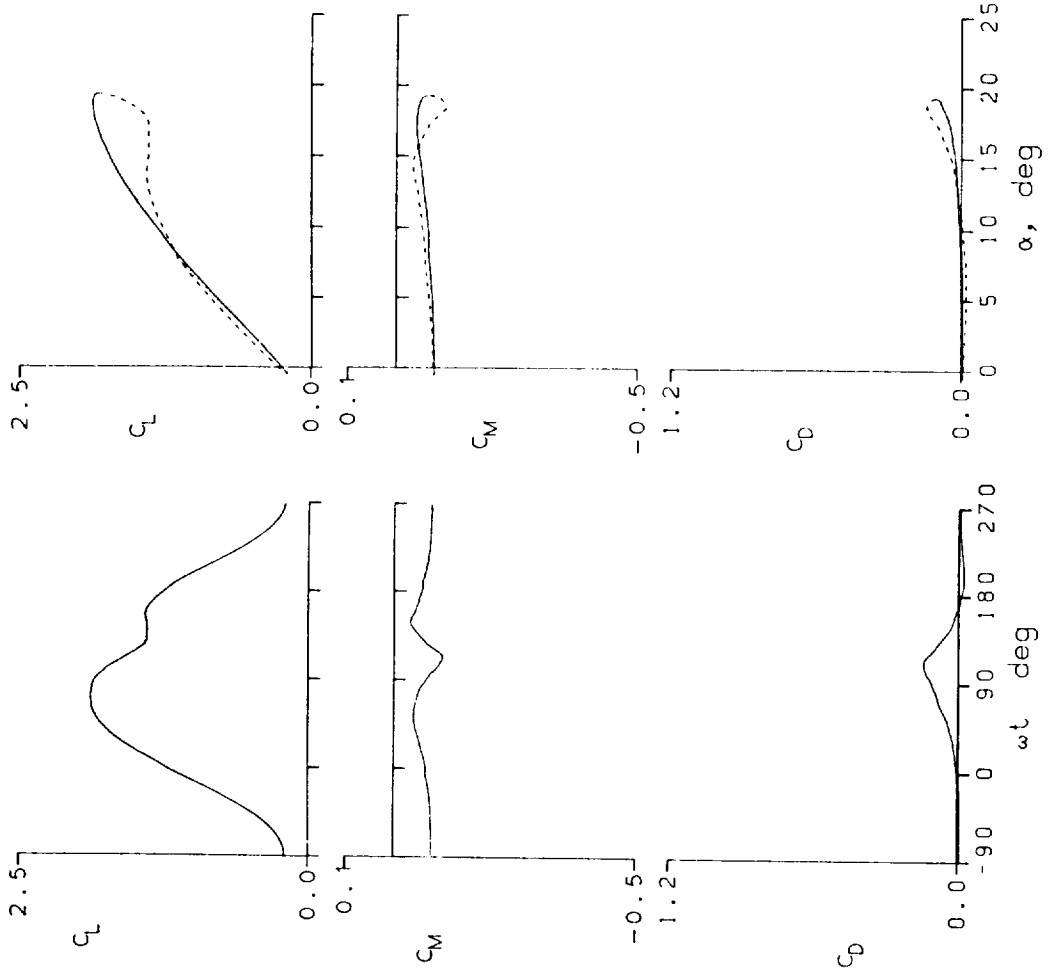


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 70021 A0 = 9.22° k = 0.097
 Re = 2.34 E6 A1 = 9.94° M = 0.185
 CLmax = 2.05 CMmin = -0.09 CDmax = 0.07
 αLmax = 19.1° ζ = 0.236 Mmax = 0.672
 αCmin = 8.8° -CPmax = 10.2 αMmax = 19.3°

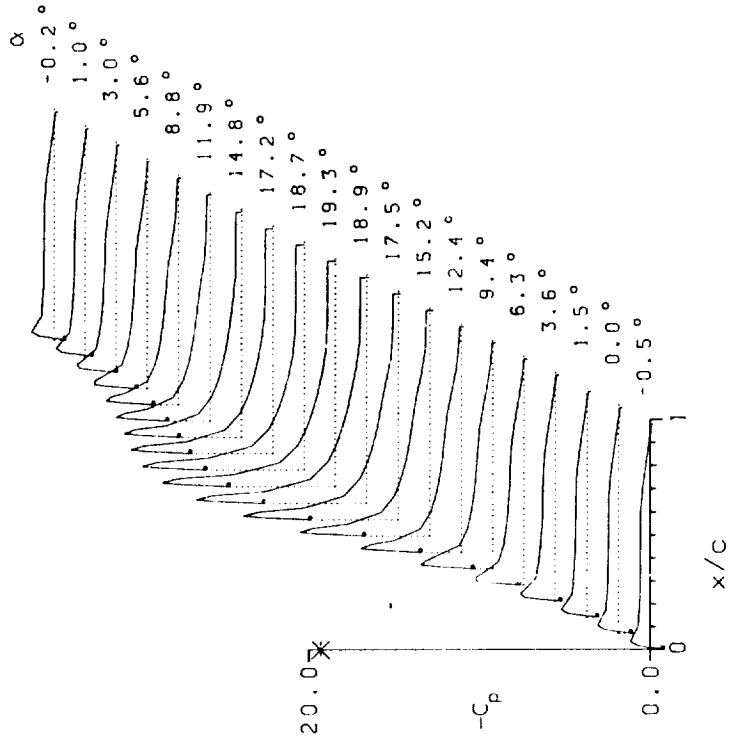
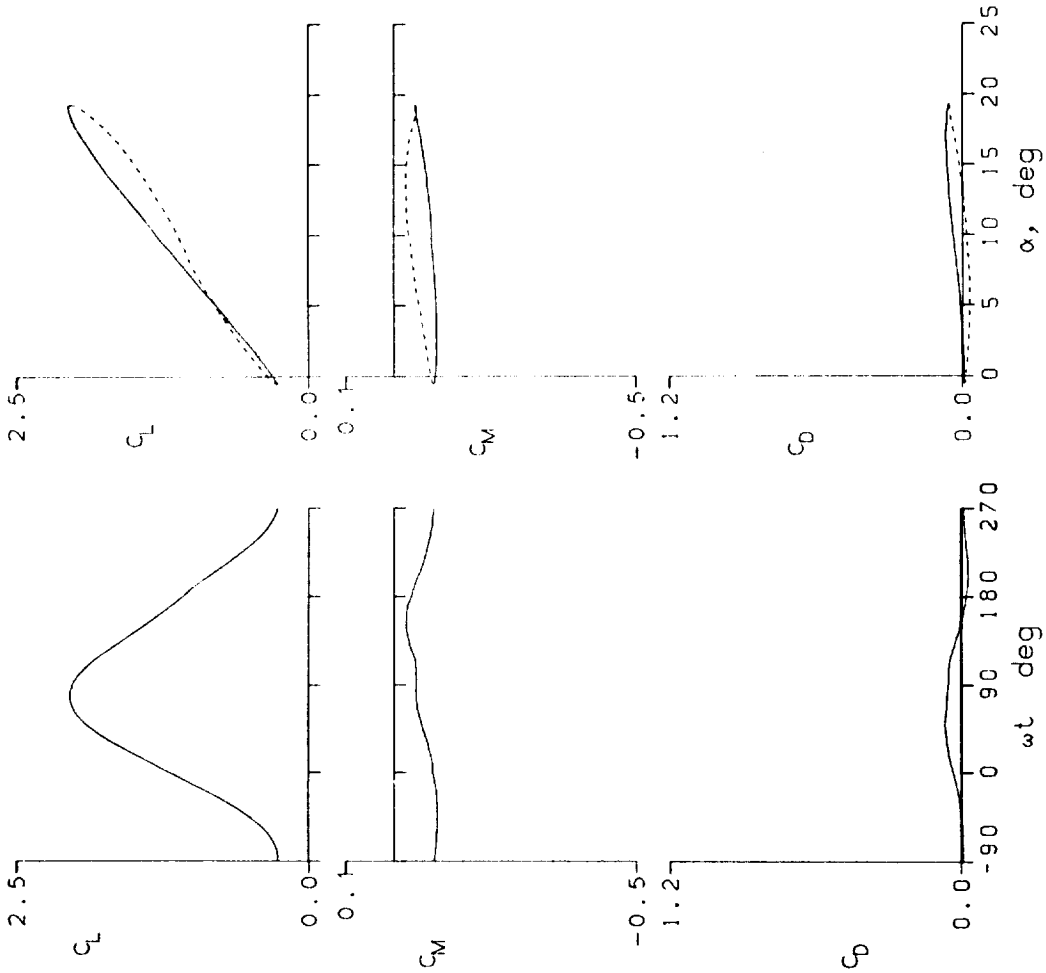


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 70C23	A0 = 9.20°	k = 0.195
Re = 2.34 E6	A1 = 9.94°	M = 0.185
CLmax = 2.12	CMmin = -0.11	CDmax = 0.11
αLmax = 19.1°	ξ = 0.506	Mmax = 0.685
αCMin = 8.7°	-CPmax = 10.6	αMmax = 19.3°

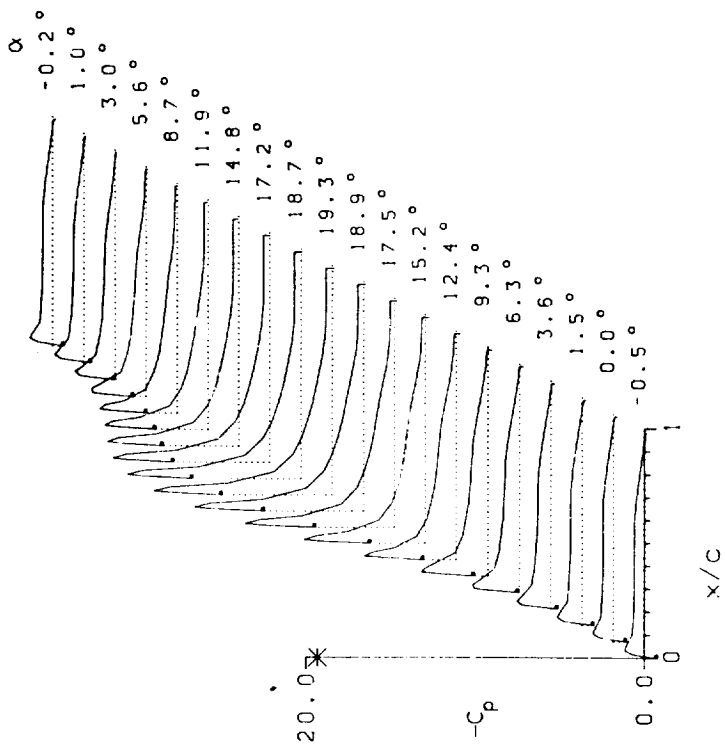
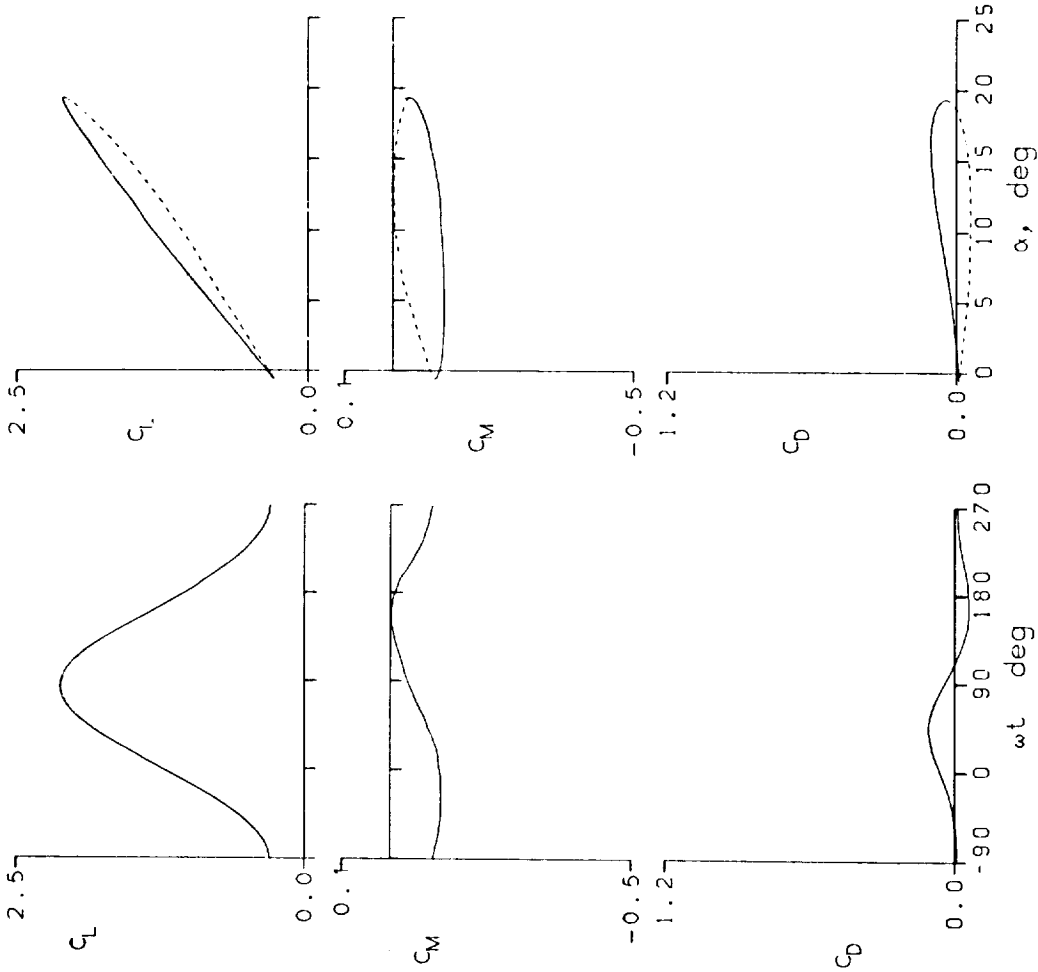


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 70107 A0 = 5.48 ° k = 0.010
 Re = 3.92 E6 A1 = 10.04 ° M = 0.301
 $C_{Lmax} = 1.77$ $C_{Mmin} = -0.09$ $C_{Dmax} = 0.06$
 $\alpha_{Lmax} = 15.5^\circ$ $\xi = 0.014$ $M_{max} = 1.185$
 $\alpha_{C_{min}} = 5.0^\circ$ $-C_{Pmax} = 8.7$ $\alpha_{Mmax} = 15.7^\circ$

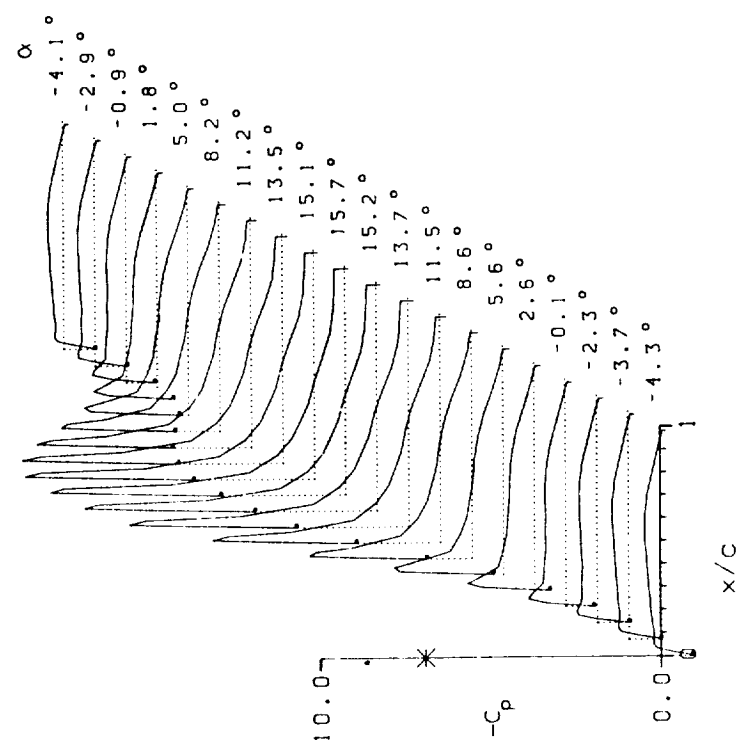
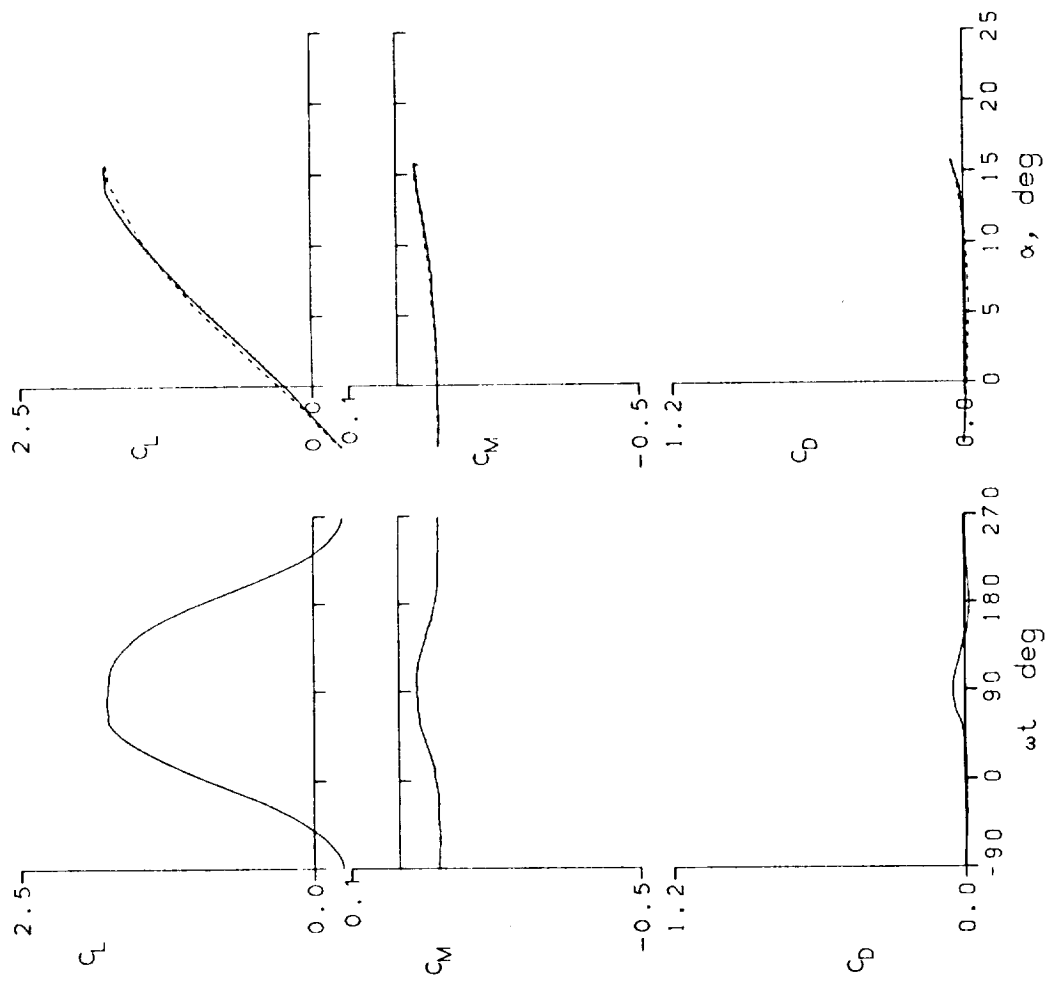


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 70109 A0 = 5.49 ° k = 0.025
 Re = 3.88 E6 A1 = 10.04 ° M = 0.301
 CLmax = 1.81 CMmin = -0.09 CDmax = 0.05
 αLmax = 14.8 ° ζ = 0.035 Mmax = 1.198
 αCmin = 5.0 ° -CPmax = 8.8 αMmax = 15.2 °

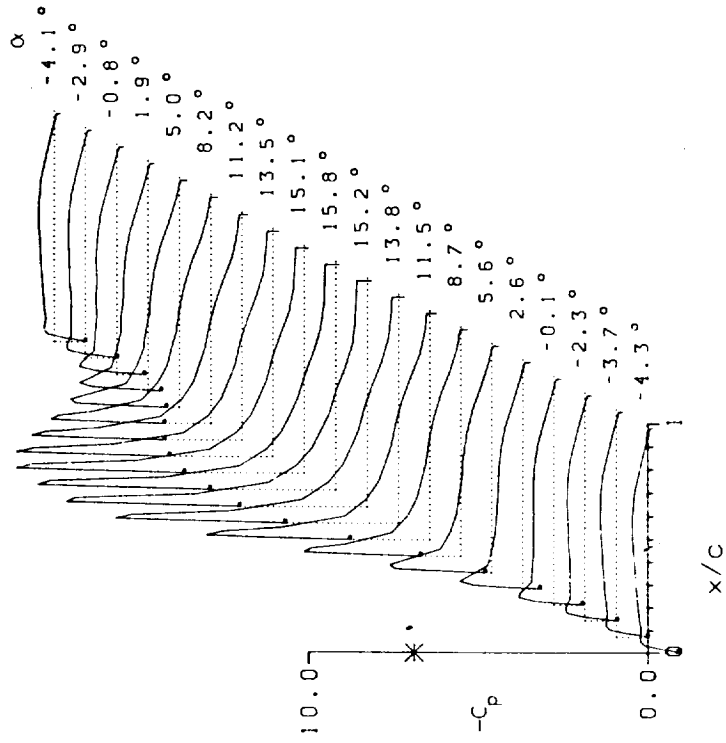
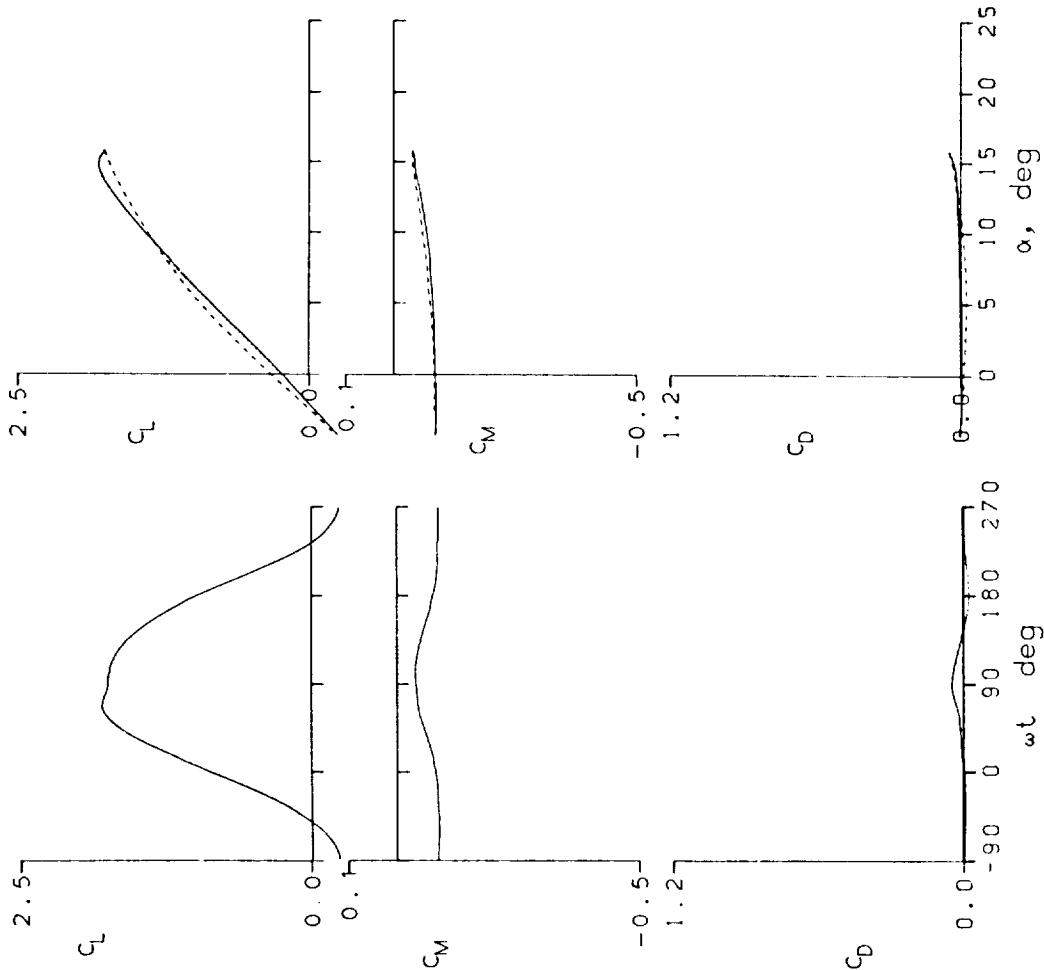


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 70113 A0 = 5.49° k = 0.049
 Re = 3.86 E6 A1 = 10.05° M = 0.300
 CLmax = 1.85 CMmin = -0.09 CDmax = 0.04
 αLmax = 15.2° ζ = 0.095 Mmax = 1.222
 αCmin = 5.0° -CPmax = 9.1 αMmax = 15.6°

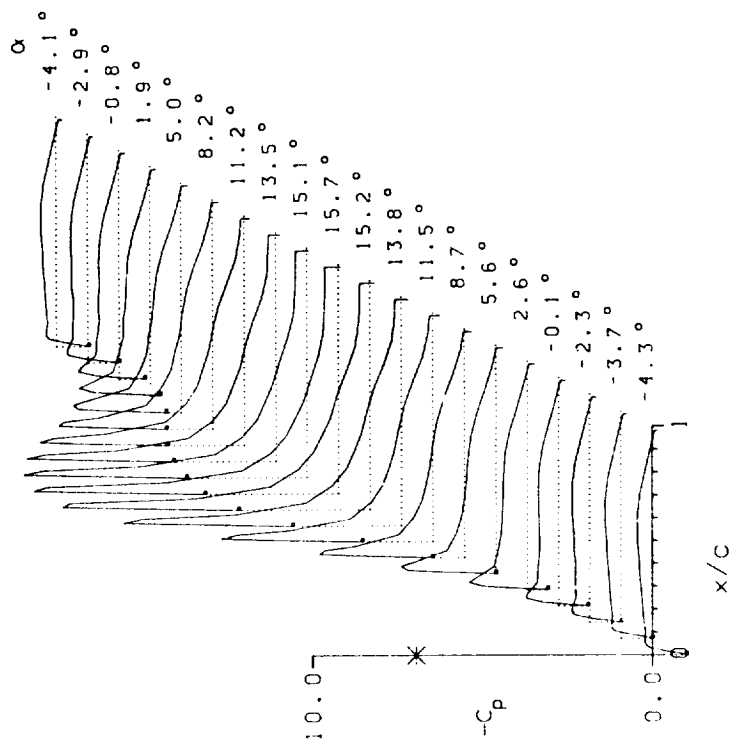
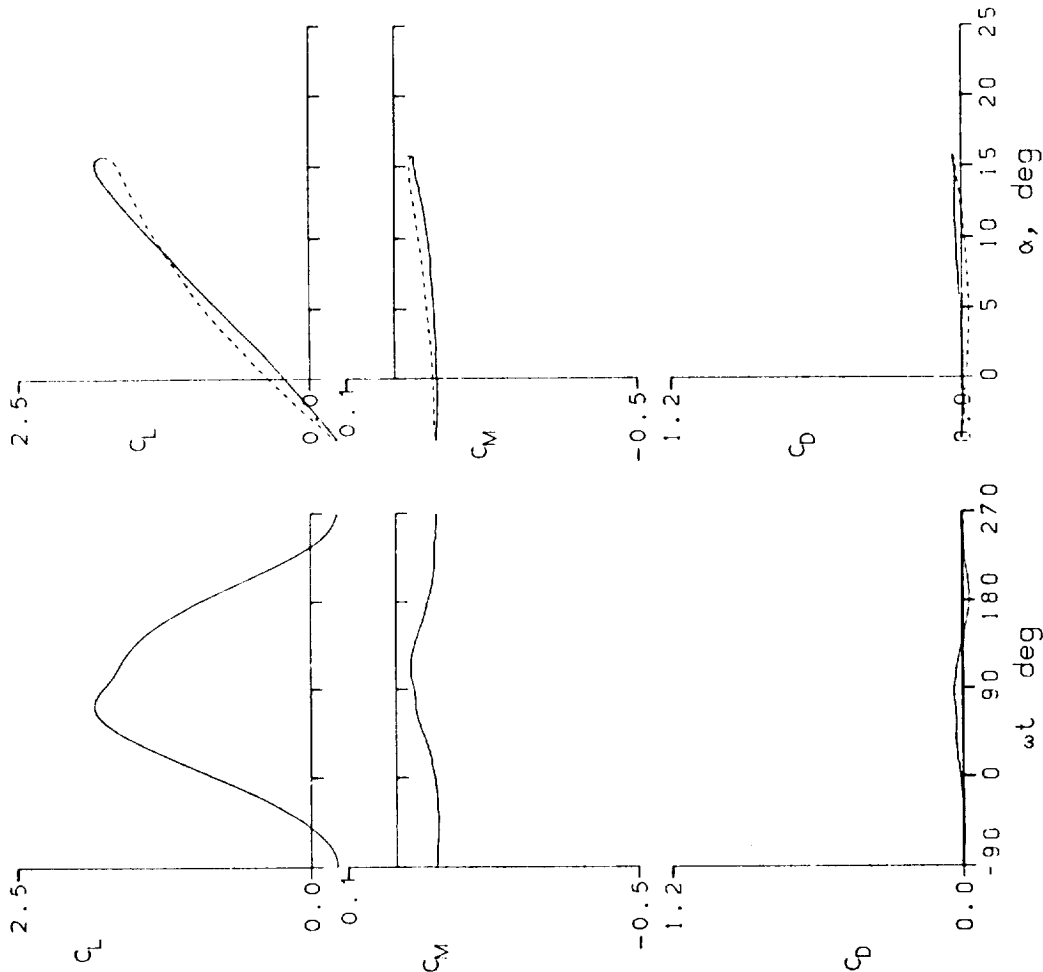


Figure 19.- Continued.

NLR-7301 AIRFOIL

FRAME : 70115	A0 = 5.48 °	k = 0.099
Re = 3.85 E6	A1 = 10.04 °	M = 0.301
C _{Lmax} = 1.91	C _{Mmin} = -0.10	C _{Dmax} = 0.06
α _{Lmax} = 15.6 °	ζ = 0.242	M _{max} = 1.256
α _{Cmin} = 4.9 °	-C _{Dmax} = 9.4	α _{Mmax} = 15.7 °

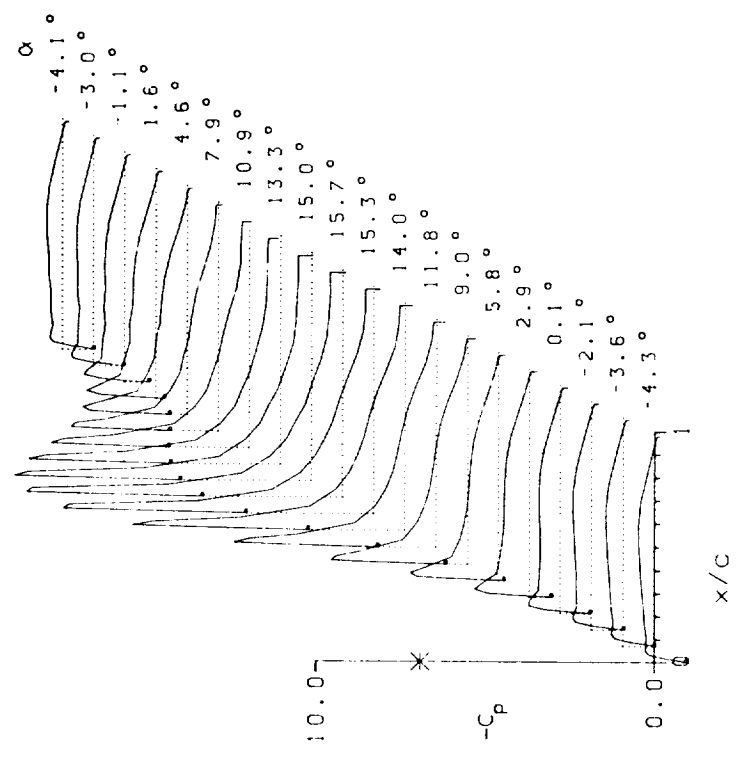
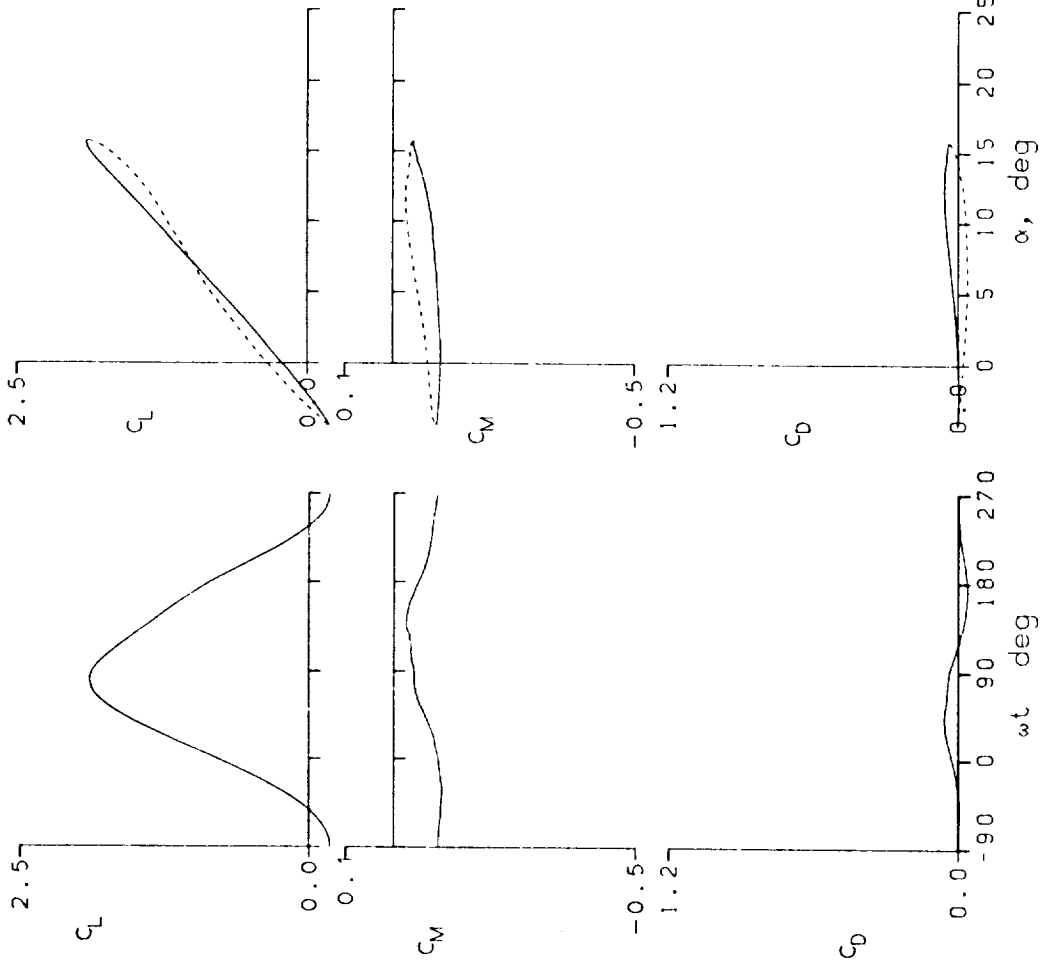


Figure 19.- Continued.

NLR-7301 AIRFOIL
 FRAME : 70117 A0 = 5.55° k = 0.148
 Re = 3.84 E6 A1 = 10.04° M = 0.301
 C_{Lmax} = 1.92 C_{Mmin} = -0.11 C_{Dmax} = 0.08
 α_{Lmax} = 15.7° ζ = 0.394 M_{max} = 1.264
 α_{Cmin} = 5.1° -C_{pmax} = 9.4 α_{Mmax} = 15.6°

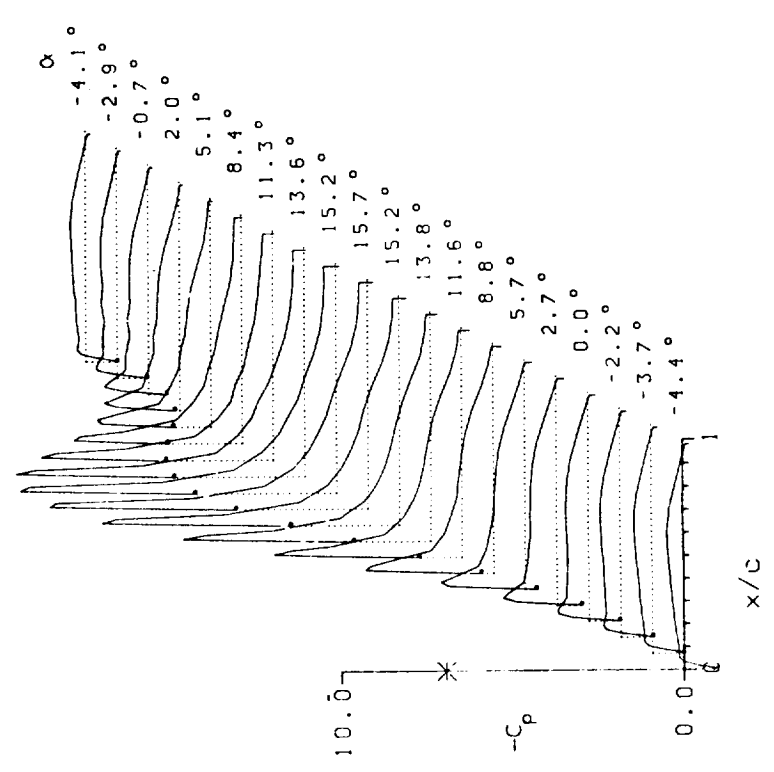
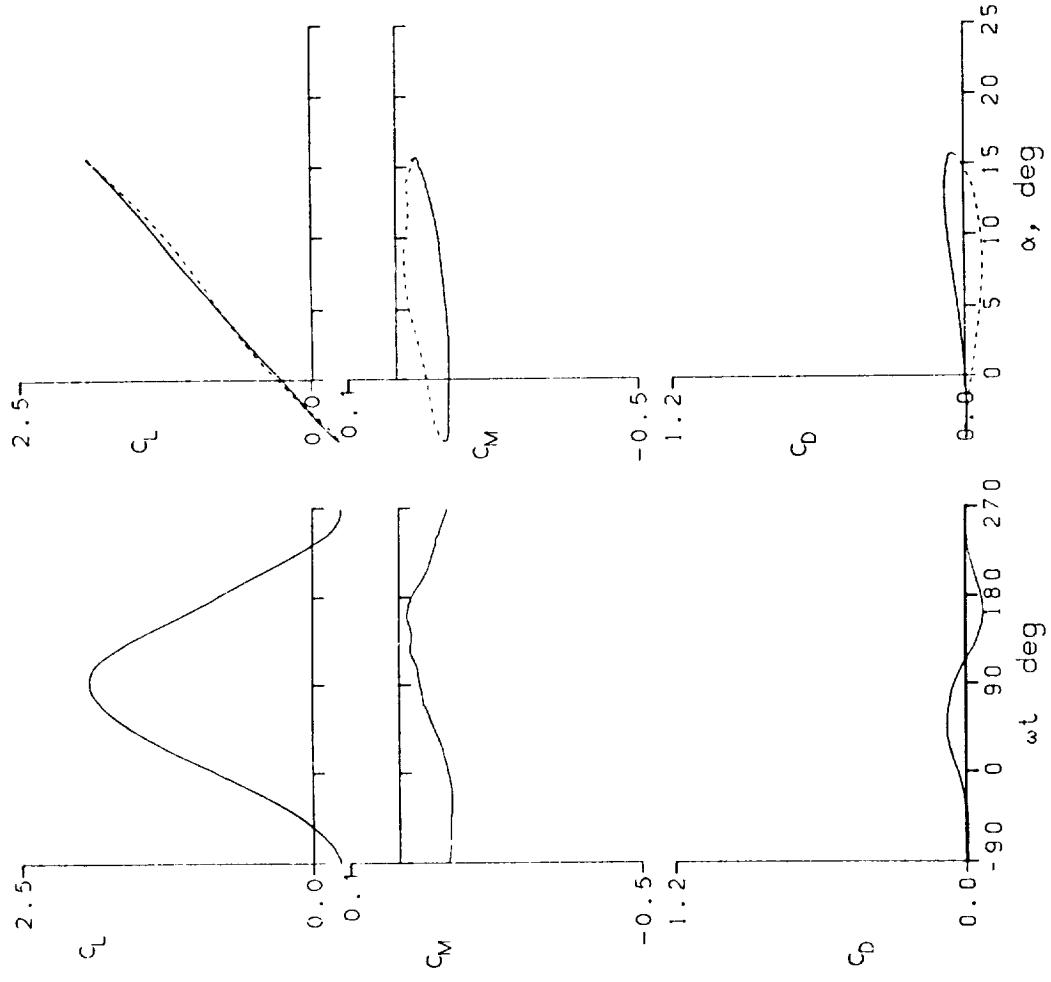


Figure 19.- Concluded.

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16. Abstract Experimentally derived force and moment data are presented for eight airfoil sections that were tested at fixed and varying incidence in a subsonic two-dimensional stream. Airfoil incidence was varied through sinusoidal oscillations in pitch over a wide range of amplitude and frequency. The surface pressure distribution, as well as the lift, drag, and pitching moment derived therefrom, are displayed in a uniform fashion to delineate the static and dynamic characteristics of each airfoil both in and out of stall.					
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