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SMALL SCALE MODEL TESTS IN
SMALL WIND AND WATER TUNNELS AT HIGH
INCIDENCE AND PITCH RATES

VOLUME III - WATER TUNNEL (HFF)
DATA BASE

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GENERAL DYNAMICS
Fort Worth Division

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The force testing of small scale models in either a small wind tunnel or a water tunnel was investigated as an inexpensive and quick means to obtain meaningful dynamic force and moment data representative of rapidly maneuvering full-scale aircraft. Force tests of flat-plate semi-span models were conducted in the General Dynamics Aerodynamic Development Facility (ADF) which is a small 14x14 in² low speed wind tunnel. Oscillatory model motions up to 48° (peak to peak) amplitude were tested at frequencies of 1 to 3 Hz. Force tests of flat and three-dimensional full span models were conducted in the General Dynamics Hydroflow Facility (HFF) which is a horizontal flow water tunnel with a 24x24 in² test section. Pitch/pulse model motions were tested for conditions similar to those tested in the (continued)				
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19. ABSTRACT (contd.)

ADF. The test velocities were 100 fps in the ADF and 0.8 fps in the HFF which yielded nominal Reynolds numbers of 0.6×10^6 and 0.06×10^6 respectively (based on root chord). Frequencies of motion in the HFF were scaled with velocity to maintain constant non-dimensional frequencies and pitch rates. Thus, frequencies for the HFF tests were nominally 0.01 and 0.03 Hz. Specific objectives of this investigation were: (1) verify static and dynamic force and moment measurements from the small scale tests with results from reliable or multiple sources; (2) determine time history effect for various frequencies, amplitudes, starting angles and peak angles; (3) evaluate the effects of test medium; (4) determine Reynolds number effects; (5) demonstrate the importance of model three-dimensionality; and (6) evaluate the effects of planform geometry variations.

This Volume III presents the data base generated from tests in the HFF. The normal force and pitching moment data are in plotted and tabulated form for the straked wing, 55° and 70° delta wings and $70^\circ/30^\circ$ cranked wing full span models. In addition to the four basic models, results are also given for the three-dimensional E-7 configuration with fuselage and fin along with a flat plate version of this model. Steady results and unsteady results are included for the overall incidence range of 0° to 90° . Geometric data for the models are also given.



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FOREWORD

The small scale wind and water tunnel tests discussed in this report were sponsored by the Office of Naval Research under Contract Number N00014-85-C-0419 and performed by the Fort Worth Division of General Dynamics. The investigation spanned the period from 16 September 1985 through 15 September 1988. The program was monitored by Dr. Robert E. Whitehead, Dr. T. C. Tai and finally Dr. Spiro Lekoudis all of ONR.

The program manager and principle investigator was Dr. Atlee M. Cunningham, Jr. of the Computational Fluid Dynamics Group who was assisted by Todd Bushlow and Steve Schwoerke of the Aeroanalysis Group as well as Tim Wilson and John Mercer of the Aerospace Technology Labs.

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SUMMARY

This volume presents the data base generated from tests in the General Dynamics Hydroflow Facility (HFF). This facility is a 24x24in² horizontal flow water tunnel with velocity capability of up to 1.0 fps. Both static and dynamic data as well as model geometry are included. The normal force and pitching moment results are in plotted and tabulated form for the straked wing, 55° and 70° delta wings and 70°/30° cranked wing full-span models. In addition to the four basic models, results are also given for the three-dimensional E-7 configuration with fuselage and fin along with a flat plate version of this model. The static range of test incidence is from 0° to about 90° where as the dynamic range is nominally from 8° to 64°.

A discussion of the plot format used in this volume is given in Section 4.1 of Volume I of this report. Multiple conditions are shown on each plot to highlight the development of unsteady forces and moments with varying starting and peak angles for model motion at fixed frequencies. The plots all include static data for a reference. The dynamic data are represented as solid lines for positive pitch rate and dashed lines for negative pitch rate.

In Volume I, all discussions referred to nominal values of reduced frequency and non-dimensional pitch rate. The actual test velocities and frequencies are listed in Table 1 and are used in the plots and listings given in this data volume. Table 2 provides a directory for the page numbers of various plots which are keyed on the overall incidence range, which angle is held constant (ie starting or peak angle) and configuration. Table 3 provides a similar directory for listings but only refers to the incidence range and configuration.

SYMBOLS

A_m	Model Planform Area, ft^2
C_l	$M_l/(qA_ms)$, Rolling Moment Coefficient
C_m	$M_m/(qA_mC_r)$, Pitching Moment Coefficient (MAC is used for the E-7 models)
C_N	$F_N/(qA_m)$, Normal Force Coefficient
c_r	Root chord, ft
f	Frequency, Hz
F_N	Normal Force, lbs
k	$\pi f c_r/V$, Reduced Frequency
MAC	Mean Aerodynamic Chord, ft
M_l	Rolling Moment, ft-lbs
M_m	Pitching Moment, ft-lbs
q	$\rho V^2/2$, Dynamic Pressure
s	Semi-span, ft
V	Free Stream Velocity, ft/sec
α	Angle of Attack, deg
$\dot{\alpha}$	Pitch Rate, deg/sec
$\bar{\alpha}$	$\Delta \alpha k \pi/180$, Non-Dimensional Pitch Rate
α_{min}	Minimum Angle, deg
$\Delta \alpha$	Oscillatory or Pitch/Pulse Half Amplitude, deg

TABLE 1 TEST PITCH/PULSE TIMES AND VELOCITIES

Configuration	Cr (in)	V (fps)	T ₁ (sec)	k ₁	T ₂ (sec)	k ₂
Straked	8.85	0.802	107.9	0.0268	38.6	0.0748
55° Delta	7.00	0.802	82.8	0.0276	27.6	0.0828
70° Delta	9.00	0.802	106.4	0.0276	35.5	0.0828
Cranked	9.00	0.802	106.4	0.0276	35.5	0.0828
E-7	10.48	0.802	102.5	0.0335	38.8	0.0885

$$k = \frac{2\pi Cr}{2 VT}$$

TABLE 2 VOLUME III DIRECTORY FOR PLOTS

Configuration	Condition	$\alpha_{\min}$	$\alpha_{\max}$	Fixed α	Page
Straked	Steady	0°	60°	--	12
	Unsteady	8°	56°	$\alpha_{\min}$	13
	"	16°	64°	$\alpha_{\min}$	14
	"	24°	56°	$\alpha_{\min}$	15
	"	32°	64°	$\alpha_{\min}$	16
	"	8°	40°	$\alpha_{\max}$	17
	"	16°	48°	$\alpha_{\max}$	18
	"	8°	56°	$\alpha_{\max}$	19
	"	16°	64°	$\alpha_{\max}$	20
	"	8°	24°	--	21
	"	8°	40°	--	22
	"	8°	56°	--	23
55° Delta	Steady	0°	70°	--	50
	Unsteady	8°	56°	$\alpha_{\min}$	51
	"	16°	64°	$\alpha_{\min}$	52
	"	24°	56°	$\alpha_{\min}$	53
	"	32°	64°	$\alpha_{\min}$	54
	"	8°	40°	$\alpha_{\max}$	55
	"	16°	48°	$\alpha_{\max}$	56
	"	8°	56°	$\alpha_{\max}$	57
	"	16°	64°	$\alpha_{\max}$	58
	"	8°	24°	--	59
	"	8°	40°	--	60
	"	8°	56°	--	61
70° Delta	Steady	0°	70°	--	88
	Unsteady	8°	56°	$\alpha_{\min}$	89
	"	16°	64°	$\alpha_{\min}$	90
	"	24°	56°	$\alpha_{\min}$	91
	"	32°	64°	$\alpha_{\min}$	92
	"	8°	40°	$\alpha_{\max}$	93
	"	16°	48°	$\alpha_{\max}$	94

TABLE 2 VOLUME III DIRECTORY FOR PLOTS (continued)

Configuration	Condition	$\alpha_{\min}$	$\alpha_{\max}$	Fixed α	Page
70° Delta	Unsteady	8°	56°	$\alpha_{\max}$	95
	"	16°	64°	$\alpha_{\max}$	96
	"	8°	24°	--	97
	"	8°	40°	--	98
	"	8°	56°	--	99
70°/30° Cranked	Steady	0°	70°	--	124
	Unsteady	8°	56°	$\alpha_{\min}$	125
	"	16°	64°	$\alpha_{\min}$	126
	"	24°	56°	$\alpha_{\min}$	127
	"	32°	64°	$\alpha_{\min}$	128
	"	8°	40°	$\alpha_{\max}$	129
	"	16°	48°	$\alpha_{\max}$	130
	"	8°	56°	$\alpha_{\max}$	131
	"	16°	64°	$\alpha_{\max}$	132
	"	8°	24°	--	133
	"	8°	40°	--	134
	"	8°	56°	--	135
E-7, 3-D	Steady	0°	70°	--	162
	Unsteady	8°	56°	--	163
	"	8°	56°	--	164
E-7, Flat	Steady	0°	70°	--	165
	Unsteady	8°	56°	--	166
	"	8°	56°	--	167

TABLE 3 VOLUME III DIRECTORY FOR LISTINGS

Configuration	Condition	min	max	k	Page
Straked	Steady	0°	90°	0	24
	Unsteady	8°	24°	0.0268	25
	"	8°	24°	0.0748	26
	"	8°	40°	0.0268	27
	"	8°	40°	0.0748	28
	"	8°	56°	0.0268	29
	"	8°	56°	0.0748	30
	"	16°	32°	0.0268	31
	"	16°	32°	0.0748	32
	"	16°	48°	0.0268	33
	"	16°	48°	0.0748	34
	"	16°	64°	0.0268	35
	"	16°	64°	0.0748	36
	"	24°	40°	0.0268	37
	"	24°	40°	0.0748	38
	"	24°	56°	0.0268	39
	"	24°	56°	0.0748	40
	"	32°	48°	0.0268	41
	"	32°	48°	0.0748	42
	"	32°	64°	0.0268	43
	"	32°	64°	0.0748	44
	"	40°	56°	0.0268	45
	"	40°	56°	0.0748	46
	"	48°	64°	0.0268	47
	"	48°	64°	0.0748	48
55° Delta	Steady	0°	90°	0	62
	Unsteady	8°	24°	0.0276	63
	"	8°	24°	0.0828	64
	"	8°	40°	0.0276	65
	"	8°	40°	0.0828	66
	"	8°	56°	0.0276	67

TABLE 3 VOLUME III DIRECTORY FOR LISTINGS (continued)

Configuration	Condition	min	max	k	Page
55° Delta	Unsteady	8°	56°	0.0828	68
	"	16°	32°	0.0276	69
	"	16°	32°	0.0828	70
	"	16°	48°	0.0276	71
	"	16°	48°	0.0828	72
	"	16°	64°	0.0276	73
55° Delta	"	16°	64°	0.0828	74
	"	24°	40°	0.0276	75
	"	24°	40°	0.0828	76
	"	24°	56°	0.0276	77
	"	24°	56°	0.0828	78
	"	32°	48°	0.0276	79
	"	32°	48°	0.0828	80
	"	32°	64°	0.0276	81
	"	32°	64°	0.0828	82
	"	40°	56°	0.0276	83
	"	40°	56°	0.0828	84
	"	48°	64°	0.0276	85
	"	48°	64°	0.0828	86
70° Delta	Steady	0°	90°	0	100
	Unsteady	8°	24°	0.0276	101
	"	8°	24°	0.0828	102
	"	8°	40°	0.0276	103
	"	8°	40°	0.0828	104
	"	8°	56°	0.0276	105
	"	8°	56°	0.0828	106
	"	16°	32°	0.0276	107
	"	16°	32°	0.0828	108
	"	16°	48°	0.0276	109
	"	16°	48°	0.0828	110
	"	16°	64°	0.0276	111

TABLE 3 VOLUME III DIRECTORY FOR LISTINGS (continued)

Configuration	Condition	min	max	k	Page
70° Delta	Unsteady	16°	64°	0.0828	112
	"	24°	40°	0.0276	113
	"	24°	40°	0.0828	114
	"	24°	56°	0.0276	115
	"	24°	56°	0.0828	116
	"	32°	48°	0.0276	117
	"	32°	48°	0.0828	118
	"	32°	64°	0.0276	119
	"	32°	64°	0.0828	120
	"	40°	56°	0.0828	121
	"	48°	64°	0.0828	122
70°/30° Cranked	Steady	0°	90°	0	136
	Unsteady	8°	24°	0.0276	137
	"	8°	24°	0.0828	138
	"	8°	40°	0.0276	139
	"	8°	40°	0.0828	140
	"	8°	56°	0.0276	141
	"	8°	56°	0.0828	142
	"	16°	32°	0.0276	143
	"	16°	32°	0.0828	144
	"	16°	48°	0.0276	145
	"	16°	48°	0.0828	146
	"	16°	64°	0.0276	147
	"	16°	64°	0.0828	148
	"	24°	40°	0.0276	149
	"	24°	40°	0.0828	150
	"	24°	56°	0.0276	151
	"	24°	56°	0.0828	152
	"	32°	48°	0.0276	153
	"	32°	48°	0.0828	154
	"	32°	64°	0.0276	155
	"	32°	64°	0.0828	156

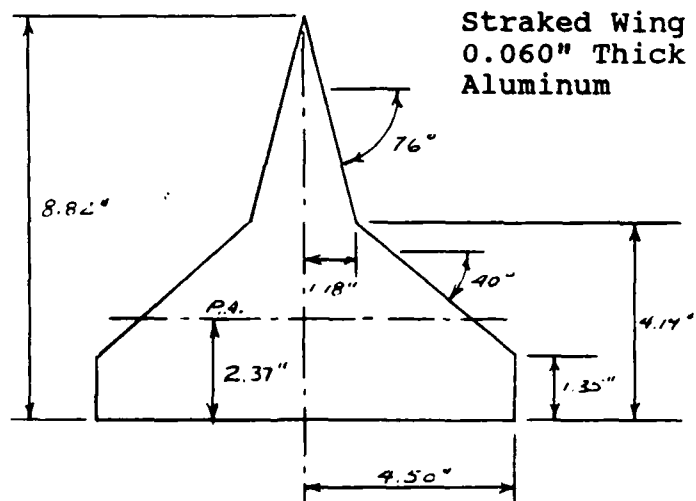
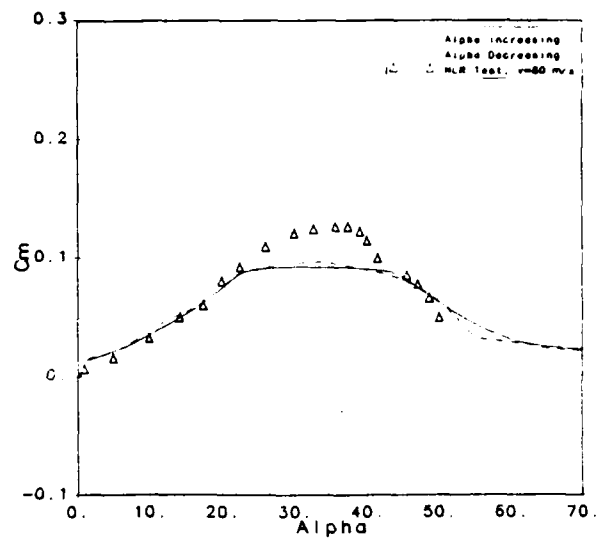
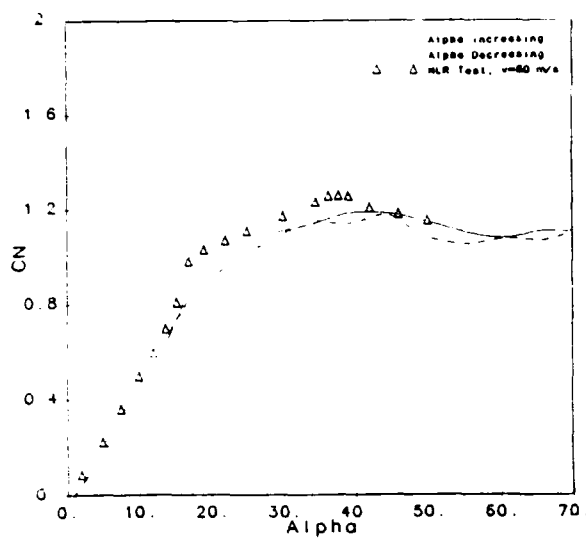
TABLE 3 VOLUME III DIRECTORY FOR LISTINGS (continued)

Configuration	Condition	min	max	k	Page
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	"	40°	56°	0.0828	158
	"	48°	64°	0.0276	159
	"	48°	64°	0.0828	160
E-7, 3-D	Steady	0°	90°	0	168
	Unsteady	8°	56°	0.0335	169
	"	8°	56°	0.0885	170
E-7, Flat	Steady	0°	90°	0	171
	Unsteady	8°	56°	0.0335	172
	"	8°	56°	0.0885	173

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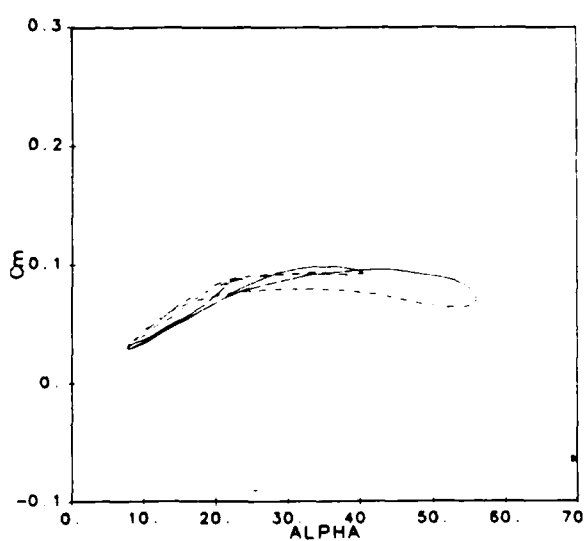
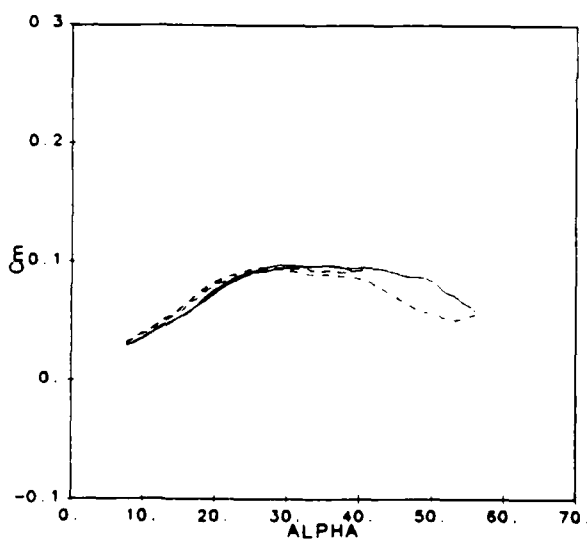
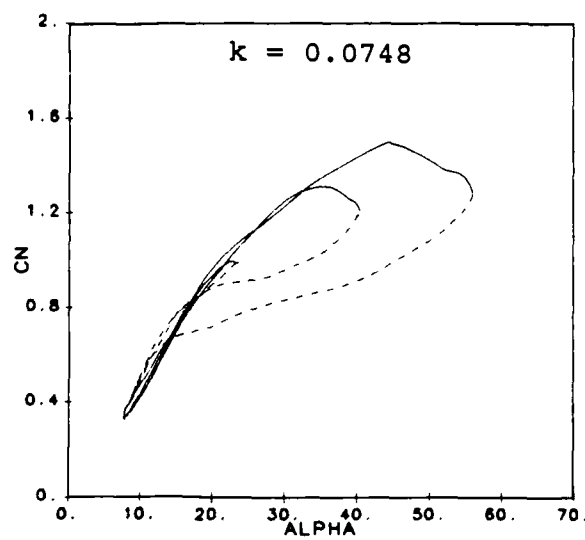
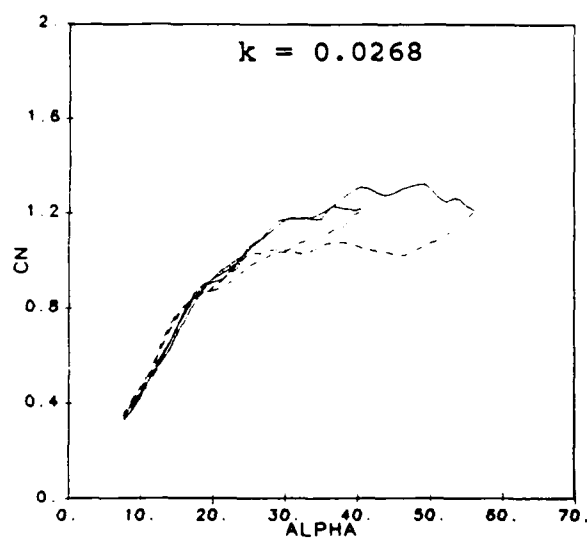
APPENDIX A

PLOTS AND LISTINGS OF THE HFF FORCE AND
MOMENT DATA FOR THE FULL-SPAN STRAKED WING MODEL

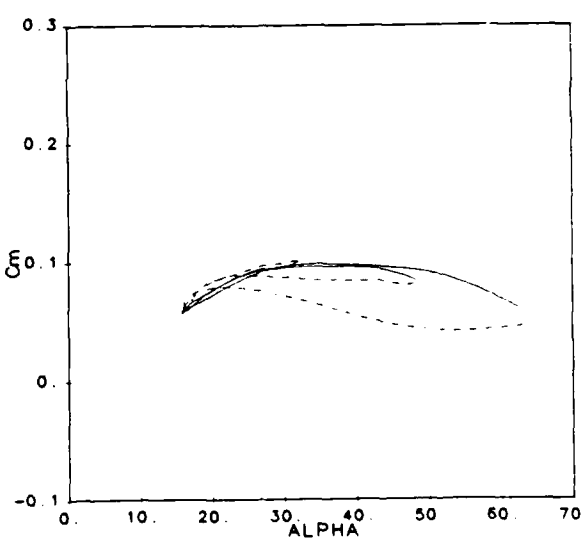
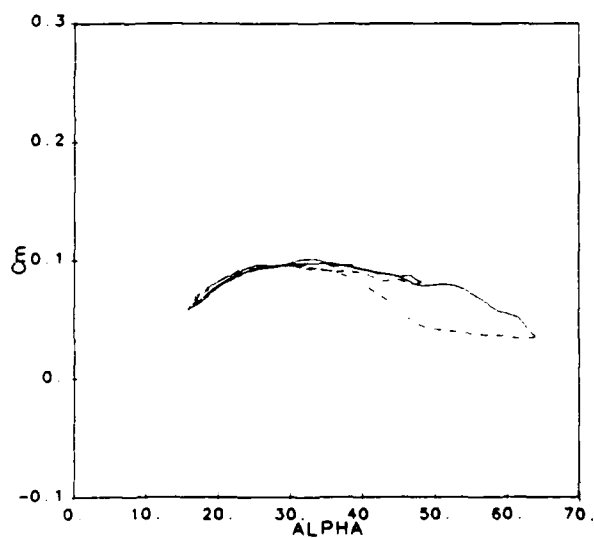
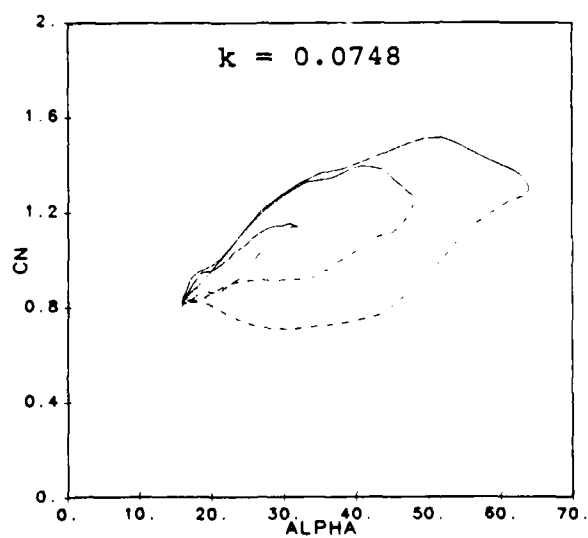
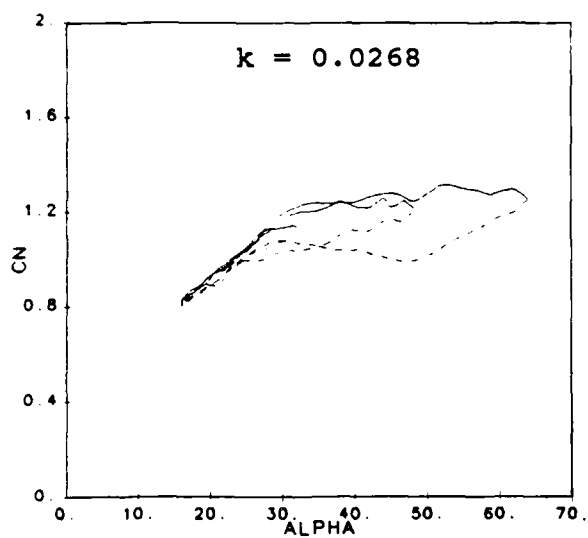


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Rounded, All Side
and Trailing Edges
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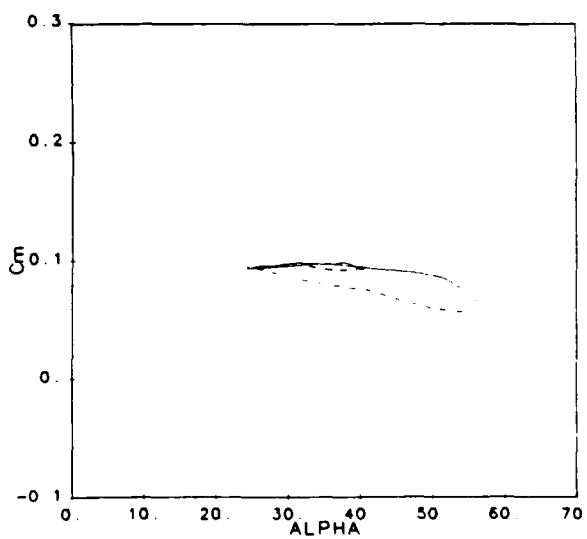
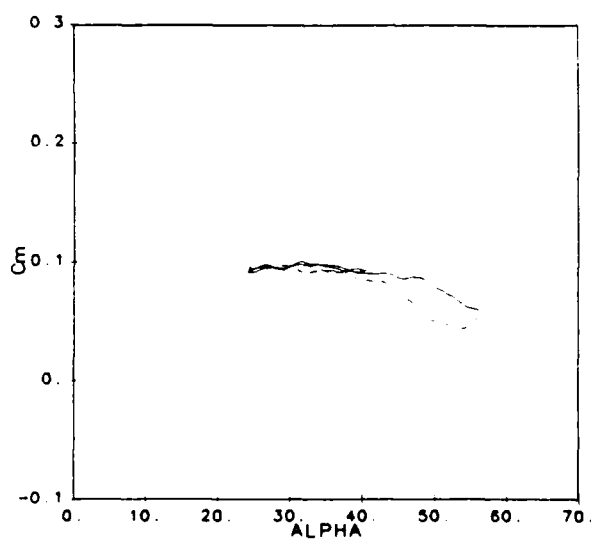
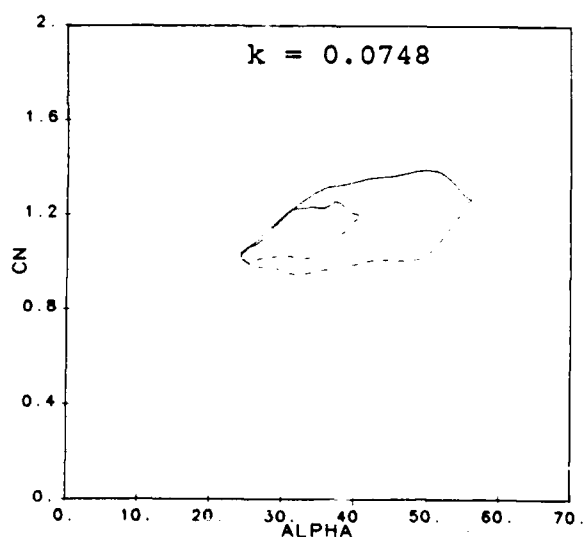
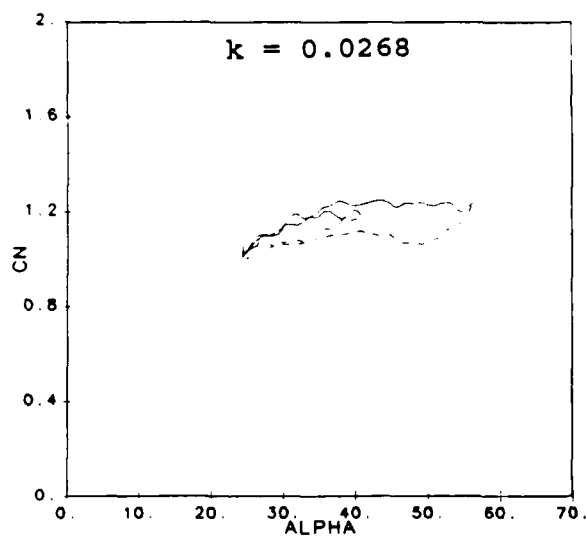
Straked Wing, Steady



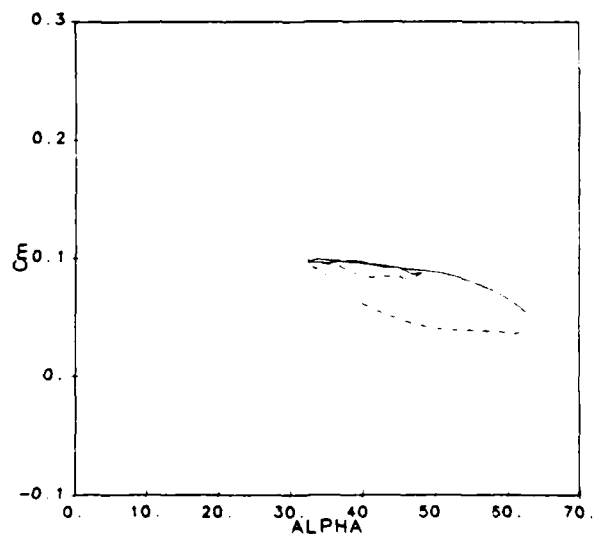
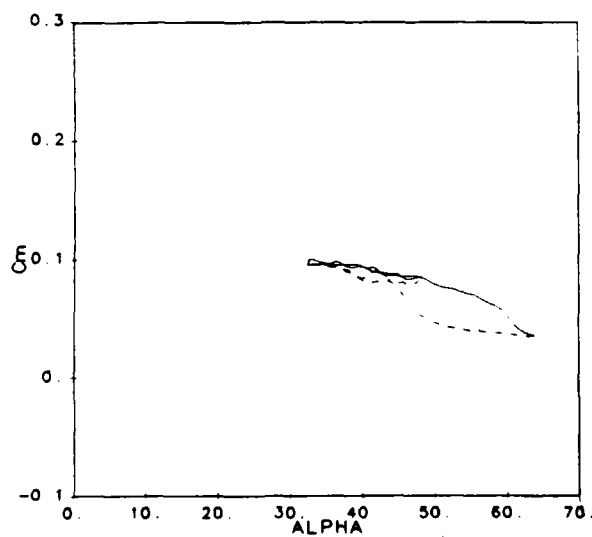
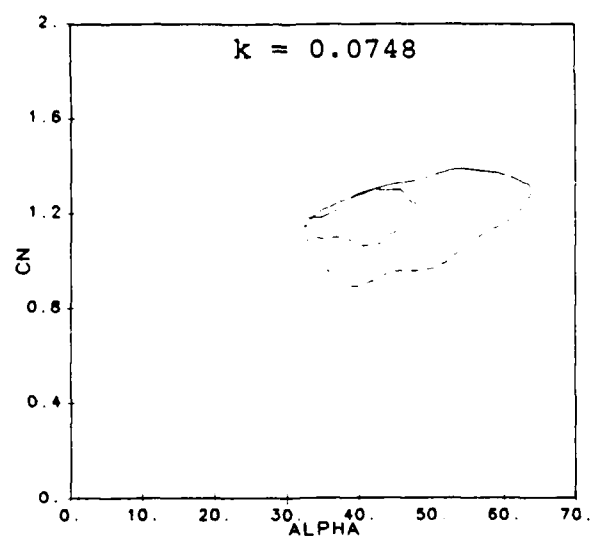
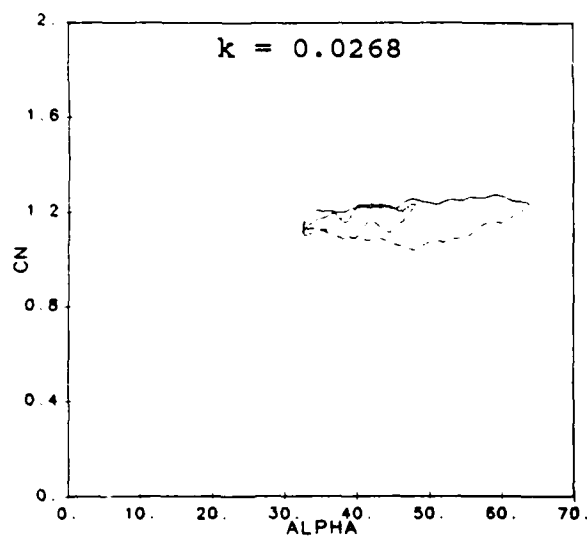
Straked Wing, Incidence = 8° to 56°



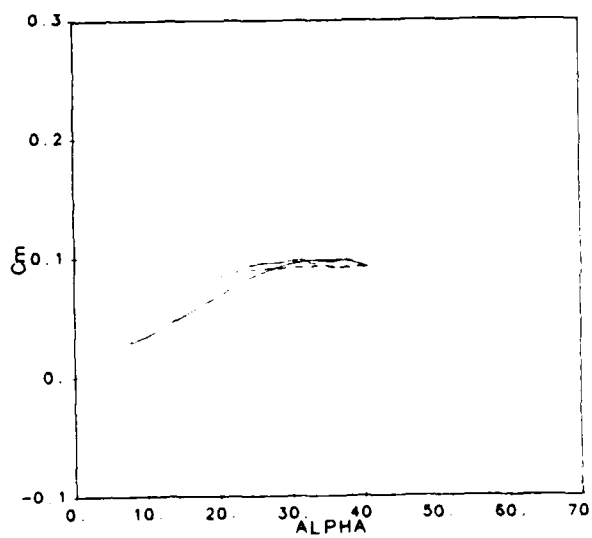
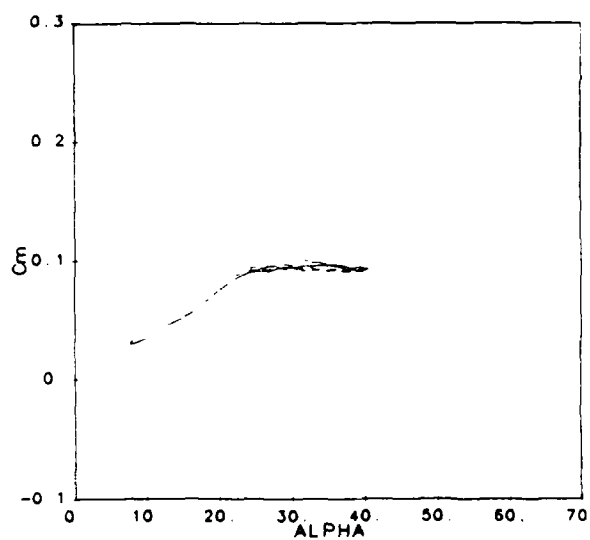
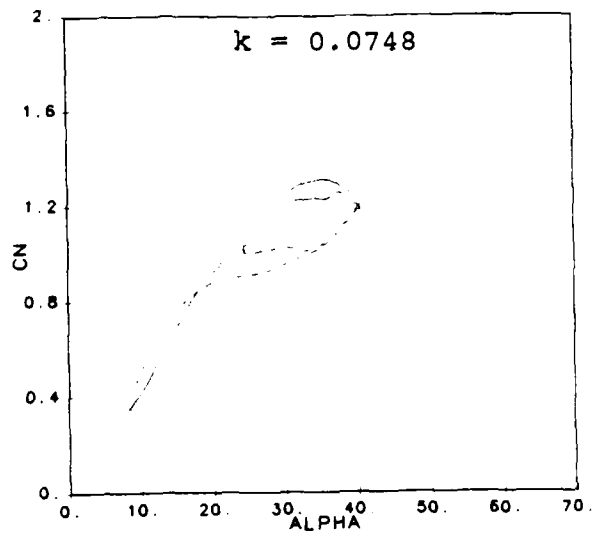
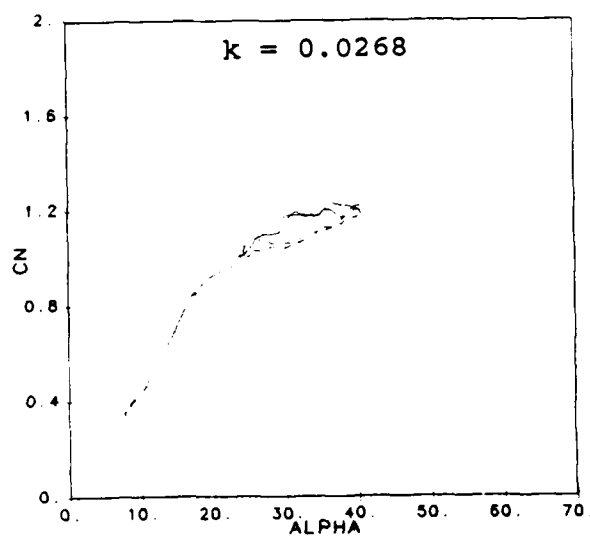
Straked Wing, Incidence = 16° to 64°



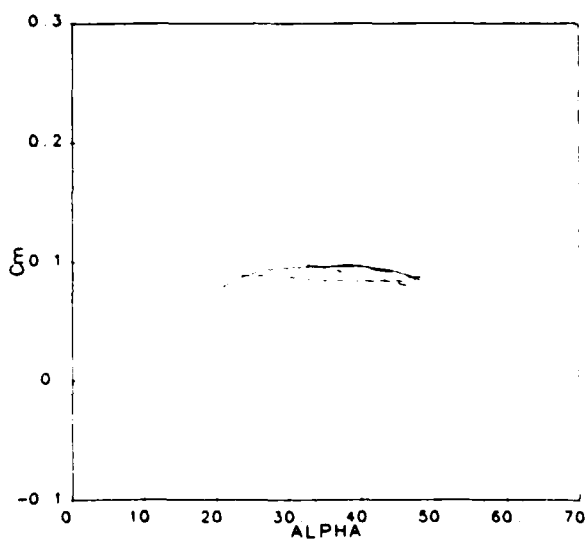
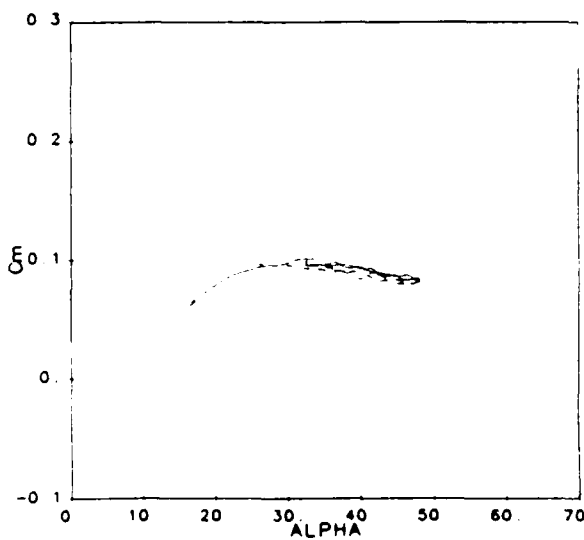
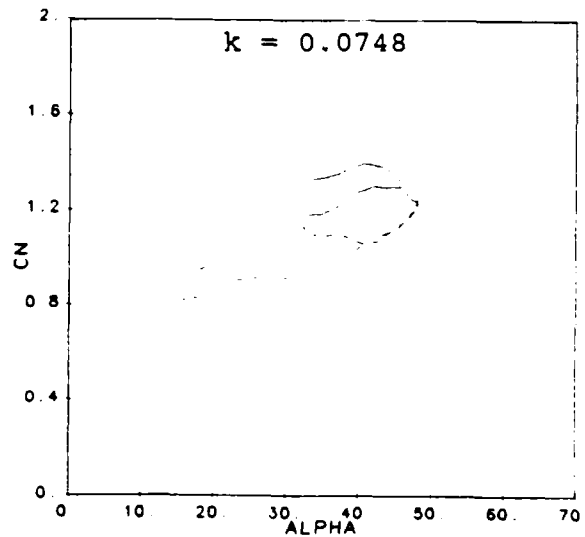
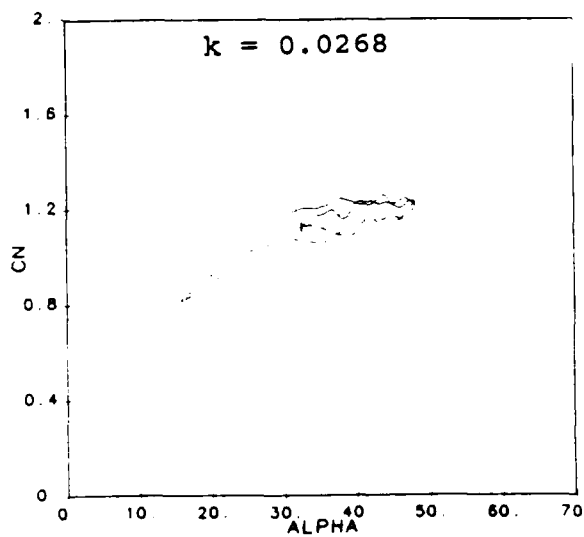
Straked Wing, Incidence = 24° to 56°



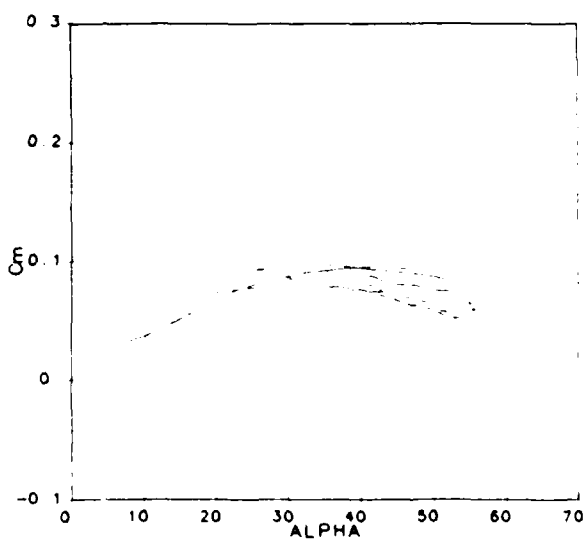
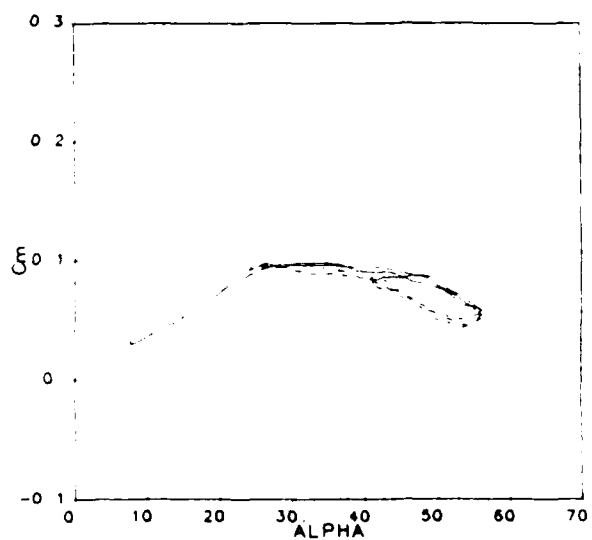
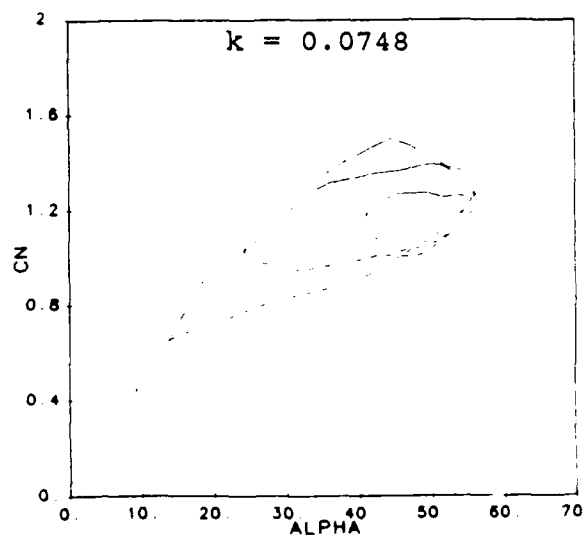
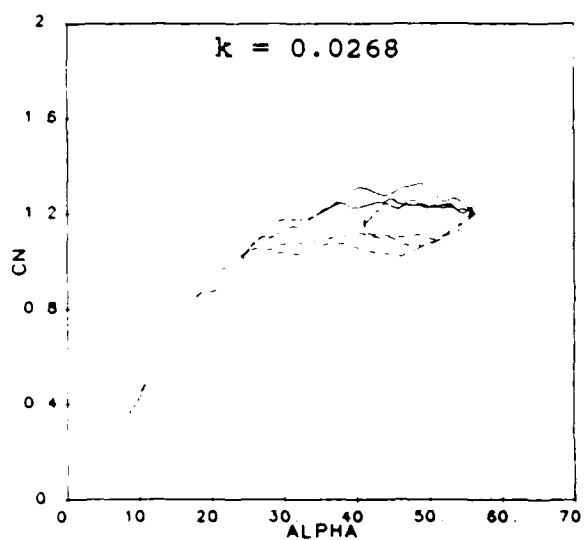
Straked Wing, Incidence = 32° to 64°



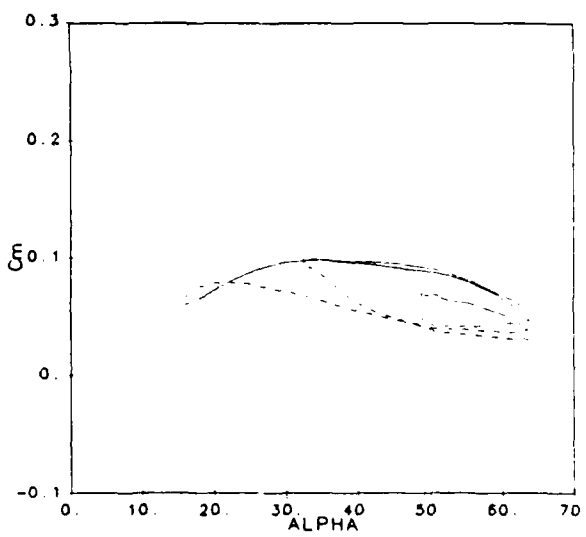
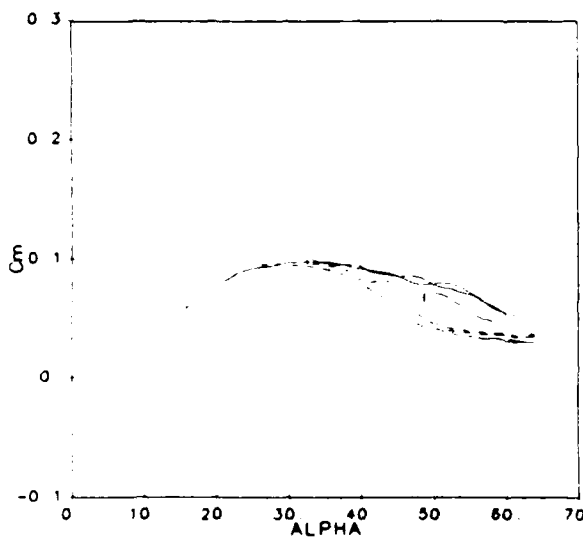
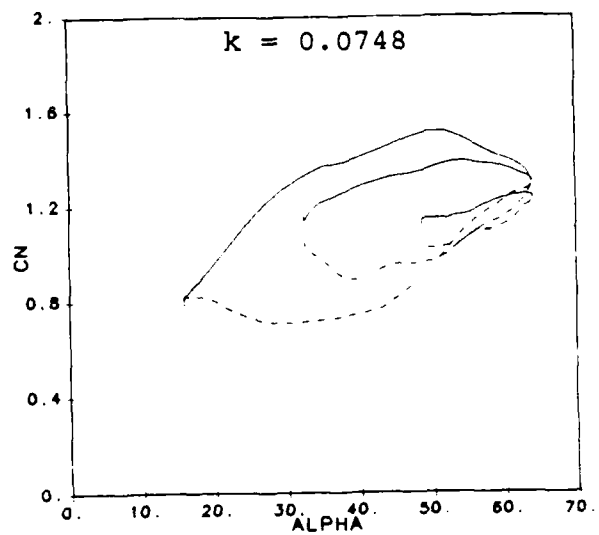
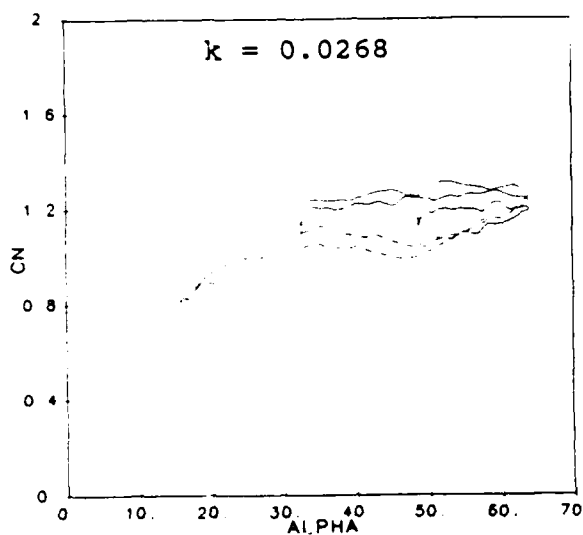
Straked Wing, Incidence = 8° to 40°



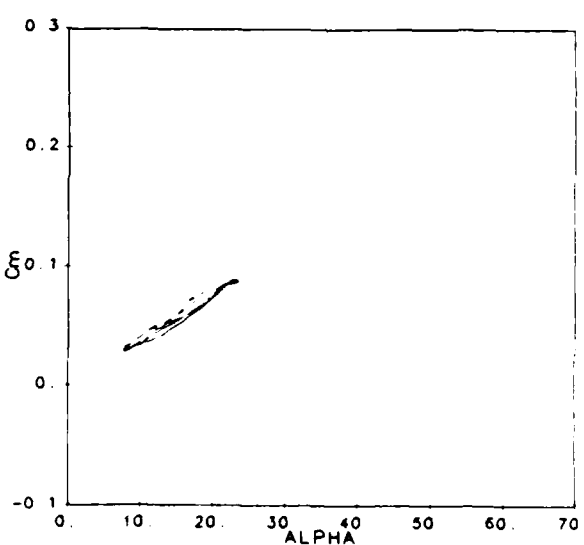
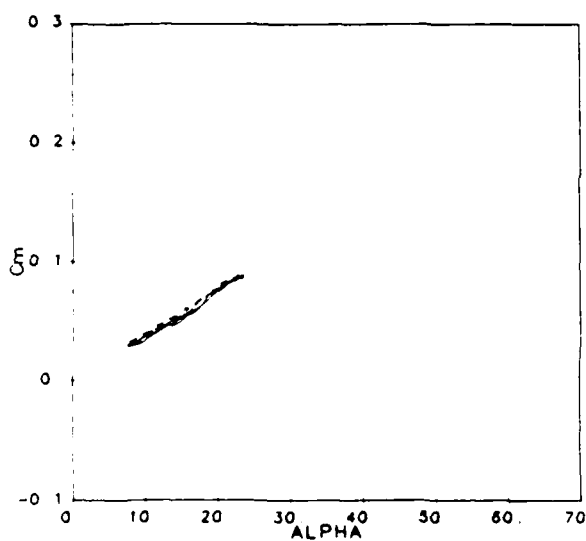
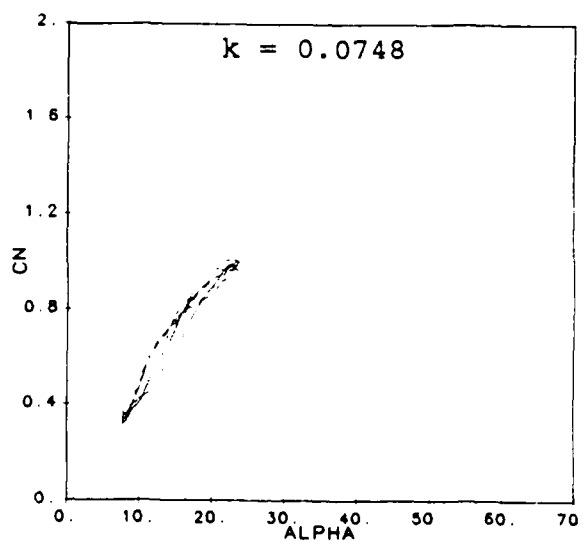
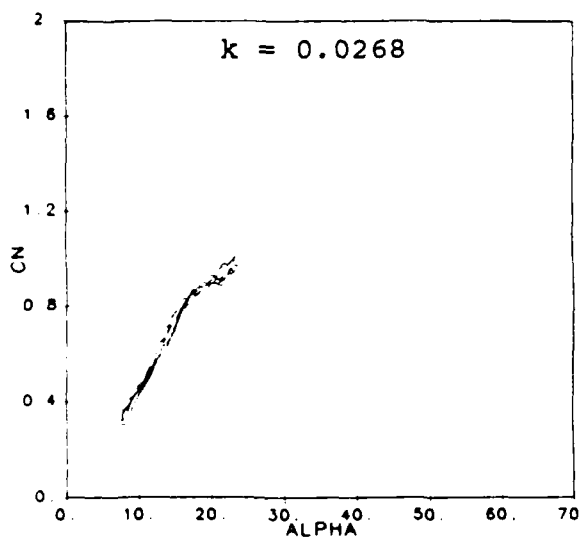
Straked Wing, Incidence = 16° to 48°



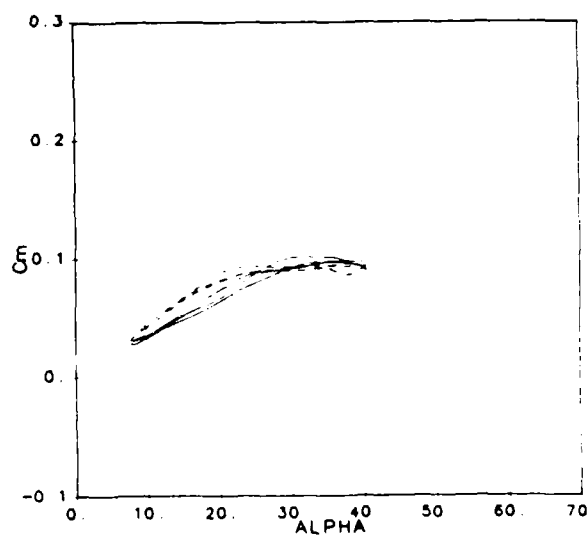
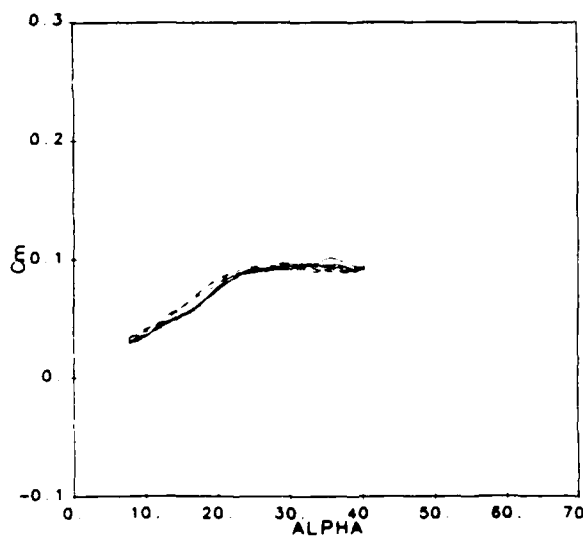
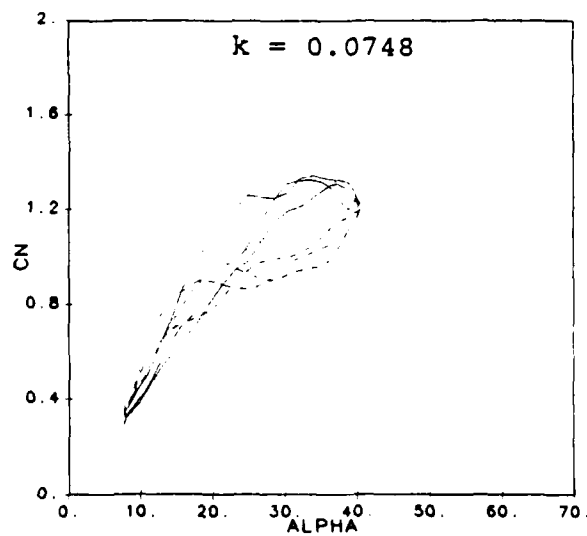
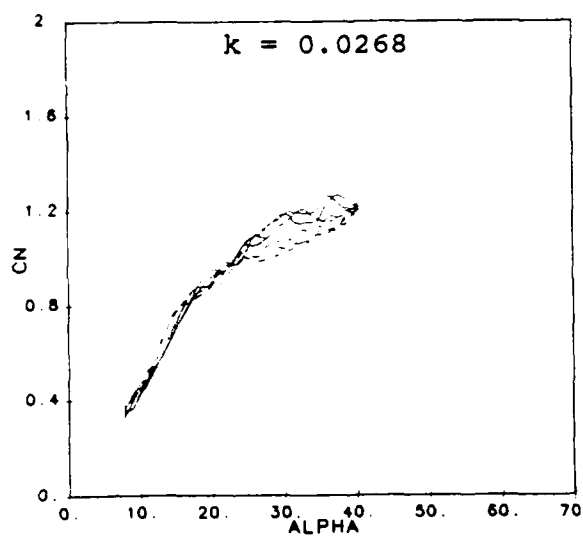
Straked Wing, Incidence = 8° to 56°



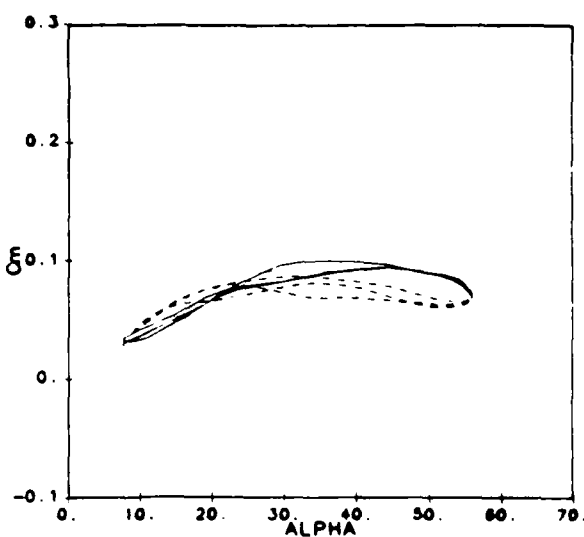
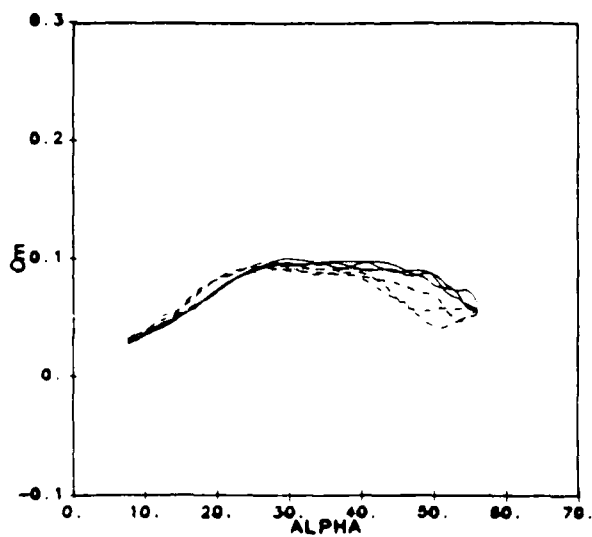
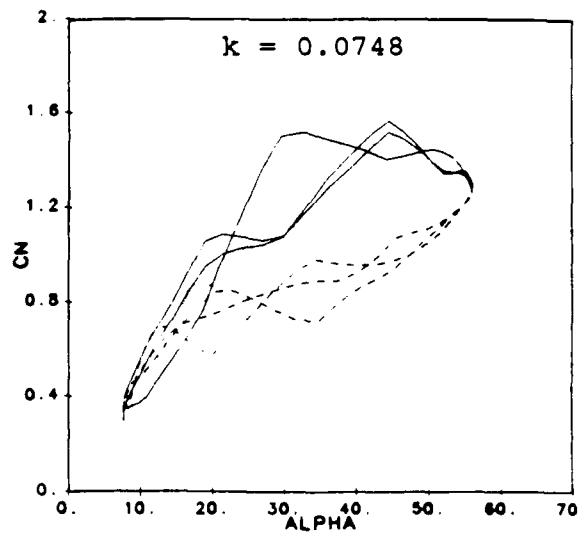
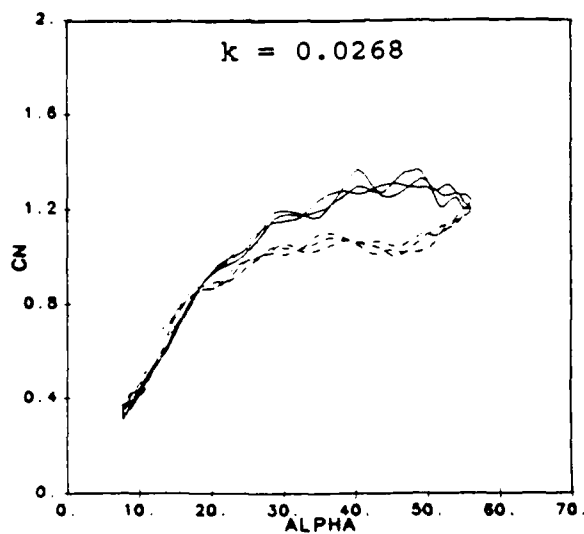
Straked Wing, Incidence = 16° to 64°



Straked Wing, Incidence = 8° to 24°



Straked Wing, Incidence = 8° to 40°



Straked Wing, Incidence = 8° to 56°

Straked Wing Static Data
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0000
Alpha Min. = 0 deg.
Alpha Max. = 90 deg.

Time	Alpha	CN	Cm
0.0000	0.9100	0.0006	0.0124
0.0000	6.3600	0.2346	0.0239
0.0000	11.8000	0.5093	0.0407
0.0000	17.2400	0.8649	0.0609
0.0000	22.6800	0.9894	0.0869
0.0000	28.1200	1.0967	0.0917
0.0000	33.5600	1.1368	0.0919
0.0000	39.0100	1.1843	0.0910
0.0000	44.4500	1.1837	0.0858
0.0000	49.8900	1.1498	0.0628
0.0000	55.3300	1.1019	0.0427
0.0000	60.7700	1.0808	0.0297
0.0000	66.2200	1.1119	0.0243
0.0000	71.6600	1.1035	0.0227
0.0000	77.1000	1.1148	0.0167
0.0000	82.5400	1.1029	0.0141
0.0000	87.9800	1.1243	0.0128
0.0000	93.4200	1.1620	0.0094
0.0000	93.4200	1.1620	0.0094
0.0000	87.9800	1.2179	0.0054
0.0000	82.5400	1.1318	0.0098
0.0000	77.1000	1.0949	0.0145
0.0000	71.6600	1.1188	0.0210
0.0000	66.2200	1.0721	0.0231
0.0000	60.7700	1.0772	0.0285
0.0000	55.3300	1.0535	0.0323
0.0000	49.8900	1.0849	0.0638
0.0000	44.4500	1.1795	0.0829
0.0000	39.0100	1.1421	0.0910
0.0000	33.5600	1.1517	0.0962
0.0000	28.1200	1.0679	0.0932
0.0000	22.6800	0.9698	0.0876
0.0000	17.2400	0.8401	0.0611
0.0000	11.8000	0.5536	0.0447
0.0000	6.3600	0.2757	0.0242
0.0000	0.9100	-0.0070	0.0121

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 8 deg.
Alpha Max. = 24 deg.

Time	Alpha	CN	Cm
0.0000	7.7800	0.3359	0.0294
2.8080	7.7700	0.3360	0.0301
5.6160	7.9500	0.3387	0.0303
8.4230	9.1700	0.3963	0.0330
11.2310	10.5800	0.4666	0.0383
14.0390	11.9000	0.5380	0.0427
16.8470	13.2600	0.6181	0.0471
19.6540	14.6900	0.6996	0.0513
22.4620	16.0700	0.7934	0.0565
25.2700	17.4000	0.8612	0.0625
28.0780	18.8900	0.9041	0.0713
30.8850	20.2900	0.9143	0.0773
33.6930	21.6300	0.9345	0.0825
36.5010	22.8900	0.9795	0.0862
39.3090	23.4300	0.9745	0.0876
42.1160	22.2500	0.9473	0.0855
44.9240	20.9000	0.9131	0.0824
47.7320	19.4800	0.8705	0.0780
50.5400	18.0800	0.8555	0.0715
53.3470	16.7000	0.8332	0.0657
56.1550	15.2800	0.7791	0.0577
58.9630	13.9300	0.7018	0.0530
61.7710	12.5000	0.6073	0.0485
64.5780	11.1800	0.5175	0.0427
67.3860	9.7900	0.4527	0.0388
70.1940	8.4800	0.3729	0.0337
73.0020	7.9000	0.3545	0.0312
75.8090	7.9000	0.3524	0.0303
78.6170	7.9000	0.3668	0.0315
81.4250	7.9000	0.3486	0.0298
84.2330	7.9000	0.3505	0.0297
87.0400	7.9000	0.3490	0.0307
89.8480	7.8900	0.3511	0.0310
92.6560	7.8900	0.3508	0.0311
95.4640	7.9000	0.3367	0.0303
98.2710	7.8900	0.3414	0.0310
101.0790	7.9000	0.3457	0.0308
103.8870	7.9000	0.3413	0.0302
106.6950	7.8900	0.3519	0.0315
109.5020	7.8900	0.3518	0.0313
112.3100	7.8900	0.3331	0.0306
115.1180	7.8900	0.3485	0.0306
117.9260	7.9000	0.3572	0.0306
120.7330	7.9000	0.3474	0.0309
123.5410	7.8900	0.3430	0.0307

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 8 deg.
Alpha Max. = 24 deg.

Time	Alpha	CN	Cm
0.0000	7.8000	0.3244	0.0297
1.4100	7.8100	0.3275	0.0295
2.8190	7.8000	0.3312	0.0294
4.2290	7.8100	0.3346	0.0297
5.6380	7.9900	0.3378	0.0297
7.0480	8.5300	0.3608	0.0307
8.4570	9.2100	0.3983	0.0330
9.8670	10.2900	0.4465	0.0363
11.2760	11.4800	0.5195	0.0412
12.6860	13.1500	0.6112	0.0471
14.0960	14.8700	0.6934	0.0530
15.5050	16.5900	0.7900	0.0590
16.9150	18.2900	0.8739	0.0659
18.3240	20.0000	0.9345	0.0747
19.7340	21.2200	0.9685	0.0821
21.1430	22.2200	0.9878	0.0865
22.5530	22.8300	0.9941	0.0877
23.9620	23.4700	0.9857	0.0877
25.3720	23.4600	0.9877	0.0878
26.7810	22.9000	0.9753	0.0872
28.1910	22.1700	0.9584	0.0860
29.6010	21.1700	0.9257	0.0841
31.0100	19.6800	0.8878	0.0805
32.4200	17.9700	0.8410	0.0750
33.8290	16.2900	0.8111	0.0672
35.2390	14.6100	0.7483	0.0583
36.6480	12.8800	0.6559	0.0522
38.0580	11.2200	0.5738	0.0467
39.4670	10.2300	0.5002	0.0414
40.8770	9.2700	0.4344	0.0369
42.2870	8.6100	0.3984	0.0341
43.6960	7.9400	0.3694	0.0319
45.1060	7.8800	0.3501	0.0305
46.5150	7.8700	0.3432	0.0302
47.9250	7.8700	0.3474	0.0303

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 8 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	7.8100	0.3497	0.0309
2.8090	7.8100	0.3475	0.0302
5.6180	7.9600	0.3569	0.0302
8.4270	9.1900	0.4094	0.0331
11.2350	10.6100	0.4614	0.0371
14.0440	11.9100	0.5394	0.0434
16.8530	13.8300	0.6387	0.0489
19.6620	15.9000	0.7661	0.0550
22.4710	17.9800	0.8695	0.0647
25.2800	20.1200	0.9263	0.0763
28.0890	22.1800	0.9634	0.0846
30.8980	24.1900	1.0277	0.0901
33.7060	26.3400	1.0858	0.0917
36.5150	28.3300	1.1327	0.0940
39.3240	30.4400	1.1774	0.0949
42.1330	32.6200	1.1804	0.0957
44.9420	34.8100	1.1770	0.0965
47.7510	36.4100	1.2279	0.0965
50.5600	37.7700	1.2200	0.0947
53.3690	39.1700	1.2141	0.0921
56.1770	40.3200	1.2147	0.0931
58.9860	39.0200	1.1840	0.0925
61.7950	37.6100	1.1377	0.0911
64.6040	36.2500	1.1235	0.0931
67.4130	34.3700	1.1055	0.0916
70.2220	32.2400	1.0782	0.0945
73.0310	30.0500	1.0424	0.0937
75.8400	27.9900	1.0449	0.0935
78.6480	25.8800	1.0312	0.0931
81.4570	23.7800	0.9980	0.0899
84.2660	21.7300	0.9393	0.0874
87.0750	19.6200	0.8787	0.0805
89.8840	17.4800	0.8451	0.0714
92.6930	15.4300	0.7933	0.0618
95.5020	13.3600	0.6846	0.0526
98.3110	11.6900	0.5653	0.0459
101.1190	10.4000	0.4820	0.0411
103.9280	8.9700	0.4123	0.0364
106.7370	7.8500	0.3569	0.0323
109.5460	7.8600	0.3448	0.0315
112.3550	7.8500	0.3378	0.0305
115.1640	7.8500	0.3439	0.0297
117.9730	7.8600	0.3432	0.0307
120.7820	7.8500	0.3420	0.0312
123.5900	7.8500	0.3579	0.0319

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 8 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	7.7800	0.3312	0.0303
1.4110	7.7800	0.3297	0.0304
2.8220	7.7800	0.3293	0.0302
4.2330	7.7800	0.3260	0.0300
5.6440	7.9300	0.3351	0.0298
7.0550	8.5800	0.3599	0.0305
8.4660	9.7400	0.4061	0.0334
9.8770	11.5600	0.4983	0.0393
11.2880	14.1000	0.6466	0.0481
12.6990	17.4000	0.8157	0.0593
14.1100	21.2200	0.9609	0.0722
15.5210	24.7500	1.0918	0.0842
16.9320	28.3700	1.2070	0.0926
18.3430	32.0800	1.2885	0.0972
19.7540	35.2200	1.3111	0.0985
21.1650	37.2500	1.2968	0.0977
22.5760	38.7800	1.2601	0.0959
23.9870	39.7300	1.2438	0.0945
25.3980	40.3600	1.2073	0.0924
26.8090	39.8100	1.1776	0.0923
28.2200	38.8200	1.1333	0.0921
29.6310	37.0400	1.0778	0.0919
31.0420	34.7400	1.0200	0.0931
32.4530	31.5000	0.9781	0.0925
33.8640	27.7600	0.9281	0.0912
35.2750	24.0400	0.9081	0.0897
36.6860	20.2800	0.8873	0.0841
38.0970	16.5700	0.8127	0.0724
39.5070	13.4500	0.7093	0.0587
40.9180	11.1800	0.5920	0.0487
42.3290	9.5400	0.4759	0.0413
43.7400	8.6100	0.3993	0.0358
45.1510	7.8800	0.3690	0.0328
46.5620	7.8400	0.3549	0.0318
47.9730	7.8400	0.3482	0.0317

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.7700	0.3559	0.0327
2.8090	7.7700	0.3382	0.0304
5.6180	7.9400	0.3403	0.0302
8.4260	9.1600	0.3854	0.0331
11.2350	10.7500	0.4734	0.0388
14.0440	12.7600	0.5664	0.0446
16.8530	14.9900	0.6873	0.0528
19.6620	18.5100	0.8765	0.0665
22.4700	21.9800	0.9770	0.0815
25.2790	25.3100	1.0553	0.0918
28.0880	28.7400	1.1665	0.0971
30.8970	32.3500	1.1756	0.0964
33.7050	35.9400	1.2194	0.0961
36.5140	39.4200	1.2985	0.0950
39.3230	43.0200	1.2835	0.0936
42.1320	46.0900	1.3026	0.0888
44.9410	49.2500	1.3230	0.0861
47.7490	51.3600	1.2613	0.0774
50.5580	53.3300	1.2634	0.0706
53.3670	54.7100	1.2382	0.0645
56.1760	56.0300	1.2113	0.0584
58.9850	55.1200	1.1817	0.0545
61.7930	53.8100	1.1423	0.0516
64.6020	51.8200	1.1024	0.0530
67.4110	49.7400	1.0722	0.0567
70.2200	46.5900	1.0247	0.0648
73.0280	43.4700	1.0378	0.0762
75.8370	40.0300	1.0598	0.0858
78.6460	36.4500	1.0752	0.0887
81.4550	32.9600	1.0332	0.0895
84.2640	29.3100	1.0351	0.0941
87.0720	25.8500	0.9911	0.0945
89.8810	22.3700	0.9121	0.0889
92.6900	18.9400	0.8707	0.0795
95.4990	15.3900	0.7788	0.0610
98.3080	13.1500	0.6543	0.0503
101.1160	11.0700	0.5038	0.0426
103.9250	9.4900	0.4351	0.0379
106.7340	8.1600	0.3769	0.0333
109.5430	7.8200	0.3604	0.0321
112.3520	7.8200	0.3551	0.0317
115.1600	7.8200	0.3522	0.0319
117.9690	7.8100	0.3550	0.0323
120.7780	7.8200	0.3441	0.0311
123.5870	7.8100	0.3293	0.0301

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.7800	0.3329	0.0302
1.4130	7.7700	0.3363	0.0307
2.8250	7.7700	0.3391	0.0313
4.2380	7.7800	0.3466	0.0320
5.6510	7.9600	0.3701	0.0328
7.0630	8.9200	0.4231	0.0347
8.4760	11.1100	0.5276	0.0397
9.8880	14.5400	0.6950	0.0496
11.3010	18.9600	0.9239	0.0649
12.7140	23.9100	1.0826	0.0786
14.1260	29.7400	1.2203	0.0875
15.5390	36.0500	1.3686	0.0935
16.9520	42.0300	1.4693	0.0957
18.3640	46.4000	1.4789	0.0937
19.7770	50.5500	1.4113	0.0896
21.1890	53.3800	1.3714	0.0853
22.6020	55.0500	1.3447	0.0791
24.0150	55.9700	1.2914	0.0719
25.4270	55.5700	1.2474	0.0667
26.8400	54.0900	1.1900	0.0639
28.2530	51.5200	1.1152	0.0640
29.6650	47.5600	1.0360	0.0677
31.0780	43.3500	0.9576	0.0736
32.4910	37.5100	0.8855	0.0781
33.9030	31.5000	0.8417	0.0794
35.3160	25.2300	0.7890	0.0783
36.7280	19.9500	0.7178	0.0737
38.1410	15.3300	0.6797	0.0653
39.5540	11.8400	0.6004	0.0529
40.9660	9.4800	0.4724	0.0419
42.3790	8.2800	0.3886	0.0354
43.7920	7.8400	0.3601	0.0327
45.2040	7.8400	0.3578	0.0319
46.6170	7.8300	0.3523	0.0317
48.0290	7.8300	0.3437	0.0314

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 16 deg.
Alpha Max. = 32 deg.

Time	Alpha	CN	Cm
0.0000	15.8700	0.7932	0.0587
2.8080	15.8700	0.8103	0.0586
5.6150	16.0500	0.8346	0.0600
8.4230	17.3400	0.8730	0.0642
11.2310	18.8100	0.8953	0.0717
14.0380	20.2100	0.9399	0.0796
16.8460	21.5500	0.9524	0.0832
19.6540	22.8400	0.9889	0.0873
22.4610	24.2700	1.0277	0.0915
25.2690	25.6200	1.0594	0.0942
28.0770	27.0600	1.1085	0.0945
30.8840	28.3700	1.1303	0.0959
33.6920	29.7500	1.1338	0.0975
36.5000	31.1400	1.1420	0.0971
39.3070	31.7600	1.1264	0.0962
42.1150	30.4600	1.0806	0.0959
44.9230	29.0100	1.0796	0.0956
47.7300	27.6800	1.0635	0.0943
50.5380	26.3400	1.0475	0.0960
53.3460	24.9000	1.0182	0.0954
56.1530	23.4700	0.9803	0.0914
58.9610	22.1500	0.9475	0.0885
61.7690	20.8100	0.9093	0.0851
64.5760	19.4000	0.8842	0.0801
67.3840	17.9800	0.8552	0.0750
70.1920	16.6100	0.8345	0.0675
72.9990	16.0700	0.8345	0.0619
75.8070	16.0700	0.8246	0.0618
78.6150	16.0600	0.8328	0.0619
81.4220	16.0600	0.8273	0.0605
84.2300	16.0600	0.8255	0.0593
87.0380	16.0600	0.8447	0.0605
89.8450	16.0600	0.8311	0.0608
92.6530	16.0600	0.8287	0.0617
95.4610	16.0600	0.8256	0.0618
98.2680	16.0600	0.8262	0.0612
101.0760	16.0600	0.8346	0.0599
103.8840	16.0600	0.8328	0.0601
106.6910	16.0600	0.8288	0.0590
109.4990	16.0600	0.8178	0.0598
112.3070	16.0600	0.8119	0.0597
115.1140	16.0600	0.8147	0.0595
117.9220	16.0600	0.8159	0.0595
120.7300	16.0600	0.8283	0.0597
123.5370	16.0600	0.8241	0.0589

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 16 deg.
Alpha Max. = 32 deg.

Time	Alpha	CN	Cm
0.0000	15.9000	0.7962	0.0570
1.4090	15.8900	0.7995	0.0573
2.8180	15.9000	0.8044	0.0577
4.2280	15.9000	0.8110	0.0573
5.6370	16.0600	0.8317	0.0582
7.0460	16.6700	0.8636	0.0606
8.4550	17.3800	0.8995	0.0644
9.8650	18.4700	0.9436	0.0700
11.2740	19.7300	0.9514	0.0755
12.6830	21.4500	0.9848	0.0815
14.0920	22.9500	1.0311	0.0862
15.5010	24.7100	1.0673	0.0903
16.9110	26.4500	1.1081	0.0937
18.3200	28.0100	1.1358	0.0942
19.7290	29.2400	1.1439	0.0949
21.1380	30.3400	1.1478	0.0958
22.5480	31.0600	1.1518	0.0978
23.9570	31.7600	1.1404	0.0998
25.3660	31.8300	1.1435	0.1008
26.7750	31.2100	1.1404	0.1008
28.1840	30.4300	1.1151	0.0996
29.5940	29.3500	1.0827	0.0987
31.0030	28.0000	1.0546	0.0980
32.4120	26.3400	1.0200	0.0958
33.8210	24.6300	0.9591	0.0927
35.2310	22.8400	0.9040	0.0894
36.6400	21.2800	0.8674	0.0864
38.0490	19.5000	0.8651	0.0834
39.4580	18.4700	0.8639	0.0783
40.8670	17.4500	0.8400	0.0715
42.2770	16.7700	0.8229	0.0659
43.6860	16.1500	0.8188	0.0620
45.0950	16.0600	0.8255	0.0600
46.5040	16.0500	0.8372	0.0603
47.9140	16.0600	0.8368	0.0607

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 16 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	15.9000	0.8252	0.0595
2.8090	15.9000	0.8144	0.0594
5.6180	16.0500	0.8303	0.0599
8.4260	17.3600	0.8529	0.0657
11.2350	18.8300	0.8860	0.0734
14.0440	20.2400	0.9327	0.0799
16.8530	22.0800	0.9823	0.0864
19.6620	24.0900	1.0328	0.0907
22.4700	26.2000	1.0791	0.0942
25.2790	28.2200	1.1211	0.0955
28.0880	30.3200	1.1731	0.0989
30.8970	32.5200	1.2023	0.1013
33.7050	34.7100	1.2037	0.0984
36.5140	36.7700	1.2254	0.0960
39.3230	38.8300	1.2355	0.0950
42.1320	41.0600	1.2179	0.0913
44.9410	43.0900	1.2417	0.0887
47.7490	44.5400	1.2326	0.0867
50.5580	45.7500	1.2269	0.0867
53.3670	47.0400	1.2408	0.0855
56.1760	48.1200	1.2122	0.0815
58.9850	46.9400	1.1664	0.0802
61.7930	45.6400	1.1632	0.0821
64.6020	44.4300	1.1645	0.0840
67.4110	42.7600	1.1344	0.0827
70.2200	40.7200	1.1191	0.0878
73.0280	38.4700	1.1138	0.0899
75.8370	36.3900	1.0733	0.0904
78.6460	34.2800	1.0580	0.0926
81.4550	32.1600	1.0695	0.0935
84.2640	29.9500	1.0778	0.0957
87.0720	27.8900	1.0492	0.0958
89.8810	25.7700	1.0290	0.0961
92.6900	23.6500	0.9769	0.0930
95.4990	21.6400	0.9305	0.0869
98.3080	20.0100	0.8911	0.0823
101.1160	18.6200	0.8599	0.0754
103.9250	17.1400	0.8351	0.0667
106.7340	16.0500	0.8285	0.0608
109.5430	16.0500	0.8222	0.0592
112.3520	16.0500	0.8196	0.0602
115.1600	16.0400	0.8346	0.0611
117.9690	16.0400	0.8143	0.0598
120.7780	16.0400	0.8181	0.0605
123.5870	16.0400	0.8306	0.0608

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 16 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	15.8800	0.8273	0.0600
1.4060	15.8700	0.8248	0.0595
2.8130	15.8800	0.8181	0.0590
4.2190	15.8800	0.8213	0.0588
5.6260	16.0500	0.8478	0.0605
7.0320	16.7500	0.8948	0.0642
8.4390	18.0000	0.9479	0.0694
9.8450	19.8800	0.9749	0.0761
11.2520	22.3800	1.0484	0.084
12.6580	25.6200	1.1585	0.0919
14.0650	29.2800	1.2576	0.0954
15.4710	33.0900	1.3275	0.0961
16.8780	36.9700	1.3513	0.0962
18.2840	40.6600	1.3968	0.0957
19.6910	43.5400	1.3804	0.0939
21.0970	45.3200	1.3370	0.0909
22.5040	46.7200	1.2977	0.0881
23.9100	47.6400	1.2760	0.0859
25.3160	48.1800	1.2547	0.0837
26.7230	47.7300	1.2186	0.0814
28.1290	46.7700	1.1682	0.0806
29.5360	45.1300	1.1174	0.0820
30.9420	43.0700	1.0981	0.0843
32.3490	39.9000	1.0394	0.0845
33.7550	36.0500	0.9601	0.0846
35.1620	32.4600	0.9201	0.0860
36.5680	28.5800	0.9108	0.0878
37.9750	24.9200	0.9129	0.0890
39.3810	21.6800	0.8900	0.0877
40.7880	19.4000	0.8498	0.0820
42.1940	17.7100	0.8301	0.0745
43.6010	16.7400	0.8286	0.0679
45.0070	16.0700	0.8201	0.0630
46.4140	16.0400	0.8218	0.0611
47.8200	16.0400	0.8191	0.0607

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 16 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	15.8800	0.7999	0.0583
2.8070	15.8800	0.8153	0.0582
5.6150	16.0500	0.8289	0.0600
8.4220	17.3400	0.8559	0.0637
11.2300	18.9900	0.9055	0.0729
14.0370	21.0800	0.9482	0.0818
16.8450	23.1000	1.0058	0.0890
19.6520	26.6900	1.1058	0.0938
22.4600	30.0700	1.1933	0.0973
25.2670	33.7000	1.2392	0.0979
28.0750	37.1700	1.2369	0.0958
30.8820	40.8000	1.2503	0.0913
33.6900	44.1300	1.2752	0.0877
36.4970	47.2800	1.2517	0.0800
39.3050	50.7600	1.2944	0.0799
42.1120	54.0100	1.3067	0.0753
44.9200	57.1600	1.2895	0.0637
47.7270	59.2500	1.2772	0.0563
50.5350	61.2600	1.2926	0.0521
53.3420	62.6400	1.2827	0.0435
56.1500	63.8600	1.2565	0.0361
58.9570	63.1100	1.2304	0.0347
61.7650	61.8200	1.1957	0.0341
64.5720	59.8100	1.1762	0.0357
67.3800	57.7400	1.1409	0.0368
70.1870	54.5900	1.0920	0.0385
72.9950	51.2800	1.0389	0.0407
75.8020	47.9100	0.9931	0.0453
78.6100	44.6200	1.0031	0.0595
81.4170	41.3900	1.0310	0.0743
84.2250	37.7400	1.0388	0.0867
87.0320	34.2900	1.0523	0.0929
89.8400	30.7000	1.0370	0.0952
92.6470	27.2300	0.9997	0.0959
95.4550	23.7100	0.9963	0.0936
98.2620	21.4800	0.9037	0.0866
101.0700	19.3700	0.8938	0.0805
103.8770	17.7200	0.8665	0.0722
106.6850	16.3700	0.8300	0.0654
109.4920	16.0300	0.8371	0.0628
112.3000	16.0300	0.8304	0.0613
115.1070	16.0400	0.8212	0.0592
117.9150	16.0300	0.8158	0.0581
120.7220	16.0300	0.8338	0.0597
123.5300	16.0300	0.8279	0.0602

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 16 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	15.8500	0.7892	0.0575
1.4100	15.8500	0.7983	0.0584
2.8190	15.8500	0.8078	0.0592
4.2290	15.8500	0.8184	0.0596
5.6380	16.0200	0.8287	0.0601
7.0480	16.9500	0.8607	0.0627
8.4570	19.3000	0.9307	0.0698
9.8670	22.5800	1.0536	0.0813
11.2760	26.8700	1.2054	0.0921
12.6860	31.9700	1.3203	0.0978
14.0960	38.0700	1.3835	0.0979
15.5050	44.1800	1.4539	0.0957
16.9150	49.5700	1.5135	0.0919
18.3240	54.2900	1.4853	0.0833
19.7340	58.3700	1.4202	0.0730
21.1430	61.3100	1.3855	0.0643
22.5530	63.0800	1.3471	0.0569
23.9620	63.8600	1.3096	0.0509
25.3720	63.6000	1.2821	0.0471
26.7810	62.2300	1.2588	0.0449
28.1910	59.6900	1.2155	0.0431
29.6010	55.7700	1.1349	0.0418
31.0100	51.3200	0.9850	0.0421
32.4200	45.7800	0.8244	0.0462
33.8290	40.0900	0.7454	0.0546
35.2390	33.7300	0.7183	0.0657
36.6480	28.4600	0.7106	0.0734
38.0580	23.8200	0.7477	0.0788
39.4670	20.2600	0.8038	0.0788
40.8770	17.7600	0.8230	0.0751
42.2870	16.4800	0.8252	0.0696
43.6960	16.0300	0.8210	0.0650
45.1060	16.0300	0.8134	0.0624
46.5150	16.0200	0.8212	0.0614
47.9250	16.0200	0.8429	0.0621

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 24 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	24.2100	1.0121	0.0913
2.8070	24.2000	1.0124	0.0924
5.6150	24.4000	1.0158	0.0916
8.4220	25.6900	1.0611	0.0934
11.2300	27.1000	1.0984	0.0955
14.0370	28.4200	1.1010	0.0943
16.8450	29.8000	1.1270	0.0959
19.6520	31.2000	1.1864	0.1004
22.4600	32.7100	1.1735	0.0988
25.2670	34.1800	1.1751	0.0979
28.0750	35.5000	1.2010	0.0962
30.8820	36.9400	1.1910	0.0942
33.6900	38.3000	1.1700	0.0934
36.4970	39.6900	1.2065	0.0942
39.3050	40.2700	1.1744	0.0928
42.1120	38.9400	1.1613	0.0910
44.9200	37.5100	1.1450	0.0927
47.7270	36.1600	1.1277	0.0932
50.5350	34.7900	1.1088	0.0929
53.3420	33.3500	1.0799	0.0926
56.1500	31.8600	1.0605	0.0916
58.9570	30.4500	1.0637	0.0957
61.7650	29.0000	1.0577	0.0974
64.5720	27.6900	1.0681	0.0963
67.3800	26.3200	1.0618	0.0954
70.1870	24.9000	1.0049	0.0949
72.9950	24.4000	1.0485	0.0948
75.8020	24.4000	1.0478	0.0941
78.6100	24.4000	1.0204	0.0935
81.4170	24.4000	1.0461	0.0943
84.2250	24.4000	1.0256	0.0926
87.0320	24.4000	1.0249	0.0927
89.8400	24.4000	1.0300	0.0930
92.6470	24.4000	1.0168	0.0931
95.4550	24.4000	1.0172	0.0938
98.2620	24.4000	1.0150	0.0931
101.0700	24.3900	1.0214	0.0930
103.8770	24.4000	1.0195	0.0924
106.6850	24.4000	1.0186	0.0936
109.4920	24.4000	1.0255	0.0923
112.3000	24.4000	1.0340	0.0921
115.1070	24.4000	1.0198	0.0924
117.9150	24.4000	1.0281	0.0923
120.7220	24.4000	1.0305	0.0912
123.5300	24.4000	1.0344	0.0916

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 24 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	24.2400	1.0391	0.0938
1.4110	24.2500	1.0286	0.0944
2.8230	24.2400	1.0197	0.0943
4.2340	24.2400	1.0262	0.0938
5.6450	24.4100	1.0343	0.0934
7.0570	25.0100	1.0534	0.0944
8.4680	25.7400	1.0731	0.0955
9.8790	26.8200	1.0997	0.0958
11.2900	27.9800	1.1373	0.0959
12.7020	29.6800	1.1821	0.0972
14.1130	31.3700	1.2241	0.0983
15.5240	33.2000	1.2277	0.0977
16.9360	34.9700	1.2282	0.0968
18.3470	36.6600	1.2413	0.0977
19.7580	37.8500	1.2525	0.0982
21.1700	38.8900	1.2273	0.0959
22.5810	39.5800	1.2082	0.0936
23.9920	40.3700	1.2021	0.0928
25.4040	40.3500	1.1834	0.0926
26.8150	39.7100	1.1701	0.0933
28.2260	38.9000	1.1397	0.0929
29.6380	37.8300	1.1148	0.0925
31.0490	36.4200	1.0773	0.0923
32.4600	34.7500	1.0285	0.0935
33.8710	33.0200	1.0146	0.0952
35.2830	31.2100	1.0230	0.0964
36.6940	29.4700	1.0255	0.0969
38.1050	27.8200	1.0168	0.0959
39.5170	26.8100	1.0132	0.0958
40.9280	25.7900	1.0003	0.0947
42.3390	25.1100	0.9985	0.0941
43.7510	24.4800	1.0053	0.0936
45.1620	24.4100	1.0138	0.0938
46.5730	24.4100	1.0227	0.0946
47.9850	24.4100	1.0261	0.0954

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 24 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	24.2500	1.0277	0.0933
2.8050	24.2600	1.0270	0.0937
5.6110	24.3900	1.0223	0.0929
8.4160	25.6900	1.0764	0.0965
11.2210	27.1000	1.1034	0.0973
14.0270	28.4300	1.1059	0.0952
16.8320	30.3500	1.1454	0.0973
19.6370	32.5300	1.1531	0.0981
22.4430	34.7200	1.2009	0.0982
25.2480	36.7700	1.2317	0.0966
28.0530	38.8400	1.2330	0.0922
30.8590	41.0700	1.2329	0.0906
33.6640	43.1300	1.2493	0.0908
36.4690	44.9400	1.2288	0.0873
39.2750	46.8400	1.2348	0.0876
42.0800	48.8600	1.2383	0.0850
44.8850	50.9400	1.2270	0.0763
47.6910	52.4700	1.2388	0.0715
50.4960	53.8000	1.2143	0.0652
53.3010	55.1000	1.2090	0.0612
56.1070	56.1300	1.2331	0.0576
58.9120	55.0400	1.1727	0.0479
61.7170	53.7300	1.1464	0.0444
64.5230	52.3900	1.1130	0.0449
67.3280	50.6500	1.0797	0.0498
70.1330	48.5700	1.0650	0.0558
72.9390	46.5100	1.0699	0.0682
75.7440	44.6300	1.0999	0.0760
78.5490	42.7700	1.1032	0.0838
81.3550	40.7200	1.1189	0.0847
84.1600	38.4500	1.1069	0.0891
86.9650	36.3700	1.0990	0.0925
89.7710	34.2700	1.0844	0.0942
92.5760	32.1400	1.0776	0.0978
95.3810	29.9600	1.0711	0.0973
98.1870	28.3100	1.0508	0.0950
100.9920	26.9600	1.0597	0.0960
103.7970	25.5000	1.0450	0.0951
106.6030	24.4100	1.0259	0.0963
109.4080	24.4100	1.0147	0.0945
112.2130	24.4100	1.0178	0.0935
115.0190	24.4100	1.0246	0.0929
117.8240	24.4000	1.0192	0.0936
120.6290	24.4000	1.0224	0.0946
123.4350	24.4100	1.0184	0.0945

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 24 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	24.2500	1.0441	0.0952
1.4080	24.2600	1.0313	0.0947
2.8160	24.2500	1.0267	0.0939
4.2240	24.2500	1.0211	0.0932
5.6320	24.4200	1.0355	0.0934
7.0400	25.0900	1.0615	0.0939
8.4470	26.3500	1.0733	0.0938
9.8550	28.0900	1.1230	0.0946
11.2630	30.6400	1.2025	0.0960
12.6710	34.3100	1.2891	0.0975
14.0790	37.9600	1.3259	0.0960
15.4870	41.7600	1.3523	0.0933
16.8950	45.1900	1.3623	0.0914
18.3030	48.6000	1.3850	0.0890
19.7110	51.4800	1.3851	0.0852
21.1190	53.3800	1.3428	0.0783
22.5260	54.7800	1.2961	0.0716
23.9340	55.6700	1.2720	0.0672
25.3420	56.1800	1.2643	0.0645
26.7500	55.7600	1.2551	0.0615
28.1580	54.7900	1.2073	0.0578
29.5660	53.0900	1.1428	0.0568
30.9740	50.8800	1.0589	0.0589
32.3820	47.7300	1.0068	0.0626
33.7900	44.2500	1.0091	0.0688
35.1980	40.8300	0.9963	0.0752
36.6050	36.9000	0.9735	0.0786
38.0130	33.2800	0.9509	0.0822
39.4210	30.0300	0.9619	0.0864
40.8290	27.7800	0.9765	0.0902
42.2370	26.1200	0.9820	0.0927
43.6450	25.1100	0.9999	0.0945
45.0530	24.4500	1.0167	0.0947
46.4610	24.4100	1.0192	0.0939
47.8690	24.4100	1.0166	0.0935

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 32 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	32.3900	1.1512	0.0993
2.8080	32.3900	1.1125	0.0964
5.6150	32.5700	1.1233	0.0955
8.4230	33.9100	1.1586	0.0961
11.2300	35.2700	1.1754	0.0954
14.0380	36.7000	1.1953	0.0977
16.8450	38.0300	1.1589	0.0936
19.6530	39.4200	1.2024	0.0942
22.4610	40.9700	1.2284	0.0930
25.2680	42.3200	1.2276	0.0891
28.0760	43.5800	1.2214	0.0861
30.8830	44.8200	1.2193	0.0871
33.6910	46.0400	1.2031	0.0835
36.4990	47.3500	1.2331	0.0843
39.3060	47.9400	1.2206	0.0826
42.1140	46.6700	1.1736	0.0787
44.9210	45.3600	1.1386	0.0805
47.7290	44.1800	1.1154	0.0810
50.5360	42.9600	1.1422	0.0877
53.3440	41.6000	1.1642	0.0899
56.1520	40.1700	1.1062	0.0842
58.9590	38.7000	1.0881	0.0877
61.7670	37.2700	1.0940	0.0908
64.5740	35.9200	1.1118	0.0936
67.3820	34.5800	1.1225	0.0943
70.1890	33.1500	1.1284	0.0951
72.9970	32.6000	1.1226	0.0959
75.8050	32.6000	1.1505	0.0990
78.6120	32.6000	1.1352	0.0970
81.4200	32.6000	1.1286	0.0971
84.2270	32.6000	1.1654	0.0992
87.0350	32.6000	1.1562	0.0997
89.8430	32.6000	1.1232	0.0967
92.6500	32.5900	1.1267	0.0958
95.4580	32.6000	1.1180	0.0979
98.2650	32.6000	1.1039	0.0974
101.0730	32.6000	1.1252	0.0989
103.8800	32.6000	1.1177	0.0980
106.6880	32.5900	1.1246	0.0965
109.4960	32.6000	1.1371	0.0966
112.3030	32.6000	1.1458	0.0959
115.1110	32.6000	1.1345	0.0973
117.9180	32.5900	1.1358	0.0981
120.7260	32.6000	1.1436	0.0984
123.5340	32.6000	1.1181	0.0976

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 32 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	32.4200	1.1328	0.0992
1.4110	32.4100	1.1306	0.0981
2.8220	32.4200	1.1305	0.0990
4.2330	32.4200	1.1544	0.0986
5.6440	32.5800	1.1734	0.0977
7.0550	33.2000	1.1800	0.0969
8.4670	33.9500	1.1824	0.0967
9.8780	35.0000	1.1851	0.0960
11.2890	36.2500	1.2046	0.0968
12.7000	37.9100	1.2347	0.0979
14.1110	39.6200	1.2755	0.0972
15.5220	41.4300	1.2925	0.0945
16.9330	43.0700	1.2994	0.0924
18.3440	44.5800	1.2974	0.0922
19.7550	45.6400	1.2990	0.0902
21.1660	46.5900	1.2727	0.0873
22.5770	47.2500	1.2447	0.0870
23.9890	47.9600	1.2386	0.0877
25.4000	48.0100	1.2183	0.0869
26.8110	47.3900	1.1887	0.0852
28.2220	46.6400	1.1630	0.0835
29.6330	45.6700	1.1374	0.0835
31.0440	44.4000	1.1110	0.0849
32.4550	42.9300	1.0738	0.0848
33.8660	41.2600	1.0625	0.0840
35.2770	39.4900	1.0726	0.0858
36.6880	37.7200	1.0965	0.0908
38.0990	36.0400	1.0952	0.0939
39.5110	35.0100	1.0907	0.0951
40.9220	34.0300	1.0976	0.0961
42.3330	33.3400	1.0877	0.0967
43.7440	32.6800	1.0873	0.0972
45.1550	32.5900	1.1113	0.0966
46.5660	32.5900	1.1199	0.0956
47.9770	32.6000	1.1267	0.0958

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 32 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	32.4200	1.1479	0.0977
2.8050	32.4100	1.1355	0.0983
5.6100	32.5600	1.1484	0.0994
8.4150	33.9300	1.2051	0.0982
11.2200	35.3000	1.2044	0.0966
14.0250	36.7200	1.2002	0.0955
16.8300	38.6000	1.2059	0.0958
19.6360	40.8100	1.2225	0.0914
22.4410	42.8600	1.2287	0.0881
25.2460	44.6900	1.2165	0.0862
28.0510	46.5700	1.2424	0.0858
30.8560	48.6200	1.2486	0.0835
33.6610	50.7200	1.2346	0.0770
36.4660	52.6500	1.2517	0.0747
39.2710	54.6300	1.2514	0.0708
42.0760	56.6400	1.2614	0.0654
44.8810	58.6400	1.2704	0.0595
47.6860	60.2400	1.2652	0.0500
50.4910	61.5700	1.2483	0.0410
53.2960	62.9100	1.2454	0.0370
56.1020	63.8000	1.2322	0.0354
58.9070	62.8000	1.2073	0.0350
61.7120	61.4800	1.1842	0.0358
64.5170	60.1300	1.1570	0.0369
67.3220	58.3300	1.1609	0.0379
70.1270	56.3000	1.1235	0.0389
72.9320	54.2700	1.0900	0.0404
75.7370	52.2800	1.0760	0.0423
78.5420	50.3400	1.0780	0.0458
81.3470	48.2800	1.0428	0.0516
84.1520	46.1900	1.0552	0.0650
86.9570	44.3200	1.0713	0.0788
89.7620	42.4300	1.0879	0.0816
92.5680	40.3500	1.0881	0.0813
95.3730	38.1400	1.0970	0.0903
98.1780	36.5500	1.1146	0.0943
100.9830	35.1300	1.1275	0.0948
103.7880	33.6800	1.1104	0.0961
106.5930	32.5900	1.1061	0.0966
109.3980	32.5900	1.1267	0.0980
112.2030	32.5900	1.1324	0.0982
115.0080	32.5800	1.1030	0.0948
117.8130	32.5800	1.0881	0.0950
120.6180	32.5800	1.1278	0.0960
123.4230	32.5800	1.1539	0.0978

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 32 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	32.4200	1.1558	0.0999
1.4110	32.4100	1.1557	0.0986
2.8230	32.4100	1.1592	0.0975
4.2340	32.4100	1.1465	0.0962
5.6450	32.5600	1.1434	0.0970
7.0570	33.2300	1.1751	0.0990
8.4680	34.5100	1.2109	0.0990
9.8790	36.3300	1.2331	0.0978
11.2900	38.7900	1.2674	0.0965
12.7020	42.2600	1.3030	0.0941
14.1130	45.6100	1.3279	0.0914
15.5240	49.0800	1.3487	0.0892
16.9360	52.7400	1.3844	0.0848
18.3470	56.1700	1.3812	0.0772
19.7580	59.0700	1.3714	0.0691
21.1700	61.0700	1.3500	0.0607
22.5810	62.5300	1.3305	0.0543
23.9920	63.4000	1.3210	0.0493
25.4040	63.8300	1.2992	0.0447
26.8150	63.5100	1.2676	0.0402
28.2260	62.6500	1.2249	0.0373
29.6380	60.9500	1.1739	0.0364
31.0490	58.7300	1.1351	0.0377
32.4600	55.6800	1.0819	0.0388
33.8710	52.0900	0.9941	0.0393
35.2830	48.5600	0.9568	0.0422
36.6940	44.9600	0.9549	0.0486
38.1050	41.6000	0.9103	0.0561
39.5170	38.3300	0.8928	0.0685
40.9280	36.0500	0.9443	0.0805
42.3390	34.3800	0.9870	0.0875
43.7510	33.3600	1.0065	0.0916
45.1620	32.6600	1.0312	0.0950
46.5730	32.5800	1.0563	0.0984
47.9850	32.5900	1.0794	0.0982

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 40 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	40.9900	1.1675	0.0874
2.8080	40.9900	1.1551	0.0848
5.6150	41.1300	1.1607	0.0838
8.4230	42.4000	1.2025	0.0857
11.2300	43.6700	1.2371	0.0865
14.0380	44.9400	1.2608	0.0862
16.8450	46.1500	1.2381	0.0838
19.6530	47.4600	1.2555	0.0819
22.4600	48.8300	1.2328	0.0799
25.2680	50.2500	1.2284	0.0772
28.0750	51.5400	1.2255	0.0729
30.8830	52.8500	1.2294	0.0663
33.6900	54.1800	1.2172	0.0622
36.4980	55.4800	1.2123	0.0583
39.3060	56.0900	1.1949	0.0520
42.1130	54.8600	1.1576	0.0470
44.9210	53.5400	1.1205	0.0461
47.7280	52.2400	1.1094	0.0496
50.5360	50.9400	1.0931	0.0526
53.3430	49.5000	1.1037	0.0567
56.1510	48.2100	1.1110	0.0625
58.9580	46.8000	1.1040	0.0653
61.7660	45.5100	1.1082	0.0720
64.5730	44.3200	1.1075	0.0752
67.3810	43.0700	1.1168	0.0765
70.1880	41.7200	1.1169	0.0784
72.9960	41.1700	1.1535	0.0829
75.8030	41.1700	1.1685	0.0841
78.6110	41.1600	1.1644	0.0813
81.4190	41.1700	1.1796	0.0854
84.2260	41.1600	1.1559	0.0825
87.0340	41.1600	1.1764	0.0818
89.8410	41.1600	1.1857	0.0834
92.6490	41.1600	1.1397	0.0841
95.4560	41.1700	1.1570	0.0834
98.2640	41.1600	1.1788	0.0870
101.0710	41.1700	1.1597	0.0823
103.8790	41.1600	1.1696	0.0808
106.6860	41.1600	1.1610	0.0815
109.4940	41.1700	1.1603	0.0861
112.3010	41.1700	1.1819	0.0861
115.1090	41.1700	1.1751	0.0853
117.9170	41.1700	1.1809	0.0830
120.7240	41.1700	1.1635	0.0834
123.5320	41.1600	1.1650	0.0816

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 40 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	41.0000	1.1702	0.0850
1.4110	40.9900	1.1615	0.0845
2.8220	41.0000	1.1707	0.0858
4.2340	41.0000	1.1825	0.0870
5.6450	41.1600	1.1896	0.0881
7.0560	41.7300	1.2092	0.0875
8.4670	42.4500	1.2135	0.0854
9.8780	43.3800	1.2363	0.0827
11.2900	44.5500	1.2591	0.0807
12.7010	46.0200	1.2692	0.0808
14.1120	47.6600	1.2678	0.0796
15.5230	49.2700	1.2706	0.0775
16.9340	50.9600	1.2587	0.0755
18.3460	52.5600	1.2563	0.0748
19.7570	53.7300	1.2610	0.0717
21.1680	54.6900	1.2593	0.0672
22.5790	55.3500	1.2402	0.0612
23.9900	56.0300	1.2040	0.0568
25.4020	56.0500	1.1944	0.0544
26.8130	55.4600	1.1875	0.0532
28.2240	54.7100	1.1694	0.0537
29.6350	53.7500	1.1373	0.0530
31.0460	52.3600	1.0928	0.0531
32.4580	50.7900	1.0670	0.0570
33.8690	49.0700	1.0489	0.0609
35.2800	47.4300	1.0386	0.0629
36.6910	45.8000	1.0268	0.0653
38.1020	44.3000	1.0409	0.0696
39.5140	43.3800	1.0604	0.0735
40.9250	42.4900	1.0796	0.0772
42.3360	41.8200	1.0867	0.0796
43.7470	41.1800	1.0985	0.0801
45.1580	41.1300	1.1056	0.0792
46.5700	41.1200	1.1235	0.0785
47.9810	41.1300	1.1303	0.0806

Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0268
Alpha Min. = 48 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	48.6600	1.1644	0.0659
2.8070	48.6600	1.1289	0.0670
5.6150	48.8000	1.1412	0.0716
8.4220	50.0700	1.1809	0.0722
11.2300	51.3900	1.1934	0.0696
14.0370	52.7100	1.1994	0.0658
16.8450	54.0200	1.1974	0.0605
19.6520	55.3300	1.1975	0.0539
22.4600	56.6800	1.1960	0.0498
25.2670	58.0600	1.1992	0.0479
28.0750	59.3600	1.2260	0.0385
30.8820	60.6900	1.2025	0.0321
33.6900	62.0400	1.1979	0.0309
36.4970	63.3300	1.2058	0.0304
39.3050	63.8000	1.1918	0.0302
42.1120	62.7200	1.1785	0.0304
44.9200	61.3900	1.1506	0.0304
47.7270	60.0800	1.1354	0.0315
50.5350	58.7400	1.1329	0.0334
53.3420	57.3300	1.1074	0.0334
56.1500	56.0300	1.0957	0.0342
58.9570	54.6700	1.0998	0.0352
61.7650	53.3300	1.0719	0.0360
64.5720	52.0400	1.0776	0.0390
67.3800	50.7600	1.0562	0.0406
70.1870	49.3300	1.0428	0.0487
72.9950	48.8200	1.0730	0.0613
75.8020	48.8100	1.1053	0.0658
78.6100	48.8200	1.1036	0.0666
81.4170	48.8100	1.1323	0.0703
84.2250	48.8200	1.1500	0.0694
87.0320	48.8100	1.1542	0.0703
89.8400	48.8100	1.1443	0.0696
92.6470	48.8200	1.1548	0.0722
95.4550	48.8200	1.1417	0.0706
98.2620	48.8100	1.1352	0.0660
101.0700	48.8100	1.1364	0.0666
103.8770	48.8200	1.1395	0.0709
106.6850	48.8100	1.1380	0.0698
109.4920	48.8100	1.1383	0.0689
112.3000	48.8100	1.1454	0.0703
115.1070	48.3100	1.1320	0.0688
117.9150	48.8100	1.1470	0.0726
120.7220	48.8100	1.1453	0.0699
123.5300	48.8100	1.1363	0.0671

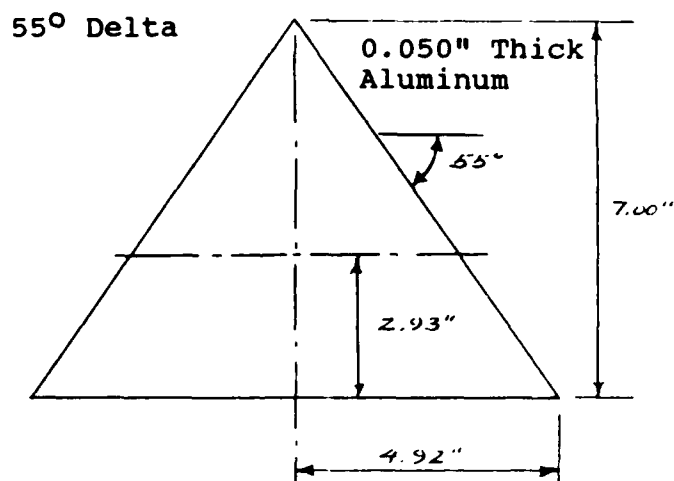
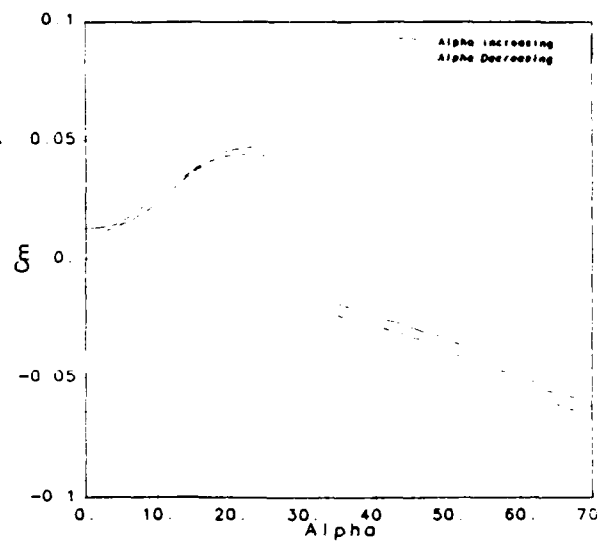
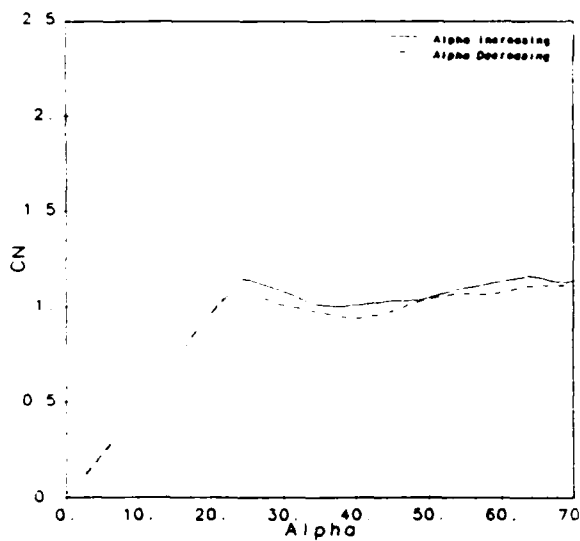
Straked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0748
Alpha Min. = 48 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	48.6900	1.1162	0.0664
1.4110	48.7000	1.1176	0.0688
2.8220	48.7000	1.1321	0.0701
4.2330	48.7000	1.1385	0.0704
5.6440	48.8100	1.1431	0.0697
7.0550	49.3200	1.1455	0.0685
8.4660	50.0500	1.1460	0.0687
9.8770	51.0400	1.1492	0.0676
11.2880	52.2100	1.1461	0.0642
12.6990	53.8300	1.1616	0.0628
14.1100	55.4000	1.1686	0.0612
15.5210	57.0100	1.2008	0.0585
16.9320	58.6900	1.2208	0.0550
18.3430	60.3100	1.2312	0.0513
19.7540	61.5400	1.2443	0.0475
21.1650	62.5300	1.2471	0.0432
22.5760	63.2100	1.2449	0.0396
23.9870	63.7600	1.2426	0.0359
25.3980	63.8800	1.2263	0.0324
26.8090	63.4100	1.2048	0.0304
28.2200	62.7400	1.1954	0.0312
29.6310	61.7800	1.1599	0.0310
31.0420	60.4000	1.1261	0.0313
32.4530	58.8000	1.1033	0.0326
33.8640	57.1000	1.0992	0.0338
35.2750	55.4500	1.0756	0.0345
36.6860	53.8800	1.0412	0.0351
38.0970	52.2400	1.0307	0.0361
39.5070	51.2100	1.0199	0.0367
40.9180	50.3000	1.0201	0.0381
42.3290	49.5400	1.0204	0.0405
43.7400	48.8900	1.0245	0.0441
45.1510	48.8100	1.0356	0.0478
46.5620	48.8000	1.0462	0.0511
47.9730	48.8000	1.0486	0.0543

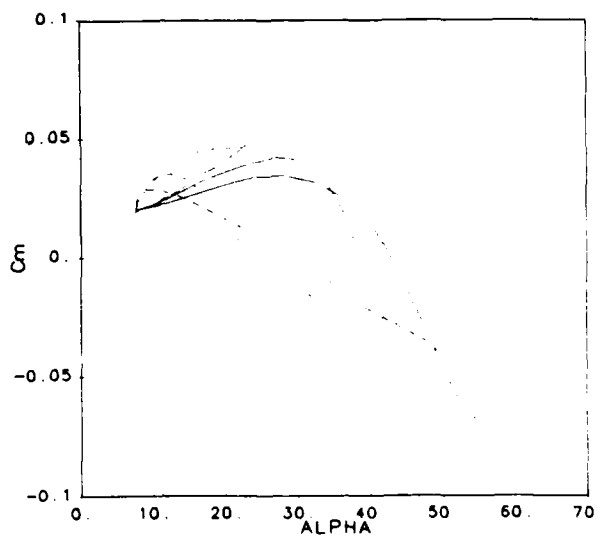
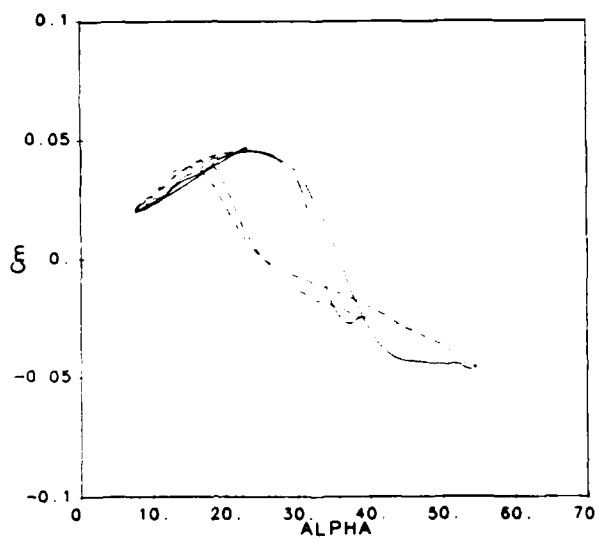
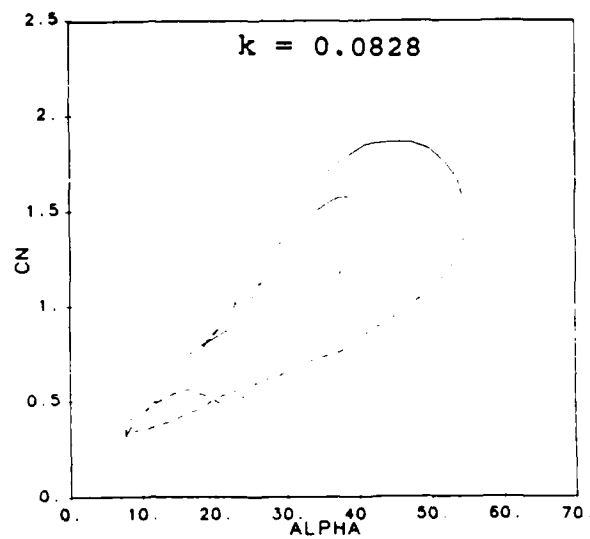
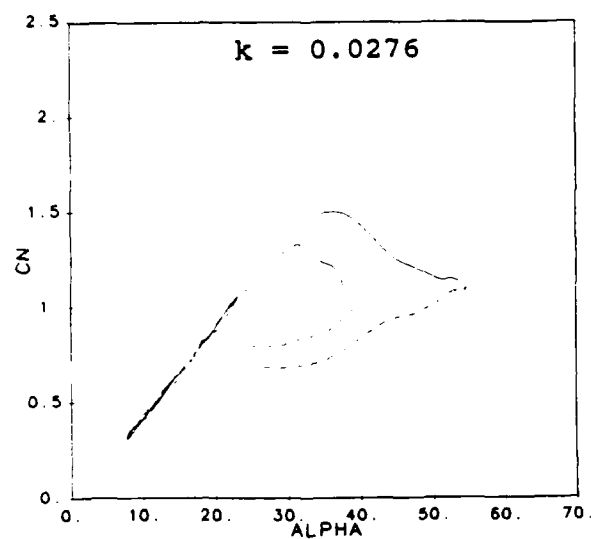
APPENDIX B

PLOTS AND LISTINGS OF THE HFF FORCE AND
MOMENT DATA FOR THE FULL-SPAN 55° DELTA WING MODEL

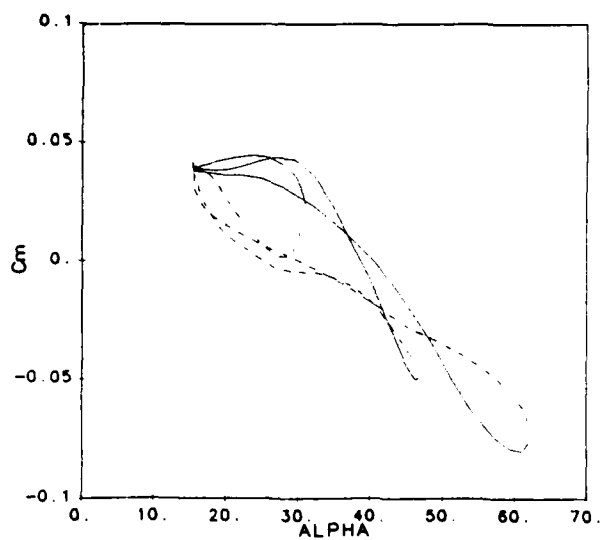
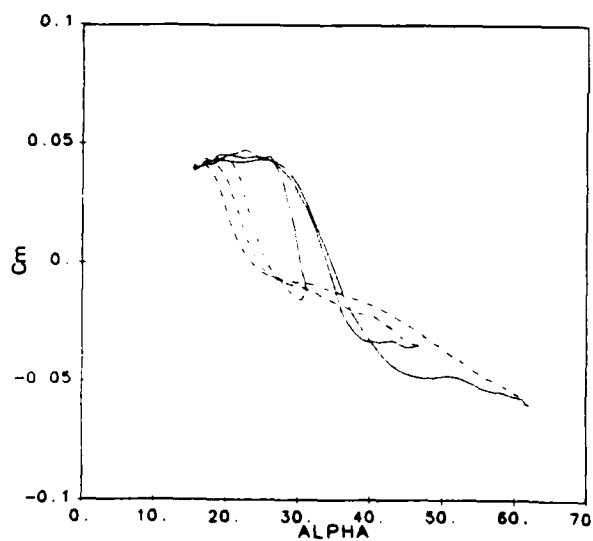
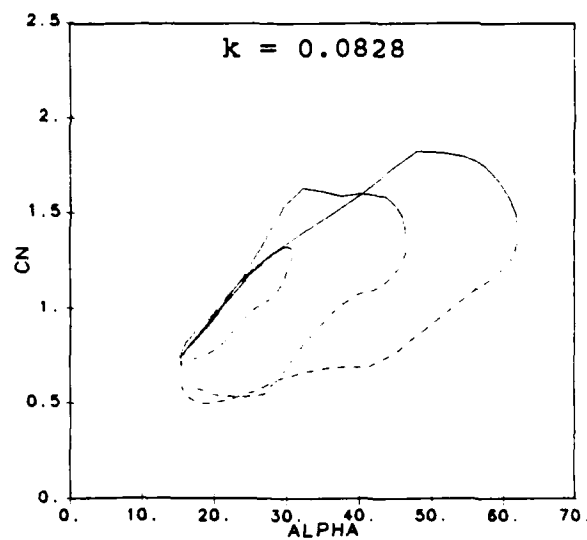
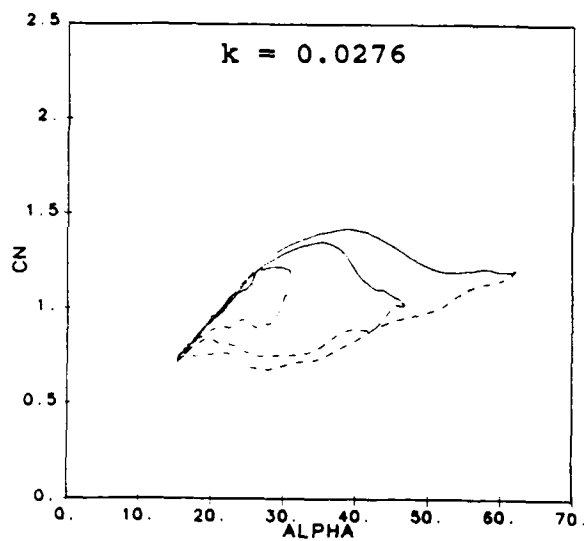


- o All Leading Edges Rounded, All Side and Trailing Edges Left Square

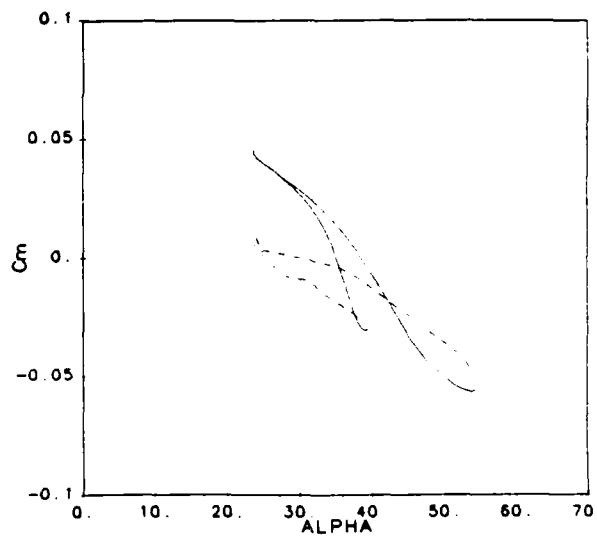
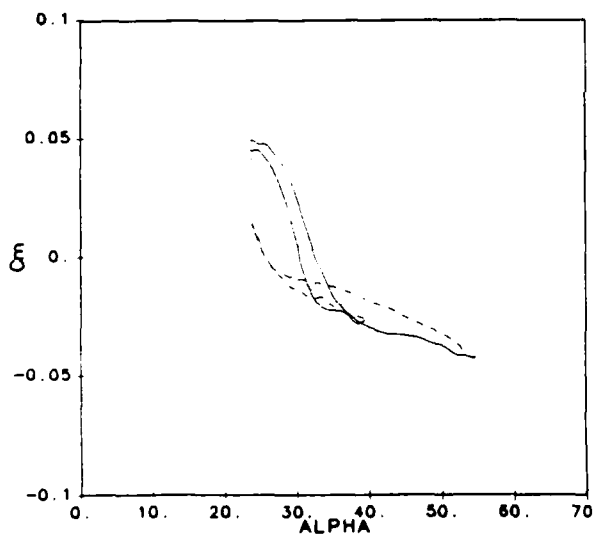
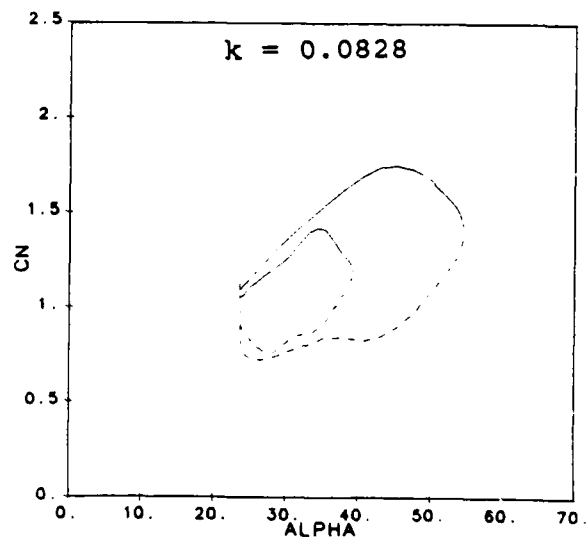
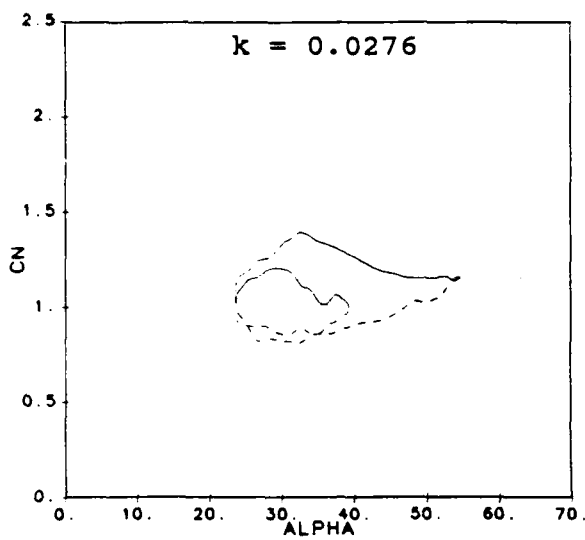
55° Delta, Steady



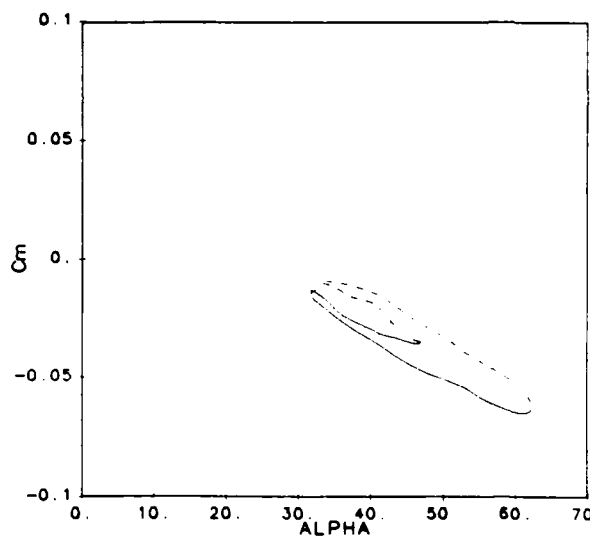
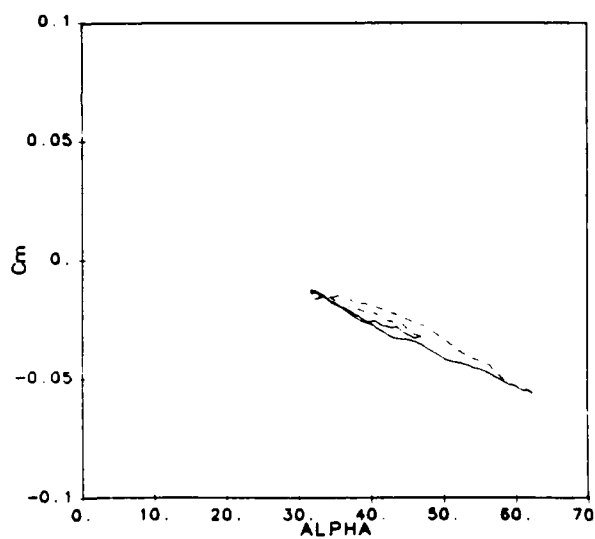
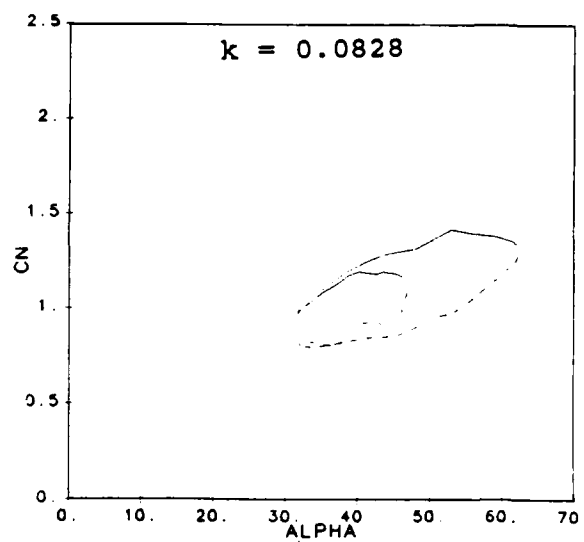
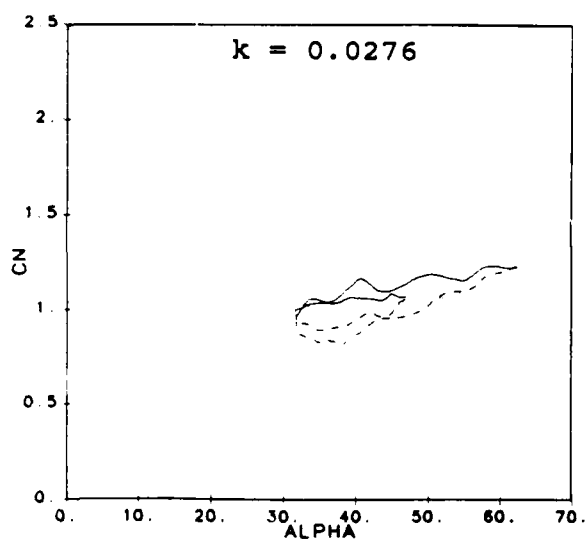
55° Delta, Incidence = 8° to 56°



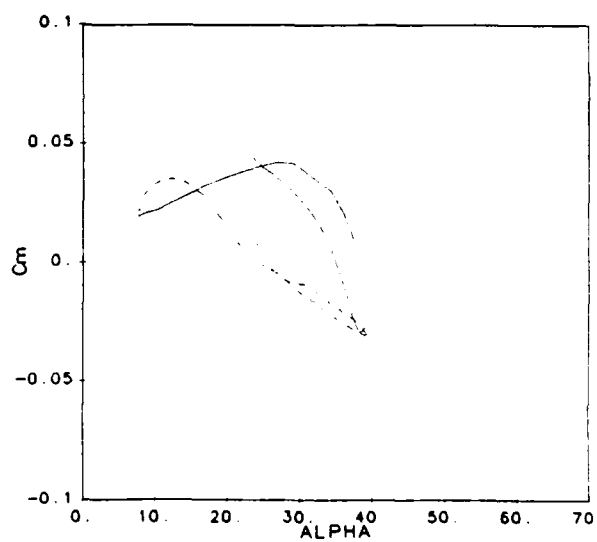
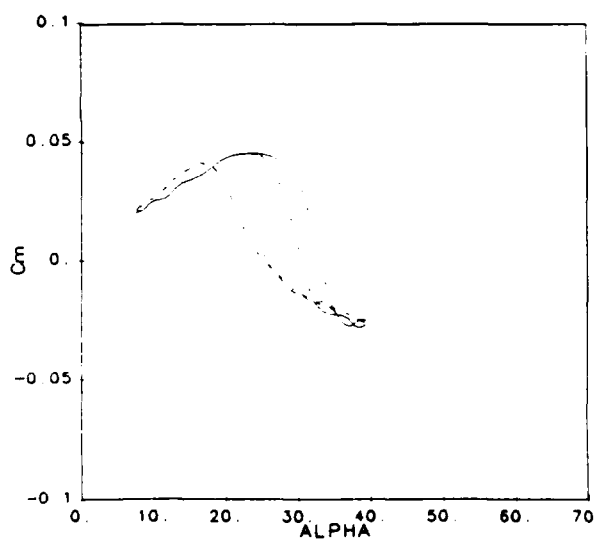
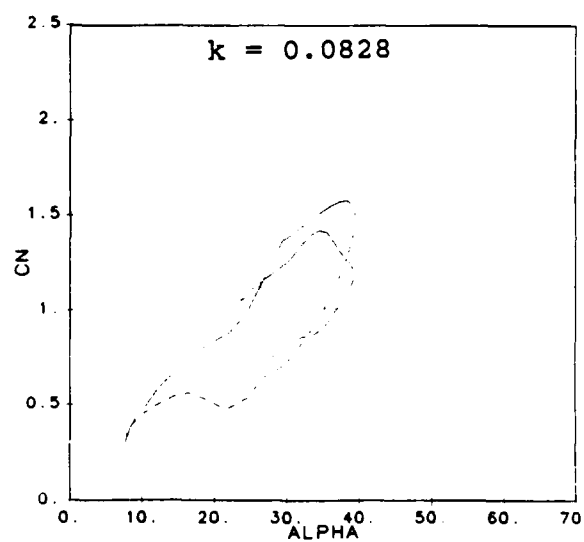
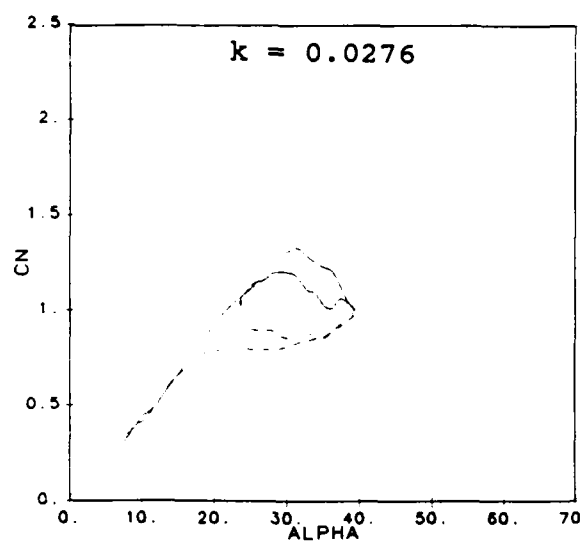
55° Delta, Incidence = 16° to 64°



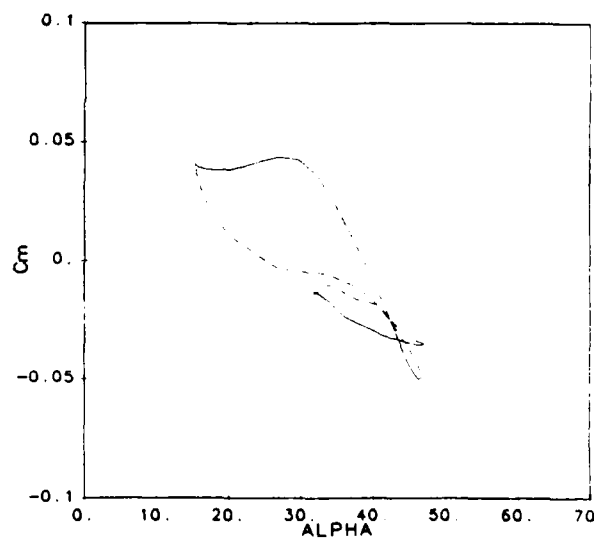
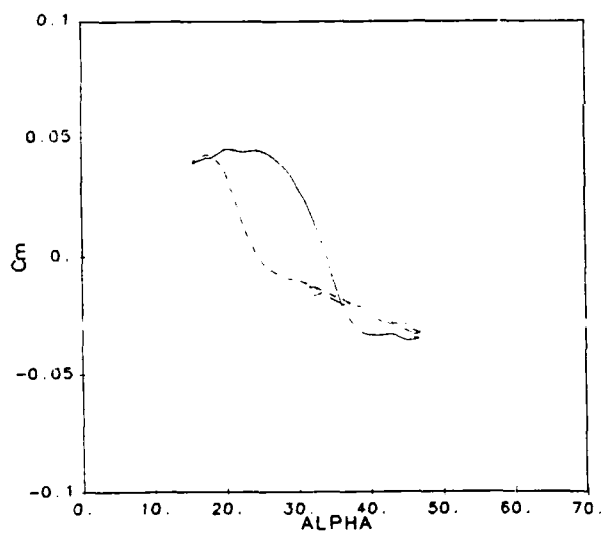
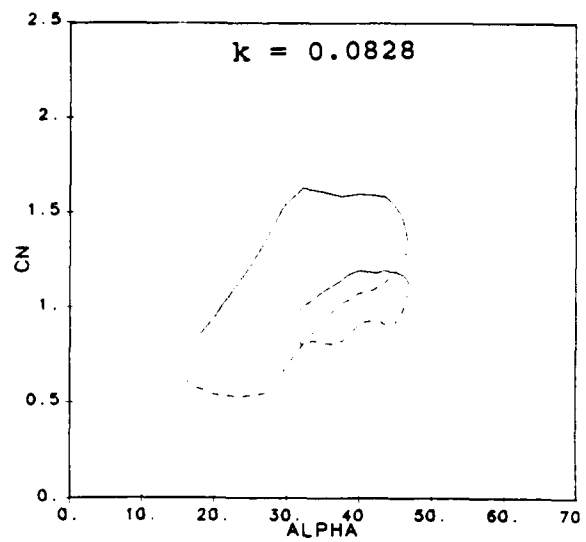
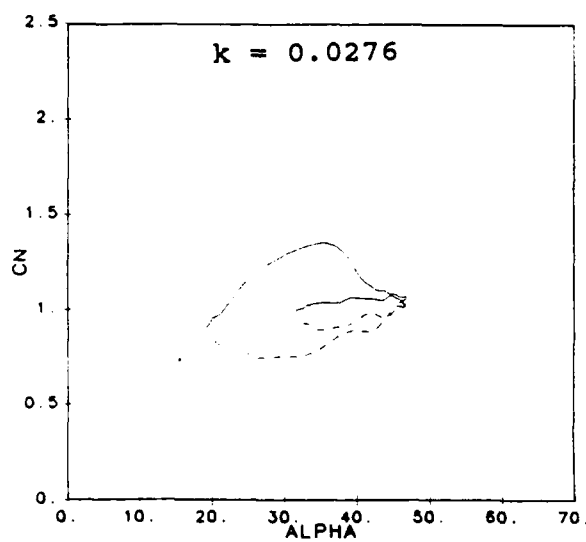
55° Delta, Incidence = 24° to 56°



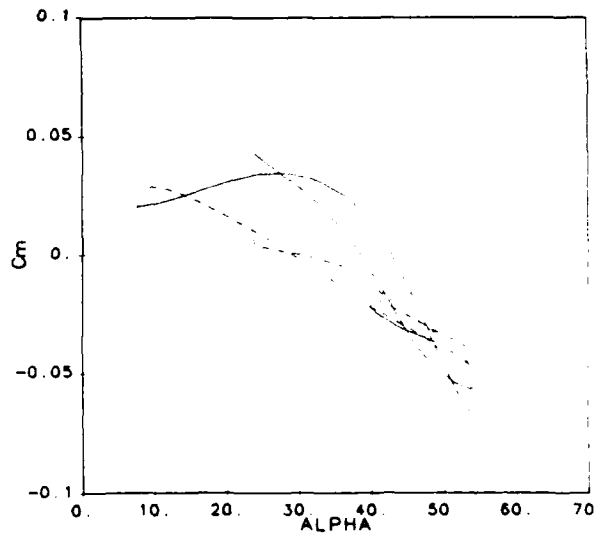
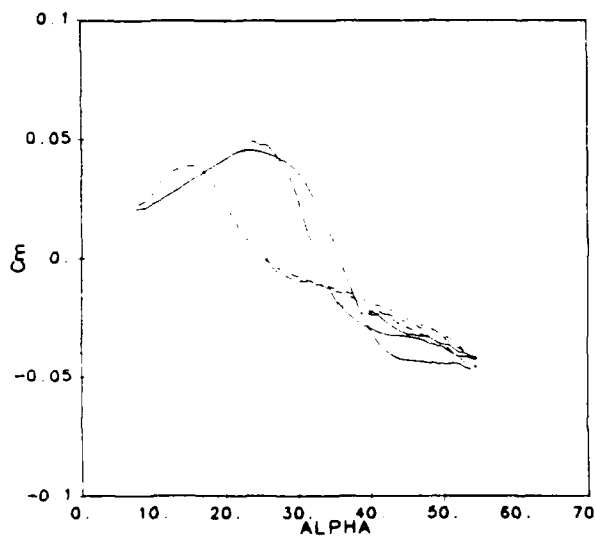
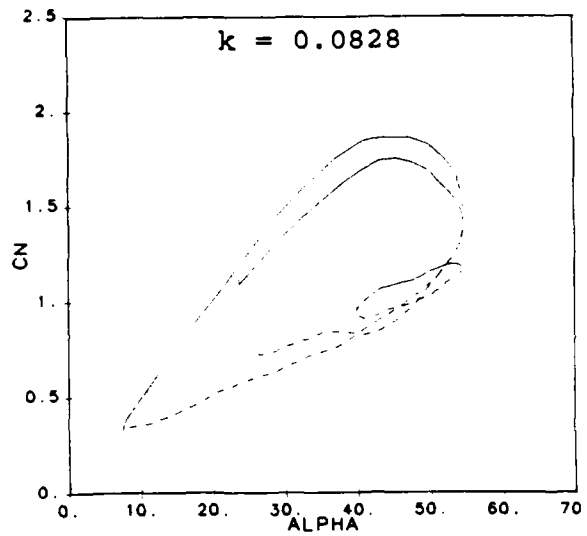
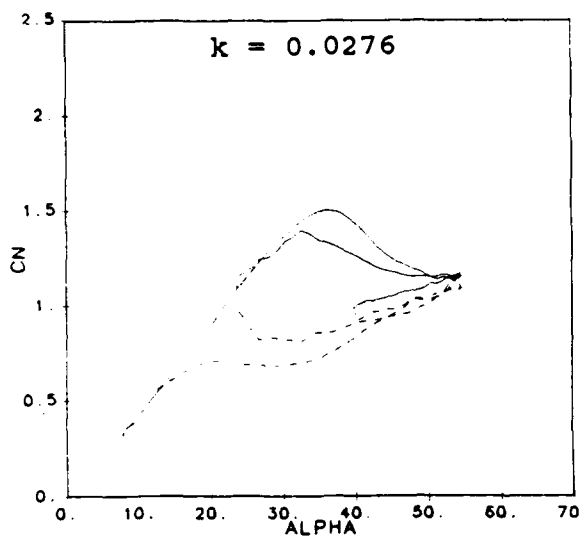
55° Delta, Incidence = 32° to 64°



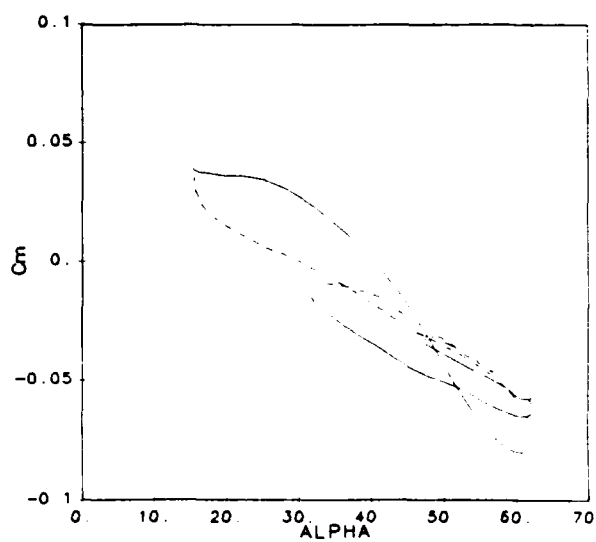
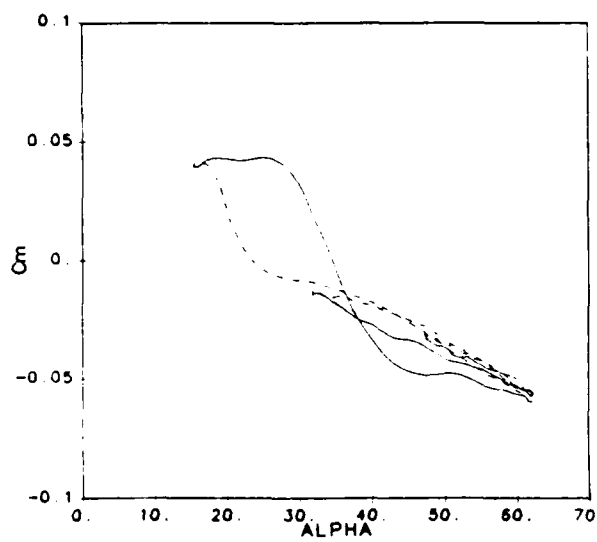
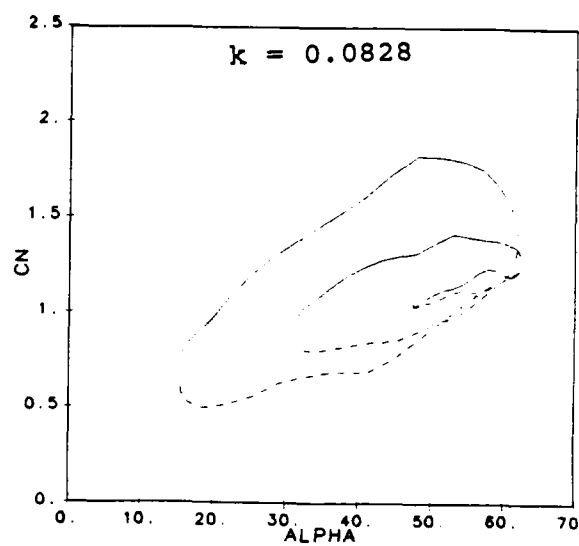
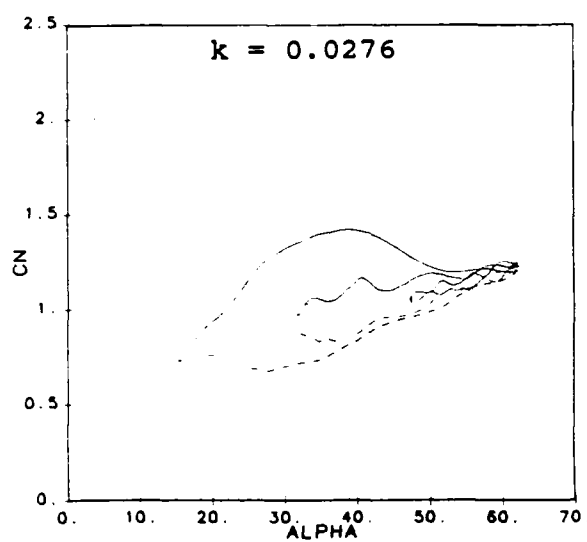
55° Delta, Incidence = 8° to 40°



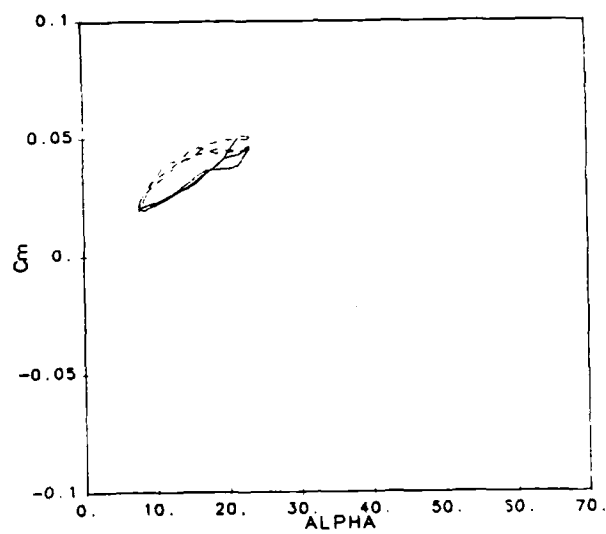
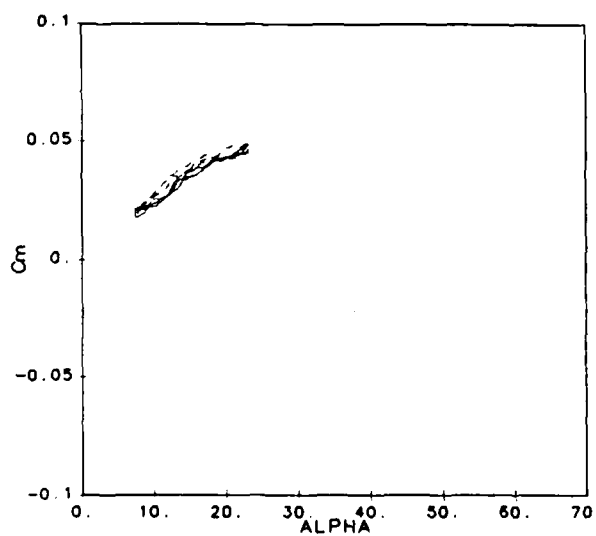
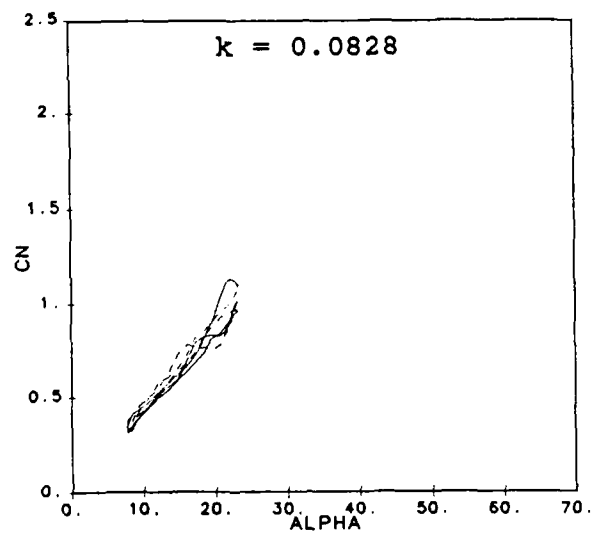
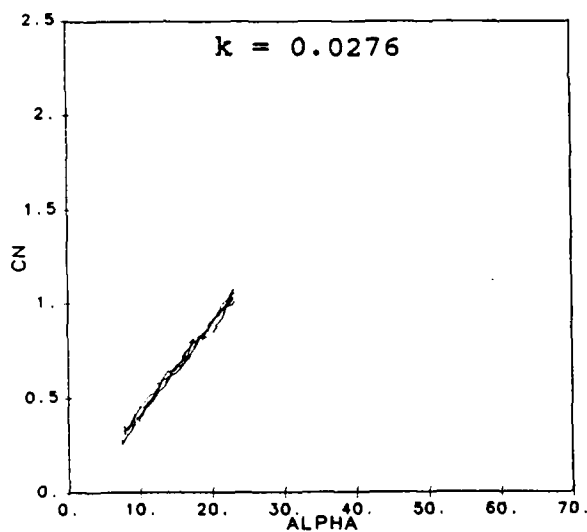
55° Delta, Incidence = 16° to 48°



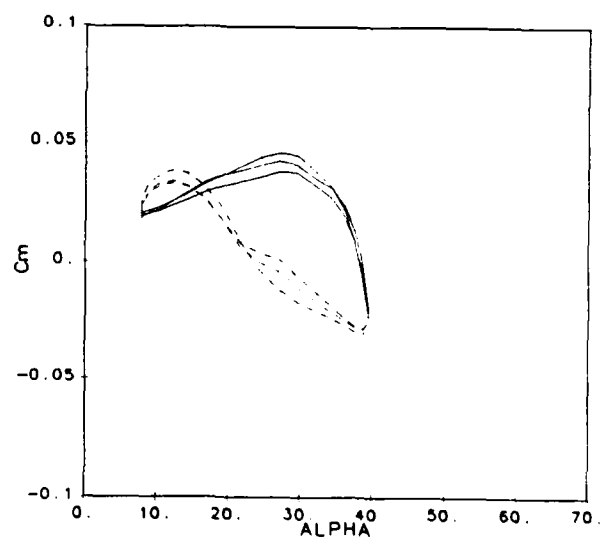
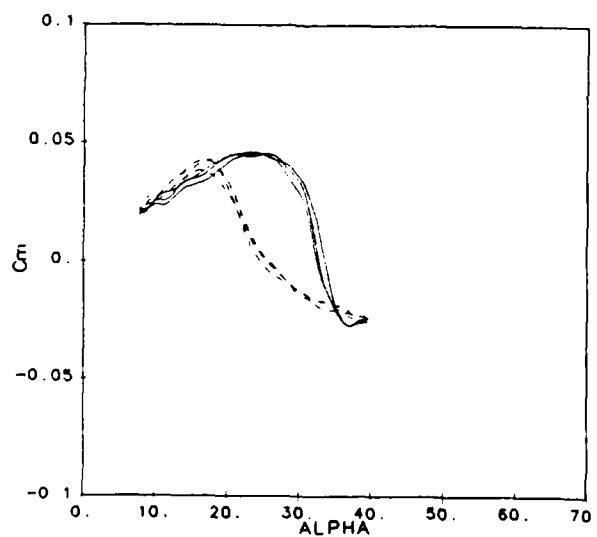
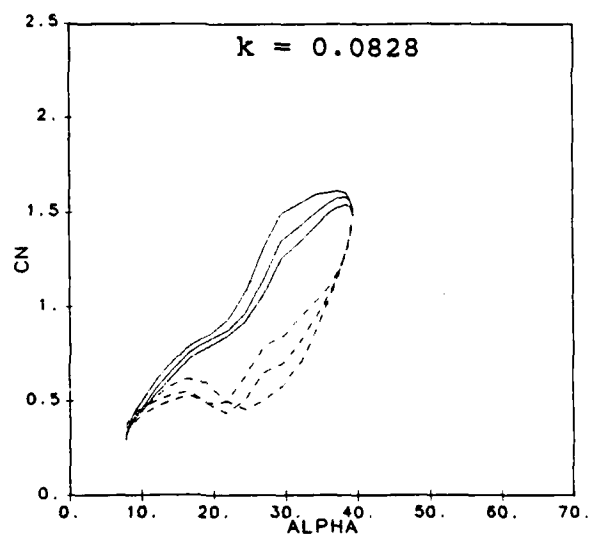
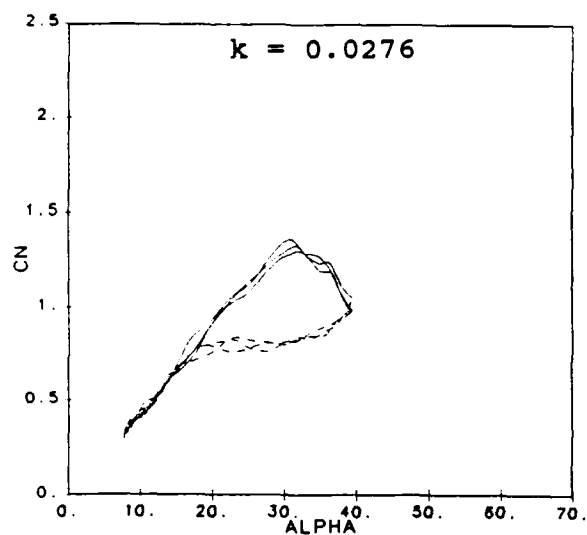
$55^\circ \text{ Delta, Incidence} = 8^\circ \text{ to } 56^\circ$



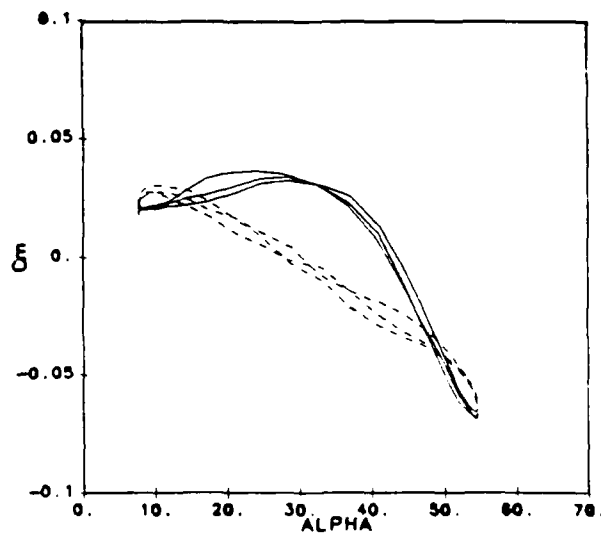
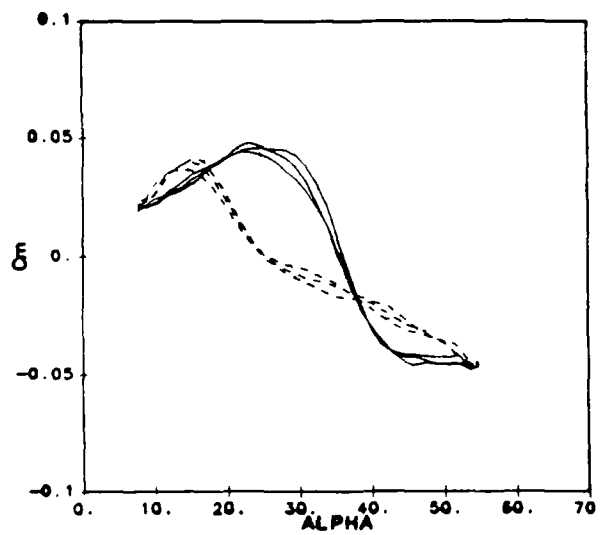
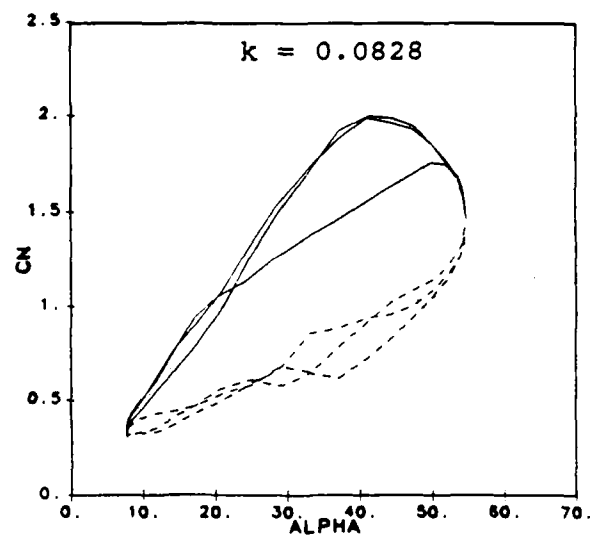
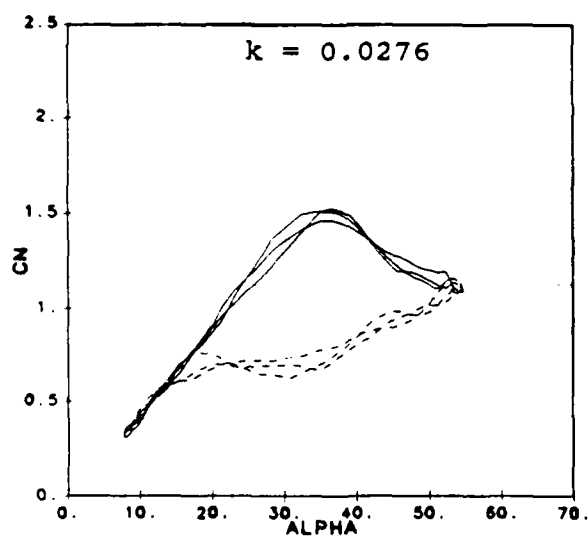
55° Delta, Incidence = 16° to 64°



55° Delta, Incidence = 8° to 24°



55° Delta, Incidence = 8° to 40°



55° Delta, Incidence = 8° to 56°

55 Deg. Delta Static Data
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0000
Alpha Min. = 0 deg.
Alpha Max. = 90 deg.

Time	Alpha	CN	Cm
0.0000	-0.2300	0.0106	0.0129
0.0000	4.6900	0.2144	0.0150
0.0000	9.6100	0.4732	0.0254
0.0000	14.5200	0.6966	0.0367
0.0000	19.4400	0.9427	0.0452
0.0000	24.3600	1.1421	0.0450
0.0000	29.2800	1.0898	-0.0078
0.0000	34.2000	1.0144	-0.0178
0.0000	39.1200	1.0039	-0.0232
0.0000	44.0400	1.0257	-0.0279
0.0000	48.9600	1.0360	-0.0327
0.0000	53.8800	1.0872	-0.0389
0.0000	58.8000	1.1221	-0.0460
0.0000	63.7200	1.1597	-0.0551
0.0000	68.6400	1.1256	-0.0595
0.0000	73.5600	1.1658	-0.0690
0.0000	78.4800	1.1595	-0.0768
0.0000	83.4000	1.1848	-0.0847
0.0000	88.3200	1.1716	-0.0938
0.0000	88.3200	1.1390	-0.0985
0.0000	83.4000	1.1120	-0.0933
0.0000	78.4800	1.0976	-0.0814
0.0000	73.5600	1.0966	-0.0739
0.0000	68.6400	1.1105	-0.0649
0.0000	63.7200	1.1074	-0.0592
0.0000	58.8000	1.0671	-0.0483
0.0000	53.8800	1.0657	-0.0448
0.0000	48.9600	1.0290	-0.0364
0.0000	44.0400	0.9658	-0.0318
0.0000	39.1200	0.9399	-0.0273
0.0000	34.2000	0.9765	-0.0231
0.0000	29.2800	1.0139	-0.0126
0.0000	24.3600	1.1010	0.0401
0.0000	19.4400	0.9401	0.0434
0.0000	14.5200	0.6801	0.0358
0.0000	9.6100	0.4378	0.0226
0.0000	4.6900	0.2077	0.0142
0.0000	-0.2300	-0.0233	0.0107

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 24 deg.

Time	Alpha	CN	Cm
0.0000	7.7000	0.3176	0.0216
2.8090	7.7000	0.3132	0.0204
5.6190	7.8700	0.3113	0.0201
8.4280	9.0200	0.3648	0.0217
11.2380	10.4000	0.4313	0.0243
14.0470	11.6700	0.4916	0.0265
16.8560	12.9900	0.5756	0.0311
19.6660	14.3800	0.6318	0.0345
22.4750	15.7300	0.6769	0.0364
25.2850	17.0300	0.7411	0.0388
28.0940	18.4900	0.8237	0.0422
30.9030	19.8400	0.8841	0.0427
33.7130	21.1700	0.9626	0.0444
36.5220	22.4200	1.0178	0.0455
39.3320	22.9500	1.0408	0.0471
42.1410	21.8300	0.9684	0.0454
44.9500	20.5200	0.8889	0.0444
47.7600	19.1500	0.8375	0.0438
50.5690	17.7500	0.8081	0.0432
53.3790	16.4200	0.7405	0.0414
56.1880	15.0300	0.6580	0.0388
58.9970	13.7000	0.6034	0.0365
61.8070	12.3400	0.5547	0.0341
64.6160	11.0300	0.4846	0.0300
67.4260	9.6700	0.4092	0.0263
70.2350	8.3900	0.3413	0.0224
73.0440	7.8700	0.3299	0.0207
75.8540	7.8700	0.3285	0.0210
78.6630	7.8700	0.3291	0.0213
81.4730	7.8700	0.3281	0.0205
84.2820	7.8600	0.3294	0.0211
87.0910	7.8700	0.3223	0.0205
89.9010	7.8600	0.3283	0.0206
92.7100	7.8600	0.3336	0.0214
95.5200	7.8600	0.3331	0.0211

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 24 deg.

Time	Alpha	CN	Cm
0.0000	7.8200	0.3308	0.0205
1.4060	7.8300	0.3272	0.0212
2.8110	7.8300	0.3237	0.0209
4.2170	7.8300	0.3257	0.0204
5.6220	7.9400	0.3383	0.0204
7.0280	8.6300	0.3708	0.0207
8.4330	10.0600	0.4310	0.0222
9.8390	11.9800	0.5100	0.0253
11.2440	14.5900	0.5963	0.0297
12.6500	17.1300	0.7268	0.0355
14.0550	19.5800	0.8496	0.0400
15.4610	21.4400	0.9415	0.0437
16.8660	22.4600	1.0075	0.0462
18.2720	23.1800	1.0258	0.0473
19.6770	22.7300	0.9979	0.0466
21.0830	21.6700	0.9290	0.0462
22.4880	19.8100	0.8509	0.0459
23.8940	17.3000	0.7718	0.0452
25.2990	14.7400	0.6699	0.0423
26.7050	12.1600	0.5523	0.0377
28.1110	10.2500	0.4674	0.0325
29.5160	8.9300	0.3964	0.0273
30.9220	8.0900	0.3537	0.0236
32.3270	7.8900	0.3403	0.0217
33.7330	7.8800	0.3356	0.0212
35.1380	7.8800	0.3295	0.0208

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	7.8200	0.3099	0.0202
2.8110	7.8200	0.3160	0.0206
5.6220	7.9400	0.3313	0.0208
8.4330	9.0500	0.3840	0.0223
11.2440	10.4400	0.4528	0.0256
14.0550	12.3100	0.5125	0.0279
16.8660	14.3700	0.6278	0.0334
19.6770	16.5900	0.7467	0.0361
22.4880	20.0300	0.9257	0.0433
25.3000	23.2500	1.0595	0.0453
28.1110	26.6600	1.1797	0.0435
30.9220	29.9800	1.3038	0.0331
33.7330	32.3400	1.3073	0.0091
36.5440	34.4300	1.2447	-0.0156
39.3550	36.3600	1.2087	-0.0262
42.1660	37.7100	1.1022	-0.0264
44.9770	39.1100	1.0170	-0.0248
47.7880	38.7200	0.9783	-0.0246
50.5990	37.3700	0.9318	-0.0228
53.4100	35.6900	0.8795	-0.0204
56.2210	33.6300	0.8526	-0.0183
59.0320	31.5400	0.8304	-0.0159
61.8430	28.4900	0.7973	-0.0094
64.6540	25.0900	0.7960	0.0006
67.4650	21.7500	0.8020	0.0194
70.2760	18.4600	0.7744	0.0391
73.0880	15.5900	0.6815	0.0400
75.8990	13.6000	0.5922	0.0359
78.7100	11.5300	0.4804	0.0304
81.5210	10.0200	0.4127	0.0261
84.3320	8.6900	0.3770	0.0245
87.1430	7.8800	0.3380	0.0217
89.9540	7.8800	0.3184	0.0211
92.7650	7.8800	0.3241	0.0210
95.5760	7.8700	0.3305	0.0211

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	7.8000	0.3127	0.0200
1.4320	7.7900	0.3092	0.0200
2.8640	7.8000	0.3067	0.0196
4.2960	7.8000	0.3088	0.0196
5.7280	7.9500	0.3383	0.0197
7.1600	9.1000	0.4244	0.0210
8.5920	12.1600	0.5782	0.0248
10.0240	16.7300	0.7589	0.0320
11.4560	22.0000	0.8839	0.0380
12.8880	26.9500	1.1725	0.0421
14.3200	31.9600	1.4374	0.0356
15.7530	36.1000	1.5515	0.0214
17.1850	38.4500	1.5749	-0.0011
18.6170	39.4100	1.5007	-0.0214
20.0490	38.6900	1.3248	-0.0291
21.4810	36.2300	1.0815	-0.0257
22.9130	32.2000	0.8293	-0.0170
24.3450	26.9900	0.6496	-0.0047
25.7770	21.7100	0.4785	0.0077
27.2090	16.4800	0.5664	0.0288
28.6410	12.4400	0.5067	0.0352
30.0730	9.3900	0.4267	0.0317
31.5050	8.0600	0.3674	0.0258
32.9370	7.8600	0.3389	0.0221
34.3690	7.8600	0.3279	0.0204
35.8010	7.8600	0.3201	0.0193

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.8100	0.3157	0.0201
2.8110	7.8200	0.3166	0.0207
5.6210	7.9500	0.3389	0.0208
8.4320	9.0200	0.3704	0.0212
11.2430	10.5900	0.4422	0.0235
14.0540	12.9200	0.5581	0.0279
16.8640	16.3400	0.7188	0.0349
19.6750	20.2800	0.9037	0.0423
22.4860	24.2600	1.1156	0.0452
25.2970	29.5800	1.3480	0.0376
28.1070	35.1500	1.4995	0.0047
30.9180	40.2100	1.4259	-0.0314
33.7290	43.9900	1.2761	-0.0423
36.5390	47.3900	1.2056	-0.0436
39.3500	50.5300	1.1485	-0.0445
42.1610	52.3700	1.1489	-0.0446
44.9720	53.6400	1.1294	-0.0466
47.7820	54.6400	1.0912	-0.0455
50.5930	53.6100	1.0864	-0.0453
53.4040	52.1700	1.0691	-0.0419
56.2150	49.9200	1.0064	-0.0362
59.0250	46.5500	0.9532	-0.0314
61.8360	43.0000	0.9103	-0.0257
64.6470	38.9700	0.8069	-0.0186
67.4570	33.4800	0.7048	-0.0116
70.2680	28.0400	0.6854	-0.0053
73.0790	23.0500	0.6968	0.0076
75.8900	19.0400	0.7003	0.0282
78.7000	15.3600	0.6303	0.0388
81.5110	12.1800	0.5444	0.0355
84.3220	10.3200	0.4497	0.0287
87.1330	8.9400	0.3757	0.0239
89.9430	7.8700	0.3378	0.0219
92.7540	7.8700	0.3333	0.0208
95.5650	7.8800	0.3230	0.0210

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.7500	0.3212	0.0191
1.4320	7.7600	0.3262	0.0197
2.8650	7.7500	0.3264	0.0201
4.2970	7.7500	0.3343	0.0202
5.7300	7.8600	0.3710	0.0204
7.1620	9.8400	0.4843	0.0213
8.5950	14.3800	0.7263	0.0252
10.0270	20.8400	1.0448	0.0313
11.4600	28.3000	1.4233	0.0344
12.8920	36.9200	1.7509	0.0240
14.3250	44.2400	1.8614	-0.0080
15.7570	49.9200	1.8214	-0.0453
17.1900	53.4900	1.6748	-0.0656
18.6220	54.6500	1.4853	-0.0663
20.0550	53.8700	1.2826	-0.0554
21.4870	50.2400	1.1000	-0.0416
22.9200	44.5200	0.9403	-0.0298
24.3520	37.2000	0.7614	-0.0169
25.7850	28.8800	0.6369	0.0004
27.2170	20.8400	0.5306	0.0153
28.6500	14.6400	0.4105	0.0249
30.0820	10.0300	0.3547	0.0287
31.5150	8.0300	0.3338	0.0258
32.9470	7.7900	0.3222	0.0217
34.3800	7.7800	0.3230	0.0205
35.8120	7.7700	0.3280	0.0204

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 32 deg.

Time	Alpha	CN	Cm
0.0000	15.3800	0.7179	0.0398
2.8110	15.3800	0.7170	0.0394
5.6210	15.5600	0.7439	0.0398
8.4320	16.7500	0.7829	0.0406
11.2430	18.1900	0.8528	0.0429
14.0540	19.5500	0.9164	0.0452
16.8640	20.8700	0.9787	0.0455
19.6750	22.1100	1.0377	0.0468
22.4860	23.5000	1.0798	0.0461
25.2970	24.8400	1.1026	0.0433
28.1070	26.2200	1.1895	0.0440
30.9180	27.5000	1.2077	0.0359
33.7290	28.8400	1.2205	0.0220
36.5390	30.1600	1.2146	0.0015
39.3500	30.8000	1.1549	-0.0137
42.1610	29.5500	0.9997	-0.0143
44.9720	28.1400	0.9198	-0.0102
47.7820	26.8500	0.9084	-0.0047
50.5930	25.5400	0.9179	0.0008
53.4040	24.1500	0.9396	0.0125
56.2150	22.7600	0.9024	0.0246
59.0250	21.4700	0.9050	0.0382
61.8360	20.1800	0.8909	0.0436
64.6470	18.7900	0.8515	0.0436
67.4570	17.4300	0.8137	0.0431
70.2680	16.0900	0.7763	0.0423
73.0790	15.6000	0.7446	0.0403
75.8900	15.6000	0.7383	0.0397
78.7000	15.6000	0.7381	0.0399
81.5110	15.6000	0.7387	0.0395
84.3220	15.5900	0.7410	0.0395
87.1330	15.6000	0.7467	0.0394
89.9430	15.6000	0.7341	0.0395
92.7540	15.6000	0.7479	0.0405
95.5650	15.6000	0.7403	0.0400

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 32 deg.

Time	Alpha	CN	Cm
0.0000	15.4300	0.7171	0.0413
1.4140	15.4300	0.7237	0.0407
2.8270	15.4300	0.7243	0.0403
4.2410	15.4300	0.7315	0.0401
5.6550	15.5600	0.7456	0.0398
7.0680	16.2800	0.7883	0.0396
8.4820	17.7600	0.8536	0.0408
9.8950	19.8100	0.9520	0.0426
11.3090	22.1700	1.0533	0.0438
12.7230	24.7900	1.1691	0.0441
14.1360	27.1300	1.2507	0.0419
15.5500	29.0000	1.3042	0.0379
16.9640	30.1400	1.3233	0.0322
18.3770	30.9800	1.2990	0.0242
19.7910	30.4900	1.2398	0.0146
21.2040	29.4000	1.1282	0.0049
22.6180	27.5400	1.0418	0.0016
24.0320	25.0800	0.9799	0.0066
25.4450	22.4800	0.8698	0.0159
26.8590	19.9700	0.7759	0.0269
28.2730	17.9900	0.7414	0.0355
29.6860	16.5800	0.7187	0.0385
31.1000	15.7600	0.7016	0.0388
32.5130	15.5600	0.7253	0.0398
33.9270	15.5500	0.7404	0.0401
35.3410	15.5600	0.7448	0.0404

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	15.4700	0.7014	0.0396
2.8060	15.4700	0.7208	0.0391
5.6130	15.6000	0.7527	0.0393
8.4190	16.7600	0.7919	0.0406
11.2250	18.2000	0.8457	0.0416
14.0310	20.1600	0.9579	0.0450
16.8380	22.0700	1.0206	0.0440
19.6440	24.2600	1.1309	0.0444
22.4500	27.5800	1.2357	0.0391
25.2570	31.0700	1.3084	0.0233
28.0630	34.4700	1.3485	-0.0054
30.8690	37.8700	1.3143	-0.0295
33.6760	40.2200	1.1906	-0.0331
36.4820	42.1700	1.1192	-0.0330
39.2880	43.9000	1.1006	-0.0340
42.0940	45.1500	1.0706	-0.0355
44.9010	46.4900	1.0356	-0.0349
47.7070	46.1300	1.0162	-0.0344
50.5130	44.8800	1.0015	-0.0330
53.3200	43.3600	0.9324	-0.0284
56.1260	41.5500	0.8875	-0.0245
58.9320	39.5600	0.8921	-0.0223
61.7380	36.3900	0.8358	-0.0184
64.5450	33.0100	0.7643	-0.0136
67.3510	29.5700	0.7556	-0.0095
70.1570	26.2400	0.7501	-0.0054
72.9640	23.4200	0.8019	0.0064
75.7700	21.3900	0.8138	0.0235
78.5760	19.4100	0.8400	0.0384
81.3830	17.8000	0.8021	0.0426
84.1890	16.3700	0.7603	0.0412
86.9950	15.6000	0.7305	0.0394
89.8010	15.6000	0.7330	0.0390
92.6080	15.5900	0.7353	0.0390
95.4140	15.5900	0.7481	0.0404

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	15.4200	0.7395	0.0415
1.4320	15.4200	0.7471	0.0409
2.8640	15.4200	0.7492	0.0401
4.2960	15.4200	0.7450	0.0399
5.7280	15.6200	0.7545	0.0396
7.1600	16.9800	0.8122	0.0383
8.5920	20.2000	0.9537	0.0383
10.0240	24.4500	1.1833	0.0417
11.4560	29.5600	1.5332	0.0426
12.8880	35.0000	1.6105	0.0224
14.3200	40.0500	1.5982	-0.0086
15.7530	43.6900	1.5834	-0.0348
17.1850	45.8500	1.4842	-0.0483
18.6170	46.7000	1.3534	-0.0490
20.0490	46.0100	1.2380	-0.0423
21.4810	43.6700	1.1326	-0.0310
22.9130	39.8900	1.0740	-0.0162
24.3450	34.6700	0.9117	-0.0069
25.7770	29.4600	0.6583	-0.0047
27.2090	24.2300	0.5333	0.0019
28.6410	19.9700	0.5433	0.0112
30.0730	17.0600	0.5861	0.0244
31.5050	15.7500	0.6403	0.0345
32.9370	15.5600	0.6888	0.0386
34.3690	15.5500	0.7182	0.0399
35.8010	15.5500	0.7353	0.0408

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	15.4500	0.7228	0.0397
2.8080	15.4500	0.7412	0.0402
5.6160	15.6200	0.7277	0.0395
8.4240	16.7700	0.7810	0.0412
11.2320	18.3700	0.8728	0.0430
14.0400	20.8300	0.9602	0.0424
16.8480	24.1000	1.1035	0.0430
19.6560	27.8800	1.2662	0.0402
22.4640	32.1000	1.3561	0.0177
25.2720	37.5800	1.4182	-0.0215
28.0800	42.8900	1.3826	-0.0430
30.8880	47.4800	1.2746	-0.0486
33.6950	51.4300	1.2035	-0.0477
36.5030	54.9000	1.1981	-0.0520
39.3110	58.0000	1.2147	-0.0543
42.1190	59.8600	1.1992	-0.0562
44.9270	61.1700	1.1969	-0.0574
47.7350	62.0000	1.2025	-0.0596
50.5430	61.1100	1.1707	-0.0574
53.3510	59.6600	1.1488	-0.0544
56.1590	57.3000	1.1320	-0.0501
58.9670	54.0400	1.0703	-0.0446
61.7750	50.3300	0.9886	-0.0371
64.5830	46.3400	0.9499	-0.0282
67.3910	41.3600	0.8671	-0.0193
70.1990	35.8600	0.7511	-0.0129
73.0070	30.8500	0.7071	-0.0084
75.8150	26.7500	0.6812	-0.0064
78.6230	23.1100	0.7477	0.0014
81.4310	20.0000	0.7575	0.0219
84.2390	18.0500	0.7487	0.0379
87.0470	16.6100	0.7494	0.0416
89.8550	15.5800	0.7274	0.0406
92.6630	15.5800	0.7274	0.0394
95.4710	15.5800	0.7353	0.0392

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	15.4300	0.6991	0.0400
1.4060	15.4300	0.7159	0.0400
2.8110	15.4300	0.7272	0.0398
4.2170	15.4300	0.7350	0.0389
5.6220	15.5600	0.7752	0.0381
7.0280	17.6000	0.8830	0.0370
8.4330	22.0200	1.0717	0.0360
9.8390	28.1600	1.2902	0.0305
11.2440	36.3200	1.4935	0.0127
12.6500	44.3200	1.7232	-0.0149
14.0550	51.5200	1.8180	-0.0512
15.4610	57.1900	1.7537	-0.0742
16.8660	60.8700	1.5744	-0.0800
18.2720	61.9600	1.4146	-0.0731
19.6770	61.3300	1.2715	-0.0625
21.0830	57.7500	1.1391	-0.0504
22.4880	52.0300	0.9757	-0.0384
23.8940	44.7900	0.7586	-0.0272
25.2990	36.7600	0.6908	-0.0108
26.7050	28.9100	0.6259	0.0018
28.1110	22.4000	0.5226	0.0109
29.5160	17.8100	0.4985	0.0196
30.9220	15.7500	0.5690	0.0299
32.3270	15.5100	0.6471	0.0364
33.7330	15.5100	0.6867	0.0386
35.1380	15.5000	0.7005	0.0396

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 24 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	23.5900	1.0310	0.0457
2.8110	23.5900	1.0362	0.0459
5.6220	23.7300	1.0612	0.0449
8.4330	24.9100	1.1242	0.0446
11.2430	26.3400	1.1524	0.0391
14.0540	27.6100	1.1800	0.0314
16.8650	28.9300	1.2046	0.0191
19.6760	30.3100	1.1998	0.0017
22.4870	31.7300	1.1652	-0.0129
25.2980	33.1400	1.1032	-0.0200
28.1080	34.4700	1.0665	-0.0223
30.9190	35.8500	1.0146	-0.0227
33.7300	37.1700	1.0584	-0.0246
36.5410	38.4900	1.0402	-0.0279
39.3520	39.2000	0.9795	-0.0258
42.1630	37.9400	0.9372	-0.0241
44.9730	36.5500	0.9098	-0.0236
47.7840	35.2300	0.8613	-0.0210
50.5950	33.9100	0.8626	-0.0175
53.4060	32.5100	0.8942	-0.0173
56.2170	31.0600	0.8561	-0.0155
59.0280	29.6900	0.8617	-0.0131
61.8380	28.2900	0.8896	-0.0095
64.6490	26.9800	0.8992	-0.0054
67.4600	25.6700	0.8989	0.0005
70.2710	24.3300	0.9112	0.0095
73.0820	23.7900	0.9486	0.0222
75.8930	23.8000	0.9571	0.0300
78.7030	23.7900	0.9986	0.0359
81.5140	23.7900	1.0222	0.0391
84.3250	23.8000	1.0329	0.0395
87.1360	23.7900	1.0297	0.0406
89.9470	23.8000	1.0356	0.0409
92.7580	23.8000	1.0524	0.0421
95.5680	23.8000	1.0382	0.0406

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 24 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	23.6800	1.0688	0.0469
1.4100	23.6800	1.0540	0.0460
2.8190	23.6800	1.0437	0.0445
4.2290	23.6900	1.0458	0.0443
5.6390	23.8000	1.0561	0.0434
7.0490	24.5300	1.0800	0.0410
8.4580	25.9800	1.1339	0.0379
9.8680	27.8500	1.1894	0.0331
11.2780	30.4800	1.2712	0.0253
12.6880	33.2400	1.3998	0.0134
14.0970	35.6100	1.4087	-0.0044
15.5070	37.4300	1.3073	-0.0223
16.9170	38.5500	1.2539	-0.0299
18.3260	39.3900	1.1938	-0.0301
19.7360	38.8900	1.1341	-0.0282
21.1460	37.7500	1.0575	-0.0241
22.5560	35.8800	0.9479	-0.0204
23.9650	33.4100	0.8623	-0.0153
25.3750	30.7800	0.8424	-0.0092
26.7850	28.1600	0.7572	-0.0076
28.1940	26.2300	0.7888	-0.0029
29.6040	24.8100	0.8474	0.0024
31.0140	24.0000	0.8909	0.0089
32.4240	23.7900	0.9093	0.0157
33.8330	23.7900	0.9163	0.0217
35.2430	23.7900	0.9384	0.0266
36.6530	23.7900	0.9657	0.0297

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 24 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	23.6700	1.0793	0.0500
2.8110	23.6700	1.1133	0.0489
5.6220	23.7700	1.1512	0.0490
8.4330	24.9500	1.1780	0.0475
11.2440	26.3600	1.2290	0.0459
14.0550	28.2300	1.2605	0.0381
16.8660	30.2900	1.3378	0.0228
19.6770	32.5300	1.3956	0.0002
22.4880	35.9700	1.3318	-0.0204
25.3000	39.4400	1.2732	-0.0286
28.1110	42.6800	1.2076	-0.0323
30.9220	45.7300	1.1739	-0.0333
33.7330	47.8900	1.1539	-0.0353
36.5440	49.9300	1.1534	-0.0371
39.3550	51.7900	1.1569	-0.0407
42.1660	53.1000	1.1539	-0.0414
44.9770	54.4000	1.1465	-0.0425
47.7880	54.0600	1.1558	-0.0422
50.5990	52.8600	1.1052	-0.0389
53.4100	51.2300	1.0410	-0.0344
56.2210	49.3400	1.0278	-0.0313
59.0320	47.3100	1.0096	-0.0286
61.8430	44.4100	0.9388	-0.0243
64.6540	41.3700	0.9189	-0.0202
67.4650	37.8900	0.8765	-0.0155
70.2760	34.5400	0.8587	-0.0120
73.0880	31.7200	0.8126	-0.0101
75.8990	29.5700	0.8258	-0.0090
78.7100	27.5500	0.8263	-0.0060
81.5210	25.9800	0.8599	-0.0014
84.3320	24.5900	0.9402	0.0083
87.1430	23.7900	0.9831	0.0192
89.9540	23.7800	0.9895	0.0290
92.7650	23.7800	1.0233	0.0359
95.5760	23.7800	1.0583	0.0403

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 24 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	23.6600	1.1271	0.0481
1.4080	23.6600	1.1296	0.0476
2.8150	23.6700	1.1138	0.0465
4.2230	23.6600	1.0984	0.0453
5.6310	23.8100	1.0952	0.0436
7.0380	25.0700	1.1509	0.0397
8.4460	27.9800	1.2810	0.0332
9.8540	32.5500	1.4456	0.0220
11.2620	37.8300	1.6123	0.0030
12.6690	42.9700	1.7396	-0.0220
14.0770	47.5900	1.7304	-0.0432
15.4850	51.4700	1.6193	-0.0539
16.8920	53.7500	1.5240	-0.0565
18.3000	54.6400	1.4236	-0.0539
19.7080	54.0500	1.3012	-0.0484
21.1150	51.7600	1.1625	-0.0400
22.5230	47.8400	0.9808	-0.0309
23.9310	43.1100	0.8474	-0.0200
25.3390	38.0100	0.8441	-0.0084
26.7460	32.8100	0.8020	-0.0020
28.1540	28.4200	0.7383	0.0011
29.5620	25.4000	0.7292	0.0030
30.9690	24.0200	0.7752	0.0040
32.3770	23.7900	0.8454	0.0088
33.7850	23.7900	0.9166	0.0164
35.1920	23.7800	0.9708	0.0220

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 32 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	31.6700	0.9927	-0.0137
2.8110	31.6700	1.0026	-0.0122
5.6210	31.8100	1.0006	-0.0129
8.4320	33.0300	1.0212	-0.0147
11.2430	34.4100	1.0356	-0.0173
14.0540	35.7800	1.0390	-0.0195
16.8640	37.0700	1.0373	-0.0216
19.6750	38.4300	1.0537	-0.0239
22.4860	39.9300	1.0656	-0.0259
25.2970	41.2600	1.0613	-0.0268
28.1070	42.5100	1.0566	-0.0282
30.9180	43.7000	1.0524	-0.0284
33.7290	44.8800	1.0853	-0.0312
36.5390	46.1600	1.0682	-0.0329
39.3500	46.7800	1.0576	-0.0321
42.1610	45.5900	1.0238	-0.0304
44.9720	44.3200	0.9700	-0.0269
47.7820	43.1600	0.9686	-0.0259
50.5930	41.9800	0.9853	-0.0251
53.4040	40.6400	0.9631	-0.0224
56.2150	39.2500	0.9312	-0.0214
59.0250	37.8100	0.9127	-0.0207
61.8360	36.4300	0.9036	-0.0180
64.6470	35.1000	0.8943	-0.0168
67.4570	33.7900	0.9174	-0.0152
70.2680	32.4100	0.9237	-0.0161
73.0790	31.8700	0.9251	-0.0148
75.8900	31.8600	0.9398	-0.0137
78.7000	31.8600	0.9353	-0.0142
81.5110	31.8600	0.9371	-0.0149
84.3220	31.8600	0.9314	-0.0151
87.1330	31.8700	0.9521	-0.0151
89.9430	31.8600	0.9479	-0.0128
92.7540	31.8600	0.9497	-0.0127
95.5650	31.8600	0.9724	-0.0144

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 32 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	31.7500	0.9839	-0.0124
1.4060	31.7500	0.9742	-0.0124
2.8110	31.7500	0.9742	-0.0128
4.2170	31.7500	0.9784	-0.0132
5.6220	31.8600	0.9857	-0.0132
7.0280	32.6000	1.0121	-0.0142
8.4330	34.1200	1.0550	-0.0177
9.8390	36.0300	1.1063	-0.0234
11.2440	38.6100	1.1737	-0.0274
12.6500	41.3300	1.1884	-0.0315
14.0550	43.4900	1.1964	-0.0331
15.4610	45.1300	1.1866	-0.0349
16.8660	46.2200	1.1665	-0.0357
18.2720	46.9600	1.1279	-0.0352
19.6770	46.5200	1.0472	-0.0345
21.0830	45.4800	0.9402	-0.0333
22.4880	43.7600	0.9070	-0.0295
23.8940	41.5800	0.9315	-0.0217
25.2990	38.9300	0.8709	-0.0170
26.7050	36.2900	0.8077	-0.0140
28.1110	34.3300	0.8220	-0.0105
29.5160	32.9600	0.8117	-0.0110
30.9220	32.0800	0.8014	-0.0135
32.3270	31.8600	0.8490	-0.0132
33.7330	31.8600	0.8840	-0.0136
35.1380	31.8500	0.9017	-0.0137
36.5440	31.8600	0.9086	-0.0141

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 32 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	31.7400	0.9757	-0.0128
2.8090	31.7400	0.9728	-0.0128
5.6190	31.8400	0.9704	-0.0137
8.4280	33.0700	1.0406	-0.0141
11.2370	34.4200	1.0565	-0.0170
14.0460	36.3600	1.0435	-0.0208
16.8560	38.3900	1.0973	-0.0251
19.6650	40.7300	1.1671	-0.0283
22.4740	43.8300	1.0974	-0.0331
25.2840	47.0200	1.1397	-0.0355
28.0930	50.2600	1.1882	-0.0417
30.9020	53.4500	1.1650	-0.0444
33.7110	55.6300	1.1690	-0.0466
36.5210	57.6200	1.2261	-0.0499
39.3300	59.5300	1.2315	-0.0526
42.1390	60.8500	1.2237	-0.0545
44.9490	62.0600	1.2265	-0.0554
47.7580	61.8000	1.2276	-0.0547
50.5670	60.6000	1.2011	-0.0540
53.3760	58.9400	1.1958	-0.0517
56.1860	57.0000	1.1456	-0.0464
58.9950	55.0200	1.1020	-0.0424
61.8040	52.1300	1.0855	-0.0381
64.6140	48.9200	0.9957	-0.0308
67.4230	45.5600	0.9617	-0.0257
70.2320	42.5500	0.9453	-0.0217
73.0410	39.8700	0.8680	-0.0188
75.8510	37.6900	0.8250	-0.0176
78.6600	35.6800	0.8415	-0.0147
81.4690	34.0800	0.8480	-0.0152
84.2790	32.7000	0.8676	-0.0133
87.0880	31.8500	0.8961	-0.0136
89.8970	31.8500	0.9341	-0.0136
92.7060	31.8500	0.9607	-0.0130
95.5160	31.8400	0.9644	-0.0146

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 32 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	31.7300	0.9862	-0.0128
1.4100	31.7300	0.9782	-0.0122
2.8190	31.7300	0.9784	-0.0120
4.2290	31.7300	0.9905	-0.0131
5.6380	31.8500	1.0052	-0.0155
7.0480	33.2400	1.0461	-0.0196
8.4570	36.2200	1.1352	-0.0266
9.8670	40.7900	1.2437	-0.0354
11.2770	45.5000	1.2971	-0.0445
12.6860	50.5700	1.3677	-0.0510
14.0960	55.3100	1.4013	-0.0586
15.5050	59.1800	1.3828	-0.0638
16.9150	61.5000	1.3547	-0.0649
18.3250	62.2600	1.3140	-0.0624
19.7340	61.8000	1.2545	-0.0575
21.1440	59.5000	1.1692	-0.0512
22.5530	55.5500	1.0421	-0.0437
23.9630	50.7500	0.9568	-0.0337
25.3720	45.6800	0.8625	-0.0247
26.7820	40.9200	0.8457	-0.0147
28.1920	36.5100	0.8140	-0.0103
29.6010	33.5500	0.7976	-0.0091
31.0110	32.1000	0.8167	-0.0106
32.4200	31.8700	0.8411	-0.0124
33.8300	31.8600	0.8583	-0.0139
35.2390	31.8700	0.8844	-0.0142
36.6490	31.8500	0.9203	-0.0143

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 40 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	39.8100	0.9928	-0.0234
2.8110	39.8200	0.9755	-0.0219
5.6220	39.9600	0.9911	-0.0222
8.4330	41.1600	1.0181	-0.0242
11.2440	42.4000	1.0246	-0.0274
14.0550	43.6200	1.0357	-0.0298
16.8660	44.8000	1.0486	-0.0317
19.6770	46.0700	1.0635	-0.0324
22.4880	47.4300	1.0752	-0.0326
25.3000	48.7400	1.0794	-0.0347
28.1110	50.0400	1.1061	-0.0361
30.9220	51.3300	1.1150	-0.0371
33.7330	52.6100	1.1421	-0.0397
36.5440	53.8700	1.1570	-0.0412
39.3550	54.4700	1.1613	-0.0420
42.1660	53.3300	1.1064	-0.0399
44.9770	52.0500	1.0715	-0.0376
47.7880	50.7900	1.0503	-0.0350
50.5990	49.5300	1.0344	-0.0316
53.4100	48.1200	1.0374	-0.0296
56.2210	46.8300	1.0032	-0.0293
59.0320	45.4900	0.9818	-0.0277
61.8430	44.2300	0.9802	-0.0259
64.6540	43.0600	0.9670	-0.0243
67.4650	41.8600	0.9586	-0.0234
70.2760	40.5400	0.9247	-0.0238
73.0880	40.0300	0.9547	-0.0226
75.8990	40.0300	0.9508	-0.0209
78.7100	40.0300	0.9613	-0.0219
81.5210	40.0300	0.9665	-0.0218
84.3320	40.0300	0.9727	-0.0231
87.1430	40.0300	0.9650	-0.0228
89.9540	40.0300	0.9797	-0.0226
92.7650	40.0300	0.9884	-0.0228
95.5760	40.0300	0.9720	-0.0228

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 40 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	39.9000	0.9715	-0.0222
1.4080	39.9100	0.9616	-0.0223
2.8160	39.9100	0.9556	-0.0217
4.2240	39.9100	0.9519	-0.0215
5.6310	40.0100	0.9633	-0.0223
7.0390	40.7500	0.9946	-0.0243
8.4470	42.1300	1.0402	-0.0275
9.8550	43.8700	1.0743	-0.0305
11.2630	46.2700	1.0974	-0.0337
12.6710	48.8100	1.1310	-0.0366
14.0780	51.0700	1.1709	-0.0409
15.4860	52.8500	1.1941	-0.0451
16.8940	53.9200	1.1912	-0.0465
18.3020	54.6400	1.1730	-0.0456
19.7100	54.2100	1.1495	-0.0428
21.1180	53.1800	1.1212	-0.0391
22.5250	51.3900	1.0696	-0.0356
23.9330	49.1200	1.0173	-0.0325
25.3410	46.5100	0.9754	-0.0284
26.7490	44.0800	0.9543	-0.0241
28.1570	42.3600	0.9197	-0.0215
29.5650	41.0600	0.9091	-0.0189
30.9730	40.2200	0.9253	-0.0183
32.3800	40.0300	0.9373	-0.0192
33.7880	40.0200	0.9471	-0.0203
35.1960	40.0200	0.9514	-0.0209
36.6040	40.0200	0.9464	-0.0213

55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 48 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	47.3600	1.0475	-0.0301
2.8110	47.3600	1.0455	-0.0315
5.6220	47.4900	1.0685	-0.0324
8.4330	48.6700	1.0899	-0.0354
11.2430	49.9800	1.0865	-0.0365
14.0540	51.2500	1.1330	-0.0400
16.8650	52.5300	1.1360	-0.0407
19.6760	53.8000	1.1305	-0.0417
22.4870	55.1000	1.1619	-0.0443
25.2980	56.4500	1.1875	-0.0461
28.1080	57.7300	1.1738	-0.0474
30.9190	59.0100	1.2310	-0.0507
33.7300	60.3200	1.2523	-0.0537
36.5410	61.6000	1.2414	-0.0546
39.3520	62.0900	1.2442	-0.0569
42.1630	61.0900	1.2195	-0.0542
44.9730	59.8100	1.1587	-0.0495
47.7840	58.5200	1.1485	-0.0484
50.5950	57.2000	1.1592	-0.0470
53.4060	55.8300	1.1123	-0.0435
56.2170	54.5800	1.1076	-0.0412
59.0280	53.2400	1.1063	-0.0394
61.8380	51.9500	1.0829	-0.0367
64.6490	50.6800	1.0876	-0.0361
67.4600	49.4300	1.0737	-0.0346
70.2710	48.0400	1.0371	-0.0321
73.0820	47.5300	1.0341	-0.0320
75.8930	47.5400	1.0522	-0.0325
78.7030	47.5400	1.0491	-0.0314
81.5140	47.5300	1.0522	-0.0320
84.3250	47.5300	1.0533	-0.0328
87.1360	47.5300	1.0524	-0.0332
89.9470	47.5300	1.0385	-0.0327
92.7580	47.5300	1.0505	-0.0328
95.5680	47.5300	1.0696	-0.0335

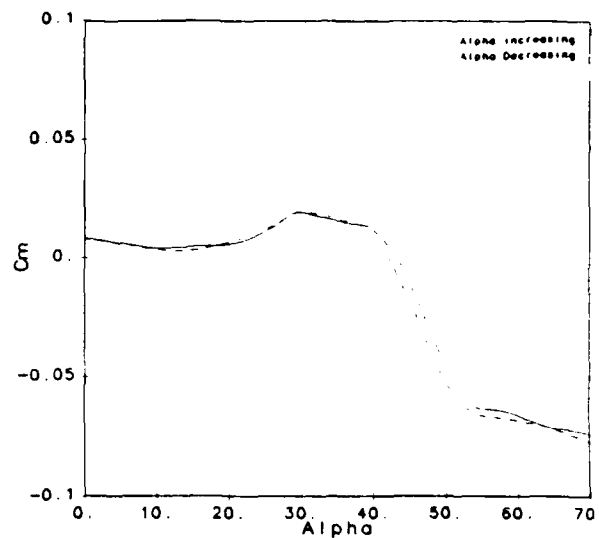
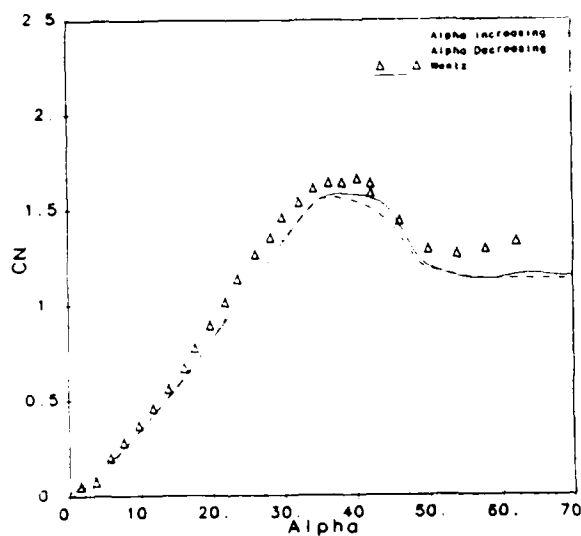
55 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 48 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	47.4500	1.0466	-0.0327
1.4080	47.4400	1.0456	-0.0324
2.8150	47.4400	1.0527	-0.0325
4.2230	47.4400	1.0507	-0.0334
5.6310	47.5300	1.0414	-0.0345
7.0380	48.2500	1.0422	-0.0357
8.4460	49.6500	1.0853	-0.0381
9.8540	51.5200	1.1210	-0.0414
11.2620	53.9900	1.1473	-0.0453
12.6690	56.5100	1.2183	-0.0493
14.0770	58.7700	1.2327	-0.0533
15.4850	60.5700	1.1995	-0.0572
16.8920	61.6400	1.2088	-0.0572
18.3000	62.2200	1.2242	-0.0571
19.7080	61.8900	1.2238	-0.0552
21.1150	60.9300	1.1995	-0.0527
22.5230	59.1400	1.1595	-0.0502
23.9310	56.8000	1.1158	-0.0468
25.3390	54.2600	1.1196	-0.0407
26.7460	51.8000	1.0888	-0.0362
28.1540	49.9100	1.0566	-0.0333
29.5620	48.6100	1.0502	-0.0316
30.9690	47.7000	1.0365	-0.0307
32.3770	47.5300	1.0311	-0.0306
33.7850	47.5300	1.0354	-0.0313
35.1920	47.5200	1.0428	-0.0322
36.6000	47.5200	1.0492	-0.0327

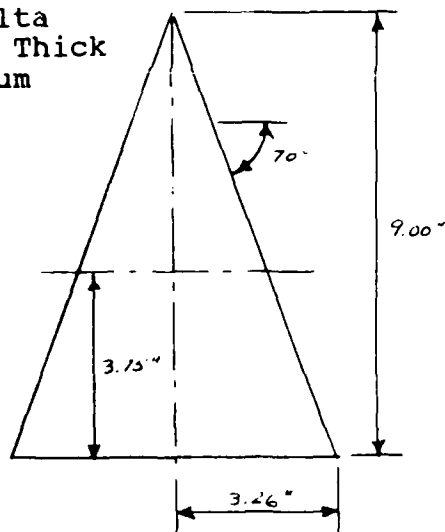
APPENDIX C

PLOTS AND LISTINGS OF THE HFF FORCE AND
MOMENT DATA FOR THE FULL-SPAN 70° DELTA WING MODEL

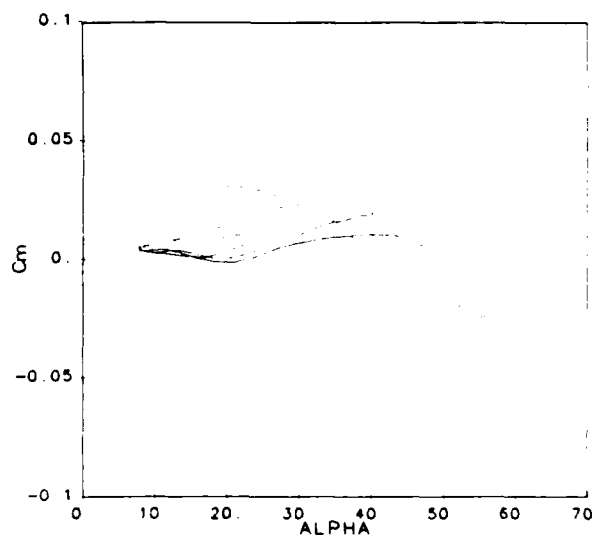
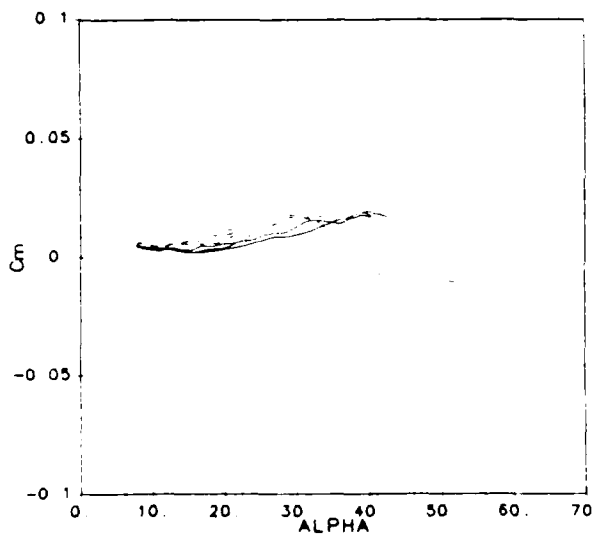
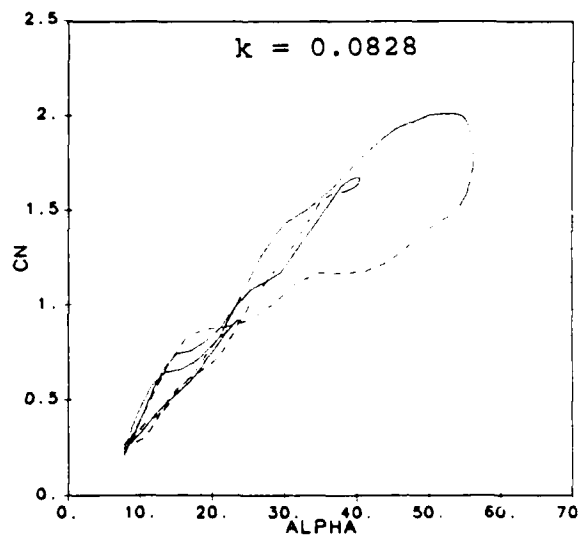
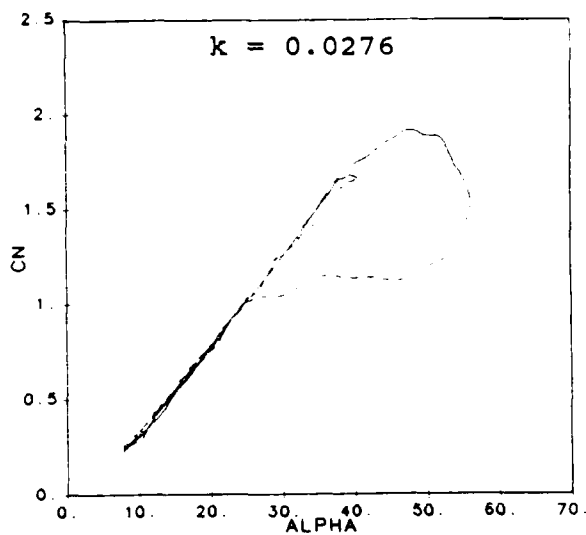


70° Delta
0.060" Thick
Aluminum

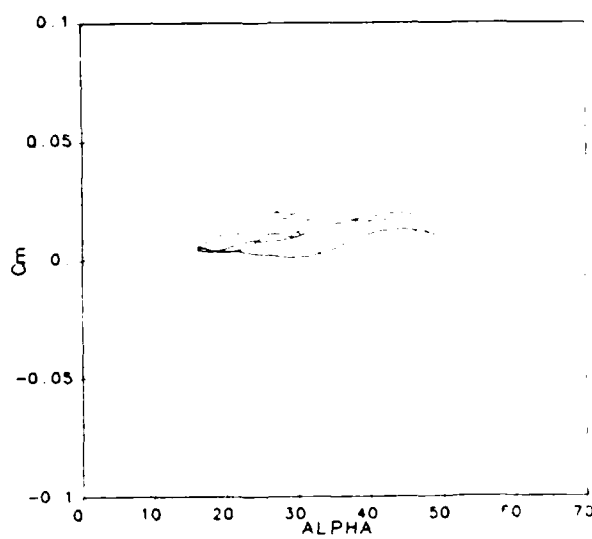
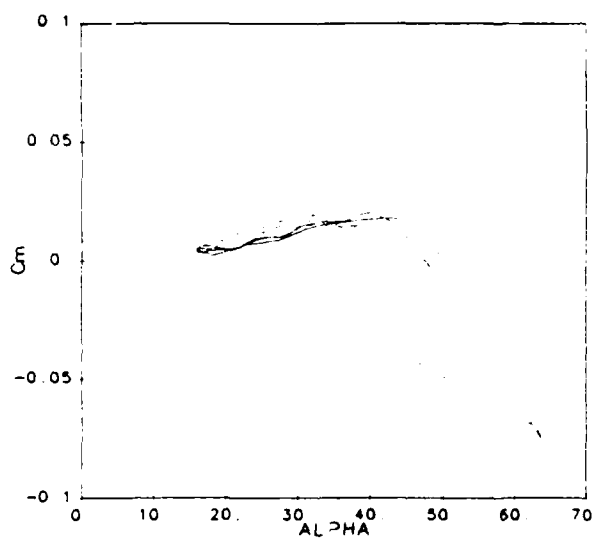
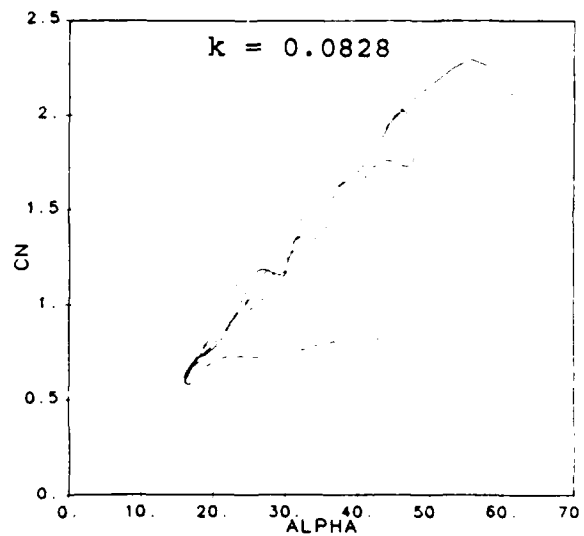
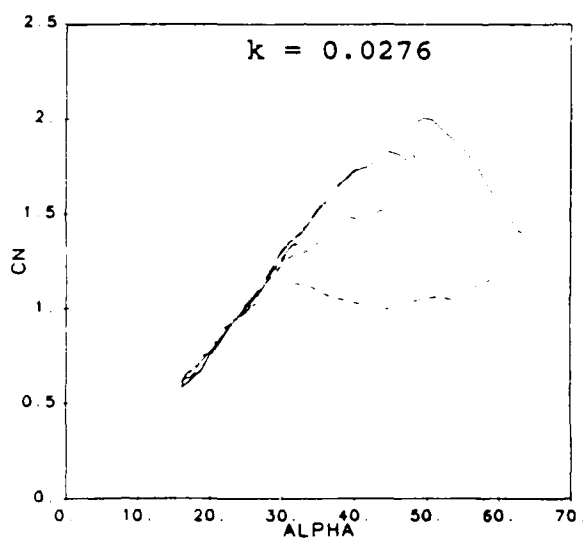
- o All Leading Edges Rounded, All Side and Trailing Edges Left Square



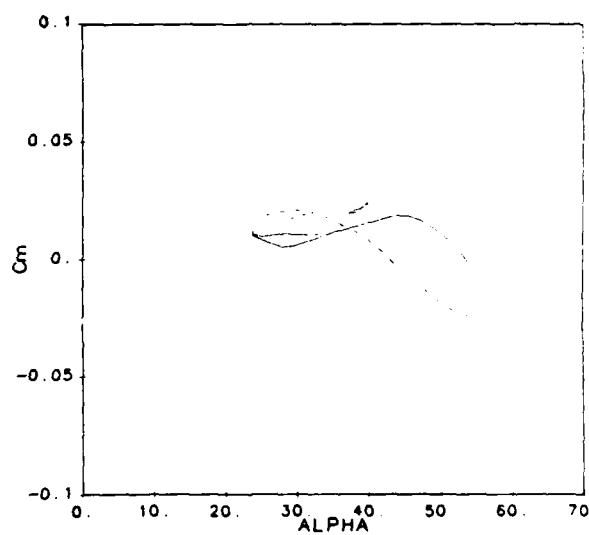
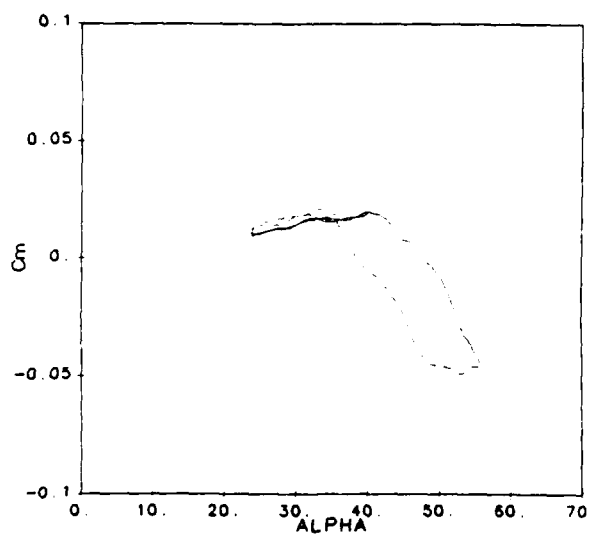
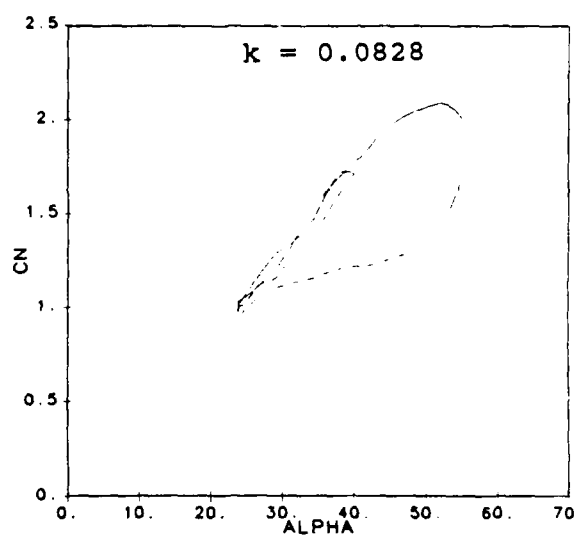
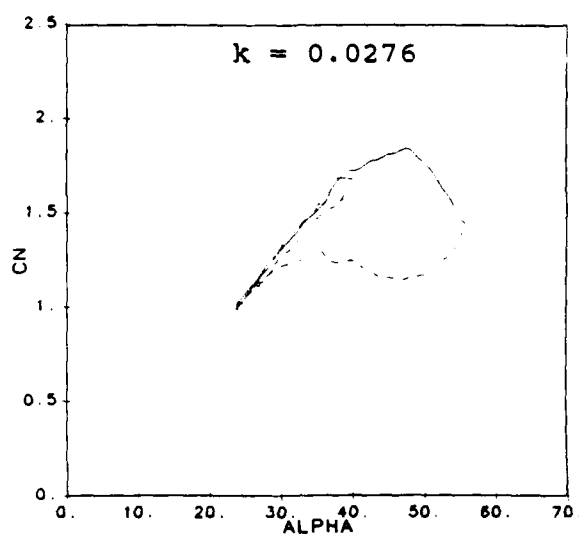
70° Delta, Steady



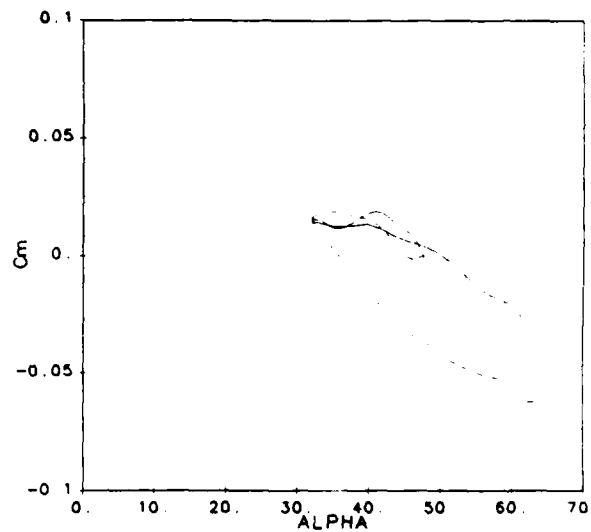
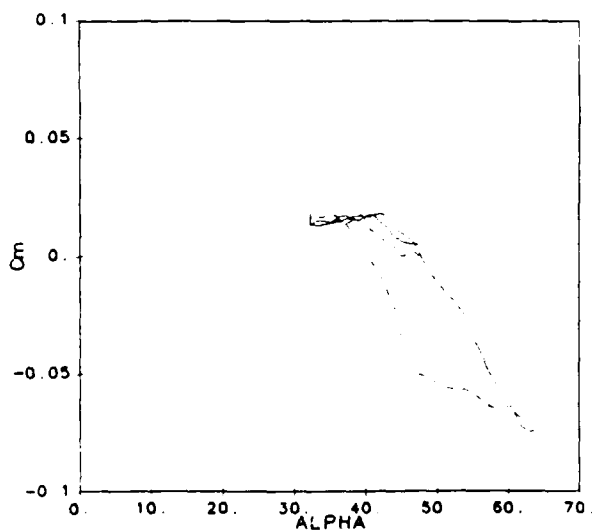
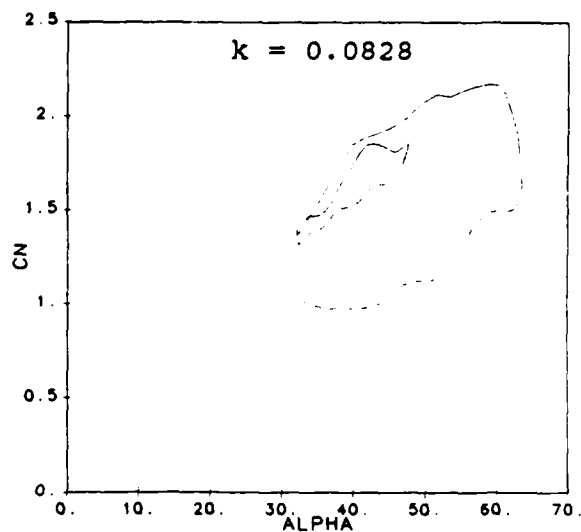
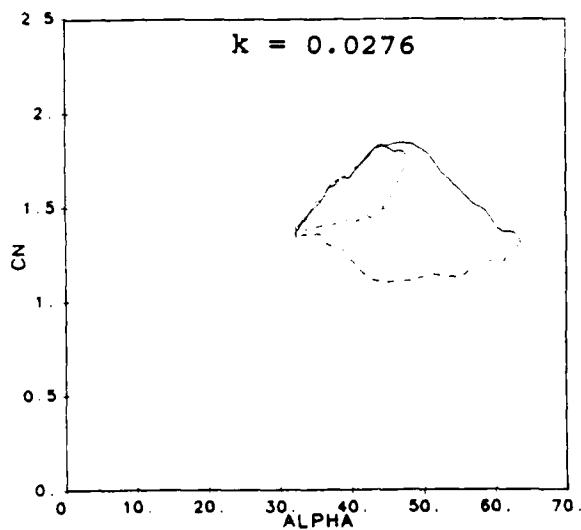
70° Delta, Incidence = 8° to 56°



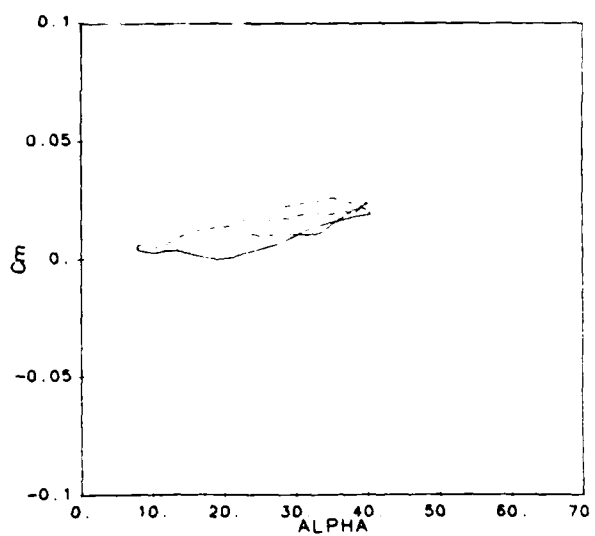
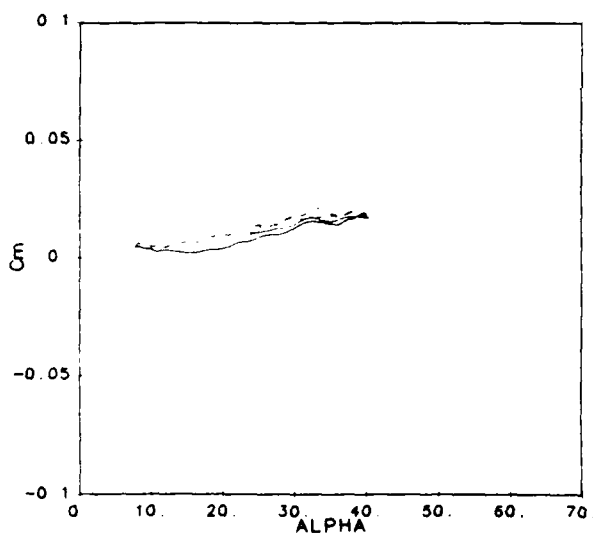
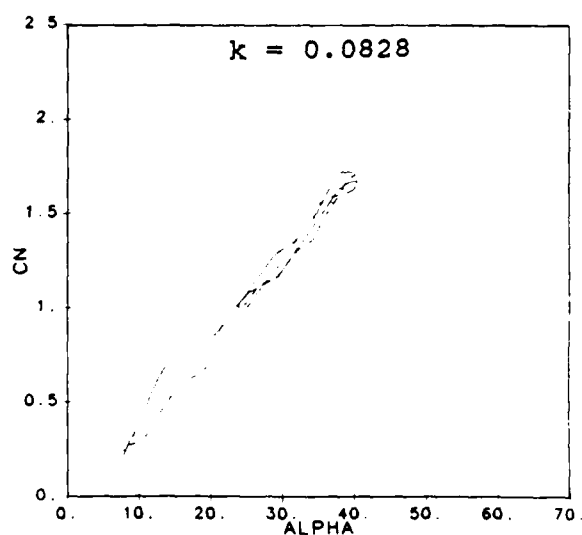
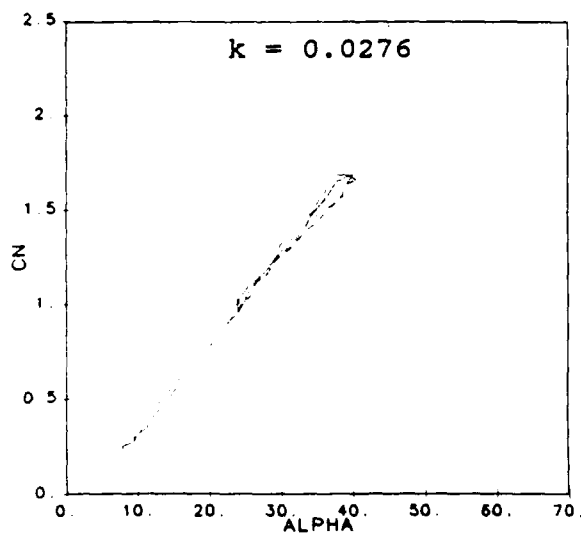
70° Delta, Incidence = 16° to 64°



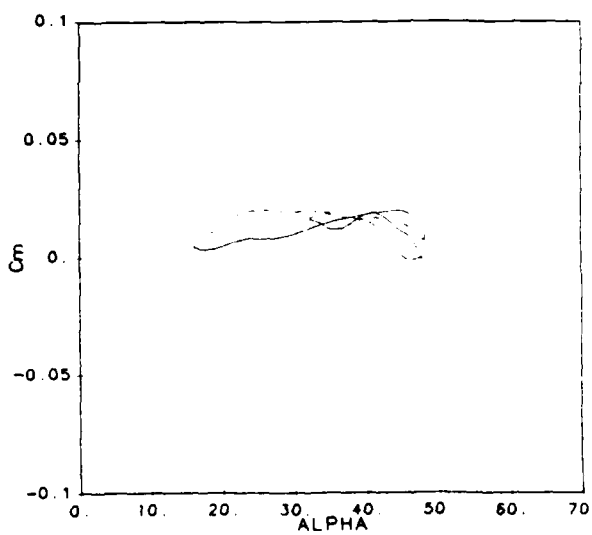
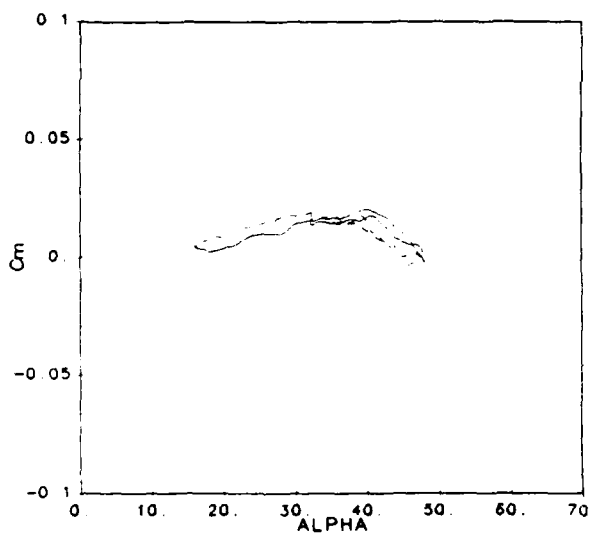
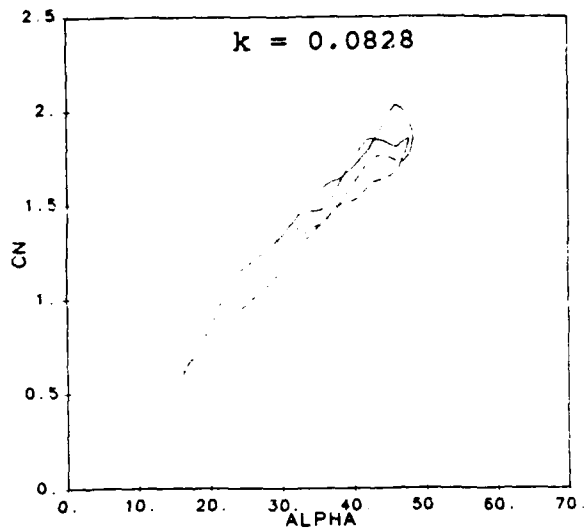
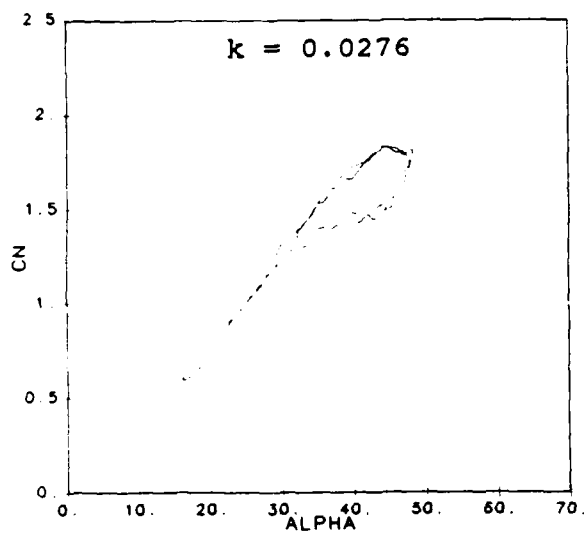
70° Delta, Incidence = 24° to 56°



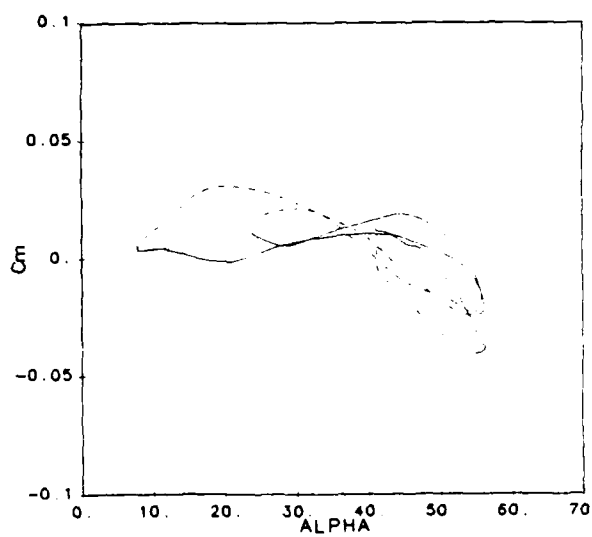
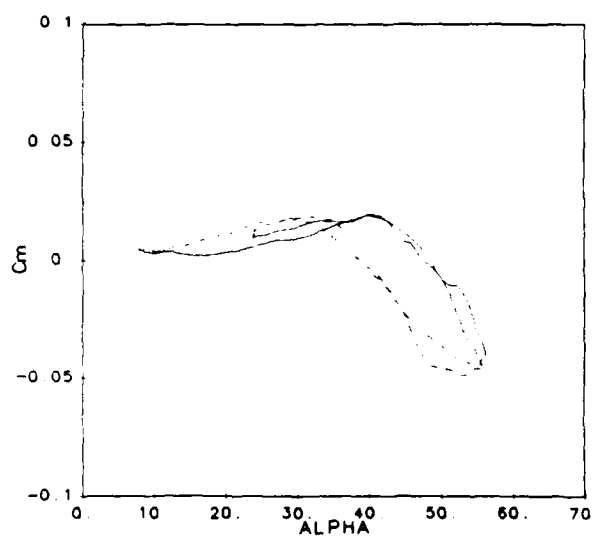
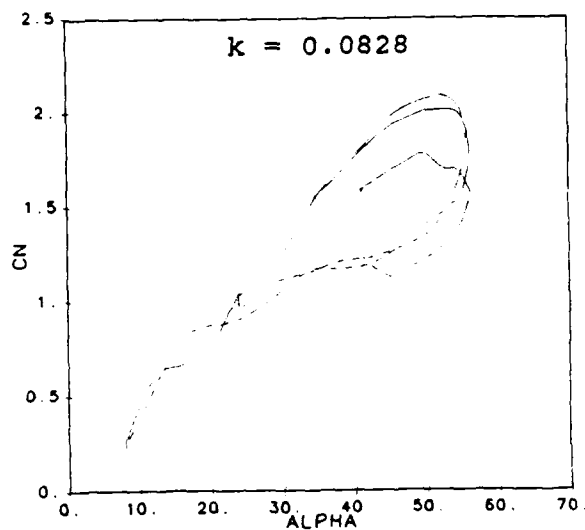
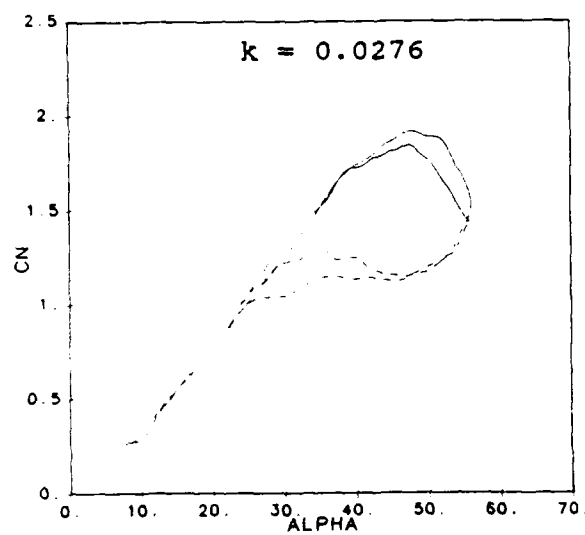
70° Delta, Incidence = 32° to 64°



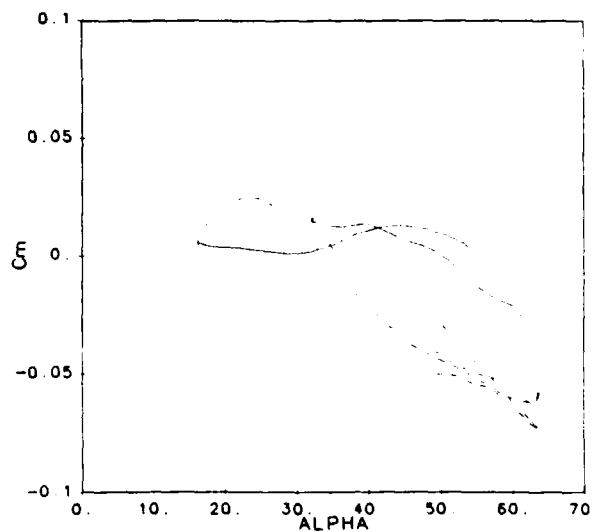
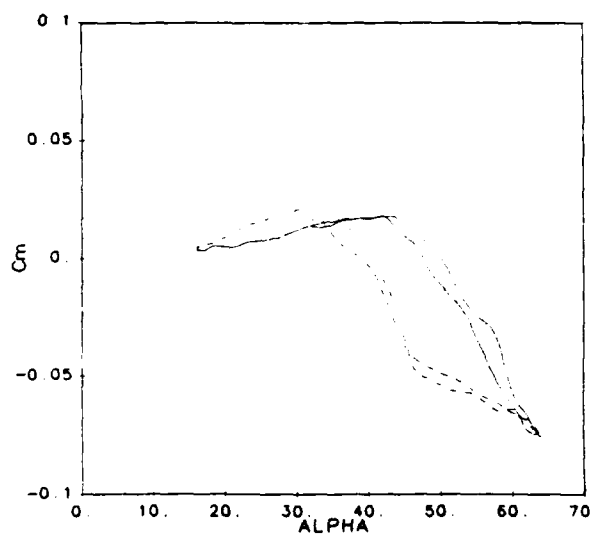
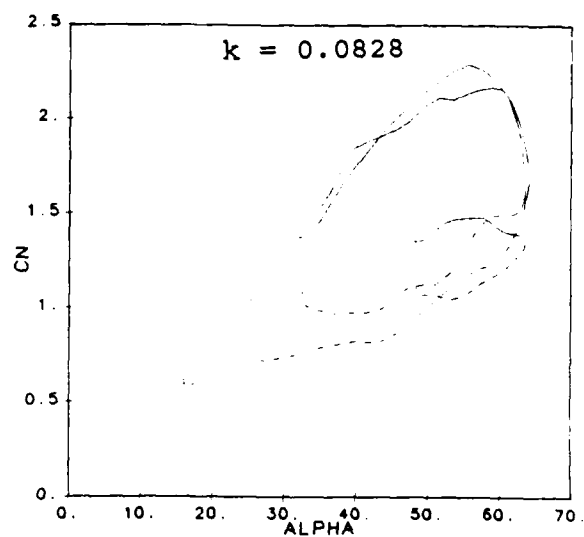
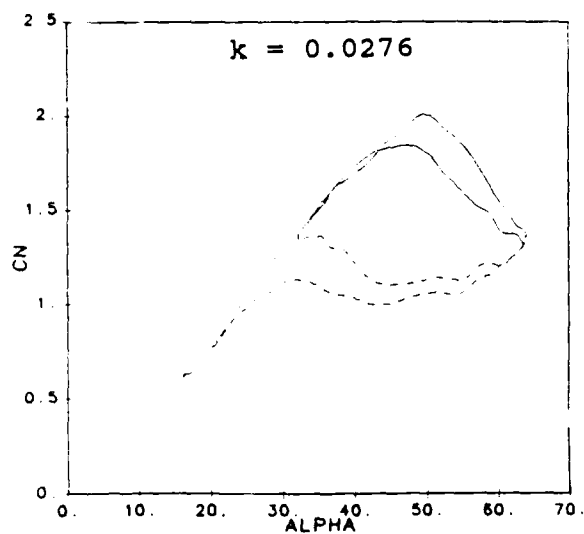
70° Delta, Incidence = 8° to 24°



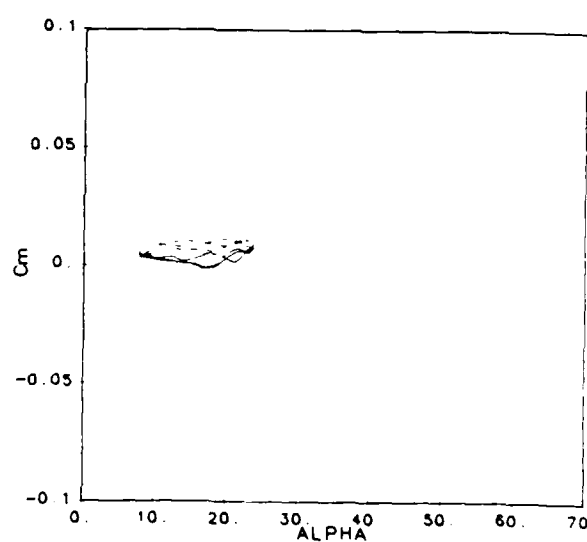
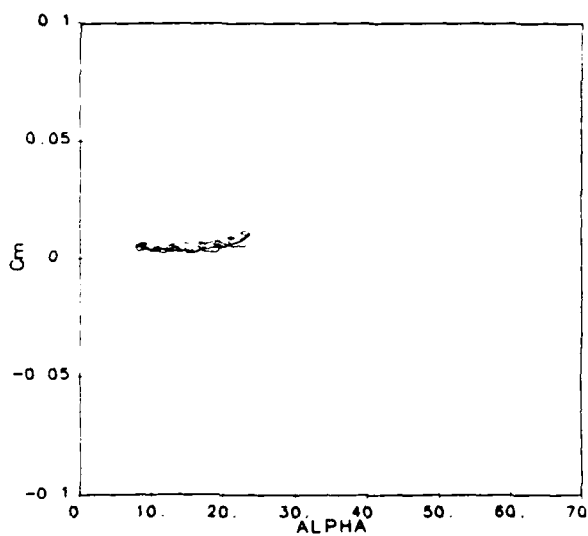
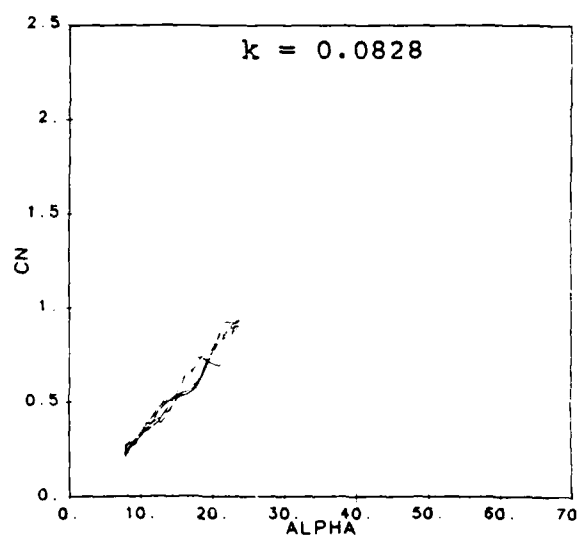
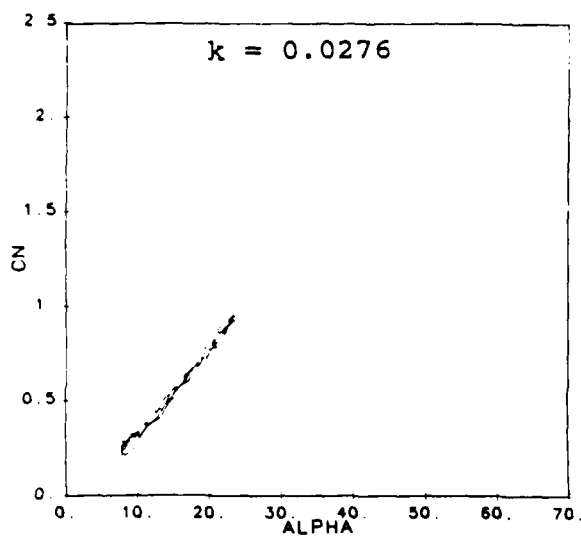
70° Delta, Incidence = 16° to 48°



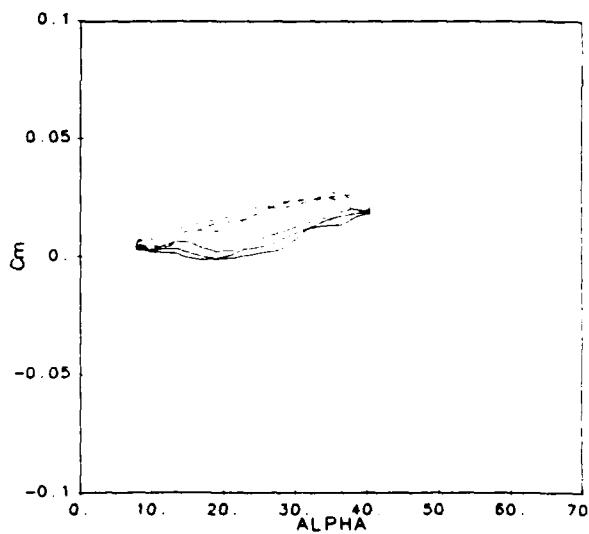
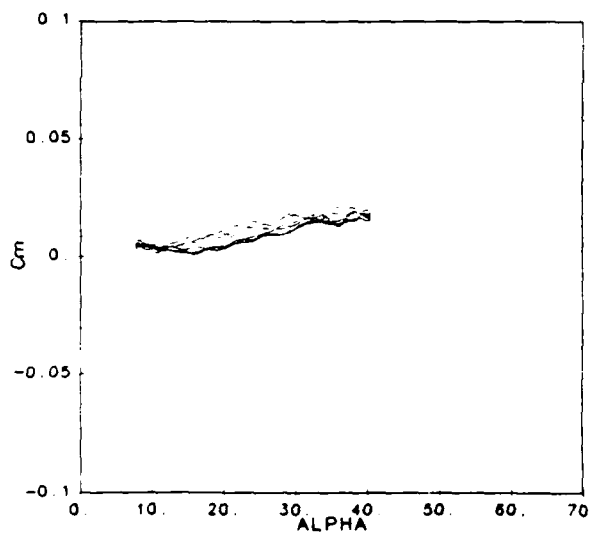
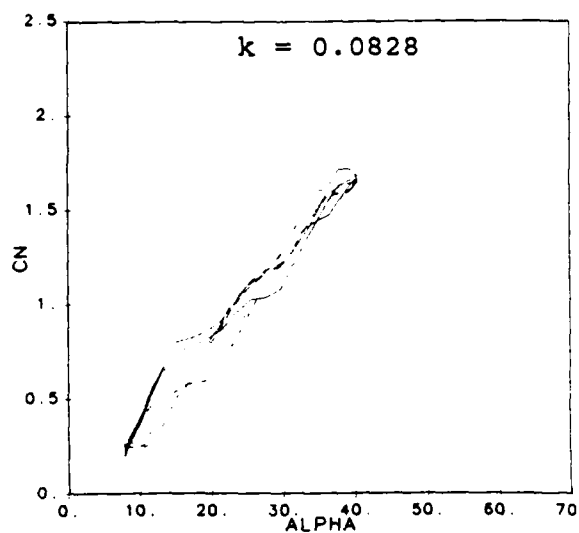
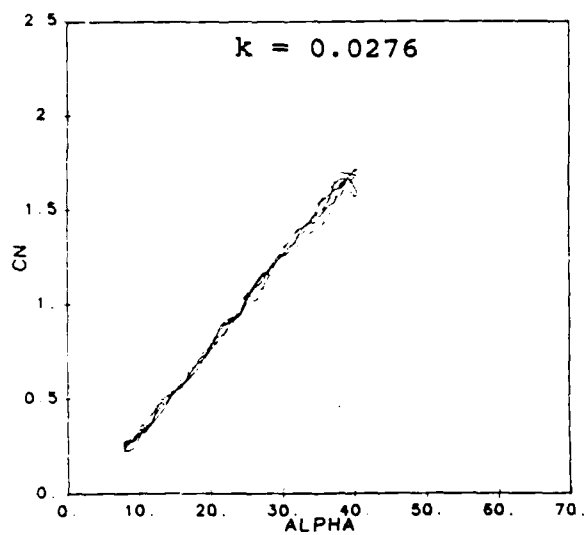
70° Delta, Incidence = 8° to 56°



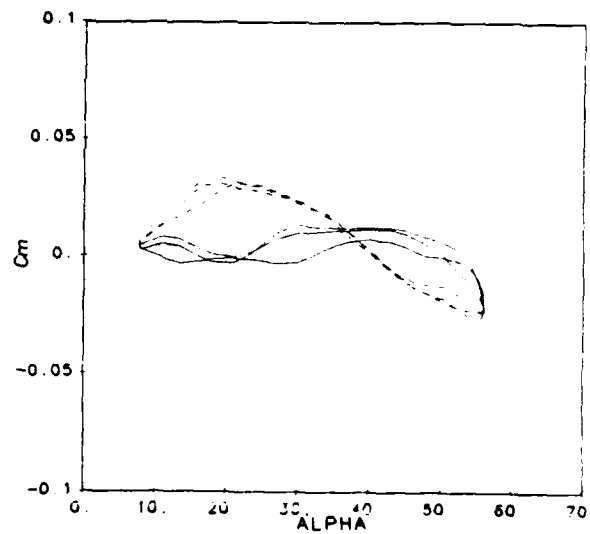
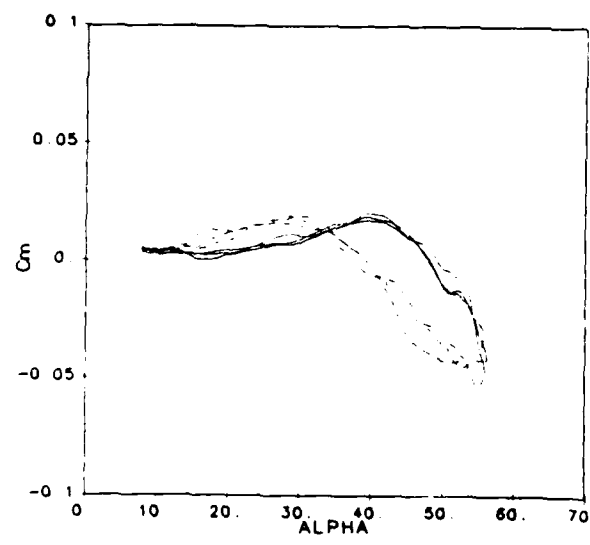
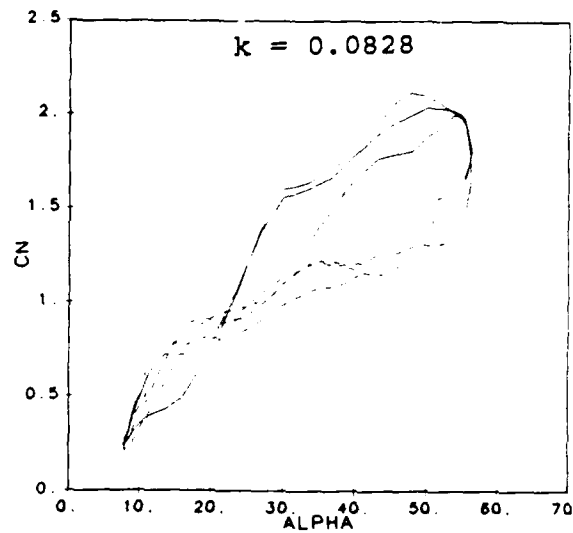
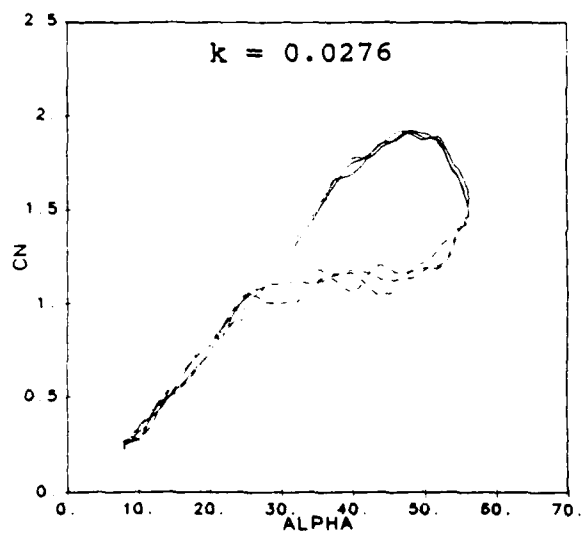
70° Delta, Incidence = 16° to 64°



70° Delta, Incidence = 8° to 40°



70° Delta, Incidence = 8° to 40°



70° Delta, Incidence = 8° to 56°

70 Deg. Delta Static Data
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0000
Alpha Min. = 0 deg.
Alpha Max. = 90 deg.

Time	Alpha	CN	Cm
0.0000	-0.0800	0.0130	0.0087
0.0000	4.8500	0.1519	0.0063
0.0000	9.7700	0.3383	0.0040
0.0000	14.6900	0.5528	0.0046
0.0000	19.6200	0.8035	0.0055
0.0000	24.5400	1.0532	0.0104
0.0000	29.4700	1.3064	0.0197
0.0000	34.3900	1.5382	0.0161
0.0000	39.3100	1.5800	0.0133
0.0000	44.2400	1.5130	-0.0049
0.0000	49.1600	1.2279	-0.0392
0.0000	54.0900	1.1481	-0.0625
0.0000	59.0100	1.1364	-0.0650
0.0000	63.9300	1.1643	-0.0708
0.0000	68.8600	1.1483	-0.0731
0.0000	73.7800	1.1532	-0.0777
0.0000	78.7100	1.1596	-0.0837
0.0000	83.6300	1.1365	-0.0879
0.0000	88.5500	1.1188	-0.0982
0.0000	88.5500	1.1057	-0.1003
0.0000	83.6300	1.1037	-0.0941
0.0000	78.7100	1.1123	-0.0874
0.0000	73.7800	1.1293	-0.0822
0.0000	68.8600	1.1370	-0.0758
0.0000	63.9300	1.1354	-0.0709
0.0000	59.0100	1.1354	-0.0678
0.0000	54.0900	1.1527	-0.0657
0.0000	49.1600	1.2085	-0.0476
0.0000	44.2400	1.4417	-0.0120
0.0000	39.3100	1.5492	0.0122
0.0000	34.3900	1.5413	0.0171
0.0000	29.4700	1.3266	0.0193
0.0000	24.5400	1.0925	0.0115
0.0000	19.6200	0.7999	0.0064
0.0000	14.6900	0.5447	0.0030
0.0000	9.7700	0.3432	0.0036
0.0000	4.8500	0.1318	0.0062
0.0000	-0.0800	-0.0182	0.0083

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 24 deg.

Time	Alpha	CN	Cm
0.0000	7.9100	0.2321	0.0054
2.8090	7.9100	0.2405	0.0057
5.6180	8.0300	0.2406	0.0047
8.4280	9.1200	0.2784	0.0043
11.2370	10.5600	0.3198	0.0032
14.0460	11.8700	0.3778	0.0034
16.8550	13.2500	0.4272	0.0037
19.6650	14.6700	0.5114	0.0031
22.4740	16.0400	0.5795	0.0035
25.2830	17.4000	0.6577	0.0046
28.0920	18.8800	0.7226	0.0048
30.9010	20.2900	0.7740	0.0055
33.7110	21.6400	0.8367	0.0060
36.5200	22.9200	0.9210	0.0072
39.3290	23.4800	0.9466	0.0101
42.1380	22.3100	0.8921	0.0099
44.9480	20.9700	0.8329	0.0085
47.7570	19.5500	0.7534	0.0065
50.5660	18.1500	0.6976	0.0057
53.3750	16.7400	0.6304	0.0057
56.1840	15.3400	0.5632	0.0054
58.9940	13.9700	0.5024	0.0056
61.8030	12.5600	0.4390	0.0054
64.6120	11.2000	0.3743	0.0046
67.4210	9.8400	0.3230	0.0048
70.2300	8.5100	0.2815	0.0060
73.0400	7.9800	0.2499	0.0048
75.8490	7.9800	0.2473	0.0050
78.6580	7.9800	0.2396	0.0049
81.4670	7.9800	0.2411	0.0048
84.2770	7.9800	0.2419	0.0049
87.0860	7.9700	0.2463	0.0048
89.8950	7.9700	0.2576	0.0051
92.7040	7.9800	0.2522	0.0053
95.5130	7.9700	0.2419	0.0053
98.3230	7.9700	0.2428	0.0047
101.1320	7.9700	0.2322	0.0047
103.9410	7.9700	0.2407	0.0051
106.7500	7.9700	0.2473	0.0048
109.5600	7.9700	0.2477	0.0048
112.3690	7.9700	0.2445	0.0046
115.1780	7.9700	0.2512	0.0044
117.9870	7.9700	0.2344	0.0047
120.7960	7.9700	0.2354	0.0052
123.6060	7.9800	0.2384	0.0042

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 24 deg.

Time	Alpha	CN	Cm
0.0000	7.8900	0.2310	0.0053
1.4250	7.8900	0.2288	0.0048
2.8490	7.8900	0.2281	0.0045
4.2740	7.8900	0.2298	0.0044
5.6980	8.0100	0.2405	0.0041
7.1230	8.5500	0.2671	0.0037
8.5470	9.4900	0.3034	0.0031
9.9720	10.8700	0.3623	0.0024
11.3960	12.5700	0.4393	0.0022
12.8210	14.4700	0.5129	0.0013
14.2450	16.5500	0.5844	0.0007
15.6700	18.5000	0.6726	0.0021
17.0940	20.2500	0.7662	0.0041
18.5190	21.7100	0.8434	0.0054
19.9440	22.6500	0.8827	0.0060
21.3680	23.3500	0.9165	0.0073
22.7930	23.6300	0.9205	0.0091
24.2170	23.0800	0.9030	0.0098
25.6420	22.1300	0.8663	0.0100
27.0660	20.6900	0.8103	0.0098
28.4910	18.9500	0.7263	0.0087
29.9150	16.9800	0.6280	0.0081
31.3400	14.9100	0.5349	0.0081
32.7640	13.0100	0.4344	0.0084
34.1890	11.2700	0.3898	0.0082
35.6130	9.9400	0.3389	0.0070
37.0380	8.9000	0.2831	0.0056
38.4630	8.2600	0.2535	0.0053
39.8870	7.9600	0.2434	0.0054
41.3120	7.9600	0.2396	0.0054
42.7360	7.9500	0.2451	0.0056
44.1610	7.9600	0.2471	0.0055
45.5850	7.9600	0.2459	0.0055

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	7.8900	0.2368	0.0049
2.8080	7.8800	0.2401	0.0047
5.6160	7.9900	0.2553	0.0052
8.4240	9.1200	0.2690	0.0041
11.2310	10.5600	0.3321	0.0029
14.0390	11.8700	0.3834	0.0033
16.8470	13.8000	0.4776	0.0025
19.6550	15.8900	0.5706	0.0022
22.4630	17.9800	0.6679	0.0034
25.2710	20.1100	0.7767	0.0039
28.0780	22.1700	0.8930	0.0065
30.8860	24.2000	0.9696	0.0075
33.6940	26.3600	1.1065	0.0098
36.5020	28.3500	1.2009	0.0103
39.3100	30.4600	1.3024	0.0135
42.1180	32.6700	1.4029	0.0155
44.9260	34.8800	1.5026	0.0147
47.7330	36.5000	1.5787	0.0147
50.5410	37.8500	1.6529	0.0165
53.3490	39.2800	1.6786	0.0176
56.1570	40.4400	1.6569	0.0173
58.9650	39.1800	1.6379	0.0187
61.7730	37.7600	1.5789	0.0193
64.5800	36.4100	1.4997	0.0178
67.3880	34.5300	1.4206	0.0179
70.1960	32.3700	1.3457	0.0168
73.0040	30.1800	1.2664	0.0167
75.8120	28.1000	1.1641	0.0155
78.6200	26.0000	1.0518	0.0133
81.4280	23.9200	0.9761	0.0136
84.2350	21.8400	0.8619	0.0110
87.0430	19.7300	0.7746	0.0094
89.8510	17.5900	0.6861	0.0085
92.6590	15.4900	0.5891	0.0068
95.4670	13.4300	0.4967	0.0055
98.2750	11.7900	0.4048	0.0047
101.0830	10.4700	0.3456	0.0049
103.8900	9.0400	0.2832	0.0055
106.6980	7.9500	0.2578	0.0062
109.5060	7.9500	0.2546	0.0053
112.3140	7.9400	0.2478	0.0048
115.1220	7.9400	0.2460	0.0049
117.9300	7.9400	0.2511	0.0048
120.7370	7.9400	0.2441	0.0042
123.5450	7.9500	0.2454	0.0044

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	7.9200	0.2187	0.0053
1.4250	7.9200	0.2119	0.0047
2.8500	7.9200	0.2124	0.0043
4.2750	7.9100	0.2166	0.0040
5.6990	8.0300	0.2332	0.0038
7.1240	8.7300	0.2889	0.0033
8.5490	10.6500	0.4357	0.0029
9.9740	13.4500	0.6729	0.0037
11.3990	17.0100	0.7597	0.0010
12.8240	21.2500	0.8845	0.0009
14.2480	25.3500	1.0836	0.0047
15.6730	29.5000	1.1733	0.0093
17.0980	33.3900	1.3867	0.0144
18.5230	36.6100	1.5594	0.0166
19.9480	38.7500	1.6537	0.0184
21.3730	40.0000	1.6736	0.0189
22.7970	40.4300	1.6652	0.0192
24.2220	39.7500	1.6231	0.0210
25.6470	37.8100	1.5957	0.0238
27.0720	35.0500	1.5522	0.0258
28.4970	31.3900	1.3248	0.0238
29.9220	27.3300	1.1187	0.0218
31.3460	22.9100	0.8503	0.0168
32.7710	18.6700	0.6610	0.0133
34.1960	14.8300	0.5466	0.0109
35.6210	11.7400	0.3572	0.0058
37.0460	9.6100	0.2824	0.0055
38.4710	8.4700	0.2723	0.0061
39.8950	7.9900	0.2786	0.0060
41.3200	7.9900	0.2548	0.0050
42.7450	7.9800	0.2413	0.0047
44.1700	7.9800	0.2416	0.0046
45.5950	7.9800	0.2419	0.0041

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.9500	0.2427	0.0042
2.8100	7.9600	0.2534	0.0055
5.6210	8.0800	0.2693	0.0049
8.4310	9.1700	0.2844	0.0035
11.2410	10.7600	0.3613	0.0033
14.0520	12.7700	0.4447	0.0035
16.8620	14.9600	0.5491	0.0023
19.6720	18.4700	0.7138	0.0026
22.4820	21.9400	0.8678	0.0044
25.2930	25.3000	1.0315	0.0072
28.1030	28.8600	1.1928	0.0087
30.9130	33.1700	1.4093	0.0125
33.7240	37.1900	1.6386	0.0166
36.5340	40.8100	1.7535	0.0184
39.3440	44.1100	1.8465	0.0131
42.1550	47.2600	1.9131	0.0053
44.9650	50.1400	1.8858	-0.0082
47.7750	52.1200	1.8668	-0.0107
50.5860	53.9400	1.7233	-0.0193
53.3960	55.2500	1.6389	-0.0319
56.2060	56.0100	1.5011	-0.0402
59.0160	54.8200	1.3954	-0.0450
61.8270	53.2600	1.2775	-0.0431
64.6370	51.2900	1.2164	-0.0394
67.4470	48.9500	1.1748	-0.0337
70.2580	45.5900	1.1191	-0.0248
73.0680	42.4800	1.1385	-0.0113
75.8780	38.9000	1.1366	0.0000
78.6890	35.1900	1.1410	0.0094
81.4990	30.9300	1.0591	0.0167
84.3090	27.0900	1.0390	0.0175
87.1190	23.5400	0.9513	0.0152
89.9300	20.1400	0.7545	0.0112
92.7400	16.6200	0.6126	0.0083
95.5500	13.9800	0.5088	0.0060
98.3610	11.8500	0.3900	0.0047
101.1710	10.1200	0.2805	0.0038
103.9810	8.7500	0.2714	0.0045
106.7920	8.0300	0.2460	0.0043
109.6020	8.0200	0.2408	0.0039
112.4120	8.0200	0.2340	0.0038
115.2230	8.0200	0.2452	0.0040
118.0330	8.0200	0.2444	0.0041
120.8430	8.0200	0.2397	0.0041
123.6530	8.0200	0.2200	0.0039

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.9200	0.2433	0.0054
1.4260	7.9200	0.2454	0.0052
2.8530	7.9200	0.2494	0.0049
4.2790	7.9200	0.2448	0.0040
5.7050	8.0900	0.2672	0.0036
7.1320	8.9800	0.3636	0.0036
8.5580	11.4900	0.5688	0.0041
9.9850	15.7300	0.6615	0.0007
11.4110	21.0200	0.8297	-0.0014
12.8370	26.9200	1.2689	0.0047
14.2640	33.1900	1.5087	0.0085
15.6900	39.8900	1.7498	0.0104
17.1160	45.4300	1.9317	0.0080
18.5430	49.9800	2.0032	0.0027
19.9690	53.5800	2.0112	-0.0042
21.3960	55.2600	1.9610	-0.0119
22.8220	56.1500	1.8051	-0.0197
24.2480	55.7300	1.6582	-0.0237
25.6750	54.2200	1.5222	-0.0230
27.1010	50.8900	1.4285	-0.0171
28.5270	46.3100	1.2799	-0.0123
29.9540	40.9500	1.1753	0.0000
31.3800	34.4800	1.1695	0.0170
32.8070	28.2100	1.0013	0.0257
34.2330	21.5700	0.8787	0.0307
35.6590	16.4200	0.8275	0.0279
37.0860	12.1500	0.5565	0.0174
38.5120	9.5000	0.3537	0.0104
39.9380	8.3700	0.2732	0.0074
41.3650	8.0000	0.2340	0.0052
42.7910	7.9900	0.2260	0.0045
44.2180	7.9900	0.2305	0.0045
45.6440	7.9800	0.2374	0.0047

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 32 deg.

Time	Alpha	CN	Cm
0.0000	16.0700	0.5789	0.0045
2.8080	16.0700	0.5729	0.0046
5.6160	16.2400	0.5853	0.0049
8.4240	17.4500	0.6330	0.0047
11.2310	18.9200	0.6837	0.0045
14.0390	20.3100	0.7770	0.0047
16.8470	21.6700	0.8585	0.0057
19.6550	22.9700	0.9112	0.0070
22.4630	24.3800	0.9798	0.0089
25.2710	25.7500	1.0425	0.0098
28.0790	27.1700	1.1064	0.0101
30.8870	28.5000	1.1946	0.0113
33.6940	29.8900	1.2438	0.0134
36.5020	31.2700	1.3329	0.0152
39.3100	31.9300	1.3445	0.0165
42.1180	30.6600	1.2980	0.0165
44.9260	29.2200	1.2172	0.0162
47.7340	27.8800	1.1427	0.0148
50.5420	26.5300	1.0808	0.0138
53.3500	25.0900	0.9883	0.0122
56.1570	23.6600	0.9499	0.0112
58.9650	22.3200	0.9103	0.0108
61.7730	20.9800	0.8377	0.0090
64.5810	19.5700	0.7674	0.0070
67.3890	18.1800	0.6960	0.0059
70.1970	16.7800	0.6497	0.0060
73.0050	16.2800	0.6105	0.0046
75.8120	16.2800	0.6029	0.0042
78.6200	16.2700	0.6161	0.0044
81.4280	16.2800	0.6181	0.0049
84.2360	16.2800	0.5994	0.0048
87.0440	16.2700	0.5966	0.0039
89.8520	16.2700	0.5969	0.0042
92.6600	16.2800	0.6021	0.0044
95.4680	16.2700	0.6076	0.0040
98.2750	16.2700	0.6050	0.0047
101.0830	16.2800	0.6023	0.0043
103.8910	16.2700	0.5990	0.0041
106.6990	16.2700	0.5981	0.0042
109.5070	16.2800	0.5966	0.0045
112.3150	16.2700	0.6074	0.0047
115.1230	16.2800	0.6134	0.0049
117.9310	16.2800	0.6023	0.0047
120.7380	16.2700	0.6117	0.0049
123.5460	16.2800	0.5953	0.0045

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 32 deg.

Time	Alpha	CN	Cm
0.0000	16.1700	0.6008	0.0045
1.4250	16.1800	0.5998	0.0045
2.8490	16.1700	0.5966	0.0044
4.2740	16.1600	0.6033	0.0046
5.6980	16.2900	0.6261	0.0048
7.1230	16.8100	0.6643	0.0048
8.5470	17.8300	0.7111	0.0041
9.9720	19.2600	0.7416	0.0033
11.3960	20.9900	0.8010	0.0035
12.8210	22.7200	0.9180	0.0051
14.2450	24.7900	1.0931	0.0090
15.6700	26.7900	1.1872	0.0110
17.0940	28.3600	1.1642	0.0099
18.5190	29.9200	1.1748	0.0115
19.9440	30.9700	1.2952	0.0152
21.3680	31.7500	1.3583	0.0167
22.7930	32.0800	1.3526	0.0165
24.2170	31.5000	1.3408	0.0167
25.6420	30.5200	1.3011	0.0171
27.0660	29.0500	1.2322	0.0172
28.4910	27.3600	1.1756	0.0170
29.9150	25.4000	1.0697	0.0151
31.3400	23.3800	0.9491	0.0124
32.7640	21.4900	0.8779	0.0112
34.1890	19.7700	0.8180	0.0106
35.6130	18.3500	0.7629	0.0096
37.0380	17.2700	0.6889	0.0074
38.4630	16.5900	0.6416	0.0057
39.8870	16.3000	0.6099	0.0043
41.3120	16.2900	0.5997	0.0038
42.7360	16.3000	0.5981	0.0041
44.1610	16.2900	0.5901	0.0041
45.5850	16.2800	0.5889	0.0041

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	16.1500	0.6011	0.0051
2.8080	16.1500	0.5998	0.0046
5.6160	16.2900	0.5973	0.0043
8.4240	17.4900	0.6281	0.0033
11.2310	18.9400	0.6797	0.0028
14.0390	20.3500	0.7677	0.0040
16.8470	22.2100	0.8683	0.0062
19.6550	24.2500	0.9680	0.0094
22.4630	26.3600	1.0603	0.0101
25.2710	28.3500	1.1891	0.0104
28.0790	30.4700	1.3360	0.0147
30.8870	32.6600	1.3991	0.0157
33.6940	34.8800	1.5252	0.0164
36.5020	36.9300	1.6302	0.0171
39.3100	39.0400	1.6893	0.0197
42.1180	41.2600	1.7406	0.0190
44.9260	43.2800	1.7969	0.0152
47.7340	44.7200	1.8271	0.0110
50.5420	45.9500	1.8174	0.0077
53.3500	47.2400	1.7858	0.0015
56.1570	48.3000	1.7881	-0.0029
58.9650	47.1700	1.6475	-0.0004
61.7730	45.8700	1.5562	-0.0035
64.5810	44.6500	1.5034	-0.0029
67.3890	42.9600	1.4963	0.0055
70.1970	40.9000	1.4597	0.0096
73.0050	38.6600	1.4854	0.0140
75.8120	36.5900	1.3961	0.0145
78.6200	34.5000	1.3350	0.0159
81.4280	32.3500	1.2929	0.0192
84.2360	30.1400	1.2393	0.0177
87.0440	28.0600	1.1513	0.0172
89.8520	25.9500	1.0498	0.0152
92.6600	23.8600	0.9570	0.0130
95.4680	21.8200	0.8877	0.0116
98.2750	20.2000	0.8268	0.0088
101.0830	18.8000	0.7604	0.0088
103.8910	17.3300	0.6716	0.0068
106.6990	16.2600	0.6234	0.0042
109.5070	16.2500	0.6013	0.0044
112.3150	16.2500	0.6089	0.0040
115.1230	16.2500	0.6035	0.0038
117.9310	16.2500	0.6095	0.0040
120.7380	16.2500	0.6142	0.0043
123.5460	16.2500	0.6082	0.0047

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	16.1600	0.6007	0.0048
1.4250	16.1700	0.6034	0.0050
2.8490	16.1600	0.6037	0.0044
4.2740	16.1600	0.6017	0.0040
5.6980	16.3100	0.6100	0.0040
7.1230	17.0200	0.6608	0.0037
8.5470	19.0100	0.7840	0.0038
9.9720	21.9300	1.0098	0.0069
11.3970	25.3200	1.1840	0.0079
12.8210	29.4100	1.3181	0.0093
14.2460	34.0200	1.5316	0.0142
15.6700	38.1600	1.6420	0.0172
17.0950	42.0400	1.7930	0.0191
18.5190	44.8700	1.9904	0.0197
19.9440	46.7800	2.0030	0.0159
21.3690	47.9400	1.9203	0.0109
22.7930	48.2900	1.8507	0.0074
24.2180	47.6500	1.7582	0.0078
25.6420	45.8700	1.7358	0.0127
27.0670	43.3400	1.7604	0.0168
28.4910	39.7300	1.5988	0.0162
29.9160	35.5600	1.4046	0.0176
31.3400	31.2200	1.2288	0.0197
32.7650	27.0100	1.0330	0.0199
34.1900	23.1600	0.9194	0.0195
35.6140	20.0800	0.7845	0.0136
37.0390	17.8800	0.6897	0.0099
38.4630	16.7100	0.6456	0.0074
39.8880	16.2700	0.6358	0.0063
41.3120	16.2700	0.6244	0.0054
42.7370	16.2700	0.6185	0.0049
44.1620	16.2600	0.6144	0.0045
45.5860	16.2600	0.6119	0.0041

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	16.1600	0.6164	0.0047
2.8080	16.1700	0.6153	0.0046
5.6160	16.3000	0.6194	0.0034
8.4240	17.4800	0.6436	0.0039
11.2320	19.0800	0.7336	0.0053
14.0400	21.1700	0.8240	0.0050
16.8490	23.2100	0.9535	0.0071
19.6570	26.7900	1.1060	0.0085
22.4650	30.1800	1.3068	0.0121
25.2730	33.8400	1.4620	0.0153
28.0810	37.4000	1.6287	0.0167
30.8890	41.7100	1.7828	0.0178
33.6970	45.3000	1.8801	0.0143
36.5050	48.6500	1.9879	0.0060
39.3130	52.0200	1.9467	-0.0108
42.1210	55.3100	1.8338	-0.0252
44.9290	58.1300	1.6735	-0.0360
47.7380	60.1000	1.5486	-0.0573
50.5460	61.9200	1.4498	-0.0662
53.3540	63.2600	1.3972	-0.0730
56.1620	63.8800	1.3505	-0.0750
58.9700	62.8600	1.2773	-0.0698
61.7780	61.2600	1.2327	-0.0676
64.5860	59.2400	1.1691	-0.0640
67.3940	56.9100	1.1228	-0.0598
70.2020	53.5900	1.0469	-0.0538
73.0100	50.3100	1.0567	-0.0491
75.8180	46.8200	1.0238	-0.0432
78.6260	43.5000	0.9977	-0.0262
81.4350	39.3100	1.0426	-0.0005
84.2430	35.4500	1.0866	0.0087
87.0510	31.9200	1.1345	0.0199
89.8590	28.4100	1.0674	0.0185
92.6670	24.9100	0.9780	0.0155
95.4750	22.2400	0.8747	0.0127
98.2830	20.2100	0.7696	0.0091
101.0910	18.3900	0.7198	0.0067
103.8990	16.9500	0.6511	0.0061
106.7070	16.2700	0.6088	0.0043
109.5150	16.2600	0.6030	0.0047
112.3240	16.2600	0.6093	0.0054
115.1320	16.2700	0.6066	0.0051
117.9400	16.2600	0.6069	0.0042
120.7480	16.2600	0.6253	0.0046
123.5560	16.2600	0.6138	0.0049

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	16.1300	0.5918	0.0061
1.4260	16.1300	0.5882	0.0055
2.8530	16.1300	0.5956	0.0055
4.2790	16.1300	0.6142	0.0058
5.7050	16.2900	0.6417	0.0055
7.1320	17.1600	0.6890	0.0046
8.5580	19.7800	0.7751	0.0035
9.9840	23.7100	0.9638	0.0027
11.4110	28.7500	1.1802	0.0009
12.8370	35.1600	1.4745	0.0048
14.2630	41.6000	1.8305	0.0120
15.6900	47.6400	2.0839	0.0116
17.1160	53.2500	2.2505	0.0052
18.5420	57.8500	2.2566	-0.0084
19.9690	61.5100	2.0971	-0.0219
21.3950	63.2600	1.8992	-0.0370
22.8210	64.0100	1.7298	-0.0501
24.2480	63.7100	1.5902	-0.0588
25.6740	62.3400	1.4077	-0.0621
27.1010	59.0100	1.2336	-0.0590
28.5270	54.5500	1.1510	-0.0510
29.9530	48.9600	0.9701	-0.0426
31.3800	43.1000	0.8185	-0.0303
32.8060	36.6900	0.8062	-0.0103
34.2320	30.2800	0.7391	0.0109
35.6590	25.0100	0.7241	0.0244
37.0850	20.6400	0.7093	0.0228
38.5110	17.8700	0.6199	0.0152
39.9380	16.6400	0.5781	0.0096
41.3640	16.2600	0.5897	0.0068
42.7900	16.2500	0.6006	0.0053
44.2170	16.2500	0.6000	0.0041
45.6430	16.2400	0.5958	0.0033

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 24 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	23.8400	1.0258	0.0101
2.8110	23.8500	1.0172	0.0104
5.6210	23.9800	1.0151	0.0107
8.4320	25.1500	1.0830	0.0108
11.2420	26.5900	1.1333	0.0119
14.0530	27.9100	1.1998	0.0124
16.8630	29.2800	1.2752	0.0131
19.6740	30.6900	1.3607	0.0154
22.4850	32.1900	1.4126	0.0171
25.2950	33.6400	1.4691	0.0159
28.1060	34.9800	1.5386	0.0154
30.9160	36.4100	1.6188	0.0165
33.7270	37.7600	1.6850	0.0174
36.5370	39.1600	1.6839	0.0177
39.3480	39.8000	1.6713	0.0195
42.1590	38.4800	1.5782	0.0183
44.9690	37.0400	1.5274	0.0186
47.7800	35.6900	1.4970	0.0183
50.5900	34.3300	1.4542	0.0198
53.4010	32.8800	1.3837	0.0208
56.2110	31.4100	1.3170	0.0185
59.0220	29.9800	1.2709	0.0176
61.8330	28.5400	1.1958	0.0157
64.6430	27.2100	1.1364	0.0140
67.4540	25.8500	1.0985	0.0138
70.2640	24.4500	1.0361	0.0129
73.0750	23.9500	0.9854	0.0114
75.8850	23.9500	1.0106	0.0123
78.6960	23.9400	0.9978	0.0122
81.5060	23.9500	1.0123	0.0111
84.3170	23.9400	1.0267	0.0118
87.1280	23.9400	1.0118	0.0117
89.9380	23.9500	1.0126	0.0111
92.7490	23.9400	1.0088	0.0118
95.5590	23.9400	0.9995	0.0115
98.3700	23.9400	1.0050	0.0106
101.1800	23.9300	0.9961	0.0111
103.9910	23.9500	1.0055	0.0110
106.8020	23.9400	1.0260	0.0116
109.6120	23.9400	1.0267	0.0122
112.4230	23.9500	1.0131	0.0111
115.2330	23.9500	1.0262	0.0109
118.0440	23.9500	1.0126	0.0112
120.8540	23.9400	1.0082	0.0110
123.6650	23.9400	1.0394	0.0113

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 24 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	23.8400	1.0132	0.0122
1.4250	23.8400	1.0098	0.0114
2.8490	23.8400	1.0070	0.0108
4.2740	23.8500	1.0036	0.0108
5.6980	23.9700	1.0164	0.0106
7.1230	24.5000	1.0501	0.0103
8.5470	25.5200	1.1001	0.0098
9.9720	26.9100	1.1818	0.0104
11.3960	28.5400	1.2628	0.0110
12.8210	30.4600	1.3249	0.0105
14.2450	32.6400	1.3877	0.0106
15.6700	34.6400	1.4978	0.0139
17.0940	36.3400	1.6173	0.0173
18.5190	37.7900	1.7128	0.0208
19.9440	38.8300	1.7202	0.0216
21.3680	39.6500	1.7192	0.0230
22.7930	39.9200	1.7022	0.0238
24.2170	39.3100	1.6899	0.0223
25.6420	38.3000	1.6269	0.0200
27.0660	36.7800	1.5384	0.0201
28.4910	35.0800	1.4264	0.0192
29.9150	33.1700	1.3355	0.0193
31.3400	31.0400	1.2593	0.0192
32.7640	29.0600	1.1579	0.0173
34.1890	27.4200	1.1337	0.0175
35.6130	26.0100	1.0827	0.0164
37.0380	24.9200	1.0282	0.0149
38.4630	24.2600	1.0071	0.0130
39.8870	23.9600	1.0010	0.0118
41.3120	23.9500	0.9924	0.0113
42.7360	23.9500	1.0030	0.0115
44.1610	23.9500	0.9937	0.0120
45.5850	23.9500	0.9900	0.0124

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 24 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	23.7600	0.9866	0.0110
2.8080	23.7600	0.9900	0.0108
5.6160	23.9300	1.0015	0.0102
8.4240	25.1900	1.0634	0.0106
11.2310	26.6200	1.1439	0.0121
14.0390	27.9500	1.2245	0.0128
16.8470	29.8500	1.3004	0.0141
19.6550	32.0300	1.3931	0.0164
22.4630	34.2500	1.4889	0.0167
25.2710	36.2900	1.5694	0.0163
28.0790	38.3800	1.6968	0.0175
30.8870	40.6100	1.7255	0.0194
33.6940	42.6800	1.7751	0.0163
36.5020	44.5300	1.8036	0.0092
39.3100	46.4000	1.8279	0.0053
42.1180	48.4200	1.8200	-0.0020
44.9260	50.5100	1.7448	-0.0100
47.7340	52.0300	1.6565	-0.0210
50.5420	53.3700	1.5822	-0.0313
53.3500	54.6700	1.4887	-0.0382
56.1570	55.6700	1.4340	-0.0450
58.9650	54.6100	1.3416	-0.0459
61.7730	53.3000	1.2654	-0.0488
64.5810	51.9600	1.2292	-0.0471
67.3890	50.2100	1.1755	-0.0456
70.1970	48.1200	1.1574	-0.0433
73.0050	46.0500	1.1482	-0.0309
75.8120	44.1800	1.1487	-0.0189
78.6200	42.3000	1.1847	-0.0111
81.4280	40.2400	1.2464	-0.0056
84.2360	37.9600	1.2359	0.0027
87.0440	35.9000	1.2837	0.0143
89.8520	33.7900	1.2954	0.0172
92.6600	31.6500	1.2337	0.0187
95.4680	29.4900	1.2149	0.0178
98.2750	27.8500	1.1518	0.0168
101.0830	26.5000	1.1042	0.0156
103.8910	25.0300	1.0550	0.0144
106.6990	23.9600	1.0072	0.0122
109.5070	23.9700	1.0100	0.0127
112.3150	23.9600	0.9950	0.0139
115.1230	23.9600	1.0055	0.0140
117.9310	23.9600	1.0124	0.0137
120.7380	23.9600	1.0115	0.0121
123.5460	23.9600	1.0096	0.0097

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 24 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	23.8400	0.9762	0.0104
1.4230	23.8400	0.9939	0.0110
2.8460	23.8400	1.0098	0.0112
4.2690	23.8300	1.0242	0.0113
5.6920	23.9500	1.0333	0.0105
7.1150	24.6500	1.0530	0.0090
8.5380	26.6000	1.1074	0.0065
9.9610	29.3600	1.2172	0.0057
11.3840	33.0700	1.4467	0.0094
12.8070	37.2600	1.6674	0.0133
14.2300	41.7100	1.8322	0.0171
15.6530	45.4900	1.9830	0.0186
17.0760	49.1000	2.0532	0.0131
18.4990	52.1100	2.0870	0.0056
19.9220	54.1400	2.0508	-0.0032
21.3450	55.2700	1.9574	-0.0114
22.7680	55.6500	1.8355	-0.0176
24.1910	55.0600	1.6865	-0.0227
25.6150	53.3100	1.5196	-0.0239
27.0380	50.6500	1.3607	-0.0196
28.4610	47.1300	1.2881	-0.0111
29.8840	43.3400	1.2359	-0.0010
31.3070	39.1000	1.2183	0.0106
32.7300	34.8300	1.1661	0.0168
34.1530	31.0100	1.1226	0.0209
35.5760	27.9000	1.0925	0.0203
36.9990	25.6800	1.0208	0.0189
38.4220	24.4400	0.9647	0.0163
39.8450	23.9700	0.9490	0.0138
41.2680	23.9700	0.9657	0.0131
42.6910	23.9700	0.9803	0.0136
44.1140	23.9600	0.9860	0.0142
45.5370	23.9600	0.9925	0.0142

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 32 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	32.1400	1.3880	0.0160
2.8090	32.1400	1.3937	0.0155
5.6180	32.2900	1.3949	0.0142
8.4280	33.5700	1.4457	0.0151
11.2370	34.9200	1.5282	0.0144
14.0460	36.3400	1.5681	0.0147
16.8550	37.7000	1.6151	0.0162
19.6640	39.0900	1.6593	0.0154
22.4740	40.6300	1.6979	0.0177
25.2830	41.9900	1.7631	0.0146
28.0920	43.2800	1.8137	0.0110
30.9010	44.5500	1.8290	0.0073
33.7110	45.7600	1.8006	0.0057
36.5200	47.0500	1.7977	0.0052
39.3290	47.6300	1.7189	0.0003
42.1380	46.3900	1.6249	0.0016
44.9470	45.0900	1.5393	-0.0001
47.7570	43.9100	1.4749	0.0046
50.5660	42.6500	1.4462	0.0067
53.3750	41.2800	1.4488	0.0106
56.1840	39.8500	1.4378	0.0159
58.9930	38.3700	1.3990	0.0157
61.8030	36.9300	1.3876	0.0138
64.6120	35.5700	1.3979	0.0176
67.4210	34.2300	1.4069	0.0169
70.2300	32.8000	1.3644	0.0164
73.0390	32.2600	1.3324	0.0163
75.8490	32.2500	1.3495	0.0173
78.6580	32.2600	1.3466	0.0178
81.4670	32.2500	1.3370	0.0188
84.2760	32.2500	1.3798	0.0191
87.0850	32.2600	1.3516	0.0183
89.8950	32.2500	1.3687	0.0171
92.7040	32.2500	1.3816	0.0175
95.5130	32.2500	1.3628	0.0172
98.3220	32.2500	1.3690	0.0175
101.1310	32.2500	1.3508	0.0165
103.9410	32.2500	1.3656	0.0170
106.7500	32.2500	1.3788	0.0176
109.5590	32.2500	1.3677	0.0177
112.3680	32.2500	1.3874	0.0192
115.1780	32.2500	1.3874	0.0197
117.9870	32.2600	1.3909	0.0178
120.7960	32.2500	1.3891	0.0159
123.6050	32.2500	1.3741	0.0153

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 32 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	32.1400	1.3758	0.0144
1.4210	32.1300	1.3712	0.0155
2.8420	32.1400	1.3648	0.0165
4.2640	32.1400	1.3790	0.0169
5.6850	32.2400	1.4031	0.0161
7.1060	32.7900	1.4343	0.0153
8.5270	33.8800	1.4658	0.0140
9.9490	35.2200	1.4712	0.0119
11.3700	36.8600	1.5306	0.0123
12.7910	38.7900	1.6696	0.0164
14.2120	40.9500	1.8067	0.0189
15.6330	42.8500	1.8499	0.0163
17.0550	44.3800	1.8344	0.0120
18.4760	45.7300	1.8076	0.0096
19.8970	46.6600	1.8260	0.0060
21.3180	47.4600	1.8461	0.0010
22.7400	47.7400	1.8472	-0.0006
24.1610	47.2400	1.7804	-0.0003
25.5820	46.2900	1.6954	-0.0014
27.0030	44.9800	1.6506	0.0007
28.4240	43.4300	1.6307	0.0059
29.8460	41.6600	1.5797	0.0121
31.2670	39.5700	1.5166	0.0158
32.6880	37.5600	1.4908	0.0171
34.1090	35.8600	1.4118	0.0183
35.5310	34.4200	1.3846	0.0192
36.9520	33.3100	1.3523	0.0186
38.3730	32.6200	1.3217	0.0172
39.7940	32.2600	1.3133	0.0163
41.2150	32.2600	1.3185	0.0171
42.6370	32.2600	1.3301	0.0168
44.0580	32.2500	1.3394	0.0158
45.4790	32.2600	1.3551	0.0170

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 32 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	32.1400	1.3696	0.0144
2.8090	32.1500	1.3558	0.0143
5.6180	32.2700	1.3700	0.0136
8.4280	33.5600	1.4346	0.0132
11.2370	34.9100	1.4983	0.0141
14.0460	36.3500	1.5668	0.0168
16.8550	38.2200	1.6454	0.0168
19.6640	40.4400	1.7063	0.0169
22.4740	42.5100	1.7742	0.0175
25.2830	44.3600	1.8236	0.0113
28.0920	46.2200	1.8390	0.0072
30.9010	48.2800	1.8387	-0.0037
33.7110	50.4000	1.7937	-0.0121
36.5200	52.3200	1.6989	-0.0186
39.3290	54.3200	1.6208	-0.0282
42.1380	56.2900	1.5478	-0.0418
44.9470	58.3500	1.4918	-0.0549
47.7570	59.9400	1.4086	-0.0620
50.5660	61.2700	1.3720	-0.0688
53.3750	62.6000	1.3659	-0.0739
56.1840	63.5100	1.3114	-0.0738
58.9930	62.5800	1.2730	-0.0713
61.8030	61.2700	1.2214	-0.0676
64.6120	59.9200	1.2057	-0.0638
67.4210	58.1300	1.2161	-0.0645
70.2300	56.0800	1.1583	-0.0608
73.0390	54.0600	1.1284	-0.0569
75.8490	52.0500	1.1382	-0.0564
78.6580	50.1000	1.1331	-0.0538
81.4670	48.0200	1.1121	-0.0509
84.2760	45.9100	1.1061	-0.0435
87.0850	44.0700	1.1053	-0.0224
89.8950	42.1600	1.1347	-0.0090
92.7040	40.0900	1.2186	0.0008
95.5130	37.8600	1.2972	0.0109
98.3220	36.2300	1.3216	0.0156
101.1310	34.8100	1.3562	0.0192
103.9410	33.4000	1.3565	0.0172
106.7500	32.2600	1.3296	0.0163
109.5590	32.2600	1.3290	0.0150
112.3680	32.2600	1.3506	0.0169
115.1780	32.2500	1.3635	0.0164
117.9870	32.2500	1.3478	0.0168
120.7960	32.2600	1.3538	0.0169
123.6050	32.2500	1.3662	0.0166

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 32 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	32.0800	1.3826	0.0164
1.4230	32.0800	1.3865	0.0157
2.8460	32.0800	1.3866	0.0155
4.2690	32.0800	1.3823	0.0151
5.6920	32.2300	1.3709	0.0144
7.1150	33.0200	1.4215	0.0140
8.5380	34.9800	1.5306	0.0126
9.9610	37.8600	1.7234	0.0129
11.3840	41.5700	1.8822	0.0116
12.8070	45.3300	1.9382	0.0064
14.2300	49.4900	2.0629	0.0019
15.6530	53.5100	2.1018	-0.0085
17.0760	57.0600	2.1577	-0.0169
18.4990	60.0700	2.1629	-0.0210
19.9220	62.1100	2.0100	-0.0329
21.3450	63.1800	1.7849	-0.0472
22.7680	63.4800	1.6318	-0.0582
24.1910	62.9900	1.5339	-0.0621
25.6150	61.2700	1.4908	-0.0598
27.0380	58.5300	1.4860	-0.0527
28.4610	55.0600	1.3004	-0.0499
29.8840	51.1300	1.1273	-0.0445
31.3070	46.9100	1.1013	-0.0350
32.7300	43.0900	0.9873	-0.0268
34.1530	39.3000	0.9741	-0.0133
35.5760	36.1700	0.9710	-0.0012
36.9990	34.0200	0.9947	0.0070
38.4220	32.7900	1.0434	0.0112
39.8450	32.3000	1.1461	0.0132
41.2680	32.2900	1.2347	0.0151
42.6910	32.2900	1.2682	0.0165
44.1140	32.2900	1.2675	0.0171
45.5370	32.2900	1.2594	0.0168

70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 40 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	40.9600	1.5871	0.0116
1.4230	40.9600	1.5894	0.0133
2.8460	40.9600	1.5830	0.0148
4.2690	40.9700	1.5692	0.0137
5.6920	41.1400	1.5832	0.0117
7.1150	41.7200	1.6091	0.0113
8.5380	42.7200	1.6312	0.0107
9.9610	43.9800	1.6601	0.0083
11.3840	45.4800	1.6979	0.0056
12.8080	47.2200	1.7313	0.0040
14.2310	49.2000	1.7751	-0.0030
15.6540	51.1500	1.7431	-0.0098
17.0770	52.7600	1.6944	-0.0173
18.5000	54.1900	1.6959	-0.0254
19.9230	55.1600	1.6595	-0.0316
21.3460	55.8900	1.6044	-0.0363
22.7690	56.1200	1.5455	-0.0386
24.1920	55.5900	1.4758	-0.0400
25.6150	54.6600	1.3872	-0.0406
27.0380	53.2600	1.3206	-0.0395
28.4610	51.6300	1.2593	-0.0353
29.8840	49.7500	1.2168	-0.0315
31.3070	47.7500	1.1660	-0.0259
32.7300	45.9300	1.1275	-0.0192
34.1530	44.4100	1.1350	-0.0143
35.5760	43.1400	1.1656	-0.0112
37.0000	42.1300	1.1964	-0.0086
38.4230	41.4500	1.2203	-0.0053
39.8460	41.1700	1.2703	-0.0015
41.2690	41.1600	1.3364	0.0021
42.6920	41.1700	1.3778	0.0056
44.1150	41.1700	1.3968	0.0081
45.5380	41.1600	1.4140	0.0103

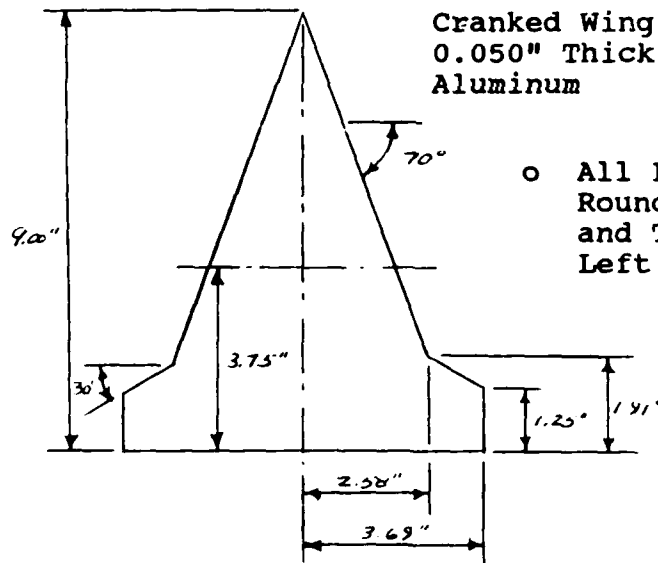
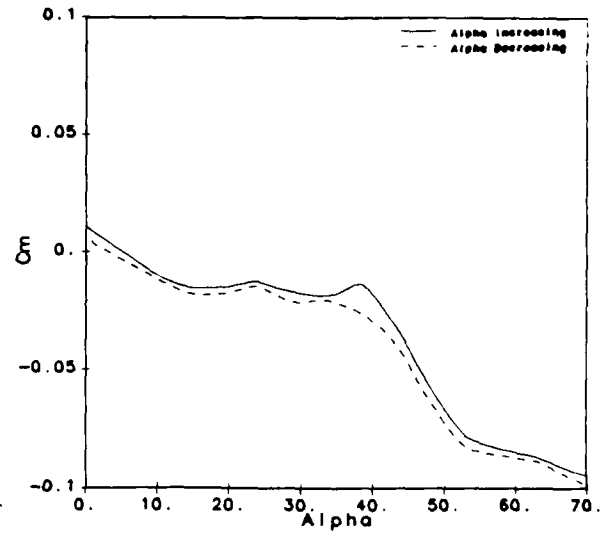
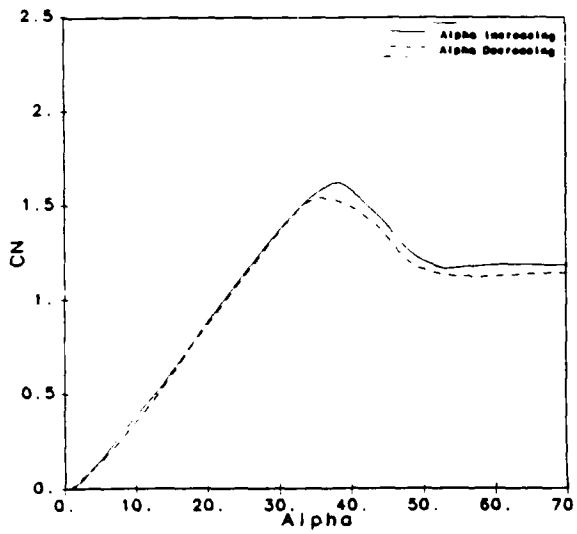
70 Deg. Delta
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 48 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	48.2400	1.3960	-0.0178
1.4230	48.2400	1.3679	-0.0194
2.8460	48.2400	1.3552	-0.0203
4.2690	48.2300	1.3528	-0.0214
5.6920	48.3800	1.3520	-0.0221
7.1150	48.9400	1.3533	-0.0241
8.5380	50.0200	1.3792	-0.0279
9.9610	51.3100	1.4192	-0.0331
11.3840	52.9300	1.4609	-0.0379
12.8070	54.7200	1.4766	-0.0445
14.2300	56.6700	1.4809	-0.0508
15.6530	58.5600	1.4609	-0.0564
17.0760	60.1900	1.4152	-0.0624
18.4990	61.6300	1.3964	-0.0665
19.9220	62.6200	1.3890	-0.0699
21.3450	63.2300	1.3648	-0.0717
22.7680	63.4300	1.3302	-0.0726
24.1910	63.0100	1.3046	-0.0721
25.6140	62.1300	1.2635	-0.0700
27.0370	60.7300	1.2117	-0.0657
28.4600	59.0800	1.1700	-0.0608
29.8830	57.2000	1.1294	-0.0568
31.3060	55.2200	1.0746	-0.0545
32.7290	53.4000	1.0475	-0.0523
34.1520	51.7600	1.0603	-0.0505
35.5750	50.4400	1.0727	-0.0501
36.9980	49.3700	1.0669	-0.0500
38.4210	48.6800	1.0641	-0.0496
39.8440	48.4000	1.0641	-0.0487
41.2670	48.4000	1.0925	-0.0501
42.6900	48.4000	1.1217	-0.0509
44.1130	48.3900	1.1363	-0.0498
45.5360	48.4000	1.1413	-0.0464

APPENDIX D

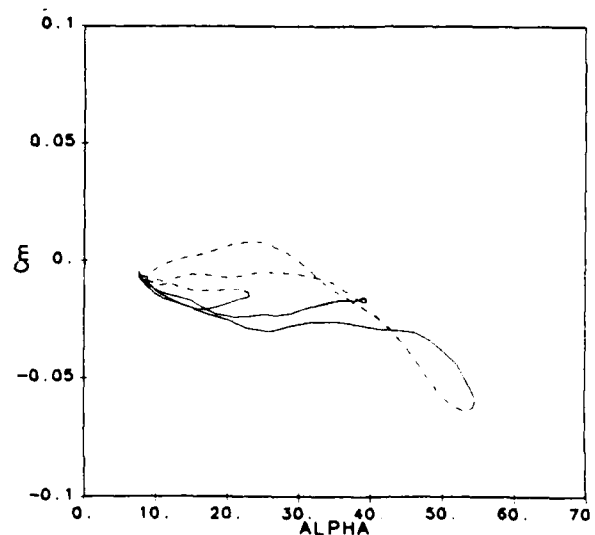
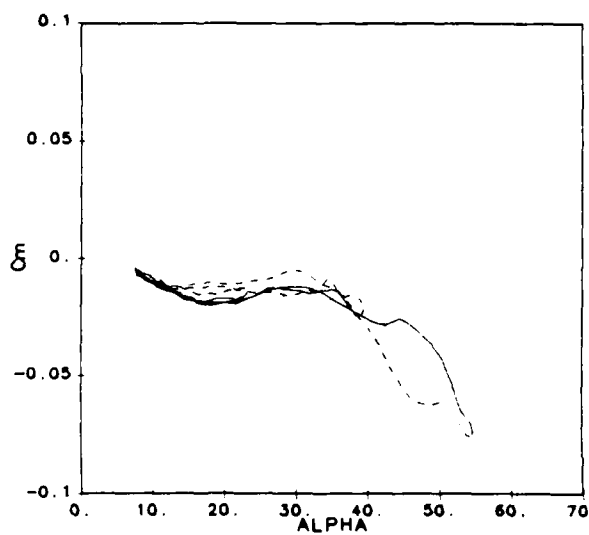
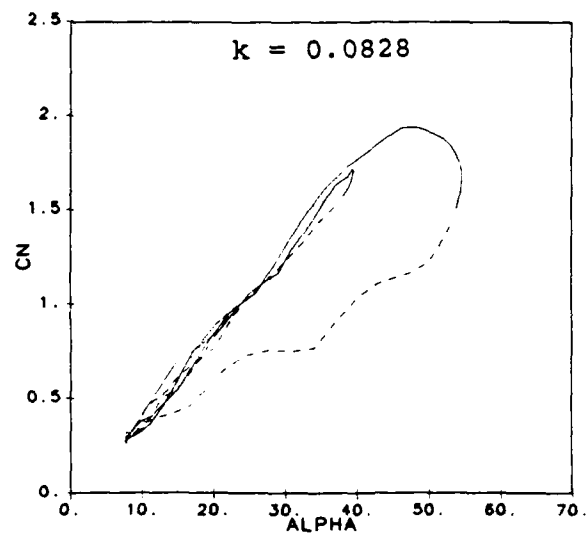
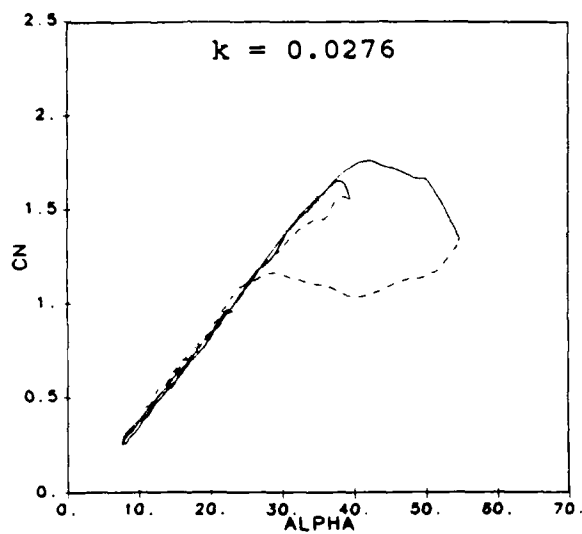
PLOTS AND LISTINGS OF THE HFF FORCE AND
MOMENT DATA FOR THE FULL-SPAN $70^{\circ}/30^{\circ}$ CRANKED WING MODEL



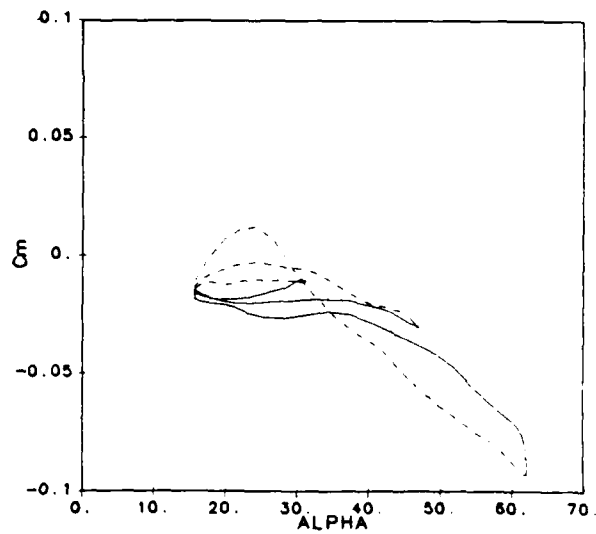
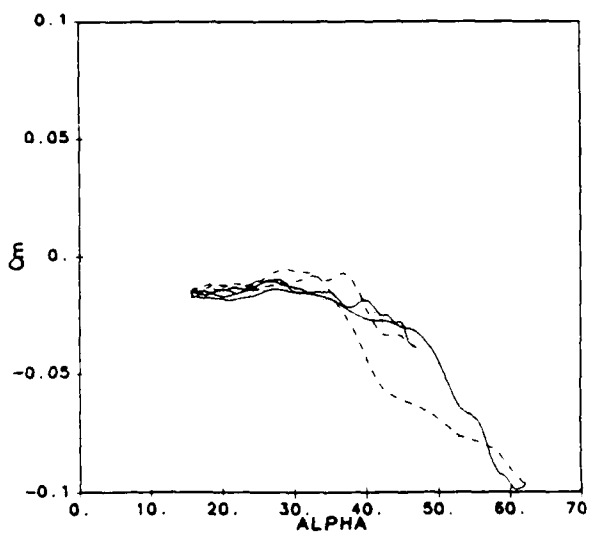
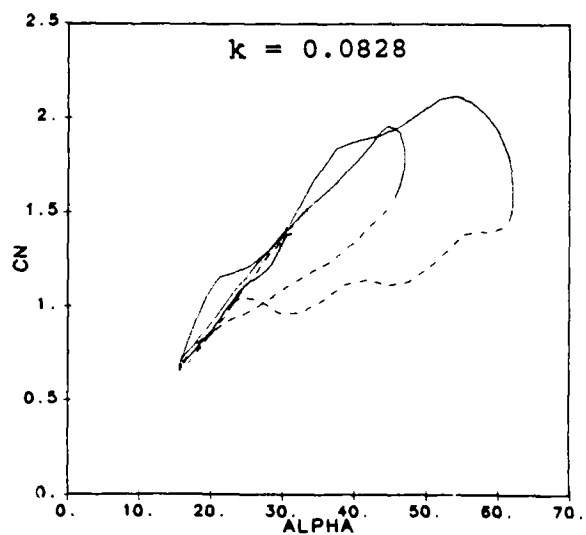
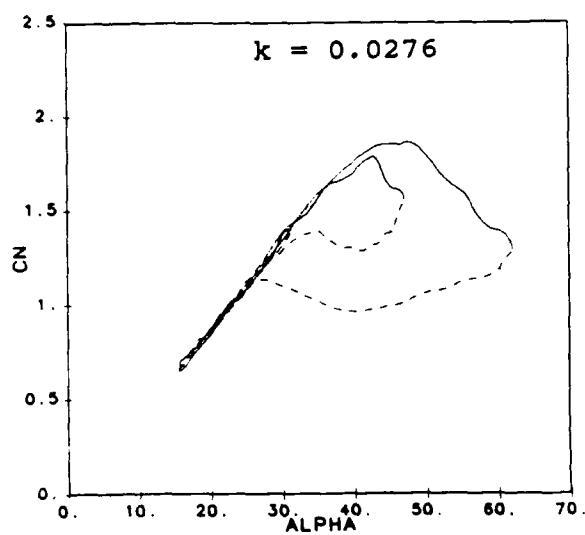
Cranked Wing
0.050" Thick
Aluminum

- o All Leading Edges
Rounded, All Side
and Trailing Edges
Left Square

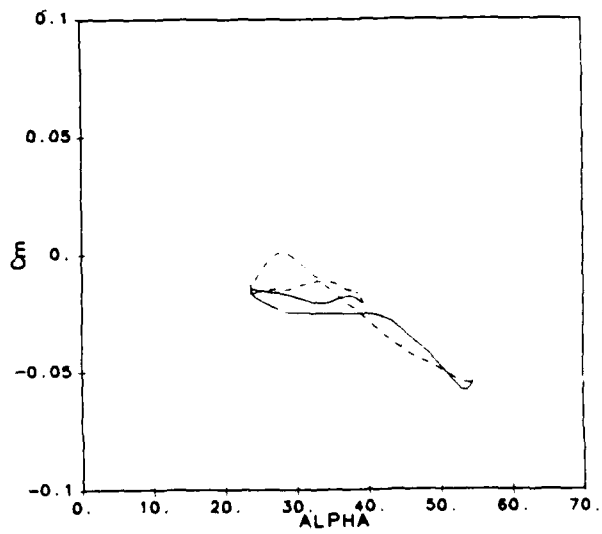
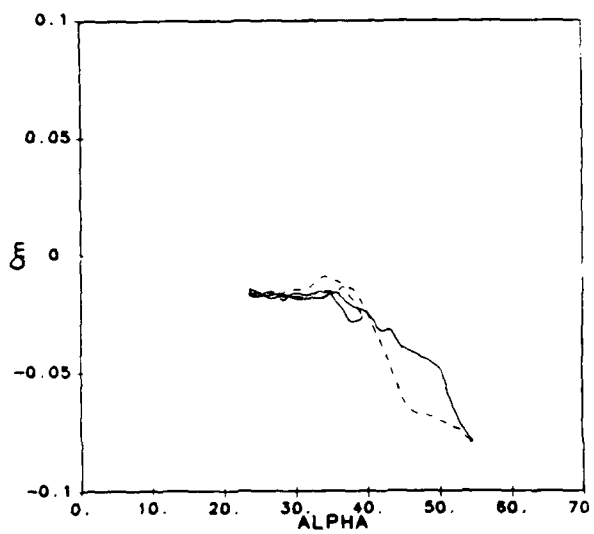
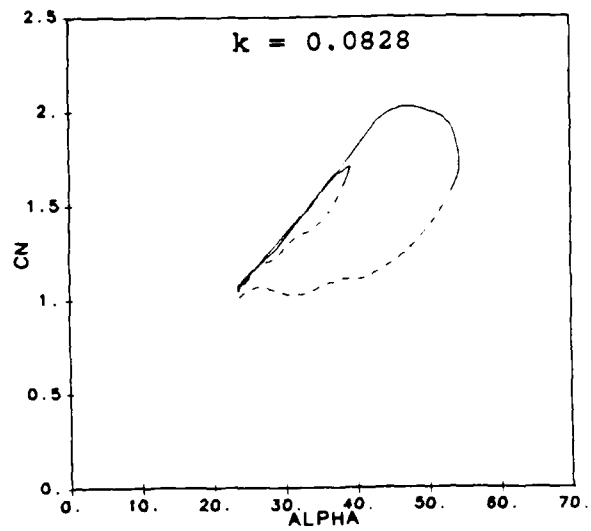
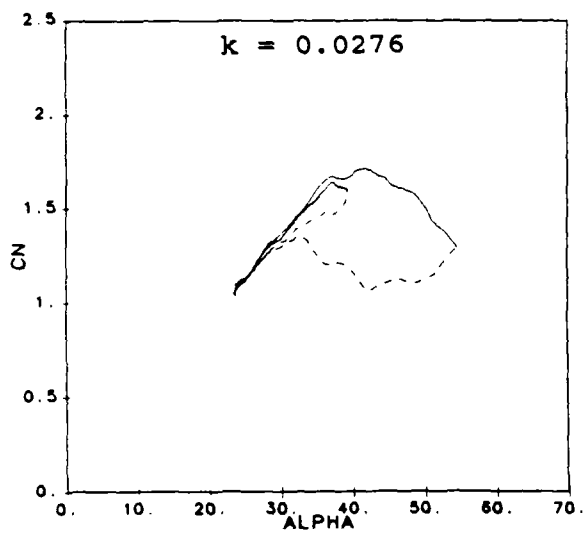
70°/30° Cranked Wing, Steady



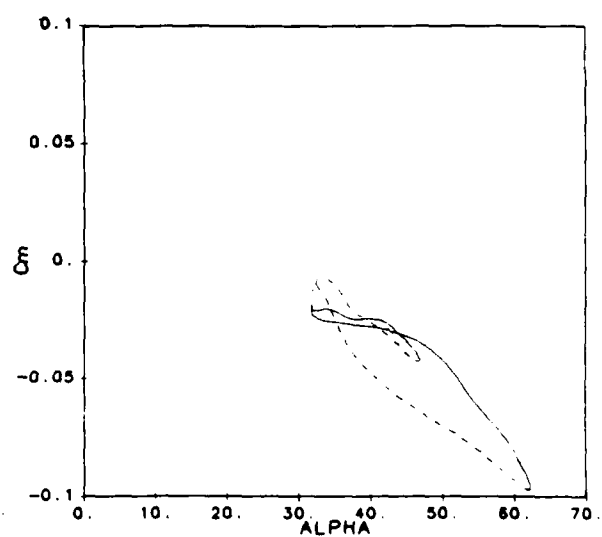
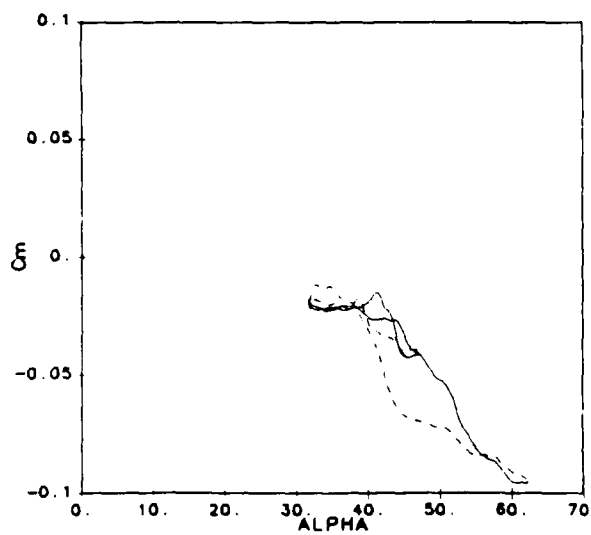
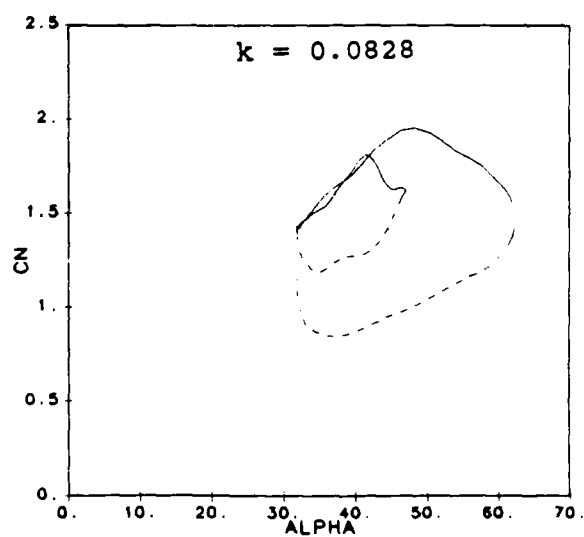
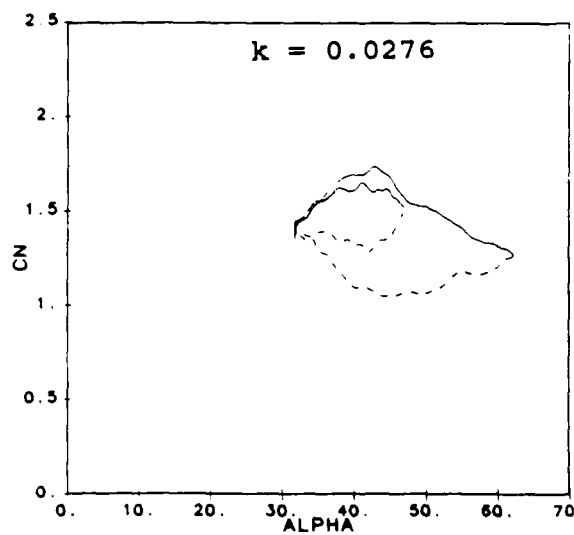
70°/30° Cranked Wing, Incidence = 8° to 56°



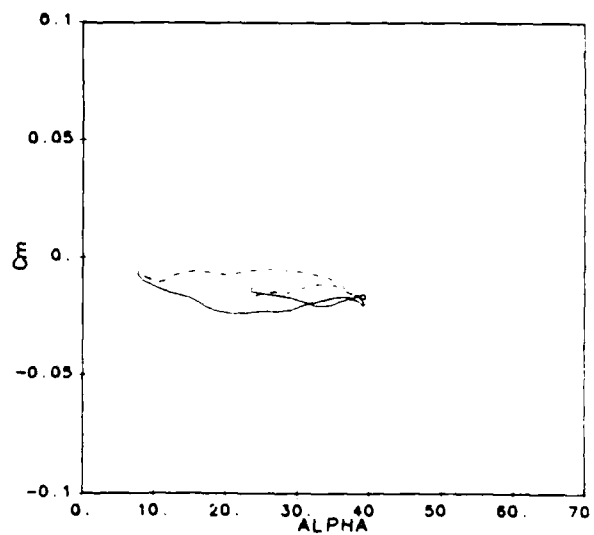
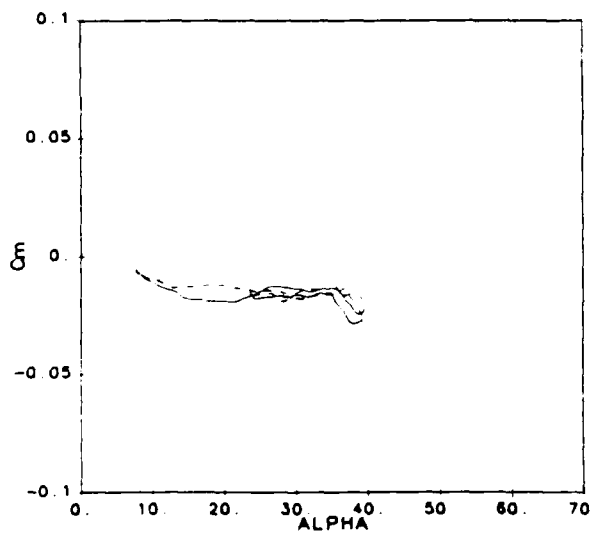
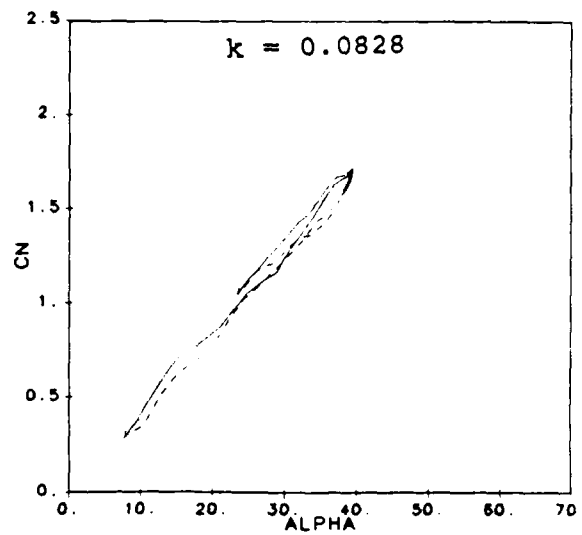
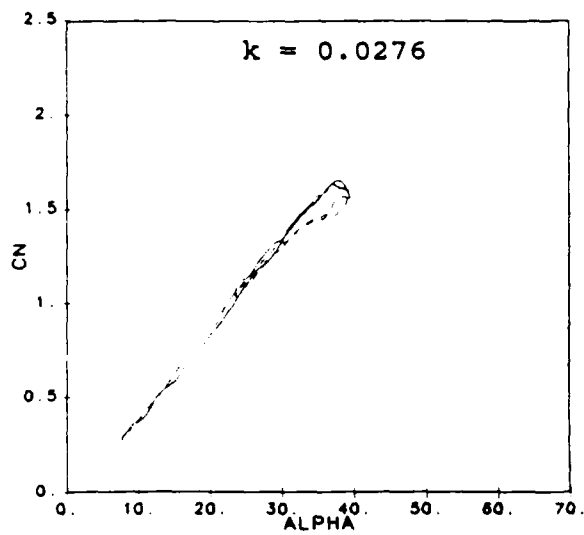
70°/30° Cranked Wing, Incidence = 16° to 64°



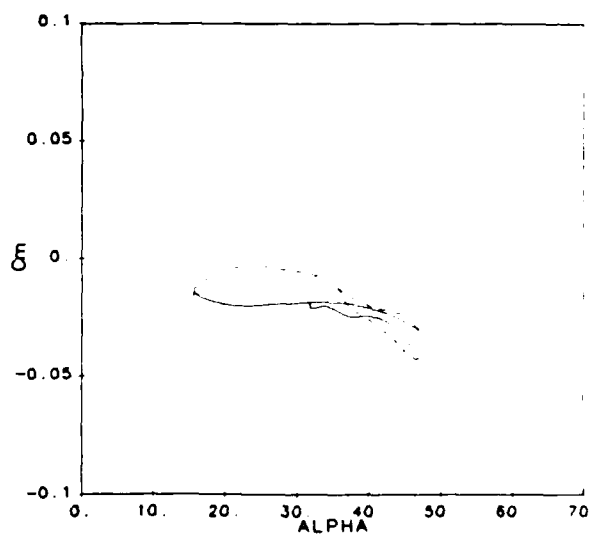
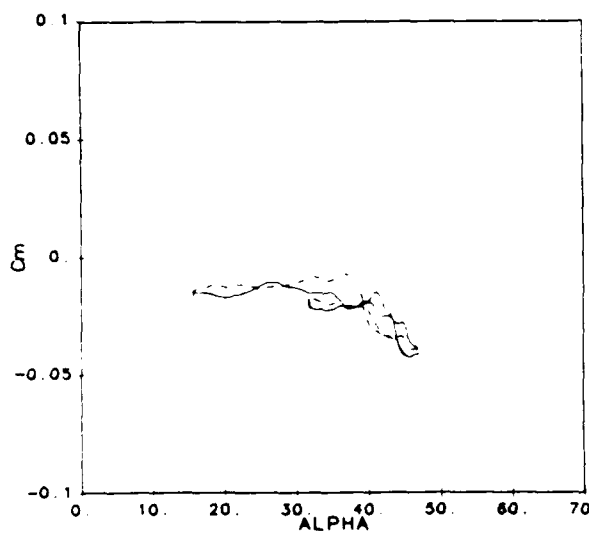
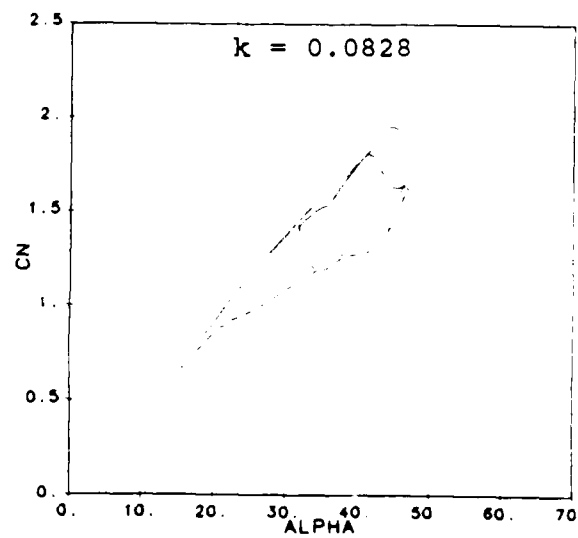
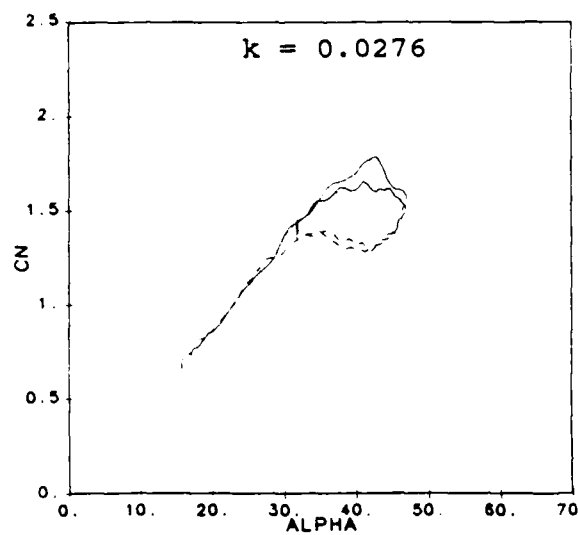
70°/30° Cranked Wing, Incidence = 24° to 56°



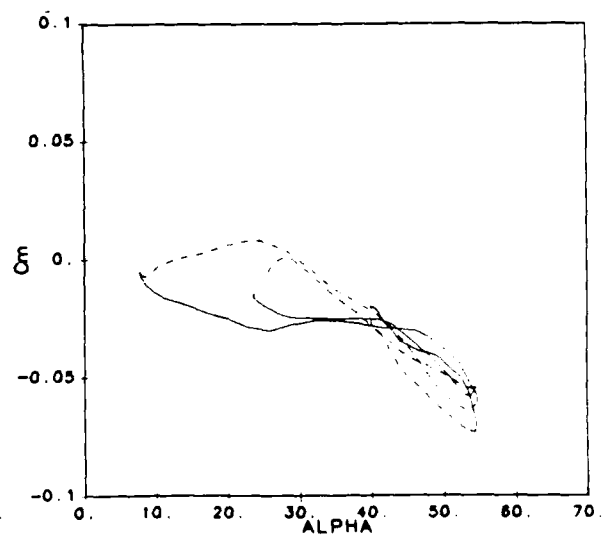
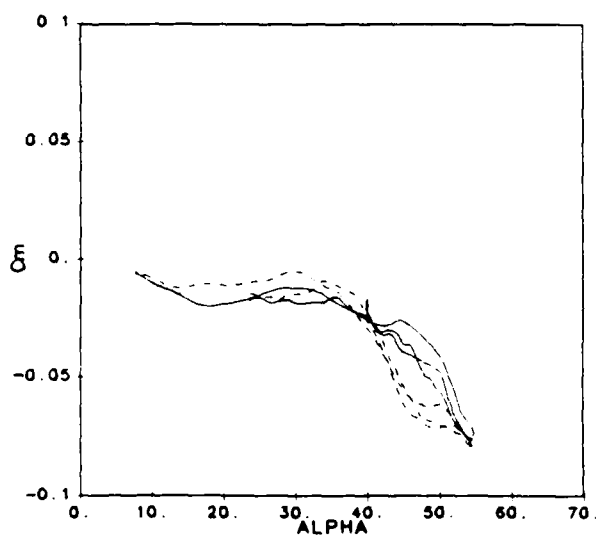
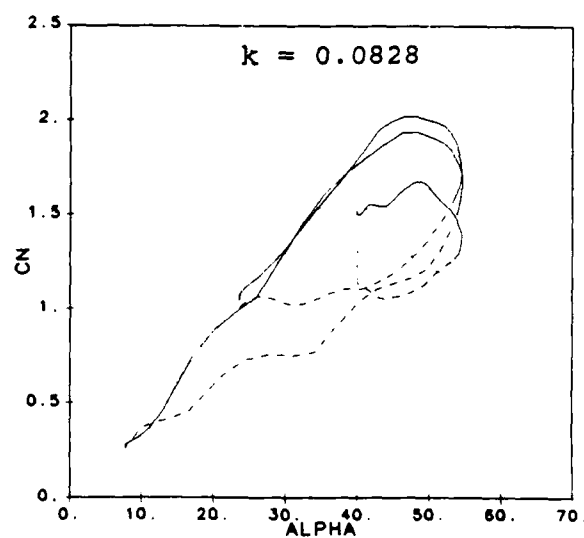
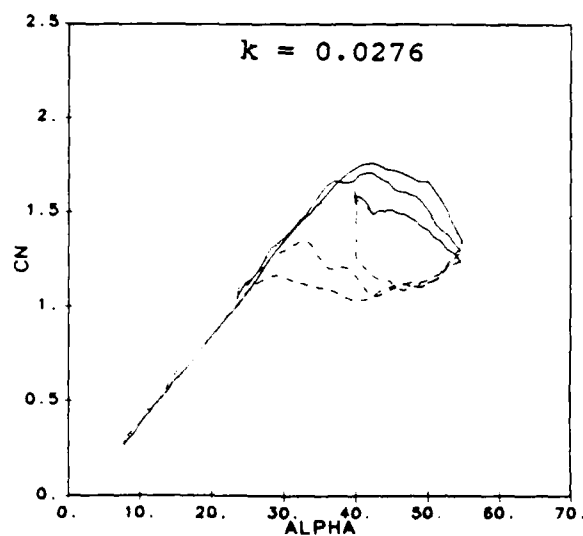
70°/30° Cranked Wing, Incidence = 32° to 64°



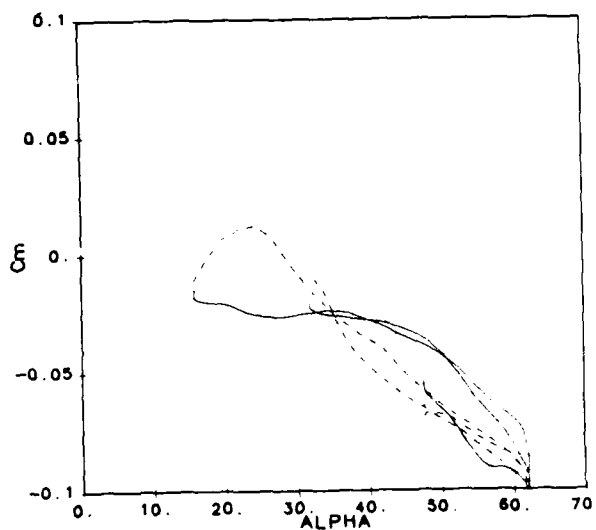
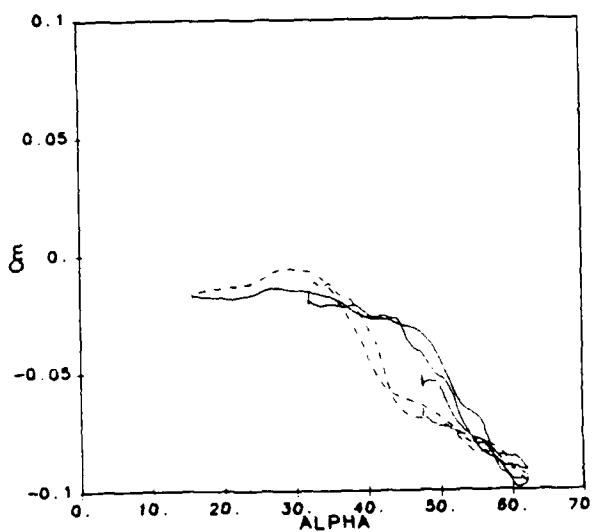
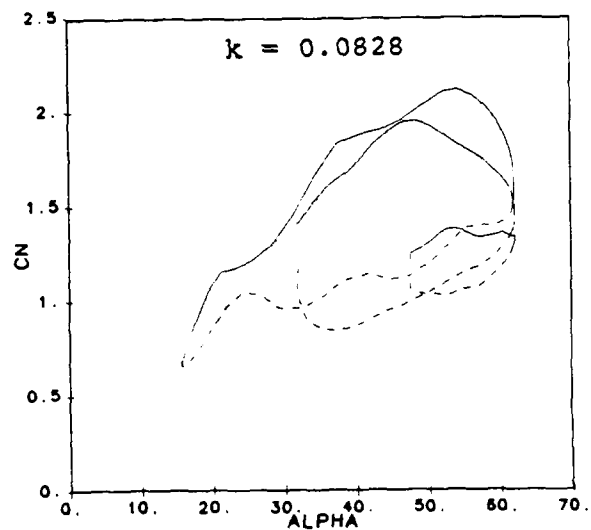
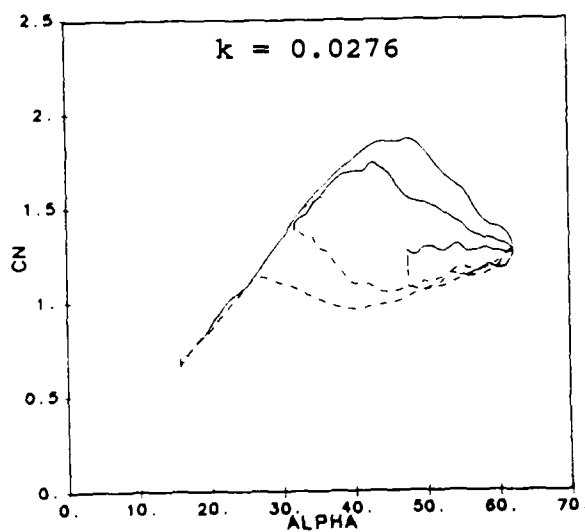
70°/30° Cranked Wing, Incidence = 8° to 40°



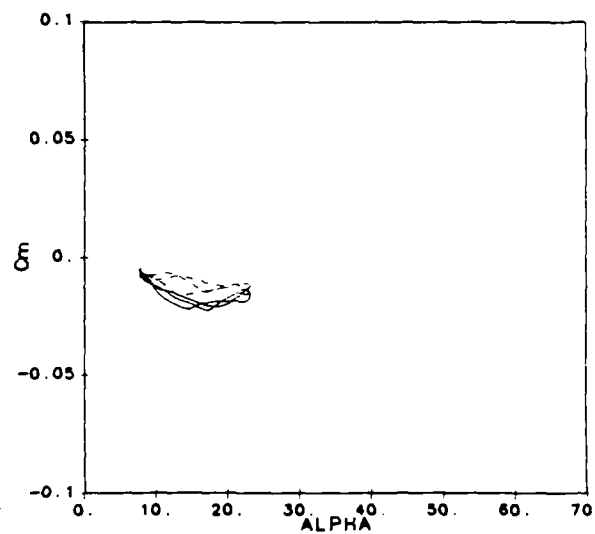
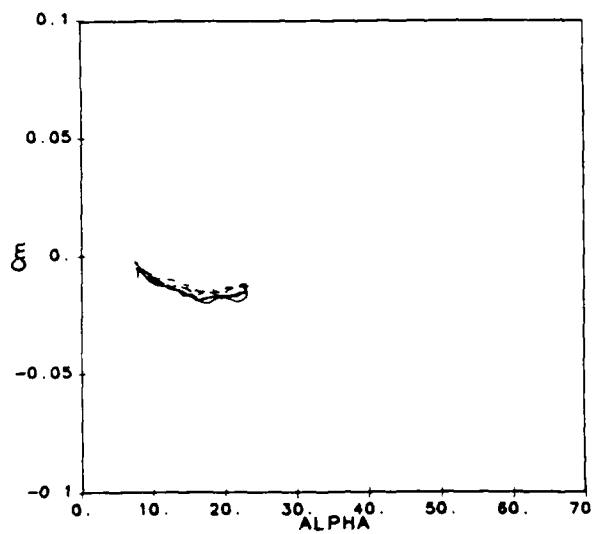
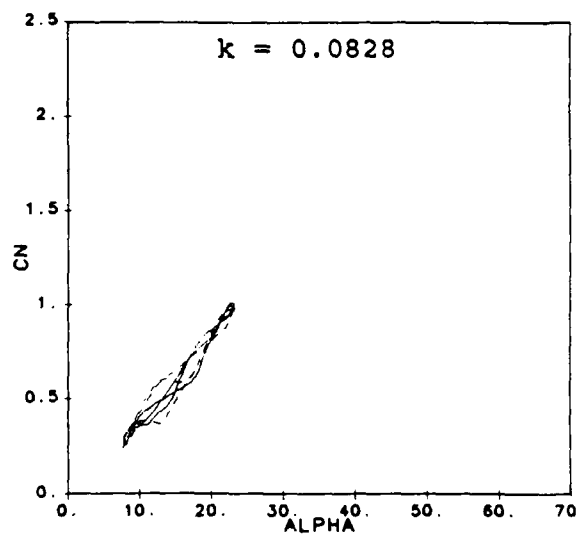
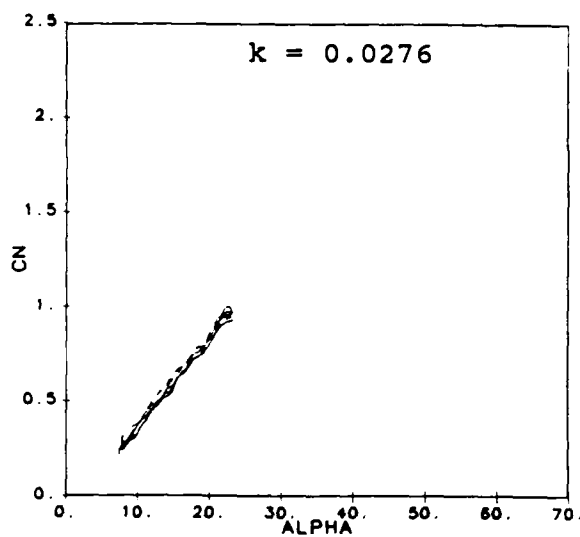
70°/30° Cranked Wing, Incidence = 16° to 48°



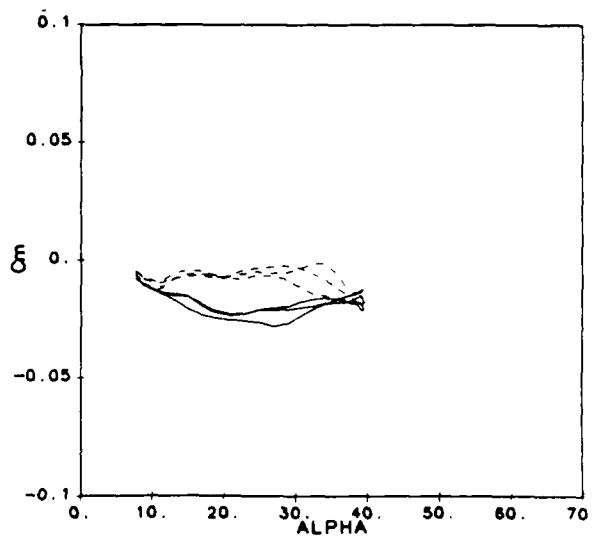
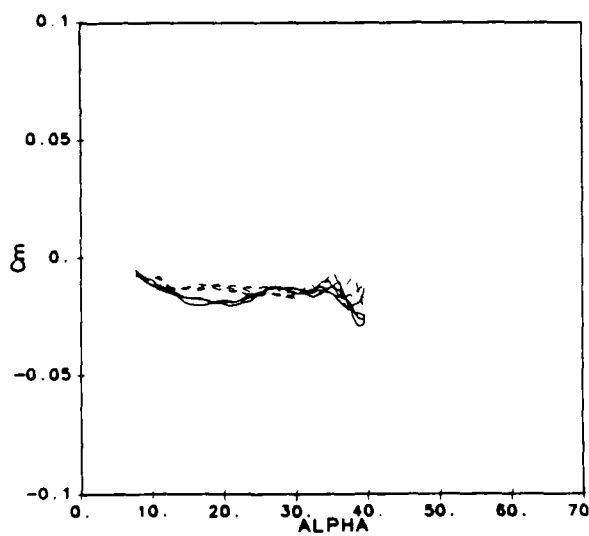
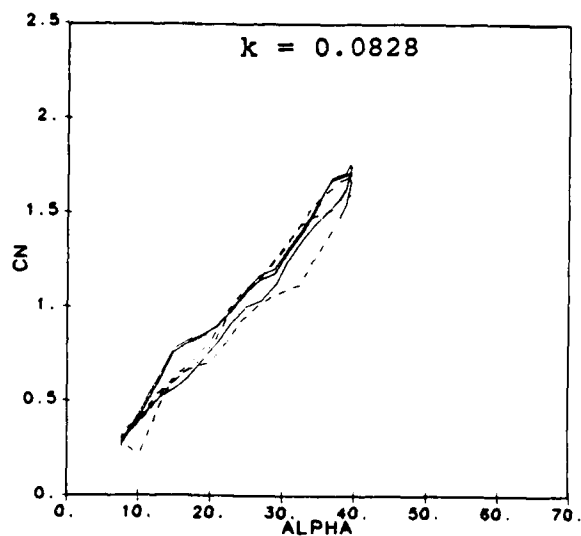
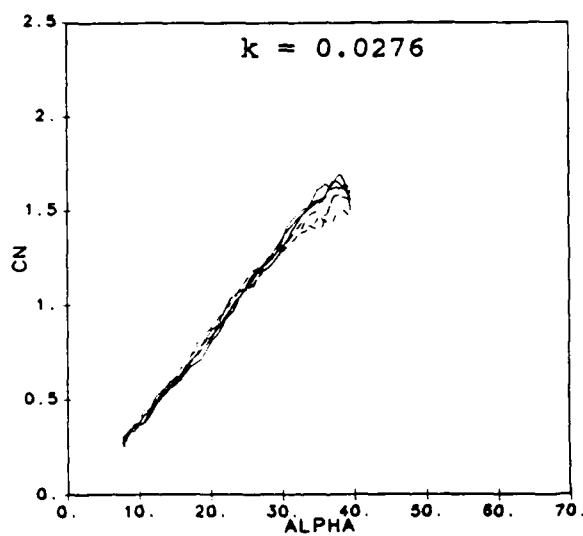
70°/30° Cranked Wing, Incidence = 8° to 56°



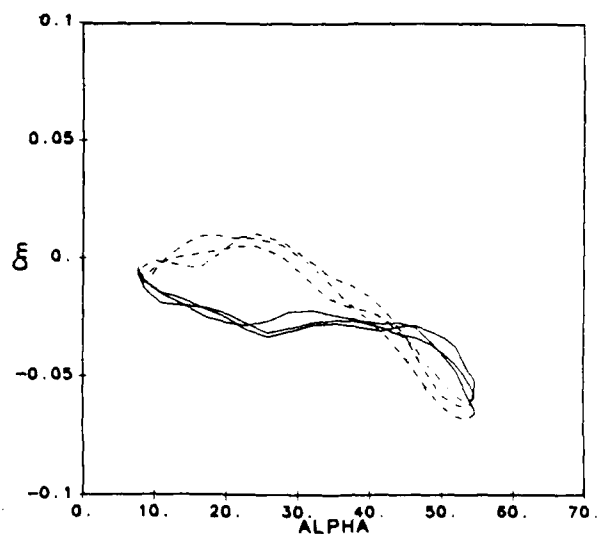
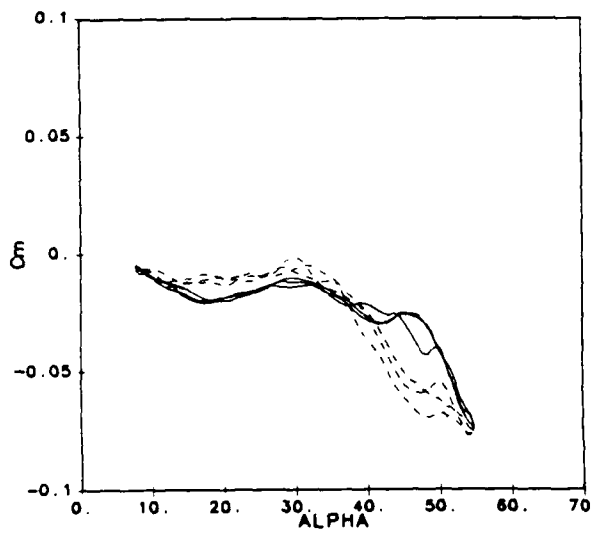
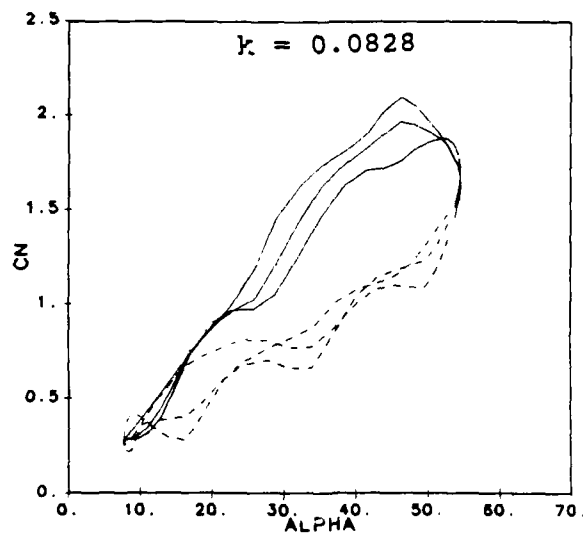
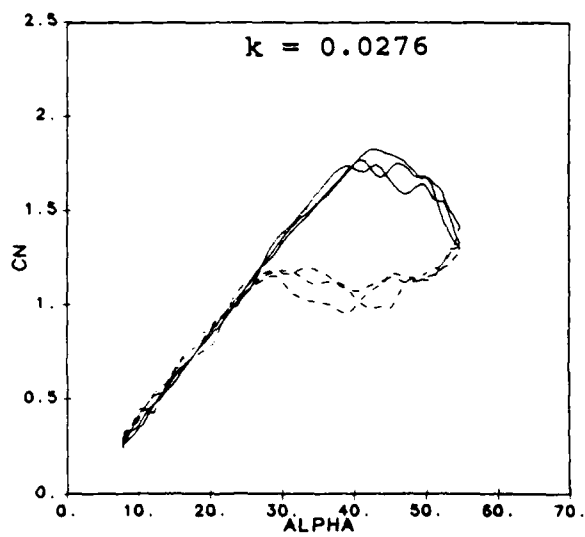
70°/30° Cranked Wing, Incidence = 16° to 64°



70°/30° Cranked Wing, Incidence = 8° to 24°



70°/30° Cranked Wing, Incidence = 8° to 40°



70°/30° Cranked Wing, Incidence = 8° to 56°

Cranked Wing Static Data
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0000
Alpha Min. = 0 deg.
Alpha Max. = 90 deg.

Time	Alpha	CN	Cm
0.0000	-0.5400	-0.0467	0.0120
0.0000	4.3400	0.1183	0.0019
0.0000	9.2200	0.3479	-0.0084
0.0000	14.1000	0.5660	-0.0149
0.0000	18.9900	0.8288	-0.0151
0.0000	23.8700	1.0763	-0.0127
0.0000	28.7500	1.3115	-0.0168
0.0000	33.6300	1.5155	-0.0187
0.0000	38.5100	1.6204	-0.0136
0.0000	43.4000	1.4606	-0.0322
0.0000	48.2800	1.2552	-0.0583
0.0000	53.1600	1.1644	-0.0782
0.0000	58.0400	1.1799	-0.0834
0.0000	62.9200	1.1865	-0.0866
0.0000	67.8100	1.1824	-0.0924
0.0000	72.6900	1.1837	-0.0968
0.0000	77.5700	1.1782	-0.1030
0.0000	82.4500	1.1799	-0.1067
0.0000	87.3300	1.1634	-0.1159
0.0000	87.3300	1.1258	-0.1195
0.0000	82.4500	1.1031	-0.1099
0.0000	77.5700	1.1013	-0.1044
0.0000	72.6900	1.1305	-0.1014
0.0000	67.8100	1.1423	-0.0954
0.0000	62.9200	1.1309	-0.0883
0.0000	58.0400	1.1210	-0.0860
0.0000	53.1600	1.1322	-0.0832
0.0000	48.2800	1.1955	-0.0643
0.0000	43.4000	1.4014	-0.0396
0.0000	33.6300	1.5115	-0.0207
0.0000	28.7500	1.3011	-0.0211
0.0000	23.8700	1.0613	-0.0146
0.0000	18.9900	0.8190	-0.0179
0.0000	14.1000	0.5520	-0.0174
0.0000	9.2200	0.3153	-0.0102
0.0000	-0.5400	-0.0741	0.0093

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 24 deg.

Time	Alpha	CN	Cm
0.0000	7.7300	0.2724	-0.0034
2.1060	7.7300	0.2575	-0.0048
4.2120	7.7300	0.2531	-0.0045
6.3180	8.1400	0.2597	-0.0054
8.4240	8.9900	0.3004	-0.0079
10.5300	10.0300	0.3430	-0.0102
12.6370	10.9600	0.3932	-0.0118
14.7430	11.9800	0.4493	-0.0132
16.8490	13.0200	0.4957	-0.0143
18.9550	14.0400	0.5398	-0.0156
21.0610	15.0500	0.5809	-0.0165
23.1670	16.0400	0.6419	-0.0179
25.2730	17.0700	0.6863	-0.0186
27.3790	18.0900	0.7392	-0.0181
29.4850	19.1300	0.7665	-0.0170
31.5910	20.1500	0.8300	-0.0171
33.6970	21.1300	0.8986	-0.0174
35.8030	22.0200	0.9534	-0.0171
37.9090	23.0700	0.9607	-0.0157
40.0160	22.7600	0.9543	-0.0127
42.1220	21.8400	0.9355	-0.0127
44.2280	20.9000	0.9050	-0.0135
46.3340	19.9100	0.8477	-0.0146
48.4400	18.8700	0.7829	-0.0154
50.5460	17.8800	0.7492	-0.0150
52.6520	16.8000	0.6997	-0.0154
54.7580	15.8000	0.6657	-0.0146
56.8640	14.7400	0.6218	-0.0131
58.9700	13.8000	0.5720	-0.0122
61.0760	12.7500	0.5447	-0.0122
63.1820	11.7500	0.4753	-0.0111
65.2890	10.7200	0.4084	-0.0099
67.3950	9.8100	0.3619	-0.0082
69.5010	8.7600	0.3119	-0.0064
71.6070	7.9500	0.2850	-0.0049
73.7130	7.9500	0.2745	-0.0057
75.8190	7.9500	0.2775	-0.0063
77.9250	7.9400	0.2947	-0.0063
80.0310	7.9400	0.2965	-0.0066
82.1370	7.9500	0.2839	-0.0064
84.2430	7.9400	0.2757	-0.0053
86.3490	7.9400	0.2783	-0.0056
88.4560	7.9400	0.2836	-0.0064
90.5620	7.9400	0.2886	-0.0075
92.6680	7.9500	0.2903	-0.0072
94.7740	7.9500	0.2925	-0.0067
96.8800	7.9400	0.2879	-0.0067
98.9860	7.9400	0.2878	-0.0070
101.0920	7.9500	0.2873	-0.0072
103.1980	7.9400	0.2817	-0.0075
105.3040	7.9500	0.2828	-0.0074
107.4100	7.9400	0.2875	-0.0064
109.5160	7.9400	0.2845	-0.0065
111.6220	7.9400	0.2863	-0.0066
113.7280	7.9400	0.2782	-0.0074
115.8350	7.9400	0.2789	-0.0072
117.9410	7.9400	0.2850	-0.0070
120.0470	7.9400	0.2884	-0.0065
122.1530	7.9400	0.2746	-0.0055

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 24 deg.

Time	Alpha	CN	Cm
0.0000	7.8300	0.2830	-0.0066
1.3630	7.8300	0.2771	-0.0064
2.7250	7.8300	0.2685	-0.0059
4.0880	7.8300	0.2675	-0.0062
5.4500	7.9300	0.2833	-0.0070
6.8130	8.4200	0.3190	-0.0084
8.1750	9.3700	0.3629	-0.0106
9.5380	10.6000	0.3891	-0.0139
10.9000	12.2500	0.4414	-0.0165
12.2630	14.0800	0.5102	-0.0191
13.6250	16.0200	0.6095	-0.0206
14.9880	17.9700	0.7231	-0.0200
16.3510	19.6600	0.8243	-0.0186
17.7130	21.1000	0.8976	-0.0169
19.0760	22.0000	0.9400	-0.0162
20.4380	22.7500	0.9706	-0.0156
21.8010	23.1400	0.9890	-0.0143
23.1630	22.7200	0.9751	-0.0129
24.5260	21.8900	0.9301	-0.0122
25.8880	20.6700	0.8602	-0.0122
27.2510	19.0600	0.7696	-0.0126
28.6130	17.2400	0.6676	-0.0127
29.9760	15.2700	0.5659	-0.0128
31.3390	13.4300	0.5151	-0.0112
32.7010	11.7000	0.4900	-0.0092
34.0640	10.3100	0.4294	-0.0082
35.4260	9.1900	0.3641	-0.0075
36.7890	8.4300	0.3094	-0.0070
38.1510	8.0400	0.2868	-0.0064
39.5140	7.9500	0.2856	-0.0062
40.8760	7.9400	0.2851	-0.0059
42.2390	7.9500	0.2784	-0.0056
43.6010	7.9400	0.2751	-0.0056

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	7.8300	0.2877	-0.0060
2.1070	7.8200	0.2860	-0.0052
4.2140	7.8300	0.2824	-0.0061
6.3210	8.2100	0.3051	-0.0072
8.4280	9.0500	0.3490	-0.0093
10.5350	10.0800	0.3735	-0.0108
12.6420	11.0200	0.4050	-0.0125
14.7490	12.0600	0.4680	-0.0138
16.8560	13.5900	0.5411	-0.0156
18.9620	15.0900	0.5873	-0.0179
21.0690	16.5800	0.6635	-0.0182
23.1760	18.1800	0.7274	-0.0189
25.2830	19.7300	0.8103	-0.0188
27.3900	21.1900	0.8799	-0.0192
29.4970	22.6500	0.9602	-0.0179
31.6040	24.1700	1.0473	-0.0161
33.7110	25.7900	1.1399	-0.0134
35.8180	27.2100	1.1966	-0.0125
37.9250	28.7400	1.2501	-0.0131
40.0320	30.3100	1.3527	-0.0136
42.1390	31.9100	1.4431	-0.0149
44.2460	33.5400	1.5071	-0.0136
46.3530	34.9100	1.5684	-0.0131
48.4600	35.8900	1.5897	-0.0143
50.5670	36.9200	1.6305	-0.0184
52.6730	37.9400	1.6507	-0.0222
54.7800	39.0800	1.6051	-0.0241
56.8870	39.2700	1.5539	-0.0189
58.9940	38.3000	1.5628	-0.0165
61.1010	37.2600	1.5354	-0.0160
63.2080	36.2100	1.4631	-0.0154
65.3150	35.2200	1.4469	-0.0105
67.4220	33.7200	1.4308	-0.0112
69.5290	32.1800	1.3849	-0.0136
71.6360	30.5800	1.3237	-0.0147
73.7430	29.0000	1.2641	-0.0157
75.8500	27.4800	1.2023	-0.0147
77.9570	25.9900	1.1290	-0.0141
80.0640	24.3800	1.0874	-0.0146
82.1710	22.8800	1.0268	-0.0136
84.2780	21.3600	0.9267	-0.0131
86.3850	19.9000	0.8427	-0.0122
88.4910	18.3700	0.7909	-0.0119
90.5980	16.7600	0.7169	-0.0125
92.7050	15.2700	0.6374	-0.0127
94.8120	13.7800	0.5558	-0.0130
96.9190	12.3200	0.4869	-0.0127
99.0260	11.3000	0.4417	-0.0107
101.1330	10.3200	0.3939	-0.0096
103.2400	9.3600	0.3482	-0.0091
105.3470	8.3300	0.3106	-0.0078
107.4540	7.9400	0.2877	-0.0070
109.5610	7.9400	0.2755	-0.0068
111.6680	7.9300	0.2745	-0.0065
113.7750	7.9300	0.2837	-0.0064
115.8820	7.9300	0.2844	-0.0065
117.9890	7.9300	0.2836	-0.0062
120.0960	7.9300	0.2869	-0.0066
122.2020	7.9400	0.2966	-0.0072

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	7.7900	0.2900	-0.0055
1.4260	7.8000	0.2863	-0.0057
2.8530	7.8000	0.2845	-0.0059
4.2790	7.7900	0.2839	-0.0065
5.7050	7.9400	0.2940	-0.0079
7.1320	8.6300	0.3350	-0.0100
8.5580	10.4500	0.4334	-0.0129
9.9850	13.3200	0.6048	-0.0156
11.4110	16.7800	0.7473	-0.0200
12.8370	20.9000	0.8658	-0.0238
14.2640	24.9500	1.0555	-0.0228
15.6900	28.9200	1.1657	-0.0223
17.1160	32.8500	1.3923	-0.0185
18.5430	35.8000	1.5714	-0.0169
19.9690	37.8500	1.6540	-0.0168
21.3960	39.0700	1.7048	-0.0156
22.8220	39.4600	1.7060	-0.0171
24.2480	38.8000	1.6187	-0.0170
25.6750	36.8600	1.5183	-0.0136
27.1010	34.0900	1.4142	-0.0082
28.5270	30.5400	1.2528	-0.0060
29.9540	26.5600	1.0954	-0.0050
31.3800	22.2700	0.9083	-0.0063
32.8070	18.1800	0.7086	-0.0064
34.2330	14.4200	0.5879	-0.0061
35.6590	11.4700	0.4127	-0.0100
37.0860	9.4600	0.3263	-0.0094
38.5120	8.3300	0.3229	-0.0070
39.9380	7.9200	0.3204	-0.0065
41.3650	7.9100	0.3085	-0.0067
42.7910	7.9100	0.3010	-0.0069
44.2180	7.9100	0.2940	-0.0069
45.6440	7.9100	0.2934	-0.0068

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.8100	0.2871	-0.0059
2.1060	7.8100	0.2718	-0.0059
4.2120	7.8100	0.2736	-0.0056
6.3180	8.1900	0.2891	-0.0063
8.4240	9.0300	0.3205	-0.0078
10.5300	10.0700	0.3761	-0.0100
12.6360	11.5200	0.4536	-0.0120
14.7420	13.0800	0.5172	-0.0139
16.8480	14.6700	0.5983	-0.0166
18.9540	17.2800	0.7087	-0.0197
21.0600	19.8500	0.8361	-0.0189
23.1650	22.1900	0.9462	-0.0175
25.2710	24.7700	1.0653	-0.0153
27.3770	27.2700	1.2087	-0.0126
29.4830	30.3200	1.3636	-0.0120
31.5890	33.5700	1.4932	-0.0143
33.6950	36.2900	1.6134	-0.0195
35.8010	38.9600	1.7115	-0.0239
37.9070	41.5300	1.7576	-0.0278
40.0130	43.7200	1.7366	-0.0267
42.1190	46.1400	1.7113	-0.0287
44.2250	48.3800	1.6676	-0.0351
46.3310	49.8600	1.6632	-0.0403
48.4370	51.2700	1.5941	-0.0498
50.5430	52.5600	1.5160	-0.0606
52.6490	53.5300	1.4369	-0.0671
54.7550	54.5100	1.3648	-0.0712
56.8610	54.3800	1.3103	-0.0757
58.9670	53.4600	1.2689	-0.0736
61.0730	52.4500	1.2098	-0.0692
63.1790	50.9600	1.1627	-0.0639
65.2850	49.5300	1.1373	-0.0615
67.3900	47.7200	1.1304	-0.0619
69.4960	45.2600	1.1000	-0.0565
71.6020	42.9500	1.0572	-0.0447
73.7080	40.5900	1.0349	-0.0320
75.8140	37.9700	1.0590	-0.0216
77.9200	35.4000	1.0990	-0.0126
80.0260	32.3000	1.1275	-0.0080
82.1320	29.1700	1.1649	-0.0051
84.2380	26.4000	1.1256	-0.0087
86.3440	23.9000	1.0284	-0.0097
88.4500	21.3100	0.9052	-0.0108
90.5560	18.8000	0.7976	-0.0106
92.6620	16.2200	0.7075	-0.0108
94.7680	14.1700	0.5955	-0.0120
96.8740	12.6400	0.5019	-0.0117
98.9800	11.1200	0.4513	-0.0091
101.0860	9.9600	0.4124	-0.0076
103.1920	8.9300	0.3480	-0.0066
105.2980	7.9500	0.3049	-0.0065
107.4040	7.9200	0.2888	-0.0059
109.5090	7.9300	0.2741	-0.0052
111.6150	7.9200	0.2757	-0.0051
113.7210	7.9200	0.2760	-0.0050
115.8270	7.9200	0.2737	-0.0055
117.9330	7.9300	0.2799	-0.0055
120.0390	7.9200	0.2881	-0.0055
122.1450	7.9200	0.2862	-0.0059

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.8100	0.2831	-0.0045
1.4250	7.8100	0.2736	-0.0048
2.8500	7.8000	0.2705	-0.0051
4.2750	7.8100	0.2731	-0.0053
5.6990	7.9500	0.2828	-0.0068
7.1240	8.7300	0.2981	-0.0106
8.5490	11.1300	0.3667	-0.0162
9.9740	15.1300	0.6058	-0.0200
11.3990	20.2000	0.8901	-0.0252
12.8240	25.9300	1.0612	-0.0302
14.2480	32.1200	1.4350	-0.0258
15.6730	38.6900	1.7292	-0.0274
17.0980	44.0000	1.8782	-0.0293
18.5230	48.5300	1.9360	-0.0342
19.9480	52.1000	1.8752	-0.0437
21.3730	53.8000	1.7950	-0.0534
22.7970	54.6500	1.7071	-0.0575
24.2220	54.3600	1.5848	-0.0619
25.6470	52.9200	1.4150	-0.0634
27.0720	49.7600	1.2131	-0.0567
28.4970	45.4200	1.1409	-0.0381
29.9220	40.2400	1.0424	-0.0220
31.3460	33.9700	0.7712	-0.0106
32.7710	27.8100	0.7589	0.0046
34.1960	21.4200	0.6530	0.0075
35.6210	16.3300	0.4502	0.0025
37.0460	12.0900	0.3978	-0.0005
38.4710	9.5400	0.3424	-0.0051
39.8950	8.3100	0.2963	-0.0069
41.3200	7.9500	0.2875	-0.0063
42.7450	7.9400	0.2762	-0.0058
44.1700	7.9300	0.2688	-0.0053
45.5950	7.9300	0.2620	-0.0050

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 32 deg.

Time	Alpha	CN	Cm
0.0000	15.6500	0.6668	-0.0153
2.1060	15.6400	0.6559	-0.0156
4.2120	15.6400	0.6505	-0.0147
6.3180	16.0400	0.6553	-0.0151
8.4240	16.9800	0.6995	-0.0162
10.5290	18.0400	0.7552	-0.0162
12.6350	19.0400	0.7994	-0.0148
14.7410	20.0700	0.8465	-0.0139
16.8470	21.0500	0.9156	-0.0147
18.9530	21.9900	0.9721	-0.0158
21.0590	23.0200	1.0136	-0.0144
23.1650	24.0100	1.0324	-0.0120
25.2710	25.0600	1.0826	-0.0103
27.3770	26.0700	1.1592	-0.0103
29.4820	27.0400	1.2053	-0.0098
31.5880	28.0100	1.2698	-0.0098
33.6940	29.0600	1.3313	-0.0124
35.8000	30.0800	1.3855	-0.0152
37.9060	31.1600	1.3993	-0.0155
40.0120	30.8400	1.3598	-0.0137
42.1180	29.8400	1.3000	-0.0138
44.2240	28.8200	1.2676	-0.0119
46.3290	27.7800	1.2198	-0.0110
48.4350	26.8100	1.1665	-0.0122
50.5410	25.8300	1.1474	-0.0127
52.6470	24.7700	1.0836	-0.0140
54.7530	23.7600	1.0362	-0.0142
56.8590	22.7100	0.9857	-0.0138
58.9650	21.7200	0.9652	-0.0131
61.0710	20.7500	0.9204	-0.0124
63.1770	19.7800	0.8603	-0.0122
65.2820	18.7200	0.8134	-0.0123
67.3880	17.7400	0.7578	-0.0137
69.4940	16.6500	0.7027	-0.0138
71.6000	15.8300	0.6777	-0.0142
73.7060	15.8300	0.6797	-0.0150
75.8120	15.8300	0.6762	-0.0150
77.9180	15.8300	0.6701	-0.0149
80.0240	15.8300	0.6755	-0.0156
82.1300	15.8300	0.6799	-0.0159
84.2350	15.8200	0.6707	-0.0157
86.3410	15.8200	0.6626	-0.0158
88.4470	15.8200	0.6705	-0.0148
90.5530	15.8200	0.6826	-0.0146
92.6590	15.8200	0.6747	-0.0151
94.7650	15.8200	0.6552	-0.0156
96.8710	15.8200	0.6576	-0.0153
98.9770	15.8200	0.6645	-0.0152
101.0830	15.8300	0.6608	-0.0158
103.1880	15.8200	0.6738	-0.0154
105.2940	15.8300	0.6915	-0.0159
107.4000	15.8300	0.6935	-0.0155
109.5060	15.8300	0.6867	-0.0148
111.6120	15.8200	0.6772	-0.0156
113.7180	15.8300	0.6736	-0.0165
115.8240	15.8300	0.6717	-0.0149
117.9300	15.8300	0.6660	-0.0144
120.0350	15.8300	0.6643	-0.0158
122.1410	15.8300	0.6864	-0.0155

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 32 deg.

Time	Alpha	CN	Cm
0.0000	15.7400	0.6581	-0.0166
1.4240	15.7400	0.6523	-0.0164
2.8490	15.7400	0.6564	-0.0162
4.2730	15.7400	0.6673	-0.0159
5.6980	15.8600	0.6801	-0.0158
7.1220	16.3400	0.6993	-0.0165
8.5470	17.3900	0.7458	-0.0177
9.9710	18.7600	0.8082	-0.0184
11.3960	20.4200	0.8839	-0.0183
12.8200	22.0700	0.9761	-0.0182
14.2450	24.1000	1.0794	-0.0169
15.6690	26.0500	1.1417	-0.0154
17.0940	27.6400	1.1873	-0.0141
18.5180	29.1300	1.2627	-0.0122
19.9430	30.1400	1.3538	-0.0104
21.3670	30.9400	1.3873	-0.0104
22.7920	31.2300	1.3865	-0.0109
24.2160	30.6600	1.3798	-0.0112
25.6410	29.6600	1.3395	-0.0107
27.0650	28.2200	1.2750	-0.0105
28.4900	26.6200	1.1926	-0.0105
29.9140	24.6900	1.0963	-0.0101
31.3390	22.7000	0.9885	-0.0107
32.7630	20.8800	0.8876	-0.0118
34.1880	19.2200	0.8264	-0.0118
35.6120	17.8500	0.7981	-0.0112
37.0360	16.7700	0.7598	-0.0117
38.4610	16.0900	0.7207	-0.0131
39.8850	15.8400	0.6876	-0.0148
41.3100	15.8300	0.6682	-0.0155
42.7340	15.8300	0.6644	-0.0154
44.1590	15.8300	0.6798	-0.0148
45.5830	15.8400	0.6952	-0.0147

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	15.7300	0.6621	-0.0151
2.1070	15.7300	0.6888	-0.0151
4.2140	15.7300	0.6964	-0.0149
6.3210	16.0700	0.7109	-0.0148
8.4280	17.0200	0.7471	-0.0149
10.5350	18.0600	0.7750	-0.0153
12.6420	19.0800	0.8307	-0.0163
14.7490	20.1100	0.8640	-0.0170
16.8560	21.5600	0.9228	-0.0161
18.9620	23.0300	1.0071	-0.0148
21.0690	24.5400	1.0846	-0.0128
23.1760	26.1000	1.1538	-0.0106
25.2830	27.5500	1.2004	-0.0108
27.3900	29.0900	1.2847	-0.0126
29.4970	30.6900	1.4098	-0.0136
31.6040	32.2700	1.4481	-0.0152
33.7110	33.8600	1.4993	-0.0153
35.8180	35.3900	1.5890	-0.0156
37.9250	36.8700	1.6457	-0.0207
40.0320	38.4900	1.6605	-0.0210
42.1390	40.0600	1.6993	-0.0186
44.2460	41.5900	1.7622	-0.0234
46.3530	42.8400	1.7861	-0.0248
48.4600	43.7100	1.7313	-0.0277
50.5670	44.6300	1.6489	-0.0278
52.6730	45.5900	1.6092	-0.0341
54.7800	46.6200	1.5975	-0.0380
56.8870	46.8100	1.5333	-0.0385
58.9940	45.9000	1.4414	-0.0361
61.1010	44.9400	1.3778	-0.0342
63.2080	43.9800	1.3488	-0.0342
65.3150	43.1000	1.3181	-0.0336
67.4220	41.7700	1.2908	-0.0315
69.5290	40.3100	1.2925	-0.0240
71.6360	38.7500	1.2994	-0.0141
73.7430	37.1200	1.3299	-0.0073
75.8500	35.6000	1.3734	-0.0089
77.9570	34.0800	1.3802	-0.0098
80.0640	32.5200	1.3609	-0.0082
82.1710	30.9800	1.3197	-0.0099
84.2780	29.3600	1.2609	-0.0117
86.3850	27.7900	1.2463	-0.0123
88.4910	26.3100	1.1791	-0.0127
90.5980	24.7500	1.1080	-0.0130
92.7050	23.2700	1.0140	-0.0119
94.8120	21.7200	0.9433	-0.0116
96.9190	20.3700	0.8659	-0.0128
99.0260	19.3300	0.8345	-0.0121
101.1330	18.3200	0.8180	-0.0118
103.2400	17.2500	0.7513	-0.0131
105.3470	16.2200	0.7146	-0.0136
107.4540	15.8200	0.6880	-0.0142
109.5610	15.8200	0.6786	-0.0155
111.6680	15.8200	0.6844	-0.0158
113.7750	15.8100	0.6774	-0.0147
115.8820	15.8100	0.6768	-0.0142
117.9890	15.8100	0.6870	-0.0147
120.0960	15.8100	0.6843	-0.0163
122.2020	15.8100	0.6665	-0.0169

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	15.7200	0.6693	-0.0170
1.4280	15.7200	0.6683	-0.0163
2.8560	15.7200	0.6694	-0.0153
4.2840	15.7200	0.6805	-0.0147
5.7120	15.8500	0.7020	-0.0151
7.1400	16.6200	0.7491	-0.0164
8.5670	18.5100	0.8355	-0.0183
9.9950	21.3900	0.9770	-0.0201
11.4230	24.7500	1.1468	-0.0199
12.8510	28.7100	1.3178	-0.0190
14.2790	33.2600	1.5100	-0.0183
15.7070	37.2100	1.6455	-0.0189
17.1350	40.9600	1.7964	-0.0215
18.5630	43.6600	1.9245	-0.0245
19.9910	45.5200	1.9458	-0.0282
21.4190	46.6400	1.8856	-0.0293
22.8470	46.9800	1.7705	-0.0305
24.2750	46.3600	1.6451	-0.0280
25.7020	44.5800	1.5106	-0.0234
27.1300	42.0600	1.4237	-0.0216
28.5580	38.6200	1.2951	-0.0182
29.9860	34.5000	1.1929	-0.0102
31.4140	30.2600	1.0957	-0.0054
32.8420	26.1500	0.9886	-0.0036
34.2700	22.4100	0.9207	-0.0032
35.6980	19.4700	0.8298	-0.0062
37.1260	17.3900	0.7468	-0.0090
38.5540	16.2100	0.7061	-0.0117
39.9820	15.8200	0.6842	-0.0129
41.4090	15.8100	0.6735	-0.0143
42.8370	15.8100	0.6657	-0.0152
44.2650	15.8100	0.6675	-0.0155
45.6930	15.8100	0.6746	-0.0153

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 16 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	15.7400	0.6791	-0.0176
2.1070	15.7500	0.6819	-0.0171
4.2140	15.7500	0.6954	-0.0169
6.3210	16.0900	0.7098	-0.0172
8.4280	17.0200	0.7384	-0.0176
10.5350	18.0600	0.7776	-0.0177
12.6420	19.6300	0.8475	-0.0178
14.7490	21.1000	0.9289	-0.0185
16.8560	22.6200	1.0108	-0.0177
18.9620	25.2400	1.0902	-0.0156
21.0690	27.7000	1.2162	-0.0139
23.1760	30.2300	1.3492	-0.0151
25.2830	32.9700	1.4961	-0.0164
27.3900	35.5100	1.6055	-0.0188
29.4970	38.5300	1.7095	-0.0246
31.6040	41.6200	1.8079	-0.0273
33.7110	44.0800	1.8489	-0.0292
35.8180	46.5400	1.8482	-0.0314
37.9250	49.0700	1.8337	-0.0391
40.0320	51.4200	1.7272	-0.0542
42.1390	53.8200	1.6329	-0.0663
44.2460	56.0500	1.5509	-0.0725
46.3530	57.5100	1.4547	-0.0867
48.4600	58.9600	1.4026	-0.0925
50.5670	60.2700	1.3880	-0.0975
52.6730	61.2500	1.3597	-0.0983
54.7800	62.0400	1.3132	-0.0966
56.8870	61.9400	1.2777	-0.0957
58.9940	61.1900	1.2477	-0.0939
61.1010	60.1700	1.1893	-0.0904
63.2080	58.6700	1.1509	-0.0844
65.3150	57.1900	1.1367	-0.0809
67.4220	55.4200	1.1271	-0.0786
69.5290	52.9800	1.0826	-0.0763
71.6360	50.5500	1.0660	-0.0702
73.7430	48.0800	1.0330	-0.0654
75.8500	45.6200	0.9967	-0.0618
77.9570	43.2500	0.9773	-0.0585
80.0640	40.3900	0.9627	-0.0464
82.1710	37.2600	0.9792	-0.0260
84.2780	34.5200	1.0225	-0.0128
86.3850	32.0200	1.0720	-0.0068
88.4910	29.3300	1.1092	-0.0057
90.5980	26.8200	1.1327	-0.0074
92.7050	24.2400	1.0458	-0.0117
94.8120	22.1300	0.9461	-0.0127
96.9190	20.6500	0.8781	-0.0136
99.0260	19.1500	0.8237	-0.0140
101.1330	17.9200	0.7844	-0.0143
103.2400	16.8400	0.7318	-0.0154
105.3470	15.8500	0.6764	-0.0167
107.4540	15.8200	0.6793	-0.0170
109.5610	15.8200	0.6902	-0.0171
111.6680	15.8200	0.6970	-0.0164
113.7750	15.8100	0.6842	-0.0164
115.8820	15.8100	0.6602	-0.0173
117.9890	15.8100	0.6665	-0.0173
120.0960	15.8200	0.6768	-0.0173
122.2020	15.8200	0.6815	-0.0171

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 16 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	15.7200	0.6769	-0.0183
1.4280	15.7100	0.6745	-0.0182
2.8560	15.7200	0.6739	-0.0179
4.2840	15.7100	0.6774	-0.0178
5.7130	15.8500	0.7041	-0.0184
7.1410	16.8000	0.8097	-0.0195
8.5690	19.3600	1.0481	-0.0204
9.9970	23.1900	1.1774	-0.0243
11.4250	28.1400	1.2958	-0.0264
12.8530	34.3700	1.6663	-0.0236
14.2810	40.6900	1.8818	-0.0286
15.7100	46.4900	1.9572	-0.0370
17.1380	51.9600	2.1019	-0.0473
18.5660	56.4000	2.0843	-0.0608
19.9940	59.8700	1.9428	-0.0696
21.4220	61.5000	1.7913	-0.0768
22.8500	62.0400	1.6283	-0.0879
24.2790	61.9200	1.5060	-0.0927
25.7070	60.5900	1.4192	-0.0893
27.1350	57.2900	1.3990	-0.0793
28.5630	52.9200	1.2943	-0.0704
29.9910	47.4600	1.1306	-0.0577
31.4190	41.7600	1.1443	-0.0394
32.8470	35.4400	1.0264	-0.0261
34.2760	29.2900	0.9662	-0.0049
35.7040	24.2000	1.0484	0.0124
37.1320	19.9800	0.8595	0.0070
38.5600	17.3600	0.7158	-0.0023
39.9880	16.1400	0.6605	-0.0089
41.4160	15.8200	0.6593	-0.0131
42.8440	15.8100	0.6825	-0.0156
44.2730	15.8100	0.6868	-0.0174
45.7010	15.8100	0.6841	-0.0178

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 24 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	23.5900	1.0678	-0.0142
2.1060	23.5900	1.0448	-0.0152
4.2120	23.5900	1.0480	-0.0155
6.3180	23.9200	1.1007	-0.0168
8.4240	24.8100	1.1270	-0.0176
10.5290	25.8800	1.1649	-0.0171
12.6350	26.8100	1.2232	-0.0169
14.7410	27.8100	1.2728	-0.0167
16.8470	28.8300	1.3127	-0.0172
18.9530	29.8900	1.3332	-0.0160
21.0590	30.9600	1.3826	-0.0166
23.1650	31.9900	1.4336	-0.0166
25.2710	33.0800	1.4798	-0.0156
27.3770	34.0400	1.5159	-0.0158
29.4820	35.0900	1.5543	-0.0167
31.5880	36.0500	1.5911	-0.0212
33.6940	37.0900	1.6383	-0.0255
35.8000	38.1000	1.6124	-0.0284
37.9060	39.2100	1.6010	-0.0268
40.0120	38.8200	1.5208	-0.0232
42.1180	37.8100	1.4826	-0.0184
44.2240	36.7800	1.4701	-0.0138
46.3290	35.7700	1.4650	-0.0159
48.4350	34.7600	1.4477	-0.0154
50.5410	33.7700	1.4227	-0.0153
52.6470	32.7000	1.3996	-0.0163
54.7530	31.6900	1.3689	-0.0168
56.8590	30.5900	1.3265	-0.0179
58.9650	29.5600	1.3147	-0.0174
61.0710	28.5100	1.2663	-0.0188
63.1770	27.5300	1.2285	-0.0180
65.2820	26.5100	1.1832	-0.0157
67.3880	25.5600	1.1429	-0.0158
69.4940	24.4700	1.0972	-0.0160
71.6000	23.6800	1.0678	-0.0163
73.7060	23.6800	1.0370	-0.0159
75.8120	23.6700	1.0558	-0.0157
77.9180	23.6800	1.0778	-0.0161
80.0240	23.6800	1.0765	-0.0157
82.1300	23.6800	1.0751	-0.0149
84.2350	23.6800	1.0697	-0.0157
86.3410	23.6800	1.0653	-0.0156
88.4470	23.6800	1.0651	-0.0160
90.5530	23.6800	1.0604	-0.0163
92.6590	23.6800	1.0465	-0.0159
94.7650	23.6800	1.0448	-0.0152
96.8710	23.6800	1.0656	-0.0137
98.9770	23.6800	1.0705	-0.0136
101.0830	23.6700	1.0649	-0.0142
103.1880	23.6800	1.0628	-0.0166
105.2940	23.6700	1.0757	-0.0159
107.4000	23.6700	1.0782	-0.0155
109.5060	23.6700	1.0764	-0.0154
111.6120	23.6700	1.0747	-0.0145
113.7180	23.6700	1.0721	-0.0144
115.8240	23.6700	1.0650	-0.0151
117.9300	23.6800	1.0612	-0.0155
120.0350	23.6700	1.0622	-0.0150
122.1410	23.6700	1.0652	-0.0156

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 24 deg.
Alpha Max. = 40 deg.

Time	Alpha	CN	Cm
0.0000	23.5800	1.0827	-0.0129
1.4240	23.5800	1.0721	-0.0130
2.8490	23.5800	1.0605	-0.0137
4.2730	23.5800	1.0547	-0.0145
5.6980	23.6800	1.0576	-0.0145
7.1220	24.1700	1.0854	-0.0148
8.5470	25.2100	1.1320	-0.0153
9.9710	26.5400	1.1870	-0.0160
11.3960	28.1300	1.2613	-0.0165
12.8200	29.9800	1.3435	-0.0181
14.2450	32.0900	1.4311	-0.0200
15.6690	34.0400	1.5069	-0.0205
17.0940	35.7300	1.6033	-0.0188
18.5180	37.1600	1.6695	-0.0177
19.9430	38.1700	1.6748	-0.0180
21.3670	38.9700	1.6996	-0.0201
22.7920	39.2400	1.6938	-0.0195
24.2160	38.6500	1.6361	-0.0168
25.6410	37.6300	1.5516	-0.0153
27.0650	36.1800	1.4572	-0.0135
28.4900	34.5000	1.3885	-0.0115
29.9140	32.6400	1.3505	-0.0114
31.3390	30.5700	1.2955	-0.0129
32.7630	28.6700	1.2162	-0.0149
34.1880	27.0400	1.1898	-0.0146
35.6120	25.6700	1.1455	-0.0153
37.0360	24.6000	1.0958	-0.0157
38.4610	23.9400	1.0605	-0.0166
39.8850	23.6800	1.0522	-0.0172
41.3100	23.6800	1.0516	-0.0173
42.7340	23.6700	1.0535	-0.0168
44.1590	23.6700	1.0618	-0.0160
45.5830	23.6700	1.0754	-0.0155

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 24 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	23.5800	1.0446	-0.0167
2.1070	23.5900	1.0388	-0.0168
4.2140	23.5800	1.0440	-0.0169
6.3210	23.9100	1.0724	-0.0166
8.4280	24.8100	1.1236	-0.0161
10.5350	25.8900	1.1607	-0.0174
12.6420	26.8200	1.2148	-0.0183
14.7490	27.8300	1.2858	-0.0175
16.8560	29.3500	1.3423	-0.0177
18.9620	30.9300	1.3966	-0.0187
21.0690	32.4900	1.4658	-0.0181
23.1760	34.0500	1.5465	-0.0177
25.2830	35.6000	1.6255	-0.0159
27.3900	37.0800	1.6654	-0.0198
29.4970	38.7300	1.6551	-0.0228
31.6040	40.2700	1.6947	-0.0253
33.7110	41.7900	1.7118	-0.0318
35.8180	43.1200	1.6811	-0.0315
37.9250	44.4500	1.6615	-0.0379
40.0320	45.9500	1.6116	-0.0406
42.1390	47.3700	1.5945	-0.0430
44.2460	48.9700	1.5643	-0.0454
46.3530	50.2800	1.4946	-0.0486
48.4600	51.2300	1.4303	-0.0590
50.5670	52.2200	1.3954	-0.0666
52.6730	53.1400	1.3632	-0.0724
54.7800	54.1300	1.3139	-0.0769
56.8870	54.3700	1.2808	-0.0789
58.9940	53.4800	1.2494	-0.0759
61.1010	52.5600	1.2070	-0.0736
63.2080	51.5700	1.1616	-0.0729
65.3150	50.6000	1.1343	-0.0707
67.4220	49.2300	1.1079	-0.0692
69.5290	47.6800	1.1081	-0.0673
71.6360	46.2000	1.1233	-0.0661
73.7430	44.7100	1.1046	-0.0594
75.8500	43.3500	1.0817	-0.0479
77.9570	42.0200	1.0589	-0.0376
80.0640	40.5300	1.1314	-0.0285
82.1710	39.0200	1.1976	-0.0185
84.2780	37.3600	1.2086	-0.0136
86.3850	35.8200	1.2136	-0.0112
88.4910	34.2800	1.2939	-0.0092
90.5980	32.7500	1.3504	-0.0116
92.7050	31.2400	1.3276	-0.0144
94.8120	29.6200	1.2859	-0.0146
96.9190	28.1400	1.2560	-0.0167
99.0260	27.1500	1.2127	-0.0164
101.1330	26.1600	1.1689	-0.0158
103.2400	25.1300	1.1193	-0.0160
105.3470	24.1100	1.0995	-0.0148
107.4540	23.6700	1.0940	-0.0144
109.5610	23.6700	1.0714	-0.0147
111.6680	23.6700	1.0534	-0.0168
113.7750	23.6700	1.0635	-0.0169
115.8820	23.6700	1.0627	-0.0166
117.9890	23.6700	1.0585	-0.0175
120.0960	23.6700	1.0570	-0.0166
122.2020	23.6700	1.0636	-0.0164

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 24 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	23.5700	1.0463	-0.0162
1.4230	23.5800	1.0456	-0.0154
2.8460	23.5800	1.0495	-0.0148
4.2690	23.5800	1.0653	-0.0149
5.6920	23.6700	1.0814	-0.0158
7.1150	24.3400	1.1109	-0.0181
8.5380	26.2400	1.1707	-0.0213
9.9610	28.9500	1.2690	-0.0245
11.3840	32.6200	1.4466	-0.0249
12.8080	36.6700	1.6357	-0.0252
14.2310	41.0000	1.8446	-0.0254
15.6540	44.6400	1.9909	-0.0319
17.0770	48.2000	2.0192	-0.0414
18.5000	51.0700	1.9872	-0.0505
19.9230	53.0300	1.9329	-0.0575
21.3460	54.1600	1.8274	-0.0563
22.7690	54.5200	1.7197	-0.0540
24.1920	53.9600	1.6228	-0.0549
25.6150	52.2500	1.4983	-0.0527
27.0380	49.6100	1.3550	-0.0479
28.4610	46.2200	1.2257	-0.0431
29.8840	42.5000	1.1355	-0.0348
31.3070	38.3800	1.1076	-0.0235
32.7300	34.2100	1.0499	-0.0136
34.1530	30.4900	1.0267	-0.0033
35.5760	27.4800	1.0642	0.0007
37.0000	25.3700	1.0532	-0.0059
38.4230	24.1200	1.0249	-0.0117
39.8460	23.6800	1.0111	-0.0141
41.2690	23.6800	1.0401	-0.0151
42.6920	23.6800	1.0657	-0.0153
44.1150	23.6700	1.0702	-0.0158
45.5380	23.6700	1.0701	-0.0161

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 32 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	31.7600	1.3416	-0.0181
2.1060	31.7600	1.4337	-0.0180
4.2120	31.7700	1.4412	-0.0205
6.3180	32.1500	1.4471	-0.0213
8.4240	33.2000	1.4767	-0.0220
10.5290	34.1200	1.5334	-0.0225
12.6350	35.1800	1.5535	-0.0222
14.7410	36.1400	1.5633	-0.0205
16.8470	37.1700	1.6023	-0.0205
18.9530	38.2300	1.6196	-0.0210
21.0590	39.3500	1.6027	-0.0204
23.1650	40.3400	1.6187	-0.0175
25.2710	41.3600	1.6483	-0.0150
27.3770	42.2600	1.6097	-0.0210
29.4820	43.1600	1.6132	-0.0244
31.5880	44.0300	1.6082	-0.0348
33.6940	44.9700	1.6057	-0.0417
35.8000	45.9500	1.5634	-0.0423
37.9060	46.9400	1.5188	-0.0413
40.0120	46.5800	1.4731	-0.0391
42.1180	45.6400	1.4008	-0.0391
44.2240	44.6800	1.3546	-0.0400
46.3290	43.7400	1.3451	-0.0357
48.4350	42.8800	1.3134	-0.0342
50.5410	41.9800	1.2843	-0.0334
52.6470	41.0200	1.3224	-0.0311
54.7530	40.0300	1.3181	-0.0281
56.8590	38.9800	1.3489	-0.0184
58.9650	37.8600	1.3370	-0.0205
61.0710	36.8400	1.3828	-0.0211
63.1770	35.8200	1.3912	-0.0191
65.2820	34.8300	1.3837	-0.0199
67.3880	33.8200	1.3651	-0.0193
69.4940	32.8000	1.3812	-0.0179
71.6000	31.9400	1.3951	-0.0178
73.7060	31.9300	1.4048	-0.0187
75.8120	31.9300	1.4113	-0.0204
77.9180	31.9300	1.4284	-0.0217
80.0240	31.9300	1.4153	-0.0193
82.1300	31.9300	1.4441	-0.0186
84.2350	31.9200	1.4230	-0.0192
86.3410	31.9200	1.4040	-0.0192
88.4470	31.9200	1.4192	-0.0204
90.5530	31.9200	1.4285	-0.0206
92.6590	31.9200	1.3968	-0.0198
94.7650	31.9200	1.3918	-0.0210
96.8710	31.9200	1.4402	-0.0212
98.9770	31.9200	1.4460	-0.0206
101.0830	31.9300	1.4037	-0.0200
103.1880	31.9300	1.3875	-0.0206
105.2940	31.9300	1.4191	-0.0206
107.4000	31.9200	1.4549	-0.0192
109.5060	31.9200	1.4118	-0.0204
111.6120	31.9200	1.3870	-0.0202
113.7180	31.9200	1.4287	-0.0200
115.8240	31.9200	1.4440	-0.0190
117.9300	31.9300	1.4429	-0.0186
120.0350	31.9200	1.4125	-0.0183
122.1410	31.9200	1.3903	-0.0192

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 32 deg.
Alpha Max. = 48 deg.

Time	Alpha	CN	Cm
0.0000	31.8500	1.4063	-0.0181
1.4230	31.8500	1.4073	-0.0190
2.8460	31.8500	1.4254	-0.0185
4.2690	31.8400	1.4306	-0.0196
5.6920	31.9400	1.4222	-0.0209
7.1150	32.4600	1.4496	-0.0208
8.5380	33.5100	1.4789	-0.0202
9.9610	34.8500	1.5163	-0.0209
11.3840	36.4600	1.5665	-0.0237
12.8060	38.3300	1.6674	-0.0246
14.2290	40.4100	1.7773	-0.0246
15.6520	42.1800	1.7970	-0.0262
17.0750	43.6200	1.6954	-0.0298
18.4980	44.9900	1.6303	-0.0337
19.9210	45.9700	1.6315	-0.0374
21.3440	46.6700	1.6324	-0.0406
22.7670	46.9200	1.6139	-0.0423
24.1900	46.4200	1.5834	-0.0425
25.6130	45.4700	1.5021	-0.0409
27.0360	44.1400	1.3994	-0.0361
28.4590	42.6800	1.3233	-0.0320
29.8820	40.9800	1.2810	-0.0281
31.3050	39.0000	1.2695	-0.0238
32.7280	37.0100	1.2349	-0.0193
34.1510	35.3600	1.1919	-0.0107
35.5740	33.9500	1.2026	-0.0072
36.9960	32.9400	1.2449	-0.0065
38.4190	32.2400	1.2949	-0.0098
39.8420	31.9300	1.3402	-0.0152
41.2650	31.9200	1.3901	-0.0179
42.6880	31.9200	1.4111	-0.0196
44.1110	31.9200	1.4147	-0.0205
45.5340	31.9200	1.3860	-0.0185

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 32 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	31.8400	1.3810	-0.0200
2.1060	31.8500	1.3964	-0.0202
4.2120	31.8500	1.4090	-0.0188
6.3180	32.1600	1.4321	-0.0200
8.4240	33.1900	1.4575	-0.0214
10.5300	34.1400	1.5087	-0.0213
12.6370	35.1800	1.5523	-0.0210
14.7430	36.1600	1.5962	-0.0218
16.8490	37.7000	1.6516	-0.0215
18.9550	39.3300	1.6852	-0.0233
21.0610	40.8400	1.6916	-0.0264
23.1670	42.2600	1.7217	-0.0259
25.2730	43.5700	1.7178	-0.0268
27.3790	44.9600	1.6818	-0.0322
29.4850	46.4800	1.5949	-0.0401
31.5910	47.9200	1.5376	-0.0437
33.6970	49.4600	1.5242	-0.0507
35.8030	50.8900	1.5062	-0.0540
37.9090	52.3200	1.4750	-0.0645
40.0160	53.8100	1.4394	-0.0746
42.1220	55.2500	1.4018	-0.0817
44.2280	56.7400	1.3538	-0.0854
46.3340	58.1200	1.3329	-0.0880
48.4400	59.1100	1.3310	-0.0918
50.5460	60.0800	1.3124	-0.0952
52.6520	61.0500	1.3050	-0.0952
54.7580	61.8900	1.2828	-0.0956
56.8640	62.0700	1.2640	-0.0941
58.9700	61.3900	1.2549	-0.0925
61.0760	60.4600	1.2296	-0.0917
63.1820	59.4900	1.1951	-0.0894
65.2890	58.4800	1.1776	-0.0869
67.3950	57.0400	1.1685	-0.0846
69.5010	55.5200	1.1793	-0.0838
71.6070	54.1000	1.1674	-0.0826
73.7130	52.6000	1.1099	-0.0780
75.8190	51.1500	1.0820	-0.0731
77.9250	49.6900	1.0555	-0.0722
80.0310	48.1800	1.0698	-0.0706
82.1370	46.7400	1.0646	-0.0693
84.2430	45.1800	1.0491	-0.0672
86.3490	43.7600	1.0529	-0.0622
88.4560	42.4300	1.0838	-0.0516
90.5620	41.0300	1.0950	-0.0372
92.6680	39.5600	1.1080	-0.0281
94.7740	37.8900	1.1827	-0.0196
96.8800	36.4300	1.2639	-0.0178
98.9860	35.4400	1.2817	-0.0143
101.0920	34.3800	1.3408	-0.0122
103.1980	33.4500	1.3435	-0.0136
105.3040	32.3600	1.3810	-0.0121
107.4100	31.9100	1.4121	-0.0175
109.5160	31.9100	1.4011	-0.0193
111.6220	31.9100	1.4095	-0.0188
113.7280	31.9100	1.4075	-0.0205
115.8350	31.9100	1.4005	-0.0196
117.9410	31.9000	1.3980	-0.0194
120.0470	31.9000	1.4178	-0.0200
122.1530	31.9100	1.4101	-0.0206

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 32 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	31.8400	1.4070	-0.0227
1.4220	31.8400	1.4088	-0.0211
2.8430	31.8400	1.4102	-0.0196
4.2650	31.8500	1.4119	-0.0207
5.6860	31.9200	1.4148	-0.0230
7.1080	32.5700	1.4438	-0.0241
8.5290	34.4300	1.5402	-0.0256
9.9510	37.1700	1.6396	-0.0269
11.3720	40.7800	1.7576	-0.0280
12.7940	44.3700	1.8914	-0.0311
14.2150	48.4700	1.9503	-0.0375
15.6370	52.3800	1.8752	-0.0507
17.0580	55.9200	1.7916	-0.0652
18.4800	58.8100	1.7068	-0.0753
19.9010	60.8600	1.6288	-0.0862
21.3230	61.8800	1.5419	-0.0925
22.7440	62.0900	1.4586	-0.0962
24.1660	61.8200	1.3730	-0.0971
25.5870	60.2700	1.2798	-0.0937
27.0090	57.6600	1.1927	-0.0871
28.4300	54.3100	1.1339	-0.0786
29.8520	50.4900	1.0527	-0.0709
31.2730	46.4100	0.9777	-0.0629
32.6950	42.5500	0.9146	-0.0545
34.1160	39.0200	0.8586	-0.0444
35.5380	35.8100	0.8500	-0.0301
36.9600	33.7000	0.8902	-0.0150
38.3810	32.4400	0.9644	-0.0097
39.8030	31.9400	1.0510	-0.0081
41.2240	31.9300	1.1691	-0.0056
42.6460	31.9300	1.2816	-0.0080
44.0670	31.9200	1.3450	-0.0122
45.4890	31.9200	1.3772	-0.0146

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 40 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	39.8300	1.5535	-0.0200
2.1060	39.8200	1.6162	-0.0181
4.2120	39.8200	1.6231	-0.0186
6.3180	40.1600	1.5815	-0.0232
8.4240	41.0900	1.5650	-0.0296
10.5290	41.9900	1.5024	-0.0309
12.6350	42.8900	1.5057	-0.0301
14.7410	43.7600	1.5031	-0.0307
16.8470	44.6700	1.5129	-0.0345
18.9530	45.6900	1.4953	-0.0363
21.0590	46.6800	1.4902	-0.0406
23.1650	47.6200	1.4679	-0.0476
25.2710	48.7200	1.4382	-0.0504
27.3770	49.6200	1.4145	-0.0548
29.4820	50.5700	1.3786	-0.0583
31.5880	51.5300	1.3528	-0.0656
33.6940	52.5000	1.3060	-0.0707
35.8000	53.4600	1.2889	-0.0744
37.9060	54.4400	1.2480	-0.0758
40.0120	54.1900	1.2358	-0.0762
42.1180	53.2800	1.2183	-0.0739
44.2240	52.3500	1.1938	-0.0710
46.3290	51.3600	1.1641	-0.0701
48.4350	50.4100	1.1327	-0.0708
50.5410	49.4300	1.1329	-0.0714
52.6470	48.5100	1.1088	-0.0709
54.7530	47.4300	1.1016	-0.0668
56.8590	46.4900	1.0879	-0.0616
58.9650	45.4600	1.1100	-0.0557
61.0710	44.4900	1.1377	-0.0505
63.1770	43.5700	1.1385	-0.0448
65.2820	42.7000	1.1515	-0.0387
67.3880	41.8000	1.1790	-0.0315
69.4940	40.8400	1.2242	-0.0269
71.6000	39.9800	1.2684	-0.0226
73.7060	39.9800	1.3336	-0.0221
75.8120	39.9700	1.3728	-0.0272
77.9180	39.9700	1.4312	-0.0244
80.0240	39.9700	1.4447	-0.0196
82.1300	39.9700	1.4688	-0.0188
84.2350	39.9700	1.5048	-0.0189
86.3410	39.9700	1.4936	-0.0188
88.4470	39.9800	1.4838	-0.0214
90.5530	39.9800	1.4575	-0.0210
92.6590	39.9800	1.4490	-0.0207
94.7650	39.9700	1.4587	-0.0209
96.8710	39.9800	1.4600	-0.0165
98.9770	39.9800	1.4965	-0.0188
101.0830	39.9800	1.5432	-0.0250
103.1880	39.9800	1.5278	-0.0245
105.2940	39.9800	1.4822	-0.0210
107.4000	39.9700	1.5044	-0.0190
109.5060	39.9700	1.5927	-0.0207
111.6120	39.9700	1.5817	-0.0220
113.7180	39.9700	1.5478	-0.0215
115.8240	39.9700	1.5234	-0.0228
117.9300	39.9700	1.5832	-0.0228
120.0350	39.9700	1.5658	-0.0188
122.1410	39.9700	1.5344	-0.0180

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 40 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	39.9000	1.5560	-0.0169
1.4230	39.9100	1.5420	-0.0173
2.8460	39.9100	1.5172	-0.0186
4.2690	39.9000	1.5036	-0.0207
5.6920	39.9800	1.5044	-0.0204
7.1150	40.4900	1.5082	-0.0206
8.5380	41.4400	1.5502	-0.0246
9.9610	42.6300	1.5490	-0.0293
11.3840	44.0800	1.5491	-0.0346
12.8080	45.8200	1.6104	-0.0376
14.2310	47.7400	1.6656	-0.0397
15.6540	49.6000	1.6607	-0.0421
17.0770	51.1700	1.5916	-0.0470
18.5000	52.5700	1.5402	-0.0506
19.9230	53.5200	1.4986	-0.0566
21.3460	54.2300	1.4384	-0.0655
22.7690	54.4800	1.3602	-0.0720
24.1920	54.0100	1.2926	-0.0730
25.6150	53.1100	1.2522	-0.0717
27.0380	51.7800	1.2155	-0.0687
28.4610	50.1800	1.1609	-0.0644
29.8840	48.4300	1.1087	-0.0597
31.3070	46.4500	1.0727	-0.0535
32.7300	44.6100	1.0603	-0.0484
34.1530	43.1200	1.0569	-0.0412
35.5760	41.8700	1.0919	-0.0343
37.0000	40.9400	1.1206	-0.0309
38.4230	40.2400	1.1320	-0.0286
39.8460	39.9600	1.1472	-0.0264
41.2690	39.9600	1.1915	-0.0237
42.6920	39.9600	1.2532	-0.0239
44.1150	39.9600	1.3100	-0.0247
45.5380	39.9500	1.3427	-0.0269

Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0276
Alpha Min. = 48 deg.
Alpha Max. = 64 deg.

Time	Alpha	CN	Cm
0.0000	47.4300	1.2733	-0.0527
2.1060	47.4300	1.2678	-0.0510
4.2120	47.4300	1.2691	-0.0553
6.3180	47.8000	1.2569	-0.0546
8.4240	48.8200	1.2479	-0.0539
10.5290	49.7200	1.2808	-0.0548
12.6350	50.6700	1.2885	-0.0607
14.7410	51.6300	1.2725	-0.0673
16.8470	52.5800	1.2628	-0.0720
18.9530	53.5600	1.2825	-0.0754
21.0590	54.5500	1.3019	-0.0784
23.1650	55.5000	1.2692	-0.0802
25.2710	56.5400	1.2662	-0.0814
27.3770	57.4700	1.2738	-0.0856
29.4820	58.4500	1.2819	-0.0885
31.5880	59.4000	1.2656	-0.0898
33.6940	60.4000	1.2619	-0.0898
35.8000	61.3500	1.2556	-0.0910
37.9060	62.1100	1.2582	-0.0911
40.0120	61.8900	1.2326	-0.0904
42.1180	61.1400	1.1836	-0.0873
44.2240	60.2000	1.1724	-0.0856
46.3290	59.2000	1.1889	-0.0857
48.4350	58.2400	1.1824	-0.0855
50.5410	57.2400	1.1620	-0.0831
52.6470	56.3000	1.1464	-0.0799
54.7530	55.2400	1.1363	-0.0784
56.8590	54.3100	1.1380	-0.0800
58.9650	53.2900	1.1444	-0.0782
61.0710	52.3500	1.1192	-0.0756
63.1770	51.3700	1.1061	-0.0734
65.2820	50.4100	1.1012	-0.0727
67.3880	49.4600	1.0933	-0.0726
69.4940	48.4800	1.0807	-0.0704
71.6000	47.6100	1.0820	-0.0680
73.7060	47.6000	1.1102	-0.0692
75.8120	47.5900	1.1265	-0.0679
77.9180	47.6000	1.1410	-0.0659
80.0240	47.5900	1.1592	-0.0641
82.1300	47.5900	1.1788	-0.0633
84.2350	47.5900	1.1659	-0.0581
86.3410	47.5900	1.1668	-0.0544
88.4470	47.5900	1.1887	-0.0553
90.5530	47.5900	1.1968	-0.0563
92.6590	47.5900	1.1935	-0.0552
94.7650	47.5900	1.1870	-0.0553
96.8710	47.5900	1.1838	-0.0541
98.9770	47.5900	1.2190	-0.0542
101.0830	47.6000	1.2203	-0.0553
103.1880	47.6000	1.2086	-0.0557
105.2940	47.6000	1.2193	-0.0544
107.4000	47.5900	1.2295	-0.0539
109.5060	47.6000	1.2278	-0.0531
111.6120	47.5900	1.2122	-0.0535
113.7180	47.5900	1.2186	-0.0542
115.8240	47.5900	1.2432	-0.0547
117.9300	47.5900	1.2391	-0.0543
120.0350	47.5900	1.2182	-0.0529
122.1410	47.5900	1.2205	-0.0538

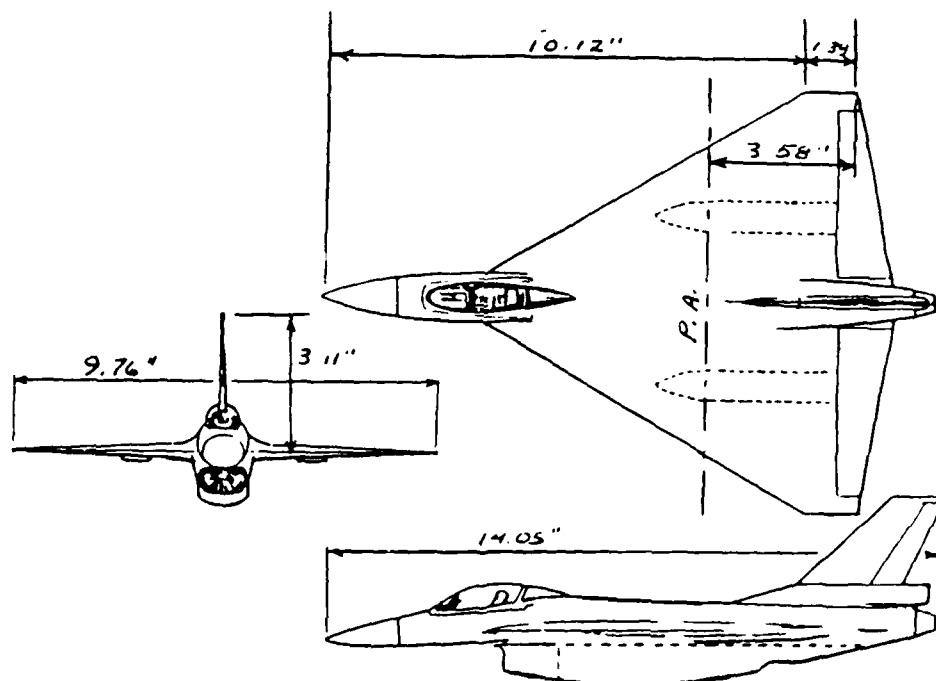
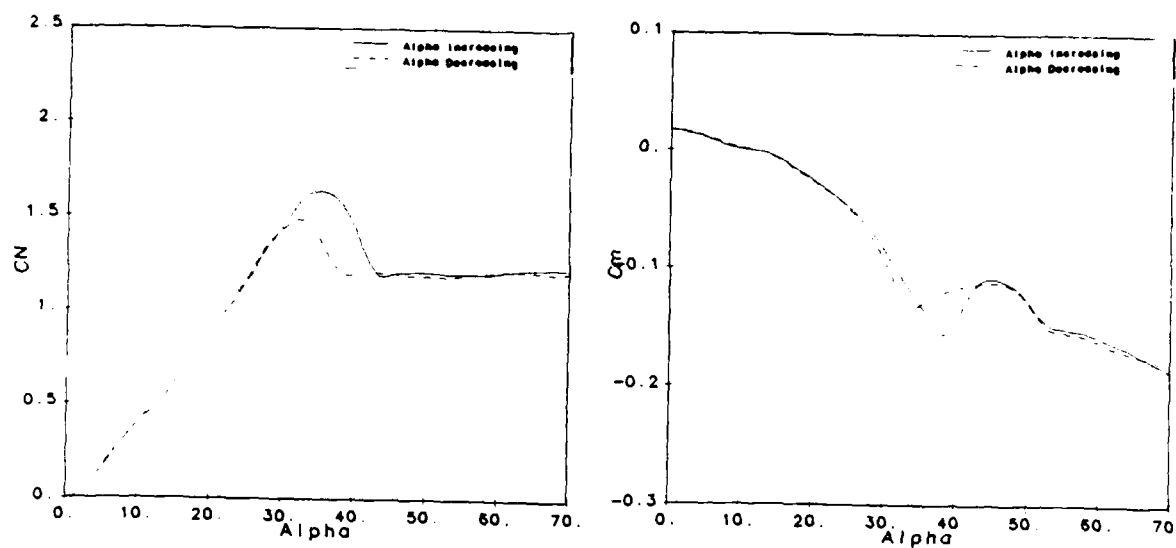
Cranked Wing
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0828
Alpha Min. = 48 deg.
Alpha Max. = 64 deg.

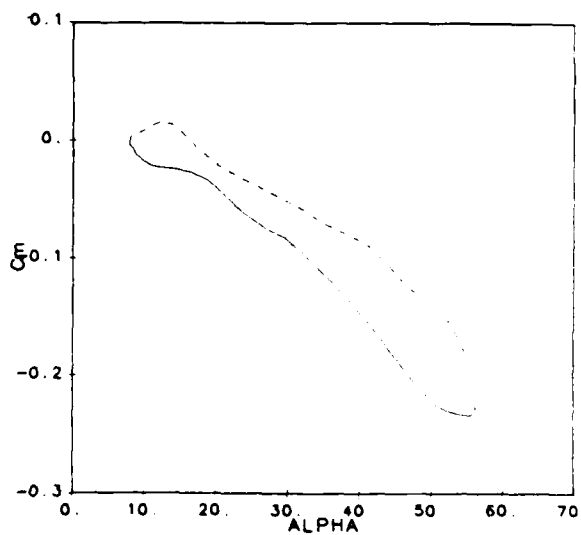
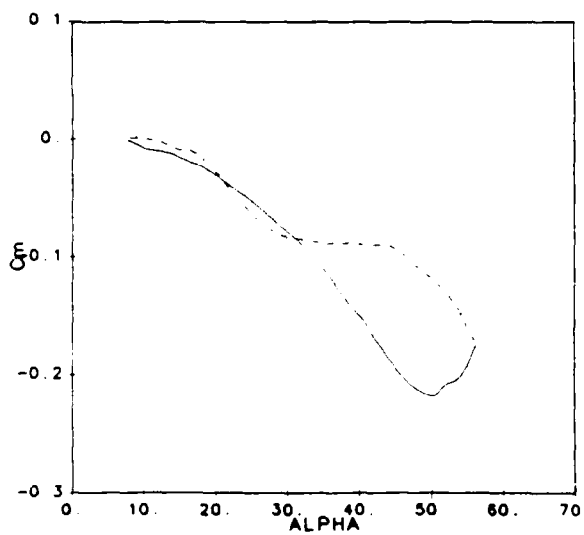
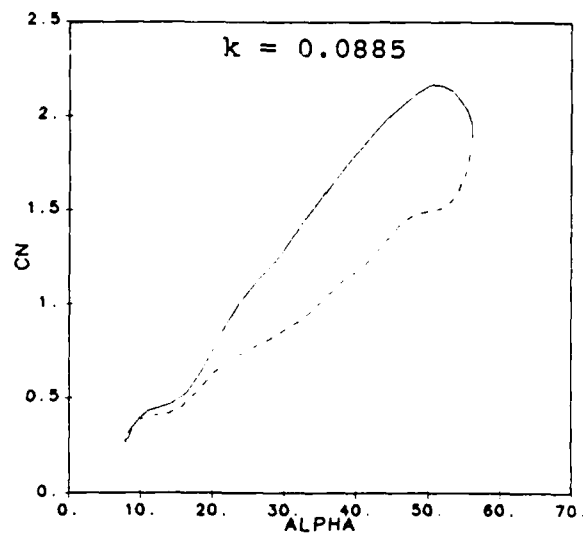
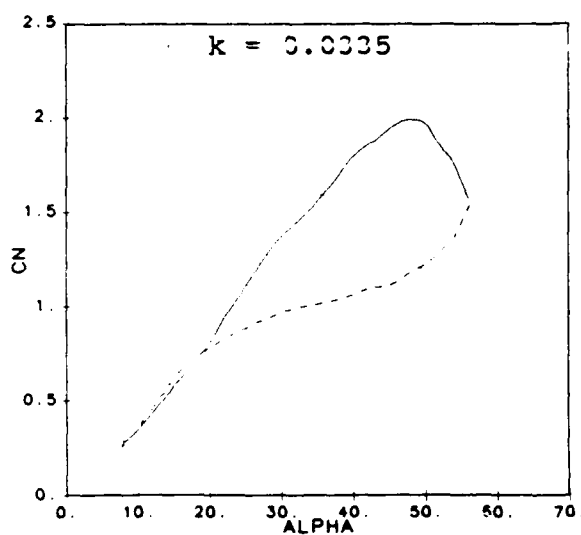
Time	Alpha	CN	Cm
0.0000	47.5400	1.2134	-0.0561
1.4250	47.5400	1.2252	-0.0556
2.8500	47.5400	1.2379	-0.0542
4.2750	47.5400	1.2464	-0.0541
5.6990	47.6200	1.2484	-0.0574
7.1240	48.1600	1.2616	-0.0603
8.5490	49.1600	1.2776	-0.0630
9.9740	50.4200	1.3135	-0.0665
11.3990	51.9900	1.3632	-0.0725
12.8240	53.7300	1.3798	-0.0808
14.2480	55.6500	1.3573	-0.0882
15.6730	57.4700	1.3349	-0.0905
17.0980	59.0900	1.3447	-0.0913
18.5230	60.4700	1.3593	-0.0932
19.9480	61.4100	1.3409	-0.0967
21.3730	61.9900	1.3427	-0.1000
22.7970	62.1100	1.3264	-0.0995
24.2220	61.7700	1.2774	-0.0961
25.6470	61.0000	1.2170	-0.0905
27.0720	59.6400	1.1592	-0.0853
28.4970	58.0300	1.1012	-0.0826
29.9220	56.2200	1.0692	-0.0795
31.3460	54.2600	1.0503	-0.0758
32.7710	52.4600	1.0272	-0.0722
34.1960	50.8600	1.0371	-0.0688
35.6210	49.5600	1.0356	-0.0678
37.0460	48.6300	1.0391	-0.0675
38.4710	47.8600	1.0536	-0.0678
39.8950	47.6100	1.0753	-0.0691
41.3200	47.6000	1.0959	-0.0685
42.7450	47.6000	1.1042	-0.0675
44.1700	47.6000	1.1090	-0.0658
45.5950	47.6000	1.1224	-0.0634

APPENDIX E

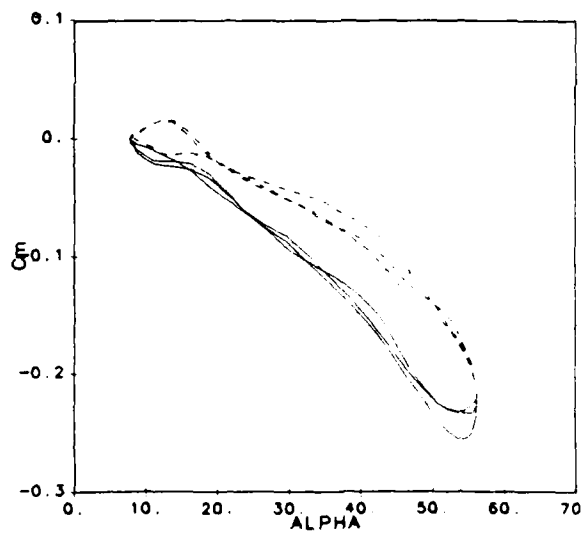
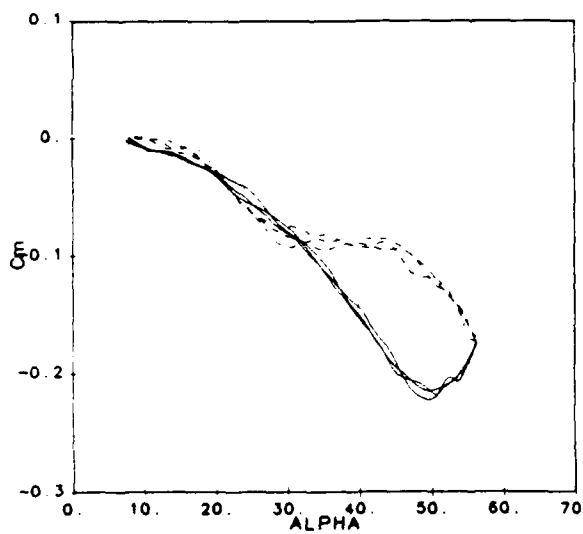
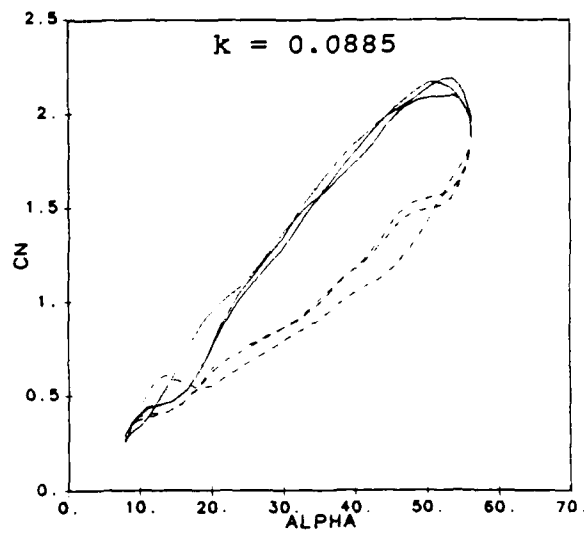
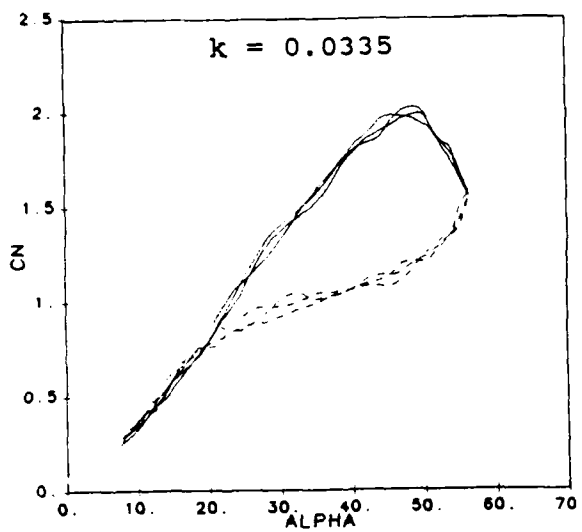
PLOTS AND LISTINGS OF THE HFF FORCE AND
MOMENT DATA FOR THE FULL-SPAN E-7 MODELS



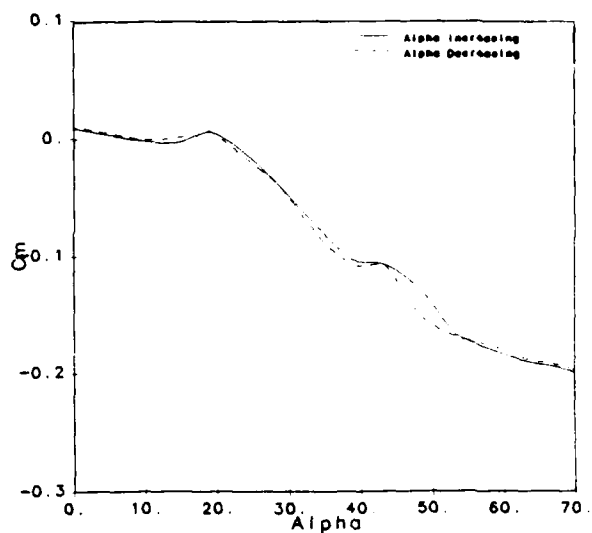
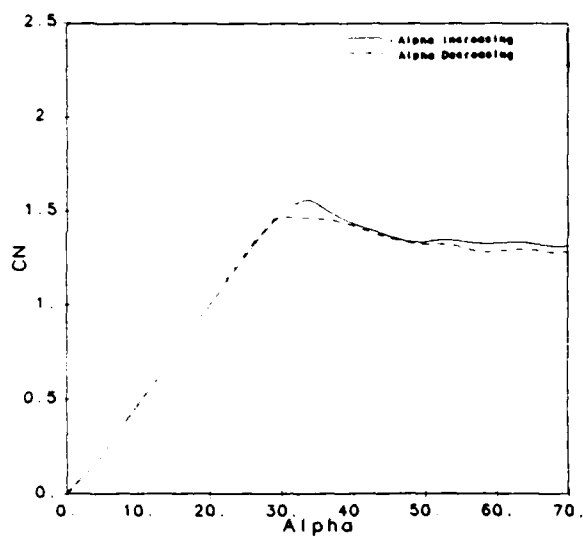
E-7, 3-D, Steady



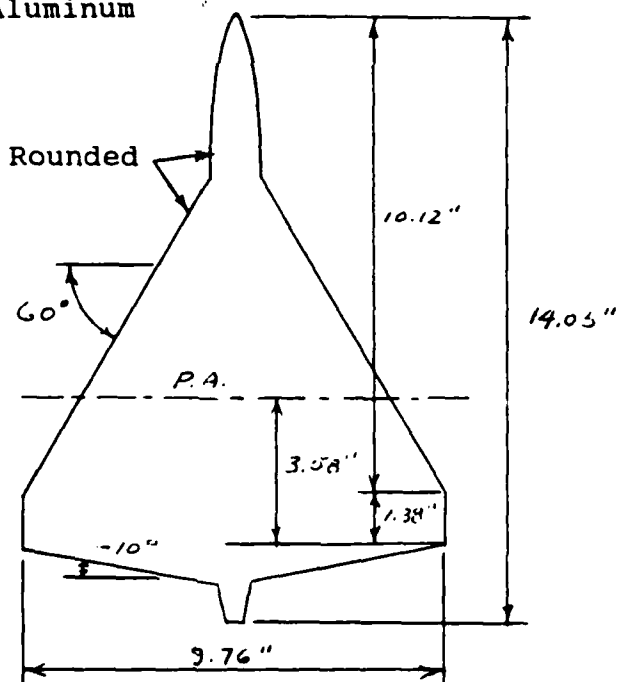
E-7, 3-D, Incidence = 8° to 56°



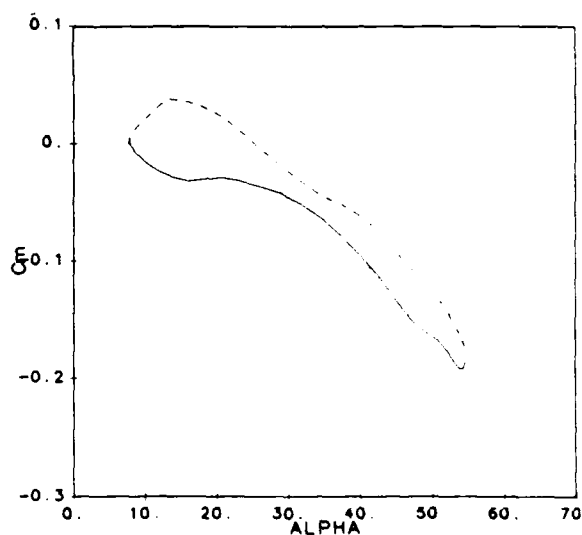
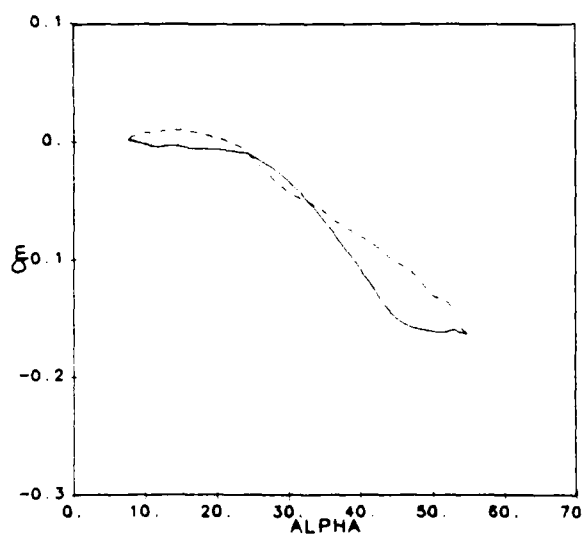
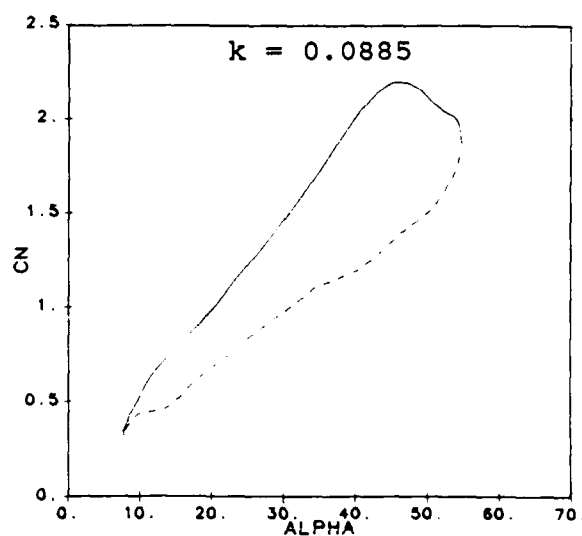
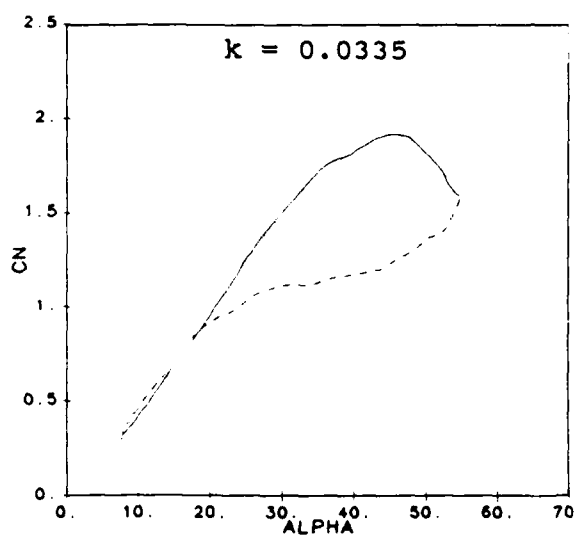
E-7, 3-D, Incidence = 8° to 56°



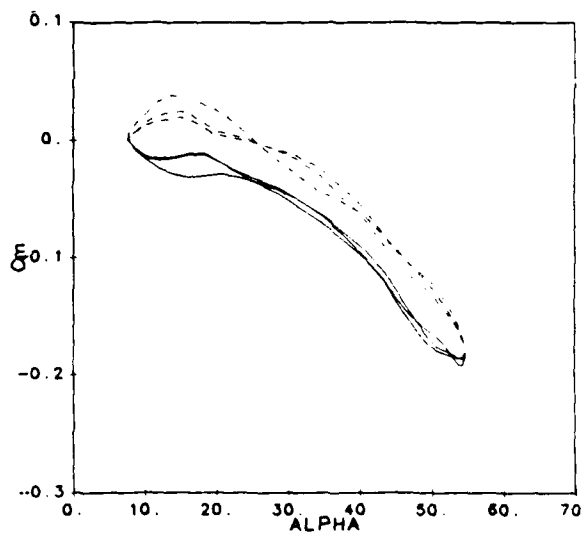
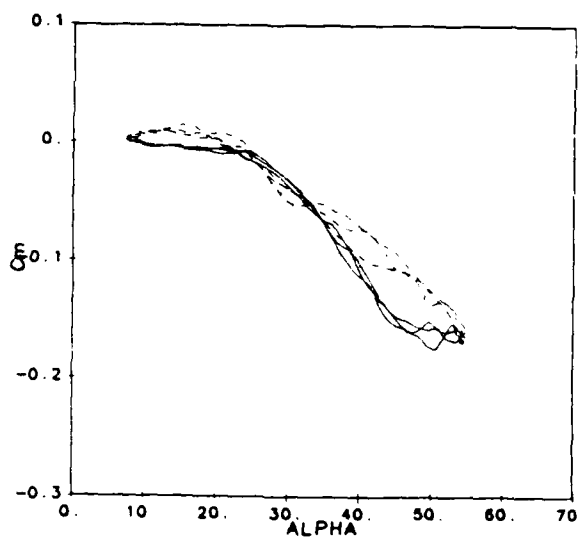
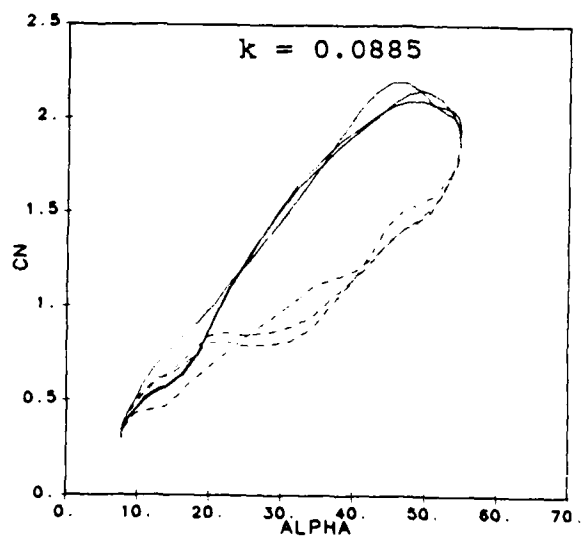
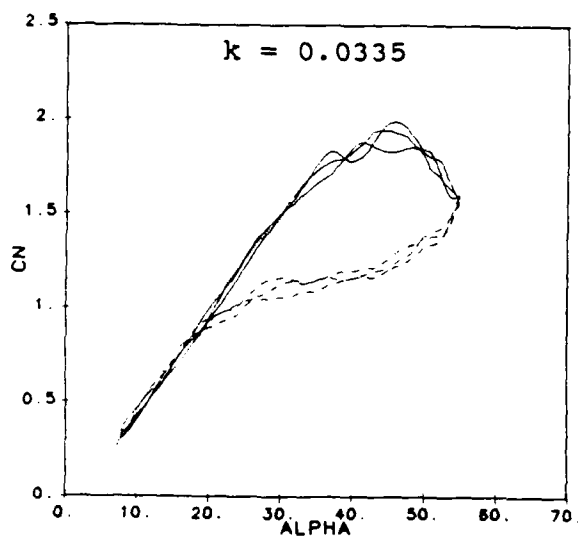
0.050" Thick
Aluminum



E-7, Flat, Steady



E-7, Flat, Incidence = 8° to 56°



E-7, Flat, Incidence = 8° to 56°

E7 3-D Model Static Data
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0000
Alpha Min. = 0 deg.
Alpha Max. = 90 deg.

Time	Alpha	CN	Cm
0.0000	-1.0000	-0.0556	0.0180
0.0000	3.9200	0.1053	0.0128
0.0000	8.8400	0.3460	0.0025
0.0000	13.7600	0.5371	-0.0025
0.0000	18.6800	0.7997	-0.0194
0.0000	23.6000	1.0694	-0.0402
0.0000	28.5200	1.3638	-0.0703
0.0000	33.4400	1.6135	-0.1166
0.0000	38.3600	1.5653	-0.1559
0.0000	43.2800	1.1884	-0.1114
0.0000	48.2000	1.2078	-0.1156
0.0000	53.1200	1.1992	-0.1479
0.0000	58.0400	1.1983	-0.1534
0.0000	62.9600	1.2205	-0.1652
0.0000	67.8800	1.2289	-0.1792
0.0000	72.8000	1.2163	-0.1937
0.0000	77.7200	1.2079	-0.2095
0.0000	82.6400	1.2275	-0.2291
0.0000	87.5600	1.2051	-0.2325
0.0000	87.5600	1.2027	-0.2385
0.0000	82.6400	1.2023	-0.2271
0.0000	77.7200	1.2018	-0.2144
0.0000	72.8000	1.2135	-0.2021
0.0000	67.8800	1.2058	-0.1768
0.0000	62.9600	1.2163	-0.1688
0.0000	58.0400	1.2051	-0.1566
0.0000	53.1200	1.1842	-0.1507
0.0000	48.2000	1.1878	-0.1163
0.0000	43.2800	1.2035	-0.1125
0.0000	38.3600	1.1914	-0.1198
0.0000	33.4400	1.4779	-0.1338
0.0000	28.5200	1.3758	-0.0761
0.0000	23.6000	1.0877	-0.0405
0.0000	18.6800	0.8444	-0.0206
0.0000	13.7600	0.5730	-0.0027
0.0000	8.8400	0.3429	0.0035
0.0000	3.9200	0.1250	0.0134
0.0000	-1.0000	-0.0501	0.0194

E7 3-D Model
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0335
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.8600	0.2547	-0.0014
2.8070	7.8500	0.2615	-0.0009
5.6150	8.0300	0.2802	-0.0017
8.4220	9.2300	0.3158	-0.0054
11.2300	10.7500	0.3817	-0.0096
14.0370	12.8400	0.4711	-0.0115
16.8450	15.0200	0.5828	-0.0163
19.6520	18.6100	0.7356	-0.0249
22.4600	22.0500	0.9381	-0.0399
25.2670	25.4500	1.1344	-0.0544
28.0750	28.8700	1.3243	-0.0734
30.8820	32.5000	1.4616	-0.0924
33.6900	36.1100	1.6037	-0.1179
36.4970	39.6100	1.7803	-0.1467
39.3050	43.1100	1.8824	-0.1770
42.1120	46.1800	1.9677	-0.2023
44.9200	49.4100	1.9839	-0.2164
47.7270	51.4900	1.8861	-0.2111
50.5350	53.4900	1.7914	-0.2043
53.3420	54.8500	1.6805	-0.1930
56.1500	56.2200	1.5618	-0.1743
58.9570	55.3700	1.4735	-0.1645
61.7650	54.0800	1.3672	-0.1471
64.5720	52.0900	1.2899	-0.1299
67.3800	50.1000	1.2250	-0.1183
70.1870	46.8400	1.1506	-0.1022
72.9950	43.6900	1.1060	-0.0897
75.8020	40.3500	1.0681	-0.0894
78.6100	36.6900	1.0285	-0.0883
81.4170	33.2100	1.0024	-0.0862
84.2250	29.5800	0.9627	-0.0829
87.0320	26.1600	0.9098	-0.0697
89.8400	22.6300	0.8422	-0.0475
92.6470	19.2000	0.7645	-0.0227
95.4550	15.6900	0.6524	-0.0093
98.2620	13.4400	0.5340	-0.0053
101.0700	11.3000	0.4241	-0.0016
103.8770	9.7800	0.3570	0.0001
106.6850	8.4100	0.3091	0.0008
109.4920	8.0700	0.2756	-0.0004
112.3000	8.0700	0.2722	-0.0016
115.1070	8.0700	0.2839	-0.0011
117.9150	8.0700	0.2803	-0.0016
120.7220	8.0700	0.2916	-0.0030
123.5300	8.0700	0.2829	-0.0025

E7 3-D Model
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0885
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.9500	0.2787	-0.0010
1.4110	7.9500	0.2782	-0.0005
2.8220	7.9500	0.2780	-0.0005
4.2330	7.9500	0.2763	-0.0014
5.6440	8.1000	0.2864	-0.0032
7.0550	8.8800	0.3379	-0.0088
8.4660	11.1400	0.4233	-0.0168
9.8770	14.5400	0.5189	-0.0215
11.2880	18.9500	0.7478	-0.0349
12.6990	23.9100	1.0446	-0.0619
14.1100	29.7900	1.3257	-0.0881
15.5210	36.1800	1.6324	-0.1206
16.9320	42.0900	1.8767	-0.1578
18.3430	46.5000	2.0394	-0.1973
19.7540	50.6300	2.1313	-0.2289
21.1650	53.5000	2.1371	-0.2396
22.5760	55.2500	2.0639	-0.2377
23.9870	56.1500	1.9553	-0.2270
25.3980	55.8400	1.8001	-0.2048
26.8090	54.3900	1.6539	-0.1792
28.2200	51.9000	1.5389	-0.1543
29.6310	47.9900	1.4343	-0.1304
31.0420	43.6400	1.2616	-0.1010
32.4530	37.9100	1.0734	-0.0744
33.8640	31.9700	0.8802	-0.0546
35.2750	25.5900	0.7431	-0.0380
36.6860	20.3000	0.6183	-0.0212
38.0970	15.6700	0.4994	-0.0007
39.5070	12.1300	0.4615	0.0060
40.9180	9.7800	0.3905	0.0037
42.3290	8.5000	0.3287	0.0023
43.7400	8.0700	0.3067	0.0015
45.1510	8.0700	0.2980	-0.0003
46.5620	8.0600	0.2914	-0.0017
47.9730	8.0500	0.2810	-0.0014

E7 Flat Model Static Data
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0000
Alpha Min. = 0 deg.
Alpha Max. = 90 deg.

Time	Alpha	CN	Cm
0.0000	-0.5200	-0.0072	0.0102
0.0000	4.3800	0.1771	0.0042
0.0000	9.2700	0.4315	-0.0011
0.0000	14.1700	0.6779	-0.0034
0.0000	19.0600	0.9456	0.0059
0.0000	23.9600	1.2093	-0.0122
0.0000	28.8500	1.4442	-0.0409
0.0000	33.7500	1.5614	-0.0736
0.0000	38.6400	1.4552	-0.1029
0.0000	43.5400	1.3855	-0.1078
0.0000	48.4300	1.3324	-0.1294
0.0000	53.3300	1.3460	-0.1670
0.0000	58.2200	1.3263	-0.1797
0.0000	63.1200	1.3368	-0.1897
0.0000	68.0100	1.3123	-0.1954
0.0000	72.9100	1.3146	-0.2051
0.0000	77.8000	1.2911	-0.2144
0.0000	82.7000	1.3156	-0.2355
0.0000	87.5900	1.3124	-0.2436
0.0000	87.5900	1.3078	-0.2469
0.0000	82.7000	1.2849	-0.2300
0.0000	77.8000	1.2920	-0.2186
0.0000	72.9100	1.2858	-0.2042
0.0000	68.0100	1.2811	-0.1936
0.0000	63.1200	1.2972	-0.1877
0.0000	58.2200	1.2828	-0.1761
0.0000	53.3300	1.3196	-0.1688
0.0000	48.4300	1.3279	-0.1517
0.0000	43.5400	1.3736	-0.1091
0.0000	38.6400	1.4381	-0.1065
0.0000	33.7500	1.4622	-0.0802
0.0000	28.8500	1.4609	-0.0411
0.0000	23.9600	1.2262	-0.0160
0.0000	19.0600	0.9747	0.0068
0.0000	14.1700	0.7196	0.0007
0.0000	9.2700	0.4369	-0.0002
0.0000	4.3800	0.1791	0.0058
0.0000	-0.5200	-0.0043	0.0111

E7 Flat Model
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0335
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.7200	0.2996	0.0018
2.8080	7.7200	0.2977	0.0028
5.6160	7.9000	0.3212	0.0016
8.4230	9.0600	0.3675	-0.0005
11.2310	10.6000	0.4455	-0.0034
14.0390	12.6000	0.5541	-0.0038
16.8470	14.7500	0.6750	-0.0040
19.6540	18.2400	0.8525	-0.0058
22.4620	21.6100	1.0449	-0.0076
25.2700	24.8900	1.2442	-0.0116
28.0780	28.2500	1.4245	-0.0240
30.8850	31.7700	1.5730	-0.0436
33.6930	35.2700	1.7288	-0.0692
36.5010	38.6300	1.7962	-0.0957
39.3090	42.1000	1.8685	-0.1262
42.1160	45.0600	1.9174	-0.1499
44.9240	48.1600	1.8851	-0.1588
47.7320	50.2200	1.8108	-0.1612
50.5400	52.1300	1.7311	-0.1614
53.3470	53.4500	1.6388	-0.1605
56.1550	54.7500	1.5919	-0.1633
58.9630	53.9400	1.5053	-0.1556
61.7710	52.6900	1.4131	-0.1403
64.5780	50.7500	1.3729	-0.1323
67.3860	48.7700	1.3173	-0.1208
70.1940	45.6300	1.2447	-0.1043
73.0020	42.5800	1.1883	-0.0903
75.8090	39.3100	1.1698	-0.0773
78.6170	35.7800	1.1402	-0.0633
81.4250	32.4000	1.1164	-0.0499
84.2330	28.8700	1.1033	-0.0372
87.0400	25.5400	1.0460	-0.0169
89.8480	22.1300	0.9625	-0.0011
92.6560	18.7800	0.8847	0.0056
95.4640	15.3200	0.7346	0.0099
98.2710	13.1300	0.6101	0.0099
101.0790	11.0900	0.5188	0.0078
103.8870	9.5700	0.4313	0.0067
106.6950	8.2600	0.3631	0.0044
109.5020	7.9300	0.3345	0.0016
112.3100	7.9300	0.3323	0.0017
115.1180	7.9300	0.3277	0.0025
117.9260	7.9300	0.3398	0.0026
120.7330	7.9300	0.3384	0.0027
123.5410	7.9300	0.3350	0.0029

E7 Flat Model
HFF Water Tunnel
Velocity = 0.802 ft/s.

Red. Freq. = 0.0885
Alpha Min. = 8 deg.
Alpha Max. = 56 deg.

Time	Alpha	CN	Cm
0.0000	7.8100	0.3105	0.0051
1.4100	7.8000	0.3173	0.0039
2.8190	7.8100	0.3203	0.0033
4.2290	7.8100	0.3296	0.0018
5.6380	7.9300	0.3511	-0.0007
7.0480	8.7000	0.4152	-0.0073
8.4570	10.8300	0.5295	-0.0167
9.8670	14.1300	0.6321	-0.0196
11.2760	18.4500	0.8050	-0.0182
12.6860	23.2300	1.1357	-0.0294
14.0960	28.9200	1.4499	-0.0431
15.5050	35.2100	1.7489	-0.0679
16.9150	40.9400	1.9857	-0.0996
18.3240	45.2900	2.1139	-0.1351
19.7340	49.2900	2.1339	-0.1669
21.1430	52.0900	2.0742	-0.1796
22.5530	53.8000	2.0278	-0.1877
23.9620	54.6900	1.9385	-0.1839
25.3720	54.4500	1.8092	-0.1723
26.7810	53.0600	1.6713	-0.1526
28.1910	50.6600	1.5396	-0.1301
29.6010	46.8500	1.4437	-0.1088
31.0100	42.6500	1.2705	-0.0780
32.4200	37.1200	1.0695	-0.0444
33.8290	31.3500	0.9081	-0.0204
35.2390	25.1500	0.8269	-0.0008
36.6480	19.9700	0.7773	0.0125
38.0580	15.4100	0.6183	0.0265
39.4670	11.9500	0.5338	0.0228
40.8770	9.6400	0.4672	0.0130
42.2870	8.3700	0.3942	0.0072
43.6960	7.9200	0.3539	0.0041
45.1060	7.9200	0.3395	0.0026
46.5150	7.9100	0.3378	0.0021
47.9250	7.9000	0.3418	0.0018