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NASA TECHNICAL MEMORANDUM

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LOW-SPEED WIND TUNNEL INVESTIGATION OF THE LATERAL-DIRECTIONAL CHARACTERISTICS OF A LARGE-SCALE VARIABLE WING-SWEEP FIGHTER MODEL IN THE HIGH-LIFT CONFIGURATION

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SUMMARY

The low-speed characteristics of a large-scale model of the U.S. Navy/Grumman F-14A aircraft were studied in tests conducted in the Ames Research Center 40- by 80-Foot Wind Tunnel. The primary purpose of the present tests was the determination of lateral-directional stability levels and control effectiveness of the aircarft in its high-lift configuration.

Tests were conducted at wing angles of attack between -2° and 30° and with sideslip angles between -12° and 12°. Data were taken at a Reynolds number of 8.0×10^6 based on a wing mean aerodynamic chord of 2.24 m (7.36 ft). The model configuration was changed as required to show the effects of direct lift control (spoilers) at yaw, yaw angle with speed brake deflected, and various amounts and combinations of roll control.

NOTATION

Model dimensions and test data measurements were made in the U.S. Customary Units. Equivalent information in the International System of Units (SI) was determined by using the appropriate conversion factors for those measurements presented in the text and in the figures.

ALPHA, α	wing angle of attack, deg
b	span of wing
BETA	sideslip angle, positive nose left, deg
c	chord length of wing
$\bar{c}$	mean aerodynamic chord
C_D, CD	drag coefficient, D/qS
C_L, CL	lift coefficient, lift/qS
C_M, CM	pitching-moment coefficient, $M/qS\bar{c}_W$
CN	yawing-moment coefficient, N/qSb
CR	rolling-moment coefficient, R/qSb
CY	side-force coefficient, Y/qS

D	drag
i_t, IT	horizontal tail incidence angle relative to fuselage centerline, deg
M	pitching moment
N	yawing moment
PSI, ψ	yaw angle, positive nose right, deg
PT	data point number
q, Q	free stream dynamic pressure, (lb/sq ft in tables)
R	rolling moment
S	wing area
y	spanwise distance normal to fuselage centerline
Y	side force
δ	surface deflection angle, deg
η	fraction of semispan, y/(b/2)

Subscripts

DLC	direct lift control (spoilers)
f	trailing-edge flaps
ℓ	left
L	leading-edge slats
MOD	modified (blunted slat leading edge - see figure 3)
r	right
SB	speed brakes

t	horizontal tail
u	uncorrected
w	wing
	Examples of Flap and DLC Deflection
δ_f 35	trailing-edge flaps uniformly deflected to 35°
δ_f 45/45/35	trailing-edge flaps deflected: inboard panels to 45° middle panels to 45° outboard panels to 35°
δ_{DLC} -4.5	DLC uniformly in the stowed position
δ_{DLC} 5	DLC middle panels deflected to 5° (neutral) with inboard and outboard panels at -4.5° (stowed)
δ_{DLC} -4.5/+20	DLC deflected to -4.5° on left wing and middle panels +20° on right wing
i_t -5	horizontal tail uniform deflection to -5°
i_t 11.1/-11.1	horizontal tail deflected left panel to 11.1°, right panel to -11.1°

INTRODUCTION

An extensive series of tests of a 3/4-scale unpowered model of the U.S. Navy/Grumman F-14A aircraft has been made in the NASA-Ames 40- by 80-Foot Wind Tunnel. The purpose of the program was to obtain low-speed data at large scale and high Reynolds numbers for the high-lift configuration. The longitudinal characteristics have been reported in reference 1. This report presents the model lateral-directional stability and control characteristics. All tests were made at an approximate Reynolds number of 8.0×10^6 based on the model mean aerodynamic chord. Included are the effects of spoiler defection at yaw, yaw angle with speed brake deflected, and various amounts and combinations of roll control. These results are presented without analysis.

MODEL DESCRIPTION

The F-14A model in the basic high-lift configuration installed in the NASA-Ames 40- by 80-Foot Wind Tunnel, is shown in figure 1. A three-view drawing and further model details are presented in figures 2 and 3. Dimensional data are given in table I.

A full model description of the wing, leading-edge slat and trailing-edge flap systems, engine inlets, tails and miscellaneous equipment can be found in reference 1.

Roll Control Devices

The wing upper-surface spoilers spanned the trailing-edge flaps with a hinge line at 59 percent chord. The spoiler segments inboard and outboard of the extreme flap actuator fairings were constrained to a setting of -4.5°. The remaining central five segments were adjustable between -4.5° and +20°. Spoiler roll control was accomplished by deflection of one set of the central spoiler segments upward while holding the set on the opposite wing at -4.5° (see figure 3). Direct lift control (DLC) was accomplished by deflection of both left and right sets upward.

The horizontal tail panels were pivoted about an axis perpendicular to the fuselage centerline and located at the 52.5-percent tail-root-chord position. Tail roll control was provided by deflecting one tail panel upward and the other downward the same amount.

Model Geometry Revisions

Several model modifications were made during the five wind-tunnel entries which comprised the test program to parallel design changes and to increase the accuracy of the simulation of the airplane. Examples of the former are the addition of the glove slats, the change of wing-slat deflection angle and the increase in slat leading-edge radius. Changes to improve the modeling accuracy included reworking the trailing-edge flap coves and the cove-to-spoiler seals during Test 1; and, between Tests 1 and 2, improving the slat contours at several areas, and making a small correction to the trailing-edge trim line.

The horizontal tail mounting system was strengthened prior to Test 5. This required a slight recontouring of the empennage area to enclose the revised hardware in the tail booms, and necessitated spacing the horizontal tail panels outward by about one percent span of the tail.

TEST PROCEDURE

All runs were conducted at constant forward speed for a given model configuration. The majority of the data were obtained by varying yaw angle between -12° and 12° at selected angles of attack. Additional data were taken at a fixed yaw angle as angle of attack was varied between nominal values of -2° and 30°. The data were taken at a dynamic pressure of about 1648 N/sq in (34.4 lb/sq ft) and a Reynolds number of 8.0×10^6, based on a wing mean aerodynamic chord of 2.24 meters (7.36 feet).

DATA REDUCTION

The force and moment coefficients presented in the tabulations and figures which follow are referenced to the wind axis system for forces and stability axis system for moments. The moment center was located at 16.2 percent wing mean aerodynamic chord.

Corrections

Standard corrections for wind-tunnel wall effects and strut tares were applied to the data as follows:

$$\alpha = \alpha_u + 0.604\ C_{L_u}$$

$$C_D = C_{D_u} + 0.0106\ C_{L_u}^{\ 2} - 0.0024$$

$$C_M = C_{M_u} + 0.0080\ C_{L_u} - 0.0011$$

Accuracy of Data

The data are accurate within the following limits which include errors due to data acquisition and reduction as well as the errors of the force measurement system itself.

Lift, N (lb)	± 44.4 (± 10.0)
Drag, N (lb)	± 13.3 (± 3.0)
Pitching moment, N-m (ft-lb)	± 217 (± 160)
Rolling moment, N-m (ft-lb)	± 169 (± 125)
Yawing moment, N-m (ft-lb)	± 32.6 (± 24)
Dynamic pressure, N/sq m (lb/sq ft)	± 9.6 (± 0.2)
Angle of attack, deg	± 0.1
Yaw angle, deg	± 0.1
Flap deflections, deg	± 1
Tail deflections, deg	± 0.5

RESULTS

The basic force and moment data for all test conditions are presented in coefficient form in Parts B of tables II through IV. Parts A of the same tables are tabulation schedules showing the appropriate configuration arrangements for the tabulated data presented.

Standard Configuration

The basic model was configured to match as closely as possible the high-lift landing geometry of the F-14A aircraft. The plotted summary data (figures 4 through 17) assume the following standard configuration details, only the deviations from which will be noted:

δ_L = 17° MOD, δ_f = 35°, i_t = 0°, and δ_{DLC} = -4.5°;

glove slats and flat actuator fairings installed;

and without landing gear, pylons, missiles,

speed brakes, or tail split flaps.

Reference 1 shows some differences in the longitudinal data, obtained with the reference configurations of the several tests, which were brought about by the evolution of the aircraft design during the testing program. Analysis of the lateral-directional data should not be affected by these differences.

Summary Figures

Selected lateral-directional data showing the effects of various configuration changes are plotted in figures 4 through 17. A plotting schedule describing the model geometry for which data are shown in the summary plots is contained in table V.

The effect of spoiler deflection from -4.5° to 5° is shown in figures 4 and 5 for an early test. The effect of yaw for the standard configuration is presented in figures 6 and 7. Figures 8 and 9 show the results of attitude change with the direct lift control set at 5°. Figures 10 and 11 show similar results with the speed brake deflected to 60°. The effects of spoiler-only roll control are presented in figures 12, 13 and 15. Combined spoiler and tail roll control effects are shown in figures 14, 16 and 17.

REFERENCE

1. Eckert, William T.; and Maki, Ralph L.: Low-Speed Wind Tunnel Investigation of the Longitudinal Characteristics of a Large-Scale Variable Wing-Sweep Fighter Model in the High-Lift Configuration. NASA TM X-62,244, 1973.

TABLE I - MODEL DIMENSIONS

Fuselage overall length, m (ft)	14.11	(46.28)
Glove		
Sweep angle, deg		68
Pivot point location, m (ft) from nose	8.21	(26.95)
Thickness at pivot (η = 0.278), m (ft)	0.33	(1.09)
percent chord		10.2
Wing		
Area, sq m (sq ft)	29.52	(317.8)
Span, m (ft)	14.66	(48.10)
Chord length, m (ft)		
mean aerodynamic (η = 0.398)	2.24	(7.36)
root	3.19	(10.45)
tip	0.84	(2.77)
Leading-edge sweep angle, deg		20
Aspect ratio	7.28	
Taper ratio	0.265	
Incidence angle of root chord relative to fuselage centerline, deg		-0.5
Thickness-to-chord ratio (η = 0.25)	0.096	
(η = 1.0)	0.070	
Dihedral from η = 0.25, deg		-1.83
Pivot location, spanwise, η	0.278	

Leading-edge slats

	η	slat chord (% c)	gap at δ_L 17_{MOD} (% c)
inboard	0.335	14.3	2.5
outboard	0.922	21.0	2.0

Trailing-edge flaps		
Chord, percent wing chord		30
$\eta_{inboard}$	0.233	
$\eta_{outboard}$	0.924	
Gap, percent wing chord		1.5
Overlap, percent wing chord		2.0
Tail length ($\bar{c}_w/4$ to $\bar{c}_t/4$), m (ft)	4.13	(13.56)

TABLE I - (Concluded)

Horizontal tails		
Number of panels	2	
Projected area per panel, sq m (sq ft)	3.71	(39.93)
Span (tip-to-tip) prior to Test 4, m (ft)	7.74	(24.50)
Chord length, m (ft)		
mean aerodynamic	1.91	(6.28)
root (exposed)	2.68	(8.80)
tip	0.60	(1.98)
Leading-edge sweep angle, deg	50.5	
Aspect ratio (per panel)	1.26	
Taper ratio	0.213	
Incidence pivot point location, percent tail root chord	52.5	
Dihedral, deg	-3.5	
Split flap area, sq m (sq ft)	0.21	(2.21)
Vertical tails		
Number of panels	2	
Projected area per panel, sq m (sq ft)	3.10	(33.34)
Height, m (ft)	1.95	(6.41)
Chord length, m (ft)		
mean aerodynamic	1.70	(5.57)
root (exposed)	2.34	(7.69)
tip	1.14	(3.75)
Leading-edge sweep angle, deg	43	
Outward cant from vertical, deg	5	
Ventral fins		
Number of panels	2	
Projected area per panel, sq m (sq ft)	0.55	(5.96)
Height, m (ft)	0.38	(1.25)
Length, m (ft)	2.52	(8.28)

TABLE II - PART A - TEST 1 TABULATION SCHEDULE.

Run	q	Model Attitude		Wing					Tail	
		α Range	ψ Range	δ_f	δ_{DLC}	δ_L	Glove Slat	Flap Actuator Fairings	i_t	δ_{SB}
15	34.4	-2 → +28	0	35	-4.5	16°20'$_{MOD}$	On	Off	0	0
18	↓	-2 → +26	↓	↓	5	↓	↓	↓	↓	↓
28	↓	↓	+6	↓	-4.5	↓	↓	↓	↓	↓
29	↓	10	-4 → + 12	↓	↓	↓	↓	↓	↓	↓
30	↓	4	↓	↓	↓	↓	↓	↓	↓	↓
31	↓	10	↓	↓	5	↓	↓	↓	↓	↓
32	↓	-2 → +26	+6	↓	↓	↓	↓	↓	↓	↓

TABLE II - PART B - TEST 1 DATA.

RUN 15

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.53	0.0	0.0	33.80	0.7771	0.1273	-0.0571	0.0085	-0.0019	-0.0022
2	0.60	0.0	0.0	33.85	0.9967	0.1371	-0.0856	0.0103	-0.0021	-0.0029
3	2.74	0.0	0.0	33.84	1.2224	0.1551	-0.1115	0.0082	-0.0021	-0.0025
4	4.87	0.0	0.0	33.98	1.4411	0.1808	-0.1196	0.0090	-0.0019	-0.0022
5	6.99	0.0	0.0	33.85	1.6326	0.2119	-0.1578	0.0086	-0.0016	-0.0016
6	9.10	0.0	0.0	33.88	1.8215	0.2471	-0.1409	0.0071	-0.0013	-0.0005
7	11.20	0.0	0.0	33.88	1.9944	0.2906	-0.1456	0.0071	-0.0013	-0.0004
8	12.25	0.0	0.0	33.80	2.0656	0.3142	-0.1458	0.0051	-0.0002	0.0006
9	13.29	0.0	0.0	33.75	2.1320	0.3408	-0.1585	0.0071	-0.0007	-0.0005
10	15.38	0.0	0.0	33.83	2.2772	0.3999	-0.1785	0.0075	-0.0012	-0.0020
11	17.45	0.0	0.0	33.82	2.4089	0.4780	-0.1998	0.0106	-0.0020	-0.0081
12	19.51	0.0	0.0	34.12	2.5060	0.5787	-0.1988	0.0089	-0.0011	-0.0037
13	21.55	0.0	0.0	34.03	2.5629	0.6807	-0.2049	0.0097	-0.0007	-0.0102
14	23.54	0.0	0.0	33.85	2.5530	0.8140	-0.2537	0.0224	-0.0032	-0.0284
15	25.55	0.0	0.0	33.82	2.5605	0.9459	-0.2748	0.0203	-0.0055	-0.0294
16	27.55	0.0	0.0	33.96	2.5587	1.1006	-0.3094	0.0164	-0.0040	-0.0240
17	29.54	0.0	0.0	33.86	2.5429	1.2523	-0.3358	0.0259	-0.0033	-0.0231
18	2.74	0.0	0.0	58.62	1.2285	0.1540	-0.1066	0.0083	-0.0019	-0.0030

RUN 18

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.76	0.0	0.0	33.93	0.3998	0.1269	0.0481	0.0075	-0.0018	-0.0024
2	0.36	0.0	0.0	33.94	0.5966	0.1312	0.0268	0.0078	-0.0017	-0.0016
3	2.48	0.0	0.0	33.82	0.7961	0.1411	0.0289	0.0081	-0.0019	-0.0020
4	4.60	0.0	0.0	34.07	1.0015	0.1584	0.0239	0.0087	-0.0017	-0.0008
5	6.73	0.0	0.0	33.91	1.2020	0.1828	0.0155	0.0112	-0.0016	-0.0013
6	8.85	0.0	0.0	33.85	1.4025	0.2119	-0.0006	0.0084	-0.0016	-0.0005
7	10.97	0.0	0.0	33.82	1.5995	0.2513	-0.0004	0.0069	-0.0010	0.0010
8	12.03	0.0	0.0	33.86	1.6986	0.2748	-0.0114	0.0068	-0.0010	0.0022
9	13.08	0.0	0.0	33.75	1.7949	0.3012	-0.0208	0.0068	-0.0004	0.0029
10	15.20	0.0	0.0	33.84	1.9835	0.3591	-0.0594	0.0080	-0.0014	0.0020
11	17.32	0.0	0.0	33.87	2.1848	0.4365	-0.1019	0.0088	-0.0016	0.0031
12	19.42	0.0	0.0	33.87	2.3560	0.5410	-0.1348	0.0145	-0.0042	-0.0025
13	21.48	0.0	0.0	33.90	2.4508	0.6547	-0.1540	0.0067	-0.0005	-0.0017
14	23.50	0.0	0.0	33.92	2.4915	0.7854	-0.2188	0.0139	-0.0032	-0.0096
15	25.53	0.0	0.0	33.98	2.5313	0.9179	-0.2725	0.0211	-0.0056	-0.0225
16	27.54	0.0	0.0	33.96	2.5526	1.0667	-0.3151	0.0219	-0.0050	-0.0237

TABLE II - PART B - TEST 1 DATA - CONTINUED.

RUN 28

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.53	-6.0	0.0	34.05	0.7729	0.1364	-0.0611	0.0991	-0.0177	0.0064
2	0.60	-6.0	0.0	34.06	0.9936	0.1469	-0.0811	0.0987	-0.0173	0.0077
3	2.73	-6.0	0.0	34.07	1.2150	0.1654	-0.1011	0.1024	-0.0175	0.0072
4	4.86	-6.0	0.0	33.92	1.4298	0.1903	-0.1184	0.1006	-0.0177	0.0093
5	6.98	-6.0	0.0	33.84	1.6186	0.2194	-0.1564	0.0997	-0.0183	0.0114
6	9.09	-6.0	0.0	33.82	1.8086	0.2556	-0.1414	0.0920	-0.0183	0.0155
7	11.19	-6.0	0.0	34.02	1.9695	0.2950	-0.1480	0.0881	-0.0198	0.0154
8	12.24	-6.0	0.0	34.03	2.0466	0.3197	-0.1616	0.0832	-0.0203	0.0178
9	13.28	-6.0	0.0	33.91	2.1270	0.3470	-0.1580	0.0815	-0.0205	0.0170
10	15.38	-6.0	0.0	34.18	2.2770	0.4077	-0.1814	0.0718	-0.0195	0.0175
11	17.45	-6.0	0.0	33.79	2.4043	0.4805	-0.1902	0.0675	-0.0212	0.0091
12	19.51	-6.0	0.0	34.03	2.4949	0.5755	-0.1847	0.0473	-0.0198	0.0149
13	21.55	-6.0	0.0	34.02	2.5613	0.6877	-0.2081	0.0360	-0.0168	0.0117
14	23.56	-6.0	0.0	33.90	2.5881	0.8286	-0.3166	0.0293	-0.0141	0.0057
15	25.55	-6.0	0.0	34.08	2.5715	0.9691	-0.2853	0.0219	-0.0127	0.0095
16	27.55	-6.0	0.0	33.88	2.5653	1.1189	-0.3066	0.0160	-0.0093	0.0136

TABLE II - PART B - TEST 1 DATA - CONTINUED.

RUN 29

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	11.19	4.0	0.0	33.96	1.9757	0.2918	-0.1464	-0.0407	0.0093	-0.0123
2	11.20	2.0	0.0	33.97	1.9889	0.2906	-0.1462	-0.0139	0.0038	-0.0060
3	11.21	0.0	0.0	33.84	1.9964	0.2915	-0.1466	0.0078	-0.0013	-0.0004
4	11.21	-2.0	0.0	33.96	1.9988	0.2922	-0.1445	0.0333	-0.0075	0.0061
5	11.20	-4.0	0.0	33.95	1.9891	0.2926	-0.1465	0.0567	-0.0128	0.0124
6	11.19	-6.0	0.0	33.84	1.9768	0.2948	-0.1502	0.0827	-0.0185	0.0178
7	11.18	-8.0	0.0	33.81	1.9576	0.2995	-0.1452	0.1131	-0.0252	0.0224
8	11.15	-12.0	0.0	34.05	1.9073	0.3123	-0.1510	0.1667	-0.0353	0.0293

RUN 30

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	4.87	4.0	0.0	34.02	1.4334	0.1840	-0.1161	-0.0485	0.0079	-0.0114
2	4.87	2.0	0.0	33.84	1.4365	0.1818	-0.1165	-0.0184	0.0029	-0.0070
3	4.87	0.0	0.0	34.12	1.4433	0.1813	-0.1155	0.0082	-0.0019	-0.0022
4	4.87	-2.0	0.0	34.00	1.4362	0.1822	-0.1158	0.0370	-0.0067	0.0016
5	4.86	-4.0	0.0	34.06	1.4190	0.1850	-0.1155	0.0673	-0.0115	0.0055
6	4.86	-6.0	0.0	33.83	1.4163	0.1887	-0.1193	0.0988	-0.0171	0.0091
7	4.85	-8.0	0.0	34.05	1.4073	0.1944	-0.1155	0.1325	-0.0229	0.0119
8	4.83	-12.0	0.0	33.90	1.3760	0.2117	-0.1121	0.1932	-0.0333	0.0214

TABLE II - PART B - TEST 1 DATA - CONCLUDED.

RUN 31

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	10.97	4.0	0.0	33.89	1.6034	0.2555	-0.0098	-0.0452	0.0096	-0.0081
2	10.97	2.0	0.0	33.95	1.6027	0.2524	-0.0046	-0.0186	0.0041	-0.0031
3	10.97	0.0	0.0	33.88	1.6036	0.2510	0.0019	0.0070	-0.0010	0.0014
4	10.97	-2.0	0.0	33.91	1.6062	0.2522	-0.0015	0.0323	-0.0057	0.0067
5	10.97	-4.0	0.0	33.80	1.6061	0.2550	-0.0090	0.0581	-0.0109	0.0108
6	10.97	-6.0	0.0	33.81	1.5984	0.2591	-0.0181	0.0876	-0.0170	0.0150
7	10.96	-8.0	0.0	34.02	1.5899	0.2648	-0.0255	0.1175	-0.0229	0.0190
8	10.95	-10.0	0.0	33.88	1.5784	0.2713	-0.0345	0.1439	-0.0280	0.0234
9	10.94	-12.0	0.0	33.90	1.5641	0.2790	-0.0367	0.1686	-0.0325	0.0276

RUN 32

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.76	-6.0	0.0	33.95	0.4023	0.1349	0.0350	0.0939	-0.0149	0.0080
2	0.36	-6.0	0.0	33.84	0.5972	0.1387	0.0259	0.0933	-0.0148	0.0099
3	2.48	-6.0	0.0	33.84	0.8016	0.1491	0.0218	0.0969	-0.0153	0.0107
4	4.60	-6.0	0.0	33.96	0.9943	0.1667	0.0209	0.0990	-0.0159	0.0110
5	6.72	-6.0	0.0	33.90	1.1957	0.1908	0.0107	0.0964	-0.0165	0.0118
6	8.85	-6.0	0.0	33.87	1.4028	0.2218	-0.0096	0.0933	-0.0167	0.0133
7	10.96	-6.0	0.0	34.10	1.5964	0.2586	-0.0188	0.0869	-0.0169	0.0148
8	12.03	-6.0	0.0	34.13	1.6981	0.2811	-0.0267	0.0829	-0.0174	0.0158
9	13.08	-6.0	0.0	34.02	1.7833	0.3071	-0.0452	0.0790	-0.0178	0.0169
10	15.20	-6.0	0.0	33.80	1.9881	0.3731	-0.0657	0.0749	-0.0174	0.0135
11	17.31	-6.0	0.0	33.84	2.1698	0.4391	-0.0920	0.0636	-0.0180	0.0140
12	19.41	-6.0	0.0	34.04	2.3365	0.5370	-0.1207	0.0536	-0.0205	0.0120
13	21.47	-6.0	0.0	34.02	2.4415	0.6563	-0.1557	0.0346	-0.0157	0.0158
14	23.52	-6.0	0.0	34.00	2.5161	0.7910	-0.2665	0.0286	-0.0118	0.0105
15	25.54	-6.0	0.0	34.00	2.5476	0.9358	-0.2893	0.0236	-0.0105	0.0139
16	27.54	-6.0	0.0	34.00	2.5556	1.0868	-0.2964	0.0160	-0.0092	0.0158

TABLE III - PART A - TEST 2 TABULATION SCHEDULE.

Run	q	Model Attitude		Wing					Tail	
		α Range	ψ Range	δ_f	δ_{DLC}	δ_L	Glove Slat	Flap Actuator Fairings	i_t	δ_{SB}
14	34.4	-2 → +26	0	35	-4.5/5	17° MOD	On	On	10.7/-10.7	0
15	↓	↓	↓	↓	-4.5/0	↓	↓	↓	8.6/-8.6	↓
16	↓	↓	↓	↓	-4.5/20	↓	↓	↓	0	↓
17	↓	↓	↓	↓	↓	↓	↓	↓	11.1/-11.1	↓
18	↓	0	-10 → +12	↓	↓	↓	↓	↓	↓	↓
19	↓	10	↓	↓	↓	↓	↓	↓	↓	↓
20	↓	-2 → +26	-6	↓	↓	↓	↓	↓	↓	↓
21	↓	↓	+6	↓	↓	↓	↓	↓	↓	↓

TABLE III - PART B - TEST 2 DATA.

RUN 14

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.61	0.0	10.7/-10.7	33.85	0.6398	0.1495	-0.0243	-0.0333	0.0115	0.0466
2	0.50	0.0	10.7/-10.7	33.88	0.8344	0.1574	-0.0641	-0.0318	0.0098	0.0485
3	2.64	0.0	10.7/-10.7	34.05	1.0559	0.1723	-0.0405	-0.0320	0.0077	0.0511
4	4.77	0.0	10.7/-10.7	33.96	1.2777	0.1945	-0.0586	-0.0314	0.0064	0.0533
5	6.87	0.0	10.7/-10.7	33.91	1.4475	0.2218	-0.0515	-0.0313	0.0048	0.0518
6	9.00	0.0	10.7/-10.7	33.82	1.6531	0.2592	-0.0467	-0.0295	0.0032	0.0542
7	11.12	0.0	10.7/-10.7	33.75	1.8607	0.3064	-0.0603	-0.0251	0.0007	0.0522
8	12.19	0.0	10.7/-10.7	33.97	1.9757	0.3344	-0.0763	-0.0231	-0.0001	0.0546
9	13.25	0.0	10.7/-10.7	33.86	2.0639	0.3632	-0.0878	-0.0205	-0.0019	0.0530
10	15.35	0.0	10.7/-10.7	33.97	2.2364	0.4340	-0.1028	-0.0133	-0.0060	0.0486
11	17.44	0.0	10.7/-10.7	33.93	2.3822	0.5191	-0.1475	-0.0064	-0.0082	0.0384
12	19.51	0.0	10.7/-10.7	34.06	2.5035	0.6217	-0.1296	-0.0102	-0.0067	0.0385
13	21.54	0.0	10.7/-10.7	33.95	2.5448	0.7290	-0.1664	-0.0047	-0.0085	0.0314
14	23.57	0.0	10.7/-10.7	33.88	2.5978	0.8534	-0.2556	-0.0052	-0.0123	0.0285
15	25.60	0.0	10.7/-10.7	33.93	2.6483	0.9766	-0.2984	-0.0045	-0.0137	0.0144
16	27.58	0.0	10.7/-10.7	33.91	2.6193	1.1295	-0.2978	0.0027	-0.0158	-0.0003

RUN 15

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.52	0.0	8.6/ -8.6	33.78	0.7978	0.1463	-0.0583	-0.0173	0.0078	0.0101
2	0.62	0.0	8.6/ -8.6	33.80	1.0249	0.1574	-0.0621	-0.0151	0.0066	0.0096
3	2.74	0.0	8.6/ -8.6	34.06	1.2238	0.1744	-0.0586	-0.0143	0.0058	0.0109
4	4.87	0.0	8.6/ -8.6	33.85	1.4356	0.1990	-0.0732	-0.0117	0.0044	0.0112
5	6.99	0.0	8.6/ -8.6	33.82	1.6352	0.2311	-0.0844	-0.0107	0.0036	0.0116
6	9.11	0.0	8.6/ -8.6	33.70	1.8317	0.2699	-0.0993	-0.0091	0.0026	0.0108
7	11.24	0.0	8.6/ -8.6	33.65	2.0536	0.3208	-0.1123	-0.0076	0.0014	0.0113
8	12.29	0.0	8.6/ -8.6	33.73	2.1418	0.3467	-0.1233	-0.0073	0.0022	0.0108
9	13.35	0.0	8.6/ -8.6	33.85	2.2383	0.3783	-0.1418	-0.0061	0.0008	0.0117
10	15.44	0.0	8.6/ -8.6	33.83	2.3789	0.4507	-0.1542	-0.0018	-0.0027	0.0084
11	17.50	0.0	8.6/ -8.6	33.74	2.4860	0.5370	-0.1467	-0.0046	-0.0025	0.0149
12	19.55	0.0	8.6/ -8.6	33.87	2.5620	0.6267	-0.1393	-0.0019	-0.0049	0.0196
13	21.59	0.0	8.6/ -8.6	33.72	2.6319	0.7469	-0.1922	0.0049	-0.0055	0.0065
14	23.63	0.0	8.6/ -8.6	33.71	2.6913	0.8749	-0.2901	0.0030	-0.0069	0.0021
15	25.62	0.0	8.6/ -8.6	33.63	2.6770	1.0084	-0.3016	-0.0144	-0.0037	0.0198
16	27.60	0.0	8.6/ -8.6	33.81	2.6528	1.1498	-0.3097	0.0072	-0.0067	-0.0023

TABLE III - PART B - TEST 2 DATA - CONTINUED.

RUN 16

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.69	0.0	0.0	34.02	0.5190	0.1478	0.0433	-0.0069	0.0045	0.0519
2	0.43	0.0	0.0	33.90	0.7103	0.1543	0.0066	-0.0089	0.0037	0.0545
3	2.56	0.0	0.0	33.97	0.9335	0.1671	0.0114	-0.0093	0.0026	0.0564
4	4.69	0.0	0.0	34.09	1.1438	0.1888	-0.0023	-0.0090	0.0021	0.0590
5	6.81	0.0	0.0	33.61	1.3451	0.2153	-0.0008	-0.0111	0.0019	0.0634
6	8.94	0.0	0.0	34.00	1.5504	0.2512	-0.0136	-0.0098	0.0006	0.0619
7	11.06	0.0	0.0	33.90	1.7494	0.2949	-0.0177	-0.0093	0.0002	0.0607
8	12.13	0.0	0.0	34.02	1.8670	0.3230	-0.0344	-0.0081	-0.0007	0.0638
9	13.18	0.0	0.0	33.95	1.9615	0.3545	-0.0470	-0.0056	-0.0018	0.0631
10	15.29	0.0	0.0	33.96	2.1414	0.4194	-0.0650	-0.0009	-0.0047	0.0565
11	17.39	0.0	0.0	33.84	2.3070	0.5045	-0.0937	0.0066	-0.0070	0.0481
12	19.48	0.0	0.0	34.02	2.4460	0.6015	-0.1053	0.0101	-0.0076	0.0399
13	21.52	0.0	0.0	33.90	2.5224	0.7171	-0.1667	0.0056	-0.0054	0.0297
14	23.55	0.0	0.0	33.83	2.5627	0.8386	-0.2501	0.0043	-0.0053	0.0368
15	25.59	0.0	0.0	34.02	2.6390	0.9759	-0.3127	0.0013	-0.0084	0.0341
16	27.51	0.0	0.0	33.73	2.5025	1.1373	-0.1500	0.0145	-0.0085	0.0157

RUN 17

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.67	0.0	11.1/-11.1	33.81	0.5521	0.1643	-0.0007	-0.0408	0.0166	0.0713
2	0.44	0.0	11.1/-11.1	33.82	0.7332	0.1719	-0.0274	-0.0410	0.0147	0.0754
3	2.57	0.0	11.1/-11.1	33.84	0.9436	0.1854	-0.0131	-0.0383	0.0119	0.0762
4	4.70	0.0	11.1/-11.1	33.82	1.1507	0.2046	-0.0201	-0.0388	0.0099	0.0777
5	6.80	0.0	11.1/-11.1	33.99	1.3260	0.2295	-0.0222	-0.0380	0.0077	0.0779
6	8.93	0.0	11.1/-11.1	33.57	1.5471	0.2671	-0.0298	-0.0376	0.0056	0.0802
7	11.06	0.0	11.1/-11.1	33.80	1.7479	0.3118	-0.0444	-0.0344	0.0034	0.0801
8	12.13	0.0	11.1/-11.1	33.63	1.8707	0.3404	-0.0551	-0.0353	0.0024	0.0843
9	13.19	0.0	11.1/-11.1	33.70	1.9782	0.3723	-0.0718	-0.0316	0.0003	0.0833
10	15.30	0.0	11.1/-11.1	33.97	2.1495	0.4406	-0.0827	-0.0219	-0.0042	0.0746
11	17.39	0.0	11.1/-11.1	33.77	2.3064	0.5245	-0.1182	-0.0142	-0.0073	0.0671
12	19.47	0.0	11.1/-11.1	33.56	2.4382	0.6176	-0.0973	-0.0106	-0.0094	0.0568
13	21.52	0.0	11.1/-11.1	33.68	2.5116	0.7246	-0.1309	-0.0038	-0.0109	0.0447
14	23.53	0.0	11.1/-11.1	33.96	2.5395	0.8405	-0.1931	-0.0081	-0.0127	0.0492
15	25.57	0.0	11.1/-11.1	33.56	2.5929	0.9667	-0.2427	-0.0074	-0.0160	0.0362
16	27.45	0.0	11.1/-11.1	33.91	2.4036	1.1085	0.0012	0.0100	-0.0176	0.0158

TABLE III - PART B - TEST 2 DATA - CONTINUED.

RUN 18

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	0.46	10.0	11.1/-11.1	33.83	0.7543	0.1995	-0.1077	-0.1884	0.0372	0.0586
2	0.46	8.0	11.1/-11.1	33.87	0.7560	0.1898	-0.0889	-0.1602	0.0334	0.0629
3	0.45	6.0	11.1/-11.1	33.97	0.7511	0.1834	-0.0733	-0.1300	0.0291	0.0665
4	0.45	4.0	11.1/-11.1	33.97	0.7455	0.1774	-0.0488	-0.0980	0.0237	0.0677
5	0.46	3.0	11.1/-11.1	33.81	0.7549	0.1763	-0.0287	-0.0808	0.0210	0.0677
6	0.46	2.0	11.1/-11.1	33.98	0.7564	0.1748	-0.0223	-0.0662	0.0187	0.0702
7	0.46	1.0	11.1/-11.1	33.87	0.7602	0.1742	-0.0187	-0.0525	0.0163	0.0733
8	0.46	0.0	11.1/-11.1	33.91	0.7586	0.1742	-0.0112	-0.0397	0.0143	0.0750
9	0.45	-1.0	11.1/-11.1	33.90	0.7511	0.1747	-0.0006	-0.0280	0.0126	0.0767
10	0.45	-2.0	11.1/-11.1	34.03	0.7474	0.1737	0.0026	-0.0126	0.0100	0.0772
11	0.45	-3.0	11.1/-11.1	34.03	0.7445	0.1745	0.0129	0.0005	0.0079	0.0791
12	0.45	-4.0	11.1/-11.1	34.01	0.7399	0.1762	0.0155	0.0160	0.0056	0.0807
13	0.44	-6.0	11.1/-11.1	34.02	0.7345	0.1784	0.0292	0.0449	0.0011	0.0846
14	0.44	-8.0	11.1/-11.1	34.03	0.7278	0.1834	0.0316	0.0776	-0.0041	0.0860
15	0.43	-10.0	11.1/-11.1	34.02	0.7176	0.1900	0.0437	0.1137	-0.0099	0.0883
16	0.42	-12.0	11.1/-11.1	34.01	0.7031	0.2000	0.0482	0.1505	-0.0152	0.0907

RUN 19

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	11.06	10.0	11.1/-11.1	34.01	1.7590	0.3453	-0.1238	-0.1605	0.0294	0.0601
2	11.07	8.0	11.1/-11.1	34.02	1.7770	0.3385	-0.1093	-0.1347	0.0243	0.0639
3	11.07	6.0	11.1/-11.1	34.07	1.7716	0.3310	-0.0979	-0.1080	0.0193	0.0654
4	11.07	4.0	11.1/-11.1	33.85	1.7706	0.3254	-0.0835	-0.0815	0.0131	0.0700
5	11.08	3.0	11.1/-11.1	34.01	1.7887	0.3231	-0.0683	-0.0707	0.0112	0.0750
6	11.07	2.0	11.1/-11.1	34.16	1.7767	0.3200	-0.0598	-0.0577	0.0085	0.0769
7	11.07	1.0	11.1/-11.1	33.86	1.7726	0.3175	-0.0504	-0.0456	0.0055	0.0789
8	11.08	0.0	11.1/-11.1	33.90	1.7822	0.3169	-0.0495	-0.0370	0.0034	0.0833
9	11.07	-1.0	11.1/-11.1	33.90	1.7768	0.3165	-0.0379	-0.0241	0.0005	0.0865
10	11.07	-2.0	11.1/-11.1	34.01	1.7693	0.3159	-0.0370	-0.0072	-0.0031	0.0870
11	11.06	-3.0	11.1/-11.1	34.00	1.7566	0.3161	-0.0303	0.0048	-0.0052	0.0881
12	11.06	-4.0	11.1/-11.1	33.98	1.7476	0.3158	-0.0215	0.0179	-0.0078	0.0892
13	11.05	-6.0	11.1/-11.1	33.85	1.7426	0.3183	-0.0160	0.0422	-0.0126	0.0952
14	11.04	-8.0	11.1/-11.1	33.80	1.7264	0.3210	-0.0129	0.0671	-0.0179	0.1009
15	11.04	-10.0	11.1/-11.1	33.94	1.7145	0.3262	-0.0089	0.0948	-0.0230	0.1058
16	11.02	-12.0	11.1/-11.1	33.96	1.6925	0.3326	-0.0083	0.1250	-0.0286	0.1085

RUN 20

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.67	6.0	11.1/-11.1	33.86	0.5517	0.1748	-0.0535	-0.1278	0.0304	0.0637
2	0.45	6.0	11.1/-11.1	33.87	0.7422	0.1825	-0.0797	-0.1285	0.0286	0.0638
3	2.57	6.0	11.1/-11.1	33.83	0.9496	0.1972	-0.0633	-0.1285	0.0269	0.0657
4	4.70	6.0	11.1/-11.1	33.83	1.1549	0.2185	-0.0763	-0.1265	0.0250	0.0669
5	6.82	6.0	11.1/-11.1	33.51	1.3619	0.2466	-0.0734	-0.1229	0.0233	0.0662
6	8.94	6.0	11.1/-11.1	34.19	1.5637	0.2827	-0.0857	-0.1207	0.0214	0.0677
7	11.07	6.0	11.1/-11.1	33.90	1.7665	0.3306	-0.0902	-0.1086	0.0192	0.0666
8	12.13	6.0	11.1/-11.1	33.97	1.8668	0.3563	-0.0986	-0.1013	0.0179	0.0650
9	13.19	6.0	11.1/-11.1	33.83	1.9782	0.3879	-0.1139	-0.0955	0.0163	0.0649
10	15.30	6.0	11.1/-11.1	33.94	2.1516	0.4516	-0.1211	-0.0826	0.0139	0.0628
11	17.39	6.0	11.1/-11.1	33.96	2.2986	0.5343	-0.1311	-0.0652	0.0099	0.0511
12	19.47	6.0	11.1/-11.1	33.78	2.4285	0.6265	-0.1208	-0.0511	0.0078	0.0403
13	21.52	6.0	11.1/-11.1	34.07	2.5236	0.7341	-0.1396	-0.0294	0.0037	0.0297
14	23.56	6.0	11.1/-11.1	33.74	2.5821	0.8577	-0.2262	-0.0192	0.0	0.0319
15	25.55	6.0	11.1/-11.1	33.81	2.5691	1.0038	-0.2815	-0.0032	-0.0130	0.0012
16	27.57	6.0	11.1/-11.1	33.81	2.5969	1.1501	-0.3374	0.0197	-0.0172	-0.0234

RUN 21

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.68	-6.0	11.1/-11.1	34.14	0.5240	0.1705	0.0322	0.0476	0.0025	0.0764
2	0.43	-6.0	11.1/-11.1	34.14	0.7098	0.1777	-0.0041	0.0461	0.0011	0.0824
3	2.56	-6.0	11.1/-11.1	34.16	0.9239	0.1912	0.0221	0.0471	-0.0014	0.0858
4	4.67	-6.0	11.1/-11.1	34.16	1.1156	0.2109	0.0112	0.0452	-0.0033	0.0887
5	6.80	-6.0	11.1/-11.1	34.07	1.3195	0.2367	0.0058	0.0461	-0.0064	0.0918
6	8.92	-6.0	11.1/-11.1	33.99	1.5236	0.2712	-0.0037	0.0443	-0.0086	0.0941
7	11.05	-6.0	11.1/-11.1	33.95	1.7326	0.3163	-0.0163	0.0405	-0.0125	0.0960
8	12.11	-6.0	11.1/-11.1	33.81	1.8314	0.3411	-0.0288	0.0421	-0.0143	0.0951
9	13.17	-6.0	11.1/-11.1	33.92	1.9345	0.3701	-0.0475	0.0385	-0.0155	0.0962
10	15.29	-6.0	11.1/-11.1	33.92	2.1286	0.4358	-0.0785	0.0330	-0.0189	0.0941
11	17.38	-6.0	11.1/-11.1	34.03	2.2796	0.5214	-0.1091	0.0347	-0.0234	0.0837
12	19.46	-6.0	11.1/-11.1	33.75	2.4230	0.6178	-0.0870	0.0317	-0.0264	0.0756
13	21.50	-6.0	11.1/-11.1	34.10	2.4888	0.7197	-0.0986	0.0257	-0.0264	0.0641
14	23.53	-6.0	11.1/-11.1	34.12	2.5405	0.8476	-0.1631	0.0098	-0.0232	0.0656
15	25.58	-6.0	11.1/-11.1	34.41	2.6124	0.9844	-0.2002	0.0054	-0.0211	0.0639
16	27.56	-6.0	11.1/-11.1	34.02	2.5885	1.1341	-0.2163	0.0123	-0.0218	0.0449

TABLE IV - PART A - TEST 5 TABULATION SCHEDULE.

Run	q	Model Attitude		Wing					Tail	
		α Range	ψ Range	δ_f	δ_{DLC}	δ_L	Glove Slat	Flap Actuator Fairings	i_t	δ_{SB}
1	34.5	-2 → +28	0	35	5	17° MOD	On	On	0	0
3	↓	↓	↓	↓	-4.5	↓	↓	↓	↓	60
4	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
5	↓	↓	-6	↓	5	↓	↓	↓	↓	↓
6	↓	-2 → +14	+6	↓	↓	↓	↓	↓	↓	↓
7	↓	0	+6 → -12	↓	↓	↓	↓	↓	↓	↓
8	↓	10	↓	↓	↓	↓	↓	↓	↓	60
9	↓	-2 → +28	-6	↓	-4.5	↓	↓	↓	↓	↓
10	↓	0	+6 → -12	↓	↓	↓	↓	↓	↓	↓
11	↓	10	↓	↓	↓	↓	↓	↓	↓	0
12	↓	-2 → +28	-6	↓	↓	↓	↓	↓	↓	↓
13	↓	0	+6 → -12	↓	↓	↓	↓	↓	↓	↓
14	↓	10	↓	↓	↓	↓	↓	↓	↓	↓
15	↓	-2 → +28	0	↓	-4.5/20	↓	↓	↓	↓	↓
16	↓	↓	-6	↓	↓	↓	↓	↓	↓	↓
17	↓	↓	+6	↓	↓	↓	↓	↓	↓	↓
18	↓	0	+6 → -12	↓	↓	↓	↓	↓	↓	↓
19	↓	10	↓	↓	↓	↓	↓	↓	↓	↓
20	↓	0	0	↓	↓	↓	↓	↓	0 → +15 0 → -15	↓
21	↓	10	↓	↓	↓	↓	↓	↓	↓	↓

TABLE IV - PART B - TEST 5 DATA.

RUN 1

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.70	0.0	0.0	34.17	0.4890	0.1380	0.0469	0.0076	-0.0023	0.0004
2	0.42	0.0	0.0	34.17	0.6908	0.1420	0.0351	0.0073	-0.0019	0.0012
3	2.55	0.0	0.0	34.16	0.9057	0.1554	0.0232	0.0082	-0.0016	0.0017
4	4.67	0.0	0.0	34.31	1.1018	0.1749	0.0310	0.0081	-0.0016	0.0019
5	6.78	0.0	0.0	34.24	1.2939	0.1990	0.0339	0.0087	-0.0013	0.0024
6	8.89	0.0	0.0	34.14	1.4805	0.2298	0.0269	0.0081	-0.0011	0.0026
7	11.02	0.0	0.0	34.11	1.6815	0.2699	0.0139	0.0075	-0.0010	0.0009
8	13.13	0.0	0.0	34.11	1.8777	0.3214	0.0032	0.0075	-0.0008	0.0019
9	15.25	0.0	0.0	34.08	2.0678	0.3846	-0.0298	0.0066	-0.0009	0.0014
10	17.36	0.0	0.0	34.07	2.2574	0.4666	-0.0623	0.0062	-0.0012	0.0016
11	19.44	0.0	0.0	34.12	2.3851	0.5749	-0.0741	0.0045	-0.0004	0.0012
12	21.49	0.0	0.0	34.22	2.4684	0.6922	-0.1278	0.0021	0.0018	-0.0021
13	23.52	0.0	0.0	34.05	2.5231	0.8233	-0.2341	0.0079	0.0027	0.0002
14	25.56	0.0	0.0	33.95	2.5786	0.9664	-0.2996	-0.0051	0.0041	0.0098
15	27.59	0.0	0.0	33.67	2.6326	1.1050	-0.3504	-0.0115	0.0030	0.0088
16	29.57	0.0	0.0	33.89	2.6074	1.2675	-0.3896	-0.0026	-0.0021	-0.0011

TABLE IV - PART B - TEST 5 DATA - CONTINUED.

RUN 3

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.54	0.0	0.0	34.12	0.7694	0.1874	-0.0559	0.0146	-0.0033	-0.0057
2	0.59	0.0	0.0	34.04	0.9688	0.1962	-0.0741	0.0112	-0.0026	-0.0022
3	2.71	0.0	0.0	34.20	1.1747	0.2131	-0.0834	0.0118	-0.0023	-0.0015
4	4.82	0.0	0.0	34.07	1.3625	0.2319	-0.0826	0.0122	-0.0029	-0.0022
5	6.94	0.0	0.0	34.12	1.5494	0.2587	-0.0692	0.0122	-0.0025	-0.0016
6	9.05	0.0	0.0	34.01	1.7313	0.2910	-0.0661	0.0100	-0.0020	-0.0003
7	11.15	0.0	0.0	34.04	1.9056	0.3323	-0.0571	0.0070	-0.0013	0.0010
8	13.27	0.0	0.0	34.12	2.1022	0.3870	-0.0695	0.0086	-0.0002	-0.0040
9	15.36	0.0	0.0	34.00	2.2495	0.4474	-0.0713	0.0081	-0.0003	-0.0005
10	17.43	0.0	0.0	34.28	2.3643	0.5402	-0.0622	0.0083	-0.0016	-0.0005
11	19.48	0.0	0.0	33.81	2.4512	0.6238	-0.0452	0.0061	-0.0007	0.0
12	21.52	0.0	0.0	33.81	2.5098	0.7419	-0.0832	0.0057	0.0003	-0.0002
13	23.56	0.0	0.0	34.47	2.5803	0.8807	-0.1886	0.0167	-0.0003	-0.0009
14	25.58	0.0	0.0	33.99	2.6205	1.0067	-0.2602	0.0021	-0.0003	-0.0006
15	27.57	0.0	0.0	34.19	2.5915	1.1575	-0.2649	-0.0189	0.0038	0.0200
16	29.51	0.0	0.0	34.43	2.5050	1.3091	-0.2782	-0.0008	-0.0009	-0.0016

RUN 4

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.52	0.0	0.0	34.05	0.7985	0.1372	-0.0575	0.0114	-0.0027	-0.0035
2	0.60	0.0	0.0	34.12	0.9960	0.1478	-0.0755	0.0110	-0.0023	-0.0011
3	2.72	0.0	0.0	34.26	1.1891	0.1639	-0.0844	0.0096	-0.0019	-0.0019
4	4.84	0.0	0.0	34.23	1.3869	0.1884	-0.0829	0.0101	-0.0019	-0.0014
5	6.94	0.0	0.0	34.15	1.5629	0.2170	-0.0836	0.0097	-0.0015	-0.0008
6	9.06	0.0	0.0	34.02	1.7508	0.2524	-0.0842	0.0095	-0.0017	-0.0004
7	11.18	0.0	0.0	34.10	1.9540	0.2981	-0.0773	0.0078	-0.0015	0.0012
8	13.30	0.0	0.0	34.12	2.1504	0.3521	-0.0949	0.0064	-0.0004	-0.0019
9	15.39	0.0	0.0	34.06	2.3065	0.4158	-0.1117	0.0059	-0.0005	-0.0002
10	17.47	0.0	0.0	34.24	2.4395	0.5133	-0.1227	0.0047	-0.0015	0.0016
11	19.53	0.0	0.0	34.06	2.5339	0.6029	-0.1262	0.0023	-0.0006	0.0030
12	21.57	0.0	0.0	34.09	2.5913	0.7249	-0.1922	-0.0013	0.0015	-0.0004
13	23.59	0.0	0.0	34.17	2.6312	0.8705	-0.3034	0.0059	0.0022	0.0054
14	25.61	0.0	0.0	33.94	2.6576	1.0100	-0.3423	-0.0203	0.0044	0.0307
15	27.63	0.0	0.0	34.31	2.6971	1.1473	-0.3872	-0.0207	0.0043	0.0221
16	29.58	0.0	0.0	34.35	2.6220	1.3011	-0.3991	-0.0093	-0.0001	0.0028

TABLE IV - PART B - TEST 5 DATA - CONTINUED.

RUN 5

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.70	6.0	0.0	34.31	0.4902	0.1458	0.0446	-0.0810	0.0128	-0.0083
2	0.42	6.0	0.0	34.29	0.6975	0.1514	0.0303	-0.0825	0.0131	-0.0090
3	2.54	6.0	0.0	34.21	0.9001	0.1636	0.0159	-0.0842	0.0136	-0.0091
4	4.66	6.0	0.0	34.14	1.0851	0.1811	0.0267	-0.0834	0.0140	-0.0101
5	6.78	6.0	0.0	33.99	1.2864	0.2074	0.0313	-0.0833	0.0147	-0.0106
6	8.89	6.0	0.0	34.07	1.4754	0.2398	0.0239	-0.0820	0.0155	-0.0111
7	11.01	6.0	0.0	33.98	1.6656	0.2797	0.0074	-0.0740	0.0151	-0.0116
8	13.13	6.0	0.0	34.25	1.8634	0.3309	-0.0131	-0.0660	0.0152	-0.0109
9	15.24	6.0	0.0	33.86	2.0548	0.3922	-0.0381	-0.0569	0.0154	-0.0105
10	17.34	6.0	0.0	34.07	2.2262	0.4684	-0.0495	-0.0491	0.0158	-0.0110
11	19.43	6.0	0.0	33.12	2.3718	0.5709	-0.0734	-0.0443	0.0187	-0.0067
12	21.48	6.0	0.0	33.58	2.4551	0.6905	-0.1123	-0.0244	0.0162	-0.0184
13	23.55	6.0	0.0	34.54	2.5631	0.8299	-0.1980	-0.0089	0.0129	-0.0182
14	25.55	6.0	0.0	34.38	2.5695	0.9744	-0.3024	-0.0042	0.0065	-0.0290
15	27.57	6.0	0.0	34.20	2.5965	1.1288	-0.3601	-0.0039	0.0053	-0.0345
16	29.56	6.0	0.0	34.17	2.5890	1.2797	-0.3881	0.0193	0.0004	-0.0490

RUN 6

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.70	-6.0	0.0	34.17	0.4900	0.1449	0.0433	0.0950	-0.0154	0.0108
2	0.41	-6.0	0.0	34.38	0.6869	0.1502	0.0325	0.0944	-0.0153	0.0121
3	2.53	-6.0	0.0	34.22	0.8853	0.1623	0.0320	0.0955	-0.0156	0.0127
4	4.65	-6.0	0.0	34.22	1.0824	0.1813	0.0308	0.0952	-0.0156	0.0158
5	6.77	-6.0	0.0	34.16	1.2815	0.2057	0.0331	0.0936	-0.0155	0.0156
6	8.90	-6.0	0.0	34.09	1.4833	0.2390	0.0206	0.0905	-0.0157	0.0170
7	11.01	-6.0	0.0	34.08	1.6750	0.2785	0.0099	0.0866	-0.0163	0.0147
8	13.13	-6.0	0.0	34.13	1.8671	0.3282	-0.0158	0.0784	-0.0161	0.0152
9	15.23	-6.0	0.0	33.96	2.0405	0.3875	-0.0327	0.0691	-0.0155	0.0150

TABLE IV - PART B - TEST 5 DATA - CONTINUED.

RUN 7

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	0.42	-6.0	0.0	33.99	0.7025	0.1504	0.0292	0.0969	-0.0155	0.0124
2	0.42	-4.0	0.0	34.12	0.6954	0.1454	0.0337	0.0656	-0.0107	0.0084
3	0.42	-2.0	0.0	34.07	0.6957	0.1443	0.0377	0.0371	-0.0061	0.0058
4	0.42	0.0	0.0	34.02	0.6964	0.1427	0.0392	0.0077	-0.0015	0.0030
5	0.42	2.0	0.0	34.05	0.6962	0.1438	0.0357	-0.0182	0.0030	-0.0019
6	0.42	4.0	0.0	34.02	0.6894	0.1454	0.0274	-0.0491	0.0081	-0.0049
7	0.42	4.0	0.0	34.14	0.6975	0.1460	0.0239	-0.0507	0.0080	-0.0060
8	0.42	6.0	0.0	34.07	0.6993	0.1505	0.0319	-0.0831	0.0130	-0.0091
9	0.42	8.0	0.0	34.01	0.6971	0.1575	0.0317	-0.1150	0.0185	-0.0150
10	0.42	10.0	0.0	33.87	0.6922	0.1683	0.0708	-0.1547	0.0247	0.0162
11	0.42	12.0	0.0	34.07	0.6951	0.1797	0.0338	-0.1867	0.0290	-0.0196

RUN 8

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	11.02	-6.0	0.0	34.00	1.6872	0.2803	0.0083	0.0855	-0.0155	0.0162
2	11.01	-4.0	0.0	34.03	1.6795	0.2731	0.0123	0.0589	-0.0107	0.0113
3	11.02	-2.0	0.0	33.83	1.6806	0.2701	0.0175	0.0312	-0.0052	0.0080
4	11.01	0.0	0.0	33.84	1.6719	0.2695	0.0134	0.0053	-0.0002	0.0021
5	11.01	2.0	0.0	33.84	1.6707	0.2703	0.0133	-0.0219	0.0052	-0.0027
6	11.01	4.0	0.0	33.75	1.6773	0.2752	0.0130	-0.0463	0.0105	-0.0081
7	11.01	6.0	0.0	33.81	1.6779	0.2809	0.0074	-0.0757	0.0158	-0.0118
8	11.01	8.0	0.0	33.82	1.6688	0.2866	0.0054	-0.1038	0.0214	-0.0174
9	11.00	10.0	0.0	33.78	1.6589	0.2935	-0.0032	-0.1337	0.0270	-0.0221
10	11.00	12.0	0.0	33.88	1.6574	0.3048	-0.0046	-0.1585	0.0319	-0.0263

TABLE IV - PART B - TEST 5 DATA - CONTINUED.

RUN 9

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.54	6.0	0.0	34.11	0.7570	0.1927	-0.0592	-0.0697	0.0112	-0.0103
2	0.58	6.0	0.0	34.21	0.9661	0.2037	-0.0710	-0.0717	0.0114	-0.0109
3	2.70	6.0	0.0	33.75	1.1645	0.2195	-0.0821	-0.0734	0.0119	-0.0109
4	4.82	6.0	0.0	33.75	1.3598	0.2417	-0.0644	-0.0750	0.0126	-0.0110
5	6.93	6.0	0.0	33.96	1.5439	0.2707	-0.0716	-0.0733	0.0133	-0.0114
6	9.05	6.0	0.0	34.59	1.7341	0.3054	-0.0686	-0.0707	0.0141	-0.0126
7	11.15	6.0	0.0	34.06	1.9073	0.3449	-0.0726	-0.0640	0.0144	-0.0122
8	13.26	6.0	0.0	34.05	2.0822	0.3930	-0.0754	-0.0597	0.0151	-0.0134
9	15.36	6.0	0.0	34.17	2.2570	0.4598	-0.0801	-0.0494	0.0158	-0.0157
10	17.42	6.0	0.0	33.92	2.3471	0.5342	-0.0625	-0.0478	0.0182	-0.0081
11	19.47	6.0	0.0	34.00	2.4286	0.6326	-0.0478	-0.0298	0.0148	-0.0165
12	21.50	6.0	0.0	34.15	2.4852	0.7517	-0.0697	-0.0275	0.0161	-0.0092
13	23.57	6.0	0.0	34.21	2.6024	0.8891	-0.2060	-0.0265	0.0158	-0.0152
14	25.55	6.0	0.0	34.37	2.5694	1.0414	-0.2538	-0.0440	0.0151	-0.0082
15	27.53	6.0	0.0	33.88	2.5249	1.1879	-0.2818	-0.0241	0.0081	-0.0380
16	29.52	6.0	0.0	33.90	2.5162	1.3268	-0.3006	-0.0046	0.0032	-0.0507

RUN 10

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	0.58	-6.0	0.0	34.08	0.9534	0.2037	-0.0727	0.0927	-0.0156	0.0041
2	0.58	-4.0	0.0	34.21	0.9538	0.1976	-0.0672	0.0667	-0.0116	0.0032
3	0.59	-2.0	0.0	34.17	0.9739	0.1975	-0.0778	0.0388	-0.0071	-0.0005
4	0.59	0.0	0.0	33.96	0.9699	0.1962	-0.0791	0.0124	-0.0027	-0.0025
5	0.59	2.0	0.0	34.08	0.9716	0.1977	-0.0747	-0.0167	0.0024	-0.0067
6	0.59	4.0	0.0	34.15	0.9754	0.1995	-0.0735	-0.0458	0.0074	-0.0094
7	0.58	6.0	0.0	34.10	0.9652	0.2040	-0.0693	-0.0717	0.0113	-0.0112
8	0.58	8.0	0.0	34.11	0.9582	0.2115	-0.0619	-0.0985	0.0152	-0.0148
9	0.56	10.0	0.0	34.07	0.9348	0.2194	-0.0471	-0.1266	0.0193	-0.0166
10	0.56	12.0	0.0	34.03	0.9265	0.2295	-0.0451	-0.1568	0.0236	-0.0166

TABLE IV - PART B - TEST 5 DATA - CONTINUED.

RUN 11

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	11.16	-6.0	0.0	34.21	1.9168	0.3453	-0.0663	0.0823	-0.0159	0.0089
2	11.17	-4.0	0.0	34.11	1.9434	0.3432	-0.0731	0.0557	-0.0098	0.0068
3	11.16	-2.0	0.0	34.20	1.9209	0.3369	-0.0629	0.0327	-0.0064	0.0073
4	11.14	0.0	0.0	34.27	1.8946	0.3311	-0.0590	0.0061	-0.0008	0.0009
5	11.15	2.0	0.0	33.87	1.9099	0.3343	-0.0654	-0.0167	0.0038	-0.0016
6	11.16	4.0	0.0	34.06	1.9140	0.3393	-0.0734	-0.0430	0.0101	-0.0082
7	11.15	6.0	0.0	34.07	1.9094	0.3445	-0.0719	-0.0656	0.0143	-0.0108
8	11.14	8.0	0.0	34.17	1.8894	0.3492	-0.0586	-0.0872	0.0190	-0.0169
9	11.12	10.0	0.0	34.15	1.8482	0.3503	-0.0455	-0.1085	0.0230	-0.0207
10	11.10	12.0	0.0	34.06	1.8223	0.3570	-0.0290	-0.1264	0.0264	-0.0276

RUN 12

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.53	6.0	0.0	34.10	0.7841	0.1437	-0.0581	-0.0794	0.0126	-0.0108
2	0.60	6.0	0.0	34.10	0.9972	0.1554	-0.0763	-0.0804	0.0126	-0.0120
3	2.73	6.0	0.0	34.12	1.2015	0.1728	-0.0911	-0.0813	0.0131	-0.0118
4	4.85	6.0	0.0	34.24	1.4003	0.1974	-0.0862	-0.0802	0.0137	-0.0124
5	6.95	6.0	0.0	34.15	1.5758	0.2266	-0.0888	-0.0806	0.0147	-0.0126
6	9.07	6.0	0.0	34.02	1.7636	0.2630	-0.0919	-0.0759	0.0148	-0.0140
7	11.17	6.0	0.0	34.39	1.9370	0.3041	-0.0905	-0.0707	0.0156	-0.0125
8	13.27	6.0	0.0	34.24	2.1090	0.3555	-0.1012	-0.0639	0.0160	-0.0149
9	15.39	6.0	0.0	34.18	2.2936	0.4241	-0.1121	-0.0531	0.0164	-0.0183
10	17.46	6.0	0.0	34.08	2.4109	0.5062	-0.1101	-0.0488	0.0186	-0.0096
11	19.51	6.0	0.0	34.14	2.5043	0.6106	-0.1283	-0.0342	0.0160	-0.0190
12	21.52	6.0	0.0	34.17	2.5239	0.7389	-0.1642	-0.0308	0.0211	-0.0015
13	23.60	6.0	0.0	34.07	2.6544	0.8588	-0.2937	-0.0048	0.0136	-0.0189
14	25.60	6.0	0.0	34.48	2.6447	1.0186	-0.3348	-0.0170	0.0152	-0.0131
15	27.58	6.0	0.0	34.05	2.6232	1.1688	-0.3768	-0.0016	0.0072	-0.0371

TABLE IV - PART B - TEST 5 DATA - CONTINUED.

RUN 13

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	0.58	-6.0	0.0	33.81	0.9529	0.1523	-0.0658	0.0969	-0.0159	0.0069
2	0.58	-4.0	0.0	33.88	0.9625	0.1483	-0.0702	0.0671	-0.0111	0.0025
3	0.59	-2.0	0.0	34.17	0.9737	0.1463	-0.0684	0.0391	-0.0067	-0.0008
4	0.59	0.0	0.0	34.24	0.9844	0.1471	-0.0653	0.0097	-0.0019	-0.0033
5	0.60	2.0	0.0	34.31	0.9879	0.1472	-0.0713	-0.0159	0.0021	-0.0069
6	0.60	4.0	0.0	34.28	0.9914	0.1493	-0.0756	-0.0481	0.0075	-0.0103
7	0.59	6.0	0.0	34.35	0.9847	0.1543	-0.0724	-0.0800	0.0126	-0.0130
8	0.59	8.0	0.0	34.31	0.9739	0.1597	-0.0644	-0.1141	0.0187	-0.0167
9	0.59	10.0	0.0	34.31	0.9706	0.1694	-0.0637	-0.1509	0.0241	-0.0197
10	0.58	12.0	0.0	34.22	0.9549	0.1802	-0.0581	-0.1814	0.0284	-0.0206

RUN 14

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	11.19	-6.0	0.0	33.88	1.9663	0.3075	-0.0873	0.0878	-0.0168	0.0098
2	11.19	-4.0	0.0	34.15	1.9645	0.3045	-0.0906	0.0590	-0.0110	0.0060
3	11.18	-2.0	0.0	34.18	1.9554	0.2981	-0.0747	0.0319	-0.0065	0.0061
4	11.18	0.0	0.0	34.34	1.9561	0.2962	-0.0756	0.0055	-0.0009	0.0017
5	11.17	2.0	0.0	34.26	1.9445	0.2957	-0.0802	-0.0193	0.0044	-0.0039
6	11.17	4.0	0.0	34.07	1.9442	0.2989	-0.0872	-0.0458	0.0102	-0.0113
7	11.17	6.0	0.0	34.05	1.9342	0.3030	-0.0912	-0.0725	0.0160	-0.0145
8	11.17	8.0	0.0	34.09	1.9301	0.3097	-0.0946	-0.0963	0.0214	-0.0222
9	11.16	10.0	0.0	34.37	1.9165	0.3172	-0.0954	-0.1262	0.0276	-0.0261
10	11.14	12.0	0.0	34.56	1.8929	0.3231	-0.0930	-0.1496	0.0319	-0.0318

RUN 15

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.69	0.0	0.0	34.31	0.5157	0.1514	0.0470	-0.0056	0.0052	0.0517
2	0.44	0.0	0.0	34.22	0.7229	0.1578	0.0211	-0.0059	0.0042	0.0527
3	2.56	0.0	0.0	34.21	0.9190	0.1705	0.0158	-0.0065	0.0036	0.0538
4	4.68	0.0	0.0	34.25	1.1291	0.1918	0.0027	-0.0086	0.0030	0.0561
5	6.80	0.0	0.0	34.15	1.3168	0.2160	0.0012	-0.0080	0.0022	0.0572
6	8.92	0.0	0.0	34.11	1.5297	0.2509	-0.0061	-0.0114	0.0014	0.0601
7	11.03	0.0	0.0	33.89	1.7131	0.2899	-0.0110	-0.0126	0.0010	0.0595
8	13.15	0.0	0.0	33.89	1.9090	0.3394	-0.0238	-0.0116	0.0002	0.0587
9	15.26	0.0	0.0	34.28	2.0890	0.4019	-0.0483	-0.0067	-0.0018	0.0564
10	17.35	0.0	0.0	33.98	2.2297	0.4849	-0.0684	0.0050	-0.0070	0.0436
11	19.43	0.0	0.0	34.34	2.3725	0.5816	-0.0800	0.0018	-0.0047	0.0394
12	21.50	0.0	0.0	34.23	2.4792	0.7029	-0.1368	0.0017	-0.0042	0.0308
13	23.52	0.0	0.0	33.96	2.5147	0.8410	-0.2241	0.0023	-0.0019	0.0369
14	25.56	0.0	0.0	34.36	2.5875	0.9800	-0.2769	-0.0097	-0.0020	0.0470
15	27.57	0.0	0.0	34.26	2.6022	1.1194	-0.3248	-0.0003	-0.0040	0.0277
16	29.55	0.0	-0.0	34.31	2.5710	1.2693	-0.3698	0.0061	-0.0055	0.0050

RUN 16

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.69	6.0	0.0	34.09	0.5062	0.1582	0.0142	-0.0920	0.0197	0.0441
2	0.44	6.0	0.0	34.11	0.7252	0.1638	-0.0125	-0.0934	0.0184	0.0430
3	2.56	6.0	0.0	34.03	0.9252	0.1779	-0.0209	-0.0954	0.0180	0.0447
4	4.68	6.0	0.0	34.12	1.1311	0.1986	-0.0279	-0.0963	0.0178	0.0454
5	6.80	6.0	0.0	34.14	1.3199	0.2255	-0.0296	-0.0967	0.0173	0.0463
6	8.91	6.0	0.0	34.09	1.5123	0.2593	-0.0343	-0.0927	0.0168	0.0443
7	11.03	6.0	0.0	34.17	1.7080	0.2993	-0.0381	-0.0867	0.0161	0.0450
8	13.13	6.0	0.0	33.76	1.8779	0.3463	-0.0525	-0.0764	0.0161	0.0425
9	15.25	6.0	0.0	34.02	2.0689	0.4117	-0.0627	-0.0660	0.0152	0.0398
10	17.35	6.0	0.0	33.93	2.2269	0.4858	-0.0633	-0.0547	0.0145	0.0344
11	19.42	6.0	0.0	34.19	2.3520	0.5894	-0.0843	-0.0378	0.0117	0.0199
12	21.48	6.0	0.0	33.86	2.4536	0.7026	-0.1244	-0.0247	0.0126	0.0144
13	23.52	6.0	0.0	34.43	2.5243	0.8321	-0.1948	-0.0170	0.0107	0.0222
14	25.54	6.0	0.0	34.24	2.5464	0.9793	-0.2751	-0.0153	0.0064	0.0088
15	27.53	6.0	0.0	34.40	2.5366	1.1275	-0.3211	-0.0005	0.0002	-0.0167
16	29.53	6.0	0.0	34.47	2.5305	1.2672	-0.3376	0.0230	-0.0034	-0.0370

TABLE IV - PART B - TEST 5 DATA - CONTINUED.

RUN 17

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	-1.70	-6.0	0.0	34.20	0.4990	0.1555	0.0486	0.0794	-0.0089	0.0568
2	0.43	-6.0	0.0	34.28	0.7064	0.1631	0.0311	0.0793	-0.0094	0.0611
3	2.55	-6.0	0.0	34.29	0.9063	0.1762	0.0229	0.0765	-0.0103	0.0647
4	4.67	-6.0	0.0	34.26	1.1099	0.1953	0.0143	0.0772	-0.0113	0.0675
5	6.79	-6.0	0.0	34.11	1.3056	0.2218	0.0145	0.0758	-0.0125	0.0704
6	8.91	-6.0	0.0	34.08	1.5075	0.2544	-0.0020	0.0722	-0.0139	0.0720
7	11.02	-6.0	0.0	33.90	1.6958	0.2949	-0.0043	0.0674	-0.0148	0.0711
8	13.14	-6.0	0.0	34.07	1.8922	0.3449	-0.0227	0.0602	-0.0157	0.0725
9	15.24	-6.0	0.0	34.23	2.0603	0.4033	-0.0423	0.0539	-0.0170	0.0694
10	17.34	-6.0	0.0	33.94	2.2166	0.4857	-0.0665	0.0485	-0.0203	0.0608
11	19.42	-6.0	0.0	33.84	2.3540	0.5828	-0.0695	0.0381	-0.0206	0.0557
12	21.48	-6.0	0.0	34.35	2.4461	0.7074	-0.1551	0.0199	-0.0160	0.0527
13	23.53	-6.0	0.0	34.37	2.5363	0.8564	-0.2707	0.0129	-0.0123	0.0574
14	25.58	-6.0	0.0	34.07	2.6165	0.9993	-0.3064	0.0038	-0.0093	0.0647
15	27.60	-6.0	0.0	34.27	2.6440	1.1405	-0.3560	-0.0112	-0.0039	0.0685
16	29.56	-6.0	0.0	34.20	2.5793	1.2888	-0.3778	-0.0177	-0.0061	0.0530

RUN 18

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	0.43	-6.0	0.0	34.07	0.7171	0.1626	0.0324	0.0778	-0.0091	0.0617
2	0.43	-4.0	0.0	34.12	0.7162	0.1586	0.0317	0.0476	-0.0041	0.0590
3	0.44	-2.0	0.0	33.95	0.7279	0.1561	0.0280	0.0194	0.0001	0.0568
4	0.44	0.0	0.0	34.03	0.7327	0.1565	0.0194	-0.0061	0.0043	0.0546
5	0.44	2.0	0.0	34.19	0.7329	0.1573	0.0070	-0.0343	0.0089	0.0509
6	0.44	4.0	0.0	34.17	0.7321	0.1597	-0.0055	-0.0659	0.0140	0.0467
7	0.44	6.0	0.0	34.21	0.7318	0.1642	-0.0131	-0.0950	0.0190	0.0441
8	0.43	8.0	0.0	34.10	0.7165	0.1709	-0.0204	-0.1274	0.0241	0.0395
9	0.43	10.0	0.0	34.09	0.7151	0.1796	-0.0269	-0.1602	0.0289	0.0376
10	0.44	12.0	0.0	34.08	0.7234	0.1899	-0.0407	-0.1900	0.0325	0.0366

TABLE IV - PART B - TEST 5 DATA - CONTINUED.

RUN 19

PT	ALPHA	BETA	IT	$\bar{Q}$	CL	CD	CM	CY	CN	CR
1	11.03	-6.0	0.0	33.92	1.7129	0.2970	-0.0057	0.0669	-0.0146	0.0731
2	11.04	-4.0	0.0	34.07	1.7229	0.2935	-0.0077	0.0414	-0.0093	0.0690
3	11.04	-2.0	0.0	34.16	1.7199	0.2911	-0.0130	0.0159	-0.0047	0.0650
4	11.04	0.0	0.0	34.10	1.7212	0.2902	-0.0153	-0.0125	0.0012	0.0597
5	11.04	2.0	0.0	34.06	1.7143	0.2898	-0.0217	-0.0383	0.0062	0.0546
6	11.03	4.0	0.0	34.12	1.7097	0.2928	-0.0301	-0.0619	0.0115	0.0482
7	11.03	6.0	0.0	34.09	1.7078	0.2975	-0.0349	-0.0874	0.0165	0.0453
8	11.02	8.0	0.0	34.08	1.6938	0.3025	-0.0441	-0.1119	0.0216	0.0379
9	11.01	10.0	0.0	34.10	1.6737	0.3081	-0.0557	-0.1391	0.0268	0.0325
10	11.00	12.0	0.0	34.15	1.6586	0.3177	-0.0613	-0.1601	0.0308	0.0289

RUN 20

PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	0.44	0.0	0.0/ 0.0	34.07	0.7275	0.1557	0.0223	-0.0086	0.0047	0.0556
2	0.44	0.0	3.0/ -3.0	33.95	0.7359	0.1581	0.0169	-0.0152	0.0072	0.0602
3	0.45	0.0	6.0/ -6.0	34.10	0.7463	0.1620	0.0044	-0.0222	0.0099	0.0644
4	0.45	0.0	9.0/ -9.0	34.09	0.7444	0.1679	0.0013	-0.0291	0.0122	0.0709
5	0.45	0.0	11.1/-11.1	34.12	0.7455	0.1746	-0.0036	-0.0347	0.0138	0.0739
6	0.45	0.0	15.0/-15.0	34.20	0.7518	0.1893	-0.0077	-0.0409	0.0162	0.0775

TABLE I. PART 6 - TEST 5 DATA CL.CLCS=.

RUN 21

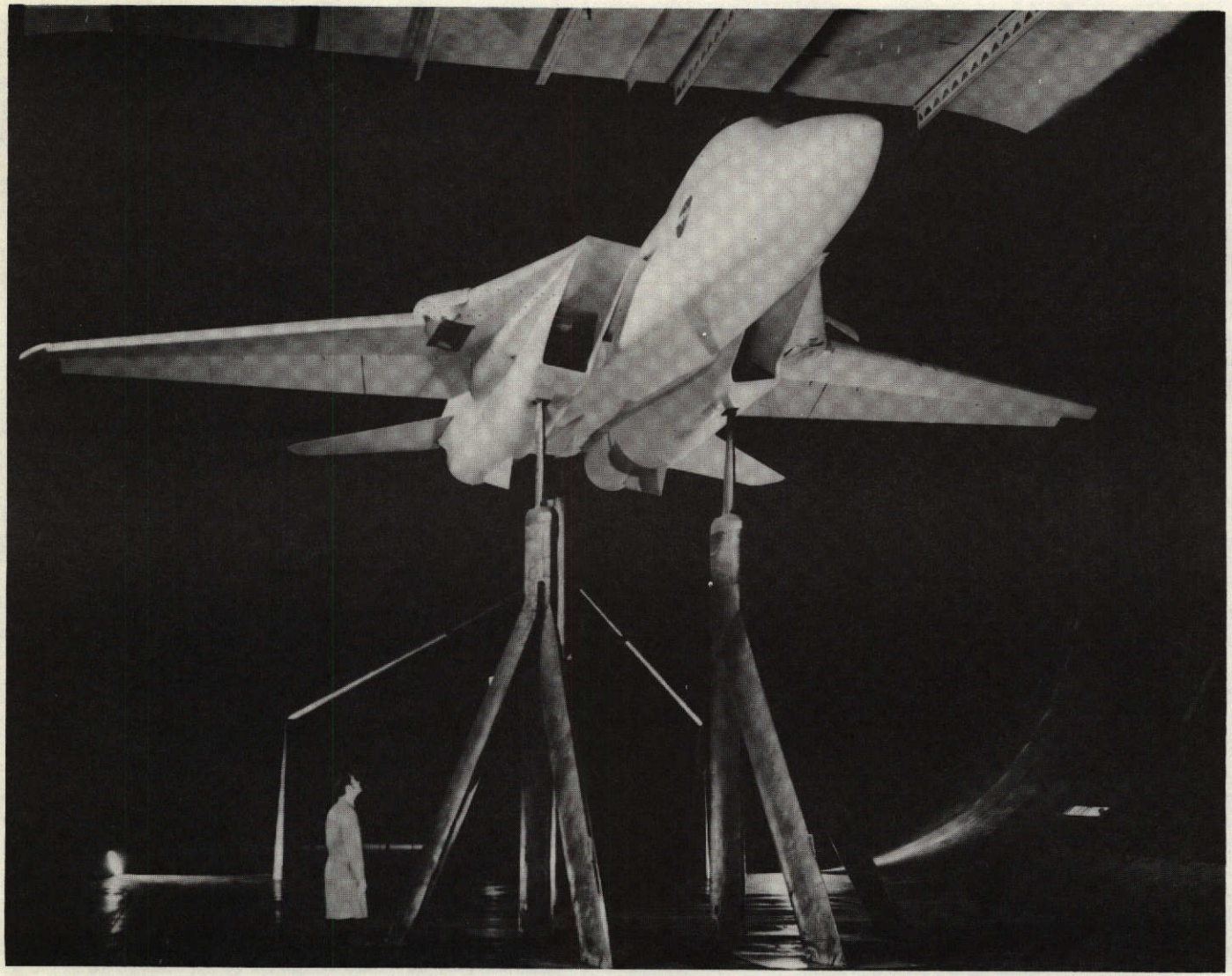
PT	ALPHA	BETA	IT	Q	CL	CD	CM	CY	CN	CR
1	11.04	0.0	0.0/ 0.0	33.97	1.7286	0.2913	-0.0238	-0.0128	0.0010	0.0616
2	11.04	0.0	3.0/ -3.0	34.05	1.7261	0.2927	-0.0190	-0.0179	0.0016	0.0652
3	11.04	0.0	6.0/ -6.0	34.04	1.7274	0.2948	-0.0118	-0.0232	0.0020	0.0691
4	11.04	0.0	9.0/ -9.0	34.00	1.7216	0.2978	-0.0133	-0.0252	0.0022	0.0731
5	11.04	0.0	11.1/-11.1	34.03	1.7217	0.3039	-0.0159	-0.0308	0.0025	0.0776
6	11.04	0.0	15.0/-15.0	33.99	1.7230	0.3181	-0.0305	-0.0378	0.0038	0.0838

TABLE V - SUMMARY PLOT SCHEDULE.

Figure	Effect Shown	Test	Run	Model Attitude		Model Configuration						
				α_u Range	ψ Range	δ_f	δ_{DLC}	δ_L	Glove Slats	Flap Actuator Fairings	i_t	δ_{SB}
4	Spoiler deflection in pitch at constant yaw with δ_L 16°20' MOD. Flap Actuator Fairings off.	1	15 28 32 18	-2 → +28 -2 → +26 ↓ ↓	0 +6 ↓ 0	35 ↓ ↓ ↓	-4.5 ↓ 5 ↓	16°20' MOD ↓ ↓ ↓	On ↓ ↓ ↓	Off ↓ ↓ ↓	0 ↓ ↓ ↓	0 ↓ ↓ ↓
5	Spoiler deflection in yaw at constant α with δ_L 16°20' MOD, Flap Actuator Fairings Off.	1	30 29 31	4 10 ↓	-4 → +12 ↓ ↓	35 ↓ ↓	-4.5 ↓ 5	16°20' MOD ↓ ↓	On ↓ ↓	Off ↓ ↓	0 ↓ ↓	0 ↓ ↓
6	Yaw angle in pitch for standard configuration	5	4 12	-2 → +28 ↓	0 -6	35 ↓	-4.5 ↓	17° MOD ↓	On ↓	On ↓	0 ↓	0 ↓
7	Angle of attack in yaw for standard configuration	5	13 14	0 10	+6 → -12 ↓	35 ↓	-4.5 ↓	17° MOD ↓	On ↓	On ↓	0 ↓	0 ↓
8	Yaw angle in pitch with δ_{DLC} 5	5	1 5 6	-2 → +28 ↓ -2 → +14	0 -6 +6	35 ↓ ↓	5 ↓ ↓	17° MOD ↓ ↓	On ↓ ↓	On ↓ ↓	0 ↓ ↓	0 ↓ ↓
9	Angle of attack in yaw with δ_{DLC} 5	5	7 8	0 10	+6 → -12 ↓	35 ↓	5 ↓	17° MOD ↓	On ↓	On ↓	0 ↓	0 ↓
10	Yaw angle in pitch with δ_{SB} 60	5	3 9	-2 → +28 ↓	0 -6	35 ↓	-4.5 ↓	17° MOD ↓	On ↓	On ↓	0 ↓	60 ↓
11	Angle of attack in yaw with δ_{SB} 60	5	10 11	0 10	+6 → -12 ↓	35 ↓	-4.5 ↓	17° MOD ↓	On ↓	On ↓	0 ↓	60 ↓
12	Yaw angle with spoiler-only roll control in pitch with δ_{DLC} -4.5/20 (Test 5)	5	15 16 17	-2 → +28 ↓ ↓	0 -6 +6	35 ↓ ↓	-4.5/20 ↓ ↓	17° MOD ↓ ↓	On ↓ ↓	On ↓ ↓	0 ↓ ↓	0 ↓ ↓
13	Angle of attack with spoiler-only roll control in yaw with δ_{DLC} -4.5/20	5	18 19	0 10 ↓	+6 → -12 ↓ ↓	35 ↓ ↓	-4.5/20 ↓ ↓	17° MOD ↓ ↓	On ↓ ↓	On ↓ ↓	0 ↓ ↓	0 ↓ ↓
14	Roll Control at ψ= 0°	2	15 14	-2 → +26 ↓	0 ↓	35 ↓	-4.5/0 -4.5/5	17° MOD ↓	On ↓	On ↓	8.6/-8.6 10.7/-10.7	0 ↓

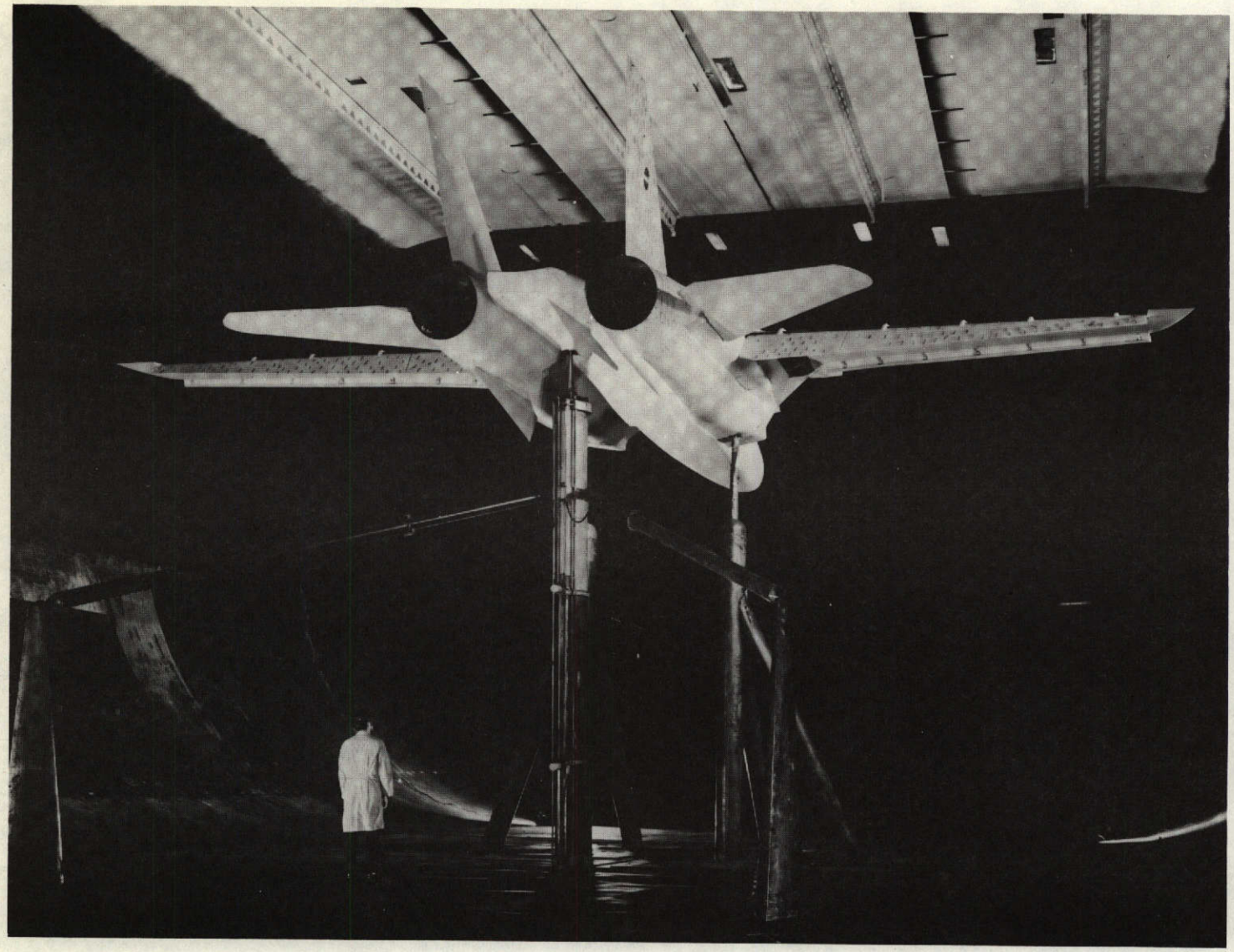
TABLE V - CONCLUDED.

Figure	Effect Shown	Test	Model Attitude			Model Configuration						
			Run	α_u Range	ψ Range	δ_f	δ_{DLC}	δ_L	Glove Slats	Flap Actuator Fairings	i_t	δ_{SB}
15	Results of spoiler-only roll control at ψ= 0° with δ_{DLC} -4.5/20 (Test 2)	2	16	-2 → +26	0	35	-4.5/20	17° MOD	On	On	0	0
16	Yaw angle for full roll control in pitch with δ_{DLC} -4.5/20, i_t 11.1/-11.1	2	17 20 21	-2 → +26 ↓	0 -6 +6	35 ↓	-4.5/20 ↓	17° MOD ↓	On ↓	On ↓	11.1/-11.1 ↓	0 ↓
17	Angle of attack for full roll control in yaw with δ_{DLC} -4.5/20, i_t 11.1/-11.1	2	18 19	0 10	-10 → +12 ↓	35 ↓	-4.5/20 ↓	17° MOD ↓	On ↓	On ↓	11.1/-11.1 ↓	0 ↓



(a) Three - quarter front view.

Figure 1.- Model installed in the Ames 40- by 80-Foot Wind Tunnel.



(b) Three - quarter rear view.

Figure 1.- Concluded.

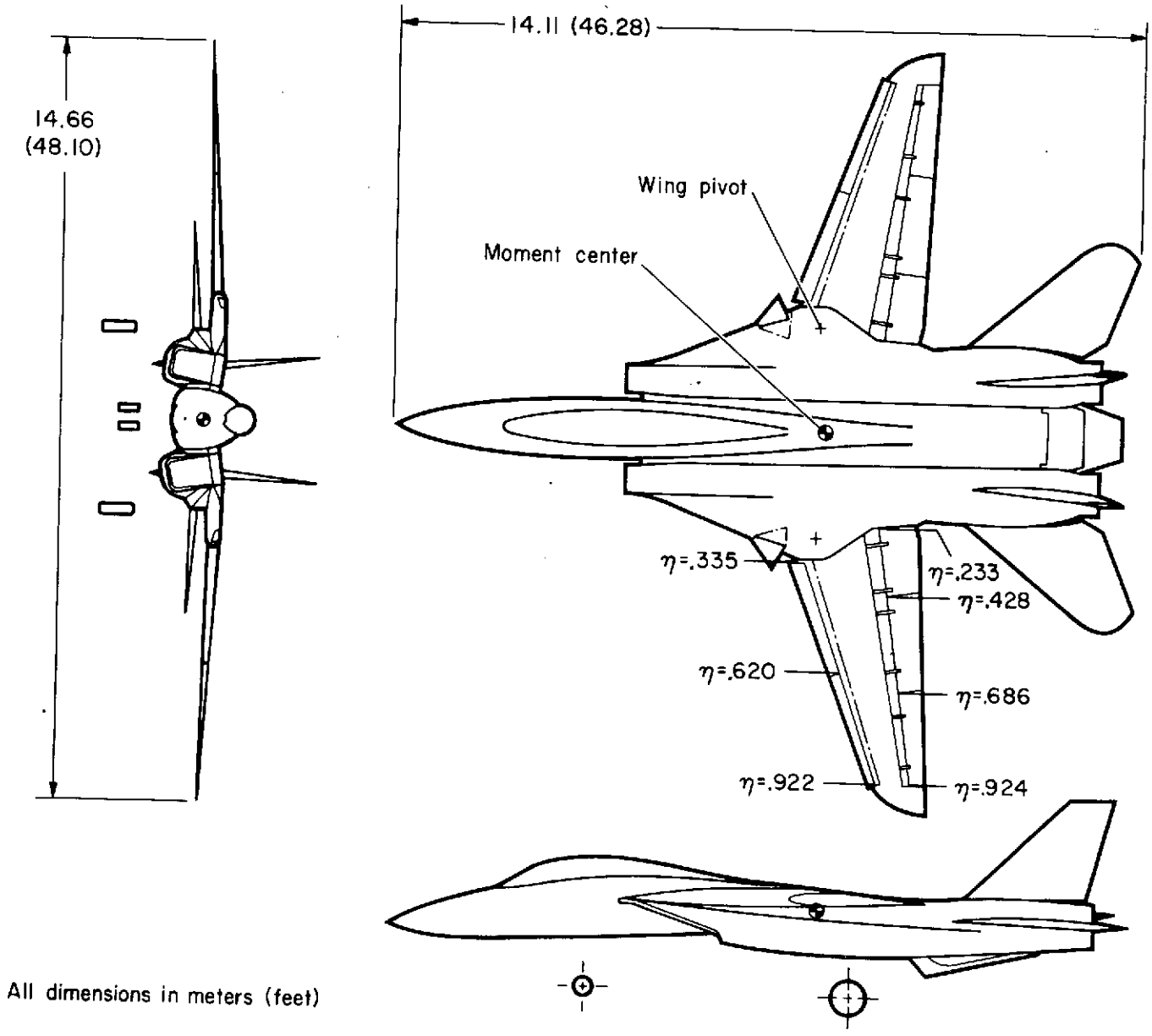


Figure 2. - Overall model geometry.

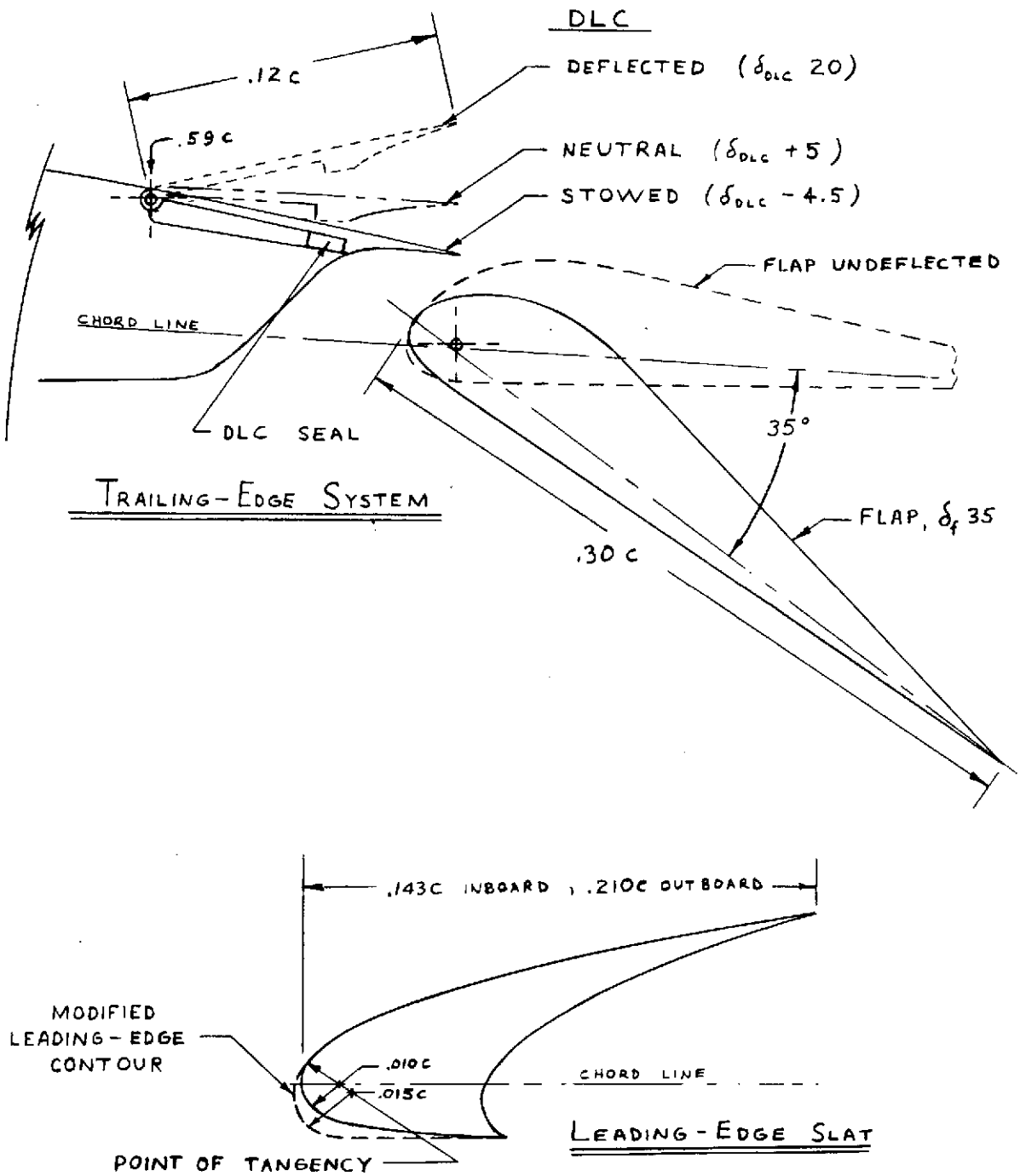
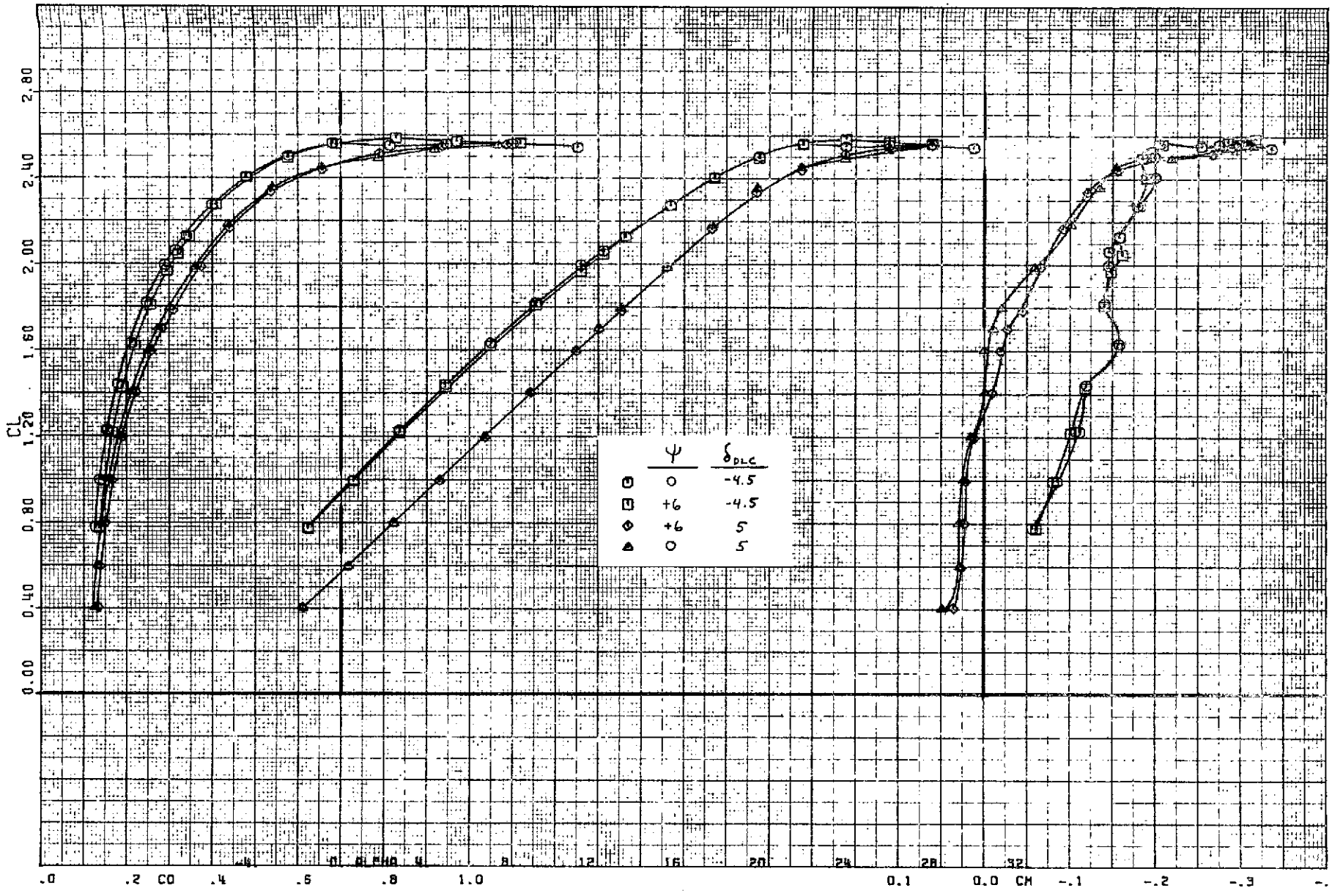
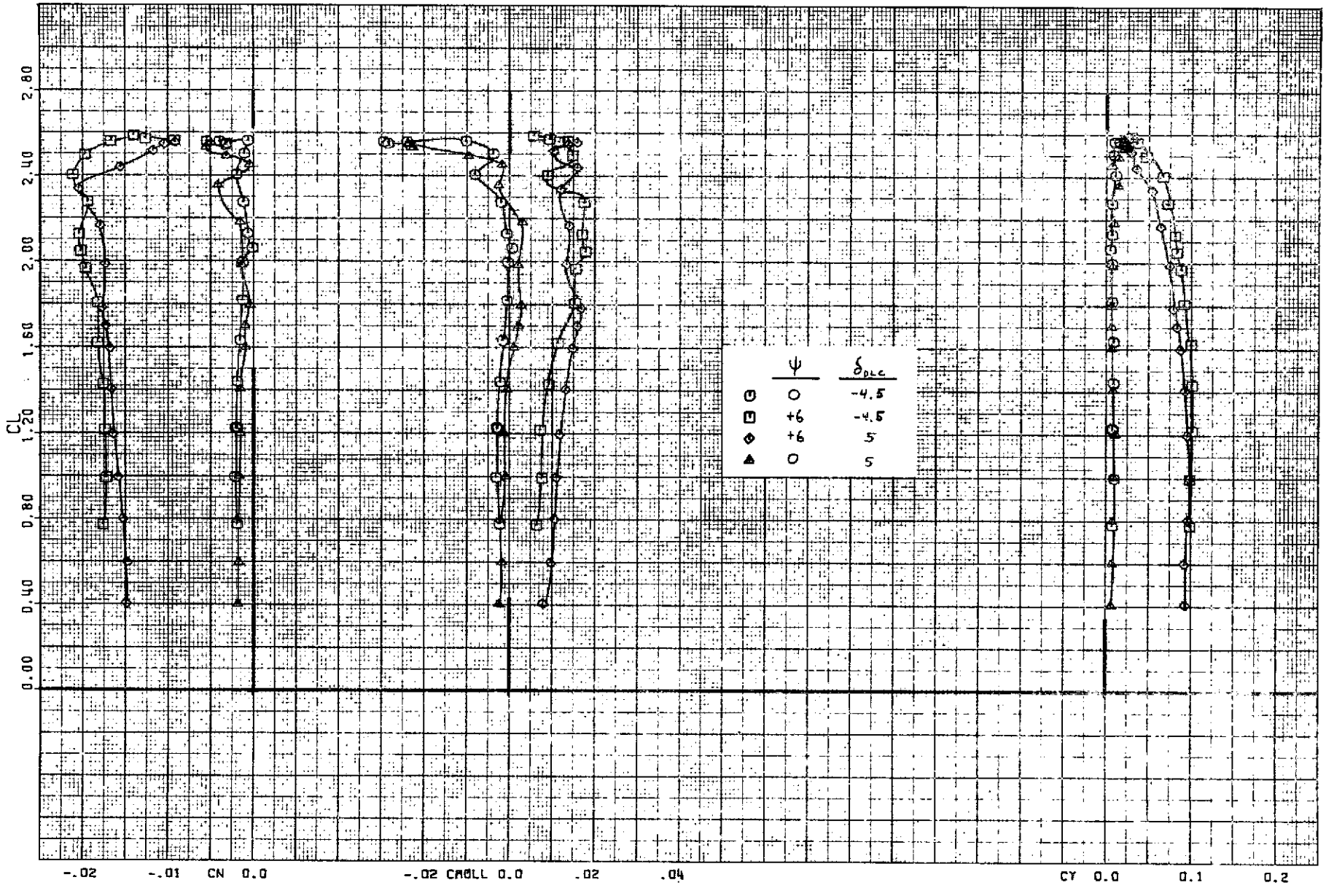


Figure 3. - Leading- and trailing- edge systems.



(a) Longitudinal characteristics.

Figure 4. - Effect of spoiler deflection in pitch sweep at at constant yaw angle; δ_L 16°20' MOD, flap actuator fairings off.



(b) Lateral - directional characteristics.

Figure 4. - Concluded.

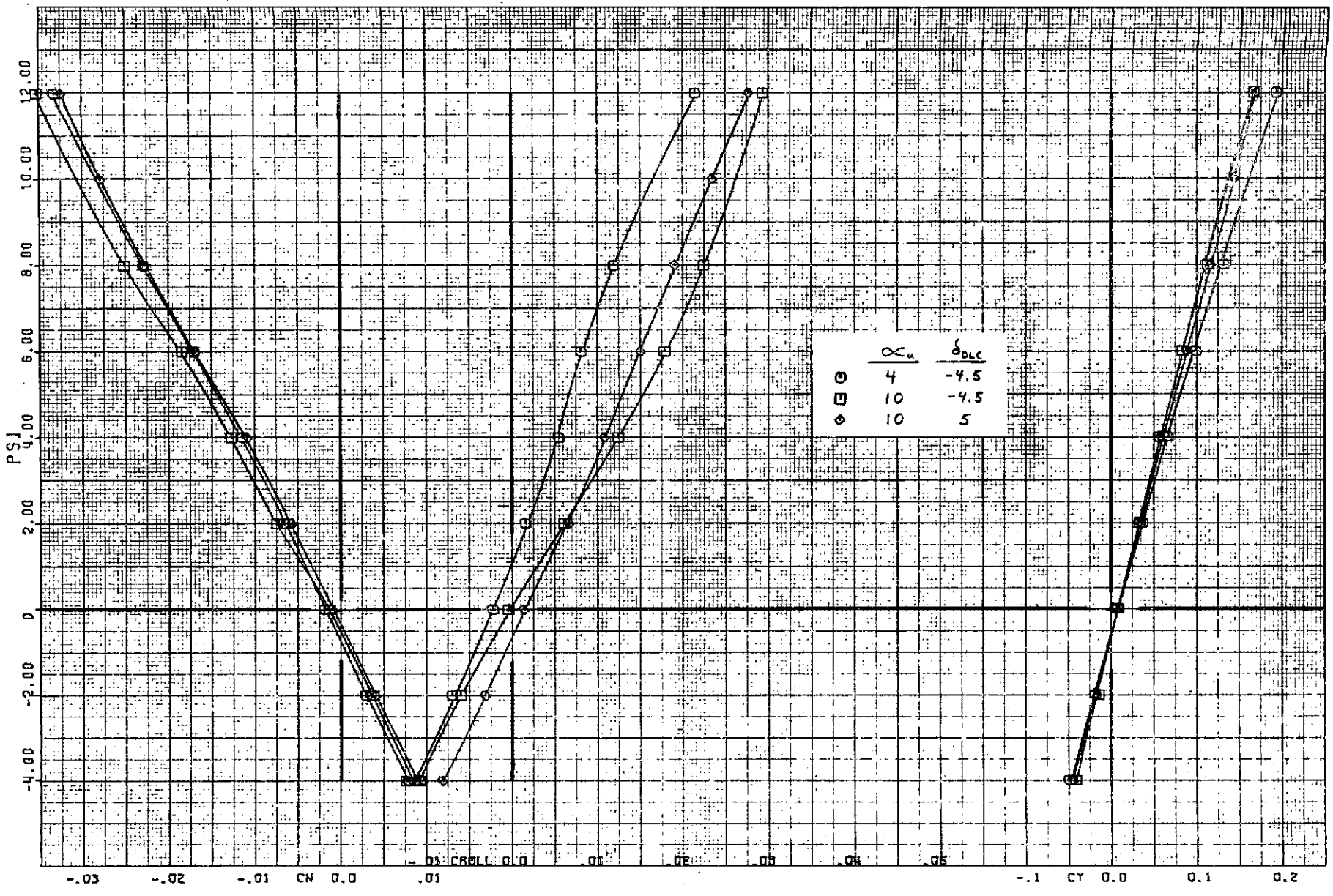
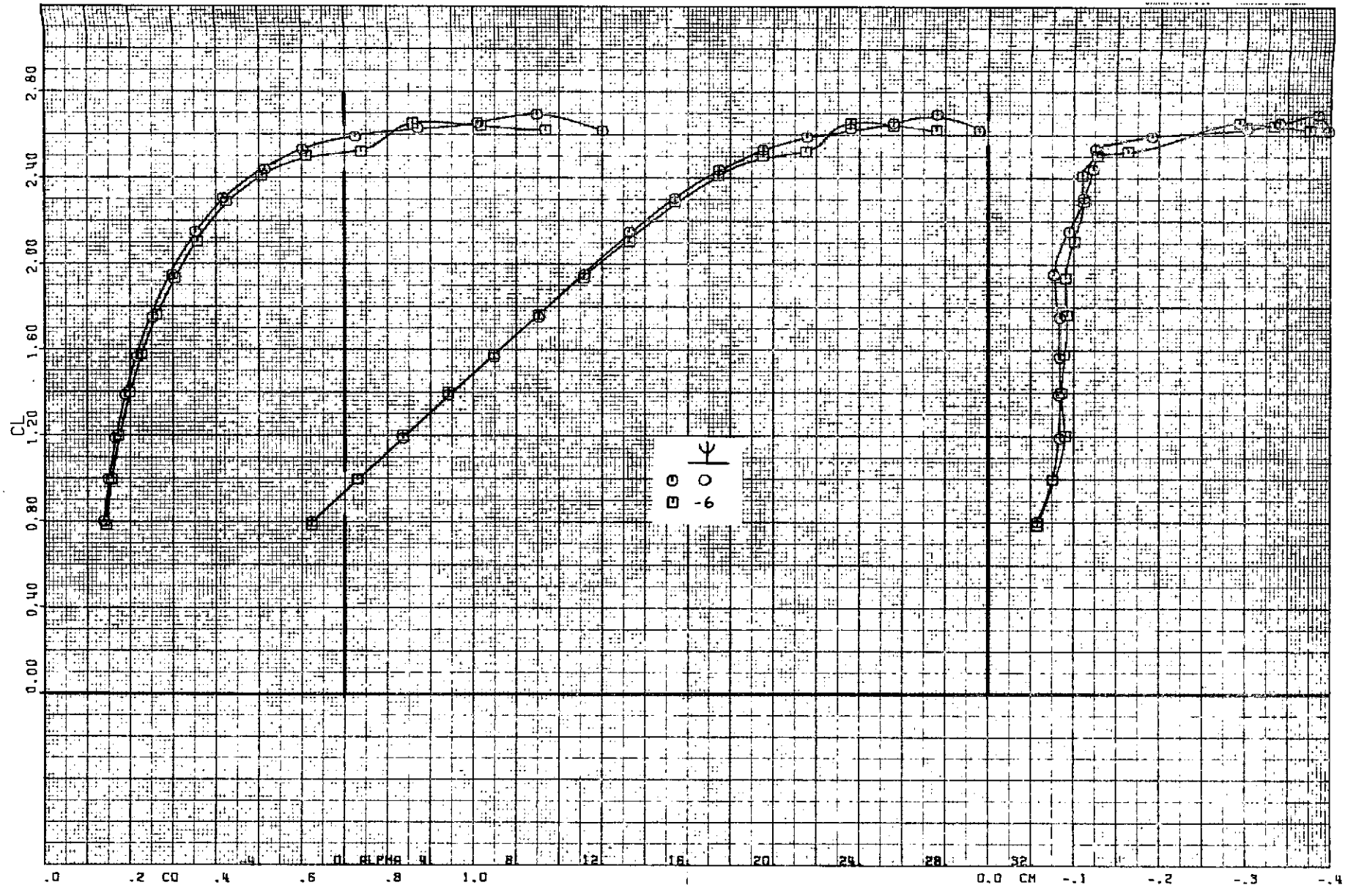
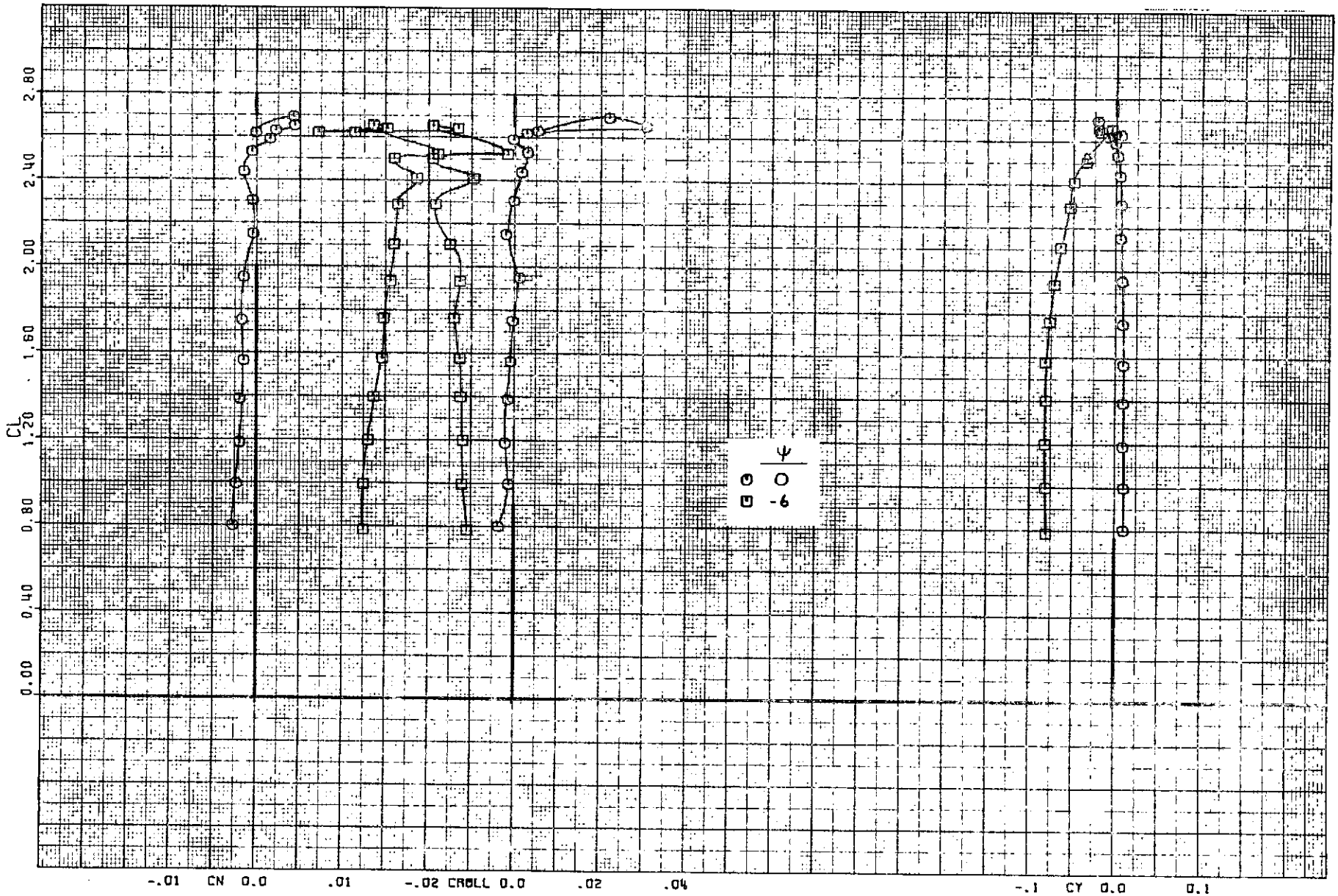


Figure 5. – Effect of spoiler deflection in yaw sweep at constant angle of attack; δ_L 16°20' MOD, flap actuator fairings off.



(a) Longitudinal characteristics.

Figure 6. - Effect of 6-degree change in yaw angle for pitch sweep.



(b) Lateral - directional characteristics.

Figure 6. - Concluded.

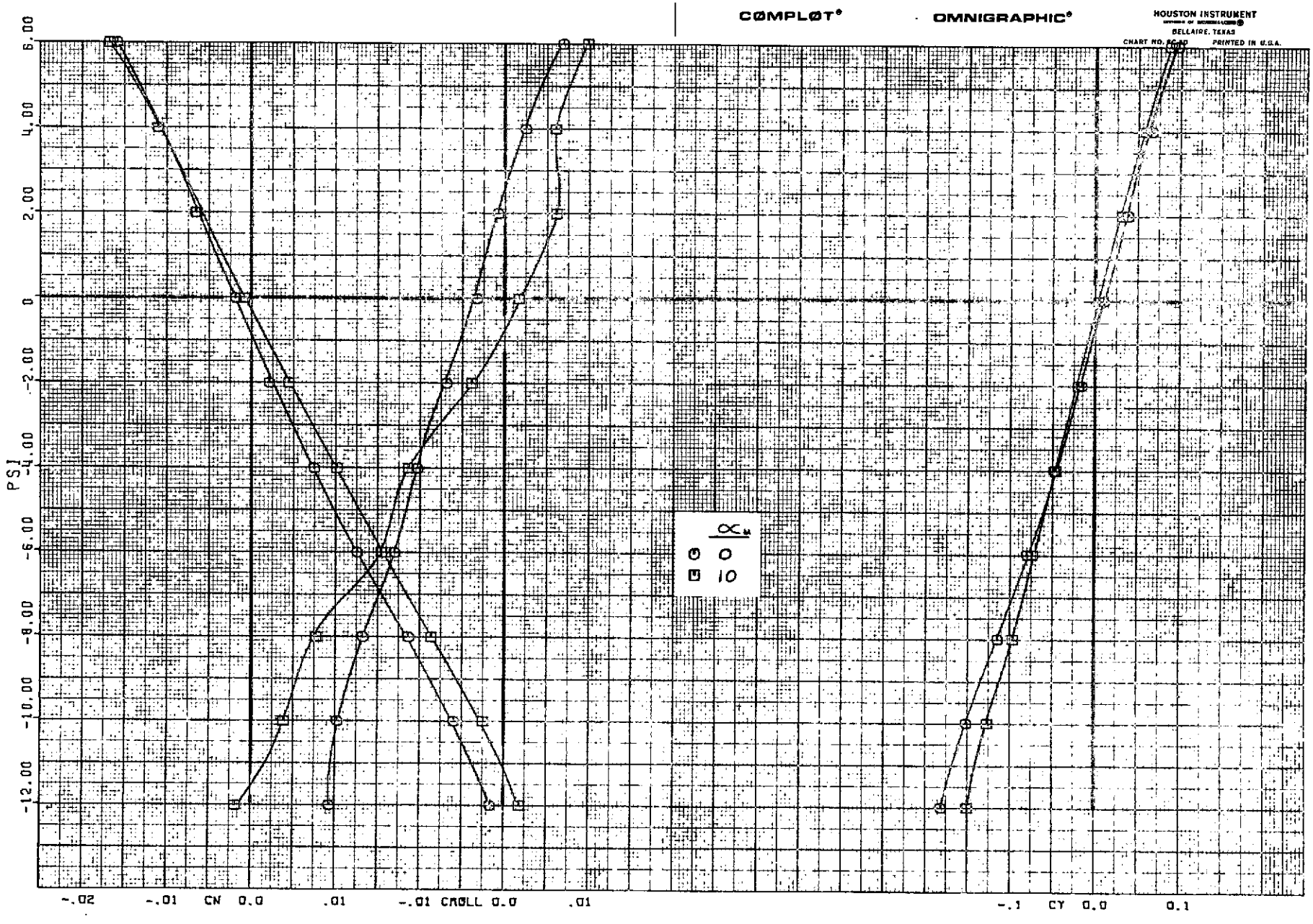
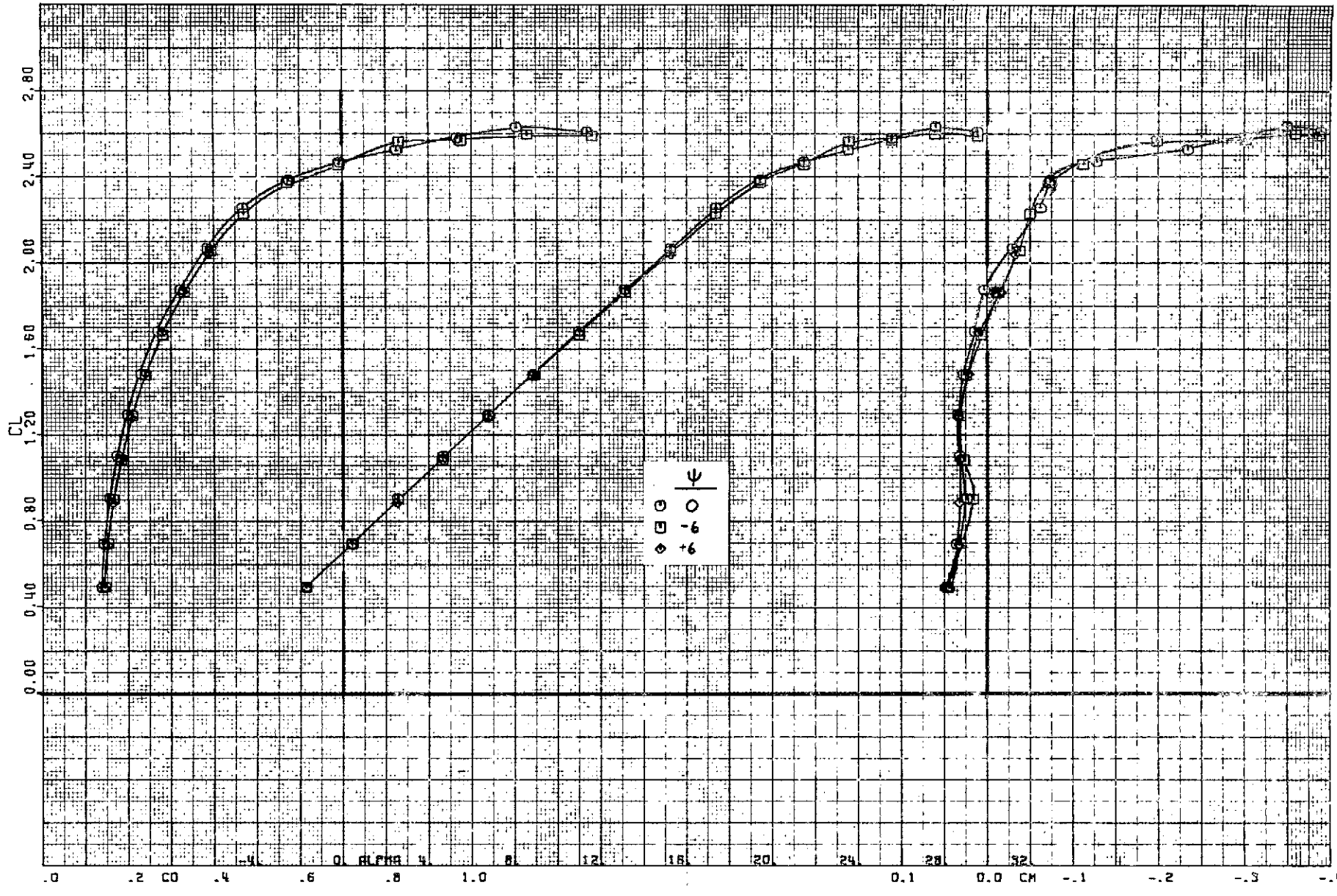


Figure 7. - Effect of 10-degree change in nominal angle of attack for yaw sweep.



(a) Longitudinal characteristics.

Figure 8. – Effect of yaw angle for pitch sweep; δ_{DLC} 5.

(b) Lateral - directional characteristics.

Figure 8. - Concluded.

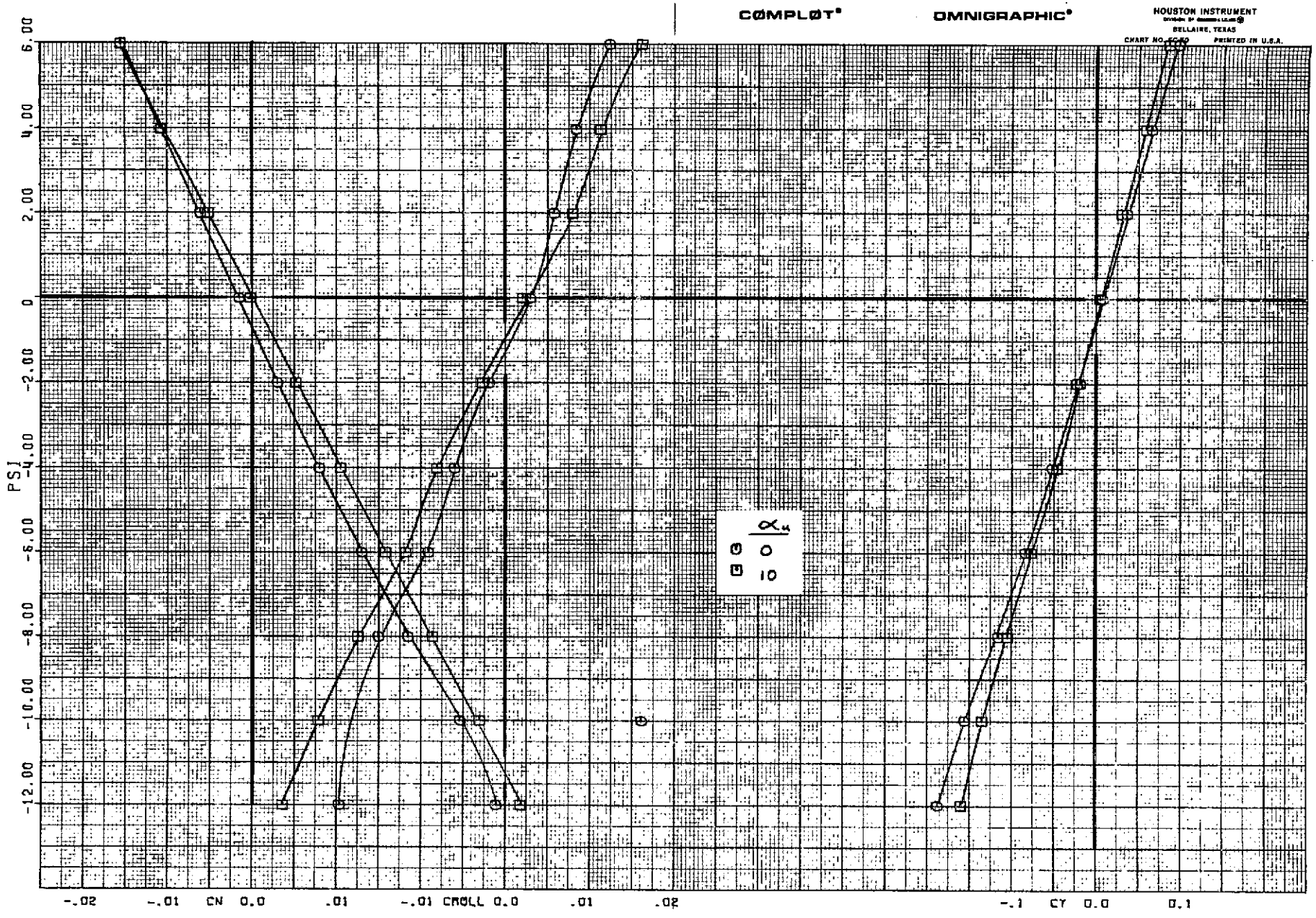
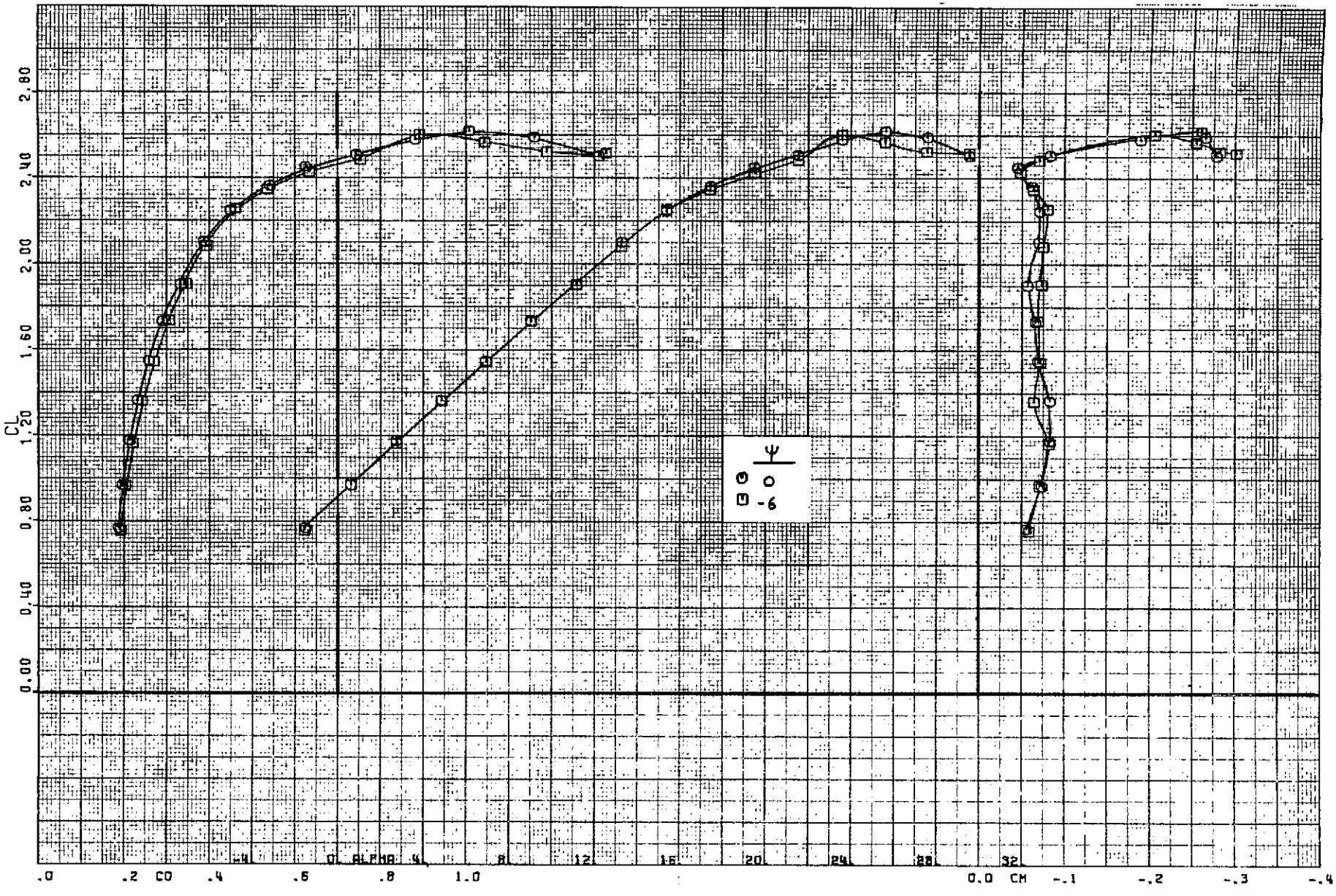
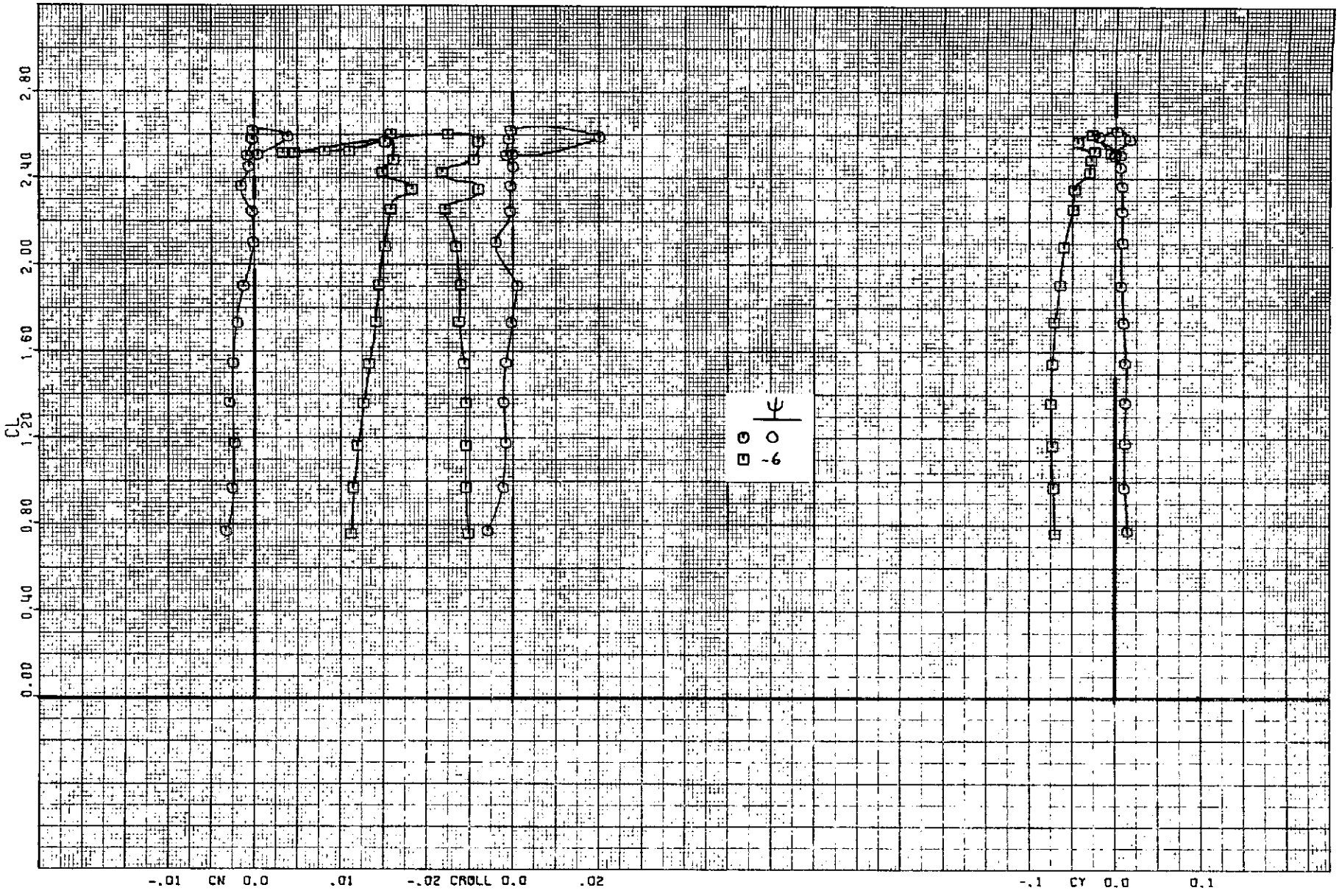


Figure 9. - Effect of 10-degree change in nominal angle of attack for yaw sweep; δ_{DLC} 5.



(a) Longitudinal characteristics.

Figure 10. - Effect of 6-degree change in yaw angle for pitch sweep; δ_{SB} 60.



(b) Lateral - directional characteristics.

Figure 10. - Concluded.

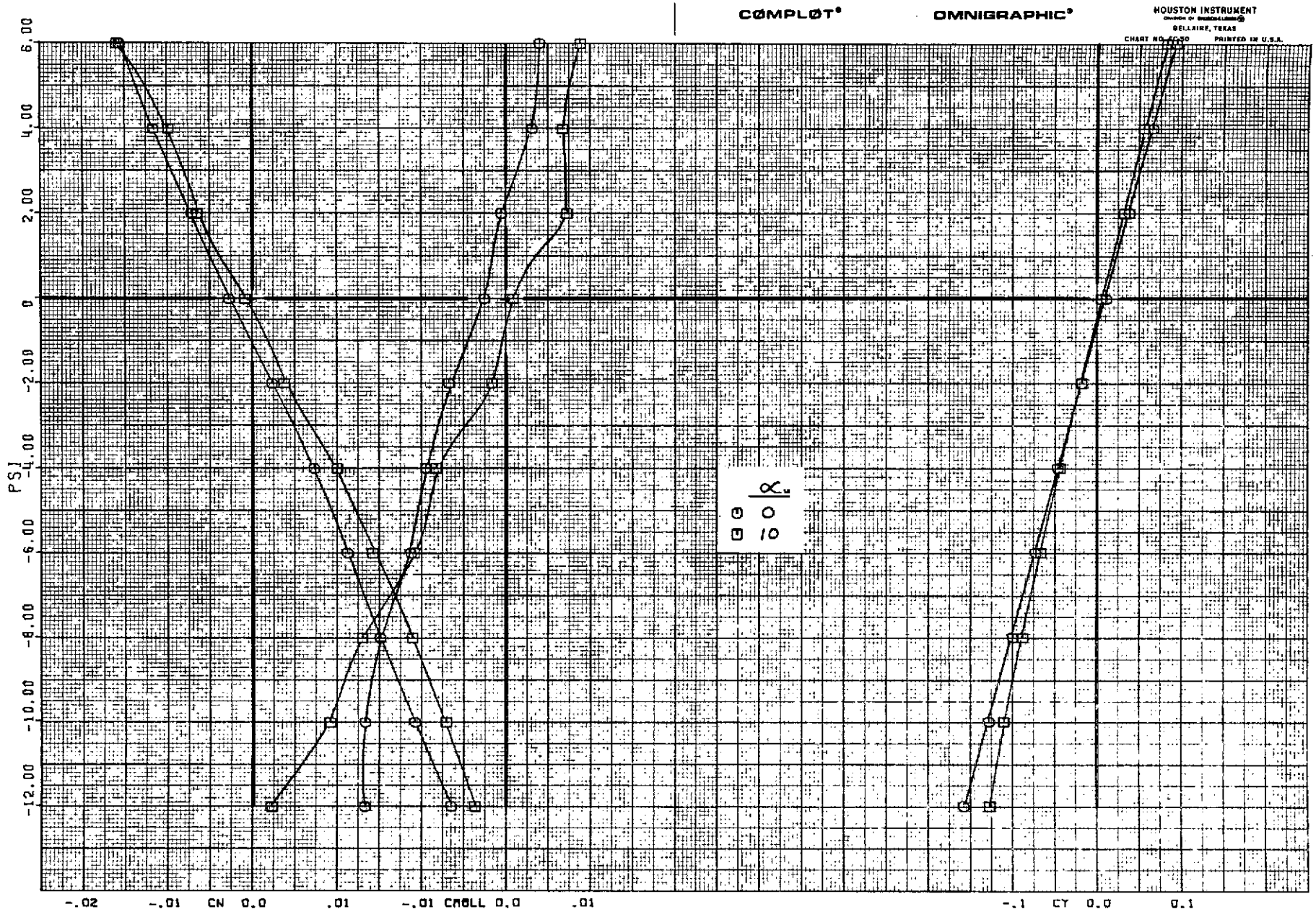
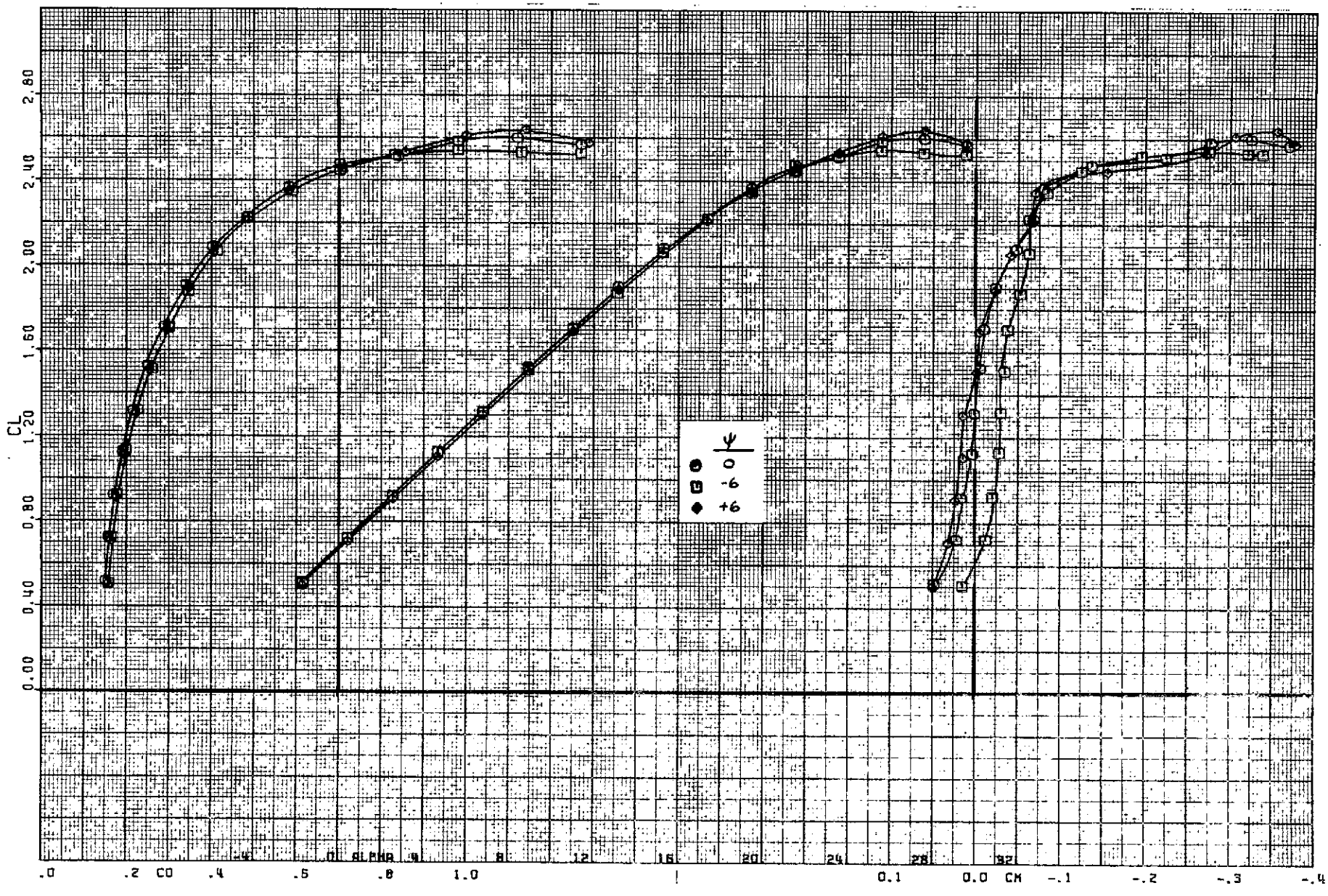
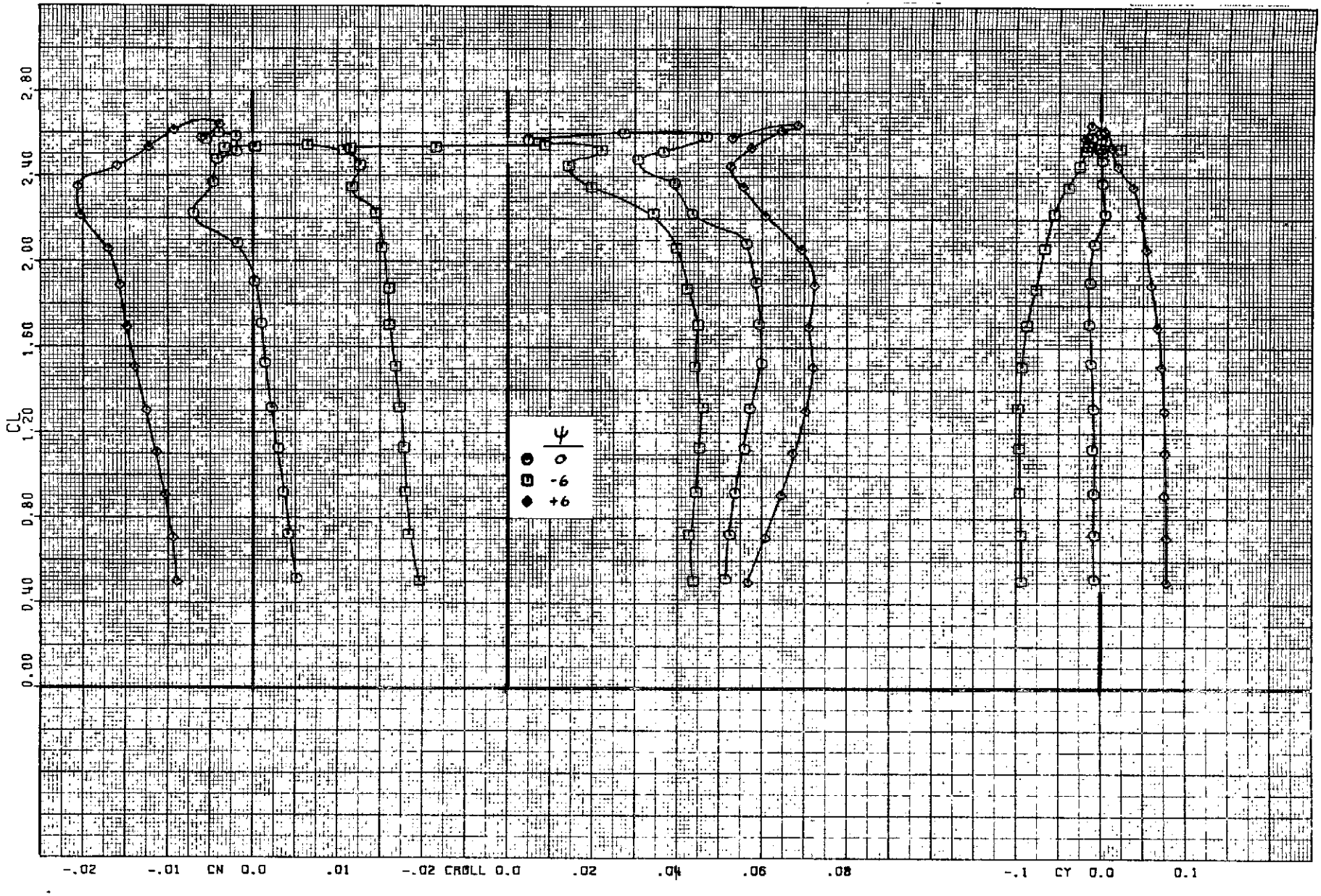


Figure 11. - Effect of 10-degree change in nominal angle of attack for yaw sweep; δ_{SB} 60.



(a) Longitudinal characteristics.

Figure 12. - Effect of yaw angle with spoiler-only roll control in pitch sweep; δ_{DLC} -4.5/20, from Test 5.



(b) Lateral - directional characteristics.

Figure 12. - Concluded.

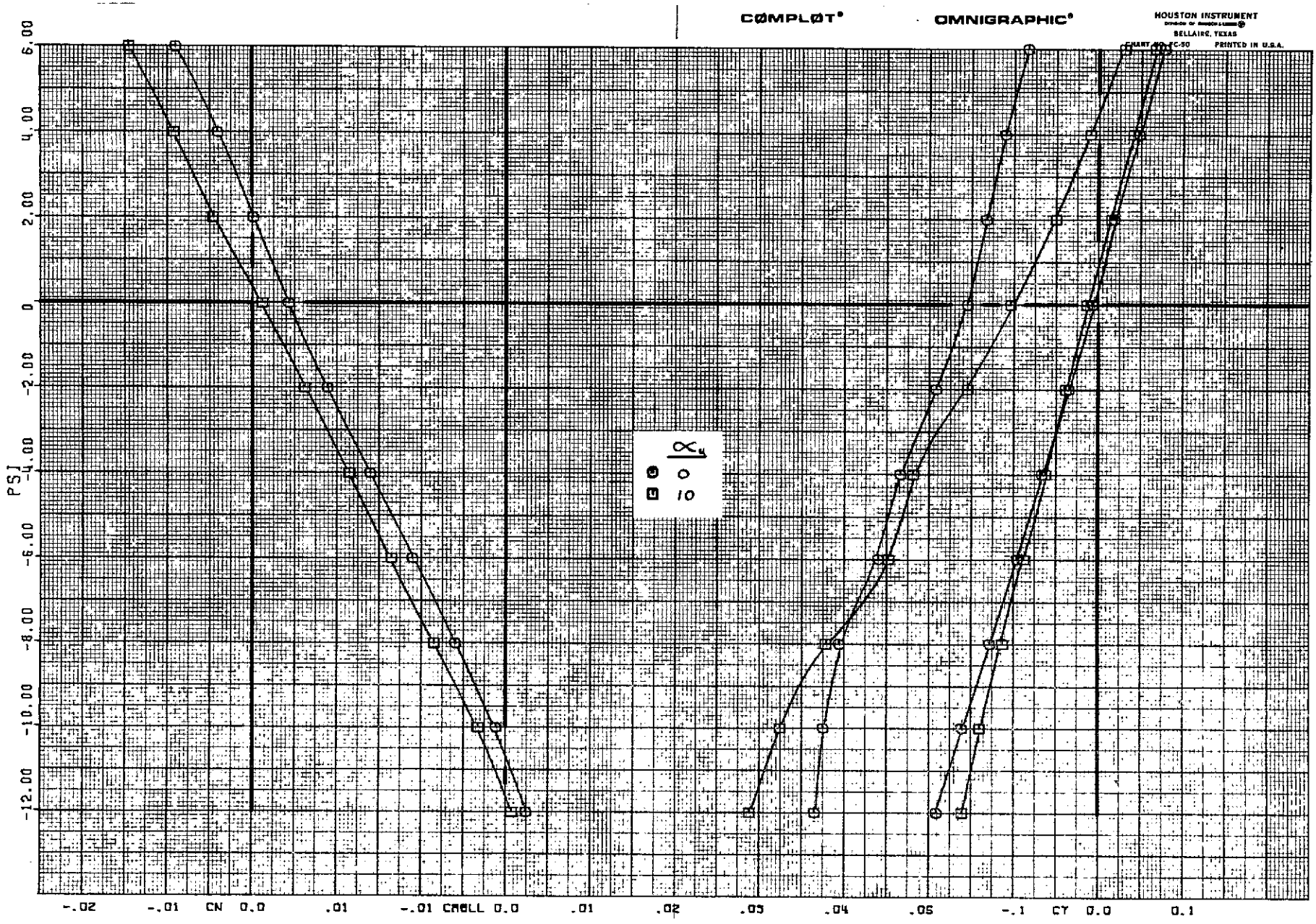
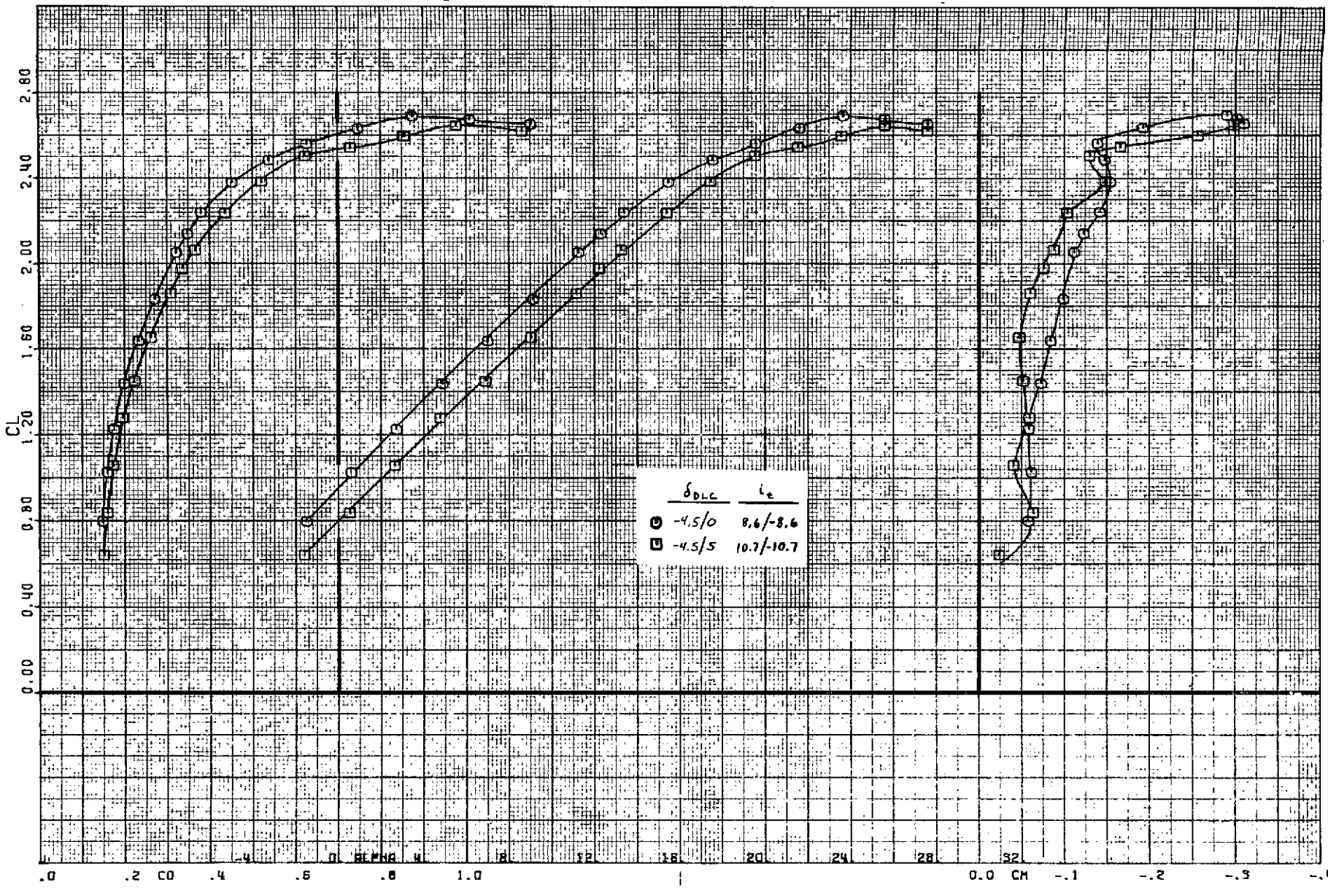
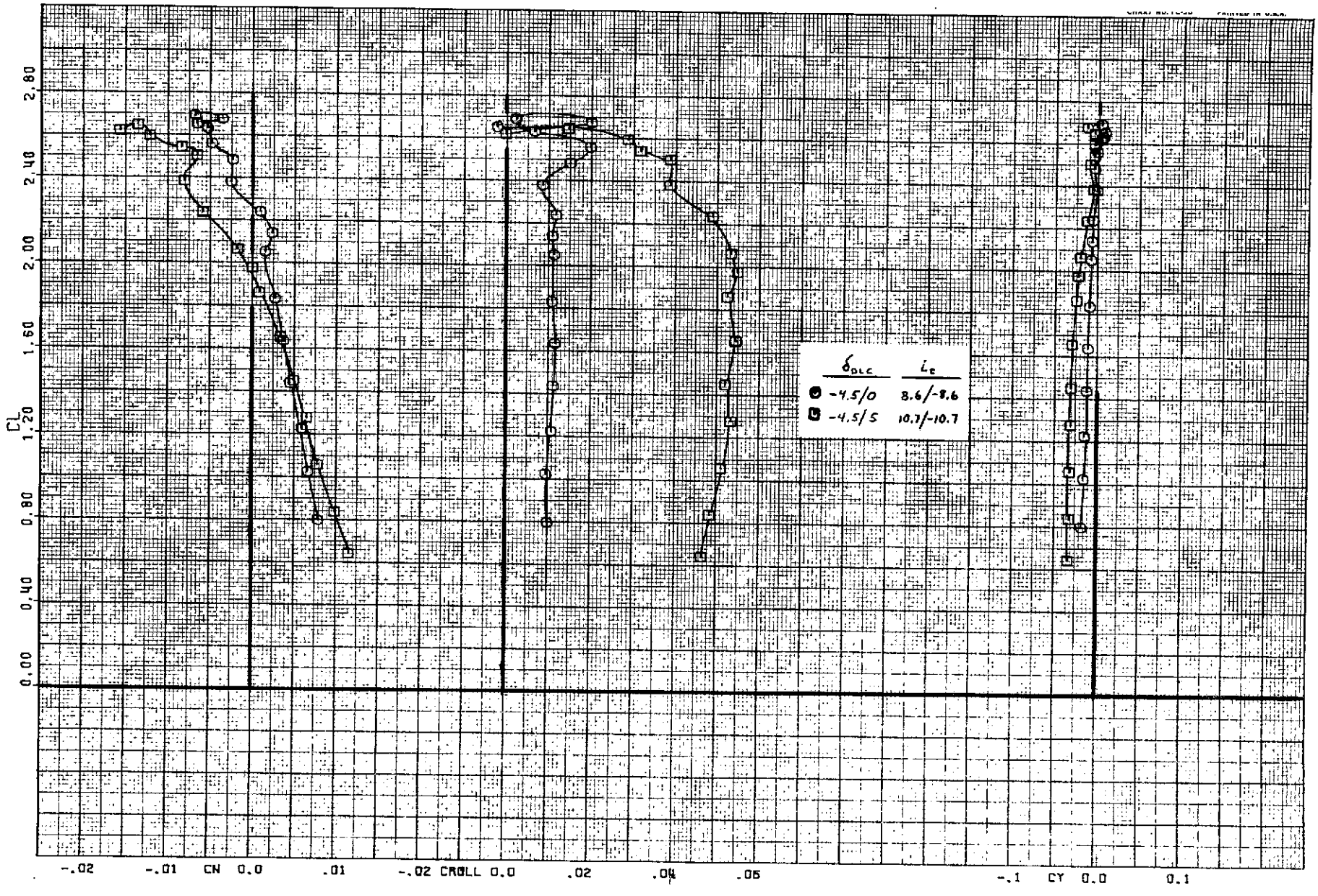


Figure 13. - Effect of 10-degree change in nominal angle of attack with spoiler-only roll control in yaw sweep; δ_{DLC} -4.5/20, from Test 5.



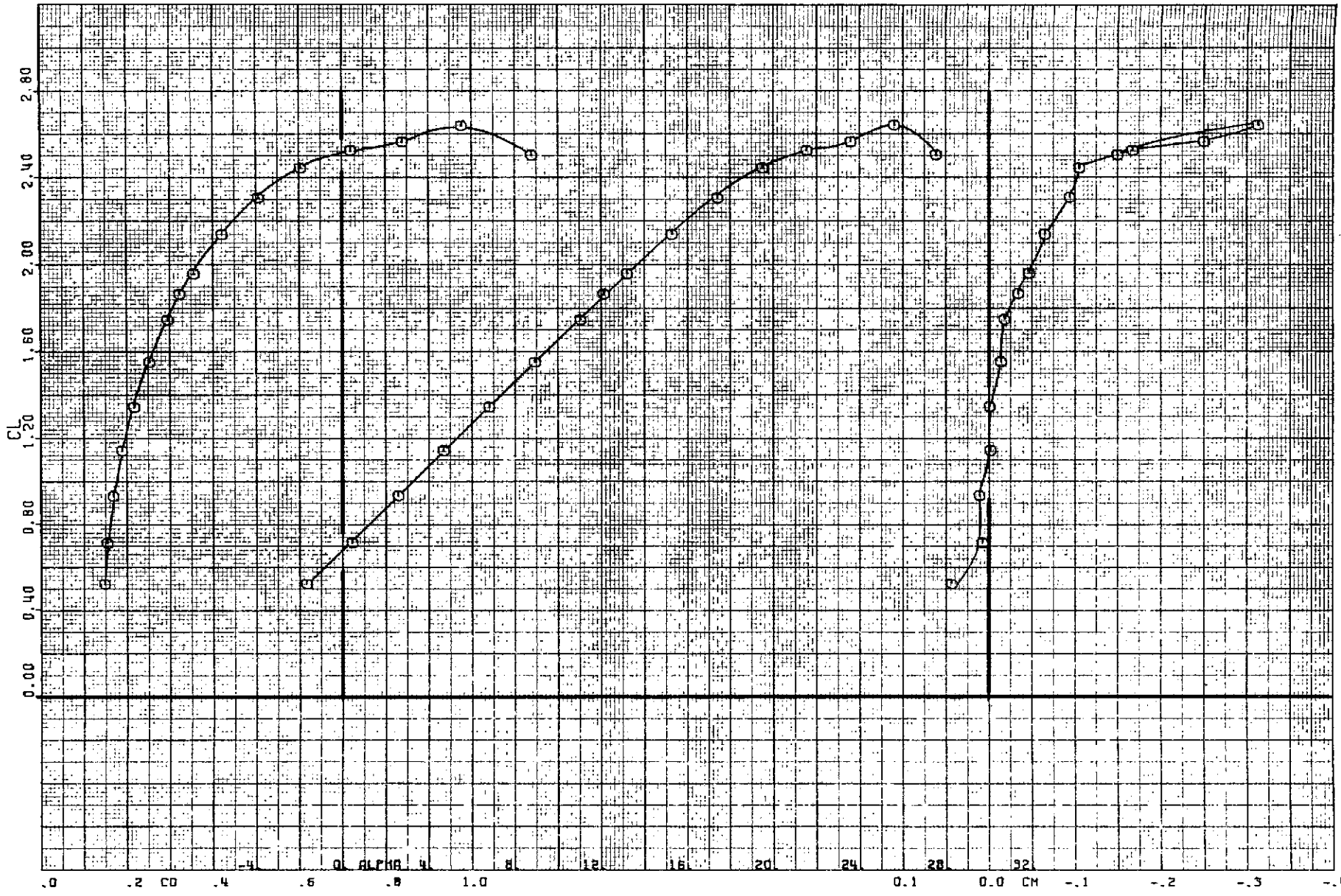
(a) Longitudinal characteristics.

Figure 14. - Effect of roll control at $\psi = 0°$.



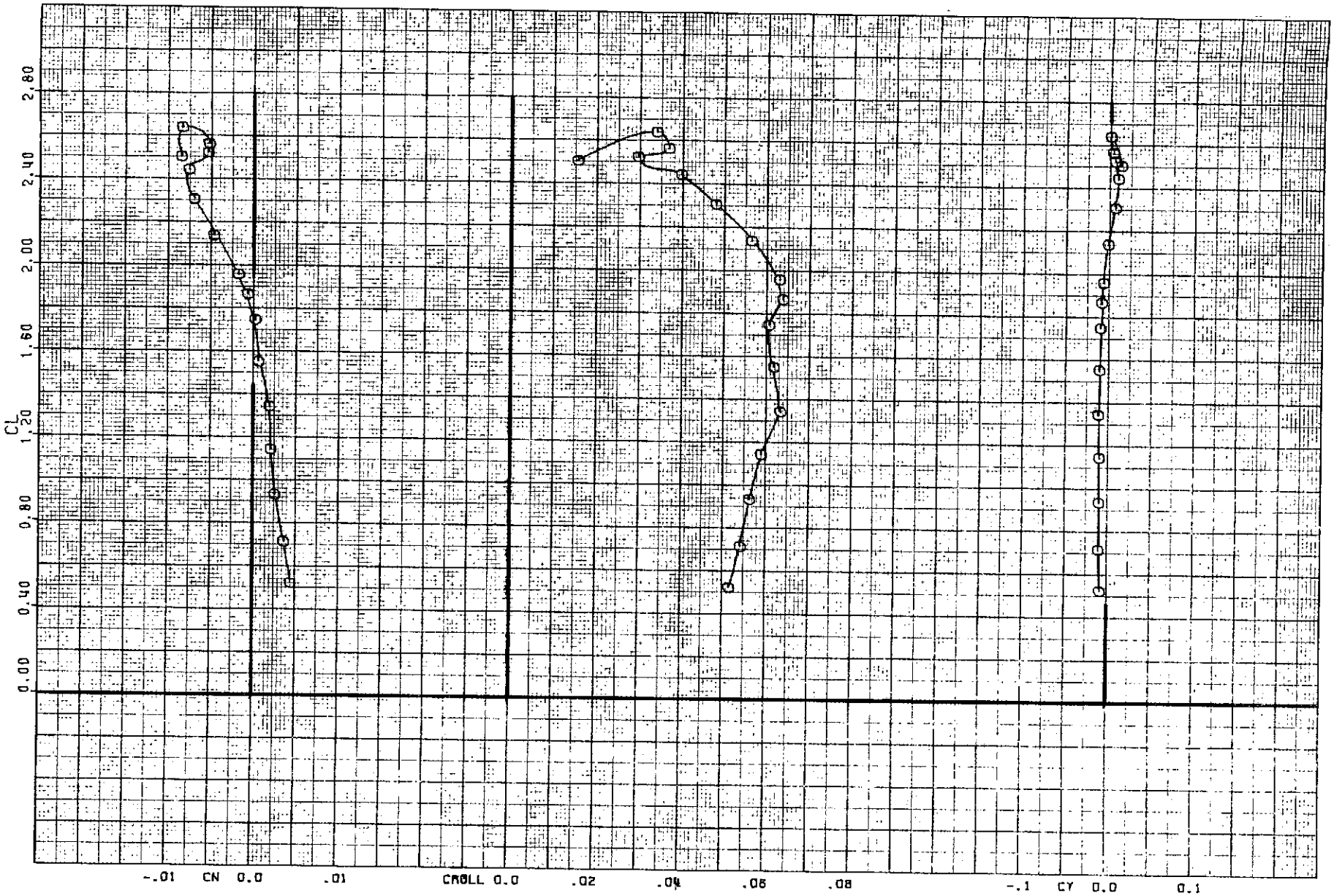
(b) Lateral - directional characteristics.

Figure 14. - Concluded.



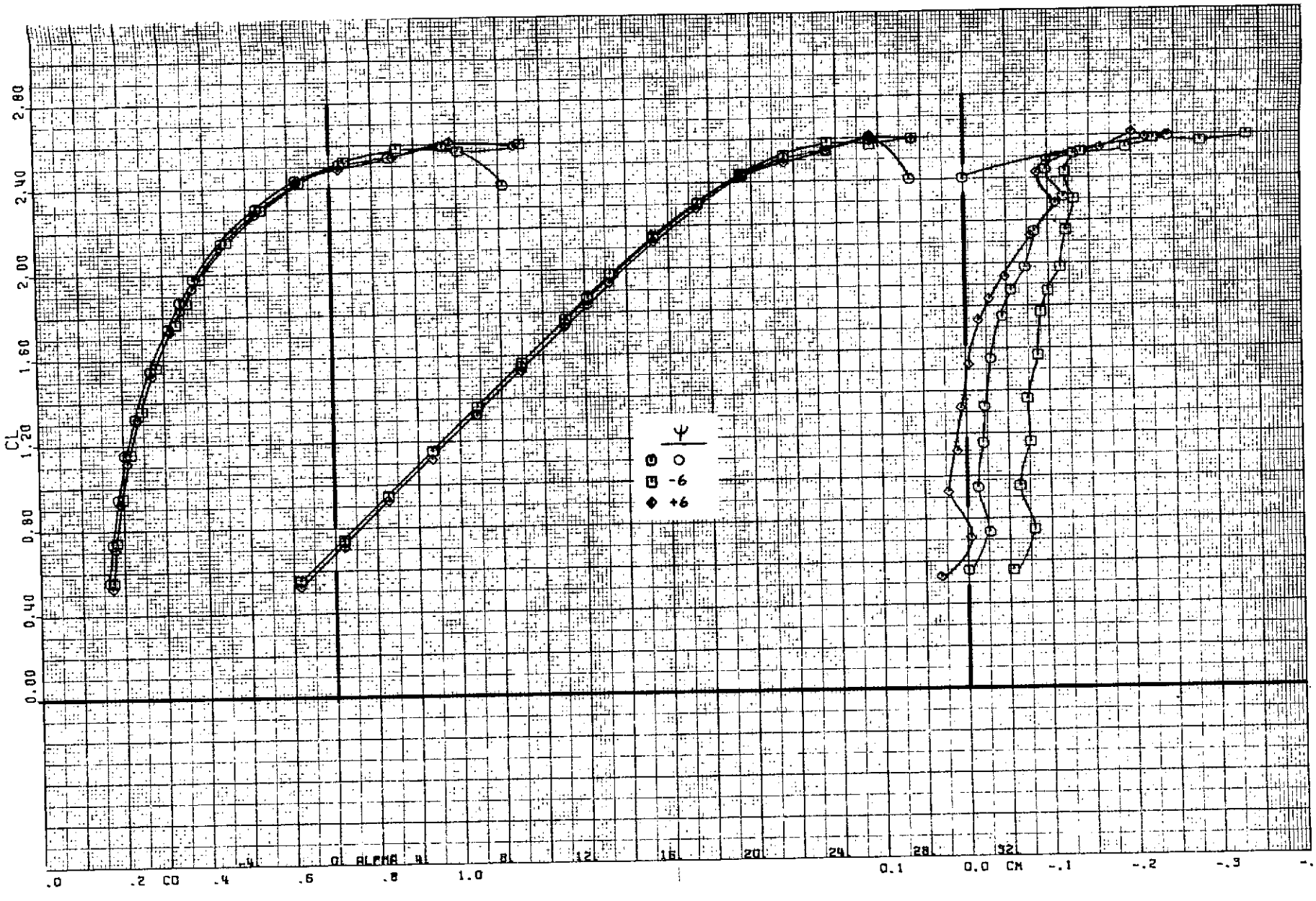
(a) Longitudinal characteristics.

Figure 15. - Results of spoiler-only roll control at $\psi = 0°$; δ_{DLC} -4.5/20, from Test 2.



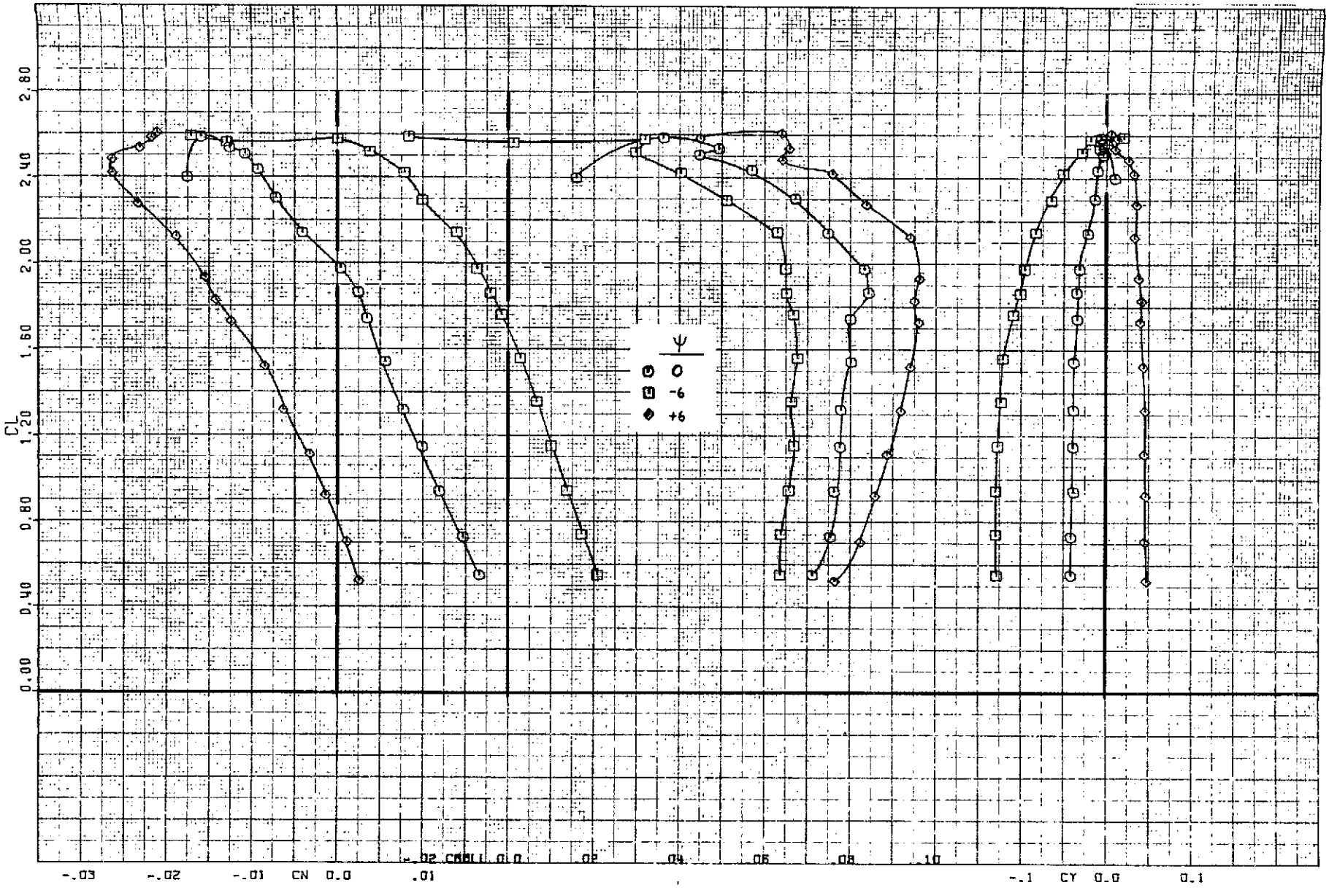
(b) Lateral - directional characteristics.

Figure 15. - Concluded.



(a) Longitudinal characteristics.

Figure 16. – Effect of yaw with full roll control for pitch sweep; δ_{DLC} -4.5/20, i_t 11.1/-11.1.



(b) Lateral - directional characteristics.

Figure 16. - Concluded.

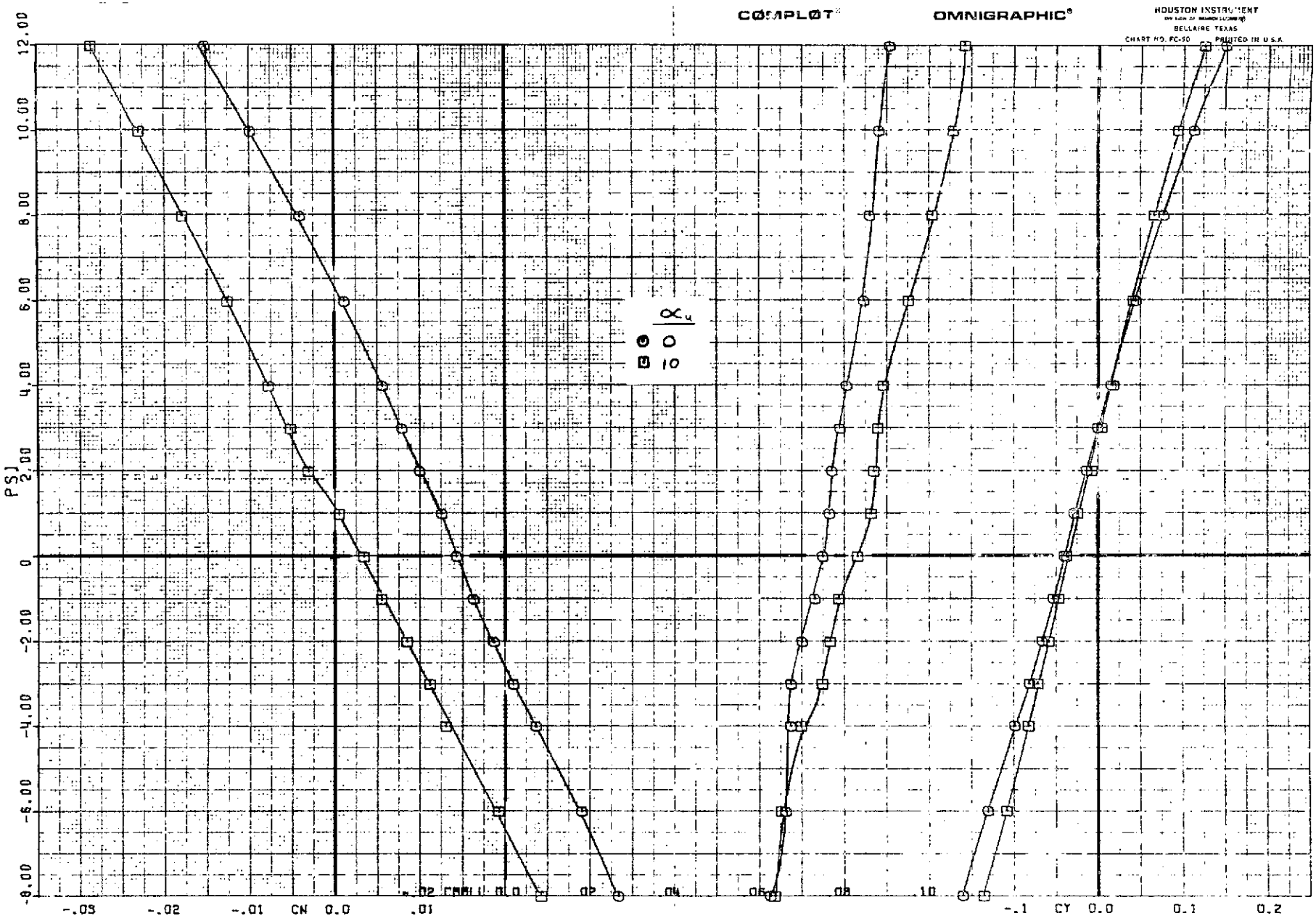


Figure 17. - Effect of 10-degree change in nominal angle of attack with full roll control in yaw sweep; δ_{DLC} -4.5/20, i_t 11.1/-11.1.