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WIND-TUNNEL TEST DATA FOR WING TRAILING
VORTEX FLOW SURVEY

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WIND-TUNNEL TEST DATA FOR WING TRAILING VORTEX FLOW SURVEY

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ABSTRACT

Data are presented on velocity measurements made with hot wire anemometers in the wake of a model of the CV-990 aircraft and a rectangular wing in the NASA-Ames 2.14x3.05 meter (7- by 10-foot) wind tunnels. Variables included angle of attack, tunnel speed and axial distance up to 12 chord lengths downstream from the wing trailing edge. Effects of deflecting trailing edge flaps and small spoiler panels are shown.

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NOTATION

A, B, C	constants in the polynomial fit to the calibration data, eqn 1
a	core radius
b	wing span
C_D	drag coefficient
C_L	lift coefficient
$\overline{E'^2}$	rms of the fluctuating component of anemometer voltage
E_{cor}	anemometer voltage corrected for tunnel temperature
E_m	measured average anemometer voltage
TI	turbulence intensity, eqn 2
T_m	measured tunnel temperature
T_{ref}	reference temperature for correcting anemometer voltage, 30°C
T_w	hot wire temperature, 200°C
u	velocity component normal to each wire
u_r	radial component of velocity
u_x, u_y, u_z	mean velocity components in wind tunnel co-ordinates, figure 1
$\sqrt{u_x'^2, u_y'^2, u_z'^2}$	rms of fluctuating component of velocity
$u_{x_{min}}$	value of u_x at center of vortex
u_θ	swirl component of velocity
$u_{\theta_{max}}$	maximum value of u_θ
V_∞	free stream value of the velocity
δf	trailing edge flap deflection

INTRODUCTION

Trailing vortices from large aircraft are known to persist for several minutes after generation and present a hazard to smaller aircraft which might intersect their path. Also, tip vortices which are shed from helicopter rotor blades present a distorted flow field to the following blade. This interaction between the rotor blade and the tip vortex of the preceding blade is a source of rotor noise and vibration. For these reasons it is desirable to develop an understanding of the vortex structure and dissipation, so that ultimately a means may be devised for reducing vortex velocities in the wake of wings and rotor blades.

The experiments discussed in the present report are a continuation of earlier work by the authors on the measurement of trailing vortices. Reference 1 reports the effect (on the vortex wake) of a small spoiler on the tip of a rectangular wing and a Convair 990 aircraft. Reference 2 reports the results of detailed measurement of velocity with a three-wire hot wire probe in the wake of a rectangular wing model. The axial distance for this survey was varied from 4 chord lengths downstream of the trailing edge to the origin of the trailing vortex on the wing surface. In the present report the range of the variables for this same rectangular wing planform is extended to include axial stations up to 12 chord lengths and variations of angle of attack and tunnel speed. Listings of the data presented in reference 2 are included in the present report.

In addition to the rectangular wing model a semi-span model of the Convair 990 aircraft was also tested. This model included wing, engine nacelles, anti-shock bodies, and a fuselage. The data for this model include variations of axial distance, angle of attack, tunnel speed and trailing edge flap deflection. The effect of a small spoiler panel, similar to that reported in reference 1 was also investigated.

Discussion of some of the results is given in reference 3. This report presents the complete test results without discussion.

MODEL, APPARATUS AND INSTRUMENTATION

The pertinent dimensions of the rectangular planform wing are given in table 1. A sketch of the CV-990 semispan model appears on figure 1; a detailed planform drawing appears on figure 2, and additional details are listed in table 1.

The tests were conducted in the Army and the NASA 2.14x3.05 meter (7- by 10-ft) wind tunnels at Ames with the semispan models mounted vertically from the tunnel floor. Surveys were obtained by attaching the hot wire probe to a survey apparatus permanently installed in the wind tunnel which allows the probe position to be varied remotely over the width and height of the tunnel and over about 3 meters (118 in) of test section length. The accuracy of the positioner is ± 0.3 mm (0.01 in).

Force and moment data were obtained using a mechanical balance system. Tunnel speed was set with the aid of a pitot static tube mounted in the test section away from the flow field of the model. The vortex wake was surveyed with a triple sensor hot wire probe consisting of three wires placed in a three axis array. This array was operated by three separate constant temperature anemometers. Measurements were effectively averaged over a region 2 mm (x 0.08 in) in diameter. The frequency response of the hot wire anemometer system was well in excess of 30 kHz which was sufficient to measure the fluctuations which were encountered.

Calibration of the hot wire was accomplished by placing a small pitot static tube on the survey apparatus in the vicinity of the hot wire sensor. The hot wire data were corrected for tunnel temperature variations by use of a platinum resistance thermometer sensor placed in the test section.

TEST PROCEDURE AND CONDITIONS

Traverses with the hot wire sensor were made through the vortex center both parallel to and normal to the spanwise direction at fixed axial stations downstream of the wing. An index of the test conditions at which the traverses were made appears in table 2.

Location of vortex center.- The vortex center was located by selecting the one of the three anemometers that was most sensitive to swirl velocity and recording this signal as well as the position of

the survey apparatus on an X-Y recorder. A plot of swirl velocity vs traverse position could be generated by moving the survey apparatus while recording the signals. At a fixed axial station and normal position a spanwise traverse was made. From the resulting signal trace an estimate of the spanwise position of the vortex center was made. Then, a normal traverse was made at this fixed spanwise center location to determine a corrected normal position of the vortex center. The procedure was continued until no further corrections to the spanwise and normal position of the vortex center were required.

Traverses.- After the location of the vortex center was determined the traverse was performed by locating the probe at each of the survey points across the vortex. The D.C. average and rms of the voltage signal was recorded with the averaging time as high as about 30 seconds in the vicinity of the vortex core where the turbulent fluctuations were large.

Calibration.- A calibration of the hot wire was made several times each day. For the calibration, the angle of attack was set to 0°, the probe was moved away from the disturbance of the model, and a series of tunnel speeds were set. At each tunnel speed the output of the anemometer, the value of the pressure difference on the pitot static tube, and the tunnel temperature were recorded.

DATA REDUCTION AND CORRECTION

Temperature correction.- The mean voltages read from the anemometer were corrected for the tunnel temperature according to the following expression:

$$E_{cor}^2 = E_m^2 \frac{T_w - T_{ref}}{T_w - T_m}$$

The wire temperature and reference temperature were 200°C and 30°C respectively.

Calibration.- The anemometer was calibrated by recording tunnel velocity and anemometer voltage for a series of tunnel velocity settings. The following polynomial was used as a least-square fit to the data

$$E_{cor}^2 = A + B (u^{\frac{1}{2}}) + C (u^{\frac{1}{2}})^2 \tag{1}$$

for each of the three anemometers. For the calibration, u is the known component of the tunnel velocity normal to the wire.

Mean velocity.- The mean velocities in wing co-ordinates (figure 1) were obtained from the velocities relative to co-ordinates fixed to the probe using a transformation of co-ordinates and the known orientation of the probe relative to the wing. These velocities in the probe co-ordinates were, in turn, obtained from the velocities normal to each wire and the known geometry of the three wire array. The velocity normal to each wire was obtained from the corrected wire voltage and the inversion of equation 1, as follows:

$$u = \frac{-B + \sqrt{B^2 - 4C(A - E_{cor}^2)}}{2C}$$

It is assumed by use of this expression that the component of velocity parallel to the wire results in no contribution to the wire voltage. Data published by the manufacturer of the anemometer indicates that this is a realistic assumption.

Turbulence intensity.- The turbulence intensity is defined as

$$TI = \frac{(\overline{u_x'^2} + \overline{u_y'^2} + \overline{u_z'^2})^{1/2}}{(\overline{u_x^2} + \overline{u_y^2} + \overline{u_z^2})^{1/2}} \quad (2)$$

The rms of the velocity component fluctuations was obtained from the rms of the fluctuating voltage signals that were measured. The rms of the velocity normal to each wire is

$$(\overline{u'^2})^{1/2} = \frac{\partial u}{\partial E} (\overline{E'^2})^{1/2}$$

The factor $\partial u/\partial E$ is the slope of the calibration curve evaluated at the measured mean voltage. The rms of the velocity components in wing co-ordinates was obtained from the rms of the velocity normal to each wire using the same transformation as was used for the mean velocities.

RESULTS

A list of traverses is given in Table 2 with the following column headings:

- Traverse Number
- Type of Traverse - Normal (Horizontal) or Spanwise (Vertical)
- α angle of attack of wing in degrees
- x axial distance in inches from trailing edge at wing tip
- x/c axial distance normalized by mean wing chord
- V_{∞} wind tunnel velocity in ft/sec

The 'remarks' column shows the type of model used and whether flaps or the panel was fitted to the model.

Location of the hot wire sensor is given in terms of counter readings. The location of the wing trailing edge at the wing tip, which is chosen as the origin of the co-ordinate system, and the wind tunnel centerline was determined by placing the sensor at these positions and recording the counter readings. These measurements are shown in Table 3. It should be noted that the location of the wing trailing edge at the wing tip is changed when the angle of attack of the model is changed. These counter readings (Table 3) are used in order to give the position of the vortex centerline and velocity distributions relative to the wing and wind tunnel walls.

The normal, spanwise and axial velocity components and turbulence intensity at each measuring point are tabulated in Table 4 and Table 5 gives the key to the traverse and column headings.

Figures 3-7 show the variation of the principal parameters, u_{0max} , α , u_{xmin} and TI_{max} as a function of variation of angle of attack, α , for both the CV-990 model and the rectangular wing.

Discussion of these results is given in reference 3.

Force Data

Force data as measured on the wind tunnel mechanical balance system are presented in figures 8-9. These show the variation of lift coefficient as a function of angle of attack and the drag vs lift coefficient curves for the CV-990 model.

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REFERENCES

1. Corsiglia, V. R., Jacobsen, R. A., and Chigier, N. A.: An Experimental Investigation of Trailing Vortices Behind a Wing With a Vortex Dissipator. Aircraft Wake Turbulence and its Detection by J. H. Olsen and A. Goldberg, Plenum Press, New York-London, 1971, pp. 229-242.
2. Chigier, N. A., and Corsiglia, V. R.: Tip Vortices - Velocity Distributions, 27th Annual National V/STOL Forum of the American Helicopter Society, Washington, D.C., May 1971, paper 552. Reprinted as NASA TM X-62,087, September 1971, pp. 1-13.
3. Chigier, N. A., and Corsiglia, V. R.: Wind Tunnel Studies of Wing Wake Turbulence, AIAA 10th Aerospace Sciences Meeting, San Diego, California, January 17-19, 1972. Paper 72-41.

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TABLE 1 - MODEL GEOMETRY

CV-990 wing

Semispan		91.5 cm (36 in)
Reference chord, $c = S/b$		31.5 cm (12.4 in)
Aspect ratio		6.2
Incidence	root	4°
	tip	2°
Section	root	NACA 0011-64
	tip	NACA 0008-64
Trailing edge flap		type, plain deflection 27°

Rectangular wing

Semispan		121.8 cm (48 in)
Reference chord		45.7 cm (18 in)
Aspect ratio		5.33
Twist		0°
Section		NACA 0015

TABLE 2 - TRAVERSE INDEX


Traverse	Type	α degrees	x inches	x/c	V_{∞} ft/sec	Remarks	
3	Norm	4	147.0	11.85	100	CV-990 Model C = 12.4 in 	
4	Span	4	147.0	11.85	100		
5	N	12	147.0	11.85	100		
6	S	12	147.0	11.85	100		
7	N	16	147.0	11.85	100		
8	S	16	147.0	11.85	100		
9	N	8	147.0	11.85	49		
10	S	8	147.0	11.85	49		
11	N	8	147.0	11.85	138		
12	S	8	147.0	11.85	138		
13	N	8	147.0	11.85	184		
14	S	8	147.0	11.85	184		
15	N	8	31.5	2.54	100		
16	S	8	31.5	2.54	100		
17	N	8	78.2	3.89	100		
18	S	8	48.2	3.89	100		
19	N	8	73.2	5.91	100		
20	S	8	73.2	5.91	100		
21	N	8	98.2	7.92	100		
22	S	8	98.2	7.92	100		
23	N	8	123.2	9.94	100		
24	S	8	123.2	9.94	100		
25	N	8	147.0	11.85	100		
26	S	8	147.0	11.85	100		
27	N	8	147.0	11.85	100		Panel on
28	S	8	147.0	11.85	100		Flaps, panel off
29	N	8	147.0	11.85	100		
30	S	8	147.0	11.85	100		
31	N	4	147.0	11.85	100		
32	S	4	147.0	11.85	100		

TABLE 2 - Concluded.

Traverse	Type	α degrees	x inches	x/c	V_{∞} ft/sec	Remarks	
33	N	4	147.0	11.85	100	Flaps 0°, panel on	
34	S	4	147.0	11.85	100	↓	
35	N	12	162.0	9.0	100	Rectangular plan- form wing C = 18 inches ↓	
36	S	12	162.0	9.0	100		
37	N	8	162.0	9.0	100		
38	S	8	162.0	9.0	100		
39	N	4	162.0	9.0	100		
40	S	4	162.0	9.0	100		
41	N	8	67.7	3.76	159		
42	S	8	67.7	3.76	159		
101	N	12	72.0	4.0	100		Rectangular plan- form wing C = 18 inches ↓
102	S	12	72.0	4.0	100		
103	N	12	36.0	2.0	100		
104	S	12	36.0	2.0	100		
105	N	12	0	0	100		
106	S	12	0	0	100		
107	N	12	-4.5	-0.25	100		
108	S	12	-4.5	-0.25	100		
109	N	12	-9.0	-0.50	100		
110	S	12	-9.0	-0.50	100		
111	N	12	-13.5	-0.75	100		
112	S	12	-13.5	-0.75	100	↓	

TABLE 3 - COUNTER READINGS FOR WING TRAILING EDGE AT THE WING TIP
AND FOR WIND TUNNEL CENTERLINE (Scale: 1.0 count =
2.54 cm (1.0 in))

CV-990 Model (Trav 1 to 34)*

Normal Survey

Tunnel centerline		45.95
Wing trailing edge at tip		
α deg	position	
4	47.76	
8	46.14	
12	44.45	
16	42.95	

Spanwise Survey

Tunnel centerline	45.63
Wing trailing edge at the wing tip	52.30

Rectangular Wing Model (Trav 35 to 42)

Normal Survey

Wing trailing edge at the wing tip	
α deg	position
4	45.30
8	44.75
12	44.12
16	43.56

Spanwise Survey

Wing trailing edge at the wing tip	64.51
------------------------------------	-------

* Traverses 1 to 42 correspond to measurements made in the Army-Ames wind tunnel. Traverses 101-112 correspond to measurements made in the NASA-Ames wind tunnel. This explains the difference in the form of the counter readings from xx.xx to 9xxxx.

TABLE 3 - Concluded

Rectangular Wing Model (Trav 101 to 112)
 (Scale: 100 counts = 2.54 cm (1.00 in))

Normal Survey	
Trav 101 to 108	
Tunnel centerline	95411
Wing trailing edge at tip	95073
Trav 109 to 112*	
Tunnel centerline	91929
Wing trailing edge at tip	91591
Spanwise Survey	
Trav 101 to 106	
Tunnel centerline	95895
Wing trailing edge at tip	95320
Trav 107 to 108	
Tunnel centerline	96205
Wing trailing edge at tip	95630
Trav 109 to 110	
Tunnel centerline	96180
Wing trailing edge at tip	95605
Trav 111 to 112	
Tunnel centerline	96155
Wing trailing edge at tip	95580

*Zero setting on counter was changed to give the values shown.

TABLE 4

Tabulation of results

(Listing of Traverses 3 - 42
 101 - 112)

KEY TO TABULATED RESULTS

TRAV	Traverse Number
NORM	Normal traverse
SPAN	Spanwise traverse
X	Axial distance in inches from wing trailing edge
X/C	Axial distance from wing trailing edge normalised by mean wing chord
ALF	ALPHA, angle of attack, α
V, FPS	Wind tunnel free stream axial velocity in ft/sec, V_∞
VORTEX CENTER	Location of vortex center for that particular traverse - corresponds to position of zero tangential velocity. The numbers refer to readings in inches on the traversing mechanism counters
DIST INCH	Readings on traversing mechanism counters in inches (for traverse numbers 101-112 the values are given in hundredths of inches)
NORM	Normal component of velocity / V_∞
SPAN	Spanwise component of velocity / V_∞
AXIAL	Axial component of velocity / V_∞
TURBUL INTENS	Turbulence Intensity $\frac{(\overline{u_x'^2} + \overline{u_y'^2} + \overline{u_z'^2})^{1/2}}{(\overline{u_x^2} + \overline{u_y^2} + \overline{u_z^2})^{1/2}}$

Note: For NORMAL TRAVERSE

NORM = u_r/V_∞ , radial component

SPAN = u_θ/V_∞ , tangential component

AXIAL = u_x/V_∞ , axial component

For SPANWISE TRAVERSE

NORM = u_θ/V_∞ , tangential component

SPAN = u_r/V_∞ , radial component

AXIAL = u_x/V_∞ , axial component

VORTEX CENTER=49.10

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
7.50	0.0096	0.0004	0.9946	0.00409
20.00	0.0092	0.0030	0.9953	0.00411
25.00	0.0086	0.0033	0.9968	0.00442
30.00	0.0090	0.0065	0.9954	0.00428
35.00	0.0065	0.0088	0.9893	0.00417
40.00	-0.0016	0.0093	0.9933	0.00803
42.00	-0.0029	0.0101	0.9923	0.00763
44.00	-0.0003	0.0094	0.9908	0.01581
45.00	0.0038	0.0109	0.9888	0.01322
46.00	0.0064	0.0155	0.9905	0.01113
47.00	0.0089	0.0203	0.9930	0.01398
48.00	-0.0019	0.0257	0.9856	0.02940
49.00	0.0069	0.0129	0.9746	0.05015
50.00	0.0278	-0.0184	0.9762	0.03286
51.00	0.0207	-0.0268	0.9877	0.01882
52.00	0.0121	-0.0316	0.9964	0.01298
53.00	0.0081	-0.0301	0.9988	0.00770
54.00	0.0053	-0.0298	1.0019	0.00602
56.00	0.0056	-0.0275	1.0011	0.00476
58.00	0.0065	-0.0210	1.0019	0.00436
60.00	0.0080	-0.0186	1.0040	0.00456
62.00	0.0065	-0.0157	1.0015	0.00465
65.00	0.0075	-0.0146	1.0027	0.00485
70.00	0.0062	-0.0127	1.0025	0.00481
75.00	0.0042	-0.0102	1.0005	0.00477
84.50	0.0049	-0.0082	1.0000	0.00604

NOT REPRODUCIBLE

TRAV04 SPAN X=147.0 ALF= 4. V,FPS=100.
VORTEX CENTER=50.60

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NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0233	0.0141	0.8899	0.08065
15.00	0.0238	0.0218	0.9266	0.06349
20.00	0.0242	0.0264	0.9305	0.05065
25.00	0.0055	0.0134	0.9746	0.03321
30.00	0.0090	0.0018	0.9875	0.00584
35.00	0.0108	-0.0019	0.9951	0.00443
40.00	0.0122	-0.0019	0.9908	0.00608
42.00	0.0071	-0.0053	0.9951	0.00521
43.00	0.0129	-0.0023	0.9933	0.00510
44.00	0.0148	-0.0017	0.9893	0.00529
45.00	0.0156	-0.0018	0.9903	0.00653
46.00	0.0187	-0.0017	0.9882	0.00686
47.00	0.0258	-0.0027	0.9876	0.01278
48.00	0.0337	-0.0048	0.9885	0.02350
49.00	0.0208	-0.0271	0.9869	0.03952
50.00	-0.0040	-0.0334	0.9909	0.04693
51.00	-0.0152	-0.0263	0.9994	0.03586
52.00	-0.0393	-0.0233	0.9968	0.03270
53.00	-0.0446	-0.0149	1.0076	0.01612
54.00	-0.0368	-0.0112	1.0048	0.00892
55.00	-0.0350	-0.0098	1.0036	0.00709
57.00	-0.0316	-0.0080	1.0017	0.00496
60.00	-0.0267	-0.0074	1.0029	0.00463
65.00	-0.0238	-0.0035	1.0021	0.00472
72.40	-0.0116	-0.0086	1.0027	0.00474

TRAV05 NORM X=147.0 ALF=12. V,FPS=100.
VORTEX CENTER=51.00

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NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
8.00	0.0041	0.0166	0.9951	0.00529
15.00	0.0036	0.0194	0.9984	0.00510
20.00	0.0015	0.0206	0.9941	0.00502
25.00	0.0025	0.0237	0.9937	0.00532
30.00	-0.0084	0.0284	0.9944	0.00643
32.00	-0.0141	0.0307	0.9986	0.00832
34.00	-0.0157	0.0336	1.0006	0.01514
36.00	-0.0223	0.0399	0.9931	0.03035
38.00	-0.0309	0.0391	0.9859	0.04298
40.00	-0.0343	0.0321	0.9741	0.04844
41.00	-0.0343	0.0315	0.9730	0.05421
42.00	-0.0361	0.0306	0.9656	0.05882
43.00	-0.0425	0.0293	0.9608	0.06090
44.00	-0.0418	0.0276	0.9540	0.06646
45.00	-0.0422	0.0322	0.9540	0.06889
46.00	-0.0476	0.0236	0.9452	0.07284
47.00	-0.0550	0.0176	0.9300	0.07933
48.00	-0.0556	0.0125	0.9275	0.08249
49.00	-0.0591	0.0056	0.9241	0.08573
50.00	-0.0657	-0.0086	0.9244	0.08043
51.00	-0.0589	-0.0228	0.9378	0.07563
52.00	-0.0576	-0.0316	0.9466	0.06801
53.00	-0.0446	-0.0395	0.9548	0.05238
54.00	-0.0380	-0.0476	0.9728	0.04714
55.00	-0.0360	-0.0437	0.9820	0.03325
56.00	-0.0340	-0.0421	0.9877	0.02786
57.00	-0.0265	-0.0415	0.9944	0.01921
58.00	-0.0194	-0.0376	0.9977	0.01388
59.00	-0.0145	-0.0355	0.9991	0.01130
60.00	-0.0140	-0.0352	0.9986	0.00863
62.00	-0.0113	-0.0324	0.9972	0.00767
64.00	-0.0113	-0.0289	1.0017	0.00656
66.00	-0.0102	-0.0240	1.0051	0.00546
68.00	-0.0074	-0.0225	1.0029	0.00560
70.00	-0.0064	-0.0230	1.0011	0.00521
75.00	-0.0020	-0.0188	1.0008	0.00552
84.50	-0.0010	-0.0144	1.0000	0.00661

TRAV06 SPAN X=147.0 ALF=12. V,FPS=100.
VORTEX CENTER=47.50

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NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0622	0.0357	0.8501	0.14988
15.00	0.0604	0.0344	0.9088	0.10153
20.00	0.0328	0.0173	0.9452	0.05231
25.00	0.0162	0.0078	0.9749	0.02819
30.00	0.0325	-0.0086	0.9690	0.04770
32.00	0.0364	-0.0098	0.9594	0.05949
34.00	0.0367	-0.0083	0.9540	0.06635
36.00	0.0340	-0.0150	0.9448	0.06997
38.00	0.0310	-0.0150	0.9466	0.06952
40.00	0.0307	-0.0112	0.9581	0.06731
41.00	0.0296	-0.0112	0.9575	0.06579
42.00	0.0331	-0.0109	0.9534	0.07008
43.00	0.0362	-0.0157	0.9469	0.07311
44.00	0.0390	-0.0146	0.9409	0.07946
45.00	0.0379	-0.0170	0.9224	0.09059
46.00	0.0231	-0.0248	0.9076	0.09040
47.00	-0.0020	-0.0239	0.8962	0.10113
48.00	-0.0178	-0.0262	0.8943	0.09598
49.00	-0.0294	-0.0279	0.9019	0.09207
50.00	-0.0405	-0.0243	0.9074	0.08637
51.00	-0.0489	-0.0207	0.9190	0.07622
52.00	-0.0603	-0.0184	0.9476	0.06454
53.00	-0.0584	-0.0136	0.9540	0.05406
54.00	-0.0610	-0.0084	0.9692	0.04512
55.00	-0.0572	-0.0089	0.9749	0.02938
56.00	-0.0570	-0.0058	0.9745	0.02367
57.00	-0.0483	-0.0086	0.9887	0.01847
58.00	-0.0439	-0.0067	0.9872	0.01115
59.00	-0.0461	-0.0055	0.9895	0.01011
60.00	-0.0440	-0.0042	0.9909	0.00726
62.00	-0.0399	-0.0035	0.9957	0.00583
64.00	-0.0338	-0.0012	0.9899	0.00565
66.00	-0.0343	-0.0003	0.9893	0.00513
68.00	-0.0333	0.0009	0.9908	0.00548
70.00	-0.0311	0.0016	0.9904	0.00544
72.45	-0.0285	0.0007	0.9891	0.00509

TRAV07 NORM X=147.0 ALF=16. V,FPS=100.
VORTEX CENTER=50.50

19

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
8.00	0.0026	0.0227	1.0084	0.00528
15.00	-0.0011	0.0212	1.0138	0.00515
20.00	-0.0006	0.0241	1.0139	0.00567
25.00	-0.0043	0.0213	1.0171	0.00606
30.00	-0.0107	0.0226	1.0166	0.00839
32.00	-0.0155	0.0247	1.0143	0.01149
34.00	-0.0218	0.0266	1.0151	0.01937
36.00	-0.0251	0.0253	1.0161	0.02366
38.00	-0.0276	0.0268	1.0127	0.03689
40.00	-0.0323	0.0263	1.0066	0.04744
41.00	-0.0353	0.0273	0.9984	0.05339
42.00	-0.0383	0.0252	0.9945	0.05659
43.00	-0.0388	0.0259	0.9747	0.06872
44.00	-0.0414	0.0218	0.9719	0.07656
45.00	-0.0401	0.0221	0.9615	0.07880
46.00	-0.0454	0.0197	0.9537	0.08626
47.00	-0.0436	0.0168	0.9423	0.09161
48.00	-0.0484	0.0062	0.9425	0.09259
49.00	-0.0471	-0.0051	0.9265	0.09313
50.00	-0.0482	-0.0172	0.9197	0.09183
51.00	-0.0442	-0.0205	0.9178	0.09088
52.00	-0.0460	-0.0311	0.9185	0.08889
53.00	-0.0398	-0.0438	0.9258	0.07657
54.00	-0.0429	-0.0496	0.9553	0.06265
55.00	-0.0360	-0.0496	0.9752	0.05325
56.00	-0.0329	-0.0486	0.9830	0.04308
57.00	-0.0292	-0.0491	0.9912	0.03363
58.00	-0.0184	-0.0474	0.9976	0.02680
59.00	-0.0167	-0.0449	1.0027	0.02265
60.00	-0.0123	-0.0406	1.0017	0.01486
62.00	-0.0118	-0.0361	1.0042	0.00995
64.00	-0.0091	-0.0327	1.0019	0.00727
66.00	-0.0085	-0.0301	1.0064	0.00608
68.00	-0.0074	-0.0294	1.0055	0.00586
70.00	-0.0025	-0.0254	1.0024	0.00583
75.00	-0.0009	-0.0226	1.0024	0.00556
84.50	0.0028	-0.0186	1.0000	0.00614

VORTEX CENTER=47.50

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.1038	0.0602	0.9482	0.08497
15.00	0.0609	0.0253	0.9720	0.06807
20.00	0.0359	-0.0022	0.9838	0.06243
25.00	0.0455	-0.0304	0.9327	0.08903
30.00	0.0425	-0.0377	0.9179	0.09072
32.00	0.0343	-0.0442	0.9260	0.08827
34.00	0.0280	-0.0447	0.9380	0.08545
36.00	0.0233	-0.0419	0.9604	0.08025
38.00	0.0228	-0.0376	0.9654	0.07481
40.00	0.0233	-0.0349	0.9660	0.07272
41.00	0.0265	-0.0338	0.9650	0.07546
42.00	0.0297	-0.0315	0.9660	0.07543
43.00	0.0330	-0.0363	0.9531	0.08507
44.00	0.0286	-0.0355	0.9451	0.08744
45.00	0.0245	-0.0348	0.9308	0.09249
46.00	0.0140	-0.0399	0.9168	0.10111
47.00	0.0057	-0.0311	0.9067	0.10165
48.00	-0.0217	-0.0387	0.9131	0.10022
49.00	-0.0257	-0.0364	0.9111	0.09928
50.00	-0.0415	-0.0326	0.9193	0.09413
51.00	-0.0465	-0.0281	0.9353	0.08130
52.00	-0.0520	-0.0238	0.9468	0.07539
53.00	-0.0556	-0.0199	0.9612	0.07031
54.00	-0.0568	-0.0158	0.9693	0.06358
55.00	-0.0590	-0.0092	0.9767	0.04736
56.00	-0.0478	-0.0129	1.0007	0.04212
57.00	-0.0469	-0.0123	1.0070	0.03169
58.00	-0.0436	-0.0104	1.0043	0.02631
59.00	-0.0436	-0.0092	1.0071	0.01749
60.00	-0.0425	-0.0048	1.0088	0.06186
62.00	-0.0298	-0.0090	1.0213	0.00888
64.00	-0.0292	-0.0080	1.0200	0.00665
66.00	-0.0265	-0.0077	1.0182	0.00561
68.00	-0.0243	-0.0089	1.0172	0.00610
70.00	-0.0215	-0.0054	1.0150	0.00574
72.45	-0.0166	-0.0039	1.0120	0.00562
72.45	-0.0171	-0.0067	1.0107	0.00563

IHC900I EXECUTION TERMINATING DUE TO ERROR COUNT FOR ERROR NUMBER 217

TRAV09 NORM X=147.0 ALF= 8. V,FPS= 49.
VORTEX CENTER=51.70

21

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
40.00	0.0148	0.0077	0.9650	0.02244
42.00	0.0161	0.0092	0.9726	0.03794
44.00	0.0159	0.0071	0.9689	0.04529
46.00	0.0125	0.0041	0.9660	0.04953
47.00	0.0094	0.0017	0.9680	0.05034
48.00	-0.0014	0.0051	0.9612	0.04917
49.00	-0.0014	0.0002	0.9661	0.05520
50.00	-0.0092	-0.0018	0.9689	0.06030
51.00	-0.0160	-0.0258	0.9517	0.06056
52.00	-0.0042	-0.0396	0.9641	0.06049
53.00	-0.0043	-0.0416	0.9426	0.06829
54.00	-0.0095	-0.0525	0.9474	0.05742
56.00	0.0042	-0.0562	0.9714	0.03760
58.00	0.0191	-0.0648	0.9830	0.02685
60.00	0.0267	-0.0599	1.0000	0.01396

TRAV10 SPAN X=147.0 ALF= 8. V,FPS= 49.
VORTEX CENTER=48.00

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
40.00	0.0664	-0.0246	0.9646	0.06415
42.00	0.0799	-0.0331	0.9737	0.06783
44.00	0.0820	-0.0180	0.9699	0.06815
46.00	0.0896	-0.0327	0.9702	0.06986
47.00	0.0407	-0.0180	0.9387	0.08044
48.00	0.0270	-0.0128	0.9314	0.08266
49.00	0.0044	-0.0102	0.9481	0.06200
50.00	-0.0130	-0.0202	0.9701	0.06089
51.00	-0.0173	-0.0180	0.9783	0.04941
52.00	-0.0149	-0.0232	0.9901	0.03641
53.00	-0.0148	-0.0204	0.9938	0.03144
54.00	-0.0083	-0.0255	0.9929	0.01610
56.00	0.0096	-0.0250	1.0073	0.01096
58.00	0.0142	-0.0226	1.0054	0.00872
60.00	0.0161	-0.0259	1.0085	0.00632

Washoe Business Forms, Inc.

TRAVII NORM X=147.0 ALF= 8. V,FPS=138.
VORTEX CENTER=50.00

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
40.00	0.0973	-0.0270	0.9801	0.03878
42.00	0.1041	-0.0392	0.9716	0.06096
44.00	0.1023	-0.0398	0.9673	0.04949
46.00	0.1011	-0.0356	0.9776	0.05030
47.00	0.0995	-0.0291	0.9734	0.05524
49.00	0.0923	-0.0365	0.9279	0.07315
48.00	0.0889	-0.0337	0.9361	0.06863
50.00	0.0824	-0.0941	0.9023	0.07501
51.00	0.1052	-0.1180	0.9218	0.06513
52.00	0.1181	-0.1330	0.9656	0.04933
53.00	0.1266	-0.1372	0.9784	0.03813
54.00	0.1282	-0.1301	0.9917	0.02877
56.00	0.1301	-0.1161	1.0000	0.01574

TRAV12 SPAN X=147.0 ALF= 8 V.FPS=138.
VORTEX CENTER=48.50

24

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
35.00	0.1590	-0.0778	0.9900	0.03092
40.00	0.1623	-0.0803	0.9888	0.05126
42.00	0.1638	-0.0782	0.9874	0.04597
44.00	0.1875	-0.0890	1.0063	0.03678
46.00	0.2069	-0.0964	0.9877	0.04603
47.00	0.1995	-0.1051	0.9629	0.06592
48.00	0.1532	-0.1002	0.9228	0.07312
49.00	0.1203	-0.0988	0.9096	0.07883
50.00	0.0596	-0.0871	0.9259	0.06858
51.00	0.0589	-0.0774	0.9384	0.05604
52.00	0.0498	-0.0686	0.9540	0.04399
53.00	0.0530	-0.0637	0.9734	0.03222
54.00	0.0731	-0.0706	0.9847	0.02470
56.00	0.0788	-0.0708	0.9833	0.01360

TRAV13 NORM X=147.0 ALF= 8. V.FPS=184.
VORTEX CENTER=50.00

25

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
36.00	0.1413	-0.0538	1.0037	0.01042
38.00	0.1429	-0.0509	1.0130	0.02003
40.00	0.1432	-0.0490	0.9980	0.03973
42.00	0.1393	-0.0575	0.9814	0.06163
44.00	0.1394	-0.0662	0.9932	0.04914
46.00	0.1357	-0.0539	0.9901	0.04795
47.00	0.1305	-0.0425	0.9793	0.05170
48.00	0.1053	-0.0345	0.9444	0.06507
49.00	0.0959	-0.0524	0.9080	0.07675
50.00	0.1008	-0.0903	0.9066	0.07729
51.00	0.1198	-0.1192	0.9119	0.06991
52.00	0.1315	-0.1432	0.9496	0.05431
53.00	0.1549	-0.1512	0.9936	0.03909
54.00	0.1582	-0.1465	0.9996	0.03242
56.00	0.1607	-0.1348	1.0049	0.02196
58.00	0.1625	-0.1213	1.0000	0.01404

McGraw-Hill

TRAV14 SPAN X=147.0 ALF= 8. V,FPS=184.
VORTEX CENTER=48.50

26

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
36.00	0.1995	-0.1023	1.0039	0.03975
38.00	0.2052	-0.1064	1.0104	0.04873
40.00	0.2064	-0.1076	1.0101	0.05045
42.00	0.2144	-0.1093	1.0209	0.04629
44.00	0.2368	-0.1158	1.0242	0.04183
46.00	0.2539	-0.1210	1.0110	0.05472
47.00	0.2421	-0.1220	0.9721	0.06566
48.00	0.1793	-0.1118	0.9069	0.08052
49.00	0.1166	-0.0975	0.9034	0.07888
50.00	0.0820	-0.0864	0.9294	0.06901
51.00	0.0776	-0.0834	0.9543	0.05419
52.00	0.0773	-0.0847	0.9843	0.04490
53.00	0.0920	-0.0844	0.9963	0.02954
54.00	0.0990	-0.0855	0.9993	0.02322
56.00	0.1106	-0.0884	1.0108	0.01412

M/S Business Forms, Inc.

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	-0.0050	0.0114	0.9817	0.00542
15.00	0.0068	0.0059	0.9922	0.00582
20.00	0.0044	0.0070	0.9960	0.00519
25.00	0.0056	0.0090	0.9959	0.00577
30.00	0.0046	0.0134	0.9978	0.00598
35.00	0.0036	0.0152	0.9979	0.00543
36.00	-0.0014	0.0181	0.9946	0.00528
37.00	-0.0024	0.0277	1.0002	0.00569
38.00	-0.0048	0.0211	0.9986	0.00592
39.00	-0.0084	0.0215	1.0026	0.00562
40.00	-0.0089	0.0247	0.9990	0.00663
41.00	-0.0103	0.0253	1.0028	0.00661
42.00	-0.0113	0.0324	1.0058	0.00857
43.00	-0.0219	0.0381	1.0068	0.02043
44.00	-0.0355	0.0485	1.0014	0.04730
45.00	-0.0590	0.0626	0.9675	0.07243
46.00	-0.0712	0.0494	0.9034	0.10284
47.00	-0.0774	0.0161	0.9022	0.11304
48.00	-0.0889	-0.0195	0.9038	0.10980
49.00	-0.0619	-0.0646	0.9442	0.08476
50.00	-0.0450	-0.0807	0.9511	0.07660
51.00	-0.0251	-0.0751	0.9776	0.06044
52.00	-0.0252	-0.0612	0.9882	0.03934
53.00	-0.0159	-0.0462	0.9964	0.01554
54.00	-0.0170	-0.0421	0.9990	0.00729
56.00	-0.0144	-0.0369	0.9994	0.00540
58.00	-0.0079	-0.0296	0.9967	0.00600
60.00	-0.0067	-0.0264	0.9974	0.00649
62.00	-0.0065	-0.0238	0.9972	0.00567
64.00	-0.0041	-0.0212	0.9980	0.00580
66.00	-0.0031	-0.0193	0.9997	0.00538
68.00	-0.0031	-0.0169	1.0015	0.00584
70.00	-0.0016	-0.0161	0.9985	0.00560
75.00	-0.0021	-0.0114	1.0006	0.00548
80.00	-0.0002	-0.0091	1.0000	0.00563

NOT REPRODUCIBLE

TRAV16 SPAN X= 31.5 ALF= 8. V,FPS=100.
VORTEX CENTER=50.20

28

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0637	-0.0031	0.8313	0.19092
15.00	0.0569	0.0089	0.7920	0.19854
20.00	0.0492	0.0184	0.9642	0.02057
25.00	0.0514	-0.0074	0.9433	0.07537
30.00	0.0325	-0.0085	0.9221	0.08778
35.00	0.0462	0.0089	0.9538	0.07105
36.00	0.0515	0.0096	0.9521	0.08794
37.00	0.0550	0.0014	0.9250	0.10934
38.00	0.0443	-0.0048	0.8945	0.12046
39.00	0.0345	-0.0066	0.8849	0.12302
40.00	0.0140	-0.0104	0.9071	0.11940
41.00	0.0048	-0.0064	0.9196	0.10848
42.00	-0.0023	-0.0038	0.9354	0.09755
43.00	0.0048	-0.0107	0.9597	0.07703
44.00	0.0210	-0.0094	0.9736	0.06114
45.00	0.0293	-0.0022	0.9831	0.04087
46.00	0.0501	0.0065	0.9863	0.03231
47.00	0.0641	0.0186	0.9855	0.03754
48.00	0.0835	0.0276	0.9620	0.06605
49.00	0.0808	0.0310	0.9210	0.09972
50.00	0.0201	0.0418	0.8536	0.11943
51.00	-0.0630	0.0339	0.8954	0.10920
52.00	-0.0977	0.0279	0.9640	0.06495
53.00	-0.0905	0.0127	1.0001	0.03466
54.00	-0.0772	0.0101	1.0010	0.01105
55.00	-0.0617	0.0006	1.0057	0.00726
56.00	-0.0492	-0.0028	1.0039	0.00561
57.00	-0.0373	-0.0050	1.0063	0.00540
58.00	-0.0396	-0.0014	1.0092	0.00540
60.00	-0.0360	-0.0017	1.0070	0.00530
62.00	-0.0297	-0.0018	1.0010	0.00528
64.00	-0.0262	-0.0021	0.9996	0.00573
66.00	-0.0267	-0.0035	1.0034	0.00550
68.00	-0.0228	-0.0006	1.0007	0.00538
70.00	-0.0148	-0.0072	1.0153	0.00560
72.40	-0.0117	-0.0082	1.0162	0.00539

TRAV17 NORM X= 48.2 ALF= 8. V,FPS=100.
VORTEX CENTER=47.50

29

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	-0.0029	0.0159	0.9851	0.00483
15.00	-0.0023	0.0182	0.9859	0.00498
20.00	0.0008	0.0162	0.9947	0.00510
25.00	0.0056	0.0155	0.9946	0.00509
30.00	0.0028	0.0189	0.9979	0.00498
32.00	0.0021	0.0198	1.0012	0.00519
34.00	0.0009	0.0197	1.0033	0.00537
35.00	-0.0024	0.0215	1.0037	0.00514
36.00	-0.0013	0.0241	1.0066	0.00520
37.00	-0.0019	0.0241	0.9984	0.00486
38.00	0.0069	0.0189	1.0096	0.00541
39.00	-0.0055	0.0252	1.0034	0.00584
40.00	-0.0072	0.0261	1.0049	0.00609
41.00	-0.0094	0.0290	0.9927	0.00714
42.00	-0.0183	0.0365	1.0143	0.01313
43.00	-0.0146	0.0408	1.0056	0.02884
44.00	-0.0205	0.0491	0.9968	0.04081
45.00	-0.0254	0.0628	0.9785	0.06310
46.00	-0.0354	0.0618	0.9298	0.08048
47.00	-0.0365	0.0285	0.8569	0.09376
48.00	-0.0347	-0.0264	0.8631	0.09367
49.00	-0.0387	-0.0833	0.9224	0.07225
50.00	-0.0293	-0.0823	0.9770	0.04709
51.00	-0.0239	-0.0748	0.9805	0.03950
52.00	-0.0220	-0.0645	0.9854	0.03823
53.00	-0.0139	-0.0468	0.9844	0.03056
54.00	-0.0125	-0.0413	0.9919	0.01767
55.00	-0.0093	-0.0353	0.9917	0.00686
56.00	-0.0067	-0.0320	0.9910	0.00596
57.00	-0.0067	-0.0284	0.9935	0.00568
58.00	-0.0066	-0.0277	0.9920	0.00519
60.00	-0.0035	-0.0222	0.9921	0.00520
65.00	-0.0036	-0.0186	0.9966	0.00516
70.00	0.0007	-0.0137	0.9948	0.00555
75.00	0.0034	-0.0097	0.9907	0.00508
82.50	-0.0015	-0.0050	1.0000	0.00568

TRAV18 SPAN X= 48.2 ALF= 8. V,FPS=100.
VORTEX CENTER=50.00

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0550	-0.0009	0.8746	0.13474
15.00	0.0648	0.0140	0.8707	0.13068
20.00	0.0415	0.0200	0.9529	0.03771
25.00	0.0393	0.0060	0.9463	0.04854
30.00	0.0299	-0.0059	0.9233	0.06594
35.00	0.0368	0.0050	0.9431	0.05718
36.00	0.0431	0.0045	0.9377	0.06829
37.00	0.0459	0.0023	0.9240	0.08196
38.00	0.0406	-0.0005	0.9012	0.09430
39.00	0.0372	-0.0054	0.8903	0.09942
40.00	0.0290	-0.0073	0.8978	0.09935
41.00	0.0152	-0.0082	0.9134	0.09109
42.00	0.0101	-0.0041	0.9280	0.08163
43.00	0.0124	-0.0032	0.9368	0.06650
44.00	0.0262	-0.0041	0.9551	0.05293
45.00	0.0336	0.0028	0.9590	0.04087
46.00	0.0405	0.0125	0.9636	0.03435
47.00	0.0573	0.0250	0.9599	0.04305
48.00	0.0760	0.0400	0.9427	0.06246
49.00	0.0589	0.0564	0.8981	0.07909
50.00	0.0056	0.0612	0.8651	0.08828
51.00	-0.0412	0.0477	0.8740	0.08492
52.00	-0.0821	0.0338	0.9143	0.07068
53.00	-0.0900	0.0255	0.9521	0.04724
54.00	-0.0739	0.0147	0.9674	0.02439
55.00	-0.0548	0.0059	0.9798	0.01022
56.00	-0.0463	0.0031	0.9758	0.00563
57.00	-0.0430	0.0016	0.9744	0.00508
58.00	-0.0361	-0.0006	0.9819	0.00516
60.00	-0.0322	0.0004	0.9760	0.00549
65.00	-0.0283	0.0009	0.9758	0.00538
72.40	-0.0200	0.0021	0.9696	0.00545

VORTEX CENTER=48.00

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	-0.0077	0.0113	0.9725	0.00470
15.00	-0.0072	0.0134	0.9734	0.00461
20.00	-0.0072	0.0135	0.9763	0.00466
25.00	-0.0077	0.0162	0.9776	0.00440
30.00	-0.0071	0.0184	0.9803	0.00440
32.00	-0.0052	0.0201	0.9809	0.00457
34.00	-0.0091	0.0215	0.9842	0.00460
35.00	-0.0096	0.0200	0.9855	0.00469
36.00	-0.0091	0.0209	0.9855	0.00473
37.00	-0.0115	0.0237	0.9893	0.00489
38.00	-0.0125	0.0238	0.9923	0.00473
39.00	-0.0150	0.0230	0.9936	0.00523
40.00	-0.0160	0.0225	0.9961	0.00577
41.00	-0.0180	0.0225	0.9992	0.00765
42.00	-0.0180	0.0251	1.0027	0.01165
43.00	-0.0194	0.0278	1.0029	0.01854
44.00	-0.0238	0.0385	1.0023	0.02718
45.00	-0.0311	0.0465	0.9991	0.03470
46.00	-0.0464	0.0598	0.9768	0.05290
47.00	-0.0539	0.0404	0.9197	0.06761
48.00	-0.0423	-0.0044	0.8679	0.07483
49.00	-0.0420	-0.0517	0.8772	0.06993
50.00	-0.0215	-0.0839	0.9457	0.05359
51.00	-0.0176	-0.0801	0.9812	0.03392
52.00	-0.0123	-0.0670	0.9903	0.01900
53.00	-0.0055	-0.0543	0.9948	0.01581
54.00	-0.0034	-0.0484	0.9925	0.01519
55.00	-0.0024	-0.0421	0.9976	0.01227
56.00	-0.0029	-0.0383	0.9976	0.00788
57.00	-0.0003	-0.0363	0.9965	0.00619
59.00	-0.0008	-0.0337	1.0008	0.00552
60.00	0.0028	-0.0311	0.9970	0.00518
62.00	0.0002	-0.0296	0.9999	0.00539
64.00	0.0023	-0.0243	1.0012	0.00573
66.00	0.0033	-0.0243	0.9999	0.00514
70.00	0.0054	-0.0196	1.0026	0.00500
75.00	0.0063	-0.0148	1.0004	0.00496
80.00	0.0073	-0.0136	1.0000	0.00517

TRAV20

SPAN

X= 73.2

ALF= 8.

V, FPS=100.

32

VORTEX CFNTER=49.70

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0330	-0.0052	0.8770	0.12372
15.00	0.0479	0.0175	0.9561	0.07307
20.00	0.0383	0.0153	0.9437	0.05944
25.00	0.0276	0.0062	0.9728	0.03283
30.00	0.0254	-0.0069	0.9586	0.04765
35.00	0.0304	-0.0017	0.9637	0.04593
40.00	0.0242	-0.0154	0.9310	0.07617
42.00	0.0154	-0.0090	0.9328	0.06907
43.00	0.0113	-0.0027	0.9472	0.06213
44.00	0.0297	-0.0045	0.9678	0.05384
45.00	0.0387	0.0007	0.9624	0.04913
46.00	0.0515	0.0139	0.9622	0.04753
46.50	0.0561	0.0141	0.9568	0.04885
47.00	0.0629	0.0146	0.9443	0.05195
47.50	0.0668	0.0121	0.9295	0.05658
48.00	0.0556	0.0274	0.9067	0.06558
49.00	0.0242	0.0355	0.8925	0.07124
50.00	-0.0219	0.0476	0.8815	0.07337
51.00	-0.0658	0.0374	0.9166	0.06783
52.00	-0.0826	0.0311	0.9382	0.05358
52.50	-0.0865	0.0238	0.9485	0.04444
53.00	-0.0841	0.0206	0.9613	0.04010
53.50	-0.0809	0.0170	0.9621	0.03411
54.00	-0.0711	0.0119	0.9679	0.03033
54.50	-0.0646	0.0076	0.9723	0.02488
55.00	-0.0628	0.0077	0.9757	0.02236
56.00	-0.0568	0.0037	0.9737	0.01015
57.00	-0.0521	0.0070	0.9703	0.00609
58.00	-0.0428	0.0045	0.9700	0.00487
60.00	-0.0355	0.0003	0.9752	0.00492
62.00	-0.0305	-0.0014	0.9751	0.00509
64.00	-0.0270	0.0000	0.9748	0.00531
66.00	-0.0265	-0.0014	0.9756	0.00564
70.00	-0.0260	-0.0017	0.9778	0.00594

TRAV21

NORM

X= 98.2

ALF= 8.

V, FPS=100.

33

VORTEX CENTER=48.20

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	-0.0074	0.0153	1.0017	0.00505
20.00	-0.0117	0.0250	1.0072	0.00500
25.00	-0.0047	0.0176	1.0033	0.00504
30.00	-0.0031	0.0244	1.0061	0.00521
32.00	-0.0052	0.0258	1.0103	0.00508
34.00	-0.0058	0.0260	1.0066	0.00499
36.00	-0.0063	0.0284	1.0108	0.00503
38.00	-0.0112	0.0294	1.0142	0.00645
39.00	-0.0166	0.0319	1.0115	0.00832
40.00	-0.0177	0.0313	1.0123	0.01171
41.00	-0.0252	0.0286	1.0112	0.02153
42.00	-0.0289	0.0320	1.0071	0.02198
43.00	-0.0327	0.0316	1.0077	0.02539
44.00	-0.0332	0.0339	1.0079	0.03084
44.50	-0.0342	0.0371	1.0070	0.03431
45.00	-0.0341	0.0383	1.0052	0.03797
45.50	-0.0377	0.0444	1.0038	0.04377
46.00	-0.0497	0.0481	0.9997	0.04844
46.50	-0.0513	0.0508	0.9888	0.05533
47.00	-0.0566	0.0391	0.9588	0.06256
47.50	-0.0592	0.0380	0.9494	0.06495
48.00	-0.0587	0.0294	0.9210	0.07119
48.50	-0.0599	0.0046	0.9079	0.07271
49.00	-0.0610	-0.0150	0.9057	0.07148
49.50	-0.0554	-0.0299	0.9080	0.06906
50.00	-0.0463	-0.0546	0.9204	0.06243
50.50	-0.0319	-0.0628	0.9296	0.05791
51.00	-0.0322	-0.0647	0.9441	0.04901
52.00	-0.0274	-0.0649	0.9745	0.04156
53.00	-0.0186	-0.0559	0.9916	0.02252
54.00	-0.0158	-0.0478	0.9939	0.01638
55.00	-0.0130	-0.0383	0.9972	0.00926
56.00	-0.0130	-0.0371	0.9980	0.00850
58.00	-0.0102	-0.0312	0.9980	0.00675
60.00	-0.0096	-0.0260	1.0010	0.00563
62.00	-0.0085	-0.0241	1.0010	0.00568
64.00	-0.0074	-0.0216	1.0014	0.00563
66.00	-0.0068	-0.0207	1.0033	0.00559
70.00	-0.0035	-0.0163	1.0024	0.00534

75.00	-0.0030	-0.0122	1.0019	0.00506
80.00	-0.0024	-0.0112	1.0000	0.00541

TRAV22 SPAN X= 98.2 ALF= 8. V,FPS=100.

35

VORTEX CENTER=49.20

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0459	0.0070	0.8816	0.12612
20.00	0.0239	0.0237	0.9319	0.05657
25.00	0.0157	0.0112	0.9802	0.02937
30.00	0.0141	0.0058	0.9757	0.03640
35.00	0.0172	0.0052	0.9740	0.04550
40.00	0.0229	-0.0082	0.9562	0.06501
42.00	0.0223	-0.0018	0.9575	0.06238
43.00	0.0193	-0.0005	0.9648	0.05943
44.00	0.0256	0.0069	0.9702	0.05525
45.00	0.0239	0.0146	0.9678	0.05193
46.00	0.0388	0.0138	0.9731	0.05037
46.50	0.0478	0.0152	0.9638	0.04862
47.00	0.0563	0.0182	0.9582	0.05291
47.50	0.0560	0.0163	0.9410	0.05934
48.00	0.0465	0.0246	0.9293	0.06572
48.50	0.0269	0.0320	0.9181	0.06715
49.00	-0.0060	0.0319	0.9059	0.07291
49.50	-0.0234	0.0433	0.9160	0.07102
50.00	-0.0452	0.0367	0.9137	0.07277
50.50	-0.0608	0.0374	0.9291	0.06611
51.00	-0.0673	0.0445	0.9431	0.06225
51.50	-0.0854	0.0296	0.9536	0.05152
52.00	-0.0906	0.0312	0.9641	0.04480
52.50	-0.0925	0.0335	0.9704	0.03880
53.00	-0.0823	0.0244	0.9814	0.03344
53.50	-0.0795	0.0227	0.9857	0.02978
54.00	-0.0765	0.0179	0.9769	0.02496
55.00	-0.0633	0.0128	0.9950	0.02093
56.00	-0.0508	0.0075	1.0011	0.01180
57.00	-0.0492	0.0053	1.0015	0.00847
58.00	-0.0448	0.0074	1.0013	0.03419
60.00	-0.0393	0.0061	0.9955	0.00582
62.00	-0.0404	0.0062	0.9990	0.00527
64.00	-0.0371	0.0049	0.9953	0.00654
66.00	-0.0349	0.0062	0.9948	0.00618
70.00	-0.0311	0.0028	0.9916	0.00631
72.40	-0.0278	0.0053	0.9880	0.00614

TRAV23 NORM X=123.2 ALF= 8. V,FPS=100.

36

VORTEX CENTER=49.50

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	0.0053	0.0143	0.9967	0.00536
20.00	0.0058	0.0146	0.9963	0.00523
25.00	0.0042	0.0174	0.9966	0.00480
30.00	0.0033	0.0201	1.0033	0.00480
32.00	0.0012	0.0232	1.0037	0.00510
34.00	0.0017	0.0235	1.0033	0.00532
36.00	-0.0024	0.0244	1.0095	0.00620
38.00	-0.0044	0.0250	1.0099	0.00933
39.00	-0.0111	0.0296	1.0070	0.01721
40.00	-0.0218	0.0316	1.0023	0.02525
41.00	-0.0265	0.0307	1.0060	0.02917
42.00	-0.0279	0.0275	0.9952	0.04118
43.00	-0.0300	0.0263	0.9975	0.03991
44.00	-0.0315	0.0228	0.9970	0.03726
44.50	-0.0284	0.0272	0.9962	0.03639
45.00	-0.0321	0.0251	0.9992	0.03859
45.50	-0.0294	0.0291	0.9970	0.04294
46.00	-0.0267	0.0329	0.9911	0.04560
46.50	-0.0372	0.0340	0.9865	0.05227
47.00	-0.0376	0.0348	0.9835	0.04950
47.50	-0.0332	0.0291	0.9640	0.05971
48.00	-0.0372	0.0207	0.9422	0.06346
48.50	-0.0450	0.0115	0.9358	0.06368
49.00	-0.0463	-0.0037	0.9217	0.06856
49.50	-0.0363	-0.0065	0.9074	0.06895
50.00	-0.0403	-0.0331	0.9270	0.05774
50.50	-0.0317	-0.0505	0.9298	0.06134
51.00	-0.0325	-0.0593	0.9360	0.05289
52.00	-0.0243	-0.0687	0.9563	0.04192
53.00	-0.0150	-0.0544	0.9777	0.03018
54.00	-0.0098	-0.0531	0.9960	0.01981
55.00	-0.0034	-0.0453	0.9944	0.01332
56.00	-0.0029	-0.0397	0.9978	0.00858
58.00	0.0008	-0.0352	0.9983	0.00622
60.00	0.0008	-0.0298	0.9995	0.00609
62.00	0.0049	-0.0262	0.9946	0.00536
64.00	0.0024	-0.0247	0.9999	0.00593
66.00	0.0044	-0.0241	0.9973	0.00502
70.00	0.0064	-0.0192	0.9932	0.00506

75.00

0.0075

-0.0169

0.9991

0.00484

80.00

0.0075

-0.0156

1.0000

0.00631

TRAV24 SPAN X=123.2 ALF= 8. V, FPS=100.

VORTEX CENTER=48.70

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0381	0.0006	0.8375	0.12299
20.00	0.0351	0.0170	0.9366	0.05074
25.00	0.0190	0.0083	0.9926	0.02106
30.00	0.0201	0.0015	0.9909	0.02608
35.00	0.0266	-0.0040	0.9799	0.03592
40.00	0.0302	-0.0096	0.9650	0.05032
42.00	0.0304	-0.0066	0.9707	0.04953
43.00	0.0295	-0.0029	0.9765	0.04744
44.00	0.0316	-0.0004	0.9813	0.04382
45.00	0.0468	0.0009	0.9802	0.04569
46.00	0.0563	0.0039	0.9799	0.04649
46.50	0.0630	0.0001	0.9557	0.05028
47.00	0.0580	0.0033	0.9568	0.04911
47.50	0.0536	0.0057	0.9318	0.06237
48.00	0.0281	0.0040	0.9225	0.06306
48.50	0.0202	0.0115	0.9181	0.06771
49.00	-0.0080	0.0125	0.9147	0.06924
49.50	-0.0152	0.0215	0.9165	0.06666
50.00	-0.0418	0.0203	0.9327	0.06215
50.50	-0.0598	0.0190	0.9455	0.05583
51.00	-0.0648	0.0141	0.9633	0.05043
51.50	-0.0686	0.0077	0.9745	0.04110
52.00	-0.0729	0.0039	0.9856	0.04106
52.50	-0.0725	0.0061	0.9898	0.03201
53.00	-0.0694	0.0125	0.9940	0.02988
53.50	-0.0629	0.0037	0.9998	0.02513
54.00	-0.0584	0.0017	1.0019	0.02090
55.00	-0.0528	0.0010	1.0036	0.01756
56.00	-0.0485	0.0029	1.0009	0.01163
57.00	-0.0349	-0.0018	1.0116	0.00853
58.00	-0.0312	-0.0021	1.0120	0.00641
60.00	-0.0313	0.0005	1.0176	0.00563
62.00	-0.0276	0.0027	1.0140	0.00516
64.00	-0.0260	0.0024	1.0131	0.00658
66.00	-0.0203	-0.0003	1.0169	0.00590
70.00	-0.0203	-0.0003	1.0188	0.00538
72.40	-0.0192	0.0022	1.0136	0.00529

TRAV25 NORM X=147.0 ALF= 8. V,FPS=100.
 VORTEX CENTER=49.70

38 A

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	0.0002	0.0152	1.0096	0.00506
20.00	0.0029	0.0168	1.0112	0.00485
25.00	0.0018	0.0174	1.0116	0.00462
30.00	0.0003	0.0190	1.0119	0.00489
32.00	-0.0007	0.0215	1.0111	0.00520
34.00	-0.0028	0.0234	1.0125	0.00599
36.00	-0.0034	0.0244	1.0126	0.00818
38.00	-0.0116	0.0398	1.0152	0.02490
39.00	-0.0140	0.0364	1.0065	0.02506
40.00	-0.0197	0.0345	1.0022	0.03649
41.00	-0.0225	0.0354	0.9941	0.04152
42.00	-0.0213	0.0281	0.9857	0.05237
43.00	-0.0186	0.0252	0.9791	0.04808
44.00	-0.0240	0.0228	0.9870	0.04508
44.50	-0.0263	0.0229	0.9915	0.04259
45.00	-0.0246	0.0257	0.9910	0.04205
45.50	-0.0252	0.0268	0.9942	0.04467
46.00	-0.0260	0.0291	0.9890	0.04516
46.50	-0.0277	0.0288	0.9927	0.04648
47.00	-0.0344	0.0333	0.9836	0.04842
47.50	-0.0330	0.0316	0.9644	0.05359
48.00	-0.0431	0.0255	0.9620	0.05923
48.50	-0.0483	0.0186	0.9520	0.06277
49.00	-0.0342	0.0041	0.9296	0.06458
49.50	-0.0397	-0.0071	0.9318	0.06685
50.00	-0.0423	-0.0234	0.9315	0.06994
50.50	-0.0405	-0.0347	0.9276	0.05866
51.00	-0.0366	-0.0463	0.9322	0.05562
52.00	-0.0260	-0.0598	0.9564	0.04485
53.00	-0.0259	-0.0631	0.9777	0.03346
54.00	-0.0210	-0.0559	0.9832	0.02651
55.00	-0.0206	-0.0494	0.9917	0.02145
56.00	-0.0166	-0.0412	0.9927	0.01275
58.00	-0.0144	-0.0334	0.9973	0.00708
60.00	-0.0127	-0.0318	0.9958	0.00605
62.00	-0.0100	-0.0273	1.0002	0.00535
64.00	-0.0061	-0.0232	0.9983	0.00562
66.00	-0.0028	-0.0214	0.9975	0.00518
70.00	-0.0040	-0.0190	1.0024	0.00527

75.00

-0.0007

-0.0165

1.0020

0.00523

80.00

-0.0001

-0.0130

1.0000

0.00505

TRAV26 SPAN X=147.0 ALF= 8. V,FPS=100.
VORTEX CENTER=48.80

40

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0362	0.0075	0.8231	0.11630
20.00	0.0284	0.0181	0.9407	0.05216
25.00	0.0082	0.0095	0.9896	0.01930
30.00	0.0108	0.0011	0.9856	0.01860
32.00	0.0124	0.0027	0.9905	0.02107
34.00	0.0218	-0.0036	0.9745	0.03259
36.00	0.0238	-0.0037	0.9688	0.03706
38.00	0.0233	-0.0058	0.9634	0.04734
39.00	0.0243	-0.0064	0.9617	0.04546
40.00	0.0243	-0.0065	0.9622	0.04565
41.00	0.0238	-0.0049	0.9639	0.04509
42.00	0.0249	-0.0049	0.9647	0.04367
43.00	0.0265	-0.0004	0.9722	0.04398
44.00	0.0337	0.0038	0.9690	0.04284
44.50	0.0353	0.0053	0.9720	0.04267
45.00	0.0398	0.0079	0.9670	0.04268
45.50	0.0472	0.0122	0.9610	0.04978
46.00	0.0461	0.0049	0.9545	0.04888
46.50	0.0434	0.0130	0.9540	0.05325
47.00	0.0457	0.0047	0.9419	0.05873
47.50	0.0349	0.0169	0.9347	0.06397
48.00	0.0116	0.0187	0.9196	0.06581
48.50	-0.0065	0.0030	0.9164	0.06563
49.00	-0.0201	0.0120	0.9186	0.06219
49.50	-0.0347	0.0133	0.9287	0.06114
50.00	-0.0482	0.0082	0.9365	0.06155
50.50	-0.0657	0.0116	0.9525	0.05203
51.00	-0.0727	0.0065	0.9607	0.04650
51.50	-0.0746	0.0082	0.9611	0.04118
52.00	-0.0717	0.0031	0.9714	0.03550
52.50	-0.0708	0.0043	0.9796	0.03061
53.00	-0.0710	-0.0000	0.9799	0.02881
53.50	-0.0700	0.0000	0.9798	0.02539
54.00	-0.0643	-0.0002	0.9872	0.01995
54.50	-0.0539	-0.0027	0.9863	0.01712
55.00	-0.0550	-0.0021	0.9881	0.01277
56.00	-0.0530	-0.0008	0.9894	0.00978
57.00	-0.0480	0.0015	0.9867	0.00832
58.00	-0.0469	0.0009	0.9862	0.00714

59.00	-0.0436	0.0011	0.9841	0.00637
60.00	-0.0438	0.0011	0.9867	0.00509
62.00	-0.0410	0.0021	0.9835	0.00545
64.00	-0.0378	0.0047	0.9851	0.00569
66.00	-0.0360	0.0005	0.9895	0.00559
68.00	-0.0269	-0.0035	0.9952	0.00553
70.00	-0.0230	-0.0044	0.9898	0.00629
72.40	-0.0210	-0.0050	0.9938	0.00571

IHC900I EXECUTION TERMINATING DUE TO ERROR COUNT FOR ERROR NUMBER 217

IHC217I FIOCS - END OF DATA SET ON UNIT 5

TRACEBACK FOLLOWS-	ROUTINE	ISN	REG. 14	REG. 15	REG. 0	PF
	IBCOM		0007CB84	0007D3D0	00000000	00
	MAIN		00002F98	5007A820	00000074	00

ENTRY POINT= 5007A820

TRAV27 NORM X=147.0 ALF= 8. V, FPS=100.
VORTEX CENTER=47.50

42

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
30.00	0.0070	0.0213	1.0087	0.00573
32.00	0.0058	0.0221	1.0107	0.00554
34.00	0.0046	0.0221	1.0122	0.00608
36.00	0.0022	0.0242	1.0137	0.00831
38.00	-0.0008	0.0274	1.0132	0.01471
40.00	-0.0083	0.0317	0.9999	0.03387
42.00	-0.0069	0.0264	0.9832	0.04542
43.00	-0.0119	0.0264	0.9733	0.04977
44.00	-0.0138	0.0178	0.9708	0.05026
45.00	-0.0174	0.0130	0.9726	0.04832
46.00	-0.0193	0.0113	0.9771	0.04590
47.00	-0.0221	0.0061	0.9708	0.04710
48.00	-0.0252	0.0009	0.9714	0.04628
49.00	-0.0267	-0.0062	0.9603	0.04628
50.00	-0.0258	-0.0201	0.9582	0.04724
51.00	-0.0276	-0.0308	0.9522	0.04782
52.00	-0.0267	-0.0310	0.9599	0.04375
53.00	-0.0254	-0.0421	0.9679	0.03878
54.00	-0.0144	-0.0441	0.9839	0.02972
55.00	-0.0157	-0.0422	0.9867	0.02770
56.00	-0.0108	-0.0362	0.9888	0.02167
58.00	-0.0096	-0.0303	0.9944	0.01502
60.00	-0.0090	-0.0240	1.0017	0.00861
62.00	-0.0053	-0.0225	1.0005	0.00564
64.00	-0.0059	-0.0201	1.0000	0.00626

TRAV28 SPAN X=147.0 ALF= 8. V,FPS=100.
VORTEX CENTER=47.70

43

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
36.00	0.0360	-0.0057	0.9738	0.03562
38.00	0.0337	-0.0071	0.9743	0.04108
40.00	0.0325	-0.0071	0.9771	0.04236
42.00	0.0360	-0.0030	0.9772	0.04069
44.00	0.0580	0.0012	0.9703	0.04788
46.00	0.0422	0.0055	0.9499	0.05335
47.00	0.0101	-0.0041	0.9307	0.05477
48.00	-0.0093	-0.0043	0.9403	0.05290
49.00	-0.0212	-0.0051	0.9528	0.05198
50.00	-0.0350	-0.0065	0.9635	0.04446
51.00	-0.0433	-0.0065	0.9789	0.03519
52.00	-0.0459	-0.0052	0.9846	0.02971
53.00	-0.0392	-0.0071	0.9945	0.02003
54.00	-0.0351	-0.0080	0.9958	0.05565
56.00	-0.0304	-0.0079	0.9986	0.00718
58.00	-0.0168	-0.0129	1.0085	0.00574
60.00	-0.0150	-0.0098	1.0099	0.00613
62.00	-0.0126	-0.0090	1.0119	0.00569
64.00	-0.0132	-0.0087	1.0108	0.00688

Avire Business Forms, Inc.

TRAV29 NORM X=147.0 ALF= P. V,FPS=100.
VORTEX CENTER=49.50

44

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	0.0053	0.0129	1.0750	0.00524
20.00	0.0047	0.0174	1.0775	0.00556
25.00	0.0040	0.0187	1.0799	0.00801
30.00	-0.0022	0.0223	1.0749	0.02236
32.00	-0.0088	0.0362	1.0544	0.03025
34.00	-0.0096	0.0407	1.0474	0.03863
36.00	-0.0137	0.0362	1.0352	0.04950
38.00	-0.0145	0.0331	1.0166	0.05680
39.00	-0.0135	0.0307	1.0039	0.05998
40.00	-0.0154	0.0311	1.0057	0.06037
41.00	-0.0158	0.0321	1.0031	0.06195
42.00	-0.0183	0.0279	1.0016	0.06298
43.00	-0.0156	0.0279	0.9982	0.06372
44.00	-0.0191	0.0260	0.9958	0.06324
44.50	-0.0240	0.0240	1.0009	0.06367
45.00	-0.0234	0.0253	1.0025	0.06503
45.50	-0.0266	0.0215	1.0010	0.06268
46.00	-0.0294	0.0199	1.0038	0.06290
46.50	-0.0114	0.0317	0.9883	0.06354
47.00	-0.0307	0.0119	0.9983	0.06730
47.50	-0.0341	0.0085	0.9876	0.06589
48.00	-0.0355	0.0015	0.9844	0.06973
48.50	-0.0377	-0.0028	0.9850	0.06825
49.00	-0.0391	-0.0085	0.9707	0.07076
49.50	-0.0421	-0.0158	0.9647	0.07275
50.00	-0.0447	-0.0240	0.9443	0.07055
50.50	-0.0496	-0.0321	0.9498	0.06665
51.00	-0.0408	-0.0386	0.9434	0.06585
52.00	-0.0478	-0.0466	0.9522	0.06023
53.00	-0.0394	-0.0577	0.9630	0.05317
54.00	-0.0359	-0.0586	0.9702	0.04258
55.00	-0.0246	-0.0575	0.9883	0.02918
56.00	-0.0230	-0.0542	0.9932	0.02196
58.00	-0.0206	-0.0408	1.0038	0.01312
60.00	-0.0168	-0.0343	1.0019	0.00759
62.00	-0.0132	-0.0299	1.0006	0.00697
64.00	-0.0125	-0.0258	1.0027	0.00621
66.00	-0.0259	-0.0340	1.0165	0.00627
70.00	-0.0068	-0.0202	0.9991	0.00595

TRAV30 SPAN X=147.0 ALF= 8. V,FPS=100.
VORTEX CENTER=44.50

46

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0426	0.0045	0.8531	0.11306
20.00	0.0339	0.0303	0.9390	0.05083
25.00	0.0188	0.0205	0.9916	0.01743
30.00	0.0261	0.0217	0.9922	0.01672
32.00	0.0298	0.0218	0.9904	0.02055
34.00	0.0353	0.0230	0.9886	0.02701
36.00	0.0466	0.0155	0.9930	0.03115
38.00	0.0514	0.0157	0.9927	0.03070
39.00	0.0513	0.0151	0.9943	0.03588
40.00	0.0620	0.0212	0.9855	0.04266
41.00	0.0622	0.0098	0.9702	0.05623
42.00	0.0594	0.0076	0.9652	0.05528
43.00	0.0470	0.0207	0.9532	0.06155
44.00	0.0281	0.0146	0.9413	0.06827
44.50	0.0200	0.0237	0.9348	0.07192
45.00	0.0073	0.0179	0.9387	0.07221
45.50	-0.0091	0.0155	0.9352	0.06886
46.00	-0.0186	0.0105	0.9323	0.07031
46.50	-0.0266	0.0089	0.9414	0.06465
47.00	-0.0282	0.0113	0.9406	0.06733
47.50	-0.0331	0.0110	0.9486	0.06470
48.00	-0.0395	0.0032	0.9479	0.06246
48.50	-0.0397	0.0040	0.9499	0.06264
49.00	-0.0417	0.0043	0.9527	0.05901
49.50	-0.0462	0.0044	0.9552	0.05742
50.00	-0.0487	0.0003	0.9583	0.05575
50.50	-0.0469	0.0025	0.9547	0.05424
51.00	-0.0492	0.0006	0.9574	0.05344
52.00	-0.0566	-0.0027	0.9672	0.04562
53.00	-0.0559	0.0015	0.9693	0.04302
54.00	-0.0545	0.0022	0.9733	0.03428
56.00	-0.0574	0.0042	0.9846	0.02166
58.00	-0.0548	0.0044	0.9832	0.01039
60.00	-0.0481	0.0044	0.9903	0.00821
65.00	-0.0392	0.0018	0.9917	0.00654
72.40	-0.0313	0.0014	0.9930	0.00622

TRAV31 NORM X=147.0 ALF= 4. V, FPS=100.

VORTEX CENTER=50.80

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	-0.0016	0.0276	1.0193	0.00525
20.00	-0.0016	0.0277	1.0216	0.00521
25.00	0.0005	0.0283	1.0256	0.00564
30.00	0.0034	0.0317	1.0227	0.00827
32.00	0.0034	0.0351	1.0234	0.01589
34.00	0.0000	0.0389	1.0223	0.03217
36.00	-0.0161	0.0454	1.0038	0.03607
38.00	-0.0310	0.0489	0.9896	0.04050
40.00	-0.0395	0.0359	0.9741	0.04475
41.00	-0.0404	0.0190	0.9664	0.04534
42.00	-0.0381	0.0113	0.9567	0.04797
43.00	-0.0356	0.0012	0.9525	0.04655
44.00	-0.0342	-0.0035	0.9496	0.04487
45.00	-0.0335	-0.0015	0.9497	0.04338
46.00	-0.0318	0.0101	0.9640	0.03948
46.50	-0.0281	0.0095	0.9722	0.03655
47.00	-0.0339	0.0070	0.9775	0.03417
47.50	-0.0354	0.0061	0.9787	0.03078
48.00	-0.0333	0.0058	0.9792	0.03078
48.50	-0.0369	0.0094	0.9833	0.03024
49.00	-0.0487	0.0077	0.9840	0.03254
49.50	-0.0541	0.0041	0.9792	0.03833
50.00	-0.0473	-0.0040	0.9647	0.04449
50.50	-0.0472	-0.0165	0.9546	0.04511
51.00	-0.0442	-0.0409	0.9434	0.04850
51.50	-0.0479	-0.0438	0.9460	0.03458
52.00	-0.0323	-0.0558	0.9567	0.03418
52.50	-0.0288	-0.0630	0.9669	0.02939
53.00	-0.0220	-0.0700	0.9721	0.02387
53.50	-0.0275	-0.0659	0.9839	0.02016
54.00	-0.0136	-0.0637	0.9855	0.01658
55.00	-0.0136	-0.0599	0.9859	0.01321
56.00	-0.0100	-0.0537	0.9957	0.00765
57.00	-0.0077	-0.0461	0.9959	0.00615
58.00	-0.0092	-0.0423	0.9987	0.00570
59.00	-0.0077	-0.0392	1.0013	0.00560
60.00	-0.0055	-0.0355	1.0012	0.00543
62.00	-0.0040	-0.0339	1.0005	0.00544
64.00	-0.0032	-0.0327	1.0004	0.00558

66.00	-0.0025	-0.0307	1.0032	0.00585
68.00	-0.0025	-0.0291	1.0021	0.00599
70.00	-0.0010	-0.0283	1.0031	0.00566
85.00	0.0028	-0.0213	1.0000	0.00768

TRAV32 SPAN X=147.0 ALF= 4. V,FPS=100.
VORTEX CENTER=46.20

49

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0080	-0.0073	0.8620	0.09118
20.00	0.0193	0.0215	0.9163	0.05802
25.00	0.0038	0.0086	0.9661	0.03014
30.00	0.0098	0.0044	0.9765	0.00750
32.00	0.0188	-0.0016	0.9833	0.00658
34.00	0.0209	-0.0028	0.9833	0.00629
36.00	0.0266	-0.0061	0.9867	0.00604
38.00	0.0300	-0.0105	0.9839	0.00616
39.00	0.0328	-0.0121	0.9828	0.00639
40.00	0.0329	-0.0122	0.9850	0.00674
41.00	0.0377	-0.0118	0.9794	0.00825
42.00	0.0425	-0.0098	0.9750	0.01232
43.00	0.0472	-0.0158	0.9667	0.02721
43.50	0.0480	-0.0123	0.9705	0.02152
44.00	0.0572	-0.0061	0.9619	0.03132
44.50	0.0636	-0.0247	0.9391	0.03234
45.00	0.0580	-0.0267	0.9313	0.04572
45.50	0.0261	-0.0135	0.9158	0.05368
46.00	0.0070	-0.0184	0.9173	0.05701
46.50	-0.0218	-0.0208	0.9214	0.04943
47.00	-0.0436	-0.0232	0.9289	0.04113
47.50	-0.0561	-0.0176	0.9470	0.03971
48.00	-0.0613	-0.0175	0.9535	0.03164
48.50	-0.0695	-0.0200	0.9586	0.02814
49.00	-0.0695	-0.0185	0.9602	0.02564
49.50	-0.0737	-0.0177	0.9690	0.02112
50.00	-0.0725	-0.0192	0.9700	0.01909
50.50	-0.0720	-0.0204	0.9716	0.01458
51.00	-0.0707	-0.0211	0.9727	0.01477
51.50	-0.0682	-0.0218	0.9758	0.01125
52.00	-0.0617	-0.0247	0.9799	0.00972
53.00	-0.0535	-0.0259	0.9838	0.00647
54.00	-0.0513	-0.0262	0.9825	0.00585
55.00	-0.0473	-0.0223	0.9787	0.00544
56.00	-0.0458	-0.0199	0.9786	0.00542
57.00	-0.0446	-0.0215	0.9814	0.00586
58.00	-0.0438	-0.0202	0.9813	0.00568
60.00	-0.0424	-0.0210	0.9806	0.00562
62.00	-0.0425	-0.0202	0.9834	0.00567

64.00	-0.0419	-0.0198	0.9845	0.00667
66.00	-0.0420	-0.0206	0.9862	0.00713
68.00	-0.0419	-0.0190	0.9851	0.00611
70.00	-0.0419	-0.0206	0.9840	0.00697
72.00	-0.0420	-0.0214	0.9857	0.00728

TRAV33 NORM X=147.0 ALF= 4. V,FPS=100.
VORTEX CENTER=50.40

51

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
20.00	-0.0000	0.0000	1.0308	0.0
30.00	-0.0000	0.0038	1.0335	0.0
35.00	0.0009	0.0081	1.0288	0.0
40.00	-0.0083	0.0095	1.0309	0.0
44.00	0.0001	-0.0007	1.0194	0.0
45.00	0.0009	-0.0013	1.0233	0.0
46.00	-0.0007	-0.0022	1.0186	0.0
47.00	-0.0022	-0.0009	0.9973	0.0
48.00	-0.0030	-0.0086	0.9929	0.0
49.00	-0.0046	-0.0173	0.9828	0.0
50.00	-0.0013	-0.0171	0.9769	0.0
51.00	-0.0046	-0.0269	0.9780	0.0
52.00	-0.0079	-0.0296	0.9796	0.0
54.00	-0.0190	-0.0326	0.9929	0.0
56.00	-0.0224	-0.0285	1.0000	0.0

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	0.0047	-0.0026	0.9478	0.08550
20.00	0.0151	0.0191	0.9915	0.07183
25.00	0.0071	0.0161	1.0677	0.03944
30.00	0.0036	0.0079	1.0821	0.00825
32.00	0.0090	0.0038	1.0836	0.00718
34.00	0.0090	0.0038	1.0808	0.00691
36.00	0.0090	0.0018	1.0794	0.01067
37.00	0.0090	-0.0031	1.0759	0.01221
38.00	0.0098	-0.0016	1.0752	0.01681
39.00	0.0125	-0.0059	1.0689	0.01820
40.00	0.0108	-0.0051	1.0745	0.11182
41.00	0.0161	-0.0039	1.0666	0.03449
42.00	0.0196	-0.0019	1.0638	0.02671
42.50	0.0204	-0.0013	1.0603	0.02797
43.00	0.0196	0.0010	1.0658	0.03027
43.50	0.0221	0.0016	1.0609	0.02969
44.00	0.0211	0.0022	1.0553	0.03219
44.50	0.0140	0.0093	1.0453	0.03214
45.00	0.0236	0.0009	1.0470	0.03417
45.50	0.0237	0.0018	1.0503	0.03289
46.00	0.0194	-0.0007	1.0538	0.03364
46.50	0.0133	0.0018	1.0544	0.03114
47.00	-0.0025	-0.0012	1.0560	0.02876
47.50	-0.0052	-0.0017	1.0568	0.02879
48.00	-0.0123	-0.0019	1.0617	0.02675
48.50	-0.0169	-0.0045	1.0654	0.02378
49.00	-0.0205	-0.0037	1.0683	0.02100
49.50	-0.0223	-0.0057	1.0692	0.01370
50.00	-0.0159	-0.0030	1.0660	0.01225
51.00	-0.0233	-0.0073	1.0714	0.00993
52.00	-0.0233	-0.0092	1.0700	0.00801
53.00	-0.0242	-0.0106	1.0673	0.00746
54.00	-0.0224	-0.0117	1.0693	0.00661
55.00	-0.0216	-0.0112	1.0713	0.00679
56.00	-0.0179	-0.0121	1.0684	0.00619
58.00	-0.0161	-0.0110	1.0669	0.00691
62.00	-0.0134	-0.0007	1.0758	0.00754
68.00	-0.0097	-0.0112	1.0611	0.00717

VORTEX CENTER=44.70

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	-0.0077	0.0260	0.9806	0.00718
15.00	-0.0047	0.0279	0.9805	0.00677
20.00	-0.0093	0.0292	0.9870	0.00692
25.00	-0.0123	0.0363	0.9940	0.00685
30.00	-0.0101	0.0418	0.9973	0.00677
32.00	-0.0101	0.0501	1.0036	0.01406
34.00	-0.0070	0.0434	0.9929	0.02538
36.00	-0.0046	0.0567	0.9964	0.01235
37.00	-0.0017	0.0665	1.0054	0.00979
38.00	-0.0055	0.0716	1.0114	0.00898
39.00	-0.0033	0.0743	1.0127	0.00898
40.00	-0.0009	0.0908	1.0198	0.01311
41.00	0.0035	0.1163	1.0324	0.02168
41.50	0.0180	0.1314	1.0292	0.02656
42.00	0.0363	0.1430	1.0254	0.04654
42.50	0.0455	0.1539	1.0360	0.04276
43.00	0.0160	0.1710	1.0450	0.06187
43.50	0.1186	0.1667	1.0510	0.09466
44.00	0.1205	0.0599	1.0718	0.11790
44.50	0.1521	0.1362	1.0741	0.11229
45.00	0.1490	-0.0292	1.0499	0.13627
45.50	0.1480	-0.0749	1.0165	0.10579
46.00	0.1239	-0.1117	1.0342	0.09185
46.50	0.0932	-0.1833	1.0031	0.05562
47.00	0.0489	-0.1707	1.0425	0.04108
47.50	0.0383	-0.1714	1.0354	0.04655
48.00	0.0356	-0.1754	1.0122	0.02740
48.50	0.0313	-0.1637	1.0264	0.02636
49.00	0.0507	-0.1385	1.0051	0.02202
50.00	0.0271	-0.1326	1.0241	0.01579
51.00	0.0231	-0.1203	1.0051	0.01309
52.00	0.0193	-0.1021	0.9948	0.00974
53.00	0.0143	-0.0966	1.0028	0.00777
54.00	0.0098	-0.0874	0.9912	0.00759
55.00	0.0097	-0.0756	1.0020	0.00717
56.00	0.0097	-0.0724	1.0073	0.00717
58.00	0.0155	-0.0636	1.0000	0.00755
60.00	0.0124	-0.0583	1.0024	0.00700
65.00	0.0093	-0.0502	1.0000	0.00853

70.00	0.0085	-0.0361	1.0114	0.00802
75.00	0.0081	-0.0257	1.0006	0.00753
80.00	0.0074	-0.0225	1.0000	0.00732

TRAV36 SPAN X=162.0 ALF=12. V,FPS=100.

55

VORTEX CENTER=60.20

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	-0.0234	-0.0373	0.9562	0.06002
15.00	-0.0100	-0.0357	0.9378	0.06439
20.00	0.0004	-0.0260	0.9402	0.05616
25.00	0.0082	-0.0181	0.9576	0.03753
30.00	0.0149	-0.0157	0.9619	0.02093
35.00	0.0193	-0.0021	0.9683	0.01235
40.00	0.0208	0.0008	0.9699	0.00919
42.00	0.0267	-0.0001	0.9715	0.00807
44.00	0.0401	-0.0047	0.9721	0.00852
46.00	0.0499	-0.0031	0.9794	0.00824
48.00	0.0510	-0.0078	0.9908	0.00775
49.00	0.0589	-0.0089	0.9780	0.00817
50.00	0.0605	-0.0050	0.9845	0.00831
51.00	0.0669	-0.0060	0.9759	0.00752
52.00	0.0677	-0.0046	0.9779	0.00879
53.00	0.0739	-0.0028	0.9837	0.00904
54.00	0.0924	-0.0144	0.9862	0.01112
55.00	0.1092	-0.0086	0.9844	0.01447
55.50	0.1028	-0.0161	0.9930	0.01899
56.00	0.1082	-0.0344	0.9817	0.01955
56.50	0.1117	-0.0533	1.0107	0.02145
57.00	0.1283	-0.0556	0.9951	0.01950
57.50	0.0908	-0.1021	1.0261	0.03956
58.00	0.1141	-0.1060	0.9942	0.04055
58.50	0.1137	-0.1146	1.0125	0.05892
59.00	0.0507	-0.1823	1.0235	0.08658
59.50	0.0621	-0.1999	1.0520	0.10687
60.00	-0.0060	-0.2036	1.0573	0.06269
60.50	-0.0723	-0.1738	1.0493	0.06041
61.00	-0.1085	-0.1605	1.0622	0.07922
61.50	-0.1327	-0.1597	1.0631	0.05610
62.00	-0.1506	-0.1081	1.0251	0.03826
62.50	-0.1219	-0.0838	1.0274	0.02951
63.00	-0.1179	-0.0706	1.0204	0.02521
64.00	-0.1224	-0.0609	1.0139	0.01708
65.00	-0.1030	-0.0519	1.0057	0.01512
66.00	-0.0998	-0.0470	0.9965	0.01393
67.00	-0.0938	-0.0374	0.9926	0.01306
68.00	-0.0875	-0.0338	0.9875	0.01083

69.00	-0.0871	-0.0315	0.9923	0.00809
70.00	-0.0847	-0.0286	0.9874	0.00744
72.00	-0.0713	-0.0205	0.9807	0.00726

VORTEX CENTER=44.70

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	-0.0024	0.0134	0.9944	0.00728
15.00	-0.0076	0.0389	1.0124	0.00754
20.00	-0.0085	0.0094	0.9947	0.00713
25.00	-0.0023	0.0151	0.9933	0.00696
30.00	0.0017	0.0153	0.9864	0.00722
32.00	0.0017	0.0242	0.9927	0.00713
34.00	0.0043	0.0289	0.9865	0.00716
36.00	0.0039	0.0277	0.9781	0.01627
37.00	0.0054	0.0277	0.9781	0.01942
38.00	0.0031	0.0304	0.9832	0.01288
39.00	0.0076	0.0350	0.9809	0.00985
40.00	0.0069	0.0457	0.9894	0.01072
40.50	0.0030	0.0489	0.9985	0.01274
41.00	0.0105	0.0554	0.9938	0.01385
41.50	0.0127	0.0611	0.9969	0.01673
42.00	0.0187	0.0664	0.9921	0.01596
42.50	0.0166	0.0676	0.9904	0.02266
43.00	-0.0039	0.0928	0.9943	0.04812
43.50	0.0061	0.0826	0.9994	0.05008
44.00	0.0470	0.0345	0.9560	0.08974
44.50	0.0154	-0.0176	0.9915	0.07785
45.00	0.0636	-0.0189	0.9934	0.09860
45.50	0.0636	-0.0463	0.9741	0.08583
46.00	0.0697	-0.0130	1.0052	0.08566
46.50	0.0531	-0.0964	0.9818	0.04892
47.00	0.0451	-0.0912	0.9977	0.02944
47.50	0.0255	-0.1006	1.0074	0.02444
48.00	0.0247	-0.1037	1.0068	0.02325
48.50	0.0315	-0.0919	1.0005	0.02056
49.00	0.0299	-0.0886	1.0034	0.02025
50.00	0.0203	-0.0930	0.9988	0.01244
51.00	0.0206	-0.0740	1.0054	0.01057
52.00	0.0130	-0.0669	1.0007	0.00805
53.00	0.0044	-0.0605	1.0048	0.00813
54.00	0.0079	-0.0559	1.0001	0.00780
55.00	0.0029	-0.0524	1.0087	0.00814
56.00	0.0069	-0.0473	1.0096	0.00844
58.00	0.0046	-0.0414	1.0130	0.00791
60.00	0.0046	-0.0339	1.0183	0.00911

65.00	0.0091	-0.0261	1.0112	0.00855
70.00	0.0060	-0.0252	1.0120	0.00853
75.00	0.0057	-0.0195	1.0043	0.00722
80.00	0.0075	-0.0168	1.0000	0.00694

TRAV38 SPAN X=162.0 ALF= 8. V,FPS=100.
VORTEX CENTER=59.70

59

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	-0.0291	-0.0252	0.9575	0.05460
15.00	-0.0233	-0.0241	0.9694	0.04741
20.00	-0.0036	-0.0235	0.9762	0.03744
25.00	0.0007	-0.0110	0.9883	0.02756
30.00	0.0097	-0.0108	0.9879	0.01616
35.00	0.0167	-0.0133	0.9780	0.01066
40.00	0.0221	-0.0074	0.9761	0.00777
42.00	0.0252	-0.0067	0.9706	0.00759
44.00	0.0251	-0.0076	0.9722	0.00825
46.00	0.0267	-0.0067	0.9706	0.00858
48.00	0.0266	-0.0027	0.9774	0.00847
49.00	0.0266	0.0020	0.9812	0.00856
50.00	0.0280	0.0021	0.9808	0.00924
51.00	0.0382	-0.0030	0.9878	0.00948
52.00	0.0375	-0.0025	0.9868	0.00808
53.00	0.0434	-0.0025	0.9872	0.00981
54.00	0.0486	-0.0014	0.9811	0.01211
55.00	0.0604	0.0078	0.9833	0.01213
55.50	0.0721	0.0064	0.9795	0.01445
56.00	0.0755	0.0132	0.9777	0.01697
56.50	0.0807	-0.0043	0.9696	0.03037
57.00	0.0951	-0.0007	0.9851	0.03028
57.50	0.1005	-0.0254	0.9725	0.05636
58.00	0.0962	-0.0224	0.9779	0.06658
58.50	0.0821	-0.0036	0.9913	0.08227
59.00	0.0205	-0.0302	0.9889	0.08764
59.50	0.0027	-0.0011	0.9852	0.08188
60.00	-0.0166	0.0005	0.9628	0.08971
60.50	-0.0991	0.0093	0.9910	0.07152
61.00	-0.0865	-0.0124	0.9911	0.05941
61.50	-0.1067	-0.0018	1.0043	0.04788
62.00	-0.1043	0.0059	1.0038	0.04554
62.50	-0.0967	-0.0076	0.9880	0.03433
63.00	-0.0953	-0.0070	0.9786	0.01915
64.00	-0.0860	-0.0075	0.9853	0.01510
65.00	-0.0833	-0.0135	0.9779	0.01396
66.00	-0.0749	-0.0147	0.9931	0.01150
67.00	-0.0714	-0.0113	1.0033	0.01095
68.00	-0.0676	-0.0193	1.0044	0.00667

TRAV39

NORM

X=162.0

ALF= 4.

V, FPS=100.

61

VORTEX CENTER=46.00

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
10.00	-0.0024	0.0080	1.0263	0.00826
15.00	-0.0041	0.0124	1.0290	0.00782
20.00	-0.0044	0.0106	1.0354	0.00787
25.00	-0.0060	0.0094	1.0342	0.00785
30.00	-0.0015	0.0105	1.0260	0.00756
32.00	-0.0033	0.0084	1.0267	0.00749
34.00	-0.0040	0.0122	1.0273	0.01158
36.00	-0.0112	0.0139	1.0397	0.00905
37.00	-0.0058	0.0191	1.0343	0.00884
38.00	-0.0047	0.0202	1.0274	0.00905
39.00	-0.0094	0.0161	1.0391	0.01167
40.00	-0.0090	0.0187	1.0301	0.01567
40.50	-0.0019	0.0179	1.0170	0.01564
41.00	-0.0134	0.0150	1.0334	0.01644
41.50	-0.0108	0.0154	1.0310	0.01604
42.00	-0.0134	0.0172	1.0350	0.01706
42.50	-0.0135	0.0231	1.0417	0.01563
43.00	-0.0122	0.0206	1.0302	0.01633
43.50	-0.0151	0.0228	1.0391	0.02212
44.00	-0.0203	0.0151	1.0381	0.03069
44.50	-0.0279	0.0186	1.0123	0.03566
45.00	-0.0300	0.0136	1.0170	0.04010
45.50	-0.0042	0.0092	0.9827	0.05276
46.00	-0.0300	-0.0222	0.9916	0.04956
46.50	-0.0233	-0.0210	0.9899	0.05589
47.00	-0.0148	-0.0512	0.9980	0.05124
47.50	-0.0111	-0.0471	0.9955	0.02350
48.00	-0.0063	-0.0471	1.0004	0.02311
48.50	-0.0052	-0.0485	0.9942	0.01652
49.00	-0.0149	-0.0462	1.0042	0.04059
50.00	-0.0141	-0.0457	1.0060	0.01260
51.00	-0.0050	-0.0315	1.0000	0.00747
52.00	-0.0036	-0.0295	1.0096	0.00823
53.00	-0.0037	-0.0285	1.0130	0.00774
54.00	-0.0036	-0.0274	1.0111	0.00838
55.00	-0.0019	-0.0233	1.0118	0.00837
56.00	0.0016	-0.0234	1.0075	0.00763
58.00	-0.0018	-0.0213	1.0112	0.00783
60.00	-0.0008	-0.0158	1.0099	0.00798

65.00	-0.0016	-0.0143	1.0105	0.00795
70.00	-0.0014	-0.0133	1.0061	0.00734
75.00	0.0028	-0.0088	1.0045	0.00722
80.00	0.0088	-0.0084	1.0000	0.00799

TRAV40

SPAN

X=162.0

ALF= 4.

V, FPS=100.

VORTEX CENTER=60.50

63

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
11.00	-0.0331	-0.0174	0.9285	0.00741
15.00	-0.0336	-0.0142	0.9379	0.00652
20.00	-0.0121	-0.0078	0.9682	0.00475
25.00	0.0012	-0.0056	0.9784	0.02459
30.00	-0.0006	-0.0083	0.9844	0.01258
35.00	0.0009	-0.0072	0.9876	0.00846
40.00	0.0027	-0.0032	0.9859	0.07605
42.00	0.0109	-0.0023	0.9803	0.07854
44.00	0.0075	-0.0009	0.9893	0.08077
46.00	0.0083	0.0017	0.9901	0.08202
48.00	0.0100	-0.0016	0.9863	0.06595
49.00	0.0116	-0.0006	0.9845	0.08243
50.00	0.0091	-0.0050	0.9868	0.07222
51.00	0.0116	-0.0036	0.9848	0.07938
52.00	0.0099	0.0008	0.9919	0.07793
53.00	0.0132	0.0015	0.9859	0.07922
54.00	0.0140	0.0001	0.9884	0.11066
55.00	0.0140	-0.0030	0.9862	0.01138
56.00	0.0318	0.0024	0.9918	0.01102
56.50	0.0351	-0.0089	0.9858	0.01393
57.00	0.0399	0.0043	0.9892	0.01111
57.50	0.0375	-0.0057	0.9811	0.01901
58.00	0.0516	-0.0026	0.9660	0.03071
58.50	0.0524	0.0051	0.9724	0.04403
59.00	0.0294	-0.0125	0.9852	0.05350
59.50	0.0076	-0.0044	0.9819	0.04137
60.00	0.0119	0.0026	0.9720	0.07248
60.50	0.0081	0.0205	0.9775	0.06454
61.00	-0.0228	-0.0035	0.9764	0.04301
61.50	-0.0286	-0.0062	0.9779	0.03841
62.00	-0.0274	0.0031	0.9649	0.05005
63.00	-0.0428	-0.0080	0.9736	0.01962
64.00	-0.0456	-0.0125	0.9649	0.01594
65.00	-0.0449	-0.0069	0.9703	0.01185
66.00	-0.0435	-0.0026	0.9755	0.10338
67.00	-0.0433	-0.0017	0.9738	0.08960
68.00	-0.0362	-0.0047	0.9846	0.05981
69.00	-0.0286	-0.0102	0.9885	0.06190
70.00	-0.0264	-0.0094	0.9939	0.00728

72.00 -0.0206 -0.0108 0.9914 0.00737

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IHC900I EXECUTION TERMINATING DUE TO ERROR COUNT FOR ERROR NUMBER 217

IHC217I FIOCS - END OF DATA SET ON UNIT 5

TRACEBACK FOLLOWS-	ROUTINE	ISN	REG. 14	REG. 15	REG. 0	REG.
	IBCOM		00055384	00055BD0	00000000	000
	MAIN		00002F98	50053020	00000074	000

ENTRY POINT= 50053020

TRAV41 NORM X= 67.7 ALF= 8. V,FPS=159.
 VORTEX CENTER=46.00

65

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
32.00	0.0522	0.0106	0.9845	0.01026
34.00	0.0513	0.0125	0.9783	0.01102
36.00	0.0540	0.0150	0.9811	0.01073
37.00	0.0525	0.0192	0.9778	0.01214
38.00	0.0521	0.0246	0.9907	0.01228
39.00	0.0521	0.0281	0.9911	0.01265
40.00	0.0504	0.0360	0.9846	0.02425
41.00	0.0508	0.0321	0.9725	0.03067
42.00	0.0500	0.0474	0.9769	0.01907
42.50	0.0546	0.0494	0.9995	0.02222
43.00	0.0605	0.0617	0.9923	0.01802
43.50	0.0678	0.0762	0.9915	0.01962
44.00	0.0768	0.0853	0.9869	0.02615
44.50	0.0968	0.1083	0.9756	0.03210
45.00	0.1109	0.1204	0.9833	0.05771
45.50	0.2109	0.0865	0.9876	0.05775
46.00	0.2039	0.0066	0.9903	0.08509
46.50	0.1730	-0.1307	0.9667	0.06853
47.00	0.1550	-0.1489	0.9811	0.05255
47.50	0.1143	-0.1675	0.9932	0.03290
48.00	0.1022	-0.1569	0.9960	0.02492
48.50	0.1029	-0.1523	0.9874	0.02291
49.00	0.1015	-0.1405	0.9833	0.01907
49.50	0.0917	-0.1262	0.9890	0.01577
50.00	0.0828	-0.1170	0.9906	0.01435
51.00	0.0771	-0.1059	0.9984	0.01150
52.00	0.0700	-0.0977	0.9891	0.01048
53.00	0.0636	-0.0797	0.9833	0.01145
54.00	0.0632	-0.0758	0.9923	0.01332
55.00	0.0630	-0.0750	0.9878	0.01279
56.00	0.0611	-0.0667	1.0001	0.01355
58.00	0.0633	-0.0624	1.0046	0.01258
60.00	0.0608	-0.0599	0.9959	0.01274
62.00	0.0594	-0.0545	1.0000	0.01271

Moore Business Forms, Inc.

TRAV42 SPAN X= 67.7 ALF= 8. V,FPS=159.
VORTEX CENTER=61.60

66

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
44.00	0.0816	-0.0332	0.9679	0.01128
46.00	0.0823	-0.0321	0.9700	0.01074
48.00	0.0811	-0.0312	0.9722	0.01159
50.00	0.0814	-0.0300	0.9681	0.01223
51.00	0.0844	-0.0300	0.9720	0.01268
52.00	0.0851	-0.0296	0.9732	0.01185
53.00	0.0878	-0.0294	0.9631	0.01243
54.00	0.0910	-0.0263	0.9728	0.01219
55.00	0.0966	-0.0231	0.9678	0.01168
56.00	0.1063	-0.0216	0.9658	0.01292
56.50	0.1114	-0.0197	0.9723	0.01239
57.00	0.1223	-0.0221	0.9814	0.01193
57.50	0.1321	-0.0202	0.9867	0.01275
58.00	0.1389	-0.0169	0.9777	0.01591
58.50	0.1527	-0.0100	0.9768	0.01843
59.00	0.1860	-0.0037	0.9815	0.02090
59.50	0.1996	0.0053	0.9694	0.02645
60.00	0.2201	0.0059	0.9679	0.04170
60.50	0.2438	0.0192	0.9940	0.07067
61.00	0.1834	-0.0500	0.9721	0.11416
61.50	0.0289	0.0110	0.9837	0.13834
62.00	-0.1243	-0.0024	1.0216	0.11353
62.50	-0.1113	0.0179	0.9858	0.04216
63.00	-0.1261	0.0046	0.9927	0.05858
63.50	-0.1096	-0.0051	0.9766	0.03989
64.00	-0.0855	-0.0075	0.9822	0.02983
65.00	-0.0688	-0.0075	0.9677	0.02046
66.00	-0.0458	-0.0175	0.9768	0.01595
67.00	-0.0378	-0.0179	0.9809	0.01219
68.00	-0.0294	-0.0160	0.9761	0.00923
69.00	-0.0170	-0.0216	0.9862	0.01081
70.00	0.0172	-0.0387	0.9999	0.01038
72.00	0.0011	-0.0198	0.9761	0.01020

IHC900I EXECUTION TERMINATING DUE TO ERROR COUNT FOR ERROR NUMBER 217

IHC217I FIDCS - END OF DATA SET ON UNIT 5

TRACEBACK FOLLOWS- ROUTINE ISN REG. 14 REG. 15 REG. 0 REG.

Moore Business Forms, Inc. f

TRAV101 NORM X/C= 4.00 ALF=12. V.FPS=100.

67

VORTEX CENTER=91685

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
88500	0.0096	-0.0141	0.9968	0.00000
89500	-0.0001	-0.0139	0.9923	0.00000
90000	-0.0001	-0.0195	1.0005	0.00000
90200	0.0001	-0.0266	1.0008	0.00000
90400	-0.0000	-0.0312	0.9968	0.00000
90600	0.0042	-0.0433	1.0041	0.00000
90800	0.0113	-0.0528	1.0102	0.00000
91000	0.0048	-0.0532	0.9925	0.00000
91200	-0.0114	-0.0634	1.0183	0.00000
91300	-0.0184	-0.0911	1.0239	0.00000
91350	-0.0108	-0.1099	1.0209	0.00000
91400	-0.0248	-0.1360	1.0327	0.00000
91450	-0.0245	-0.1626	1.0454	0.00000
91500	-0.0312	-0.2020	1.0757	0.00000
91550	-0.0469	-0.2315	1.0972	0.00000
91600	-0.0327	-0.2261	1.1382	0.00000
91650	-0.0981	-0.1291	1.1862	0.00000
91700	-0.1061	0.0686	1.1718	0.00000
91750	-0.1086	0.1313	1.1410	0.00000
91800	-0.0879	0.1499	1.0988	0.00000
91850	-0.0334	0.1339	1.0869	0.00000
91900	-0.0142	0.1217	1.0547	0.00000
91950	-0.0175	0.1124	1.0455	0.00000
92000	-0.0116	0.1058	1.0152	0.00000
92100	-0.0082	0.0972	1.0024	0.00000
92200	-0.0012	0.0849	0.9969	0.00000
92300	-0.0067	0.0767	1.0026	0.00000
92400	-0.0039	0.0696	1.0016	0.00000
92600	-0.0029	0.0567	0.9972	0.00000
92800	-0.0001	0.0555	0.9957	0.00000
93000	-0.0007	0.0479	0.9923	0.00000
93500	-0.0023	0.0397	0.9917	0.00000
94000	-0.0046	0.0333	0.9899	0.00000
95000	-0.0062	0.0251	0.9896	0.00000
95800	-0.0052	0.0191	1.0000	0.00000

TRAV102 SPAN X/C= 4.00 ALE=12. V.FPS=100.

68

VORTEX CENTER=94793

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
97890	-0.0281	0.0238	0.9901	0.00000
97000	-0.0296	0.0308	1.0016	0.00000
96000	-0.0446	0.0313	1.0010	0.00000
95800	-0.0518	0.0342	0.9998	0.00000
95600	-0.0603	0.0350	1.0037	0.00000
95300	-0.0955	0.0322	1.0044	0.00000
95200	-0.1229	0.0387	1.0014	0.00000
95150	-0.1418	0.0385	0.9911	0.00000
95100	-0.1584	0.0345	1.0004	0.00000
95050	-0.1778	0.0386	1.0074	0.00000
95000	-0.2055	0.0432	1.0233	0.00000
94950	-0.2168	0.0146	1.0562	0.00000
94900	-0.2145	-0.0118	1.0969	0.00000
94850	-0.1535	-0.0792	1.1544	0.00000
94800	-0.0171	-0.1538	1.1659	0.00000
94750	0.1075	-0.1610	1.1479	0.00000
94700	0.1758	-0.1008	1.1100	0.00000
94650	0.2178	-0.0516	1.0811	0.00000
94600	0.2029	-0.0318	1.0610	0.00000
94500	0.1745	0.0034	1.0259	0.00000
94400	0.1471	0.0103	1.0133	0.00000
94200	0.1194	0.0085	1.0012	0.00000
94000	0.0978	0.0085	1.0027	0.00000
93800	0.0825	0.0085	0.9994	0.00000
93600	0.0660	0.0089	1.0004	0.00000
93400	0.0552	0.0119	0.9945	0.00000

TRAV103 NORM X/C= 2.00 ALF=12. V.FPS=100.
VORTEX CENTER=95200

69

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
99330	0.0059	0.0136	0.9899	0.10341
98500	0.0077	0.0188	0.9889	0.10472
98000	0.0070	0.0236	0.9834	0.10468
97500	0.0059	0.0253	0.9859	0.10447
97000	0.0075	0.0328	0.9892	0.10430
96500	0.0077	0.0455	0.9931	0.10413
96000	0.0066	0.0623	0.9930	0.10416
95800	0.0027	0.0804	1.0010	0.10312
95600	0.0008	0.1152	1.0101	0.10169
95500	0.0077	0.1266	1.0228	0.10253
95400	0.0074	0.1557	1.0640	0.10563
95300	-0.0022	0.1886	1.1298	0.11337
95250	-0.0087	0.1949	1.1546	0.12811
95200	-0.0473	0.0326	1.1776	0.18001
95150	-0.0414	-0.2103	1.1532	0.13672
95100	-0.0097	-0.2880	1.1042	0.12094
95050	-0.0001	-0.2740	1.0799	0.11763
95000	-0.0018	-0.2274	1.0662	0.11684
94900	0.0038	-0.1508	1.0425	0.11252
94800	0.0043	-0.1055	1.0302	0.11275
94700	-0.0003	-0.1031	0.9963	0.11533
94600	-0.0039	-0.1014	1.0126	0.11042
94400	-0.0001	-0.0772	1.0106	0.10960
94000	0.0063	-0.0563	1.0085	0.10761
93000	0.0084	-0.0343	0.9998	0.10728
92000	0.0093	-0.0236	1.0000	0.10731

TRAV104 SPAN X/C= 2.00 ALF=12. V.FPS=100.

70

VORTEX CENTER=95500

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
99000	0.0422	-0.0039	0.9899	0.15763
98500	0.0501	-0.0132	1.0389	0.10720
98000	0.0495	-0.0043	1.0275	0.10652
97500	0.0519	-0.0006	1.0353	0.10672
97000	0.0559	0.0043	1.0366	0.10686
96800	0.0595	0.0087	1.0478	0.10712
96600	0.0645	0.0162	1.0427	0.10731
96400	0.0690	0.0182	1.0386	0.10769
96200	0.0855	0.0241	1.0414	0.10897
96100	0.0994	0.0268	1.0571	0.11098
96000	0.1139	0.0316	1.0533	0.11294
95950	0.1219	0.0332	1.0539	0.11442
95900	0.1373	0.0334	1.0551	0.11593
95850	0.1566	0.0440	1.0719	0.11882
95800	0.1797	0.0458	1.0709	0.12353
95750	0.2117	0.0576	1.0917	0.12792
95700	0.2369	0.0697	1.1059	0.13142
95650	0.2751	0.0858	1.1246	0.13729
95600	0.2981	0.0976	1.1611	0.14241
95550	0.2508	0.0784	1.2054	0.17599
95500	-0.0076	0.0128	1.2475	0.22802
95450	-0.2294	-0.0014	1.2029	0.12563
95400	-0.2866	0.0462	1.1515	0.09797
95350	-0.2647	0.0463	1.1198	0.08408
95300	-0.2298	0.0410	1.1067	0.08520
95200	-0.1651	0.0322	1.0665	0.08849
95100	-0.1355	0.0232	1.0416	0.08972
95000	-0.1122	0.0202	1.0439	0.09166
94900	-0.0931	0.0198	1.0402	0.09420
94800	-0.0813	0.0092	1.0420	0.09593
94600	-0.0617	0.0084	1.0361	0.09922
94400	-0.0501	0.0094	1.0412	0.10058
94130	-0.0406	0.0085	1.0519	0.10181

TRAV105 NORM X/C= 0.00 ALF=12. V.FPS=100.

71

VORTEX CENTER=95210

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
99330	-0.0016	0.0062	1.0446	0.11368
98500	-0.0005	0.0047	1.0333	0.11315
98000	0.0017	0.0100	1.0391	0.11325
97500	0.0025	0.0138	1.0381	0.11391
97000	0.0071	0.0242	1.0473	0.11332
96500	0.0093	0.0383	1.0435	0.11452
96000	0.0132	0.0630	1.0500	0.11337
95800	0.0047	0.0836	1.0425	0.11136
95600	-0.0048	0.1173	1.0613	0.11055
95500	-0.0274	0.1465	1.0734	0.10695
95400	-0.0867	0.1793	1.1282	0.10095
95350	-0.2073	0.2082	1.2020	0.10019
95300	-0.3007	0.2147	1.2338	0.11908
95250	-0.1934	0.1312	1.2068	0.16509
95200	-0.1447	-0.0405	1.3327	0.11988
95150	-0.0446	-0.3126	1.1890	0.12568
95100	-0.0182	-0.3912	1.0994	0.13591
95050	-0.0292	-0.2069	1.1051	0.12223
95000	-0.0397	-0.1765	1.0631	0.11839
94900	-0.0322	-0.1302	1.0380	0.11821
94800	-0.0241	-0.1051	1.0185	0.11806
94700	-0.0155	-0.0844	1.0142	0.11949
94600	-0.0081	-0.0722	1.0095	0.11924
94400	-0.0021	-0.0552	0.9968	0.11945
94000	0.0066	-0.0391	0.9974	0.11982
93000	0.0119	-0.0165	0.9974	0.11995
92000	0.0131	-0.0107	1.0000	0.12054

TRAV106 SPAN X/C= 0.00 ALF=12. V.FPS=100.
VORTEX CENTER=95400

12

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
98400	0.0997	-0.0221	0.8161	0.20047
98200	0.1058	-0.0139	0.8269	0.19386
98000	0.1085	-0.0096	0.8309	0.18419
97800	0.1032	0.0016	0.8013	0.19626
97600	0.1006	0.0051	0.7764	0.19455
97400	0.1005	0.0083	0.7846	0.19481
97200	0.1023	0.0124	0.7992	0.18767
97000	0.1056	0.0181	0.7899	0.18924
96800	0.1088	0.0234	0.7965	0.18491
96600	0.1130	0.0332	0.7995	0.17871
96400	0.1184	0.0411	0.8242	0.16960
96200	0.1234	0.0522	0.8439	0.15656
96100	0.1299	0.0553	0.8633	0.14849
96000	0.1382	0.0567	0.8814	0.14318
95900	0.1462	0.0633	0.8982	0.13778
95800	0.1486	0.0647	0.9080	0.13647
95750	0.1557	0.0614	0.9307	0.13621
95700	0.1631	0.0563	0.9349	0.13681
95650	0.1723	0.0442	0.9400	0.13902
95600	0.1870	0.0289	0.9558	0.14091
95550	0.2014	-0.0107	0.9846	0.14402
95500	0.1781	-0.0760	1.0050	0.15760
95450	0.1180	-0.1916	1.0161	0.17468
95400	-0.0092	-0.4534	1.0850	0.16988
95350	-0.1209	-0.3206	1.0706	0.14159
95300	-0.0762	-0.1820	1.0632	0.14163
95250	-0.0954	-0.1001	0.6918	0.20170
95200	-0.2041	-0.0320	1.0429	0.10224
95150	-0.1687	-0.0122	1.0284	0.10557
95100	-0.1377	-0.0032	1.0172	0.10867
95000	-0.1043	0.0055	1.0109	0.11263
94900	-0.0790	0.0090	1.0089	0.11584
94800	-0.0608	0.0075	1.0126	0.11764
94600	-0.0411	0.0106	0.9968	0.11969
94400	-0.0294	0.0080	0.9959	0.12094
94127	-0.0231	0.0090	0.9945	0.12231

TRAV107 NORM X/C=-0.25 ALF=12. V.FPS=100.

13

VORTEX CENTER=95310

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
95240	0.1439	-0.1936	1.4201	0.14052
95250	0.1480	-0.1921	1.4162	0.14085
95260	0.1463	-0.1914	1.4187	0.14067
95270	0.1240	-0.1908	1.4161	0.13648
95280	0.0984	-0.1986	1.4271	0.13448
95290	0.0587	-0.1894	1.4191	0.13135
95300	-0.0209	-0.0944	1.4041	0.12460
95310	-0.0327	-0.0765	1.3957	0.12391
95320	-0.0901	0.0465	1.3929	0.11780
95330	-0.1586	0.2303	1.3925	0.10618
95340	-0.1579	0.2500	1.3825	0.10642
95350	-0.1376	0.2913	1.3764	0.10973
95360	-0.0902	0.2835	1.3248	0.11492
95370	-0.0636	0.2584	1.2565	0.11787
95380	-0.0438	0.2468	1.2421	0.11326
95390	-0.0211	0.2435	1.2443	0.11228
95400	0.0089	0.2345	1.2201	0.11133
95450	0.0532	0.2025	1.1511	0.11351
95500	0.0600	0.1666	1.1000	0.11579
95550	0.0597	0.1478	1.0823	0.11668
95600	0.0574	0.1287	1.0701	0.11740
95700	0.0511	0.0946	1.0537	0.11842
95800	0.0483	0.0841	1.0513	0.11863
95900	0.0454	0.0712	1.0472	0.11817
96000	0.0424	0.0544	1.0360	0.11875
96500	0.0358	0.0338	1.0263	0.11908
98000	0.0253	0.0088	1.0105	0.11926
99300	0.0240	-0.0018	1.0000	0.11976

TRAV108 SPAN X/C=-0.25 ALF=12. V,FPS=100.

74

VORTEX CENTER=95420

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
97690	0.1752	0.0112	1.0193	0.13914
96690	0.1778	0.0360	0.9998	0.13856
96190	0.1765	0.0536	0.9825	0.13789
96090	0.1704	0.0637	0.9683	0.13708
95990	0.1704	0.0669	0.9638	0.13701
95890	0.1739	0.0749	0.9603	0.13698
95790	0.1805	0.0807	0.9714	0.13758
95690	0.1886	0.0883	0.9736	0.13785
95640	0.2005	0.0909	0.9780	0.13959
95590	0.2238	0.0920	0.9798	0.14257
95570	0.2430	0.0948	0.9959	0.14386
95550	0.2630	0.0950	0.9972	0.14645
95530	0.2880	0.0969	0.9979	0.14837
95510	0.3231	0.1157	1.0124	0.15196
95490	0.3339	0.1022	1.0454	0.15529
95470	0.3680	0.0887	1.1322	0.16770
95450	0.3818	0.0460	1.2208	0.17268
95430	0.2198	-0.1643	1.3989	0.18792
95410	-0.1018	-0.0913	1.3786	0.12999
95390	-0.1147	0.0151	1.2639	0.12091
95370	-0.0611	0.0524	1.2130	0.13005
95350	-0.0098	0.1053	1.0699	0.15858
95330	-0.0283	0.1330	1.0290	0.16661
95310	-0.1013	0.1629	1.0561	0.15709
95290	-0.1789	0.1757	1.0907	0.13255
95270	-0.2462	0.1807	1.1078	0.10616
95250	-0.2641	0.1841	1.1172	0.09522
95230	-0.2591	0.1723	1.0995	0.09012
95210	-0.2486	0.1486	1.0859	0.09051
95190	-0.2300	0.1367	1.0863	0.09256
95140	-0.1862	0.0989	1.0733	0.09709
95090	-0.1586	0.0775	1.0591	0.09991
94990	-0.1157	0.0523	1.0540	0.10609
94890	-0.0876	0.0374	1.0433	0.10970
94790	-0.0711	0.0252	1.0329	0.11269
94690	-0.0582	0.0200	1.0177	0.11348
94190	-0.0313	0.0116	1.0093	0.11883
93810	-0.0212	0.0097	1.0044	0.12013

TRAV109 NORM X/C=-0.50 ALF=12. V.FPS=100.

75

VORTEX CENTER=95400

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
95382	0.1870	-0.1251	1.2431	0.13378
95392	0.2245	-0.0895	1.2600	0.13286
95402	0.2908	-0.0257	1.2477	0.13545
95412	0.3773	0.0976	1.2242	0.13709
95422	0.4583	0.2098	1.1804	0.13809
95432	0.4791	0.2782	1.1683	0.13610
95442	0.4210	0.2685	1.1710	0.13134
95452	0.3422	0.2449	1.1719	0.12828
95462	0.2770	0.2256	1.1589	0.12375
95472	0.2256	0.2152	1.1548	0.12024
95482	0.1831	0.2068	1.1469	0.11730
95492	0.1574	0.1917	1.1360	0.11640
95502	0.1338	0.1814	1.1266	0.11612
95512	0.1173	0.1772	1.1273	0.11527
95522	0.1081	0.1734	1.1288	0.11390
95542	0.0892	0.1548	1.1125	0.11350
95562	0.0804	0.1448	1.1158	0.11339
95582	0.0692	0.1319	1.0929	0.11337
95602	0.0611	0.1209	1.0998	0.11324
95622	0.0578	0.1129	1.0947	0.11341
95642	0.0466	0.1052	1.0893	0.11284
95662	0.0425	0.1051	1.0842	0.11256
95682	0.0418	0.1004	1.0801	0.11277
95732	0.0382	0.0914	1.0792	0.11303
95782	0.0297	0.0764	1.0708	0.11302
95832	0.0278	0.0689	1.0678	0.11320
95882	0.0237	0.0664	1.0611	0.11305
95982	0.0163	0.0596	1.0456	0.11289
96082	0.0153	0.0462	1.0468	0.11347
96182	0.0119	0.0443	1.0430	0.11332
96482	0.0073	0.0333	1.0311	0.11351
97482	0.0015	0.0113	1.0141	0.11427
98482	0.0028	0.0073	1.0000	0.11481

TRAV110 SPAN X/C=-0.50 ALF=12. V.EPS=100.

VORTEX CENTER=95350

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
97715	0.1746	0.0125	1.2666	0.12918
96715	0.1877	0.0272	1.2398	0.13195
96215	0.1875	0.0442	1.2177	0.13147
96115	0.1860	0.0475	1.2151	0.13126
96015	0.1870	0.0593	1.2065	0.13096
95915	0.1906	0.0651	1.2172	0.13110
95815	0.1834	0.0727	1.2003	0.13038
95715	0.1869	0.0859	1.1878	0.13063
95665	0.1916	0.0896	1.1846	0.13090
95665	0.1679	0.1018	1.1214	0.13573
95615	0.1712	0.1094	1.1186	0.13578
95595	0.1679	0.1098	1.1206	0.13566
95575	0.1720	0.1122	1.1153	0.13422
95555	0.1745	0.1140	1.1254	0.13622
95535	0.1786	0.1202	1.1227	0.13639
95515	0.1828	0.1221	1.1309	0.13683
95495	0.1880	0.1300	1.1322	0.13703
95475	0.2022	0.1318	1.1304	0.13861
95455	0.2232	0.1411	1.1321	0.13969
95435	0.2531	0.1553	1.1312	0.14139
95415	0.2857	0.1910	1.1272	0.14251
95395	0.3751	0.2277	1.1403	0.14701
95375	0.4211	0.3224	1.2323	0.15438
95355	0.1344	0.3138	1.3418	0.14762
95375	0.3861	0.3284	1.2239	0.15575
95355	0.1545	0.3165	1.3380	0.14872
95335	-0.1574	0.2963	1.2929	0.12772
95315	-0.2339	0.2673	1.2617	0.10384
95295	-0.1947	0.2207	1.2079	0.10467
95275	-0.1723	0.1924	1.1806	0.10427
95255	-0.1599	0.1751	1.1561	0.10481
95235	-0.1482	0.1558	1.1280	0.10536
95215	-0.1339	0.1412	1.1144	0.10584
95165	-0.1176	0.1116	1.0893	0.10733
95115	-0.1082	0.0965	1.0701	0.10767
95015	-0.0855	0.0682	1.0355	0.11020
94915	-0.0723	0.0489	1.0321	0.11215
94815	-0.0645	0.0375	1.0130	0.11271
94715	-0.0494	0.0269	1.0037	0.11463
94215	-0.0236	0.0110	0.9765	0.11802

93835

-0.0165

0.0075

0.9843

0.11887

TRAV111 NORM X/C=-0.75 ALE=12. V.FPS=100.
VORTEX CENTER=95500

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NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
95482	0.1056	0.1129	1.1088	0.12667
95492	0.1056	0.1129	1.1088	0.12667
95502	0.0954	0.1156	1.1177	0.12535
95512	0.0795	0.1114	1.1289	0.12388
95522	0.0717	0.1138	1.1383	0.12041
95532	0.0589	0.1054	1.1357	0.11903
95542	0.0501	0.1036	1.1381	0.11664
95552	0.0451	0.1040	1.1340	0.11629
95562	0.0383	0.1034	1.1349	0.11569
95572	0.0311	0.0955	1.1397	0.11552
95582	0.0276	0.0933	1.1338	0.11542
95602	0.0185	0.0943	1.1234	0.11476
95622	0.0157	0.0867	1.1147	0.11498
95642	0.0150	0.0765	1.1082	0.11544
95662	0.0088	0.0793	1.1043	0.11486
95682	0.0061	0.0671	1.0974	0.11482
95702	0.0013	0.0627	1.0968	0.11458
95722	0.0006	0.0591	1.0951	0.11469
95742	0.0020	0.0567	1.0817	0.11514
95762	0.0020	0.0575	1.0806	0.11516
95782	0.0014	0.0508	1.0717	0.11550
95832	-0.0020	0.0480	1.0673	0.11537
95882	0.0008	0.0458	1.0575	0.11588
95982	-0.0005	0.0367	1.0429	0.11606
96082	-0.0011	0.0342	1.0289	0.11637
96282	-0.0024	0.0276	1.0163	0.11677
96482	-0.0010	0.0271	1.0000	0.11731

TRAV112 SPAN X/C=-0.75 ALF=12. V.EPS=100.

VORTEX CENTER=95320

NORMALIZED VELOCITY

DIST INCH	NORM	SPAN	AXIAL	TURBUL INTENS
95740	0.0923	0.0450	1.2244	0.11665
95690	0.0891	0.0469	1.2218	0.11727
95640	0.0945	0.0590	1.2178	0.11745
95620	0.0918	0.0529	1.2128	0.11774
95600	0.0918	0.0545	1.2140	0.11766
95580	0.0930	0.0591	1.2022	0.11778
95560	0.0942	0.0592	1.2046	0.11802
95540	0.0906	0.0635	1.1967	0.11688
95520	0.0906	0.0671	1.2068	0.11673
95500	0.0897	0.0729	1.1949	0.11662
95480	0.0880	0.0747	1.1924	0.11734
95460	0.0859	0.0834	1.1954	0.11693
95440	0.0834	0.0864	1.1911	0.11586
95420	0.0799	0.0914	1.1822	0.11553
95400	0.0759	0.0982	1.1881	0.11503
95380	0.0672	0.1080	1.1761	0.11575
95360	0.0726	0.1195	1.1524	0.11782
95340	0.0593	0.1492	1.1771	0.11359
95320	-0.0038	0.1654	1.1504	0.10602
95300	-0.0613	0.1418	1.1347	0.10139
95280	-0.0740	0.1252	1.1233	0.10102
95260	-0.0802	0.1091	1.1145	0.10084
95240	-0.0826	0.0963	1.1024	0.10117
95220	-0.0794	0.0862	1.0958	0.10193
95200	-0.0754	0.0721	1.0765	0.10297
95180	-0.0728	0.0691	1.0741	0.10339
95160	-0.0695	0.0651	1.0613	0.10397
95140	-0.0691	0.0620	1.0526	0.10310
95090	-0.0634	0.0492	1.0466	0.10438
95040	-0.0568	0.0416	1.0287	0.10556
94990	-0.0512	0.0388	1.0184	0.10634
94940	-0.0443	0.0282	0.9993	0.10775
94740	-0.0344	0.0217	0.9872	0.10920
94540	-0.0271	0.0168	0.9732	0.11039
94340	-0.0205	0.0122	0.9620	0.11146

CV - 990 AIRCRAFT
(DIMENSIONS IN CM)

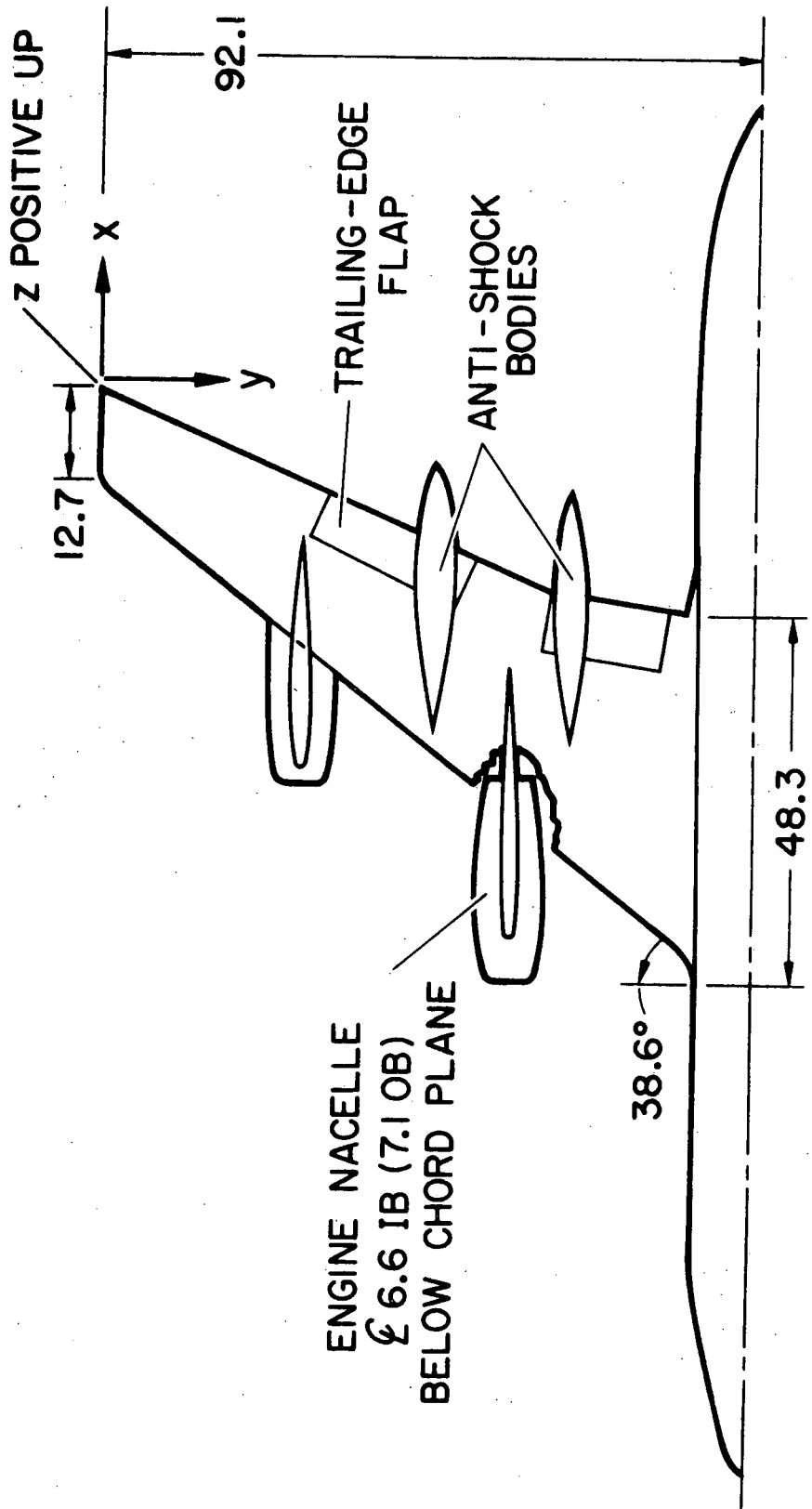
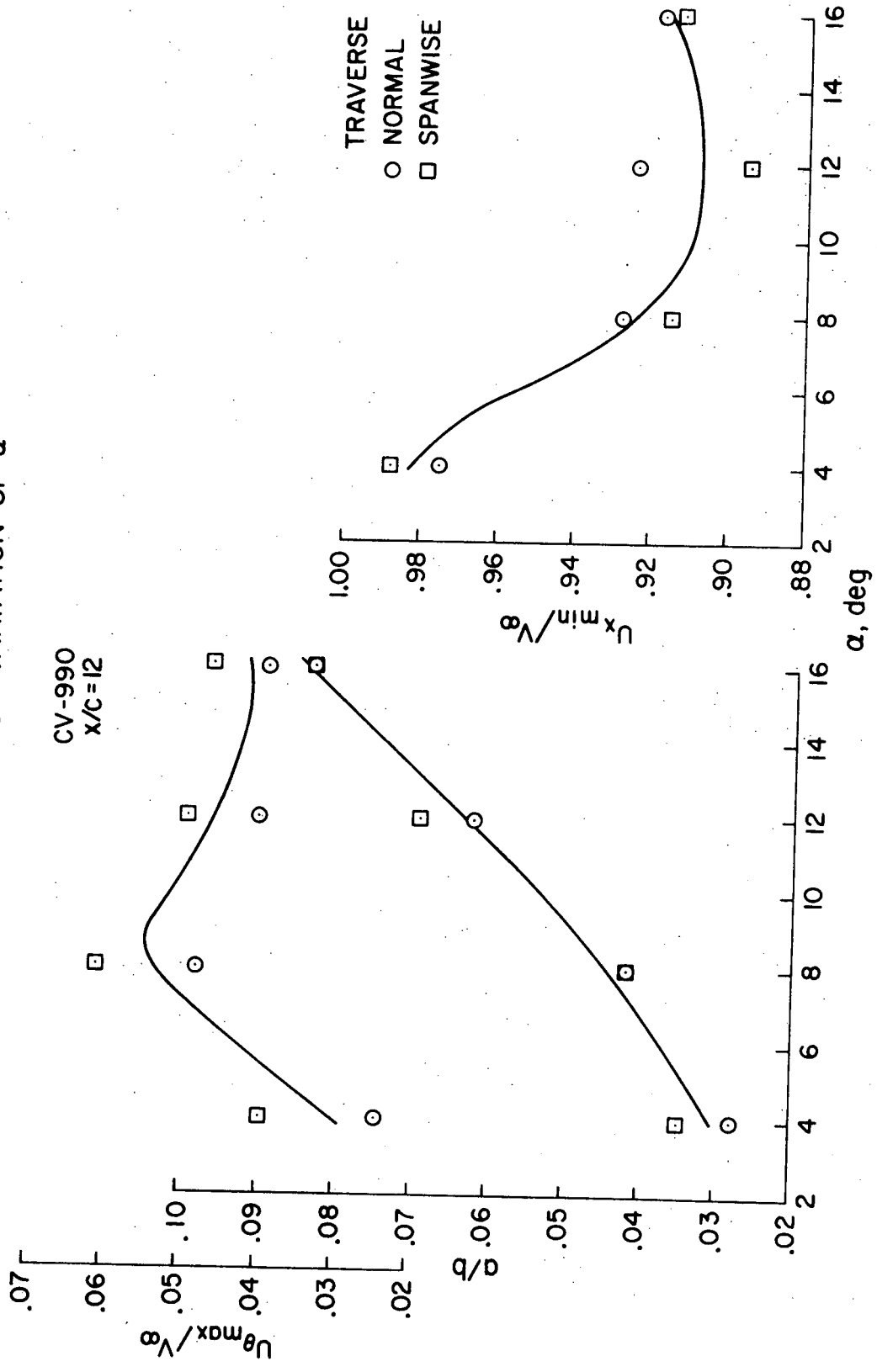


Figure 1.- CV-990 Semispan Model.

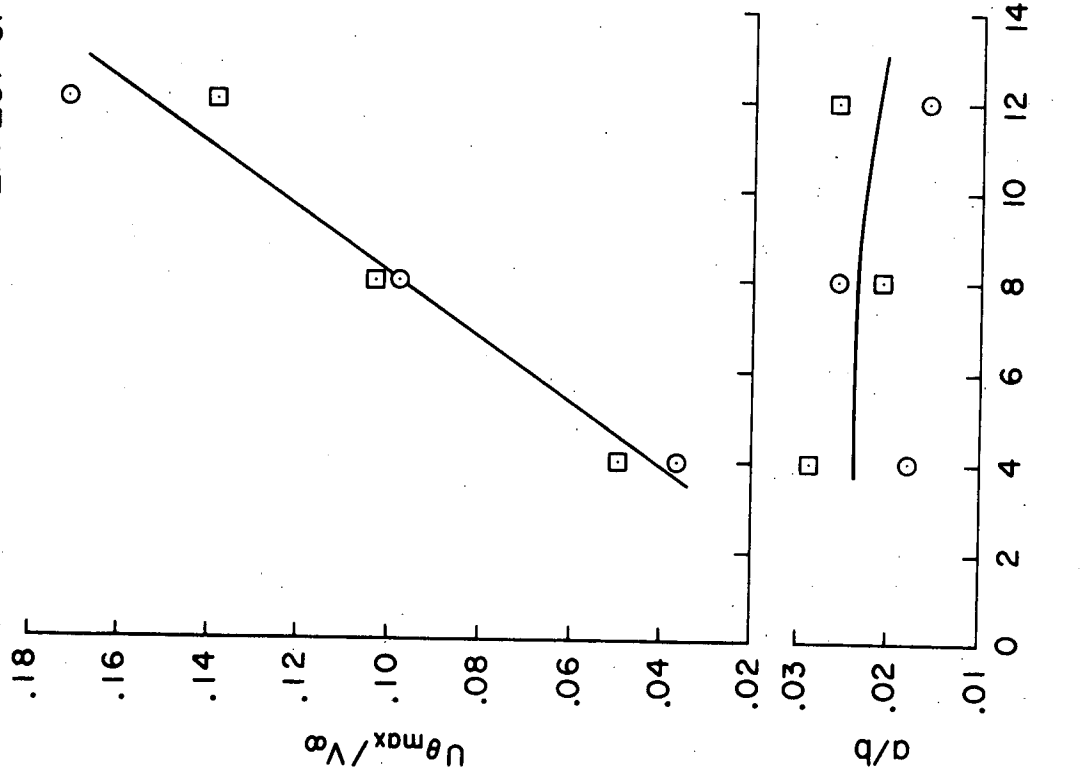
EFFECT OF VARIATION OF α



(a) CV-990 model at x/c = 12.

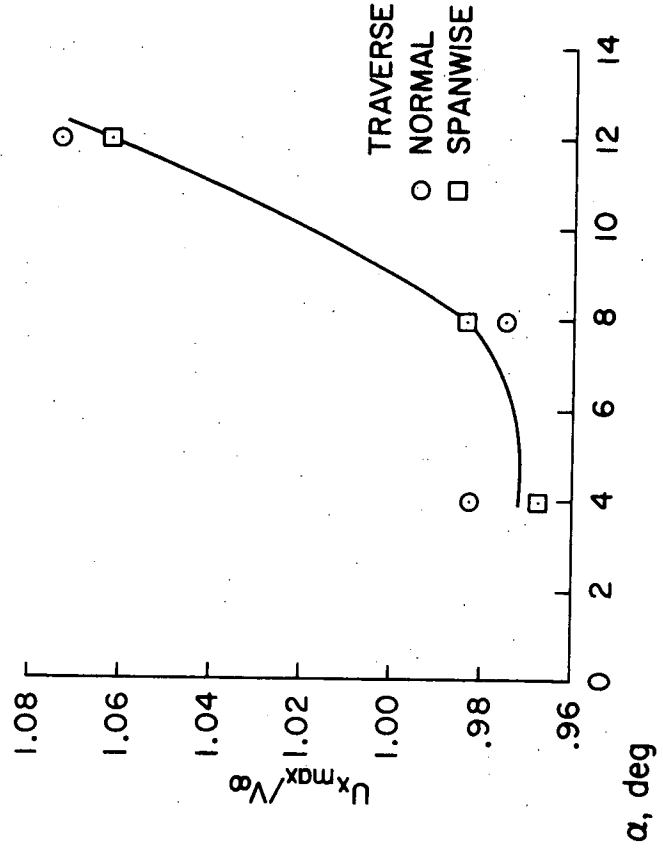
Figure 3.- Effect of variation of α on $u_{\theta_{max}}/V_{\infty}$, a/b , $u_{x_{min}}/V_{\infty}$

EFFECT OF VARIATION OF α



(b) Rectangular wing at $x/c = 9$.

Figure 3.- Concluded.



MAXIMUM VALUE OF TURBULENCE INTENSITY

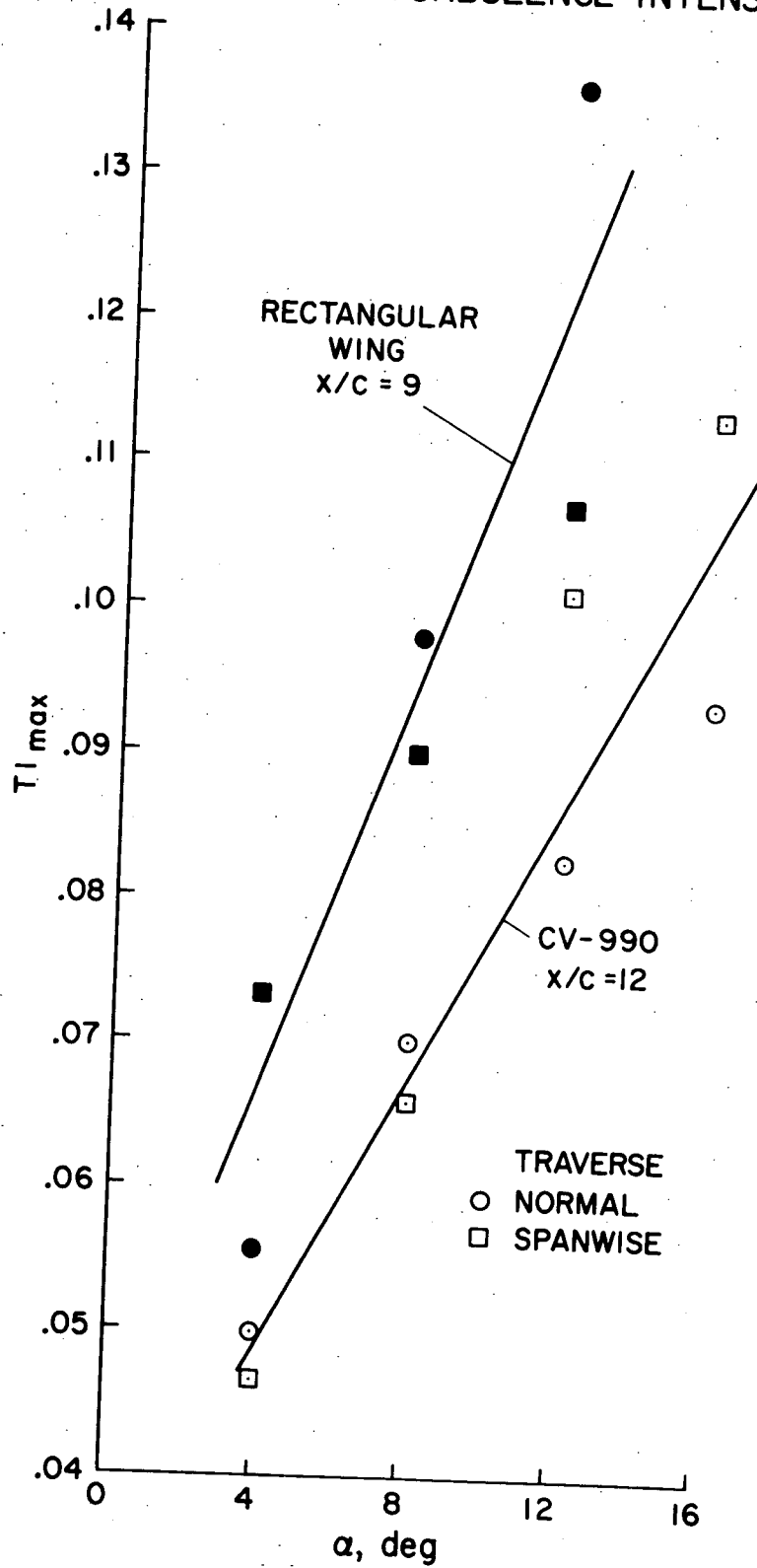
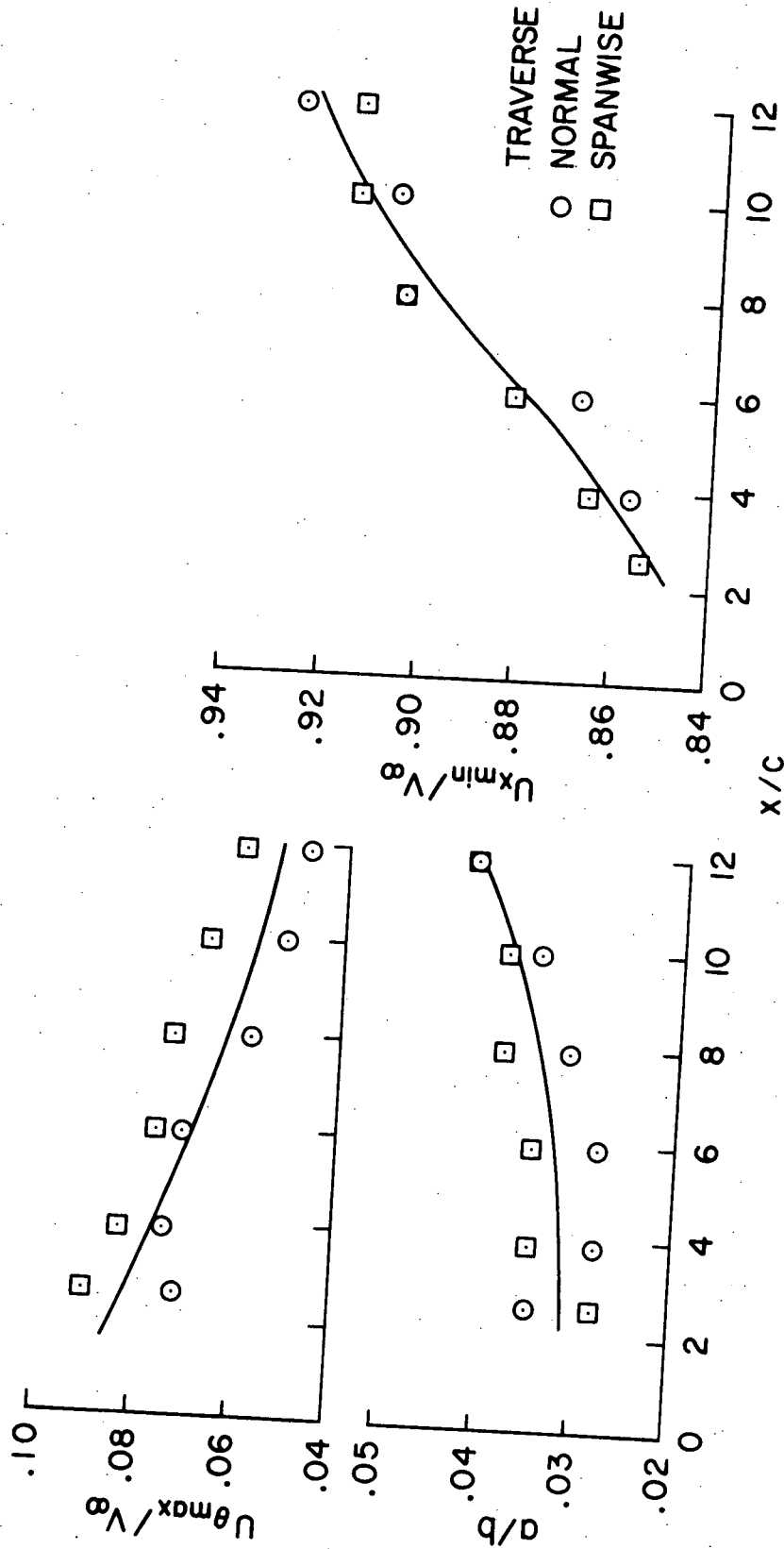


Figure 4.- Effect of variation of α on turbulence intensity maximum.

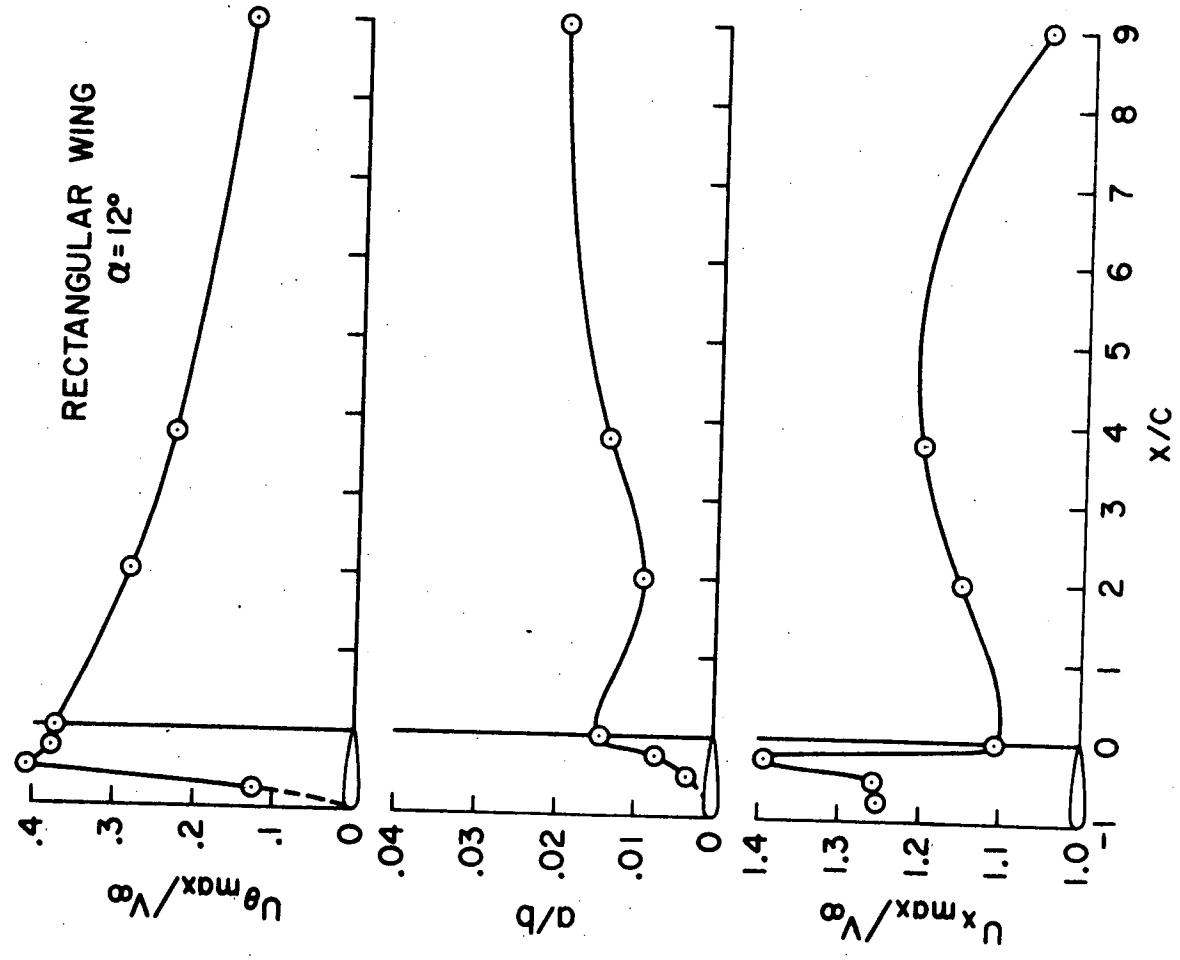
EFFECT OF VARIATION OF AXIAL DISTANCE
 CV-990 $\alpha = 8^\circ$



(a) CV-990 model at $\alpha = 8^\circ$.

Figure 5.- Effect of variation of x/c on $u_{\theta_{max}}/V_{\infty}$, a/b , $u_{\theta_{min}}/V_{\infty}$

EFFECT OF VARIATION OF AXIAL DISTANCE



(b) Rectangular Wing at $\alpha = 12^\circ$.

Figure 5.- Concluded.

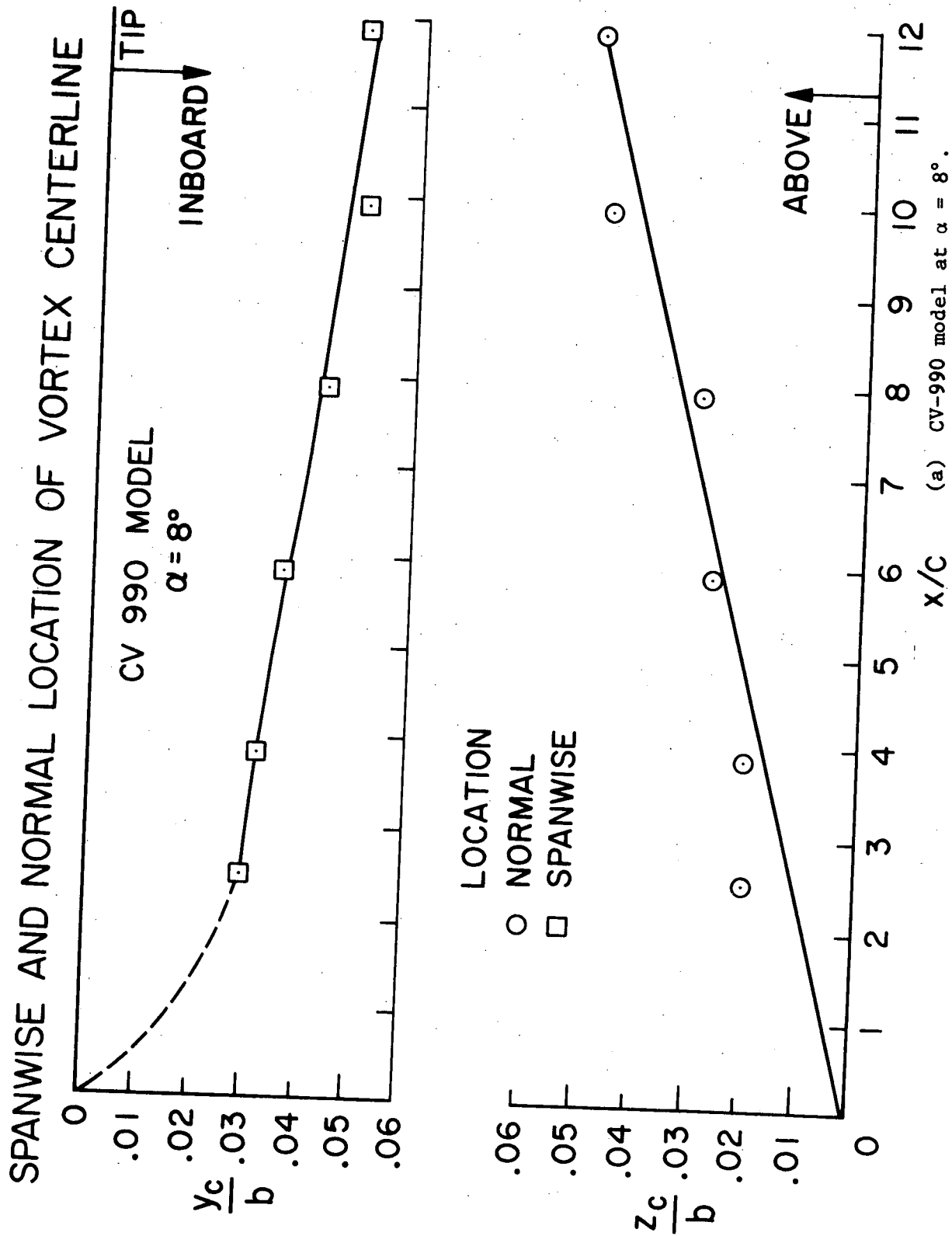
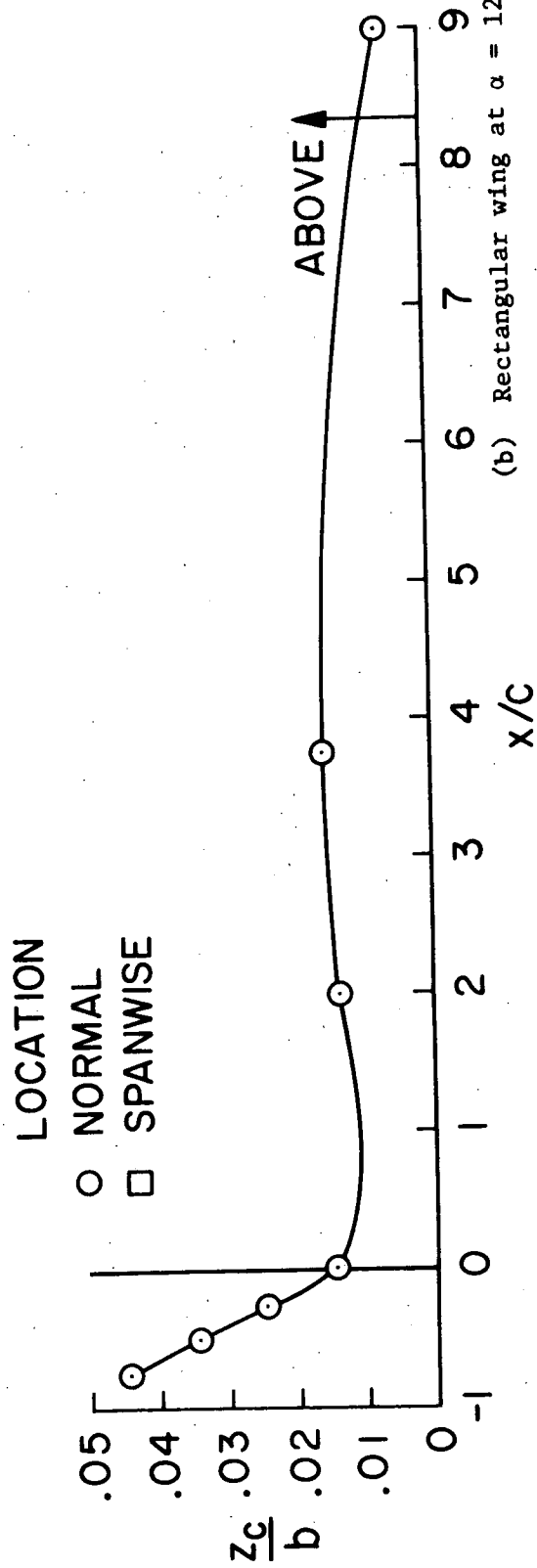
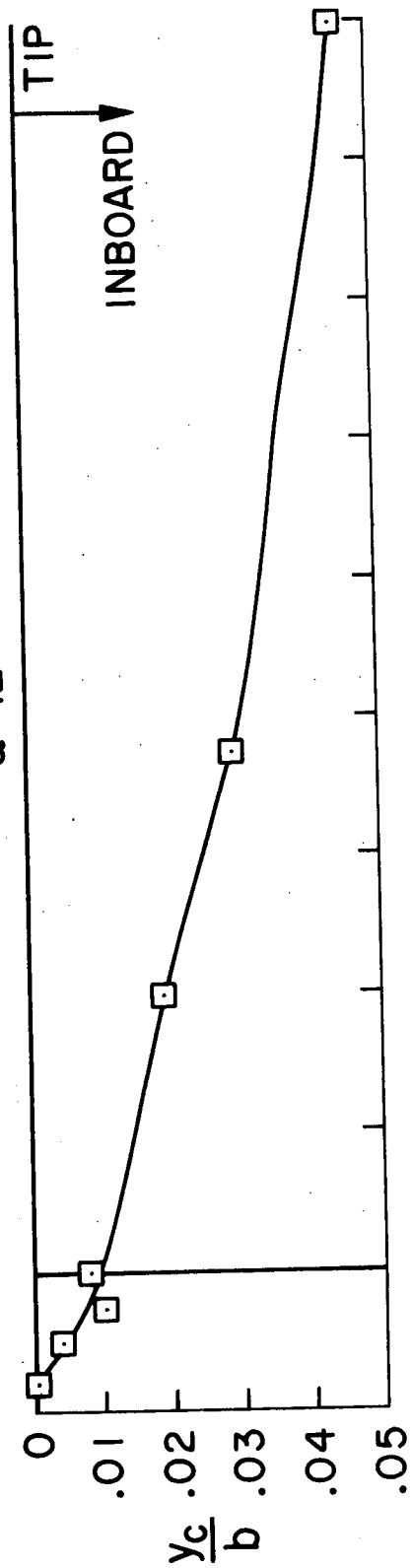


Figure 6.- Spanwise and normal location of vortex centerline as function of axial distance.

SPANWISE AND NORMAL LOCATION OF VORTEX CENTERLINE
 RECTANGULAR WING
 $\alpha = 12^\circ$



(b) Rectangular wing at $\alpha = 12^\circ$.

EFFECT OF TRAILING EDGE FLAP DEFLECTION
CV-990 $x/c=12$

TRAILING EDGE FLAPS, deg

○ 0
□ 27

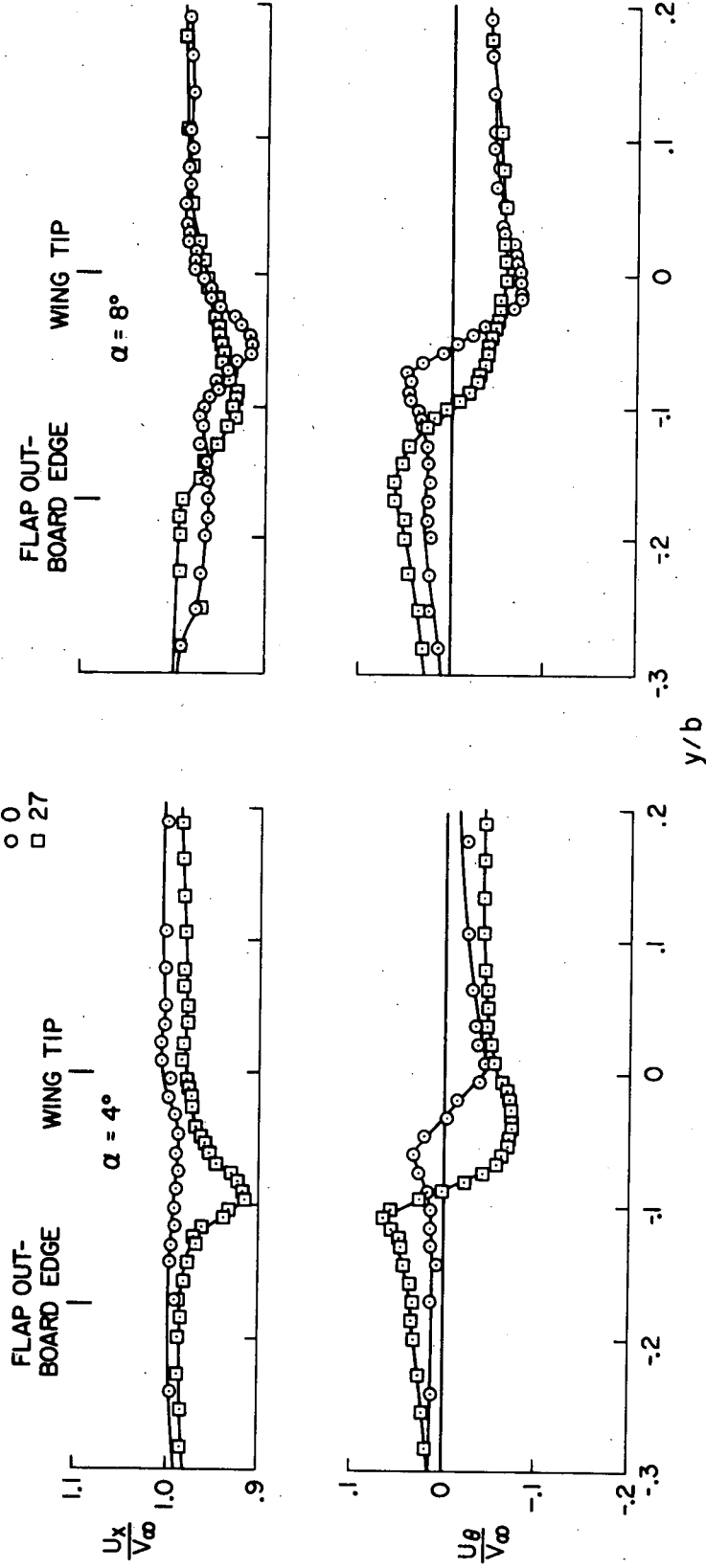


Figure 7.- Effect of trailing edge flap deflection on u_x/V_∞ , u_θ/V_∞ . CV-990, $x/c = 12$.

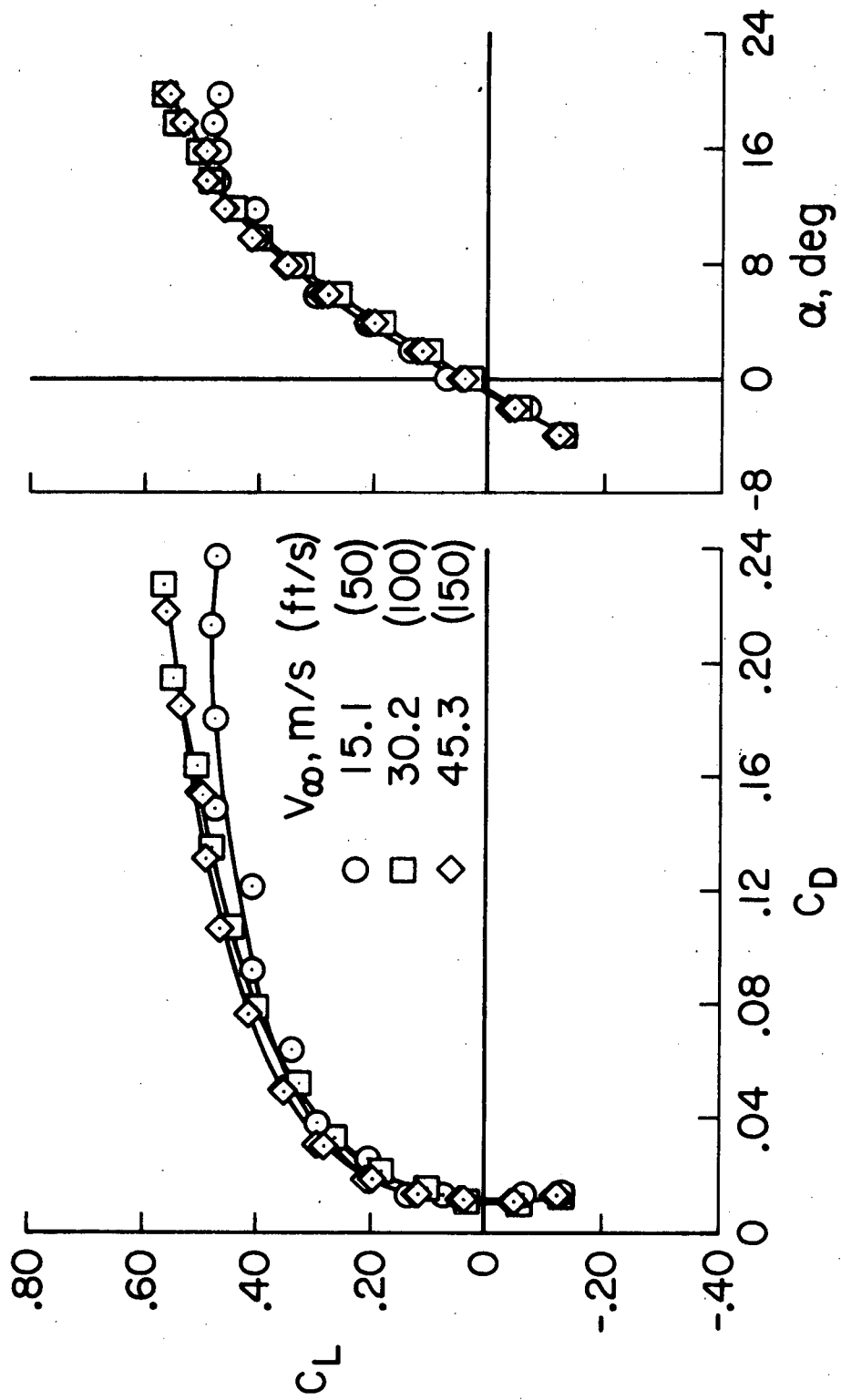


Figure 8.- Effect of α on lift and drag coefficient. CV-990

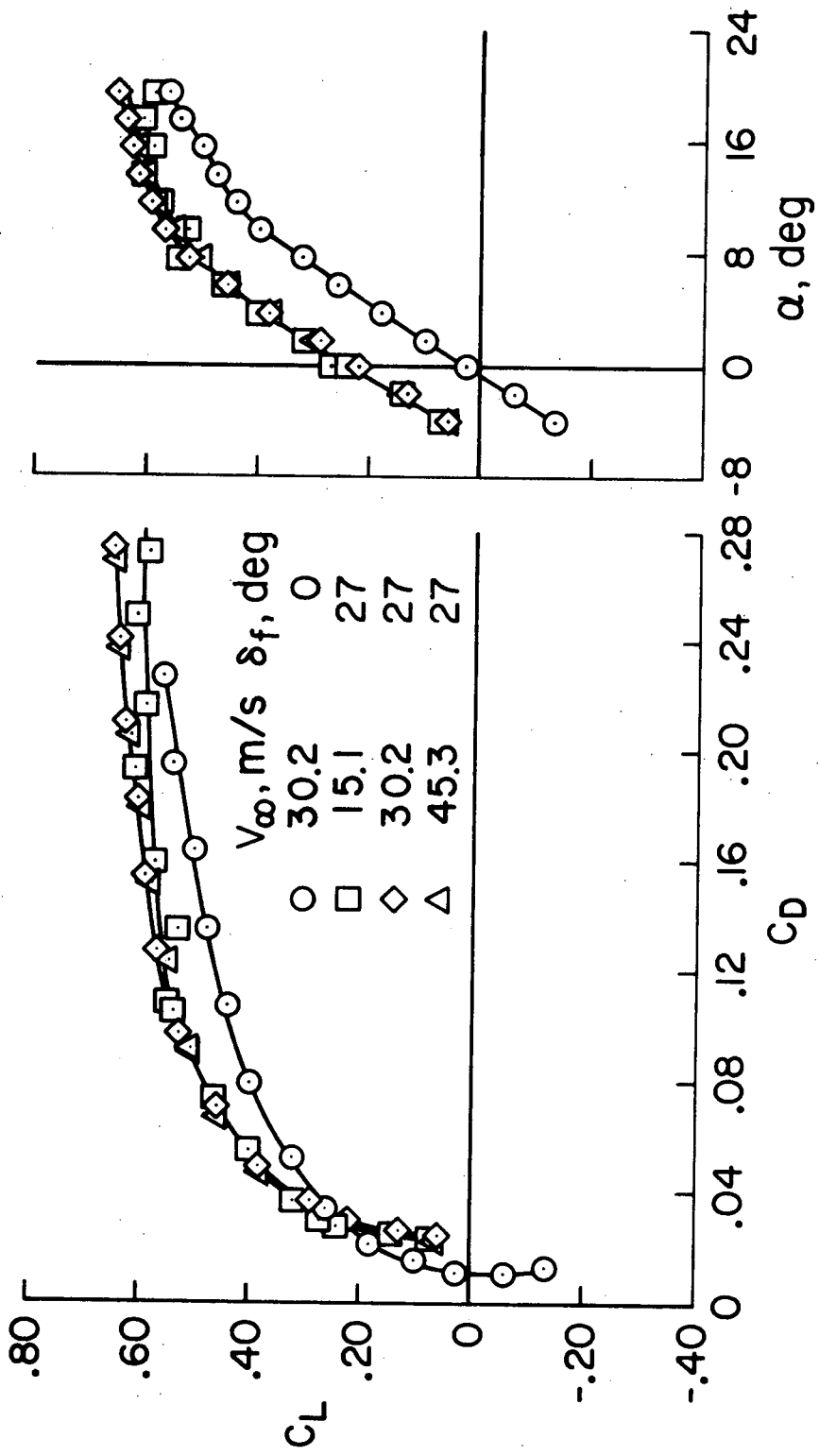


Figure 9.- Effect of trailing edge flap deflection on lift and drag coefficient. CV-990