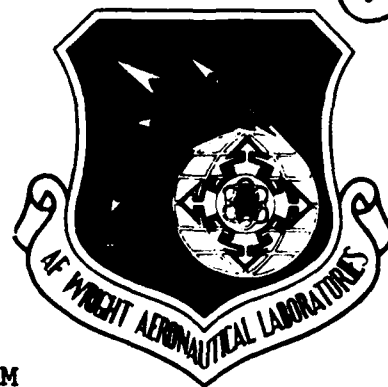


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PART VI

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UNSTEADY LOW-SPEED WINDTUNNEL TEST
OF A STRAKED DELTA WING, OSCILLATING IN PITCH

PART VI: PRESENTATION OF THE VISUALIZATION PROGRAM

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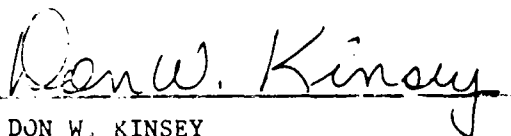
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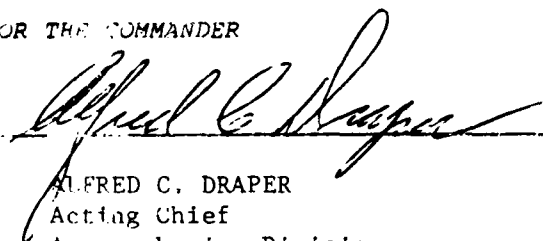


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19. ABSTRACT (Continue on reverse if necessary and identify by block number) Results of a wind tunnel test of an oscillating straked wing. The report provides unsteady airloads and pressure distributions for a range of incidence (-8 to 50 deg.) and amplitudes (1 to 16 deg.). The wind speed was 80 meters/second, which provided reduced frequencies up to 0.50 based on root chord. The zeroth and first harmonic as well as the continuous time history of the pressure and overall loads were measured. Flow visualization was performed for flow of 30 meters/second using a pulsating laser light sheet. In part VI results of the flow visualization investigation are presented in the appendix in the form of tables and plots of vortex core positions, both as a function of phase angle during one cycle of oscillation. Table 13a through c in part I provides a convenient cross-reference of test conditions and the table numbers in this part. The phase angles are varied in steps of 45 deg so that a time history is developed during one cycle. When it was impossible to measure vortex core positions, due to either vortex burst or (See Reverse)					
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Zwaan, R.J.,	"	"	"	"	"

19. ABSTRACT CONTD

overexposure, no values are given in the tables and plots. Results are presented for the three laser light screen positions. The entries in the table for the aft position near the wing trailing edge are limited because very few core position measurements were possible due to vortex bursting.

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FOREWORD

This report summarizes the results of the windtunnel test of an oscillating straked wing conducted under a cooperative program of research between General Dynamics Fort Worth Division, Fort Worth, Texas, and the National Aerospace Laboratory (NLR), The Netherlands. The model and support system was designed and fabricated at NLR under a separate program with General Dynamics and NLR funding. The test preparation, wind-tunnel test and reporting were performed at NLR under Air Force Contract F33615-85-C-3013, for the Flight Dynamics Laboratory of the Air Force Wright Aeronautical Laboratories, Wright-Patterson Air Force Base, Ohio. The work was administered by Mr. D.W. Kinsey of the Aeromechanics Division (AFWAL/FIM). Additional technical monitoring support was provided by Mr. T. Cord of the Flight Control Division (AFWAL/FIG).

The program manager and principal investigator was Dr. A.M. Cunningham Jr. at General Dynamics and Mr. R.G. den Boer was the principal investigator at NLR. Mr. den Boer was assisted by the following NLR specialists: C.S.G. Dogger, E.G.M. Geurts, A.J. Persoon, A.P. Retèl and R.J. Zwaan.

This report consists of six parts. Part I presents a general description of the model and test program and a discussion of the results. Part II contains the steady pressure distribution plots and the major part of the zeroth and first order harmonic unsteady pressure distribution plots. Part III contains the remainder of the unsteady pressure distribution plots and plots of the steady and the zeroth and first order harmonic unsteady overall loads. Part IV contains time history plots of the unsteady pressures and overall loads. Part V contains power spectral density plots of the overall loads at harmonic oscillation and time history plots of overall loads for (1-cos) model motions. Part VI contains results of the flow visualization program.



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LIST OF SYMBOLS

ALPHA, α	wing incidence	(deg)
b	local wing span	(m)
c	local chord	(m)
DALPHA, $d\alpha$	amplitude of unsteady wing incidence	(deg)
f, FREQ	frequency	(Hz)
PHI, φ	phase angle	(deg)
x	chordwise coordinate in wing reference plane apex: $x = 0$ (figures 1,5, part I)	(m)
y	spanwise coordinate in wing reference plane (figures 1,5, part I)	(m)
z	coordinate in plane of symmetry normal to wing reference plane (figures 1,5, part I)	(m)

GREEK

α , ALPHA	wing incidence	(deg)
$d\alpha$, DALPHA	amplitude of unsteady wing incidence	(deg)
φ , PHI	phase angle	(deg)

APPENDIX A

FLOW VISUALIZATION DATA TABLES AND VORTEX POSITION PLOTS

Note: In the header of the tables and figures, by x/c the position of the laser light screen relative to the root chord is indicated.

TABLE	x/c = 40.42 %		ALPHA = 9.98 deg		FREQ = 1.13 Hz			
	b/2 = 79.16 mm		DALPHA = 4.04 deg					
01	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90	-0.747	0.392	0.730	0.392				
135	-0.718	0.366	0.734	0.381				
180	-0.740	0.342	0.742	0.353				
225	-0.764	0.304	0.774	0.307				
270	-0.779	0.306	0.762	0.313				
315			0.766	0.330				

TABLE	x/c = 40.42 %		ALPHA = 9.87 deg		FREQ = 1.13 Hz			
	b/2 = 79.16 mm		DALPHA = 8.11 deg					
02	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45	-0.737	0.420	0.718	0.425				
90	-0.726	0.421	0.702	0.428				
135	-0.737	0.397	0.716	0.397				
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 9.28 deg		FREQ = 1.13 Hz	
	b/2 = 79.16 mm		DALPHA = 16.59 deg			
03	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45	-0.697	0.504	0.680	0.504		
90	-0.665	0.499	0.648	0.499		
135	-0.690	0.428	0.713	0.428		
180						
225						
270						
315						

TABLE	x/c = 40.42 %		ALPHA = 10.01 deg		FREQ = 1.88 Hz	
	b/2 = 79.16 mm		DALPHA = 3.78 deg			
04	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45						
90			0.648	0.421		
135			0.700	0.408		
180			0.745	0.363		
225						
270	-0.769	0.292	0.772	0.307		
315			0.768	0.307		

TABLE	x/c = 40.42 %		ALPHA = 9.38 deg		FREQ = 1.88 Hz			
	b/2 = 79.16 mm		DALPHA = 15.51 deg					
05	STRAKE VORTEX		WING VORTEX					
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90	-0.687	0.553	0.663	0.559				
135	-0.701	0.461	0.692	0.476				
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 10.00 deg		FREQ = 3.00 Hz			
	b/2 = 79.16 mm		DALPHA = 3.74 deg					
06	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90	-0.752	0.368	0.715	0.387				
135								
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 9.88 deg		FREQ = 3.00 Hz			
	b/2 = 79.16 mm		DALPHA = 7.47 deg					
07	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90	-0.711	0.433	0.713	0.439				
135	-0.724	0.378	0.721	0.389				
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 9.42 deg		FREQ = 3.00 Hz			
	b/2 = 79.16 mm		DALPHA = 15.23 deg					
08	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45	-0.705	0.525	0.715	0.534				
90	-0.675	0.549	0.683	0.555				
135	-0.696	0.410	0.701	0.420				
180								
225								
270								
315								

	x/c = 40.42 %		ALPHA = 10.00 deg		FREQ = 5.00 Hz			
TABLE	b/2 = 79.16 mm		DALPHA = 3.68 deg					
09	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90								
135								
180	-0.732	0.333	0.718	0.339				
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 18.92 deg		FREQ = 1.13 Hz			
	b/2 = 79.16 mm		DALPHA = 7.65 deg					
10	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90	-0.701	0.468	0.707	0.476				
135								
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 18.78 deg		FREQ = 1.13 Hz			
	b/2 = 79.16 mm		DALPHA = 13.50 deg					
11	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45			0.709	0.493				
90	-0.701	0.474	0.690	0.476				
135			0.696	0.463				
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 18.94 deg		FREQ = 1.88 Hz			
	b/2 = 79.16 mm		DALPHA = 3.58 deg					
12	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.711	0.411	0.721	0.416				
45	-0.710	0.450	0.711	0.452				
90	-0.719	0.454	0.691	0.454				
135	-0.707	0.443	0.705	0.446				
180	-0.709	0.428	0.721	0.437				
225	-0.716	0.402	0.723	0.404				
270	-0.738	0.381	0.721	0.386				
315	-0.710	0.405	0.719	0.405				

TABLE	x/c = 40.42 %		ALPHA = 18.93 deg		FREQ = 1.88 Hz			
	b/2 = 79.16 mm		DALPHA = 7.15 deg					
13	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90	-0.692	0.481	0.697	0.485				
135			0.723	0.470				
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 18.79 deg		FREQ = 1.88 Hz			
	b/2 = 79.16 mm		DALPHA = 12.63 deg					
14	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45			0.700	0.550				
90	-0.707	0.512	0.686	0.516				
135	-0.692	0.476	0.697	0.490				
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 22.44 deg		FREQ = 3.00 Hz	
	b/2 = 79.16 mm		DALPHA = 3.51 deg			
15	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT		LEFT	
					RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45			0.731	0.560		
90	-0.720	0.548	0.716	0.561		
135			0.706	0.518		
180						
225						
270						
315						

TABLE	x/c = 40.42 %		ALPHA = 22.42 deg		FREQ = 3.00 Hz	
	b/2 = 79.16 mm		DALPHA = 6.98 deg			
16	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT		LEFT	
					RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45	-0.685	0.543	0.691	0.569		
90	-0.697	0.542	0.699	0.557		
135	-0.701	0.528	0.701	0.541		
180						
225						
270						
315						

	x/c = 40.42 %		ALPHA = 22.28 deg		FREQ = 3.00 Hz	
TABLE	b/2 = 79.16 mm		DALPHA = 14.00 deg			
17	STRAKE VORTEX				WING VORTEX	
	LEFT		RIGHT		LEFT	
					RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45	-0.695	0.565	0.697	0.575		
90	-0.687	0.530	0.701	0.533		
135						
180						
225						
270						
315						

TABLE	x/c = 40.42 %		ALPHA = 22.50 deg		FREQ = 6.00 Hz			
	b/2 = 79.16 mm		DALPHA = 3.44 deg					
18	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90	-0.719	0.439	0.702	0.445				
135	-0.700	0.474	0.713	0.475				
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 22.42 deg		FREQ = 6.00 Hz			
	b/2 = 79.16 mm		DALPHA = 6.88 deg					
19	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90	-0.719	0.493	0.685	0.498				
135	-0.718	0.469	0.690	0.472				
180								
225								
270								
315								

TABLE	x/c = 40.42 %		ALPHA = 35.84 deg		FREQ = 1.13 Hz			
	b/2 = 79.16 mm		DALPHA = 3.73 deg					
20	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90								
135								
180								
225	-0.721	0.435	0.707	0.468				
270	-0.713	0.442	0.705	0.446				
315	-0.720	0.445	0.716	0.464				

TABLE	x/c = 40.42 %		ALPHA = 35.89 deg		FREQ = 1.13 Hz	
	b/2 = 79.16 mm		DALPHA = 7.48 deg			
21	STRAKE VORTEX				WING VORTEX	
	LEFT		RIGHT		LEFT	
					RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0			0.713	0.464		
45						
90						
135						
180						
225	-0.707	0.399	0.707	0.426		
270	-0.706	0.401	0.721	0.416		
315	-0.704	0.411	0.705	0.428		

TABLE	x/c = 40.42 %		ALPHA = 36.03 deg		FREQ = 1.13 Hz	
	b/2 = 79.16 mm		DALPHA = 15.23 deg			
22	STRAKE VORTEX				WING VORTEX	
	LEFT		RIGHT		LEFT	
					RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45						
90						
135						
180						
225			0.713	0.400		
270			0.693	0.403		
315			0.699	0.409		

TABLE	$x/c = 40.42 \%$		ALPHA = 35.87 deg		FREQ = 1.88 Hz	
	$b/2 = 79.16 \text{ mm}$		DALPHA = 7.02 deg			
23	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.732	0.424	0.735	0.451		
45						
90						
135						
180			0.737	0.455		
225			0.721	0.459		
270			0.699	0.421		
315			0.713	0.424		

TABLE	$x/c = 40.42 \%$		ALPHA = 36.01 deg		FREQ = 1.88 Hz	
	$b/2 = 79.16 \text{ mm}$		DALPHA = 14.26 deg			
24	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45						
90						
135						
180						
225						
270						
315			0.705	0.442		

TABLE	$x/c = 40.42 \%$ $\text{ALPHA} = 35.86 \text{ deg}$ $\text{FREQ} = 3.00 \text{ Hz}$ $b/2 = 79.16 \text{ mm}$ $\text{DALPHA} = 3.44 \text{ deg}$							
	STRAKE VORTEX				WING VORTEX			
25	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0			0.701	0.477				
45								
90								
135								
180								
225			0.726	0.454				
270			0.725	0.426				
315			0.726	0.464				

TABLE	$x/c = 40.42 \%$ $\text{ALPHA} = 35.87 \text{ deg}$ $\text{FREQ} = 3.00 \text{ Hz}$ $b/2 = 79.16 \text{ mm}$ $\text{DALPHA} = 6.93 \text{ deg}$							
	STRAKE VORTEX				WING VORTEX			
26	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90								
135								
180								
225								
270								
315			0.713	0.490				

TABLE	x/c = 40.42 %		ALPHA = 35.86 deg		FREQ = 6.00 Hz	
	b/2 = 79.16 mm		DALPHA = 3.37 deg			
27	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45						
90						
135						
180						
225						
270			0.705	0.416		
315						

TABLE	x/c = 65.88 %		ALPHA = 9.98 deg		FREQ = 1.13 Hz	
	b/2 = 225.00 mm		DALPHA = 4.04 deg			
28	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45					-0.793	0.077
90					0.815	0.093
135					-0.791	0.087
180					0.821	0.099
225					-0.795	0.073
270					0.820	0.089
315						

TABLE	x/c = 65.88 %		ALPHA = 9.87 deg		FREQ = 1.13 Hz	
	b/2 = 225.00 mm		DALPHA = 8.11 deg			
29	STRAKE VORTEX				WING VORTEX	
	LEFT		RIGHT		LEFT	
					RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45					-0.797	0.098
90					-0.752	0.115
135					-0.791	0.090
180						
225						
270						
315						

TABLE	x/c = 65.88 %		ALPHA = 9.28 deg		FREQ = 1.13 Hz	
	b/2 = 225.00 mm		DALPHA = 16.59 deg			
30	STRAKE VORTEX				WING VORTEX	
	LEFT		RIGHT		LEFT	
					RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45					-0.790	0.129
90						
135						
180						
225						
270						
315						

TABLE	x/c = 65.88 %		ALPHA = 10.01 deg		FREQ = 1.88 Hz	
	b/2 = 225.00 mm		DALPHA = 3.78 deg			
31	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45					-0.805	0.077
90					-0.804	0.083
135					-0.801	0.073
180						
225						
270						
315						

TABLE	x/c = 65.88 %		ALPHA = 9.91 deg		FREQ = 1.88 Hz	
	b/2 = 225.00 mm		DALPHA = 7.60 deg			
32	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45					-0.793	0.087
90					-0.786	0.097
135					-0.797	0.084
180						
225						
270						
315						

TABLE	x/c = 65.88 %		ALPHA = 9.38 deg		FREQ = 1.88 Hz	
	b/2 = 225.00 mm		DALPHA = 15.51 deg			
33	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45					-0.776	0.128
90					-0.783	0.142
135					-0.793	0.115
180						
225						
270						
315						

TABLE	x/c = 65.88 %		ALPHA = 10.00 deg		FREQ = 3.00 Hz	
	b/2 = 225.00 mm		DALPHA = 3.74 deg			
34	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45					-0.799	0.071
90					-0.801	0.076
135					-0.801	0.074
180						
225						
270						
315						

TABLE	x/c = 65.88 %		ALPHA = 9.88 deg		FREQ = 3.00 Hz			
	b/2 = 225.00 mm		DALPHA = 7.47 deg					
35	STRAKE		VORTEX		WING		VORTEX	
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.464	0.119	0.474	0.123				
45					-0.795	0.063	0.792	0.076
90	-0.466	0.172	0.437	0.178	-0.798	0.074	0.783	0.085
135	-0.454	0.167	0.440	0.170	-0.806	0.058	0.799	0.068
180	-0.449	0.131	0.440	0.136				
225	-0.453	0.084	0.453	0.094				
270								
315								

TABLE	x/c = 65.88 %		ALPHA = 9.42 deg		FREQ = 3.00 Hz			
	b/2 = 225.00 mm		DALPHA = 15.23 deg					
35	STRAKE		VORTEX		WING		VORTEX	
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.458	0.134	0.468	0.140				
45	-0.446	0.206	0.450	0.206	-0.768	0.111	0.782	0.116
90	-0.413	0.241	0.439	0.241	-0.775	0.120	0.781	0.136
135	-0.422	0.217	0.428	0.217	-0.799	0.085	0.796	0.095
180								
225								
270								
315								

TABLE	x/c = 65.88 %		ALPHA = 10.00 deg		FREQ = 6.00 Hz	
	b/2 = 225.00 mm		DALPHA = 3.68 deg			
37	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45					-0.813	0.052
90					-0.792	0.057
135	-0.436	0.155	0.456	0.155	-0.800	0.050
180	-0.442	0.143	0.448	0.148	-0.814	0.039
225						
270						
315	-0.452	0.100	0.471	0.102		

TABLE	x/c = 65.88 %		ALPHA = 9.88 deg		FREQ = 6.00 Hz	
	b/2 = 225.00 mm		DALPHA = 7.36 deg			
38	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.452	0.117	0.477	0.117		
45	-0.464	0.142	0.482	0.151	-0.791	0.062
90	-0.442	0.169	0.458	0.177	-0.778	0.077
135	-0.436	0.178	0.448	0.184	-0.797	0.063
180	-0.428	0.149	0.446	0.157	-0.819	0.038
225						
270						
315						

TABLE	x/c = 65.88		%	ALPHA = 18.96 deg		FREQ = 1.13 Hz		
	b/2 = 225.00		mm	DALPHA = 3.82 deg				
39	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.448	0.203	0.467	0.210	-0.795	0.103	0.816	0.106
45	-0.442	0.221	0.463	0.226	-0.797	0.116	0.816	0.123
90	-0.435	0.225	0.454	0.230	-0.788	0.124	0.824	0.127
135	-0.442	0.215	0.455	0.223				
180	-0.448	0.210	0.469	0.212	-0.807	0.101	0.799	0.109
225	-0.452	0.229	0.466	0.231	-0.788	0.124	0.821	0.129
270	-0.447	0.188	0.464	0.193	-0.798	0.087	0.812	0.103
315	-0.454	0.195	0.462	0.200	-0.802	0.097	0.814	0.107

TABLE	$x/c = 65.88$		%	ALPHA = 18.92 deg		FREQ = 1.13 Hz	
	$b/2 = 225.00$		mm	DALPHA = 7.65 deg			
40	STRAKE		VORTEX		WING		VORTEX
	LEFT		RIGHT		LEFT		RIGHT
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b 2z/b
0	-0.449	0.205	0.470	0.212	-0.779	0.102	0.813 0.117
45	-0.437	0.231	0.457	0.242			
90	-0.429	0.243	0.450	0.251			
135	-0.434	0.234	0.450	0.243			
180	-0.446	0.204	0.457	0.213			
225	-0.442	0.181	0.465	0.185			
270	-0.467	0.167	0.467	0.172			
315	-0.446	0.182	0.465	0.189			

TABLE	x/c = 65.88 %		ALPHA = 18.78 deg		FREQ = 1.13 Hz	
	b/2 = 225.00 mm		DALPHA = 13.50 deg			
41	STRAKE		VORTEX		WING	
	LEFT		RIGHT		VORTEX	
PHI	2y/b 2z/b		2y/b 2z/b		2y/b 2z/b	
0	-0.452	0.208	0.468	0.213	-0.787	0.117
45	-0.428	0.245	0.450	0.261		0.810 0.132
90			0.438	0.300		
135			0.450	0.263		
180	-0.441	0.209	0.460	0.214	-0.797	0.092
225	-0.445	0.160	0.461	0.165		0.825 0.107
270	-0.448	0.117	0.467	0.125		
315	-0.452	0.157	0.469	0.163		

TABLE	x/c = 65.88 %		ALPHA = 18.94 deg		FREQ = 1.88 Hz	
	b/2 = 225.00 mm		DALPHA = 3.58 deg			
42	STRAKE		VORTEX		WING	
	LEFT		RIGHT		VORTEX	
PHI	2y/b 2z/b		2y/b 2z/b		2y/b 2z/b	
0	-0.457	0.194	0.456	0.200		
45	-0.456	0.205	0.453	0.214		
90	-0.448	0.214	0.453	0.222		
135	-0.449	0.213	0.453	0.218		
180	-0.455	0.204	0.452	0.212		
225	-0.457	0.185	0.453	0.193		
270	-0.457	0.179	0.457	0.188		
315	-0.455	0.182	0.459	0.194		

TABLE	x/c = 65.88 %		ALPHA = 18.93 deg		FREQ = 1.88 Hz	
	b/2 = 225.00 mm		DALPHA = 7.15 deg			
43	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.456	0.199	0.463	0.206	-0.797	0.107
45	-0.440	0.225	0.455	0.235	-0.795	0.123
90	-0.432	0.241	0.440	0.250		
135	-0.429	0.233	0.448	0.239		
180	-0.438	0.208	0.459	0.214		
225	-0.445	0.179	0.461	0.190	-0.801	0.080
270	-0.444	0.161	0.464	0.170		
315	-0.444	0.169	0.459	0.180	-0.799	0.079

TABLE	x/c = 65.88 %		ALPHA = 18.79 deg		FREQ = 1.88 Hz	
	b/2 = 225.00 mm		DALPHA = 12.63 deg			
44	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.448	0.205	0.472	0.213	-0.790	0.114
45	-0.433	0.253	0.444	0.263	-0.786	0.164
90			0.448	0.295		
135			0.457	0.284		
180	-0.433	0.219	0.452	0.227		
225	-0.437	0.169	0.456	0.178		
270	-0.447	0.127	0.464	0.138		
315	-0.457	0.150	0.473	0.161		

TABLE	x/c = 65.88 %		ALPHA = 18.97 deg		FREQ = 3.00 Hz	
	b/2 = 225.00 mm		DALPHA = 3.54 deg			
45	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.459	0.218	0.460	0.227	-0.800	0.116
45	-0.448	0.229	0.459	0.236	-0.805	0.123
90	-0.444	0.230	0.451	0.240	-0.803	0.123
135	-0.438	0.222	0.461	0.228	-0.793	0.109
180	-0.453	0.210	0.456	0.215	-0.802	0.109
225	-0.453	0.202	0.457	0.205	-0.805	0.099
270	-0.451	0.188	0.463	0.197	-0.803	0.094
315	-0.454	0.198	0.460	0.206	-0.802	0.104

TABLE	x/c = 65.88 %		ALPHA = 18.92 deg		FREQ = 3.00 Hz	
	b/2 = 225.00 mm		DALPHA = 7.07 deg			
46	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.452	0.218	0.463	0.225	-0.797	0.122
45	-0.440	0.241	0.458	0.250	-0.782	0.140
90	-0.432	0.246	0.462	0.251	-0.782	0.144
135	-0.435	0.231	0.458	0.237	-0.796	0.122
180	-0.435	0.205	0.465	0.211	-0.803	0.100
225	-0.447	0.176	0.464	0.181		
270	-0.440	0.173	0.460	0.179		
315	-0.442	0.189	0.454	0.198		

TABLE	x/c = 65.88 %		ALPHA = 18.83 deg		FREQ = 3.00 Hz			
	b/2 = 225.00 mm		DALPHA = 12.42 deg					
47	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.444	0.225	0.476	0.235	-0.773	0.138	0.806	0.143
45	-0.439	0.268	0.459	0.270	-0.773	0.178		
90			0.436	0.297	-0.792	0.151		
135			0.450	0.294				
180	-0.425	0.200	0.458	0.208				
225	-0.435	0.156	0.472	0.162				
270								
315	-0.460	0.172	0.485	0.180	-0.802	0.085	0.820	

TABLE	x/c = 65.88		% ALPHA = 18.98 deg		FREQ = 6.00 Hz			
	b/2 = 225.00		mm DALPHA = 3.46 deg					
48	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.447	0.192	0.473	0.202	-0.784	0.103	0.807	0.114
45	-0.444	0.211	0.476	0.218	-0.784	0.116	0.805	0.124
90	-0.446	0.227	0.456	0.232	-0.798	0.119	0.803	0.122
135	-0.446	0.229	0.448	0.239	-0.805	0.121	0.810	0.124
180	-0.446	0.225	0.446	0.234	-0.801	0.112	0.812	0.122
225	-0.444	0.213	0.458	0.216	-0.803	0.094	0.820	0.108
270	-0.443	0.198	0.470	0.204	-0.802	0.097	0.818	0.105
315	-0.445	0.188	0.472	0.197	-0.799	0.089	0.824	0.111

TABLE	x/c = 65.88 %		ALPHA = 18.93 deg		FREQ = 6.00 Hz	
	b/2 = 225.00 mm		DALPHA = 6.93 deg			
49	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0					-0.782	0.082
45					-0.782	0.115
90	-0.438	0.250	0.437	0.259	-0.775	0.153
135	-0.442	0.251	0.442	0.258	-0.792	0.144
180	-0.442	0.229	0.442	0.238		
225	-0.444	0.206	0.443	0.212	-0.813	0.077
270	-0.453	0.180			-0.812	0.061
315					-0.790	0.062

TABLE	x/c = 65.88 %		ALPHA = 22.45 deg		FREQ = 1.13 Hz	
	b/2 = 225.00 mm		DALPHA = 3.79 deg			
50	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.444	0.234	0.463	0.244	-0.789	0.132
45	-0.443	0.246	0.460	0.251	-0.789	0.148
90	-0.439	0.248	0.458	0.254	-0.787	0.157
135	-0.439	0.237	0.456	0.242	-0.792	0.141
180	-0.441	0.229	0.462	0.239	-0.799	0.123
225	-0.446	0.222	0.464	0.230	-0.790	0.115
270	-0.444	0.216	0.467	0.222	-0.790	0.112
315	-0.444	0.223	0.471	0.229	-0.791	0.116

TABLE	x/c = 65.88 %		ALPHA = 22.41 deg		FREQ = 1.13 Hz	
	b/2 = 225.00 mm		DALPHA = 7.57 deg			
51	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.445	0.224	0.468	0.230	-0.792	0.117
45	-0.441	0.247	0.464	0.254	-0.766	0.172
90			0.443	0.271	-0.803	0.157
135			0.452	0.259	-0.795	0.136
180	-0.438	0.225	0.463	0.232	-0.787	0.125
225	-0.446	0.203	0.467	0.210	-0.799	0.102
270	-0.446	0.191	0.468	0.194	-0.793	0.090
315	-0.452	0.198	0.470	0.204	-0.796	0.107

TABLE	x/c = 65.88 %		ALPHA = 22.49 deg		FREQ = 1.13 Hz	
	b/2 = 225.00 mm		DALPHA = 15.19 deg			
52	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0					-0.789	0.128
45						0.820
90						0.135
135						
180	-0.436	0.219	0.460	0.227	-0.792	0.110
225	-0.444	0.172	0.468	0.175		
270	-0.444	0.137	0.468	0.138		
315	-0.447	0.174	0.474	0.175		

TABLE	x/c = 65.88 %		ALPHA = 22.46 deg		FREQ = 1.86 Hz	
	b/2 = 225.00 mm		DALPHA = 3.54 deg			
53	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.440	0.222	0.464	0.227	-0.793	0.116
45	-0.438	0.228	0.457	0.239	-0.784	0.135
90	-0.439	0.235	0.458	0.244	-0.781	0.152
135	-0.440	0.232	0.452	0.239	-0.791	0.132
180	-0.438	0.223	0.455	0.228	-0.795	0.116
225	-0.438	0.209	0.464	0.219	-0.789	0.103
270	-0.438	0.202	0.478	0.209	-0.791	0.099
315	-0.439	0.206	0.475	0.215	-0.791	0.103

TABLE	x/c = 65.88 %		ALPHA = 22.42 deg		FREQ = 1.88 Hz	
	b/2 = 225.00 mm		DALPHA = 7.09 deg			
54	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.440	0.217	0.477	0.226	-0.787	0.117
45	-0.435	0.243	0.466	0.250		
90	-0.429	0.268	0.456	0.272		
135			0.457	0.256		
180	-0.423	0.224	0.464	0.232		
225	-0.437	0.197	0.466	0.207	-0.795	0.089
270	-0.440	0.184	0.474	0.193	-0.792	0.086
315	-0.444	0.192	0.477	0.198	-0.791	0.101

TABLE	x/c = 65.88 %		ALPHA = 22.29 deg		FREQ = 1.88 Hz	
	b/2 = 225.00 mm		DALPHA = 14.24 deg			
55	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.449	0.222	0.470	0.228	-0.783	0.136
45	-0.432	0.282	0.456	0.287		
90						
135						
180	-0.425	0.240	0.464	0.247		
225	-0.435	0.182	0.470	0.189		
270						
315						

TABLE	x/c = 65.88 %		ALPHA = 22.44 deg		FREQ = 3.00 Hz	
	b/2 = 225.00 mm		DALPHA = 3.51 deg			
56	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.455	0.205	0.455	0.217	-0.805	0.115
45	-0.449	0.218	0.449	0.230	-0.798	0.120
90	-0.446	0.223	0.446	0.230	-0.789	0.132
135	-0.447	0.218	0.447	0.229	-0.785	0.118
180	-0.445	0.215	0.445	0.227	-0.813	0.108
225	-0.449	0.203	0.449	0.214	-0.811	0.094
270	-0.457	0.191	0.457	0.202	-0.812	0.092
315	-0.460	0.194	0.460	0.204	-0.812	0.094

TABLE	x/c = 65.88 %		ALPHA = 22.42 deg		FREQ = 3.00 Hz	
	b/2 = 225.00 mm		DALPHA = 6.98 deg			
57	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.458	0.197	0.458	0.207	-0.800	0.105
45	-0.447	0.225	0.447	0.232	-0.794	0.142
90	-0.446	0.247	0.446	0.252	-0.800	0.157
135			0.449	0.244		
180	-0.442	0.219	0.442	0.226	-0.804	0.112
225	-0.451	0.188	0.451	0.194	-0.808	0.086
270	-0.458	0.165	0.458	0.169	-0.810	0.070
315	-0.463	0.170	0.463	0.178	-0.806	0.088

TABLE	x/c = 65.88 %		ALPHA = 22.28 deg		FREQ = 3.00 Hz	
	b/2 = 225.00 mm		DALPHA = 14.00 deg			
58	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.441	0.207	0.485	0.211	-0.772	0.130
45	-0.425	0.272	0.454	0.277		
90						
135						
180						
225	-0.426	0.165	0.473	0.170	-0.791	0.061
270						
315						

TABLE	x/c = 65.88 %		ALPHA = 22.50 deg		FREQ = 6.00 Hz	
	b/2 = 225.00 mm		DALPHA = 3.44 deg			
59	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.461	0.210	0.461	0.218	-0.802	0.115
45	-0.452	0.221	0.452	0.232	-0.803	0.137
90	-0.450	0.229	0.450	0.239		
135	-0.450	0.228	0.450	0.238		
180	-0.446	0.222	0.446	0.232		
225	-0.447	0.208	0.447	0.221	-0.808	0.108
270	-0.454	0.198	0.454	0.211	-0.815	0.105
315	-0.460	0.200	0.460	0.208	-0.812	0.109

TABLE	x/c = 65.88 %		ALPHA = 22.42 deg		FREQ = 6.00 Hz	
	b/2 = 225.00 mm		DALPHA = 6.88 deg			
60	STRAKE		VORTEX		WING	
	LEFT		RIGHT		LEFT	
	RIGHT				RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.469	0.195	0.469	0.205	-0.798	0.128
45	-0.457	0.227	0.457	0.235	-0.797	0.150
90	-0.449	0.251	0.449	0.259		
135	-0.449	0.269	0.449	0.269		
180	-0.448	0.239	0.448	0.250		
225	-0.446	0.210	0.446	0.221		
270	-0.456	0.189	0.456	0.197	-0.824	0.085
315	-0.466	0.179	0.466	0.188	-0.812	0.104

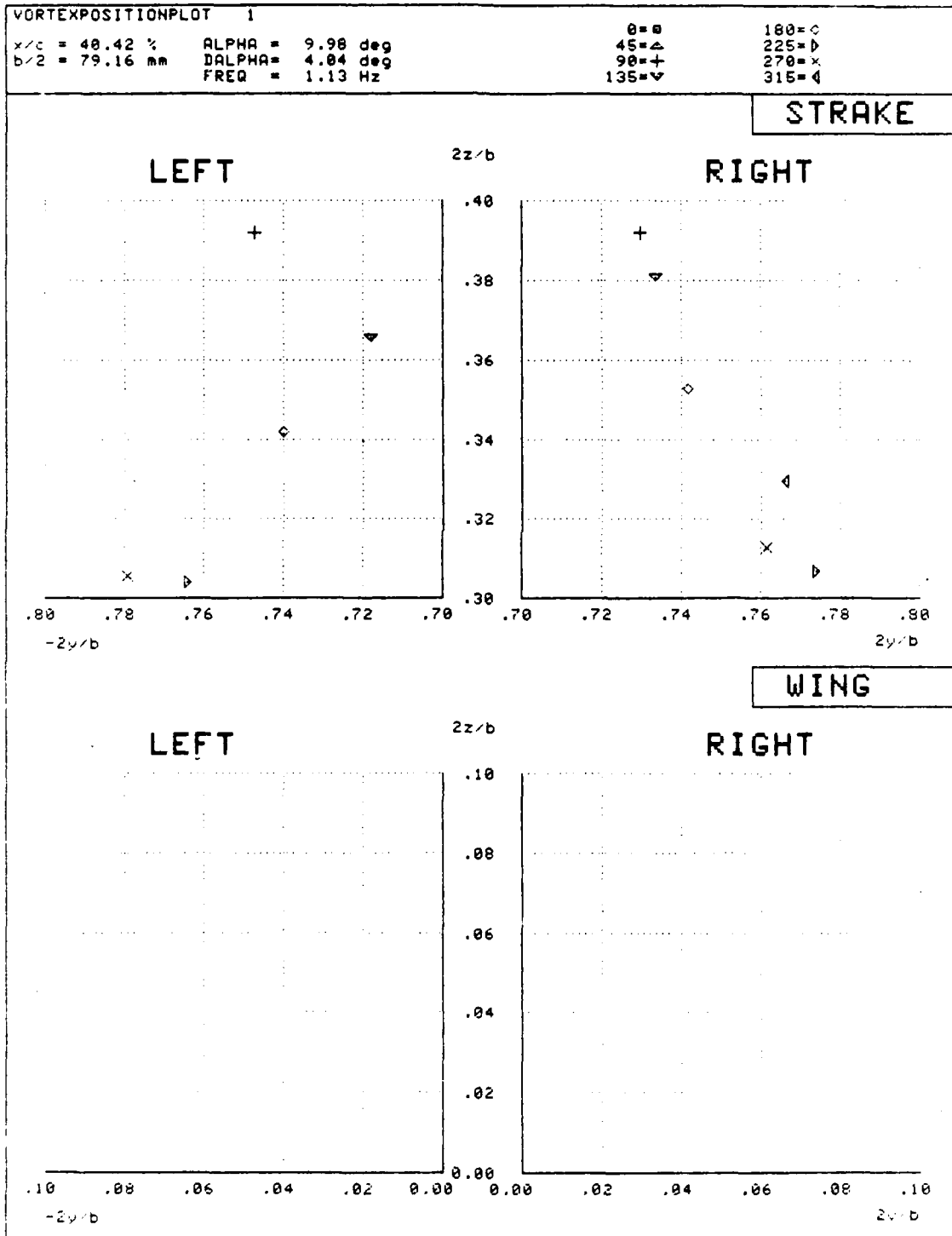
TABLE	x/c = 65.88 %		ALPHA = 36.03 deg		FREQ = 1.13 Hz	
	b/2 = 225.00 mm		DALPHA = 15.23 deg			
61	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45						
90						
135						
180						
225						
270	-0.462	0.230	0.456	0.243		
315						

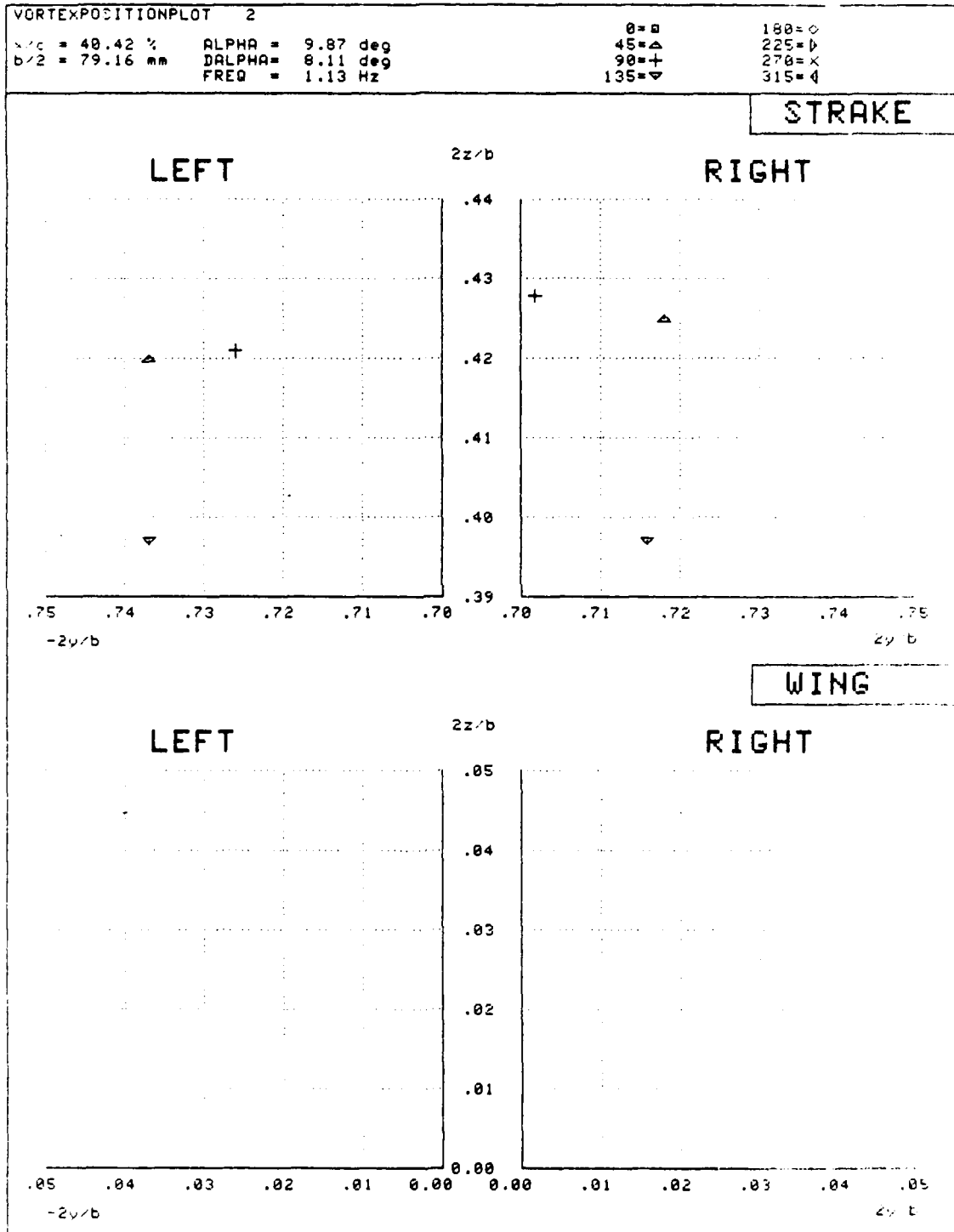
TABLE	x/c = 65.88 %		ALPHA = 36.02 deg		FREQ = 3.00 Hz	
	b/2 = 225.00 mm		DALPHA = 14.03 deg			
62	STRAKE VORTEX		WING VORTEX			
	LEFT		RIGHT			
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45						
90						
135						
180						
225						
270	-0.450	0.230	0.446	0.238		
315	-0.463	0.217	0.459	0.235		

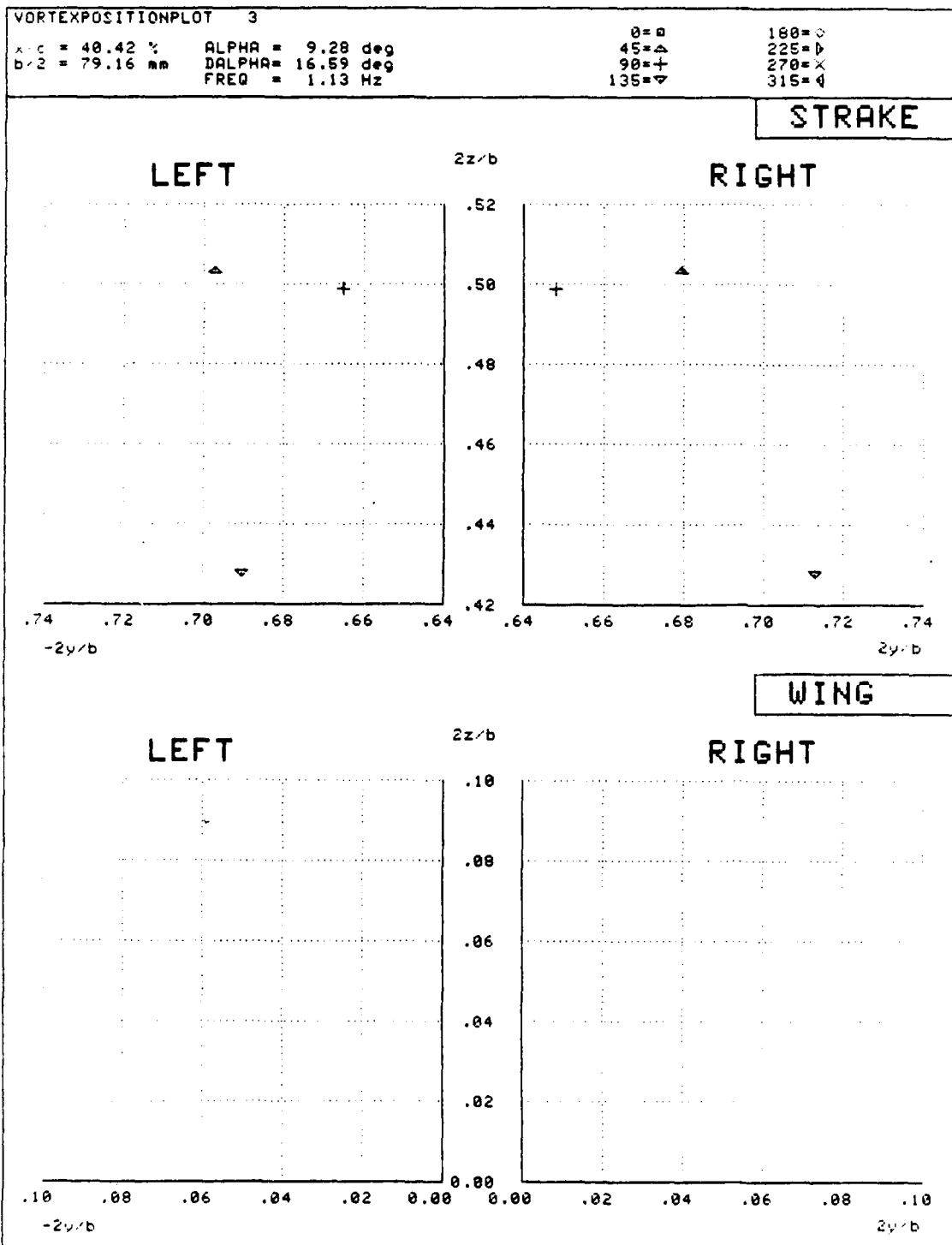
TABLE	x/c = 96.82 %		ALPHA = 10.01 deg		FREQ = 1.88 Hz			
	b/2 = 400.00 mm		DALPHA = 3.78 deg					
63	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0								
45								
90								
135	-0.351	0.117	0.362	0.119				
180								
225								
270								
315								

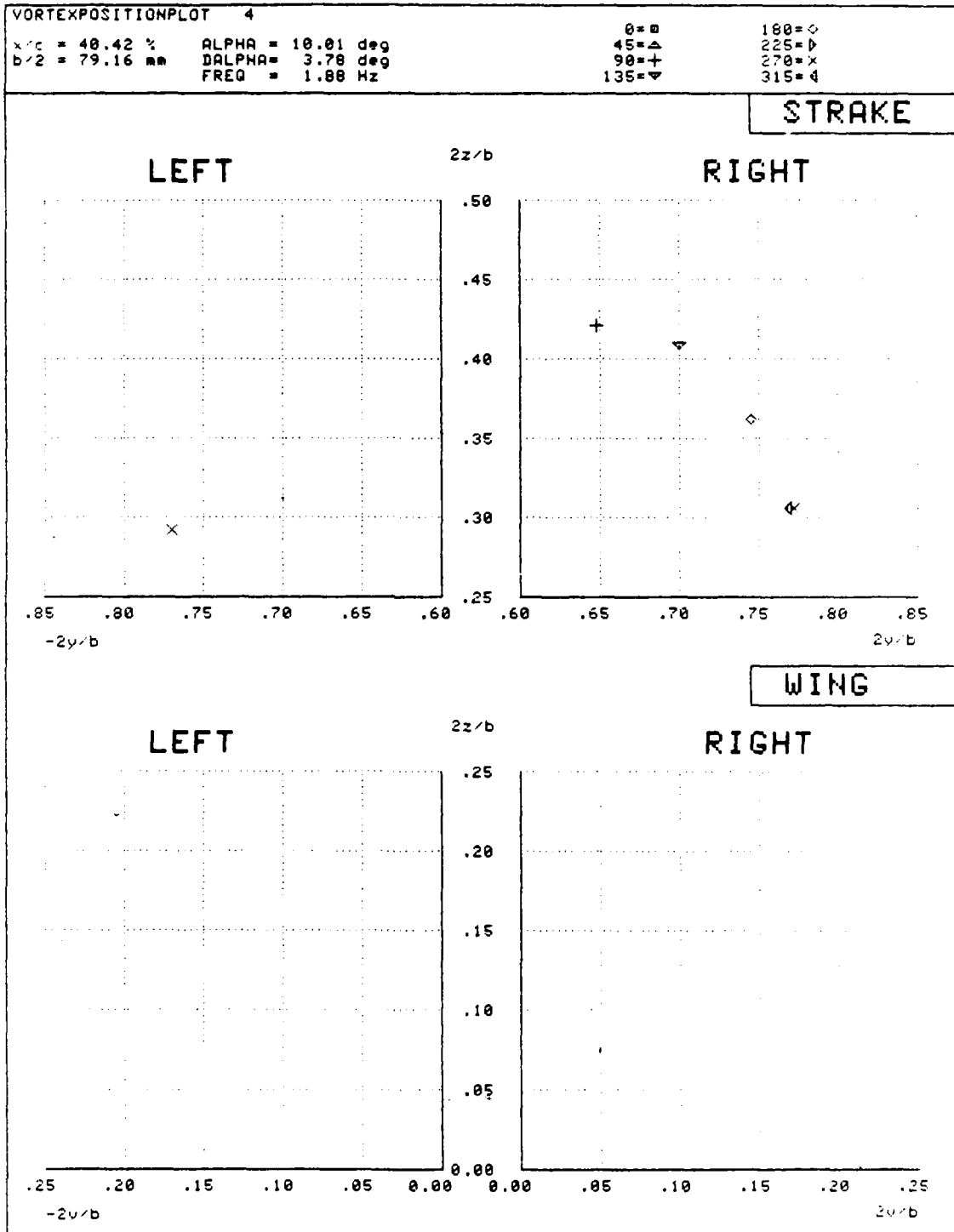
TABLE	x/c = 96.82 %		ALPHA = 9.91 deg		FREQ = 1.88 Hz			
	b/2 = 400.00 mm		DALPHA = 7.60 deg					
64	STRAKE VORTEX				WING VORTEX			
	LEFT		RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0	-0.320	0.082	0.336	0.085				
45								
90	-0.469	0.073	0.481	0.077				
135	-0.413	0.102	0.424	0.104				
180	-0.327	0.112	0.344	0.115				
225								
270								
315								

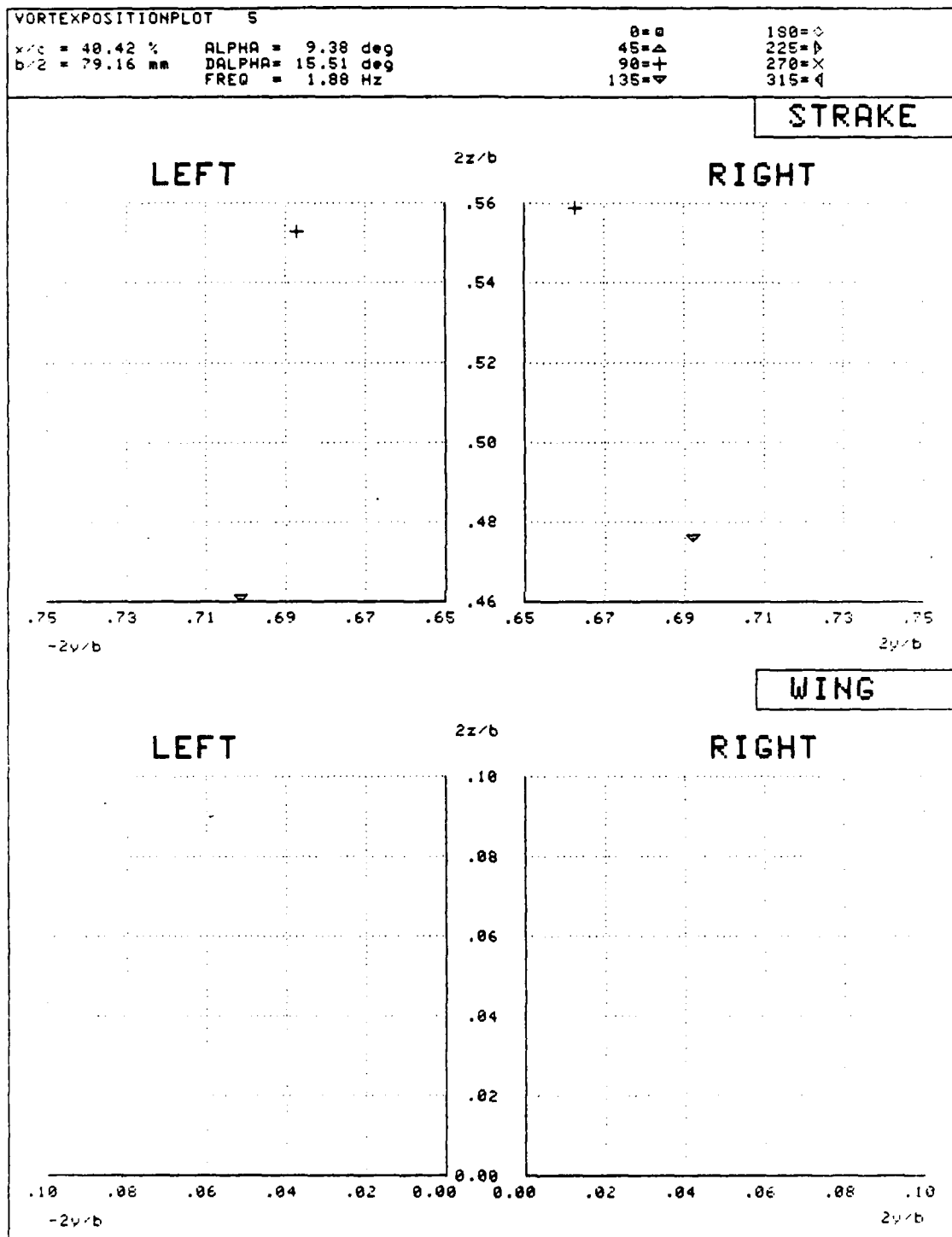
TABLE	x/c = 96.82 %		ALPHA = 9.88 deg		FREQ = 6.00 Hz	
	b/2 = 400.00 mm		DALPHA = 7.36 deg			
65	STRAKE		VORTEX		WING VORTEX	
	LEFT		RIGHT		LEFT	
	RIGHT		LEFT		RIGHT	
PHI	2y/b	2z/b	2y/b	2z/b	2y/b	2z/b
0						
45						
90						
135						
180	-0.360	0.127	0.360	0.129		
225						
270						
315						

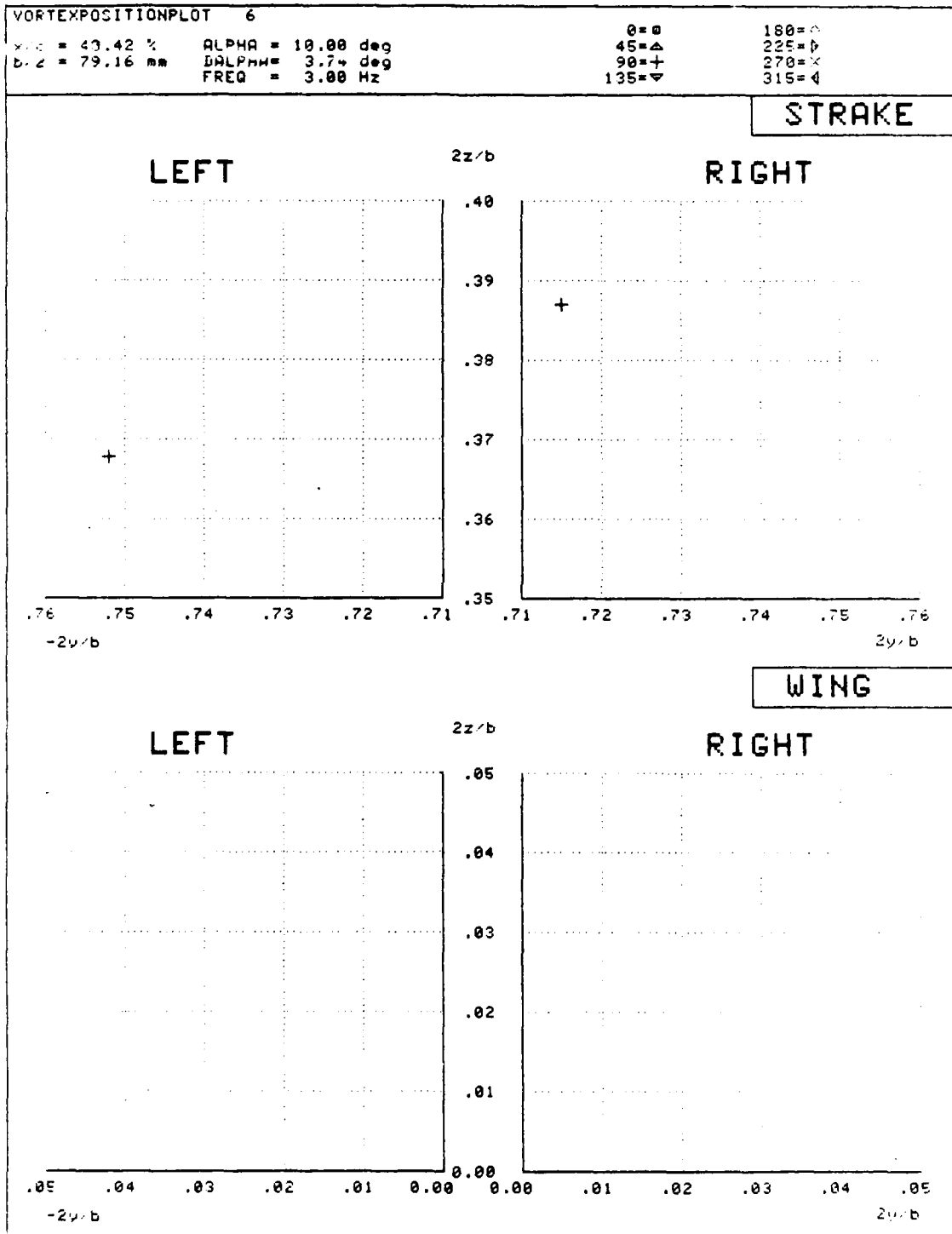


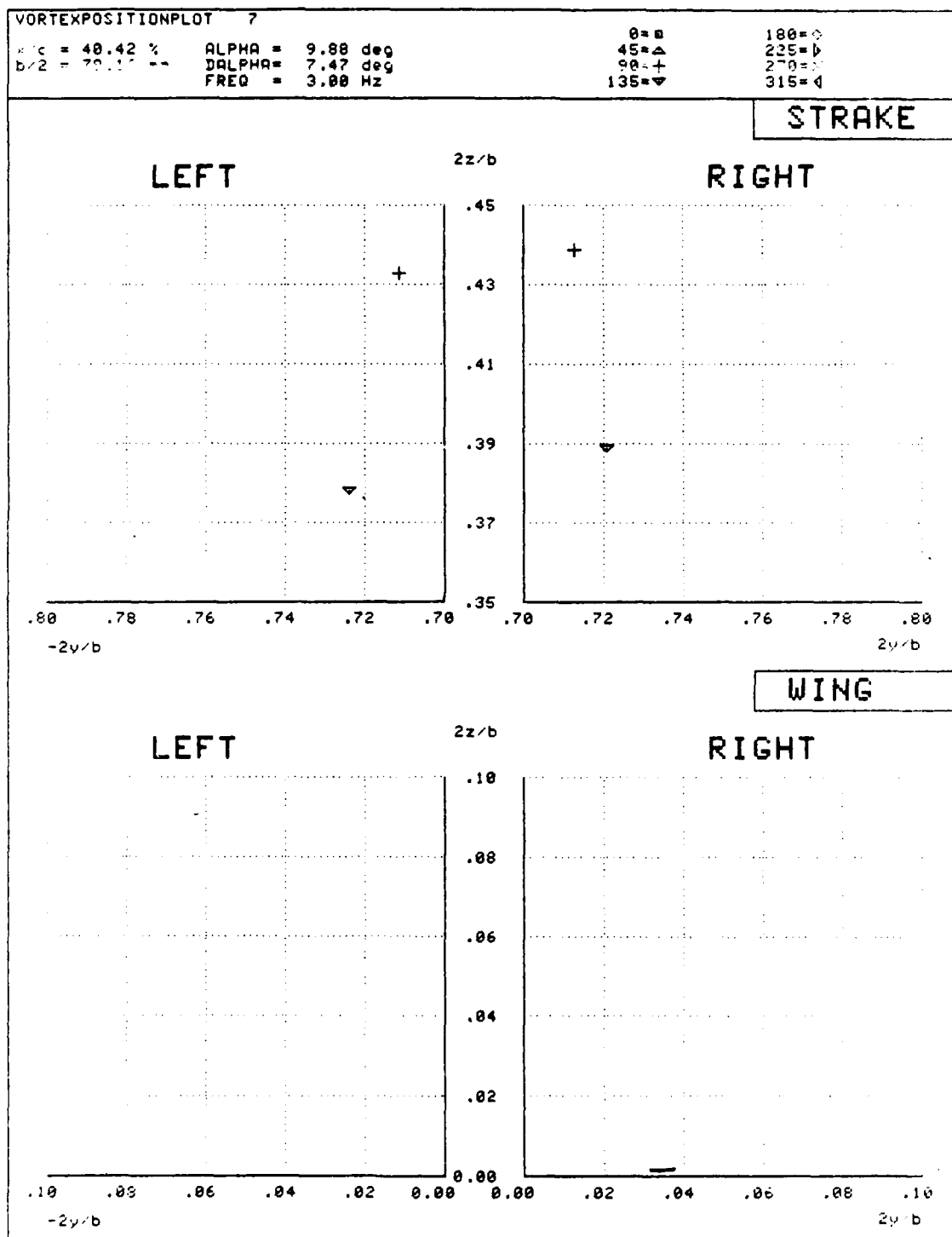


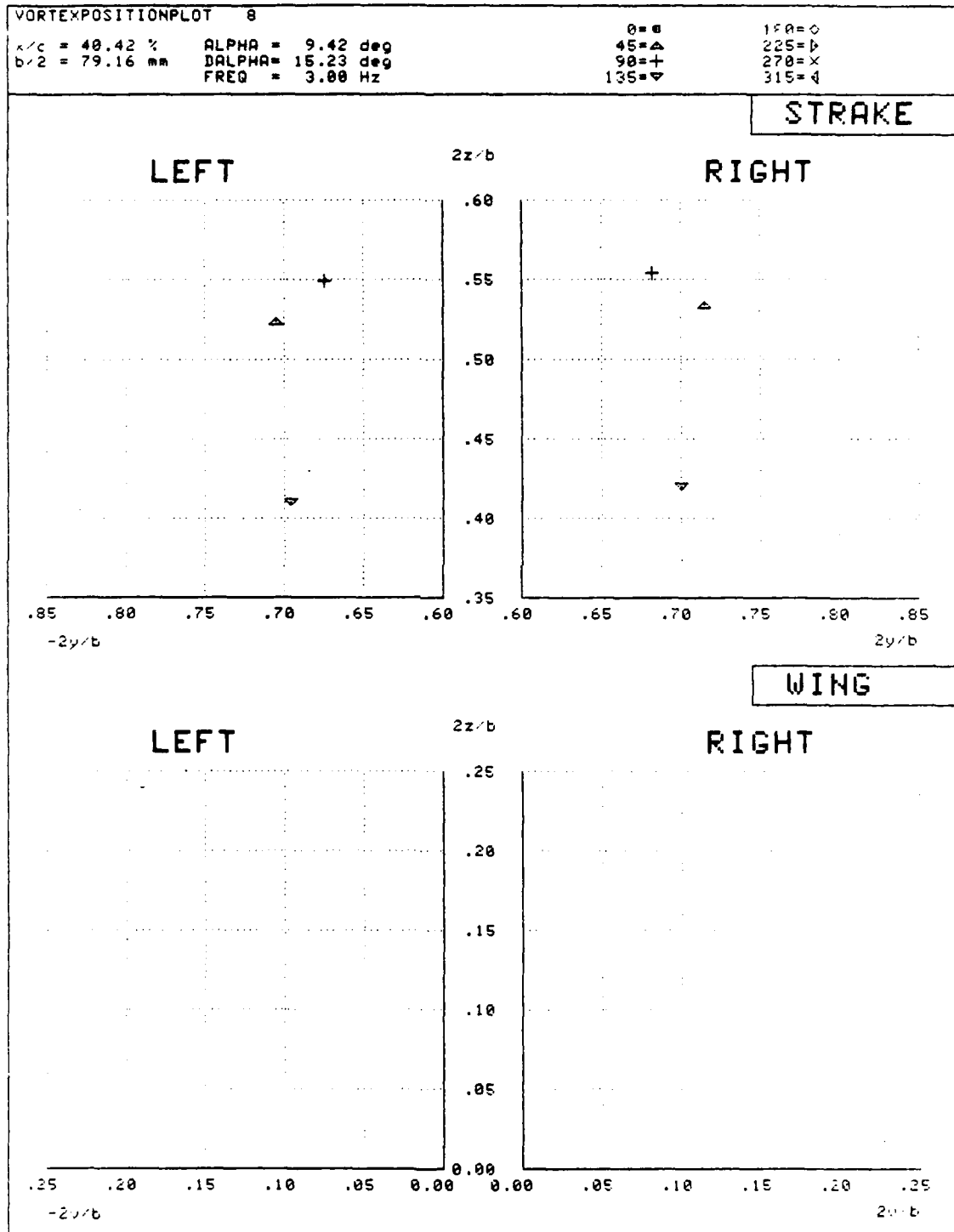


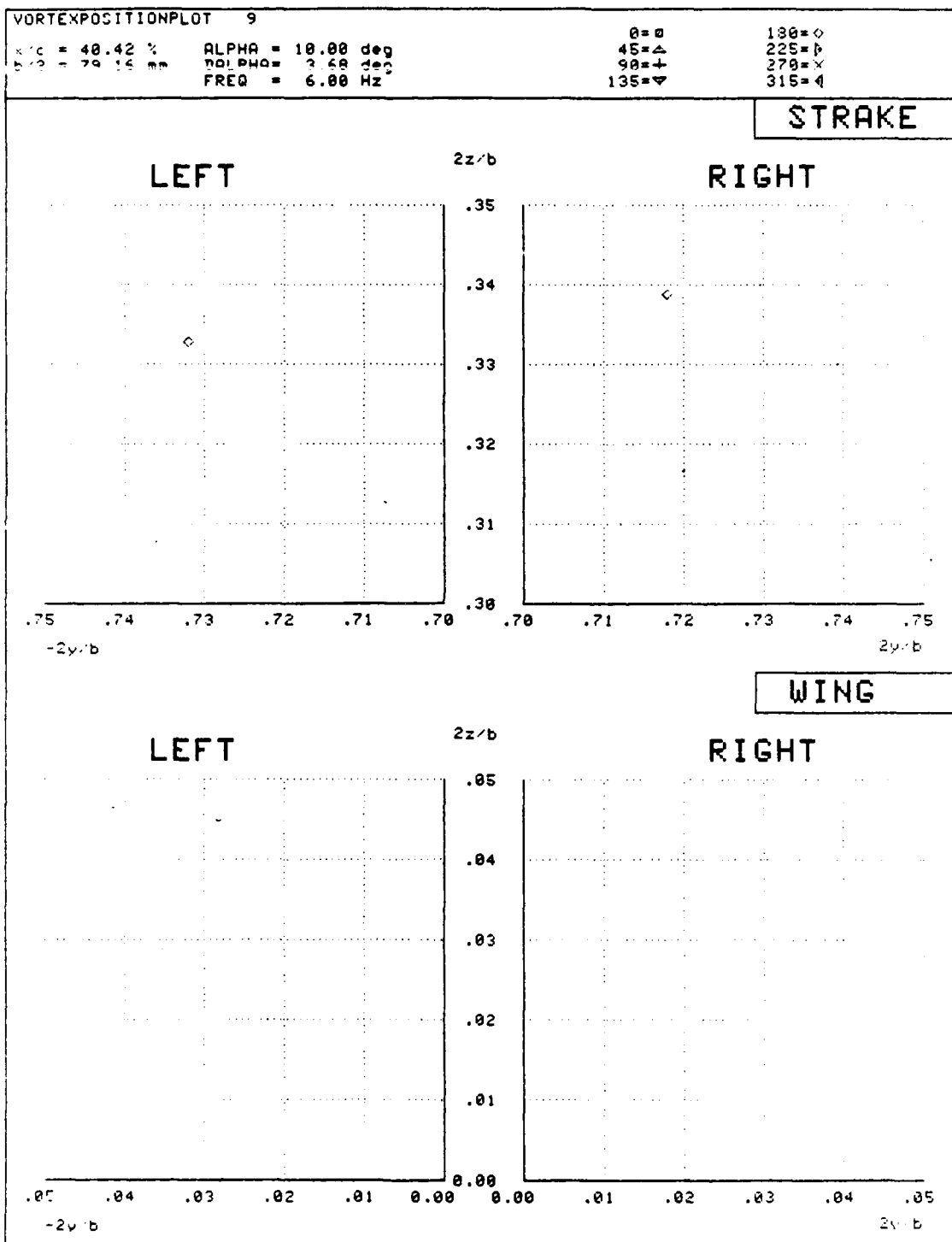












VORTEXPOSITIONPLOT 10

x/c = 48.42 % ALPHA = 18.92 deg
 b/2 = 79.16 mm DALPHA = 7.65 deg
 FREQ = 1.13 Hz

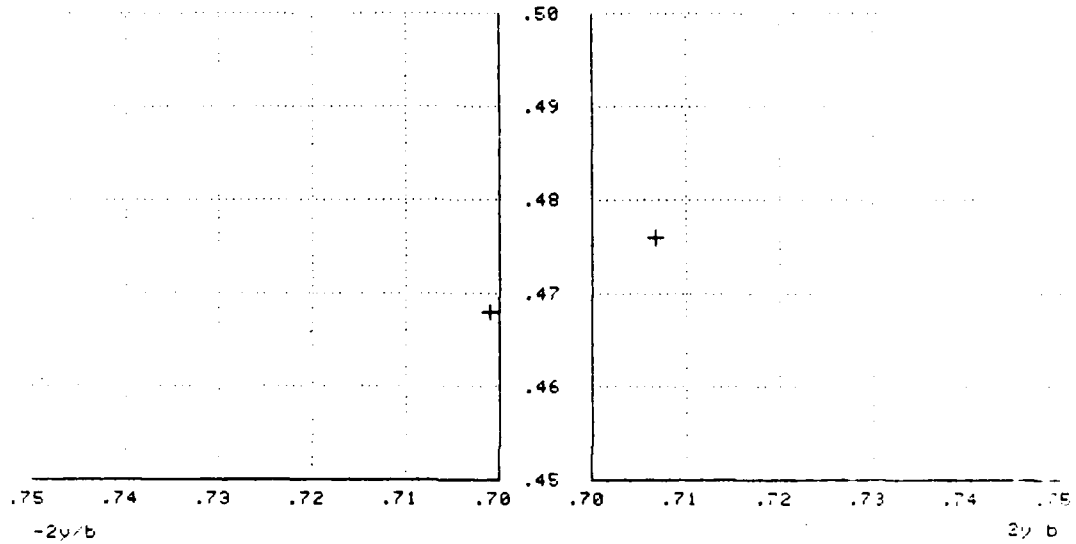
0=□ 180=△
 45=△ 225=▽
 90=+ 270=×
 135=▽ 315=△

STRAKE

LEFT

2z/b

RIGHT

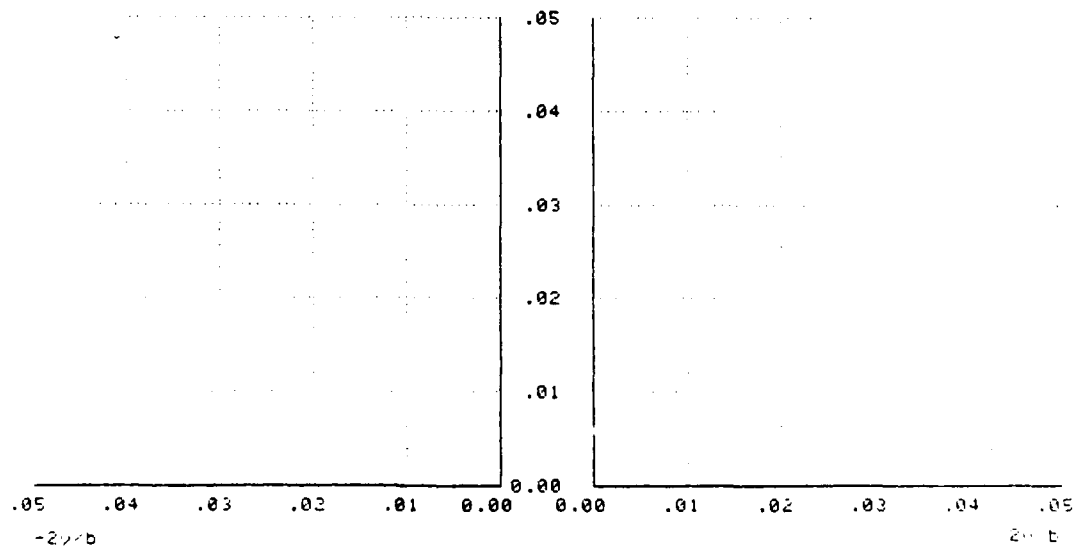


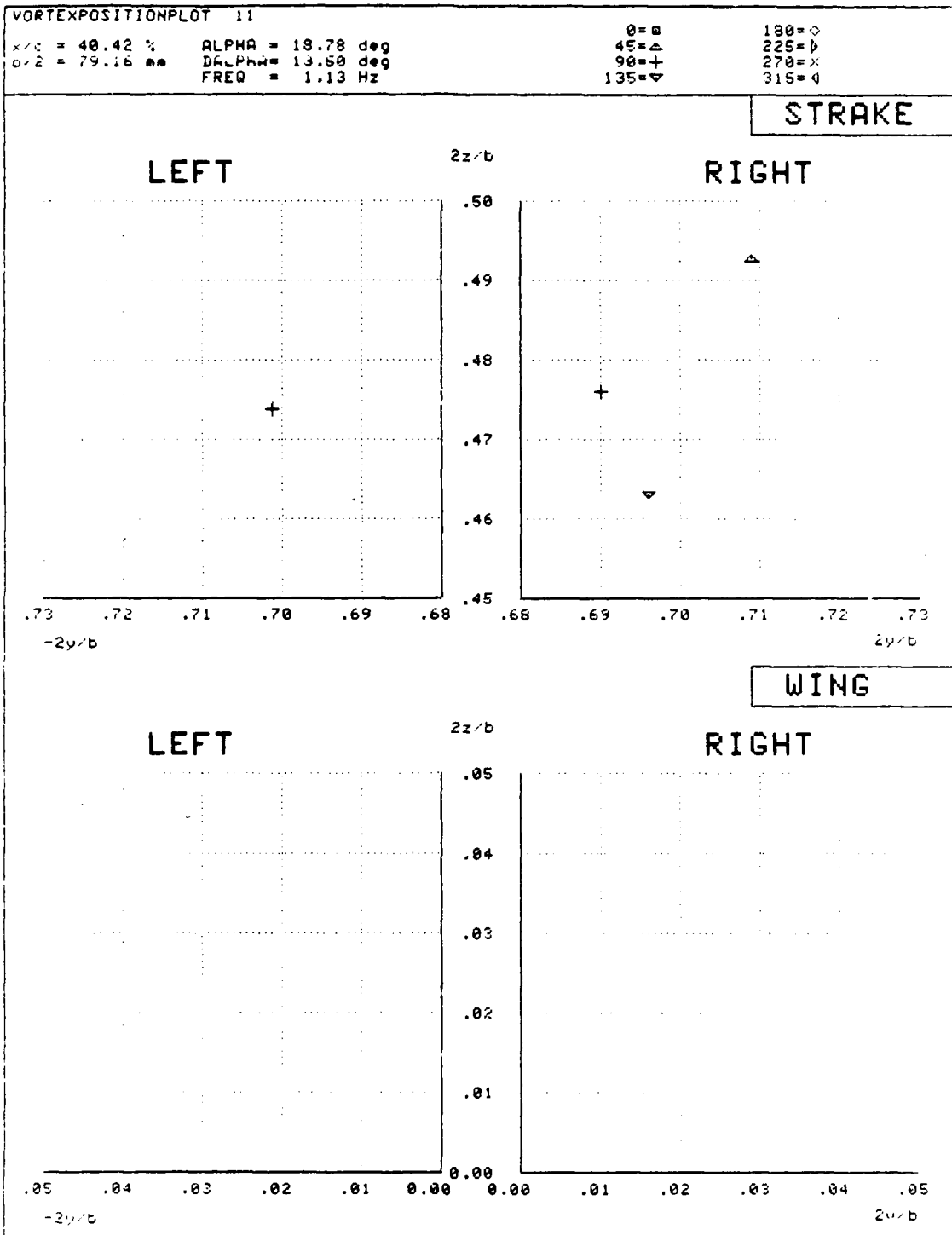
WING

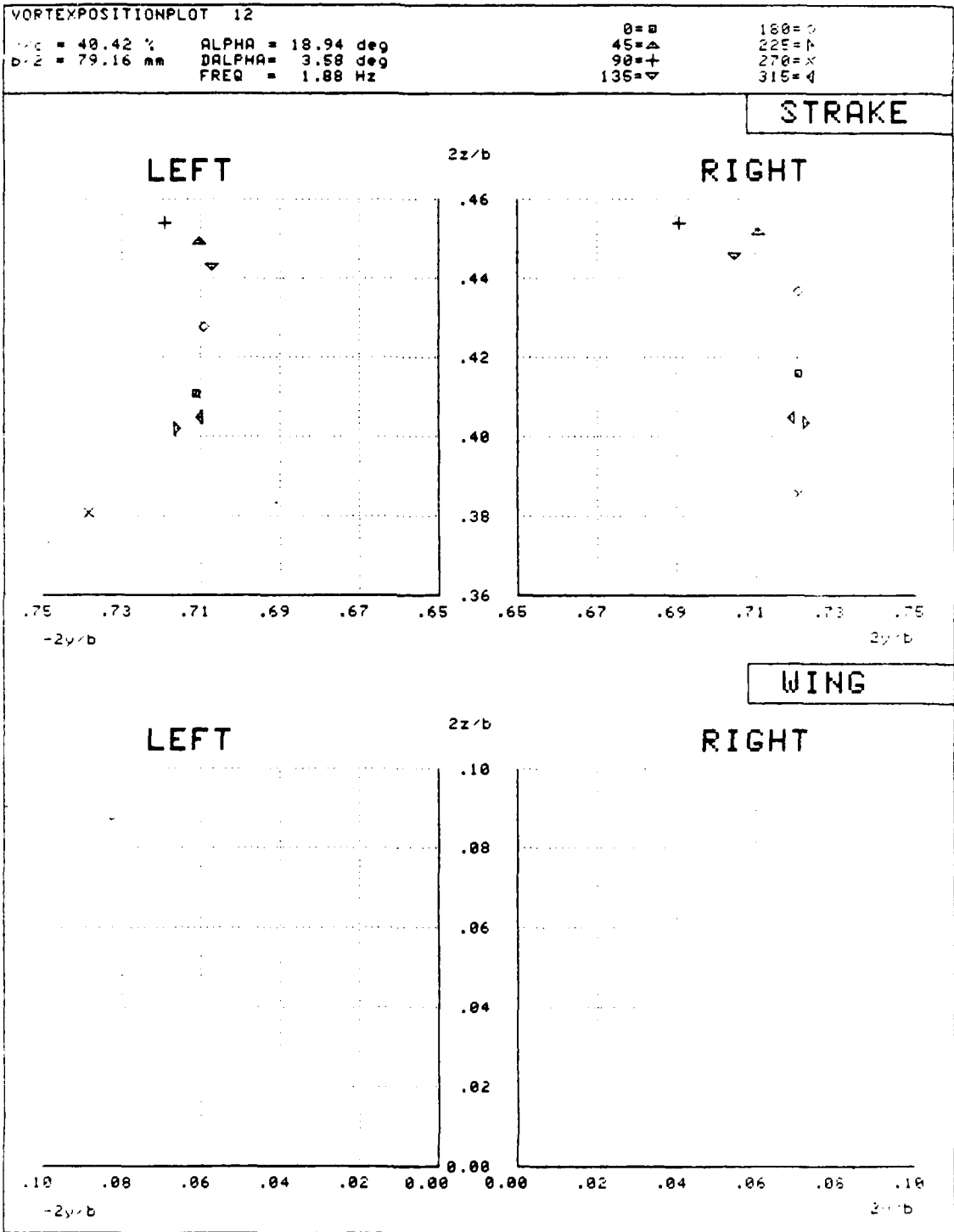
LEFT

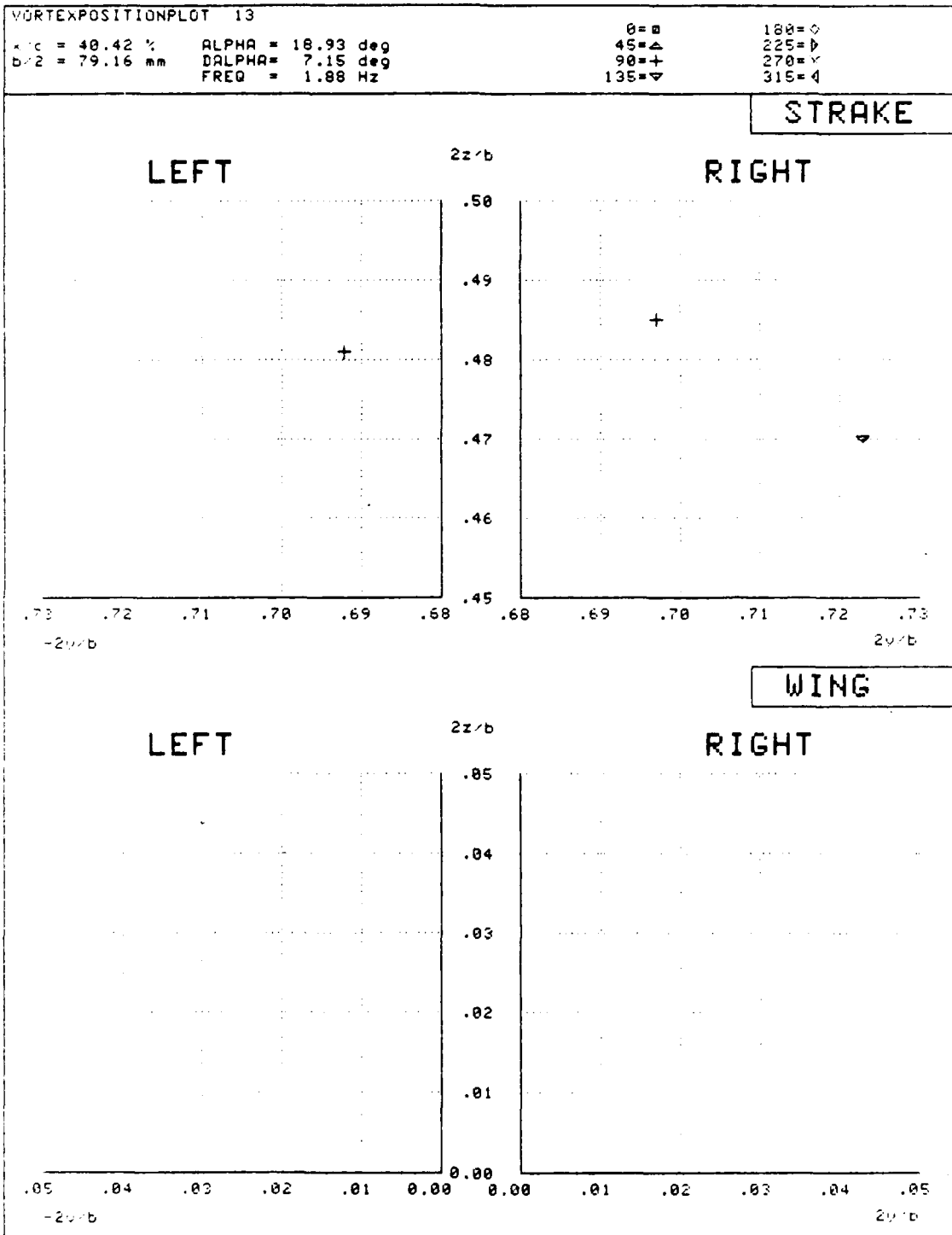
2z/b

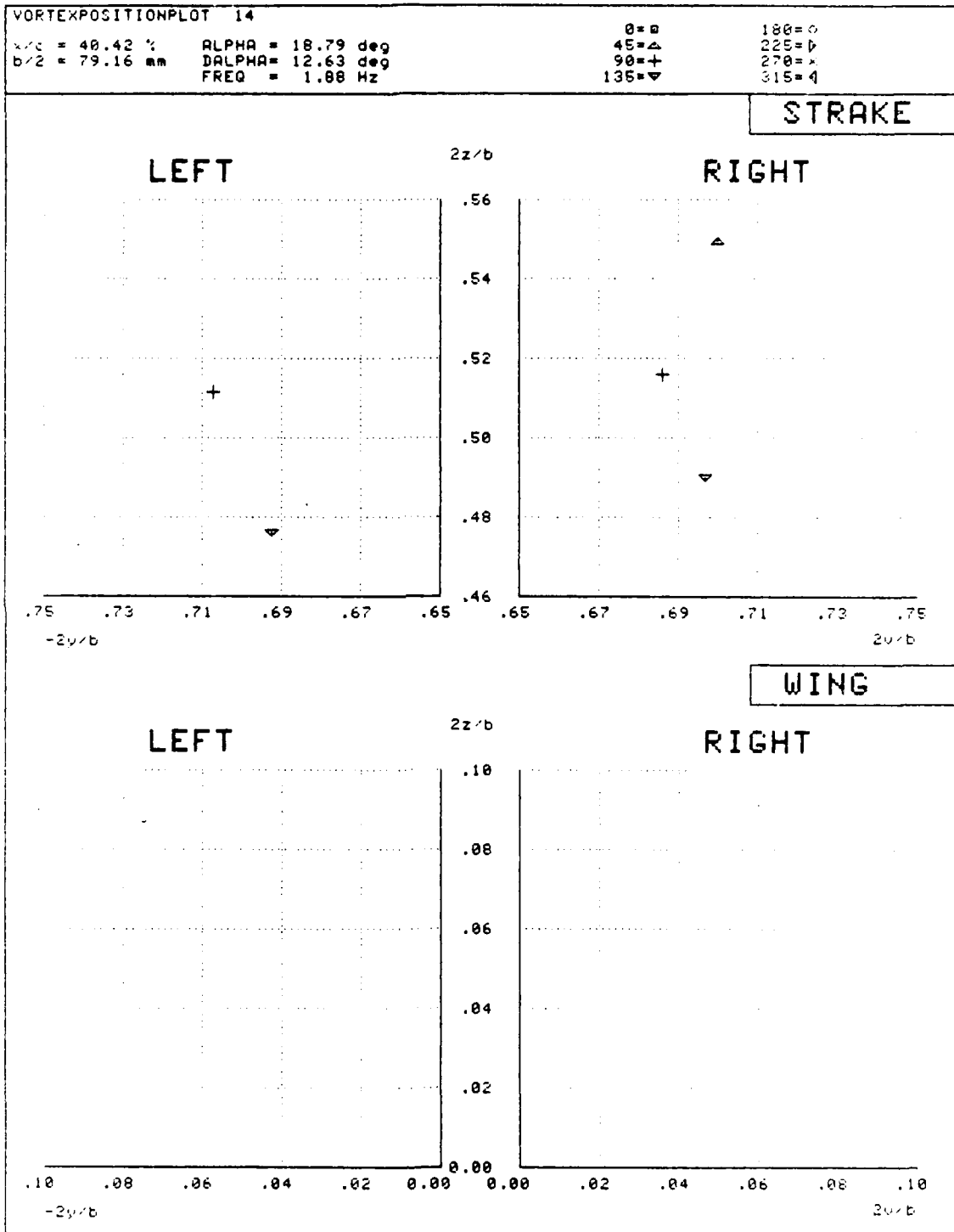
RIGHT

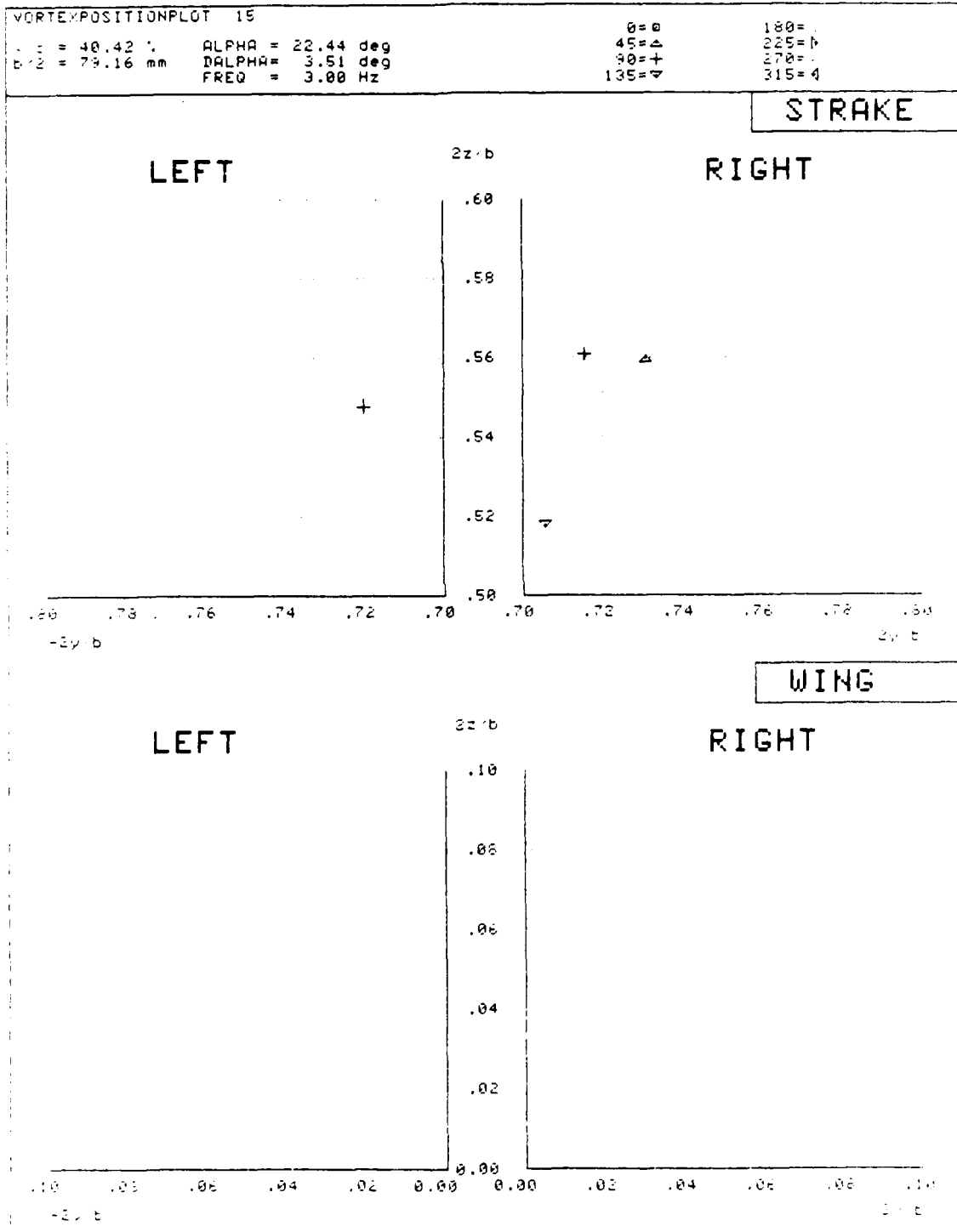


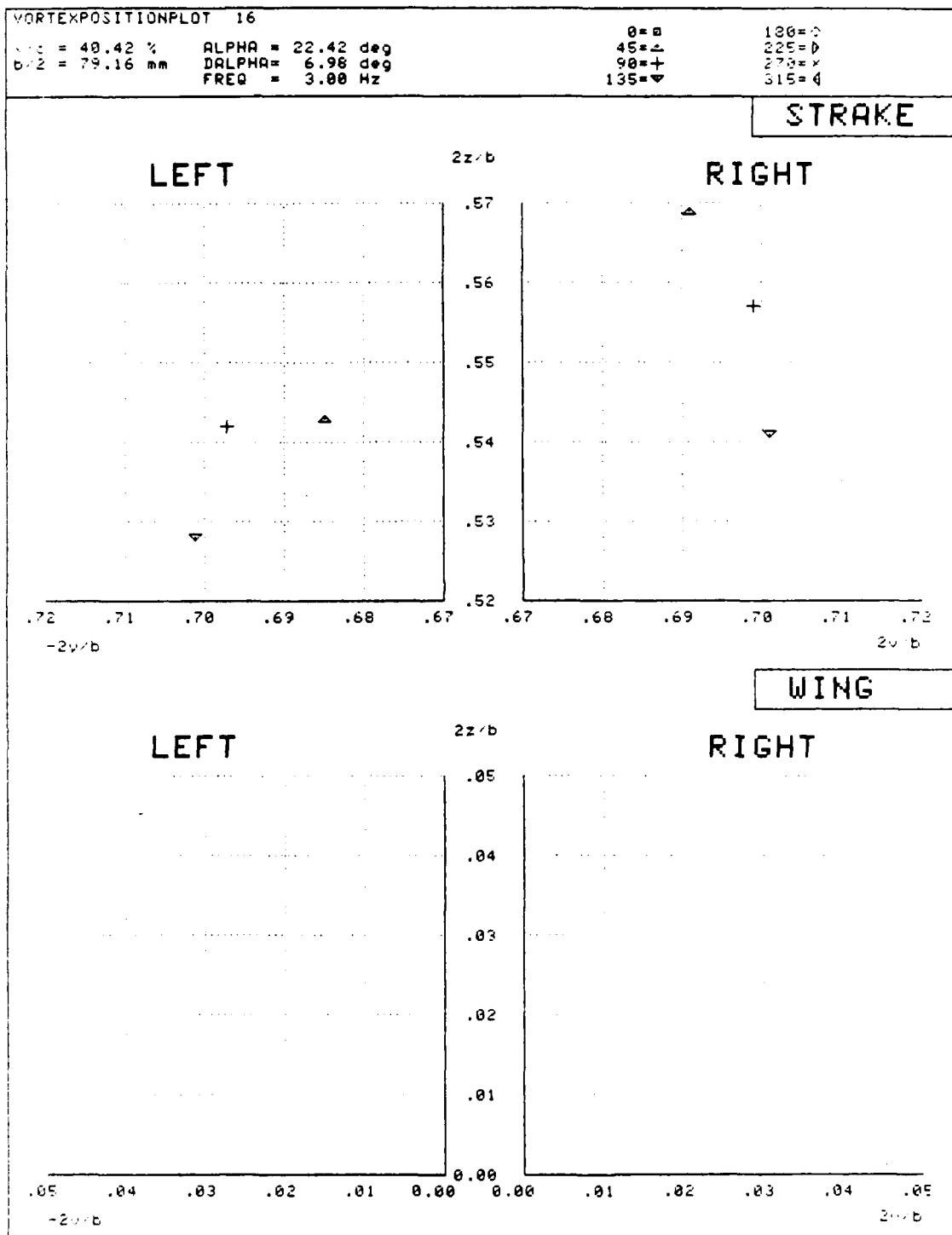


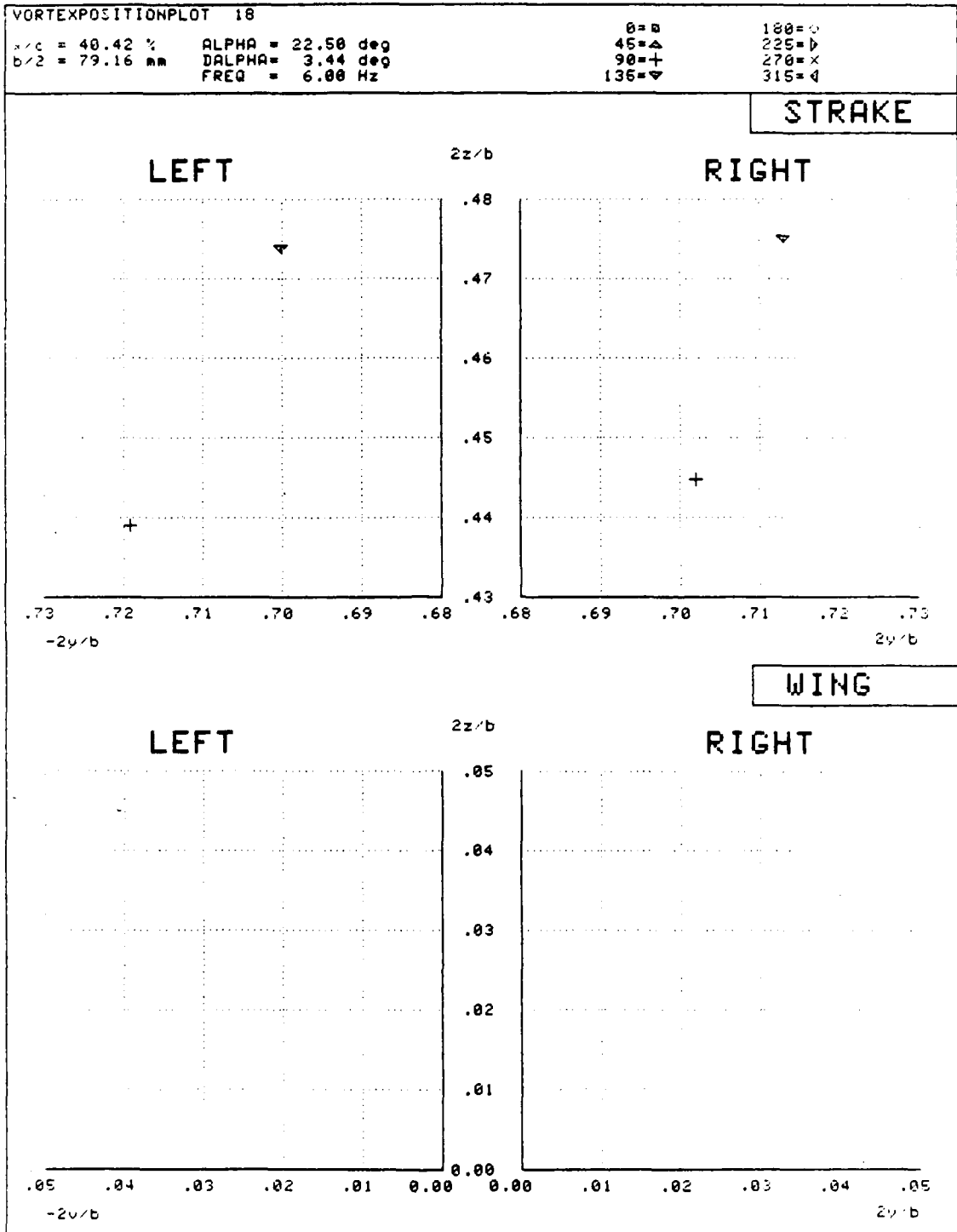


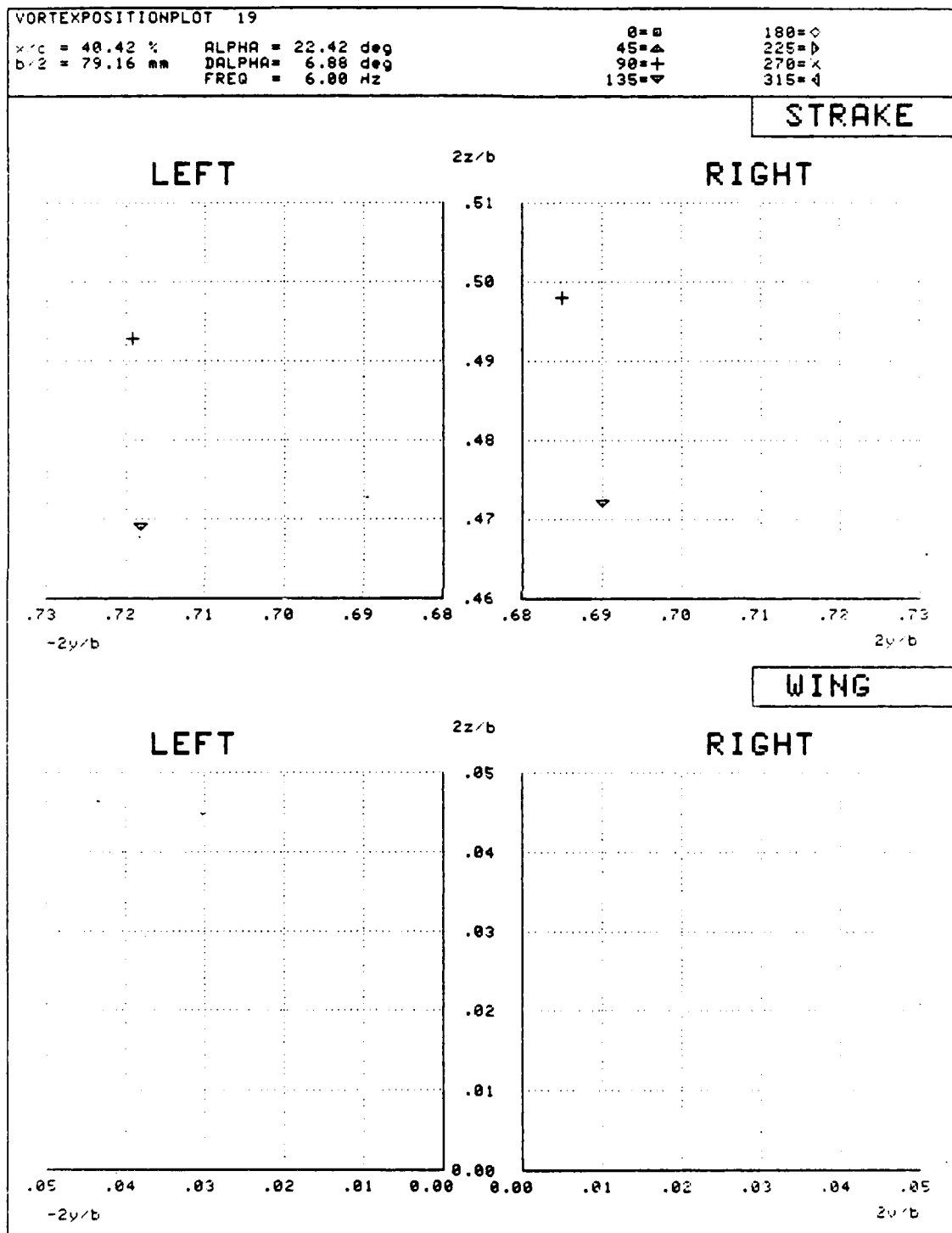










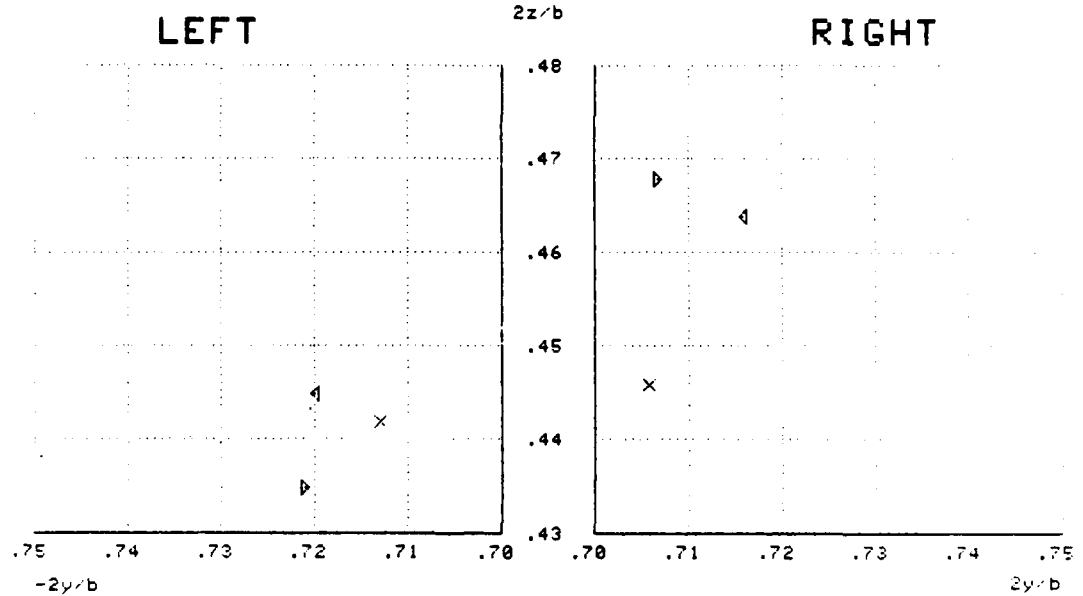


VORTEXPOSITIONPLOT 20

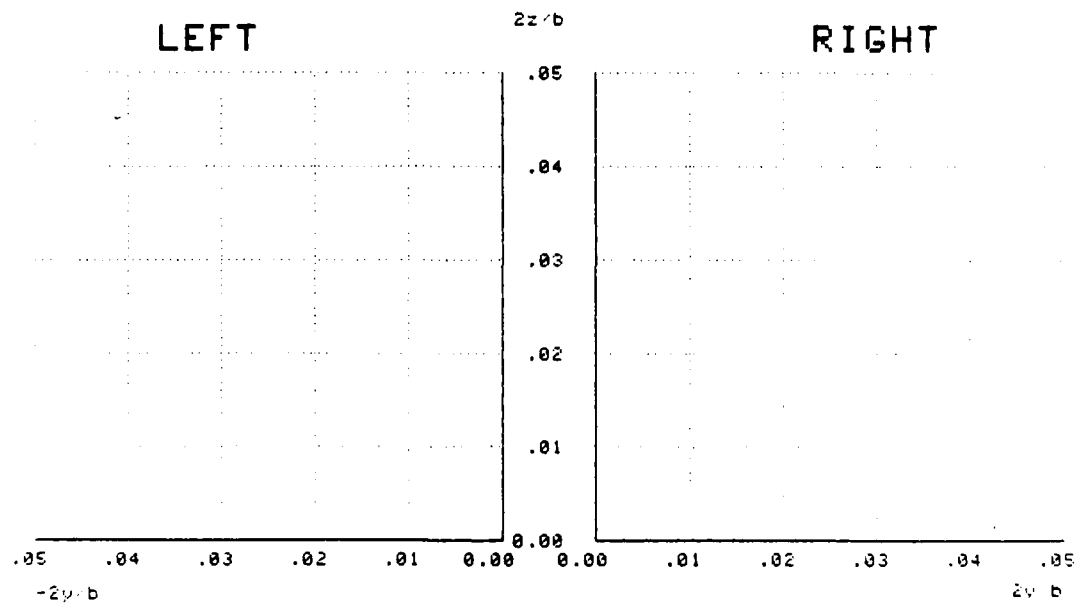
$y/c = 40.42\%$ ALPHA = 35.84 deg
 $b/2 = 79.16$ mm DALPHA = 3.73 deg
 FREQ = 1.13 Hz

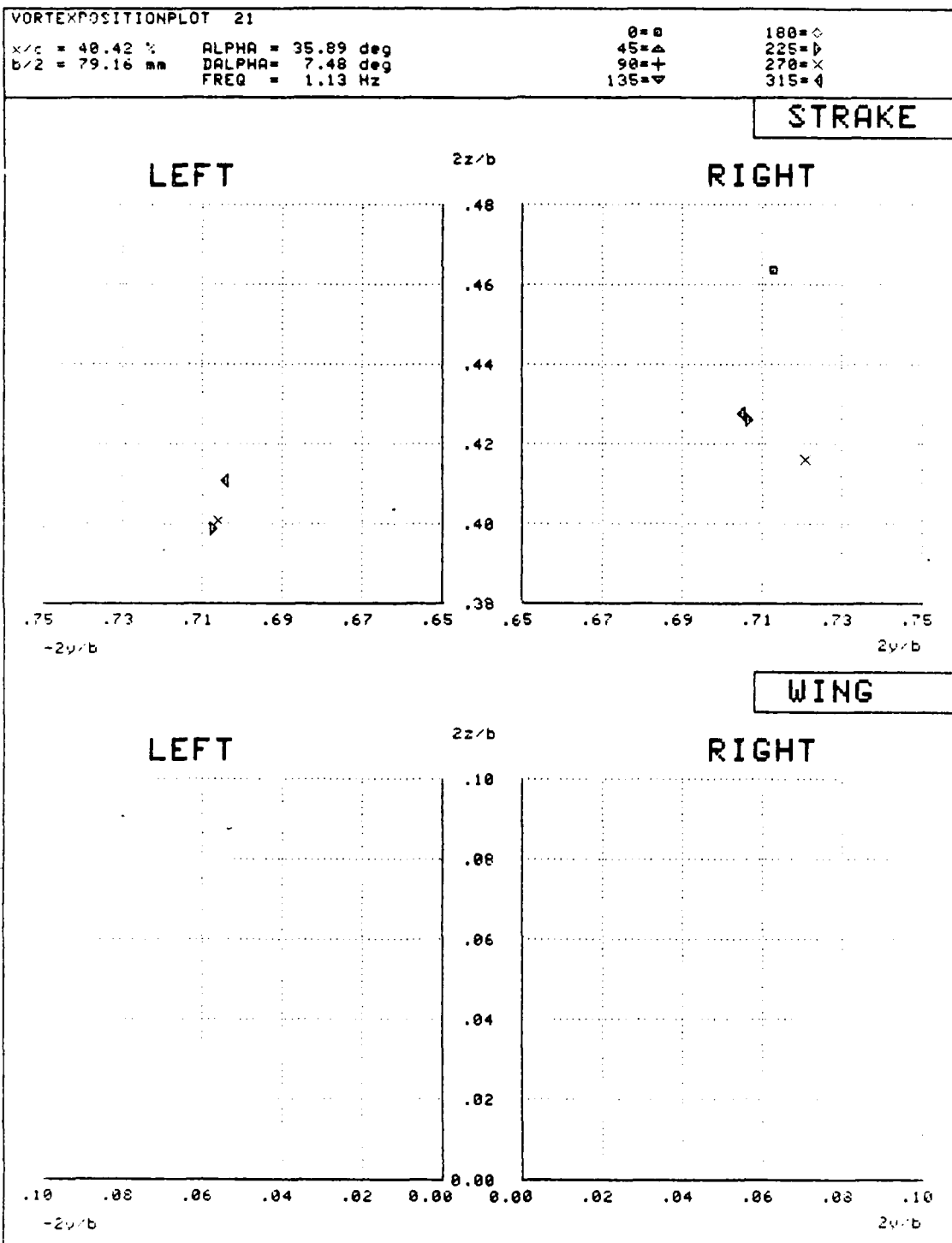
0 = □ 180 = ○
 45 = △ 225 = ▽
 90 = + 270 = ×
 135 = ▴ 315 = ▾

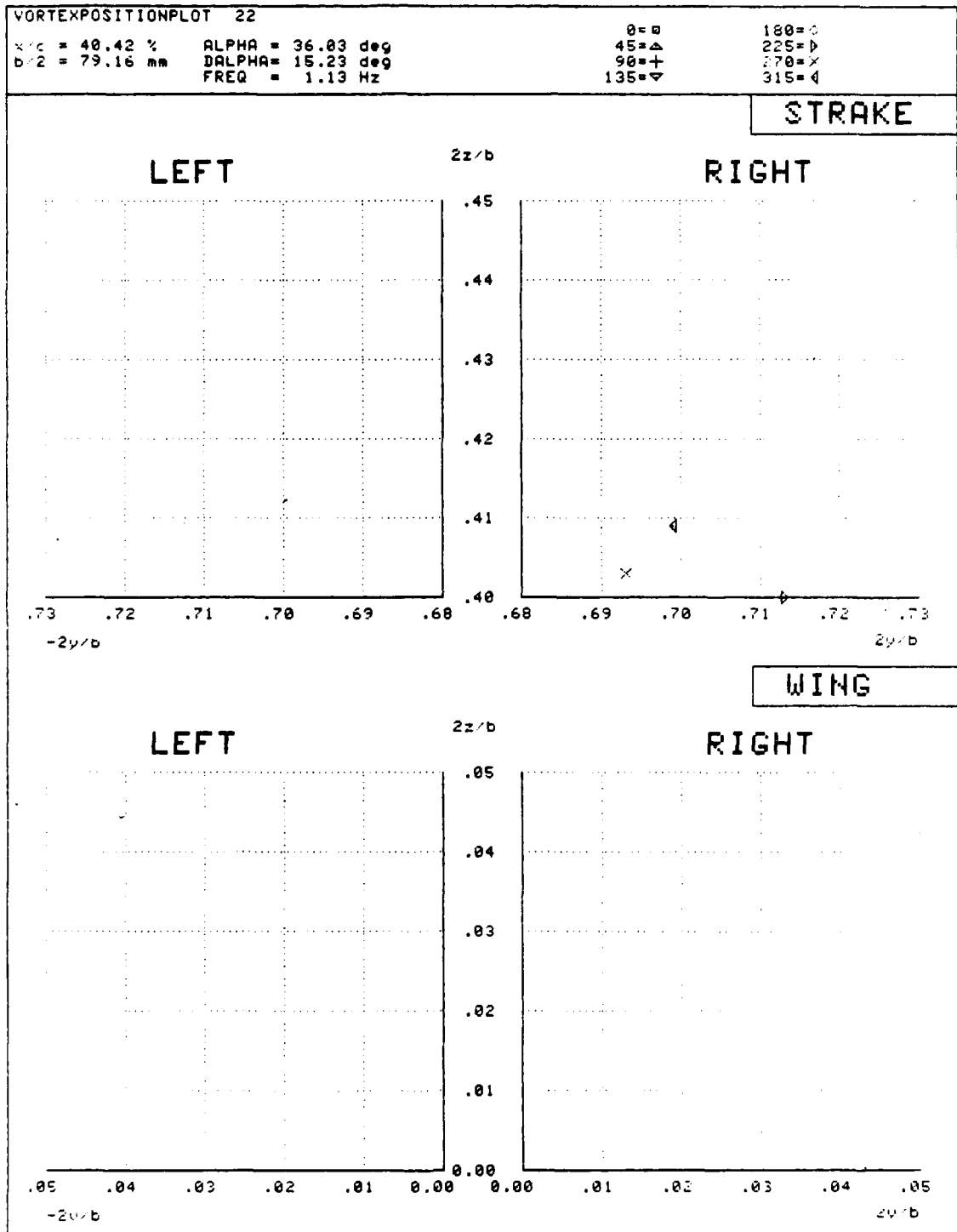
STRAKE

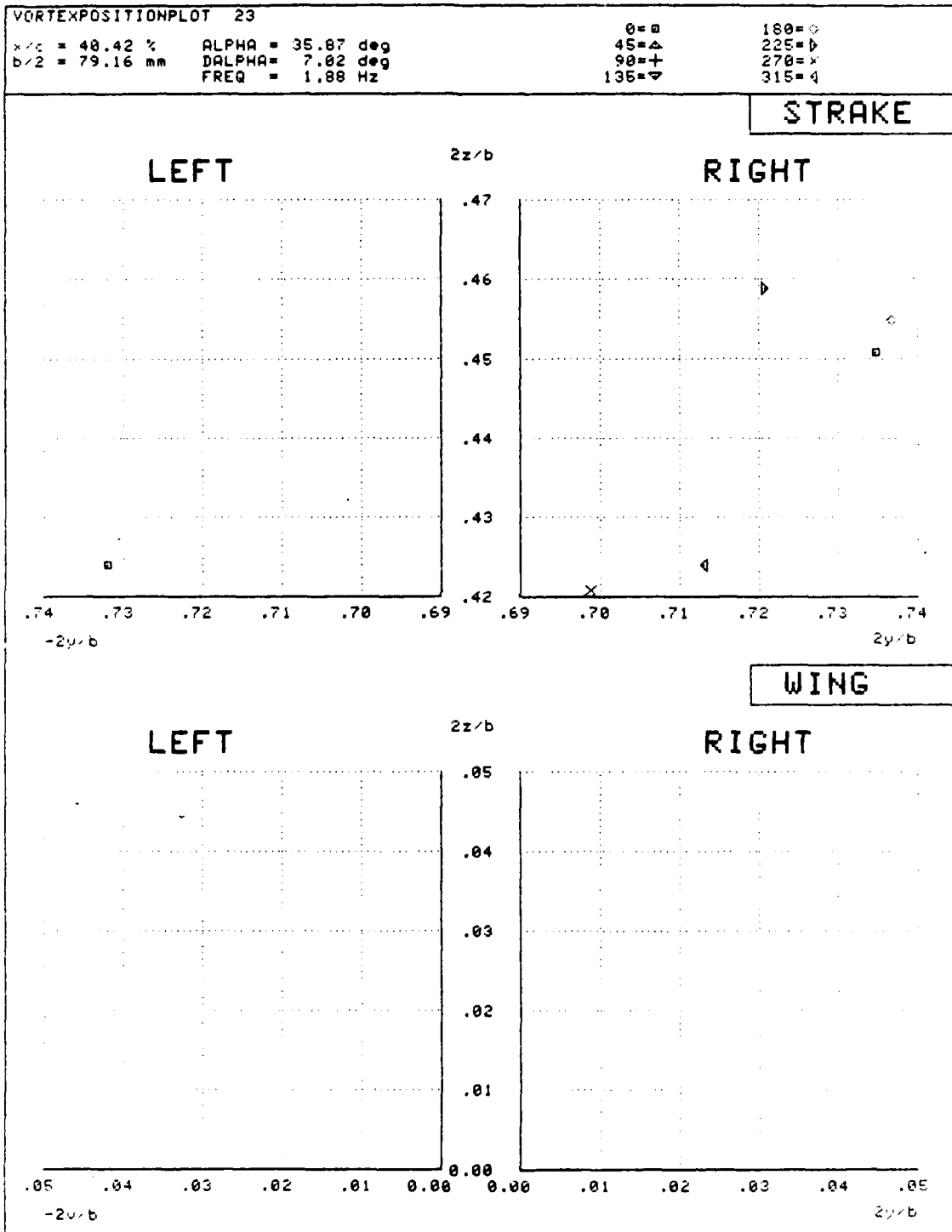


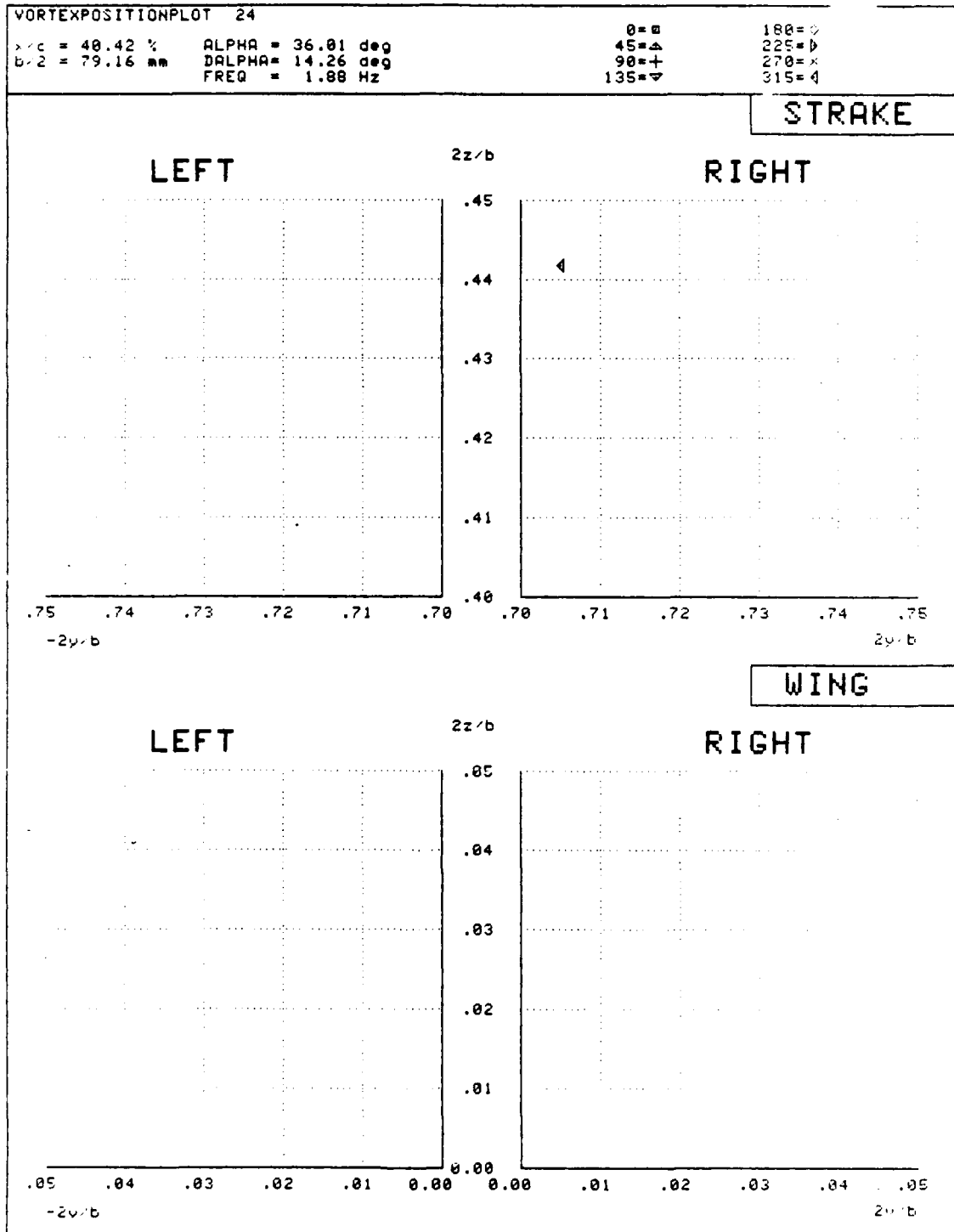
WING

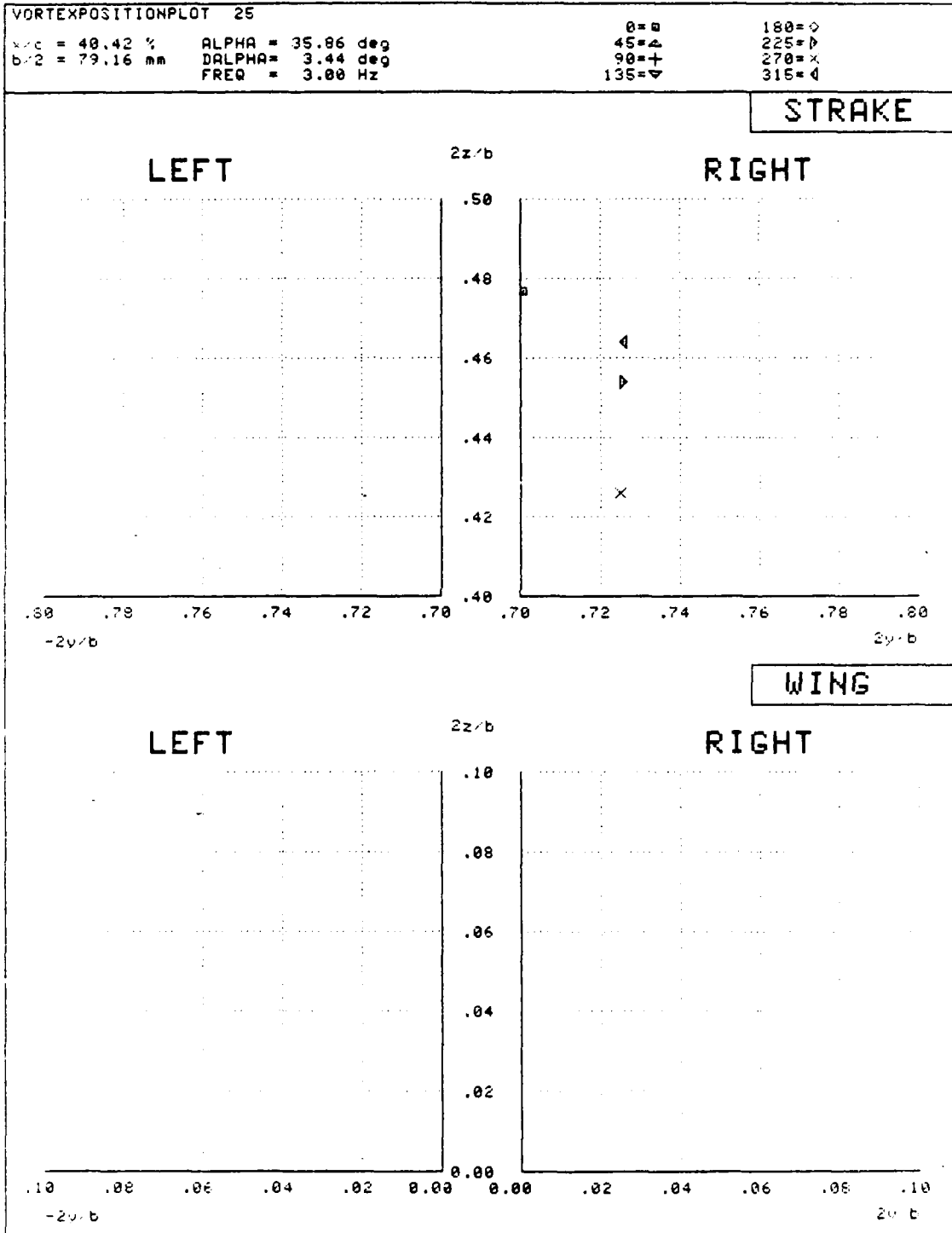


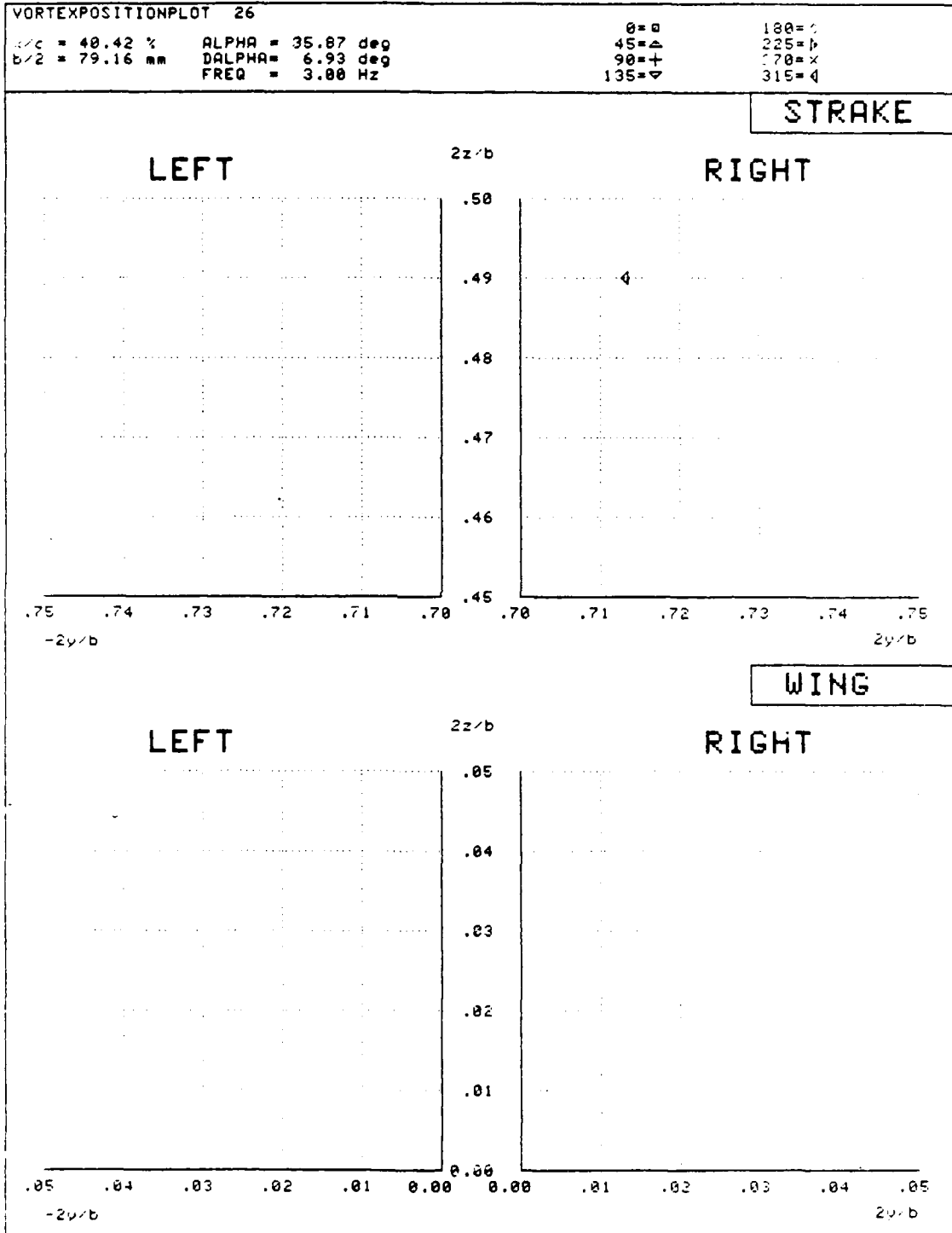


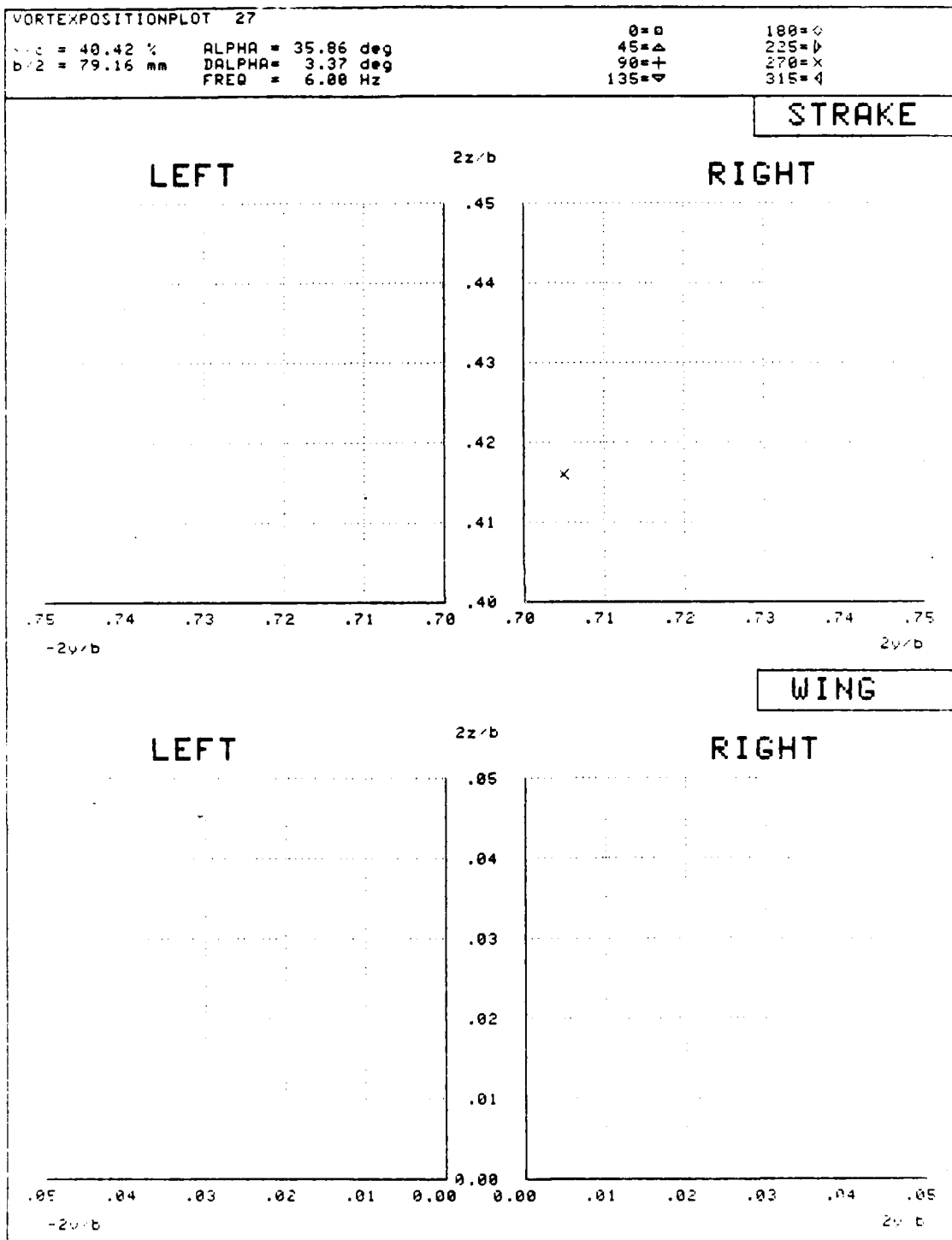












VORTEXPOSITIONPLOT 28

$\gamma/c = 65.88 \%$ ALPHA = 9.98 deg
 $b/2 = 225.0 \text{ mm}$ DALPHA = 4.04 deg
 FREQ = 1.13 Hz

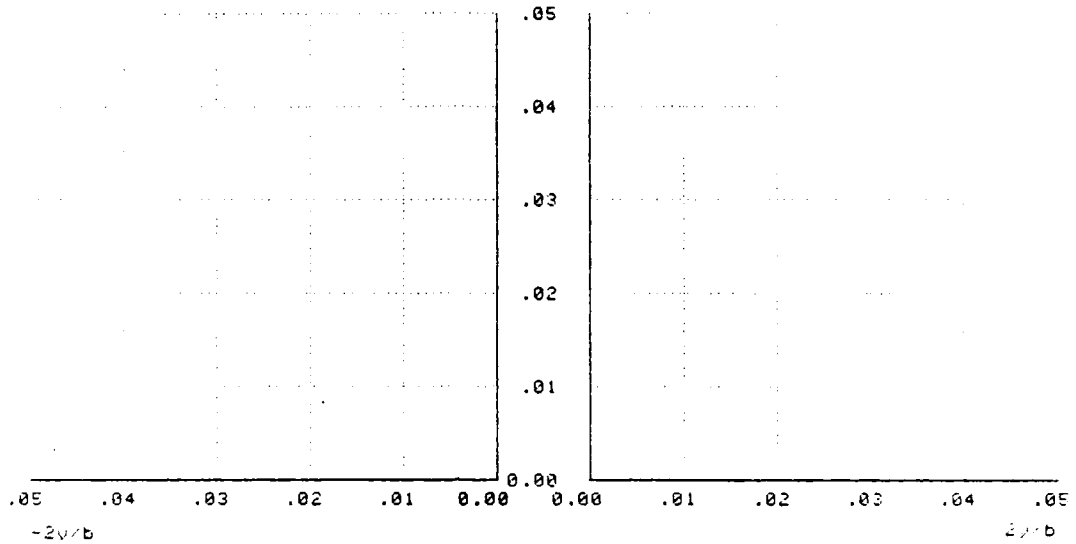
0 = $\square$ 180 = $\triangleright$
 45 = $\triangle$ 225 = $\triangleright$
 90 = $+$ 270 = $\triangleright$
 135 = ∇ 315 = $\triangleleft$

STRAKE

LEFT

$2z/b$

RIGHT

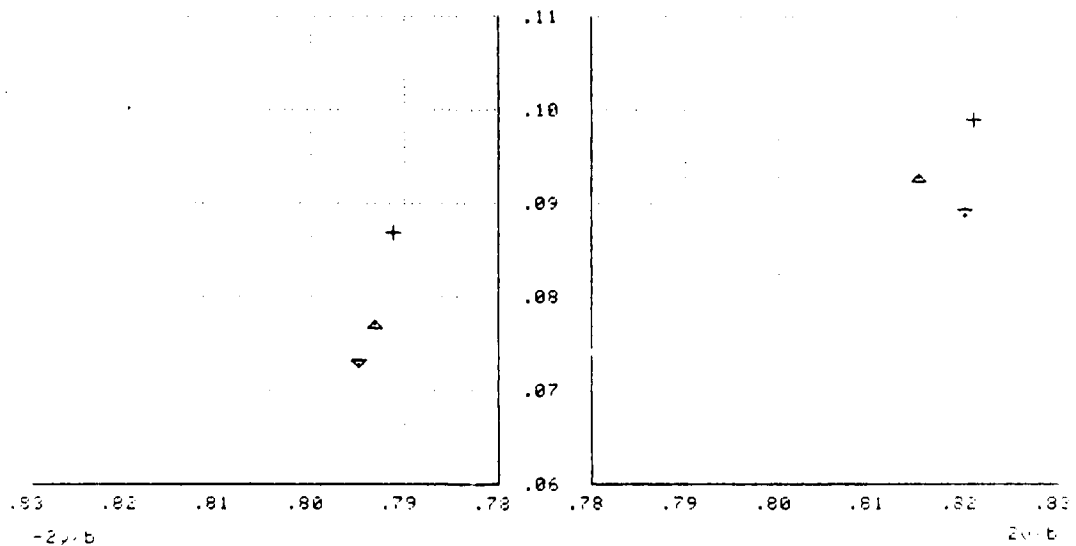


WING

LEFT

$2z/b$

RIGHT

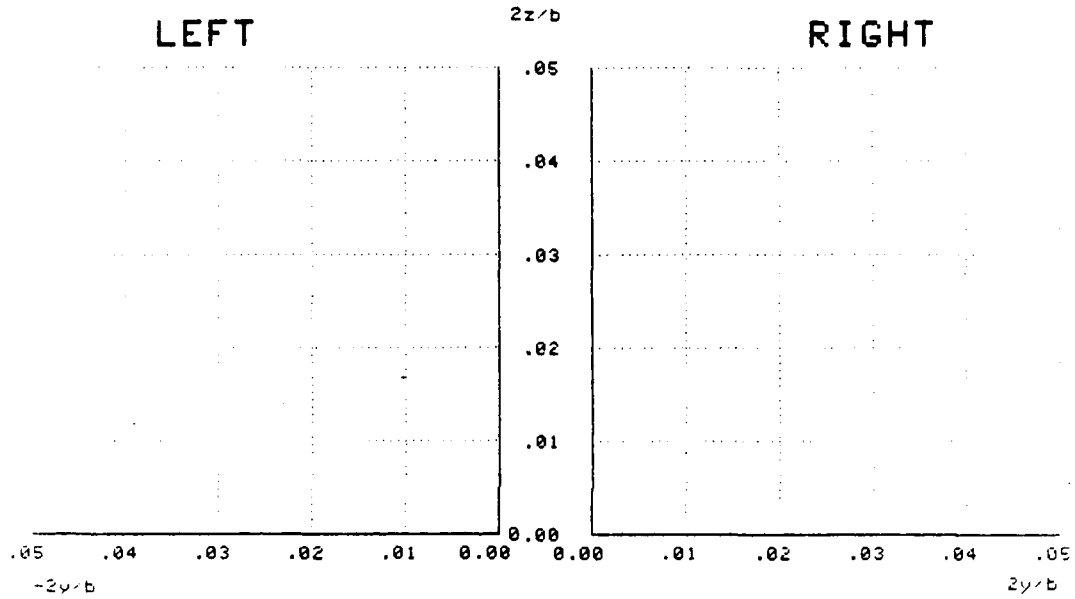


VORTEXPOSITIONPLOT 29

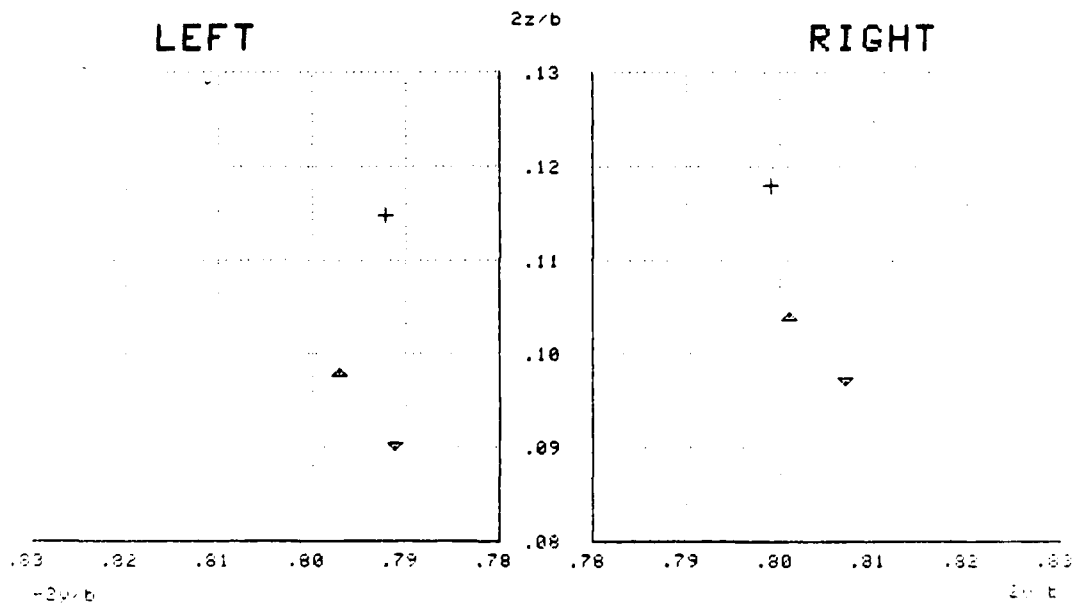
x/c = 65.98 % ALPHA = 9.87 deg
b/2 = 225.0 mm DALPHA = 8.11 deg
FREQ = 1.13 Hz

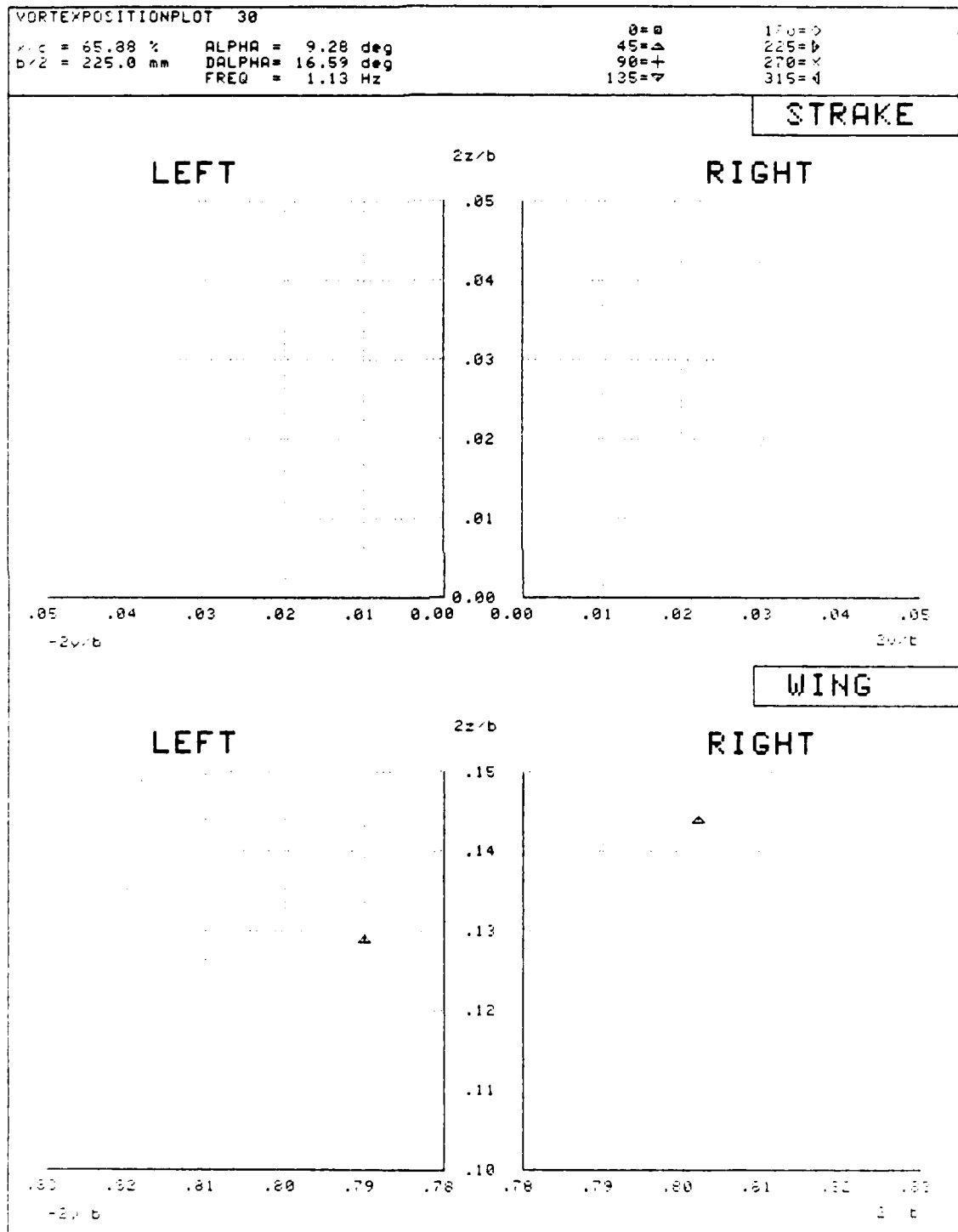
0 = □ 180 = ◊
45 = △ 225 = ▽
90 = + 270 = ×
135 = ▾

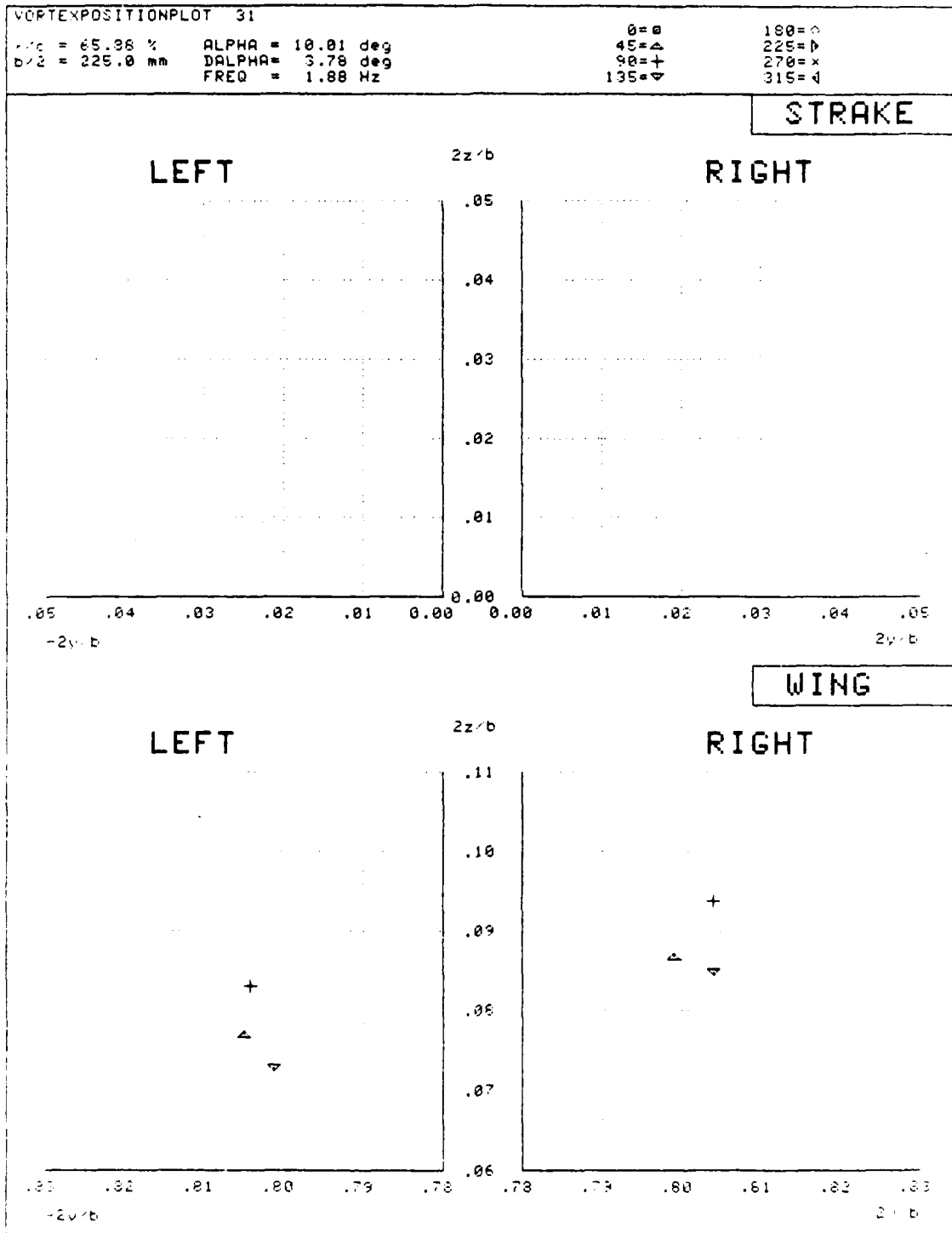
STRAKE

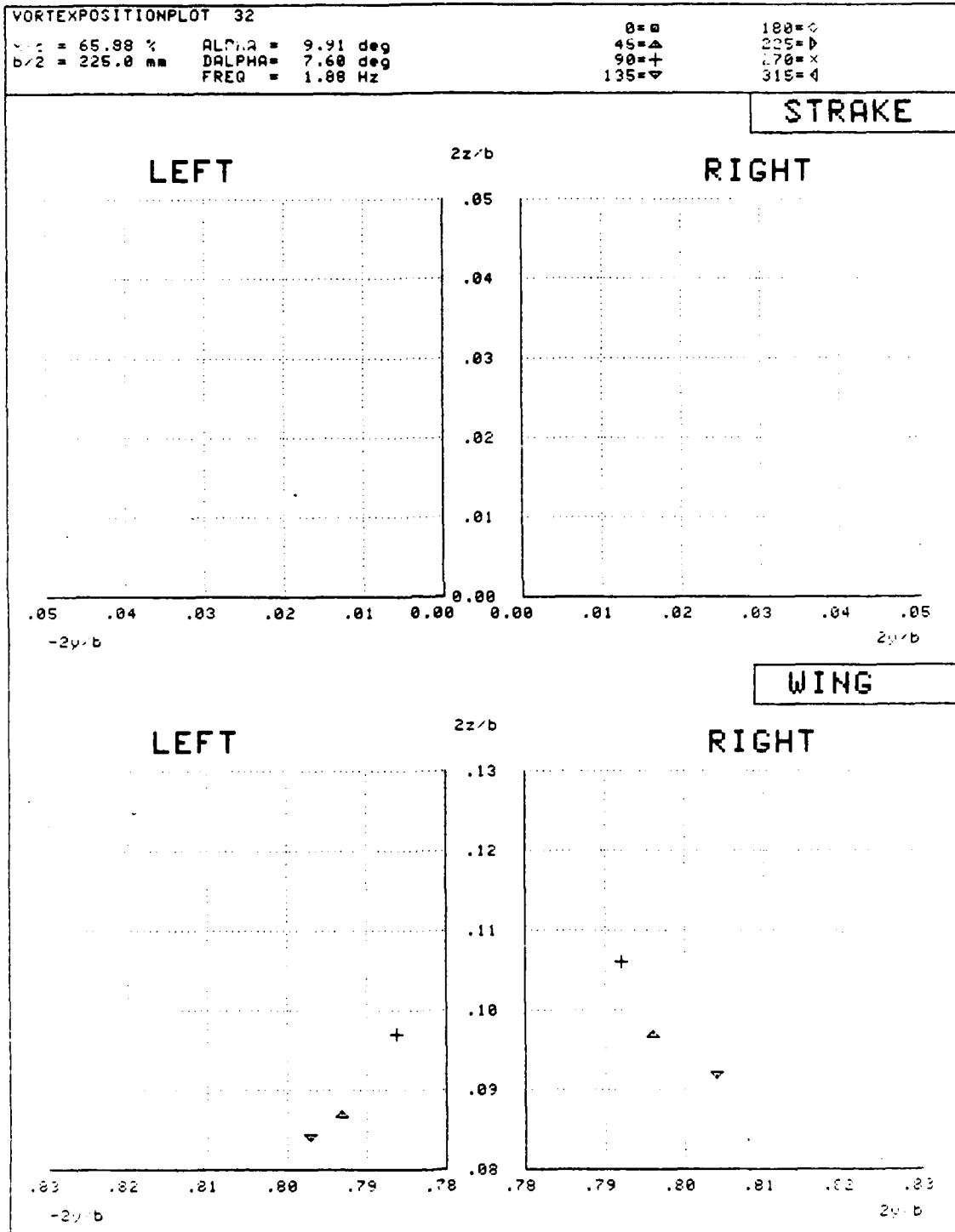


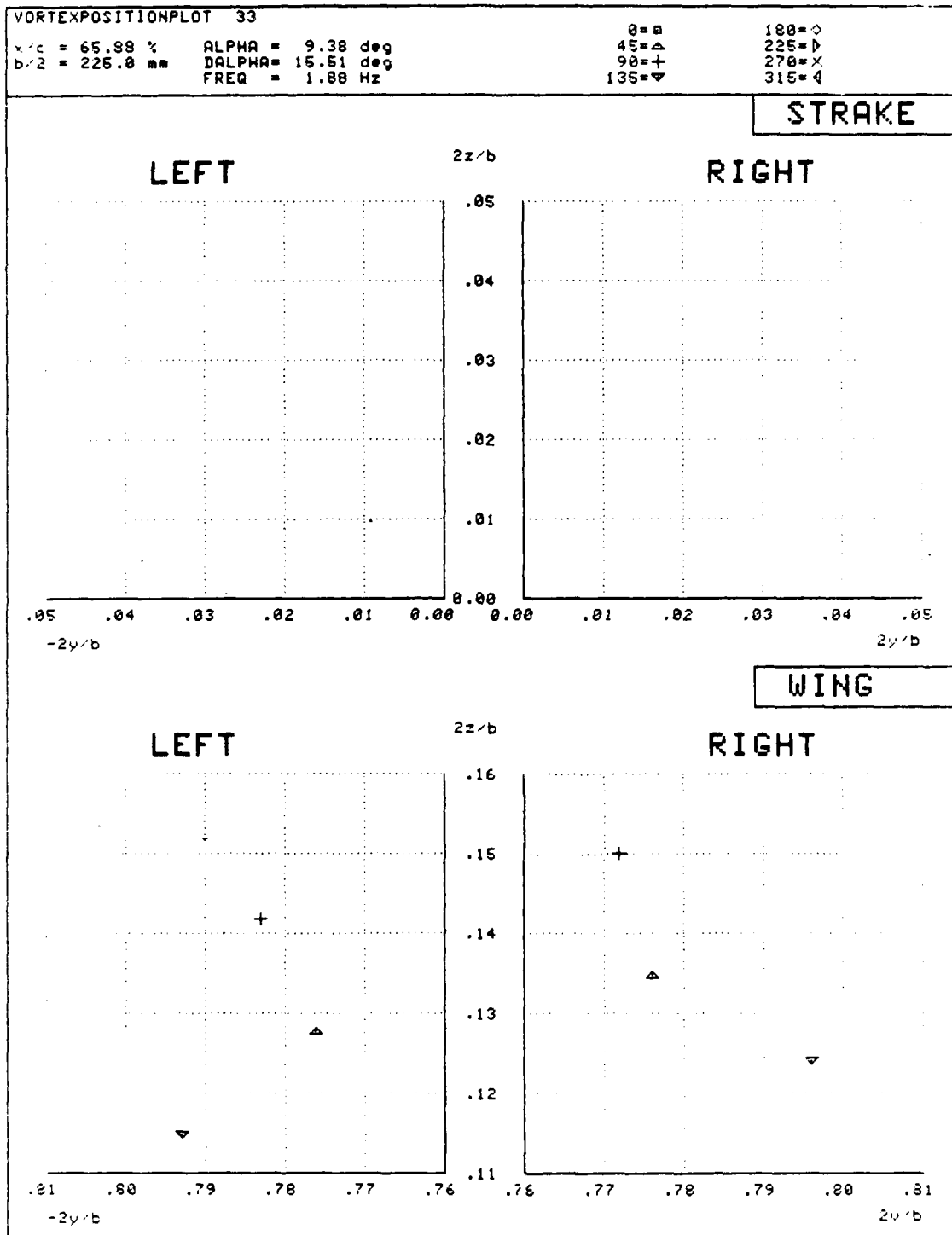
WING

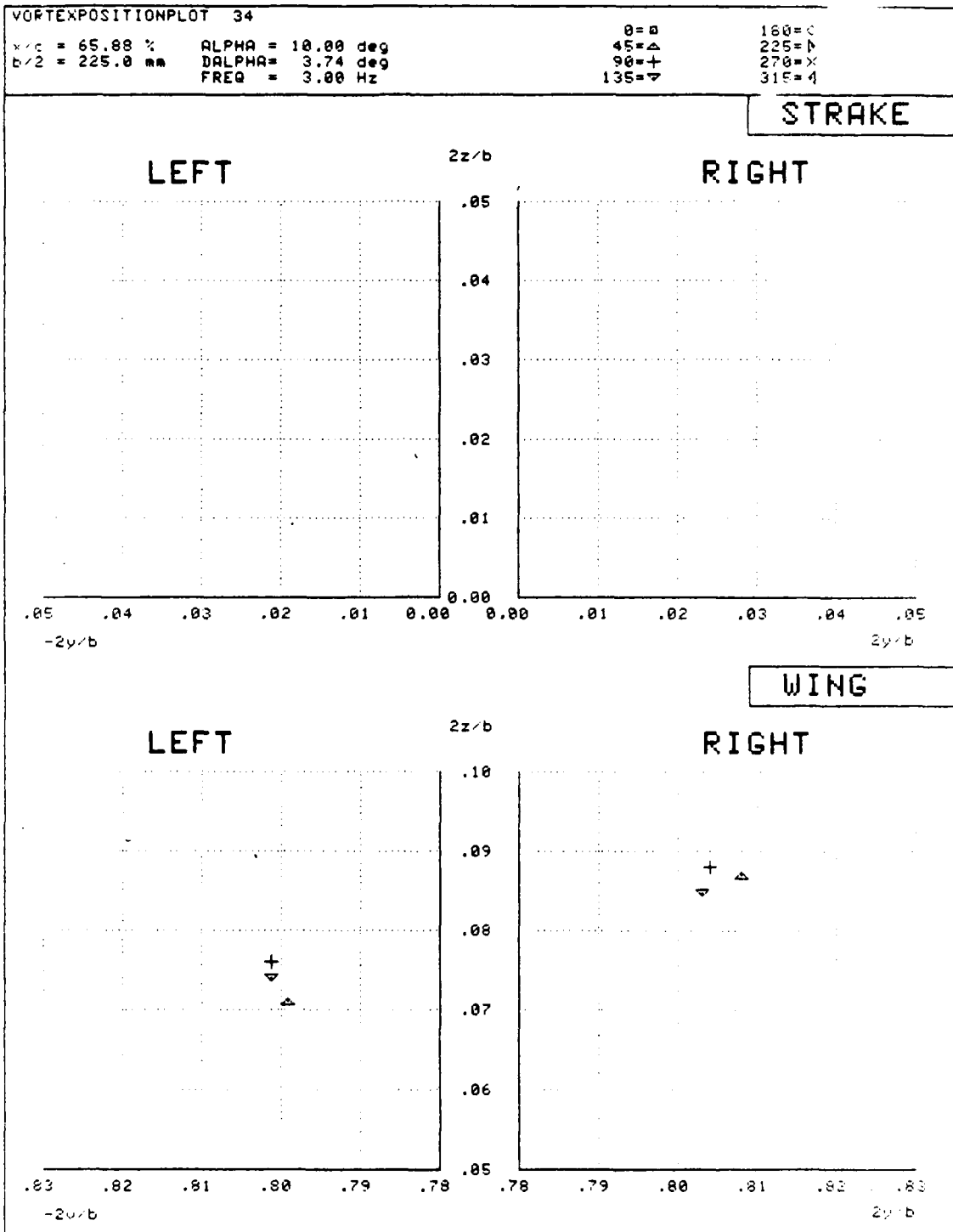


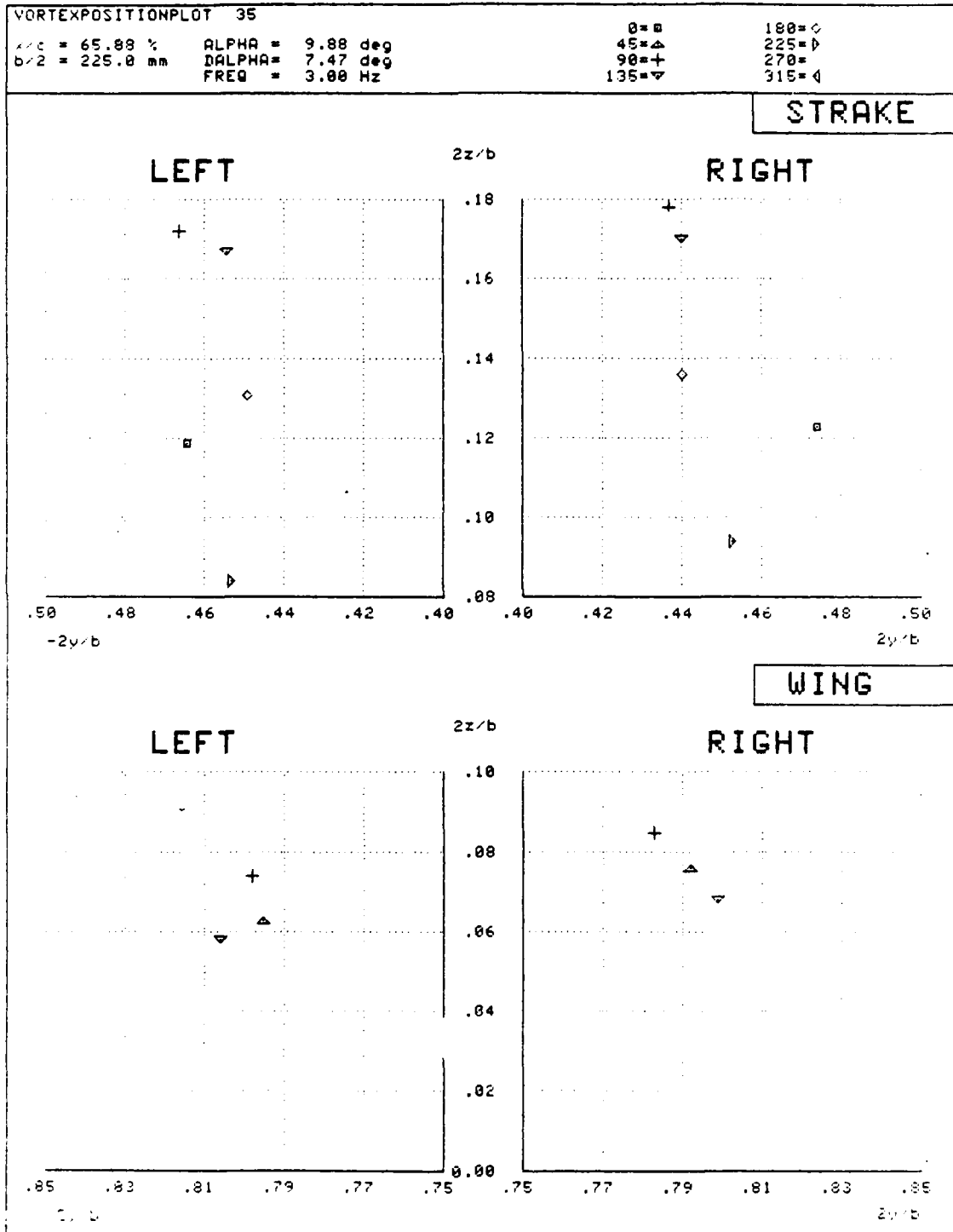










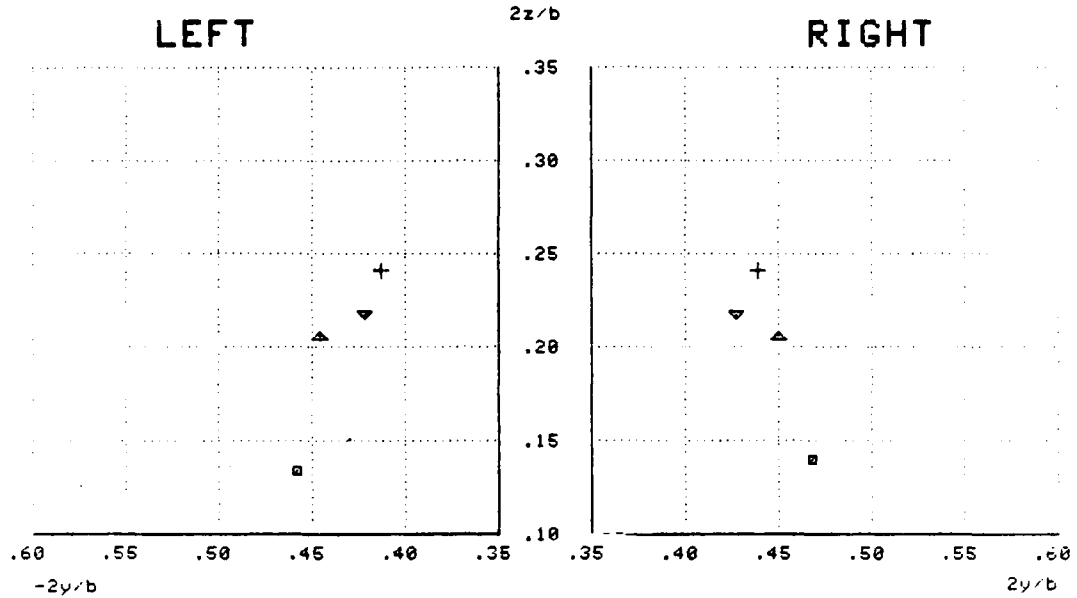


VORTEXPOSITIONPLOT 36

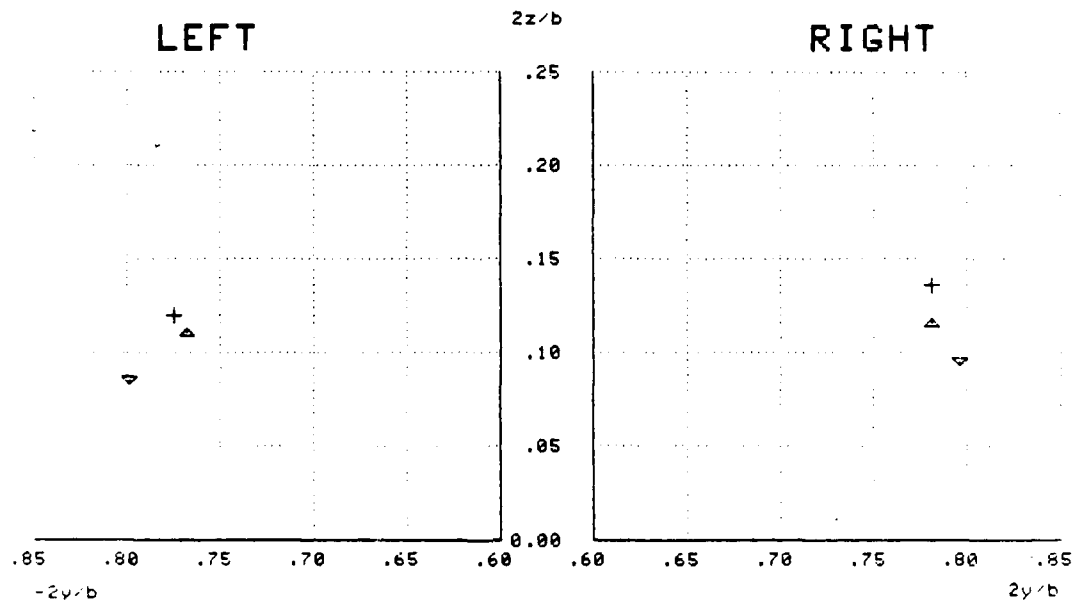
x/c = 65.88 % ALPHA = 9.42 deg
 b/2 = 225.0 mm DALPHA = 15.23 deg
 FREQ = 3.00 Hz

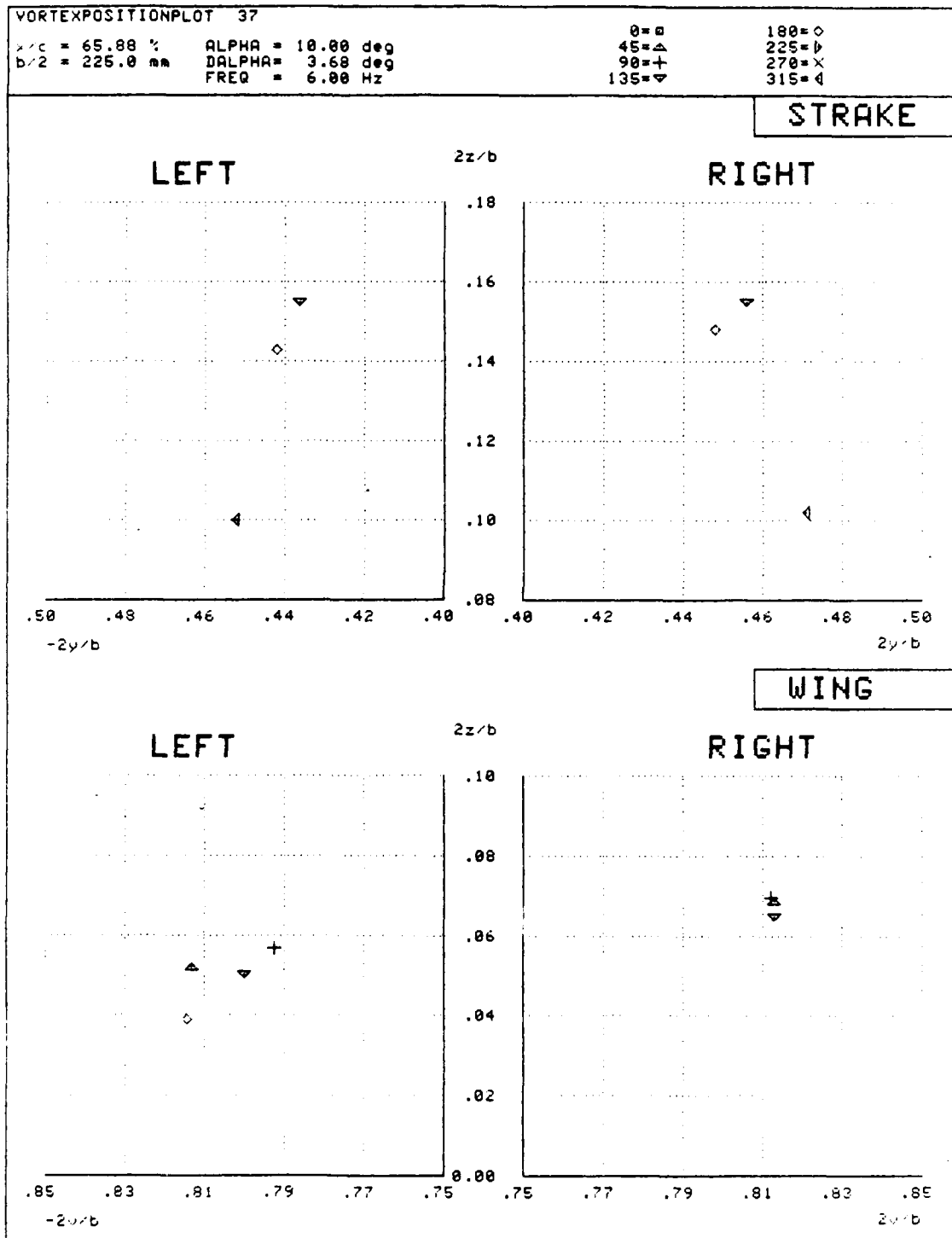
0 = □ 180 = ◇
 45 = ▲ 225 = ◊
 90 = + 270 = ×
 135 = ▼

STRAKE



WING



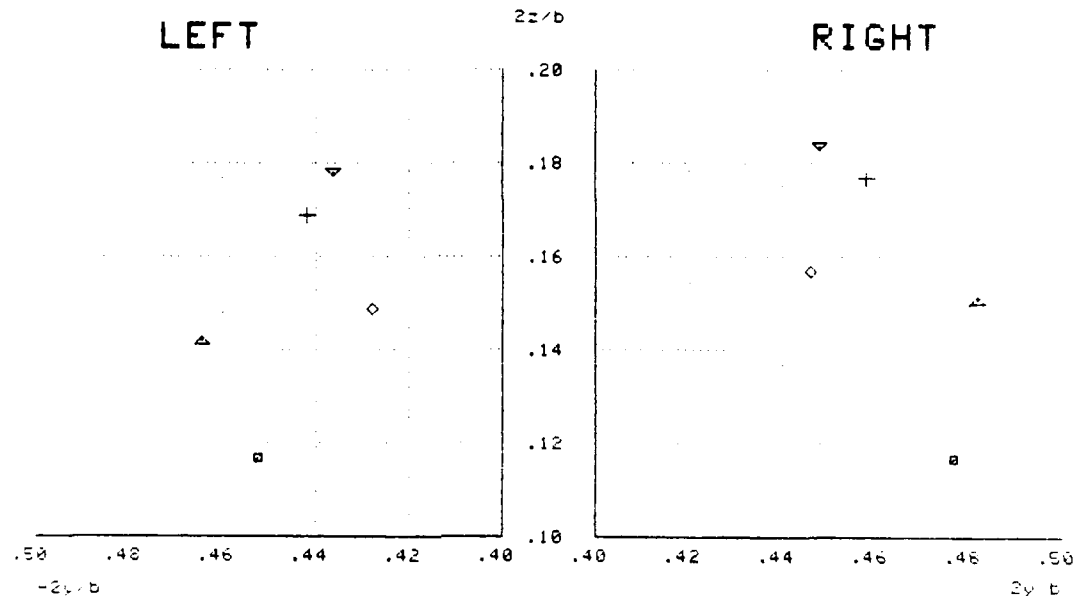


VORTEXPOSITIONPLOT 38

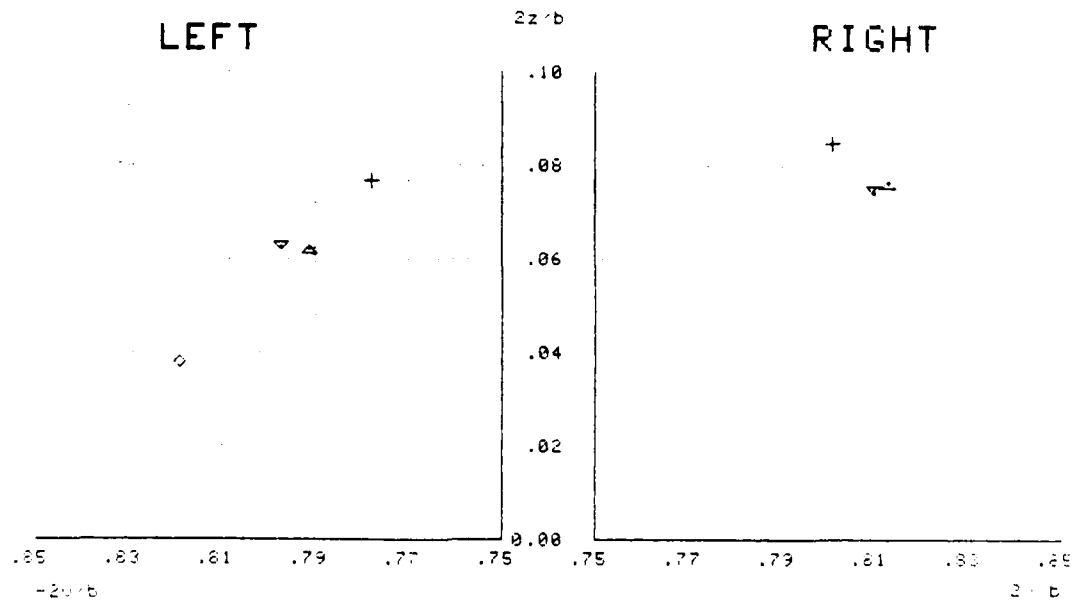
x/c = 65.88 % ALPHA = 9.88 deg
b/2 = 225.0 mm DALPHA = 7.36 deg
FREQ = 6.00 Hz

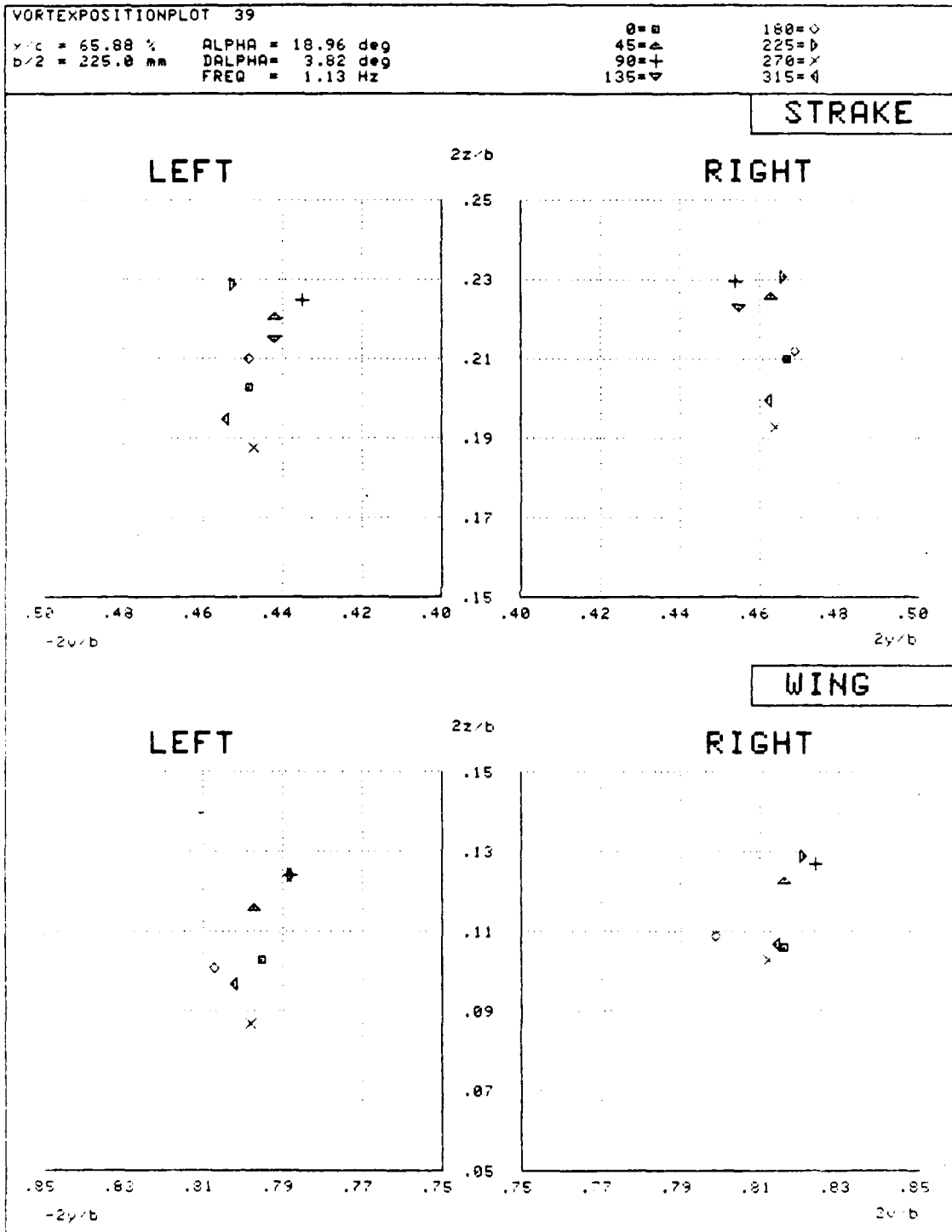
0 = □ 180 = ○
45 = △ 225 = ▽
90 = + 270 = ×
135 = ▴ 315 = ▾

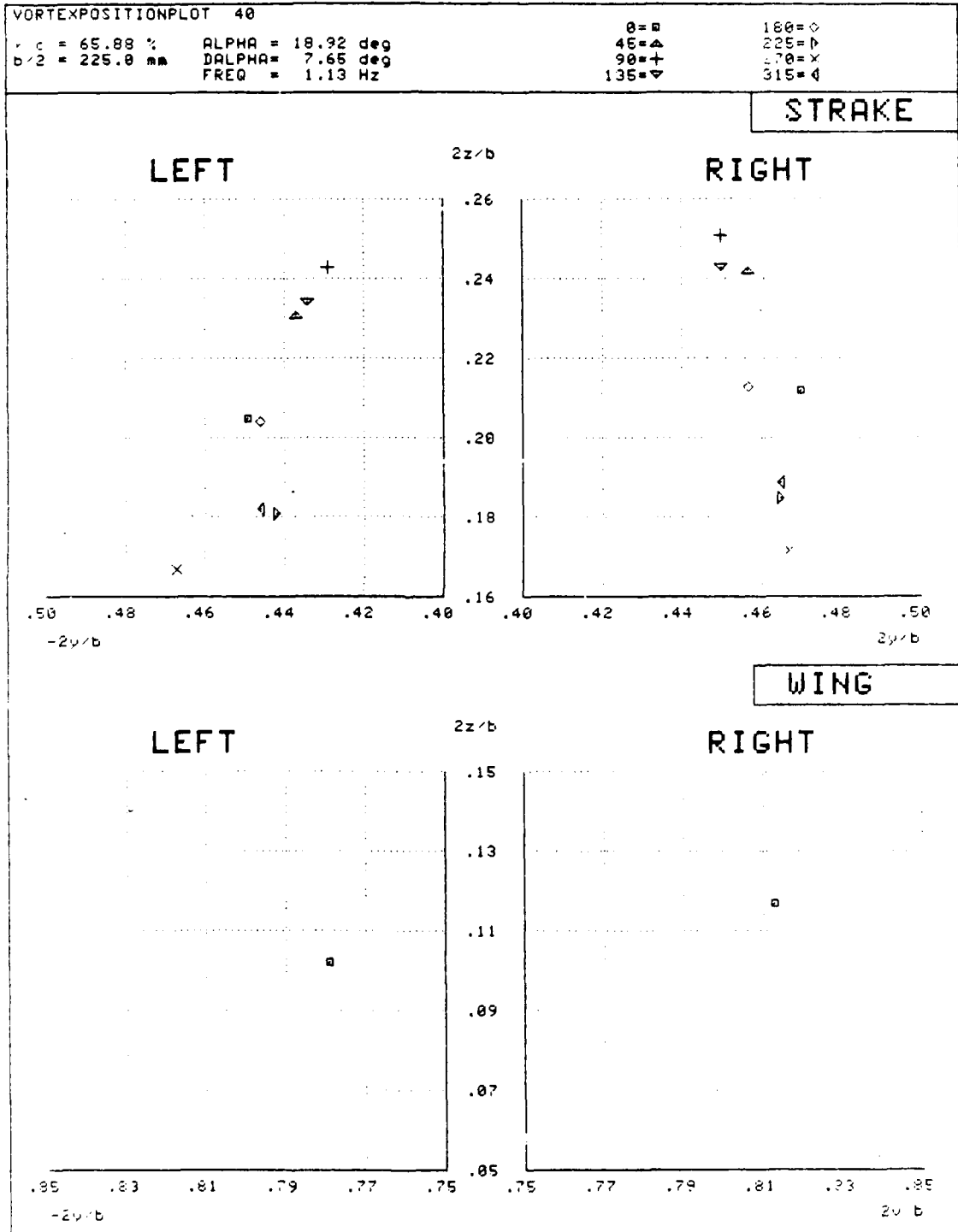
STRAKE



WING





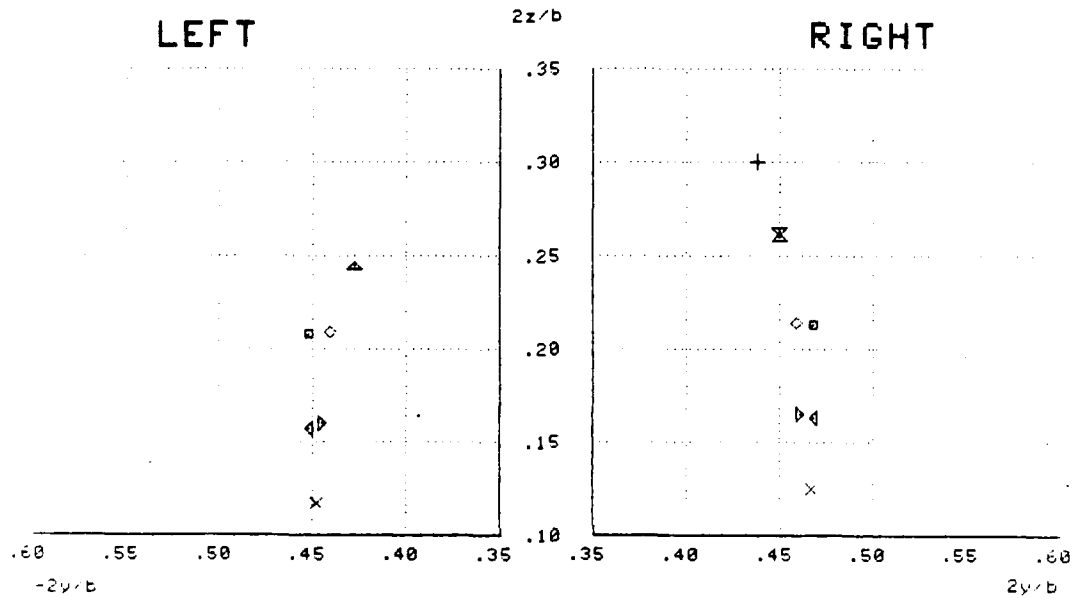


VORTEXPOSITIONPLOT 41

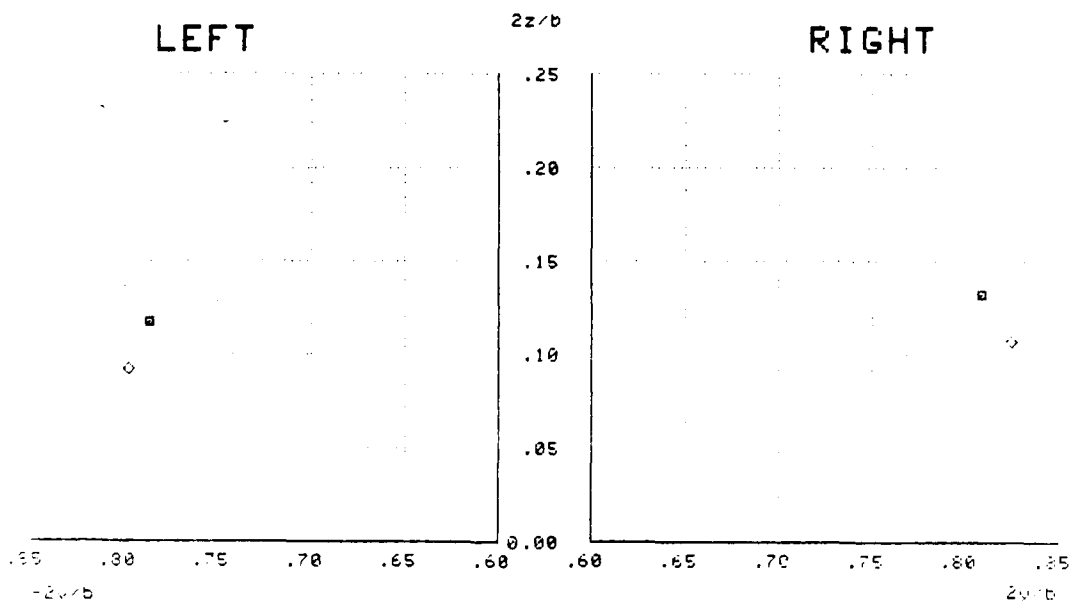
$\gamma/c = 65.88 \%$ ALPHA = 18.78 deg
 $b/2 = 225.0 \text{ mm}$ DALPHA = 13.50 deg
 FREQ = 1.13 Hz

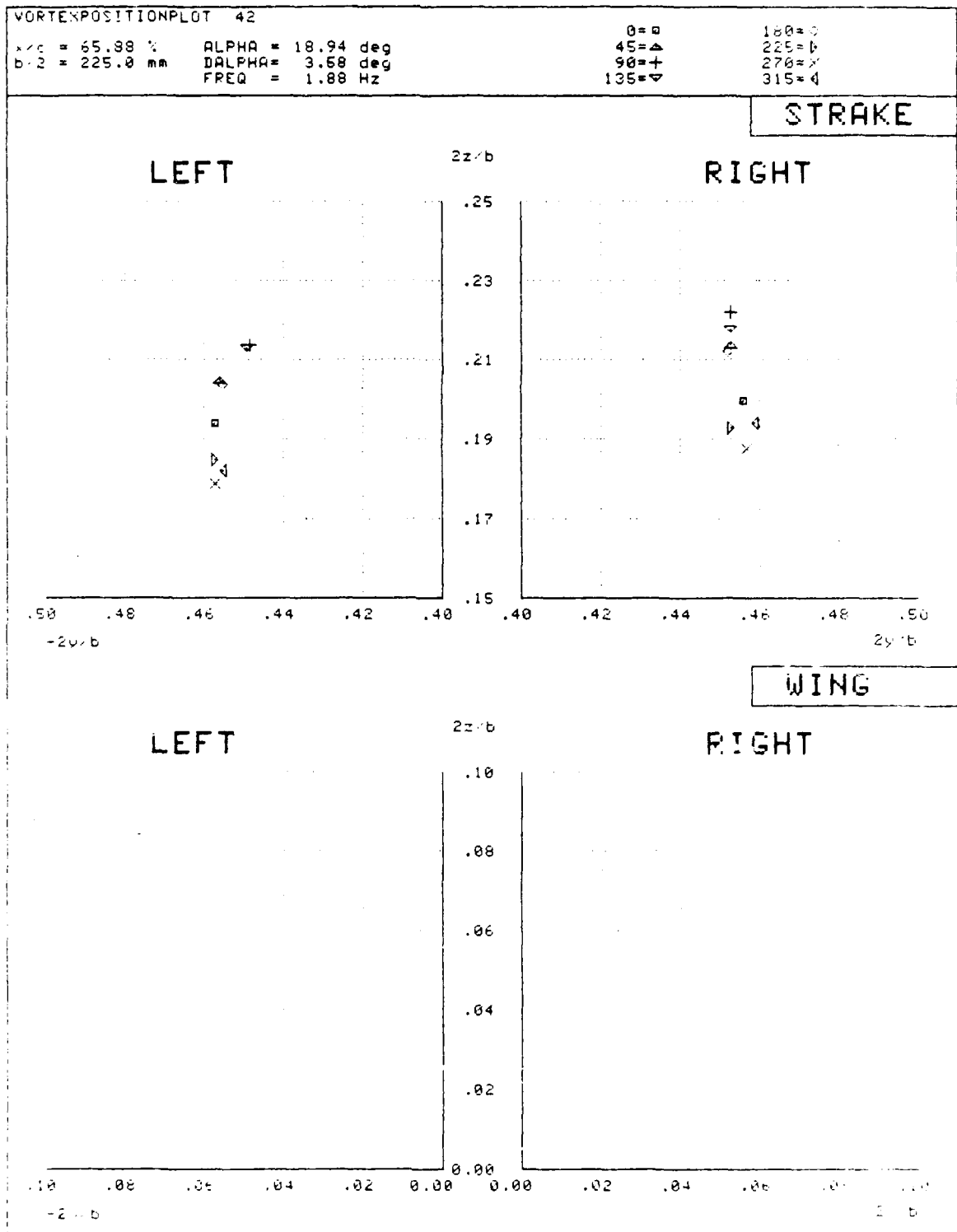
0 = $\square$ 180 = $\diamond$
 45 = $\triangle$ 225 = ∇
 90 = $+$ 270 = $\times$
 135 = ∇ 315 = ∇

STRAKE



WING



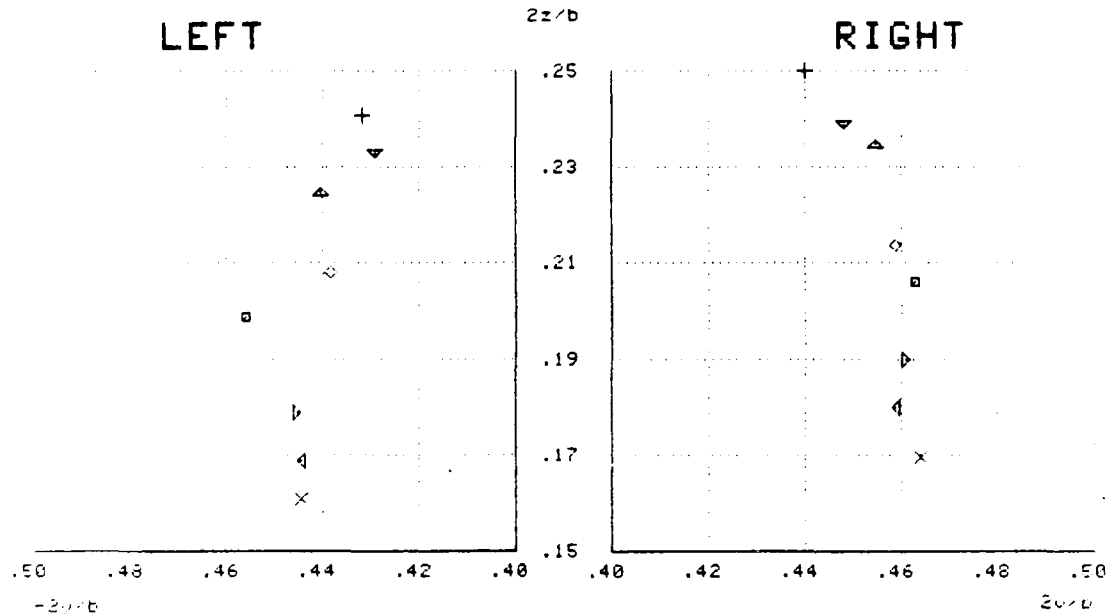


VORTEXPOSITIONPLOT 43

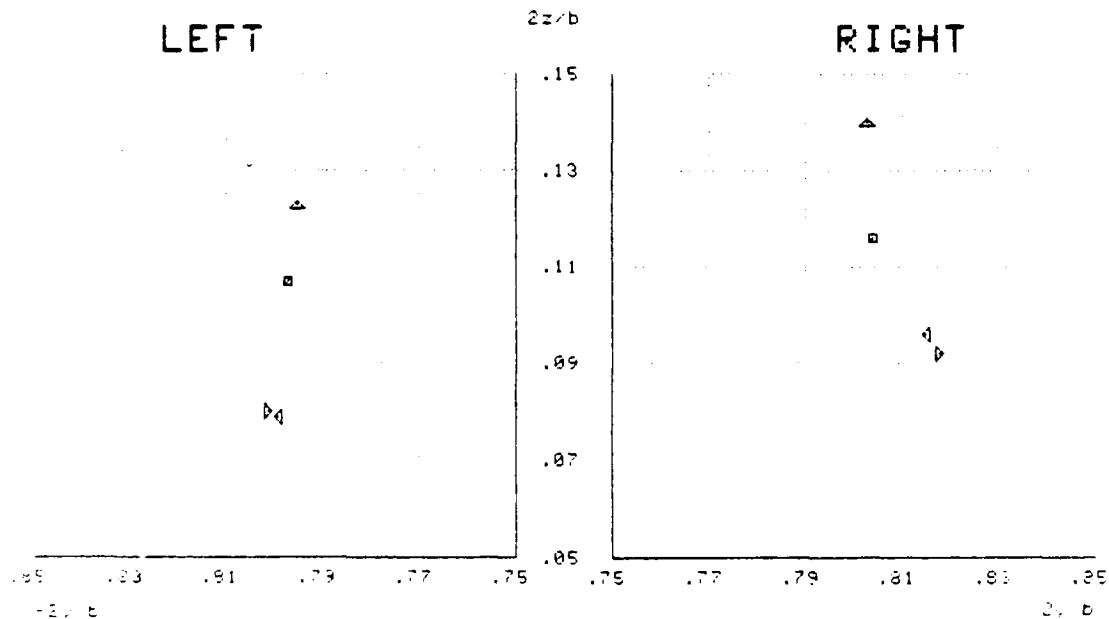
$\gamma = 65.89\%$ ALPHA = 18.93 deg
 $b/2 = 225.0\text{ mm}$ $\Delta\text{ALPHA} = 7.15\text{ deg}$
 FREQ = 1.88 Hz

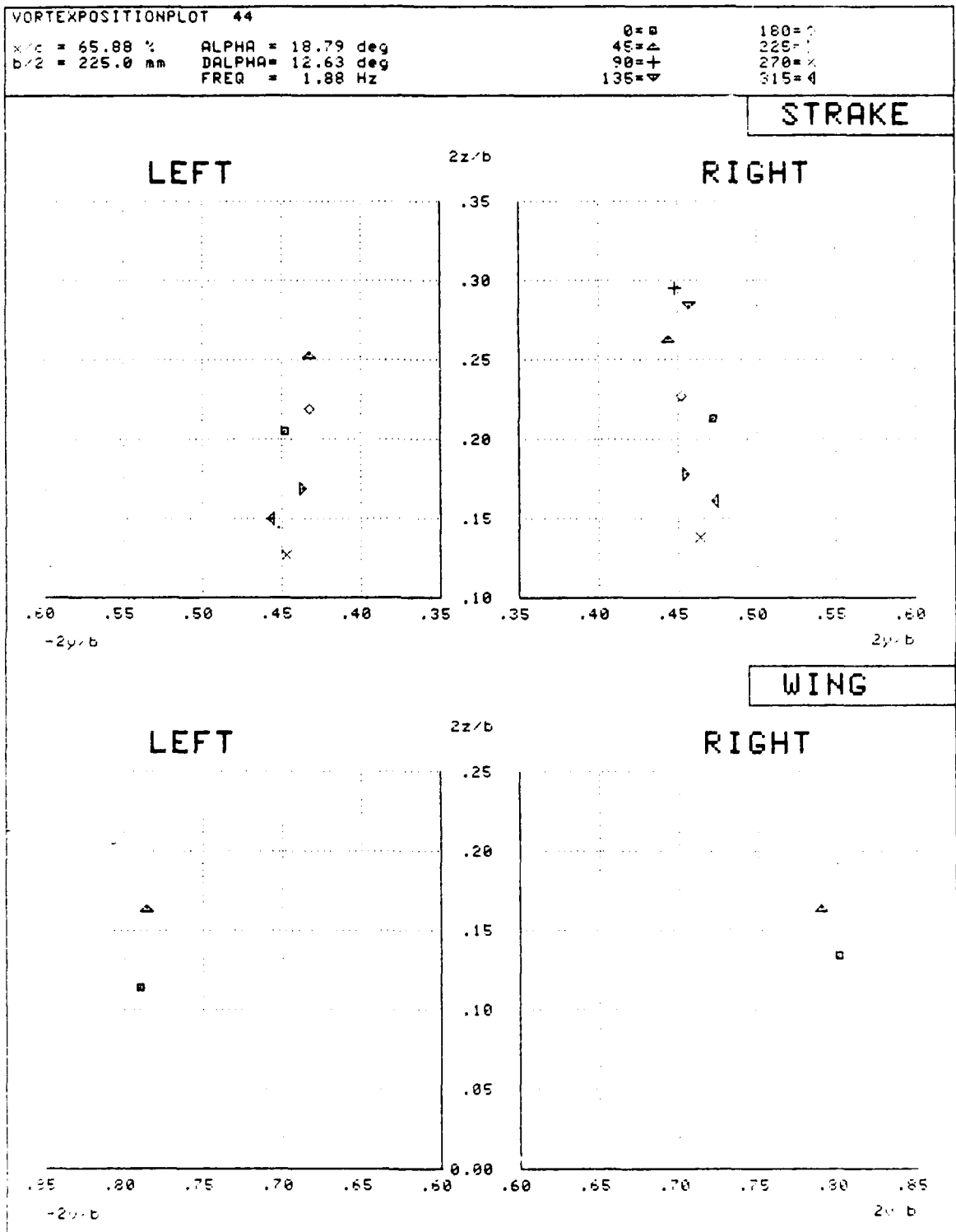
0 = $\square$ 180 = $\circ$
 45 = $\triangle$ 225 = ∇
 90 = $+$ 270 = $\times$
 135 = $\diamond$ 315 = $\cdot$

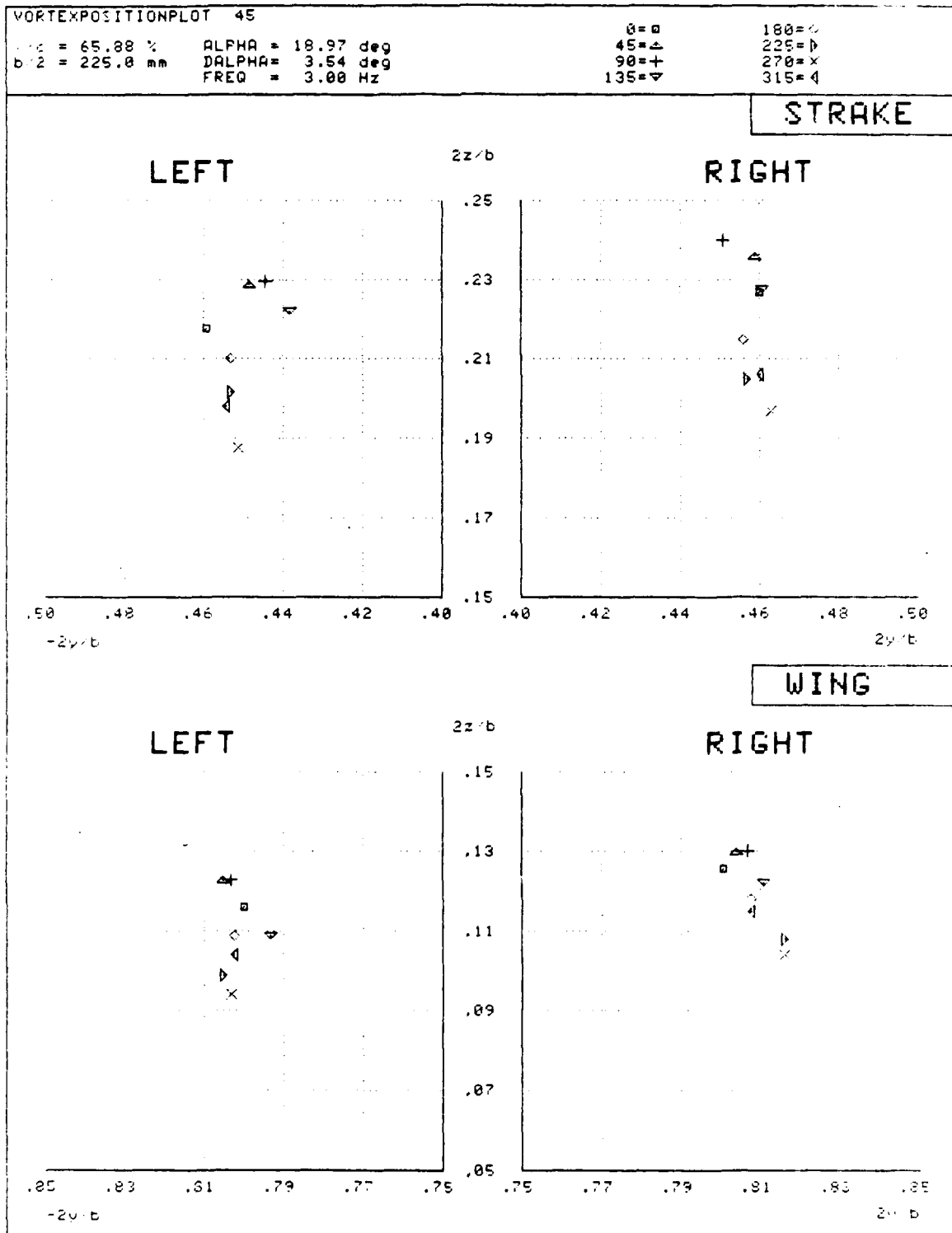
STRAKE



WING







VORTEXPOSITIONPLOT 46

x/c = 65.88 % ALPHA = 18.92 deg
b/2 = 225.0 mm DALPHA = 7.07 deg
FREQ = 3.00 Hz

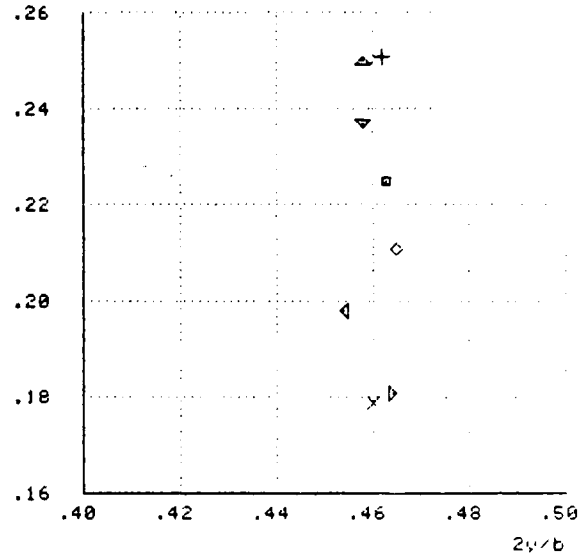
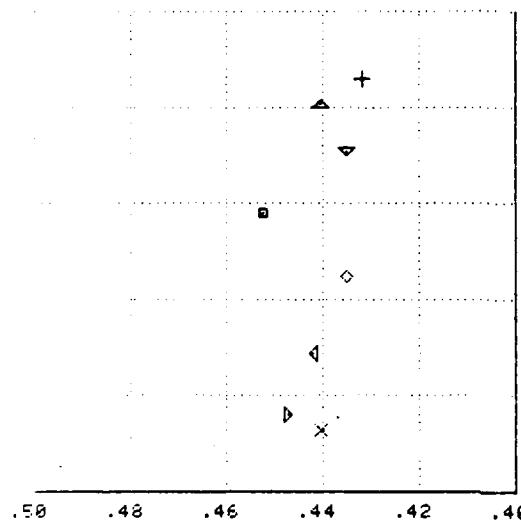
0 = □ 180 = ◇
45 = △ 225 = I
90 = + 270 = X
135 = ▽

STRAKE

LEFT

2z/b

RIGHT

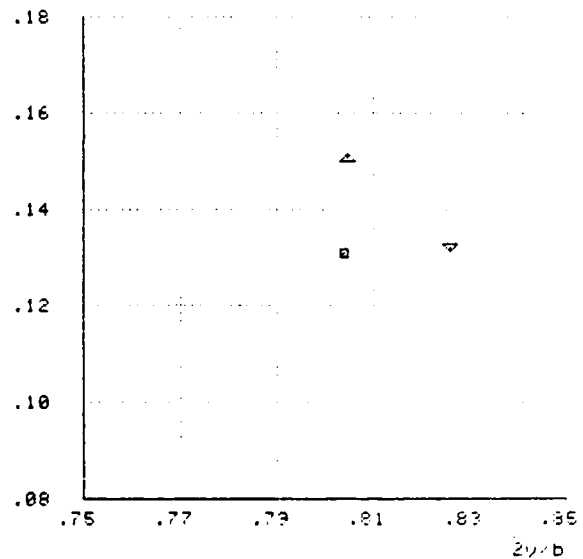
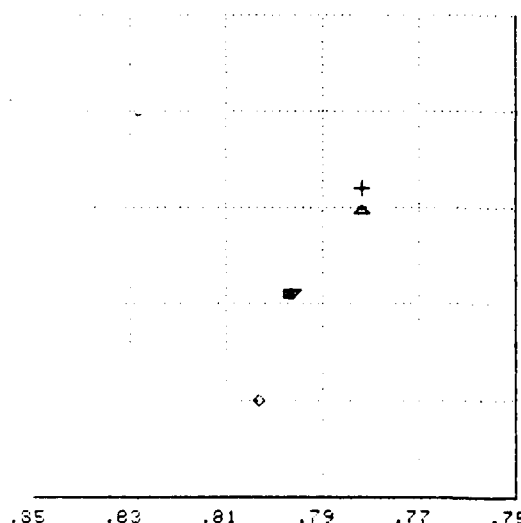


WING

LEFT

2z/b

RIGHT



VORTEXPOSITIONPLOT 47

X/C = 65.88 % ALPHA = 18.83 deg
 b/2 = 225.0 mm DALPHA = 12.42 deg
 FREQ = 3.00 Hz

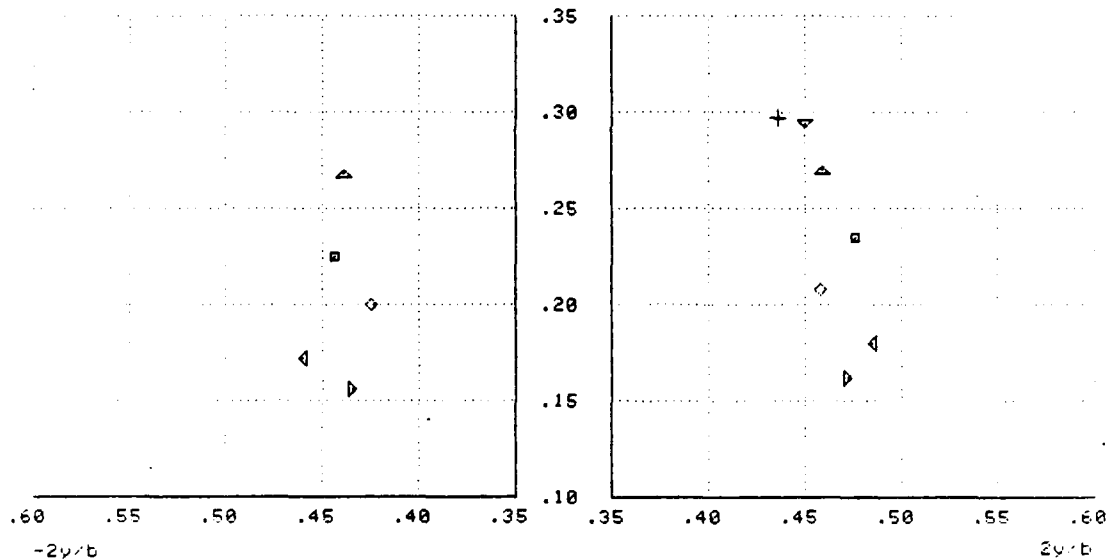
0 = □ 180 = ◇
 45 = △ 225 = ▽
 90 = + 270 = ×
 135 = ▴

STRAKE

LEFT

2z/b

RIGHT

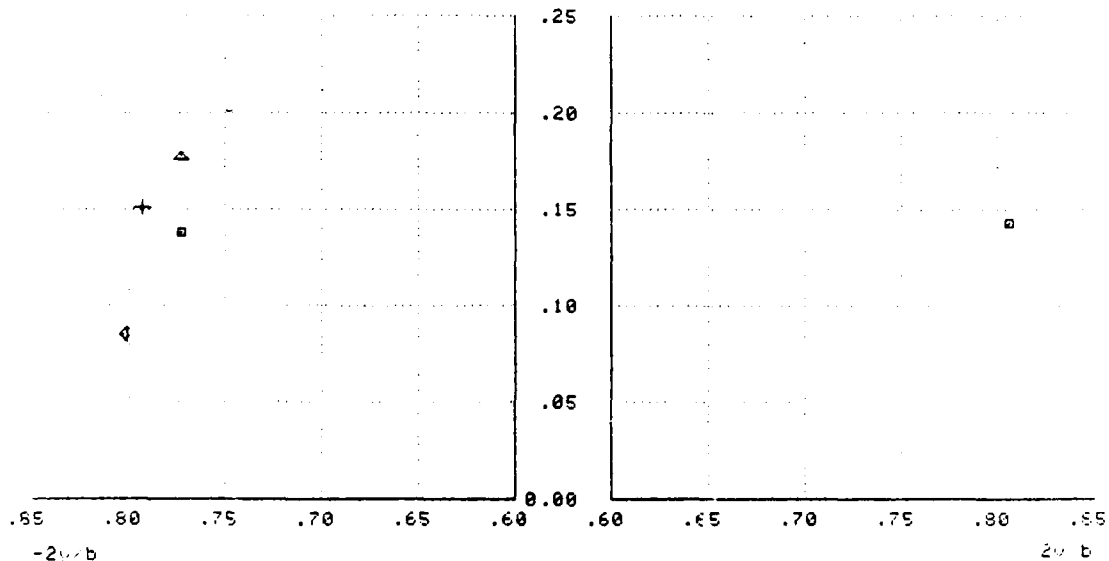


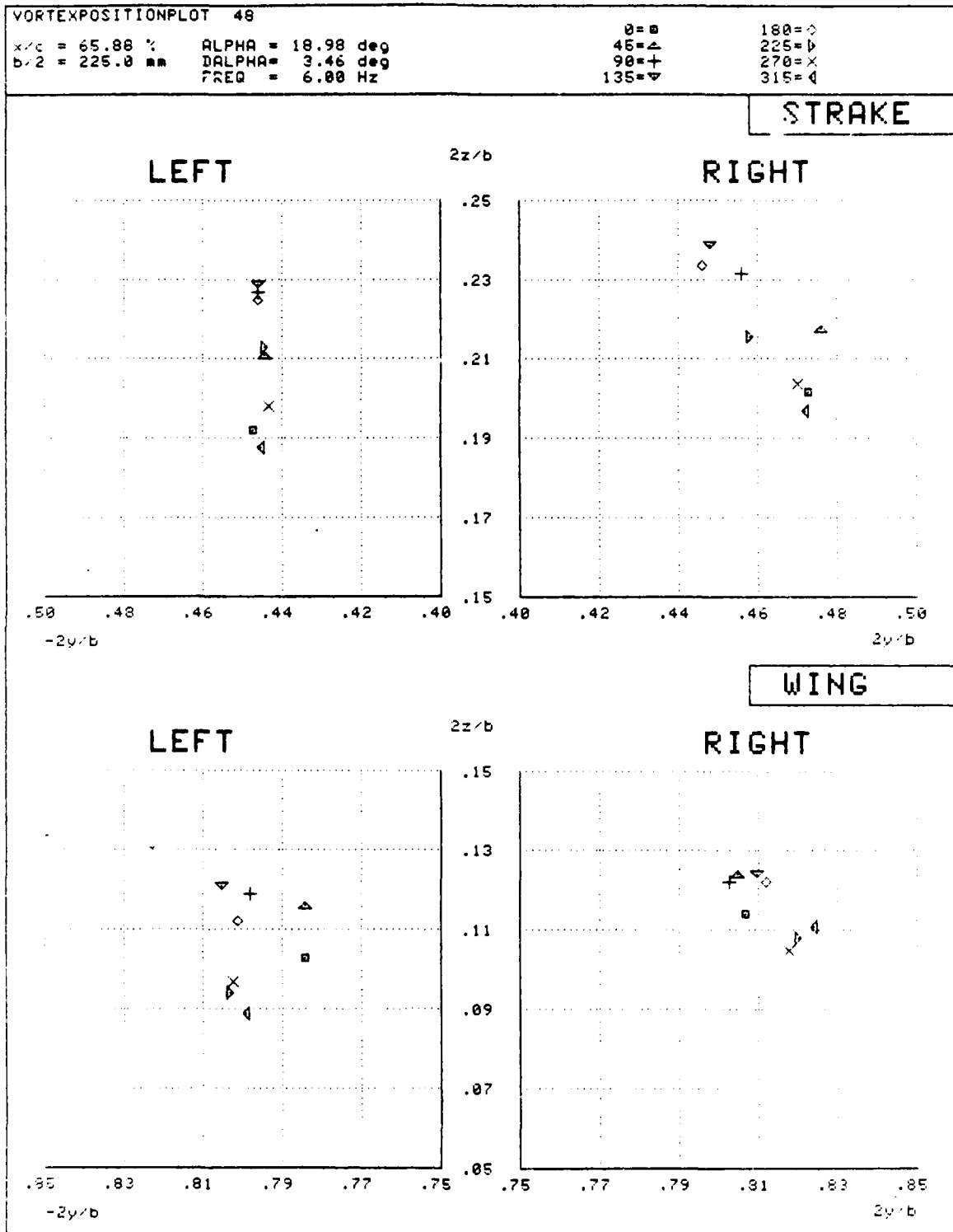
WING

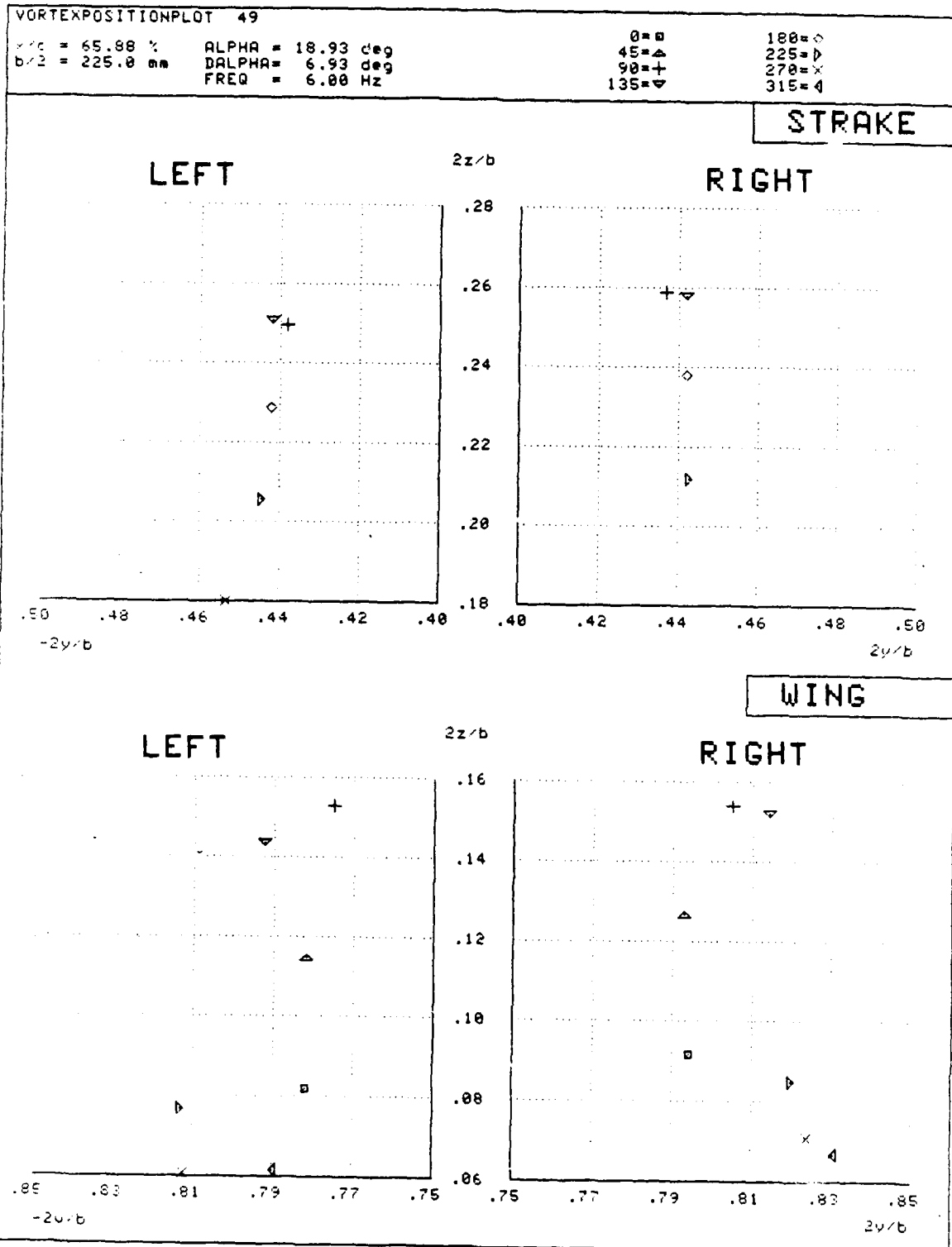
LEFT

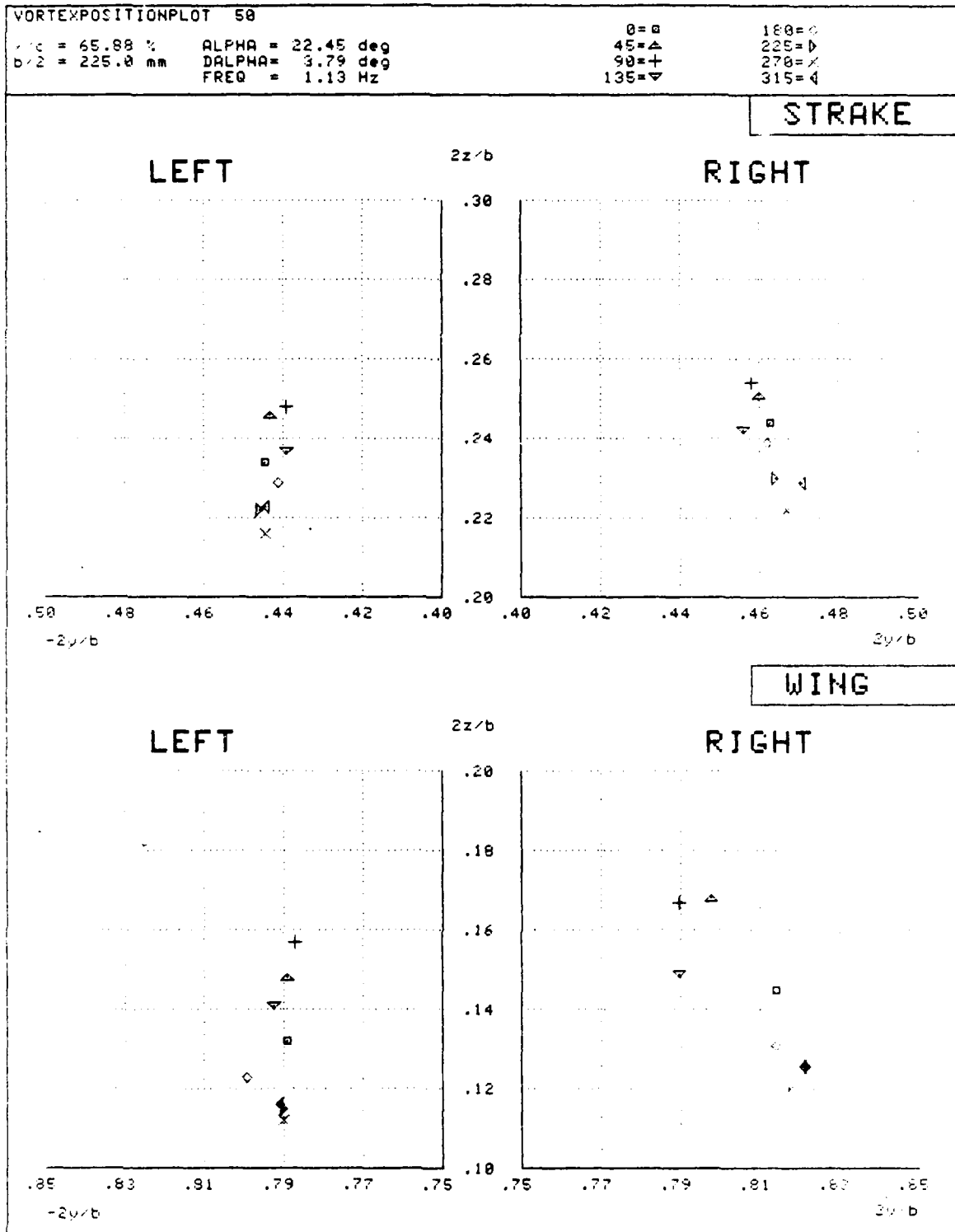
2z/b

RIGHT







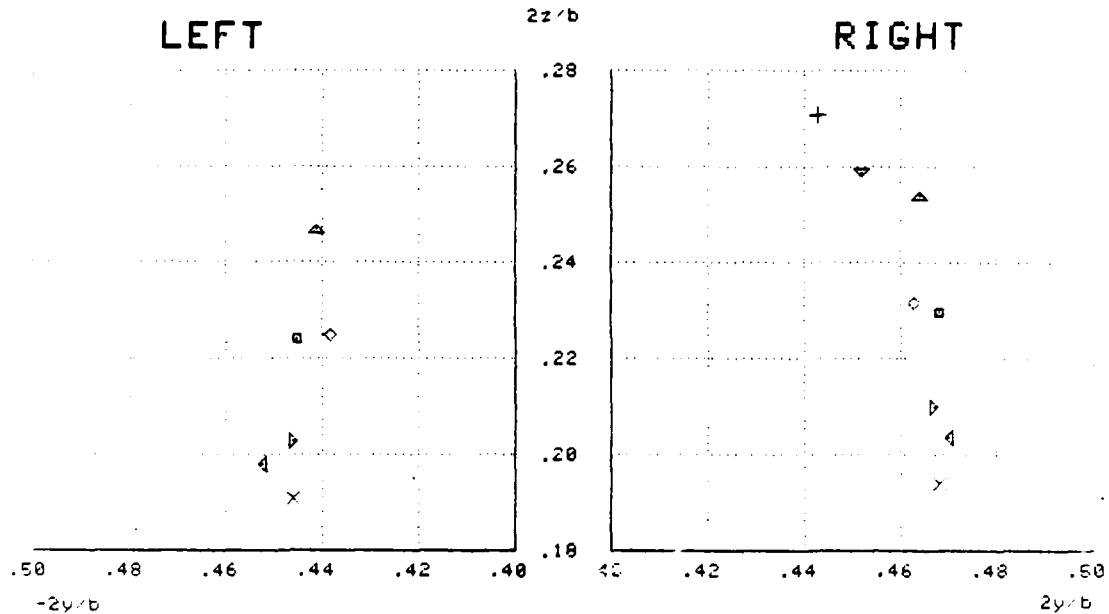


VORTEXPOSITIONPLOT 51

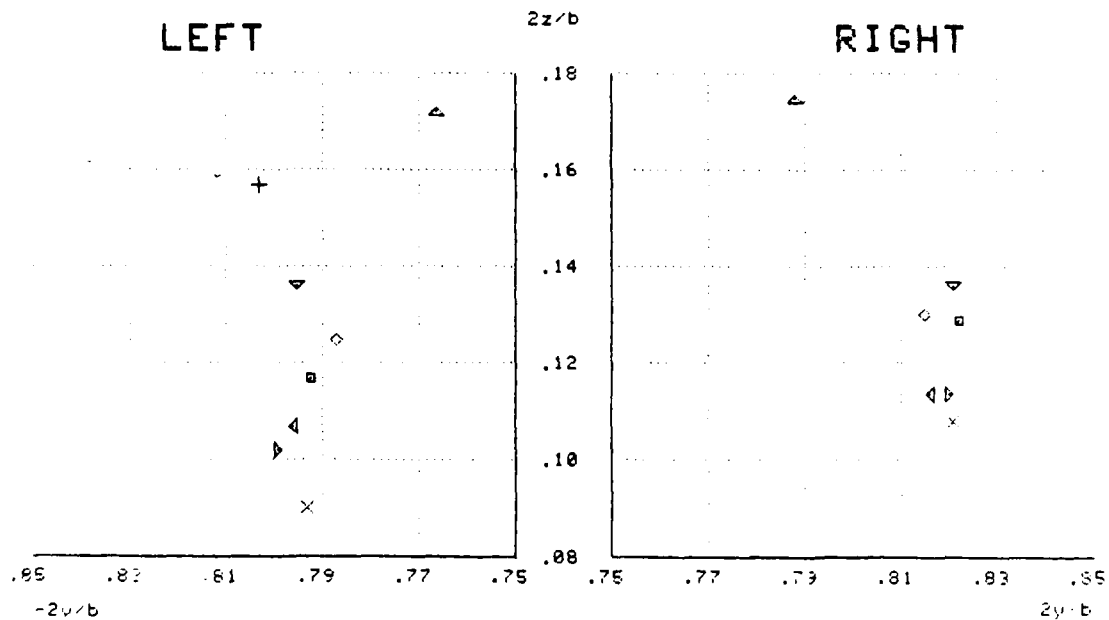
$x/c = 65.88 \%$ ALPHA = 22.41 deg
 $b/2 = 225.0 \text{ mm}$ DALPHA = 7.57 deg
 FREQ = 1.13 Hz

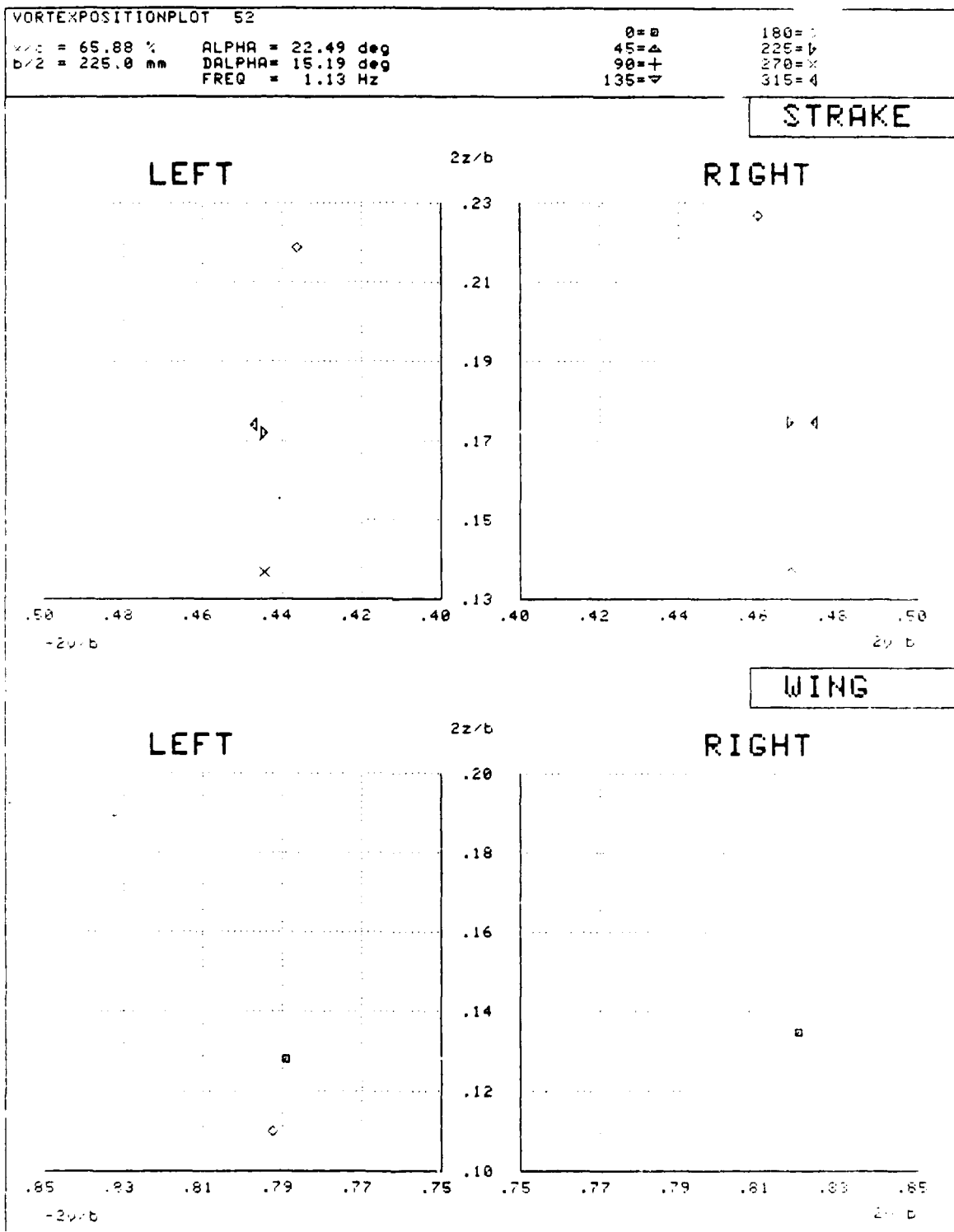
0 = $\square$ 180 = $\diamond$
 45 = $\triangle$ 225 = ∇
 90 = $+$ 270 = $\times$
 135 = ∇ 315 = ∇

STRAKE



WING





VORTEX POSITION PLOT 53

$x/c = 65.88\%$ ALPHA = 22.46 deg
 $b/2 = 225.0$ mm DIALPHA = 3.64 deg
 FREQ = 1.88 Hz

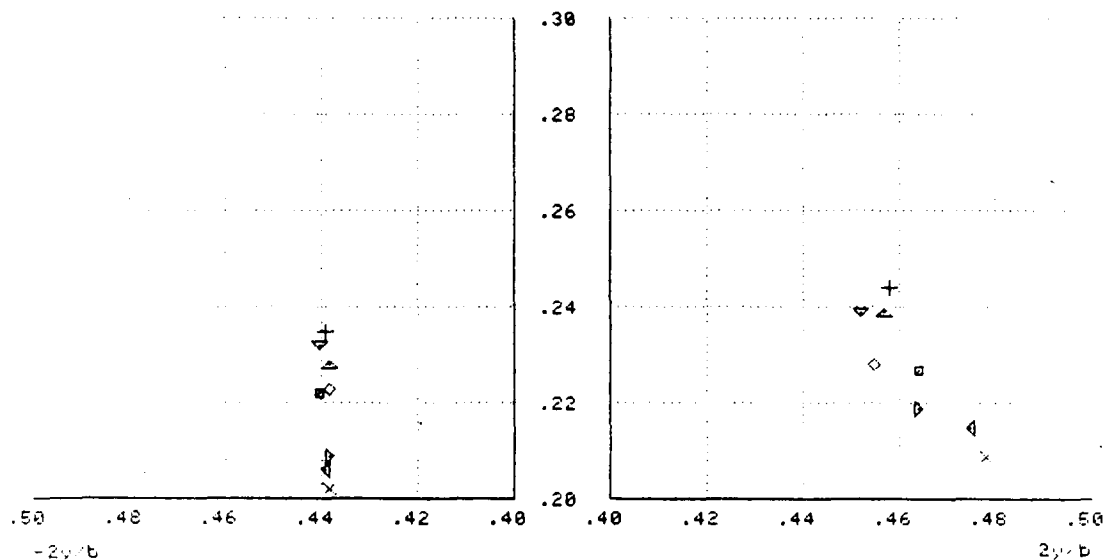
0 = □ 180 = /
 45 = △ 225 = ▽
 90 = + 270 = x
 135 = ▾

STRAKE

LEFT

$2z/b$

RIGHT

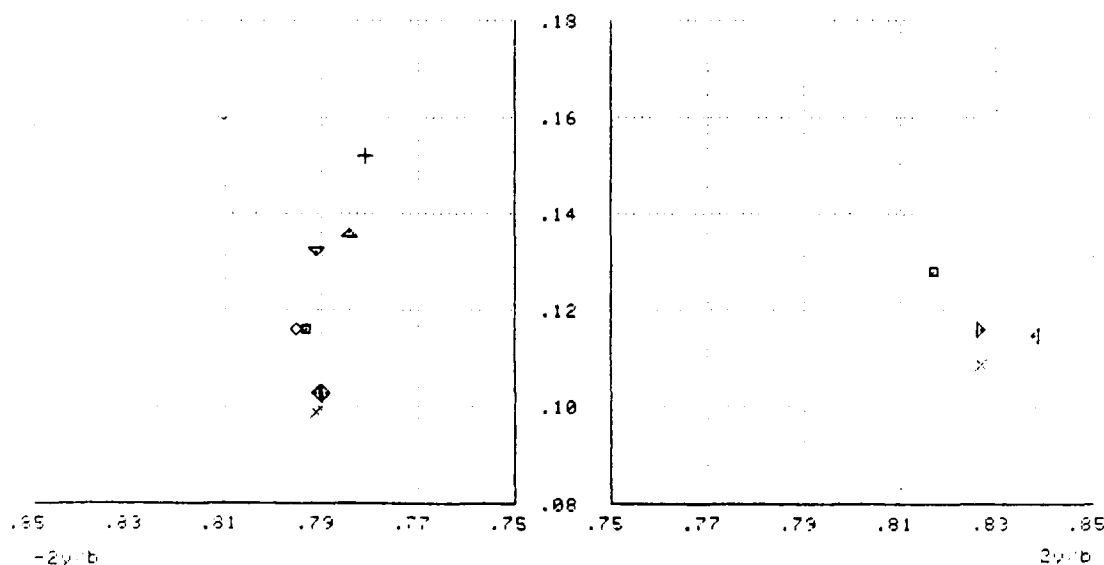


WING

LEFT

$2z/b$

RIGHT



VORTEXPOSITIONPLOT 54

$z/c = 65.98 \%$ ALPHA = 22.42 deg
 $b/2 = 225.0 \text{ mm}$ DALPHA = 7.09 deg
 FREQ = 1.88 Hz

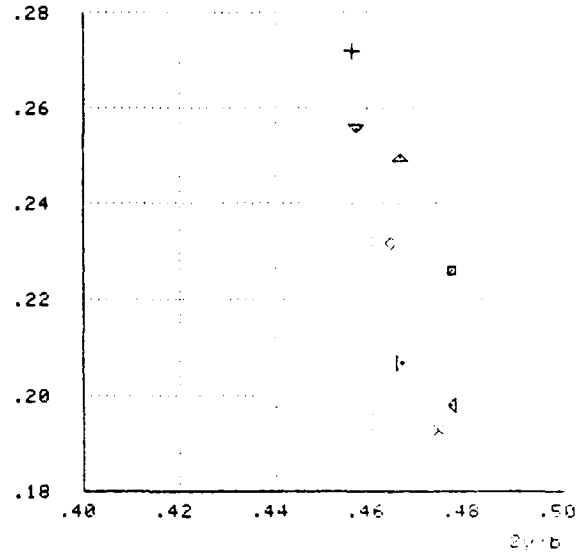
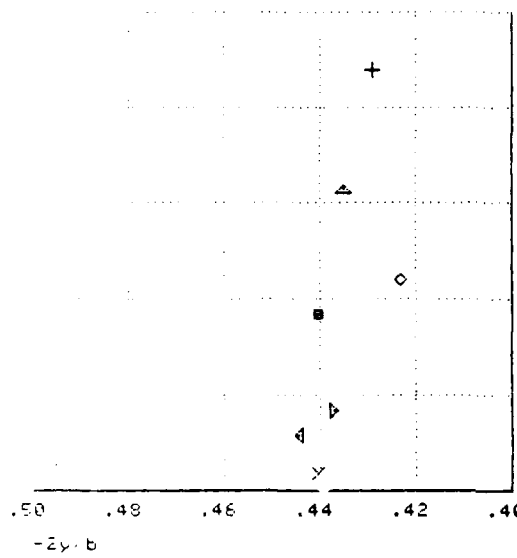
0 = $\square$ 180 = $\diamond$
 45 = $\triangle$ 225 = $\dagger$
 90 = $+$ 270 = $\times$
 135 = ∇ 315 = ∇

STRAKE

LEFT

$2z/b$

RIGHT

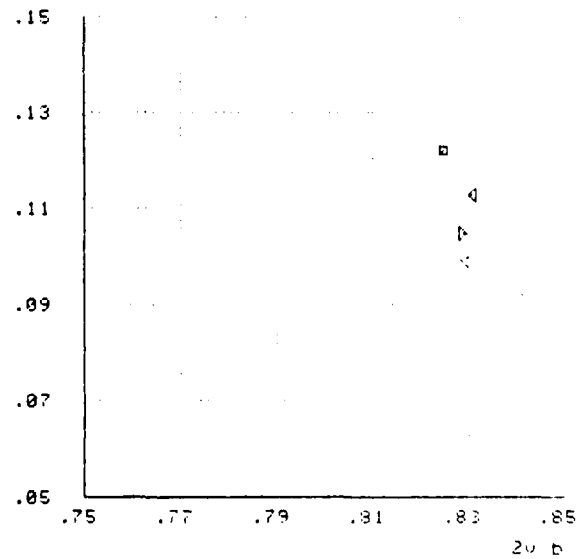
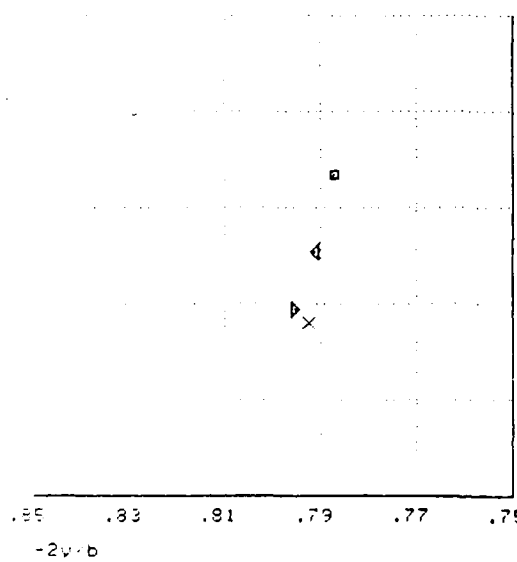


WING

LEFT

$2z/b$

RIGHT



VORTEX POSITION PLOT 55

$\alpha = 65.88^\circ$ ALPHA = 22.29 deg
 $b = 225.0$ mm BETA = 14.24 deg
 FREQ = 1.88 Hz

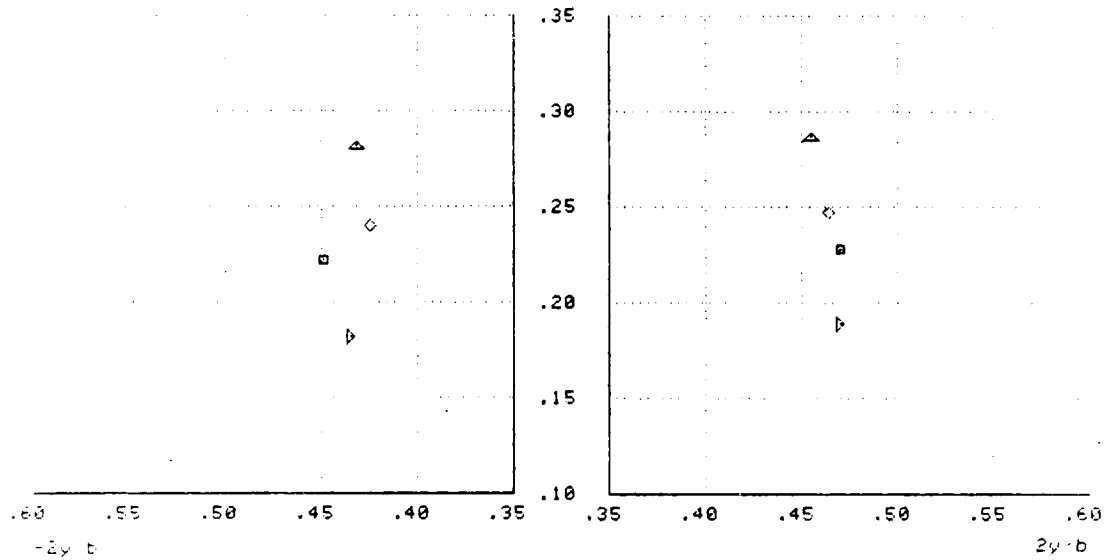
0 = $\square$ 180 = $\diamond$
 45 = $\triangle$ 225 = ∇
 90 = $+$ 270 = $\times$
 135 = ∇ 315 = ∇

STRAKE

LEFT

$2z/b$

RIGHT

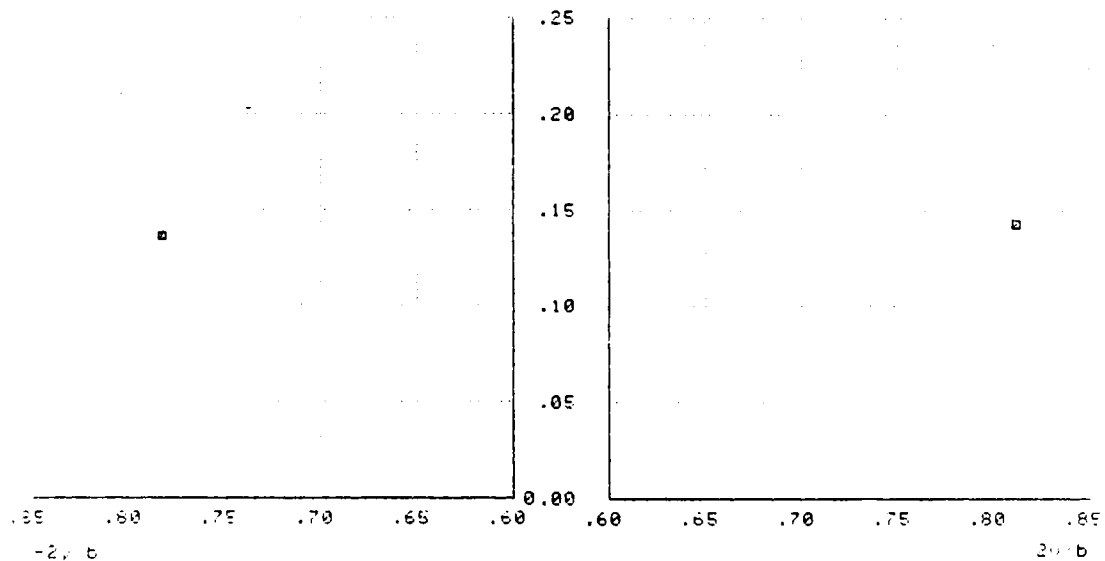


WING

LEFT

$2z/b$

RIGHT

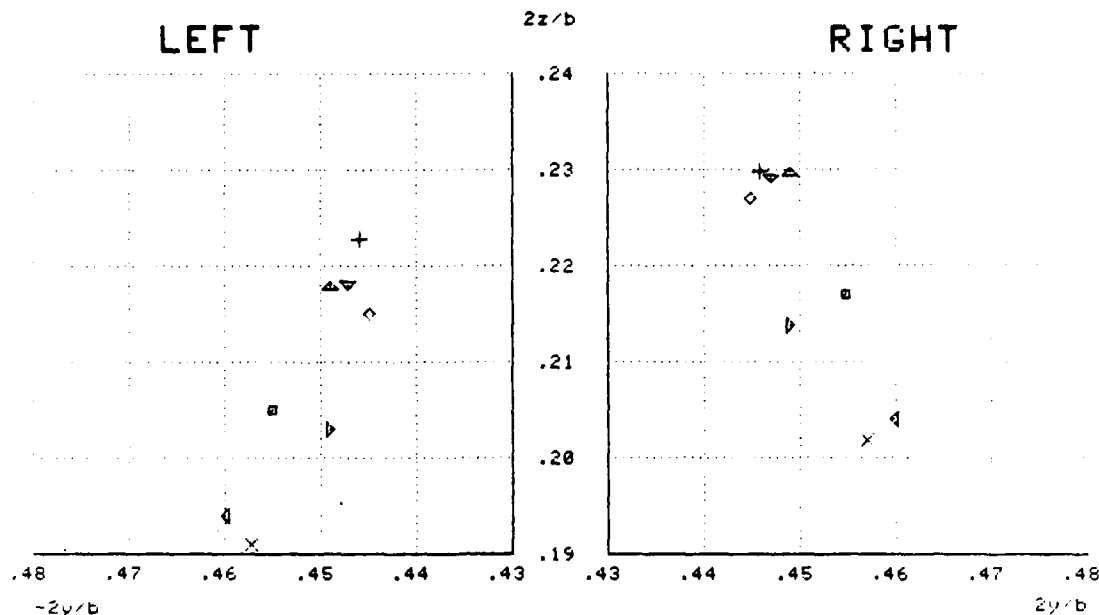


VORTEXPOSITIONPLOT 56

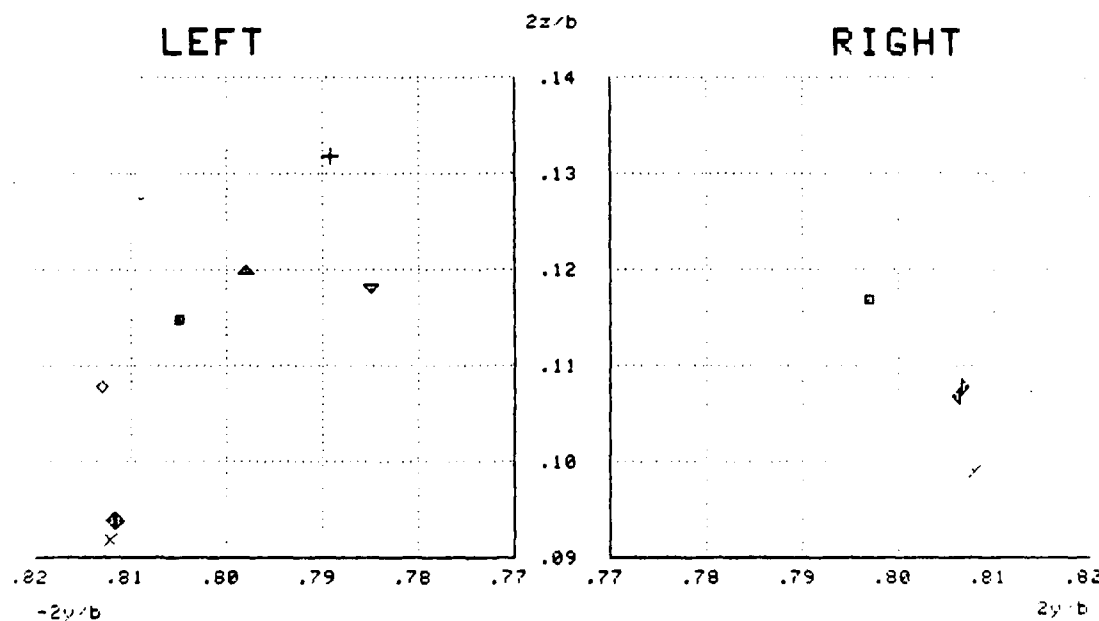
$x/c = 65.99\%$ ALPHA = 22.44 deg
 $b/2 = 225.0$ mm DALPHA = 3.51 deg
 FREQ = 3.00 Hz

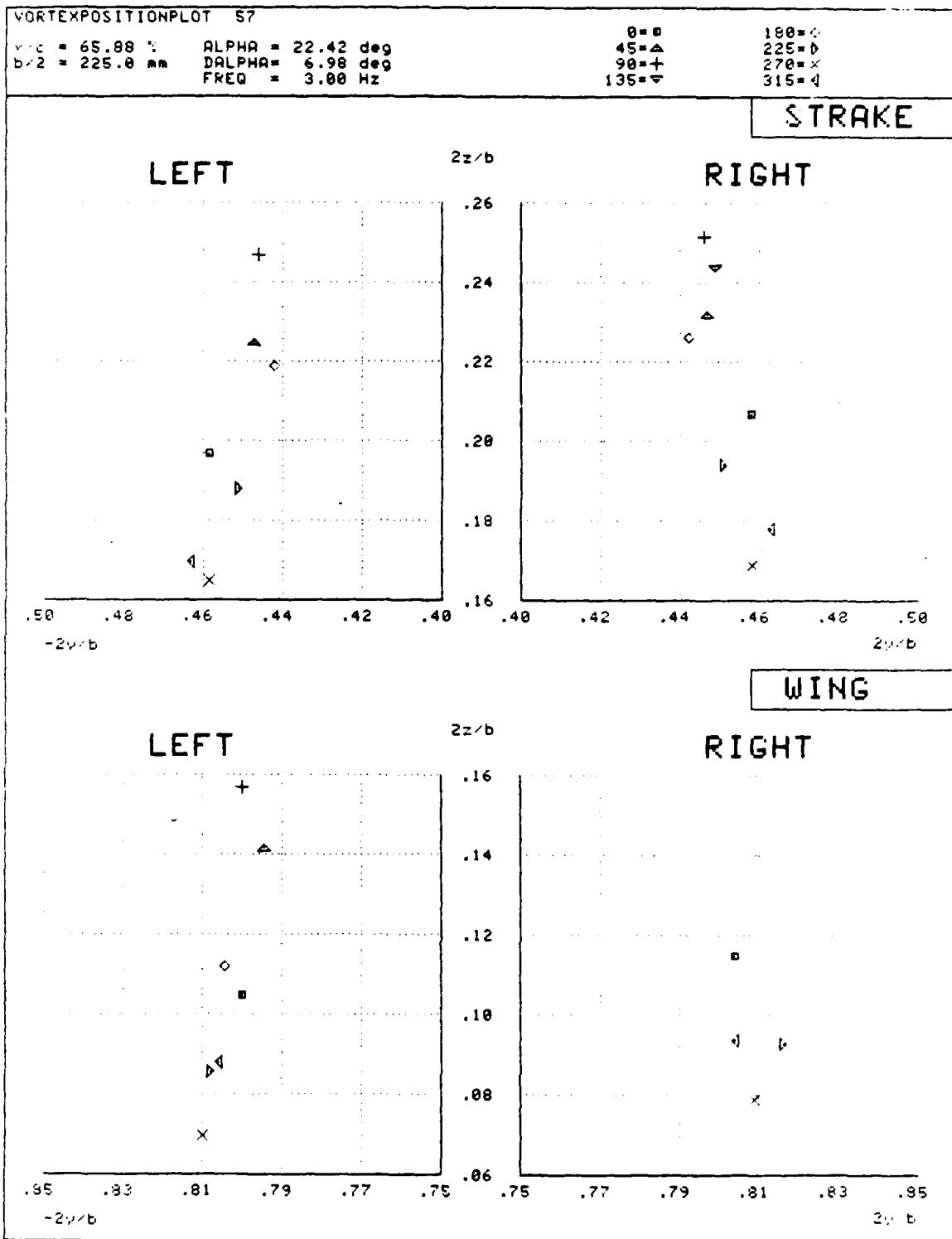
0 = $\square$ 180 = $\circ$
 45 = $\triangle$ 225 = ∇
 90 = $+$ 270 = $\times$
 135 = $\diamond$ 315 = $\cdot$

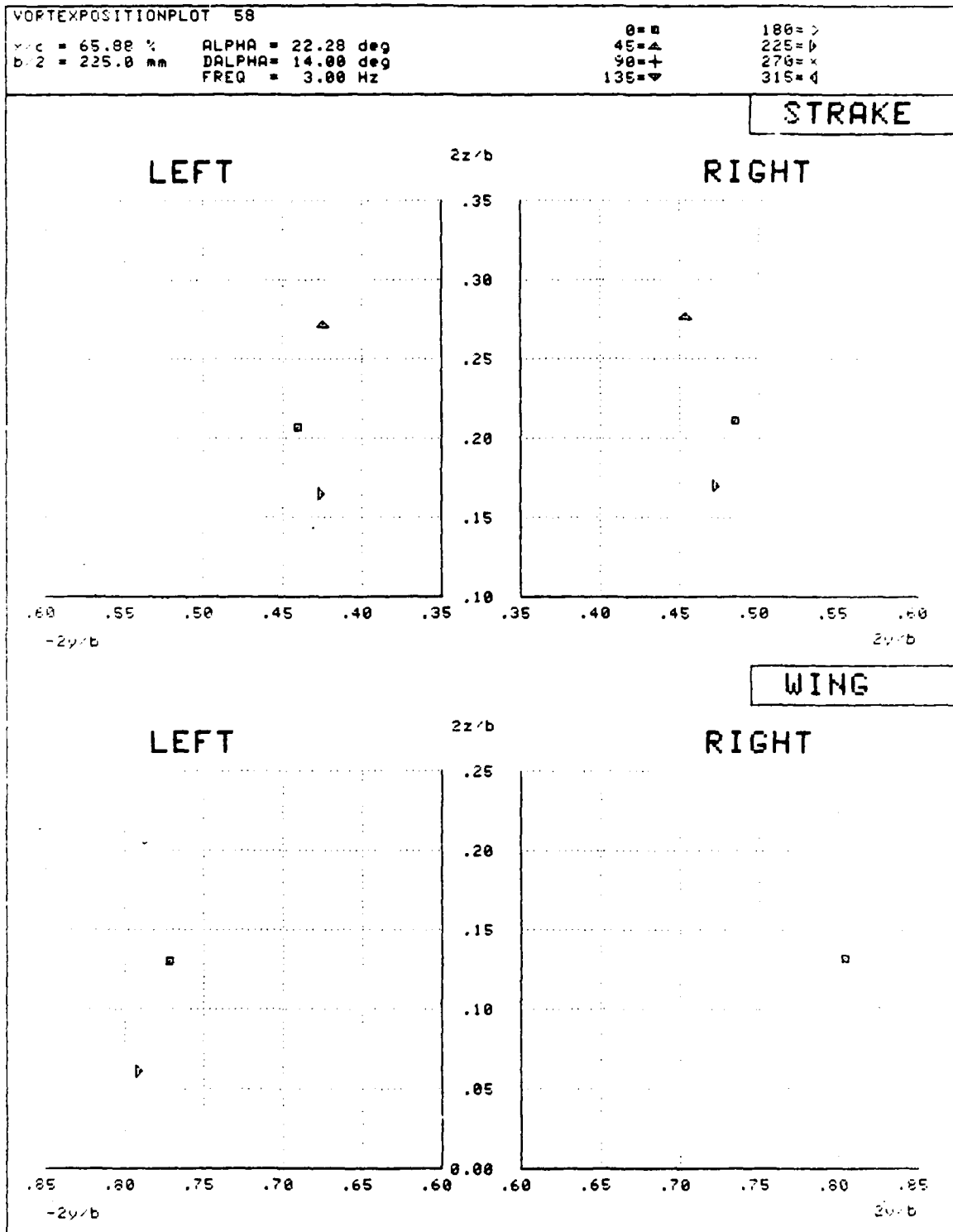
STRAKE



WING







VORTEXPOSITIONPLOT 59

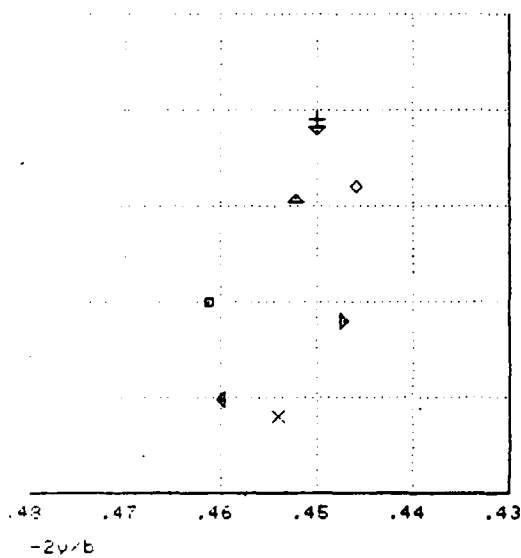
c = 65.88 % ALPHA = 22.50 deg
 b 2 = 225.0 mm DALPHA = 3.44 deg
 FREQ = 6.00 Hz

0 = □ 180 = ◇
 45 = ▲ 225 = ▽
 90 = + 270 = x
 135 = ▼

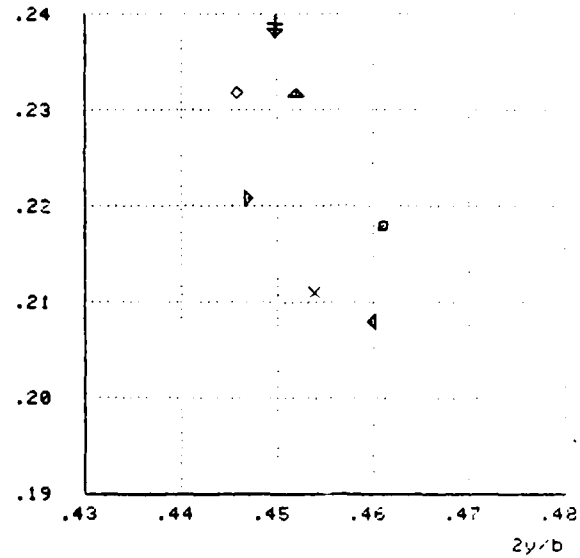
STRAKE

LEFT

2z/b



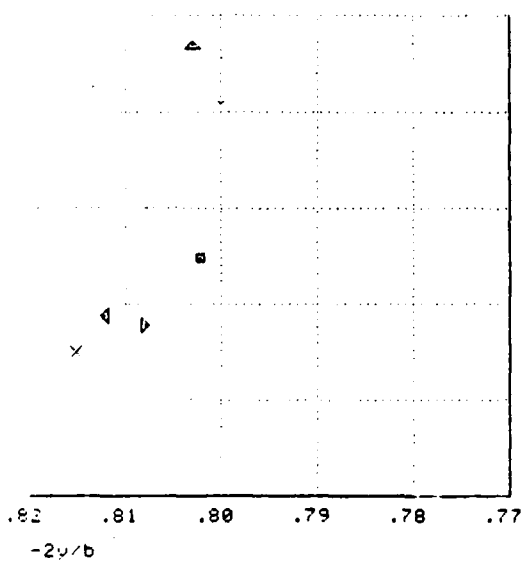
RIGHT



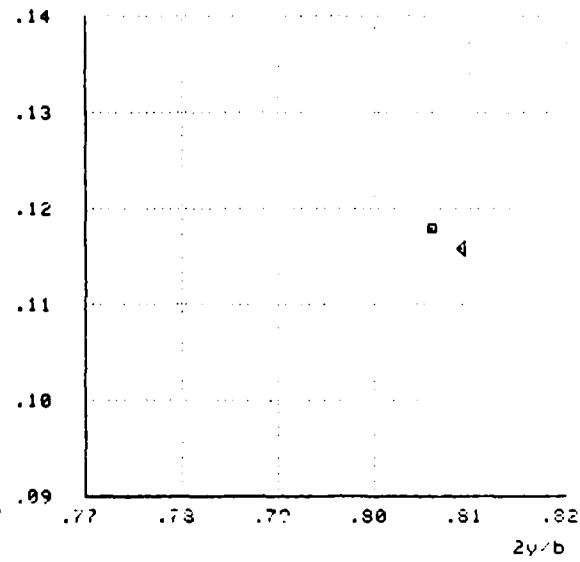
WING

LEFT

2z/b



RIGHT



VORTEXPOSITIONPLOT 60

$\gamma/c = 65.89 \%$ ALPHA = 22.42 deg
 $b/2 = 225.0 \text{ mm}$ DALPHA = 6.88 deg
 FREQ = 6.00 Hz

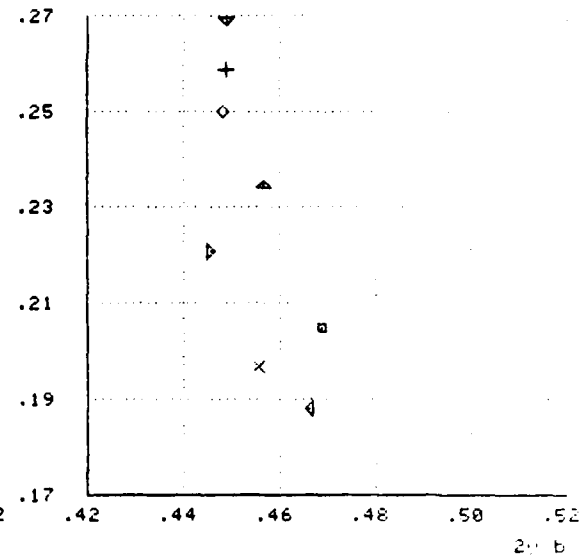
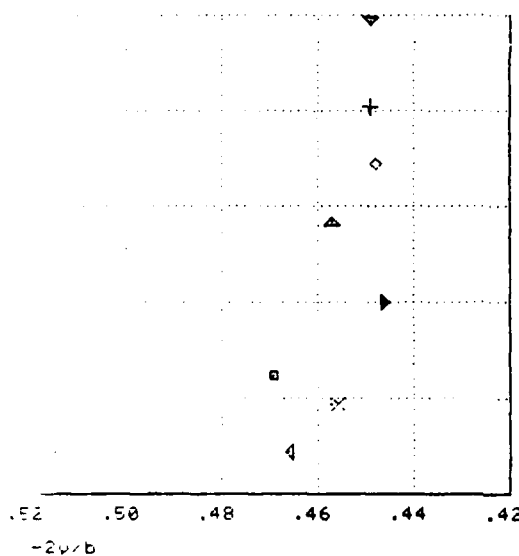
0 = $\square$ 180 = $\circ$
 45 = $\triangle$ 225 = $\times$
 90 = $+$ 270 = $\times$
 135 = ∇ 315 = ∇

STRAKE

LEFT

$2z/b$

RIGHT

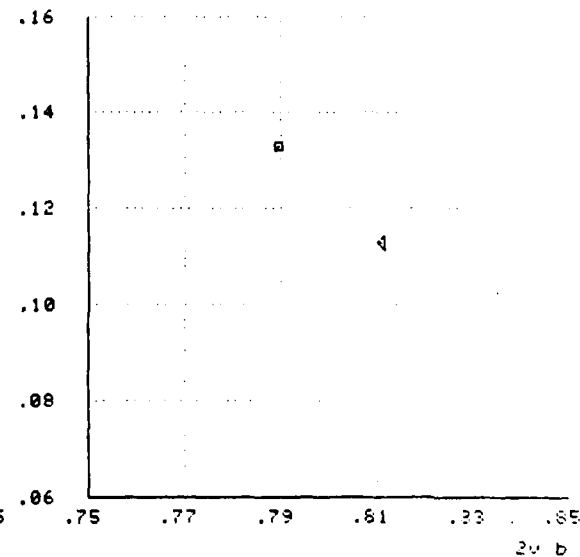
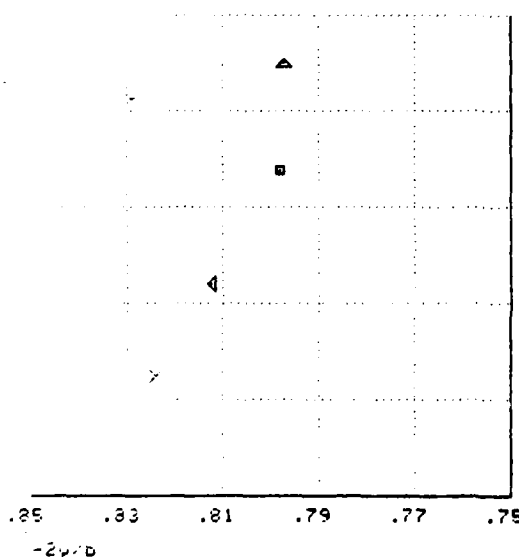


WING

LEFT

$2z/b$

RIGHT

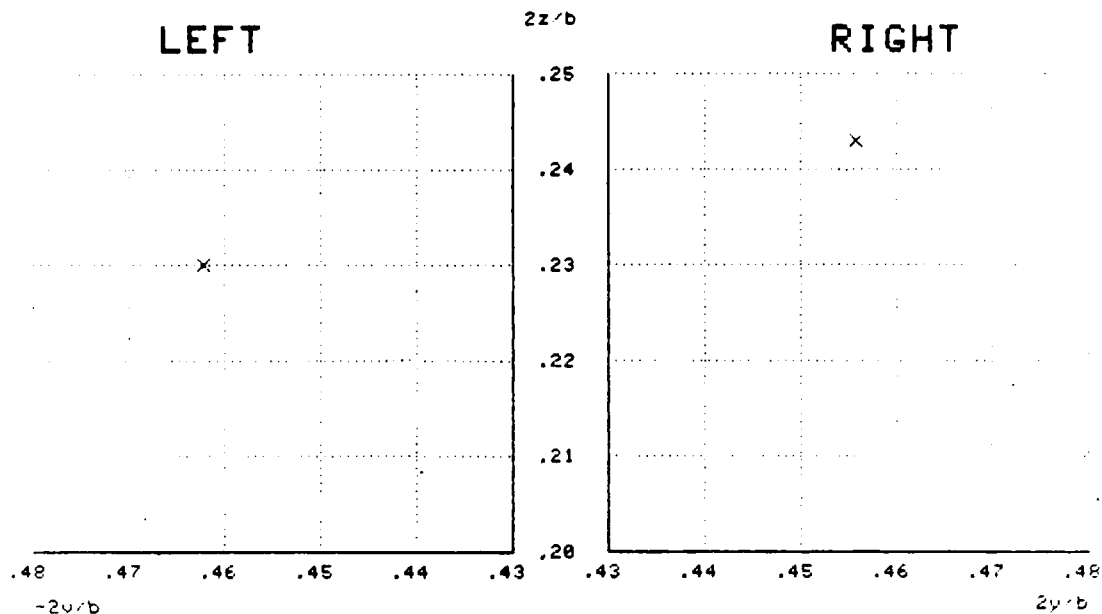


VORTEXPOSITIONPLOT 61

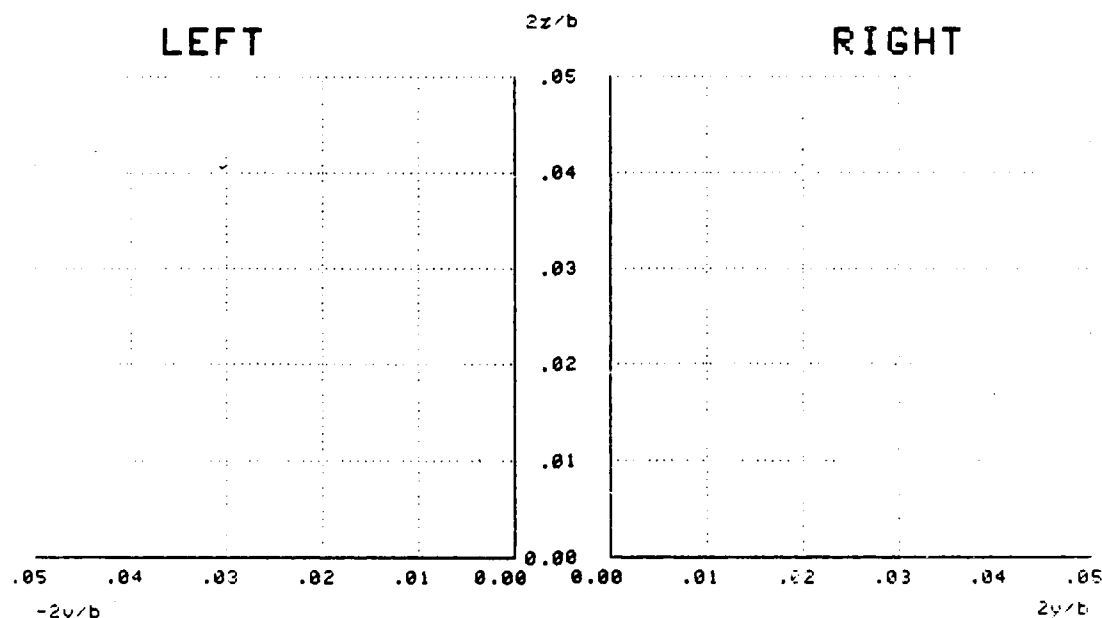
$\gamma/c = 65.88 \%$ ALPHA = 36.03 deg
 $b/2 = 225.0 \text{ mm}$ DALPHA = 15.23 deg
 FREQ = 1.13 Hz

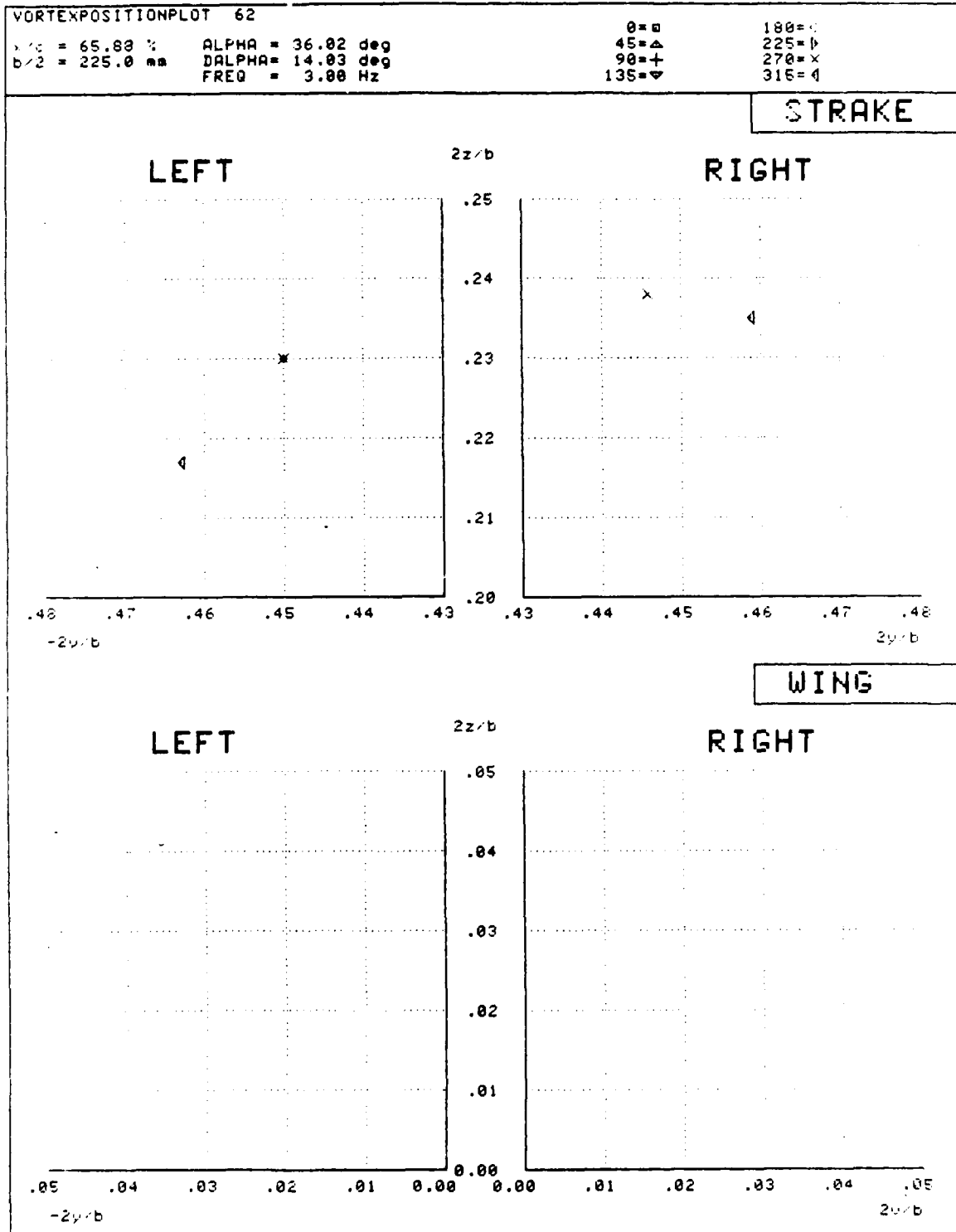
0 = $\square$ 180 = $\times$
 45 = $\triangle$ 225 = ∇
 90 = $+$ 270 = $\times$
 135 = $\diamond$ 315 = $\diamond$

STRAKE



WING



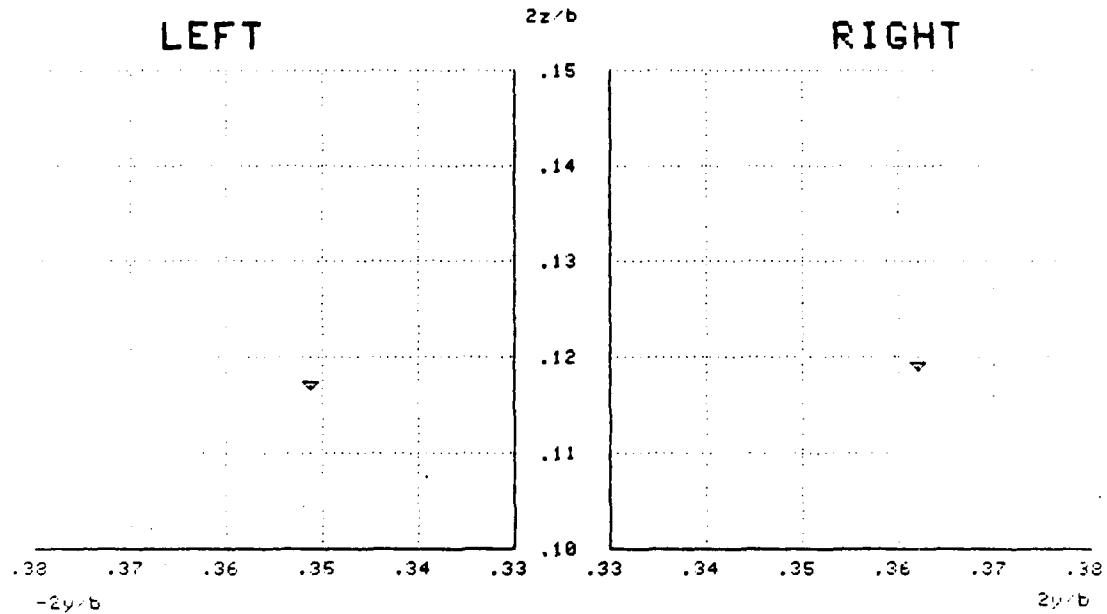


VORTEXPOSITIONPLOT 63

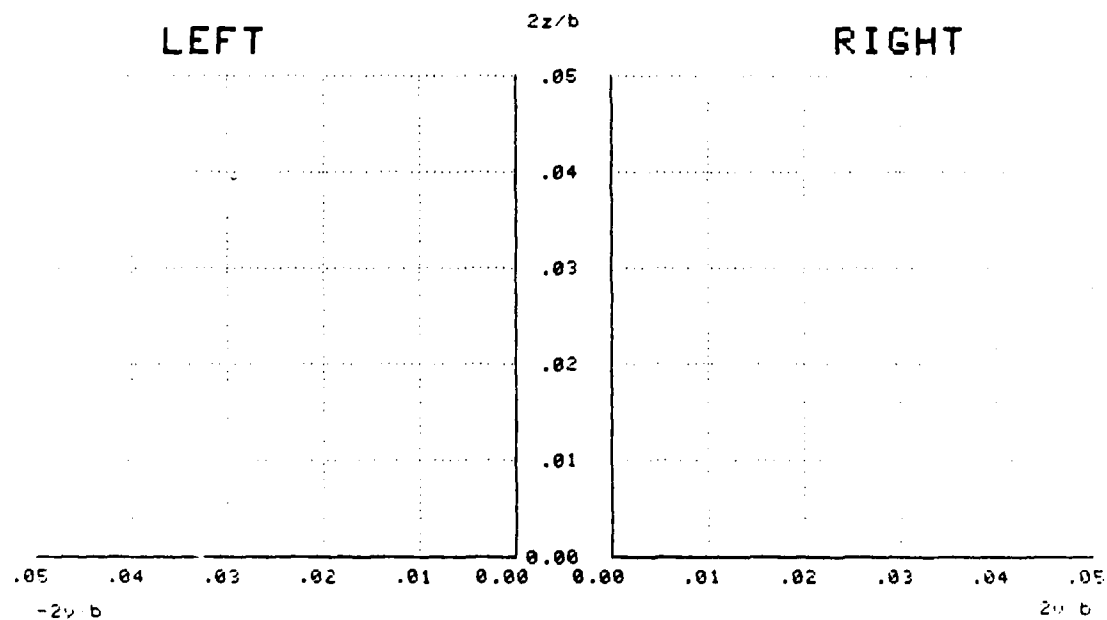
$\gamma/c = 96.92 \%$ ALPHA = 10.01 deg
 $b/2 = 400.0 \text{ mm}$ DALPHA = 3.78 deg
 FREQ = 1.88 Hz

0 = $\square$ 180 = $\circ$
 45 = $\triangle$ 225 = ∇
 90 = $+$ 270 = $\times$
 135 = $\diamond$ 315 = $\cdot$

STRAKE



WING

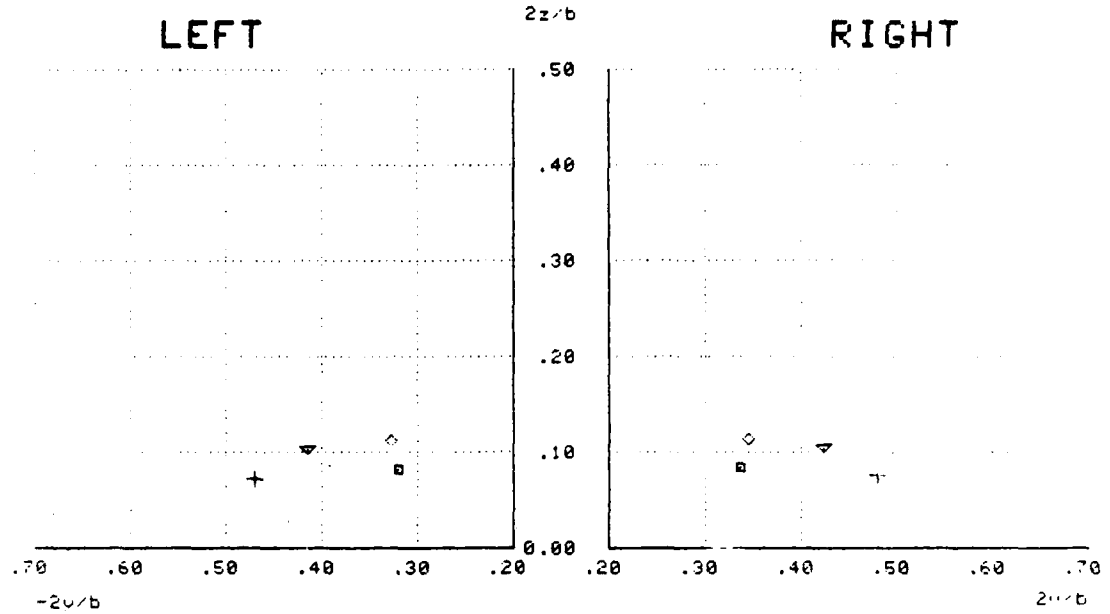


VORTEXPOSITIONPLOT 64

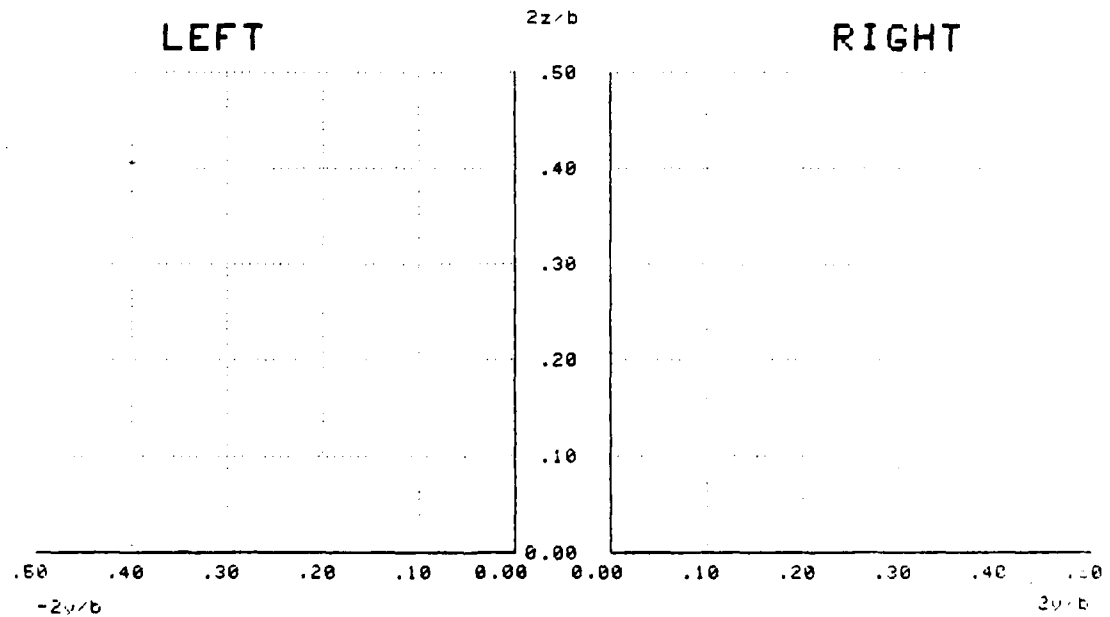
x/c = 96.32 % ALPHA = 9.91 deg
b/2 = 400.0 mm DALPHA = 7.60 deg
FREQ = 1.88 Hz

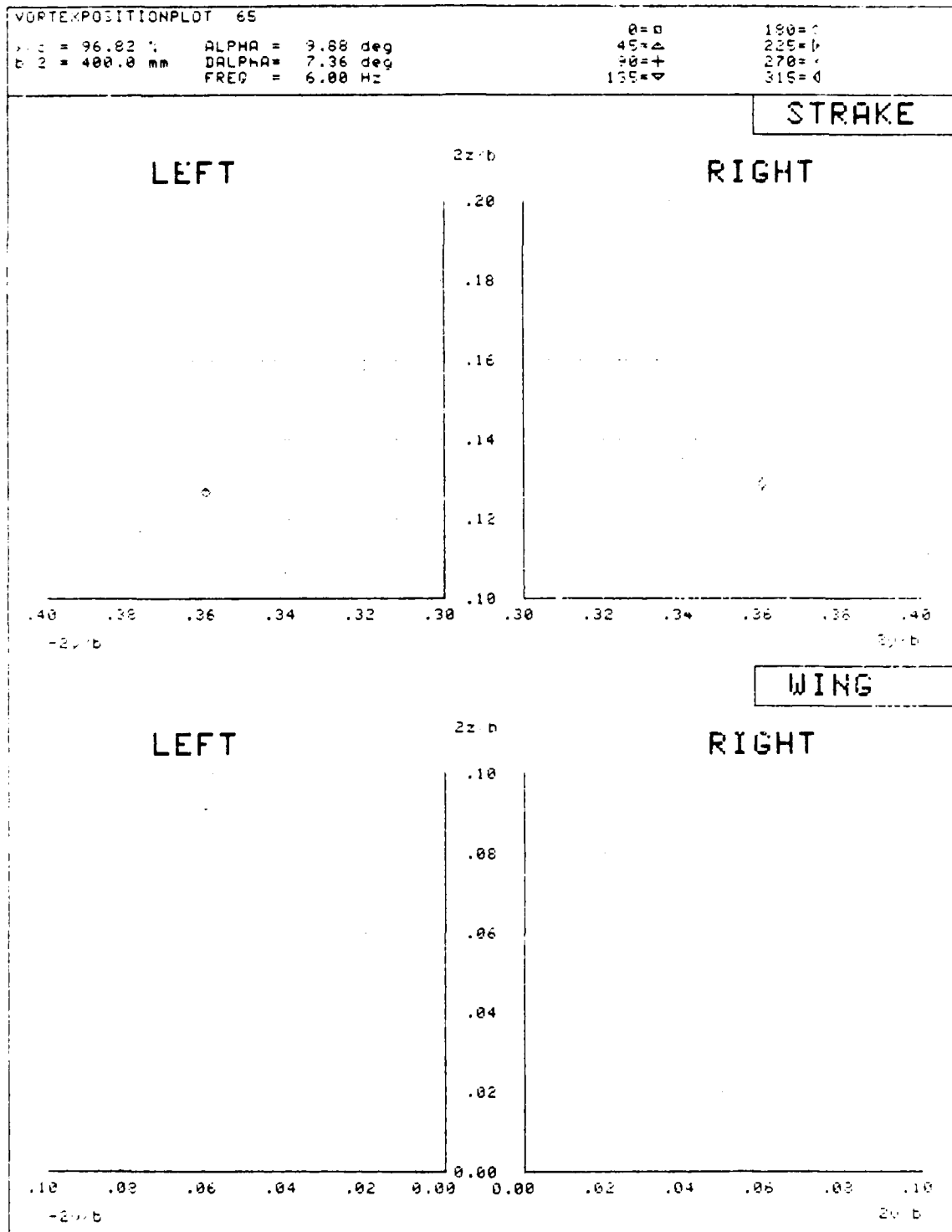
0 = □ 180 = -
45 = △ 225 = ⊥
90 = + 270 = v
135 = ▽ 315 = d

STRAKE



WING





END

DATE

10-88

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