TECHNICAL NOTE

D-1244

A TABULATION OF SECTION AERODYNAMIC CHARACTERISTICS AT MACH NUMBERS OF 1.61 AND 2.01 FOR FOUR SWEPT WINGS HAVING THE SAME PLANFORM BUT DIFFERENT SURFACE SHAPES

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SUMMARY

The section normal-force and pitching-moment coefficients for four sweptback wings with different surface shapes are tabulated. All the wings had NACA 65A005 thickness distributions, 50° of sweepback at the quarter chord, a taper ratio of 0.20, and an aspect ratio of 3.5. There were three twisted wings and one flat wing. The twisted wings had 6° of washout at the tip, but the twist variation along the span was either linear, quadratic, or cubic. The wings were tested at Mach numbers of 1.61 and 2.01 with fixed and free transition through a Reynolds number range of 1.7×10^6 to 3.6×10^6. Angle-of-attack range was from -20° to 20°.

INTRODUCTION

The usefulness of camber and twist in the design of efficient wings for supersonic aircraft has been given considerable study over the past several years. Of current interest is the prediction of the changes in aerodynamic characteristics of wings when they distort under variable flight loads. In order to obtain some insight into these problems of distortion, a general investigation of the effects of arbitrary camber and twist built into nearly rigid models is being made at low supersonic speeds by means of pressure-distribution and force tests. The tabulated results of a pressure investigation of the separate effects of camber and twist on the aerodynamic characteristics of a sweptback wing at Mach numbers of 1.61 and 2.01 are presented in reference 1, and a limited analysis of some of these results is presented in reference 2. The results of a force study of the same wings are given in reference 3. The section normal-force and pitching-moment coefficients for the flat and twisted wings of reference 1, obtained by streamwise integration of the pressure distributions, are tabulated in this report. No analysis of the data is made.

SYMBOLS

$\bar{c}$ mean aerodynamic chord, 10.33 in.

α angle of attack of root chord, deg

MODELS AND MODEL MOUNTING

Four semispan wings with the same planform but different surface shapes were tested: one was flat (designated wing F), and three were twisted (designated wings 1, 2, and 3). These designations correspond to those used in references 1 and 3.

All of the wings had an NACA 65A005 thickness distribution, 50° of sweepback at the quarter-chord line, a taper ratio of 0.20, and an aspect ratio of 3.5. A plan view of the models is shown in figure 1.

The twisted wings were derived from the flat wing by rotating each spanwise station about the leading edge. Linear, quadratic, and cubic spanwise variations of twist (wings 1, 2, and 3, respectively) were used. Each twisted wing had 6° of washout at the tip.

The flat wing had six streamwise rows of orifices located at 0.05, 0.20, 0.35, 0.50, 0.70, and 0.90 semispan. On the twisted wings, the 0.90 semispan station was omitted and replaced by stations at 0.825 and 0.95 semispan. (See fig. 1.)

The semispan wings were mounted horizontally in the tunnel from a turntable in a boundary-layer bypass plate which was located vertically in the test section about 10 inches from the tunnel wall.

TESTS AND TEST PROCEDURES

The tests were conducted in the Langley 4- by 4-foot supersonic pressure tunnel at Mach numbers of 1.61 and 2.01. At both Mach numbers all the wings were tested with fixed and free transition. Transition was fixed about 1/2 inch from the wing leading edge by grains of No. 60 carborundum.

Angle of attack was changed manually by rotating the turntable on which the models were mounted and was measured by a vernier scale outside the tunnel. The angle-of-attack range was from -20° to 20° although the complete range was not obtained for all wings at all test conditions.

Tunnel stagnation pressures of 8 and 15 pounds per square inch absolute were used to provide a range of Reynolds numbers, based on $\bar{c}$, from 1.7×10^6 to 3.6×10^6.

Measurements of tip deflection made during the tests indicated a maximum in aeroelastic twist variation for all wings occurred near an angle of attack of 10° and, for a stagnation pressure of 15 pounds per square inch absolute, amounted to about 1.5° of washout. Lower angles of attack or lower stagnation pressures gave proportionately smaller values of aeroelastic tip twist.

TABLES

The section normal-force and pitching-moment coefficients for the various spanwise stations are presented in tables 1 to 4 for the four wings. Table 1 is for the flat wing (wing F); tables 2, 3, and 4 are for the wings with linear, quadratic, and cubic variations of twist (wings 1, 2, and 3, respectively). For any given table, the order of parameter change is from free to fixed transition, from lower to higher Reynolds number, and from lower to higher Mach number.

Langley Research Center,
National Aeronautics and Space Administration,
Langley Air Force Base, Va., January 31, 1962.

REFERENCES

1. Grant, Frederick C.: A Tabulation of Wind-Tunnel Pressure Data at Mach Numbers of 1.61 and 2.01 for Five Swept Wings of the Same Plan Form but Different Surface Shapes. NACA RM L58D23, 1958.

2. Grant, Frederick C., and Mugler, John P., Jr.: Span Loadings Due to Wing Twist at Transonic and Supersonic Speeds. NACA RM L57D24a, 1957.

3. Landrum, Emma Jean, and Czarnecki, K. R.: Effects at Mach Numbers of 1.61 and 2.01 of Camber and Twist on the Aerodynamic Characteristics of Three Swept Wings Having the Same Planform. NASA TN D-929, 1961.

TABLE 1.- AERODYNAMIC CHARACTERISTICS FOR WING F

MACH NUMBER = 1.61 REYNOLDS NUMBER = 1.9 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN					
	.05	.20	.35	.50	.70	.90
	SECTION NORMAL-FORCE COEFFICIENT					
-20	-1.062	-1.116	-1.065	-.911	-.645	-.345
-18	-.921	-.964	-.928	-.831	-.633	-.354
-16	-.792	-.832	-.806	-.720	-.571	-.385
-14	-.679	-.707	-.705	-.635	-.486	-.347
-12	-.585	-.598	-.598	-.563	-.425	-.280
-10	-.478	-.488	-.496	-.481	-.368	-.239
-08	-.372	-.381	-.391	-.381	-.314	-.201
-06	-.266	-.282	-.298	-.288	-.243	-.160
-04	-.175	-.189	-.197	-.189	-.166	-.115
-02	-.086	-.096	-.095	-.096	-.081	-.054
00	.000	.000	.000	.000	.000	.000
02	.086	.096	.095	.096	.081	.054
04	.175	.189	.197	.189	.166	.115
06	.266	.282	.298	.288	.243	.160
08	.372	.381	.391	.381	.314	.201
10	.478	.488	.496	.481	.368	.239
12	.585	.598	.598	.563	.425	.280
14	.679	.707	.705	.635	.486	.347
16	.792	.832	.806	.720	.571	.385
18	.921	.964	.928	.831	.633	.354
20	1.062	1.116	1.065	.911	.645	.345
	SECTION PITCHING-MOMENT COEFFICIENT					
-20	-.319	-.074	.191	.366	.452	.351
-18	-.285	-.080	.153	.337	.447	.360
-16	-.256	-.083	.120	.284	.406	.392
-14	-.225	-.081	.096	.246	.342	.355
-12	-.193	-.072	.069	.213	.297	.285
-10	-.160	-.064	.051	.178	.254	.242
-08	-.127	-.050	.037	.133	.217	.202
-06	-.092	-.038	.027	.097	.165	.160
-04	-.062	-.026	.017	.063	.110	.115
-02	-.031	-.012	.009	.031	.053	.053
00	.000	.000	.000	.000	.000	.000
02	.031	.012	-.009	-.031	-.053	-.053
04	.062	.026	-.017	-.063	-.110	-.115
06	.092	.038	-.027	-.097	-.165	-.160
08	.127	.050	-.037	-.133	-.217	-.202
10	.160	.064	-.051	-.178	-.254	-.242
12	.193	.072	-.069	-.213	-.297	-.285
14	.225	.081	-.096	-.246	-.342	-.355
16	.256	.083	-.120	-.284	-.406	-.392
18	.285	.080	-.153	-.337	-.447	-.360
20	.319	.074	-.191	-.366	-.452	-.351

TABLE 1.- AERODYNAMIC CHARACTERISTICS FOR WING F
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 1.9 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN					
	.05	.20	.35	.50	.70	.90
	SECTION NORMAL-FORCE COEFFICIENT					
-20	-1.065	-1.124	-1.057	-.897	-.650	-.345
-18	-.913	-.969	-.915	-.826	-.635	-.363
-16	-.781	-.823	-.798	-.722	-.570	-.389
-14	-.667	-.700	-.707	-.637	-.479	-.347
-12	-.565	-.589	-.599	-.551	-.419	-.280
-10	-.457	-.481	-.496	-.474	-.374	-.243
-08	-.372	-.396	-.397	-.380	-.316	-.202
-06	-.269	-.294	-.301	-.282	-.241	-.161
-04	-.188	-.207	-.189	-.182	-.160	-.001
-02	-.117	-.092	-.093	-.094	-.081	-.057
00	.000	.000	.000	.000	.000	.000
02	.117	.092	.093	.094	.081	.057
04	.188	.207	.189	.182	.160	.116
06	.269	.294	.301	.282	.241	.161
08	.372	.396	.397	.380	.316	.202
10	.457	.481	.496	.474	.374	.243
12	.565	.589	.599	.551	.419	.280
14	.667	.700	.707	.637	.479	.347
16	.781	.823	.798	.722	.570	.389
18	.913	.969	.915	.826	.635	.363
20	1.065	1.124	1.057	.897	.650	.345
	SECTION PITCHING-MOMENT COEFFICIENT					
-20	-.319	-.079	.187	.359	.456	.351
-18	-.284	-.082	.146	.333	.449	.370
-16	-.252	-.083	.118	.288	.406	.396
-14	-.221	-.084	.094	.246	.335	.355
-12	-.189	-.076	.069	.208	.291	.285
-10	-.155	-.064	.051	.174	.259	.246
-08	-.126	-.053	.038	.133	.218	.203
-06	-.093	-.039	.028	.094	.164	.161
-04	-.064	-.030	.016	.060	.106	.117
-02	-.032	-.014	.008	.030	.053	.056
00	.000	.000	.000	.000	.000	.000
02	.032	.014	-.008	-.030	-.053	-.056
04	.064	.030	-.016	-.060	-.106	-.117
06	.093	.039	-.028	-.094	-.164	-.161
08	.126	.053	-.038	-.133	-.218	-.203
10	.155	.064	-.051	-.174	-.259	-.246
12	.189	.076	-.069	-.208	-.291	-.285
14	.221	.084	-.094	-.246	-.335	-.355
16	.252	.083	-.118	-.288	-.406	-.396
18	.284	.082	-.146	-.333	-.449	-.370
20	.319	.079	-.187	-.359	-.456	-.351

TABLE 1.- AERODYNAMIC CHARACTERISTICS FOR WING F
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 3.6 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN					
	.05	.20	.35	.50	.70	.90
	SECTION NORMAL-FORCE COEFFICIENT					
-20	-1.039	-1.087	-1.010	-.877	-.623	-.339
-18	-.897	-.943	-.919	-.799	-.617	-.390
-16	-.777	-.793	-.813	-.703	-.542	-.385
-14	-.656	-.675	-.681	-.617	-.468	-.324
-12	-.566	-.589	-.598	-.548	-.423	-.275
-10	-.461	-.481	-.489	-.473	-.364	-.234
-08	-.364	-.384	-.387	-.372	-.307	-.197
-06	-.274	-.284	-.290	-.279	-.240	-.158
-04	-.183	-.198	-.198	-.189	-.162	-.115
-02	-.086	-.097	-.097	-.091	-.079	-.056
00	.000	.000	.000	.000	.000	.000
02	.086	.097	.097	.091	.079	.056
04	.183	.198	.198	.189	.162	.115
06	.274	.284	.290	.279	.240	.158
08	.364	.384	.387	.372	.307	.197
10	.461	.481	.489	.473	.364	.234
12	.566	.589	.598	.548	.423	.275
14	.656	.675	.681	.617	.468	.324
16	.777	.793	.813	.703	.542	.385
18	.897	.943	.919	.799	.617	.390
20	1.039	1.087	1.010	.877	.623	.339
	SECTION PITCHING-MOMENT COEFFICIENT					
-20	-.320	-.080	.168	.353	.438	.344
-18	-.286	-.083	.149	.317	.437	.396
-16	-.258	-.087	.123	.272	.383	.393
-14	-.220	-.086	.084	.233	.327	.331
-12	-.191	-.077	.065	.201	.295	.278
-10	-.157	-.064	.048	.174	.253	.236
-08	-.125	-.052	.036	.128	.212	.198
-06	-.095	-.039	.026	.093	.164	.158
-04	-.065	-.027	.017	.062	.107	.115
-02	-.031	-.014	.008	.029	.052	.055
00	.000	.000	.000	.000	.000	.000
02	.031	.014	-.008	-.029	-.052	-.055
04	.065	.027	-.017	-.062	-.107	-.115
06	.095	.039	-.026	-.093	-.164	-.158
08	.125	.052	-.036	-.128	-.212	-.198
10	.157	.064	-.048	-.174	-.253	-.236
12	.191	.077	-.065	-.201	-.295	-.278
14	.220	.086	-.084	-.233	-.327	-.331
16	.258	.087	-.123	-.272	-.383	-.393
18	.286	.083	-.149	-.317	-.437	-.396
20	.320	.080	-.168	-.353	-.438	-.344

TABLE 1.- AERODYNAMIC CHARACTERISTICS FOR WING F
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 3.6 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN					
	.05	.20	.35	.50	.70	.90
	SECTION NORMAL-FORCE COEFFICIENT					
-20	-1.033	-1.087	-1.019	-.888	-.652	-.346
-18	-.889	-.935	-.903	-.791	-.611	-.388
-16	-.770	-.802	-.794	-.686	-.532	-.375
-14	-.653	-.678	-.684	-.611	-.463	-.323
-12	-.554	-.581	-.588	-.533	-.411	-.274
-10	-.465	-.489	-.494	-.468	-.365	-.238
-08	-.367	-.388	-.392	-.376	-.309	-.202
-06	-.272	-.286	-.295	-.283	-.241	-.163
-04	-.166	-.179	-.187	-.179	-.151	-.113
-02	-.084	-.094	-.096	-.091	-.077	-.054
00	.000	.000	.000	.000	.000	.000
02	.084	.094	.096	.091	.077	.054
04	.166	.179	.187	.179	.151	.113
06	.272	.286	.295	.283	.241	.163
08	.367	.388	.392	.376	.309	.202
10	.465	.489	.494	.468	.365	.238
12	.554	.581	.588	.533	.411	.274
14	.653	.678	.684	.611	.463	.323
16	.770	.802	.794	.686	.532	.375
18	.889	.935	.903	.791	.611	.388
20	1.033	1.087	1.019	.888	.652	.346
	SECTION PITCHING-MOMENT COEFFICIENT					
-20	-.319	-.079	.174	.356	.458	.354
-18	-.284	-.082	.143	.313	.432	.394
-16	-.254	-.086	.115	.262	.375	.382
-14	-.220	-.085	.085	.230	.323	.330
-12	-.187	-.076	.066	.194	.284	.278
-10	-.158	-.066	.050	.169	.253	.241
-08	-.125	-.052	.037	.130	.213	.204
-06	-.094	-.039	.027	.095	.164	.164
-04	-.059	-.025	.015	.058	.100	.113
-02	-.031	-.013	.009	.029	.051	.054
00	.000	.000	.000	.000	.000	.000
02	.031	.013	-.009	-.029	-.051	-.054
04	.059	.025	-.015	-.058	-.100	-.113
06	.094	.039	-.027	-.095	-.164	-.164
08	.125	.052	-.037	-.130	-.213	-.204
10	.158	.066	-.050	-.169	-.253	-.241
12	.187	.076	-.066	-.194	-.284	-.278
14	.220	.085	-.085	-.230	-.323	-.330
16	.254	.086	-.115	-.262	-.375	-.382
18	.284	.082	-.143	-.313	-.432	-.394
20	.319	.079	-.174	-.356	-.458	-.354

TABLE 1.- AERODYNAMIC CHARACTERISTICS FOR WING F
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 1.7 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN					
	.05	.20	.35	.50	.70	.90
	SECTION NORMAL-FORCE COEFFICIENT					
-20	-.849	-.835	-.728		-.466	-.301
-18	-.786	-.779	-.679	-.578	-.444	-.286
-16	-.661	-.670	-.603	-.515	-.389	-.252
-14	-.566	-.579	-.533	-.458	-.345	-.224
-12	-.487	-.502	-.481	-.414	-.311	-.202
-10	-.404	-.415	-.399	-.350	-.267	-.173
-08	-.323	-.332	-.322	-.287	-.219	-.142
-06	-.230	-.241	-.237	-.217	-.165	-.108
-04	-.162	-.172	-.163	-.152	-.115	-.076
-02	-.070	-.077	-.074	-.068	-.053	-.034
00	.000	.000	.000	.000	.000	.000
02	.070	.077	.074	.068	.053	.034
04	.162	.172	.163	.152	.115	.076
06	.230	.241	.237	.217	.165	.108
08	.323	.332	.322	.287	.219	.142
10	.404	.415	.399	.350	.267	.173
12	.487	.502	.481	.414	.311	.202
14	.566	.579	.533	.458	.345	.224
16	.661	.670	.603	.515	.389	.252
18	.786	.779	.679	.578	.444	.286
20	.849	.835	.728	.617	.466	.301
	SECTION PITCHING-MOMENT COEFFICIENT					
-20	-.279	-.071	.104		.326	.306
-18	-.260	-.070	.096	.222	.310	.291
-16	-.221	-.064	.083	.194	.270	.255
-14	-.190	-.061	.071	.171	.238	.226
-12	-.166	-.056	.064	.153	.213	.203
-10	-.138	-.050	.051	.128	.182	.174
-08	-.111	-.041	.038	.104	.149	.142
-06	-.080	-.030	.026	.078	.112	.108
-04	-.057	-.022	.018	.054	.078	.075
-02	-.026	-.010	.006	.023	.035	.033
00	.000	.000	.000	.000	.000	.000
02	.026	.010	-.006	-.023	-.035	-.033
04	.057	.022	-.018	-.054	-.078	-.075
06	.080	.030	-.026	-.078	-.112	-.108
08	.111	.041	-.038	-.104	-.149	-.142
10	.138	.050	-.051	-.128	-.182	-.174
12	.166	.056	-.064	-.153	-.213	-.203
14	.190	.061	-.071	-.171	-.238	-.226
16	.221	.064	-.083	-.194	-.270	-.255
18	.260	.070	-.096	-.222	-.310	-.291
20	.279	.071	-.104	-.237	-.326	-.306

TABLE 1.- AERODYNAMIC CHARACTERISTICS FOR WING F
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 1.7 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN					
	.05	.20	.35	.50	.70	.90
	SECTION NORMAL-FORCE COEFFICIENT					
-20						
-18	-.727	-.727	-.648	-.554	-.414	-.266
-16	-.640	-.646	-.586	-.502	-.380	-.245
-14	-.543	-.548	-.515	-.445	-.337	-.218
-12	-.462	-.470	-.448	-.391	-.297	-.193
-10	-.389	-.398	-.376	-.334	-.260	-.169
-08	-.302	-.312	-.297	-.272	-.213	-.138
-06	-.245	-.252	-.242	-.224	-.178	-.117
-04	-.135	-.145	-.138	-.131	-.108	-.073
-02						
00	.000	.000	.000	.000	.000	.000
02						
04	.135	.145	.138	.131	.108	.073
06	.245	.252	.242	.224	.178	.117
08	.302	.312	.297	.272	.213	.138
10	.389	.398	.376	.334	.260	.169
12	.462	.470	.448	.391	.297	.193
14	.543	.548	.515	.445	.337	.218
16	.640	.646	.586	.502	.380	.245
18	.727	.727	.648	.554	.414	.266
20						
	SECTION PITCHING-MOMENT COEFFICIENT					
-20						
-18	-.241	-.068	.090	.210	.288	.270
-16	-.214	-.066	.079	.188	.263	.248
-14	-.184	-.062	.068	.165	.232	.221
-12	-.157	-.057	.058	.144	.203	.194
-10	-.133	-.049	.044	.123	.177	.170
-08	-.104	-.040	.032	.099	.145	.138
-06	-.086	-.033	.025	.080	.121	.117
-04	-.051	-.021	.012	.045	.073	.073
-02						
00	.000	.000	.000	.000	.000	.000
02						
04	.051	.021	-.012	-.045	-.073	-.073
06	.086	.033	-.025	-.080	-.121	-.117
08	.104	.040	-.032	-.099	-.145	-.138
10	.133	.049	-.044	-.123	-.177	-.170
12	.157	.057	-.058	-.144	-.203	-.194
14	.184	.062	-.068	-.165	-.232	-.221
16	.214	.066	-.079	-.188	-.263	-.248
18	.241	.068	-.090	-.210	-.288	-.270
20						

TABLE 1.- AERODYNAMIC CHARACTERISTICS FOR WING F
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 3.1 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN					
	.05	.20	.35	.50	.70	.90
	SECTION NORMAL-FORCE COEFFICIENT					
-20	-.828	-.817	-.732	-.615	-.465	-.302
-18	-.748	-.744	-.666	-.564	-.433	-.282
-16	-.665	-.664	-.614	-.523	-.395	-.254
-14	-.568	-.572	-.545	-.466	-.352	-.226
-12	-.475	-.485	-.480	-.412	-.309	-.202
-10	-.389	-.401	-.389	-.345	-.266	-.173
-08	-.307	-.320	-.313	-.284	-.222	-.143
-06	-.229	-.240	-.226	-.213	-.173	-.112
-04	-.139	-.151	-.152	-.142	-.111	-.074
-02	-.077	-.079	-.076	-.071	-.063	-.042
00	.000	.000	.000	.000	.000	.000
02	.077	.079	.076	.071	.063	.042
04	.139	.151	.152	.142	.111	.074
06	.229	.240	.226	.213	.173	.112
08	.307	.320	.313	.284	.222	.143
10	.389	.401	.389	.345	.266	.173
12	.475	.485	.480	.412	.309	.202
14	.568	.572	.545	.466	.352	.226
16	.665	.664	.614	.523	.395	.254
18	.748	.744	.666	.564	.433	.282
20	.828	.817	.732	.615	.465	.302
	SECTION PITCHING-MOMENT COEFFICIENT					
-20	-.276	-.078	.101	.231	.323	.307
-18	-.250	-.075	.089	.210	.300	.286
-16	-.224	-.070	.084	.197	.274	.257
-14	-.193	-.066	.074	.174	.243	.227
-12	-.162	-.060	.064	.153	.212	.203
-10	-.134	-.051	.047	.127	.182	.174
-08	-.107	-.042	.035	.104	.152	.143
-06	-.081	-.032	.023	.078	.118	.112
-04	-.051	-.020	.015	.049	.075	.074
-02	-.029	-.010	.007	.024	.043	.042
00	.000	.000	.000	.000	.000	.000
02	.029	.010	-.007	-.024	-.043	-.042
04	.051	.020	-.015	-.049	-.075	-.074
06	.081	.032	-.023	-.078	-.118	-.112
08	.107	.042	-.035	-.104	-.152	-.143
10	.134	.051	-.047	-.127	-.182	-.174
12	.162	.060	-.064	-.153	-.212	-.203
14	.193	.066	-.074	-.174	-.243	-.227
16	.224	.070	-.084	-.197	-.274	-.257
18	.250	.075	-.089	-.210	-.300	-.286
20	.276	.078	-.101	-.231	-.323	-.307

TABLE I.- AERODYNAMIC CHARACTERISTICS FOR WING F
CONCLUDED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 3.1 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN					
	.05	.20	.35	.50	.70	.90
	SECTION NORMAL-FORCE COEFFICIENT					
-20	-.830	-.814	-.732	-.615	-.463	-.301
-18	-.741	-.742	-.668	-.564	-.427	-.279
-16	-.648	-.661	-.604	-.519	-.392	-.254
-14	-.558	-.567	-.538	-.464	-.349	-.226
-12	-.475	-.485	-.464	-.406	-.309	-.200
-10	-.394	-.407	-.396	-.351	-.265	-.174
-08	-.310	-.321	-.312	-.282	-.216	-.143
-06	-.232	-.240	-.232	-.213	-.166	-.109
-04	-.151	-.159	-.156	-.143	-.114	-.076
-02	-.074	-.078	-.073	-.069	-.056	-.038
00	.000	.000	.000	.000	.000	.000
02	.074	.078	.073	.069	.056	.038
04	.151	.159	.156	.143	.114	.076
06	.232	.240	.232	.213	.166	.109
08	.310	.321	.312	.282	.216	.143
10	.394	.407	.396	.351	.265	.174
12	.475	.485	.464	.406	.309	.200
14	.558	.567	.538	.464	.349	.226
16	.648	.661	.604	.519	.392	.254
18	.741	.742	.668	.564	.427	.279
20	.830	.814	.732	.615	.463	.301
	SECTION PITCHING-MOMENT COEFFICIENT					
-20	-.276	-.075	.101	.231	.322	.306
-18	-.248	-.073	.090	.210	.297	.283
-16	-.217	-.068	.083	.196	.272	.257
-14	-.189	-.064	.072	.174	.241	.228
-12	-.162	-.058	.059	.151	.213	.202
-10	-.135	-.050	.048	.130	.182	.175
-08	-.108	-.041	.035	.103	.147	.144
-06	-.081	-.031	.026	.076	.112	.110
-04	-.054	-.020	.016	.050	.077	.076
-02	-.028	-.010	.007	.024	.038	.038
00	.000	.000	.000	.000	.000	.000
02	.028	.010	-.007	-.024	-.038	-.038
04	.054	.020	-.016	-.050	-.077	-.076
06	.081	.031	-.026	-.076	-.112	-.110
08	.108	.041	-.035	-.103	-.147	-.144
10	.135	.050	-.048	-.130	-.182	-.175
12	.162	.058	-.059	-.151	-.213	-.202
14	.189	.064	-.072	-.174	-.241	-.228
16	.217	.068	-.083	-.196	-.272	-.257
18	.248	.073	-.090	-.210	-.297	-.283
20	.276	.075	-.101	-.231	-.322	-.306

TABLE 2.- AERODYNAMIC CHARACTERISTICS FOR WING 1

MACH NUMBER = 1.61 REYNOLDS NUMBER = 1.9 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.118	-1.176	-1.088	-.928	-.648	-.466	-.294
-18	-.958	-1.016	-.978	-.874	-.635	-.465	-.291
-16	-.831		-.860	-.780	-.601	-.456	-.290
-14	-.713	-.750	-.755	-.688	-.544	-.445	-.305
-12	-.602	-.625	-.650	-.608	-.488	-.399	-.296
-10	-.503	-.527	-.557	-.546	-.440	-.361	-.266
-08	-.404	-.433	-.464	-.460	-.394	-.324	-.237
-06	-.301	-.327	-.365	-.363	-.336	-.284	-.213
-04	-.205	-.227	-.271	-.270	-.268	-.238	-.182
-02	-.111	-.128	-.169	-.176	-.187	-.183	-.146
00	-.018	-.032	-.068	-.081	-.103	-.112	-.108
02	.054	.045	.016	.000	-.031	-.052	-.057
04	.151	.142	.115	.099	.049	.019	-.008
06	.241	.236	.214	.189	.127	.085	.036
08	.343	.344	.320	.294	.210	.148	.078
10	.427	.431	.401	.379	.267	.194	.112
12	.531	.539	.509	.473	.331	.243	.152
14	.634	.643	.612	.559	.399	.310	.217
16	.739	.766	.725	.647	.487	.396	.271
18	.854	.900	.845	.762	.564	.456	.294
20	.994	1.039	.965	.851	.625	.479	.296
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.317	-.065	.194	.375	.459	.421	.321
-18	-.284	-.079	.171	.357	.449	.419	.318
-16	-.260		.134	.312	.432	.413	.317
-14	-.230	-.079	.102	.263	.387	.406	.334
-12	-.193	-.070	.075	.225	.343	.360	.325
-10	-.161	-.062	.059	.201	.306	.324	.291
-08	-.128	-.053	.047	.162	.273	.289	.258
-06	-.096	-.040	.035	.122	.231	.253	.231
-04	-.064	-.027	.026	.089	.182	.210	.197
-02	-.034	-.016	.016	.056	.123	.160	.157
00	-.002	-.004	.004	.024	.068	.097	.115
02	.024	.010	-.001	-.002	.019	.045	.060
04	.058	.027	-.009	-.036	-.032	-.016	.009
06	.088	.038	-.020	-.065	-.084	-.073	-.038
08	.122	.051	-.031	-.103	-.142	-.129	-.083
10	.150	.061	-.040	-.138	-.181	-.171	-.120
12	.183	.072	-.054	-.177	-.226	-.214	-.164
14	.217	.079	-.077	-.215	-.277	-.278	-.237
16	.246	.081	-.109	-.256	-.347	-.360	-.296
18	.270	.080	-.139	-.311	-.400	-.410	-.321
20	.302	.078	-.170	-.343	-.439	-.429	-.323

TABLE 2.- AERODYNAMIC CHARACTERISTICS FOR WING 1
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 1.9 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.124	-1.179	-1.089	-.932	-.648	-.487	-.291
-18	-.951	-.989	-.970	-.870	-.630	-.359	-.285
-16	-.838	-.867	-.869	-.788	-.602	-.358	-.296
-14	-.714	-.745	-.743	-.692	-.534	-.352	-.313
-12	-.607	-.629	-.648	-.610	-.479	-.296	-.298
-10	-.512	-.533	-.560	-.552	-.441	-.260	-.268
-08	-.411	-.433	-.462	-.464	-.399	-.226	-.245
-06	-.311	-.336	-.365	-.365	-.341	-.186	-.217
-04	-.213	-.234	-.263	-.278	-.271	-.145	-.191
-02	-.116	-.138	-.164	-.178	-.189	-.085	-.153
00	-.027	-.045	-.073	-.088	-.109	-.121	-.112
02	.058	.049	.023	.003	-.029	-.050	-.057
04	.155	.151	.121	.103	.055	.020	-.005
06	.247	.248	.215	.196	.136	.090	.039
08	.346	.347	.318	.294	.222	.151	.083
10	.435	.438	.407	.380	.285	.201	.118
12	.539	.540	.507	.476	.348	.252	.157
14	.635	.637	.611	.562	.408	.316	.221
16	.751	.752	.735	.656	.493	.406	.279
18	.873	.879	.858	.772	.573	.463	.302
20	1.031	1.060	.986	.864	.649	.544	.274
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.319	-.065	.192	.377	.459	.402	.318
-18	-.283	-.072	.167	.355	.448	.348	.312
-16	-.261	-.075	.137	.316	.432	.348	.324
-14	-.231	-.078	.098	.267	.377	.346	.343
-12	-.194	-.075	.075	.226	.335	.291	.327
-10	-.164	-.067	.060	.204	.307	.257	.293
-08	-.131	-.053	.045	.163	.277	.225	.267
-06	-.099	-.041	.034	.123	.235	.188	.236
-04	-.066	-.028	.023	.091	.183	.151	.206
-02	-.035	-.015	.014	.057	.124	.096	.164
00	-.005	-.002	.006	.028	.072	.105	.119
02	.026	.011	-.002	-.002	.019	.044	.060
04	.059	.025	-.011	-.036	-.036	-.016	.005
06	.089	.037	-.020	-.067	-.089	-.078	-.042
08	.123	.049	-.030	-.102	-.151	-.132	-.088
10	.152	.061	-.039	-.136	-.195	-.177	-.127
12	.186	.071	-.053	-.177	-.240	-.223	-.170
14	.216	.079	-.073	-.216	-.283	-.283	-.241
16	.248	.078	-.106	-.260	-.350	-.368	-.304
18	.273	.073	-.142	-.314	-.406	-.416	-.329
20	.311	.067	-.168	-.345	-.456	-.470	-.299

TABLE 2.- AERODYNAMIC CHARACTERISTICS FOR WING 1
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 3.6 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.083	-1.146	-1.067	-.901	-.631	-.446	-.282
-18	-.943	-.990	-.958	-.830	-.602	-.451	-.286
-16	-.822	-.858	-.859	-.755	-.564	-.431	-.291
-14	-.696	-.722	-.738	-.667	-.510	-.427	-.305
-12	-.603	-.619	-.644	-.598	-.465	-.380	-.282
-10	-.497	-.523	-.546	-.528	-.425	-.356	-.261
-08	-.399	-.423	-.452	-.448	-.387	-.324	-.239
-06	-.305	-.331	-.358	-.356	-.333	-.285	-.214
-04	-.206	-.225	-.262	-.259	-.255	-.236	-.183
-02	-.115	-.128	-.165	-.169	-.176	-.181	-.146
00	-.026	-.040	-.069	-.080	-.102	-.114	-.105
02	.060	.054	.027	.011	-.021	-.047	-.053
04	.143	.144	.120	.102	.051	.017	-.006
06	.237	.240	.217	.196	.133	.089	.036
08	.322	.327	.305	.281	.207	.140	.073
10	.419	.426	.400	.376	.272	.191	.110
12	.520	.525	.499	.473	.332	.238	.145
14	.620	.626	.603	.542	.395	.289	.190
16	.725	.734	.714	.626	.460	.376	.255
18	.839	.862	.820	.721	.545	.430	.290
20	.984	1.025	.953	.834	.612	.472	.293
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.318	-.080	.189	.365	.446	.403	.309
-18	-.286	-.086	.153	.337	.430	.407	.313
-16	-.263	-.083	.127	.297	.404	.393	.318
-14	-.226	-.084	.094	.250	.357	.386	.335
-12	-.195	-.076	.073	.218	.323	.340	.308
-10	-.160	-.066	.056	.189	.294	.319	.285
-08	-.127	-.054	.043	.155	.269	.290	.260
-06	-.097	-.042	.033	.118	.230	.254	.232
-04	-.065	-.028	.024	.084	.171	.210	.198
-02	-.034	-.015	.015	.054	.115	.160	.157
00	-.004	-.002	.005	.025	.067	.099	.112
02	.027	.010	-.003	-.006	.014	.041	.056
04	.056	.024	-.010	-.036	-.033	-.013	.006
06	.087	.038	-.019	-.068	-.088	-.077	-.039
08	.117	.049	-.028	-.097	-.140	-.122	-.077
10	.149	.061	-.038	-.134	-.186	-.167	-.118
12	.182	.074	-.051	-.177	-.228	-.209	-.156
14	.216	.083	-.069	-.202	-.274	-.256	-.207
16	.249	.087	-.099	-.241	-.322	-.342	-.279
18	.274	.082	-.126	-.285	-.386	-.385	-.316
20	.307	.079	-.161	-.335	-.430	-.423	-.319

TABLE 2.- AERODYNAMIC CHARACTERISTICS FOR WING 1
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 3.6 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.106	-1.165	-1.071	-.906	-.641	-.454	-.288
-18	-.949	-.989	-.956	-.827	-.601	-.453	-.285
-16	-.823	-.852	-.859	-.756	-.557	-.430	-.289
-14	-.707	-.730	-.764	-.678	-.506	-.420	-.298
-12	-.605	-.632	-.653	-.610	-.471	-.387	-.282
-10	-.502	-.534	-.556		-.428	-.359	-.267
-08	-.405	-.431	-.458	-.451	-.392	-.329	-.245
-06	-.313	-.334	-.364	-.361	-.339	-.291	-.220
-04	-.212	-.231	-.261	-.263	-.257	-.241	-.186
-02	-.116	-.130	-.160	-.166	-.174	-.180	-.150
00	-.024	-.038	-.066	-.075	-.097	-.111	-.104
02	.049	.049	.017	.006	-.024	-.051	-.057
04	.142	.147	.114	.102	.051	.018	-.006
06	.236	.242	.217	.195	.132	.087	.035
08	.326	.332	.307	.285	.209	.143	.073
10	.428	.441	.410	.384	.277	.197	.113
12	.522	.541	.507	.467	.333	.245	.148
14	.625	.643	.617	.547	.398	.298	.195
16	.712	.729	.707	.623	.458	.370	.254
18	.844	.879	.822	.722	.545	.428	.259
20	.966	.969	.939	.827	.607	.467	.297
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.323	-.079	.189	.368	.454	.410	.316
-18	-.288	-.084	.154	.336	.430	.409	.312
-16	-.263	-.089	.128	.298	.401	.392	.317
-14	-.228	-.090	.102	.255	.355	.380	.327
-12	-.195	-.079	.073	.224	.327	.346	.308
-10	-.161	-.068	.058		.296	.321	.291
-08	-.129	-.054	.044	.156	.272	.294	.267
-06	-.100	-.041	.034	.121	.234	.260	.238
-04	-.067	-.027	.024	.085	.172	.214	.201
-02	-.034	-.015	.015	.053	.115	.158	.161
00	-.004	-.001	.005	.023	.064	.097	.110
02	.023	.010	-.001	-.004	.015	.045	.060
04	.055	.024	-.010	-.037	-.033	-.014	.007
06	.086	.038	-.020	-.067	-.087	-.075	-.038
08	.117	.050	-.028	-.099	-.143	-.125	-.078
10	.152	.065	-.039	-.138	-.190	-.173	-.121
12	.183	.076	-.053	-.170	-.229	-.216	-.160
14	.215	.085	-.074	-.205	-.277	-.265	-.213
16	.241	.090	-.097	-.240	-.321	-.336	-.277
18	.273	.079	-.127	-.284	-.385	-.382	-.278
20	.302	.072	-.156	-.333	-.427	-.416	-.323

TABLE 2.- AERODYNAMIC CHARACTERISTICS FOR WING 1
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 1.7 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-.870	-.864	-.783	-.664	-.478	-.399	-.291
-18	-.779	-.782	-.726	-.620	-.449	-.378	-.280
-16	-.688	-.693	-.669	-.574	-.418	-.356	-.265
-14	-.600	-.612	-.609	-.526	-.385	-.331	-.248
-12	-.509	-.521	-.530	-.471	-.351	-.303	
-10	-.409	-.429	-.452	-.408	-.310	-.271	-.206
-08	-.328	-.346	-.384	-.351	-.275	-.242	-.185
-06	-.247	-.264	-.295	-.282	-.233	-.211	-.162
-04	-.166	-.185	-.220	-.214	-.186	-.177	-.139
-02	-.086	-.097	-.138	-.133	-.130	-.131	-.101
00	-.021	-.032	-.057	-.074	-.086	-.091	-.082
02	.049	.041	.021	-.010	-.028	-.043	-.049
04	.127	.126	.102	.070	.032	.006	-.012
06	.195	.194	.175	.139	.084	.049	.016
08	.280	.281	.260	.214	.142	.095	.049
10	.357	.354	.329	.275	.191	.134	.079
12	.445	.441	.407	.337	.237	.171	.110
14	.529	.527	.473	.402	.287	.196	.141
16	.611	.602	.537	.455	.320	.223	.164
18	.704	.689	.609	.511	.355	.253	.187
20	.784	.760	.663	.555	.387	.278	.206
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.284	-.076	.115	.253	.338	.363	.321
-18	-.255	-.074	.104	.234	.316	.344	.308
-16	-.226	-.072	.094	.215	.292	.323	.291
-14	-.198	-.068	.084	.195	.268	.300	.272
-12	-.169	-.062	.071	.173	.244	.273	
-10	-.135	-.051	.058	.149	.213	.243	.225
-08	-.109	-.042	.047	.126	.189	.217	.201
-06	-.080	-.032	.033	.100	.158	.188	.175
-04	-.053	-.023	.022	.073	.126	.158	.149
-02	-.027	-.013	.012	.043	.087	.116	.109
00	-.004	-.004	.004	.024	.058	.080	.087
02	.021	.005	-.004	.004	.019	.037	.052
04	.049	.018	-.013	-.025	-.022	-.006	.013
06	.073	.027	-.021	-.051	-.057	-.043	-.017
08	.102	.036	-.031	-.078	-.096	-.083	-.053
10	.128	.047	-.041	-.099	-.129	-.117	-.085
12	.157	.057	-.052	-.121	-.160	-.150	-.118
14	.186	.064	-.060	-.148	-.195	-.170	-.152
16	.210	.068	-.070	-.168	-.219	-.194	-.178
18	.239	.072	-.082	-.190	-.244	-.222	-.203
20	.264	.074	-.091	-.207	-.266	-.245	-.224

TABLE 2.- AERODYNAMIC CHARACTERISTICS FOR WING 1
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 1.7 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20							
-18	-.758	-.772	-.717	-.611	-.453	-.373	-.281
-16	-.671	-.679	-.652	-.565	-.421	-.350	-.264
-14	-.589	-.601	-.590	-.519	-.390	-.326	-.249
-12	-.507	-.521	-.533	-.471	-.356	-.298	-.230
-10	-.409	-.426	-.463	-.404	-.317	-.270	-.210
-08	-.332	-.349	-.384	-.351	-.286	-.243	-.190
-06	-.255	-.274	-.306	-.291	-.244	-.213	-.169
-04	-.173	-.187	-.224	-.214	-.196	-.175	-.142
-02							
00	-.021	-.032	-.063	-.071	-.080	-.100	-.081
02							
04	.127	.122	.100	.062	.038	-.001	-.010
06	.204	.200	.177	.145	.095	.046	.022
08	.278	.284	.252	.217	.146	.089	.053
10	.360	.368	.336	.289	.202	.133	.086
12	.441	.446	.405	.344	.244	.168	.113
14	.535	.530	.478	.403	.284	.207	.138
16	.617	.618	.540	.459	.321	.240	.163
18	.697	.688	.603	.506	.353	.268	.182
20							
	SECTION PITCHING-MOMENT COEFFICIENT						
-20							
-18	-.251	-.073	.103	.230	.319	.337	.308
-16	-.220	-.072	.091	.211	.296	.316	.290
-14	-.194	-.067	.081	.193	.272	.293	.272
-12	-.168	-.062	.072	.173	.247	.267	.251
-10	-.135	-.051	.059	.147	.218	.241	.228
-08	-.109	-.043	.045	.127	.196	.216	.207
-06	-.085	-.033	.033	.104	.165	.188	.183
-04	-.056	-.025	.023	.072	.133	.154	.154
-02							
00	-.004	-.002	.005	.022	.053	.090	.087
02							
04	.050	.018	-.013	-.020	-.026	.002	.010
06	.076	.030	-.021	-.052	-.064	-.038	-.023
08	.101	.039	-.029	-.081	-.099	-.076	-.057
10	.129	.050	-.041	-.107	-.138	-.114	-.092
12	.155	.056	-.051	-.127	-.167	-.146	-.122
14	.185	.065	-.062	-.148	-.194	-.181	-.149
16	.212	.069	-.070	-.169	-.219	-.211	-.176
18	.236	.072	-.081	-.187	-.243	-.237	-.198
20							

TABLE 2.- AERODYNAMIC CHARACTERISTICS FOR WING 1
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 3.1 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20					-.476	-.383	-.283
-18	-.758	-.770	-.716	-.612	-.446	-.367	-.274
-16	-.681	-.688	-.664	-.568	-.419	-.348	-.265
-14	-.590	-.599	-.598	-.519	-.384	-.322	-.249
-12	-.489	-.507	-.522	-.466	-.346	-.292	-.229
-10	-.416	-.437	-.458	-.415	-.317	-.268	-.211
-08	-.331	-.352	-.375	-.353	-.276	-.236	-.189
-06	-.291	-.312	-.332	-.319	-.255	-.223	-.178
-04	-.166	-.187	-.208	-.212	-.187	-.170	-.141
-02	-.095	-.116	-.136	-.143	-.140	-.132	-.114
00	-.022	-.030	-.059	-.071	-.084	-.088	-.084
02	.049	.042	.017	-.003	-.026	-.043	-.049
04	.120	.122	.093	.070	.032	.004	-.014
06	.199	.203	.179	.146	.089	.049	.016
08	.277	.279	.247	.215	.140	.091	.047
10	.362	.362	.333	.286	.195	.133	.076
12	.438	.441	.410	.349	.243	.170	.107
14	.517	.513	.472	.409	.281	.192	.130
16	.618	.620	.546	.470	.333	.237	.159
18	.705	.709	.614	.519	.366	.272	.188
20	.789	.779	.671	.570	.404	.294	.203
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.200	-.041	.060	.287	.337	.346	.311
-18	-.248	-.076	.100	.230	.315	.332	.300
-16	-.224	-.074	.092	.212	.295	.314	.291
-14	-.193	-.070	.082	.192	.270	.289	.273
-12	-.161	-.062	.070	.172	.241	.262	.251
-10	-.137	-.054	.058	.152	.220	.239	.230
-08	-.109	-.045	.042	.128	.189	.210	.205
-06	-.094	-.040	.036	.114	.174	.198	.193
-04	-.053	-.023	.020	.073	.127	.150	.152
-02	-.029	-.014	.012	.047	.095	.116	.123
00	-.004	-.002	.004	.023	.056	.077	.090
02	.021	.008	-.003	.000	.017	.038	.053
04	.047	.019	-.011	-.025	-.022	-.003	.015
06	.074	.029	-.021	-.053	-.060	-.042	-.018
08	.101	.039	-.029	-.080	-.094	-.080	-.051
10	.131	.049	-.040	-.106	-.133	-.116	-.082
12	.155	.058	-.053	-.129	-.166	-.148	-.115
14	.182	.065	-.062	-.155	-.192	-.167	-.140
16	.215	.071	-.071	-.174	-.229	-.209	-.172
18	.242	.074	-.082	-.191	-.253	-.240	-.204
20	.267	.078	-.091	-.213	-.280	-.260	-.221

TABLE 2.- AERODYNAMIC CHARACTERISTICS FOR WING 1
CONCLUDED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 3.1 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-.869	-.879	-.792	-.676	-.559	-.391	-.282
-18	-.771	-.792	-.745	-.628	-.466	-.373	-.269
-16	-.675	-.686	-.671	-.575	-.437	-.356	-.261
-14	-.587	-.602	-.605	-.527	-.408	-.335	-.248
-12	-.500	-.518	-.538	-.476	-.374	-.312	-.234
-10	-.410	-.431	-.450	-.416	-.334	-.279	
-08	-.331	-.355	-.375	-.354	-.294	-.249	-.192
-06	-.241	-.268	-.290	-.278	-.244	-.214	-.168
-04	-.172	-.190	-.222	-.212	-.197	-.179	-.145
-02	-.095	-.116	-.139	-.140	-.143	-.139	-.118
00	-.023	-.035	-.063	-.072	-.086	-.095	-.086
02	.048	.042	.012	.010	-.026	-.046	-.051
04	.125	.124	.092	.074	.032	.004	-.015
06	.196	.199	.173	.144	.084	.046	.014
08	.274	.278	.249	.215	.139	.091	.045
10	.351	.352	.324	.278	.186	.132	.074
12	.438	.440	.402	.346	.239	.174	.107
14	.524	.517	.479	.405	.283	.210	.133
16	.601	.594	.544	.459	.327	.243	.157
18	.688	.677	.609	.514	.370	.277	.184
20	.778	.762	.671	.561	.405	.305	.204
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.284	-.079	.114	.258	.389	.353	.311
-18	-.253	-.074	.105	.236	.328	.336	.295
-16	-.222	-.076	.092	.213	.307	.320	.287
-14	-.193	-.069	.082	.195	.285	.301	.271
-12	-.165	-.062	.071	.176	.261	.280	.256
-10	-.136	-.053	.053	.153	.231	.249	
-08	-.109	-.044	.042	.128	.202	.222	.208
-06	-.078	-.032	.031	.098	.167	.190	.182
-04	-.055	-.023	.023	.072	.135	.158	.157
-02	-.029	-.012	.013	.046	.097	.123	.128
00	-.005	-.003	.004	.022	.058	.084	.093
02	.021	.007	-.003	-.010	.017	.041	.055
04	.048	.020	-.011	-.027	-.022	-.003	.016
06	.073	.029	-.021	-.053	-.057	-.040	-.015
08	.100	.039	-.029	-.080	-.094	-.079	-.048
10	.127	.049	-.039	-.103	-.126	-.115	-.079
12	.155	.059	-.050	-.129	-.163	-.152	-.115
14	.185	.066	-.063	-.151	-.193	-.184	-.144
16	.209	.070	-.074	-.172	-.225	-.214	-.170
18	.236	.077	-.082	-.192	-.255	-.245	-.200
20	.265	.078	-.092	-.209	-.281	-.271	-.221

TABLE 3.- AERODYNAMIC CHARACTERISTICS FOR WING 2

MACH NUMBER = 1.61 REYNOLDS NUMBER = 1.9 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.063	-1.152	-1.140	-.902	-.659	-.473	-.281
-18	-.945	-1.015	-1.024	-.836	-.637	-.470	-.279
-16	-.819	-.868	-.921	-.745	-.603	-.462	-.289
-14	-.706	-.747	-.819	-.668	-.532	-.441	-.301
-12	-.604	-.642	-.718	-.601	-.485	-.390	-.276
-10	-.505	-.544	-.605	-.536	-.448	-.366	-.255
-08	-.393	-.430	-.485	-.432	-.395	-.332	-.241
-06	-.306	-.334	-.381	-.344	-.338	-.295	-.220
-04	-.204	-.227	-.263	-.242	-.252	-.253	-.187
-02	-.111	-.129	-.157	-.149	-.164	-.172	-.149
00	-.019	-.026	-.060	-.052	-.081	-.098	-.100
02	.063	.064	.057	.033	-.003	-.031	-.045
04	.164	.167	.154	.134	.081	.041	.005
06	.259	.268	.286	.227	.168	.110	.049
08	.347	.367	.390	.320	.236	.164	.088
10	.444	.463	.458	.410	.297	.213	.125
12	.551	.577	.597	.495	.354	.261	.163
14	.647	.672	.720	.574	.413	.323	.223
16	.759	.786	.814	.657	.485	.399	.271
18	.885	.921	.919	.760	.573	.446	.280
20	1.025	1.066	1.060	.856	.631	.457	.259
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.309	-.067	.168	.369	.468	.427	.307
-18	-.286	-.075	.149	.346	.455	.424	.306
-16	-.259	-.079	.121	.300	.434	.419	.317
-14	-.226	-.083	.095	.259	.378	.403	.330
-12	-.194	-.077	.074	.224	.340	.352	.303
-10	-.161	-.068	.056	.197	.311	.329	.279
-08	-.125	-.054	.041	.151	.274	.296	.262
-06	-.097	-.042	.031	.116	.233	.262	.239
-04	-.065	-.028	.021	.079	.170	.225	.201
-02	-.035	-.013	.014	.048	.109	.150	.160
00	-.003	.000	.011	.016	.054	.084	.106
02	.023	.011	-.001	-.013	.002	.027	.047
04	.056	.025	-.011	-.048	-.053	-.035	-.006
06	.086	.038	-.017	-.081	-.112	-.096	-.053
08	.115	.051	-.025	-.116	-.161	-.144	-.094
10	.146	.064	-.047	-.155	-.202	-.188	-.135
12	.179	.077	-.050	-.189	-.243	-.231	-.176
14	.209	.085	-.093	-.224	-.286	-.290	-.244
16	.241	.088	-.097	-.262	-.340	-.361	-.295
18	.271	.083	-.122	-.310	-.404	-.400	-.305
20	.302	.079	-.160	-.349	-.441	-.409	-.283

TABLE 3.- AERODYNAMIC CHARACTERISTICS FOR WING 2

CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 1.9 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.069	-1.155	-1.142	-.905	-.661	-.477	-.283
-18	-.932	-1.008	-1.032	-.837	-.644	-.468	-.282
-16	-.810	-.872	-.920	-.742	-.607	-.466	-.297
-14	-.681	-.723	-.804	-.665	-.532	-.447	-.311
-12	-.585	-.619	-.696	-.606	-.495	-.403	-.288
-10	-.487	-.520	-.583	-.528	-.450	-.372	-.262
-08				-.426	-.398	-.337	-.246
-06	-.279	-.315	-.367	-.335	-.331	-.291	-.218
-04	-.189	-.208	-.256	-.234	-.244	-.239	-.185
-02	-.100	-.112	-.146	-.139	-.162	-.167	-.147
00	-.001	-.016	-.037	-.048	-.078	-.098	-.096
02	.085	.076	.077	.049	.004	-.026	-.038
04	.184	.175	.182	.139	.083	.050	.009
06	.263	.275	.290	.232	.169	.114	.052
08	.368	.376	.407	.327	.253	.171	.094
10	.463	.481	.502	.417	.313	.224	.132
12	.562	.582	.599	.503	.355	.268	.152
14	.661	.677	.711	.576	.412	.333	.230
16	.772	.796	.855	.668	.514	.406	.285
18	.893	.937	.935	.770	.581	.448	.273
20	1.044	1.092	1.083	.863	.646	.457	.254
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.311	-.065	.166	.371	.469	.431	.310
-18	-.282	-.076	.151	.347	.460	.422	.309
-16	-.256	-.082	.120	.298	.437	.423	.325
-14	-.218	-.087	.090	.258	.377	.408	.341
-12	-.187	-.075	.067	.231	.347	.364	.316
-10	-.155	-.065	.050	.195	.314	.334	.286
-08				.149	.276	.301	.267
-06	-.089	-.038	.028	.115	.227	.259	.236
-04	-.060	-.023	.020	.078	.163	.212	.199
-02	-.031	-.013	.012	.045	.107	.145	.157
00	.000	-.001	.002	.015	.052	.085	.101
02	.030	.012	-.004	-.019	-.003	.023	.040
04	.062	.026	-.012	-.049	-.054	-.043	-.010
06	.087	.038	-.019	-.082	-.114	-.100	-.056
08	.121	.052	-.028	-.117	-.174	-.151	-.102
10	.151	.062	-.037	-.154	-.216	-.199	-.143
12	.182	.075	-.049	-.192	-.244	-.238	-.167
14	.213	.085	-.069	-.224	-.283	-.300	-.251
16	.243	.087	-.106	-.266	-.363	-.366	-.310
18	.272	.082	-.125	-.313	-.409	-.402	-.296
20	.308	.077	-.165	-.350	-.452	-.409	-.278

TABLE 3.- AERODYNAMIC CHARACTERISTICS FOR WING 2
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 3.6 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.041	-1.091	-1.112	-.758	-.651	-.467	-.281
-18	-.907	-.954	-1.000	-.808	-.621	-.463	-.286
-16	-.796	-.838	-.908	-.720	-.578	-.464	-.300
-14	-.681	-.721	-.794	-.651	-.514	-.419	-.298
-12	-.577	-.613	-.683	-.584	-.478	-.391	-.278
-10	-.478	-.513	-.571	-.508	-.434	-.361	-.262
-08	-.376	-.406	-.454	-.411	-.379	-.321	-.238
-06	-.286	-.317	-.353	-.322	-.322	-.281	-.212
-04	-.184	-.208	-.242	-.225	-.231	-.227	-.177
-02	-.099	-.118	-.143	-.139	-.156	-.160	-.143
00	.008	.000	-.023	-.027	-.061	-.081	-.083
02	.086	.092	.079	.056	.010	-.017	-.036
04	.181	.187	.168	.146	.091	.051	.013
06	.272	.279	.287	.233	.173	.114	.052
08	.362	.381	.392	.325	.246	.169	.092
10	.467	.478	.508	.428	.306	.216	.129
12	.567	.586	.613	.509	.366	.263	.164
14	.659	.675	.707	.573	.420	.307	.204
16	.759	.783	.822	.646	.469	.381	.266
18	.880	.912	.925	.735	.553	.431	.286
20	1.027	1.067	1.042	.838	.626	.456	.257
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.308	-.079	.163	.276	.462	.422	.307
-18	-.280	-.086	.136	.331	.446	.419	.314
-16	-.254	-.091	.115	.282	.413	.423	.329
-14	-.220	-.091	.087	.247	.360	.378	.327
-12	-.187	-.080	.064	.215	.333	.352	.304
-10	-.154	-.067	.048	.184	.302	.323	.286
-08	-.120	-.053	.034	.142	.262	.287	.259
-06	-.091	-.041	.026	.108	.222	.250	.230
-04	-.059	-.026	.017	.074	.153	.201	.190
-02	-.031	-.014	.011	.045	.103	.138	.153
00	.003	.002	.002	.007	.040	.070	.087
02	.030	.012	-.005	-.021	-.006	.015	.037
04	.061	.025	-.013	-.052	-.059	-.044	-.014
06	.089	.038	-.017	-.083	-.117	-.101	-.055
08	.119	.053	-.025	-.116	-.169	-.149	-.099
10	.152	.063	-.037	-.161	-.211	-.191	-.139
12	.186	.077	-.050	-.196	-.253	-.233	-.178
14	.214	.087	-.065	-.221	-.293	-.274	-.222
16	.245	.093	-.092	-.254	-.327	-.345	-.290
18	.273	.093	-.119	-.294	-.390	-.385	-.309
20	.309	.081	-.148	-.339	-.439	-.409	-.281

TABLE 3.- AERODYNAMIC CHARACTERISTICS FOR WING 2
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 3.6 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.050	-1.106	-1.127	-.[illegible]	-.656	-.468	-.286
-18	-.914	-.957	-1.020	-.812	-.620	-.461	-.286
-16	-.788	-.824	-.916	-.717	-.580	-.467	-.303
-14	-.678	-.706	-.793	-.652	-.516	-.424	-.304
-12	-.573	-.612	-.676	-.584	-.477	-.395	-.282
-10	-.478	-.505	-.574	-.506	-.435	-.361	-.264
-08	-.374	-.401	-.463	-.410	-.380	-.321	-.239
-06	-.280	-.303	-.356	-.318	-.315	-.277	-.211
-04	-.183	-.201	-.237	-.220	-.227	-.224	-.177
-02	-.090	-.105	-.142	-.131	-.152	-.154	-.141
00	.000	-.010	-.033	-.038	-.072	-.089	-.087
02	.079	.081	.063	.045	.003	-.024	-.039
04	.171	.181	.176		.082	.047	.010
06	.264	.268	.281	.226	.167	.109	.049
08	.359	.373	.392	.319	.241	.168	.089
10	.456	.481	.504	.412	.305	.218	.125
12	.555	.575	.600	.489	.358	.261	.160
14	.657	.679	.717	.565	.410	.312	.207
16	.753	.776	.817	.639	.470	.375	.266
18	.874	.889	.922	.730	.549	.428	.284
20	1.018	1.060	1.053	.837	.623	.450	.255
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.311	-.079	.167	.363	.465	.423	.313
-18	-.280	-.086	.141	.333	.444	.417	.313
-16	-.252	-.091	.116	.281	.415	.426	.332
-14	-.219	-.086	.085	.248	.362	.384	.335
-12	-.186	-.079	.062	.217	.332	.355	.308
-10	-.154	-.066	.049	.184	.302	.323	.288
-08	-.120	-.052	.036	.143	.263	.287	.260
-06	-.089	-.038	.027	.108	.216	.247	.229
-04	-.058	-.025	.017	.074	.150	.198	.191
-02	-.029	-.013	.011	.043	.100	.132	.151
00	.001	.000	.002	.011	.047	.077	.092
02	.028	.013	-.003	-.017	-.003	.021	.041
04	.059	.026	-.011		-.053	-.040	-.011
06	.088	.038	-.017	-.080	-.112	-.096	-.052
08	.118	.051	-.025	-.113	-.165	-.149	-.095
10	.150	.066	-.037	-.151	-.210	-.194	-.135
12	.182	.075	-.049	-.183	-.247	-.232	-.173
14	.215	.085	-.069	-.215	-.284	-.280	-.226
16	.244	.090	-.094	-.249	-.327	-.339	-.290
18	.272	.093	-.121	-.291	-.387	-.383	-.307
20	.306	.087	-.150	-.338	-.437	-.403	-.279

TABLE 3.- AERODYNAMIC CHARACTERISTICS FOR WING 2
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 1.7 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20							
-18							
-16	-.622	-.622	-.529	-.538	-.418	-.342	-.246
-14							
-12	-.456	-.485	-.414	-.437	-.352	-.294	-.212
-10	-.365	-.395	-.327	-.375	-.309	-.262	-.194
-08	-.183	-.300	-.239	-.320	-.267	-.231	-.173
-06	-.175	-.181	-.170	-.253	-.221	-.199	-.152
-04	-.086	-.066	-.073	-.185	-.170	-.162	-.125
-02				-.110	-.123	-.121	-.099
00	-.011	.001	.004	-.060	-.069	-.082	-.074
02		.057	.071	.006	-.015	-.039	-.043
04	.117	.133	.146	.080	.044	.010	-.010
06	.202	.213	.226	.154	.102	.055	.023
08	.284	.295	.310	.214	.155	.099	.054
10	.352	.369	.378	.284	.197	.137	.083
12	.438	.458	.452	.346	.244	.176	.113
14							
16	.592	.605	.557	.439	.318	.233	.157
18							
20	.831	.791	.718	.571	.414	.307	.211
	SECTION PITCHING-MOMENT COEFFICIENT						
-20							
-18							
-16	-.206	-.062	.062	.209	.292	.308	.270
-14							
-12	-.154	-.058	.044	.167	.244	.263	.231
-10	-.123	-.049	.029	.144	.212	.233	.211
-08	-.047	-.047	.014	.126	.182	.205	.188
-06	-.062	-.044	.004	.100	.150	.176	.164
-04	-.034	-.028	-.010	.077	.114	.142	.134
-02				.048	.082	.106	.105
00	-.004	.001	-.005	.026	.046	.071	.078
02		.009	-.010	.003	.010	.034	.045
04	.040	.020	-.017	-.023	-.029	-.009	.010
06	.069	.031	-.027	-.051	-.069	-.048	-.025
08	.097	.044	-.038	-.070	-.105	-.086	-.058
10	.119	.051	-.048	-.098	-.134	-.120	-.089
12	.146	.056	-.059	-.121	-.165	-.154	-.122
14							
16	.194	.068	-.073	-.155	-.218	-.205	-.170
18							
20	.269	.069	-.103	-.208	-.288	-.273	-.230

TABLE 3.- AERODYNAMIC CHARACTERISTICS FOR WING 2
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 1.7 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20							
-18							
-16	-.636	-.457	-.560	-.512	-.418	-.341	-.247
-14							
-12	-.489	-.362	-.466	-.435	-.359	-.297	-.216
-10	-.415	-.313	-.417	-.392	-.328	-.274	-.202
-08	-.337	-.270	-.365	-.335	-.285	-.246	-.184
-06	-.258	-.219	-.308	-.274	-.238	-.213	-.165
-04	-.179	-.165	-.229	-.201	-.186	-.174	-.140
-02							
00	-.030	-.031	-.070	-.059	-.081	-.085	-.078
02							
04	.125	.130	.079	.086	.048	.016	-.007
06	.198	.195	.135	.159	.105	.060	.024
08	.276	.265	.201	.226	.158	.105	.058
10	.351	.335	.260	.286	.202	.143	.086
12	.439	.414	.308	.346	.249	.179	.114
14							
16	.591	.542	.417	.446	.326	.241	.159
18							
20							
	SECTION PITCHING-MOMENT COEFFICIENT						
-20							
-16	-.210	-.055	.073	.196	.271	.306	.271
-14							
-12	-.165	-.050	.058	.163	.226	.266	.236
-10	-.139	-.047	.052	.145	.204	.245	.220
-08	-.114	-.042	.047	.123	.175	.218	.200
-06	-.087	-.035	.040	.099	.145	.188	.179
-04	-.061	-.027	.031	.071	.112	.153	.151
-02							
00	-.009	-.006	.011	.021	.047	.075	.084
02							
04	.042	.018	.002	-.027	-.031	-.013	.007
06	.067	.029	-.003	-.055	-.066	-.053	-.026
08	.093	.041	-.012	-.079	-.098	-.092	-.063
10	.118	.051	-.021	-.101	-.123	-.126	-.092
12	.145	.059	-.025	-.125	-.151	-.157	-.123
14							
16	.196	.072	-.040	-.163	-.198	-.213	-.173
18							
20							

TABLE 3.- AERODYNAMIC CHARACTERISTICS FOR WING 2
CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 3.1 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-.807	-.790	-.693	-.643	-.489	-.393	-.279
-18							
-16	-.616	-.624	-.614	-.537	-.420	-.343	-.247
-14							
-12	-.449	-.463	-.439	-.432	-.349	-.291	-.214
-10							
-08	-.284	-.316	-.284	-.313	-.265	-.230	-.173
-06							
-04	-.112	-.128	-.122	-.180	-.173	-.160	-.127
-02							
00	-.027	-.037	-.031	-.055	-.070	-.083	-.077
02							
04	.123	.131	.135	.085	.044	.011	-.011
06							
08	.282	.283	.286	.228	.153	.100	.054
10							
12	.461	.467	.453	.359	.255	.182	.118
14							
16	.613	.609	.569	.454	.325	.240	.162
18							
20	.786	.889	.682	.555	.397	.296	.202
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.260	-.080	.092	.251	.344	.355	.307
-18							
-16	-.201	-.073	.084	.207	.292	.308	.270
-14							
-12	-.149	-.060	.047	.164	.241	.260	.234
-10							
-08	-.097	-.052	.024	.117	.180	.204	.188
-06							
-04	-.042	-.026	.001	.068	.116	.141	.137
-02							
00	-.007	-.001	.005	.021	.047	.072	.083
02							
04	.042	.021	-.014	-.027	-.030	-.009	.011
06							
08	.095	.039	-.031	-.080	-.104	-.087	-.058
10							
12	.152	.058	-.057	-.128	-.174	-.160	-.127
14							
16	.201	.071	-.075	-.164	-.223	-.212	-.176
18							
20	.256	.132	-.093	-.206	-.275	-.264	-.221

TABLE 3.- AERODYNAMIC CHARACTERISTICS FOR WING 2
CONCLUDED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 3.1 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20							
-18							
-16	-.612	-.578	-.573	-.521	-.426	-.348	-.253
-14							
-12	-.430	-.417	-.439	-.416	-.348	-.295	-.218
-10							
-08	-.244	-.243	-.280	-.291	-.269	-.230	-.175
-06							
-04	-.044	-.053	-.102	-.142	-.167	-.152	
-02							
00	.001	.000	-.031	-.035	-.063	-.078	-.074
02							
04	.116	.116	.086	.089	.044	.011	-.010
06							
08	.265	.266	.225	.225	.149	.099	.053
10							
12	.422	.425	.356	.348	.244	.175	.109
14							
16	.592	.570	.458	.453	.331	.242	
18							
20	.785	.718	.579	.559	.406	.307	.206
	SECTION PITCHING-MOMENT COEFFICIENT						
-20							
-18							
-16	-.201	-.065	.071	.196	.274	.313	.278
-14							
-12	-.145	-.059	.048	.156	.219	.263	.238
-10							
-08	-.087	-.043	.020	.108	.166	.204	.190
-06							
-04	-.023	-.026	-.006	.051	.100	.134	
-02							
00	.000	.000	.003	.012	.037	.068	.079
02							
04	.040	.019	-.003	-.031	-.028	-.010	.010
06							
08	.090	.042	-.019	-.082	-.092	-.087	-.058
10							
12	.141	.059	-.036	-.128	-.150	-.154	-.118
14							
16	.195	.073	-.051	-.167	-.205	-.215	
18							
20	.255	.084	-.072	-.209	-.250	-.274	-.225

TABLE 4.- AERODYNAMIC CHARACTERISTICS FOR WING 3

MACH NUMBER = 1.61 REYNOLDS NUMBER = 1.9 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.054	-1.159	-1.056	-.914	-.623	-.458	-.283
-18							
-16	-.761	-.838	-.859	-.766	-.574	-.441	-.287
-14							
-12	-.569	-.607	-.607	-.572	-.454	-.395	-.294
-10	-.476	-.504	-.518	-.503	-.385	-.335	-.273
-08	-.377	-.396	-.418	-.411	-.339	-.283	-.228
-06	-.284	-.299	-.322	-.318	-.298	-.248	-.202
-04	-.193	-.205	-.220	-.222	-.225	-.202	-.171
-02	-.096	-.099	-.120	-.125	-.134	-.144	-.134
00	-.009	-.010	-.024	-.035	-.059	-.080	-.083
02	.080	.087	.075	.058	.020	-.013	-.033
04	.174	.185	.173	.155	.103	.060	.014
06	.270	.287	.274	.255	.188	.127	.061
08	.361	.390	.377	.351	.254	.179	.103
10	.456	.484	.480	.451	.306	.220	.139
12	.563	.563	.574	.536	.344	.252	.183
14							
16	.737	.748	.763	.694	.466	.373	.255
18							
20	1.011	1.041	1.032	.863	.567	.397	.232
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.277	-.064	.182	.361	.440	.414	.310
-18							
-16	-.237	-.071	.145	.311	.406	.398	.314
-14							
-12	-.186	-.075	.068	.210	.323	.362	.324
-10	-.157	-.063	.054	.182	.264	.305	.300
-08	-.126	-.050	.041	.143	.231	.254	.248
-06	-.096	-.038	.031	.108	.203	.222	.218
-04	-.067	-.025	.022	.075	.150	.180	.183
-02	-.035	-.011	.013	.042	.087	.125	.144
00	-.003	-.000	.004	.013	.038	.070	.087
02	.027	.013	-.005	-.017	-.013	.012	.035
04	.060	.027	-.013	-.049	-.066	-.051	-.014
06	.092	.041	-.022	-.084	-.126	-.111	-.064
08	.120	.054	-.032	-.118	-.173	-.157	-.110
10	.151	.064	-.045	-.162	-.210	-.194	-.150
12	.183	.063	-.058	-.199	-.237	-.224	-.200
14							
16	.236	.069	-.101	-.278	-.335	-.335	-.277
18							
20	.284	.047	-.187	-.343	-.397	-.355	-.252

TABLE 4.- AERODYNAMIC CHARACTERISTICS FOR WING 3

CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 1.9 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.060	-1.161	-1.069	-.927	-.646	-.458	-.281
-18							
-16	-.778	-.850	-.874	-.788	-.604	-.432	-.282
-14							
-12	-.570	-.600	-.628	-.593	-.496	-.420	-.312
-10	-.469	-.501	-.523	-.512	-.421	-.354	-.279
-08	-.371	-.393	-.422	-.408	-.369	-.307	-.230
-06	-.283	-.297	-.323	-.318	-.309	-.270	-.207
-04	-.189	-.199	-.226	-.223	-.223	-.220	-.174
-02	-.094	-.097	-.123	-.126	-.139	-.142	-.133
00	-.006	-.004	-.020	-.033	-.058	-.079	-.081
02	.079	.083	.071	.056	.018	-.017	-.034
04	.173	.185	.171	.157	.104	.062	.016
06	.265	.282	.279	.251	.195	.132	.061
08	.362	.382	.383	.346	.274	.187	.104
10	.455	.481	.475	.444	.333	.234	.140
12	.549	.569	.580	.532	.386	.276	.191
14							
16	.735	.747	.757	.692	.507	.403	.268
18							
20	1.004	1.059	1.035	.862	.600	.401	.230
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.278	-.065	.183	.367	.457	.413	.307
-18							
-16	-.243	-.069	.150	.323	.427	.390	.309
-14							
-12	-.185	-.076	.072	.224	.356	.383	.341
-10	-.155	-.063	.054	.187	.292	.320	.307
-08	-.123	-.050	.043	.143	.255	.275	.251
-06	-.095	-.037	.031	.109	.211	.241	.224
-04	-.065	-.024	.023	.076	.148	.194	.188
-02	-.034	-.011	.015	.043	.092	.122	.143
00	-.002	.002	.004	.013	.038	.068	.086
02	.026	.013	-.004	-.017	-.012	.015	.036
04	.059	.027	-.013	-.051	-.067	-.053	-.017
06	.089	.040	-.023	-.082	-.130	-.116	-.065
08	.120	.052	-.033	-.117	-.188	-.165	-.112
10	.150	.063	-.045	-.158	-.229	-.206	-.151
12	.179	.064	-.062	-.197	-.267	-.243	-.208
14							
16	.236	.071	-.099	-.277	-.359	-.361	-.291
18							
20	.278	.054	-.188	-.343	-.419	-.359	-.251

TABLE 4.- AERODYNAMIC CHARACTERISTICS FOR WING 3
CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 3.6 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.016	-1.106	-1.029	-.881	-.624	-.448	-.284
-18							
-16	-.756	-.803	-.805	-.747	-.585	-.476	-.325
-14							
-12	-.552	-.597	-.599	-.566	-.451	-.373	-.295
-10							
-08	-.367	-.395	-.412	-.401	-.355	-.303	-.227
-06							
-04	-.178	-.192	-.212	-.214	-.212	-.211	-.166
-02							
00	.008	.000	-.011	-.024	-.046	-.066	-.072
02							
04	.169	.180	.171	.151	.102	.059	.015
06							
08	.356	.381	.369	.342	.261	.180	.096
10							
12	.551	.586	.562	.527	.372	.268	.164
14							
16	.747	.763	.753	.650	.473	.377	.259
18							
20	.987	1.038	.991	.841	.599	.404	.225
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.292	-.068	.180	.355	.441	.404	.311
-18							
-16	-.245	-.095	.116	.301	.419	.431	.356
-14							
-12	-.183	-.078	.066	.210	.315	.338	.324
-10							
-08	-.125	-.053	.039	.139	.244	.271	.247
-06							
-04	-.064	-.027	.020	.071	.139	.186	.179
-02							
00	.000	.000	.002	.009	.030	.057	.076
02							
04	.056	.026	-.013	-.048	-.065	-.051	-.016
06							
08	.118	.054	-.030	-.115	-.178	-.159	-.103
10							
12	.179	.075	-.055	-.195	-.257	-.237	-.177
14							
16	.242	.092	-.095	-.244	-.335	-.341	-.281
18							
20	.305	.072	-.174	-.339	-.419	-.361	-.245

TABLE 4.- AERODYNAMIC CHARACTERISTICS FOR WING 3

CONTINUED

MACH NUMBER = 1.61 REYNOLDS NUMBER = 3.6 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-1.035	-1.116	-1.050	-.881	-.627	-.447	-.288
-18							
-16	-.757	-.801	-.815	-.754	-.606	-.492	-.333
-14							
-12	-.556	-.599	-.601	-.569	-.460	-.389	-.300
-10							
-08	-.366	-.394	-.409	-.402	-.358	-.304	-.229
-06							
-04	-.177	-.191	-.210	-.212	-.210	-.210	-.166
-02							
00	-.002	-.008	-.022	-.033	-.055	-.078	-.079
02							
04	.174	.183	.173	.153	.101	.058	.013
06							
08	.354	.379	.366	.338	.257	.178	.094
10							
12	.552	.588	.565	.515	.380	.275	.166
14							
16	.754	.778	.754	.651	.492	.391	.270
18							
20	.994	1.053	.990	.838	.610	.405	.227
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.296	-.074	.186	.354	.443	.404	.315
-18							
-16	-.245	-.095	.118	.304	.434	.445	.365
-14							
-12	-.183	-.079	.066	.211	.321	.353	.330
-10							
-08	-.123	-.054	.039	.140	.246	.271	.249
-06							
-04	-.063	-.026	.020	.072	.138	.185	.179
-02							
00	-.003	.000	.003	.012	.036	.067	.083
02							
04	.057	.026	-.015	-.049	-.065	-.051	-.013
06							
08	.117	.054	-.031	-.114	-.176	-.158	-.100
10							
12	.180	.078	-.056	-.185	-.263	-.244	-.179
14							
16	.244	.092	-.094	-.243	-.347	-.353	-.294
18							
20	.307	.077	-.173	-.337	-.426	-.362	-.248

TABLE 4.- AERODYNAMIC CHARACTERISTICS FOR WING 3

CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 1.7 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-.830	-.804	-.717	-.618	-.479	-.381	-.281
-18							
-16	-.654	-.655	-.600	-.522	-.409	-.334	-.250
-14							
-12	-.479	-.488	-.465	-.423	-.338	-.279	-.214
-10	-.399	-.408	-.396	-.366	-.301	-.254	-.197
-08	-.318	-.327	-.327	-.304	-.259	-.224	-.174
-06	-.240	-.245	-.251	-.239	-.211	-.188	-.151
-04	-.158	-.172	-.172	-.168	-.160	-.149	-.125
-02	-.079	-.073	-.088	-.084	-.094	-.099	-.088
00	-.009	.001	-.012	-.024	-.043	-.061	-.064
02	.057	.076	.072	.046	.013	-.013	-.031
04	.132	.155	.144	.119	.072	.033	.003
06	.205	.235	.218	.185	.124	.076	.032
08	.282	.311	.306	.253	.176	.121	.065
10	.363	.395	.371	.314	.218	.157	.093
12	.441	.479	.442	.373	.264	.194	.122
14							
16	.624	.631	.572	.478	.342	.254	.167
18							
20	.803	.791	.701	.582	.414	.310	.212
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.273	-.072	.100	.237	.336	.345	.309
-18							
-16	-.220	-.066	.081	.197	.285	.300	.274
-14							
-12	-.162	-.057	.057	.156	.233	.249	.233
-10	-.136	-.048	.047	.134	.206	.225	.215
-08	-.109	-.039	.038	.110	.177	.198	.189
-06	-.083	-.030	.026	.085	.143	.166	.163
-04	-.056	-.020	.017	.059	.107	.131	.135
-02	-.028	-.010	.008	.028	.062	.086	.094
00	-.002	.001	.002	.010	.028	.053	.068
02	.020	.010	-.008	-.013	-.009	.011	.033
04	.045	.022	-.014	-.039	-.048	-.028	-.003
06	.070	.031	-.022	-.063	-.083	-.067	-.034
08	.099	.044	-.034	-.087	-.119	-.106	-.069
10	.123	.051	-.044	-.111	-.147	-.138	-.100
12	.149	.060	-.054	-.132	-.179	-.171	-.132
14							
16	.208	.068	-.075	-.175	-.235	-.225	-.181
18							
20	.262	.072	-.097	-.218	-.287	-.277	-.231

TABLE 4.- AERODYNAMIC CHARACTERISTICS FOR WING 3

CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 1.7 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20							
-18							
-16	-.655	-.657	-.607	-.527	-.413	-.334	-.250
-14							
-12	-.473	-.496	-.470	-.426	-.343	-.284	-.216
-10	-.390	-.402	-.405	-.369	-.302	-.254	-.196
-08	-.308	-.330	-.322	-.308	-.260	-.226	-.175
-06	-.227	-.259	-.238	-.245	-.217	-.193	-.154
-04	-.150	-.176	-.163	-.166	-.161	-.151	-.125
-02							
00	-.028	-.031	-.045	-.046	-.063	-.075	-.077
02							
04	.137	.159	.141	.116	.073	.034	.004
06	.213	.240	.215	.193	.130	.082	.037
08	.295	.310	.309	.256	.181	.125	.068
10	.371	.400	.360	.316	.228	.159	.094
12	.453	.471	.450	.373	.268	.194	.123
14							
16	.616	.634	.568	.478	.344	.253	.167
18							
20							
	SECTION PITCHING-MOMENT COEFFICIENT						
-20							
-18							
-16	-.217	-.063	.082	.198	.288	.300	.274
-14							
-12	-.161	-.058	.059	.156	.236	.254	.236
-10	-.133	-.050	.049	.135	.207	.226	.213
-08	-.105	-.041	.035	.111	.177	.200	.190
-06	-.080	-.031	.023	.087	.147	.171	.166
-04	-.052	-.020	.017	.057	.109	.133	.135
-02							
00	-.009	-.001	.010	.019	.044	.067	.082
02							
04	.046	.020	-.015	-.038	-.049	-.030	-.004
06	.068	.030	-.022	-.068	-.088	-.071	-.039
08	.101	.041	-.035	-.091	-.123	-.110	-.072
10	.127	.052	-.042	-.113	-.155	-.140	-.101
12	.153	.058	-.057	-.134	-.183	-.171	-.133
14							
16	.205	.065	-.075	-.177	-.236	-.224	-.180
18							
20							

TABLE 4.- AERODYNAMIC CHARACTERISTICS FOR WING 3

CONTINUED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 3.1 MILLION FREE TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-.816	-.805	-.736	-.629	-.481	-.385	-.281
-18							
-16					-.411	-.341	-.252
-14							
-12	-.474	-.500	-.504	-.442	-.351	-.297	-.221
-10							
-08					-.333	-.282	-.212
-06							
-04					-.253	-.222	-.172
-02							
00	-.011	-.007	-.012	-.024	-.046	-.062	-.065
02							
04	.138	.154	.147	.121	.072	.033	.001
06							
08	.292	.313	.306	.257	.179	.120	.065
10							
12	.445	.462	.439	.368	.262	.188	.117
14							
16	.618	.630	.575	.474	.336	.252	.164
18							
20	.796	.780	.700	.576	.406	.312	.206
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.269	-.077	.104	.240	.338	.347	.309
-18							
-16					.285	.306	.276
-14							
-12	-.160	-.059	.066	.163	.241	.265	.241
-10							
-08					.228	.252	.231
-06							
-04					.172	.197	.186
-02							
00	-.004	.000	.001	.009	.031	.054	.070
02							
04	.046	.021	-.014	-.040	-.049	-.028	-.001
06							
08	.099	.042	-.034	-.091	-.122	-.105	-.070
10							
12	.149	.059	-.054	-.132	-.179	-.166	-.126
14							
16	.205	.070	-.076	-.174	-.230	-.223	-.177
18							
20	.260	.079	-.097	-.215	-.280	-.278	-.224

TABLE 4.- AERODYNAMIC CHARACTERISTICS FOR WING 3
CONCLUDED

MACH NUMBER = 2.01 REYNOLDS NUMBER = 3.1 MILLION FIXED TRANSITION

α, DEG	FRACTION OF SEMISPAN						
	.05	.20	.35	.50	.70	.825	.95
	SECTION NORMAL-FORCE COEFFICIENT						
-20	-.829	-.824	-.731	-.635	-.486	-.389	-.284
-18							
-16				-.535	-.414	-.311	-.252
-14							
-12	-.465	-.494	-.476	-.428	-.343	-.286	-.216
-10							
-08	-.307	-.330	-.332	-.308	-.259	-.224	-.173
-06							
-04	-.141	-.153	-.159	-.153	-.148	-.137	-.115
-02							
00	-.009	-.004	-.023	-.026	-.047	-.061	-.066
02							
04	.141	.154	.140	.120	.074	.035	.003
06							
08	.287	.314	.297	.261	.180	.122	.066
10							
12	.442	.474	.442	.380	.273	.198	.122
14							
16	.619	.627	.574	.482	.348	.258	.168
18							
20	.811	.793	.707	.589	.413	.320	.213
	SECTION PITCHING-MOMENT COEFFICIENT						
-20	-.272	-.075	.102	.244	.341	.351	.312
-18							
-16				.202	.287	.282	.276
-14							
-12	-.156	-.059	.058	.159	.237	.256	.236
-10							
-08	-.106	-.043	.037	.112	.177	.199	.188
-06							
-04	-.050	-.022	.015	.051	.099	.120	.124
-02							
00	-.004	.000	.003	.009	.031	.053	.071
02							
04	048	.020	-.013	-.040	-.050	-.030	-.003
06							
08	.098	.041	-.031	-.093	-.122	-.107	-.070
10							
12	.1 8	.058	-.053	-.139	-.187	-.175	-.131
14							
16	.204	.069	-.076	-.178	-.240	-.229	-.182
18							
20	.263	.077	-.098	-.222	-.285	-.285	-.232

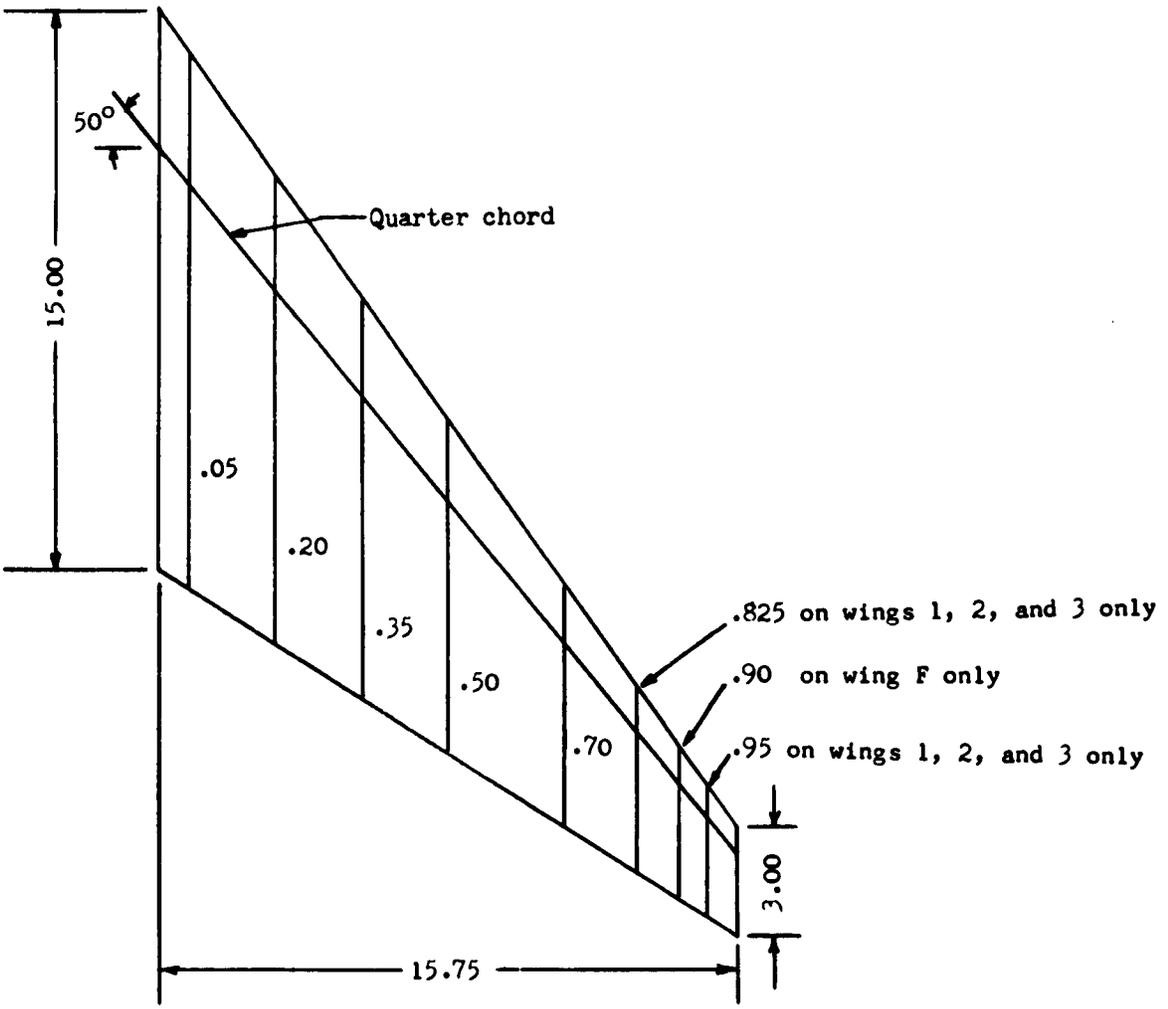

Figure 1.- Plan view of wings showing orifice stations. (Lengths are given in inches; stations are given in fractions of semispan.)

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