
REPORT No. 93

AERODYNAMIC CHARACTERISTICS OF AEROFOILS

**BY NATIONAL ADVISORY
COMMITTEE FOR AERONAUTICS**

REPORT No. 93.

AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

By NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

INTRODUCTION.

This collection of data on aerofoils has been made from the published reports of a number of the leading aerodynamic laboratories of this country and Europe. The information which was originally expressed according to the different customs of the several laboratories is here presented in a uniform series of charts and tables suitable for the use of designing engineers and for purposes of general reference.

It is a well-known fact that the results obtained in different laboratories, because of their individual methods of testing, are not strictly comparable even if proper scale corrections for size of model and speed of test are supplied. It is, therefore, unwise to compare too closely the coefficients of two wing sections tested in different laboratories. Tests of different wing sections from the same source, however, may be relied on to give true relative values.

The absolute system of coefficients has been used, since it is thought by the National Advisory Committee for Aeronautics that this system is the one most suited for international use, and yet is one for which a desired transformation can be easily made. For this purpose a set of transformation constants is included in this report.

Each aerofoil section is given a reference number, and the test data are presented in the form of curves from which the coefficients can be read with sufficient accuracy for design purposes. The dimensions of the profile of each section are given at various stations along the chord in per cent of the chord, using as datum the line shown on the curves. The shape of the section is also shown in reasonable accuracy to enable one to more clearly visualize the section under consideration, together with its characteristics. To obtain more accurately the dimensions of the profile of each section, a separate data sheet for each section has been included which gives an additional decimal place for the greater portion of the ordinates.

The authority for the results here presented is given as the name of the laboratory at which the experiments were conducted, with the size of model, wind velocity, and date of test.

TRANSFORMATION COEFFICIENTS.

For the convenience of those who prefer to use a system of units other than the absolute system there is given below a table of transformation constants based on the standard condition adopted by the National Advisory Committee for Aeronautics of:

Temperature	=	15° C.
Pressure	=	760 mm. Hg.
Humidity	=	0.
Gravity	=	9.80 m./sec. ² = 32.2 ft./sec. ²

thus giving values of specific weight of air

$$W = 0.1225 \text{ kg./m.}^3 = 0.07636 \text{ lbs./ft.}^3$$

and of density

$\sigma = 0.01250$ in the French engineering or kilogram, meter, second system.

or

$= 0.00238$ in the English or foot, pound, second system.

In absolute units	$P = C\sigma V^2.$
In kg./m. ² ——— m./sec.	$P = .1250 CV^2.$
In kg./m. ² ——— km./hr.	$P = .009645 CV^2.$
In lbs./sq. ft. ——— ft./sec.	$P = .002378 CV^2.$
In lbs./sq. ft. ——— mi./hr.	$P = .005116 CV^2.$

INDEX.

Three separate types of index are given; chart indexes which make it possible for a designer to select the wing section most suitable for the particular design in which he is interested; a group index which is arranged in the same order as the curve sheets, i. e., by countries and laboratories at which tests were conducted, each section also being designated by a reference number; and an alphabetical index.

CHART INDEX.

In order that the designer may easily pick out a wing section which is suited to the type of machine on which he is working, four index charts are given which classify the wings according to their aerodynamic and structural properties.

In Chart No. 1 the minimum drag is plotted against the L/D at one-fourth the maximum lift. This chart should be used in choosing a wing section for a high-speed machine, the wing sections being more suited for this use the farther they are from the lower left-hand corner.

In Chart No. 2 the mean spar depth is plotted against the maximum lift in order to show the possible strength and lightness of the wing structure. The higher the maximum lift coefficient is the smaller will be the wing area and the lighter the structural weight, and in the same way the greater the depth of the spars the lighter will be their weight, so that the sections the greatest distance from the lower left-hand corner will give the lightest and strongest wings.

The maximum L/D is plotted against the maximum lift in Chart No. 3, which is of use in choosing the wing section for a slow and efficient machine. In the same way as before, the sections farthest from the lower left-hand corner are the best for this purpose.

In Chart No. 4 the L/D at two-thirds the maximum lift is plotted against the maximum lift, so that this chart can be used for choosing a section that will give an efficient climb or a long range at cruising speed. The best sections for this purpose will be the farthest from the lower left-hand corner of the chart.

GROUP INDEX.

UNITED STATES.

Aerofoil.	Wind tunnel.	Report reference No.	Aerofoil.	Wind tunnel.	Report reference No.
U. S. A. 1	M. I. T.	1	U. S. A. T. S. 7	M. I. T.	30
U. S. A. 2	M. I. T.	2	U. S. A. T. S. 8	M. I. T.	31
U. S. A. 3	M. I. T.	3	U. S. A. T. S. 9	M. I. T.	32
U. S. A. 4	M. I. T.	4	U. S. A. T. S. 10	M. I. T.	33
U. S. A. 5	M. I. T.	5	U. S. A. T. S. 11	M. I. T.	34
U. S. A. 6	M. I. T.	6	U. S. A. T. S. 12	M. I. T.	35
U. S. A. 7	M. I. T.	7	U. S. A. T. S. 13	M. I. T.	36
U. S. A. 8	M. I. T.	8	U. S. A. T. S. 14	M. I. T.	37
U. S. A. 9	M. I. T.	9	U. S. A. T. S. 15	M. I. T.	38
U. S. A. 10	M. I. T.	10	U. S. A. T. S. 16	M. I. T.	39
U. S. A. 11	M. I. T.	11	U. S. A. T. S. 17	M. I. T.	40
U. S. A. 12	M. I. T.	12	U. S. A. T. S. 18	M. I. T.	41
U. S. A. 14	M. I. T.	13	Durand Propeller No. 4	M. I. T.	42
U. S. A. 15	M. I. T.	14	Durand Propeller No. 7	M. I. T.	43
U. S. A. 16	M. I. T.	15	Durand Propeller No. 10	M. I. T.	44
U. S. A. 17	M. I. T.	16	Durand Propeller No. 13	M. I. T.	45
U. S. A. 18	M. I. T.	17	Durand Propeller No. 16	M. I. T.	46
U. S. A. 19	M. I. T.	18	Offenstein	M. I. T.	47
U. S. A. 20	M. I. T.	19	Offenstein (modified)	M. I. T.	48
U. S. A. 21	M. I. T.	20	Spad	M. I. T.	49
U. S. A. 23	M. I. T.	21	Standard Aircraft Corp. No. 48	M. I. T.	50
U. S. A. 24	M. I. T.	22	V. E. Clark	M. I. T.	51
U. S. D. 9A	M. I. T.	23	W-1	M. I. T.	52
U. S. A. T. S. 1	M. I. T.	24	Navy Yard 1	W. N. Y.	53
U. S. A. T. S. 2	M. I. T.	25	Navy Yard 2	W. N. Y.	54
U. S. A. T. S. 3	M. I. T.	26	Navy Yard 3	W. N. Y.	55
U. S. A. T. S. 4	M. I. T.	27	Navy Yard 4	W. N. Y.	56
U. S. A. T. S. 5	M. I. T.	28		W. N. Y.	57
U. S. A. T. S. 6	M. I. T.	29			

BRITISH.

R. A. F. 3	N. P. L.	58	Naylor & Griffiths 8	N. P. L.	86
R. A. F. 4	N. P. L.	59	Naylor & Griffiths 9	N. P. L.	87
R. A. F. 5	N. P. L.	60	Naylor & Griffiths 10	N. P. L.	88
R. A. F. 6	N. P. L.	61	Naylor & Griffiths 11	N. P. L.	89
R. A. F. 6 (modified)	N. P. L.	62	Naylor & Griffiths 12	N. P. L.	90
R. A. F. 6a	N. P. L.	63	Naylor & Griffiths 13	N. P. L.	91
R. A. F. 6c	N. P. L.	64	Naylor & Griffiths 14	N. P. L.	92
R. A. F. 6c (both surfaces)	N. P. L.	65	Naylor & Griffiths 15	N. P. L.	93
R. A. F. 8	N. P. L.	66	Naylor & Griffiths 16	N. P. L.	94
R. A. F. 9	N. P. L.	67	Naylor & Griffiths 17	N. P. L.	95
R. A. F. 12	N. P. L.	68	Naylor & Griffiths 18	N. P. L.	96
R. A. F. 13	N. P. L.	69	Naylor & Griffiths 19	N. P. L.	97
R. A. F. 14	N. P. L.	70	Naylor & Griffiths 20	N. P. L.	98
R. A. F. 14 (modified)	N. P. L.	71	Naylor & Griffiths 21	N. P. L.	99
R. A. F. 15	N. P. L.	72	Naylor & Griffiths 22	N. P. L.	100
R. A. F. 15 (modified)	N. P. L.	73	Naylor & Griffiths 23	N. P. L.	101
R. A. F. 16	N. P. L.	74	Naylor & Griffiths 24	N. P. L.	102
R. A. F. 17	N. P. L.	75	Naylor & Griffiths 25	N. P. L.	103
R. A. F. 18	N. P. L.	76	Naylor & Griffiths 26	N. P. L.	104
R. A. F. 19	N. P. L.	77	Naylor & Griffiths 27	N. P. L.	105
R. A. F. 20	N. P. L.	78	Naylor & Griffiths 28	N. P. L.	106
Naylor & Griffiths 1	N. P. L.	79	Naylor & Griffiths 29	N. P. L.	107
Naylor & Griffiths 2	N. P. L.	80	Naylor & Griffiths 30	N. P. L.	108
Naylor & Griffiths 3	N. P. L.	81	Naylor & Griffiths 31	N. P. L.	109
Naylor & Griffiths 4	N. P. L.	82	A. D. No. 1	N. P. L.	110
Naylor & Griffiths 5	N. P. L.	83	A. D. No. 4	N. P. L.	111
Naylor & Griffiths 6	N. P. L.	84	N. P. L. 64	N. P. L.	112
Naylor & Griffiths 7	N. P. L.	85	Albatross	N. P. L.	113

BRITISH—Continued.

Aerofoil.	Wind tunnel.	Report reference No.	Aerofoil.	Wind tunnel.	Report reference No.
Avro.....	N. P. L.....	114	N. P. L. 73.....	N. P. L.....	135
Bristol.....	N. P. L.....	115	N. P. L. 214.....	N. P. L.....	136
B. I. R. 1a.....	N. P. L.....	116	Portholme.....	N. P. L.....	137
B. I. R. 3.....	N. P. L.....	117	Scout E.....	N. P. L.....	138
B. I. R. 33a.....	N. P. L.....	118	Sopwith.....	N. P. L.....	139
Curtiss.....	N. P. L.....	119	White.....	N. P. L.....	140
DeH-2.....	N. P. L.....	120	Cowley & Levy—A. 1.....	N. P. L.....	141
DeH-3.....	N. P. L.....	121	Cowley & Levy—A. 2.....	N. P. L.....	142
F. 2. B.....	N. P. L.....	122	Cowley & Levy—A. 3.....	N. P. L.....	143
Fairey.....	N. P. L.....	123	Cowley & Levy—A. 4.....	N. P. L.....	144
Handley Page 166.....	N. P. L.....	124	Cowley & Levy—A. 5.....	N. P. L.....	145
Handley Page 166a.....	N. P. L.....	125	Cowley & Levy—A. 6.....	N. P. L.....	146
Handley Page 166b.....	N. P. L.....	126	Cowley & Levy—A. 7.....	N. P. L.....	147
Handley Page 166c.....	N. P. L.....	127	Cowley & Levy—B. 1.....	N. P. L.....	148
N. P. L. 4.....	N. P. L.....	128	Cowley & Levy—B. 2.....	N. P. L.....	149
N. P. L. 4a.....	N. P. L.....	129	Cowley & Levy—B. 3.....	N. P. L.....	150
N. P. L. 4b.....	N. P. L.....	130	Cowley & Levy—B. 4.....	N. P. L.....	151
N. P. L. 4c.....	N. P. L.....	131	Cowley & Levy—B. 5.....	N. P. L.....	152
N. P. L. 4ca.....	N. P. L.....	132	Cowley & Levy—B. 6.....	N. P. L.....	153
N. P. L. 4cb.....	N. P. L.....	133	Cowley & Levy—B. 7.....	N. P. L.....	154
N. P. L. 4cy.....	N. P. L.....	134			

FRENCH.

Eiffel 8.....	Eiffel.....	155	Eiffel 43.....	Eiffel.....	184
Eiffel 9.....	Eiffel.....	156	Eiffel 44 (Voisin).....	Eiffel.....	185
Eiffel 10.....	Eiffel.....	157	Eiffel 45 (Buch).....	Eiffel.....	186
Eiffel 11.....	Eiffel.....	158	Eiffel 46 (Buch).....	Eiffel.....	187
Eiffel 12 (M. Farman).....	Eiffel.....	159	Eiffel 47 (Howard-Wright).....	Eiffel.....	188
Eiffel 13 (Bleriot 11).....	Eiffel.....	160	Eiffel 48 (Howard-Wright).....	Eiffel.....	189
Eiffel 13 bis (Bleriot 11a).....	Eiffel.....	161	Eiffel 49 (Howard-Wright).....	Eiffel.....	190
Eiffel 14 (Breguet).....	Eiffel.....	162	Eiffel 52 (Nieuport).....	Eiffel.....	181
Eiffel 15 (M. Ernout).....	Eiffel.....	163	Eiffel 53 (Nieuport).....	Eiffel.....	192
Eiffel 16 (M. Drzewiecki).....	Eiffel.....	164	Eiffel 54 (Deperdussin).....	Eiffel.....	193
Eiffel 16a.....	Eiffel.....	165	Eiffel 55 (Deperdussin).....	Eiffel.....	194
Eiffel 16b.....	Eiffel.....	166	Eiffel 56 (Deperdussin).....	Eiffel.....	195
Eiffel 16c.....	Eiffel.....	167	Eiffel 57.....	Eiffel.....	196
Eiffel 16d.....	Eiffel.....	168	Eiffel 58.....	Eiffel.....	197
Eiffel 17 (M. Drzewiecki).....	Eiffel.....	169	Eiffel 59.....	Eiffel.....	198
Eiffel 18 (M. Drzewiecki).....	Eiffel.....	170	Eiffel 60.....	Eiffel.....	199
Eiffel 30.....	Eiffel.....	171	Eiffel 61.....	Eiffel.....	200
Eiffel 31.....	Eiffel.....	172	Eiffel 62.....	Eiffel.....	201
Eiffel 32 (Lanier-Lawrance).....	Eiffel.....	173	Dorand.....	Eiffel.....	202
Eiffel 33 (Breguet).....	Eiffel.....	174	Halbroun 2.....	Eiffel.....	203
Eiffel 34 (Collix).....	Eiffel.....	175	Halbroun 3.....	Eiffel.....	204
Eiffel 35 (Dorand).....	Eiffel.....	176	S. E. A.....	Eiffel.....	205
Eiffel 36 (Odier).....	Eiffel.....	177	St. Cyr 1.....	Eiffel.....	206
Eiffel 37 (Kauffmann).....	Eiffel.....	178	St. Cyr 2.....	Eiffel.....	207
Eiffel 38 (Coanda).....	Eiffel.....	179	St. Cyr 3.....	Eiffel.....	208
Eiffel 39 (16b modified).....	Eiffel.....	180	Turin 1.....	Eiffel.....	209
Eiffel 40.....	Eiffel.....	181	Turin 2.....	Eiffel.....	210
Eiffel 41.....	Eiffel.....	182	Bleriot Triplane.....	Eiffel.....	211
Eiffel 42.....	Eiffel.....	183			

MISCELLANEOUS.

Italian 1.....	Crocco.....	212	Italian 3.....	Crocco.....	214
Italian 2.....	Crocco.....	213			

ALPHABETICAL INDEX.

Aerofoil.	Report reference No.	Aerofoil.	Report reference No.
A. D. No. 1.....	110	Eiffel 46 (Buch).....	187
A. D. No. 4.....	111	Eiffel 47 (Howard-Wright).....	188
Albatross.....	113	Eiffel 48 (Howard-Wright).....	189
Avro.....	114	Eiffel 49 (Howard-Wright).....	190
B. I. R. 1a.....	116	Eiffel 52 (Nieuport).....	191
B. I. R. 3.....	117	Eiffel 53 (Nieuport).....	192
B. I. R. 33a.....	118	Eiffel 54 (Deperdussin).....	193
Bleriot Triplane.....	211	Eiffel 55 (Deperdussin).....	194
Bristol.....	115	Eiffel 58 (Deperdussin).....	195
Clark, V. E.....	51	Eiffel 57.....	196
Cowley & Levy—A. 1.....	141	Eiffel 58.....	197
Cowley & Levy—A. 2.....	142	Eiffel 59.....	198
Cowley & Levy—A. 3.....	143	Eiffel 60.....	199
Cowley & Levy—A. 4.....	144	Eiffel 61.....	200
Cowley & Levy—A. 5.....	145	Eiffel 62.....	201
Cowley & Levy—A. 6.....	146	F. 2 B.....	122
Cowley & Levy—A. 7.....	147	Fairey.....	123
Cowley & Levy—B. 1.....	148	Halbronn 2.....	203
Cowley & Levy—B. 2.....	149	Halbronn 3.....	204
Cowley & Levy—B. 3.....	150	Handley Page 166.....	124
Cowley & Levy—B. 4.....	151	Handley Page 166a.....	125
Cowley & Levy—B. 5.....	152	Handley Page 166b.....	126
Cowley & Levy—B. 6.....	153	Handley Page 166c.....	127
Cowley & Levy—B. 7.....	154	Italian 1.....	212
Curtiss.....	119	Italian 2.....	213
DeH-2.....	120	Italian 3.....	214
DeH-3.....	121	N. P. L. 4.....	128
Dorand.....	202	N. P. L. 4a.....	129
Durand Propeller No. 4.....	42	N. P. L. 4b.....	130
Durand Propeller No. 7.....	43	N. P. L. 4c.....	131
Durand Propeller No. 10.....	44	N. P. L. 4c α	132
Durand Propeller No. 13.....	45	N. P. L. 4c β	133
Durand Propeller No. 16.....	46	N. P. L. 4c γ	134
Eiffel 8.....	155	N. P. L. 64.....	112
Eiffel 9.....	156	N. P. L. 73.....	135
Eiffel 10.....	157	N. P. L. 214.....	136
Eiffel 11.....	158	Naylor & Griffiths 1.....	79
Eiffel 12 (M. Farman).....	159	Naylor & Griffiths 2.....	80
Eiffel 13 (Bleriot 11).....	160	Naylor & Griffiths 3.....	81
Eiffel 13 bis (Bleriot 11a).....	161	Naylor & Griffiths 4.....	82
Eiffel 14 (Breguet).....	162	Naylor & Griffiths 5.....	83
Eiffel 15 (M. Ernault).....	163	Naylor & Griffiths 6.....	84
Eiffel 16 (M. Drzewiecki).....	164	Naylor & Griffiths 7.....	85
Eiffel 16a.....	165	Naylor & Griffiths 8.....	86
Eiffel 16b.....	166	Naylor & Griffiths 9.....	87
Eiffel 16c.....	167	Naylor & Griffiths 10.....	88
Eiffel 16d.....	168	Naylor & Griffiths 11.....	89
Eiffel 17 (M. Drzewiecki).....	169	Naylor & Griffiths 12.....	90
Eiffel 18 (M. Drzewiecki).....	170	Naylor & Griffiths 13.....	91
Eiffel 30.....	171	Naylor & Griffiths 14.....	92
Eiffel 31.....	172	Naylor & Griffiths 15.....	93
Eiffel 32 (Lanier-Lawrance).....	173	Naylor & Griffiths 16.....	94
Eiffel 33 (Breguet).....	174	Naylor & Griffiths 17.....	95
Eiffel 34 (Colliex).....	175	Naylor & Griffiths 18.....	96
Eiffel 35 (Dorand).....	176	Naylor & Griffiths 19.....	97
Eiffel 36 (Odier).....	177	Naylor & Griffiths 20.....	98
Eiffel 37 (Kauffmann).....	178	Naylor & Griffiths 21.....	99
Eiffel 38 (Coanda).....	179	Naylor & Griffiths 22.....	100
Eiffel 39 (16b Modified).....	180	Naylor & Griffiths 23.....	101
Eiffel 40.....	181	Naylor & Griffiths 24.....	102
Eiffel 41.....	182	Naylor & Griffiths 25.....	103
Eiffel 42.....	183	Naylor & Griffiths 26.....	104
Eiffel 43.....	184	Naylor & Griffiths 27.....	105
Eiffel 44 (Voisin).....	185	Naylor & Griffiths 28.....	106
Eiffel 45 (Buch).....	186		

Aerofoil.	Report reference No.	Aerofoil.	Report reference No.
Naylor & Griffiths 29.....	107	U. S. A. 6.....	6
Naylor & Griffiths 30.....	108	U. S. A. 7.....	7
Naylor & Griffiths 31.....	109	U. S. A. 8.....	8
Offenstein.....	47	U. S. A. 9.....	9
Offenstein (modified).....	48	U. S. A. 10.....	10
Portholme.....	137	U. S. A. 11.....	11
R. A. F. 3.....	58	U. S. A. 12.....	12
R. A. F. 4.....	59	U. S. A. 14.....	13
R. A. F. 5.....	60	U. S. A. 15.....	14
R. A. F. 6.....	61	U. S. A. 16.....	15
R. A. F. 6 (modified).....	62	U. S. A. 17.....	16
R. A. F. 6a.....	63	U. S. A. 18.....	17
R. A. F. 6c.....	64	U. S. A. 19.....	18
R. A. F. 6c (both surfaces).....	65	U. S. A. 20.....	19
R. A. F. 8.....	66	U. S. A. 21.....	20
R. A. F. 9.....	67	U. S. A. 23.....	21
R. A. F. 12.....	68	U. S. A. 24.....	22
R. A. F. 13.....	69	U. S. A. T. S. 1.....	24
R. A. F. 14.....	70	U. S. A. T. S. 2.....	25
R. A. F. 14 (modified).....	71	U. S. A. T. S. 3.....	26
R. A. F. 15.....	72	U. S. A. T. S. 4.....	27
R. A. F. 15 (modified).....	73	U. S. A. T. S. 5.....	28
R. A. F. 16.....	74	U. S. A. T. S. 6.....	29
R. A. F. 17.....	75	U. S. A. T. S. 7.....	30
R. A. F. 18.....	76	U. S. A. T. S. 8.....	31
R. A. F. 19.....	77	U. S. A. T. S. 9.....	32
R. A. F. 20.....	78	U. S. A. T. S. 10.....	33
S. E. A.....	205	U. S. A. T. S. 11.....	34
St.-Cyr 1.....	206	U. S. A. T. S. 12.....	35
St.-Cyr 2.....	207	U. S. A. T. S. 13.....	36
St.-Cyr 3.....	208	U. S. A. T. S. 14.....	37
Scout E.....	138	U. S. A. T. S. 15.....	38
Sloane.....	57	U. S. A. T. S. 16.....	39
Sopwith.....	139	U. S. A. T. S. 17.....	40
Spad.....	49	U. S. A. T. S. 18.....	41
Standard Aircraft Corp. 48.....	209	U. S. D. 9A.....	23
Turin 1.....	209	W-1.....	52
Turin 2.....	210	Washington Navy Yard 1.....	53
U. S. A. 1.....	1	Washington Navy Yard 2.....	54
U. S. A. 2.....	2	Washington Navy Yard 3.....	55
U. S. A. 3.....	3	Washington Navy Yard 4.....	56
U. S. A. 4.....	4	White.....	140
U. S. A. 5.....	5		

AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

The following tables have been prepared to give additional decimal places for the greater portion of the ordinates:

Per cent of chord.	REF. NO. 1.		REF. NO. 2.	
	U. S. A. 1.		U. S. A. 2.	
	Ordinates.			
	Upper.	Lower.	Upper.	Lower.
0	1.22	0.81	0.80	0.0
1.25	2.56	0.42	1.80	0.27
2.5	3.44	0.19	2.93	0.49
5	4.77	0.0	4.33	0.88
7.5	5.58	0.12	5.50	1.23
10	6.11	0.39	6.33	1.51
15	6.80	0.90	7.65	1.94
20	7.28	1.60	8.37	2.23
30	7.61	2.27	8.80	2.57
40	7.55	2.28	8.50	2.73
50	7.11	1.72	7.85	2.53
60	6.36	1.04	6.88	1.95
70	5.32	0.34	5.62	1.27
80	3.90	0.0	4.12	0.72
90	2.47	0.03	2.48	0.30
95	1.50	0.23	1.50	0.15
100	0.83	0.49	0.70	0.0

Per cent of chord.	REF. NO. 3.		REF. NO. 4.		REF. NO. 5.		REF. NO. 6.	
	U. S. A. 3.		U. S. A. 4.		U. S. A. 5.		U. S. A. 6.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.79	0.0	0.81	0.0	0.73	0.33	0.72	0.72
1.25	1.87	0.13	2.43	0.25	2.10	0.17	1.77	0.68
2.5	2.64	0.30	3.44	0.51	3.03	0.03	2.39	0.0
*5	3.91	0.62	4.88	1.07	4.40	0.03	3.49	0.086
7.5	5.00	0.90	6.00	1.47	5.40	0.25	4.41	0.32
10	5.98	1.15	6.83	1.82	6.20	0.57	5.13	0.63
15	7.30	1.65	7.87	2.35	7.16	1.10	6.12	1.25
20	8.20	1.87	8.57	2.57	7.92	1.55	6.90	1.97
30	8.68	2.30	8.90	2.83	8.30	2.02	7.40	2.77
40	8.44	2.50	8.57	2.93	8.14	2.17	7.36	2.90
50	7.75	2.33	7.82	2.63	7.55	1.96	6.85	2.52
60	6.80	1.78	6.90	1.98	6.75	1.55	6.03	1.93
70	5.57	1.15	5.60	1.22	5.63	1.16	4.91	1.32
80	4.08	0.63	4.08	0.62	4.24	0.76	3.52	0.72
90	2.39	0.33	2.32	0.30	2.52	0.55	2.01	0.12
95	1.55	0.15	1.45	0.18	1.50	0.35	1.15	0.0
100	0.69	0.0	0.71	0.0	0.50	0.0	0.29	0.29
*3.5						0.0		

Per cent of chord.	REF. NO. 7.		REF. NO. 8.		REF. NO. 9.		REF. NO. 10.	
	U. S. A. 7.		U. S. A. 8.		U. S. A. 9.		U. S. A. 10.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.25	0.0	1.25	0.0	1.25	0.0	1.25	0.0
1.25	3.40	-1.07	4.65	-0.38	3.25	0.0	2.43	0.0
2.5	5.38	-1.58	6.33	-0.53	4.58	0.0	3.43	0.0
5	8.70	-2.32	8.73	-0.81	6.35	0.0	4.50	0.0
7.5	11.39	-2.80	10.21	-0.95	7.47	0.0	5.73	0.0
10	13.28	-3.13	11.25	-1.05	8.22	0.0	6.32	0.0
15	16.00	-3.65	12.45	-1.15	9.15	0.0	6.90	0.0
20	17.93	-3.80	13.33	-1.22	9.70	0.0	7.27	0.0
30	20.00	-4.02	13.93	-1.29	10.07	0.0	7.50	0.0
40	20.50	-3.87	13.80	-1.28	10.00	0.0	7.45	0.0
50	19.33	-3.52	13.00	-1.20	9.47	0.0	7.10	0.0
60	17.23	-3.03	11.63	-1.09	8.43	0.0	6.43	0.0
70	14.37	-2.50	9.74	-0.91	7.12	0.0	5.33	0.0
80	10.60	-1.92	7.28	-0.66	5.56	0.0	4.20	0.0
90	6.25	-1.17	4.50	-0.40	3.62	0.0	2.92	0.0
95	3.95	-0.75	2.95	-0.10	2.60	0.0	2.23	0.0
100	1.50	0.0	1.40	0.0	1.50	0.0	1.50	0.0

Per cent of chord.	REF. NO. 11.		REF. NO. 12.		REF. NO. 13.		REF. NO. 14.	
	U. S. A. 11.		U. S. A. 12.		U. S. A. 14.		U. S. A. 15.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.25	0.0	1.25	0.0	1.25	0.633	1.22	0.63
1.25	2.32	0.0	4.73	0.0	2.277	0.467	2.56	0.46
2.5	3.21	0.0	6.88	0.0	3.100	0.333	3.44	0.33
5	4.45	0.0	9.34	0.0	4.250	0.150	4.80	0.15
7.5	5.30	0.0	11.13	0.0	4.970	0.033	5.58	0.03
10	5.85	0.0	12.27	0.0	5.417	0.0	6.11	0.0
15	6.42	0.0	13.55	0.0	6.050	0.117	6.88	0.12
20	6.78	0.0	14.56	0.0	6.567	0.333	7.28	0.33
30	7.12	0.0	15.59	0.0	6.850	0.867	7.61	0.86
40	7.05	0.0	15.07	0.0	6.867	1.000	7.55	1.00
50	6.63	0.0	14.20	0.0	6.600	0.717	7.11	0.72
60	5.95	0.0	12.71	0.0	5.967	0.277	6.36	0.28
70	5.00	0.0	10.63	0.0	5.017	0.0	5.32	0.0
80	3.92	0.0	8.03	0.0	3.850	0.110	3.90	0.11
90	2.77	0.0	4.97	0.0	2.433	0.233	2.50	0.23
95	2.12	0.0	2.65	0.0	1.620	0.370	1.67	0.37
100	1.50	0.0	1.50	0.0	0.833	0.500	0.83	0.50

Per cent of chord.	REF. No. 15.		REF. No. 16.		REF. No. 17.		REF. No. 18.	
	U. S. A. 16.		U. S. A. 17.		U. S. A. 18.		U. S. A. 19.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	1.07	1.070	0.75	0.0
1.25	2.10	-0.42	1.60	0.40	1.80	0.467	1.80	0.10
2.5	2.99	-0.64	2.55	-0.64	2.98	0.339	2.40	0.00
5	3.88	-0.76	3.70	-0.70	4.38	0.150	3.47	0.10
7.5	4.52	-0.83	4.46	-0.76	5.50	0.033	4.35	0.30
10	4.95	-0.83	4.90	-0.83	6.38	0.000	5.07	0.55
15	5.42	-0.76	5.42	-0.96	7.65	0.117	6.11	1.25
20	5.67	-0.51	5.67	-1.02	8.37	0.333	6.73	1.77
30	5.86	-0.06	5.80	-1.08	8.80	0.867	7.17	2.45
40	5.74	0.0	5.60	-1.15	8.50	1.000	6.97	2.50
50	5.29	-0.19	5.23	-1.09	7.85	0.717	6.37	1.90
60	4.65	-0.70	4.65	-1.02	6.88	0.277	5.40	1.20
70	4.01	-0.76	4.01	-0.89	5.62	0.000	4.17	0.47
80	3.25	-0.70	3.06	-0.76	4.12	0.110	3.17	0.03
90	2.23	-0.446	1.97	-0.57	2.48	0.233	2.18	0.29
95	1.37	-0.27	1.10	-0.35	1.50	0.370	2.00	0.58
100	0.0	0.0	0.0	0.0	0.74	0.740	1.50	0.0

Per cent of chord.	REF. No. 19.		REF. No. 20.		REF. No. 21.		REF. No. 22.	
	U. S. A. 20.		U. S. A. 21.		U. S. A. 23.		U. S. A. 24.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.30	0.0	1.667	0.0	1.50	1.50	1.50	1.50
1.25	3.05	0.50	2.340	0.72	2.52	0.05	2.00	1.13
2.5	3.90	0.32	2.967	0.34	3.00	0.50	3.10	0.46
5	4.83	0.13	4.370	0.15	3.81	0.20	4.12	0.20
7.5	5.47	0.03	5.500	0.033	4.45	0.07	5.00	0.05
10	5.86	0.0	6.367	0.0	5.00	0.0	5.65	0.0
15	6.37	0.16	7.600	0.100	5.77	0.09	6.65	0.09
20	6.60	0.30	8.367	0.300	6.32	0.30	7.30	0.30
30	6.77	0.67	8.800	0.866	6.92	0.80	7.93	0.80
40	6.60	0.83	8.500	1.000	6.95	1.00	7.90	1.00
50	6.10	0.62	7.833	0.717	6.60	0.94	7.45	0.94
60	5.50	0.15	6.867	0.277	5.82	0.74	6.60	0.74
70	4.83	0.0	5.600	0.0	4.72	0.55	5.33	0.55
80	4.17	0.30	4.300	0.270	3.44	0.38	3.83	0.38
90	3.47	1.05	3.317	1.000	2.00	0.19	2.10	0.19
95	3.25	1.60	2.93	1.550	1.12	0.10	1.16	0.10
100	2.55	0.0	2.643	0.0	0.10	0.10	0.10	0.10

Per cent of chord.	REF. No. 23.		REF. No. 24.		REF. No. 25.		REF. No. 26.	
	U. S. D. 9A.		U. S. A. T. S. 1.		U. S. A. T. S. 2.		U. S. A. T. S. 3.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.31	1.31	2.0	+2.00	2.0	+2.00	2.0	2.00
1.25	2.67	0.55	4.4	-1.30	4.4	0.0	4.4	0.30
2.5	3.46	0.33	5.5	-2.30	5.5	-0.50	5.5	0.00
5	4.62	0.11	7.4	-4.00	7.4	-1.35	7.4	0.50
7.5	5.30	0.05	8.8	-5.40	8.8	-1.85	8.8	0.85
10	5.90	0.0	10.0	-6.50	10.0	-2.25	10.0	1.15
15	6.36	0.10	11.8	-7.90	11.8	-2.80	11.8	1.60
20	6.62	0.26	13.1	-8.90	13.1	-3.40	13.1	2.00
30	6.70	0.63	14.7	-9.55	14.7	-4.00	14.7	2.30
40	6.59	0.62	14.8	-9.10	14.8	-4.10	14.8	2.50
50	6.38	0.42	13.9	-8.30	13.9	-4.00	13.9	2.40
60	5.95	0.22	12.3	-7.30	12.3	-3.85	12.3	2.10
70	5.31	0.06	10.3	-5.85	10.3	-3.00	10.3	1.80
80	4.24	0.0	7.8	-4.10	7.8	-2.00	7.8	1.30
90	2.67	0.08	4.9	-2.10	4.9	-1.00	4.9	0.70
95	1.77	0.15	3.3	-1.00	3.3	-0.45	3.3	0.30
100	0.59	0.59	1.0	+1.00	1.0	+1.00	1.0	1.0

Per cent of chord.	REF. No. 27.		REF. No. 28.		REF. No. 29.		REF. No. 30.	
	U. S. A. T. S. 4.		U. S. A. T. S. 5.		U. S. A. T. S. 6.		U. S. A. T. S. 7.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	2.0	2.00	2.0	+2.00	2.0	+2.00	2.0	+2.00
1.25	4.4	0.45	4.4	0.0	4.4	0.10	4.4	0.60
2.5	5.5	0.20	5.5	-0.80	5.5	-0.40	5.5	0.0
5	7.4	0.80	7.4	-1.80	7.4	-0.75	7.4	0.20
7.5	8.8	1.30	8.8	-2.50	8.8	-1.10	8.8	0.5
10	10.0	1.80	10.0	-3.00	10.0	-1.45	10.0	0.74
15	11.8	2.65	11.8	-3.40	11.8	-1.80	11.8	1.00
20	13.1	3.20	13.1	-3.50	13.1	-2.00	13.1	1.25
30	14.7	3.90	14.7	-2.90	14.7	-2.10	14.7	1.47
40	14.8	3.90	14.8	-1.50	14.8	-1.35	14.8	1.00
50	13.9	3.60	13.9	-0.65	13.9	0.0	13.9	0.0
60	12.3	3.10	12.3	-0.30	12.3	+1.00	12.3	-1.20
70	10.3	2.65	10.3	-0.20	10.3	1.40	10.3	-2.00
80	7.8	2.00	7.8	-0.10	7.8	1.35	7.8	-2.50
90	4.9	1.00	4.9	0.0	4.9	0.80	4.9	-1.90
95	3.3	0.70	3.3	0.0	3.3	0.50	3.3	-1.20
100	1.2	1.20	1.0	+1.00	1.0	1.00	1.0	+1.00

Per cent of chord.	REF. No. 47.		REF. No. 48.		REF. No. 49.		REF. No. 50.	
	Offenstein.		Offenstein-Mod.		Spad.		St. Air. Co. No. 48.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.00	1.00	1.00	1.00	0.28	0.26	1.27	1.27
1.25	1.83	0.55	1.96	0.570	1.55	0.07	2.19	0.45
2.5	2.50	0.70	2.50	0.274	2.14	0.03	2.68	0.24
5	3.57	0.04	3.572	0.0357	3.00	0.08	3.57	0.0
7.5	4.21	0.04	4.210	0.0357	3.75	0.16	4.20	0.04
10	4.65	0.11	4.65	0.1071	4.37	0.26	4.68	0.15
15	5.20	0.32	5.25	0.310	5.31	0.55	5.30	0.36
20	5.56	0.48	5.56	0.478	5.95	0.85	5.62	0.56
30	5.84	0.67	5.84	0.666	6.60	1.25	5.85	0.67
40	5.79	0.63	5.79	0.631	6.67	1.31	5.84	0.60
50	5.51	0.51	5.51	0.512	6.28	1.10	5.55	0.48
60	5.04	0.43	5.045	0.429	5.53	0.82	5.06	0.37
70	4.36	0.32	4.360	0.3214	4.51	0.51	4.35	0.30
80	3.42	0.19	3.419	0.1904	3.26	0.29	3.46	0.22
90	1.96	0.83	1.962	0.0834	1.80	0.15	2.34	0.11
95	1.30	0.78	1.050	0.0190	1.06	0.07	1.64	0.04
100	0.0	0.0	0.00	0.000	0.32	0.0	0.48	0.48

Per cent of chord.	REF. No. 51.		REF. No. 52.		REF. No. 53.		REF. No. 54.	
	V. E. Clark.		W-1.		W. N. Y. 1.		W. N. Y. 2.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.0	0.8	0.0	0.0	1.018	1.018	1.018	1.018
1.25	1.25	0.7	1.25	-1.10	1.802	0.548	1.802	0.548
2.5	3.7	0.5	1.95	-1.40	2.508	0.235	2.508	0.235
5	4.8	0.0	3.00	-1.90	3.605	0.0	3.605	0.0
7.5	5.6	0.3	3.90	-2.15	4.467	0.235	4.467	0.235
10	6.3	0.7	4.50	-2.50	5.265	0.687	5.265	0.687
15	7.0	1.7	5.35	-2.85	6.270	1.489	6.270	1.489
20	7.3	2.2	5.70	-3.00	7.175	2.228	7.175	2.228
30	7.5	2.7	5.80	-3.00	7.870	2.954	7.870	2.954
40	7.1	2.3	5.70	-3.00	7.080	2.725	7.450	2.725
50	6.5	1.8	5.20	-2.80	7.060	2.060	6.560	2.062
60	5.5	1.3	4.50	-2.50	6.070	1.210	5.310	1.210
70	4.7	0.5	3.60	-2.10	4.770	0.573	4.100	0.573
80	3.5	0.2	2.75	-1.75	3.460	0.229	2.905	0.229
90	2.2	0.0	1.75	-1.25	2.150	0.051	1.810	0.051
95	1.3	0.1	1.30	-1.10	1.450	0.080	1.260	0.080
100	0.8	0.7	0.0	0.0	0.814	0.229	0.814	0.229

Per cent of chord.	REF. No. 55.		REF. No. 56.		REF. No. 57.		REF. No. 58.	
	W. N. Y. 3.		W. N. Y. 4.		Sloane.		R. A. F. 3.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.018	1.018	0.0	0.0	0.71	0.71	0.80	0.80
1.25	1.802	0.548	1.179	0.0	1.80	0.26	2.00	0.0
2.5	2.508	0.235	2.044	0.0	2.56	0.07	3.00	0.0
5	3.605	0.0	3.880	0.0	3.40	0.01	4.40	0.90
7.5	4.467	0.235	4.409	0.235	3.95	0.05	5.50	1.30
10	5.265	0.687	5.265	0.687	4.38	0.12	6.40	1.60
15	6.270	1.489	6.270	1.489	4.93	0.36	7.68	2.10
20	7.175	2.228	7.175	2.228	5.25	0.51	8.40	2.40
30	7.870	2.954	7.870	2.954	5.62	0.63	8.80	2.90
40	7.190	2.725	7.450	2.725	5.62	0.55	8.50	3.20
50	5.925	2.062	6.560	2.062	5.30	0.46	7.80	3.10
60	4.575	1.210	5.310	1.210	4.82	0.38	6.90	2.60
70	3.356	0.573	4.100	0.573	4.10	0.33	5.60	2.10
80	2.355	0.229	2.905	0.229	3.26	0.21	4.10	1.40
90	1.502	0.051	1.810	0.051	2.14	0.08	2.40	0.80
95	1.150	0.080	1.260	0.080	1.43	0.04	1.60	0.40
100	0.814	0.229	0.814	0.229	0.58	0.0	0.70	0.0

Per cent of chord.	REF. No. 59.		REF. No. 60.		REF. No. 61.		REF. No. 62.	
	R. A. F. 4.		R. A. F. 5.		R. A. F. 6.		R. A. F. 6-Mod.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.80	0.80	0.80	0.80	0.50	0.0	0.50	0.0
1.25	2.20	0.05	2.25	0.20	2.30	0.10	2.00	0.05
2.5	3.10	0.0	3.10	0.0	3.21	0.0	3.05	0.13
5	4.30	0.90	4.30	-0.50	4.43	0.22	4.50	0.24
7.5	5.25	1.30	5.20	-0.75	5.35	0.35	5.40	0.34
10	6.00	1.60	6.00	-0.80	6.01	0.41	6.10	0.45
15	6.90	2.00	6.90	-0.55	7.08	0.70	7.15	0.63
20	7.40	2.10	7.40	-0.10	7.40	0.68	7.80	0.70
30	7.50	2.20	7.50	+1.70	7.59	0.77	8.20	0.80
40	7.20	2.10	7.20	2.20	7.47	0.68	7.70	0.80
50	6.60	1.90	6.60	2.00	7.11	0.53	7.10	0.75
60	5.90	1.60	5.90	1.60	6.51	0.41	6.43	0.64
70	4.90	1.30	4.90	1.30	5.65	0.30	5.80	0.80
80	3.80	0.90	3.80	0.90	4.42	0.19	5.33	1.45
90	2.50	0.40	2.50	0.40	2.73	0.09	4.90	2.50
95	1.70	0.22	1.65	0.30	1.85	0.05	4.78	3.20
100	0.80	0.10	0.80	0.10	0.50	0.0	4.30	4.30

Per cent of chord.	REF. NO. 79.		REF. NO. 80.		REF. NO. 81.		REF. NO. 82.	
	N. & G. 1.		N. & G. 2.		N. & G. 3.		N. & G. 4.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.25	1.13	0.0	1.44	0.0	1.69	0.0	2.25	0.0
2.5	1.58	0.0	2.01	0.0	2.36	0.0	3.14	0.0
5	2.29	0.0	2.94	0.0	3.44	0.0	4.58	0.0
7.5	2.78	0.0	3.56	0.0	4.16	0.0	5.55	0.0
10	3.07	0.0	3.94	0.0	4.61	0.0	6.14	0.0
15	3.47	0.0	4.45	0.0	5.21	0.0	6.94	0.0
20	3.70	0.0	4.74	0.0	5.55	0.0	7.40	0.0
30	3.89	0.0	4.99	0.0	5.84	0.0	7.78	0.0
*40	3.85	0.0	4.94	0.0	5.78	0.0	7.70	0.0
50	3.65	0.0	4.68	0.0	5.48	0.0	7.30	0.0
60	3.40	0.0	4.36	0.0	5.10	0.0	6.80	0.0
70	2.95	0.0	3.78	0.0	4.40	0.0	5.90	0.0
80	2.35	0.0	3.01	0.0	3.50	0.0	4.70	0.0
90	1.60	0.0	2.05	0.0	2.40	0.0	3.20	0.0
95	1.15	0.0	1.47	0.0	1.73	0.0	2.30	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*32	3.90	0.0	5.00	0.0	5.85	0.0	7.80	0.0

Per cent of chord.	REF. NO. 83.		REF. NO. 84.		REF. NO. 85.		REF. NO. 86.	
	N. & G. 5.		N. & G. 6.		N. & G. 7.		N. & G. 8.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.25	2.37	0.0	2.53	0.0	1.78	0.0	1.90	0.0
2.5	3.40	0.0	3.71	0.0	2.55	0.0	2.78	0.0
5	4.85	0.0	5.24	0.0	3.64	0.0	3.93	0.0
7.5	5.83	0.0	6.16	0.0	4.37	0.0	4.62	0.0
10	6.44	0.0	6.77	0.0	4.83	0.0	5.08	0.0
15	7.20	0.0	7.39	0.0	5.40	0.0	5.54	0.0
20	7.52	0.0	7.73	0.0	5.64	0.0	5.80	0.0
*30	7.79	0.0	7.76	0.0	5.84	0.0	5.82	0.0
40	7.59	0.0	7.47	0.0	5.70	0.0	5.60	0.0
50	7.16	0.0	7.03	0.0	5.37	0.0	5.27	0.0
60	6.59	0.0	6.47	0.0	4.94	0.0	4.85	0.0
70	5.67	0.0	5.60	0.0	4.25	0.0	4.21	0.0
80	4.53	0.0	4.45	0.0	3.40	0.0	3.34	0.0
90	3.11	0.0	3.04	0.0	2.33	0.0	2.28	0.0
95	2.27	0.0	2.20	0.0	1.70	0.0	1.65	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*24	7.80	0.0	7.80	0.0	5.85	0.0	5.85	0.0
*28	7.80	0.0	7.80	0.0	5.85	0.0	5.85	0.0

Per cent of chord.	REF. NO. 87.		REF. NO. 88.		REF. NO. 89.		REF. NO. 90.	
	N. & G. 9.		N. & G. 10.		N. & G. 11.		N. & G. 12.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.25	1.90	-0.65	1.90	-0.325	1.90	-1.14	1.90	-0.76
2.5	2.78	-0.95	2.78	-0.475	2.78	-1.75	2.78	-1.17
5	3.93	-1.34	3.93	-0.670	3.93	-2.50	3.93	-1.67
7.5	4.62	-1.58	4.62	-0.790	4.62	-2.84	4.62	-1.89
10	5.08	-1.74	5.08	-0.870	5.08	-2.99	5.08	-1.99
*15	5.54	-1.89	5.54	-0.945	5.54	-2.68	5.54	-1.79
20	5.80	-1.98	5.80	-0.990	5.80	-1.80	5.80	-1.20
*30	5.82	-1.99	5.82	-0.995	5.82	-0.20	5.82	-0.133
40	5.60	-1.91	5.60	-0.955	5.60	0.0	5.60	0.0
50	5.27	-1.80	5.27	-0.900	5.27	0.0	5.27	0.0
60	4.85	-1.66	4.85	-0.830	4.85	0.0	4.85	0.0
70	4.21	-1.44	4.21	-0.720	4.21	0.0	4.21	0.0
80	3.34	-1.14	3.34	-0.570	3.34	0.0	3.34	0.0
90	2.28	-0.78	2.28	-0.340	2.28	0.0	2.28	0.0
95	1.65	-0.56	1.65	-0.280	1.65	0.0	1.65	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*10.7	5.85	-0.20	5.85	-0.10	5.85	-3.0	5.85	-2.0
*24	5.85	-0.20	5.85	-0.10	5.85	-3.0	5.85	-2.0

Per cent of chord.	REF. NO. 91.		REF. NO. 92.		REF. NO. 93.		REF. NO. 94.	
	N. & G. 13.		N. & G. 14.		N. & G. 15.		N. & G. 16.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.25	1.90	-0.380	1.90	-0.94	1.90	-0.470	1.90	-1.30
2.5	2.78	-0.580	2.78	-1.36	2.78	-0.690	2.78	-1.50
5	3.93	-0.830	3.93	-1.83	3.93	-0.915	3.93	-1.38
7.5	4.62	-0.950	4.62	-2.00	4.62	-1.000	4.62	-1.20
10	5.08	-0.997	5.08	-1.85	5.08	-0.925	5.08	-1.07
*15	5.54	-0.890	5.54	-1.20	5.54	-0.600	5.54	-0.70
20	5.80	-0.600	5.80	-0.70	5.80	-0.350	5.80	-0.30
*30	5.82	-0.067	5.82	-0.10	5.82	-0.050	5.82	-0.06
*40	5.60	0.0	5.60	0.0	5.60	0.0	5.60	0.0
50	5.27	0.0	5.27	0.0	5.27	0.0	5.27	0.0
60	4.85	0.0	4.85	0.0	4.85	0.0	4.85	0.0
70	4.21	0.0	4.21	0.0	4.21	0.0	4.21	0.0
80	3.34	0.0	3.34	0.0	3.34	0.0	3.34	0.0
90	2.28	0.0	2.28	0.0	2.28	0.0	2.28	0.0
95	1.65	0.0	1.65	0.0	1.65	0.0	1.65	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*10.7	5.85	-1.0	5.85	-1.0	5.85	-1.0	5.85	-1.0
*24	5.85	-1.0	5.85	-1.0	5.85	-1.0	5.85	-1.0
*33.3	5.85	-1.0	5.85	-1.0	5.85	-1.0	5.85	-1.0

AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

Per cent of chord.	REF. No. 95.		REF. No. 96.		REF. No. 97.		REF. No. 98.	
	N. & G. 17.		N. & G. 18.		N. & G. 19.		N. & G. 20.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.25	1.90	-0.866	1.90	-0.433	1.13	-0.380	1.13	-0.470
2.5	2.78	-1.000	2.78	-0.500	1.58	-0.580	1.58	-0.680
5	3.93	-0.920	3.93	-0.460	2.29	-0.830	2.29	-0.915
7.5	4.62	-0.800	4.62	-0.400	2.78	-0.920	2.78	-1.000
10	5.08	-0.713	5.08	-0.357	3.07	-0.997	3.07	-0.925
*15	5.54	-0.466	5.54	-0.233	3.47	-0.890	3.47	-0.600
20	5.80	-0.200	5.80	-0.100	3.70	-0.600	3.70	-0.350
*30	5.82	-0.040	5.82	-0.020	3.89	-0.067	3.89	-0.050
*40	5.60	0.0	5.60	0.0	3.85	0.0	3.85	0.0
50	5.27	0.0	5.27	0.0	3.65	0.0	3.65	0.0
60	4.85	0.0	4.85	0.0	3.40	0.0	3.40	0.0
70	4.21	0.0	4.21	0.0	2.95	0.0	2.95	0.0
80	3.34	0.0	3.34	0.0	2.35	0.0	2.35	0.0
90	2.28	0.0	2.28	0.0	1.60	0.0	1.60	0.0
95	1.65	0.0	1.65	0.0	1.15	0.0	1.15	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*10.7						-1.0		
*24	5.85		5.85					
*32					3.90		3.90	
*33.3						0.0		0.0

Per cent of chord.	REF. No. 99.		REF. No. 100.		REF. No. 101.		REF. No. 102.	
	N. & G. 21.		N. & G. 22.		N. & G. 23.		N. & G. 24.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.25	1.13	-0.235	1.13	-0.290	1.13	-0.145	2.25	-0.290
2.5	1.58	-0.340	1.58	-0.400	1.58	-0.200	3.14	-0.400
5	2.29	-0.458	2.29	-0.590	2.29	-0.295	4.58	-0.590
7.5	2.78	-0.500	2.78	-0.760	2.78	-0.380	5.55	-0.760
10	3.07	-0.463	3.07	-0.790	3.07	-0.395	6.14	-0.790
15	3.47	-0.300	3.47	-0.890	3.47	-0.445	6.94	-0.890
20	3.70	-0.175	3.70	-0.950	3.70	-0.475	7.40	-0.950
30	3.89	-0.025	3.89	-0.997	3.89	-0.498	7.78	-0.997
*40	3.85	0.0	3.85	-0.990	3.85	-0.495	7.70	-0.990
50	3.65	0.0	3.65	-0.940	3.65	-0.470	7.30	-0.940
60	3.40	0.0	3.40	-0.870	3.40	-0.435	6.80	-0.870
70	2.95	0.0	2.95	-0.760	2.95	-0.380	5.90	-0.760
80	2.35	0.0	2.35	-0.600	2.35	-0.300	4.70	-0.600
90	1.60	0.0	1.60	-0.410	1.60	-0.205	3.20	-0.410
95	1.15	0.0	1.15	-0.290	1.15	-0.145	2.30	-0.290
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*32	3.90		3.90	-1.000	3.90	-0.500	7.80	-1.000
*33.3		0.0						

Per cent of chord.	REF. No. 103.		REF. No. 104.		REF. No. 105.		REF. No. 106.	
	N. & G. 25.		N. & G. 26.		N. & G. 27.		N. & G. 28.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.834	0.834	1.67	1.67
1.25	1.69	-0.290	1.44	-0.290				
2.5	2.36	-0.400	2.01	-0.400				
5.0	3.44	-0.590	2.94	-0.590	4.590	0.0		
7.5	4.16	-0.760	3.56	-0.760	5.550	0.0		
10	4.61	-0.790	3.94	-0.790	6.140	0.0	6.14	0.0
15	5.21	-0.890	4.45	-0.890	6.940	0.0	6.94	0.0
20	5.55	-0.950	4.74	-0.950	7.400	0.0	7.40	0.0
30	5.84	-0.997	4.99	-0.997	7.780	0.0	7.78	0.0
*40	5.78	-0.990	4.94	-0.990	7.700	0.0	7.70	0.0
50	5.48	-0.940	4.68	-0.940	7.300	0.0	7.30	0.0
60	5.10	-0.870	4.36	-0.870	6.800	0.0	6.80	0.0
70	4.40	-0.760	3.78	-0.760	5.900	0.0	5.90	0.0
80	3.50	-0.600	3.01	-0.600	4.700	0.0	4.70	0.0
90	2.40	-0.410	2.05	-0.410	3.200	0.0	3.20	0.0
95	1.73	-0.290	1.47	-0.290	2.300	0.0	2.30	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*32	5.85	-1.000	5.00	-1.000	7.800	0.0	7.80	0.0

Per cent of chord.	REF. No. 107.		REF. No. 108.		REF. No. 109.		REF. No. 110.	
	N. & G. 29.		N. & G. 30.		N. & G. 31.		A. D. No. 1.	
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	3.34	3.34	5.00	5.00	-0.834	-0.834	0.0	0.0
1.25							1.10	-0.780
2.5							1.63	-1.000
5							2.62	-1.160
7.5							3.50	-1.270
10					6.14	0.0	4.21	-1.360
15	6.94	0.0			6.94	0.0	5.20	-1.450
20	7.40	0.0	7.40	0.0	7.40	0.0	5.67	-1.500
30	7.78	0.0	7.78	0.0	7.78	0.0	6.32	-1.600
*40	7.70	0.0	7.70	0.0	7.70	0.0	6.38	-1.620
50	7.30	0.0	7.30	0.0	7.30	0.0	6.08	-1.610
60	6.80	0.0	6.80	0.0	6.80	0.0	5.38	-1.600
70	5.90	0.0	5.90	0.0	5.90	0.0	4.50	-1.400
80	4.70	0.0	4.70	0.0	4.70	0.0	3.43	-0.900
90	3.20	0.0	3.20	0.0	3.20	0.0	1.90	-0.700
95	2.30	0.0	2.30	0.0	2.30	0.0	1.10	-0.620
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*32	7.80	0.0	7.80	0.0	7.80	0.0		

Per cent of chord.	REF. No. 111.	REF. No. 112.	REF. No. 113.	REF. No. 114.				
	A. D. 4.	N. P. L. 64	Albatross.	Avro.	Ordinates.			
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.74	0.74	0.34	0.34
*1.25	1.000	-0.700	2.3	0.0	2.20	0.0	1.28	0.015
2.5	2.403	-0.945	3.3	0.0	3.20	0.20	2.08	0.06
5	3.717	-1.125	4.6	0.0	5.00	0.60	3.30	0.17
7.5	4.60	-1.300	5.5	0.0	6.20	0.95	4.30	0.28
10	5.310	-1.440	6.2	0.0	7.05	1.25	5.20	0.42
15	6.300	-1.647	7.2	0.0	8.25	1.75	6.68	0.88
20	6.858	-1.737	7.6	0.0	9.00	2.12	7.50	1.25
30	7.200	-1.800	8.0	0.0	9.64	2.50	8.30	1.78
40	6.912	-1.773	7.2	0.0	9.45	2.62	8.43	1.93
50	6.300	-1.710	7.1	0.0	8.55	2.50	8.05	1.76
60	5.472	-1.575	6.2	0.0	7.40	2.17	7.20	1.40
70	4.383	-1.368	5.1	0.0	6.02	1.76	5.75	1.04
80	3.177	-1.125	3.9	0.0	4.30	1.25	4.00	0.66
90	1.845	-0.882	2.5	0.0	2.47	0.65	2.23	0.30
95	1.060	-0.660	1.6	0.0	1.50	0.30	1.30	0.08
*100	0.0	0.0	0.0	0.0	0.35	0.35	0.20	0.20
*1								0.0
*96								0.0

Per cent of chord.	REF. No. 115.	REF. No. 116.	REF. No. 117.	REF. No. 118.				
	Bristol.	B. I. R. 1a.	B. I. R. 3.	B. I. R. 33a.	Ordinates.			
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.74	1.39	0.0	0.0	0.0	0.0	0.0	0.0
1.25	2.38	1.00	2.18	0.0	2.18	1.20	2.15	0.21
2.5	2.90	0.75	3.40	0.0	3.40	2.05	3.42	0.34
5	3.81	0.40	5.30	0.0	5.30	3.20	5.30	0.53
7.5	4.50	0.18	6.65	0.0	6.65	3.95	6.52	0.65
10	5.08	0.04	7.62	0.0	7.62	4.55	7.50	0.75
15	5.92	0.08	8.80	0.0	8.80	5.34	8.87	0.88
20	6.41	0.35	9.50	0.0	9.50	5.74	9.50	0.95
30	6.77	0.83	9.98	0.0	9.98	6.00	9.95	0.99
*40	6.76	1.05	9.88	0.0	9.88	5.84	9.80	0.98
50	6.65	0.99	9.16	0.0	9.16	5.50	9.05	0.90
60	6.14	0.71	8.10	0.0	8.10	4.80	8.00	0.80
70	5.31	0.27	6.64	0.0	6.64	3.92	6.50	0.65
80	4.14	0.0	4.78	0.0	4.78	2.85	4.75	0.47
90	2.72	0.12	2.65	0.0	2.65	1.50	2.60	0.26
95	1.90	0.40	1.50	0.0	1.50	0.78	1.42	0.14
100	1.04	0.69	0.0	0.0	0.0	0.0	0.0	0.0
*33.2			10.00	0.0	10.00	0.0		

Per cent of chord.	REF. No. 119.	REF. No. 120.	REF. No. 121.	REF. No. 122.				
	Curtiss.	DeH-2.	DeH-3.	F. 2. B.	Ordinates.			
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.43	1.43	2.00	2.00	2.30	2.30	0.8	0.8
1.25	3.50	0.22	2.80	1.30	3.15	1.60	1.87	0.3
2.5	4.25	0.07	3.40	0.95	3.78	1.12	2.7	0.1
*5	5.21	0.04	4.33	0.58	4.67	0.50	4.0	0.0
7.5	5.86	0.18	4.93	0.45	5.26	0.20	4.92	0.03
10	6.30	0.40	5.36	0.38	5.63	0.10	5.7	0.1
15	6.84	0.73	5.83	0.43	6.10	0.0	6.8	0.5
20	7.21	0.90	6.10	0.60	6.35	0.07	7.3	1.0
30	7.40	0.90	6.45	0.83	6.53	0.33	7.6	1.7
40	7.21	0.83	6.50	0.86	6.57	0.57	7.6	1.6
50	6.83	0.73	6.44	0.87	6.47	0.57	7.3	1.4
60	6.13	0.52	5.73	0.77	6.03	0.50	6.1	1.1
70	5.28	0.42	5.31	0.62	5.35	0.35	5.8	0.8
80	4.08	0.28	4.07	0.43	4.20	0.17	4.5	0.4
*90	2.35	0.15	2.53	0.23	2.73	0.0	2.9	0.1
95	1.37	0.07	1.70	0.12	1.93	0.10	1.8	0.0
*100	0.13	0.13	0.40	0.40	0.70	0.70	0.3	0.3
*3.3		0.0						
*88.0						0.0		
*98.3		0.0						

Per cent of chord.	REF. No. 123.	REF. No. 124.	REF. No. 125.	REF. No. 126.				
	Fairey.	H. P. 166.	H. P. 166a.	H. P. 166b.	Ordinates.			
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.13	0.13	0.70	0.70	0.0	0.0	0.0	0.0
*1.25	1.90	0.08	2.62	0.02	2.62	0.33	2.62	0.66
2.5	3.06	0.03	3.55	0.05	3.55	0.33	3.55	0.63
5	4.86	0.07	5.14	0.15	5.14	0.35	5.14	0.60
7.5	6.20	0.40	6.25	0.30	6.25	0.40	6.25	0.60
10	7.10	0.70	7.00	0.40	7.00	0.50	7.00	0.60
15	8.10	1.10	8.00	0.60	8.00	0.63	8.00	0.61
20	8.85	1.46	8.50	0.72	8.50	0.72	8.50	0.72
30	9.40	1.80	8.84	0.88	8.84	0.88	8.84	0.88
40	9.22	1.80	8.72	0.96	8.72	0.96	8.72	0.96
50	8.72	1.67	8.20	0.85	8.20	0.85	8.20	0.85
60	7.83	1.47	7.36	0.68	7.36	0.68	7.36	0.68
70	6.45	1.10	6.28	0.46	6.28	0.46	6.28	0.46
80	4.85	0.70	4.90	0.30	4.90	0.30	4.90	0.30
90	2.90	0.33	3.27	0.14	3.27	0.14	3.27	0.14
95	1.83	0.17	2.28	0.08	2.28	0.08	2.28	0.08
100	0.67	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*0.7			0.0					

AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

Per cent of chord.	REF. No. 127.	REF. No. 128.	REF. No. 129.	REF. No. 130.				
	H. P. 166c.	N. P. L. 4.	N. P. L. 4a.	N. P. L. 4b.	Ordinates.			
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.25	2.62	0.94	2.30	0.0	2.3	0.46	2.30	0.92
2.5	3.55	0.88	3.73	0.0	3.73	0.746	3.73	1.49
5	5.14	0.75	5.70	0.0	5.70	1.14	5.70	2.28
7.5	6.25	0.71	7.13	0.0	7.13	1.43	7.13	2.85
10	7.00	0.70	8.00	0.0	8.00	1.60	8.00	3.20
15	8.00	0.70	9.10	0.0	9.10	1.82	9.10	3.64
20	8.50	0.72	9.70	0.0	9.70	1.94	9.70	3.88
30	8.84	0.88	9.90	0.0	9.90	1.98	9.90	3.96
40	8.72	0.96	9.70	0.0	9.70	1.94	9.70	3.88
50	8.20	0.85	8.80	0.0	8.80	1.76	8.80	3.52
60	7.36	0.68	7.80	0.0	7.80	1.56	7.80	3.12
70	6.28	0.46	6.30	0.0	6.30	1.26	6.30	2.92
80	4.90	0.30	4.50	0.0	4.50	0.90	4.50	1.80
90	3.27	0.14	2.50	0.0	2.50	0.50	2.50	1.00
95	2.28	0.08	1.40	0.0	1.40	0.28	1.40	0.56
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Per cent of chord.	REF. No. 131.	REF. No. 132.	REF. No. 133.	REF. No. 134.				
	N. P. L. 4c.	N. P. L. 4ca.	N. P. L. 4cb.	N. P. L. 4cy.	Ordinates.			
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	1.50	1.50	2.39	2.39	3.90	3.90
1.25	2.3	1.38	3.50	0.0	4.30	0.32	6.60	1.00
2.5	3.73	2.24	4.60	0.25	5.35	0.0	7.50	0.25
5	5.70	3.42	6.20	1.90	6.90	0.58	8.30	0.15
7.5	7.13	4.28	7.30	3.25	7.90	2.20	8.86	1.64
10	8.00	4.80	8.10	4.10	8.50	3.60	9.20	3.30
15	9.10	5.46	9.20	5.20	9.26	5.00	9.56	4.20
20	9.70	5.82	9.70	5.80	9.70	5.60	9.80	5.03
30	9.90	5.95	9.90	5.90	9.90	5.90	9.90	5.90
40	9.70	5.82	9.70	5.80	9.70	5.80	9.70	5.80
50	8.80	5.28	8.80	5.30	8.80	5.30	8.80	5.30
60	7.80	4.68	7.80	4.70	7.80	4.70	7.80	4.70
70	6.30	3.73	6.30	3.80	6.30	3.80	6.30	3.80
80	4.50	2.70	4.50	2.70	4.50	2.70	4.50	2.70
90	2.50	1.50	2.50	1.50	2.50	1.50	2.50	1.50
95	1.40	0.84	1.40	0.80	1.40	0.80	1.40	0.80
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Per cent of chord.	REF. No. 135.	REF. No. 136.	REF. No. 137.	REF. No. 138.				
	N. P. L. 73.	N. P. L. 214.	Portholme.	Scout E.	Ordinates.			
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.50	0.50	0.0	0.0	1.00	1.00	1.10	1.10
1.25	2.80	0.0	2.20	0.31	2.15	+0.40	2.50	0.50
2.5	3.95	0.08	3.50	0.70	3.00	0.12	3.50	0.20
5	5.40	0.20	5.25	1.25	4.30	0.02	4.90	0.0
7.5	6.28	0.34	6.58	1.70	5.08	-0.04	5.82	0.02
10	6.90	0.40	7.50	2.09	5.80	-0.10	6.40	0.10
15	7.95	0.60	8.78	2.70	6.70	-0.20	7.10	0.40
20	8.50	0.80	9.51	3.25	7.20	-0.27	7.40	0.70
30	8.80	1.00	9.99	3.90	7.50	-0.35	7.50	1.10
40	8.70	1.00	9.84	3.60	7.34	-0.30	7.30	1.20
50	8.30	0.90	9.21	3.20	6.93	-0.25	7.00	1.10
60	7.30	0.70	7.92	2.55	6.30	-0.20	6.50	0.80
70	6.20	0.50	6.39	1.98	5.50	-0.12	5.60	0.40
80	5.00	0.30	4.73	1.30	4.30	-0.10	4.30	0.20
90	3.30	0.10	2.72	0.67	2.60	-0.05	2.90	0.0
95	2.10	0.05	1.65	0.32	1.65	-0.02	2.00	0.0
*100	0.40	0.40	0.50	0.0	0.20	+0.02	0.30	0.30
*97.5						0.0		

Per cent of chord.	REF. No. 139.	REF. No. 140.	REF. No. 141.	REF. No. 142.				
	Sopwith.	White.	C. & L.—A. 1.	C. & L.—A. 2.	Ordinates.			
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.80	0.80	0.58	0.58	Rad.=1.04.		Rad.=1.04.	
1.25	2.40	0.20	2.33	0.02	2.15	0.0	2.167	0.0
*2.5	3.15	0.05	3.23	0.16	2.40	0.0	2.45	0.0
5	4.30	0.0	4.55	0.70	2.97	0.0	3.07	0.0
7.5	5.20	0.0	5.50	1.13	3.46	0.0	3.57	0.0
10	5.90	0.0	6.20	1.55	3.91	0.0	4.08	0.0
15	7.00	0.25	7.20	2.20	4.75	0.0	5.01	0.0
20	7.80	0.55	7.67	2.68	5.49	0.0	5.77	0.0
30	8.60	1.10	7.70	3.22	6.64	0.0	7.00	0.0
40	8.40	1.00	6.83	3.48	7.30	0.0	7.73	0.0
50	7.80	0.70	5.70	3.30	7.50	0.0	8.00	0.0
60	7.00	0.30	7.81	2.90	7.30	0.0	7.73	0.0
70	5.80	0.0	7.10	2.40	6.64	0.0	7.00	0.0
80	4.40	0.0	5.42	1.76	5.49	0.0	5.77	0.0
90	2.80	0.0	3.26	0.91	3.91	0.0	4.08	0.0
95	1.80	0.0	2.05	0.46	2.97	0.0	3.07	0.0
*100	0.60	0.60	0.24	0.24	Rad.=1.04.		Rad.=1.04.	
*1.5			2.59	0.0				
*99.6			0.88	0.0				

Per cent of chord.	REF. No. 143.	REF. No. 144.	REF. No. 145.	REF. No. 146.				
	C. & L.—A. 3.	C. & L.—A. 4.	C. & L.—A. 5.	C. & L.—A. 6.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	Rad.=1.04.		Rad.=1.04.		Rad.=1.04.		Rad.=1.04.	
1.25	2.184	0.0	2.20	0.0	2.30	0.0	2.40	0.0
2.5	2.50	0.0	2.56	0.0	2.75	0.0	3.10	0.0
5	3.19	0.0	3.37	0.0	3.75	0.0	4.50	0.0
7.5	3.80	0.0	4.08	0.0	4.65	0.0	5.83	0.0
10	4.44	0.0	4.79	0.0	5.54	0.0	7.07	0.0
15	5.51	0.0	6.00	0.0	7.05	0.0	9.21	0.0
20	6.44	0.0	7.07	0.0	8.42	0.0	11.07	0.0
30	7.88	0.0	8.71	0.0	10.43	0.0	13.84	0.0
40	8.72	0.0	9.67	0.0	11.62	0.0	15.45	0.0
50	9.00	0.0	10.00	0.0	12.00	0.0	16.00	0.0
60	8.72	0.0	9.67	0.0	11.62	0.0	15.45	0.0
70	7.88	0.0	8.71	0.0	10.43	0.0	13.84	0.0
80	6.44	0.0	7.07	0.0	8.42	0.0	11.07	0.0
90	4.44	0.0	4.79	0.0	5.54	0.0	7.07	0.0
95	3.19	0.0	3.37	0.0	3.75	0.0	4.50	0.0
100	Rad.=1.04.		Rad.=1.04.		Rad.=1.04.		Rad.=1.04.	

Per cent of chord.	REF. No. 147.	REF. No. 148.	REF. No. 149.	REF. No. 150.				
	C. & L.—A. 7.	C. & L.—B. 1.	C. & L.—B. 2.	C. & L.—B. 3.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	Rad.=1.04.		Rad.=1.04.		Rad.=1.04.		Rad.=1.04.	
1.25	2.50	0.0	2.20	0.0	2.30	0.0	2.30	0.0
2.5	3.50	0.0	2.60	0.0	2.70	0.0	2.80	0.0
5	5.42	0.0	3.28	0.0	3.40	0.0	3.65	0.0
7.5	7.14	0.0	3.91	0.0	4.08	0.0	4.44	0.0
10	8.76	0.0	4.45	0.0	4.75	0.0	5.15	0.0
15	11.53	0.0	5.49	0.0	5.77	0.0	6.44	0.0
20	13.87	0.0	6.28	0.0	6.65	0.0	7.45	0.0
30	17.36	0.0	7.30	0.0	7.73	0.0	8.72	0.0
*40	19.34	0.0						
50	20.00	0.0	7.30	0.0	7.73	0.0	8.72	0.0
60	19.34	0.0	6.85	0.0	7.15	0.0	8.10	0.0
70	17.36	0.0	6.00	0.0	6.30	0.0	7.05	0.0
80	13.87	0.0	4.90	0.0	5.15	0.0	5.70	0.0
90	8.76	0.0	3.55	0.0	3.70	0.0	3.95	0.0
95	5.42	0.0	2.75	0.0	2.85	0.0	2.95	0.0
100	Rad.=1.04.		Rad.=1.04.		Rad.=1.04.		Rad.=1.04.	
*37.5			7.50	0.0	8.00	0.0	9.00	0.0

Per cent of chord.	REF. No. 151.	REF. No. 152.	REF. No. 153.	REF. No. 154.				
	C. & L.—B. 4.	C. & L.—B. 5.	C. & L.—B. 6.	C. & L.—B. 7.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	Rad.=1.04.		Rad.=1.04.		Rad.=1.04.		Rad.=1.04.	
1.25	2.30	0.0	2.45	0.0	2.64	0.0	2.80	0.0
2.5	2.80	0.0	3.10	0.0	3.55	0.0	4.15	0.0
5	3.80	0.0	4.35	0.0	5.35	0.0	6.55	0.0
7.5	4.79	0.0	5.54	0.0	7.07	0.0	8.75	0.0
10	5.60	0.0	6.55	0.0	8.50	0.0	10.65	0.0
15	7.07	0.0	8.42	0.0	11.07	0.0	13.87	0.0
20	8.20	0.0	9.84	0.0	13.00	0.0	16.25	0.0
30	9.67	0.0	11.62	0.0	15.45	0.0	19.34	0.0
*40								
50	9.67	0.0	11.62	0.0	15.45	0.0	19.34	0.0
60	8.90	0.0	10.70	0.0	14.20	0.0	17.88	0.0
70	7.75	0.0	9.30	0.0	12.20	0.0	15.45	0.0
80	6.20	0.0	7.30	0.0	9.60	0.0	11.95	0.0
90	4.25	0.0	4.85	0.0	6.00	0.0	7.50	0.0
95	3.10	0.0	3.40	0.0	3.95	0.0	4.72	0.0
100	Rad.=1.04.		Rad.=1.04.		Rad.=1.04.		Rad.=1.04.	
*37.5	10.00	0.0	12.00	0.0	16.00	0.0	20.00	0.0

Per cent of chord.	REF. No. 155.	REF. No. 156.	REF. No. 157.	REF. No. 158.				
	Eiffel 8.	Eiffel 9.	Eiffel 10.	Eiffel 11.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	3.60	3.60	2.73	0.0		0.0
1.25	0.66	0.12	6.35	1.0	2.96	0.32		0.20
2.5	1.24	0.32	7.28	0.22	3.23	0.60		0.40
*5	2.40	0.70	8.60	0.21	3.75	1.17		0.80
7.5	3.55	1.10	9.60	1.73	4.23	1.70		1.20
10	4.55	1.40	10.45	3.25	4.68	2.23		1.60
15	6.62	2.18	11.80	5.75	5.50	3.15		2.30
20	8.45	3.00	12.70	7.35	6.14	3.90		3.00
30	10.20	3.80	13.70	8.45	7.01	4.86		3.96
40	10.65	4.05	13.75	8.33	7.18	5.27		4.12
50	10.20	3.85	12.83	7.70	6.93	5.18		3.64
60	9.18	3.50	11.25	6.70	6.23	4.56		2.93
70	7.45	2.80	9.10	5.45	5.10	3.70		2.19
80	5.26	1.95	6.64	4.00	3.70	2.55		1.46
90	2.75	1.00	3.65	2.06	2.20	1.27		0.76
95	1.43	0.45	2.12	1.30	1.43	0.65		0.35
100	0.0	0.0	0.50	0.0	0.64	0.0		0.0
*3.75			0.0					

1.83 thick.

AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

Per cent of chord.	REF. NO. 159.	REF. NO. 160.	REF. NO. 161.	REF. NO. 162.				
	Eiffel 12.	Eiffel 13.	Eiffel 13 bis.	Eiffel 14.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.53	0.53	0.80	.80	0.70	0.70	1.25	1.25
1.25	1.43	0.10	2.88	0.12	2.06	0.16	2.75	0.0
2.5	1.60	0.16	4.20	0.88	2.85	0.45	3.28	0.15
5	1.84	0.30	6.10	2.10	4.15	1.50	4.20	0.60
7.5	2.08	0.43	7.40	3.60	5.10	1.58	4.95	1.05
10	2.30	0.53	8.30	3.80	5.83	2.05	5.60	1.40
15	2.68	0.65	9.30	4.90	6.90	2.80	6.60	2.10
20	2.85	0.74	9.70	5.65	7.58	3.35	7.25	2.73
30	3.10	0.85	9.75	6.10	8.00	3.65	7.78	3.80
40	3.05	0.84	9.40	5.93	7.40	3.22	7.55	4.27
50	2.95	0.75	8.60	5.45	6.45	2.73	6.95	4.30
60	2.80	0.60	7.43	4.60	5.40	2.13	6.05	3.90
70	2.50	0.48	5.95	3.50	4.28	1.58	4.90	3.30
80	1.96	0.30	4.25	2.33	3.10	1.04	3.50	2.40
90	1.05	0.14	2.43	1.16	1.95	0.45	2.00	1.25
95	0.68	0.06	1.56	0.58	1.31	0.23	1.24	0.60
100	0.30	0.0	0.55	0.0	0.65	0.0	0.45	0.0

Per cent of chord.	REF. NO. 163.	REF. NO. 164.	REF. NO. 165.	REF. NO. 166.				
	Eiffel 15.	Eiffel 16.	Eiffel 16a.	Eiffel 16b.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.90	1.90	0.0	0.0	0.0	0.0	0.0	0.0
1.25	3.37	0.32	1.00	0.0	1.74	0.0	3.10	0.0
2.5	3.60	0.06	1.85	0.0	2.86	0.0	5.05	0.0
5	3.86	0.15	3.17	0.0	4.80	0.0	7.87	0.0
7.5	3.93	0.26	4.24	0.0	6.36	0.0	9.80	0.0
10	3.95	0.37	5.15	0.0	7.70	0.0	11.22	0.0
15	3.82	0.43	6.30	0.0	9.38	0.0	12.83	0.0
20	3.60	0.34	6.66	0.0	9.99	0.0	13.32	0.0
30	3.13	0.0	6.25	0.0	9.63	0.0	13.05	0.0
40	2.92	0.16	5.33	0.0	8.66	0.0	11.99	0.0
50	2.90	0.56	4.63	0.0	7.33	0.0	10.30	0.0
60	2.95	1.15	3.79	0.0	5.99	0.0	8.46	0.0
70	3.20	1.83	2.90	0.0	4.57	0.0	6.42	0.0
80	3.75	2.70	1.99	0.0	3.13	0.0	4.39	0.0
90	4.50	3.80	1.10	0.0	1.76	0.0	2.42	0.0
95	4.94	4.42	0.65	0.0	1.05	0.0	1.43	0.0
100	5.40	5.10	0.0	0.0	0.0	0.0	0.0	0.0

Per cent of chord.	REF. NO. 167.	REF. NO. 168.	REF. NO. 169.	REF. NO. 170.				
	Eiffel 16c.	Eiffel 16d.	Eiffel 17.	Eiffel 18.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.0	0.0	0.0	0.0	-----	-----
1.25	4.75	0.0	7.25	0.0	0.83	0.0	-----	-----
2.5	7.20	0.0	10.15	0.0	1.25	0.0	-----	-----
5	10.57	0.0	13.65	0.0	2.06	0.0	-----	-----
7.5	12.80	0.0	15.93	0.0	2.80	0.0	-----	-----
10	14.38	0.0	17.56	0.0	3.53	0.0	-----	-----
15	16.10	0.0	19.42	0.0	4.75	0.0	-----	-----
20	16.65	0.0	19.99	0.0	5.66	0.0	6.65	0.0
30	16.05	0.0	19.37	0.0	6.54	0.0	6.50	0.0
40	14.66	0.0	17.99	0.0	6.54	0.0	6.10	0.0
50	12.86	0.0	15.83	0.0	6.00	0.0	5.35	0.0
60	10.66	0.0	12.99	0.0	5.30	0.0	4.35	0.0
70	8.00	0.0	9.83	0.0	4.18	0.0	3.35	0.0
80	5.33	0.0	6.66	0.0	3.00	0.0	2.35	0.0
90	2.84	0.0	3.50	0.0	1.75	0.0	1.40	0.0
95	1.56	0.0	1.90	0.0	1.10	0.0	0.90	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.40	0.0

Per cent of chord.	REF. NO. 171.	REF. NO. 172.	REF. NO. 173.	REF. NO. 174.				
	Eiffel 30.	Eiffel 31.	Eiffel 32.	Eiffel 33.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.20	0.0	0.0	0.0	1.00	1.00	1.10	-0.0
1.25	0.73	0.17	0.68	0.26	2.00	0.37	2.80	0.0
2.5	1.33	0.40	1.33	0.55	2.67	0.18	3.62	0.10
5	2.45	0.82	2.53	1.07	3.75	0.0	5.00	0.43
7.5	3.52	1.20	3.65	1.56	4.65	0.24	6.07	0.77
10	4.60	1.60	4.75	2.00	5.35	0.64	6.93	1.12
15	6.50	2.36	6.85	2.84	6.56	1.50	8.20	1.80
20	8.16	3.06	8.67	3.50	7.36	2.24	8.88	2.36
30	10.50	4.08	10.90	4.55	7.92	2.93	9.27	2.93
40	11.12	4.40	11.40	4.75	7.26	2.70	9.00	3.35
50	10.60	4.43	11.20	4.66	5.93	1.96	8.15	3.30
60	9.28	4.08	9.86	4.15	4.50	1.13	7.10	2.94
70	7.40	3.37	8.10	3.34	3.33	0.54	5.76	2.39
80	5.30	2.44	5.80	2.35	2.36	0.26	4.16	1.68
90	2.84	1.24	3.10	1.20	1.50	0.0	2.33	0.93
95	1.58	0.63	1.73	0.60	1.20	0.10	1.38	0.45
100	0.20	0.0	0.0	0.0	0.70	0.70	0.43	0.0

Per cent of chord.	REF. No. 175.	REF. No. 176.	REF. No. 177.	REF. No. 178.					
	Eiffel 34.	Eiffel 35.	Eiffel 36.	Eiffel 37.					
	Ordinates.								
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	
0	0.50	0.50	0.90	0.90	0.70	0.70	3.00	3.00	
1.25	1.65	0.10	2.28	0.08	1.90	0.23	3.60	1.80	
2.5	2.30	0.41	2.66	0.26	2.84	0.05	4.06	1.00	
*5	3.62	1.06	3.33	0.95	4.30	0.04	4.88	0.18	
7.5	4.90	1.67	4.03	1.56	5.28	0.15	5.60	0.02	
10	6.13	2.20	4.66	2.00	6.05	0.35	6.28	0.30	
15	8.25	3.45	5.76	2.76	7.05	0.76	7.25	1.06	
20	10.00	4.45	6.66	3.33	7.80	1.15	7.95	2.00	
30	11.90	5.40	7.70	4.32	8.66	1.78	8.50	3.30	
40	12.40	5.70	8.00	4.74	8.78	2.10	8.24	3.96	
50	11.50	5.20	7.95	5.00	8.40	2.30	7.60	4.10	
60	9.82	4.20	7.34	4.74	7.46	2.15	6.76	3.95	
70	7.95	3.30	6.22	4.33	5.92	1.86	5.55	3.50	
80	5.85	2.30	4.24	3.00	4.23	1.33	4.00	2.65	
90	3.56	1.20	2.16	1.40	2.34	0.70	2.33	1.50	
95	2.32	0.63	1.16	0.67	1.40	0.40	1.40	0.83	
100	1.00	0.0	0.10	0.10	0.40	0.0	0.0	0.0	
*4.4								0.0	

Per cent of chord.	REF. No. 179.	REF. No. 180.	REF. No. 181.	REF. No. 182.				
	Eiffel 38.	Eiffel 39.	Eiffel 40.	Eiffel 41.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.50	0.50	0.40	0.0	0.35	0.0	0.10	0.0
1.25	1.65	0.0	0.94	0.0	0.90	0.03	1.10	0.18
2.5	2.46	0.0	1.75	0.0	1.67	0.23	3.00	0.30
5	3.76	0.20	4.50	0.0	3.50	0.63	4.00	0.70
7.5	4.75	0.60	9.55	0.0	4.25	1.06	4.65	1.10
10	5.62	1.22	11.22	0.0	4.95	1.45	5.20	1.45
15	6.88	2.43	12.83	0.0	6.10	2.13	6.40	2.06
20	7.74	3.22	13.32	0.0	6.95	2.62	6.75	2.60
30	8.70	4.32	13.05	0.0	7.63	3.05	7.65	3.65
40	8.70	4.52	11.99	0.0	7.70	3.18	7.63	3.92
50	8.32	4.13	10.30	0.0	7.50	3.05	7.35	4.00
60	7.55	3.35	8.46	0.0	6.75	2.76	6.54	3.64
70	6.13	2.60	6.42	0.0	5.62	2.16	5.46	3.00
80	4.65	1.80	4.39	0.0	4.23	1.42	4.16	2.10
90	2.85	0.94	2.42	0.0	2.54	0.70	2.35	1.06
95	1.85	0.50	1.43	0.0	1.63	0.30	1.34	0.54
100	1.25	0.0	0.0	0.0	0.70	0.0	0.50	0.0

Per cent of chord.	REF. No. 183.	REF. No. 184.	REF. No. 185.	REF. No. 186.				
	Eiffel 42.	Eiffel 43.	Eiffel 44.	Eiffel 45.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.13	0.0	0.13	0.0	1.05	1.05	1.38	1.38
1.25	1.08	0.25	1.08	0.25	2.10	0.0	3.74	0.02
2.5	2.80	0.50	2.80	0.50	2.20	0.05	4.72	0.0
5	6.15	0.93	6.15	0.93	2.45	0.23	5.62	0.03
7.5	7.54	1.33	7.54	1.33	2.73	0.45	6.45	0.48
10	8.68	1.68	8.68	1.68	3.13	0.78	7.20	1.32
15	10.24	2.30	10.24	2.30	4.23	1.77	7.95	3.27
20	10.90	2.90	10.90	2.90	6.30	2.93	8.30	4.10
30	10.90	3.64	10.90	3.64	9.08	4.00	8.55	4.37
40	10.47	3.84	10.47	3.84	8.70	3.90	8.10	4.06
50	9.55	3.90	9.55	3.90	7.80	3.35	7.33	3.75
60	8.30	3.63	8.30	3.63	6.16	2.45	6.25	3.18
70	6.75	3.14	6.75	3.14	4.22	1.45	5.10	2.46
80	4.86	2.25	4.86	2.25	2.45	0.67	3.80	1.68
90	2.86	1.20	2.86	1.20	1.14	0.14	2.26	0.83
95	1.73	0.55	1.73	0.55	0.63	0.02	1.44	0.40
100	0.53	0.0	0.53	0.0	0.30	0.0	0.60	0.0

Per cent of chord.	REF. No. 187.	REF. No. 188.	REF. No. 189.	REF. No. 190.					
	Eiffel 46.	Eiffel 47.	Eiffel 48.	Eiffel 49.					
	Ordinates.								
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	
0	1.25	1.25	0.75	0.75	0.60	0.60	0.40	0.40	
1.25	2.30	0.08	2.35	0.06	2.55	0.14	2.12	0.0	
2.5	3.24	0.0	3.30	0.30	3.78	0.38	2.86	0.13	
5	5.07	0.32	4.93	0.78	5.40	0.80	4.00	0.56	
7.5	6.30	1.05	6.23	1.20	6.30	1.17	4.78	0.95	
10	6.96	1.90	7.12	1.60	6.65	1.50	5.38	1.30	
15	9.30	3.40	8.16	2.26	6.42	2.03	6.10	1.90	
20	10.60	4.70	8.68	2.75	6.08	2.40	6.26	2.27	
30	10.93	6.10	8.30	3.38	5.25	2.85	5.58	2.75	
*40	10.40	6.40	7.45	3.85	7.82	2.95	6.64	2.95	
50	9.24	6.00	6.03	4.00	7.40	2.80	6.53	2.94	
60	7.65	4.8	8.93	3.75	5.56	2.45	5.53	2.80	
*70	5.75	3.32	7.95	3.15	5.85	2.00	5.40	2.40	
80	3.65	1.76	5.90	2.20	6.53	1.43	5.55	1.66	
90	1.70	0.60	3.70	1.16	4.10	0.78	3.75	0.85	
95	1.00	0.16	2.45	0.56	2.72	0.40	2.37	0.40	
100	0.50	0.0	1.15	0.0	1.30	0.0	0.85	0.0	
*33.9								4.92	2.95
*66.82								4.28	2.31

AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

Per cent of chord.	REF. No. 191.	REF. No. 192.	REF. No. 193.	REF. No. 194.				
	Eiffel 52.	Eiffel 53.	Eiffel 54.	Eiffel 55.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.70	0.70	0.30	0.30	0.60	0.60	0.67	0.67
1.25	2.00	0.30	1.82	0.14	1.70	0.11	1.32	0.20
2.5	3.00	0.20	2.82	0.30	2.50	0.0	1.56	0.13
5	4.40	0.05	4.33	0.66	3.75	0.05	2.00	0.03
7.5	5.43	0.07	5.36	1.00	4.70	0.15	2.36	0.0
10	6.20	0.30	6.14	1.35	5.40	0.30	2.70	0.0
15	7.33	1.00	7.15	1.83	6.35	0.62	3.30	0.02
20	8.10	1.85	7.85	2.10	6.70	0.80	3.75	0.06
30	9.13	3.00	8.70	2.70	6.50	1.00	4.44	0.28
40	9.54	3.50	8.86	2.80	6.00	1.17	4.92	0.40
50	9.40	3.54	8.55	2.60	5.25	1.15	5.10	0.22
60	8.60	2.65	7.40	2.40	4.50	1.05	4.95	0.08
70	6.96	1.57	5.76	1.30	3.60	0.54	4.38	0.03
80	4.53	0.58	3.97	0.60	2.65	0.06	3.55	0.01
90	2.00	0.03	2.10	0.13	1.90	0.21	2.45	0.0
95	1.26	0.0	1.35	0.04	1.71	0.56	1.80	0.03
100	0.65	0.0	0.50	0.0	1.65	1.00	0.70	0.70

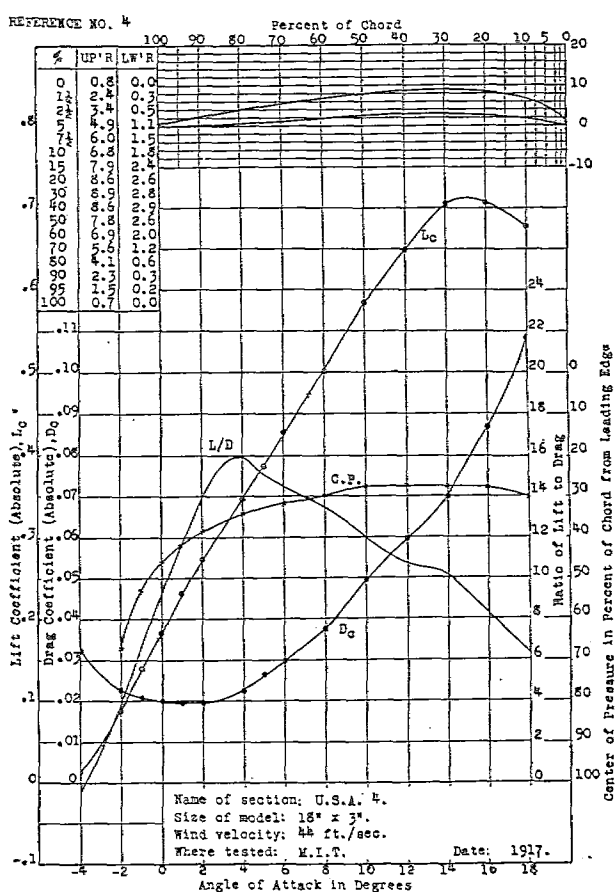
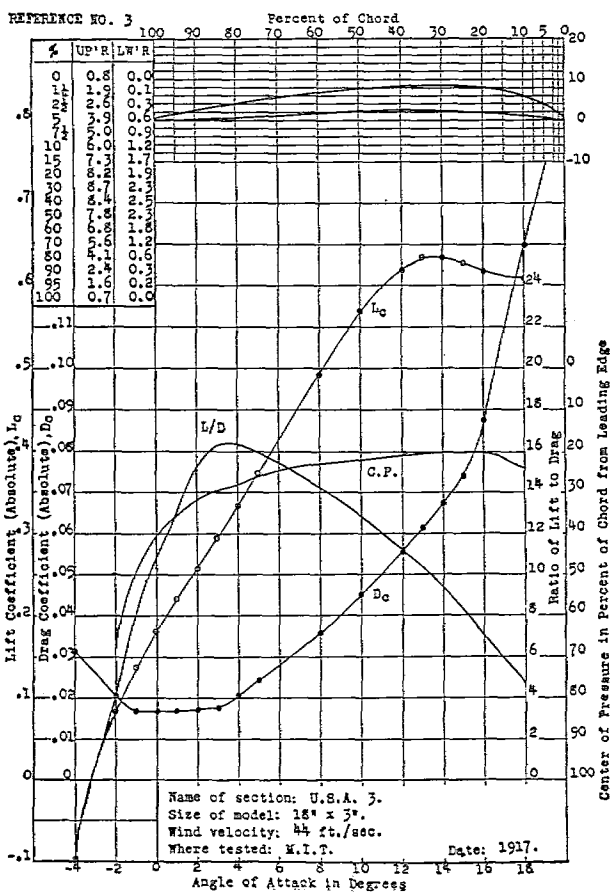
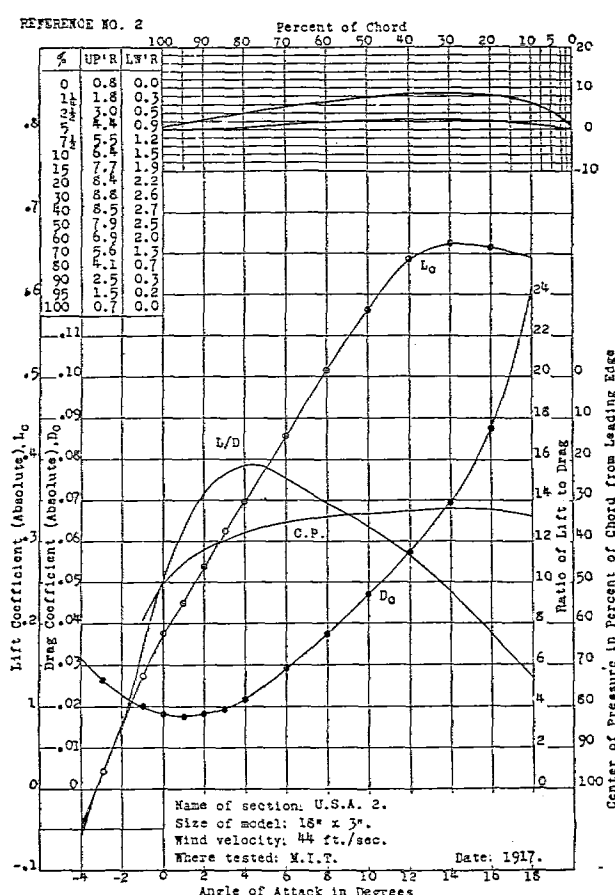
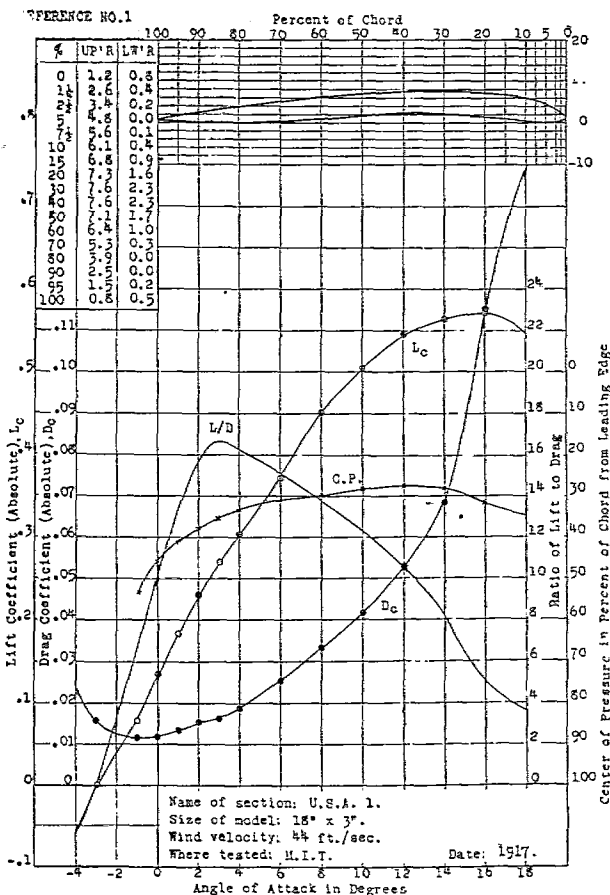
Per cent of chord.	REF. No. 195.	REF. No. 196.	REF. No. 197.	REF. No. 198.				
	Eiffel 56.	Eiffel 57.	Eiffel 58.	Eiffel 59.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	8.00	8.00	4.10	4.10	0.60	0.60
1.25	0.70	-0.64	12.70	3.50	7.06	1.14	1.95	0.15
2.5	0.90	-0.66	14.72	2.00	7.90	0.35	2.83	0.45
5	1.30	-0.70	17.55	0.50	8.90	0.0	4.46	1.03
7.5	1.62	-0.77	19.30	0.0	9.56	0.0	5.90	1.53
10	1.90	-0.85	20.60	0.0	9.90	0.0	7.13	2.00
*15	2.36	-1.00	22.40	0.0	9.92	0.0	9.37	2.84
20	2.66	-1.13	23.12	0.0	9.50	0.0	10.87	3.50
30	2.85	-1.55	22.00	0.0	8.50	0.0	13.30	4.55
40	2.86	-1.92	19.74	0.0	7.50	0.0	14.20	4.75
50	2.85	-2.24	16.94	0.0	6.43	0.0	13.66	4.66
60	2.76	-2.35	13.90	0.0	5.27	0.0	12.13	4.15
70	2.50	-2.40	10.60	0.0	4.05	0.0	9.75	3.34
80	1.94	-2.20	7.20	0.0	2.85	0.0	7.07	2.35
90	1.32	-1.70	3.78	0.0	1.62	0.0	3.72	1.20
95	0.90	-1.20	2.05	0.0	1.00	0.0	2.05	0.60
100	0.0	0.0	0.35	0.0	0.20	0.20	0.30	0.0
*12.5					10.00	0.0		

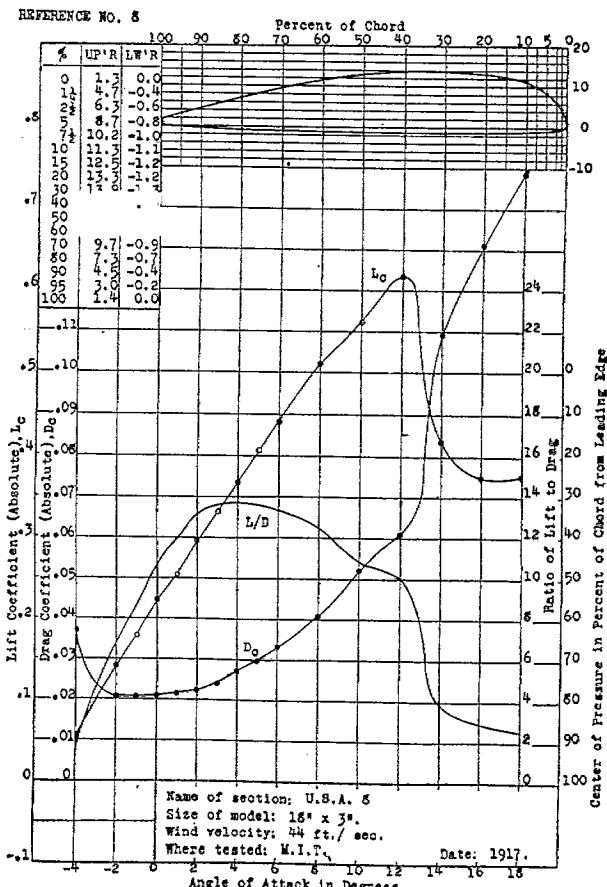
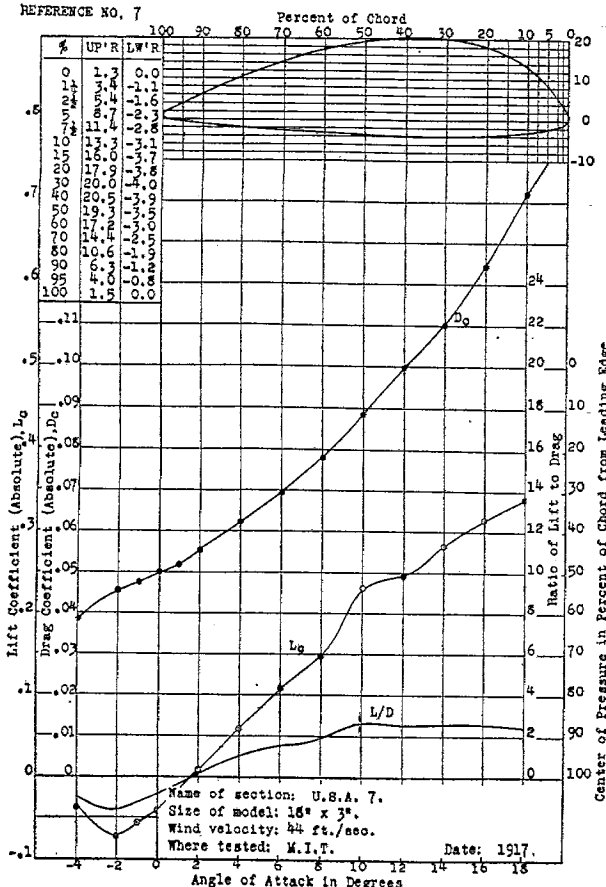
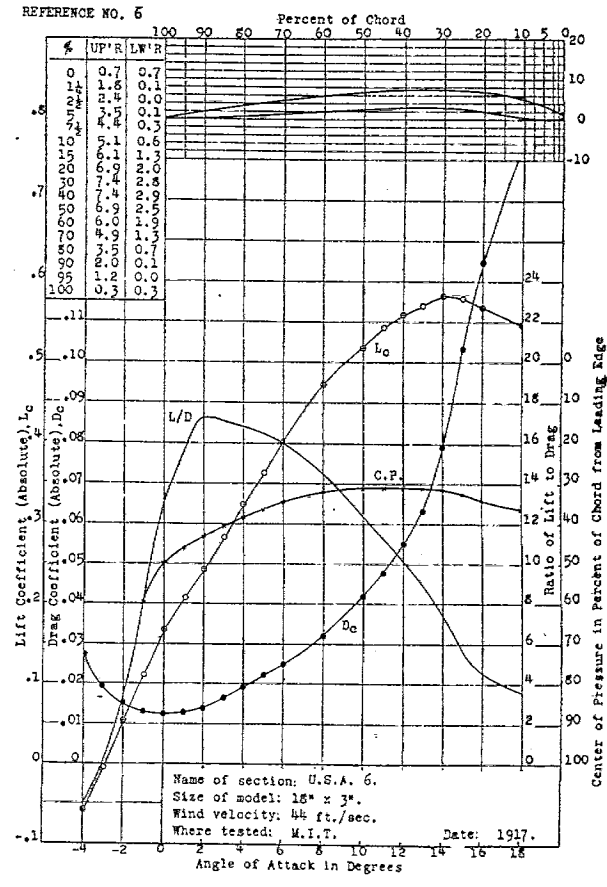
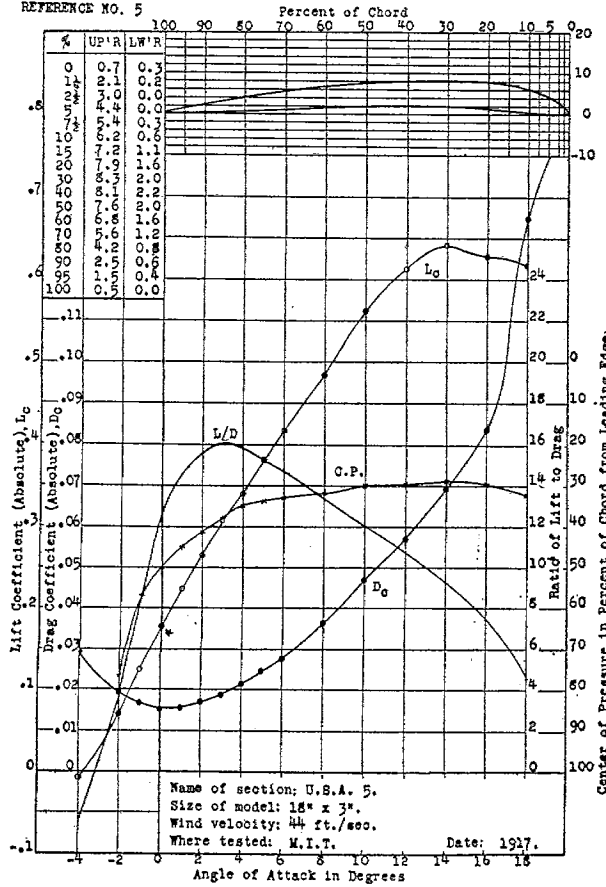
Per cent of chord.	REF. No. 199.	REF. No. 200.	REF. No. 201.	REF. No. 202.				
	Eiffel 60.	Eiffel 61.	Eiffel 62.	Dorand.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.60	0.60	0.60	0.60	0.60	0.60	1.00	1.00
1.25	2.22	0.15	2.30	0.15	2.40	0.15	2.25	0.03
2.5	3.37	0.45	3.73	0.45	3.94	0.45	2.70	0.23
5	5.50	1.03	6.18	1.03	6.80	1.03	3.50	0.63
7.5	7.28	1.53	8.33	1.53	9.34	1.53	4.25	1.06
10	8.87	2.00	10.26	2.00	11.70	2.00	4.95	1.45
15	11.57	2.84	13.63	2.84	15.56	2.84	6.10	2.13
20	13.73	3.50	16.40	3.50	18.60	3.50	6.95	2.62
30	16.55	4.55	19.87	4.55	23.00	4.55	7.63	3.05
40	17.73	4.75	21.06	4.75	24.53	4.75	7.70	3.18
50	16.84	4.66	19.85	4.66	23.00	4.66	7.50	3.05
60	15.00	4.15	17.33	4.15	19.90	4.15	6.75	2.76
70	12.15	3.34	13.65	3.34	16.00	3.34	5.62	2.16
80	8.73	2.35	9.67	2.35	11.33	2.35	4.23	1.42
90	4.65	1.20	5.15	1.20	6.03	1.20	2.54	0.70
95	2.50	0.60	2.75	0.60	3.20	0.60	1.68	0.30
100	0.35	0.0	0.40	0.0	0.40	0.0	0.70	0.0

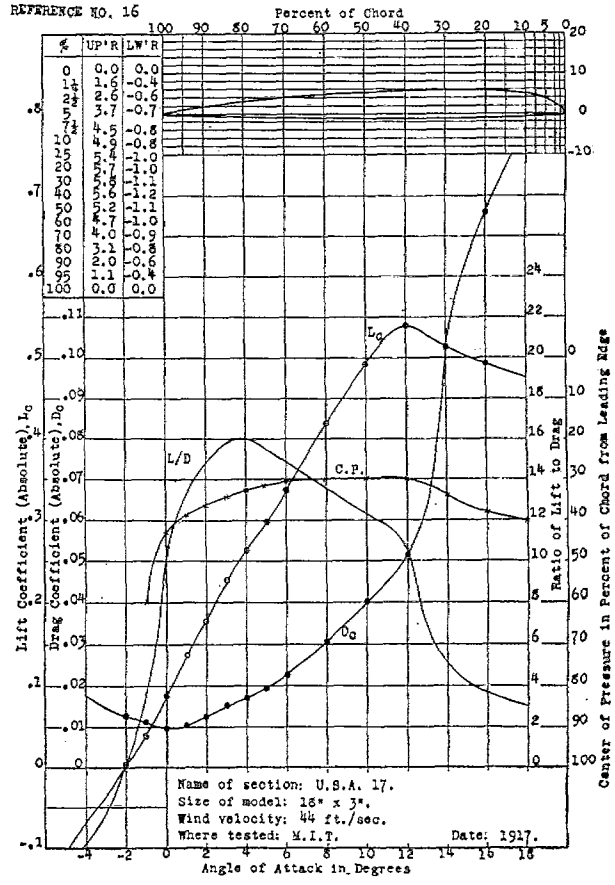
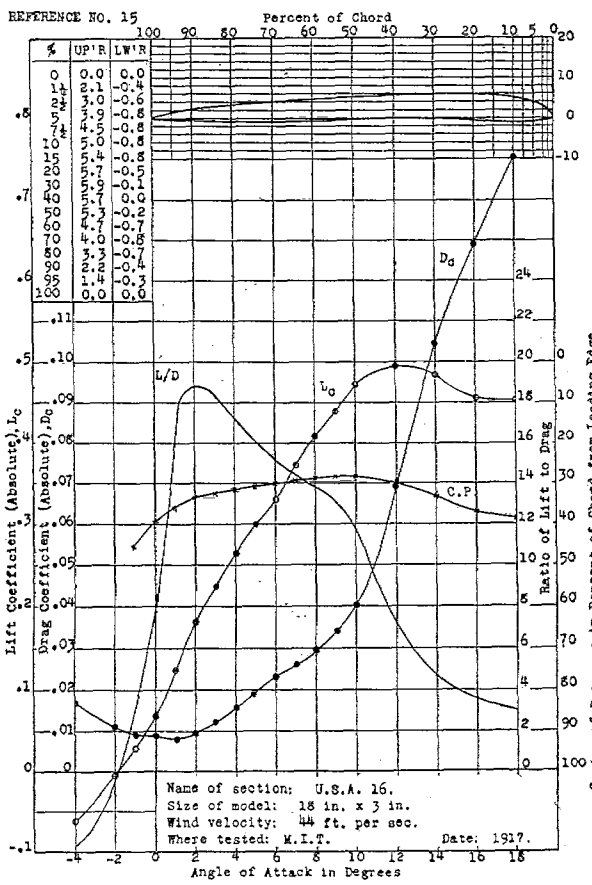
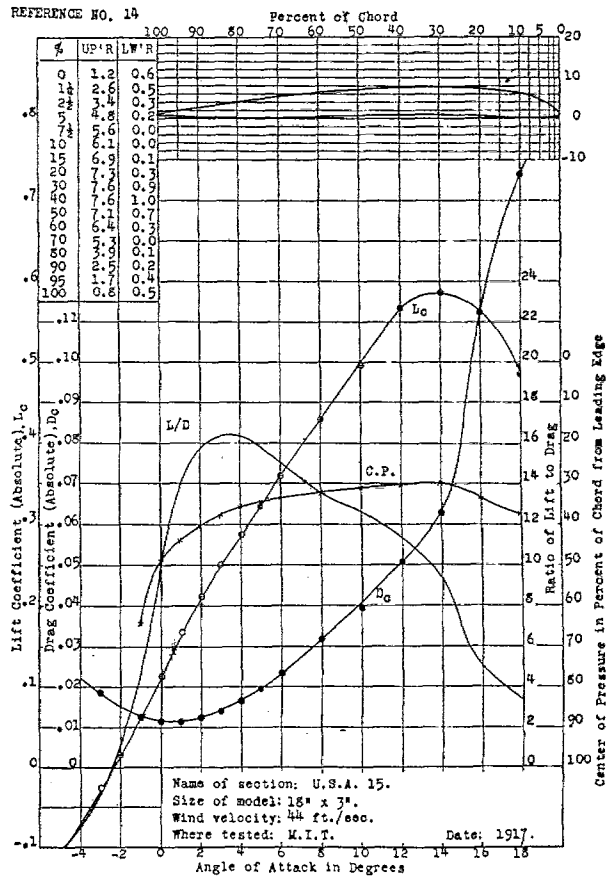
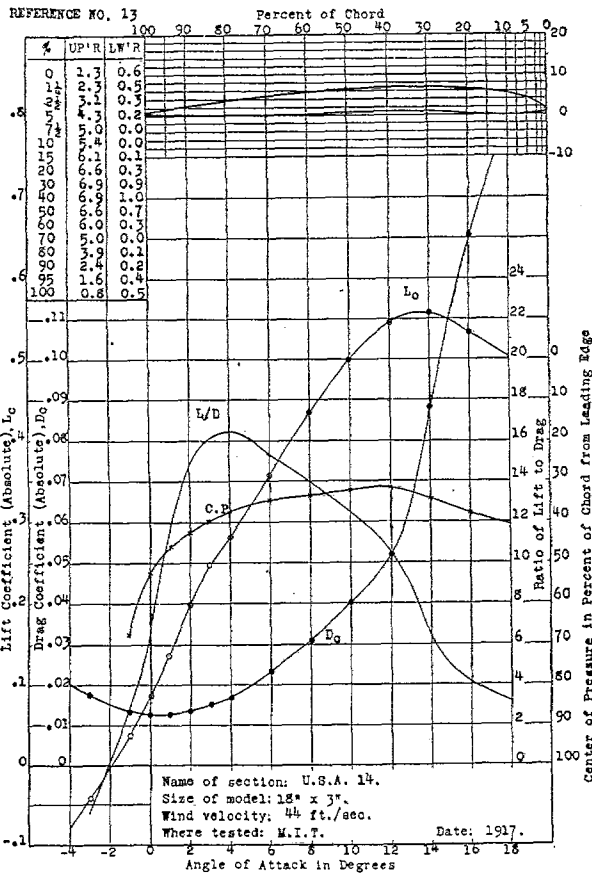
Per cent of chord.	REF. No. 203.	REF. No. 204.	REF. No. 205.	REF. No. 206.				
	Halbronn 2.	Halbronn 3.	S. E. A.	St. Cyr. 1.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	2.73	2.73	0.75	0.75	0.90	0.90	0.25	0.25
1.25	3.72	1.35	1.70	0.25	2.00	0.50	0.70	0.0
2.5	4.52	0.66	2.36	0.0	2.80	0.33	0.96	0.0
5	5.66	0.0	3.39	0.0	4.05	0.03	1.45	0.0
7.5	6.55	0.0	4.30	0.08	4.90	0.0	1.88	0.0
10	7.27	0.0	4.99	0.18	5.55	0.10	2.26	0.0
15	8.00	0.10	5.90	0.40	6.45	0.35	2.76	0.0
20	8.30	0.37	6.41	0.56	6.95	0.65	3.00	0.0
30	8.48	0.66	6.78	0.94	7.30	1.00	3.10	0.0
40	8.12	0.75	6.60	1.22	7.20	0.95	3.10	0.0
50	7.36	0.66	6.02	0.94	6.90	0.65	3.10	0.0
60	6.42	0.48	5.18	0.66	6.27	0.27	3.10	0.0
70	5.28	0.23	4.20	0.37	5.42	0.12	3.10	0.0
80	4.20	0.09	3.15	0.19	4.10	0.03	3.00	0.0
90	2.64	0.0	1.85	0.0	2.25	0.03	2.11	0.0
95	1.63	0.15	1.15	0.05	1.20	0.0	1.38	0.0
100	0.47	0.47	0.47	0.19	0.0	0.0	0.25	0.25

Per cent of chord.	REF. No. 207.	REF. No. 208.	REF. No. 209.	REF. No. 210.				
	St. Cyr. 2.	St. Cyr. 3.	Turin 1.	Turin 2.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	1.10	1.10	2.30	2.30	0.65	0.65	0.60	0.60
1.25	2.00	0.25	3.65	1.25	1.85	0.0	1.80	0.05
2.5	2.45	0.0	4.60	0.60	2.52	0.10	2.55	0.15
5	3.25	0.50	5.85	0.0	3.60	0.30	3.80	0.55
7.5	3.85	1.10	6.60	0.40	4.42	0.60	4.65	0.95
10	4.25	1.70	7.20	1.00	5.00	0.90	5.25	1.30
15	5.05	2.50	8.00	2.10	5.55	1.35	5.80	1.75
20	5.65	3.00	8.50	3.10	5.75	1.60	6.07	2.00
30	6.40	3.50	9.35	4.60	5.80	1.70	6.20	2.10
40	6.25	3.25	9.85	5.25	5.70	1.60	5.90	1.75
50	5.75	2.85	9.80	5.20	5.15	1.35	5.50	1.40
60	4.95	2.40	9.40	4.45	4.28	0.80	4.82	1.10
70	4.00	1.90	8.20	3.30	3.30	0.40	3.95	0.70
80	2.90	1.25	5.85	1.95	2.35	0.0	3.15	0.50
90	1.70	0.65	2.90	0.40	1.40	0.0	1.90	0.20
95	1.10	0.30	1.85	0.0	1.00	0.0	1.29	0.05
100	0.30	0.30	1.00	1.00	0.40	0.40	0.40	0.40

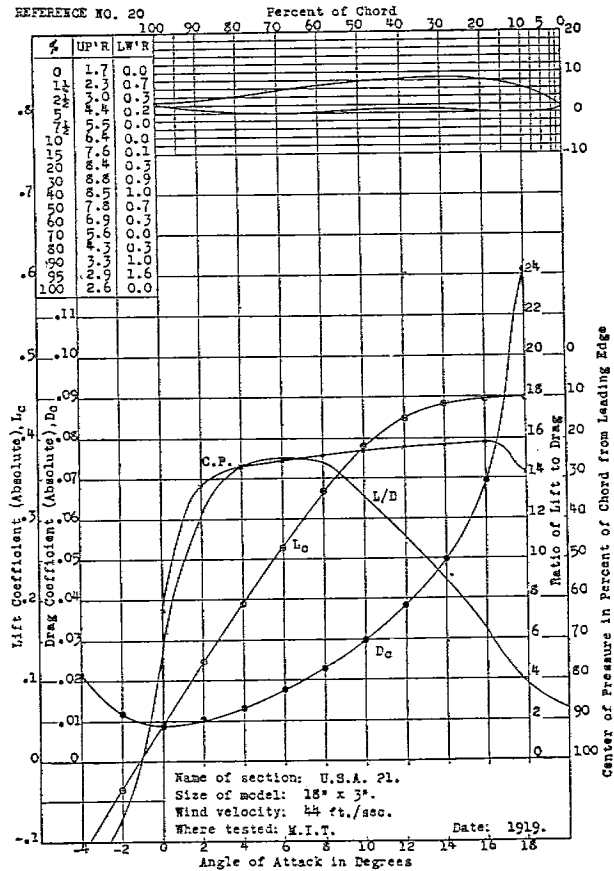
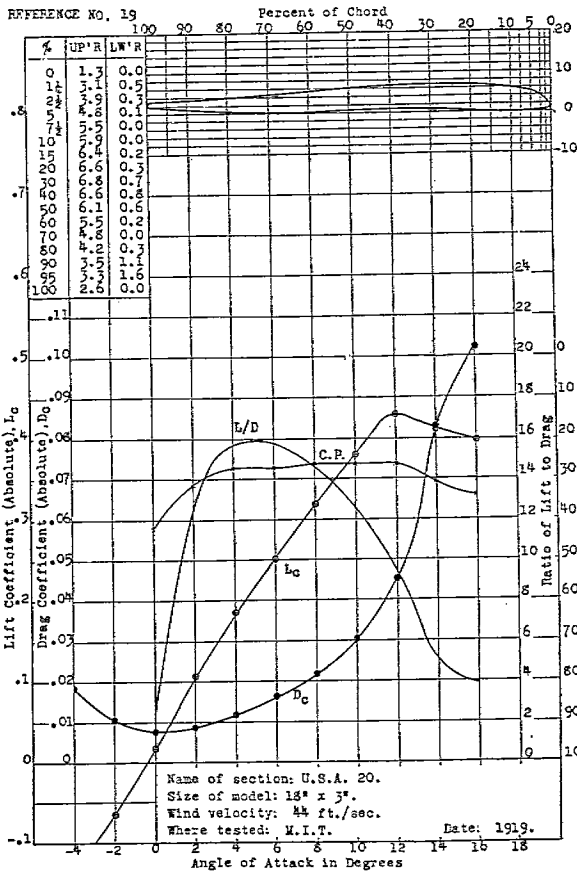
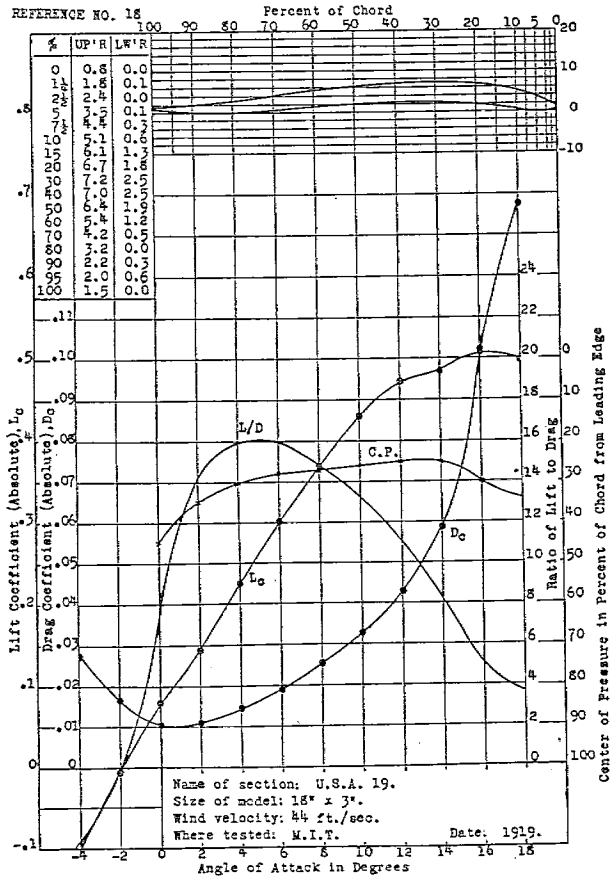
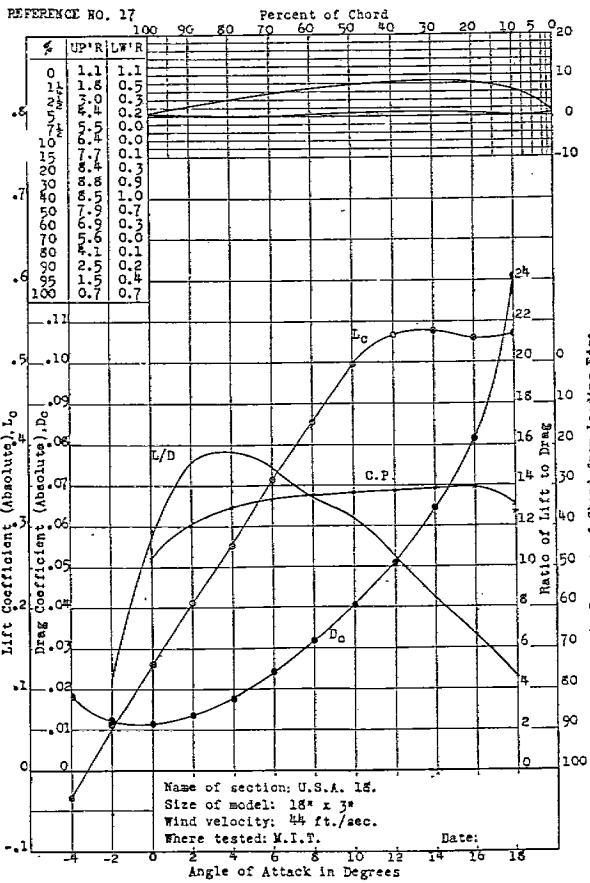
Per cent of chord.	REF. No. 211.	REF. No. 212.	REF. No. 213.	REF. No. 214.				
	Bleriot 3-pl.	Italian 1.	Italian 2.	Italian 3.				
	Ordinates.							
	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
0	0.0	0.0	0.58	0.58	0.80	0.80	0.65	0.65
1.25	2.40	0.0	1.40	0.10	1.60	0.30	2.10	0.15
2.5	3.20	0.0	2.10	0.0	2.22	0.05	3.05	0.0
5	4.30	0.0	3.12	0.05	3.35	0.08	4.36	0.18
7.5	4.80	0.0	3.90	0.20	4.20	0.20	5.20	0.70
10	5.30	0.0	4.58	0.48	4.90	0.45	5.87	1.38
15	5.60	0.0	5.48	1.12	6.05	1.10	6.60	2.10
20	5.70	0.0	6.00	1.83	6.67	1.65	7.00	2.40
30	6.00	0.0	6.35	2.42	7.40	2.70	7.15	2.50
40	5.80	0.0	6.14	2.48	7.50	3.00	6.95	2.37
50	5.20	0.0	5.70	2.00	7.18	2.80	6.38	2.10
60	4.60	0.0	5.05	1.47	6.70	2.50	5.58	1.68
70	3.70	0.0	3.95	0.93	5.40	1.75	4.72	1.17
80	2.60	0.0	2.55	0.60	3.80	0.73	3.70	0.62
90	1.60	0.0	1.37	0.28	2.00	0.35	2.18	0.30
95	1.05	0.0	0.75	0.20	1.30	0.38	1.27	0.0
100	0.45	0.0	0.25	0.25	0.38	0.38	0.0	0.0



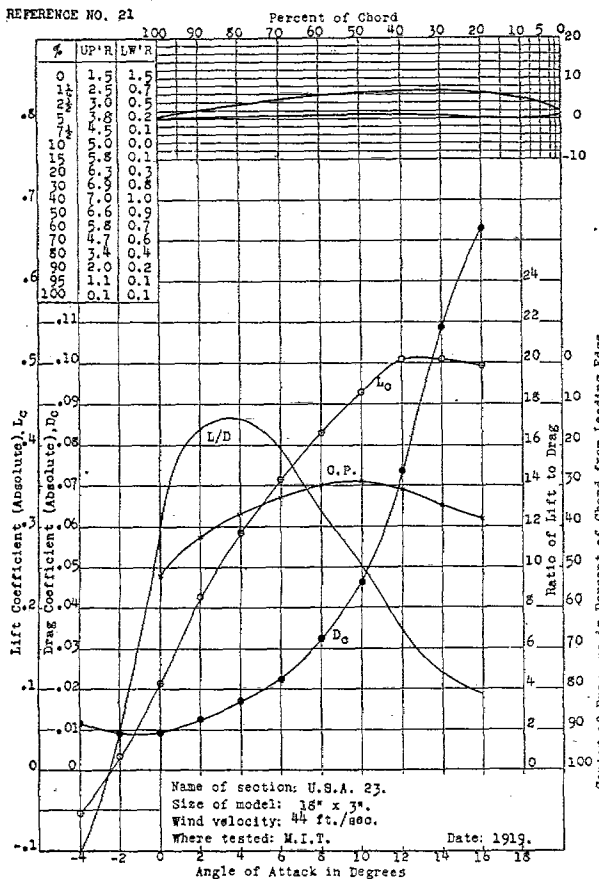




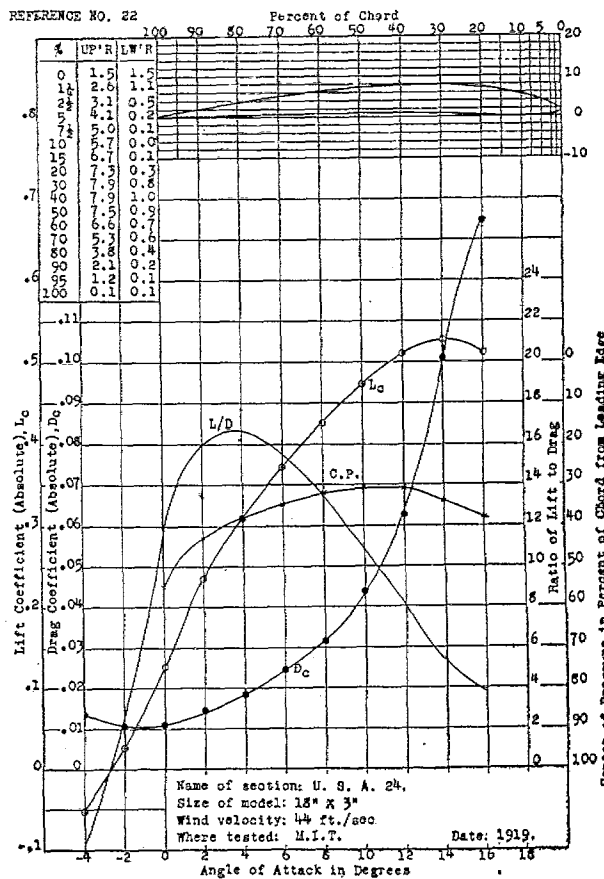
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.



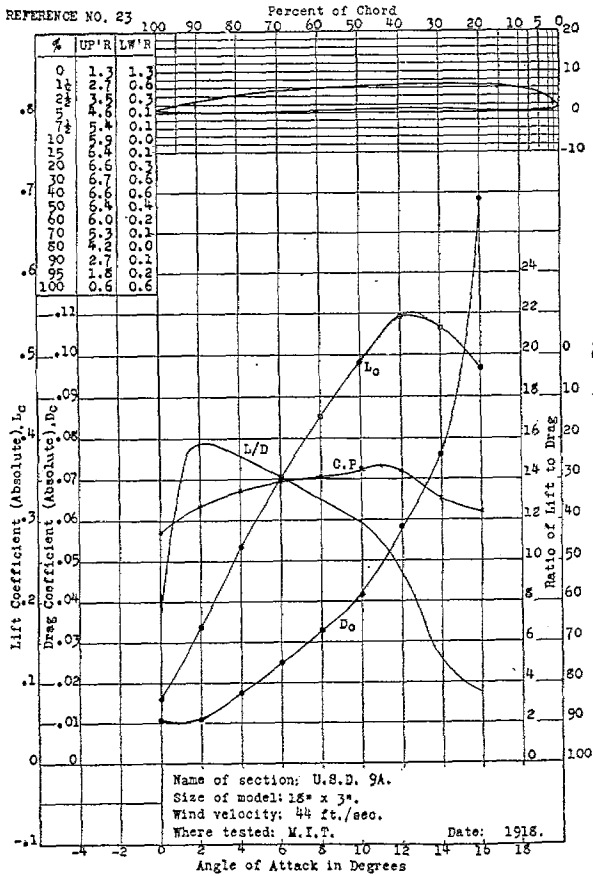
REFERENCE NO. 21



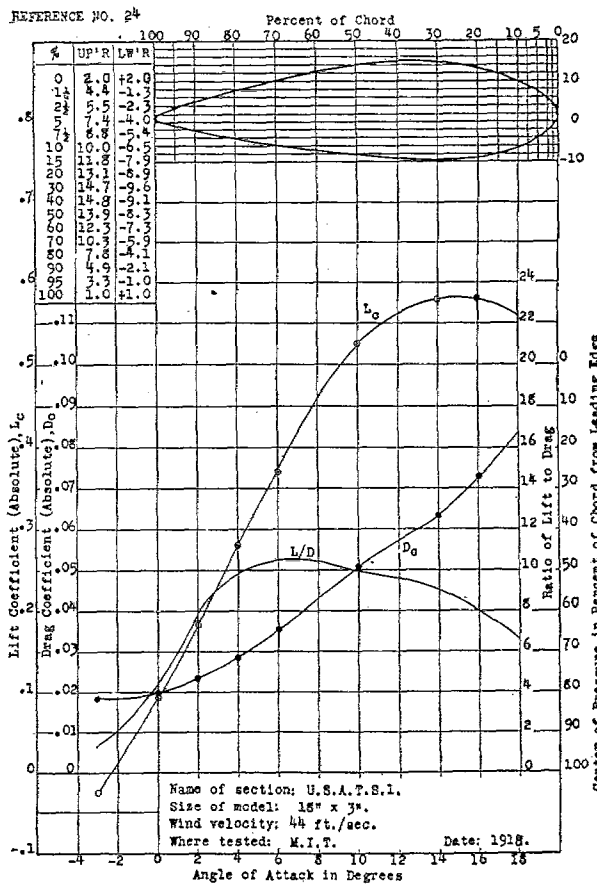
REFERENCE NO. 22



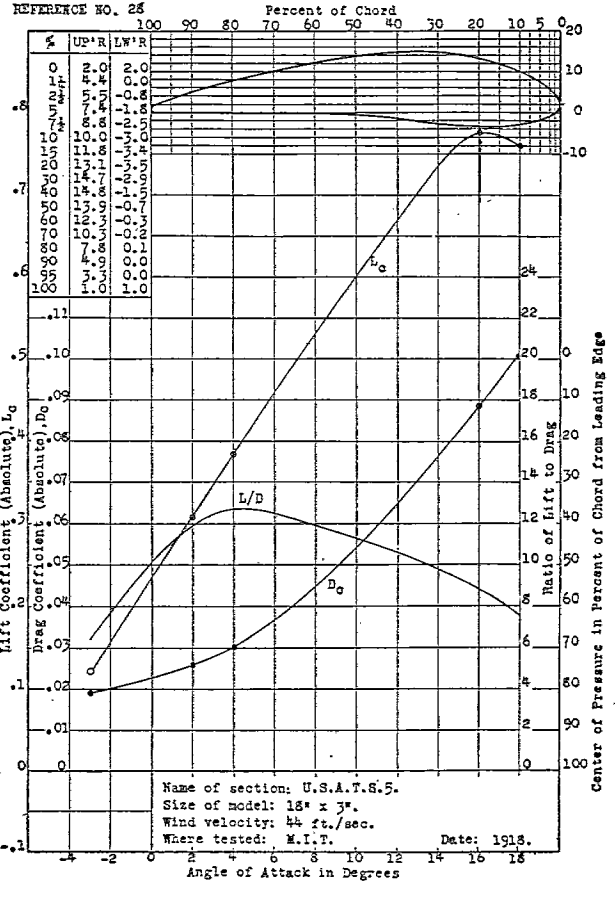
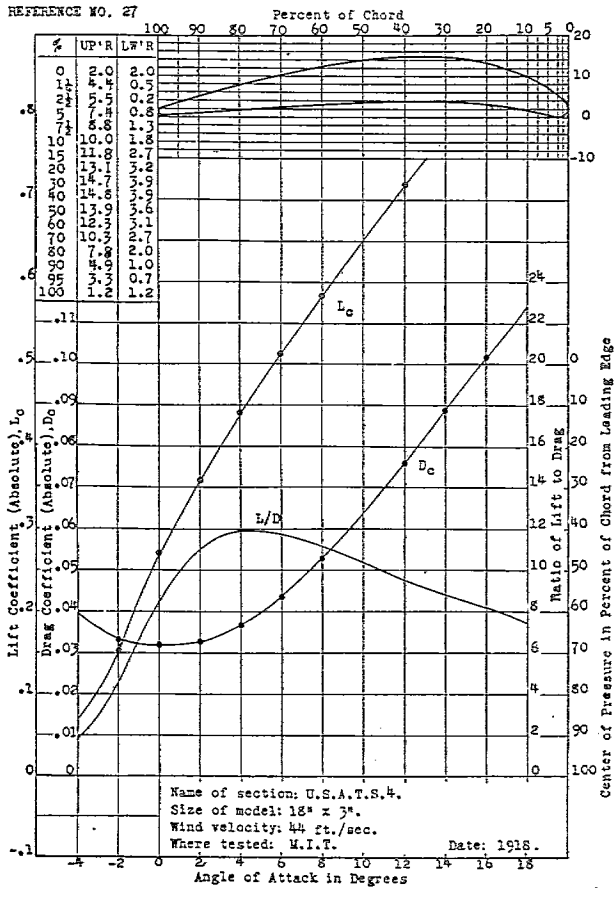
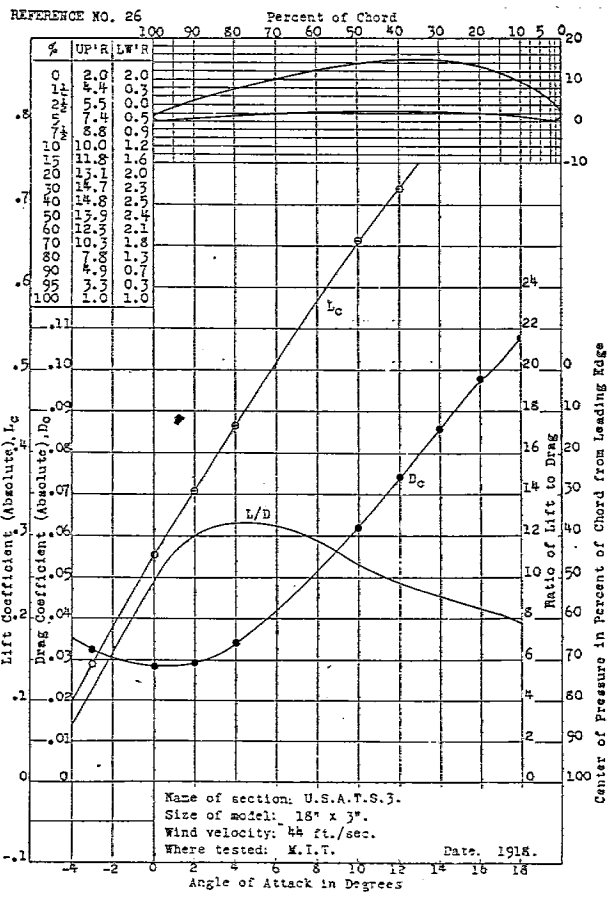
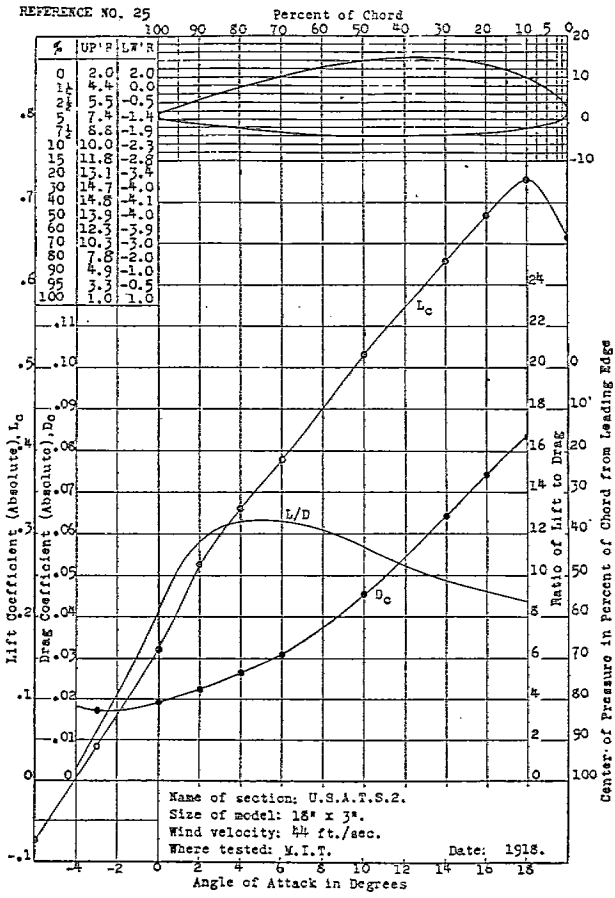
REFERENCE NO. 23

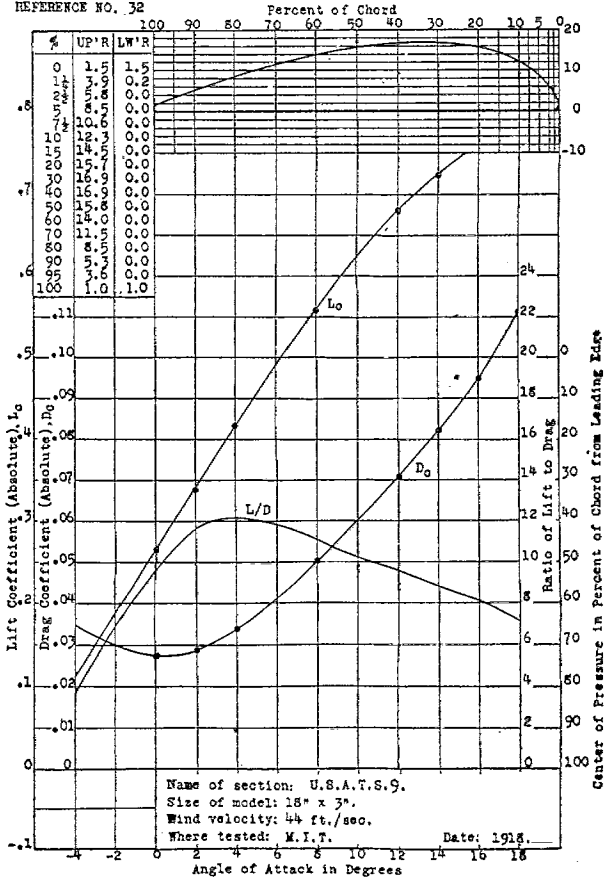
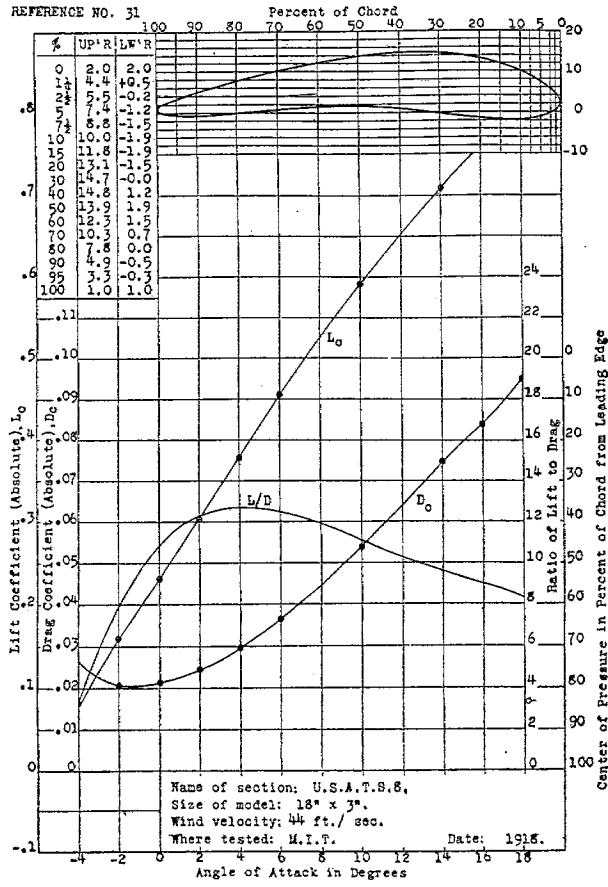
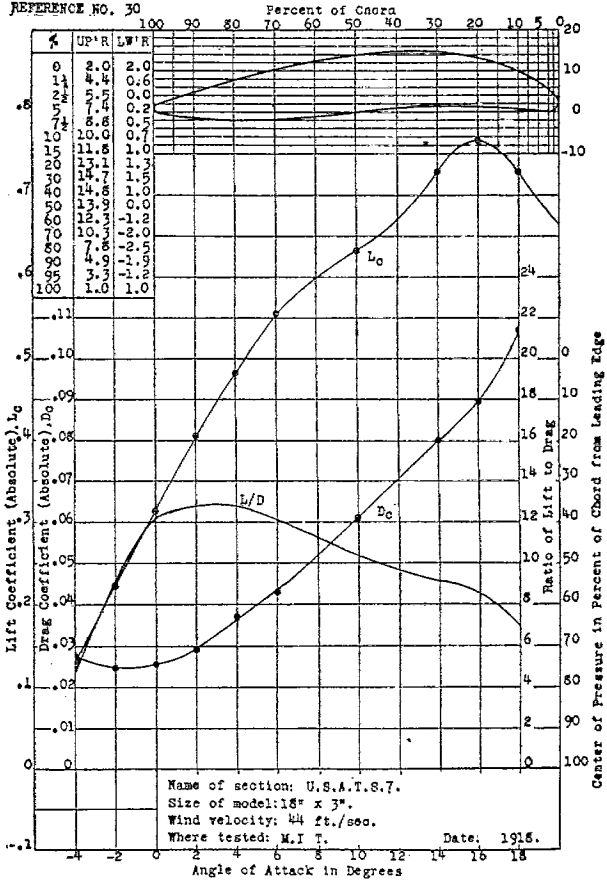
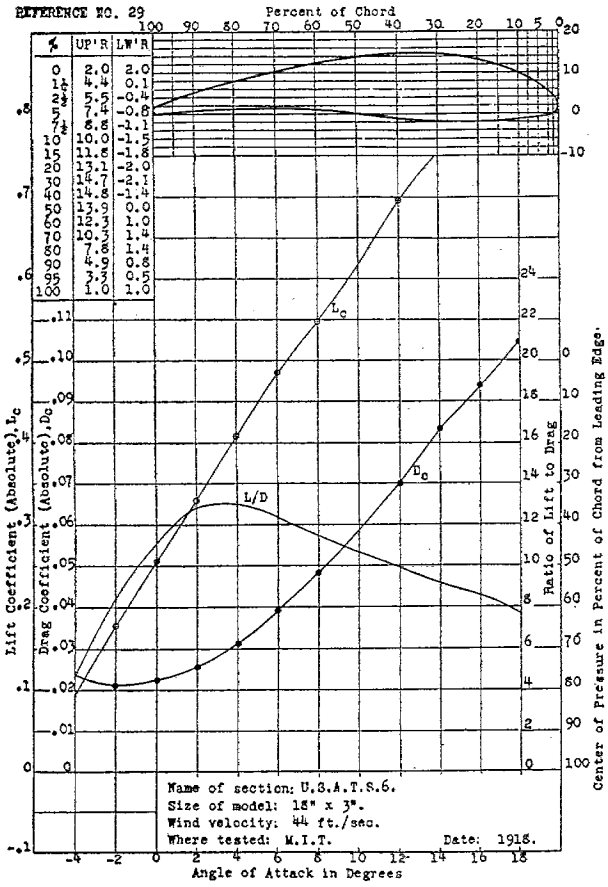


REFERENCE NO. 24

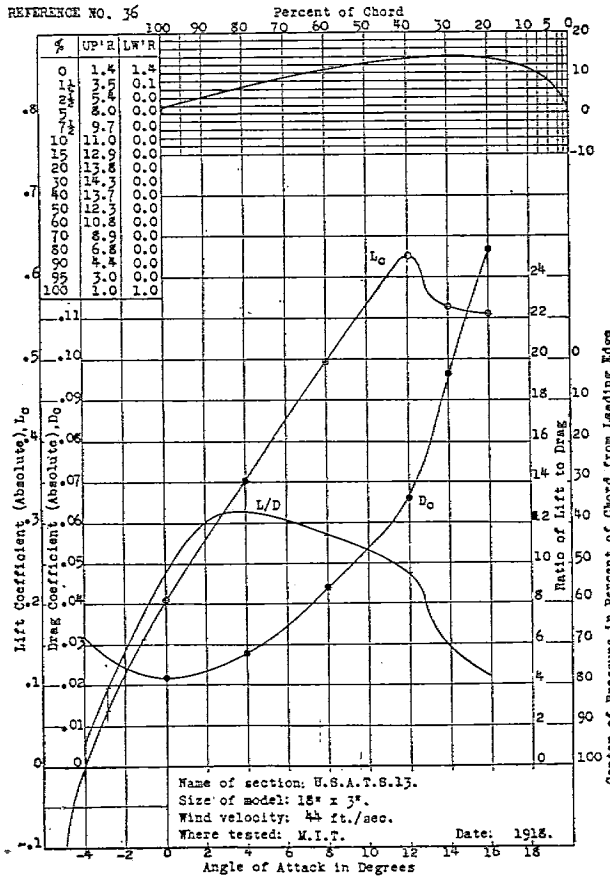
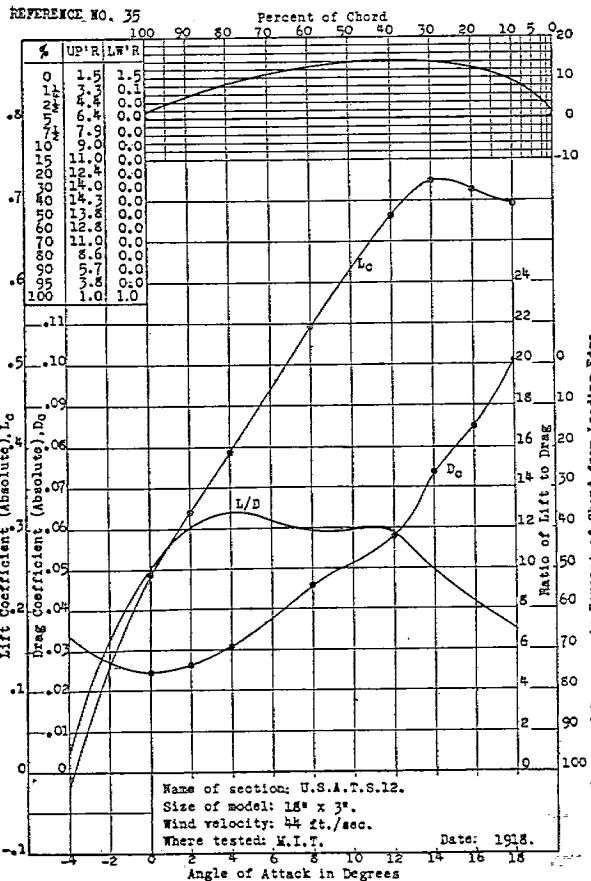
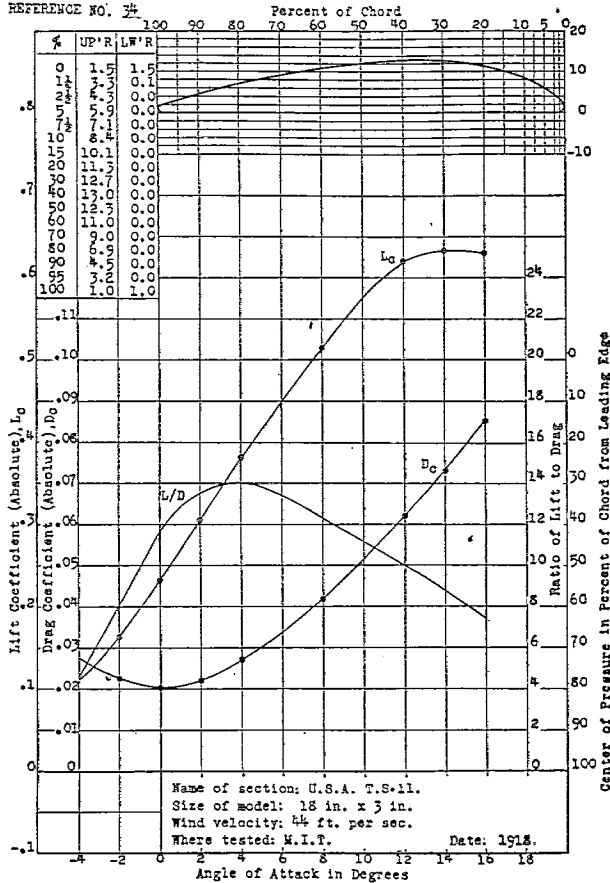
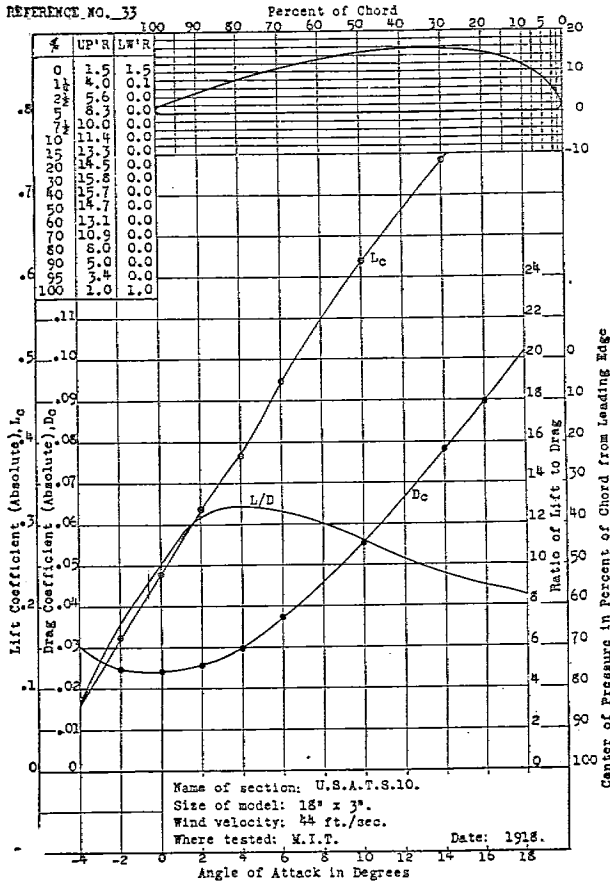


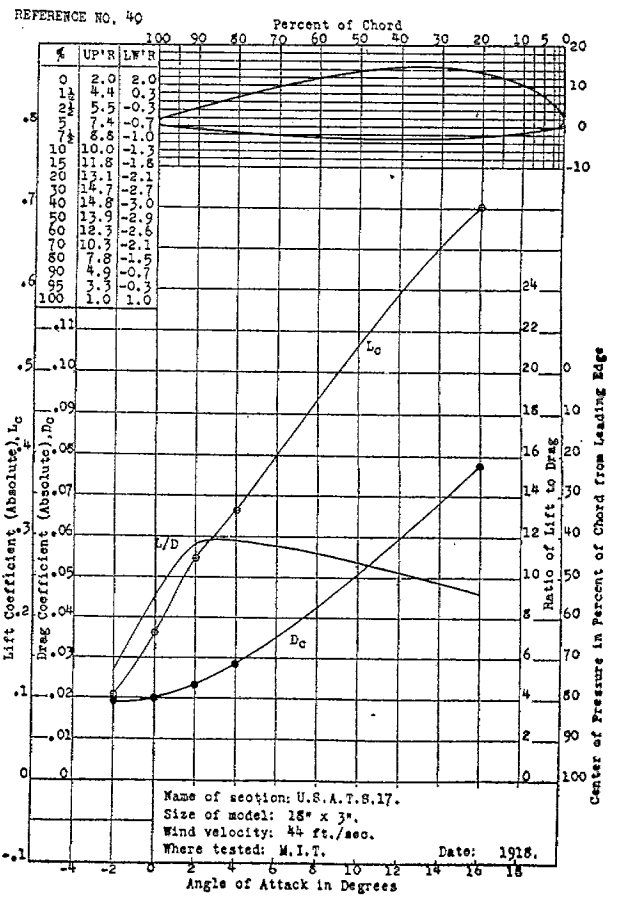
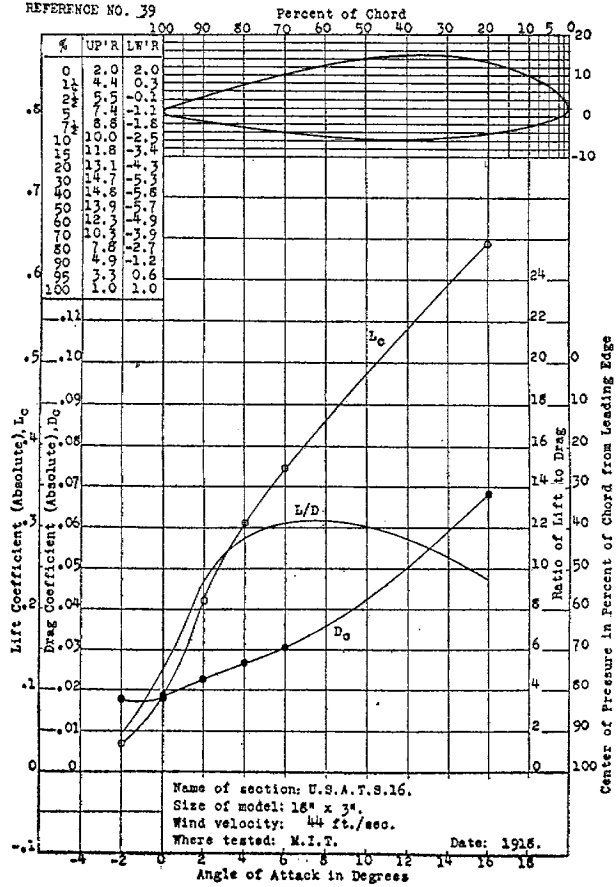
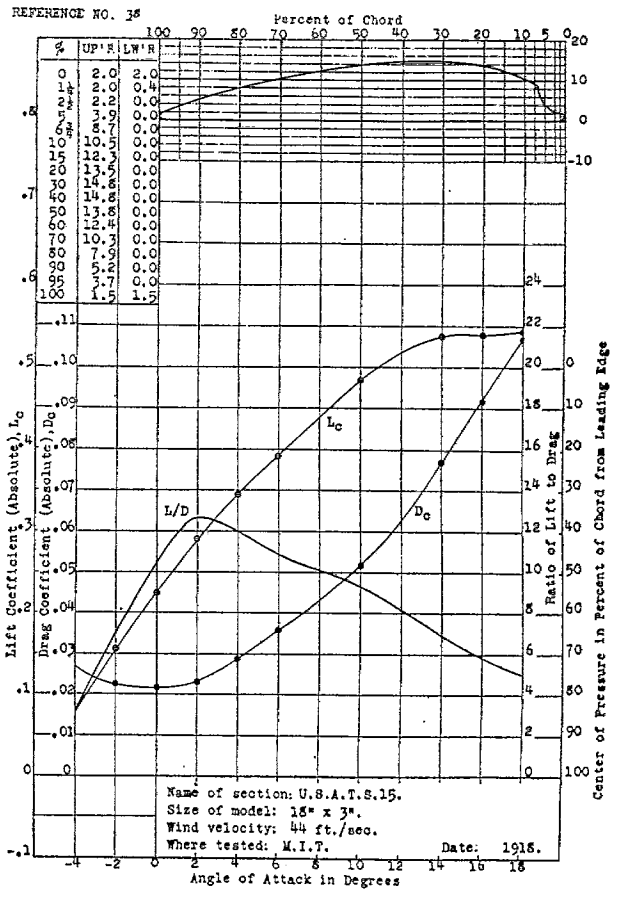
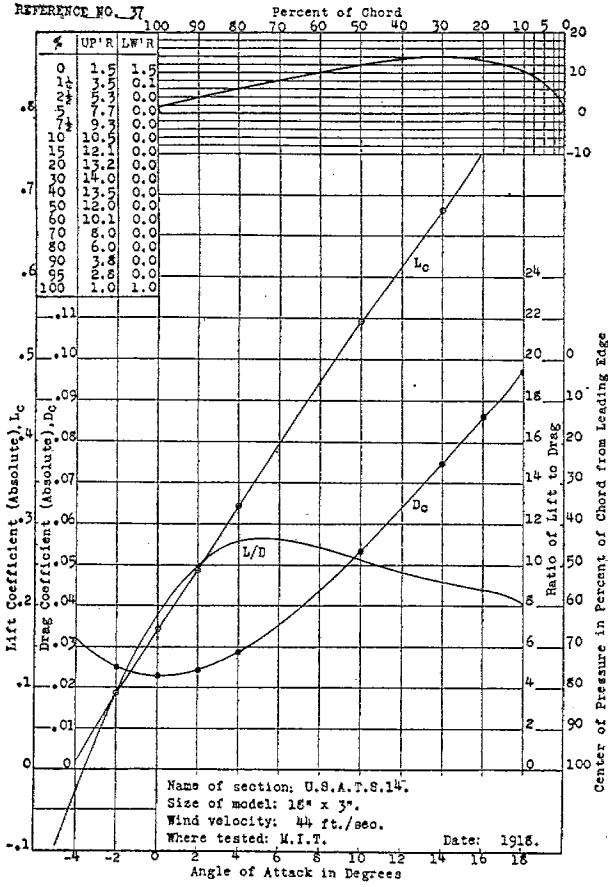
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.



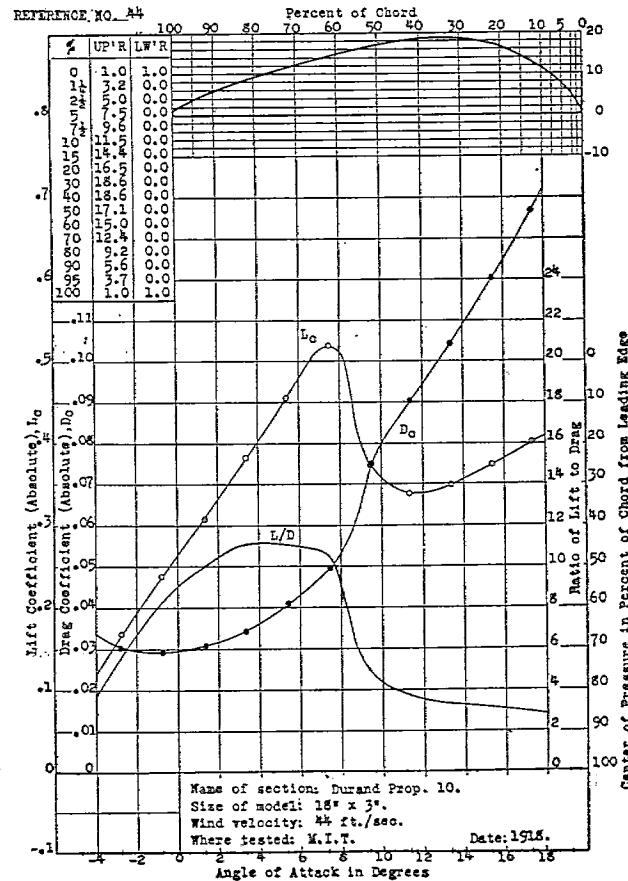
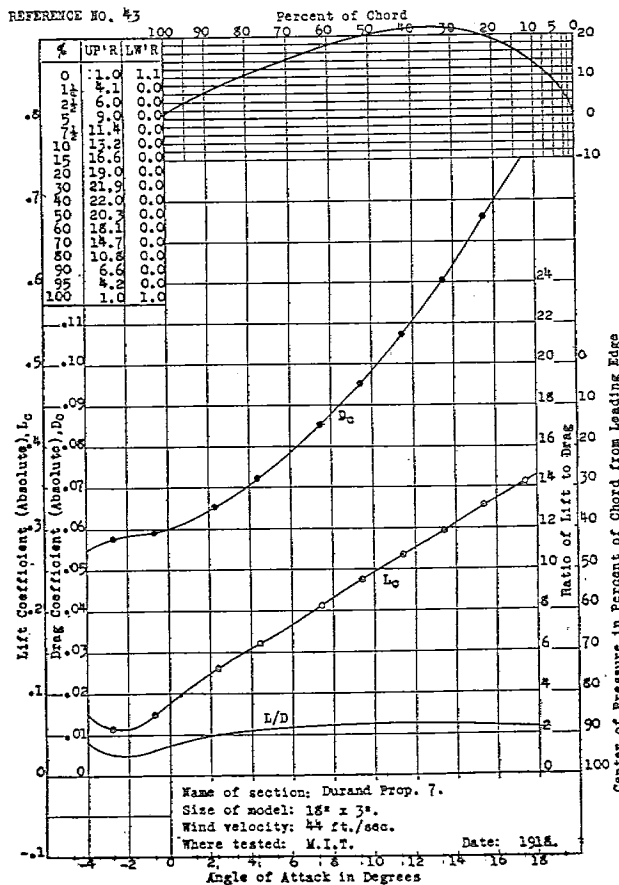
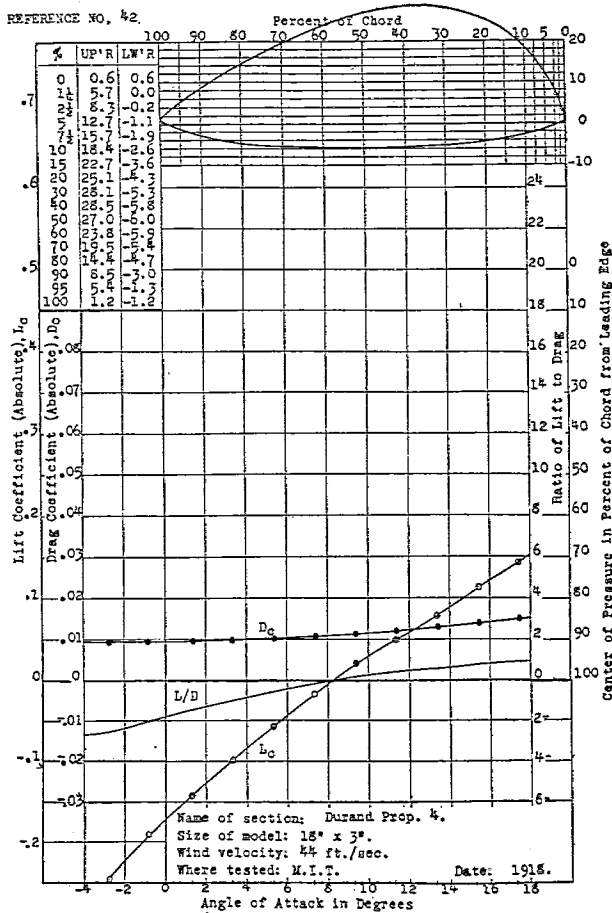
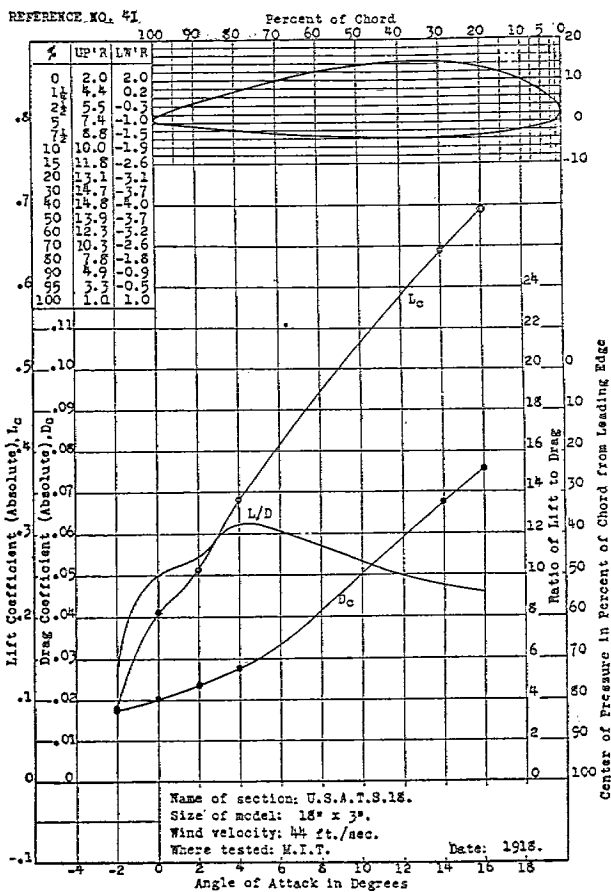


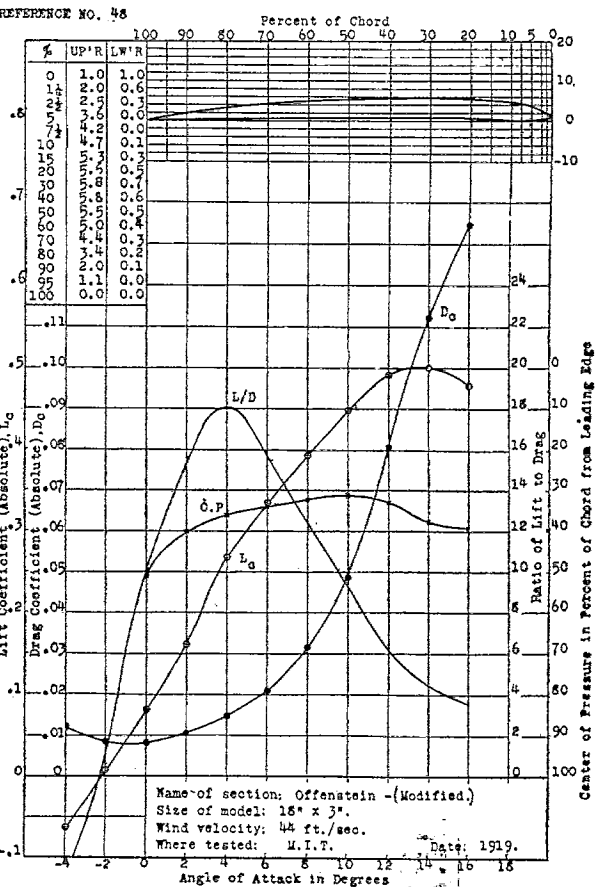
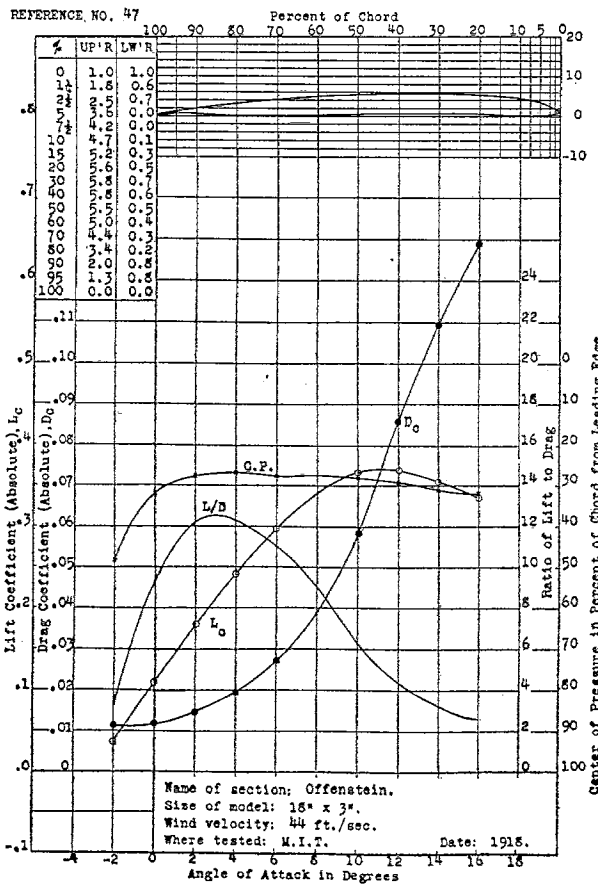
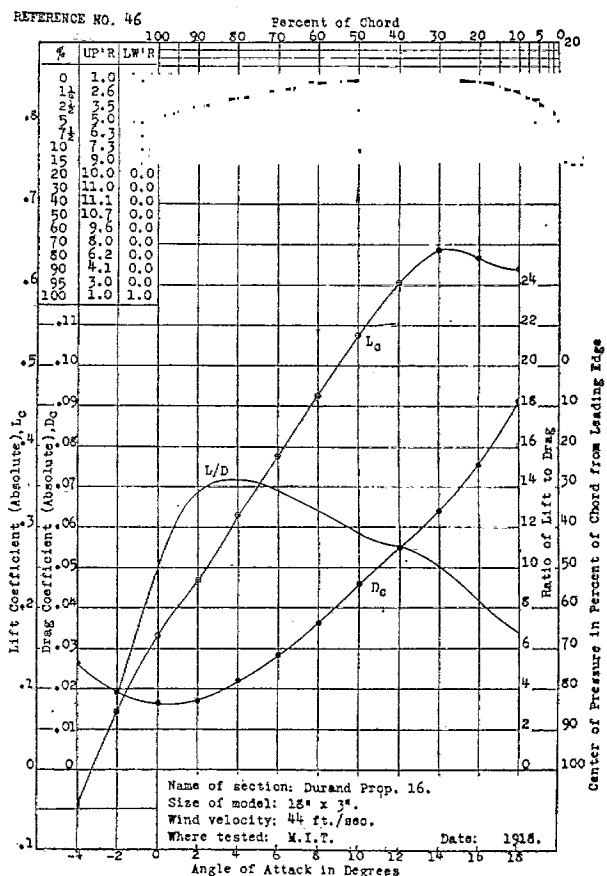
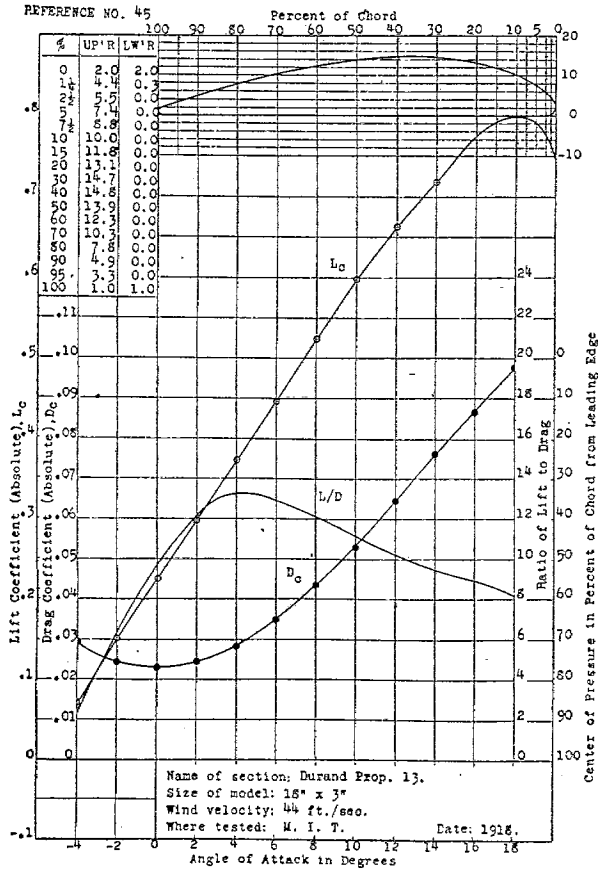
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

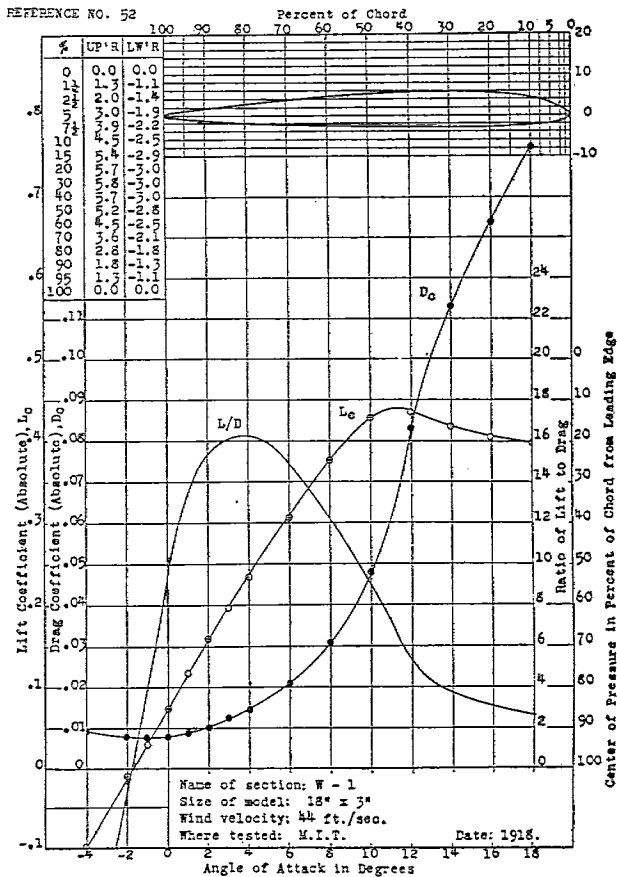
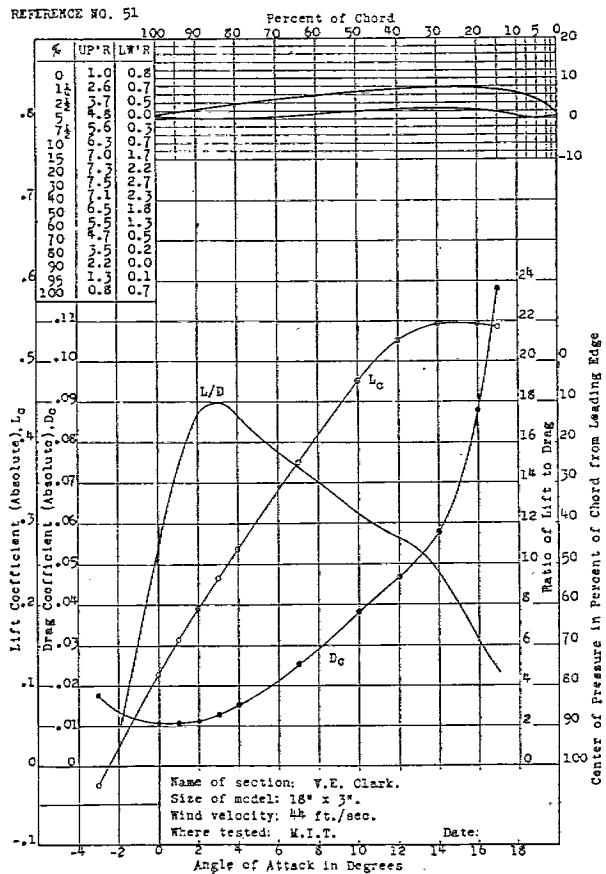
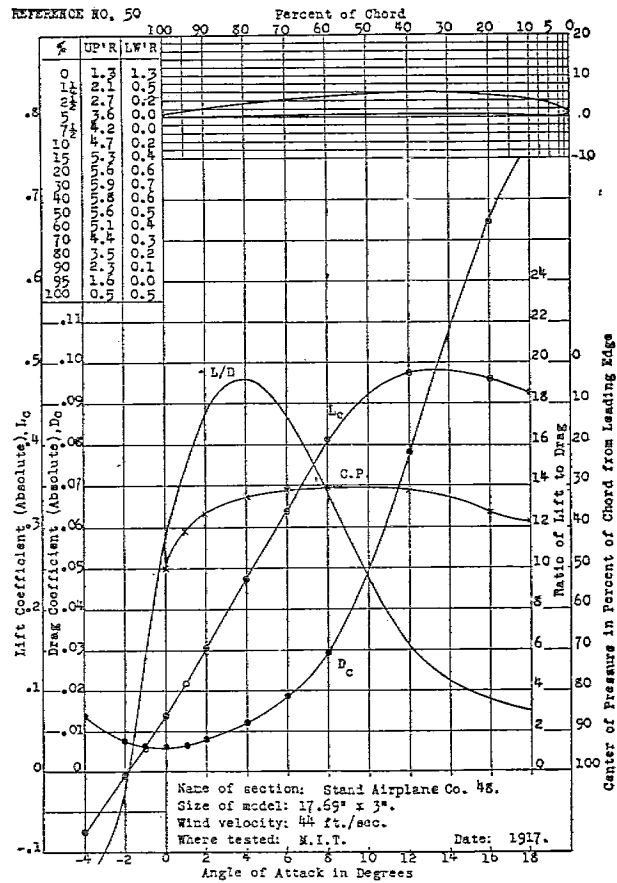
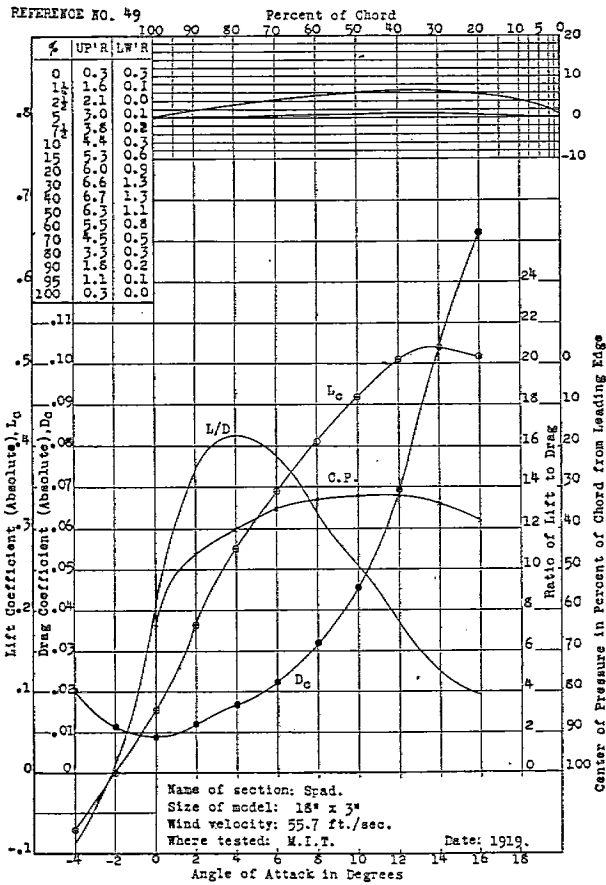




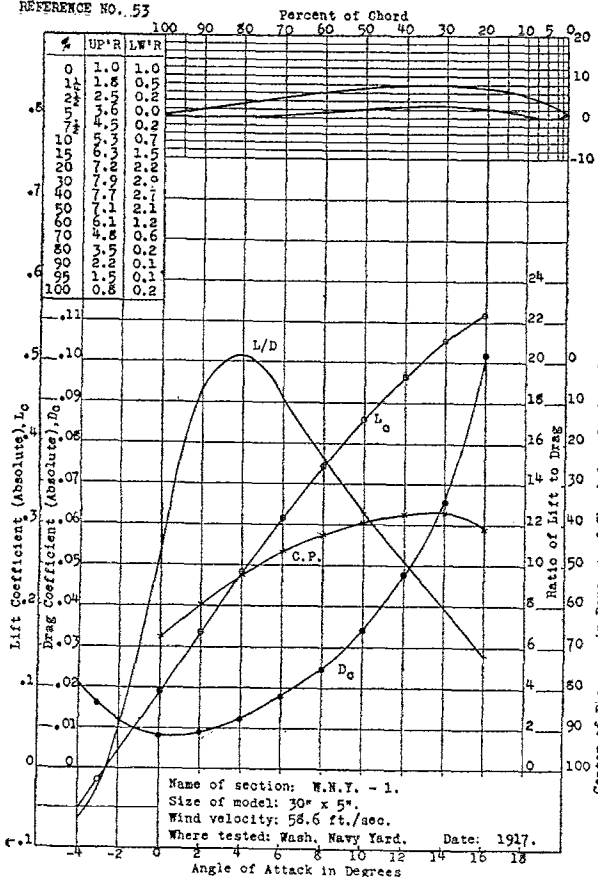
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.



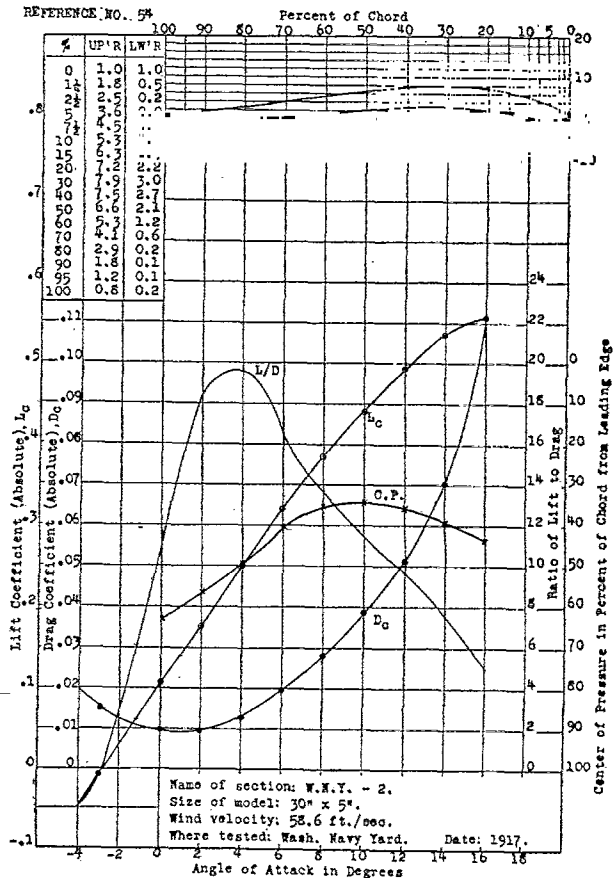




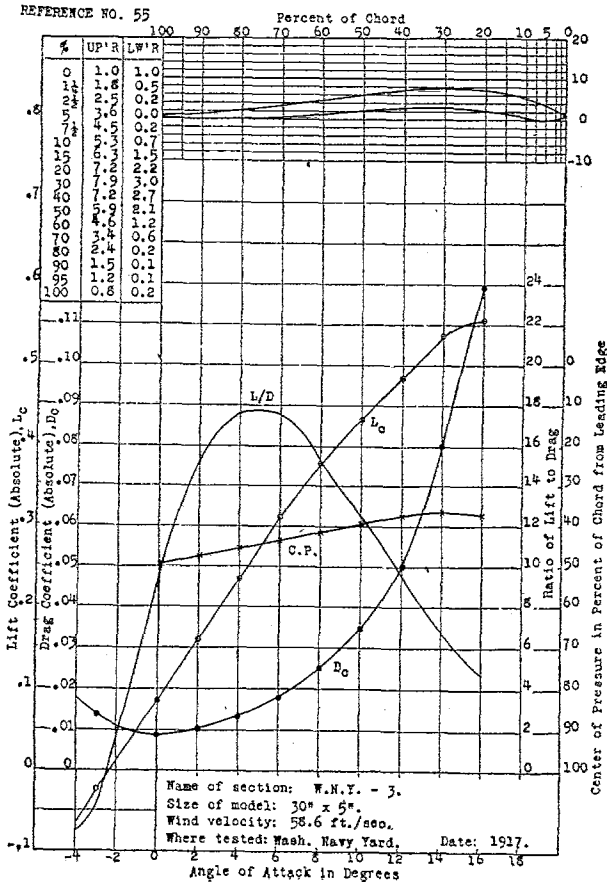
REFERENCE NO. 53



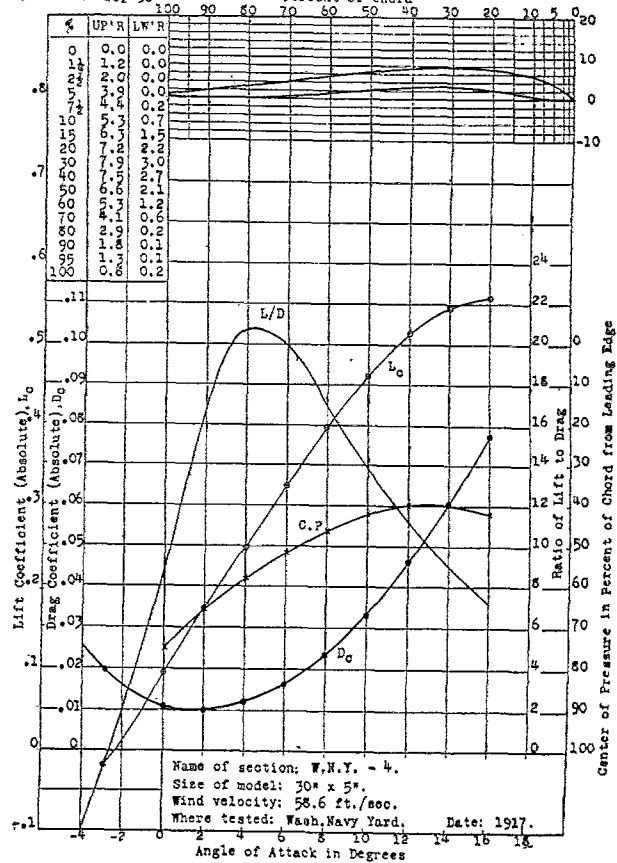
REFERENCE NO. 54



REFERENCE NO. 55

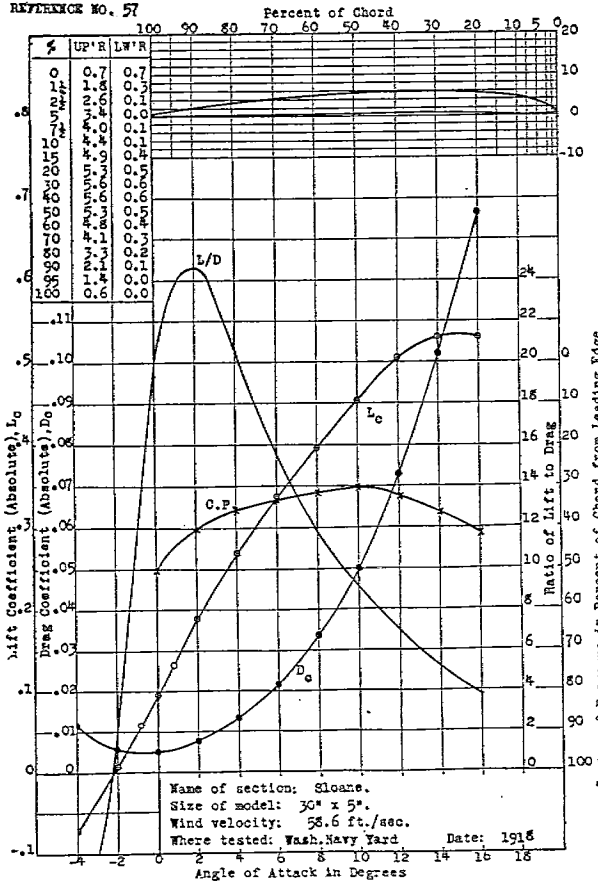


REFERENCE NO. 56

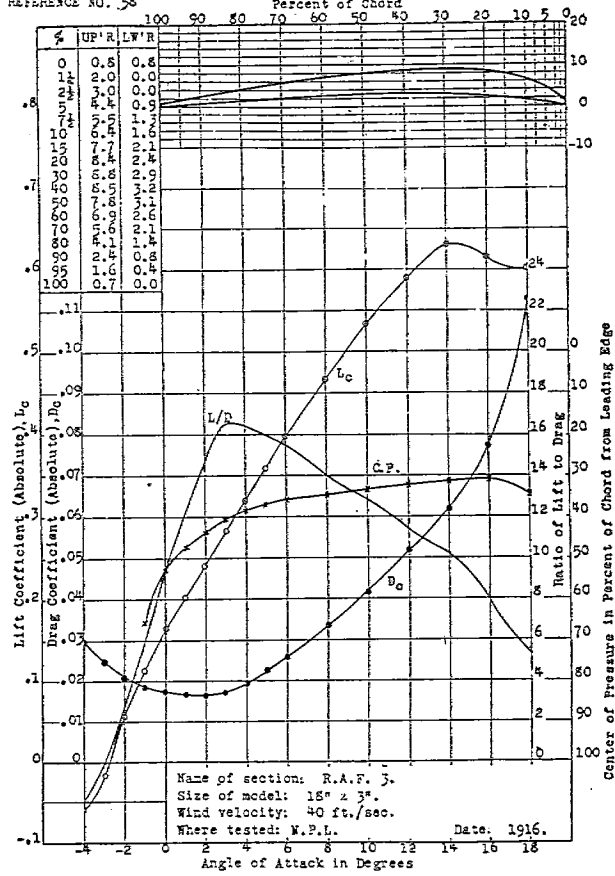


AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

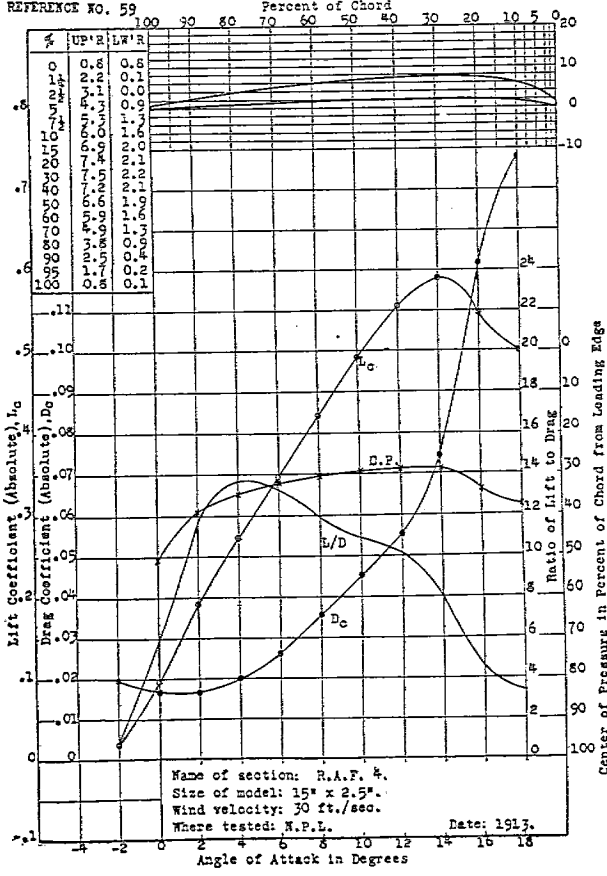
REFERENCE NO. 57



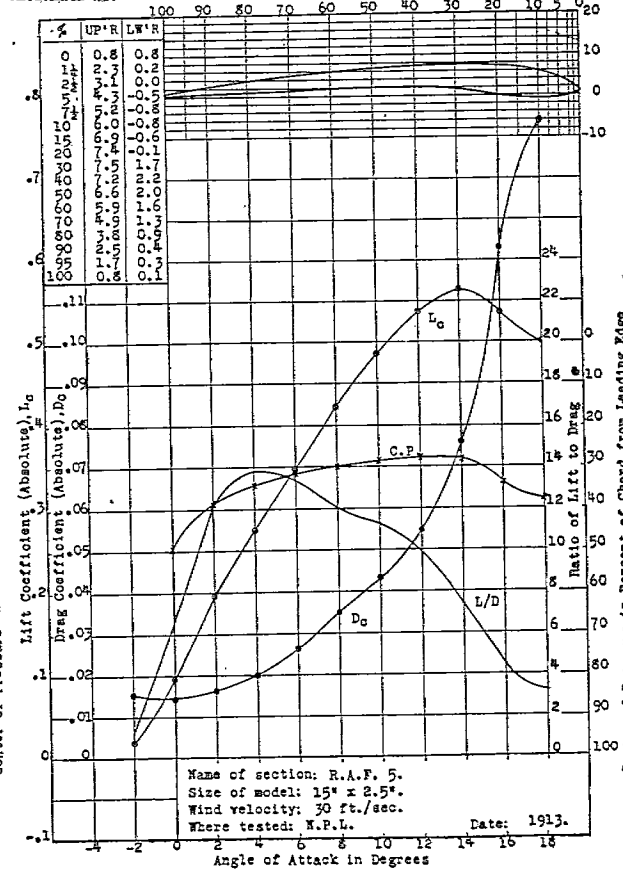
REFERENCE NO. 58

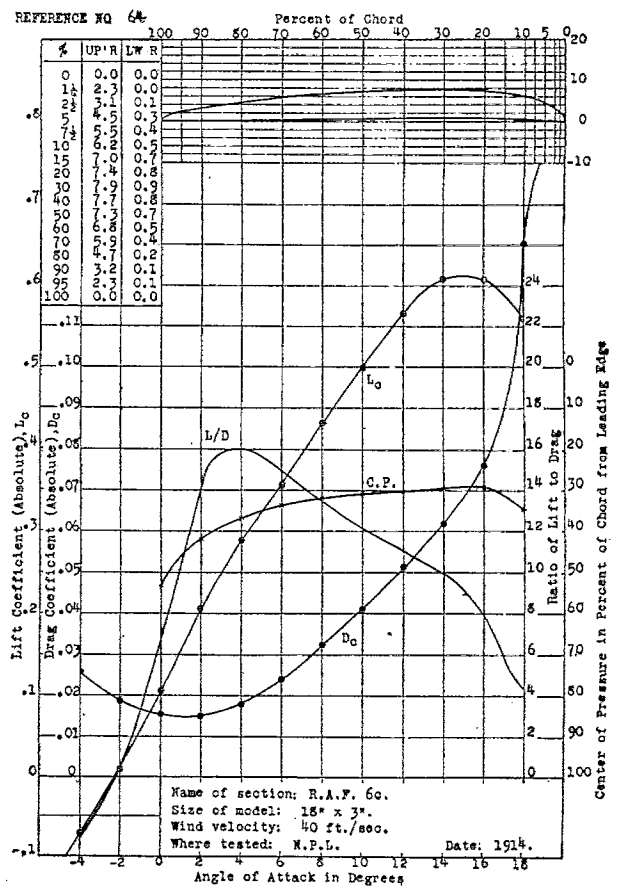
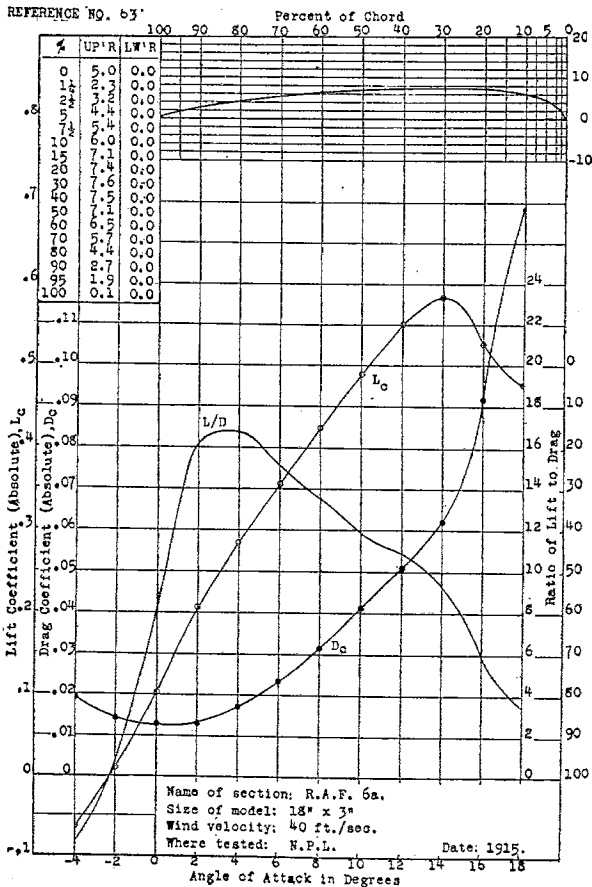
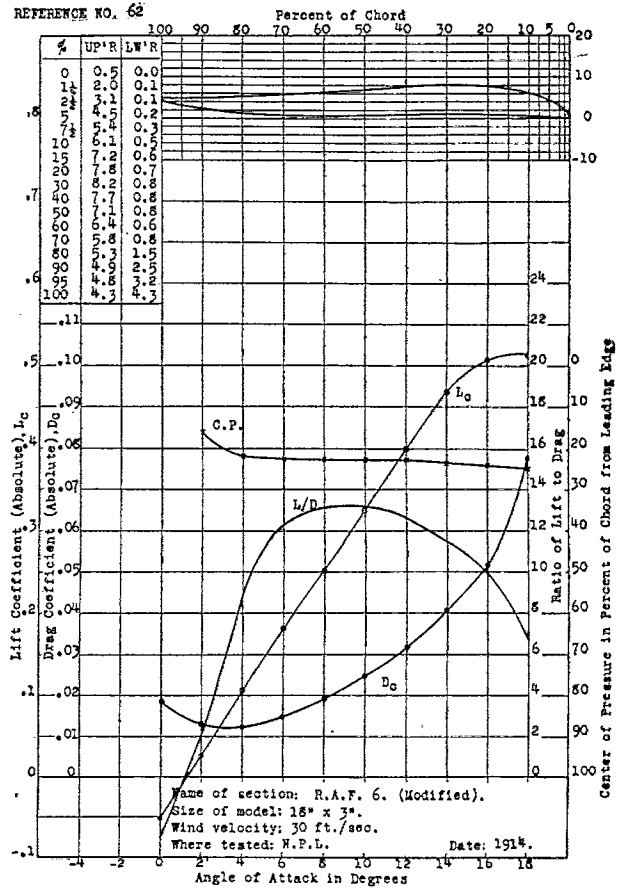
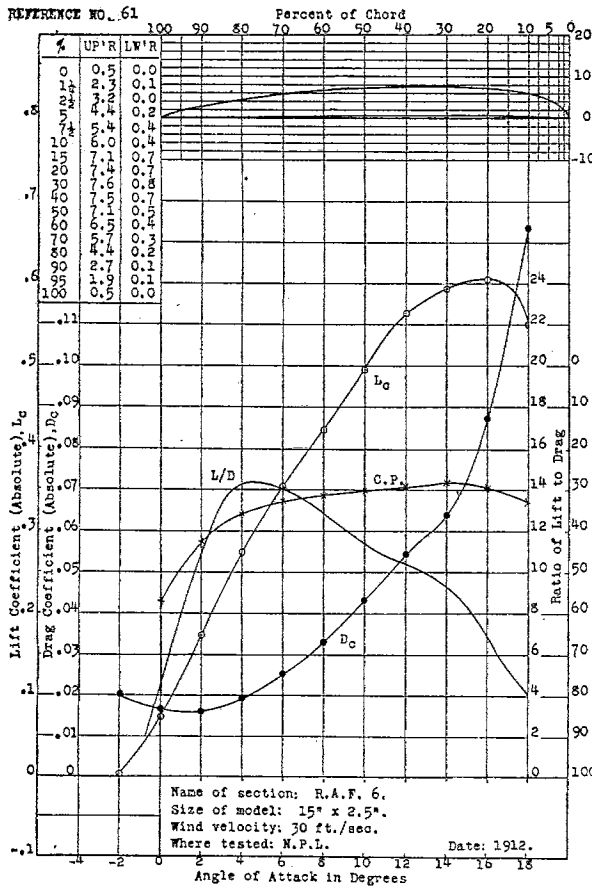


REFERENCE NO. 59

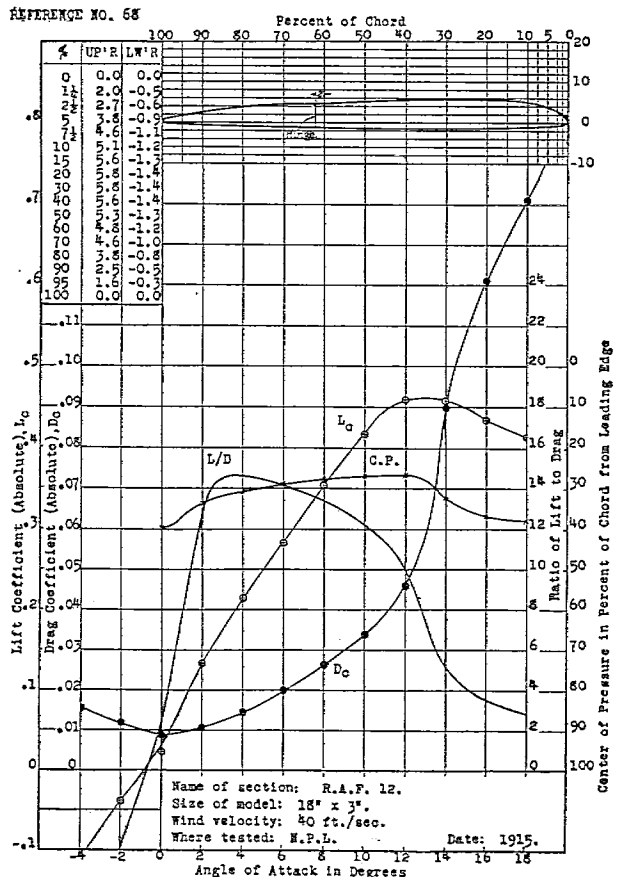
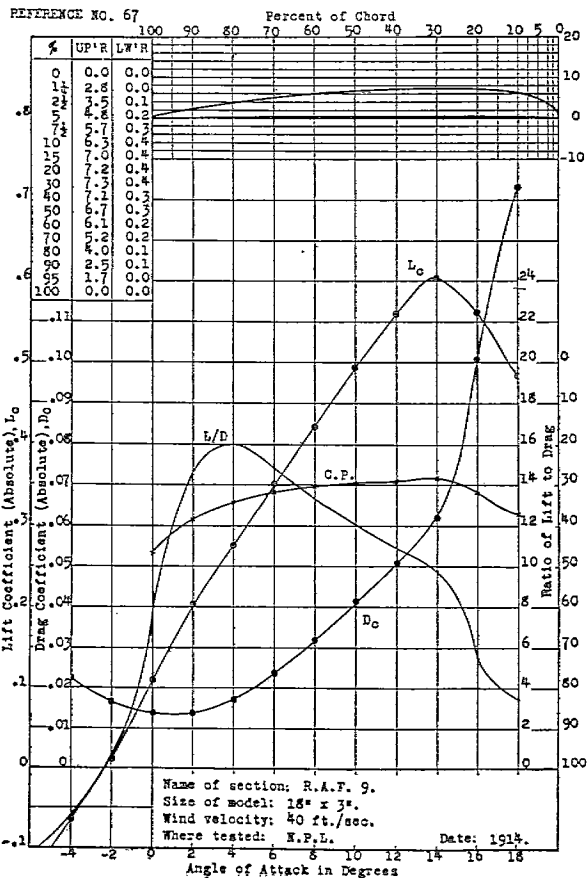
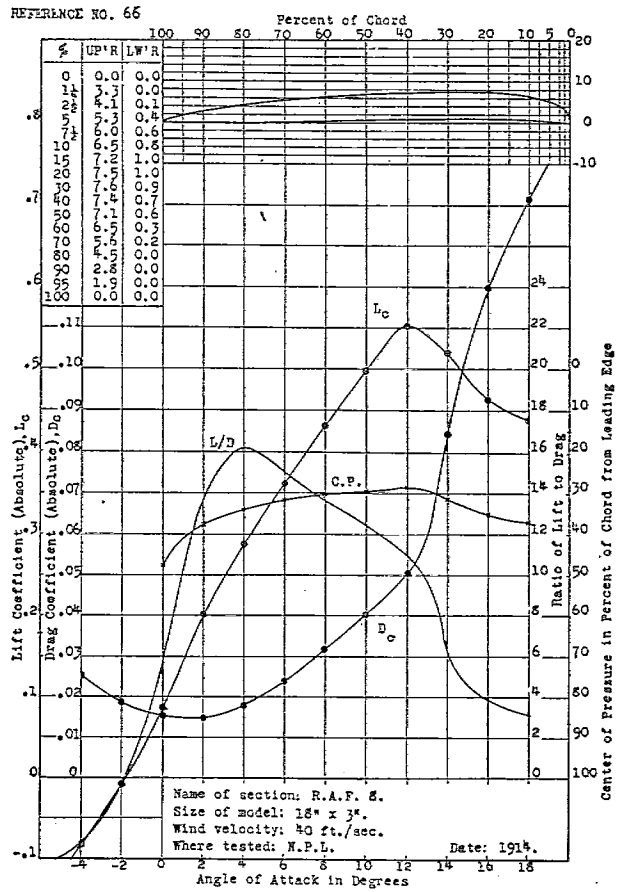
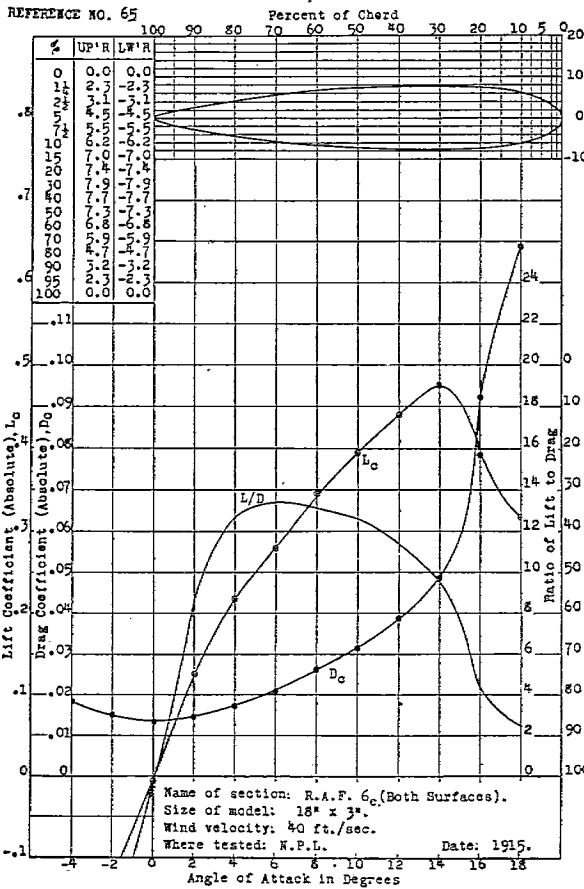


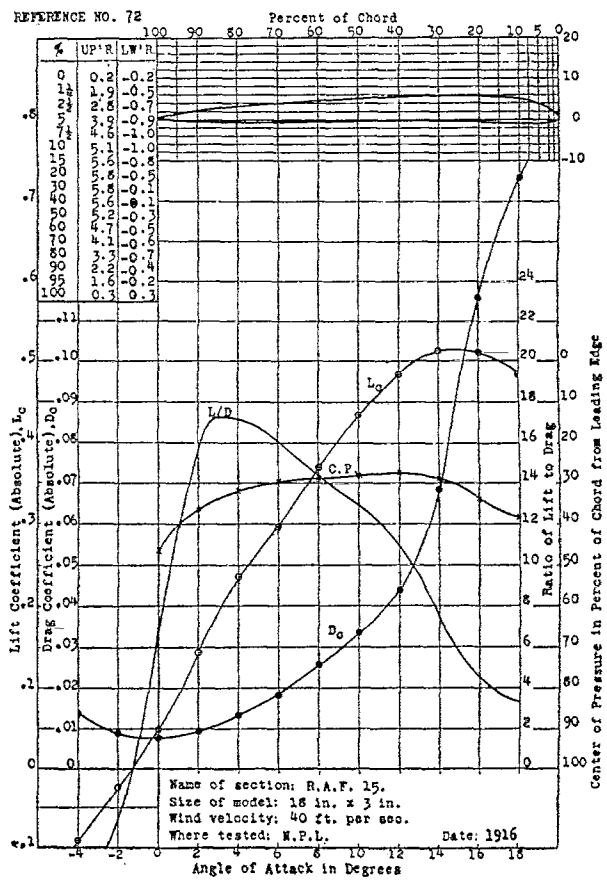
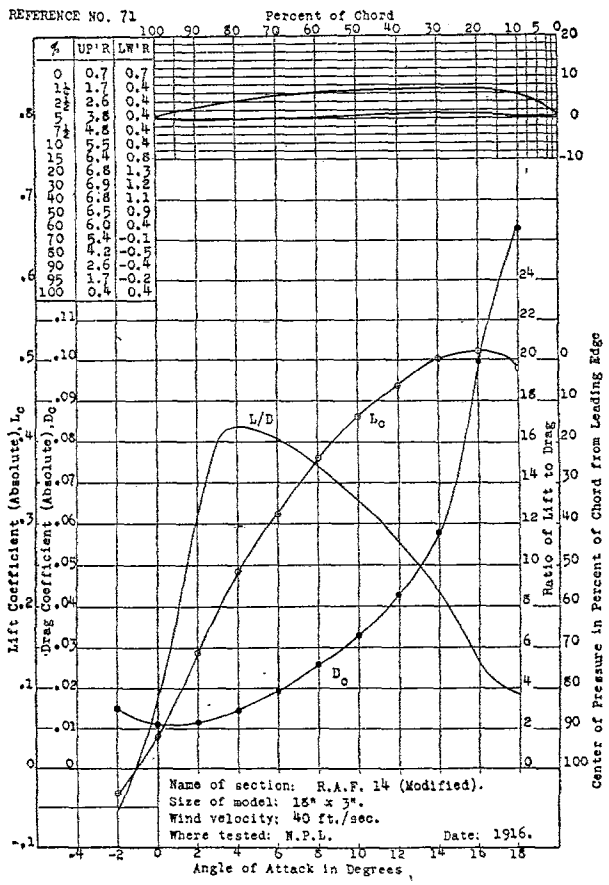
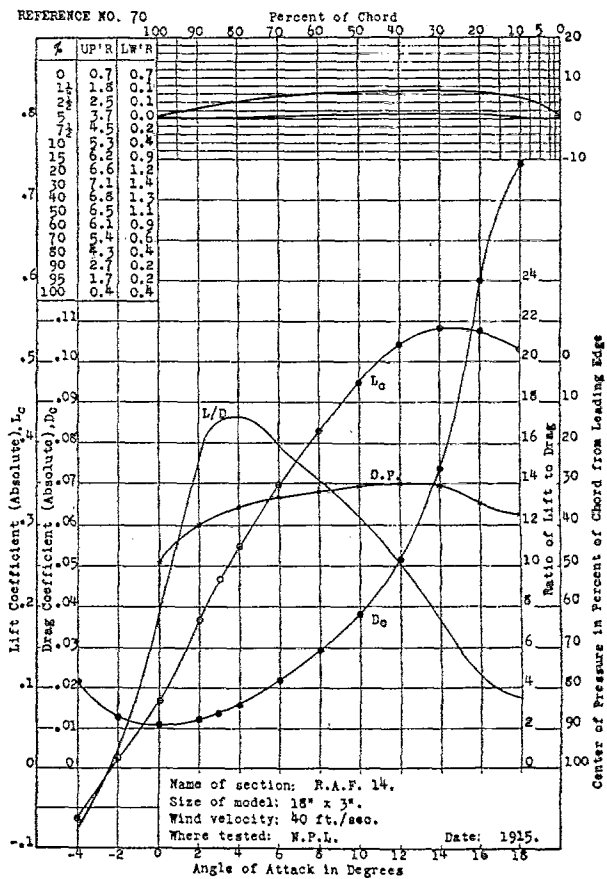
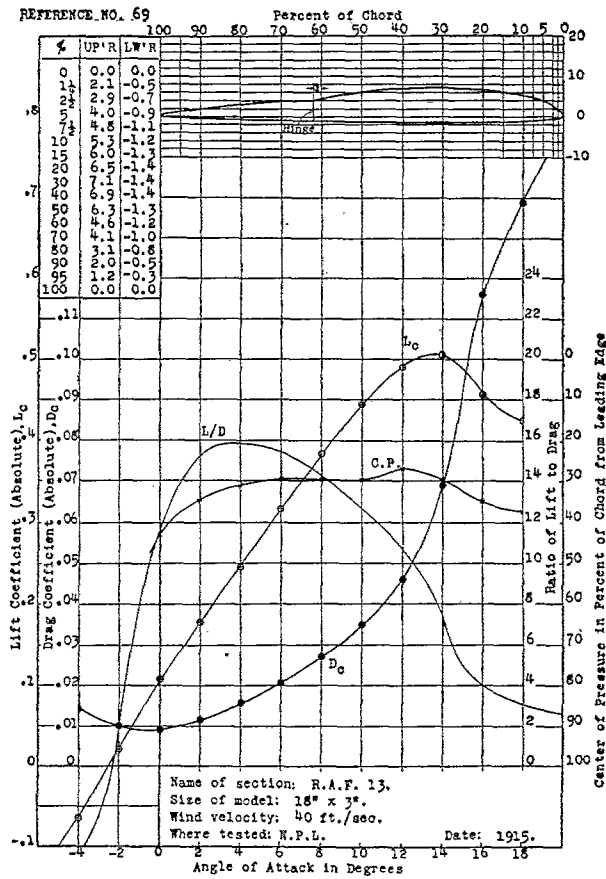
REFERENCE NO. 60



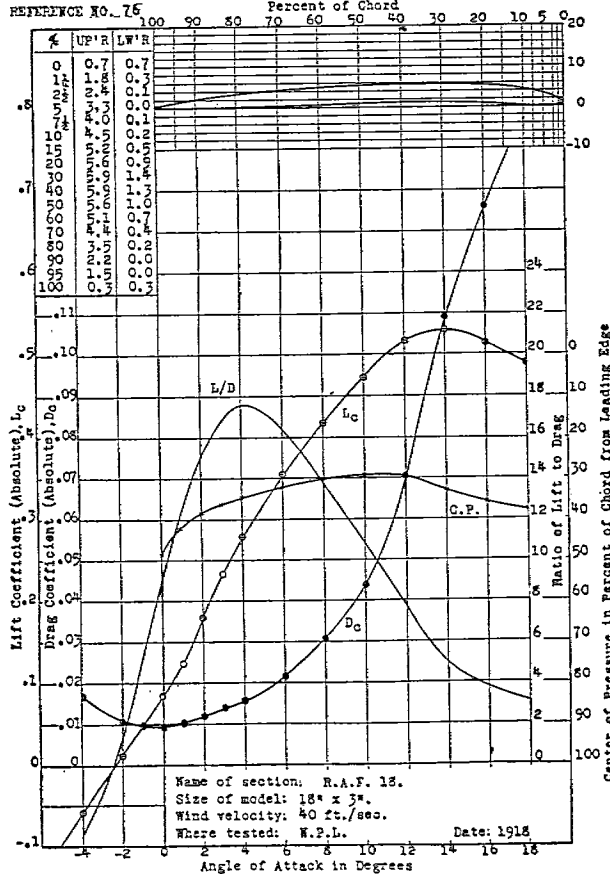
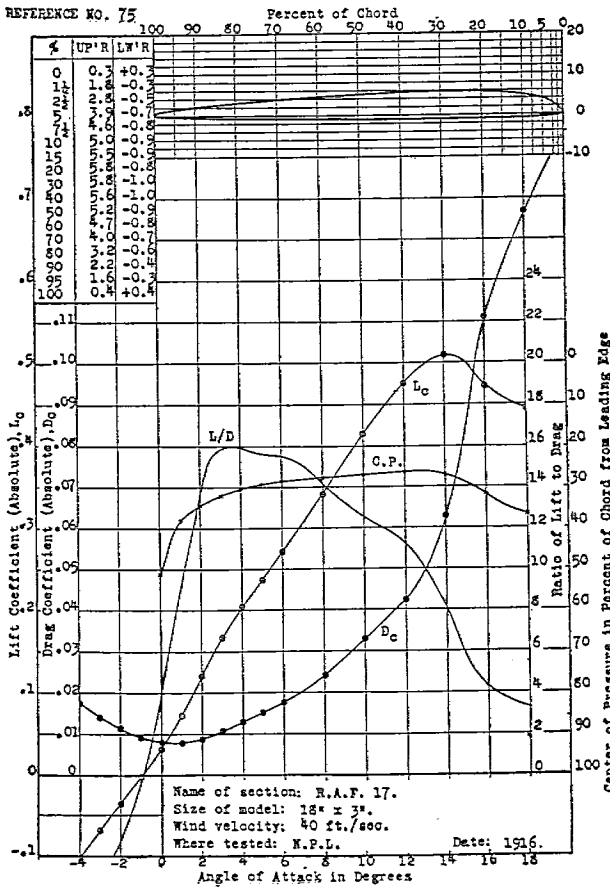
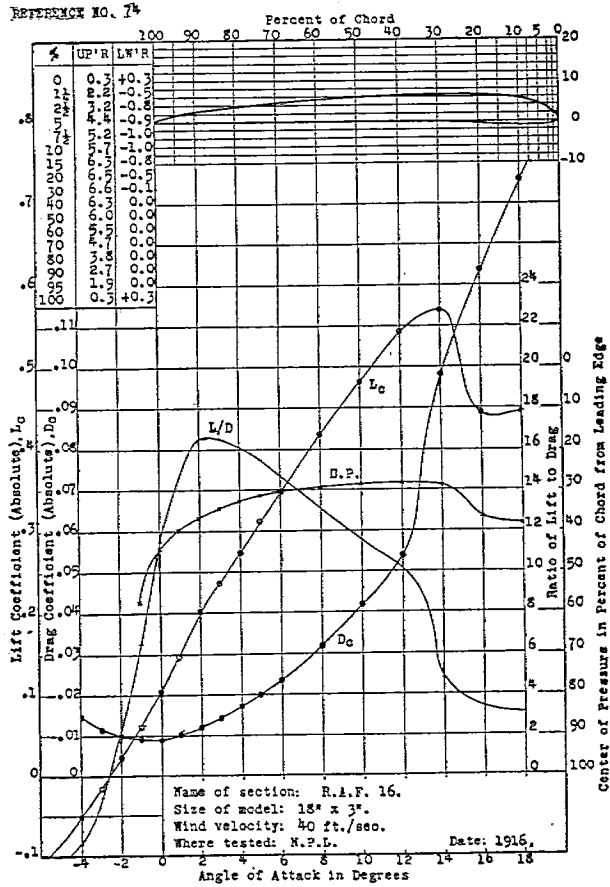
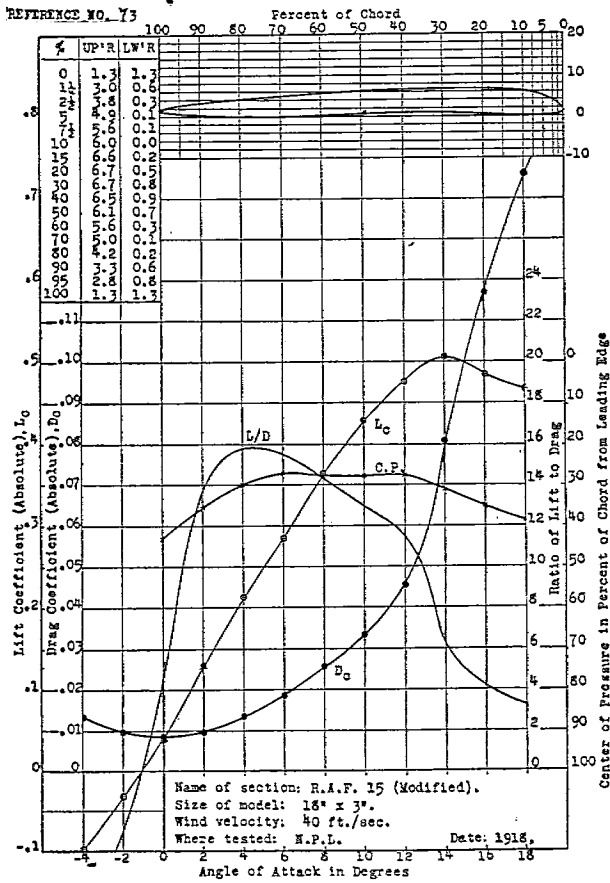


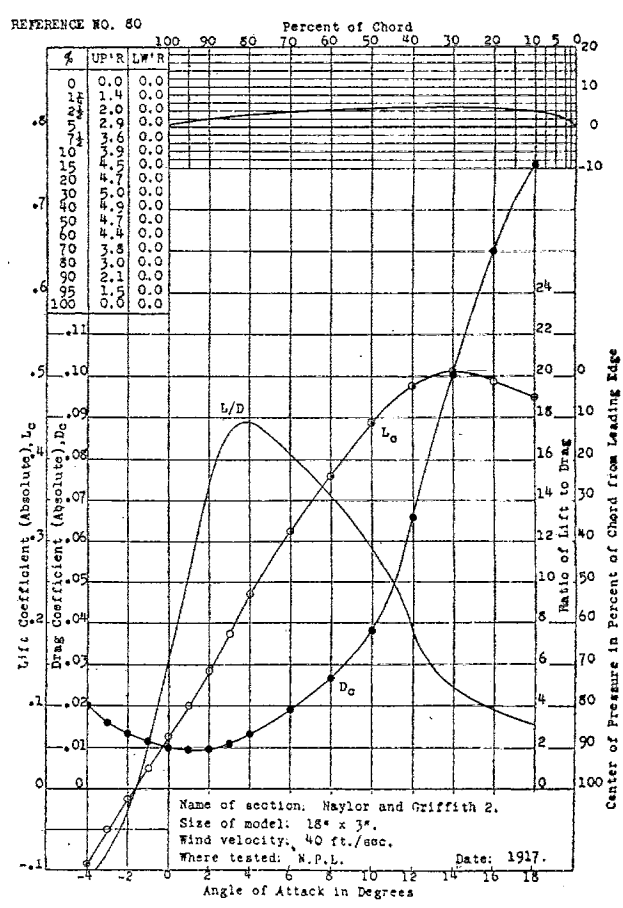
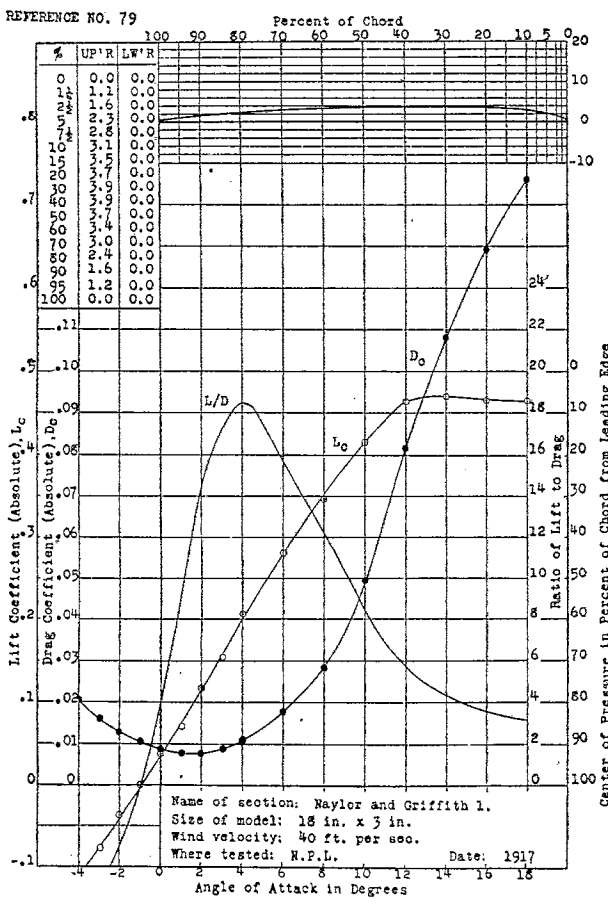
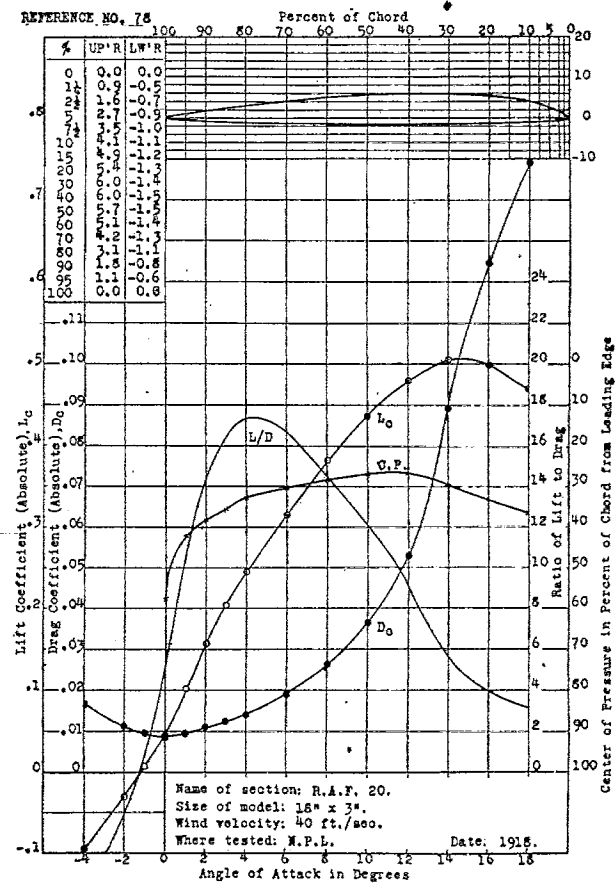
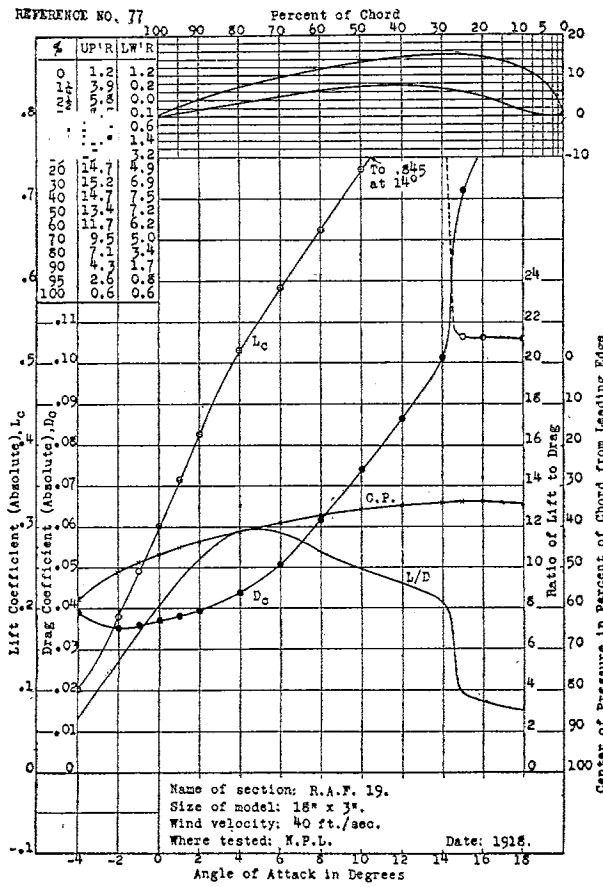
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.





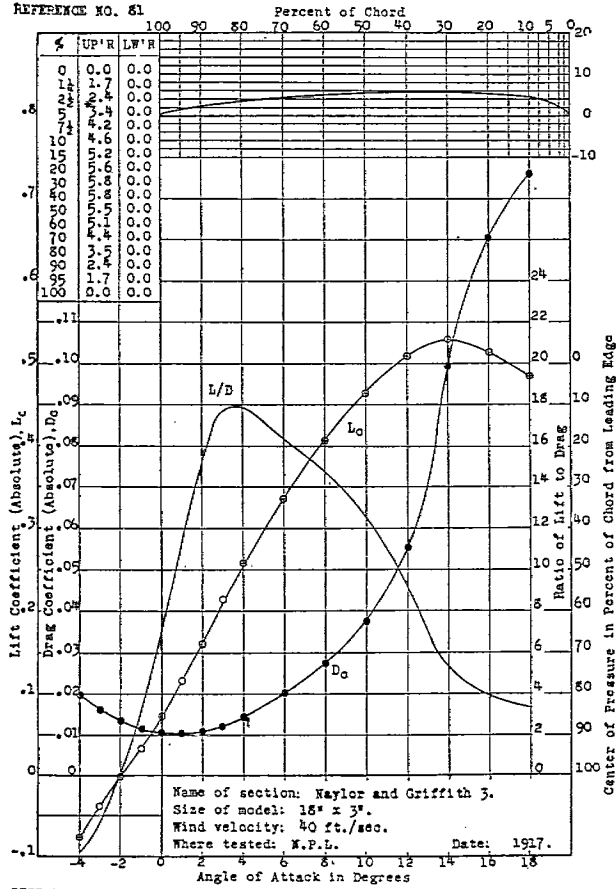
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.



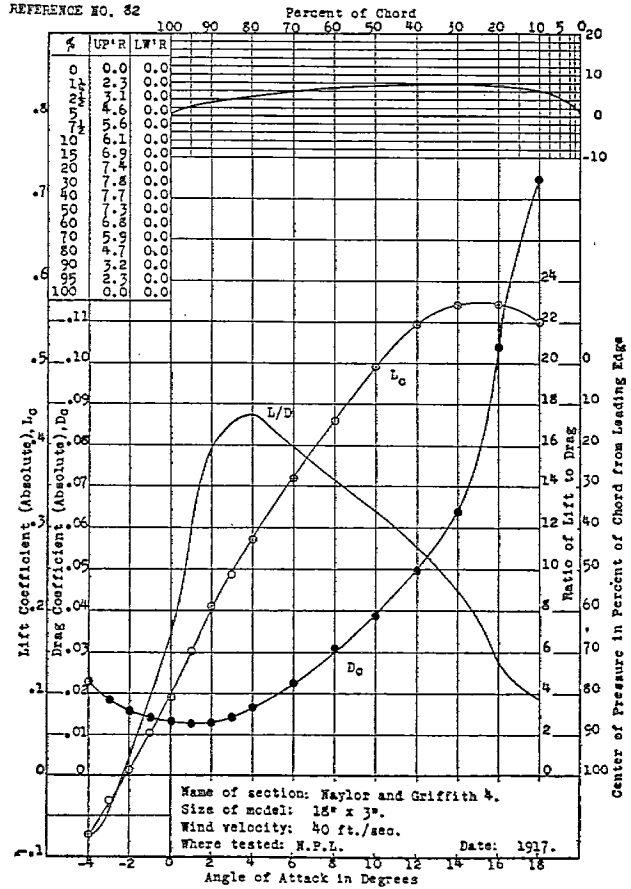


AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

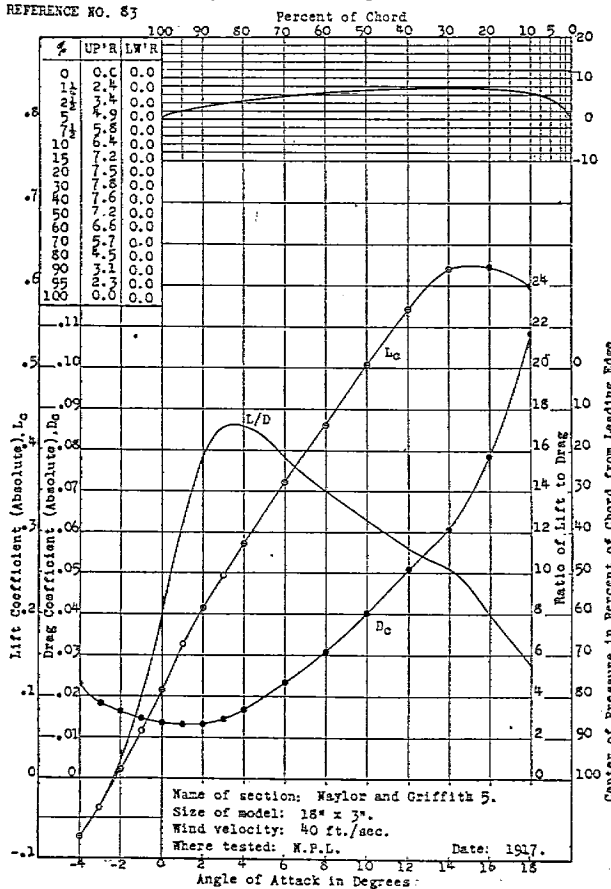
REFERENCE NO. 81



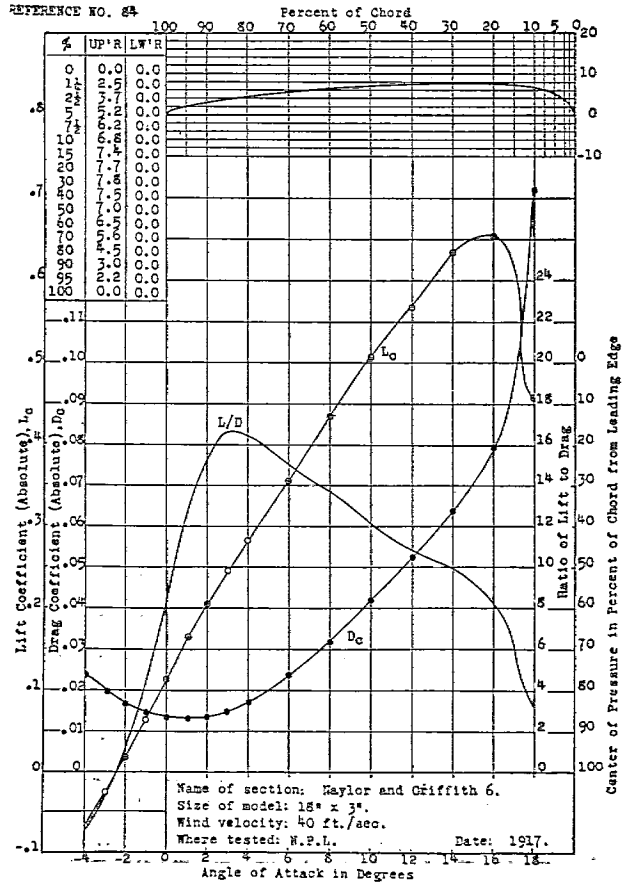
REFERENCE NO. 82

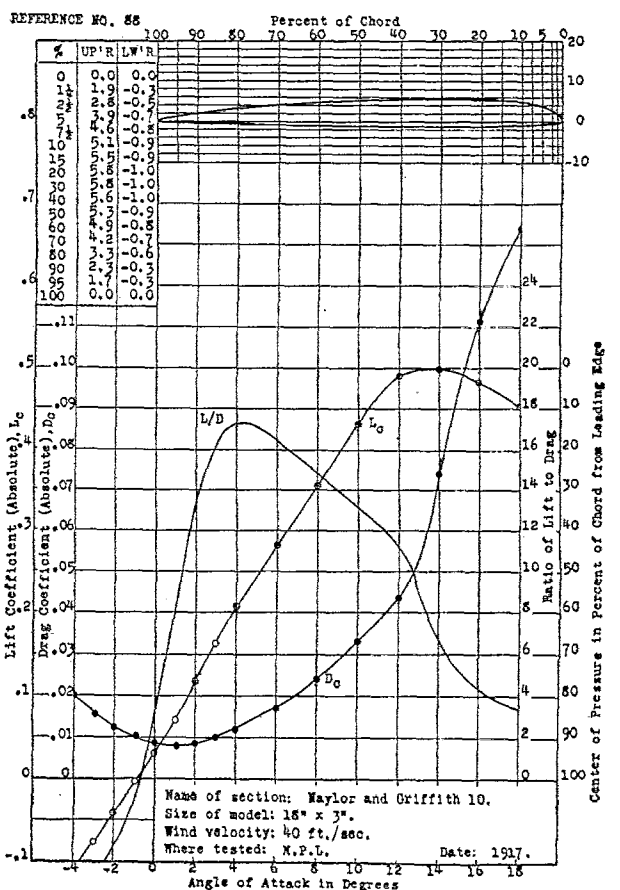
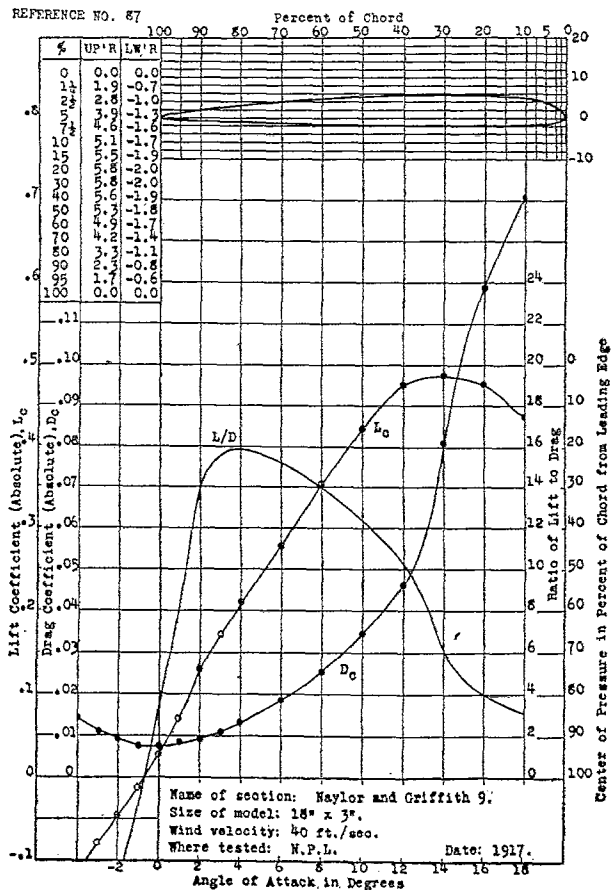
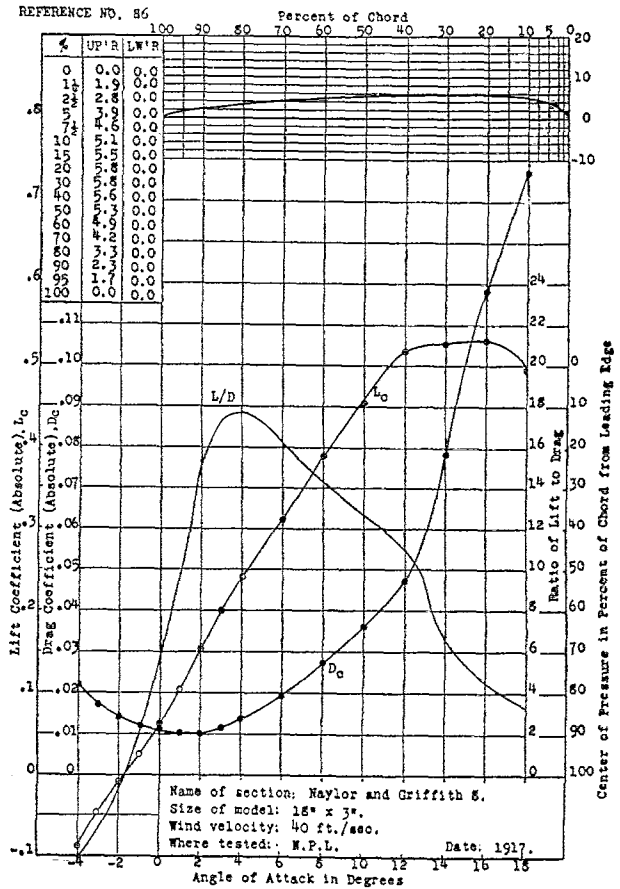
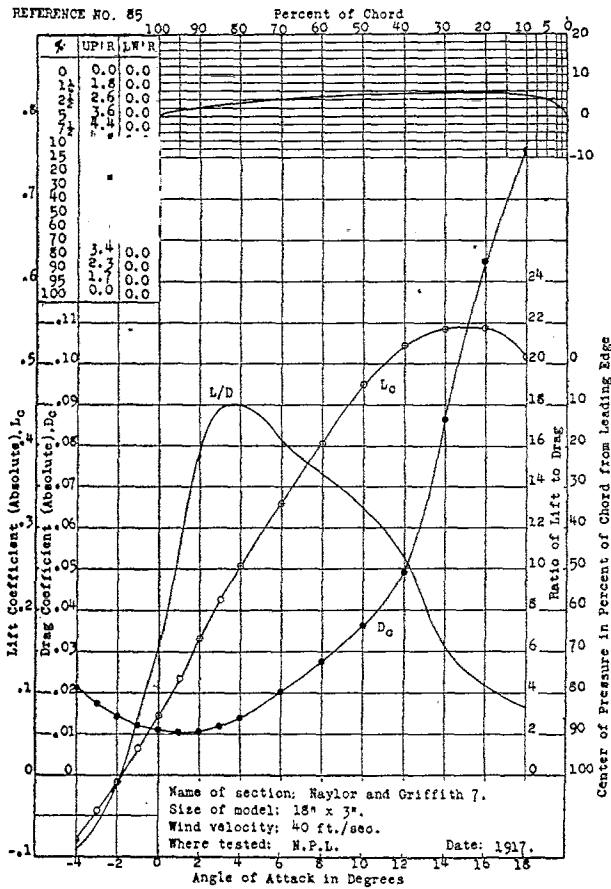


REFERENCE NO. 83



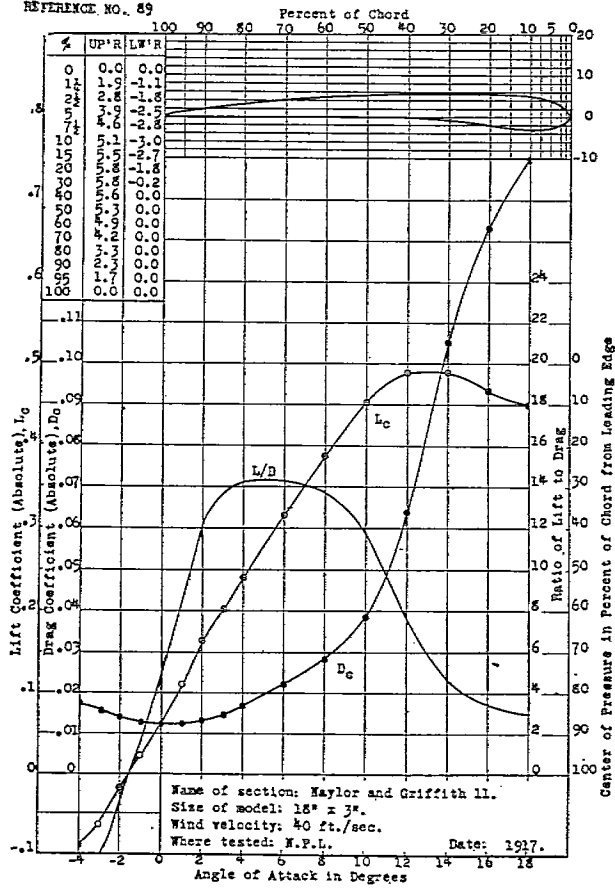
REFERENCE NO. 84



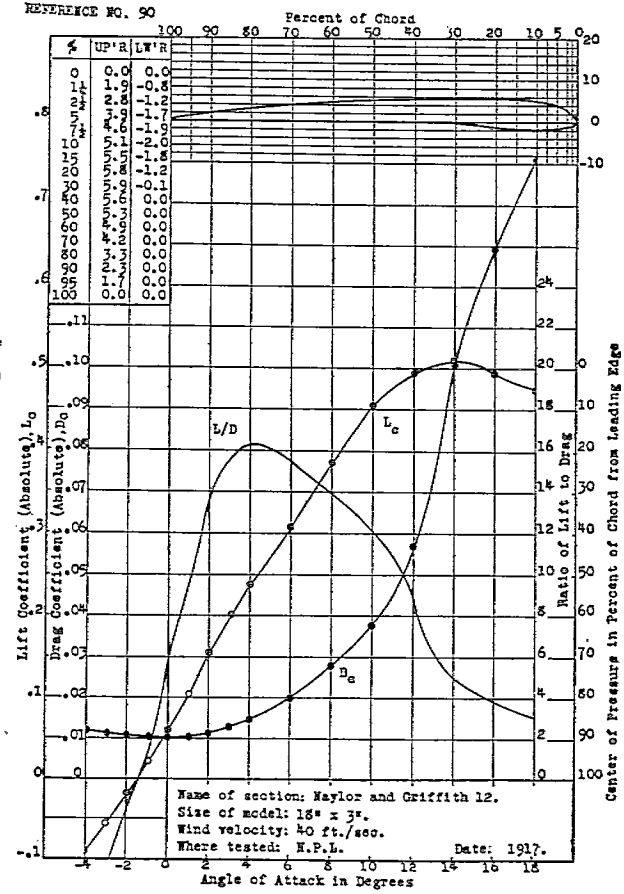


AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

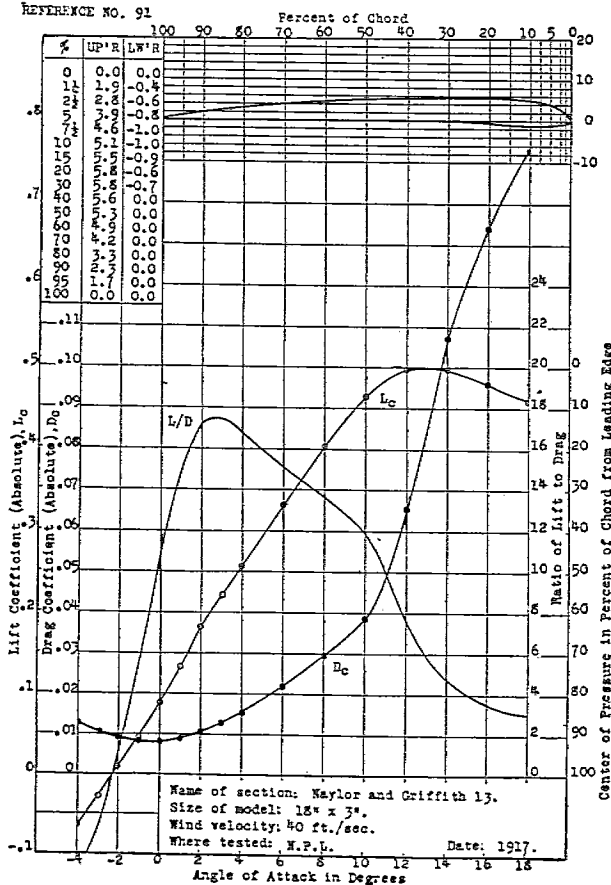
REFERENCE NO. 89



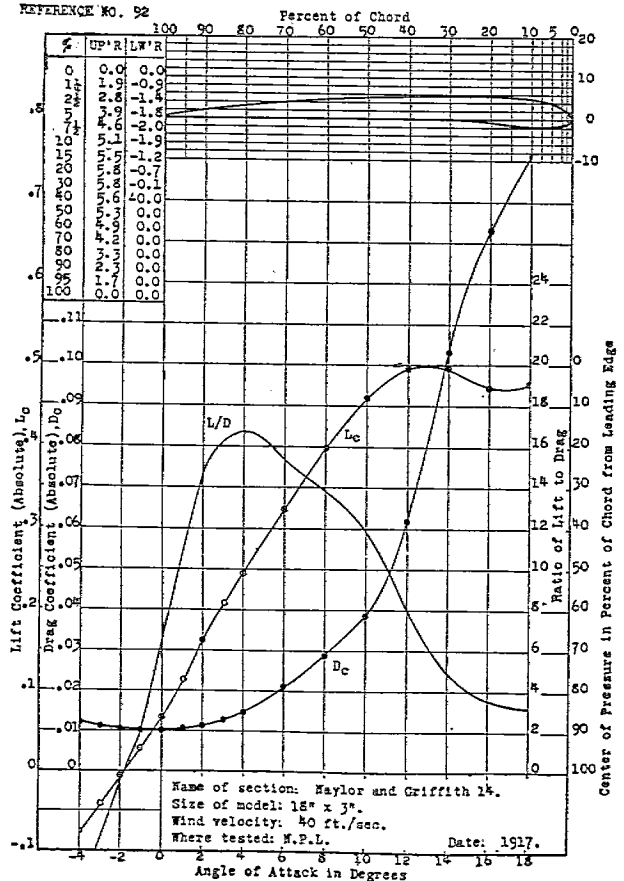
REFERENCE NO. 90



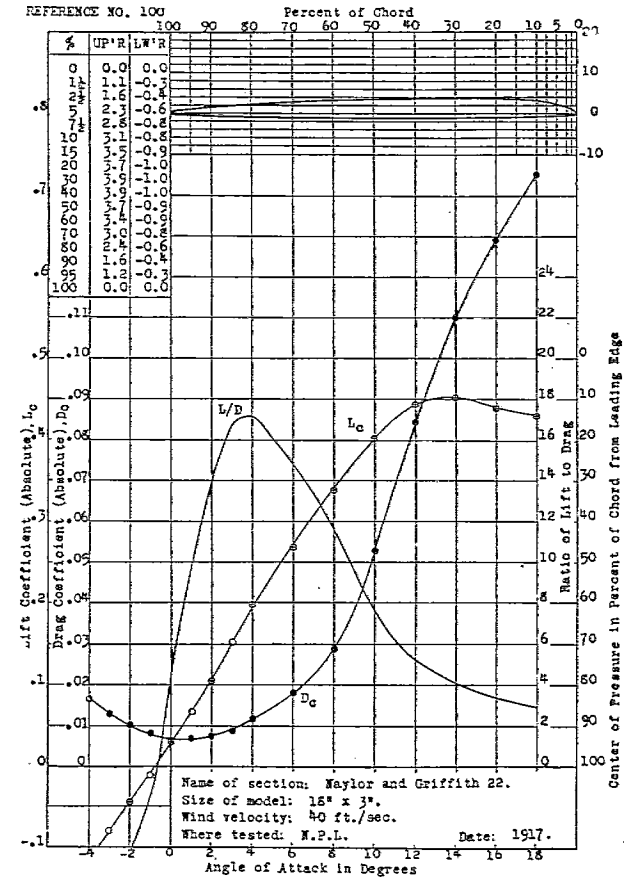
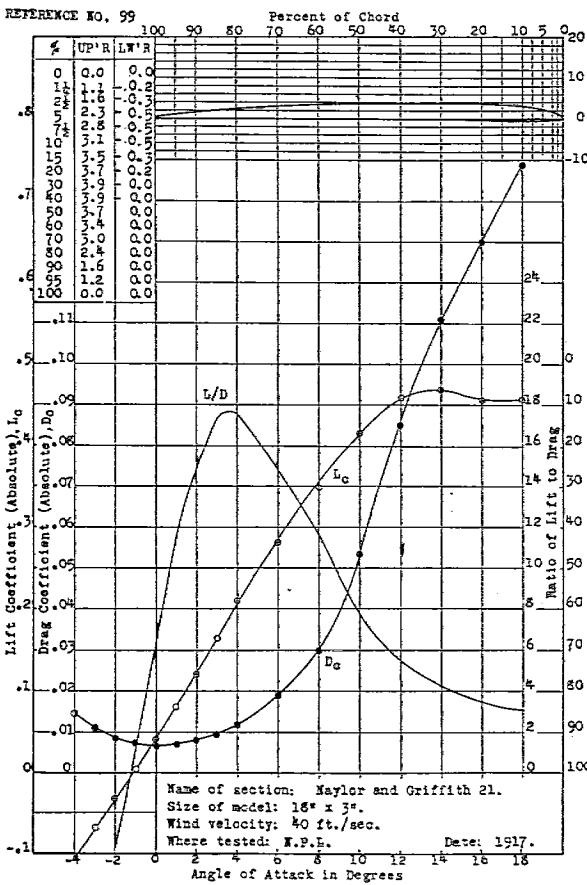
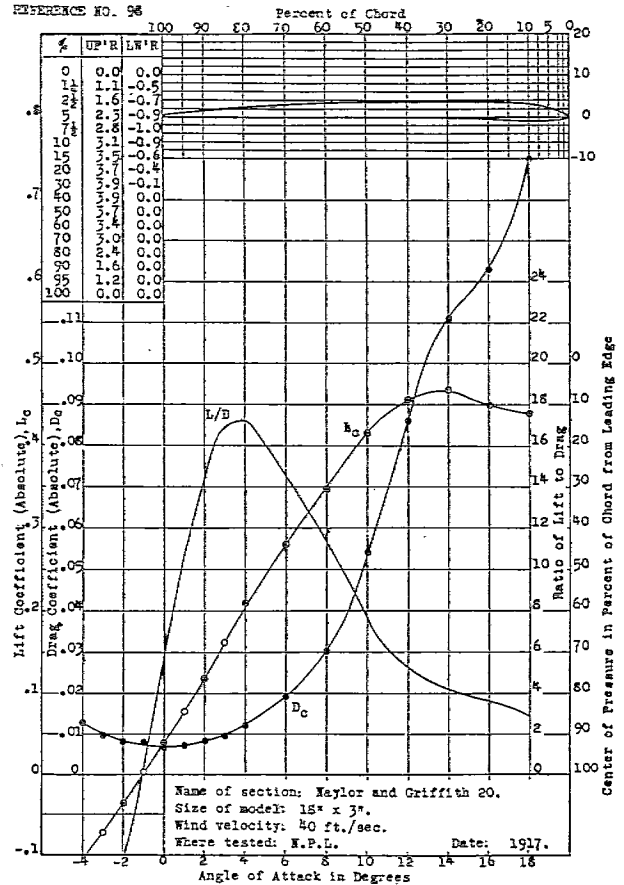
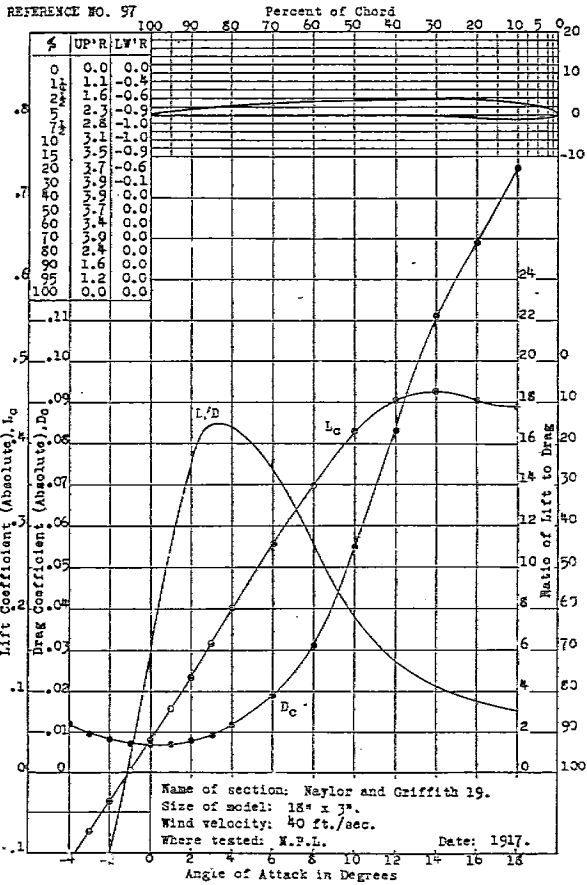
REFERENCE NO. 91

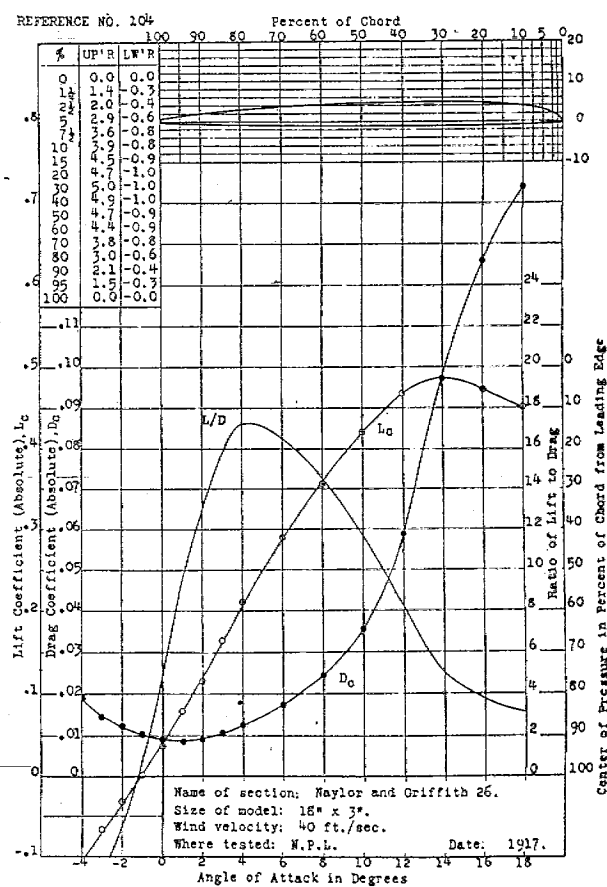
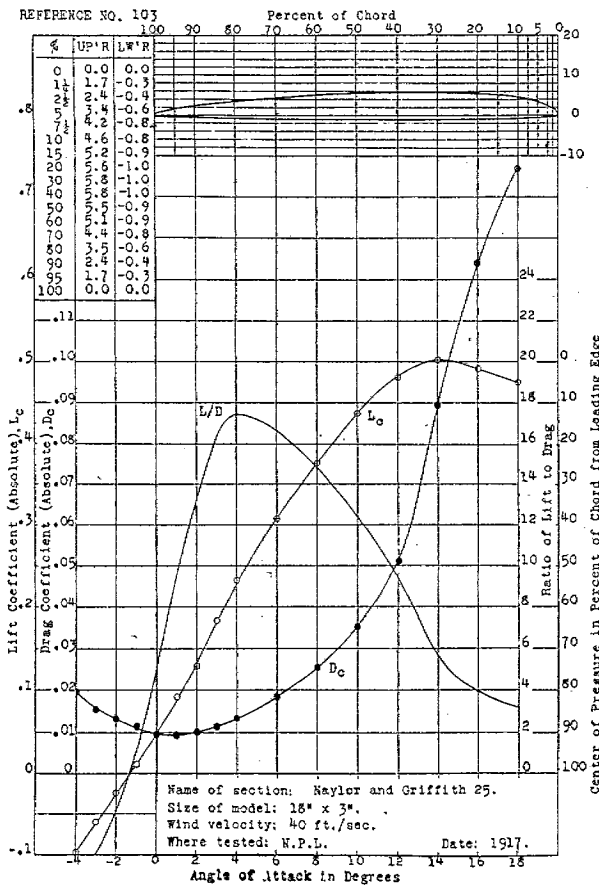
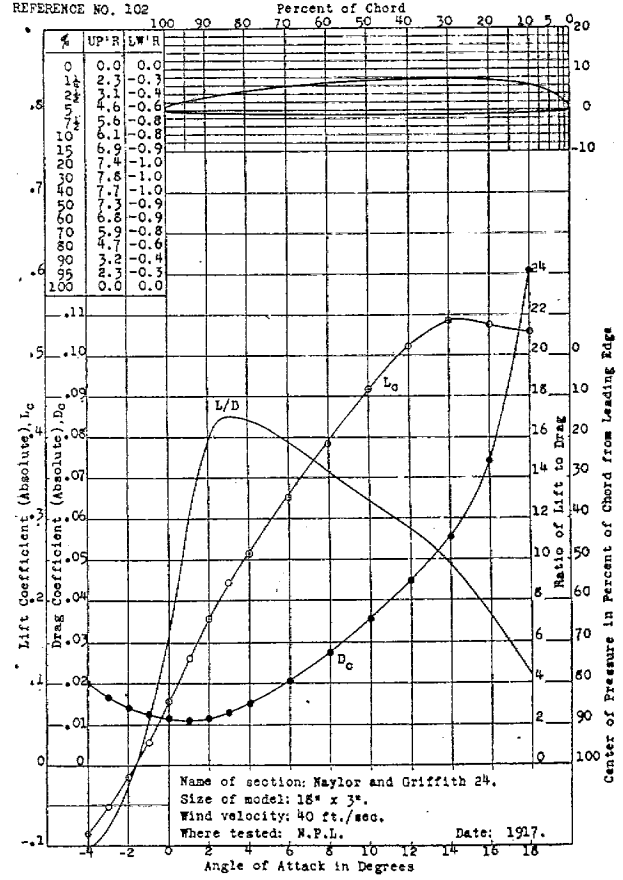
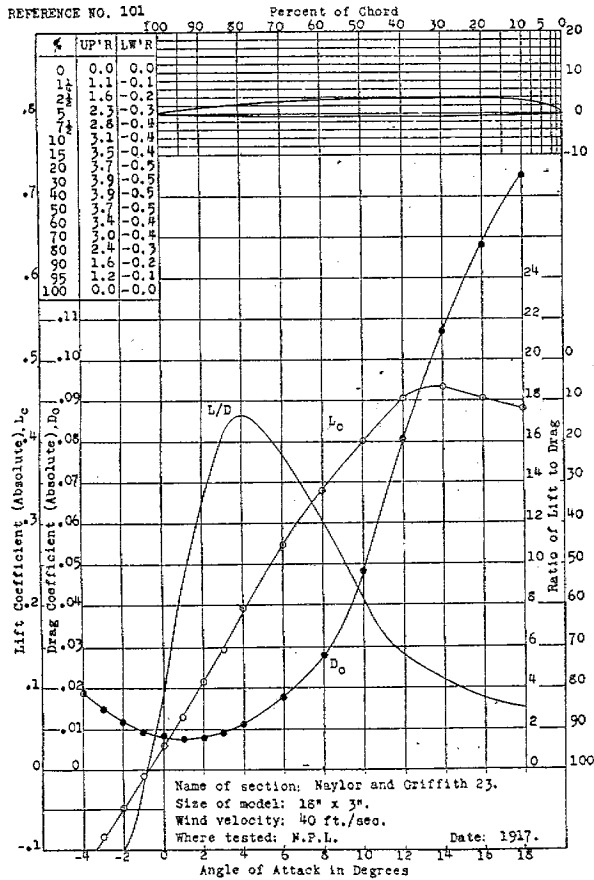


REFERENCE NO. 92



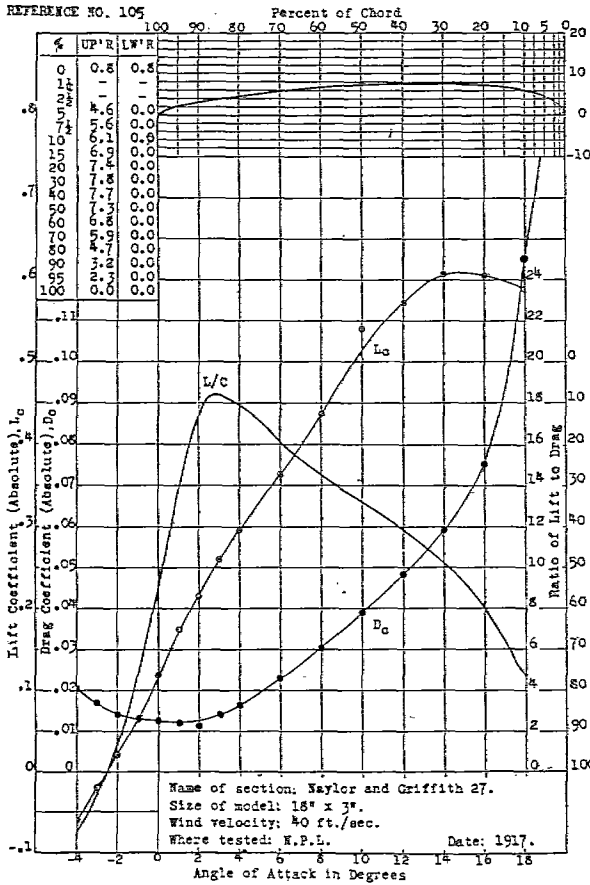
AERODYNAMIC CHARACTERISTICS OF AEROFOILS



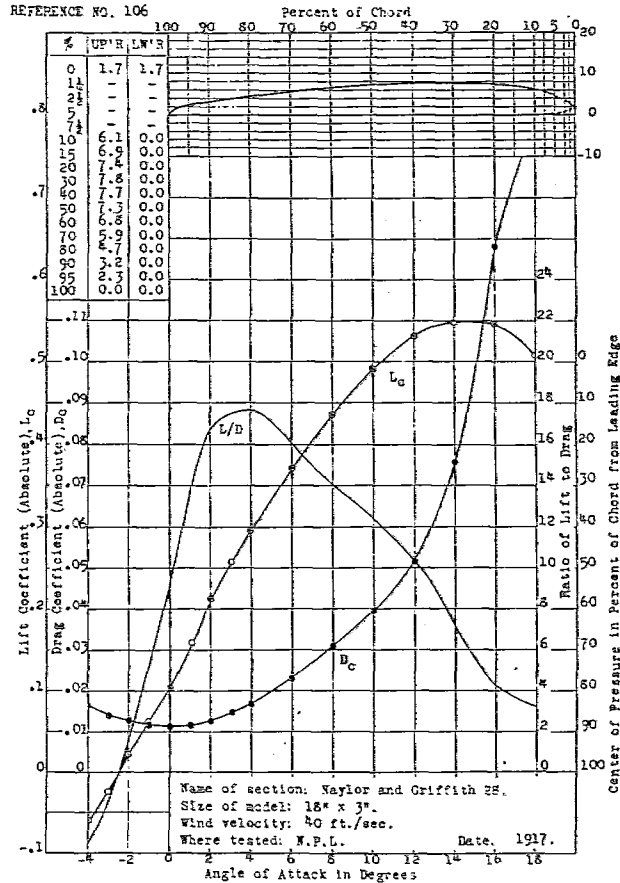


AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

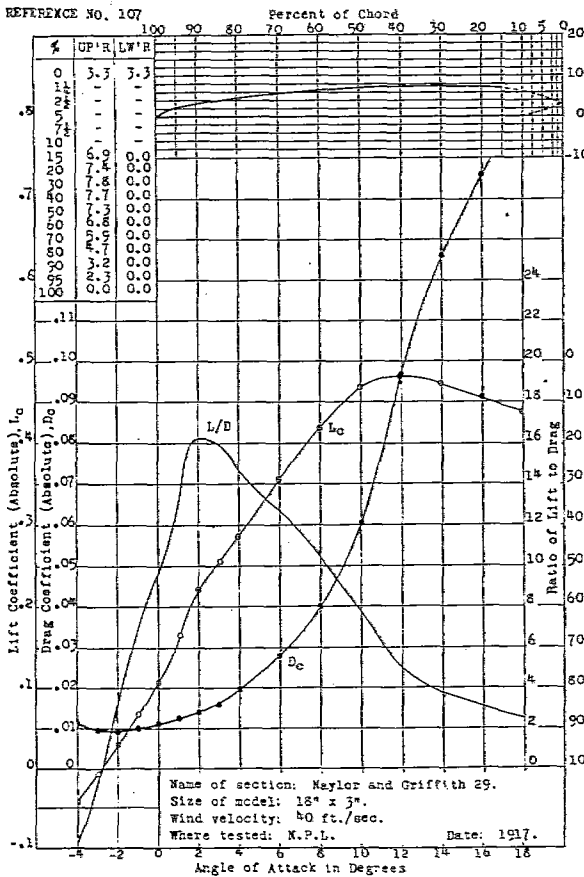
REFERENCE NO. 105



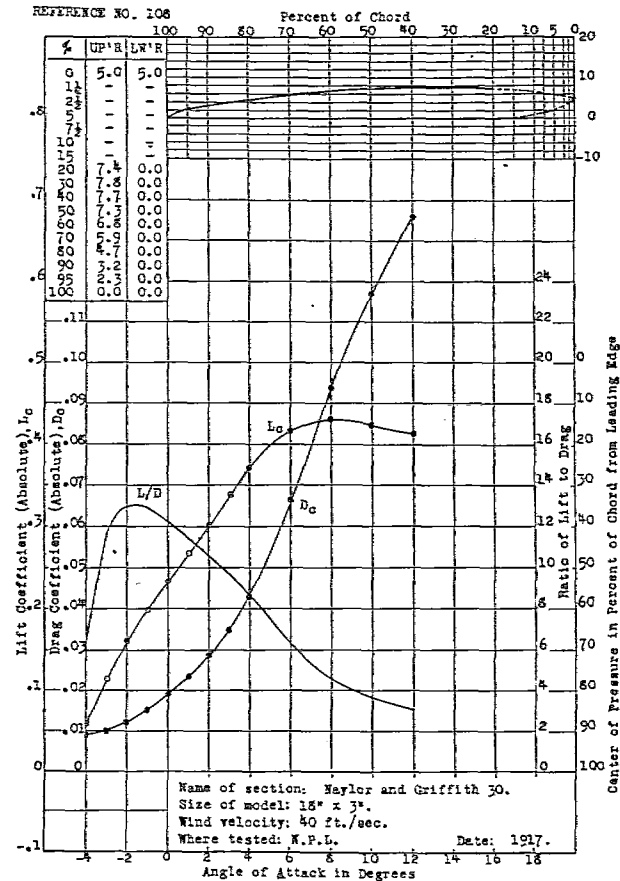
REFERENCE NO. 106

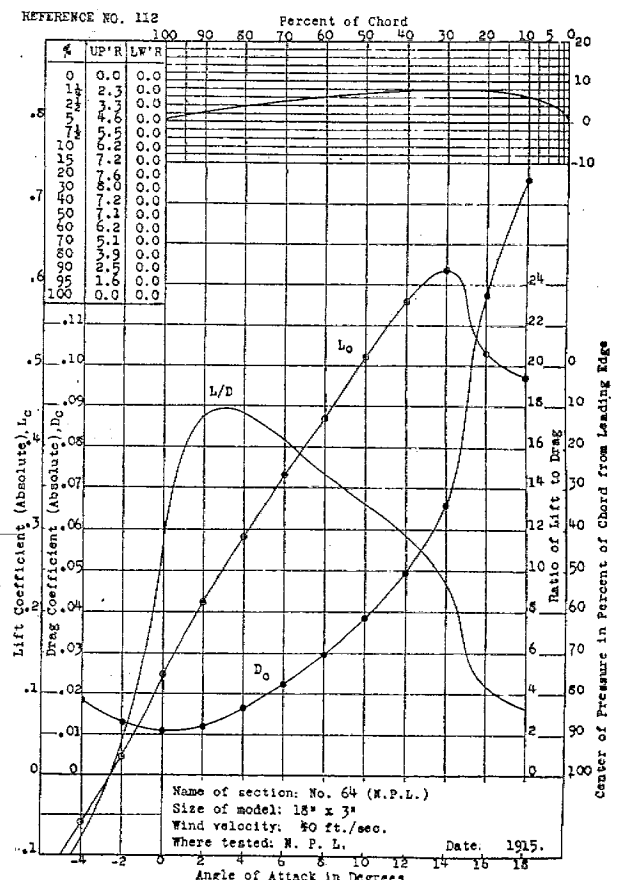
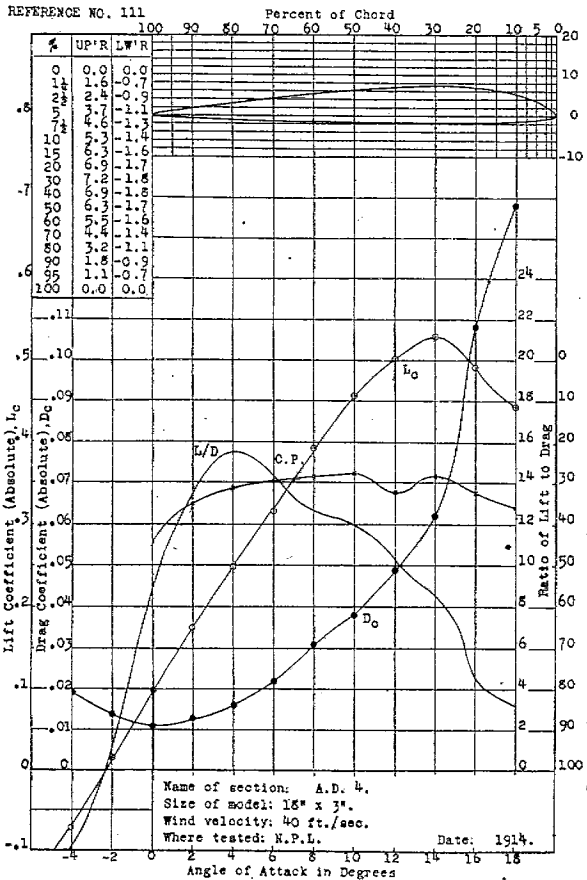
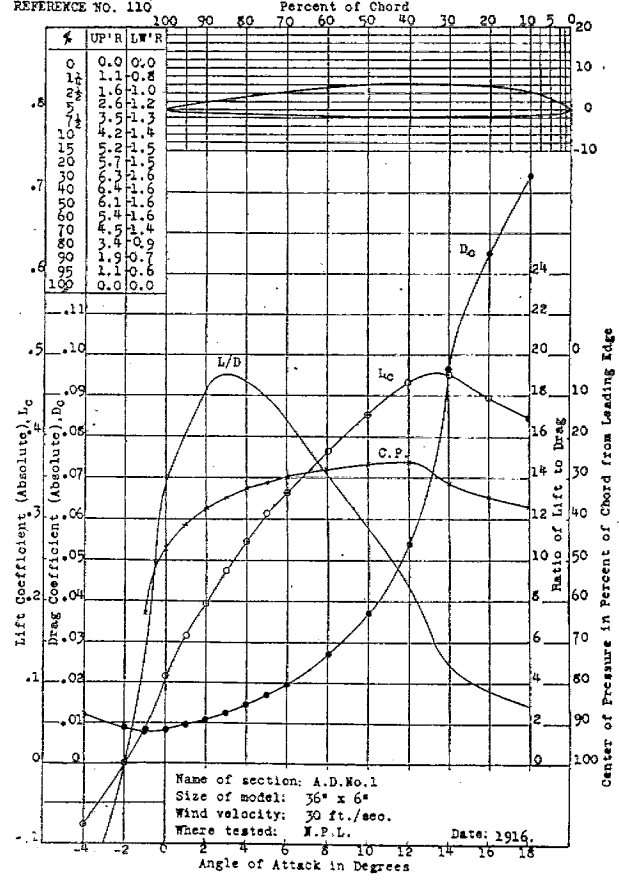
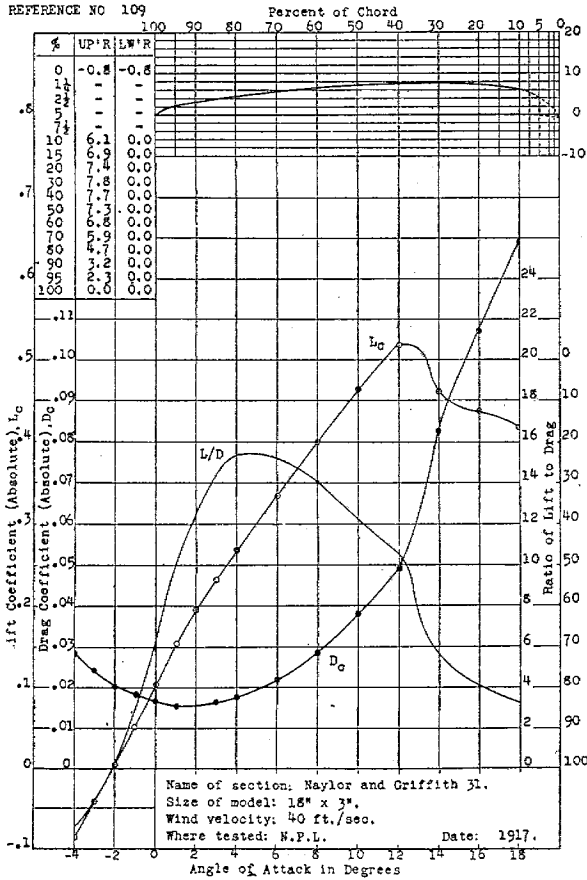


REFERENCE NO. 107

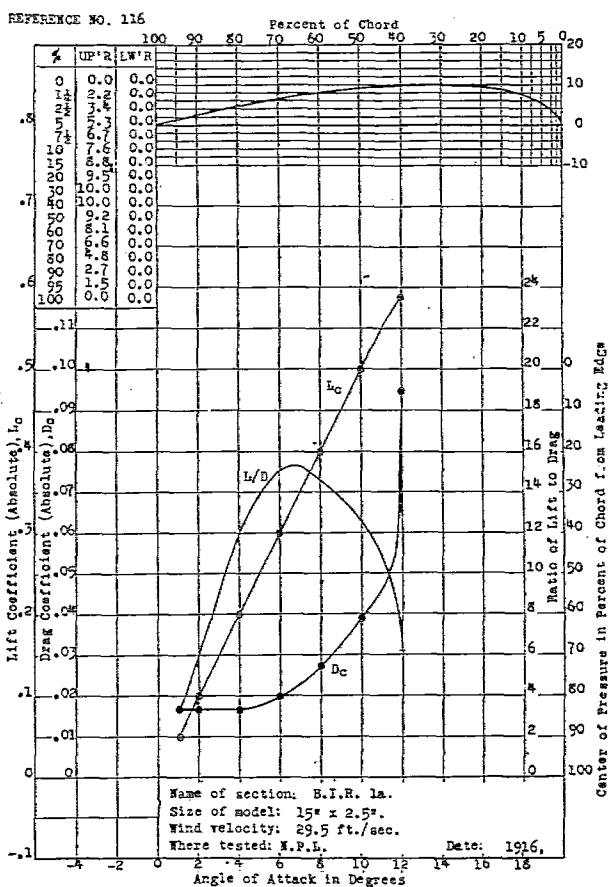
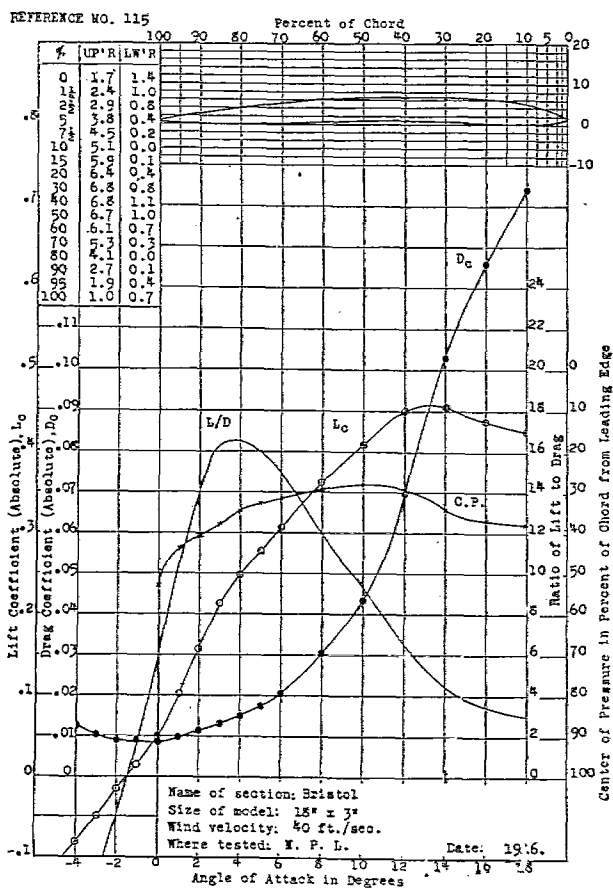
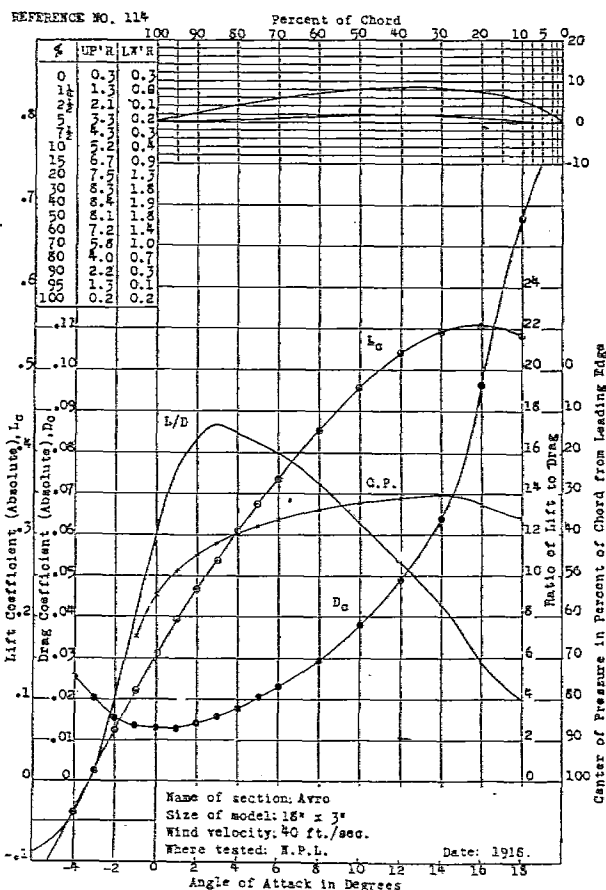
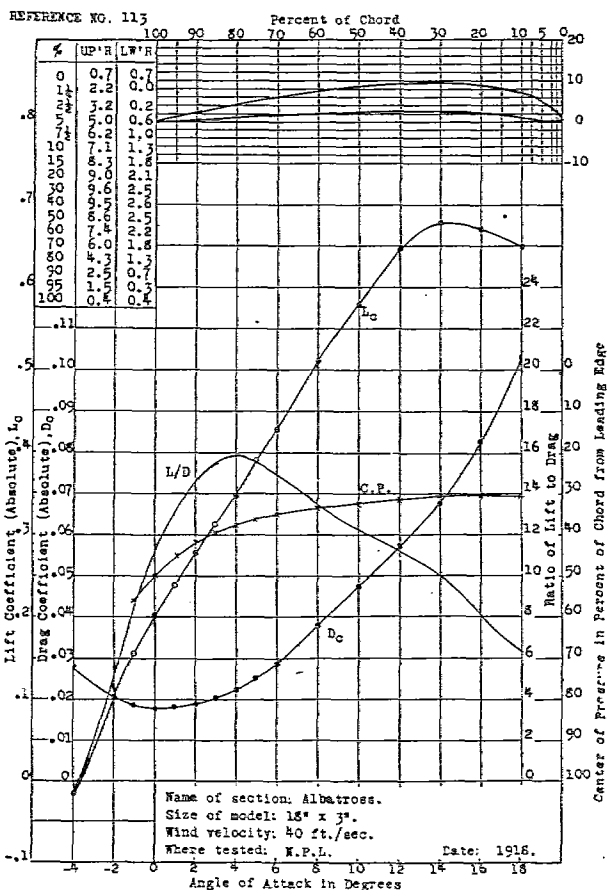


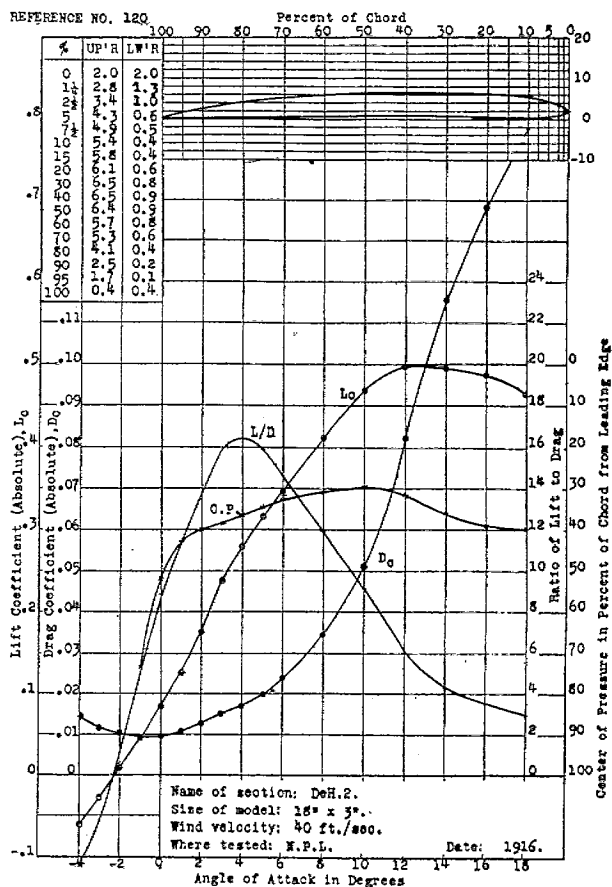
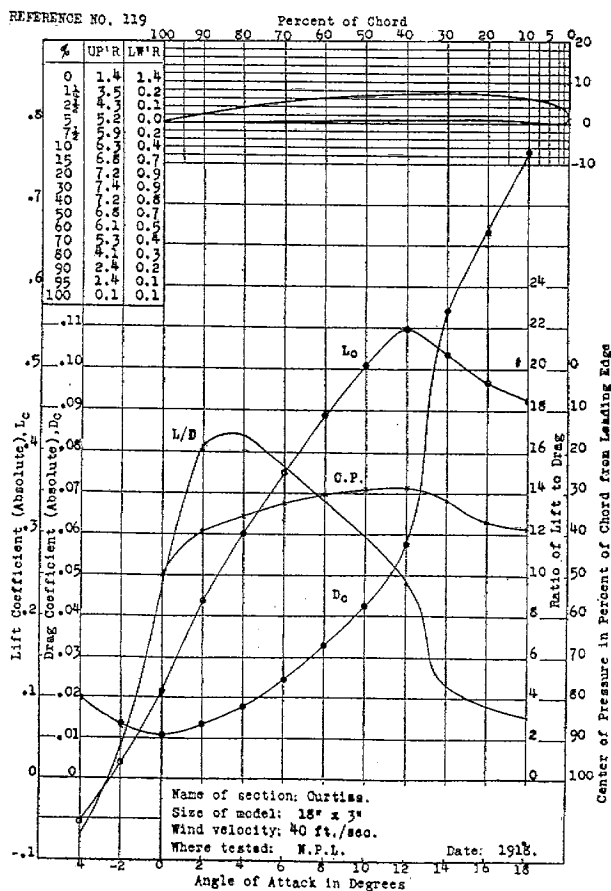
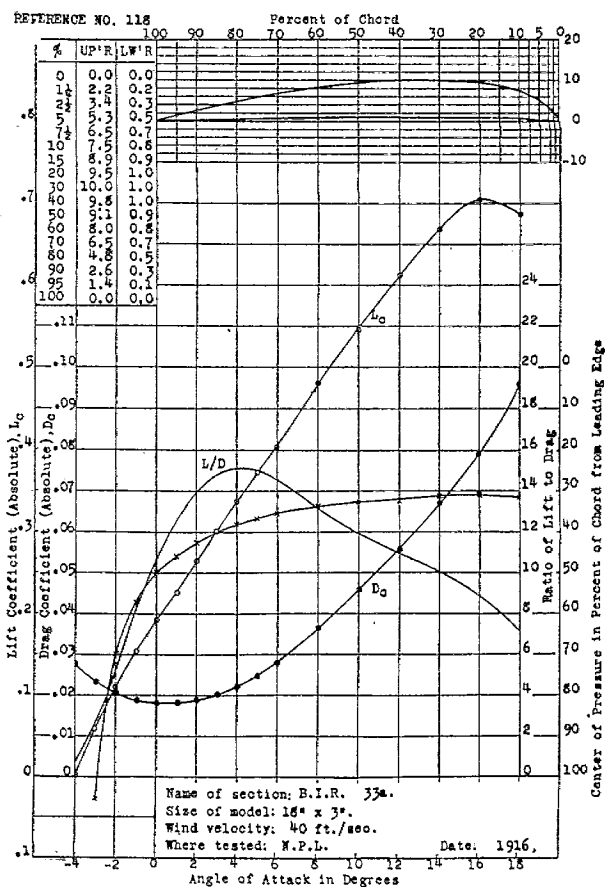
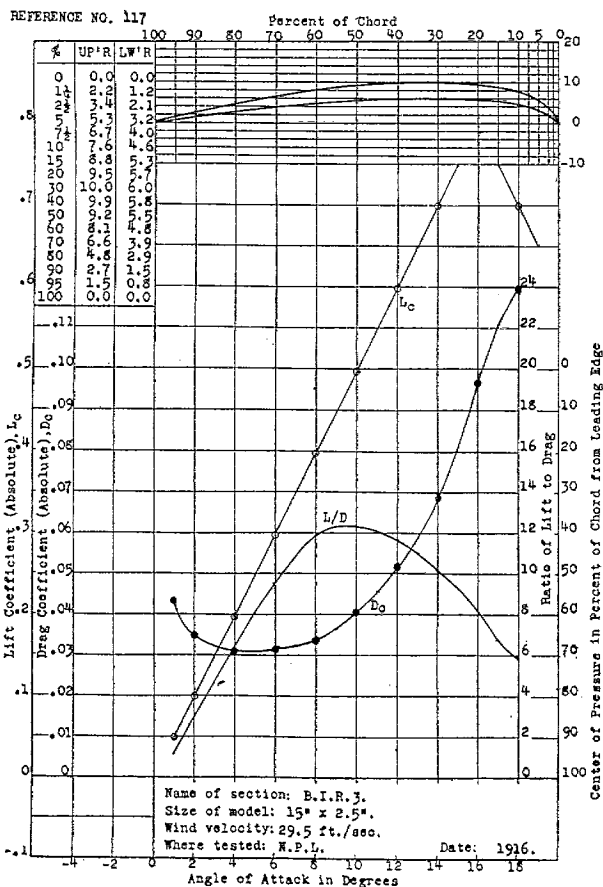
REFERENCE NO. 108

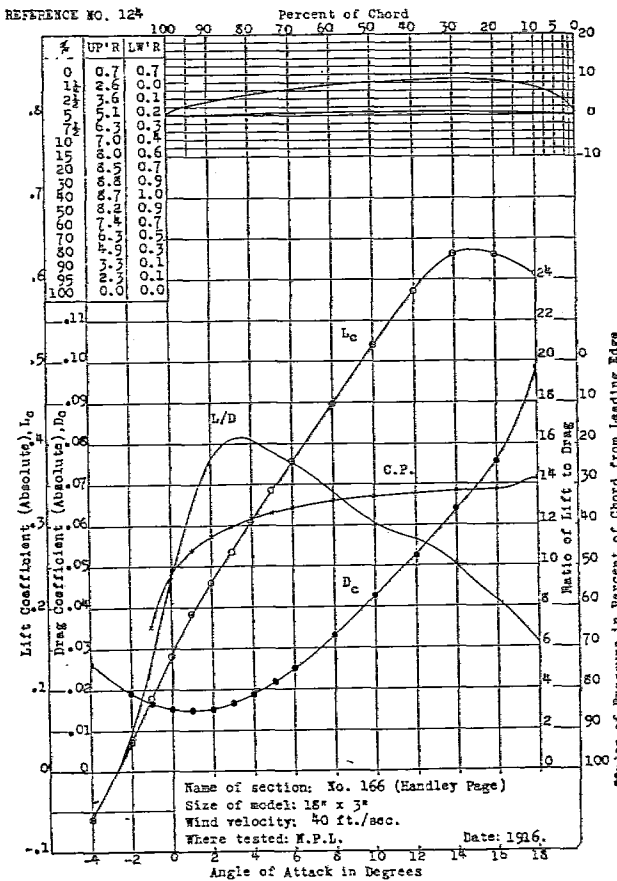
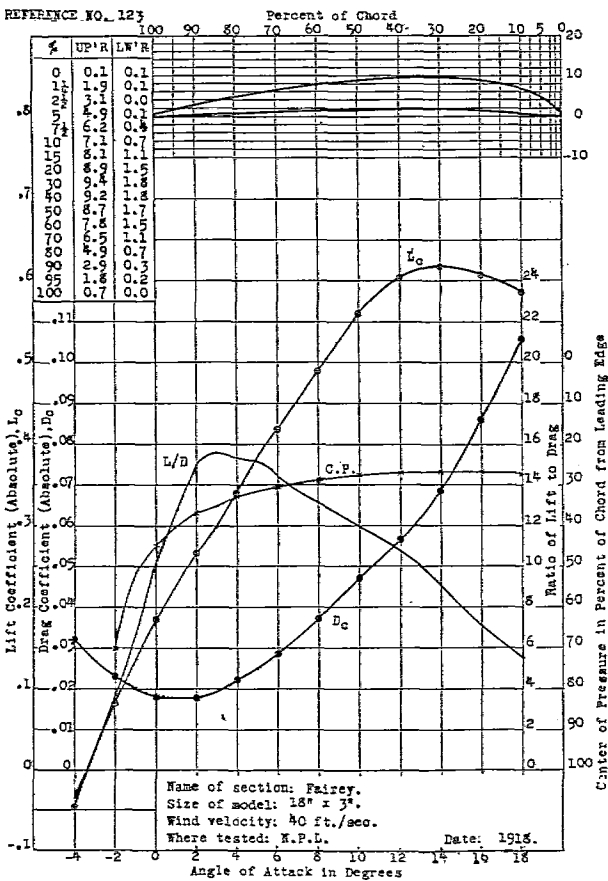
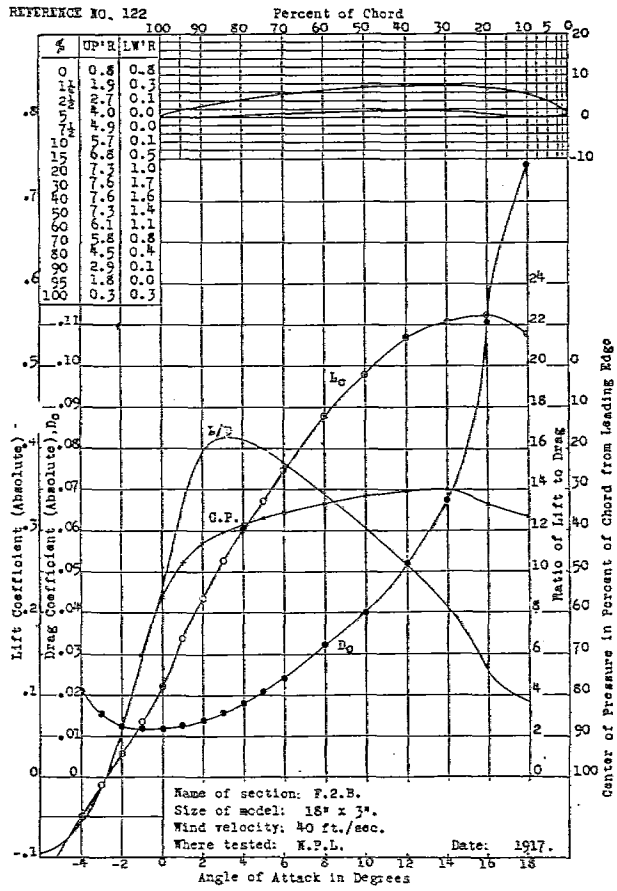
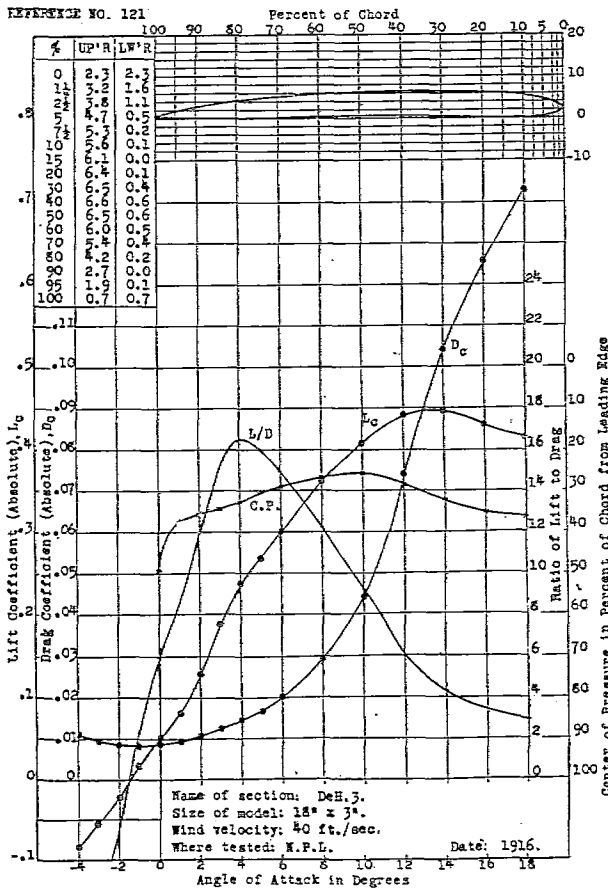


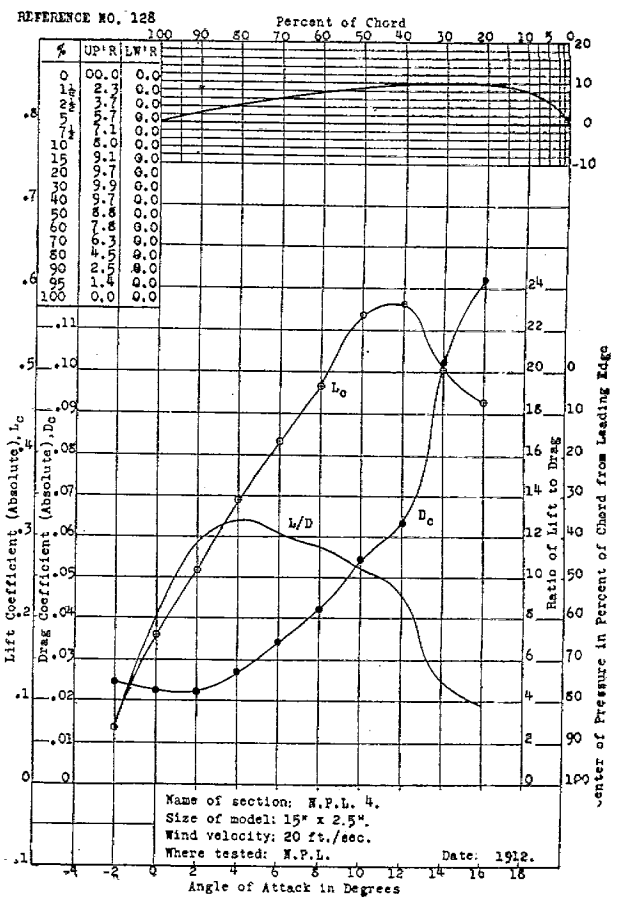
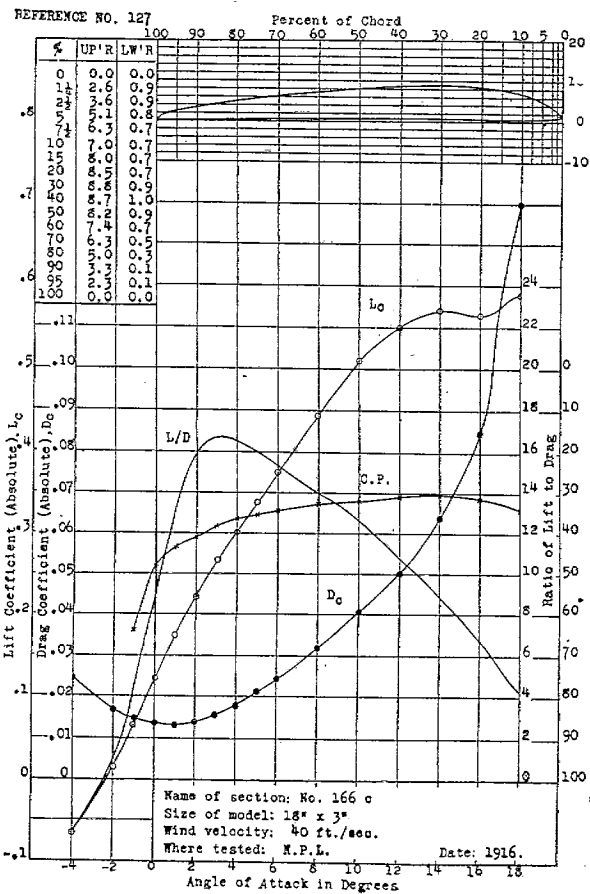
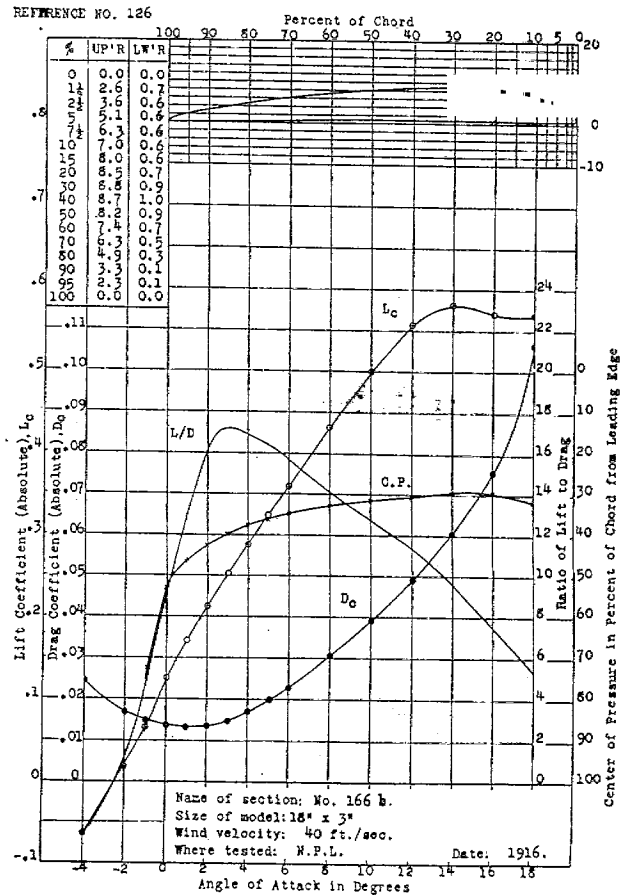
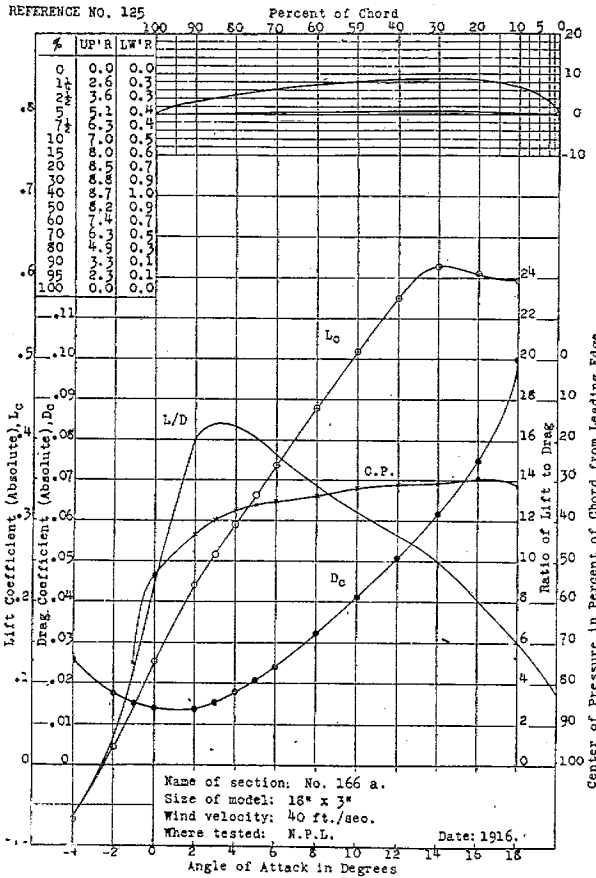


AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

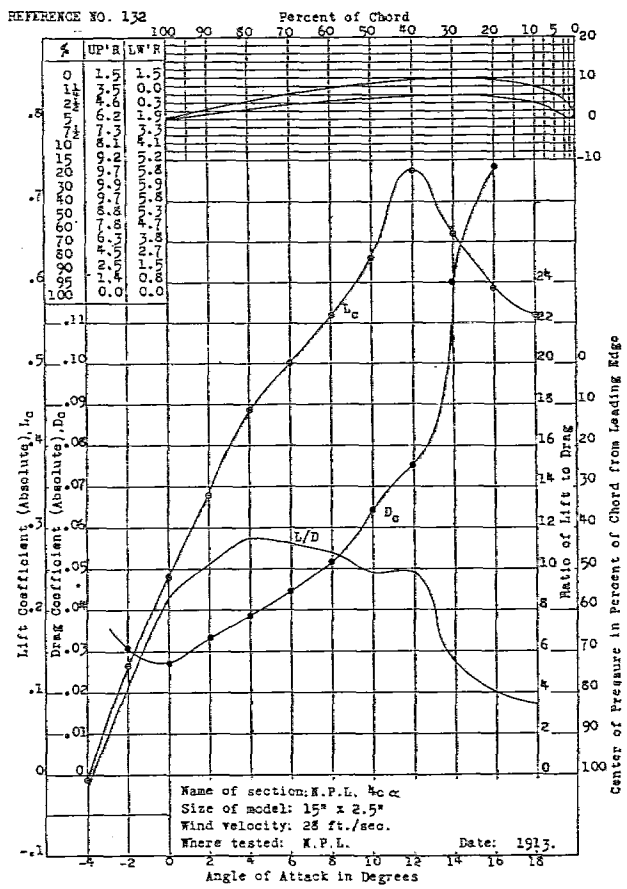
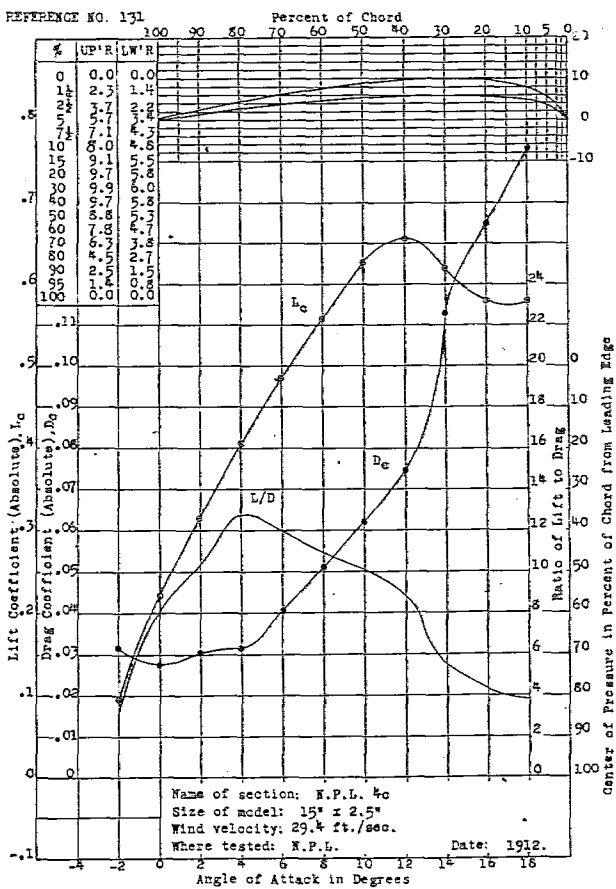
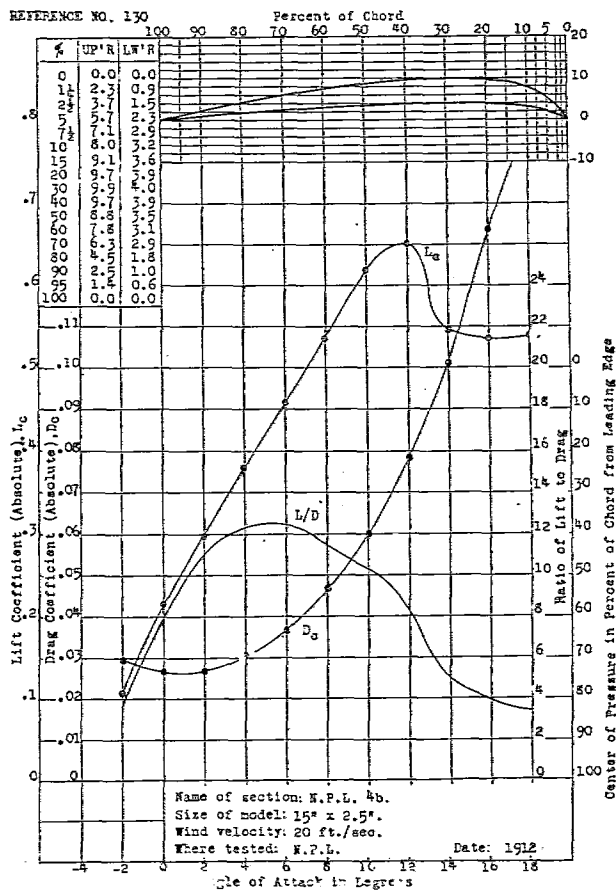
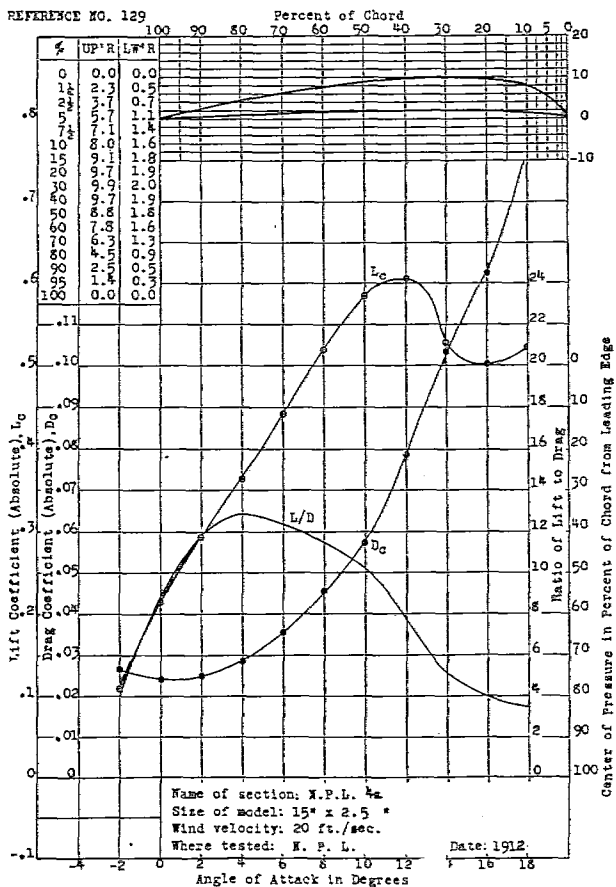




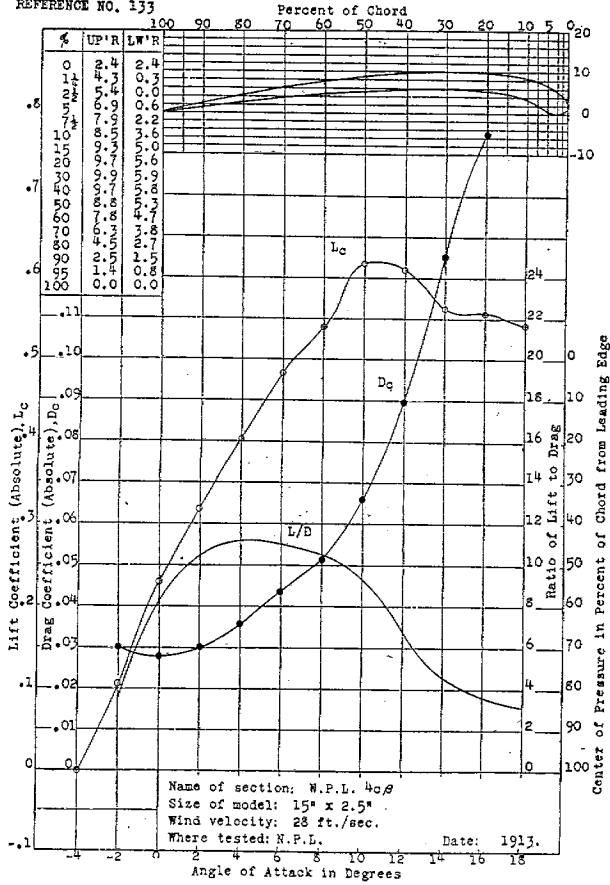




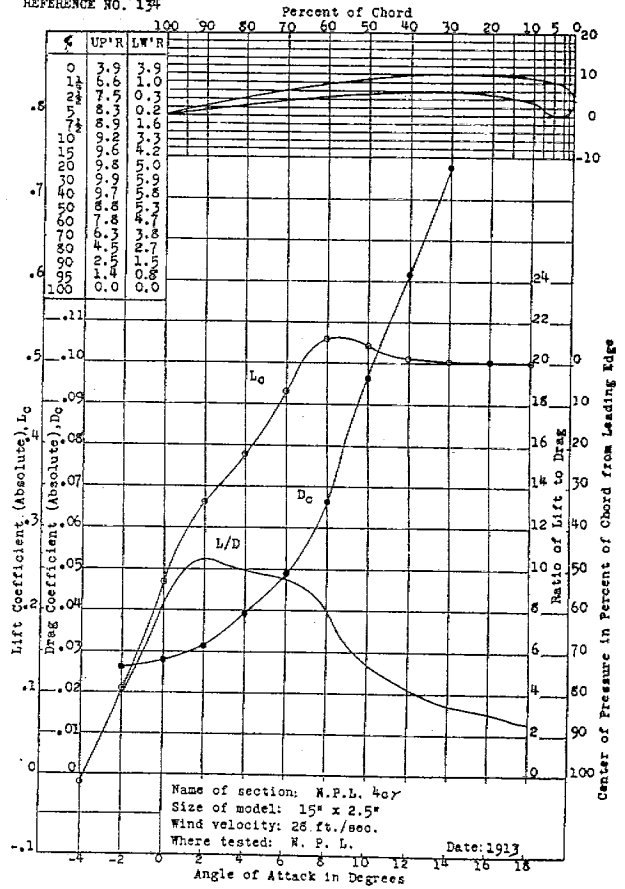
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.



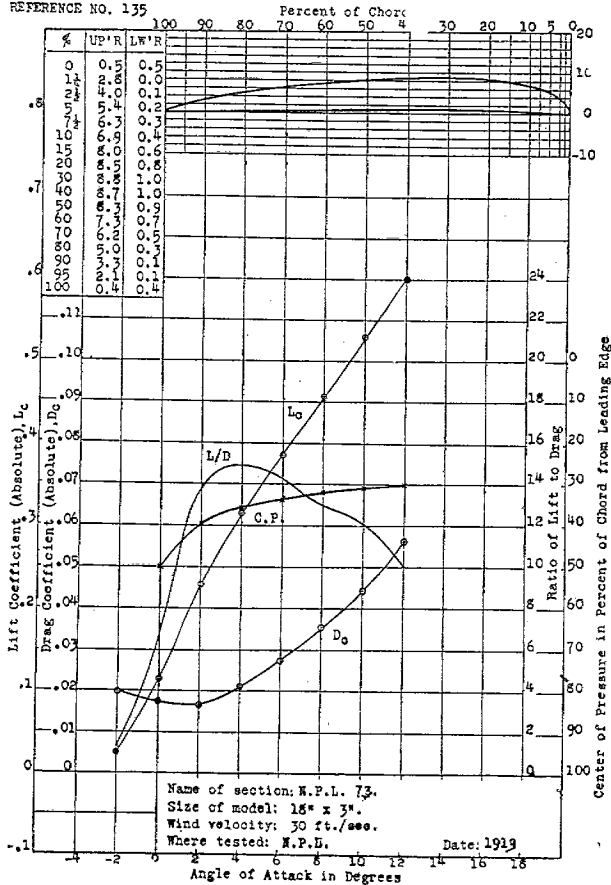
REFERENCE NO. 133



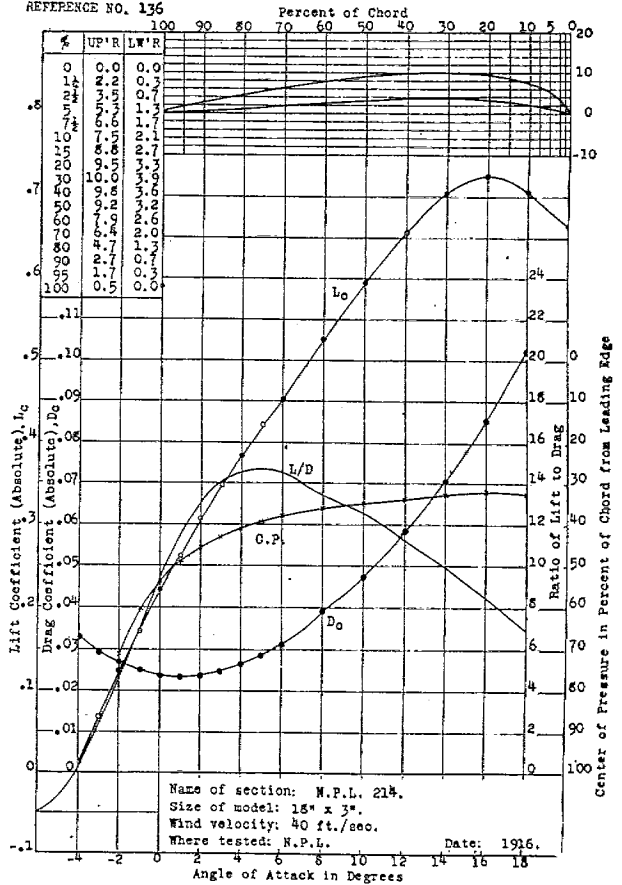
REFERENCE NO. 134



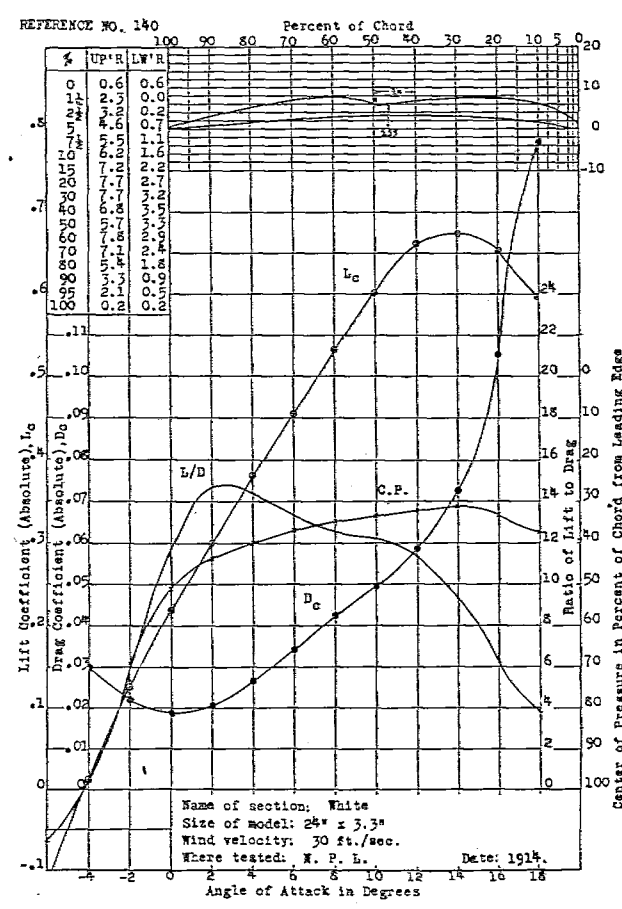
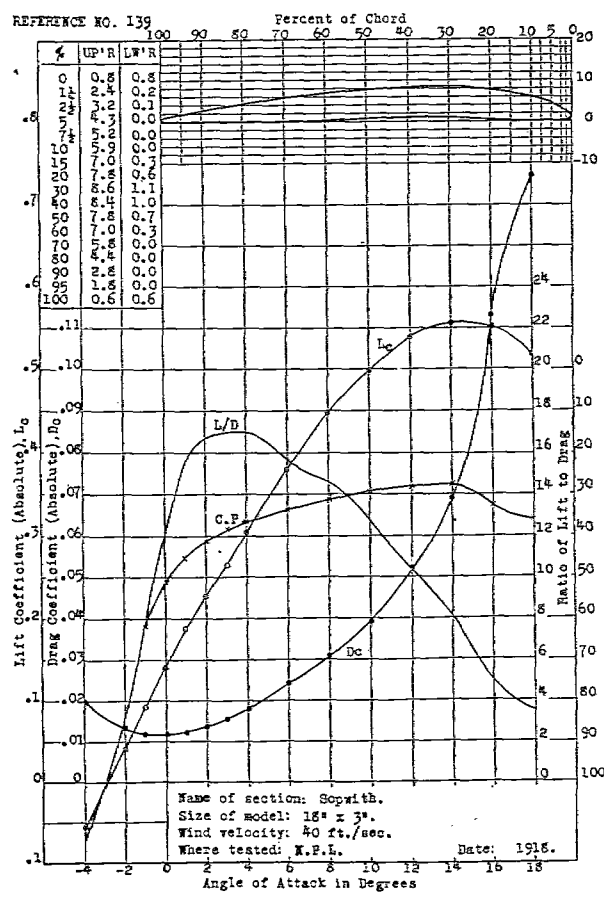
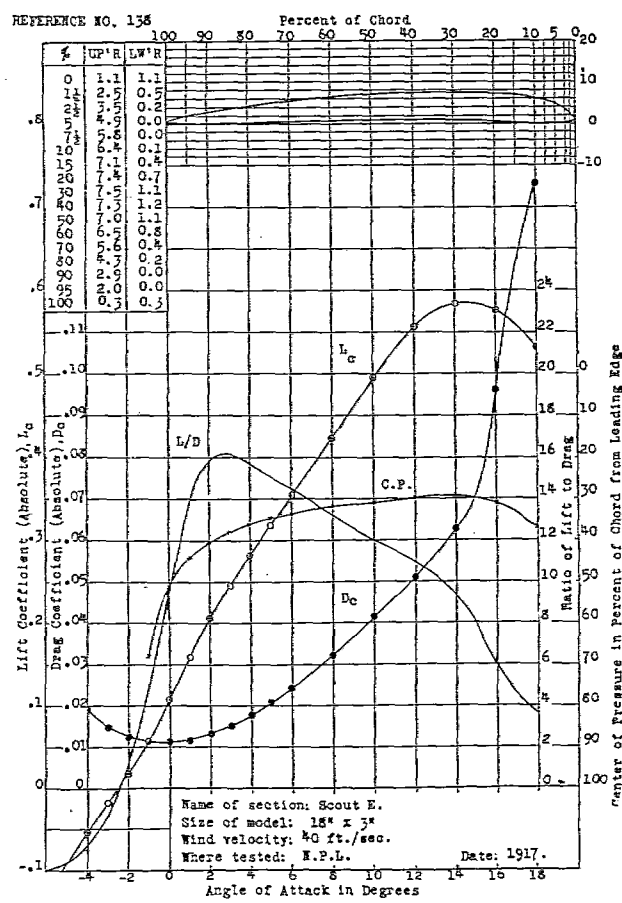
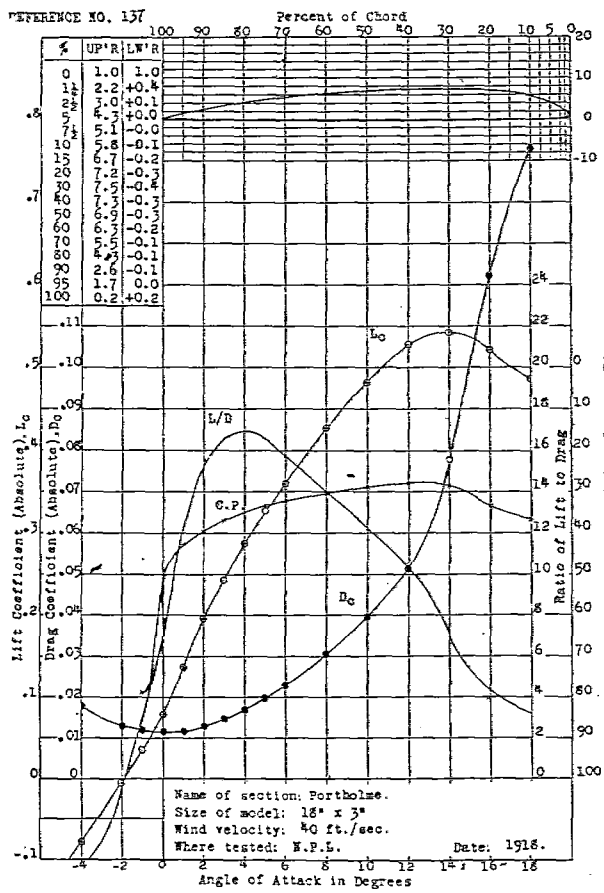
REFERENCE NO. 135

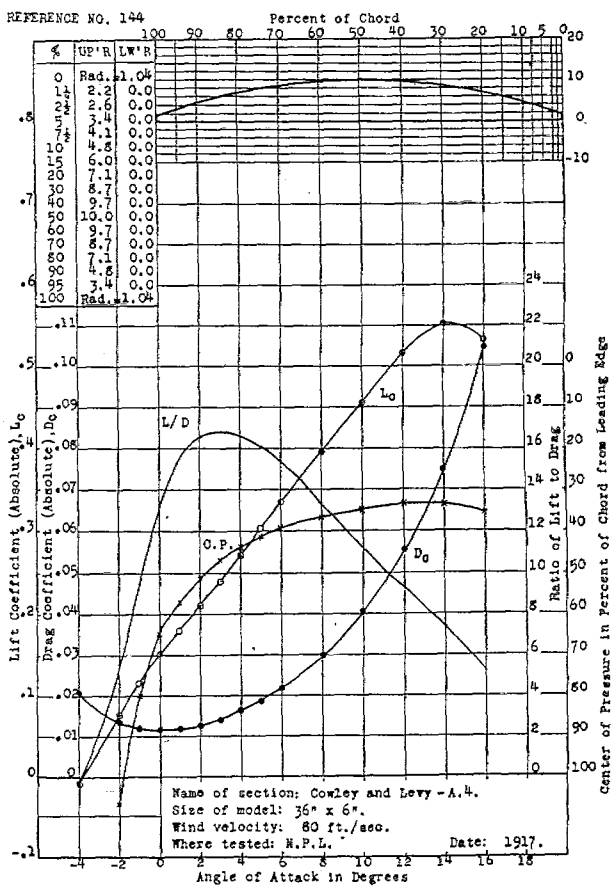
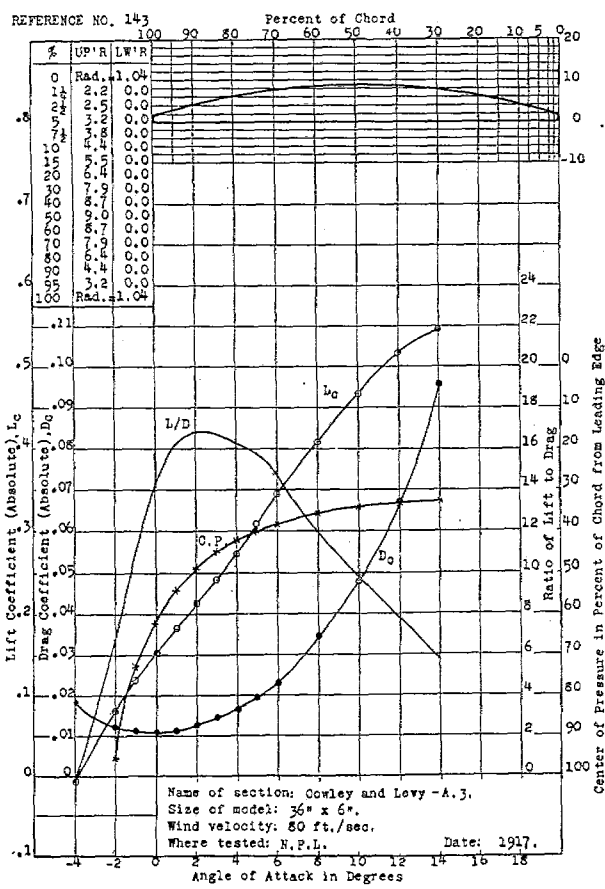
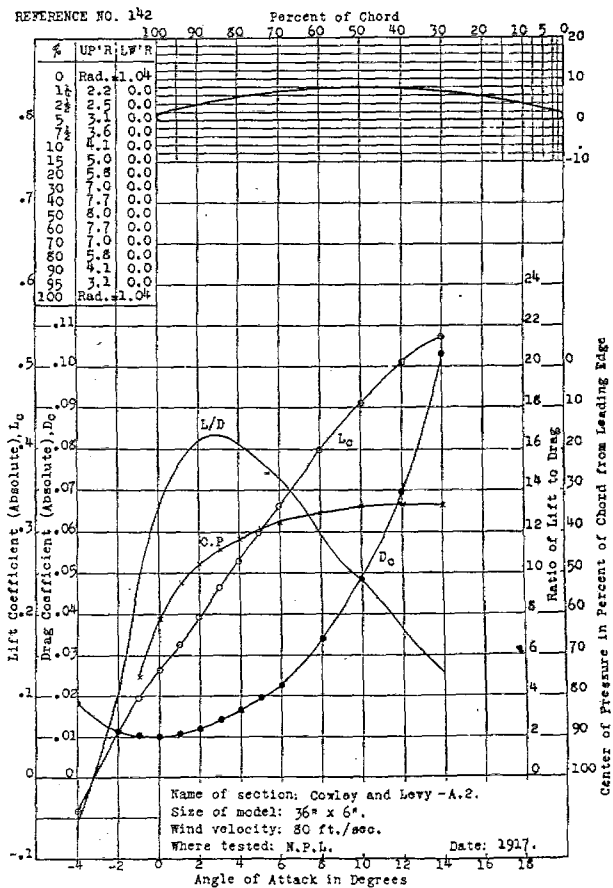
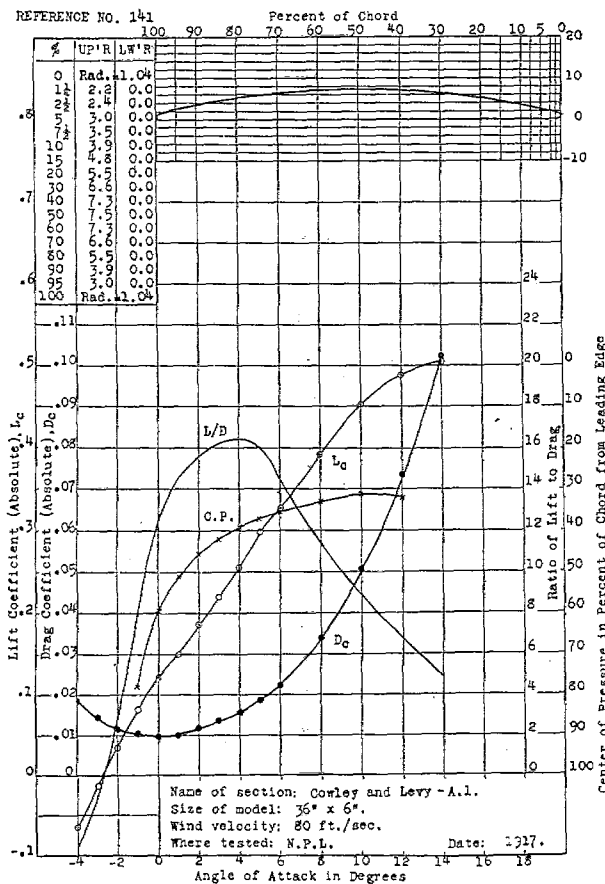


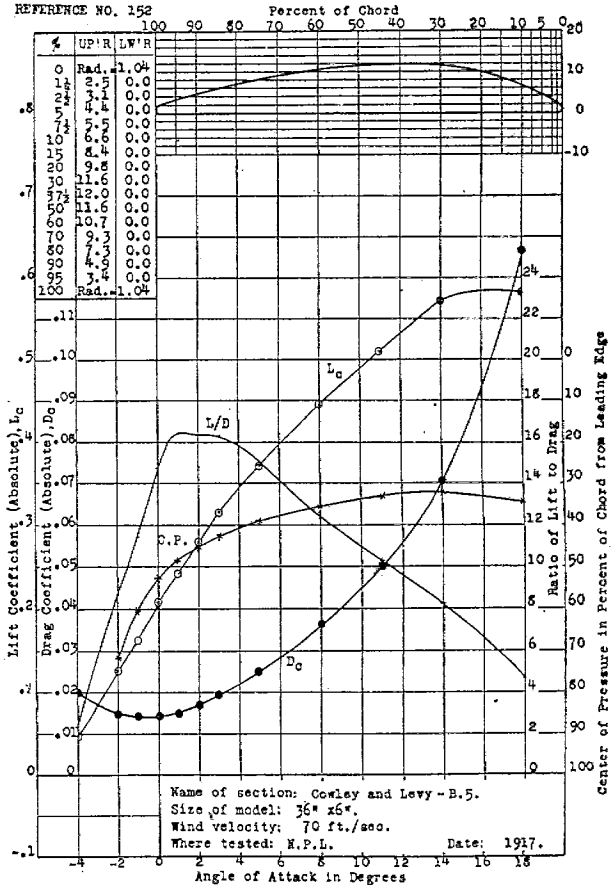
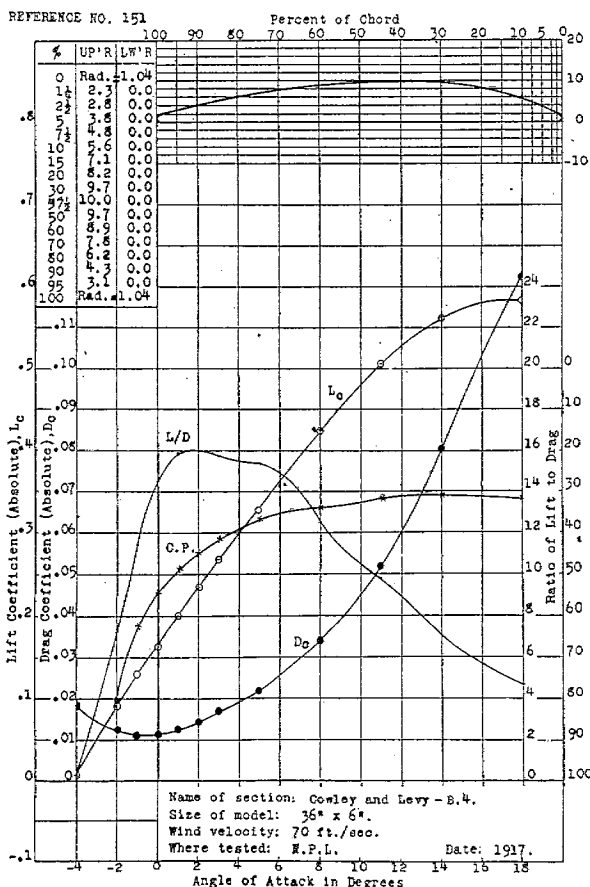
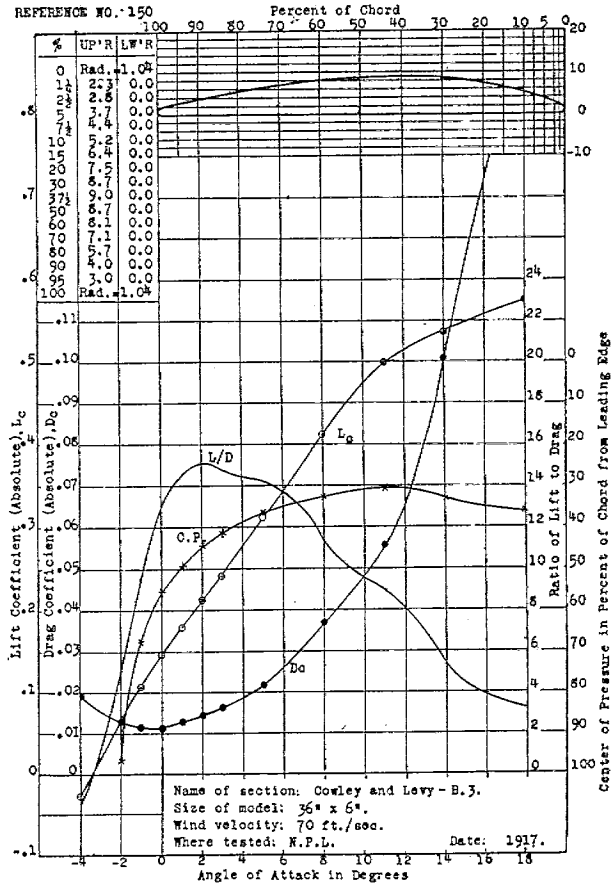
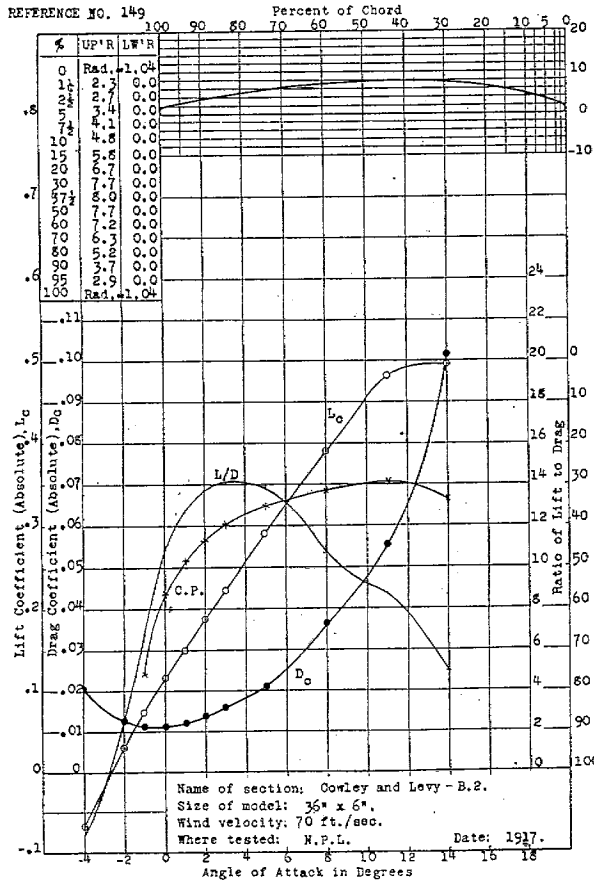
REFERENCE NO. 136



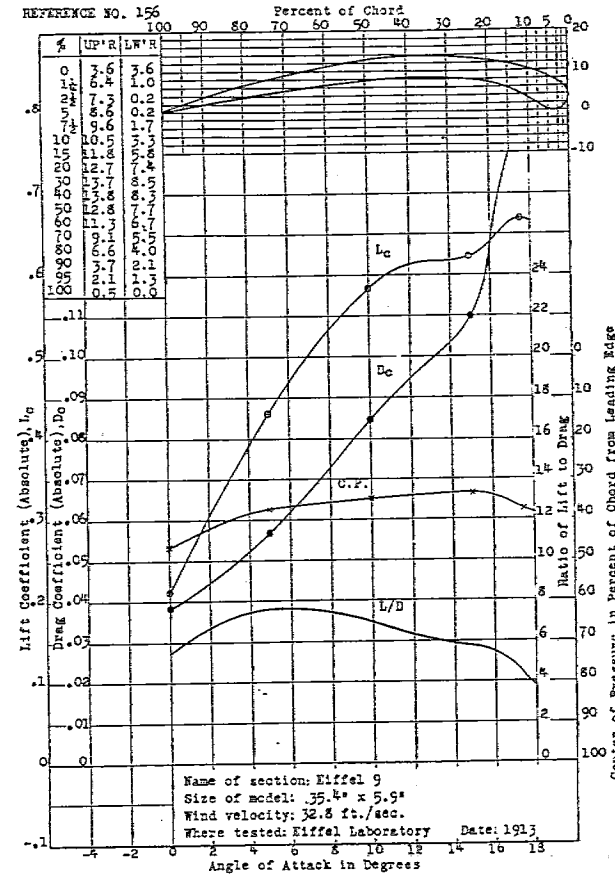
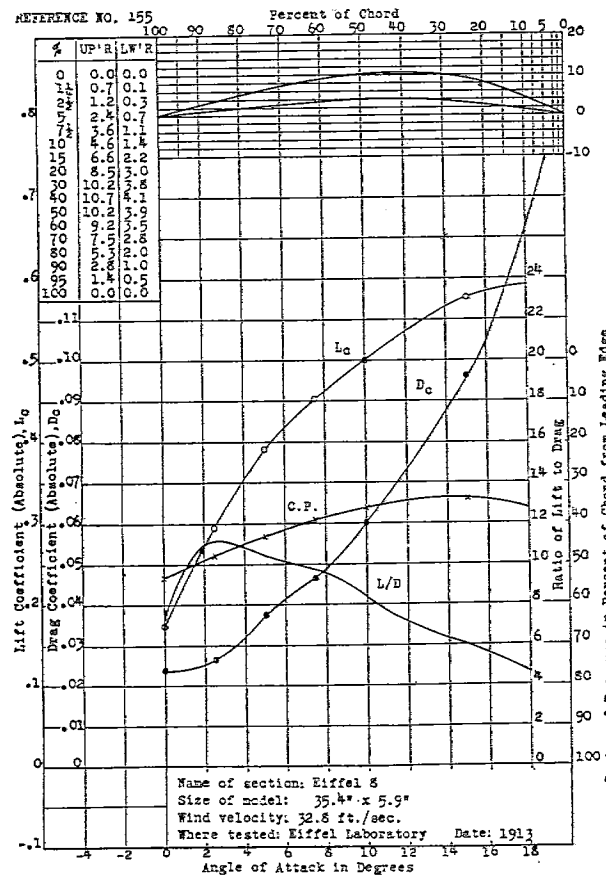
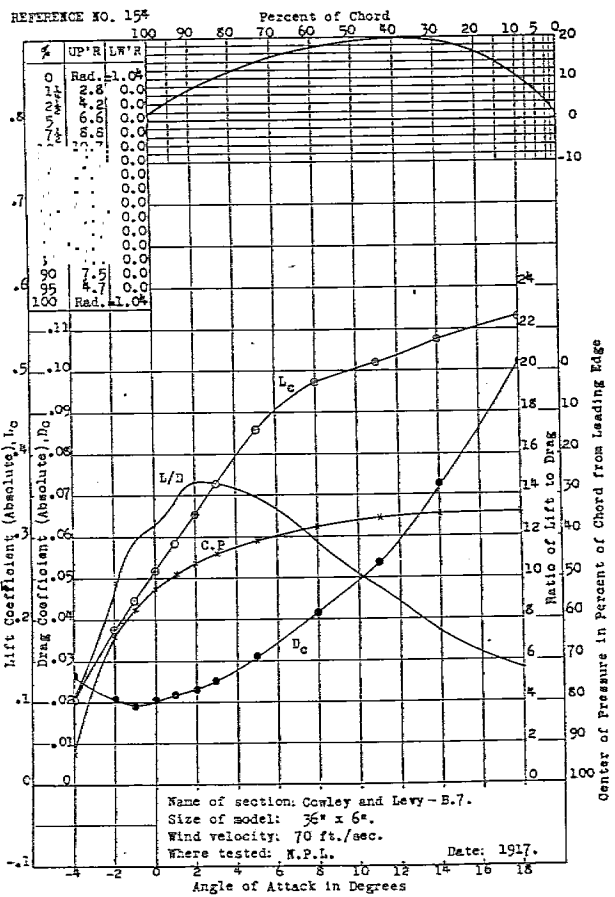
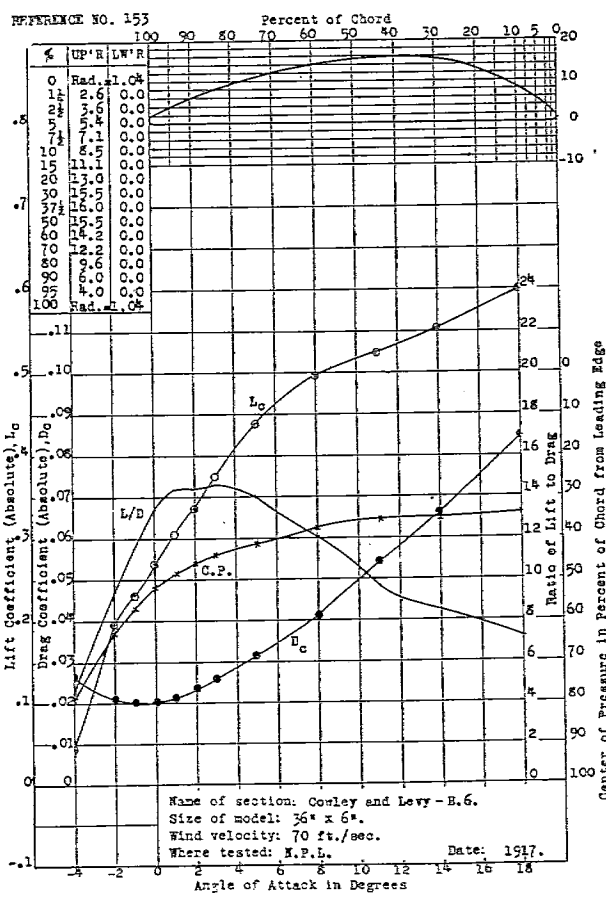
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

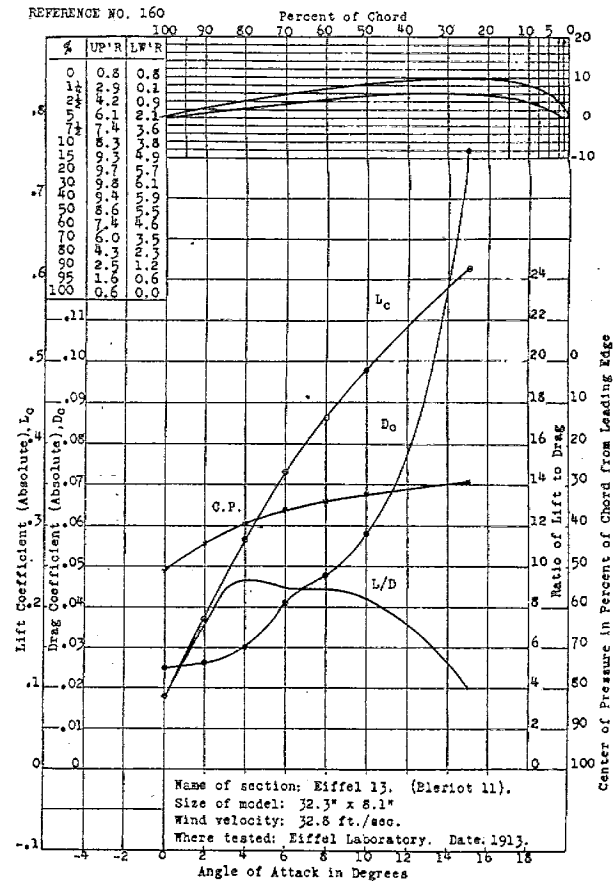
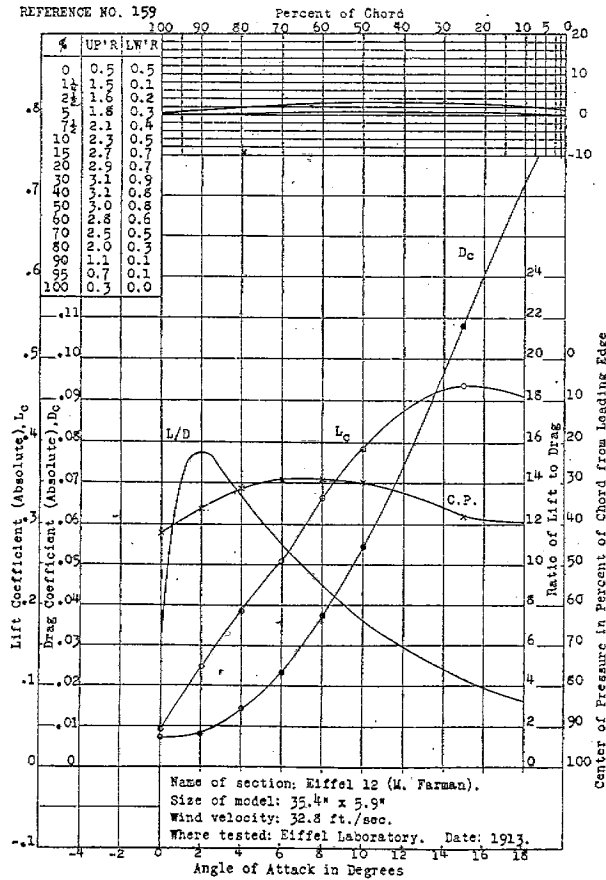
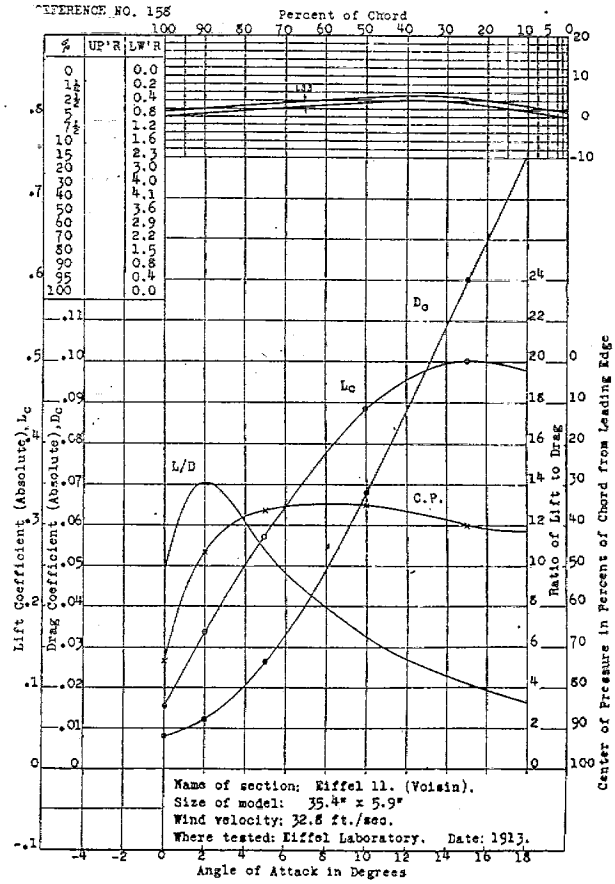
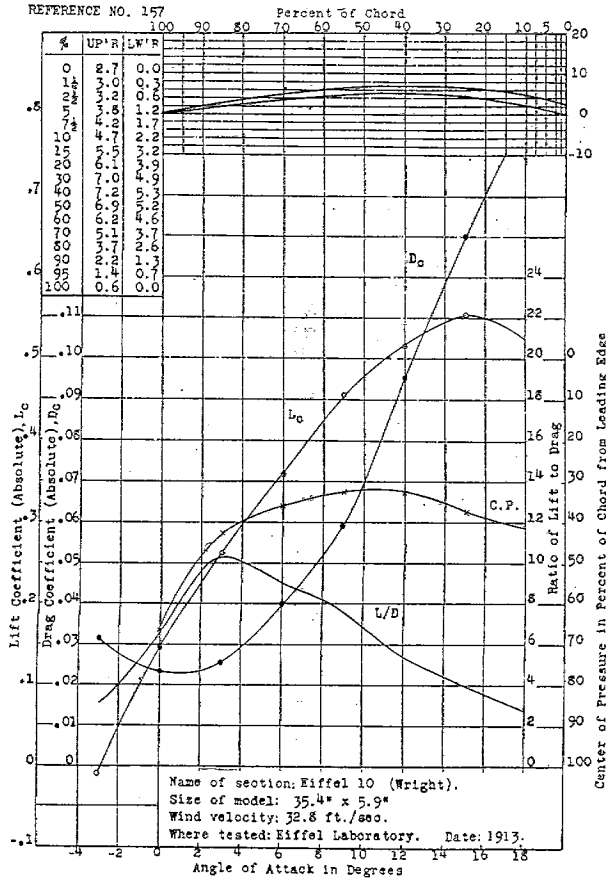




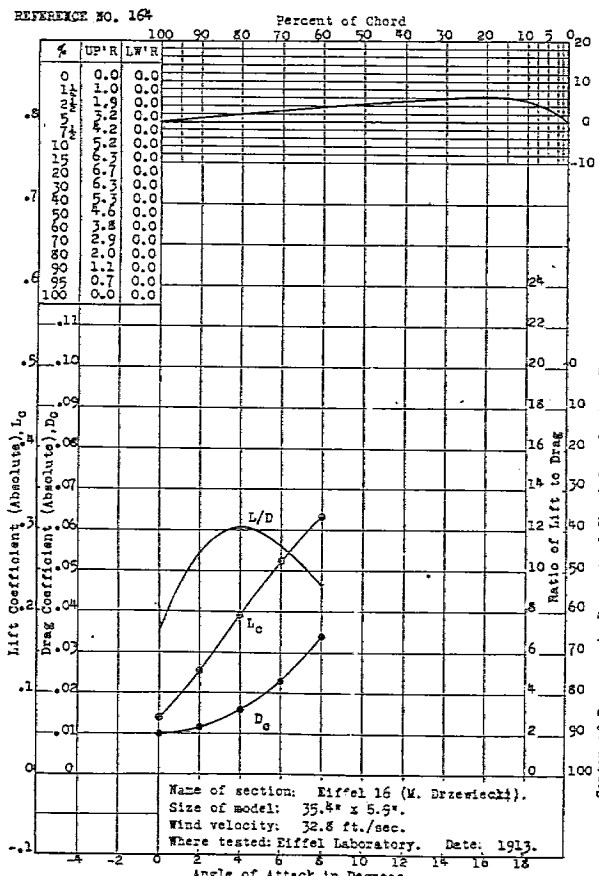
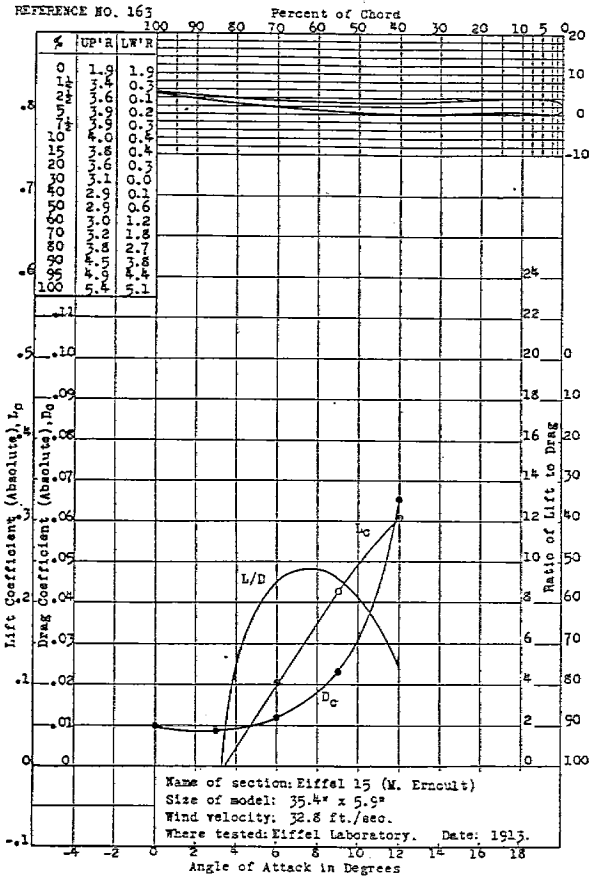
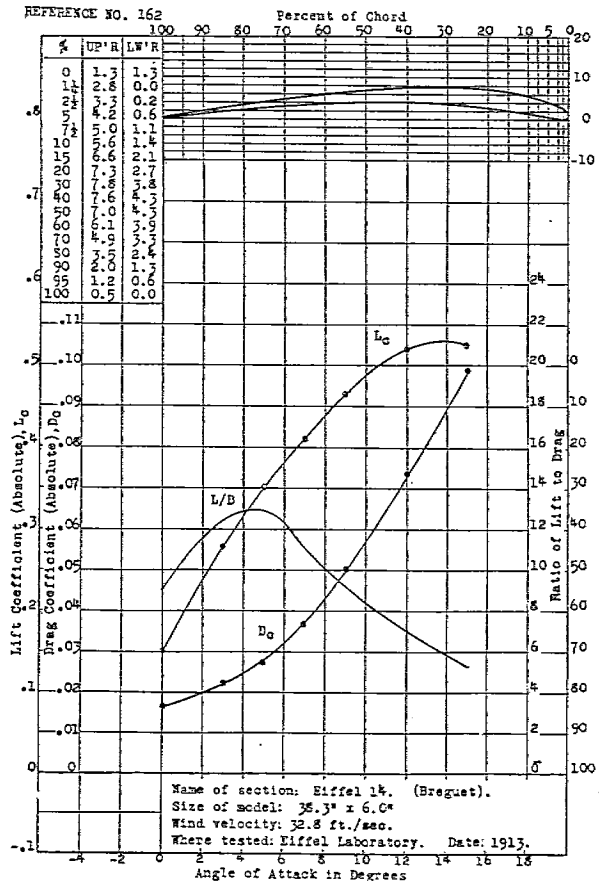
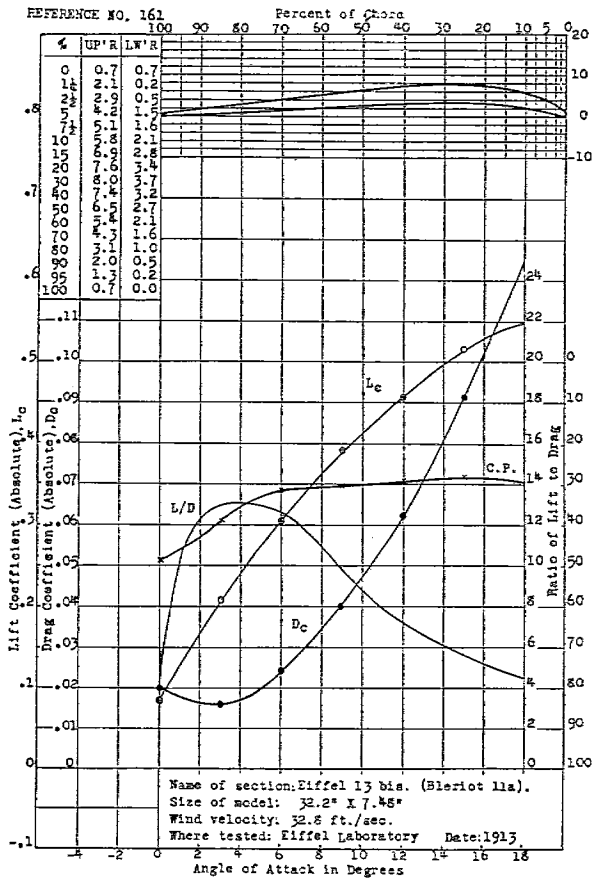


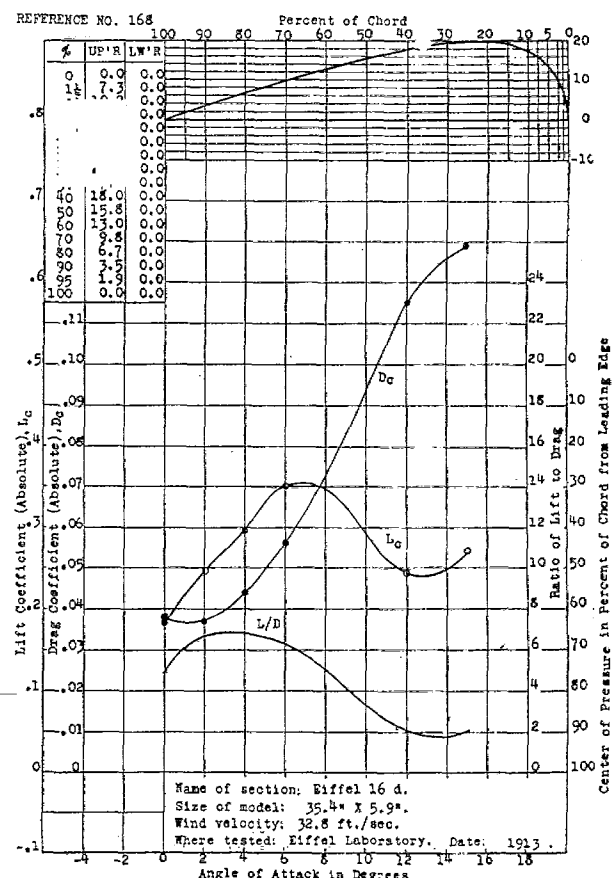
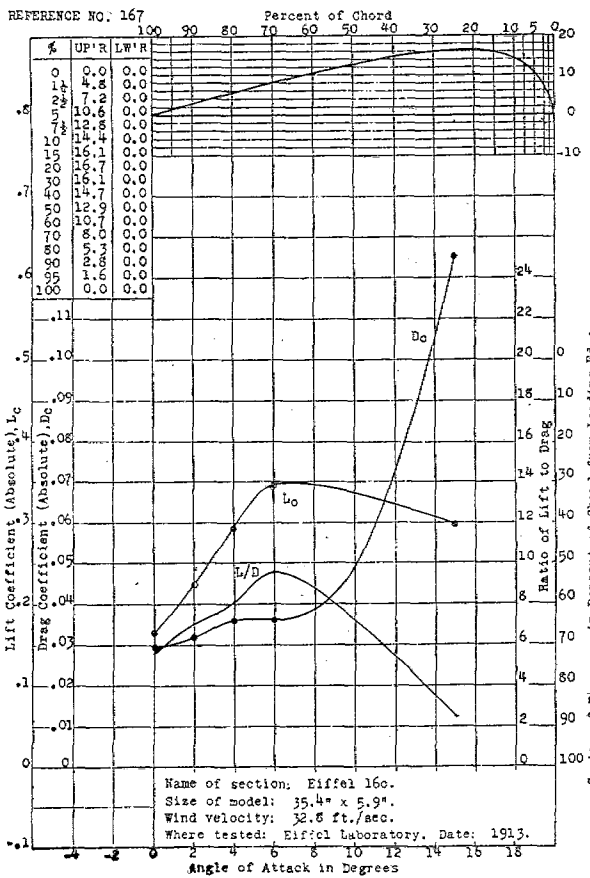
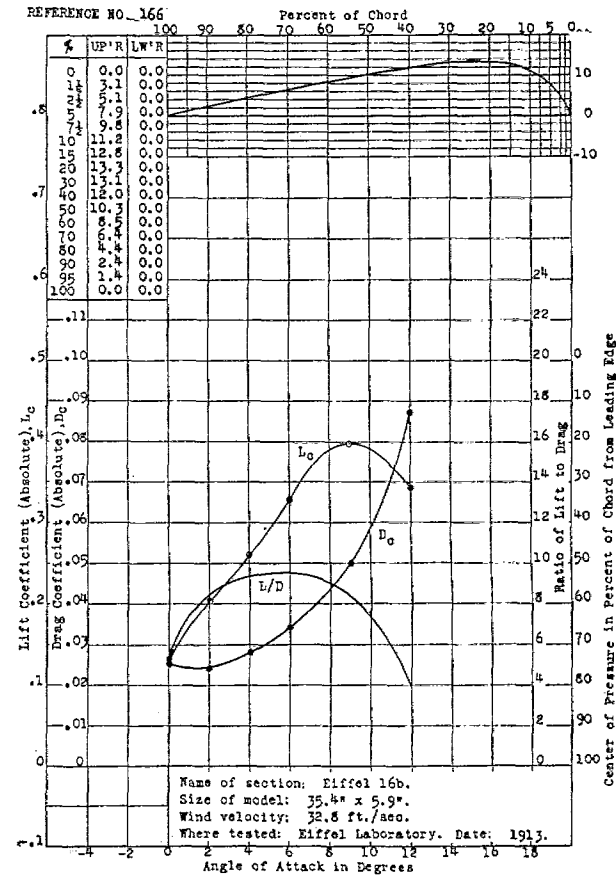
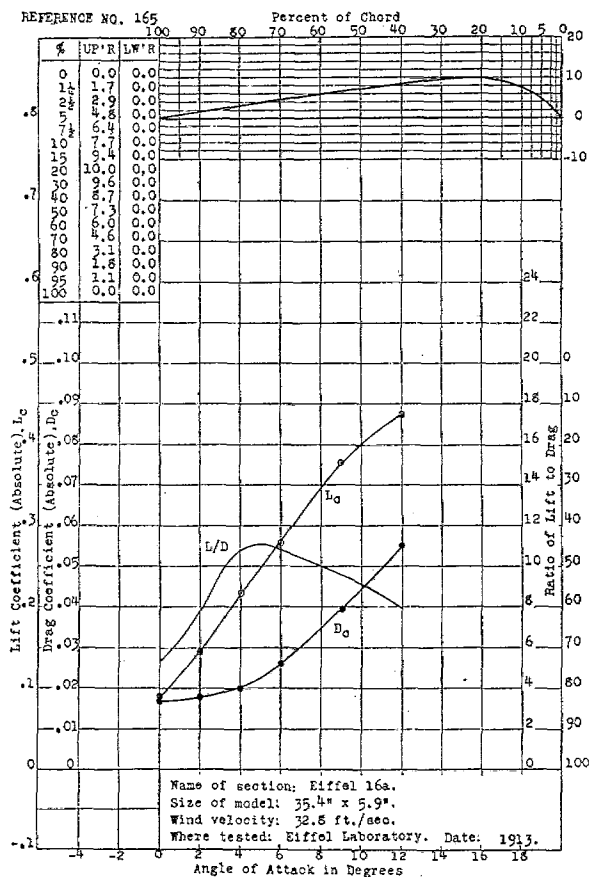
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.



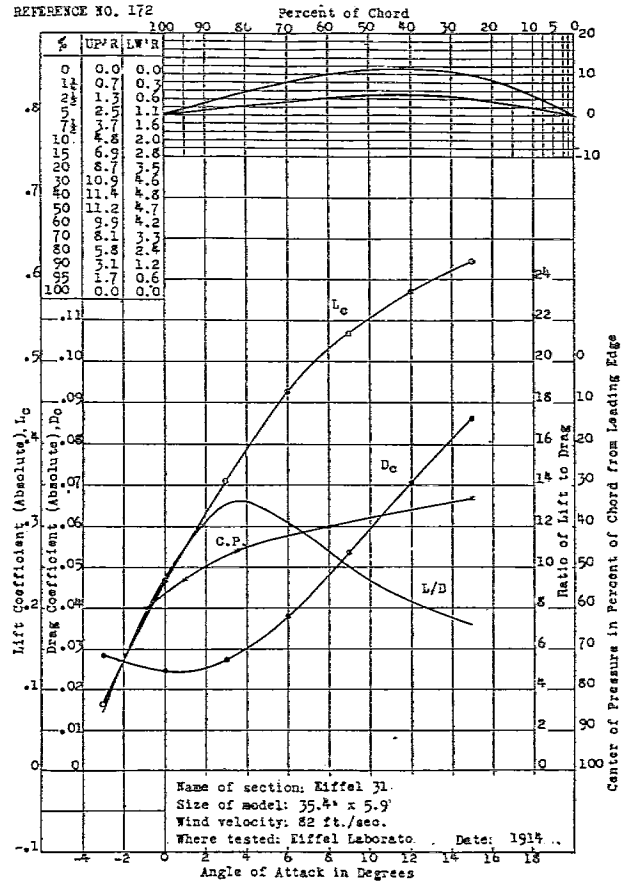
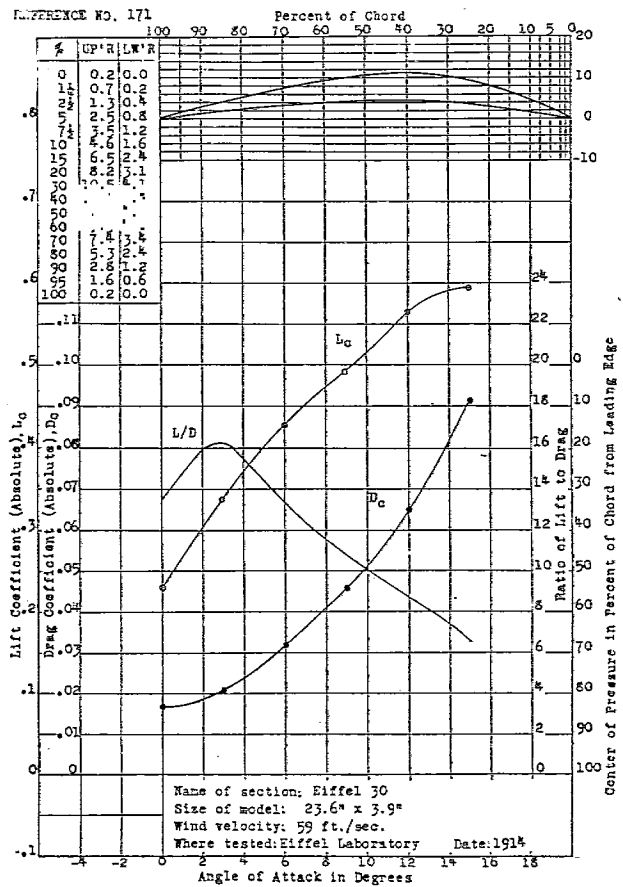
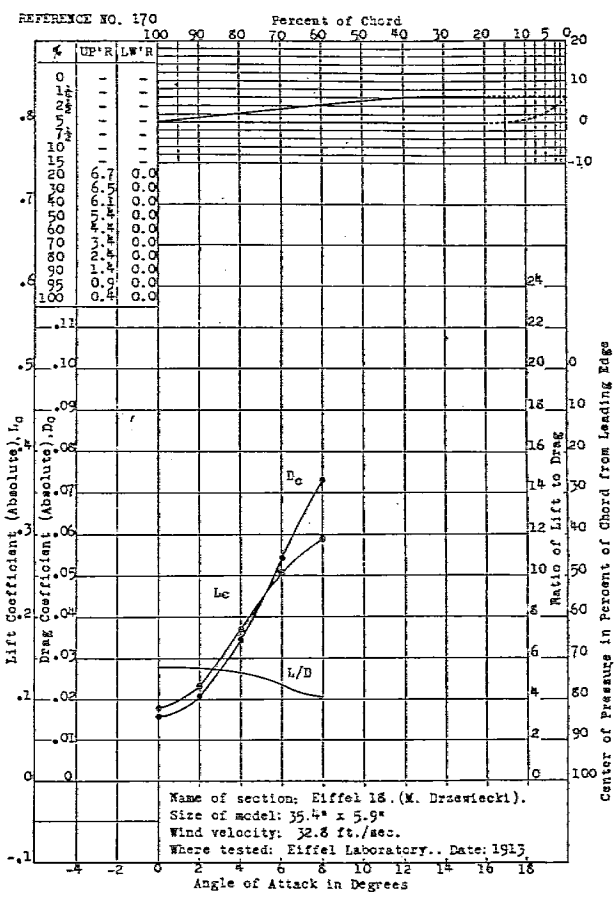
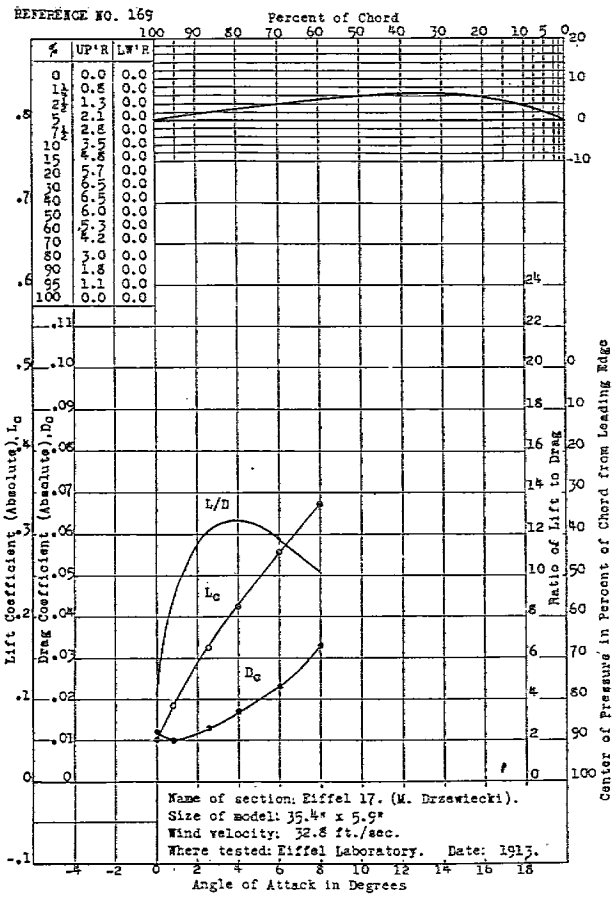


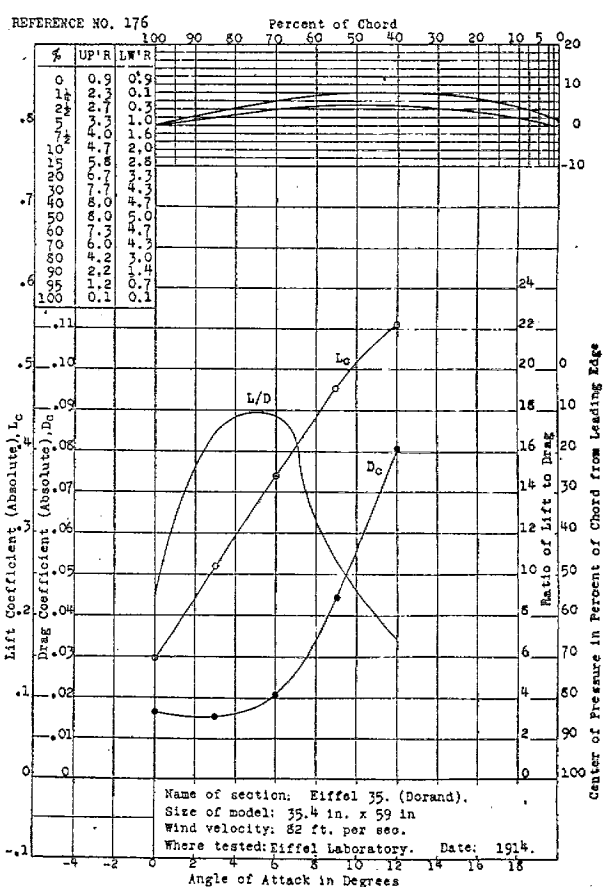
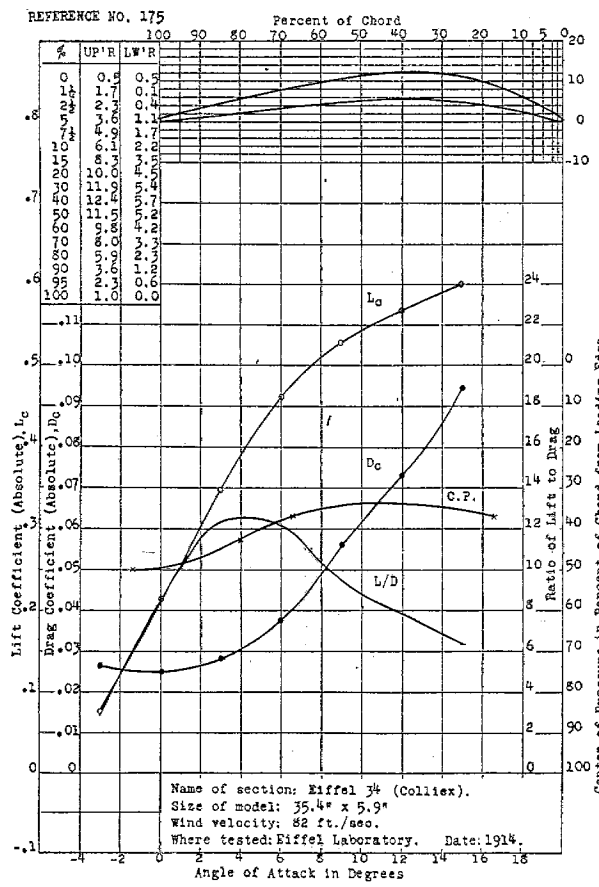
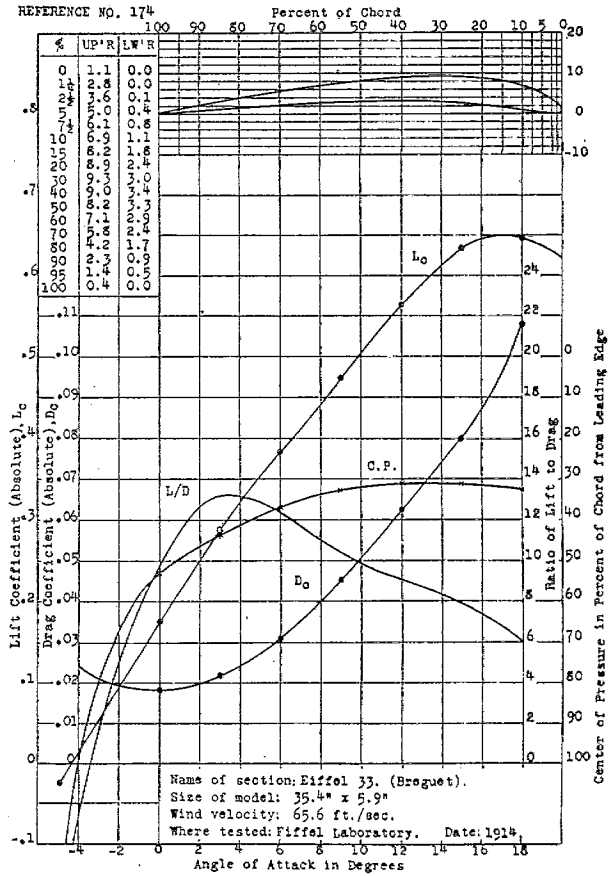
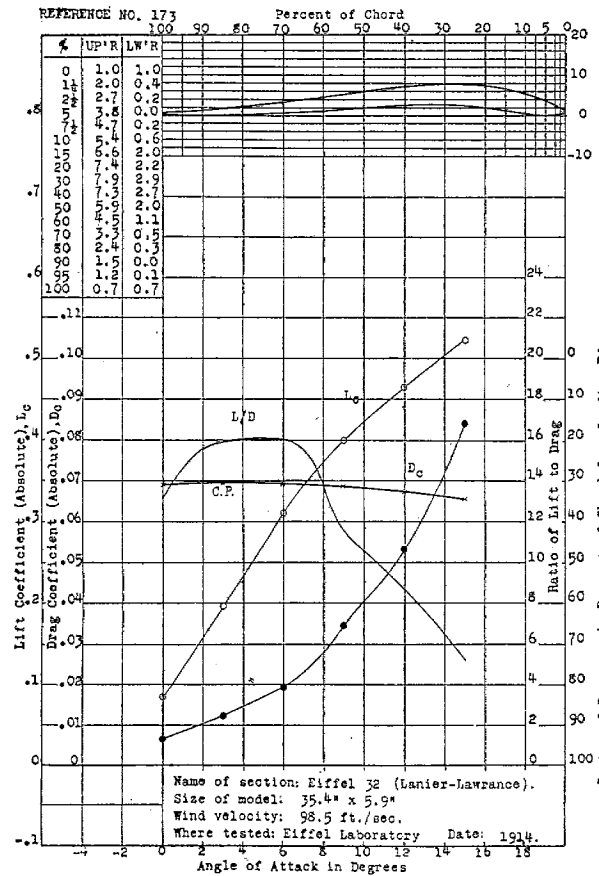
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.



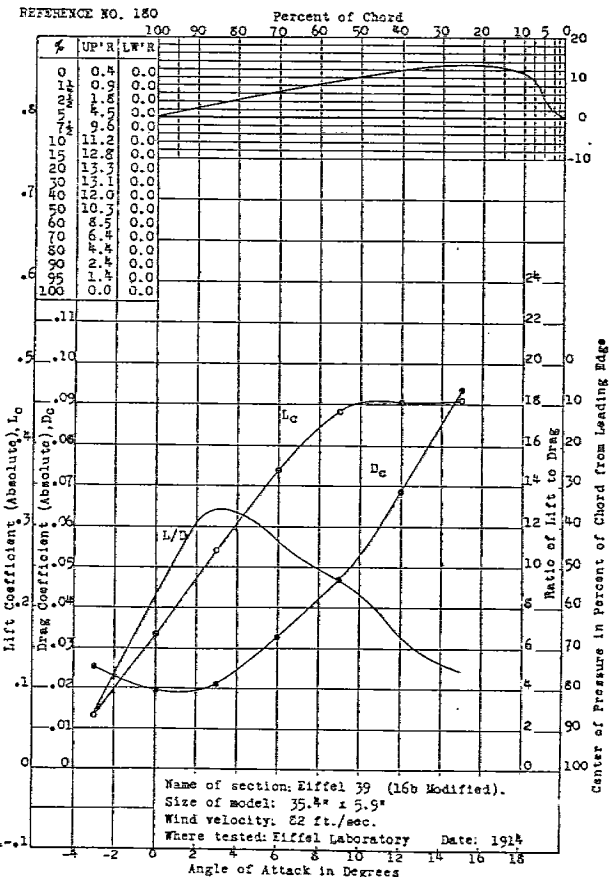
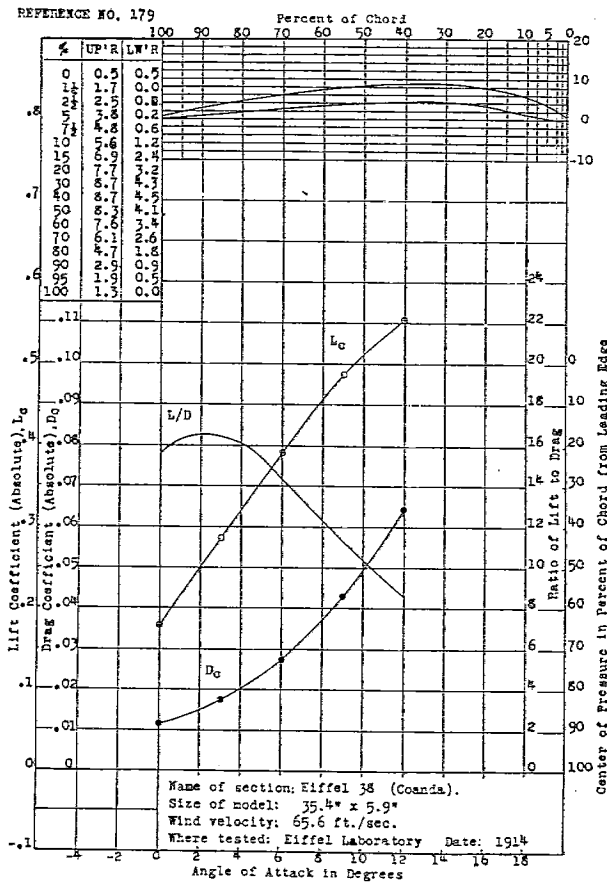
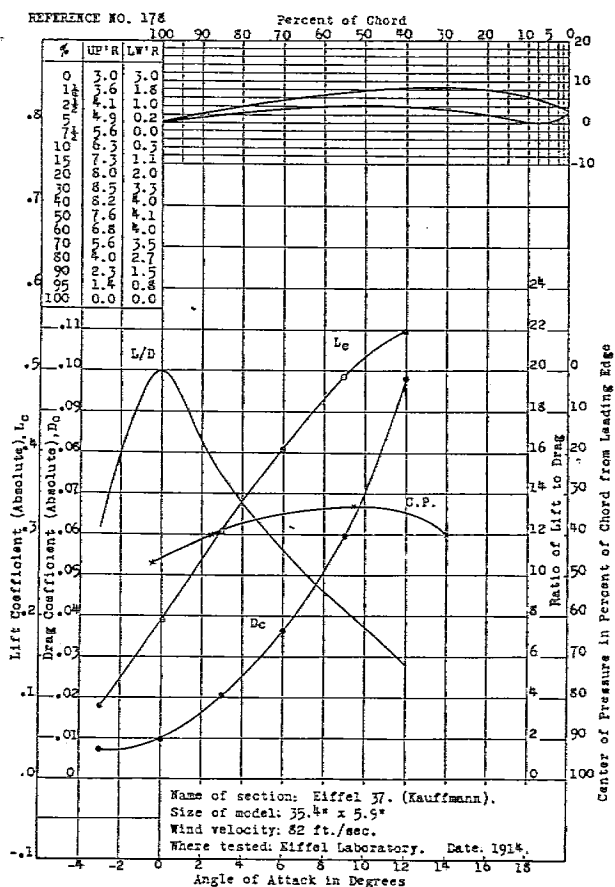
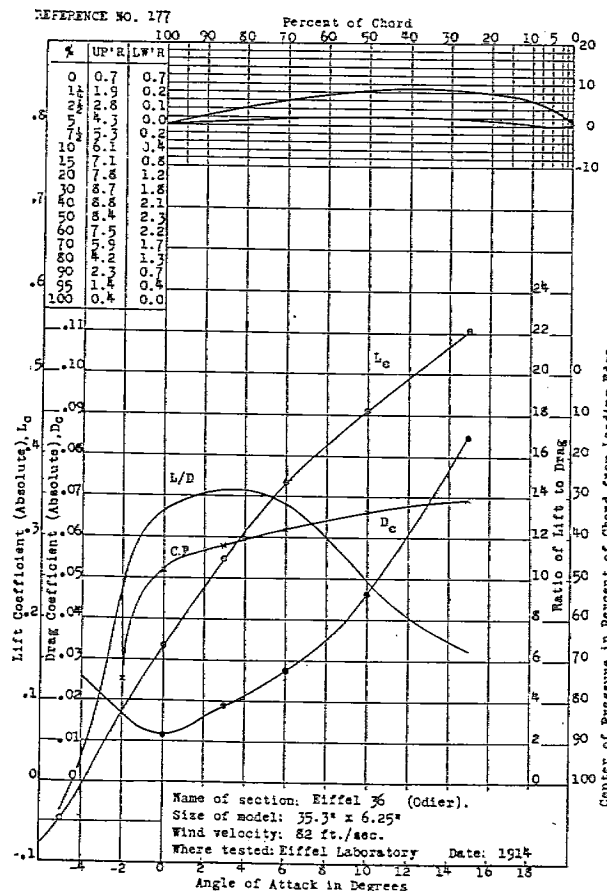


AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

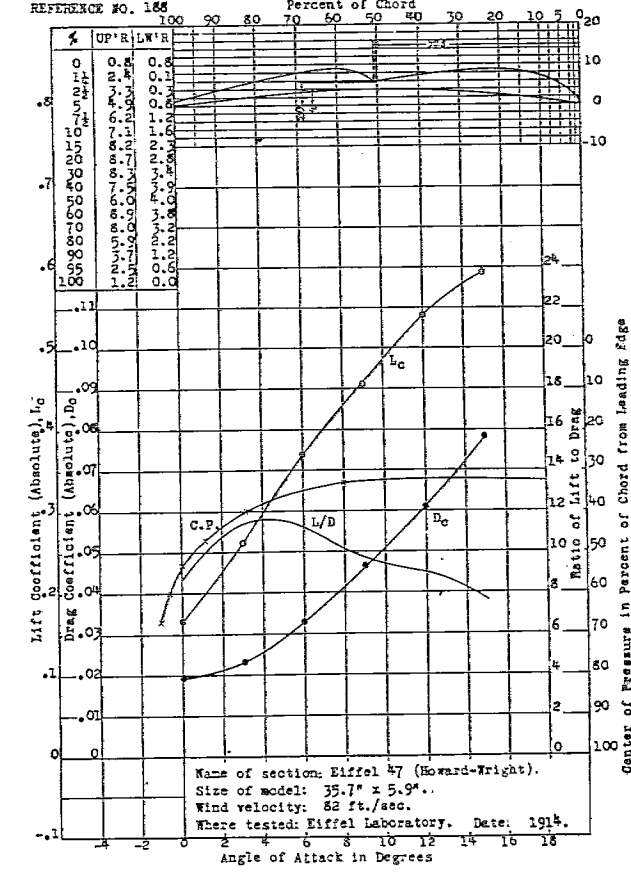
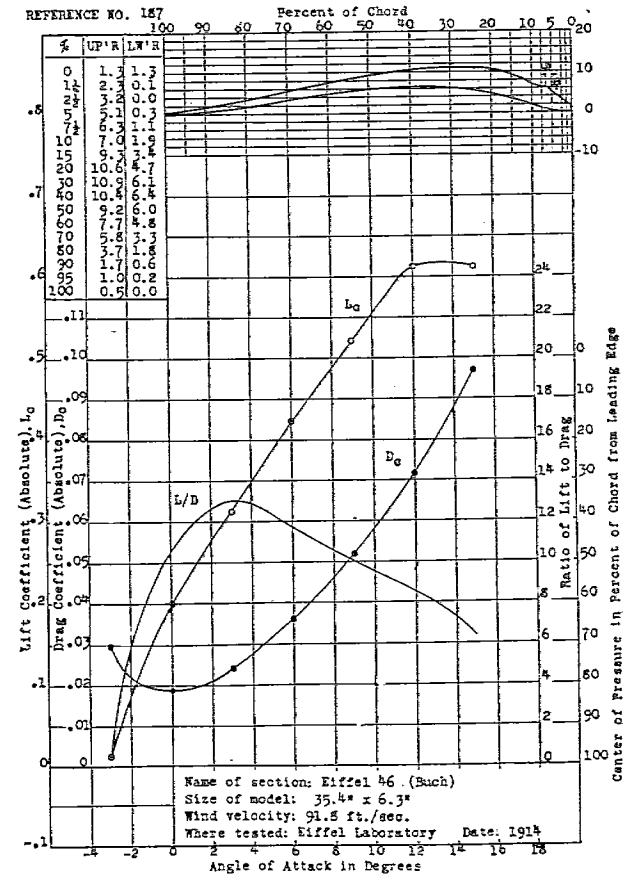
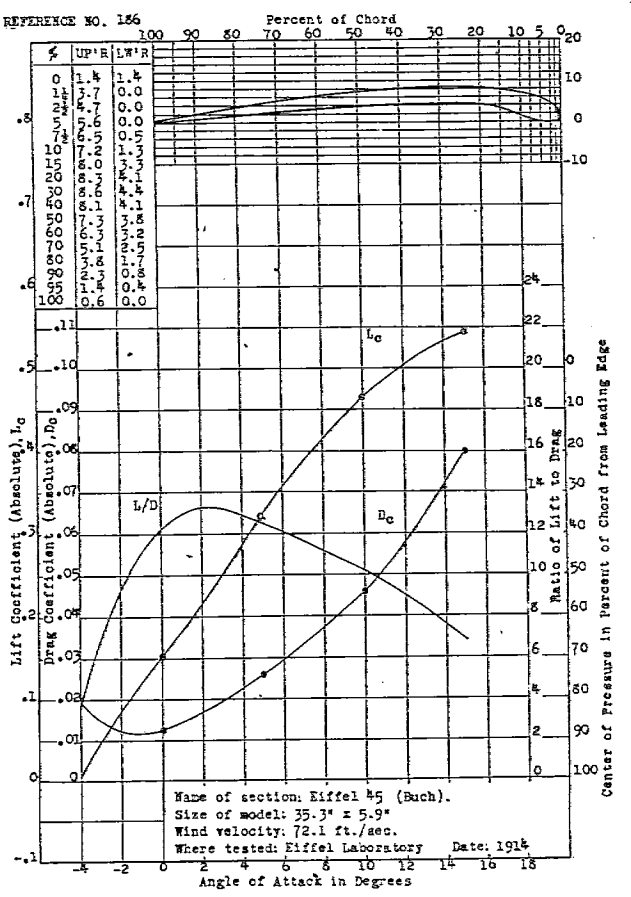
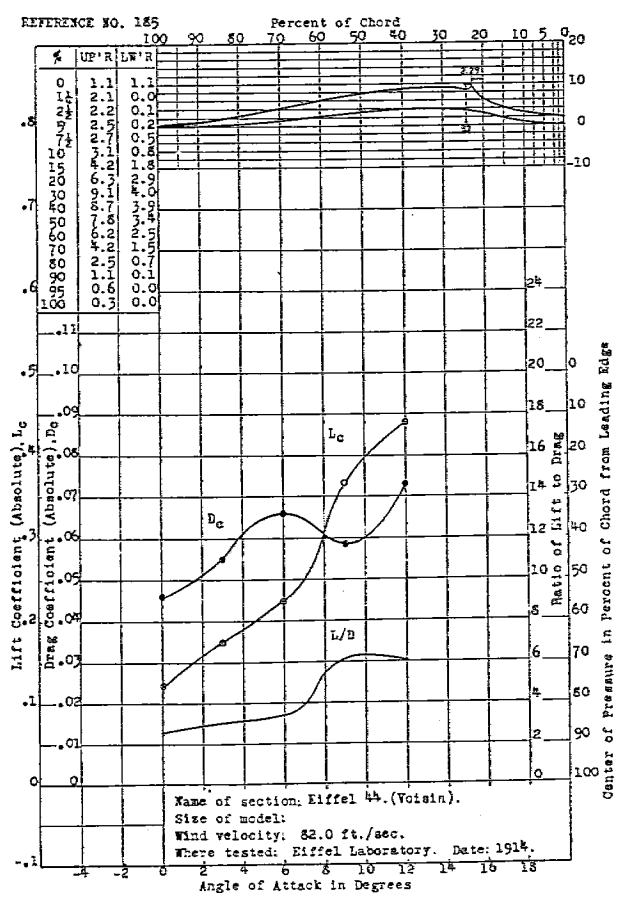


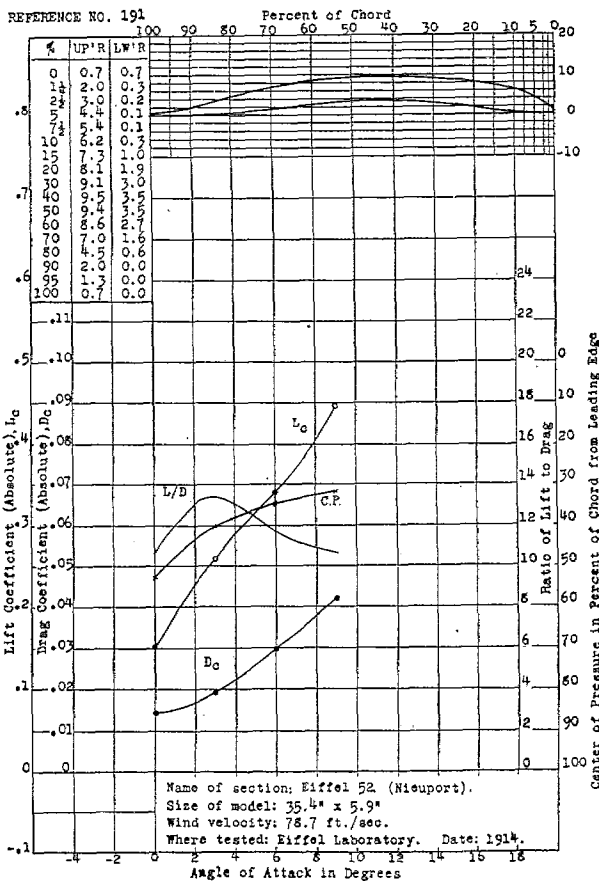
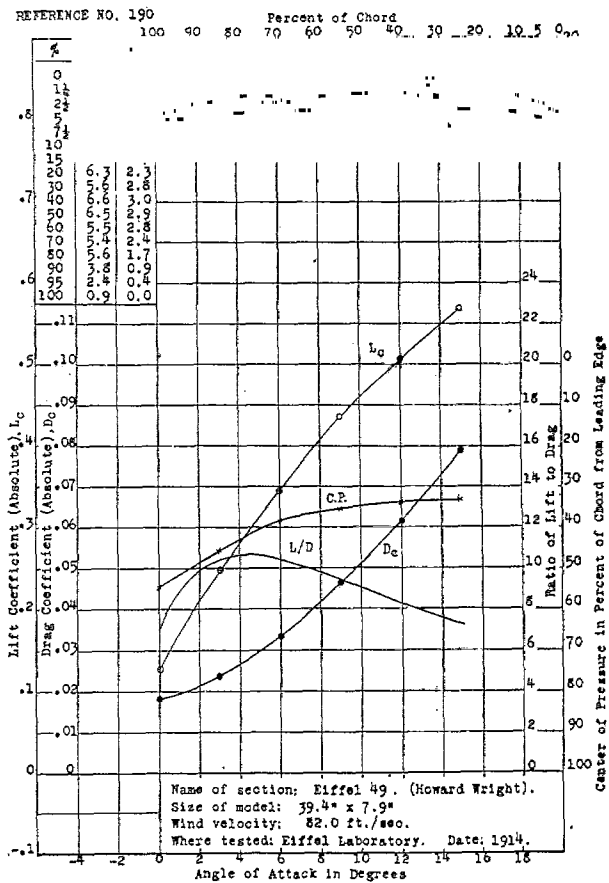
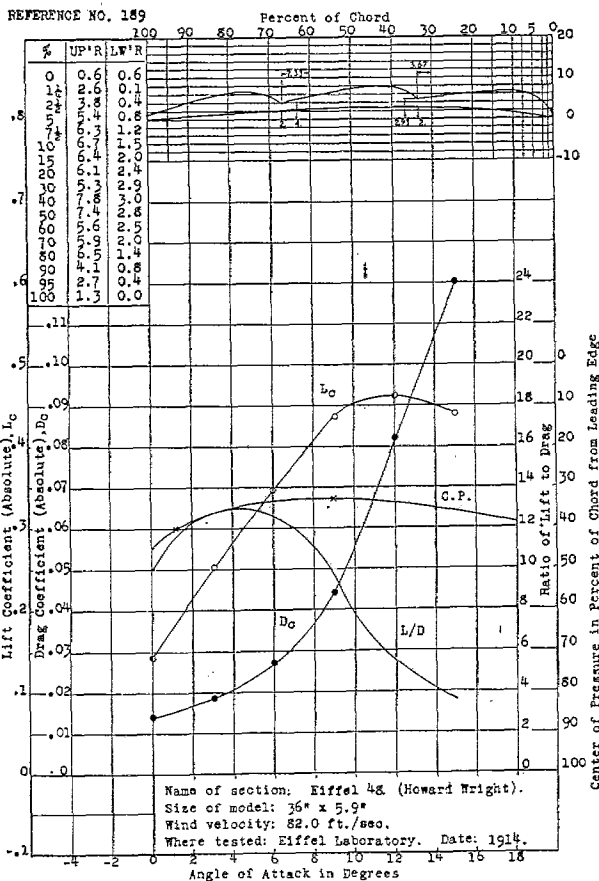


AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

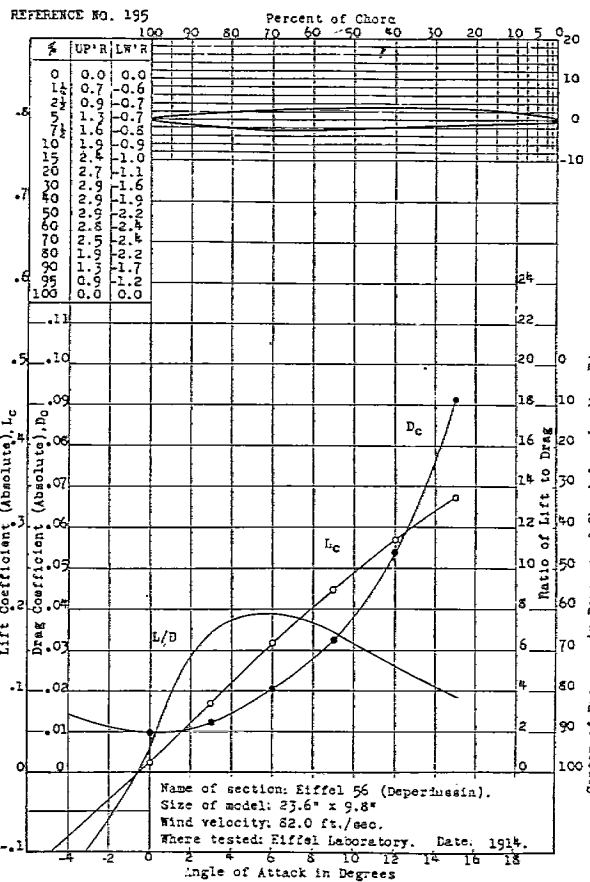
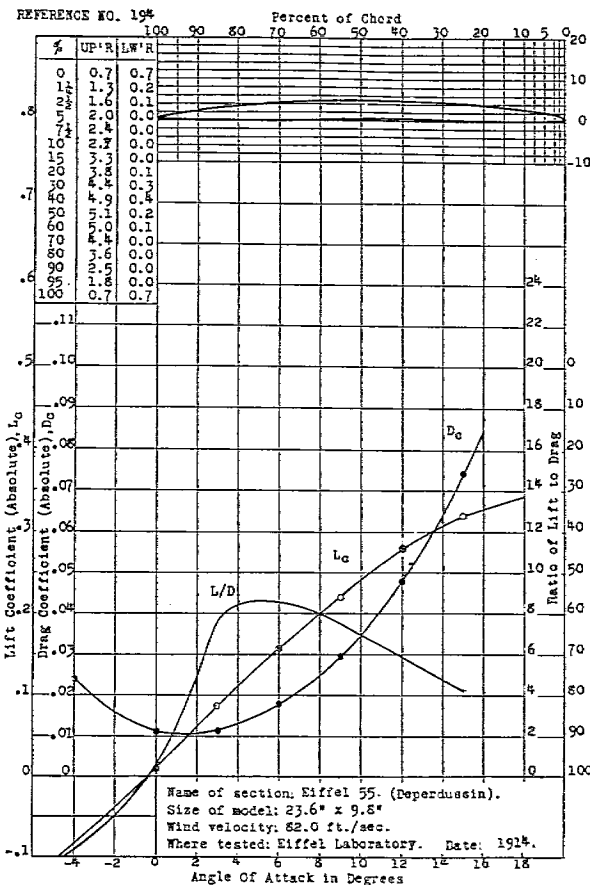
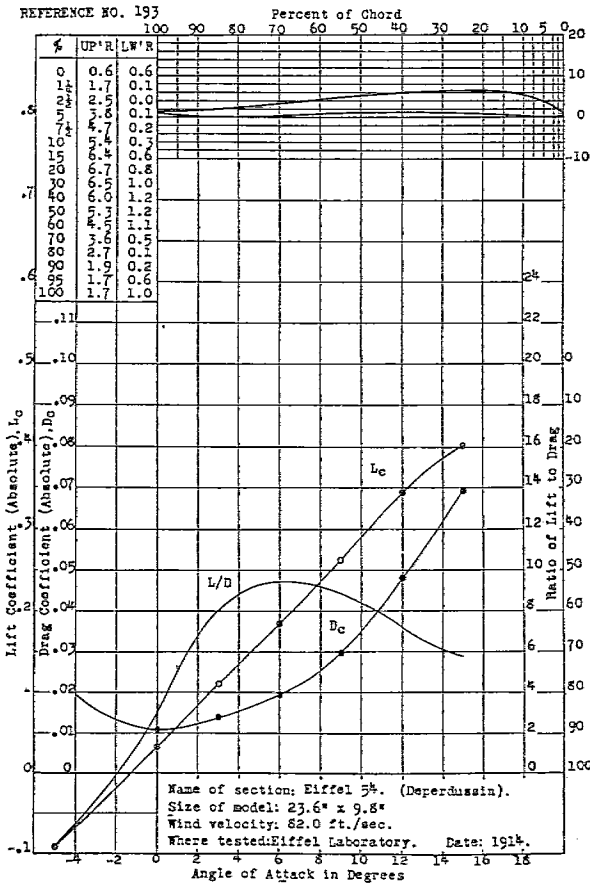


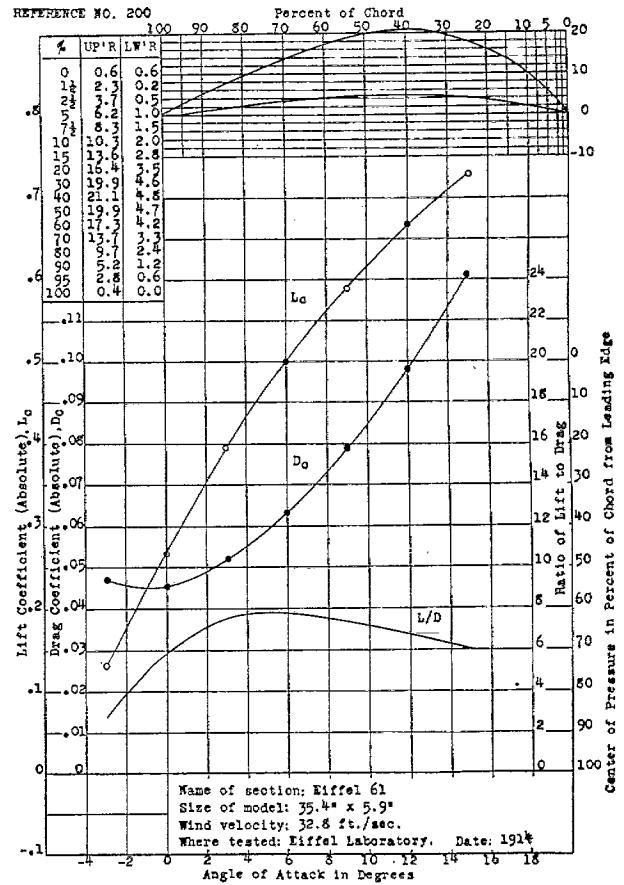
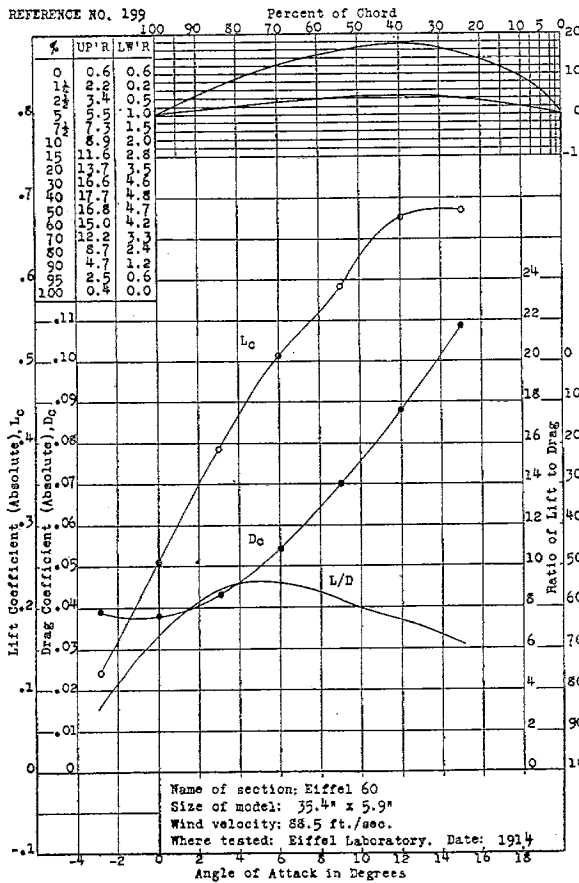
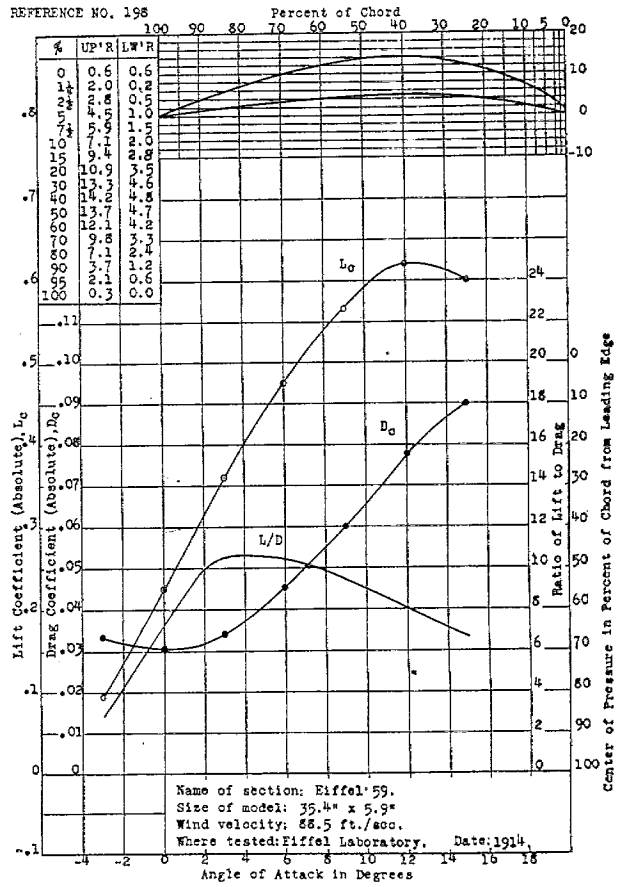
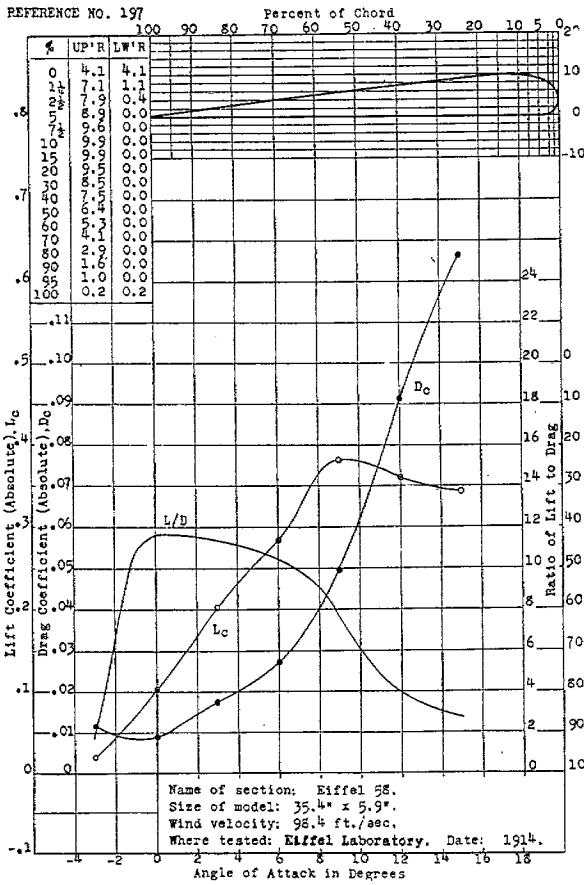
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.



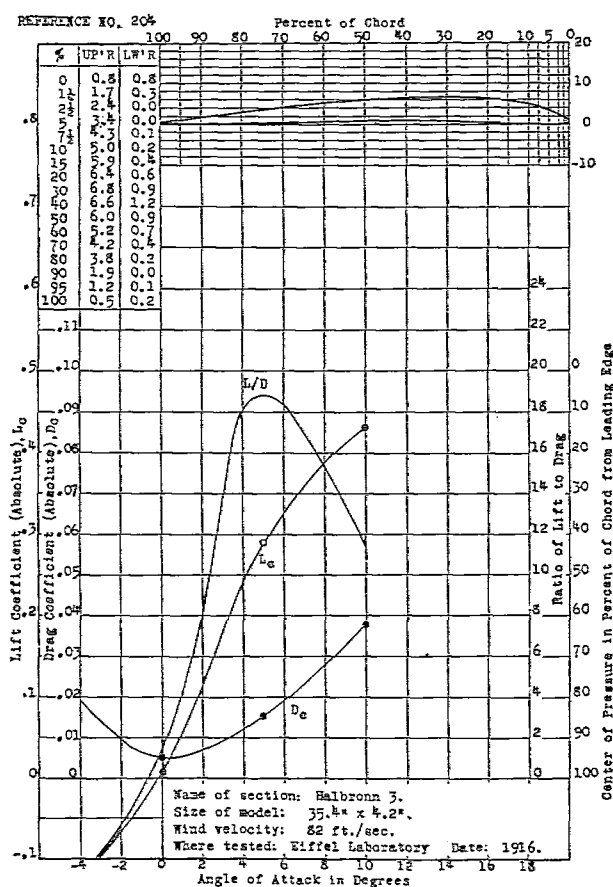
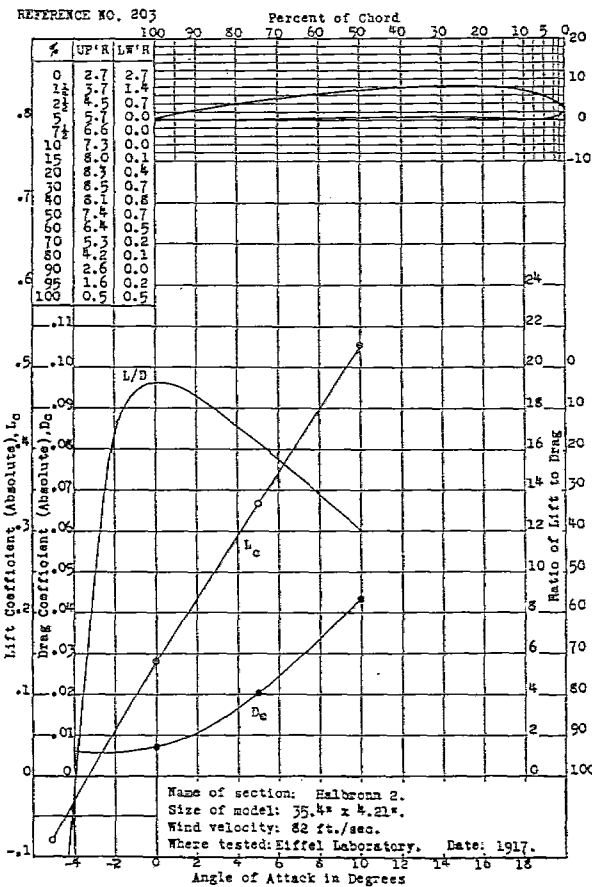
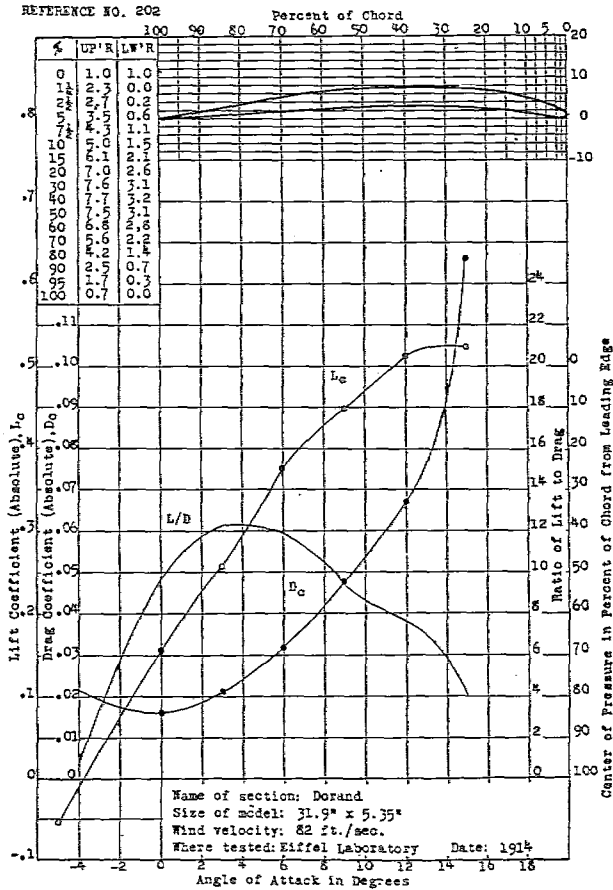
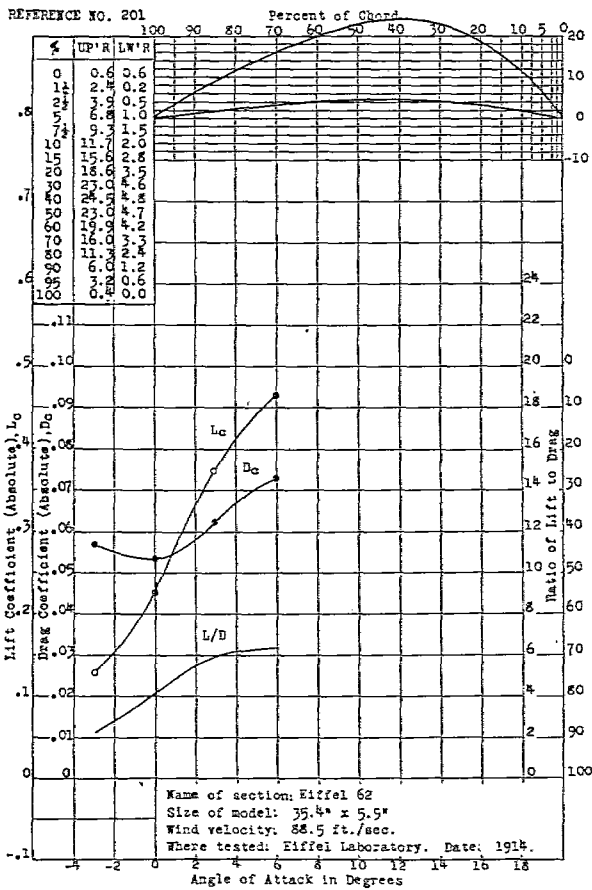


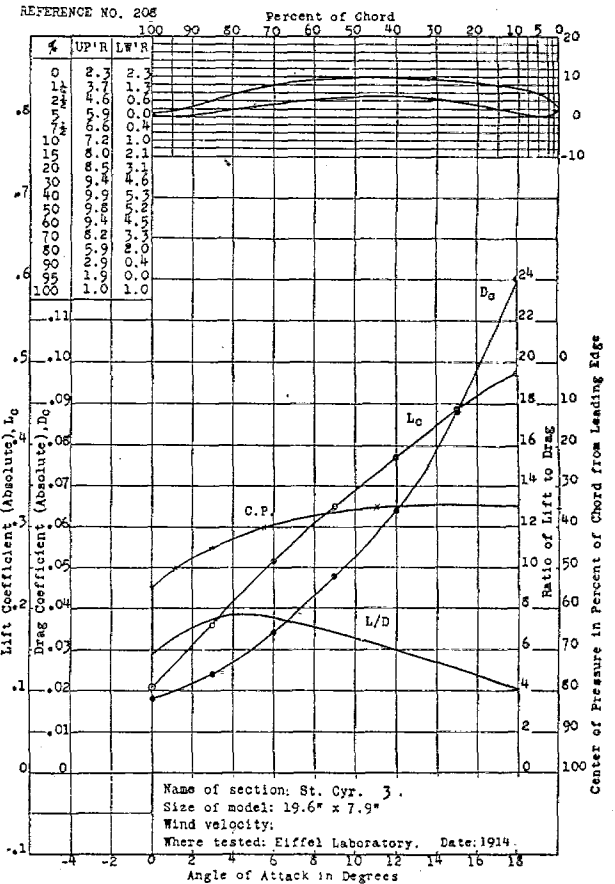
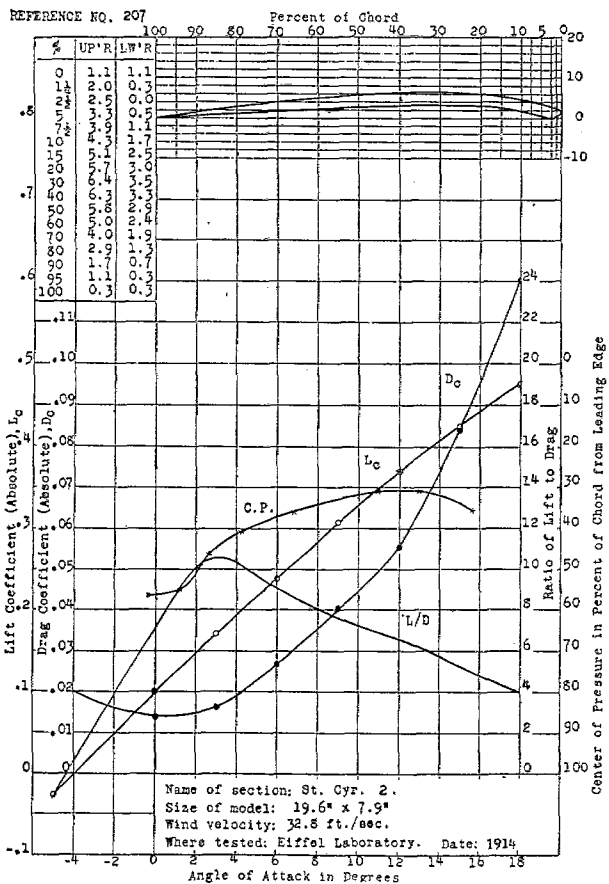
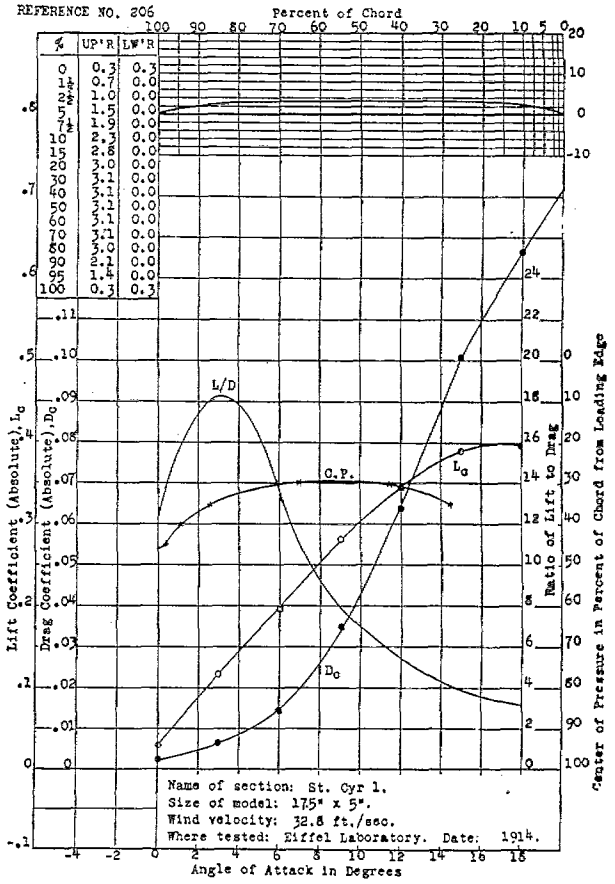
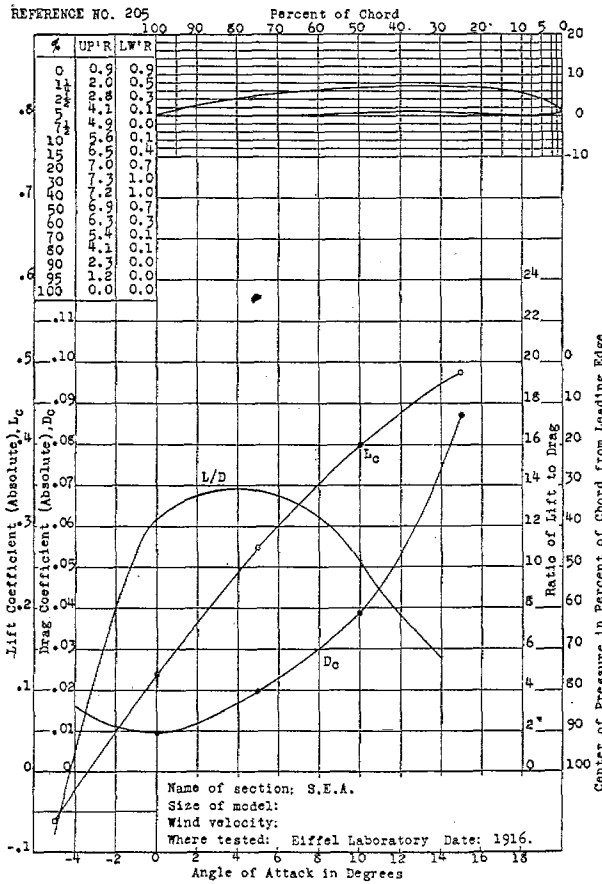
AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

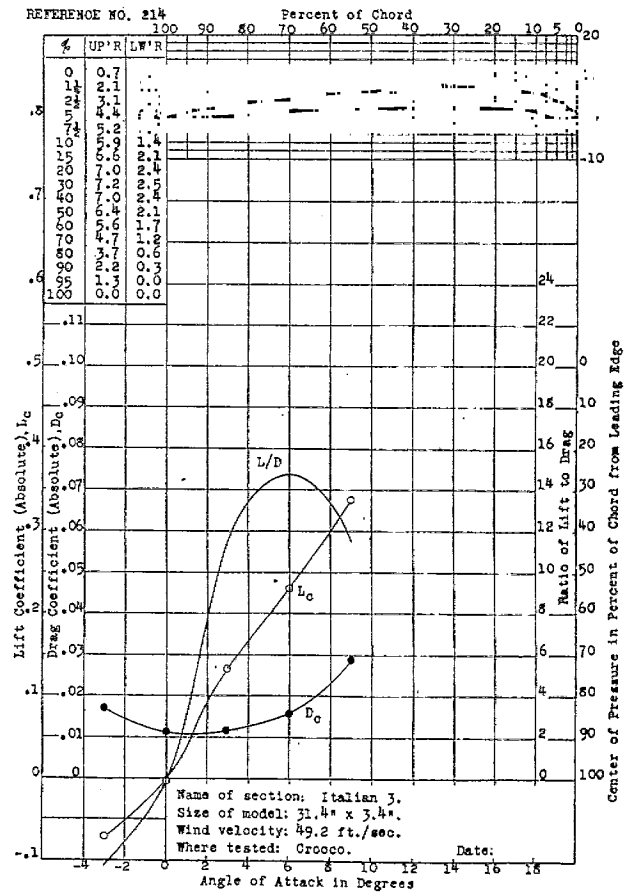
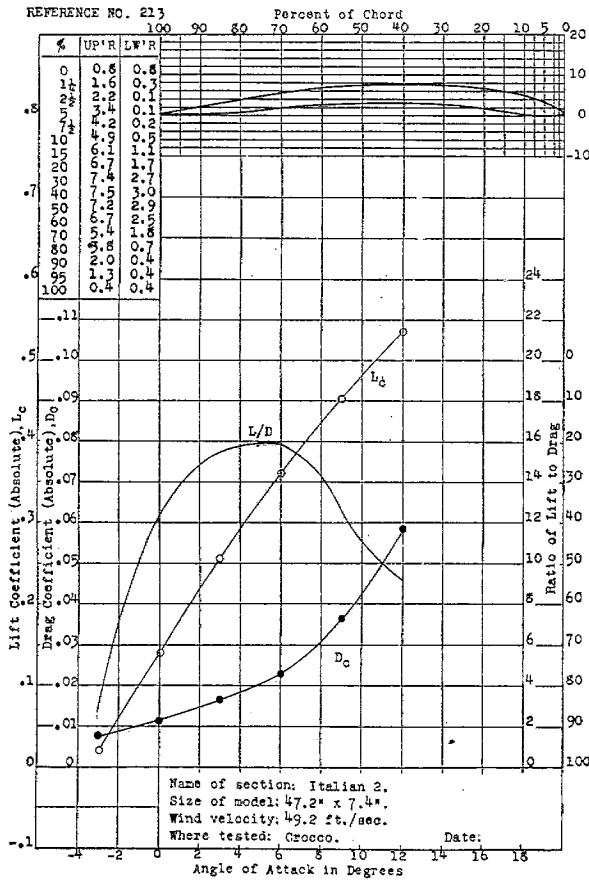




AERODYNAMIC CHARACTERISTICS OF AEROFOILS.







AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

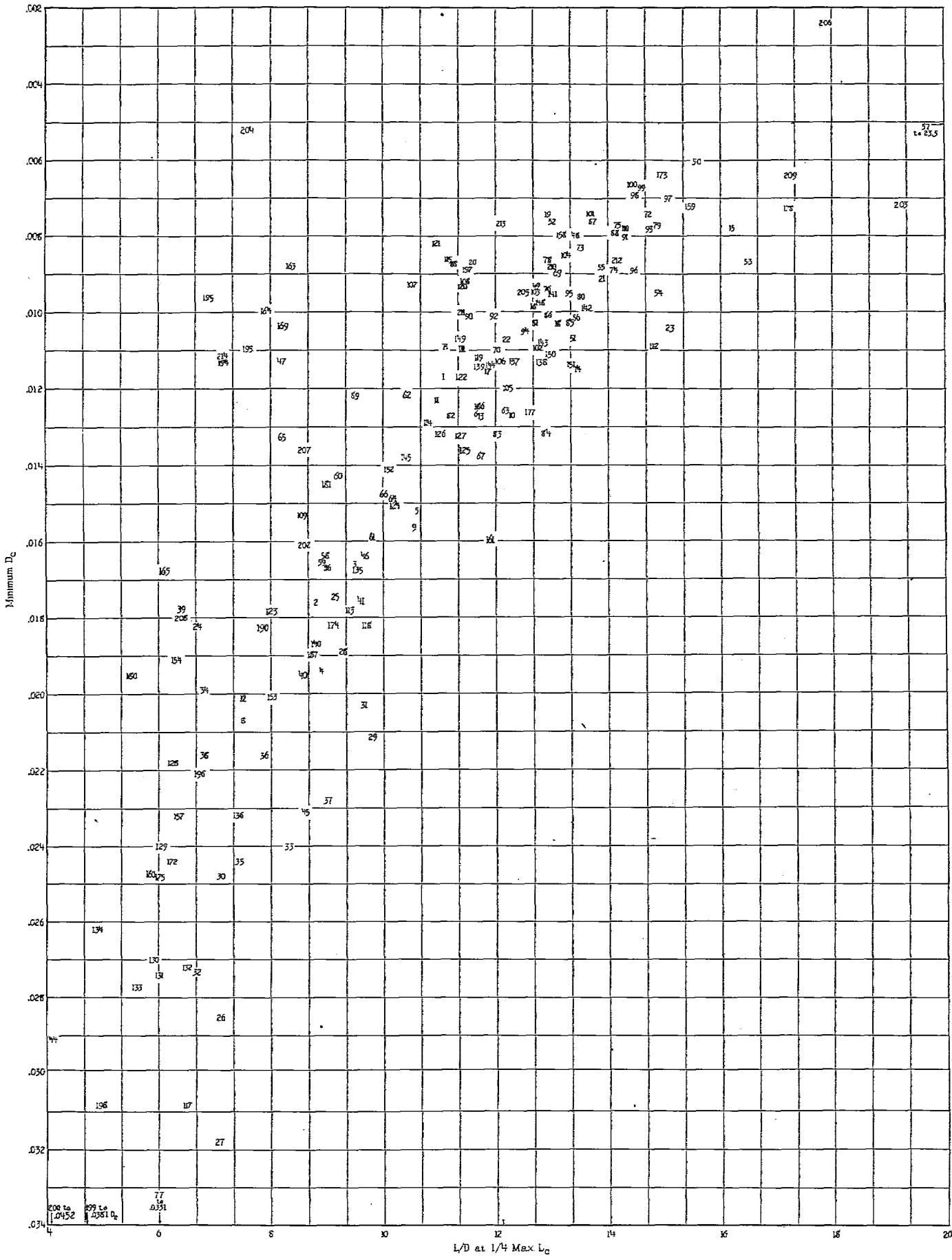
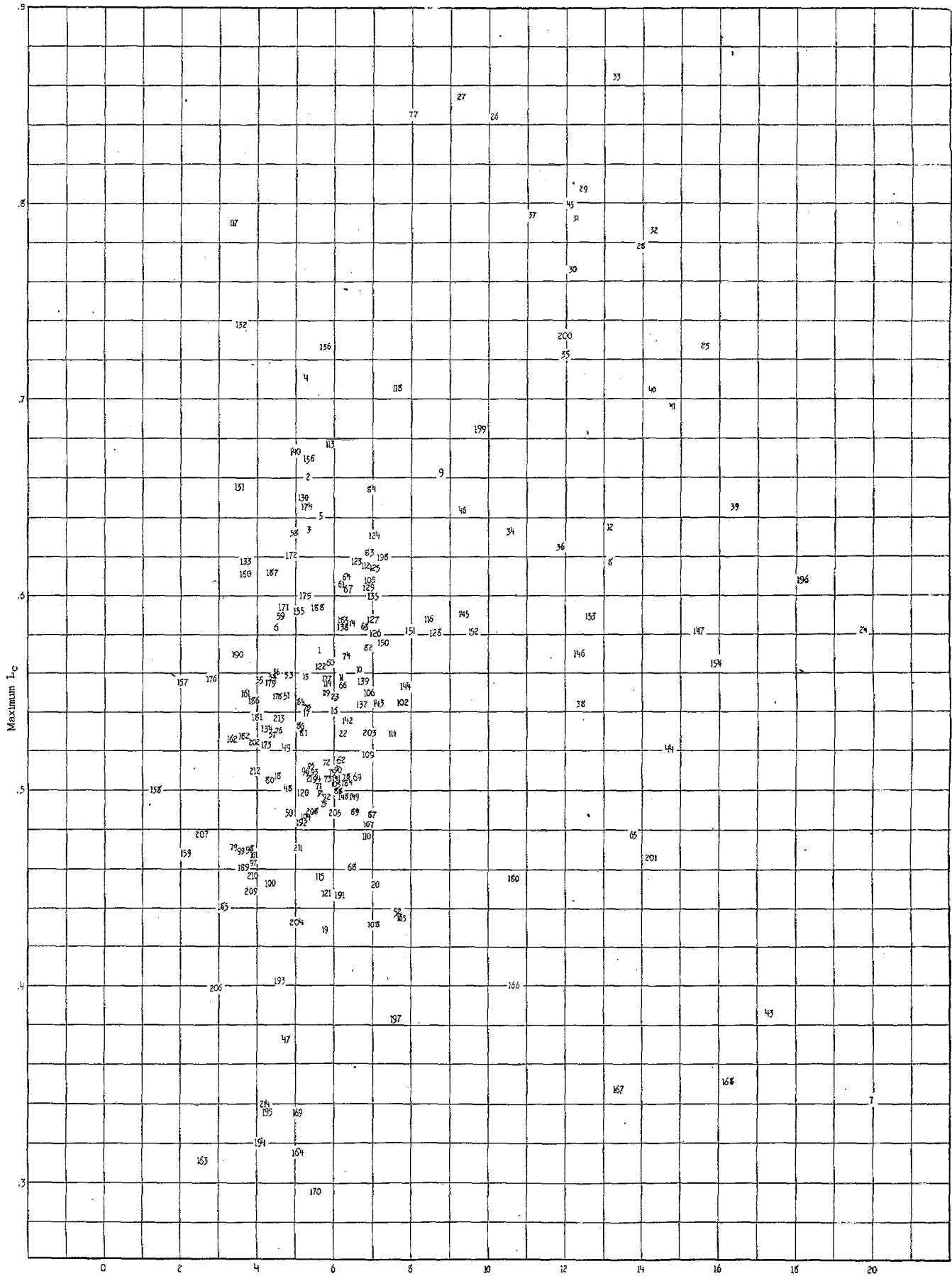


Chart No. 1



Mean Spar Depth

Chart No. 2.

AERODYNAMIC CHARACTERISTICS OF AEROFOILS.

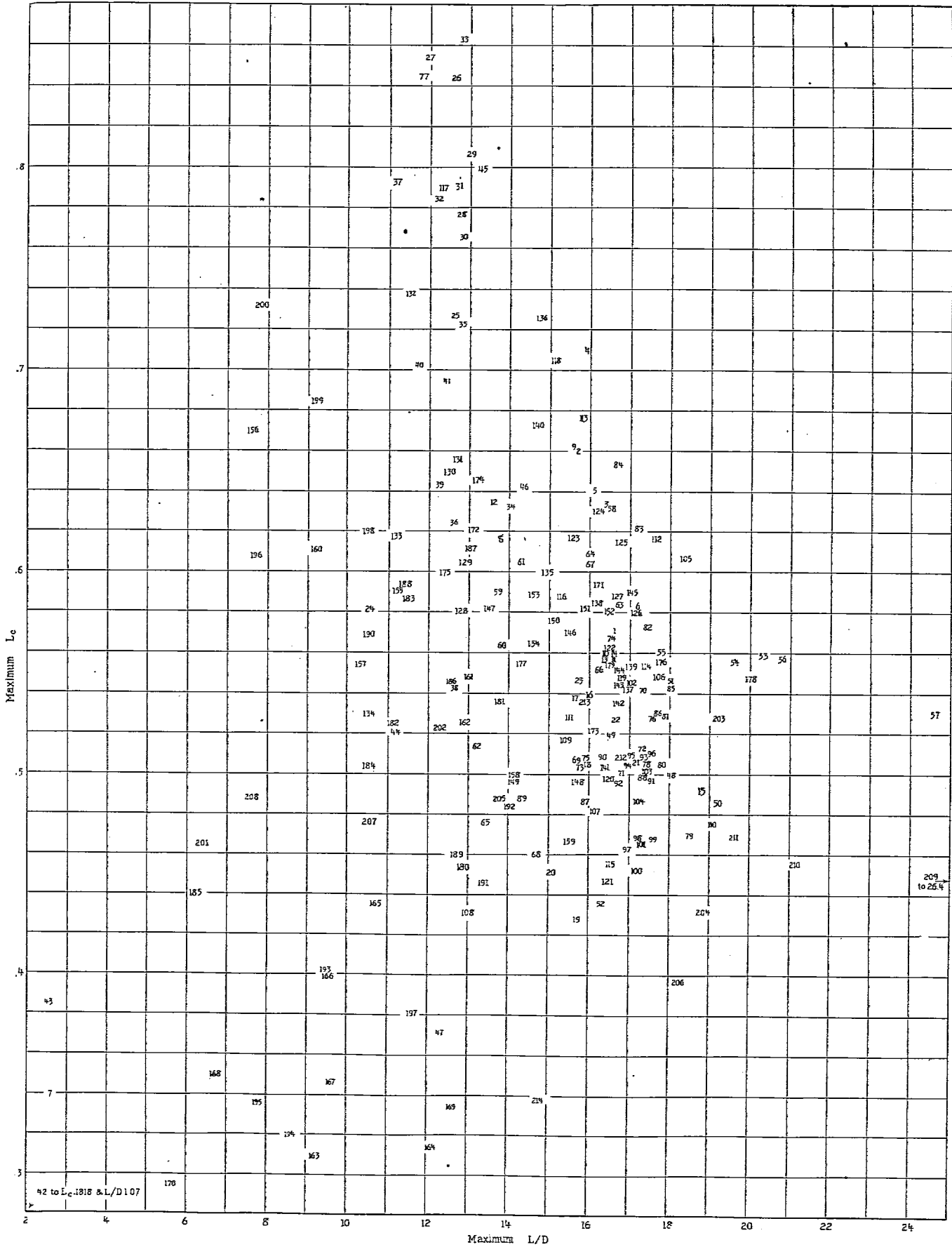
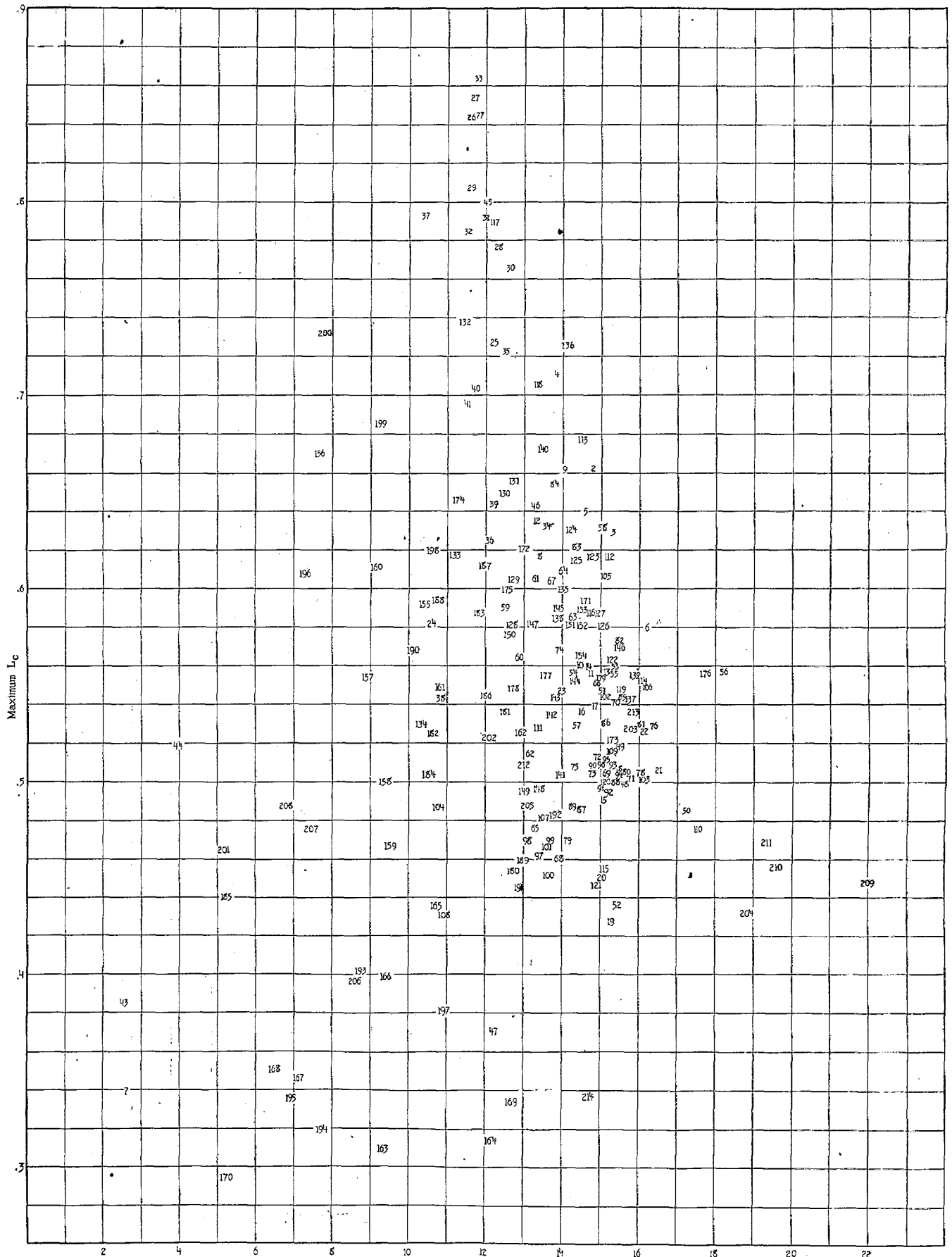


Chart No. 3.



L/D at 2/3 Max Lc
 Chart No. 4.