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**REPORT No. 93**

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**AERODYNAMIC CHARACTERISTICS OF AEROFOILS**

**BY NATIONAL ADVISORY  
COMMITTEE FOR AERONAUTICS**



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## 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. <sup>2</sup> = 32.2 ft./sec. <sup>2</sup> |

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. <sup>2</sup> ——— m./sec. | $P = .1250 CV^2.$   |
| In kg./m. <sup>2</sup> ——— 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.

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

|                    | Per<br>cent of<br>chord. | REF. NO. 1. |        | REF. NO. 2. |        |
|--------------------|--------------------------|-------------|--------|-------------|--------|
|                    |                          | U. S. A. 1. |        | U. S. A. 2. |        |
|                    |                          | Ordinates.  |        |             |        |
|                    |                          | Upper.      | Lower. | Upper.      | Lower. |
| The following      | 0                        | 1.22        | 0.81   | 0.80        | 0.0    |
| tables have been   | 1.25                     | 2.56        | 0.42   | 1.80        | 0.27   |
| prepared to give   | 2.5                      | 3.44        | 0.19   | 2.93        | 0.49   |
| additional decimal | 5                        | 4.77        | 0.0    | 4.33        | 0.83   |
| places for the     | 7.5                      | 5.58        | 0.12   | 5.50        | 1.23   |
| greater portion of | 10                       | 6.11        | 0.39   | 6.33        | 1.51   |
| the ordinates:     | 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<br>cent of<br>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        | 0.08   |
| 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                       | 8.63        | 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        | -0.58  | 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   | 2.60         | 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                 | 1.24         | 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   | 0.26         | 0.26   | 1.27                 | 1.27   |
| 1.25               | 1.83         | 0.55   | 1.96            | 0.570  | 1.55         | 0.07   | 2.10                 | 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               | 2.6          | 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   | 4.76            | 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. 63. |        | REF. NO. 64. |        | REF. NO. 65.    |        | REF. NO. 66. |        |
|--------------------|--------------|--------|--------------|--------|-----------------|--------|--------------|--------|
|                    | R. A. F. 6a. |        | R. A. F. 6c. |        | R. A. F. 6c(BS) |        | R. A. F. 8.  |        |
|                    | Ordinates.   |        |              |        |                 |        |              |        |
|                    | Upper.       | Lower. | Upper.       | Lower. | Upper.          | Lower. | Upper.       | Lower. |
| 0                  | 5.00         | 0.0    | 0.0          | 0.0    | 0.0             | 0.0    | 0.0          | 0.0    |
| 1.25               | 2.30         | 0.0    | 2.25         | 0.0    | 2.25            | -2.25  | 3.30         | 0.0    |
| 2.5                | 3.21         | 0.0    | 3.10         | 0.11   | 3.10            | -3.10  | 4.10         | 0.10   |
| 5                  | 4.43         | 0.0    | 4.53         | 0.25   | 4.53            | -4.53  | 5.30         | 0.35   |
| 7.5                | 5.35         | 0.0    | 5.50         | 0.37   | 5.50            | -5.50  | 6.00         | 0.57   |
| 10                 | 6.01         | 0.0    | 6.17         | 0.45   | 6.17            | -6.17  | 6.47         | 0.76   |
| 15                 | 7.03         | 0.0    | 6.95         | 0.67   | 6.95            | -6.95  | 7.20         | 1.00   |
| 20                 | 7.40         | 0.0    | 7.40         | 0.80   | 7.40            | -7.40  | 7.52         | 0.95   |
| 30                 | 7.59         | 0.0    | 7.85         | 0.90   | 7.85            | -7.85  | 7.58         | 0.85   |
| 40                 | 7.47         | 0.0    | 7.70         | 0.80   | 7.70            | -7.70  | 7.40         | 0.70   |
| 50                 | 7.11         | 0.0    | 7.30         | 0.65   | 7.30            | -7.30  | 7.10         | 0.55   |
| 60                 | 6.51         | 0.0    | 6.80         | 0.50   | 6.80            | -6.80  | 6.50         | 0.30   |
| 70                 | 5.65         | 0.0    | 5.90         | 0.35   | 5.90            | -5.90  | 5.60         | 0.18   |
| 80                 | 4.42         | 0.0    | 4.70         | 0.20   | 4.70            | -4.70  | 4.50         | 0.0    |
| 90                 | 2.73         | 0.0    | 3.20         | 0.10   | 3.20            | -3.20  | 2.80         | 0.0    |
| 95                 | 1.85         | 0.0    | 2.30         | 0.05   | 2.30            | -2.30  | 1.85         | 0.0    |
| 100                | 0.50         | 0.0    | 0.0          | 0.0    | 0.0             | 0.0    | 0.0          | 0.0    |

| Per<br>cent of<br>chord. | REF. NO. 67. |        | REF. NO. 68. |        | REF. NO. 69. |        | REF. NO. 70. |        |
|--------------------------|--------------|--------|--------------|--------|--------------|--------|--------------|--------|
|                          | R. A. F. 9.  |        | R. A. F. 12. |        | R. A. F. 13. |        | R. A. F. 14. |        |
|                          | Ordinates.   |        |              |        |              |        |              |        |
|                          | Upper.       | Lower. | Upper.       | Lower. | Upper.       | Lower. | Upper.       | Lower. |
| 0                        | 0.0          | 0.0    | 0.0          | 0.0    | 0.0          | 0.0    | 0.68         | 0.68   |
| 1.25                     | 2.75         | 0.02   | 2.00         | -0.46  | 2.05         | -0.50  | 1.80         | 0.13   |
| 2.5                      | 3.52         | 0.06   | 2.74         | -0.63  | 2.85         | -0.65  | 2.54         | 0.05   |
| 5                        | 4.82         | 0.20   | 3.83         | -0.89  | 3.95         | -0.89  | 3.65         | 0.03   |
| 7.5                      | 5.70         | 0.30   | 4.55         | -1.05  | 4.80         | -1.06  | 4.52         | 0.16   |
| 10                       | 6.33         | 0.35   | 5.05         | -1.22  | 5.34         | -1.18  | 5.25         | 0.39   |
| 15                       | 7.00         | 0.40   | 5.55         | -1.33  | 6.00         | -1.33  | 6.18         | 0.94   |
| 20                       | 7.23         | 0.37   | 5.76         | -1.40  | 6.50         | -1.38  | 6.63         | 1.22   |
| 30                       | 7.33         | 0.35   | 5.75         | -1.38  | 7.05         | -1.42  | 7.06         | 1.39   |
| 40                       | 7.10         | 0.30   | 5.59         | -1.36  | 6.88         | -1.36  | 6.82         | 1.27   |
| 50                       | 6.70         | 0.25   | 5.27         | -1.28  | 6.25         | -1.28  | 6.50         | 1.06   |
| 60                       | 6.10         | 0.20   | 4.80         | -1.17  | 4.60         | -1.17  | 6.08         | 0.85   |
| 70                       | 5.20         | 0.16   | 4.58         | -0.99  | 4.08         | -0.99  | 5.43         | 0.62   |
| 80                       | 4.00         | 0.10   | 3.79         | -0.76  | 3.14         | -0.76  | 4.28         | 0.42   |
| 90                       | 2.50         | 0.07   | 2.48         | -0.47  | 1.96         | -0.47  | 2.65         | 0.19   |
| 95                       | 1.67         | 0.03   | 1.62         | 0.26   | 1.24         | -0.27  | 1.70         | 0.17   |
| 100                      | 0.0          | 0.0    | 0.0          | 0.0    | 0.0          | 0.0    | 0.38         | 0.38   |

| Per cent of chord. | REF. NO. 71.     |        | REF. NO. 72. |        | REF. NO. 73.     |        | REF. NO. 74. |        |
|--------------------|------------------|--------|--------------|--------|------------------|--------|--------------|--------|
|                    | R. A. F. 14-Mod. |        | R. A. F. 15. |        | R. A. F. 15-Mod. |        | R. A. F. 16. |        |
|                    | Ordinates.       |        |              |        |                  |        |              |        |
|                    | Upper.           | Lower. | Upper.       | Lower. | Upper.           | Lower. | Upper.       | Lower. |
| 0                  | 0.66             | 0.66   | 0.20         | +0.20  | 1.33             | 1.33   | 0.30         | +0.30  |
| 1.25               | 1.74             | 0.42   | 1.90         | -0.45  | 3.00             | 0.55   | 2.20         | -0.47  |
| 2.5                | 2.55             | 0.40   | 2.80         | -0.73  | 3.75             | 0.26   | 3.15         | -0.75  |
| 5                  | 3.82             | 0.40   | 3.90         | -0.90  | 4.85             | 0.10   | 4.42         | -0.90  |
| 7.5                | 4.76             | 0.42   | 4.60         | -1.00  | 5.56             | 0.05   | 5.20         | -1.00  |
| 10                 | 5.50             | 0.40   | 5.05         | -1.00  | 6.00             | 0.0    | 5.70         | -1.03  |
| 15                 | 6.40             | 0.80   | 5.58         | -0.80  | 6.55             | 0.17   | 6.25         | -0.80  |
| 20                 | 6.80             | 1.25   | 5.76         | -0.50  | 6.70             | 0.50   | 6.50         | -0.50  |
| 30                 | 6.90             | 1.24   | 5.80         | -0.10  | 6.70             | 0.80   | 6.58         | -0.10  |
| *40                | 6.78             | 1.12   | 5.58         | -0.05  | 6.49             | 0.91   | 6.32         | 0.0    |
| 50                 | 6.47             | 0.86   | 5.17         | -0.28  | 6.13             | 0.67   | 6.00         | 0.0    |
| 60                 | 6.00             | 0.40   | 4.68         | -0.47  | 5.62             | 0.34   | 5.49         | 0.0    |
| *70                | 5.37             | -0.08  | 4.07         | -0.62  | 4.98             | 0.10   | 4.70         | 0.0    |
| *80                | 4.16             | -0.50  | 3.28         | -0.67  | 4.22             | 0.16   | 3.80         | 0.0    |
| 90                 | 2.63             | -0.40  | 2.24         | -0.35  | 3.33             | 0.55   | 2.63         | 0.0    |
| 95                 | 1.66             | -0.15  | 1.63         | -0.20  | 2.77             | 0.76   | 1.90         | 0.0    |
| 100                | 0.40             | 0.40   | 0.30         | +0.30  | 1.33             | 1.33   | 0.30         | +0.30  |
| *35                |                  |        | 5.74         | 0.0    |                  |        |              |        |
| *36.7              |                  |        |              |        |                  |        |              | 0.0    |
| *68                |                  | 0.0    |              |        |                  |        |              |        |
| *73.3              |                  |        |              |        |                  | 0.0    |              |        |

| Per<br>cent of<br>chord. | REF. NO. 75. |        | REF. NO. 76. |        | REF. NO. 77. |        | REF. NO. 78. |        |
|--------------------------|--------------|--------|--------------|--------|--------------|--------|--------------|--------|
|                          | R. A. F. 17. |        | R. A. F. 18. |        | R. A. F. 19. |        | R. A. F. 20. |        |
|                          | Ordinates.   |        |              |        |              |        |              |        |
|                          | Upper.       | Lower. | Upper.       | Lower. | Upper.       | Lower. | Upper.       | Lower. |
| 0                        | 0.30         | +0.30  | 0.70         | 0.70   | 1.20         | 1.20   | 0.0          | 0.0    |
| 1.25                     | 1.80         | -0.32  | 1.82         | 0.25   | 3.90         | 0.22   | 0.90         | -0.53  |
| 2.5                      | 2.76         | -0.48  | 2.41         | 0.05   | 5.80         | 0.03   | 1.60         | -0.68  |
| *5                       | 3.90         | -0.70  | 3.30         | 0.0    | 8.50         | 0.10   | 2.70         | -0.90  |
| 7.5                      | 4.55         | -0.80  | 4.00         | 0.05   | 10.38        | 0.62   | 3.50         | -0.96  |
| 10                       | 5.00         | -0.85  | 4.50         | 0.16   | 11.75        | 1.40   | 4.06         | -1.05  |
| 15                       | 5.54         | -0.87  | 5.20         | 0.52   | 13.70        | 3.15   | 4.86         | -1.20  |
| 20                       | 5.78         | -0.82  | 5.62         | 0.90   | 14.72        | 4.85   | 5.43         | -1.27  |
| 30                       | 5.80         | -1.00  | 5.90         | 1.40   | 15.20        | 6.90   | 6.00         | -1.40  |
| 40                       | 5.62         | -0.95  | 5.90         | 1.30   | 14.70        | 7.50   | 6.00         | -1.50  |
| 50                       | 5.20         | -0.87  | 5.60         | 1.00   | 13.40        | 7.20   | 5.70         | -1.50  |
| 60                       | 4.65         | -0.80  | 5.10         | 0.70   | 11.70        | 6.20   | 5.10         | -1.40  |
| 70                       | 3.98         | -0.70  | 4.40         | 0.40   | 9.50         | 5.00   | 4.20         | -1.40  |
| 80                       | 3.22         | -0.60  | 3.50         | 0.20   | 7.10         | 3.40   | 3.10         | -1.10  |
| 90                       | 2.24         | -0.40  | 2.20         | 0.0    | 4.30         | 1.70   | 1.80         | -0.80  |
| 95                       | 1.64         | -0.30  | 1.50         | 0.0    | 2.60         | 0.80   | 1.10         | -0.60  |
| *100                     | 0.42         | +0.42  | 0.30         | 0.30   | 0.60         | 0.60   | 0.0          | 0.0    |
| *3.5                     |              |        |              |        |              | 0.0    |              |        |
| *99                      |              |        |              |        |              | 0.0    |              |        |

| Per<br>cent of<br>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<br>cent of<br>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    |              |        | 5.85         | 0.0    |
| * 28                     | 7.80         | 0.0    |              |        | 5.85         | 0.0    |              |        |

| Per<br>cent of<br>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                    | -----        |        | -----        |        | -3.0         |        | -----        |        |
| *24                      | 5.85         | -0.20  | 5.85         | -0.10  | 5.85         | -----  | 5.85         | -----  |

| Per<br>cent of<br>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                    |              | -1.0   |              |        |              |        |              |        |
| *24                      | 5.85         |        | 5.85         |        | 5.85         |        | 5.85         |        |
| *33.3                    |              |        |              | 0.0    |              |        |              |        |

| 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<br>cent of<br>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 | 4.580         | 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          | 0.26   |
| 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          | 0.38   | 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    |               |        |
| *08.3              |               | 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    |               |        |               |        |



| 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<br>cent of<br>chord. | REF. No. 131. |        | REF. No. 132. |        | REF. No. 133. |        | REF. No. 134. |        |
|--------------------------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|
|                          | N. P. L. 4c.  |        | N. P. L. 4ca. |        | N. P. L. 4cβ  |        | N. P. L. 4cγ. |        |
|                          | 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          | 3.78   | 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<br>cent of<br>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    | 1.33 thick.   | 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    |               |        |               |        |

| 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          | 0.38   | 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          | 0.43   | 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          | 2.49   |
| 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<br>cent of<br>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   | 3.63          | 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. 179. |        | REF. NO. 189. |        | 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          | 2.00   |
| 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   | 7.08          | 3.02   |
| 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                 | 2.35          | 0.94   | 2.42          | 0.0    | 2.54          | 0.70   | 2.35          | 1.06   |
| 95                 | 1.85          | 0.50   | 1.43          | 0.0    | 1.68          | 0.30   | 1.34          | 0.54   |
| 100                | 1.25          | 0.0    | 0.0           | 0.0    | 0.70          | 0.0    | 0.50          | 0.0    |

[illegible]

| 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   |

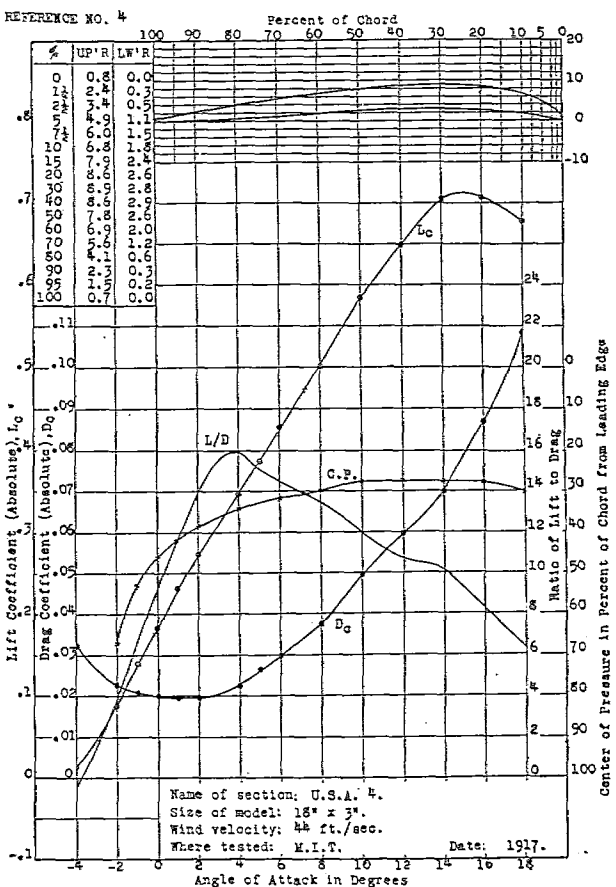
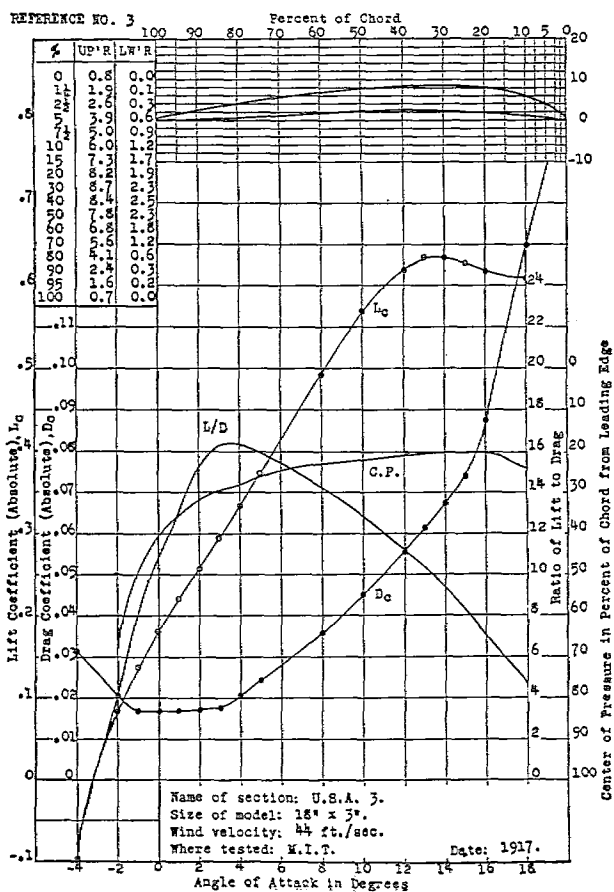
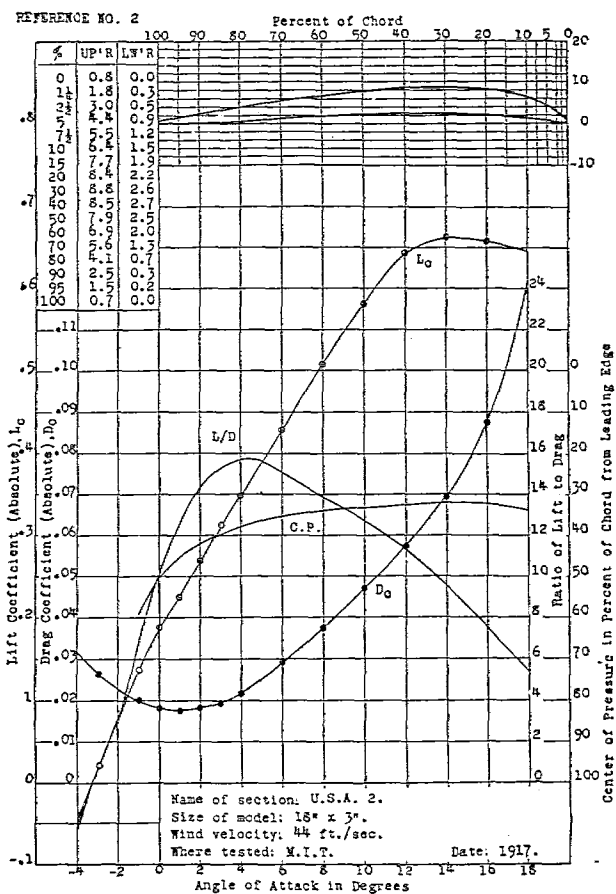
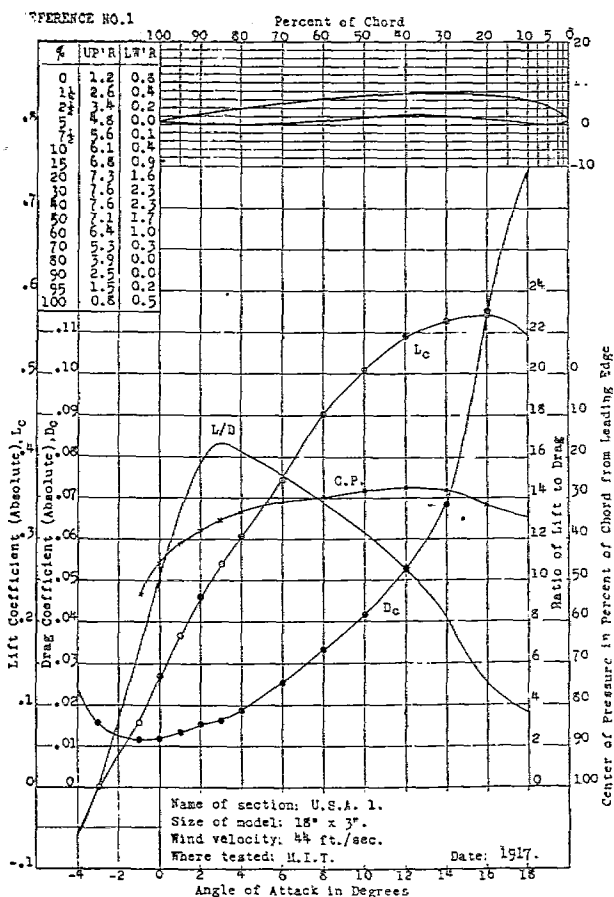
| Per cent of chord. | REF. No. 195. |        | REF. No. 196. |        | REF. No. 197. |        | REF. No. 198. |        |
|--------------------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|
|                    | Eiffel 56.    |        | Eiffel 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   | 1.63          | 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          | 0.08   | 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          | 0.08   | 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<br>cent of<br>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   |

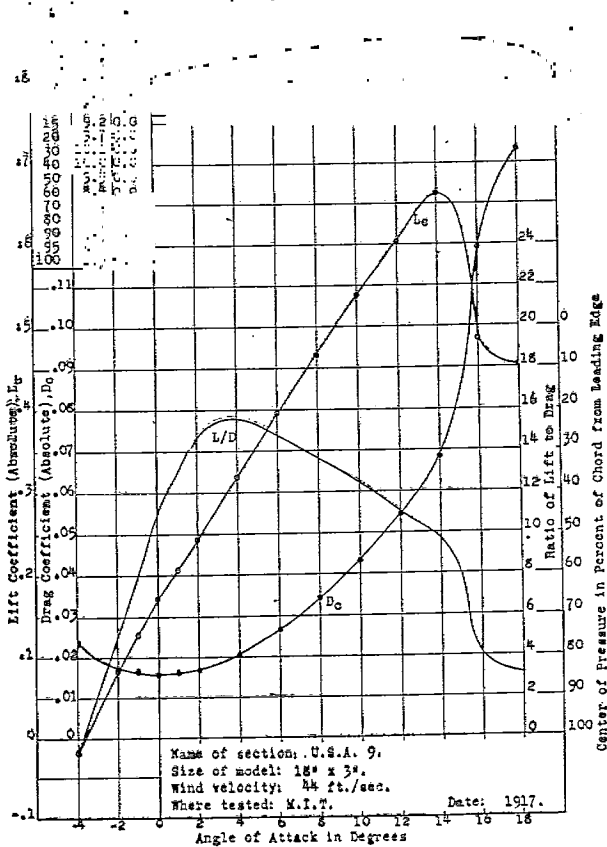
| Per<br>cent of<br>chord. | REF. NO. 211. |        | REF. NO. 212. |        | REF. NO. 213. |        | REF. NO. 214. |        |
|--------------------------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|
|                          | Bleriot 3-pl. |        | 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    |



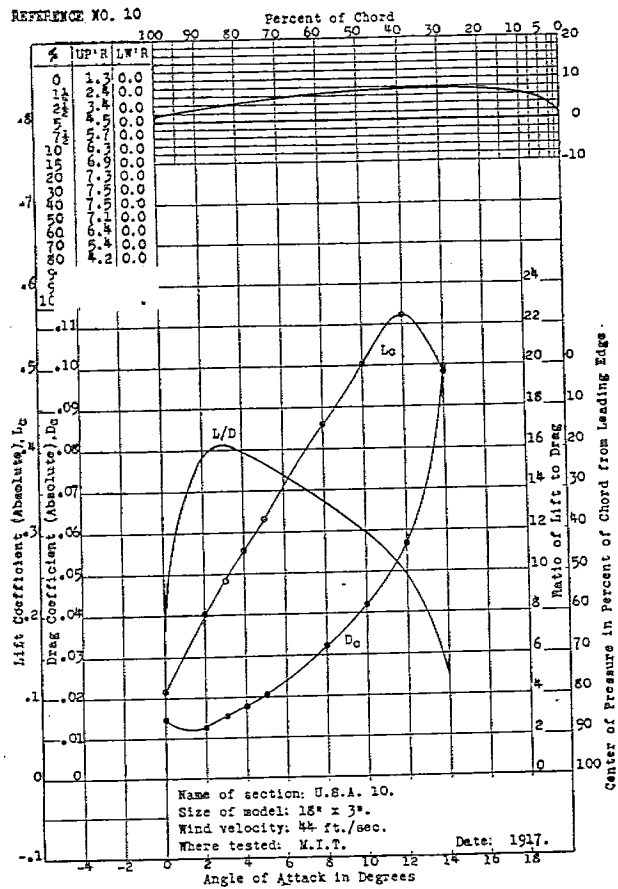




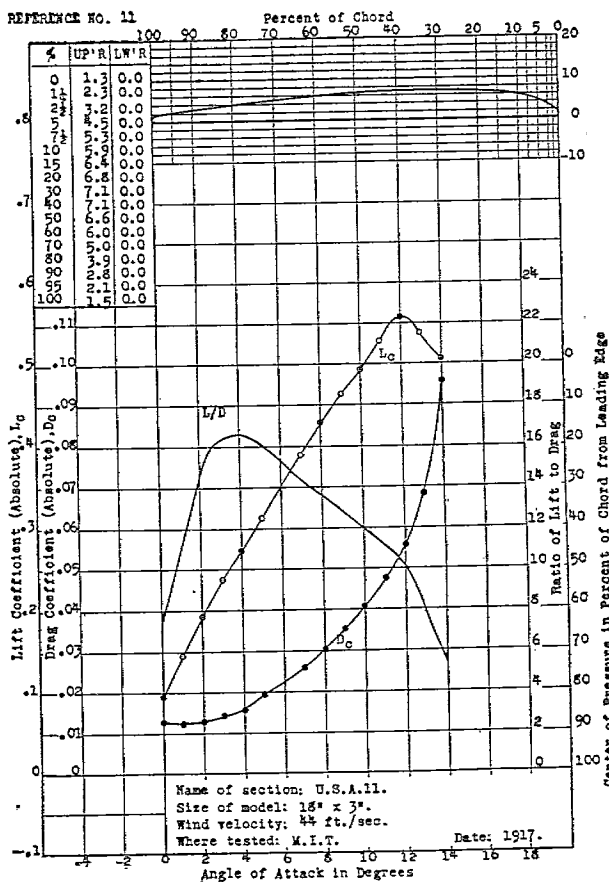
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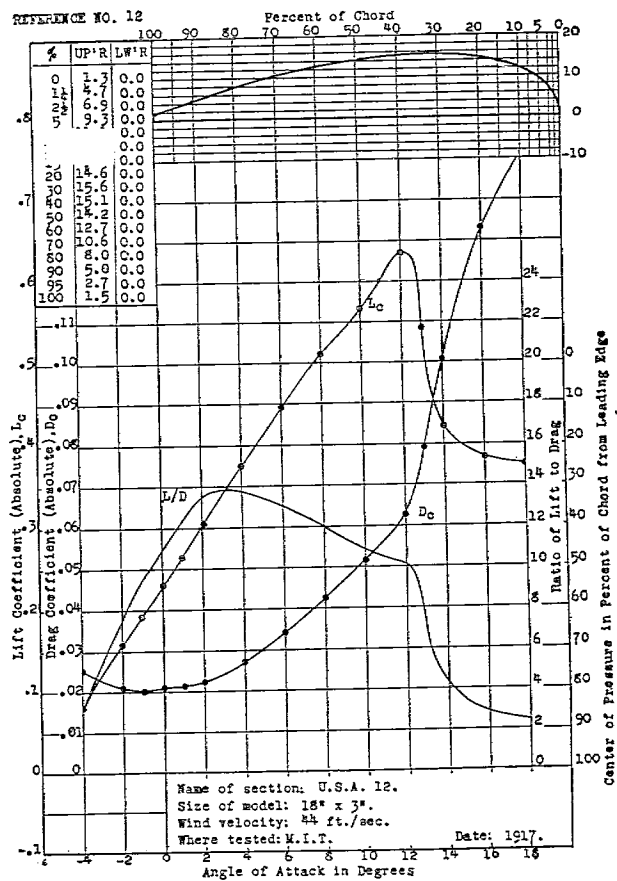
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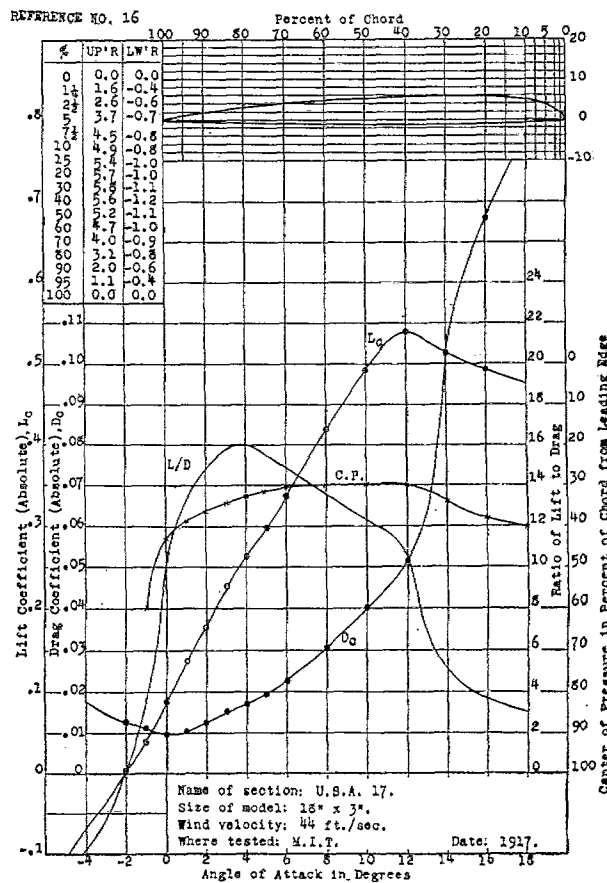
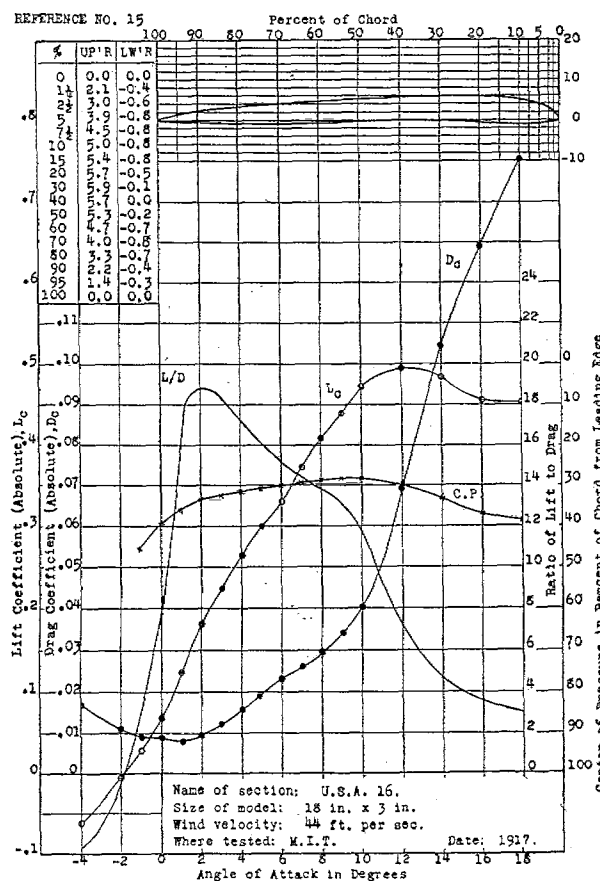
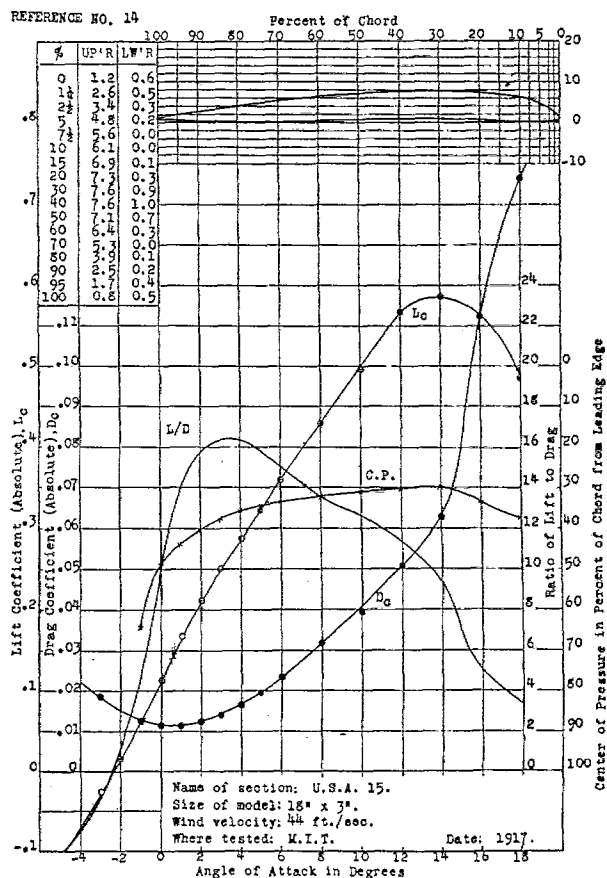
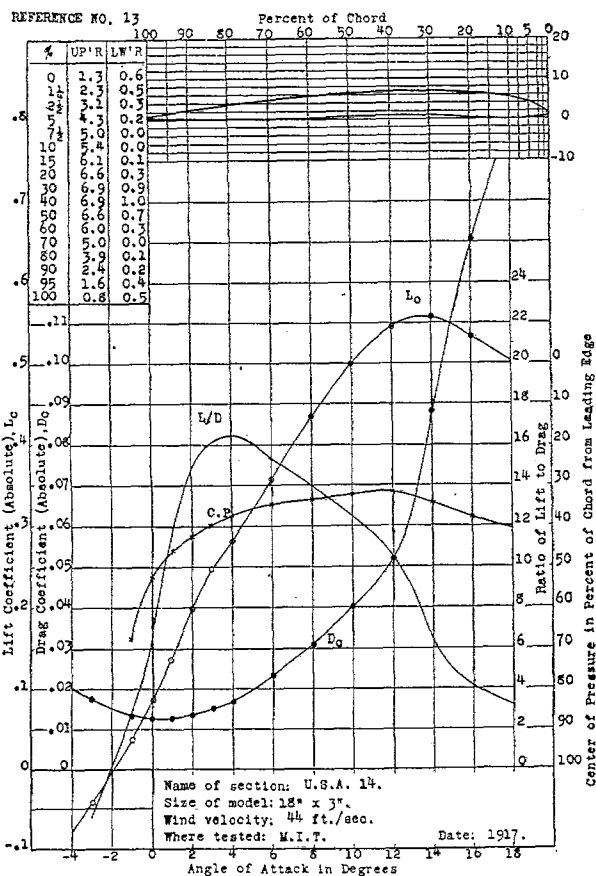


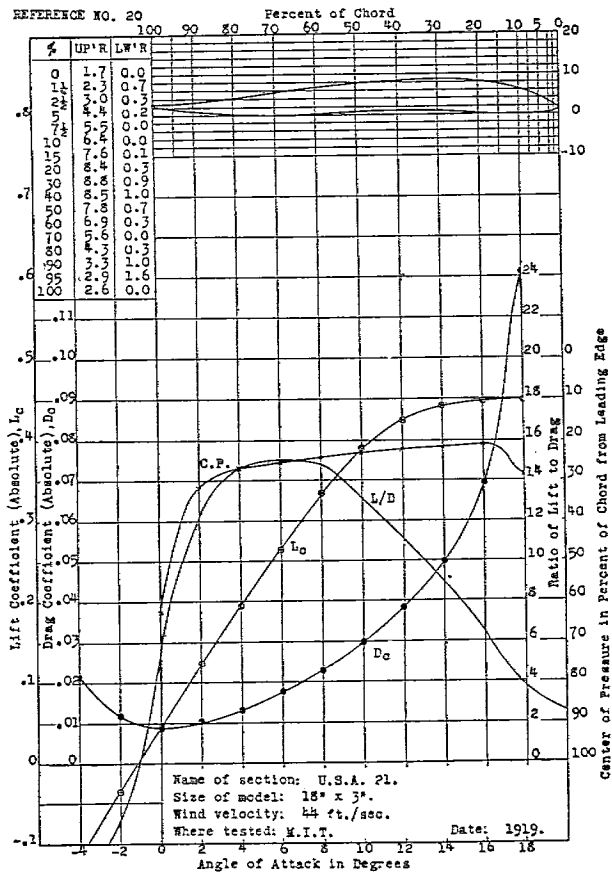
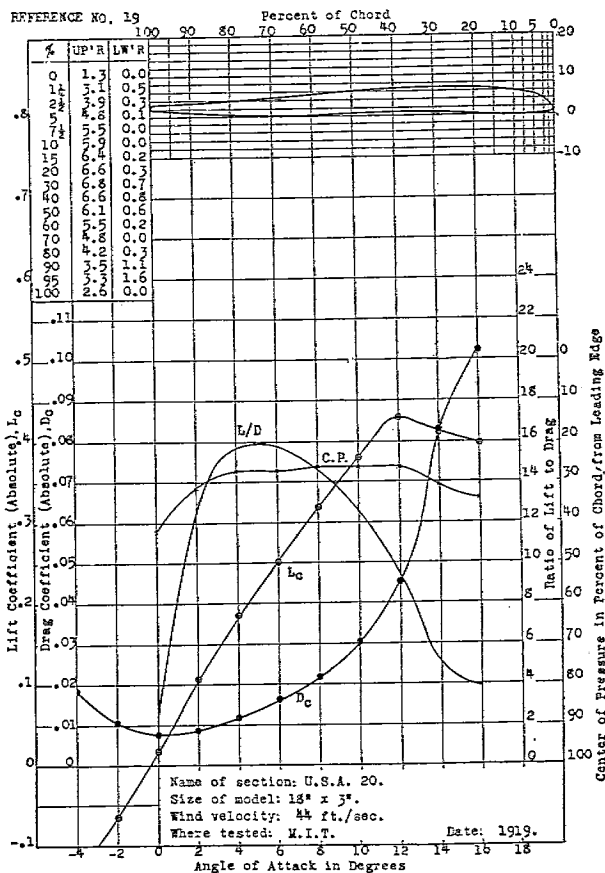
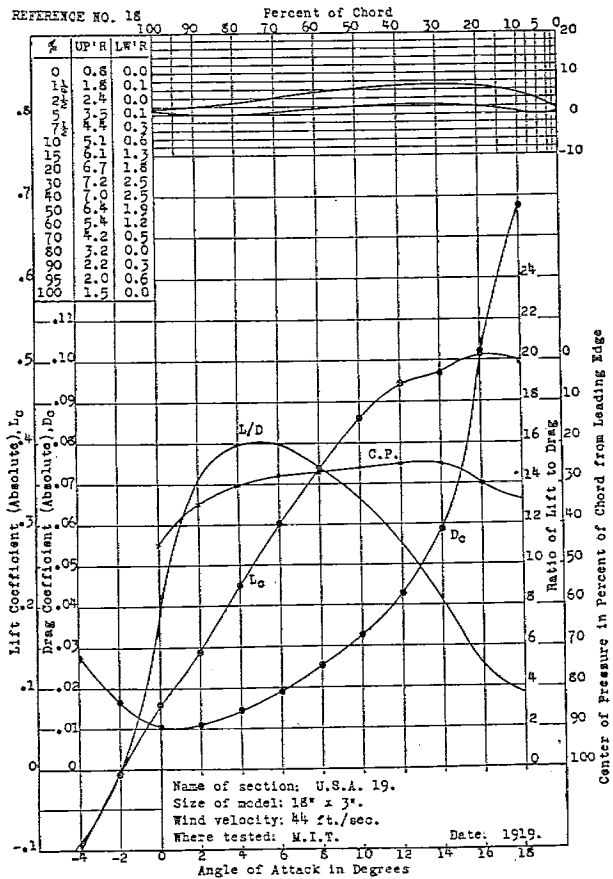
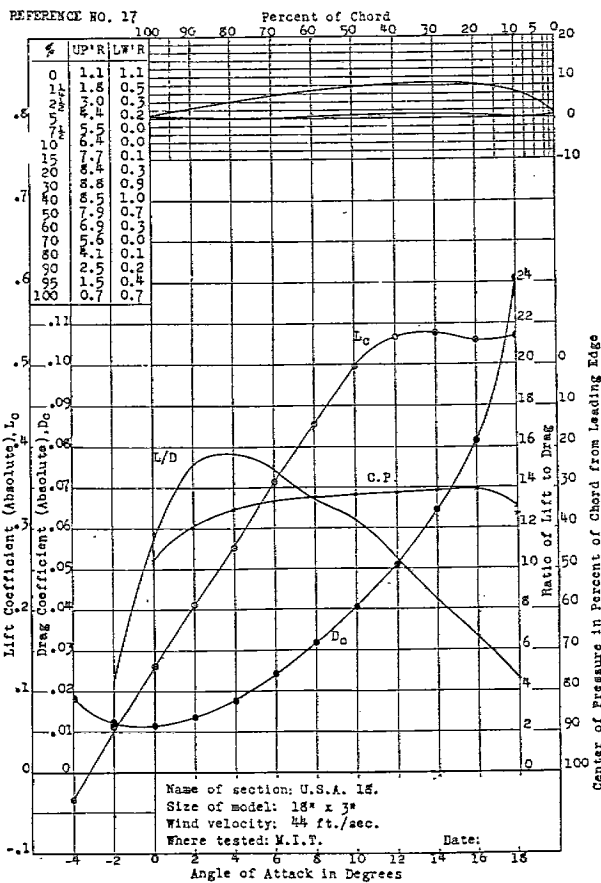
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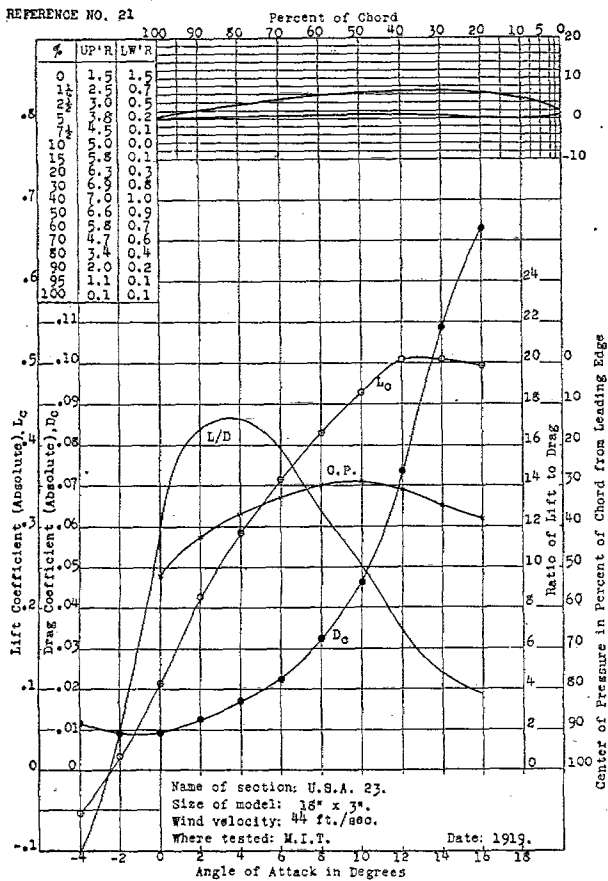
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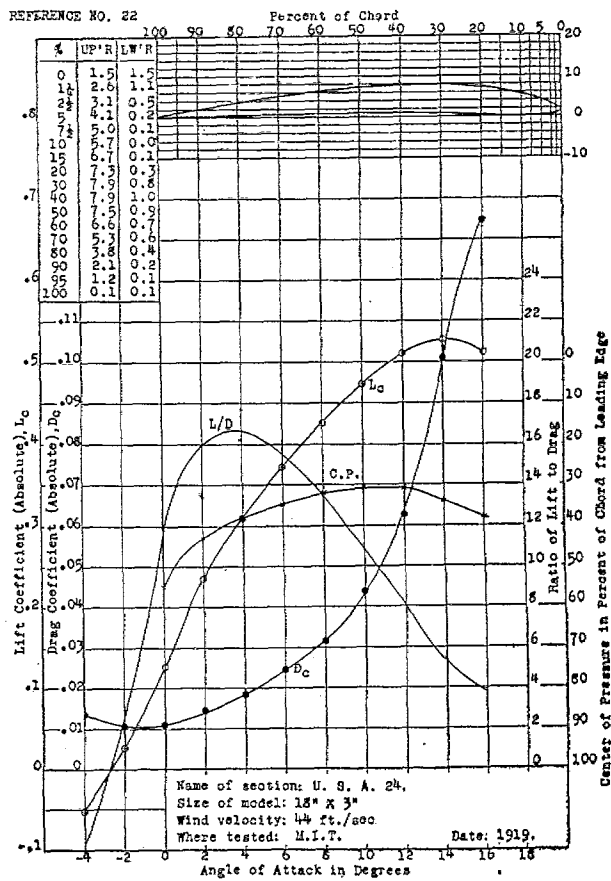




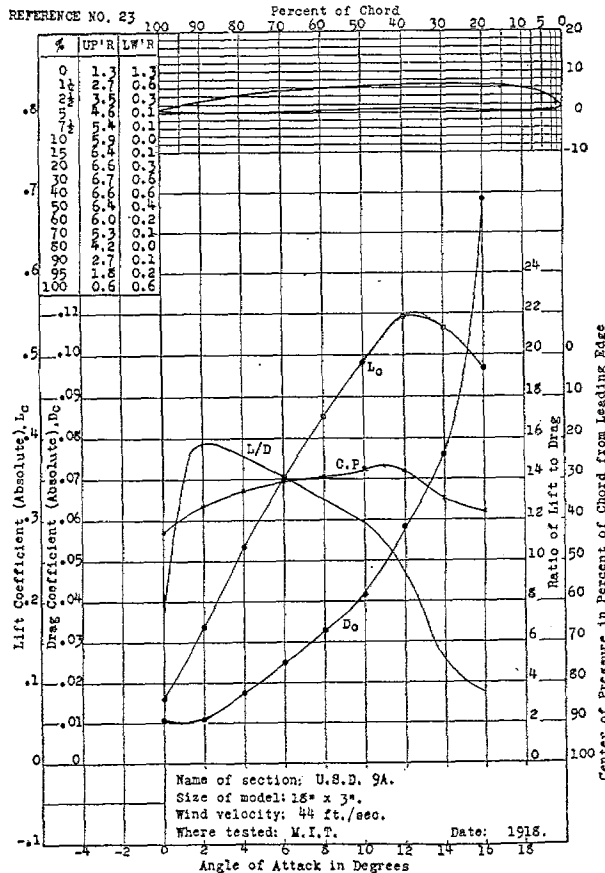
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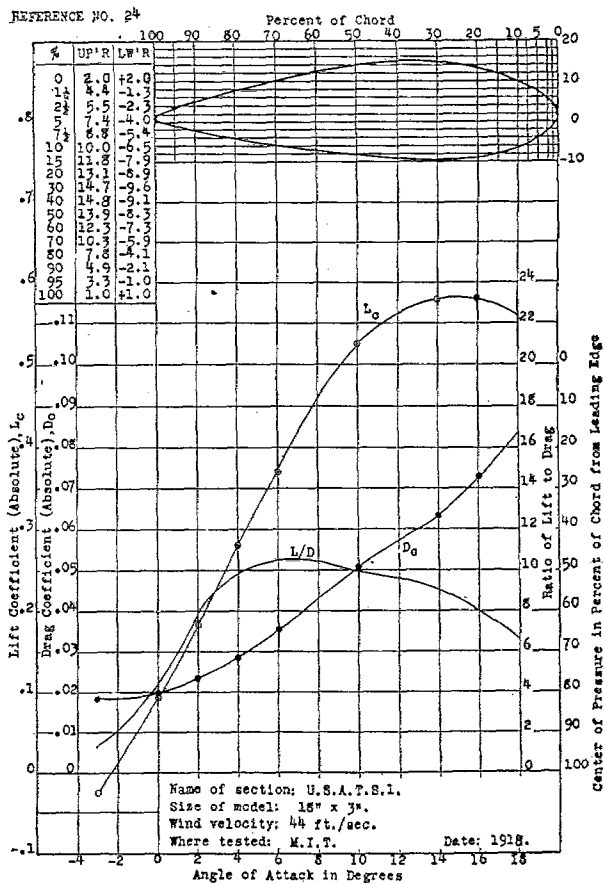
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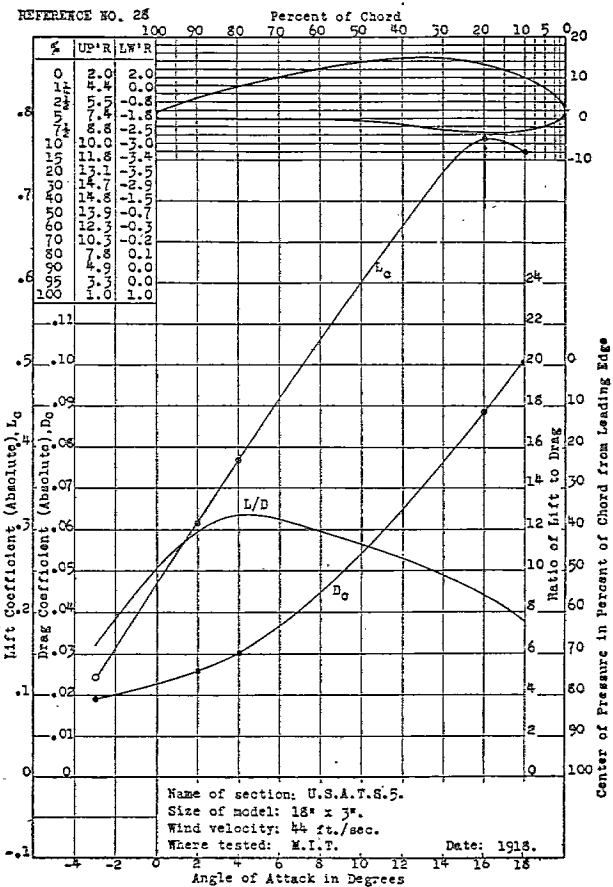
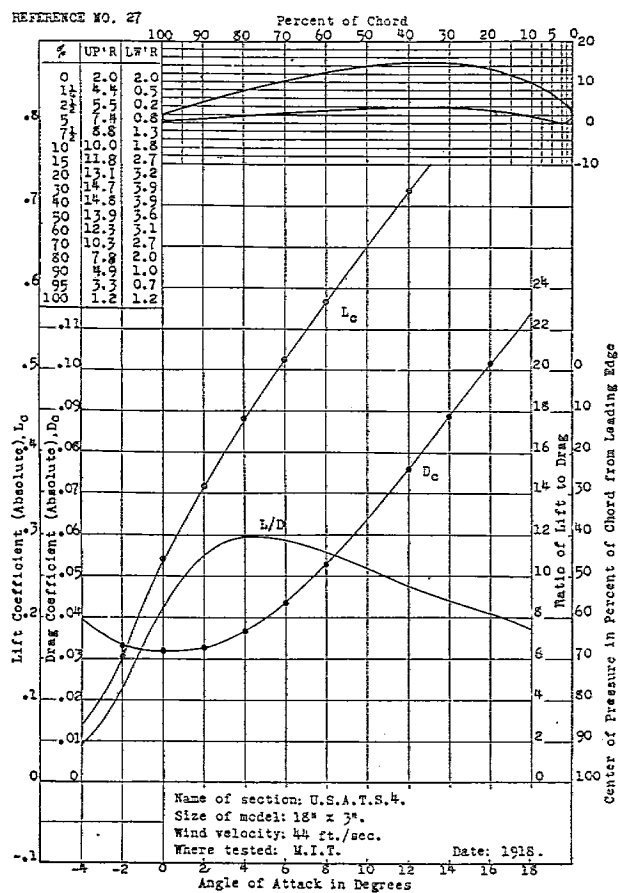
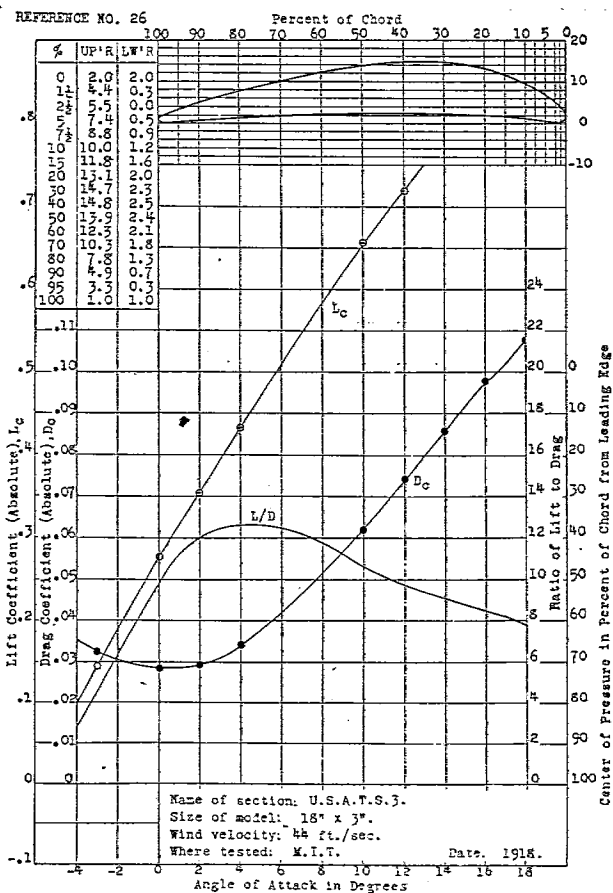
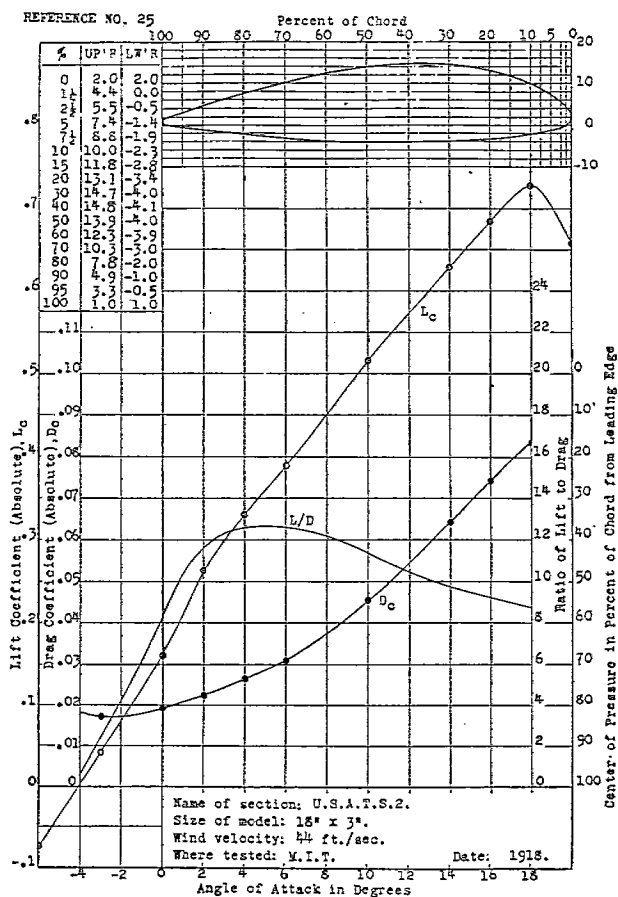


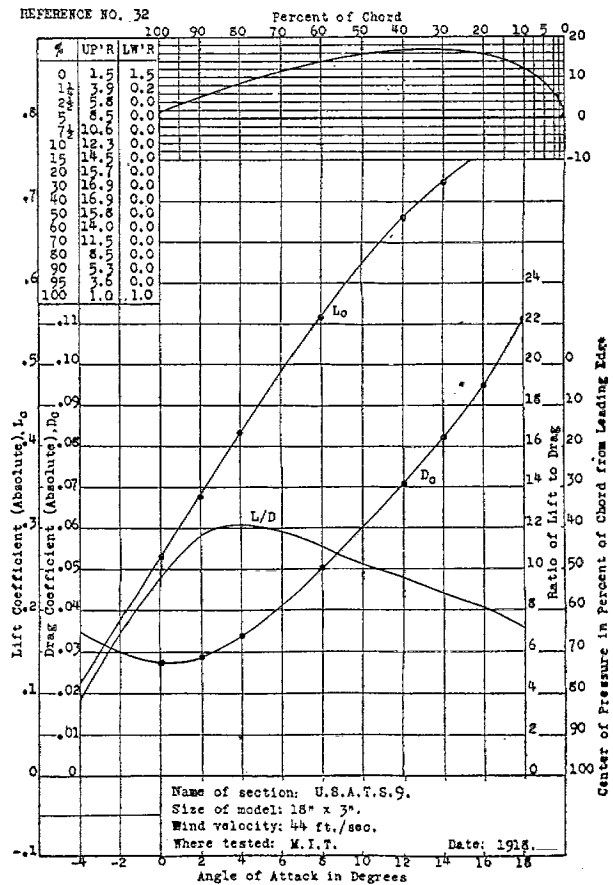
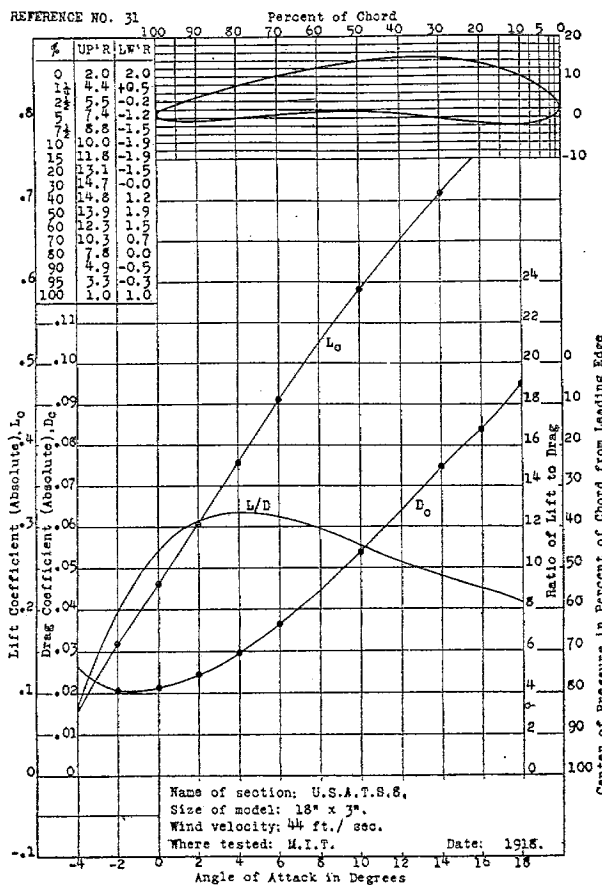
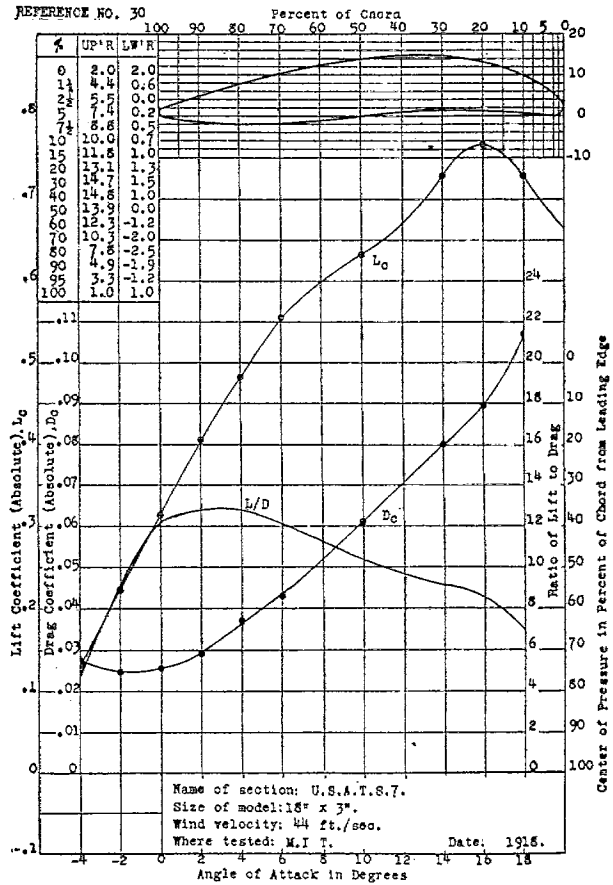
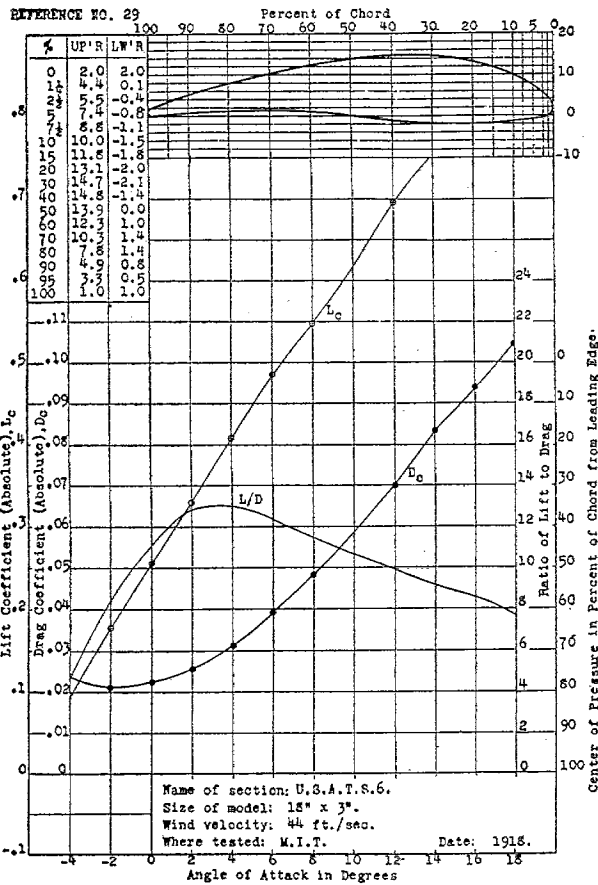
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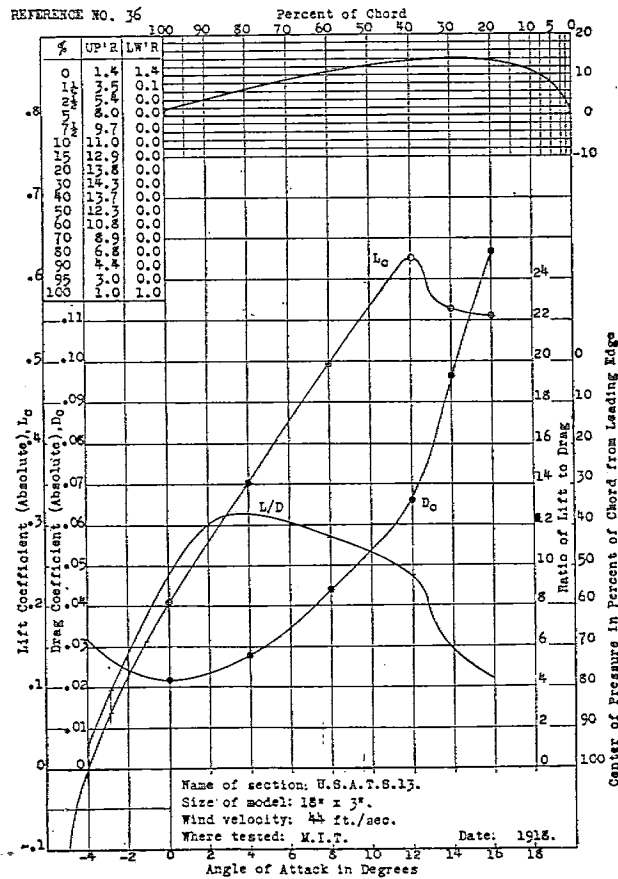
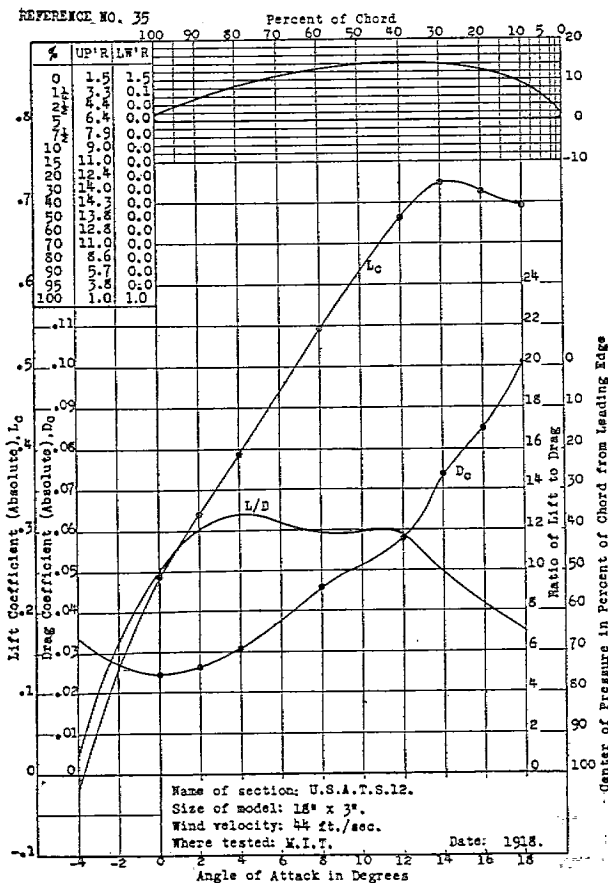
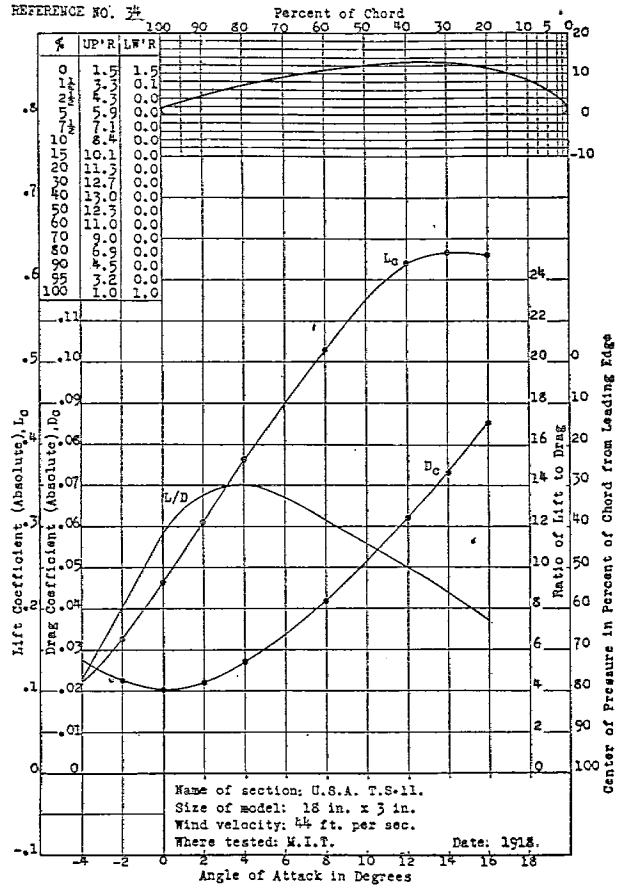
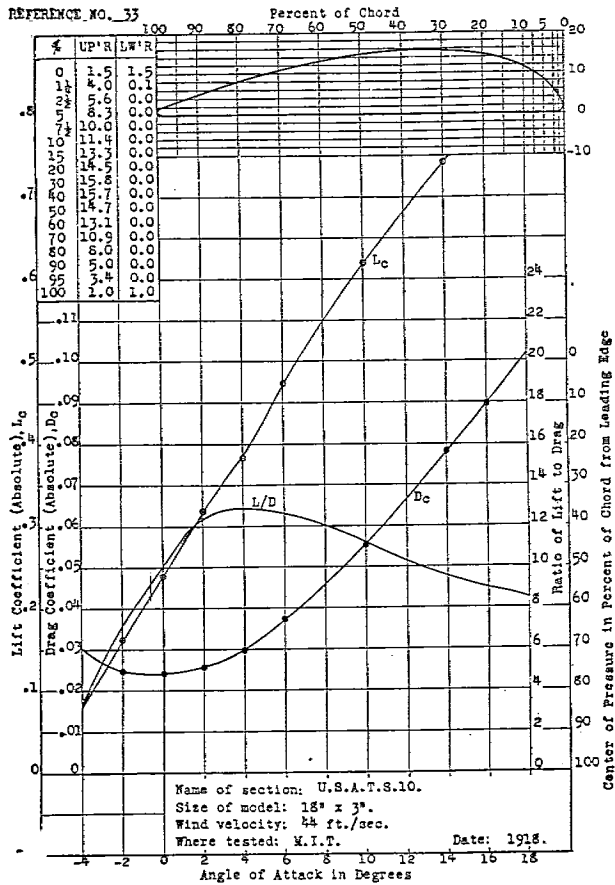


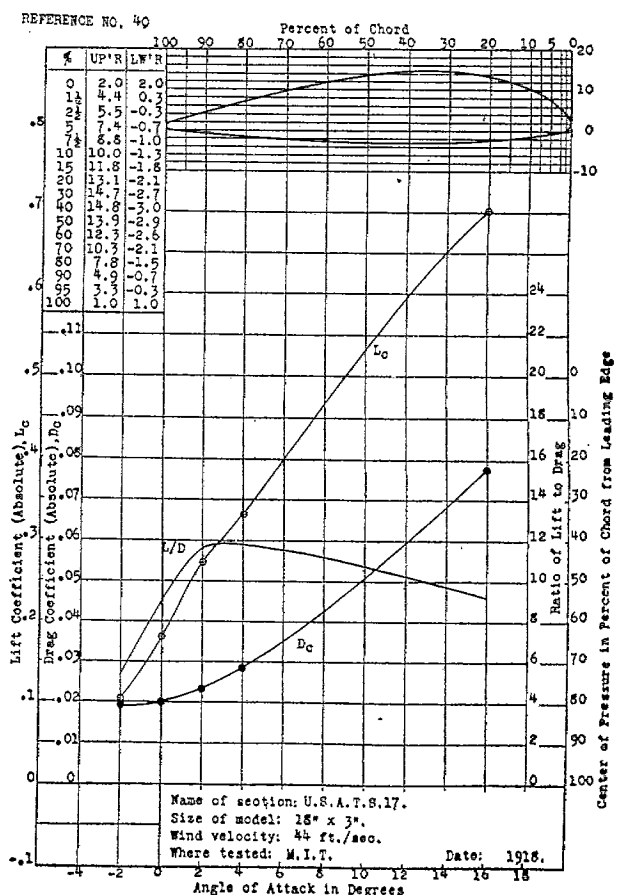
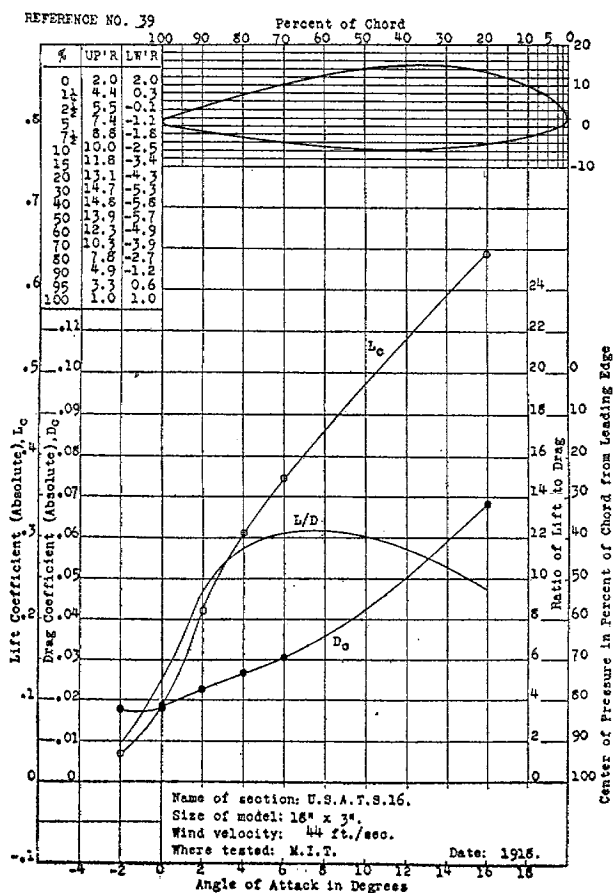
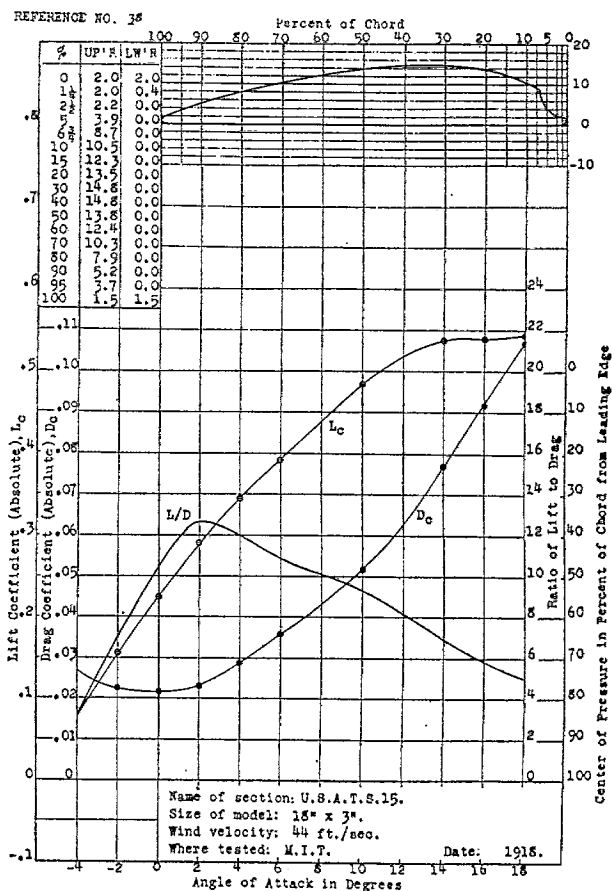
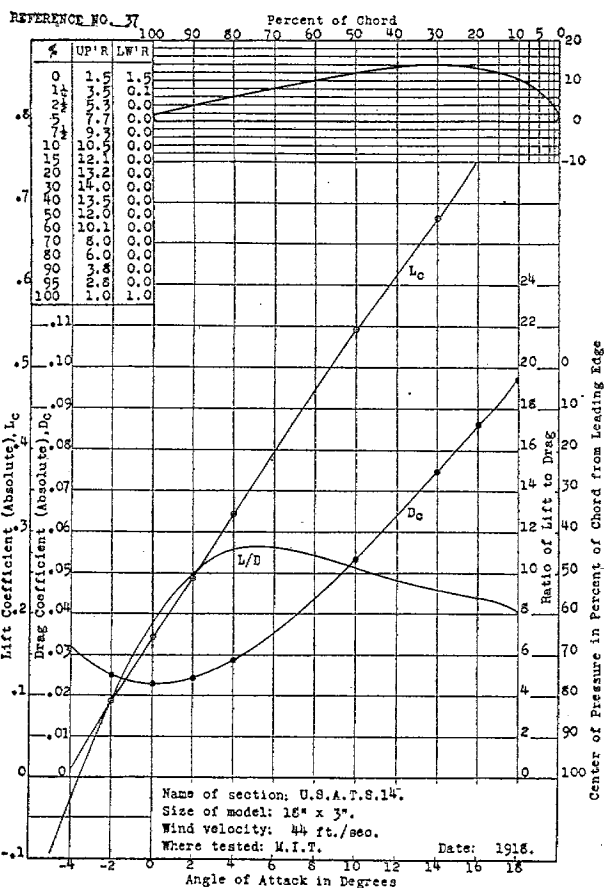
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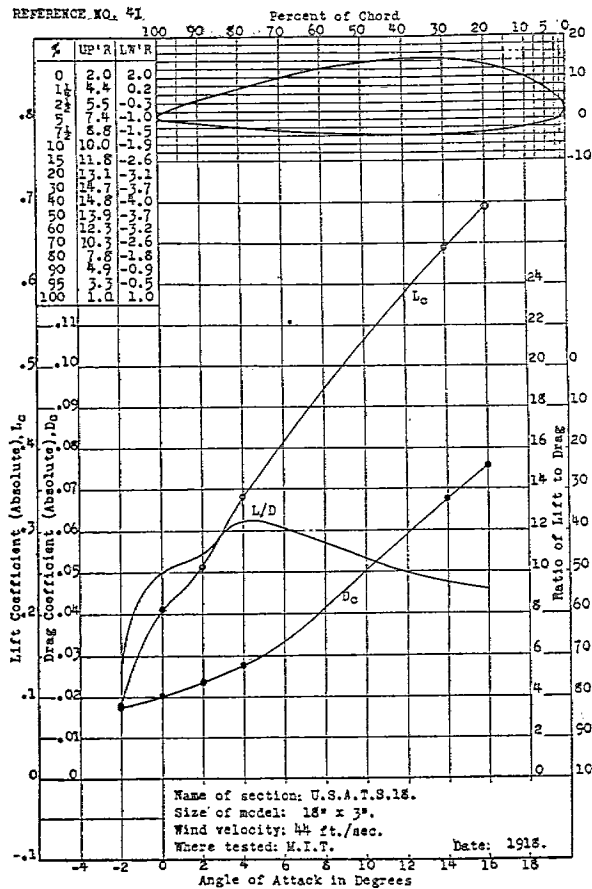




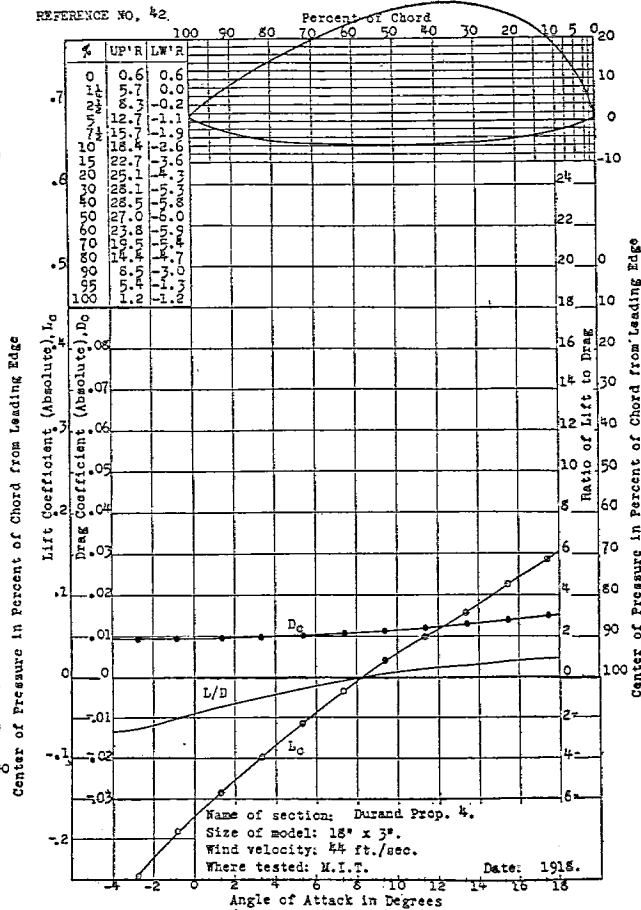




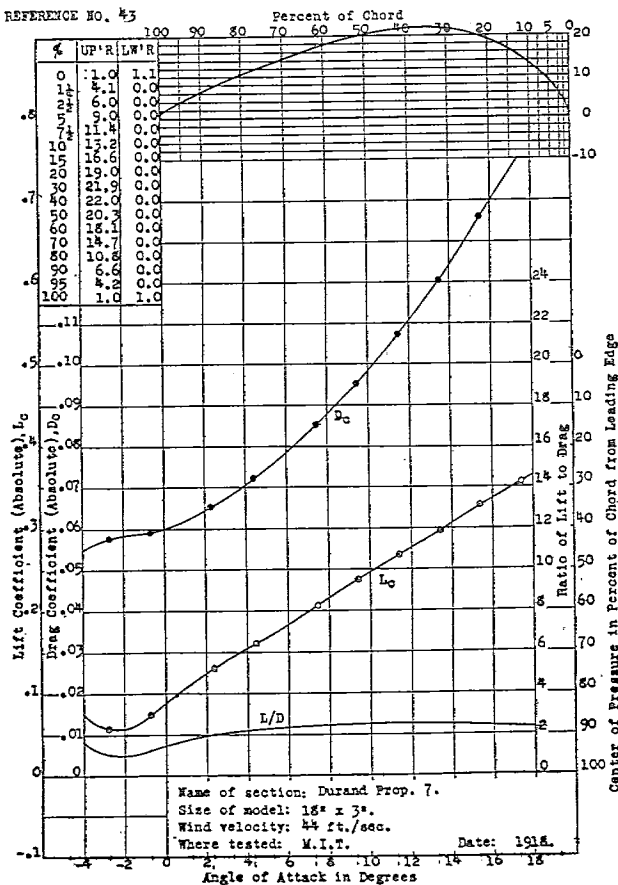
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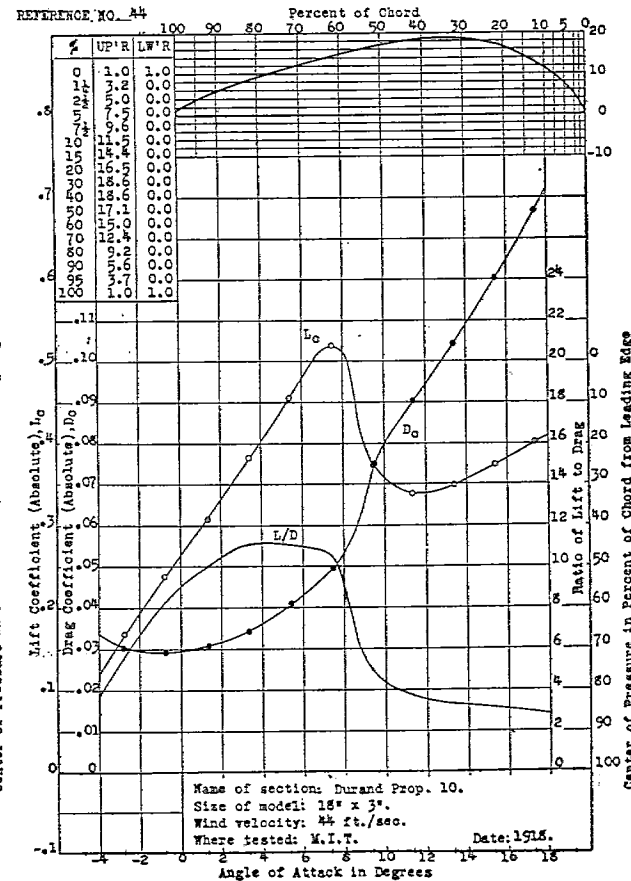
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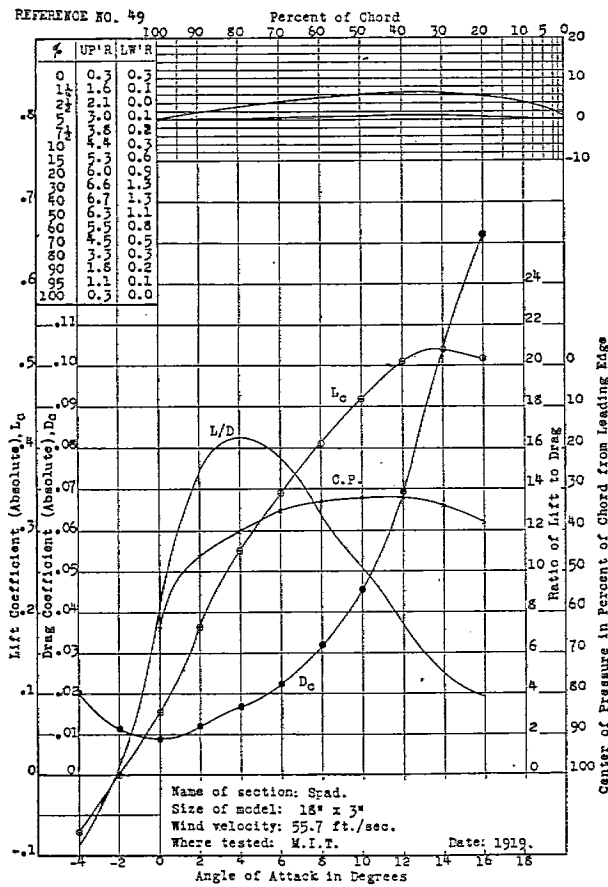


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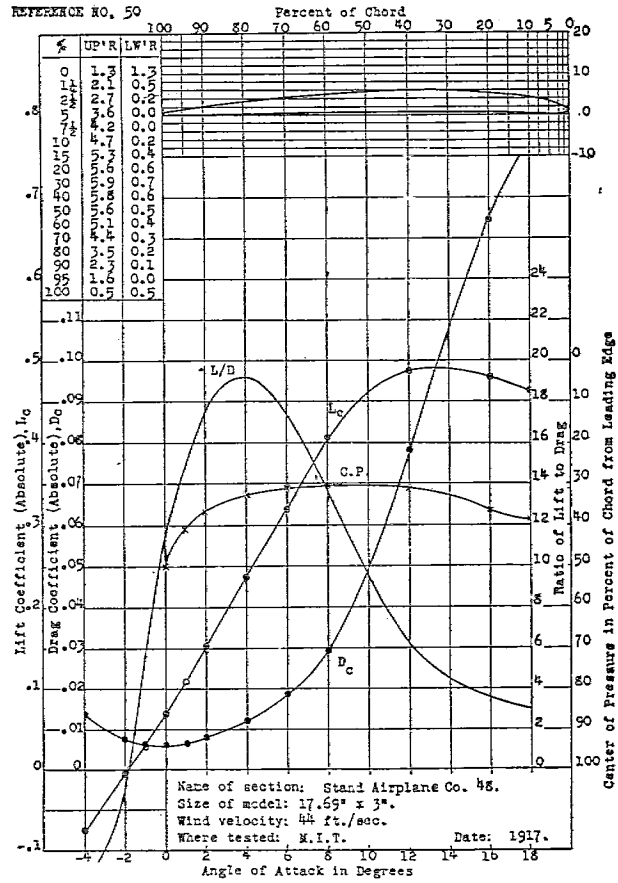




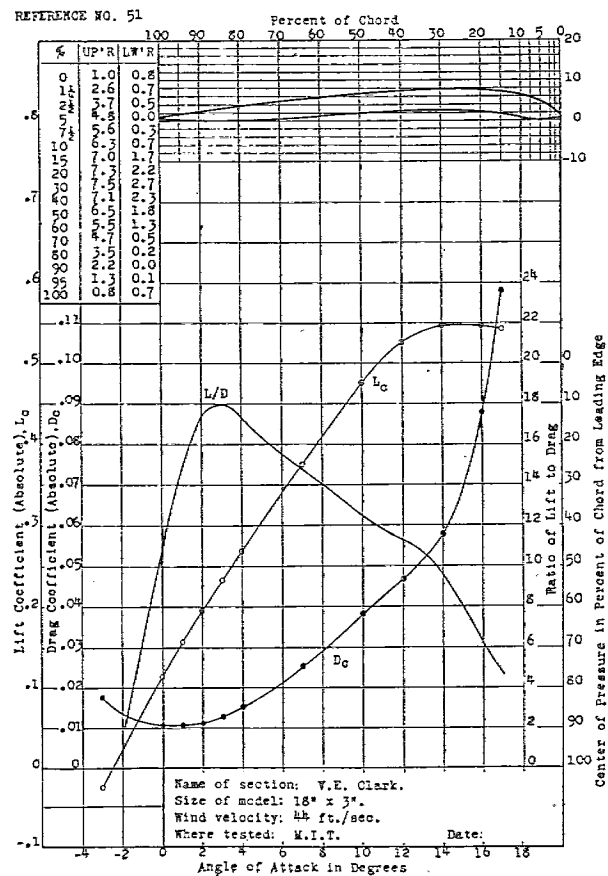
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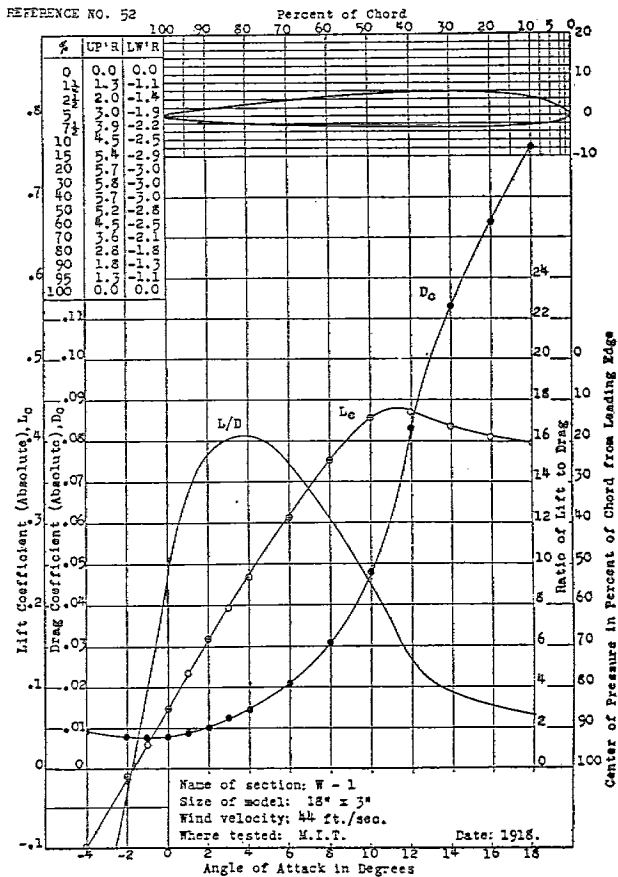
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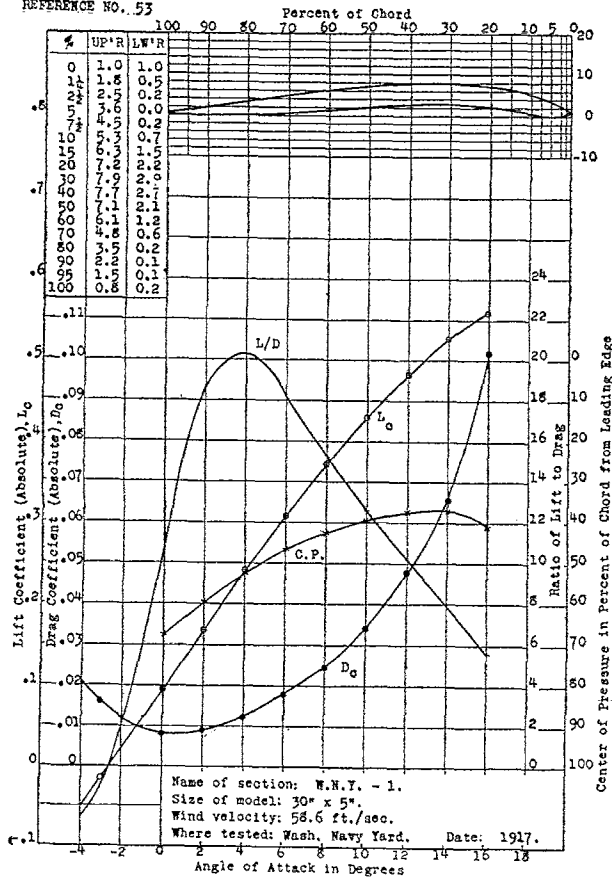
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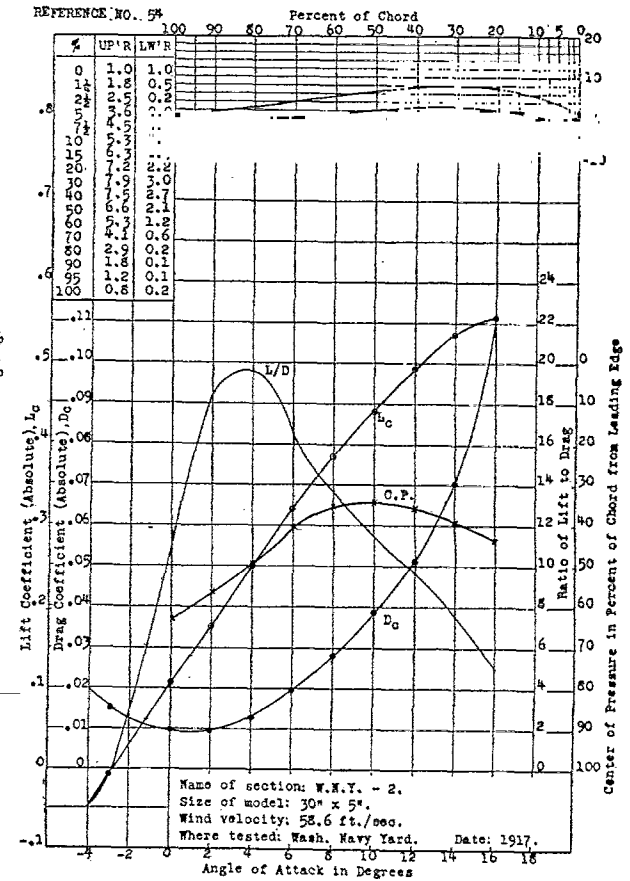
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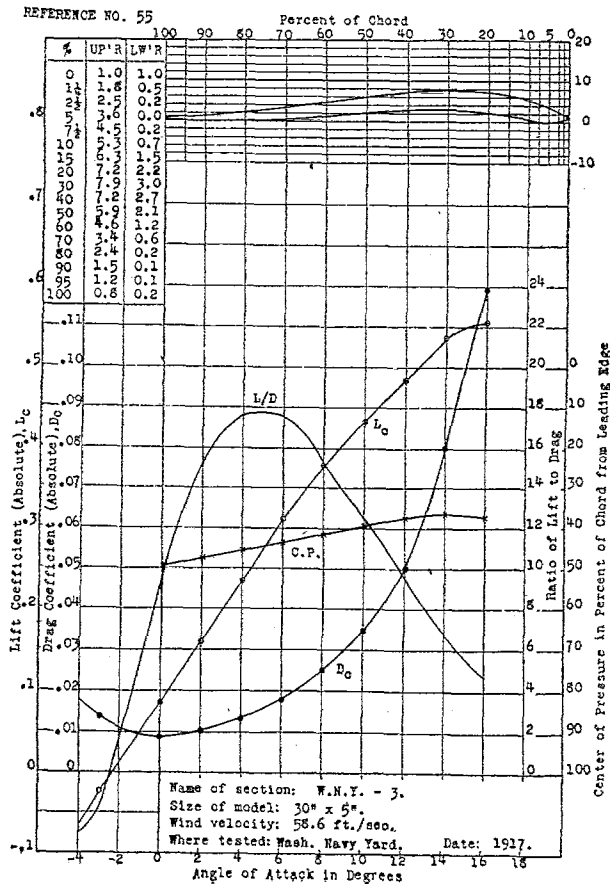
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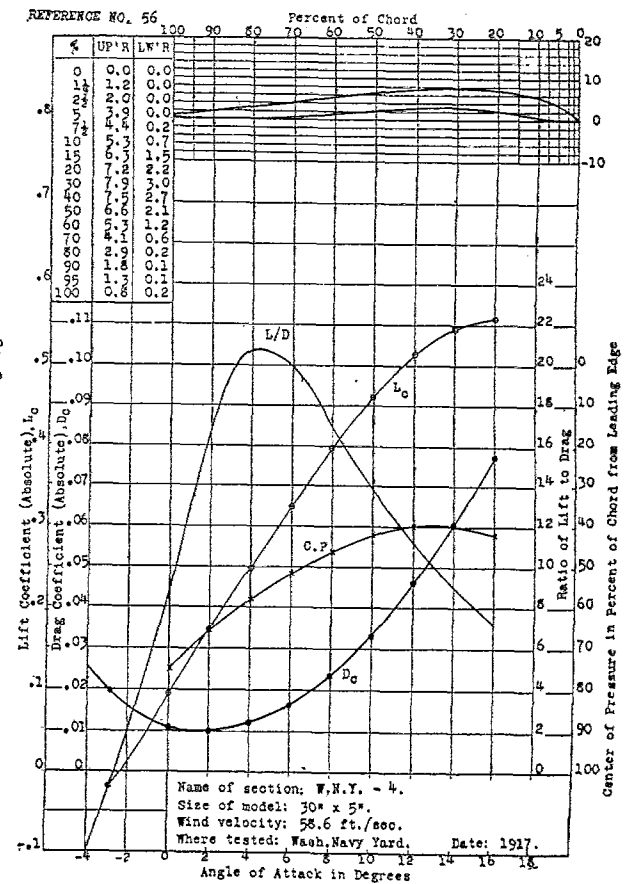
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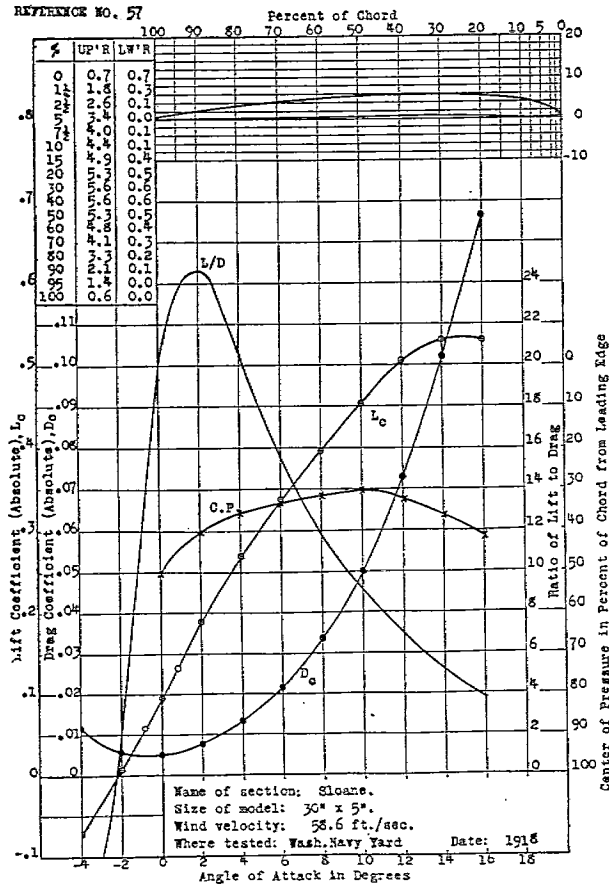
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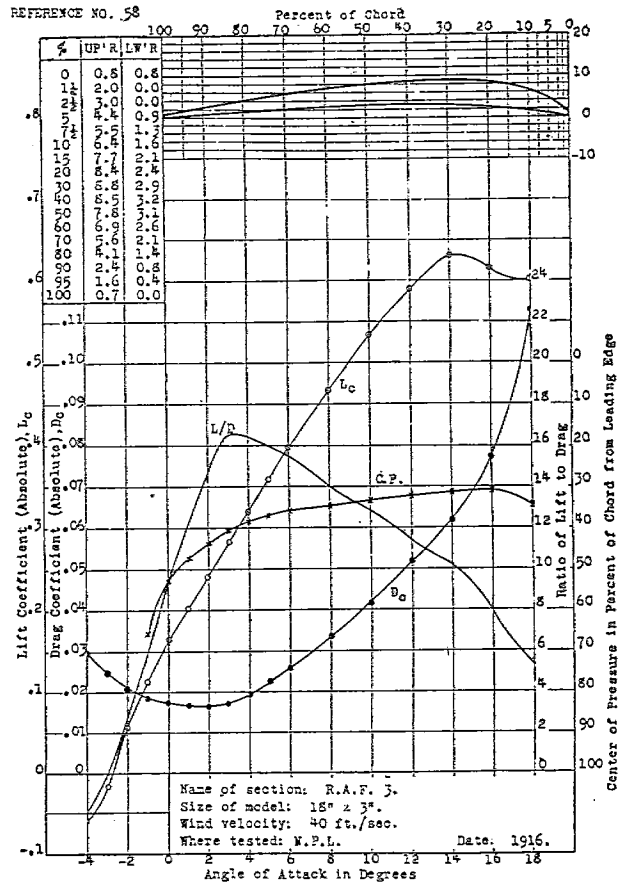
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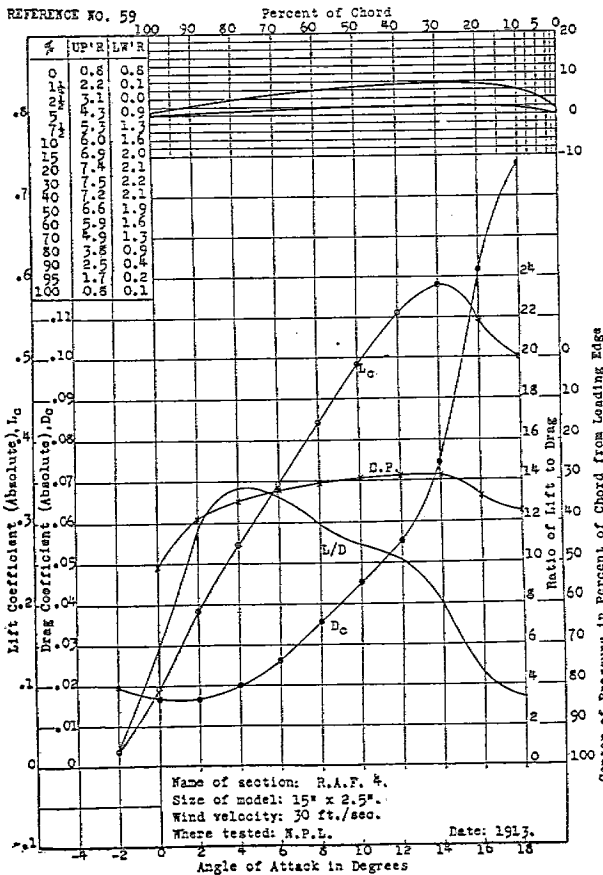
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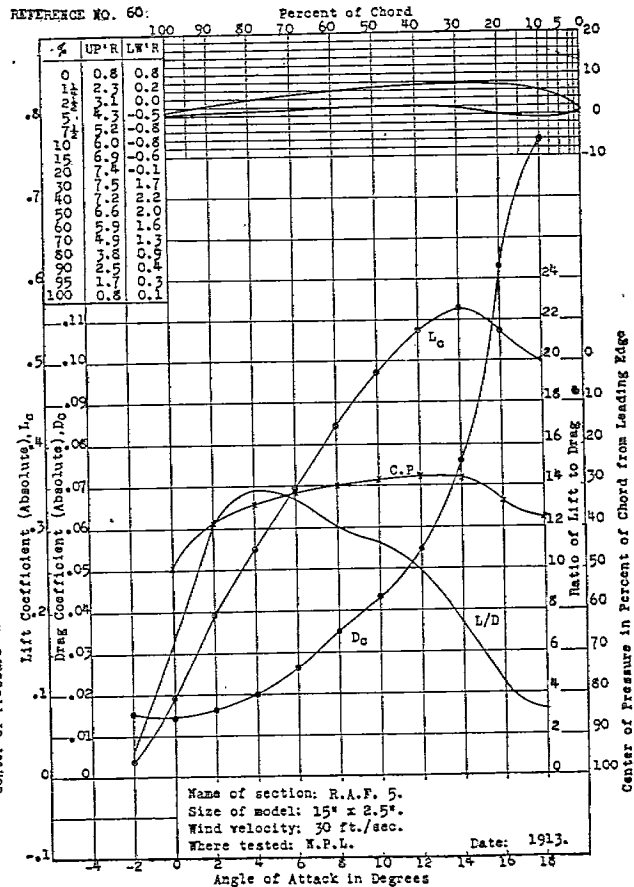
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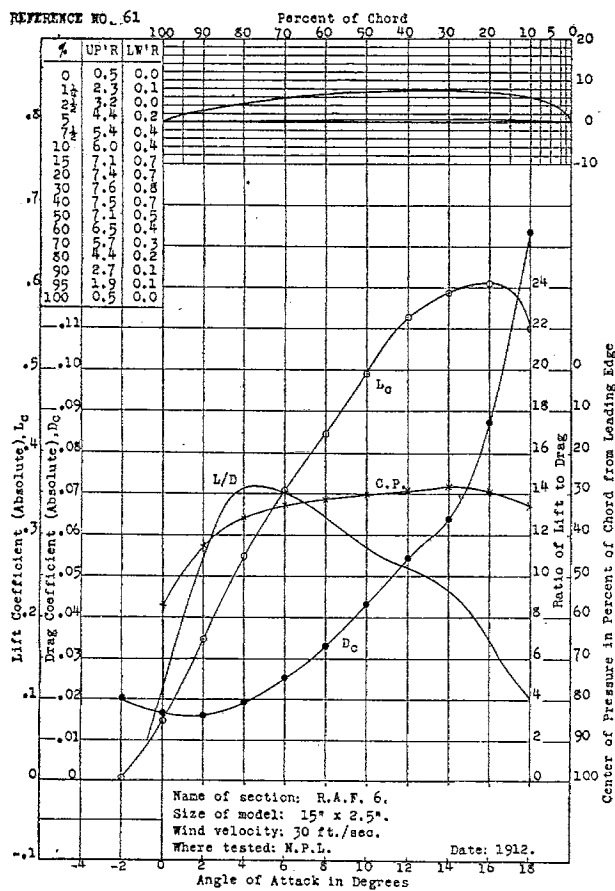
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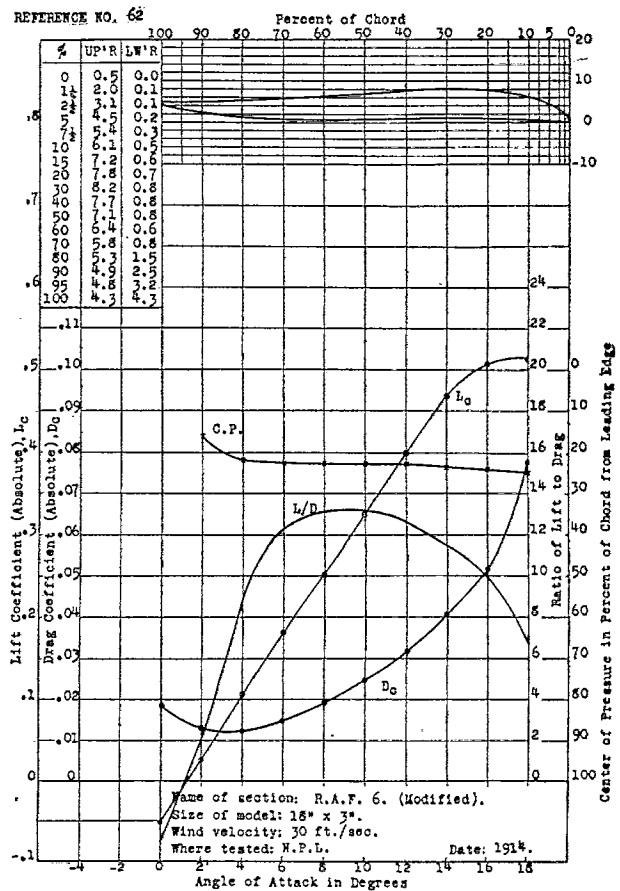
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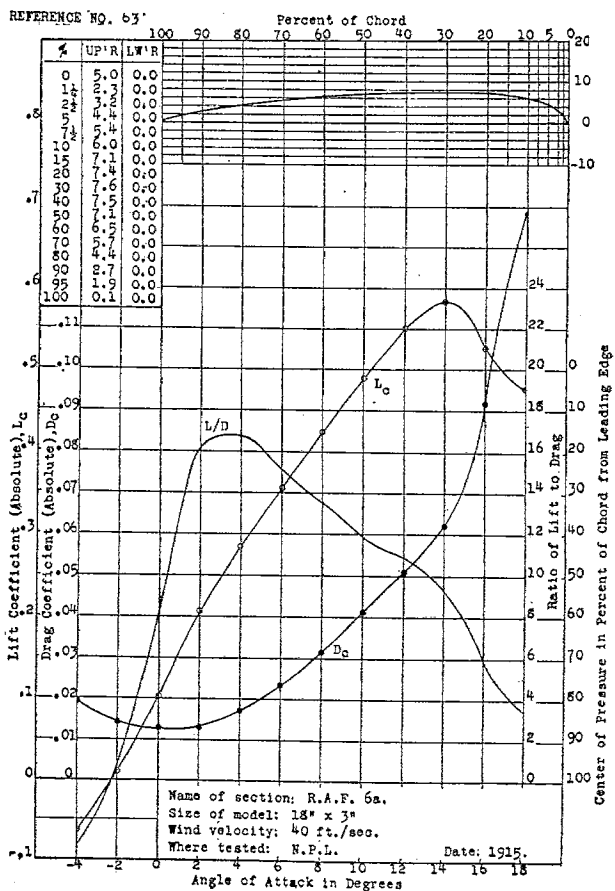
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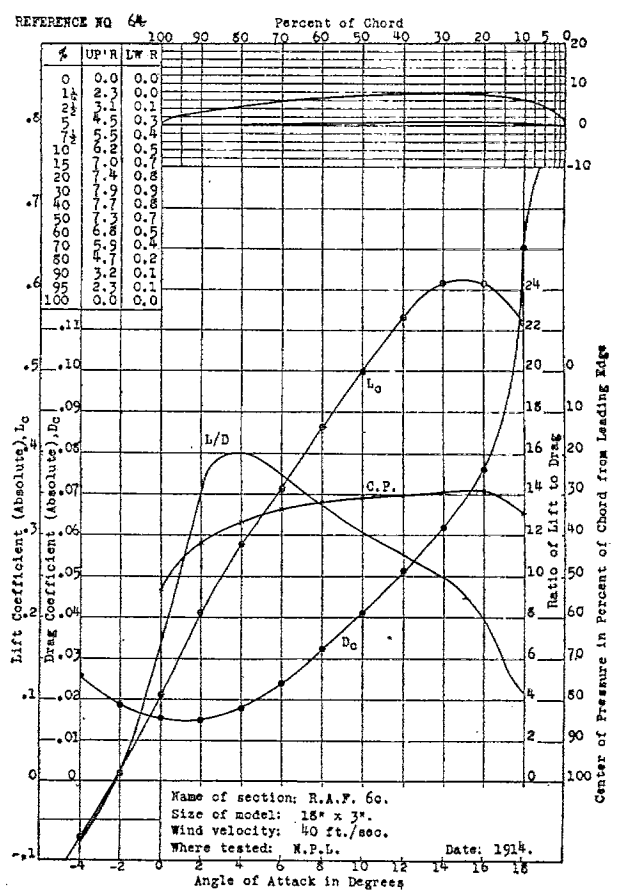
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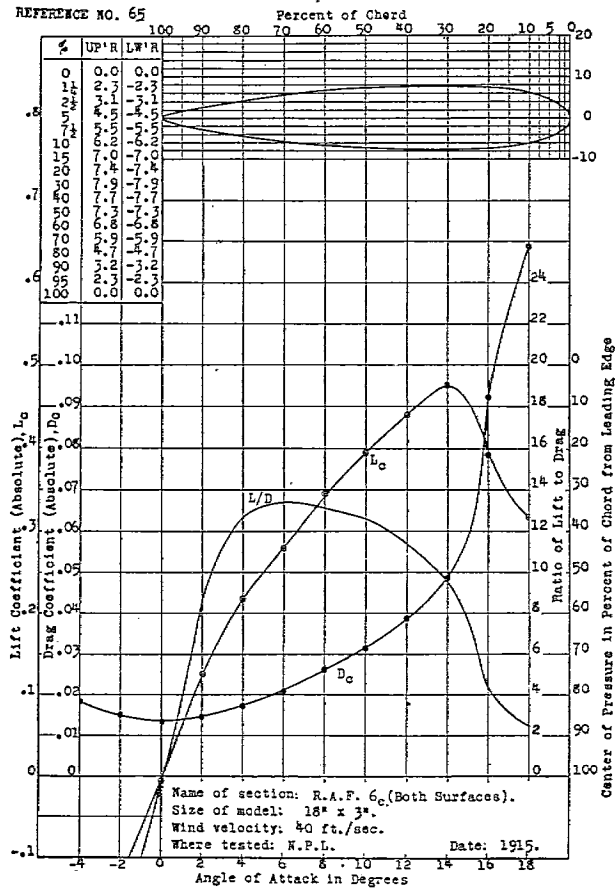
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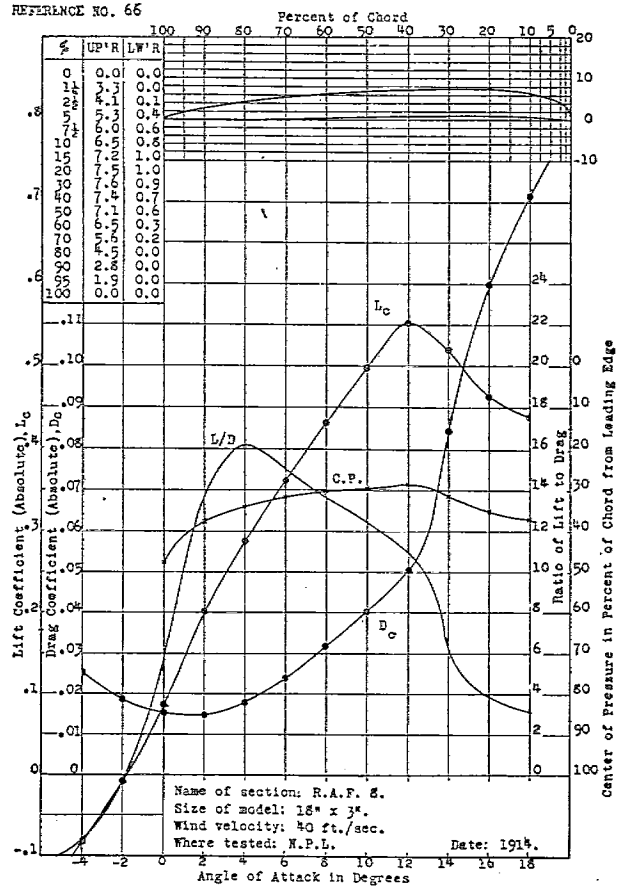
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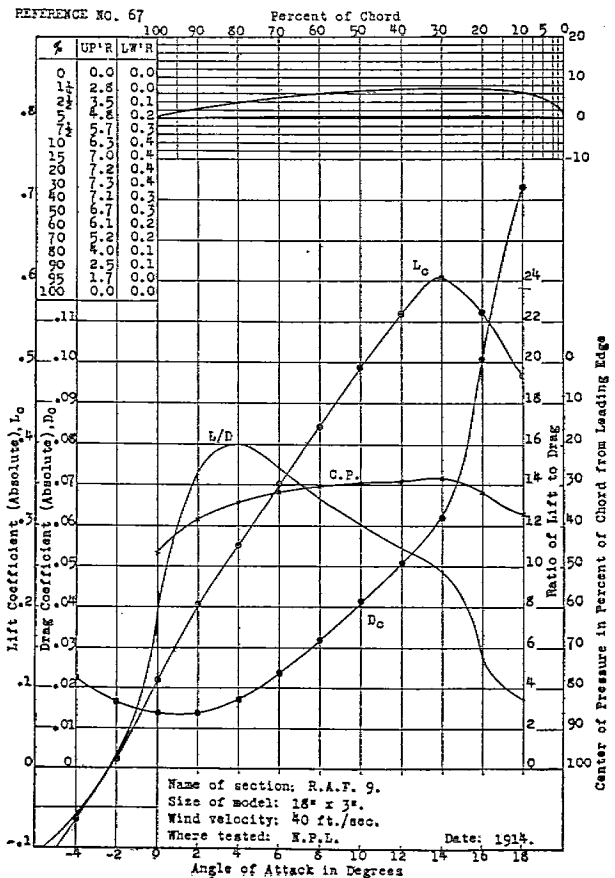
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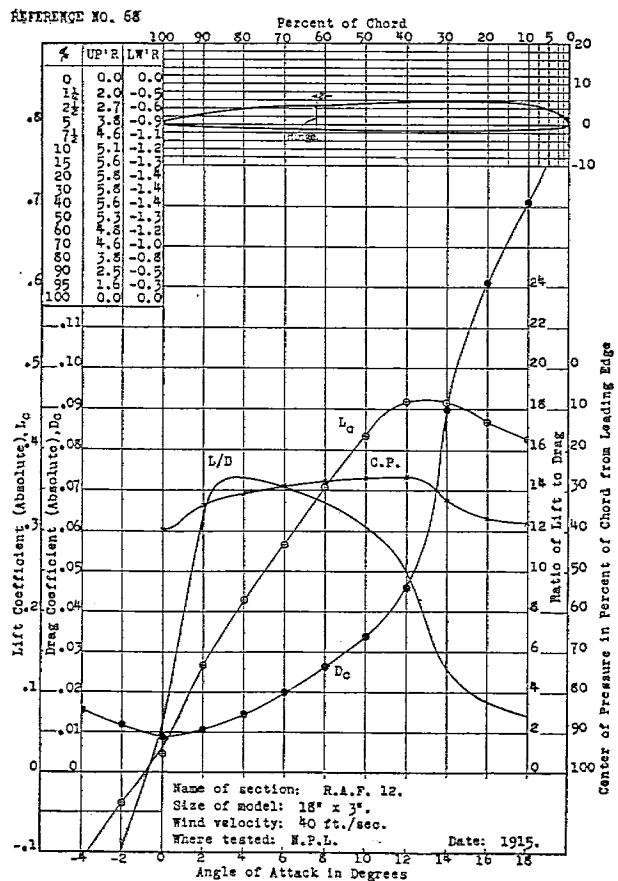
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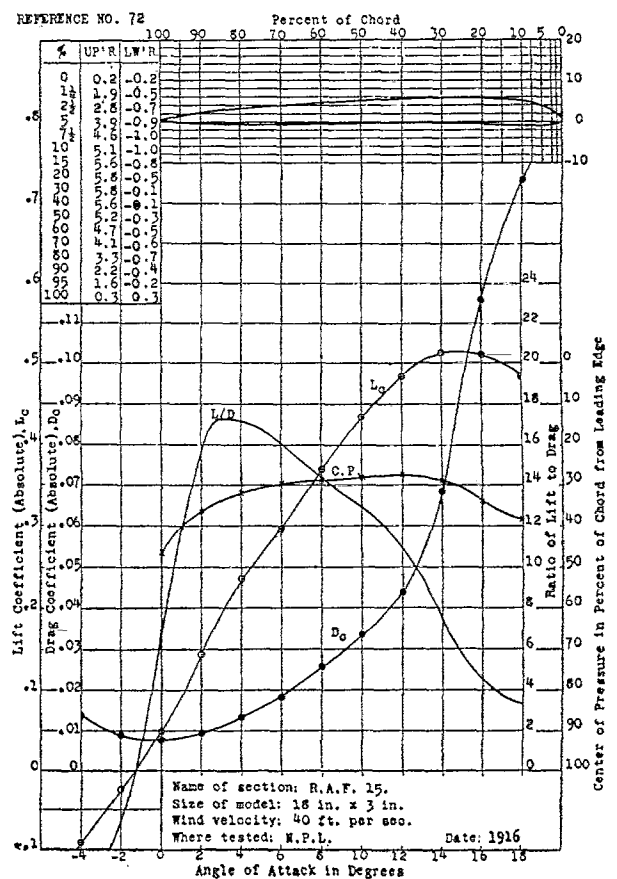
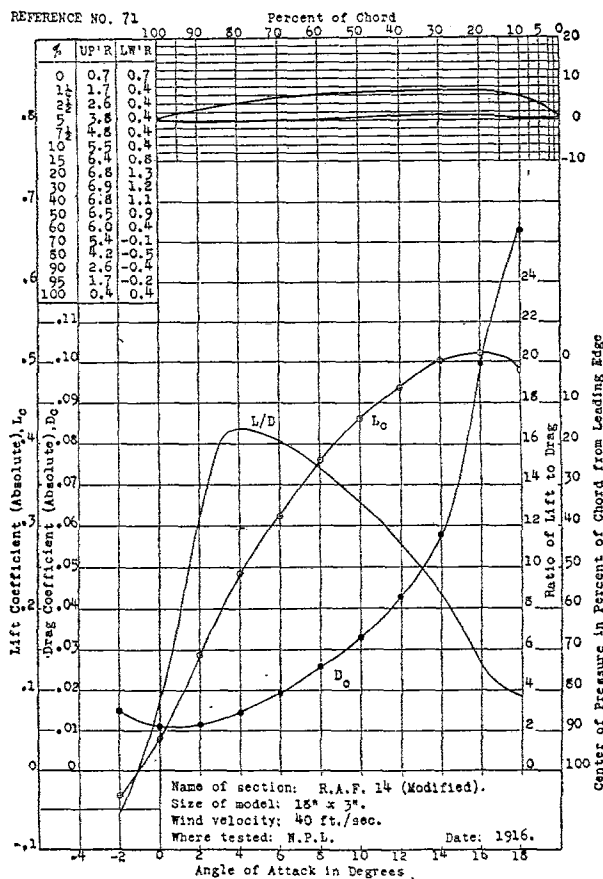
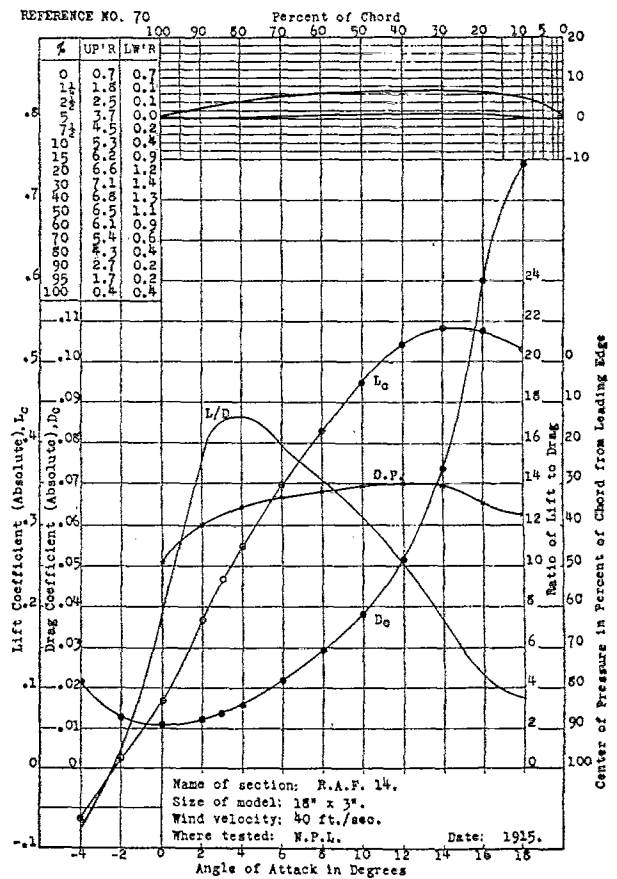
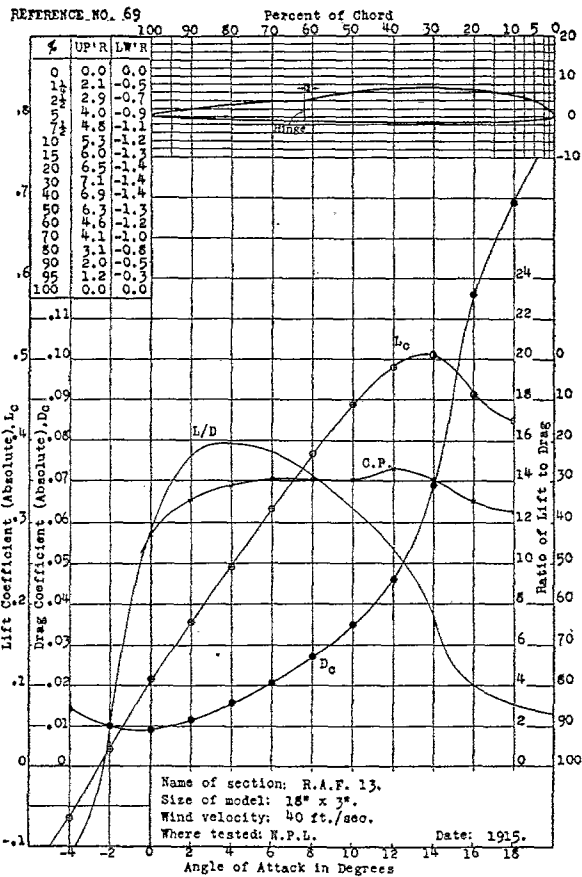


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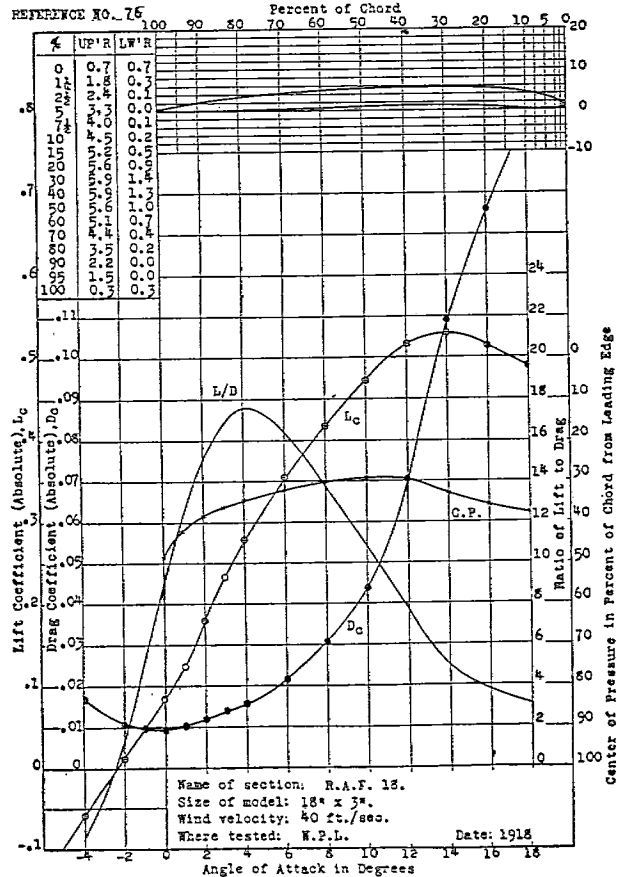
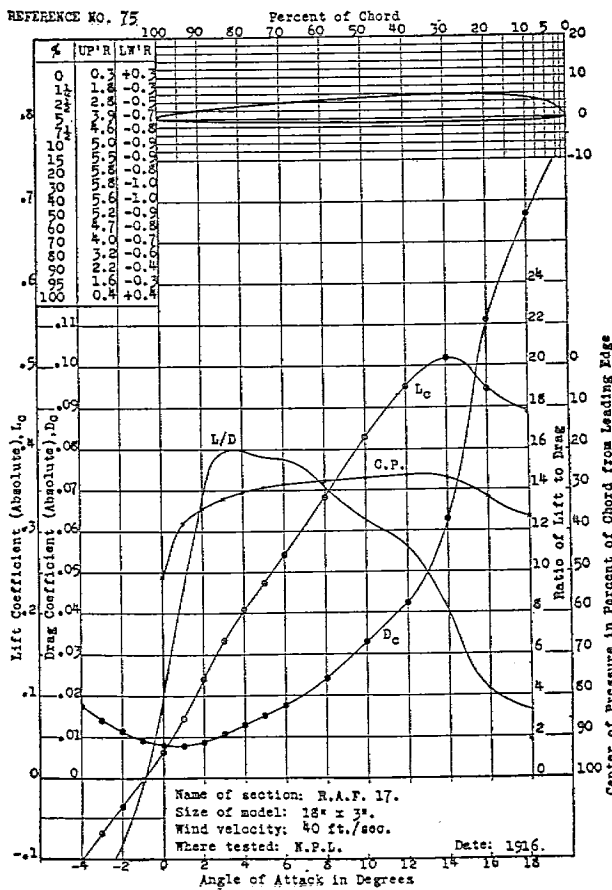
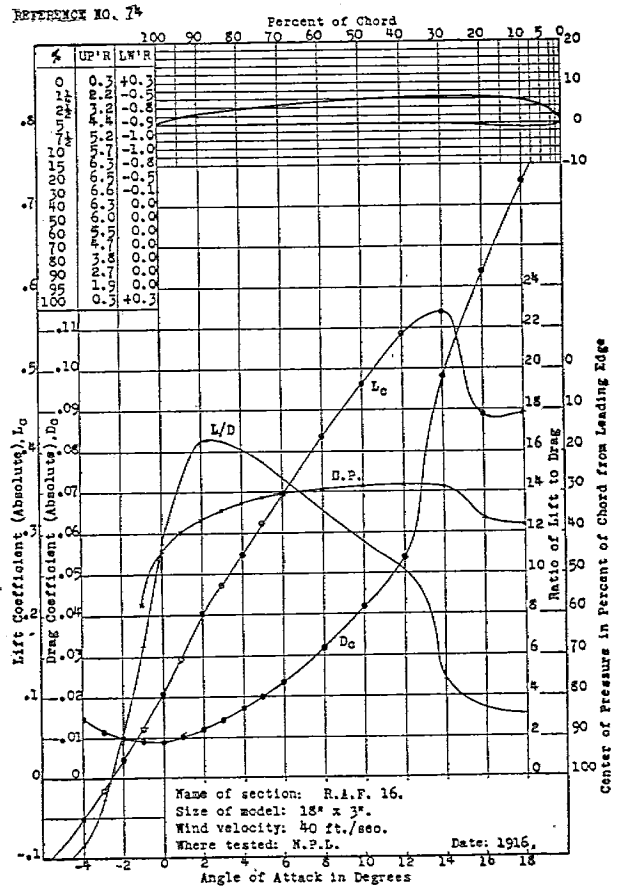
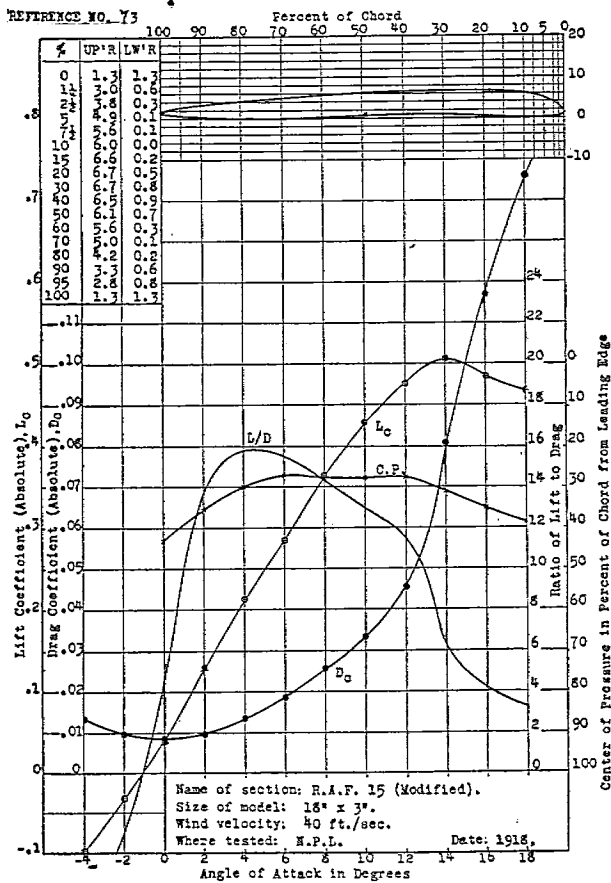


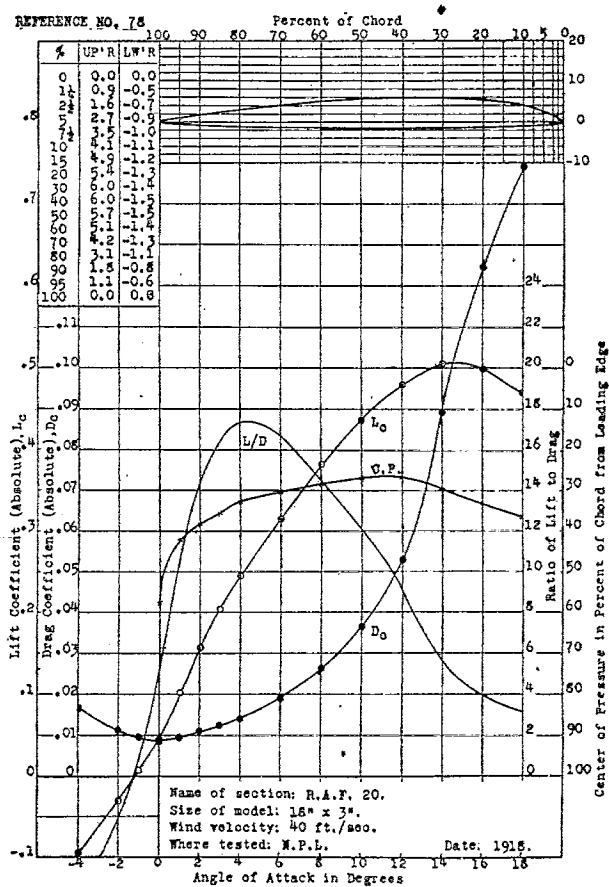
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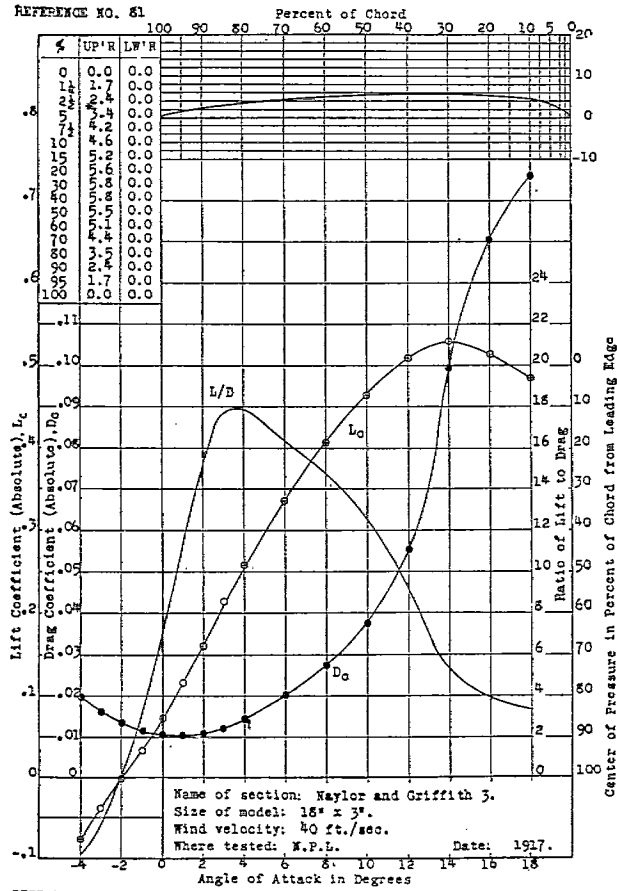




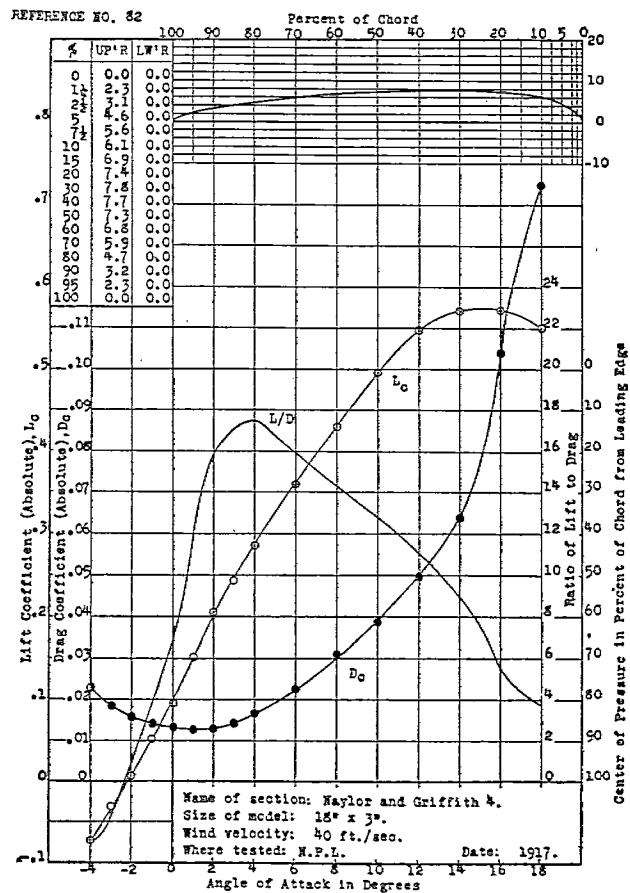




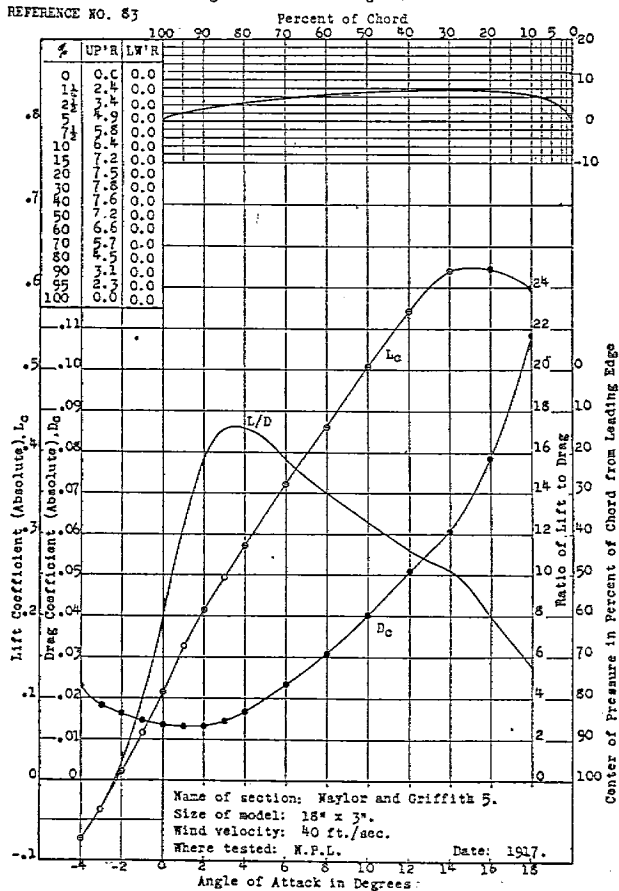
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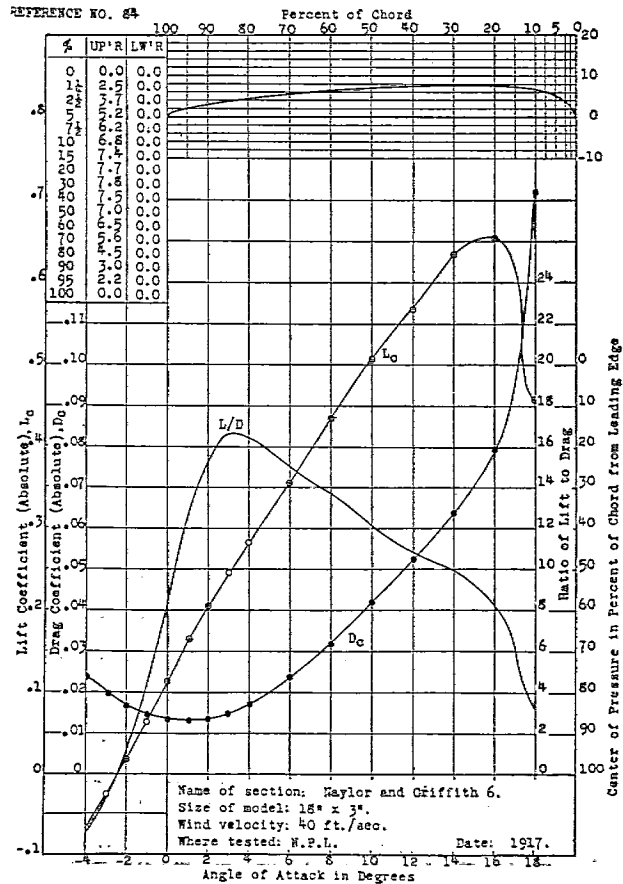
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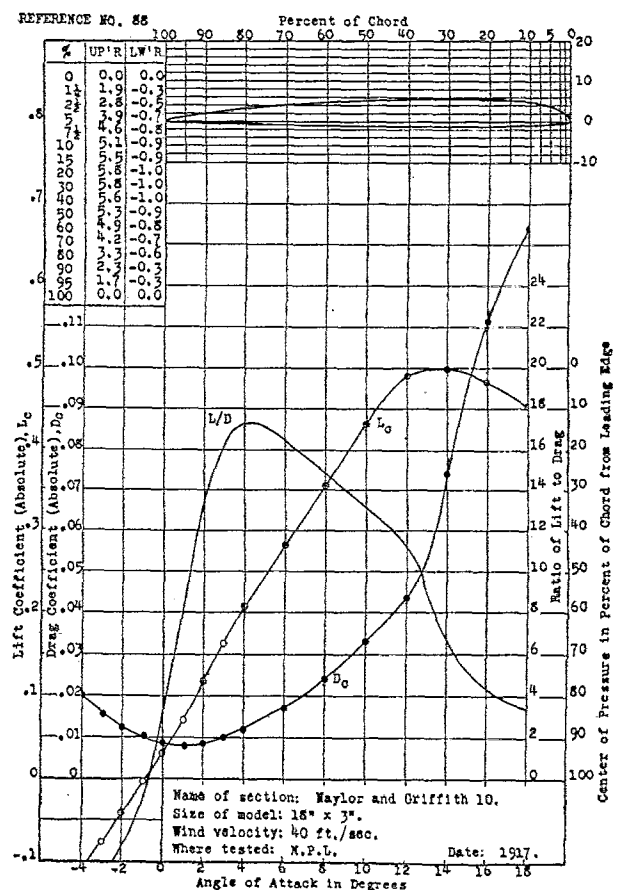
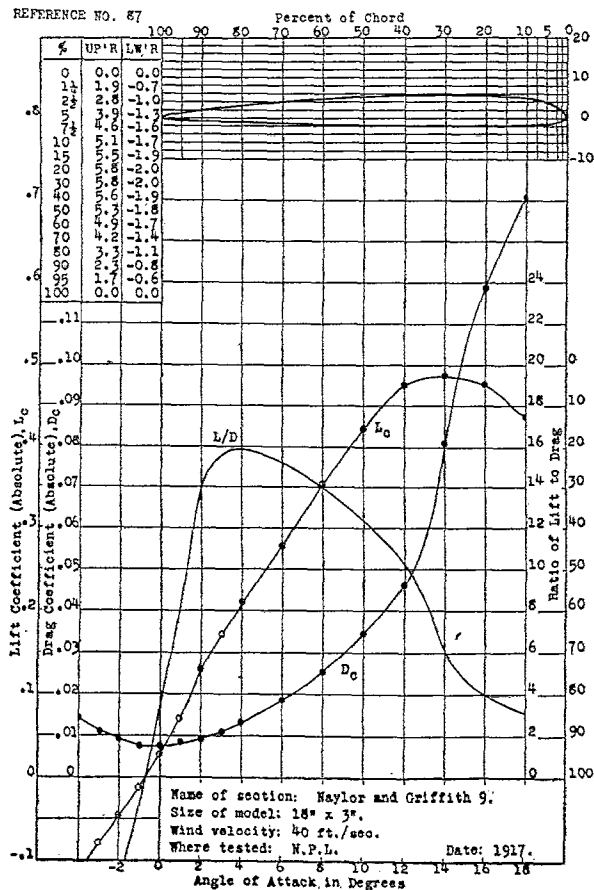
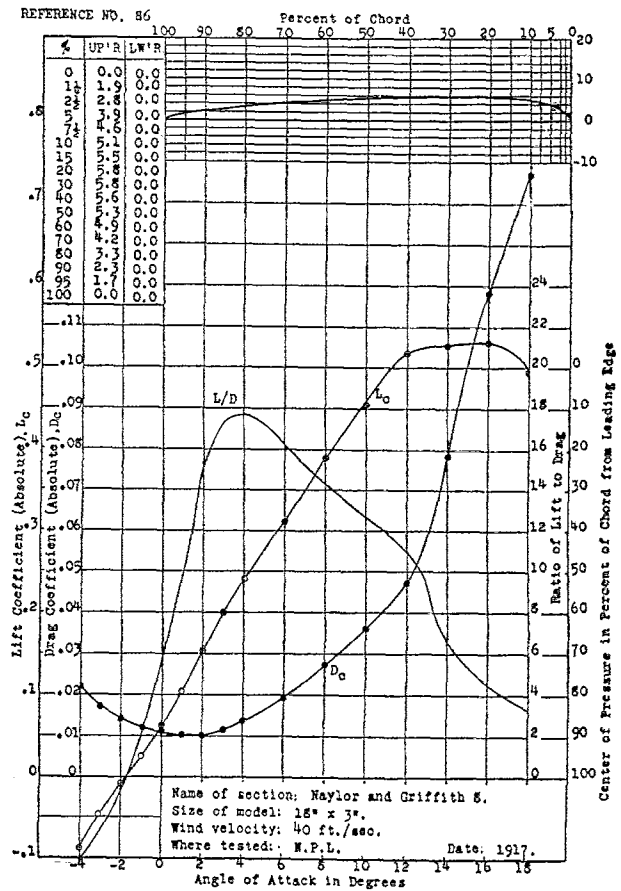
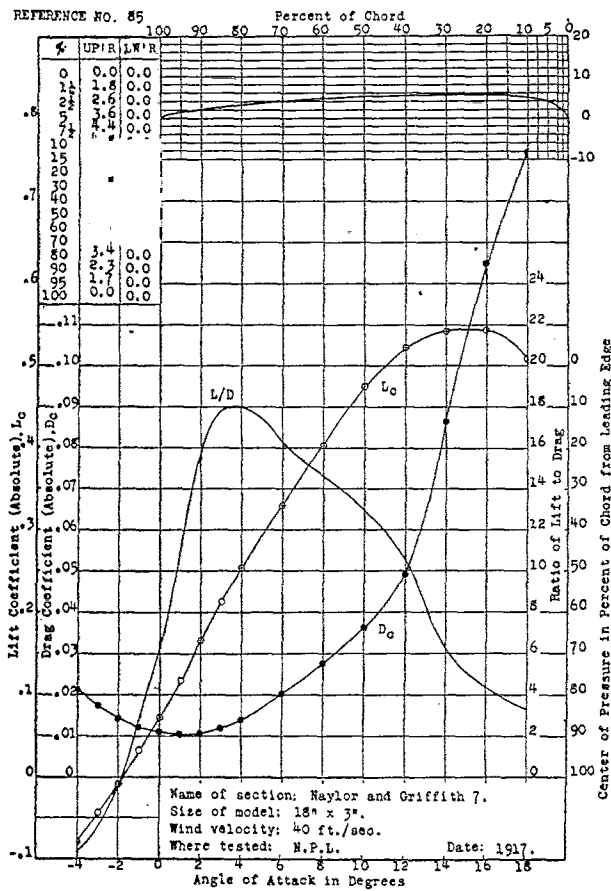


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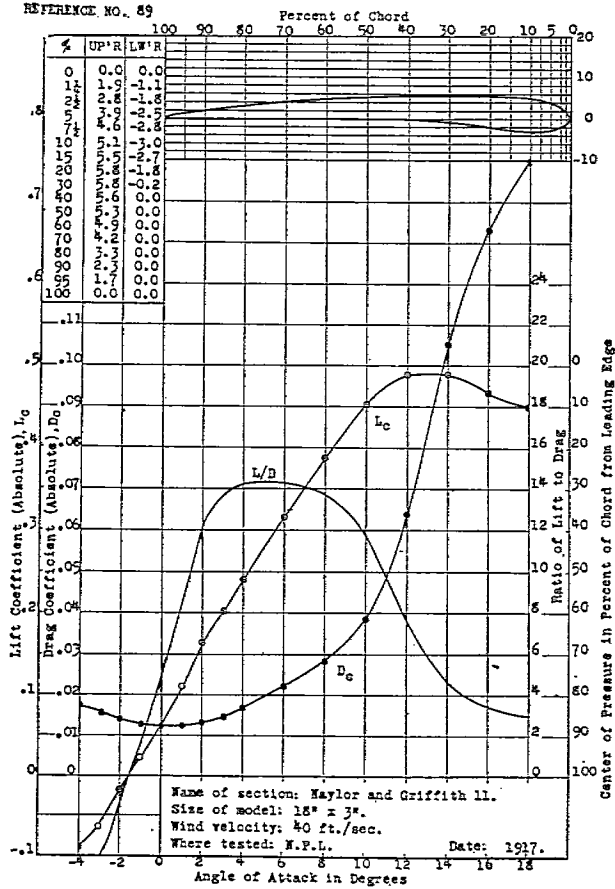


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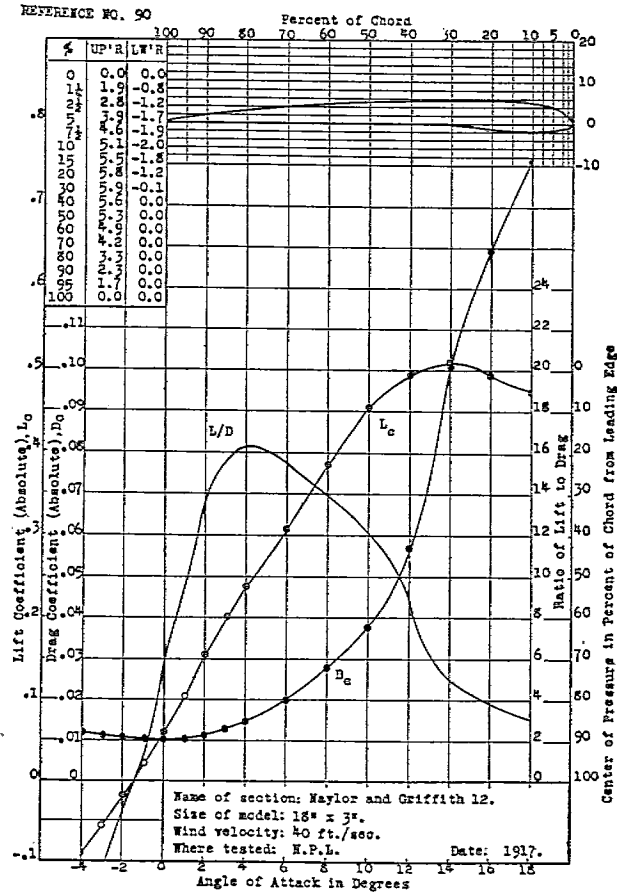




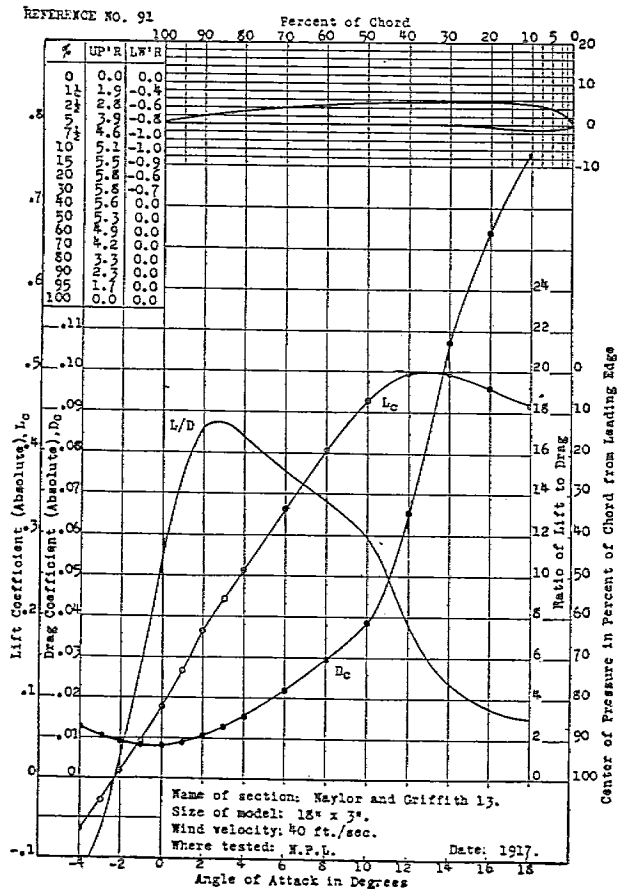
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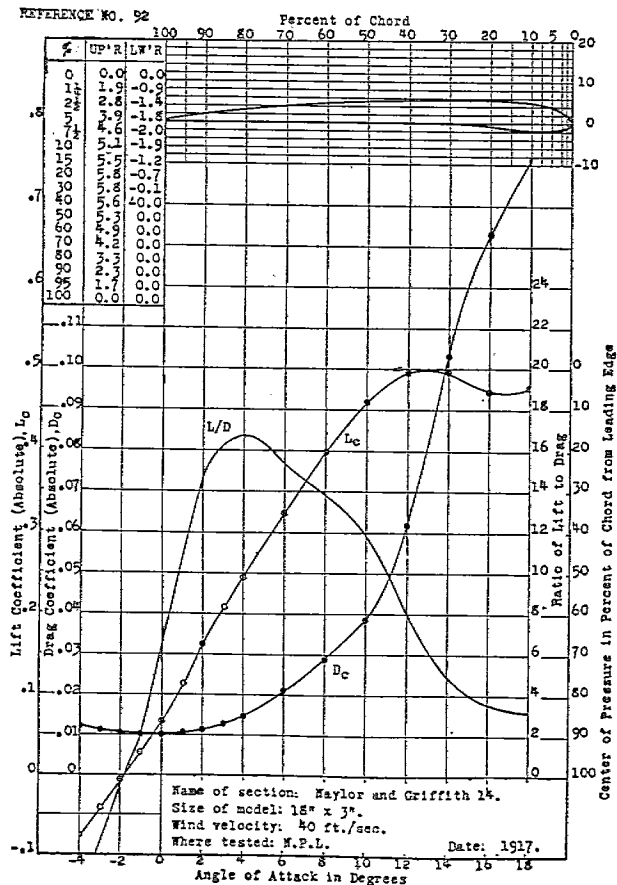
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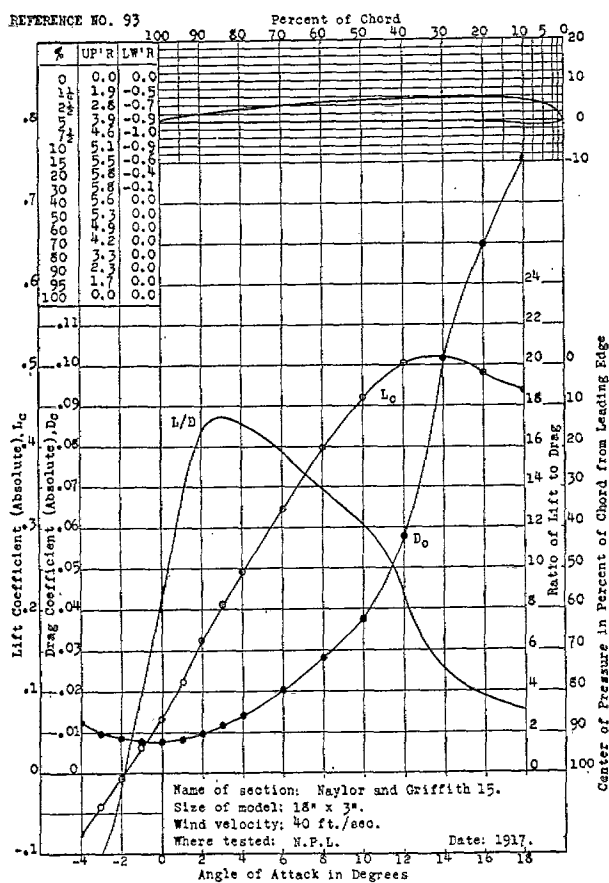
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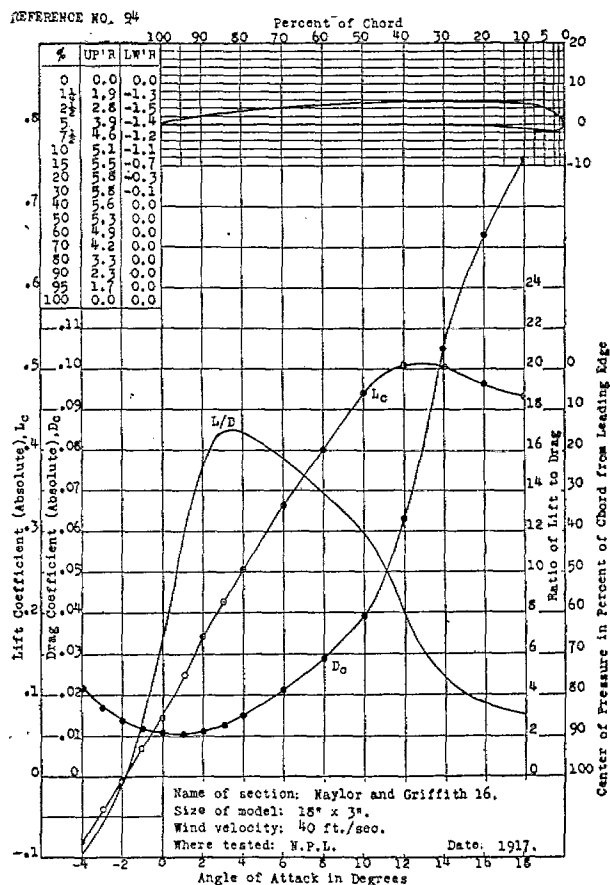
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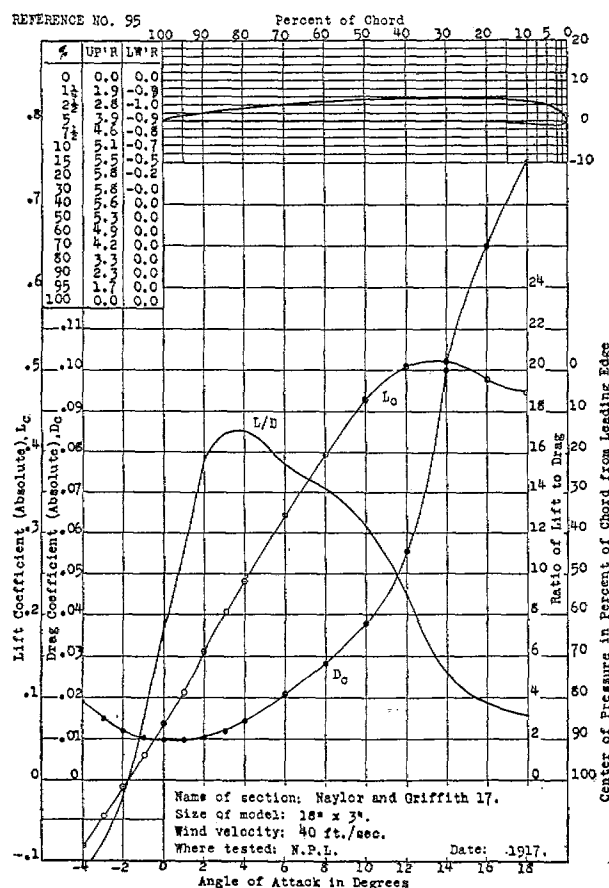
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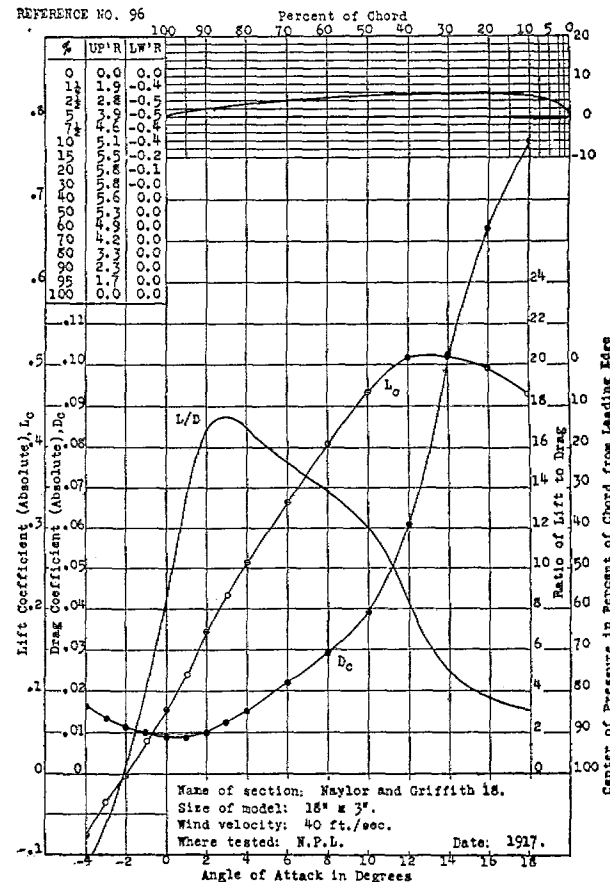
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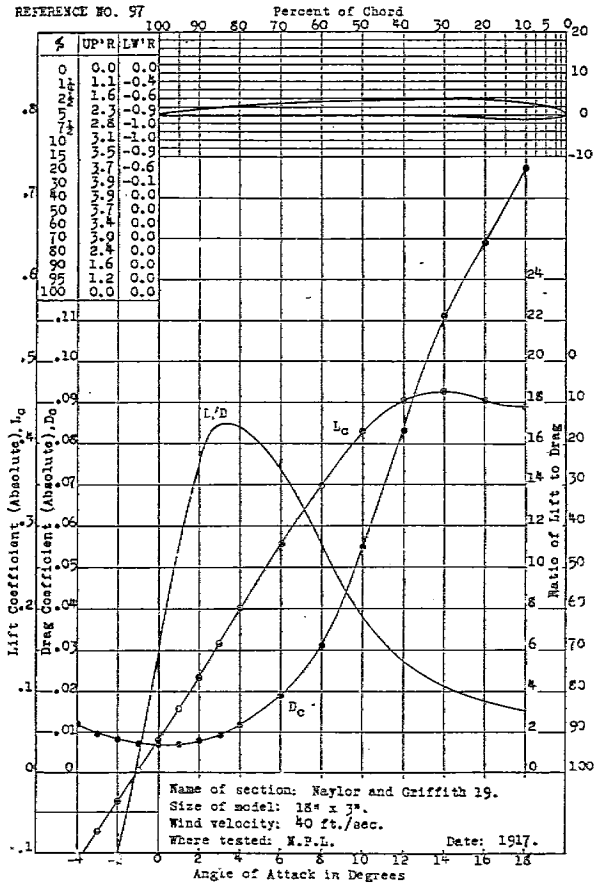
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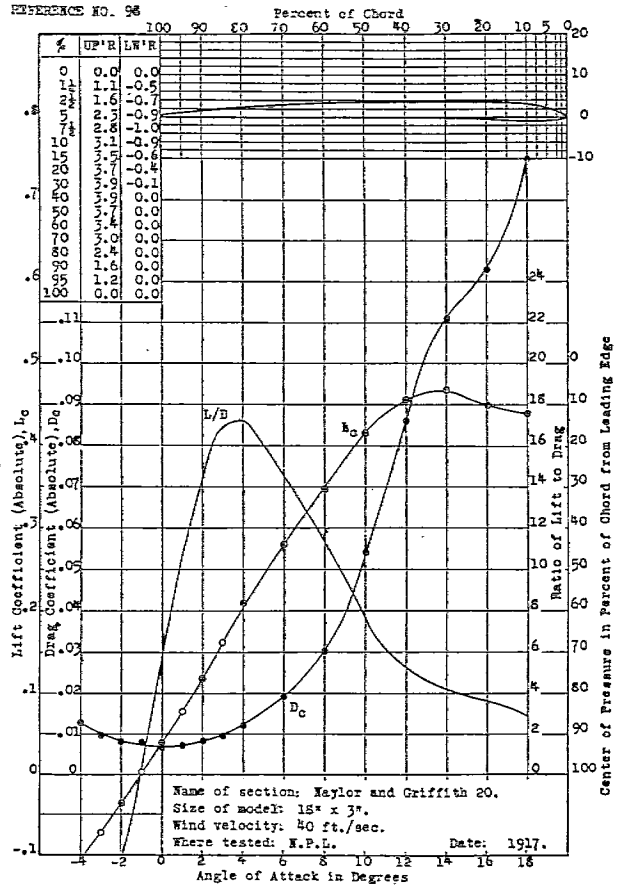
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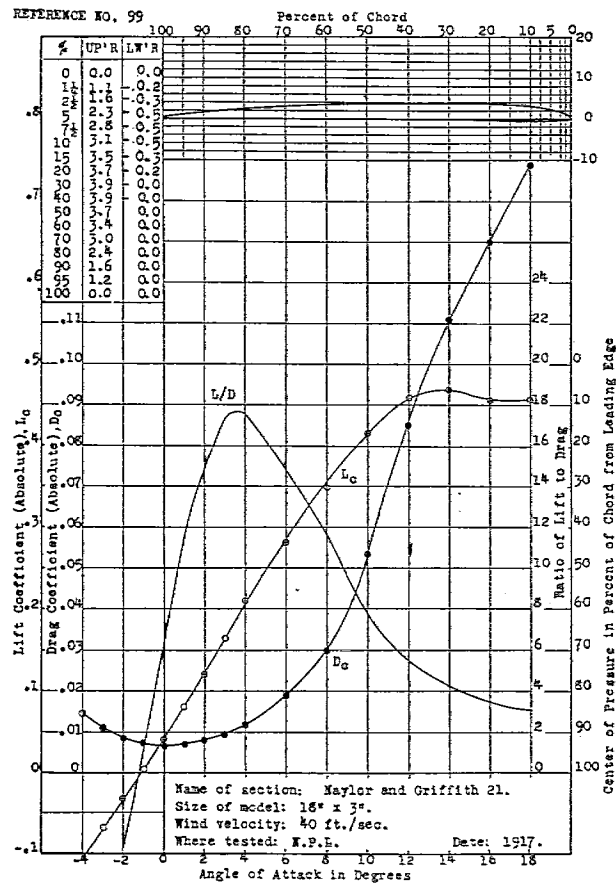
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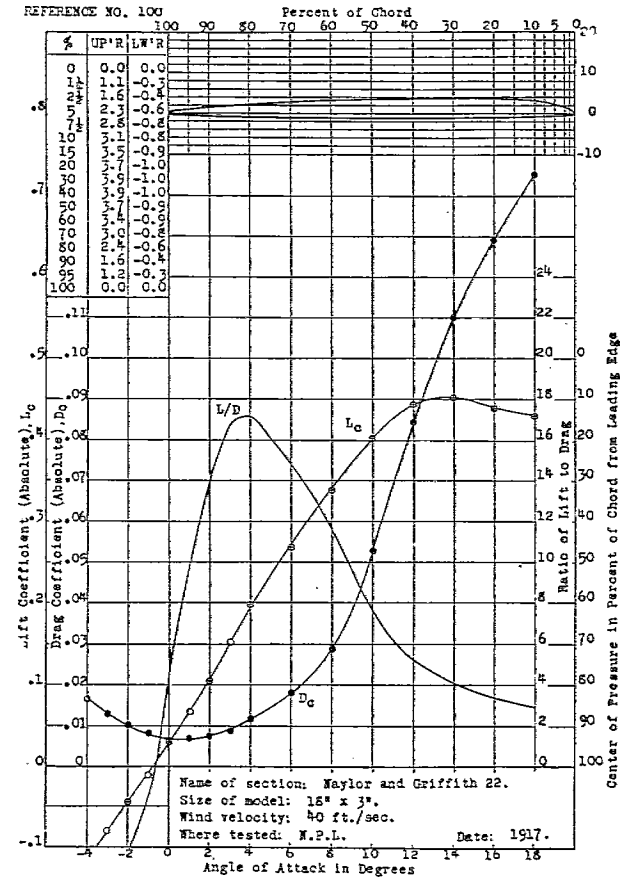
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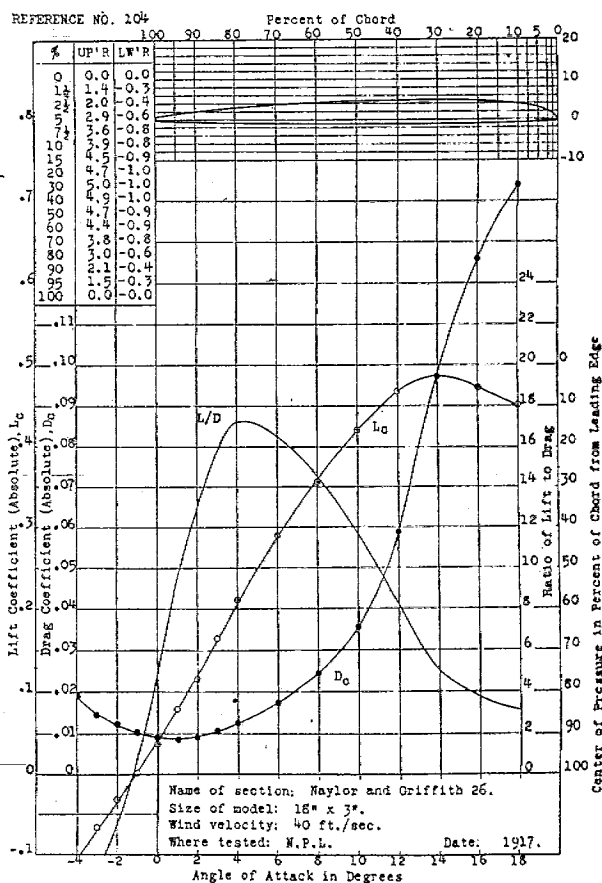
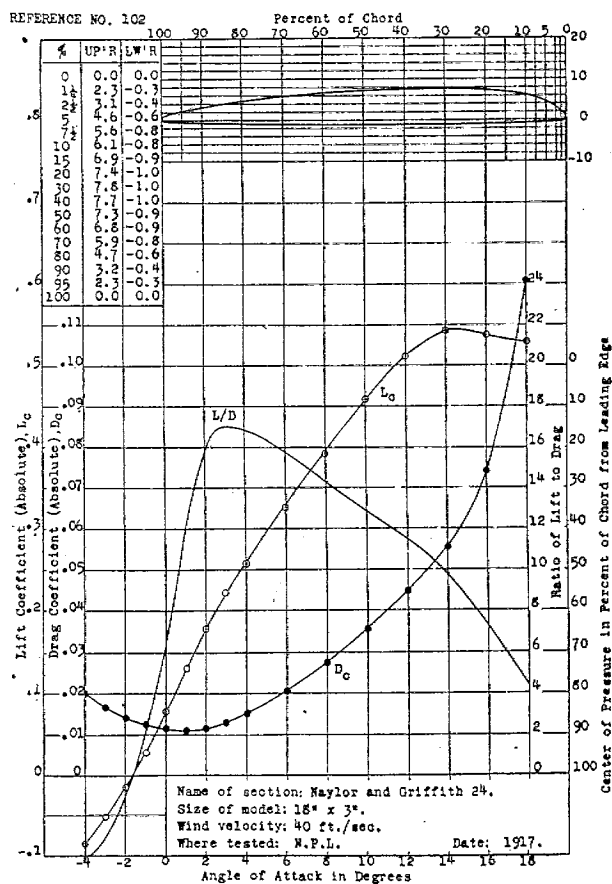


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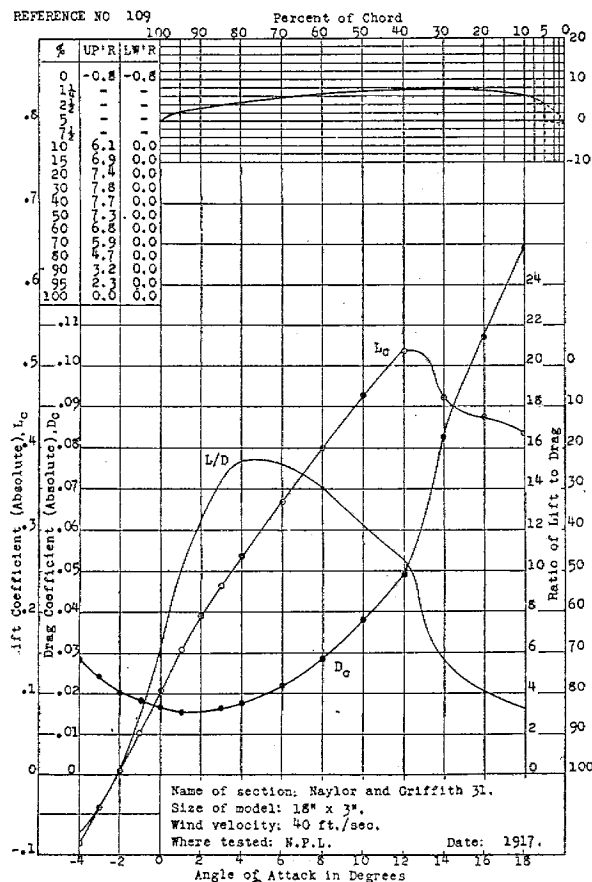




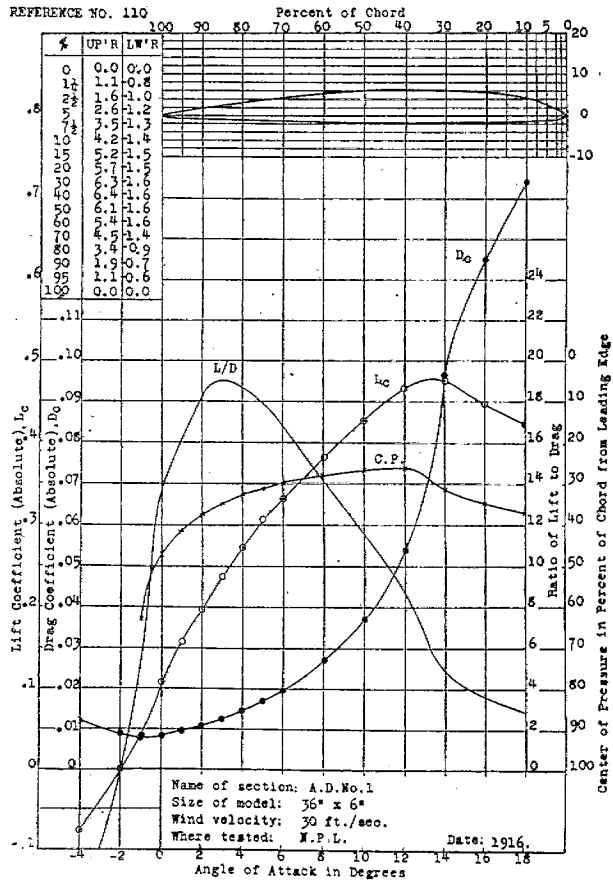




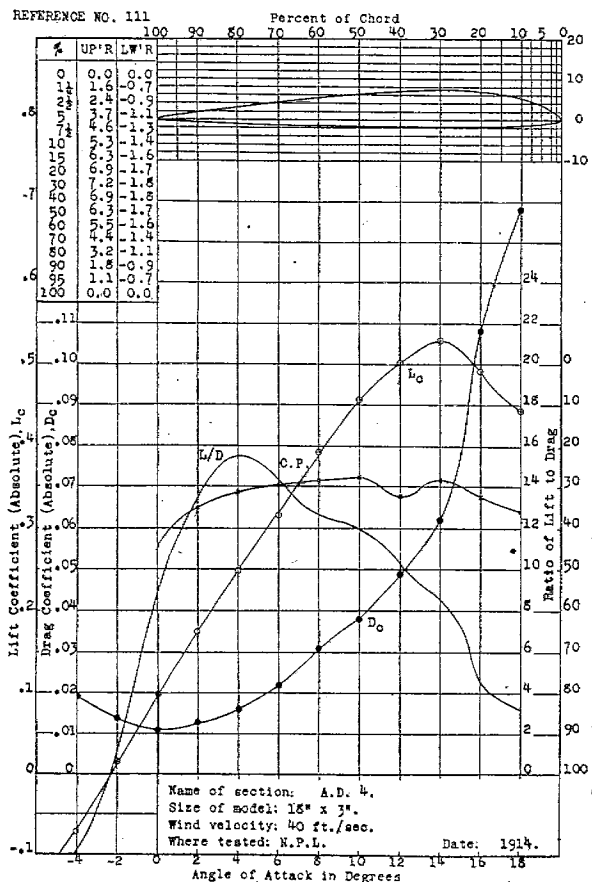
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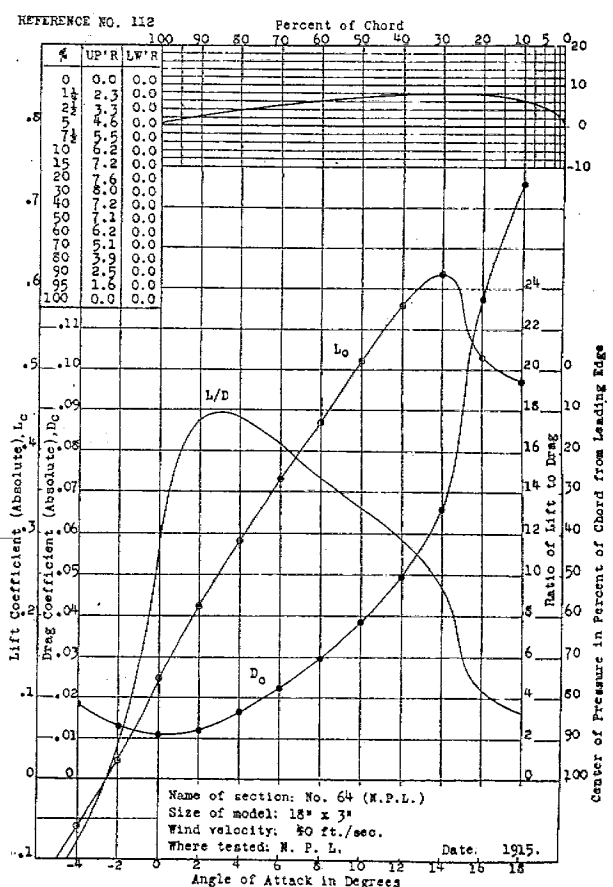
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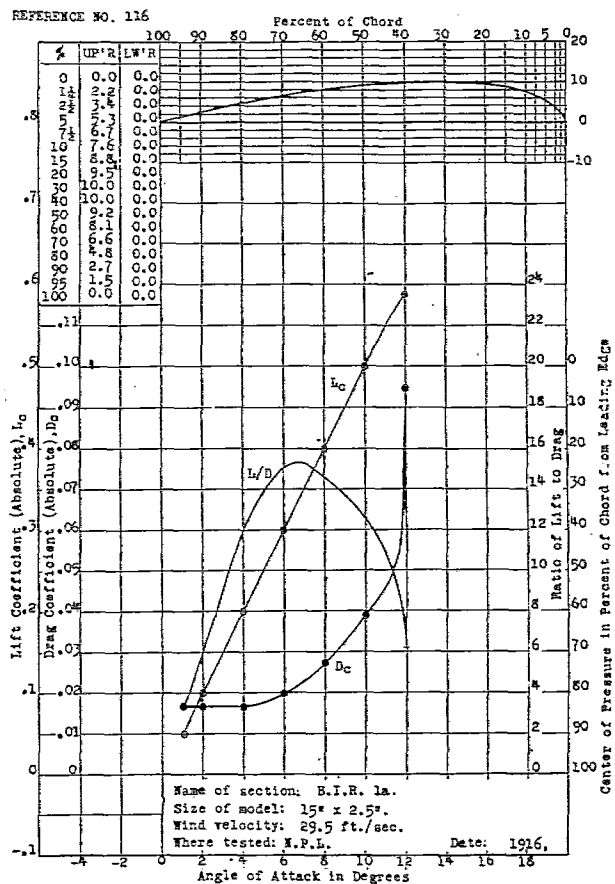
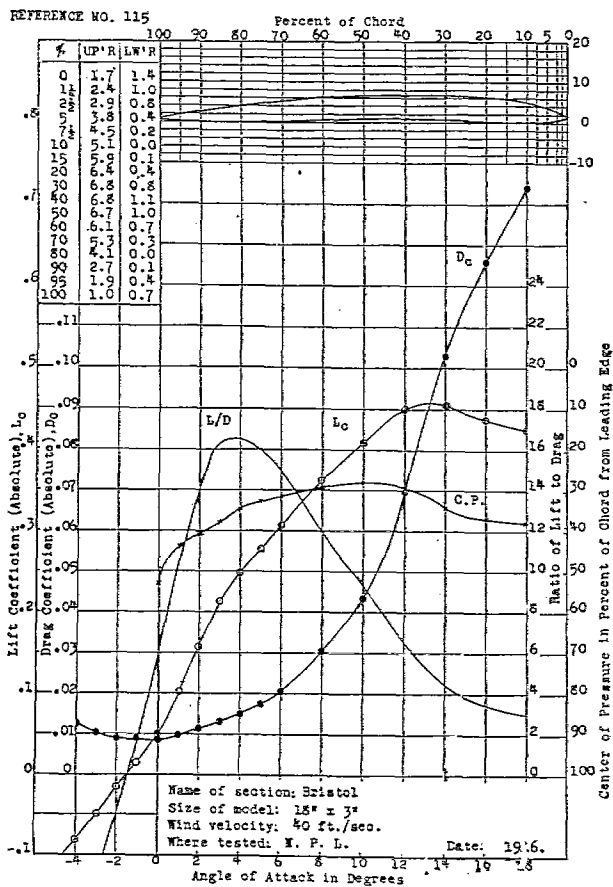
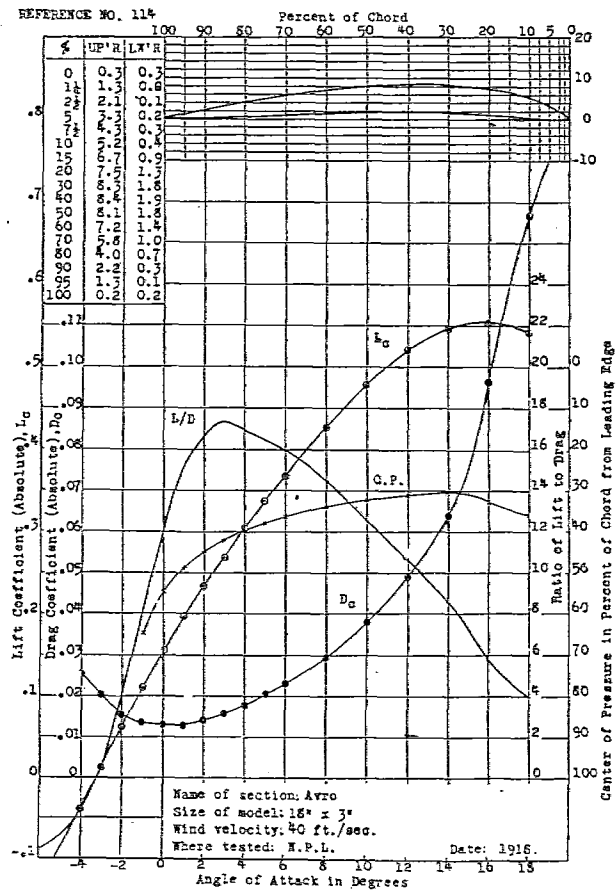
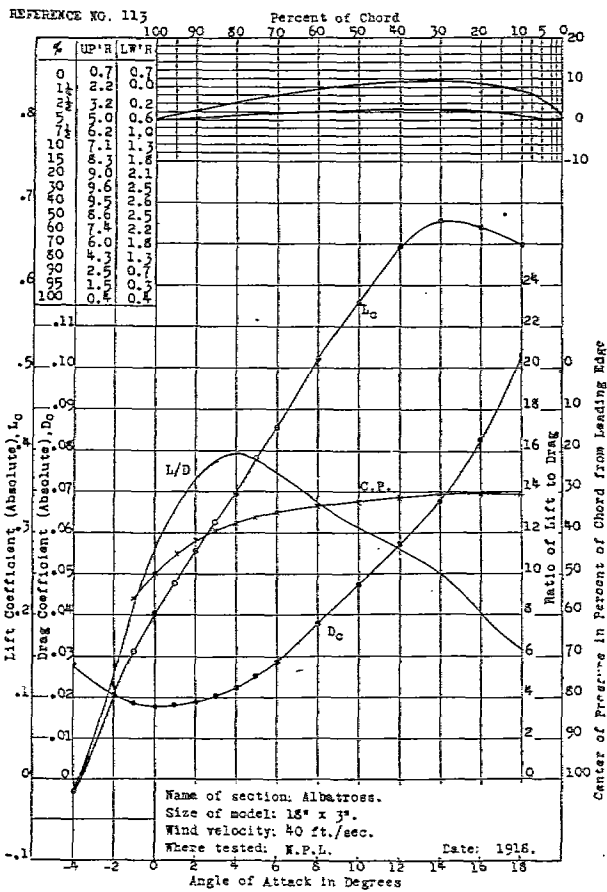


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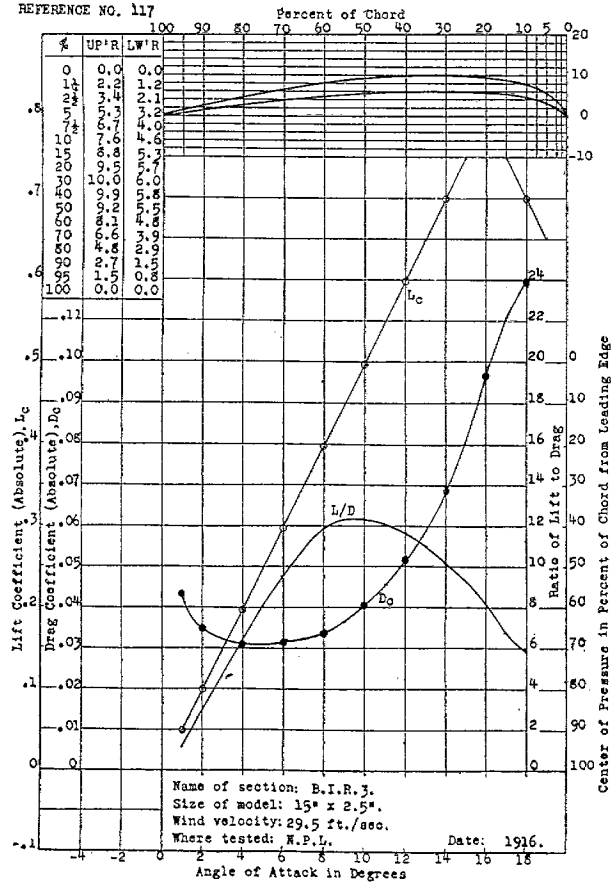


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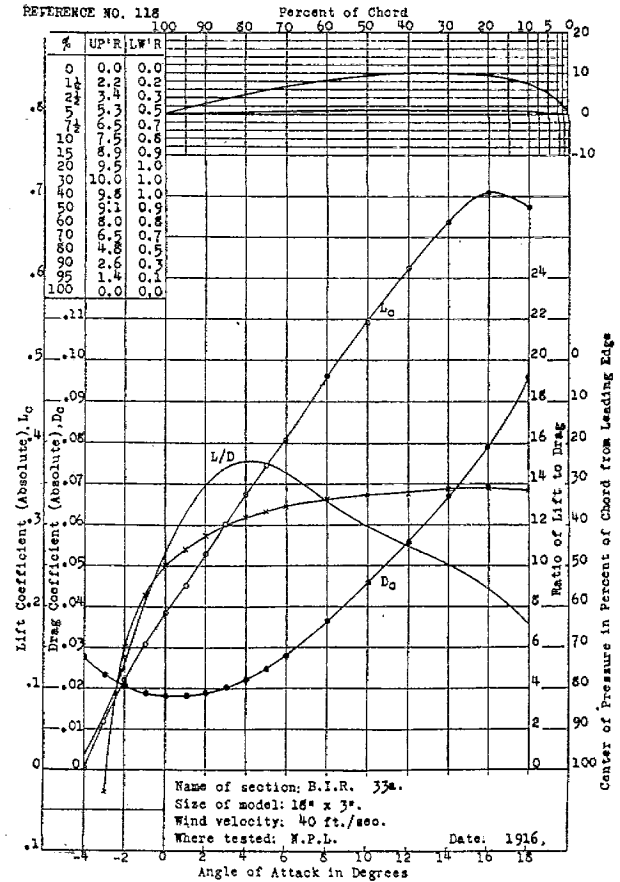




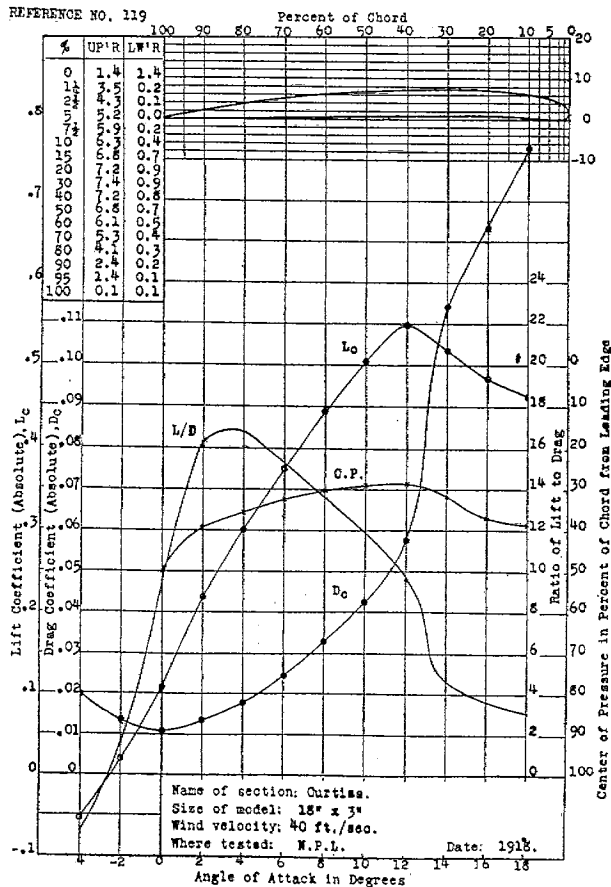
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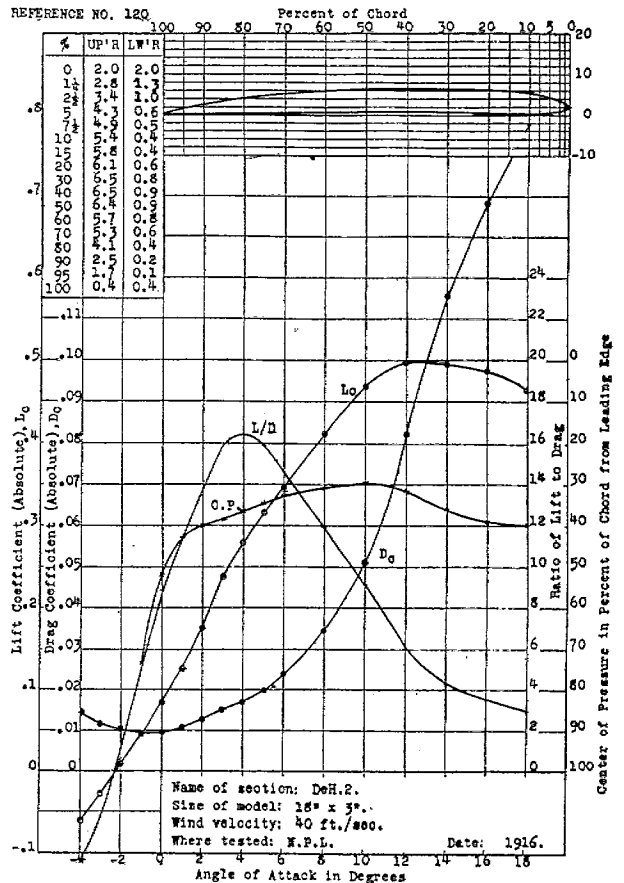
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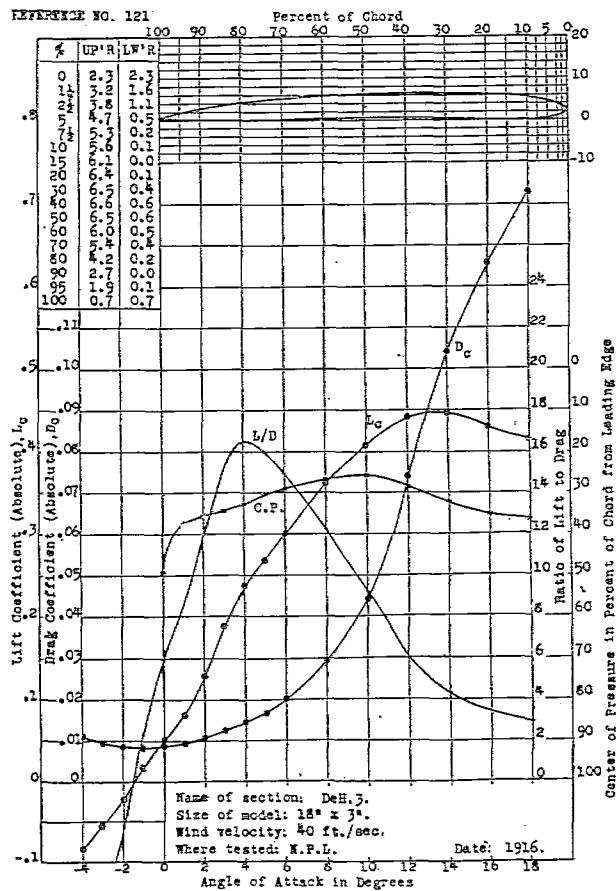
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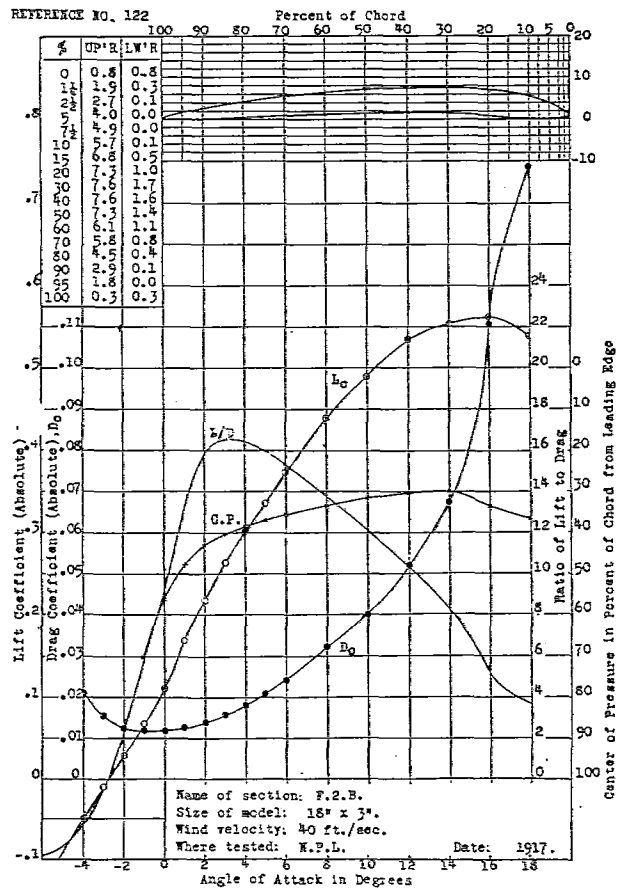
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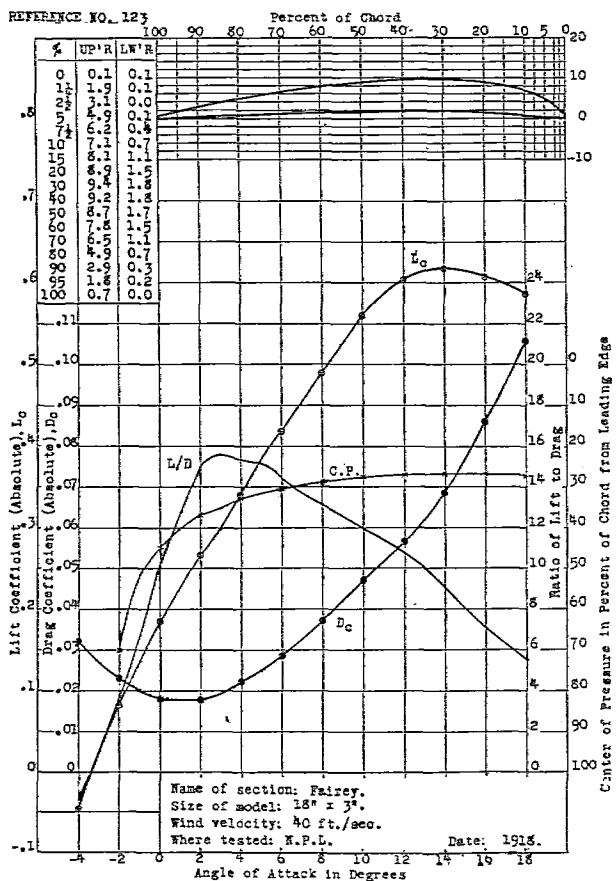
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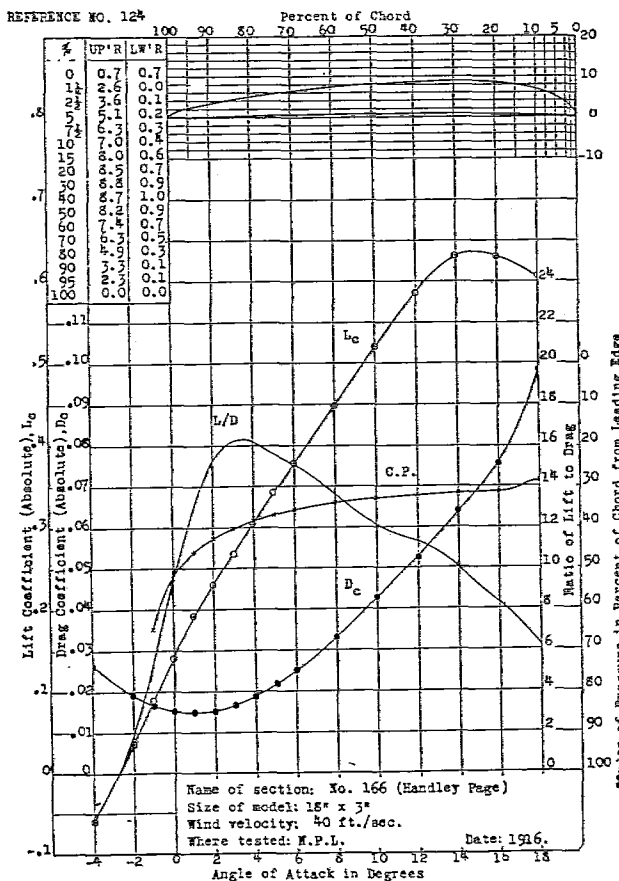
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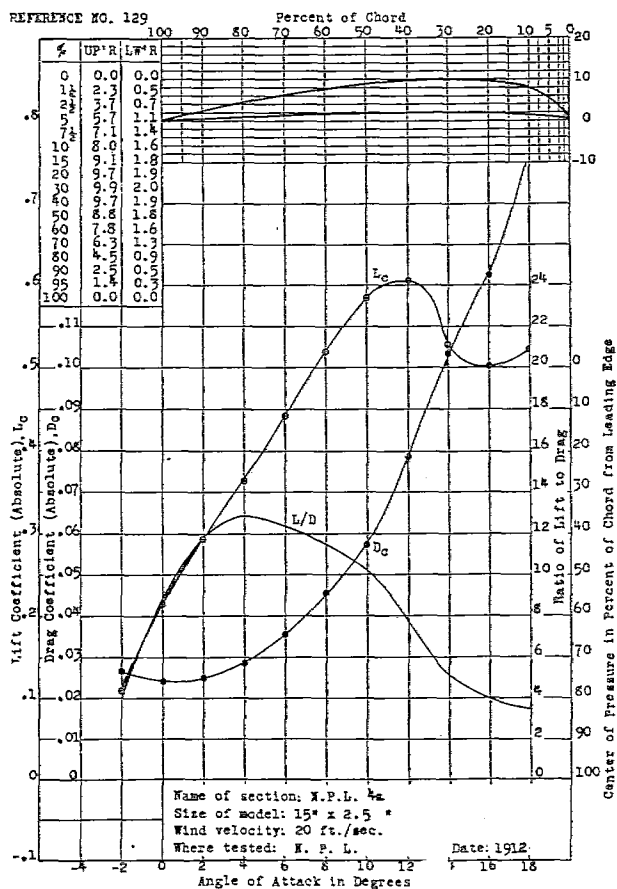


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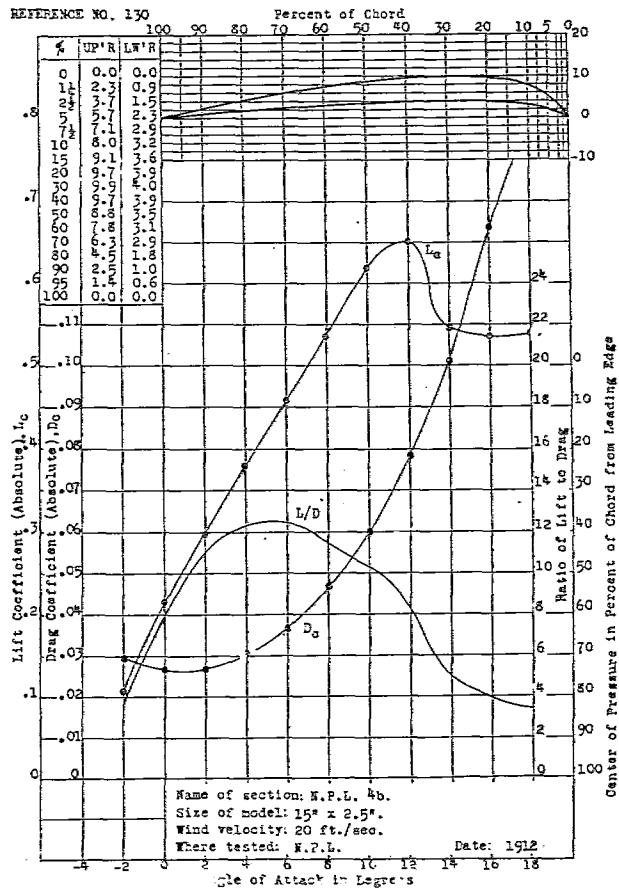




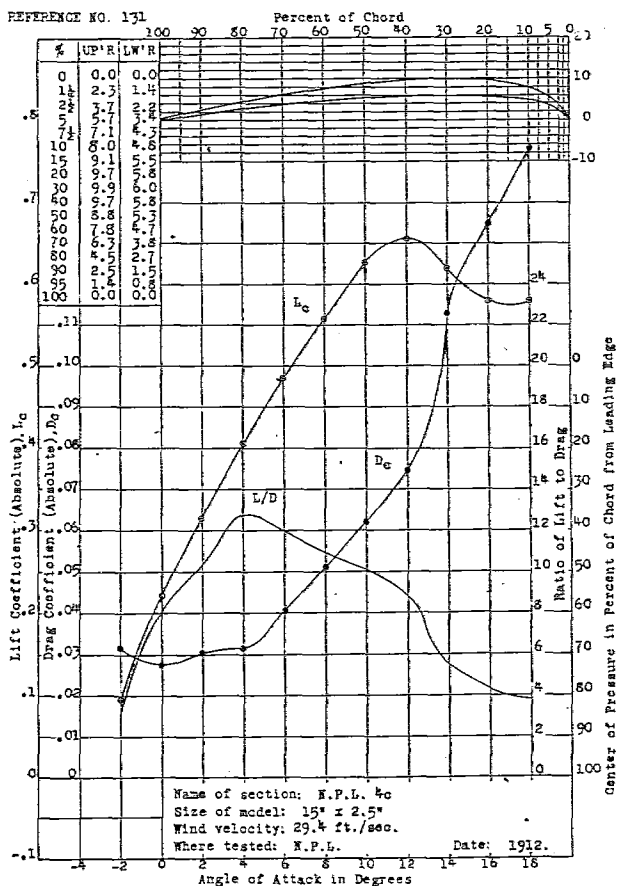
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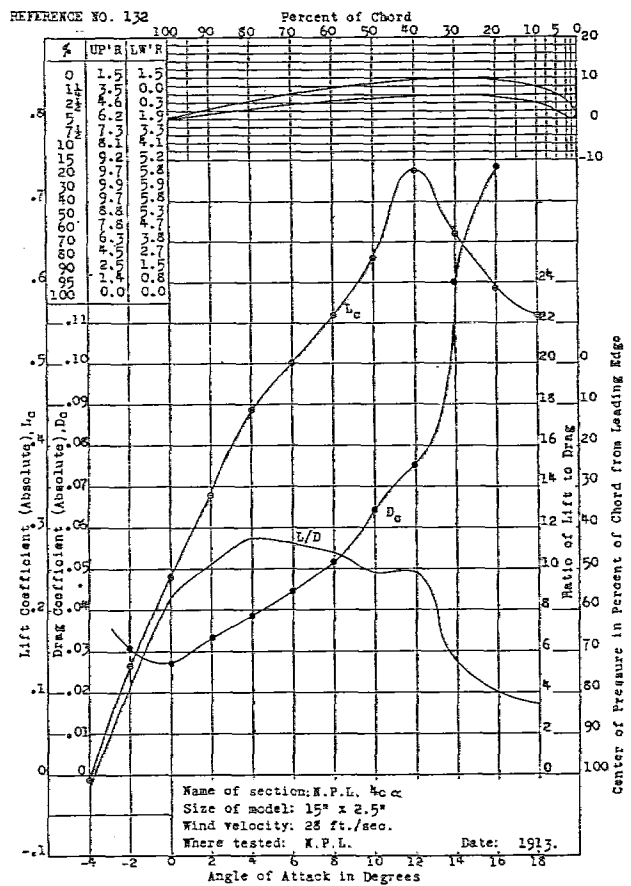
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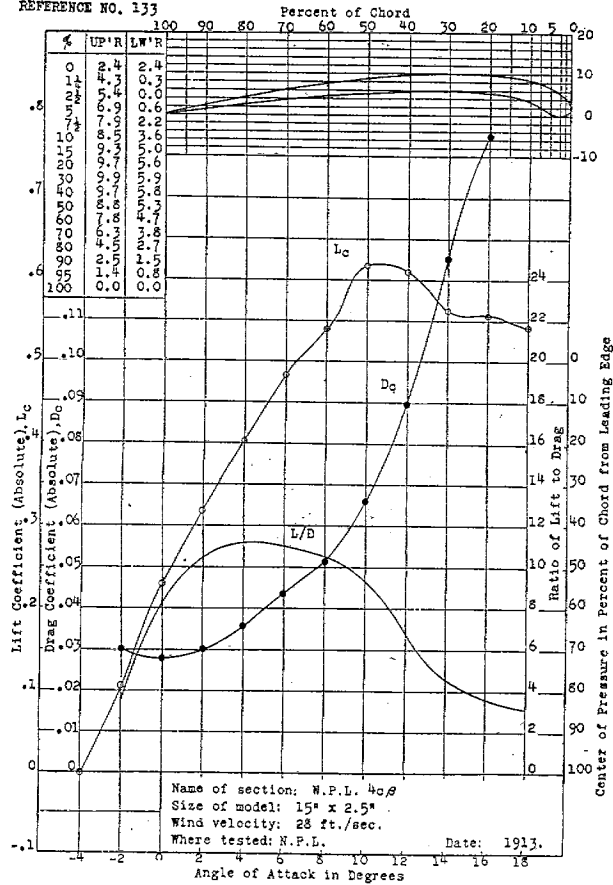
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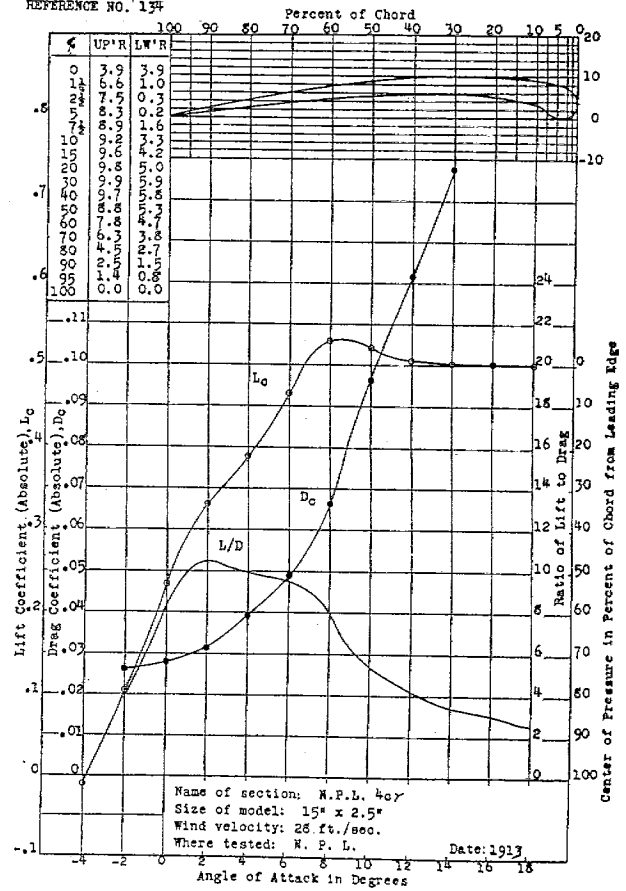
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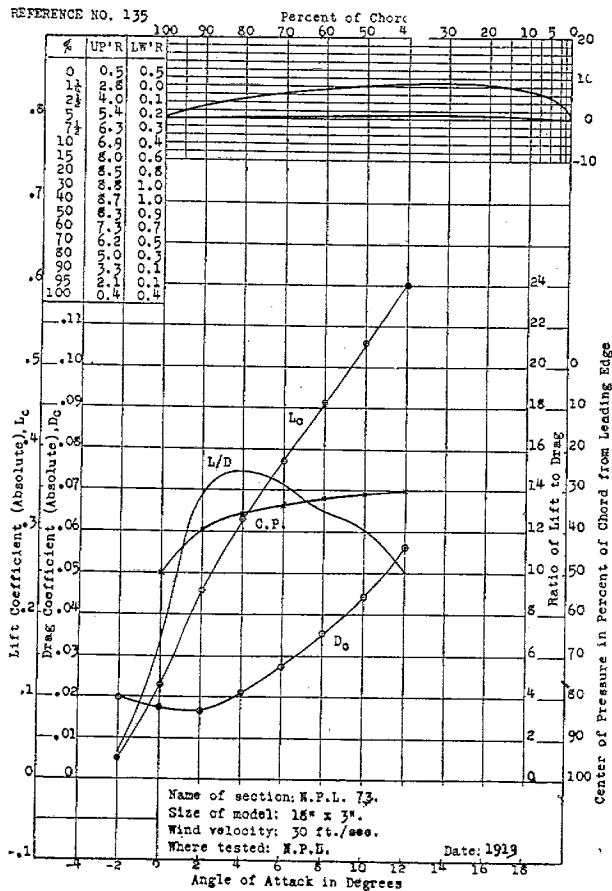
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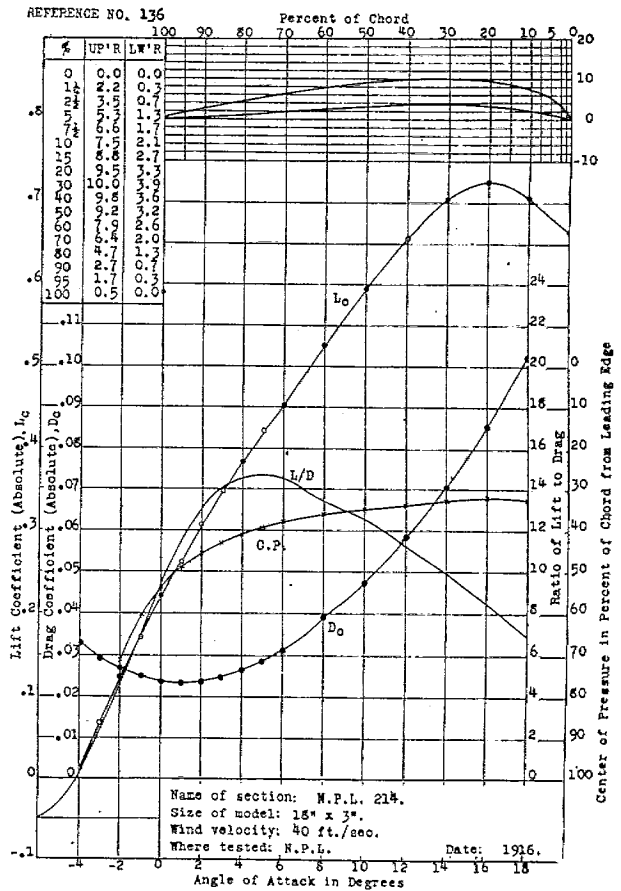
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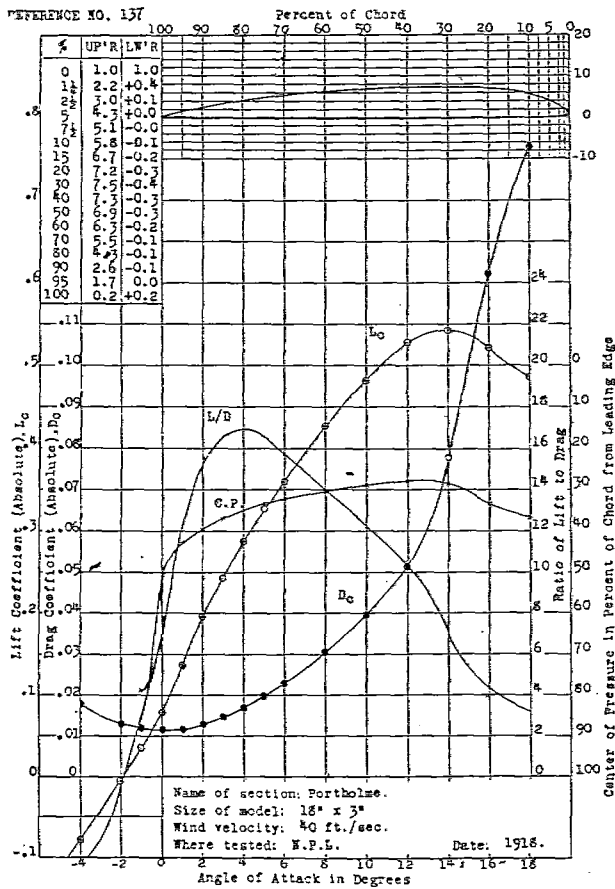


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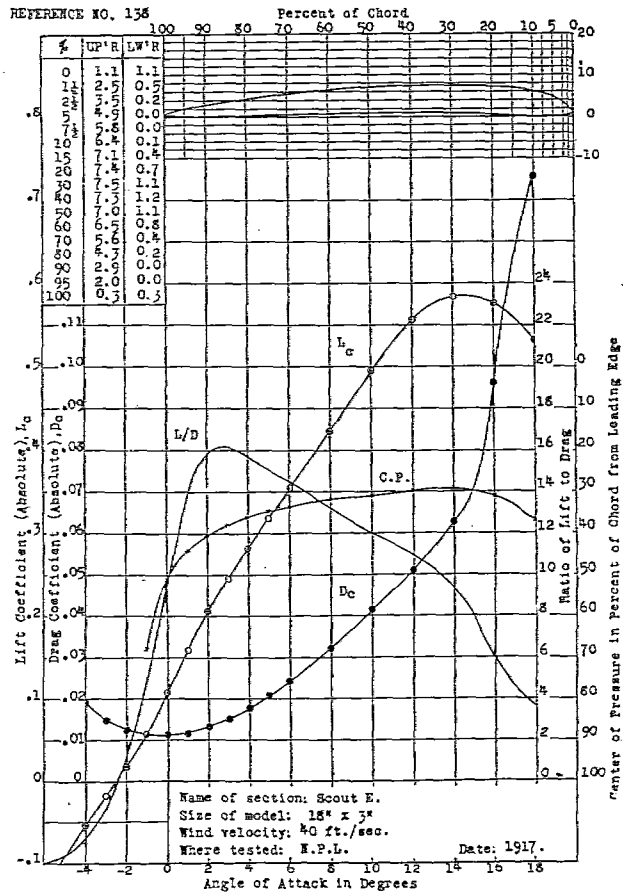




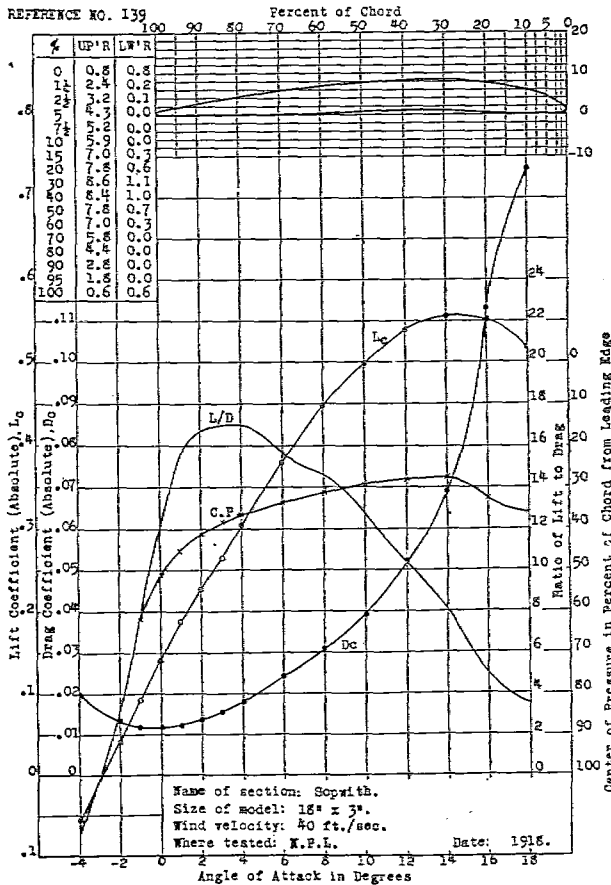
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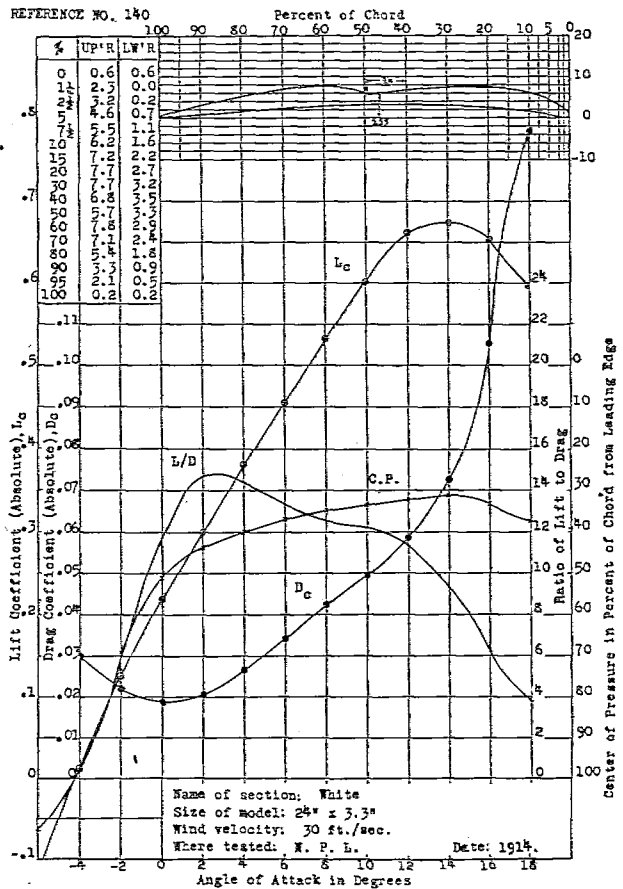
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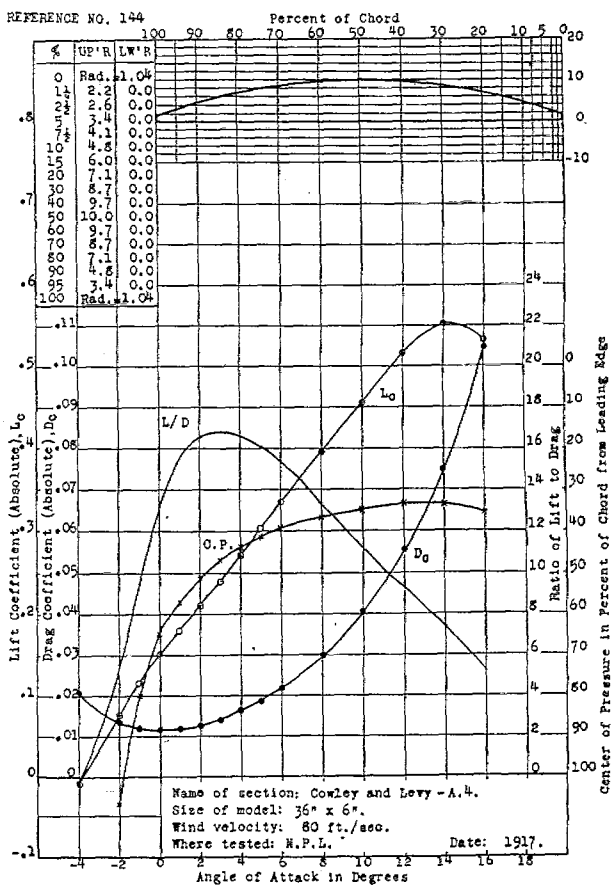
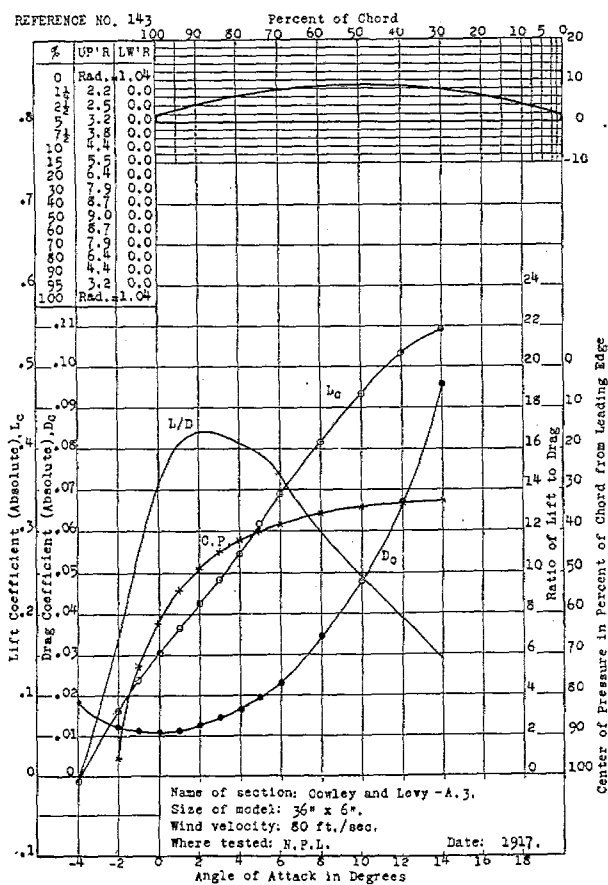
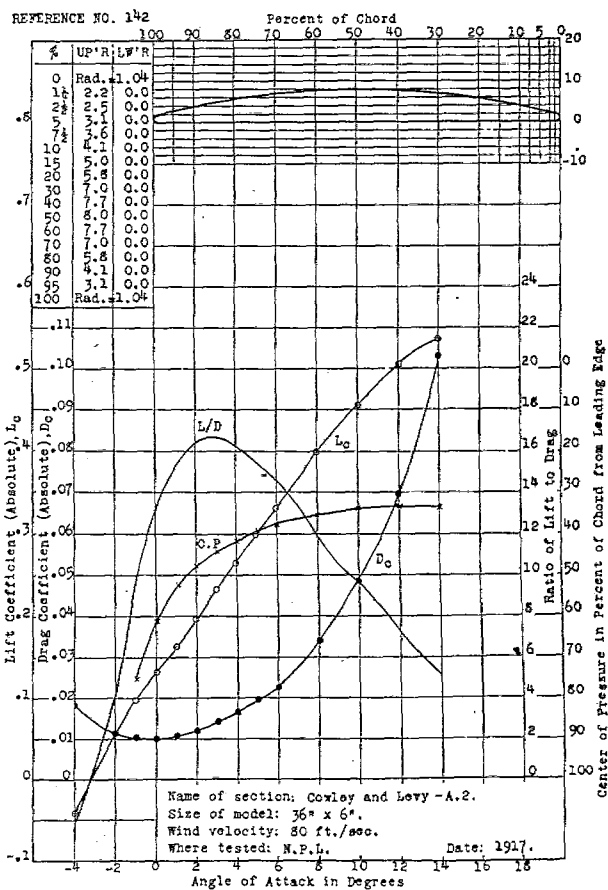
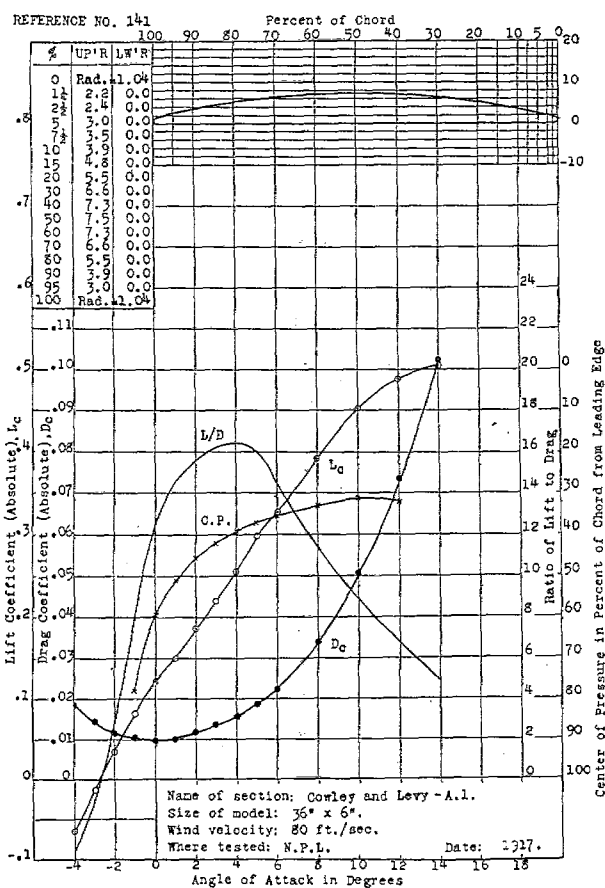


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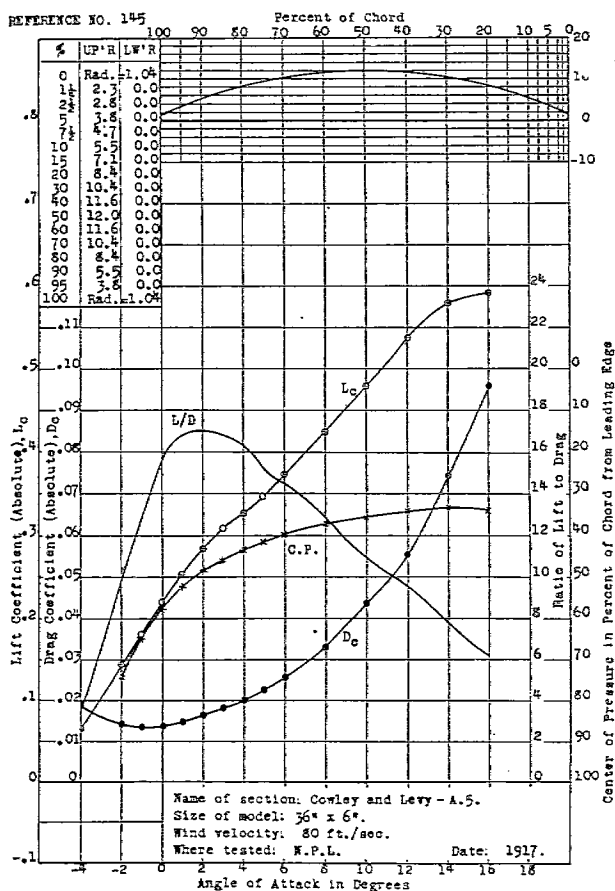


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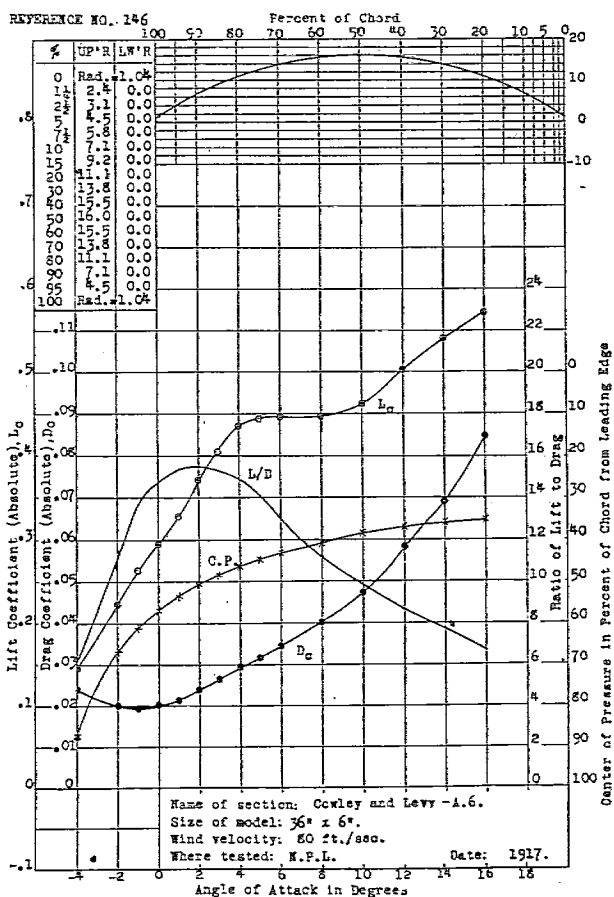




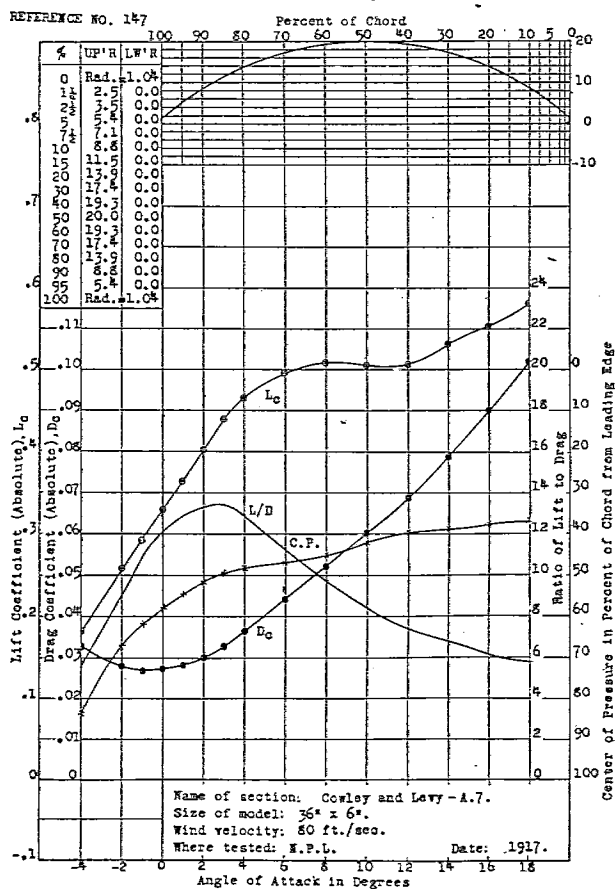
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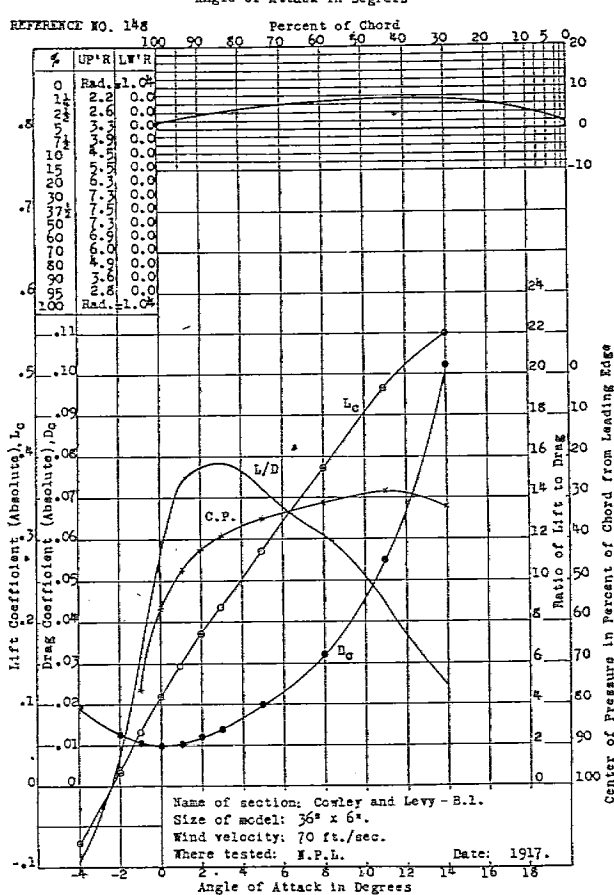
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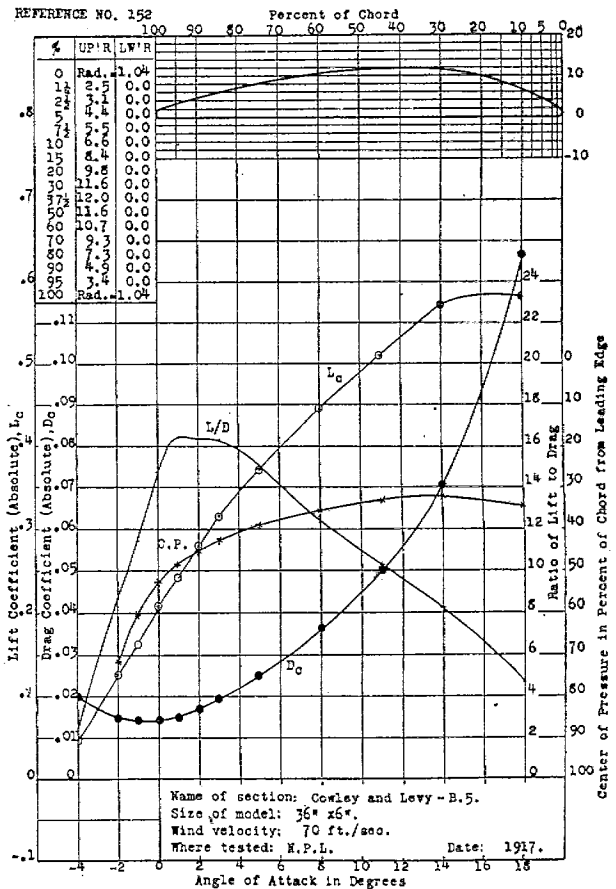
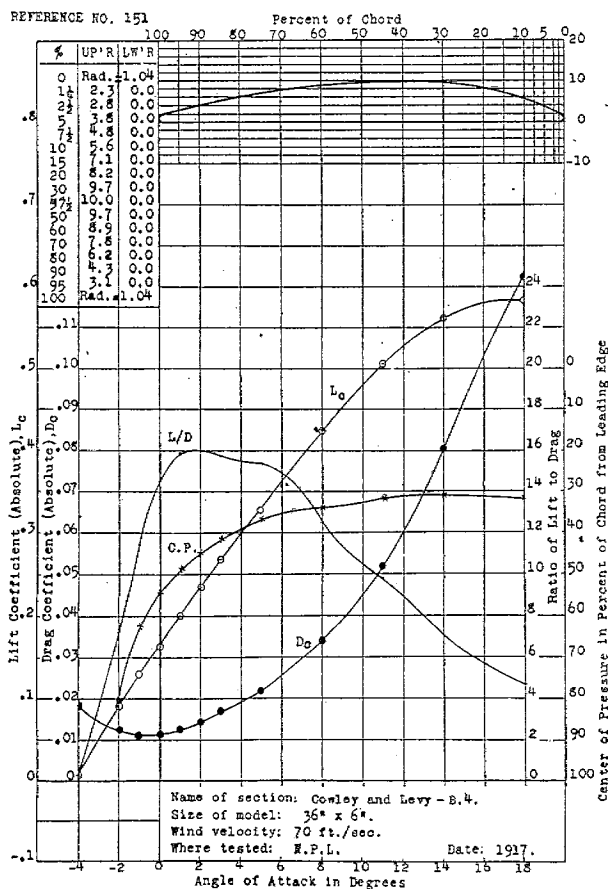
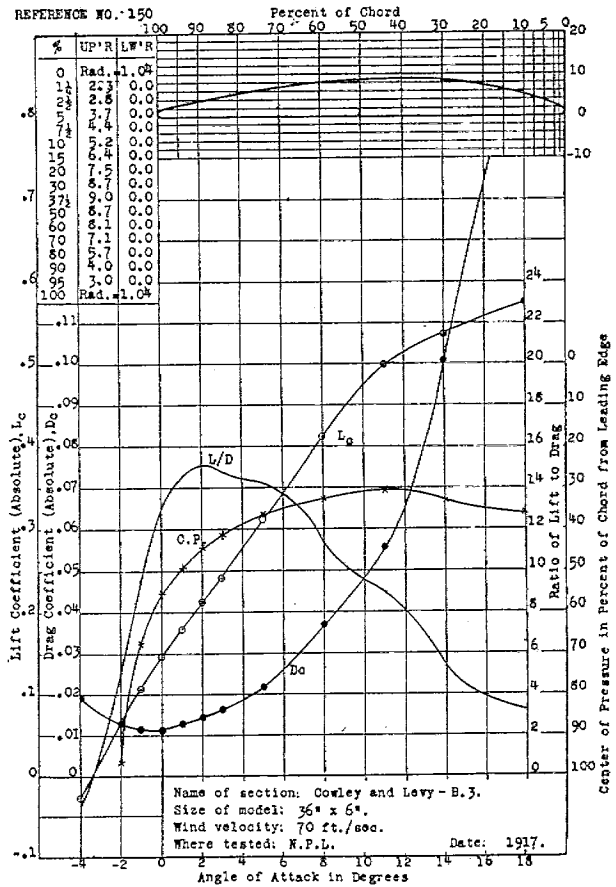
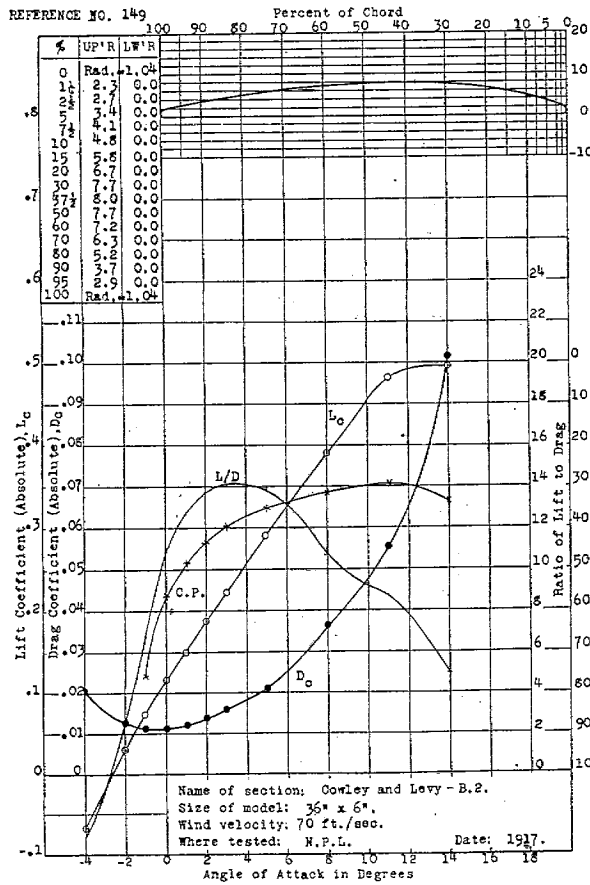


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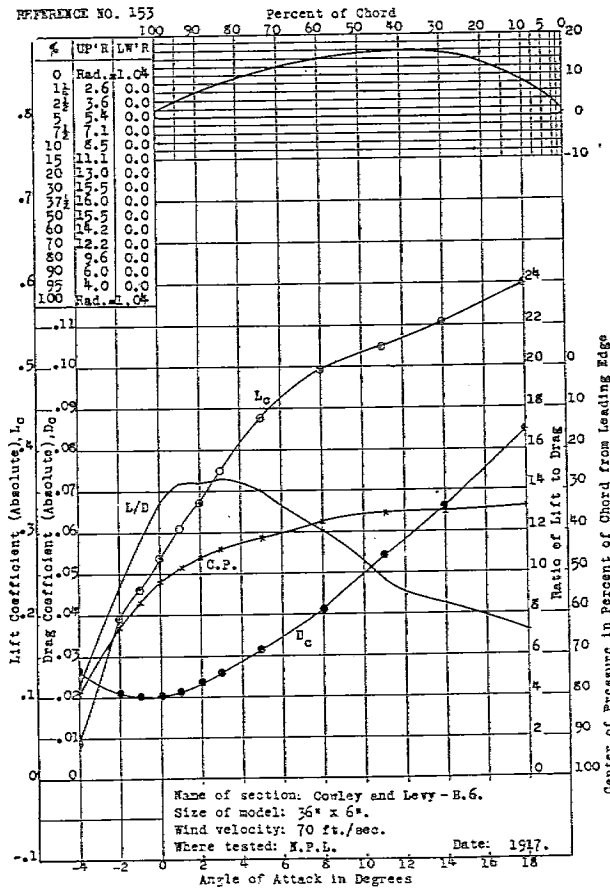


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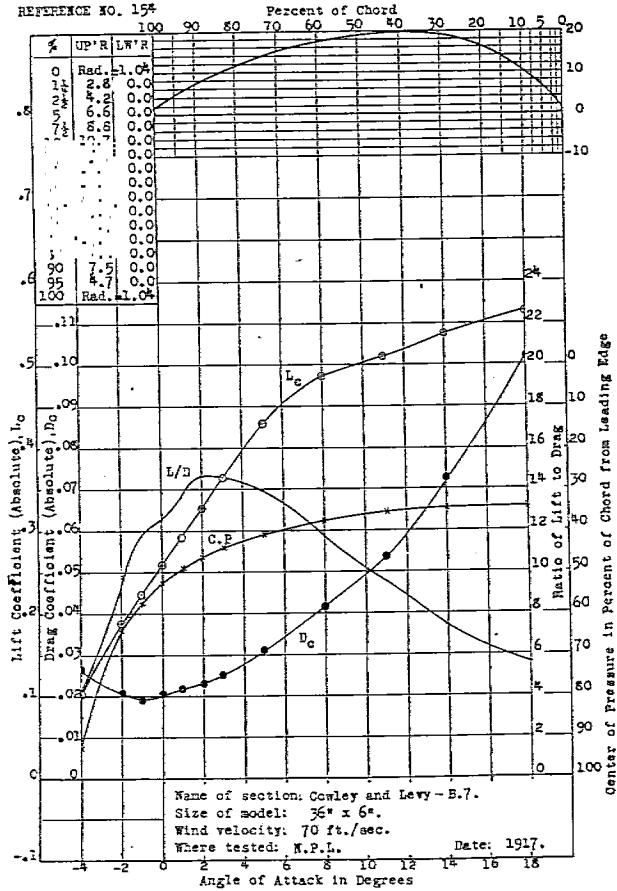




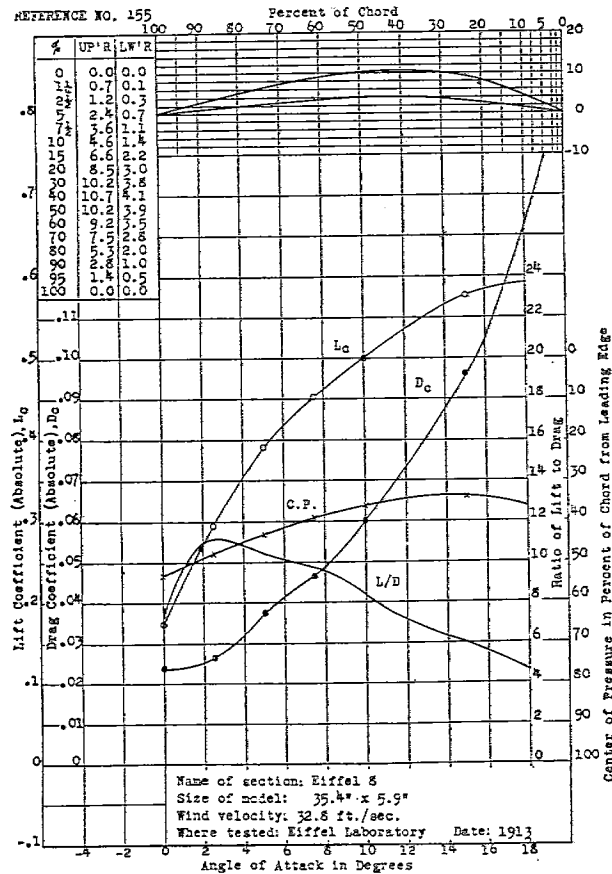
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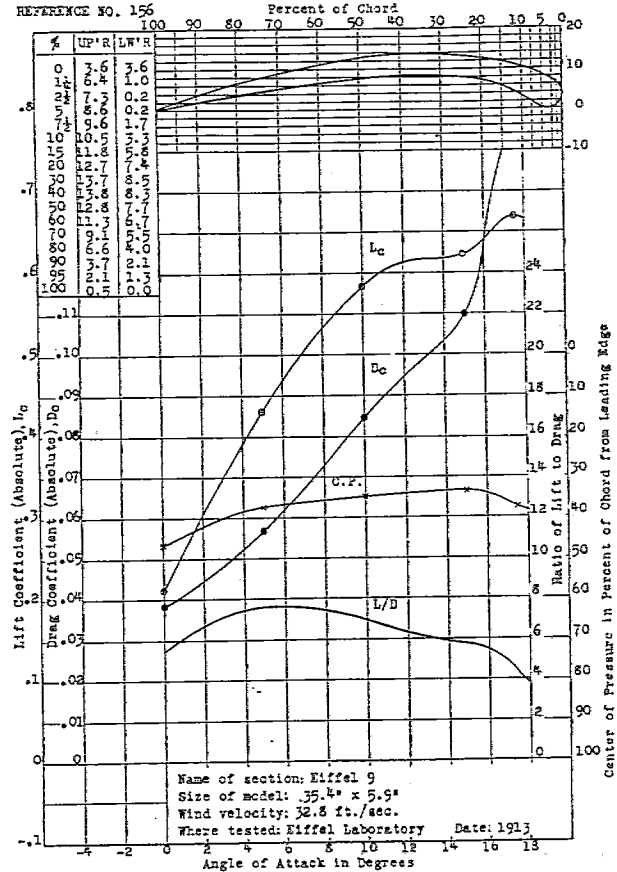
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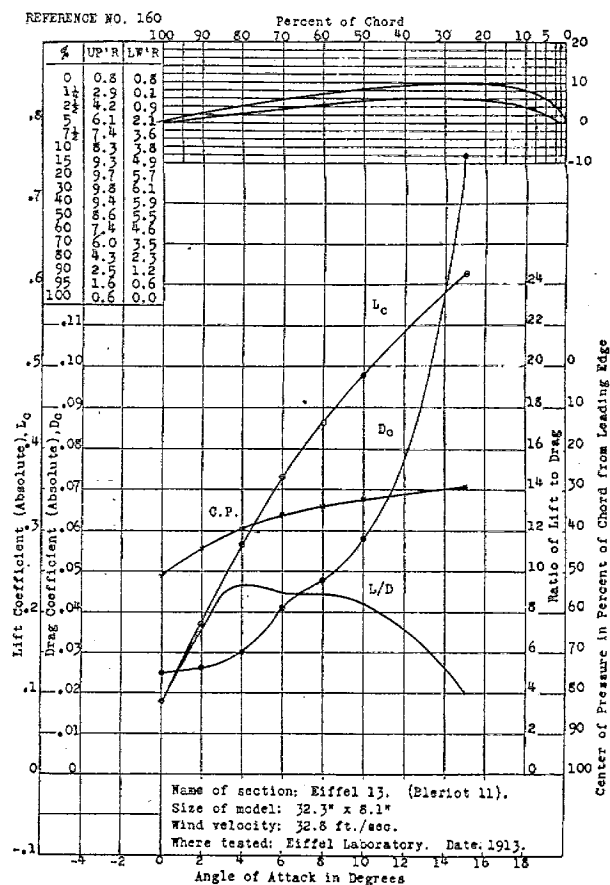
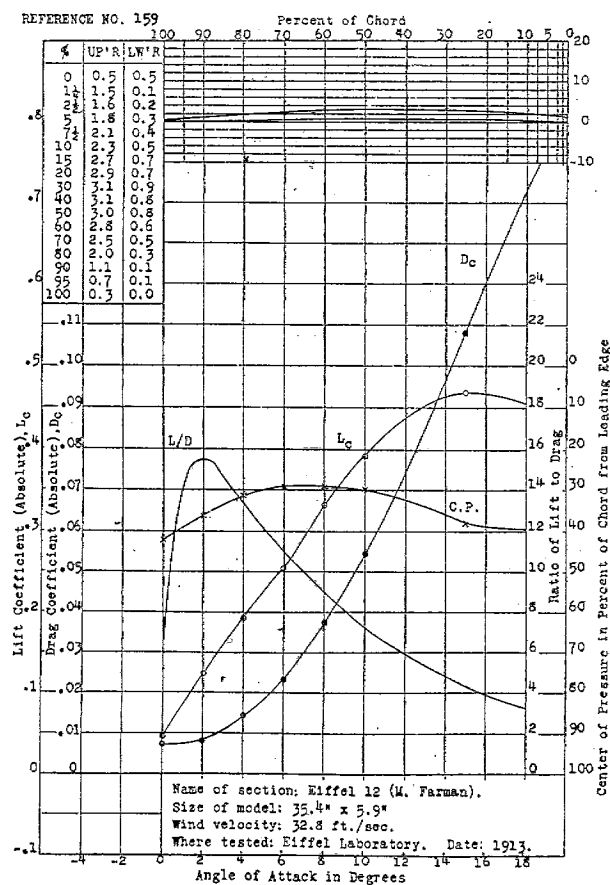
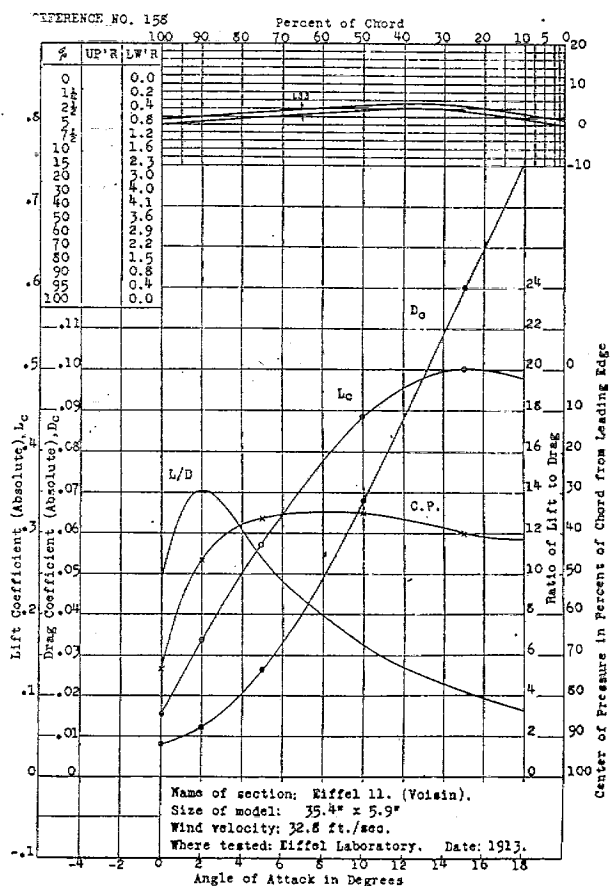
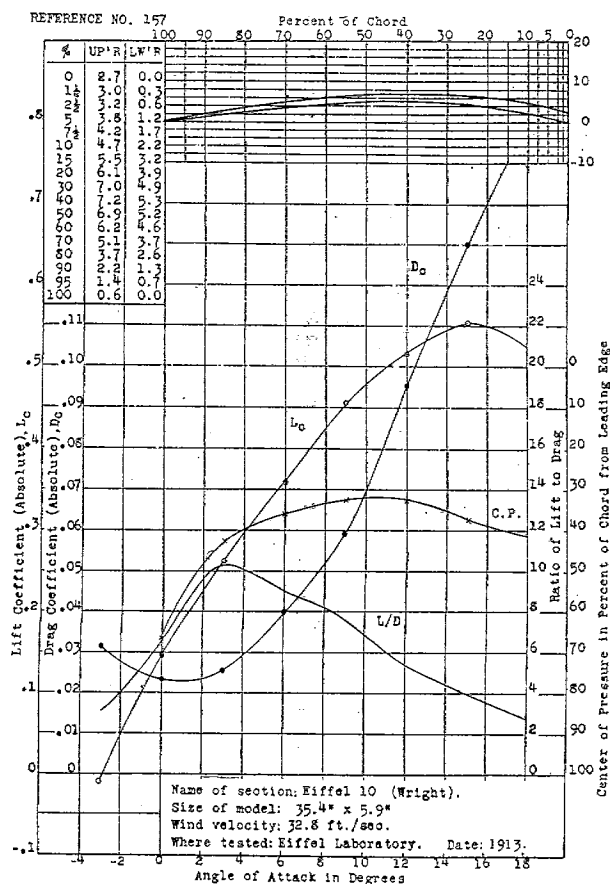


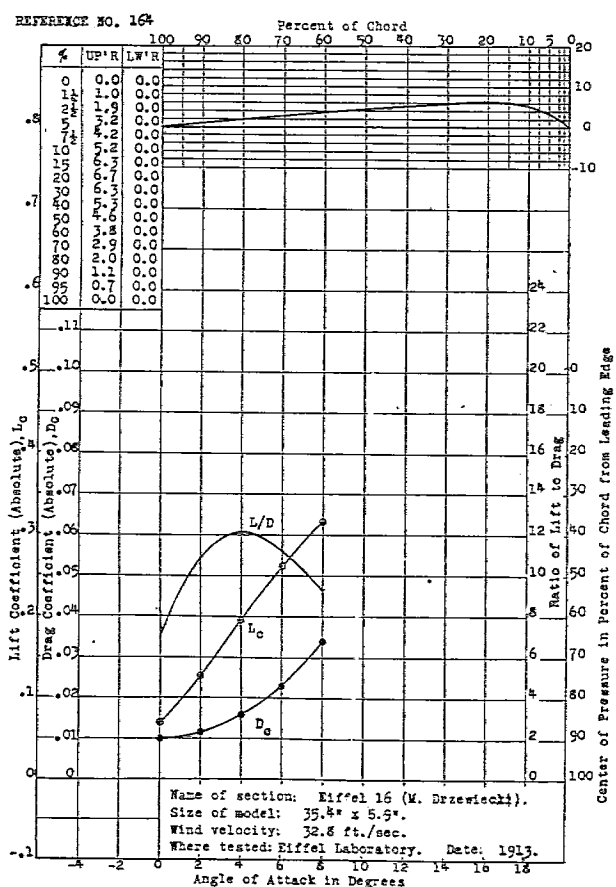
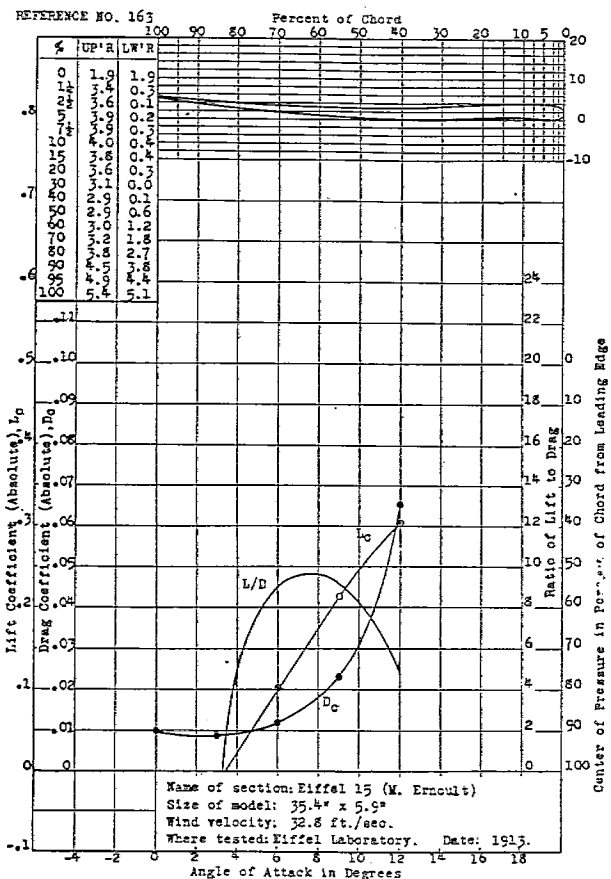
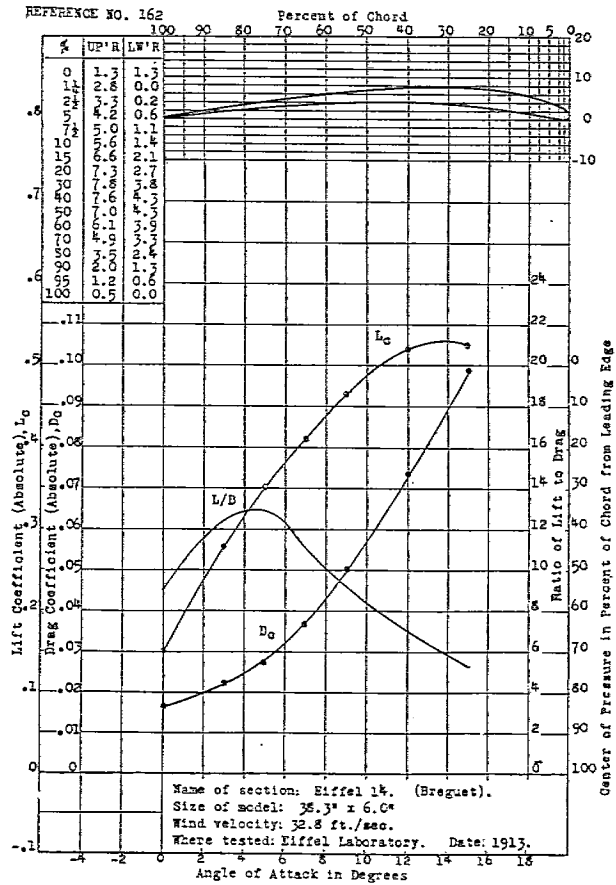
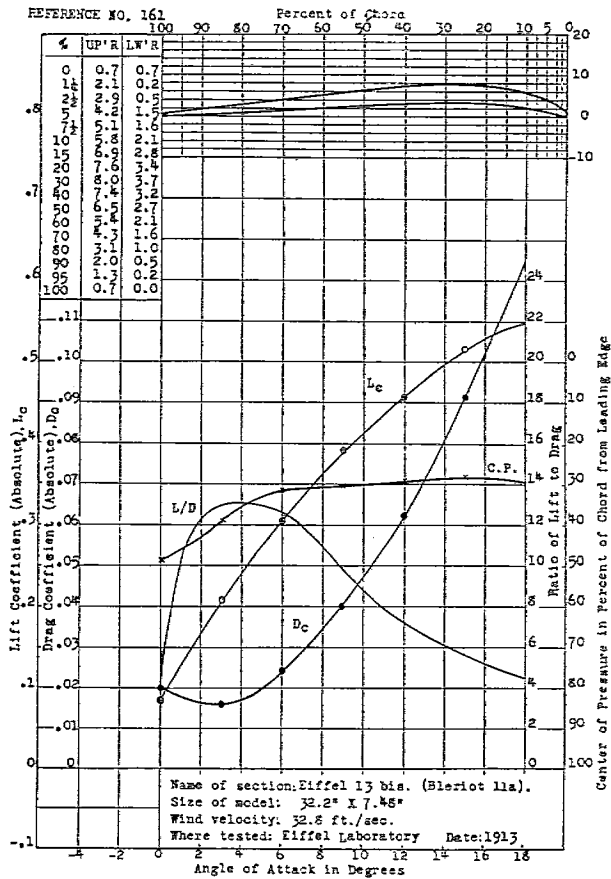
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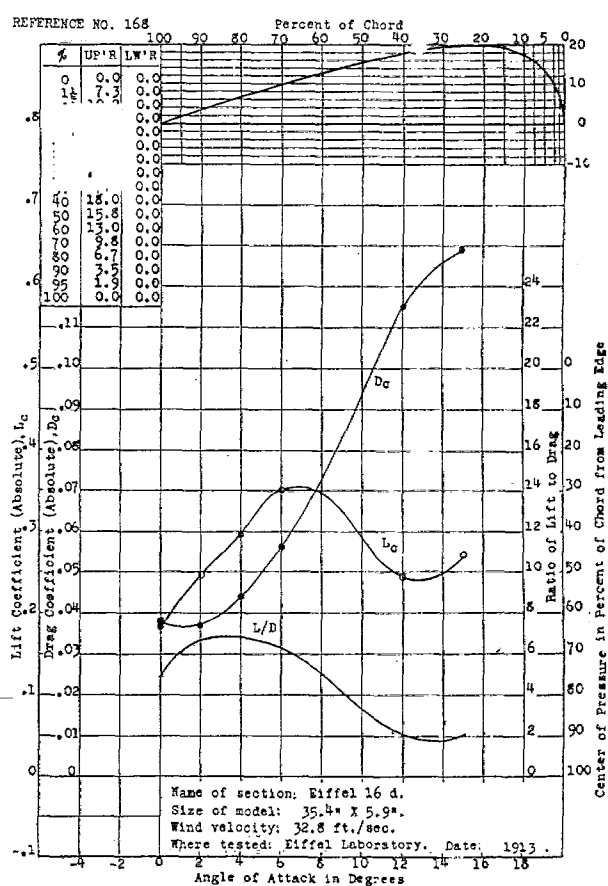
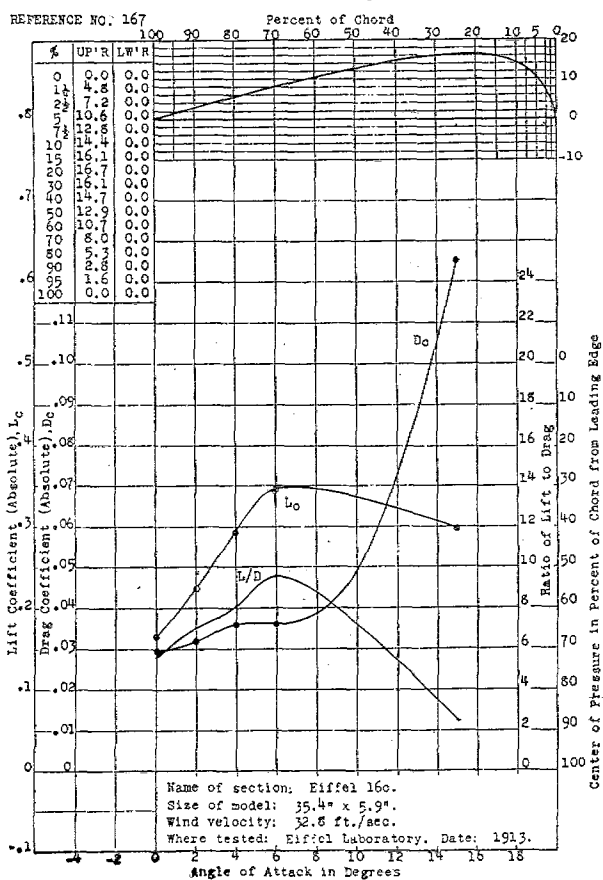
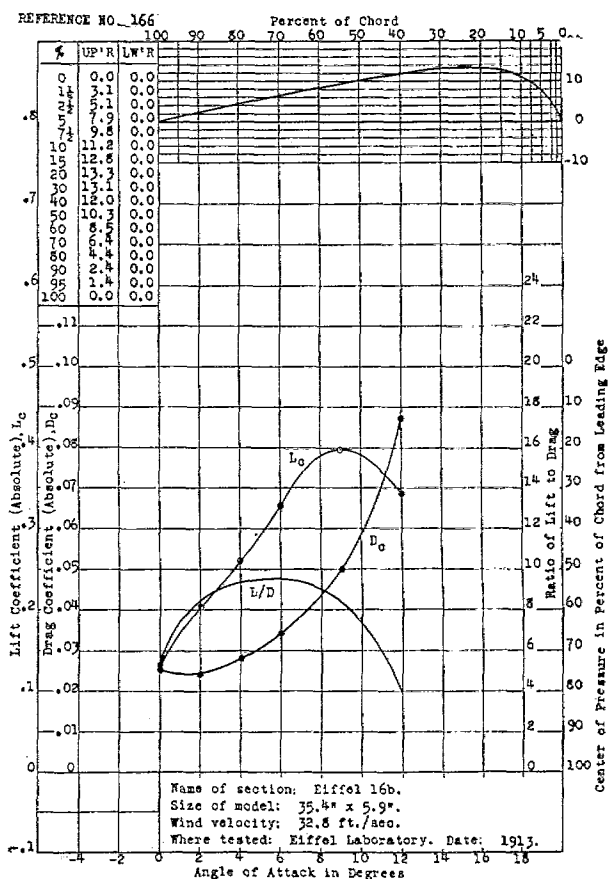
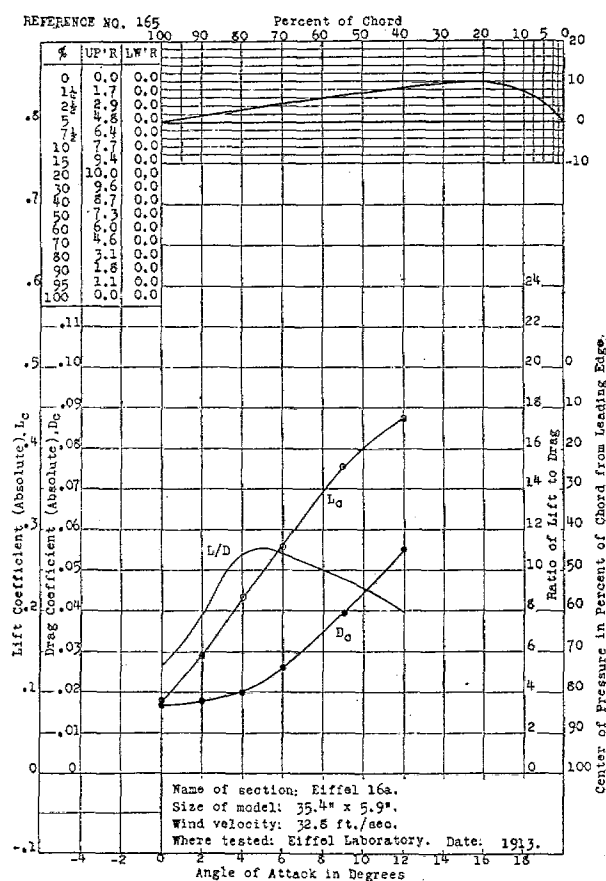


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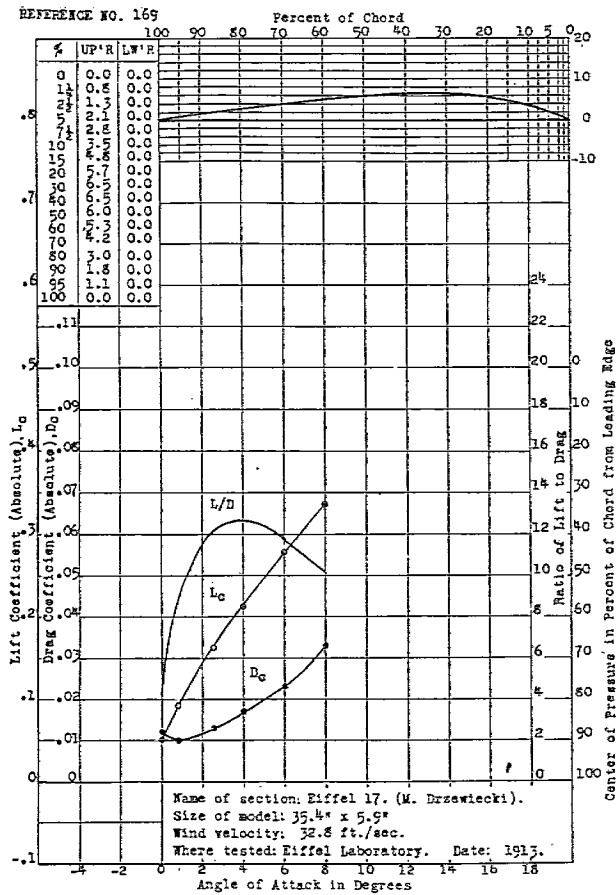




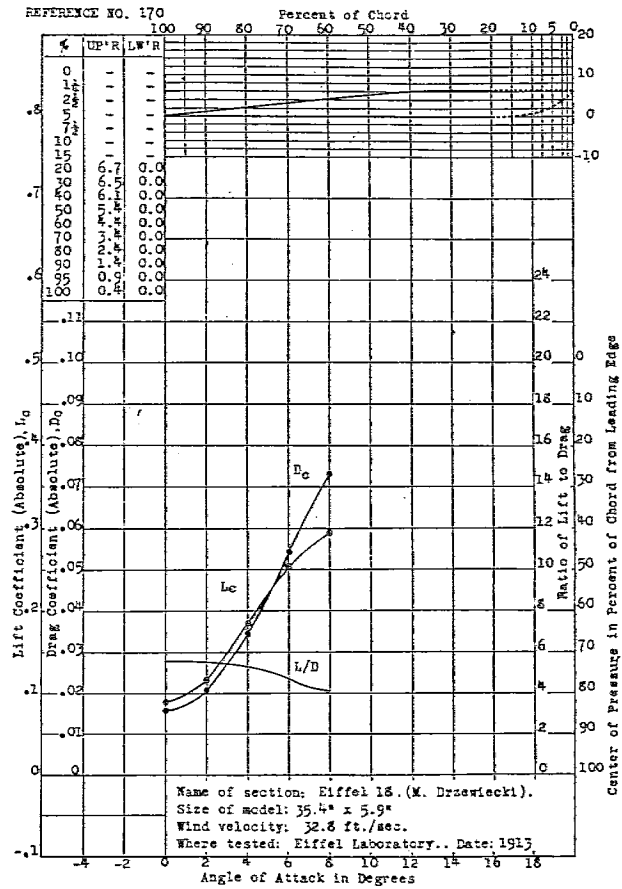




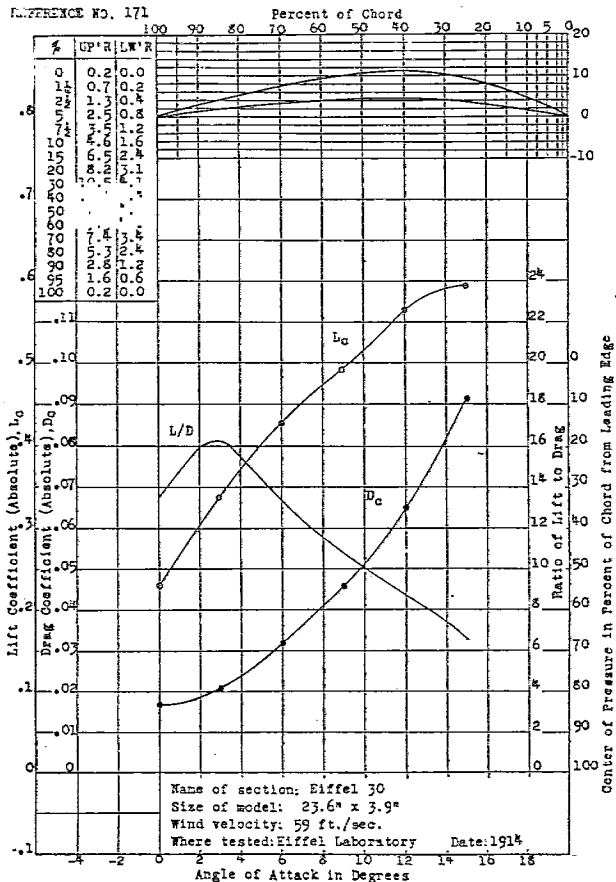
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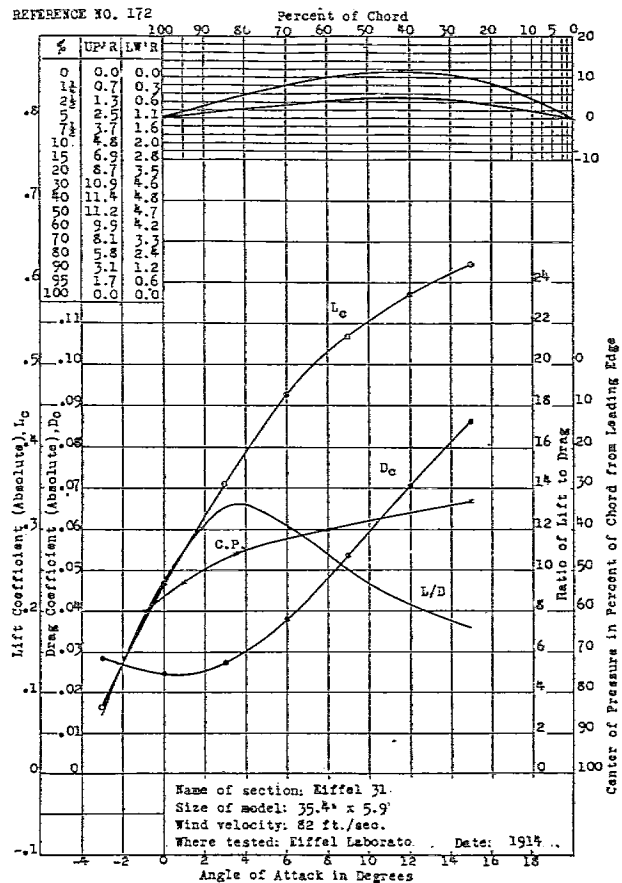
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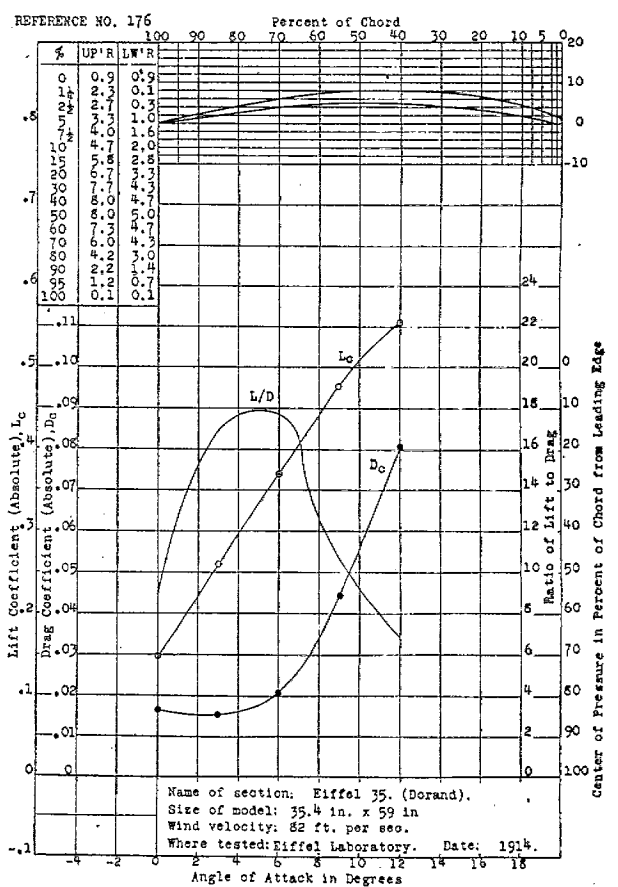
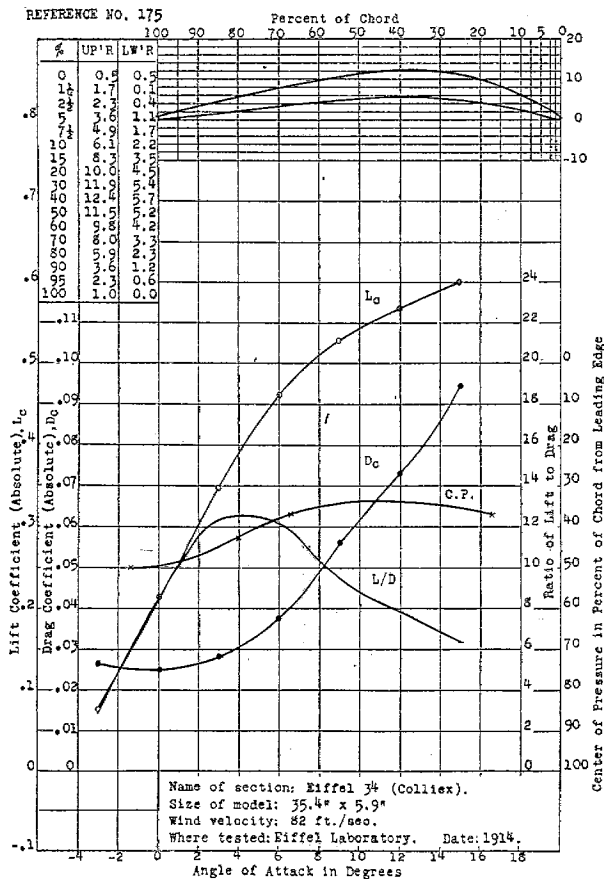
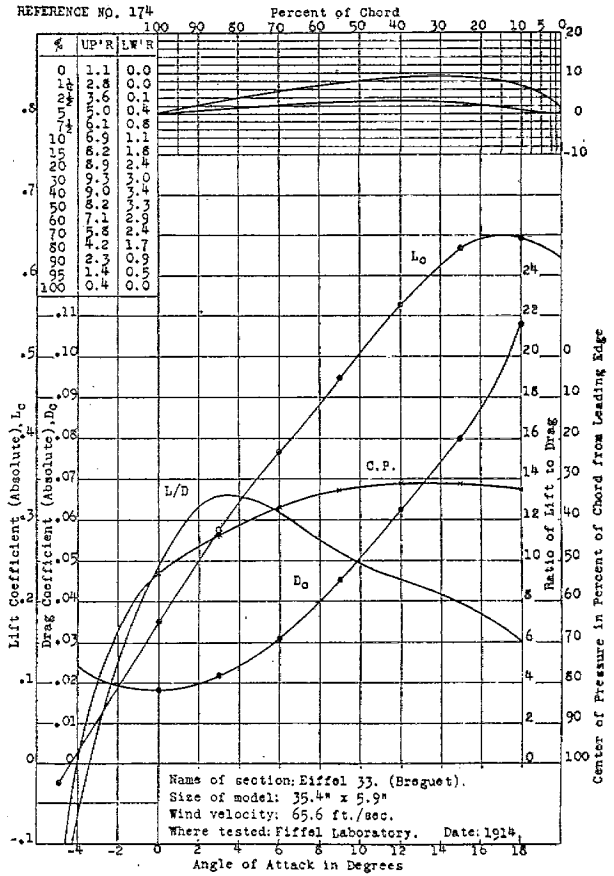
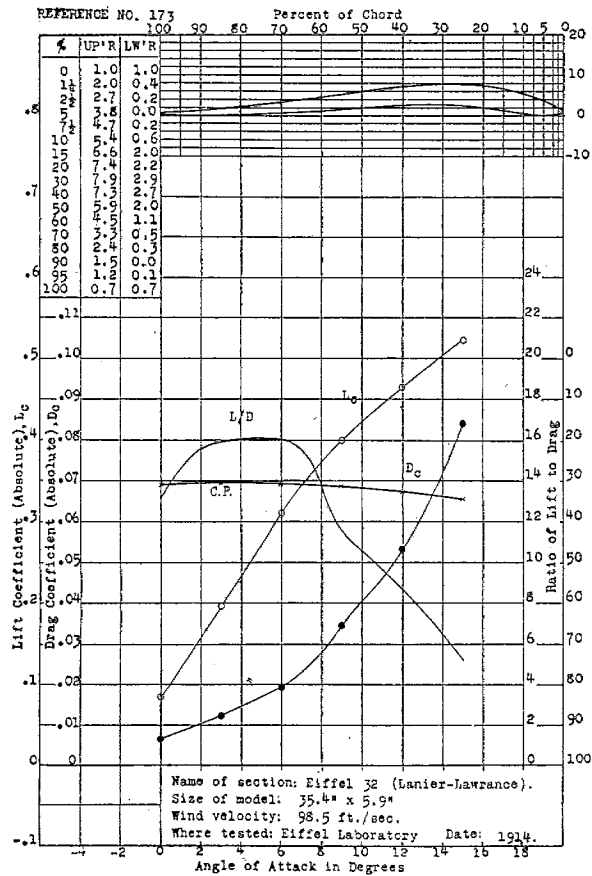


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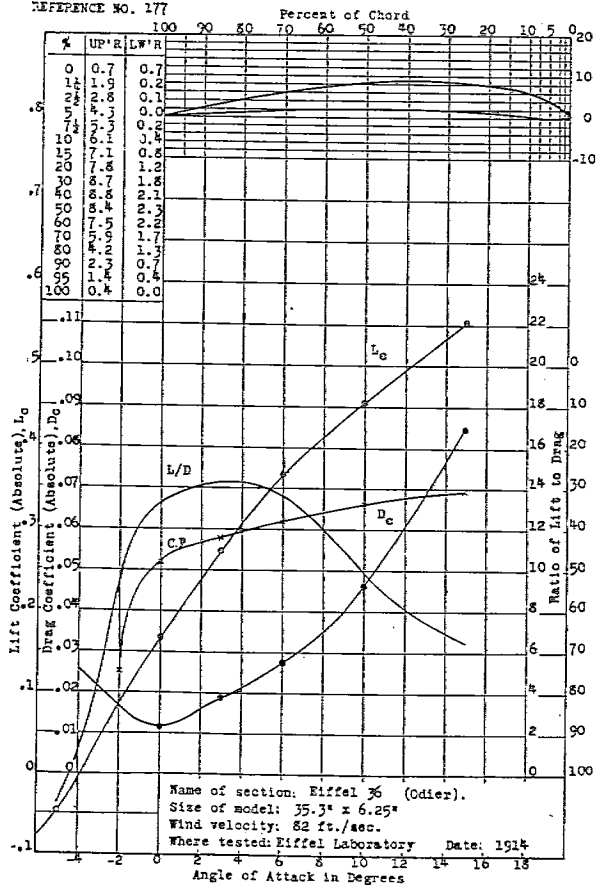


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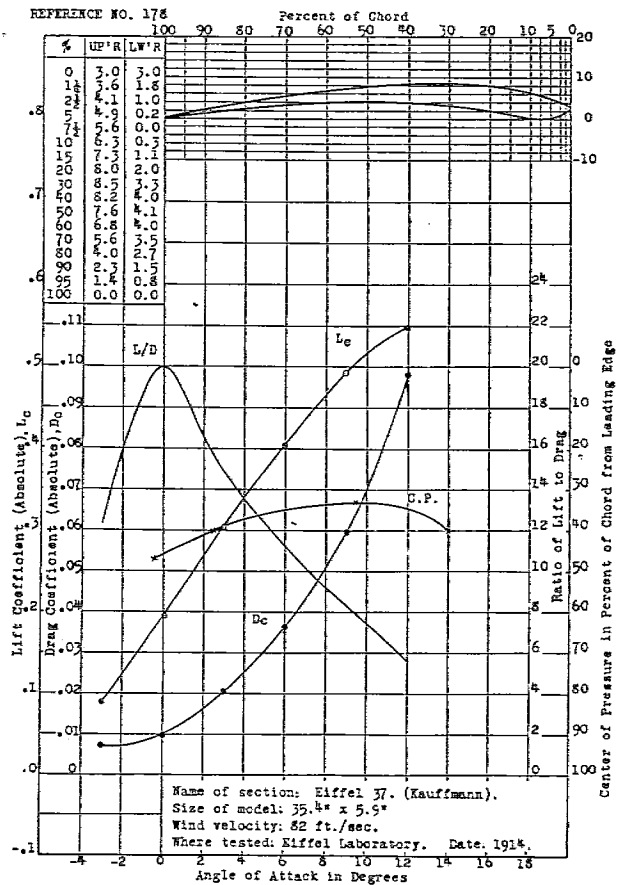




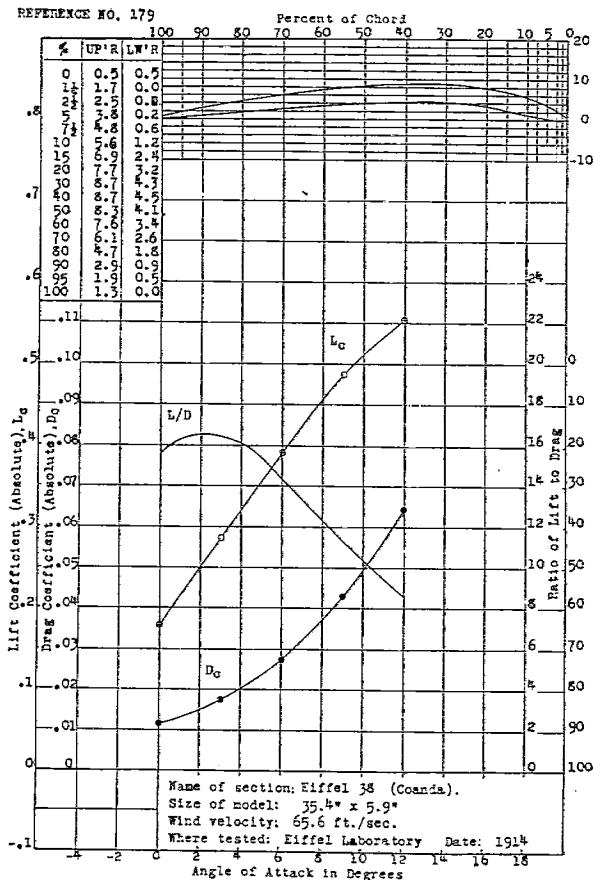
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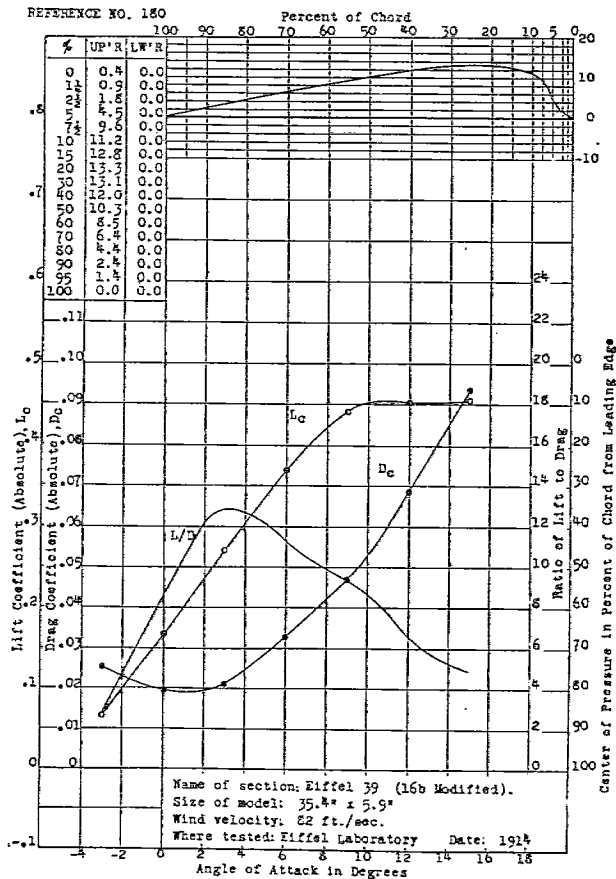
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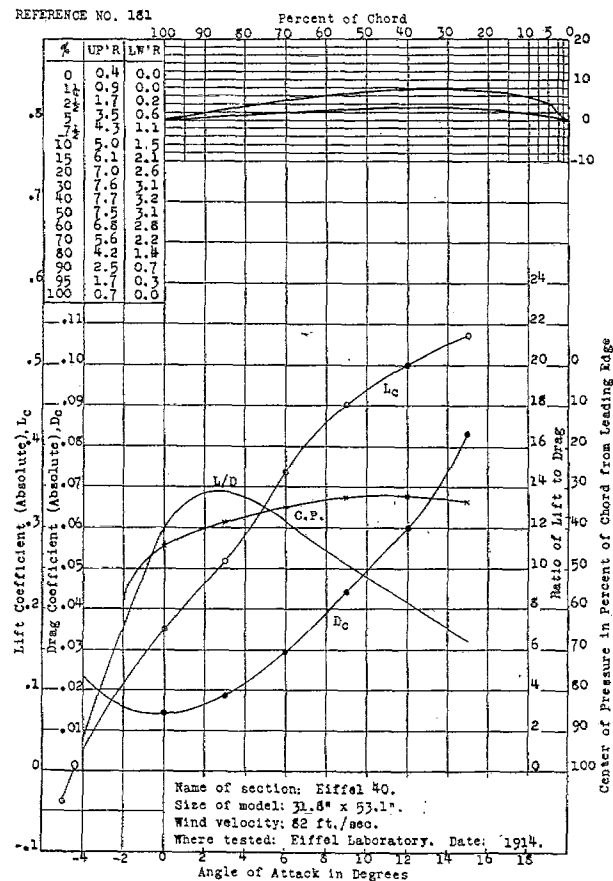
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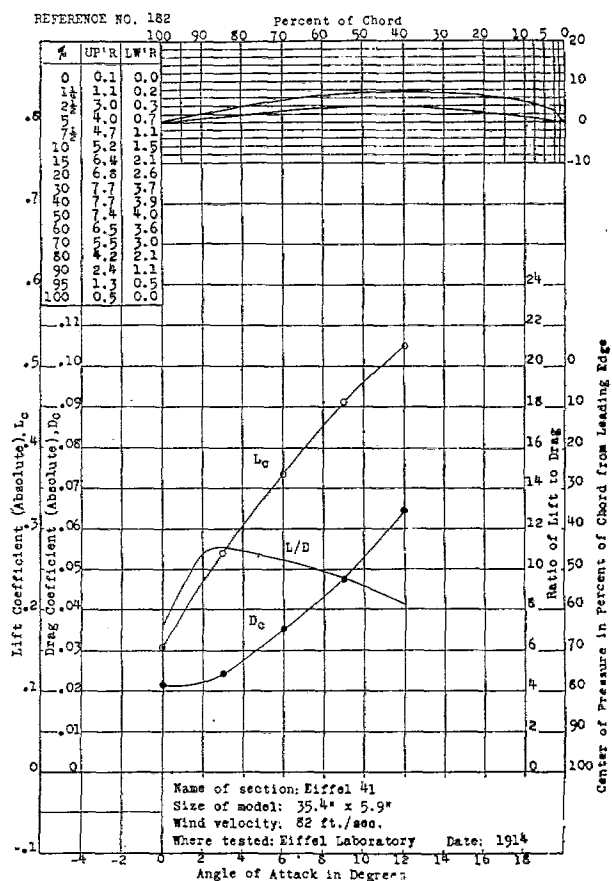
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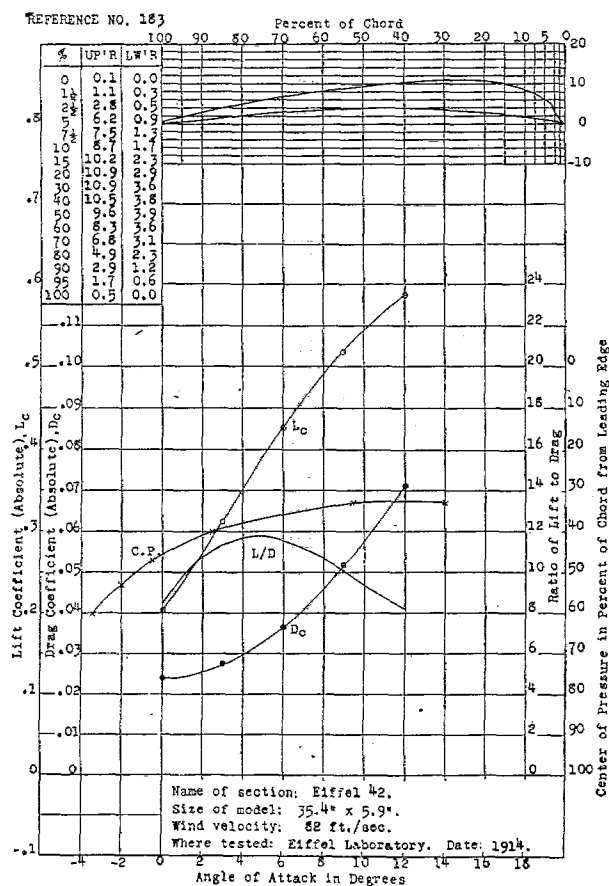
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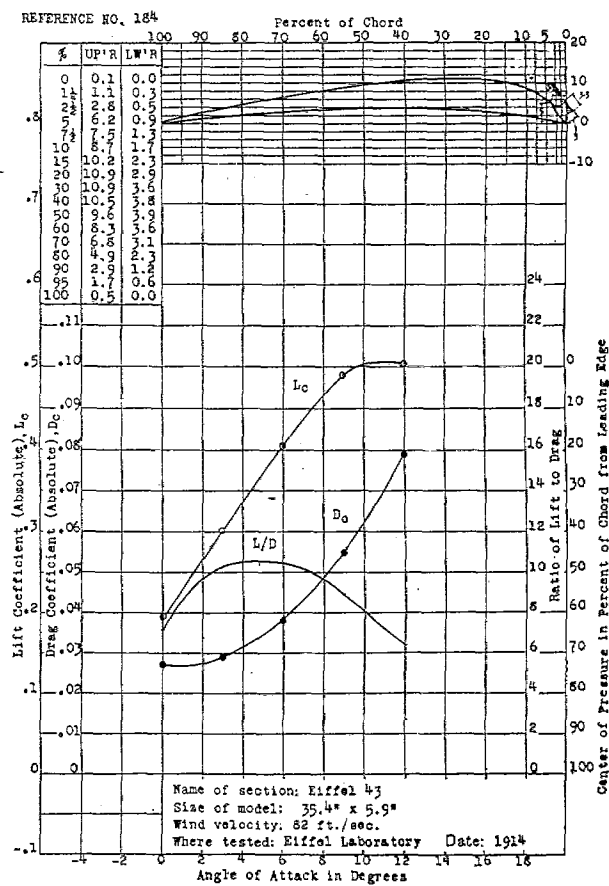
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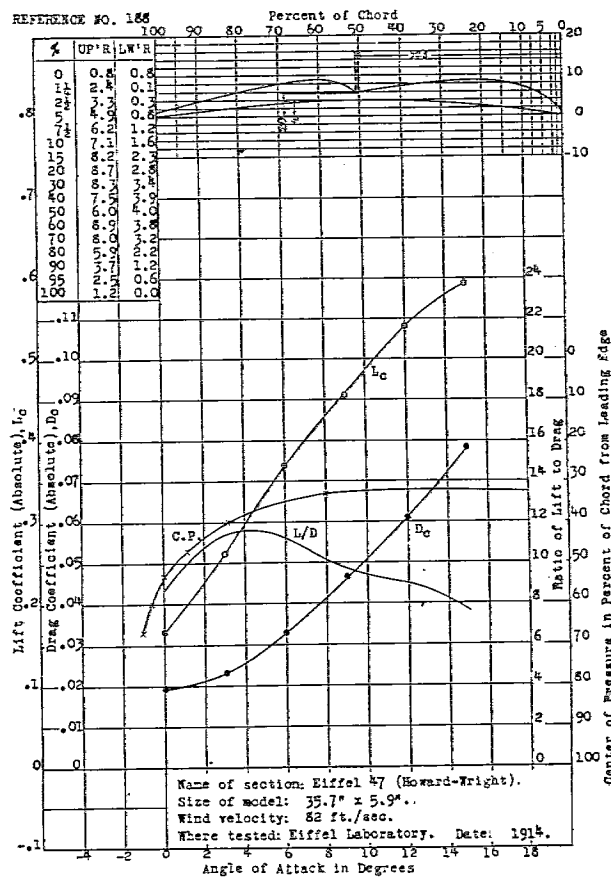
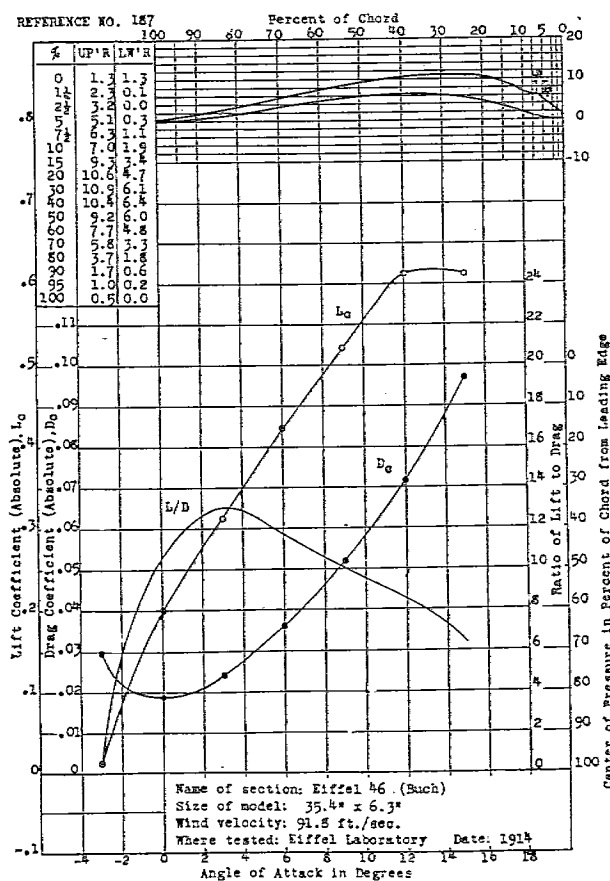
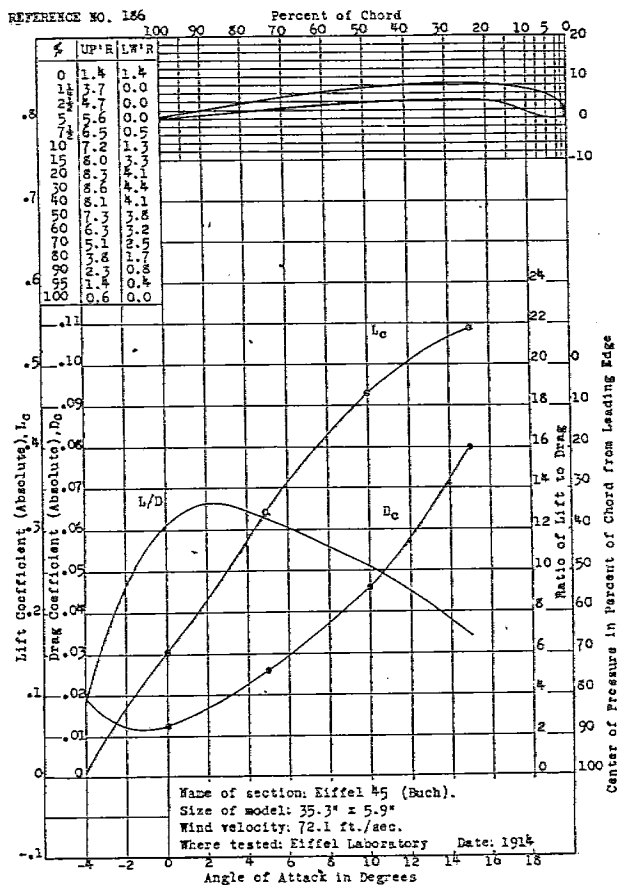
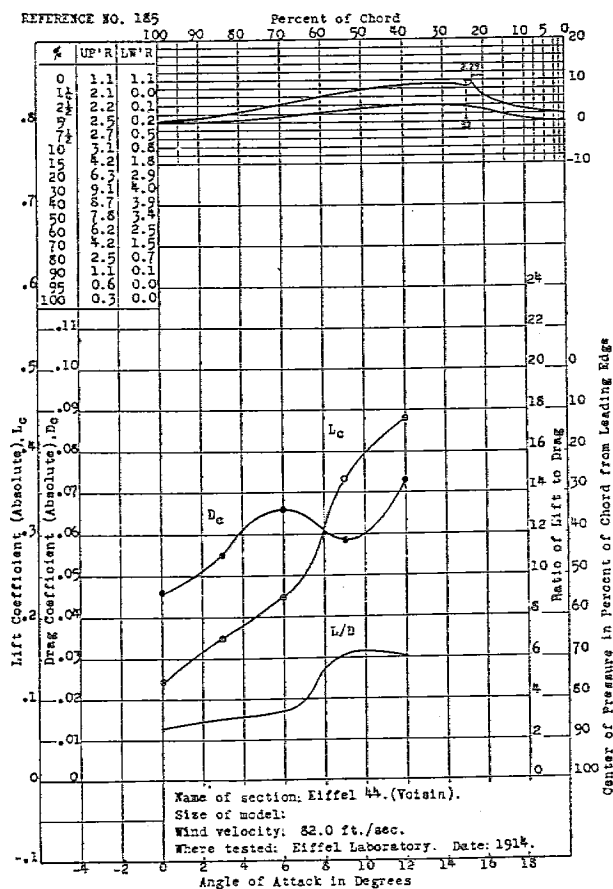


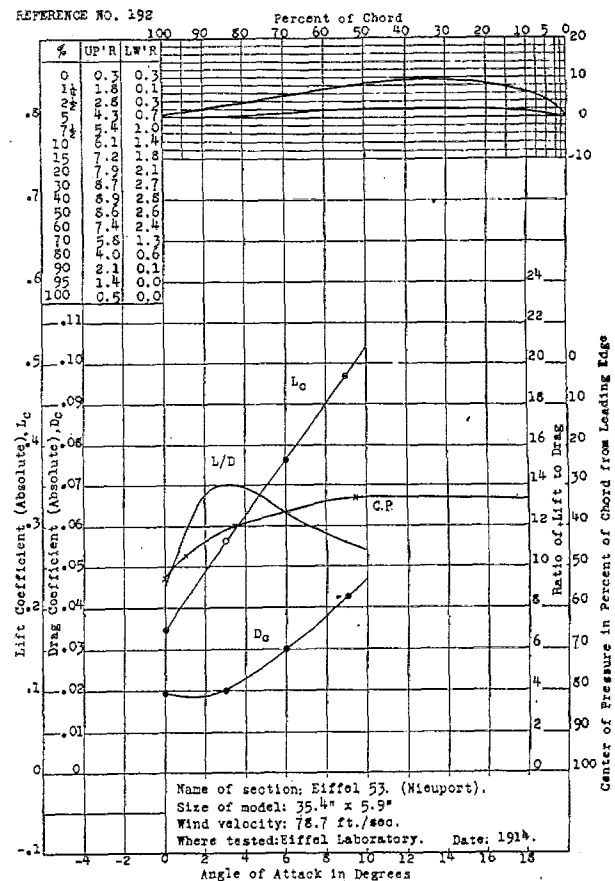
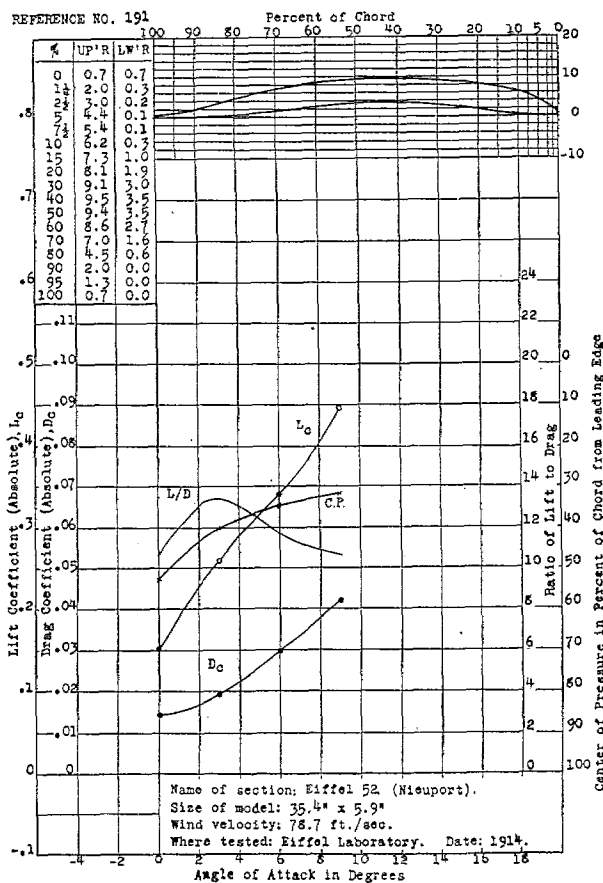
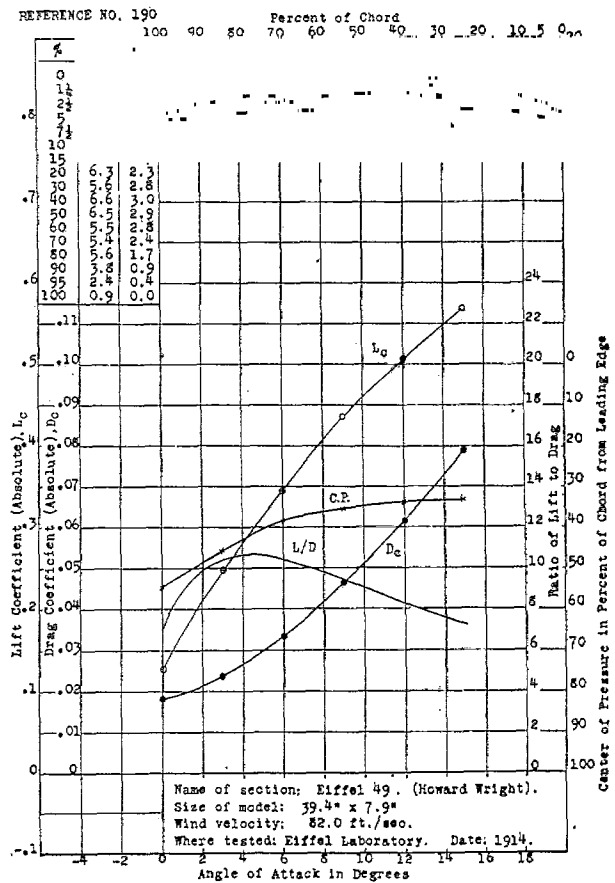
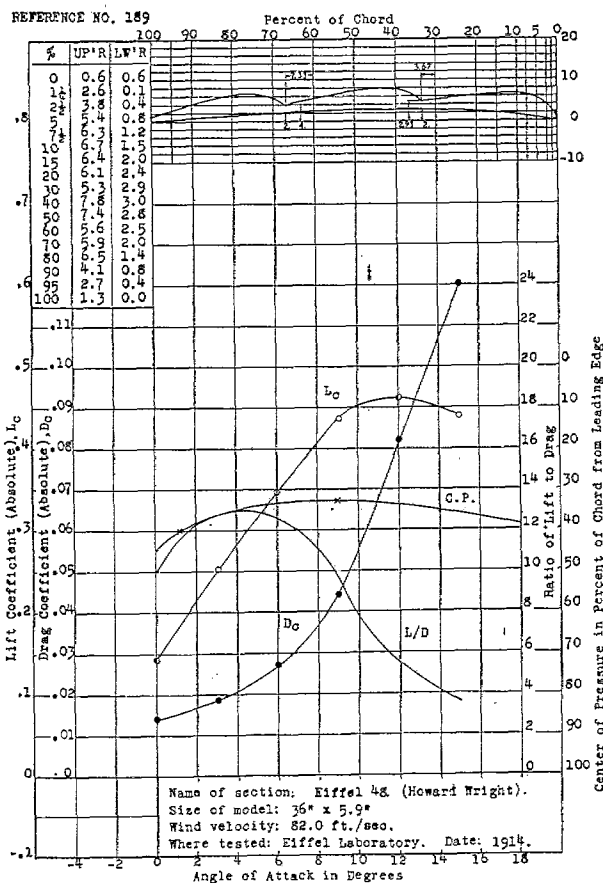
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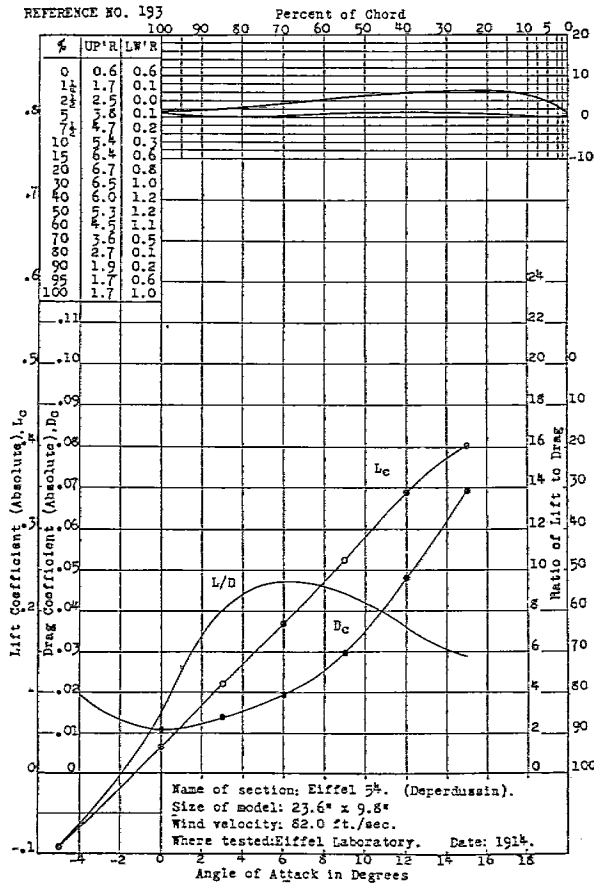
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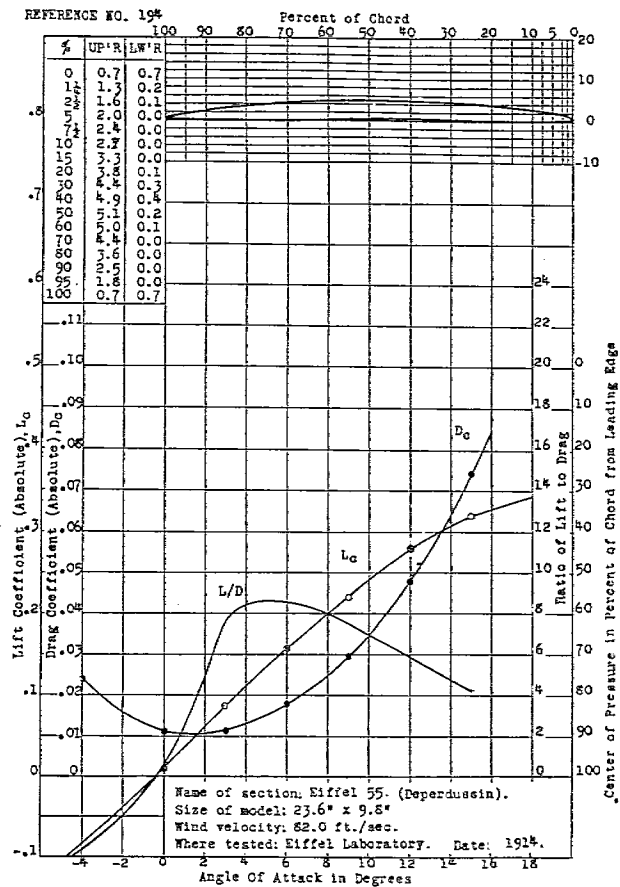




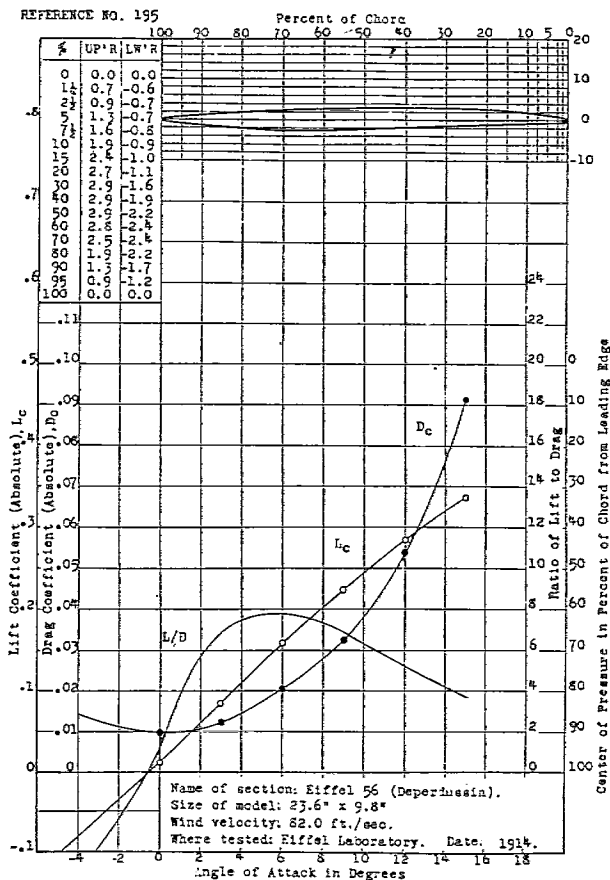
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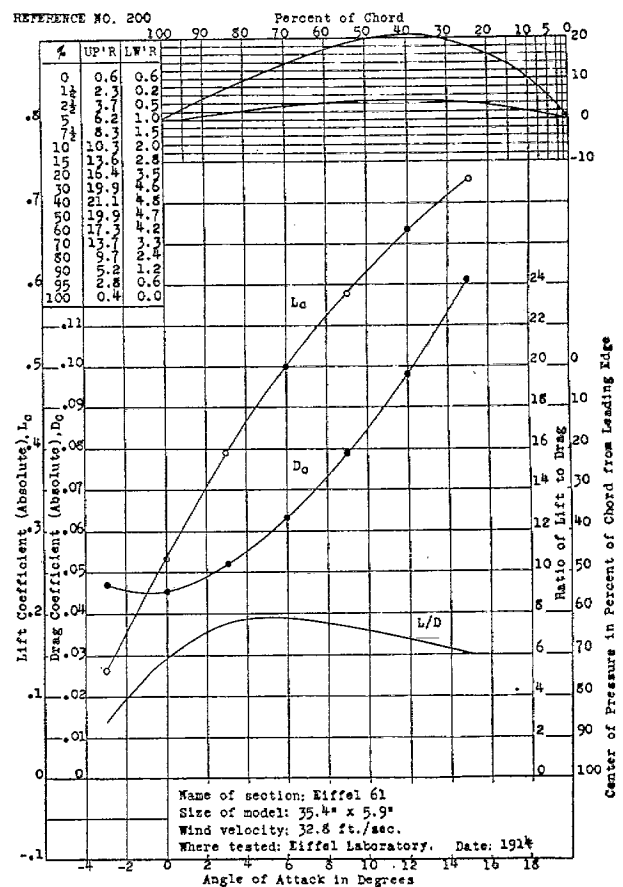
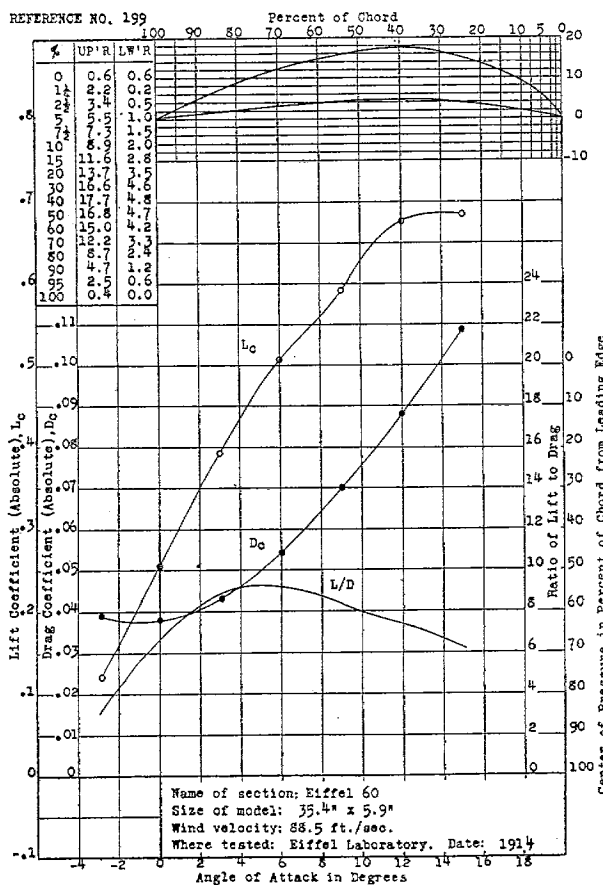
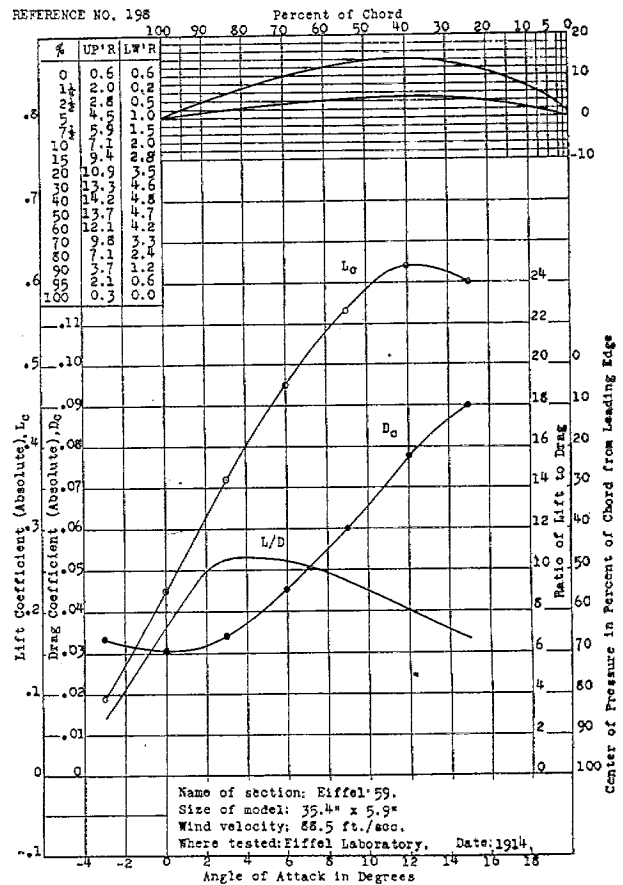
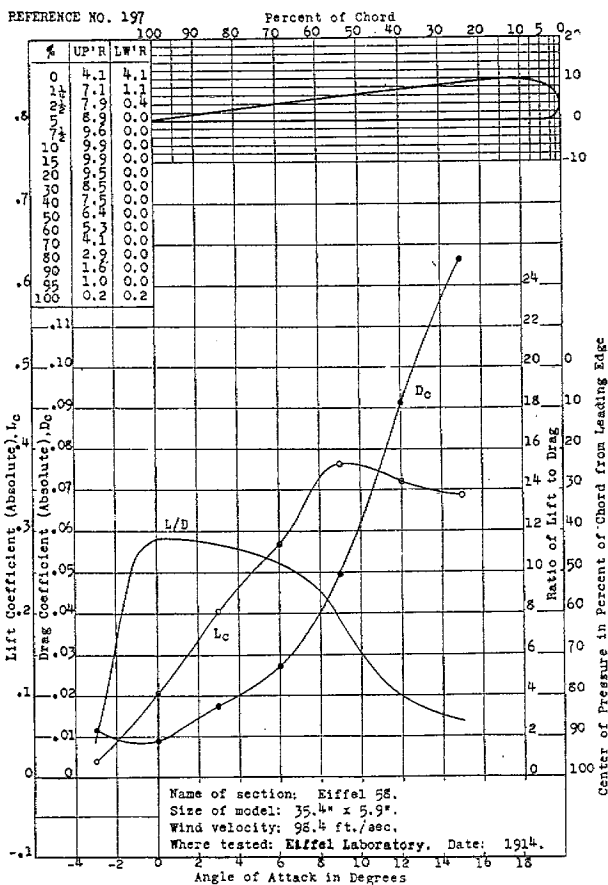


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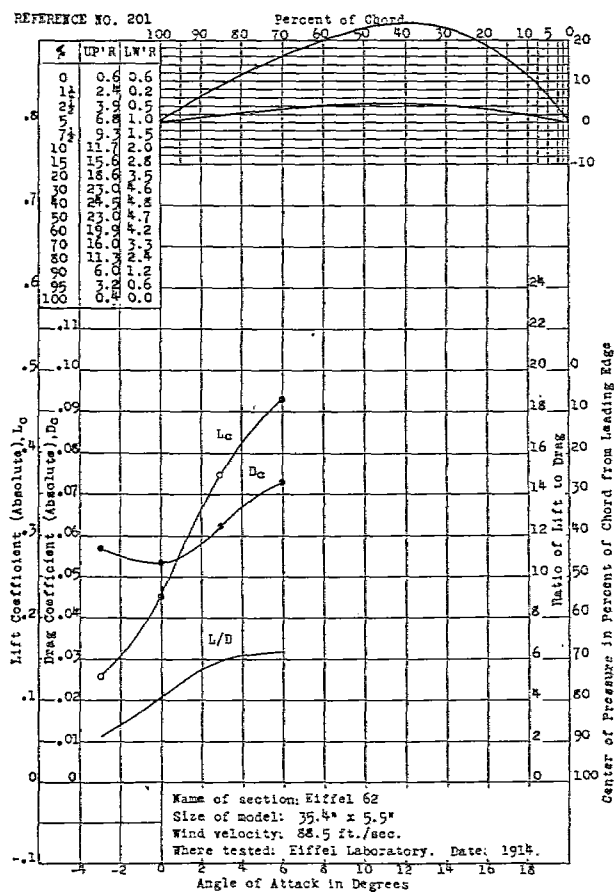
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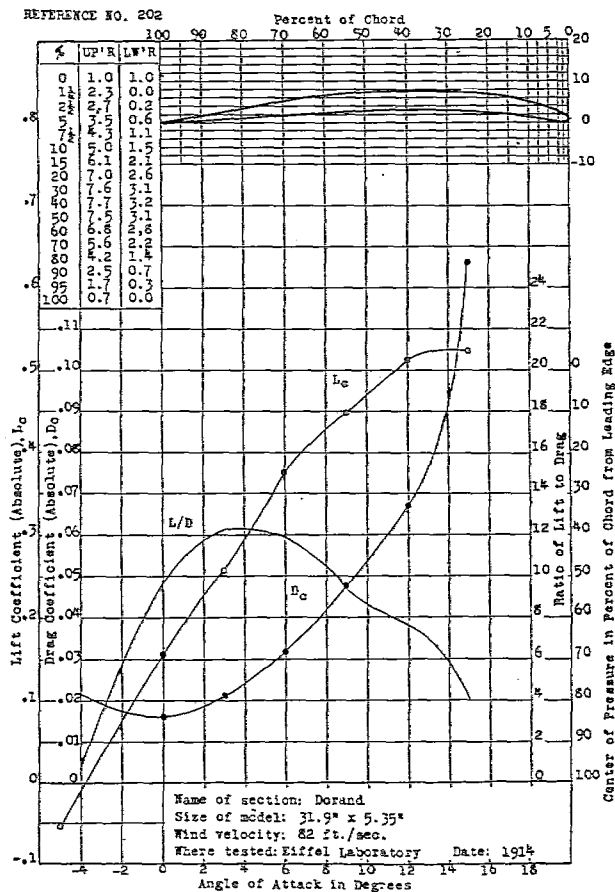




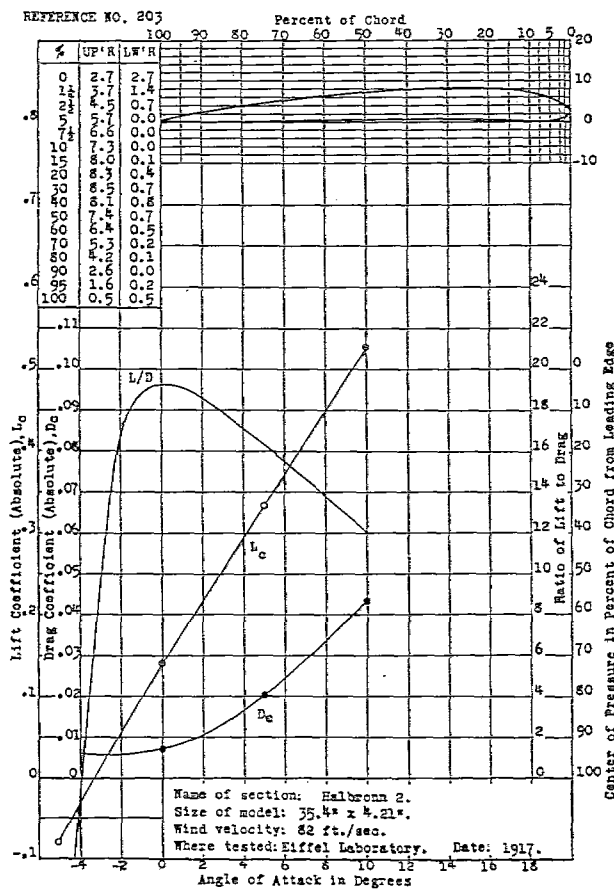
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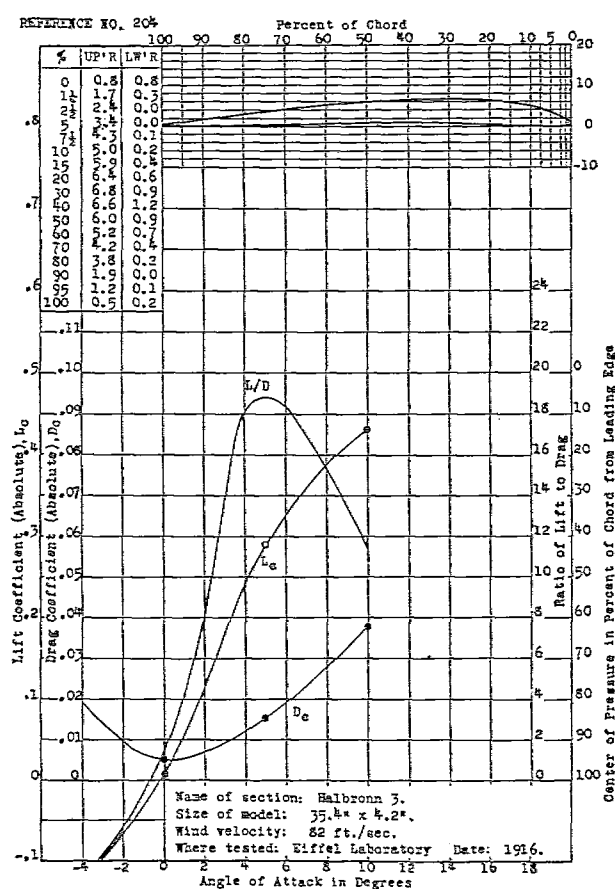
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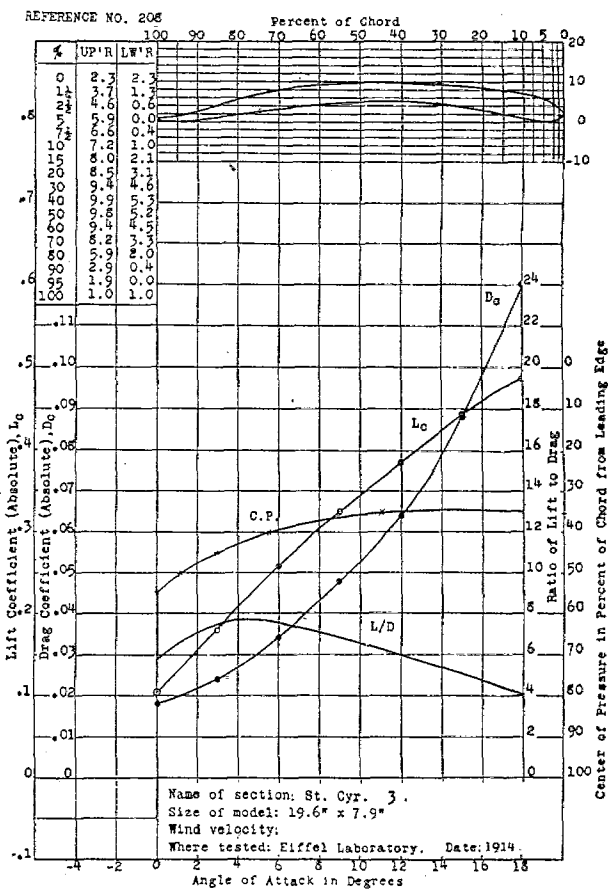
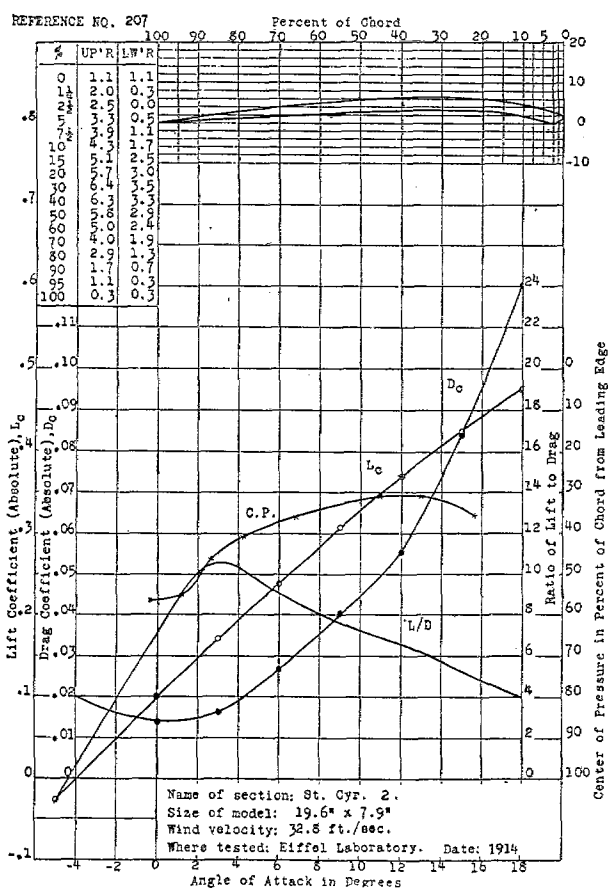
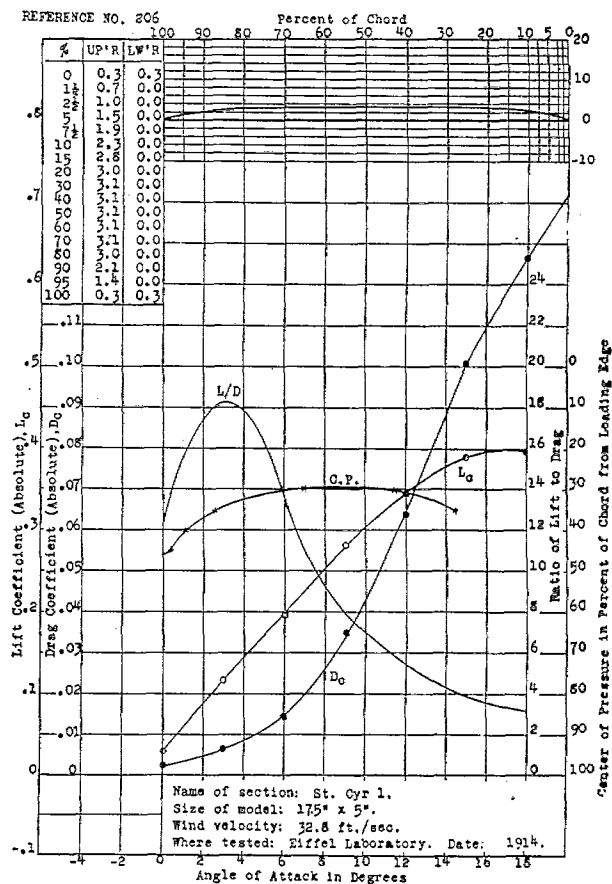
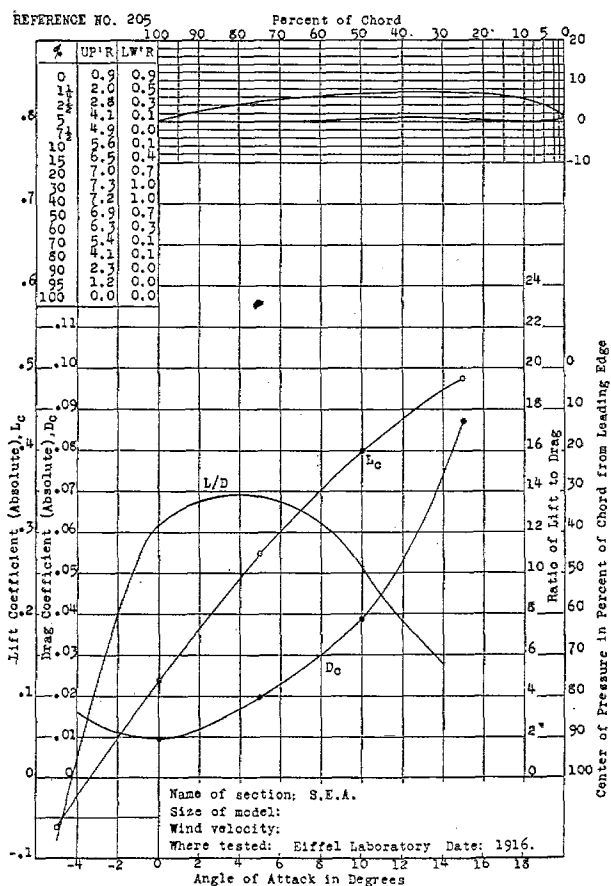


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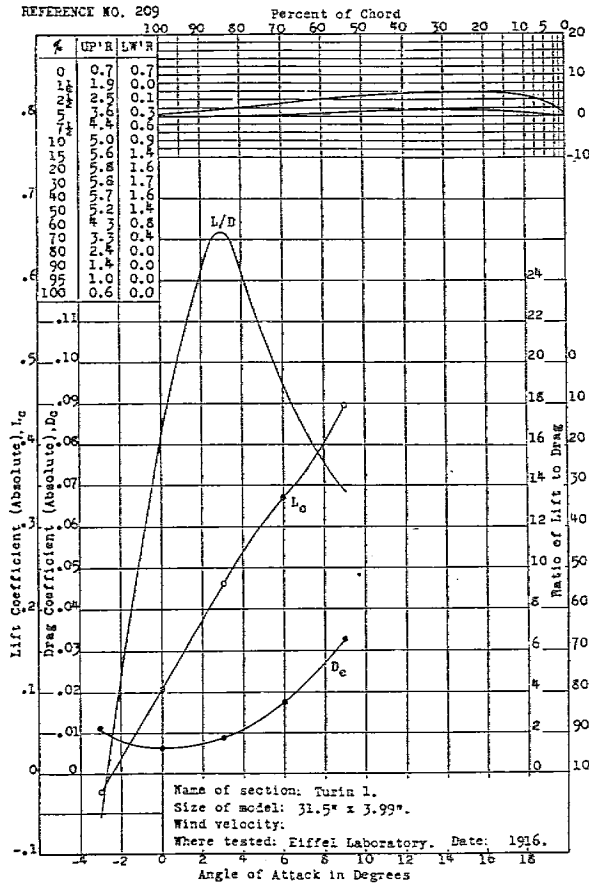


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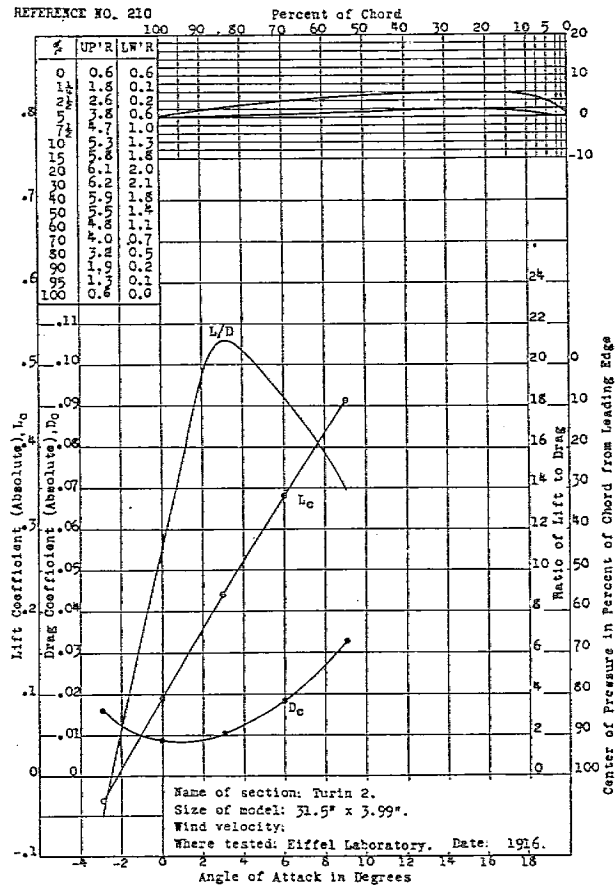




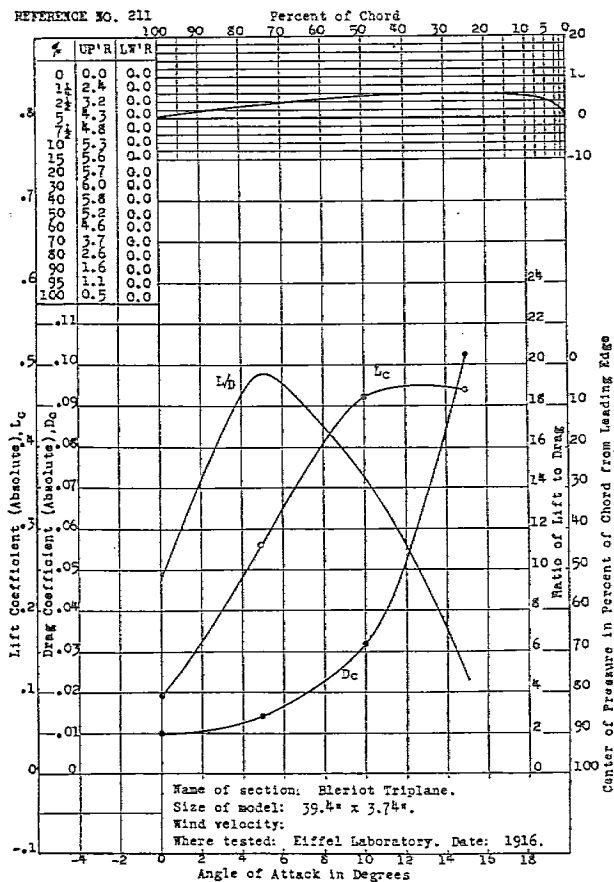
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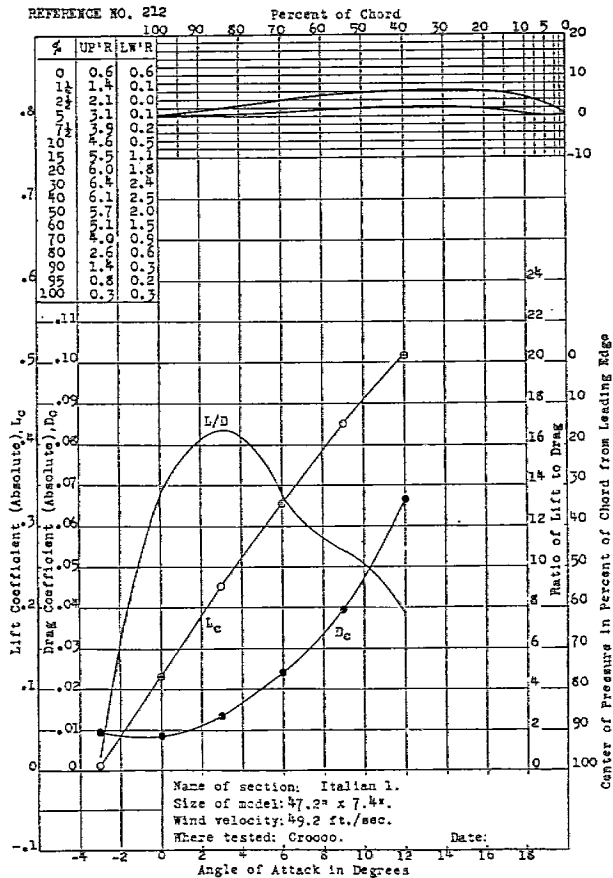
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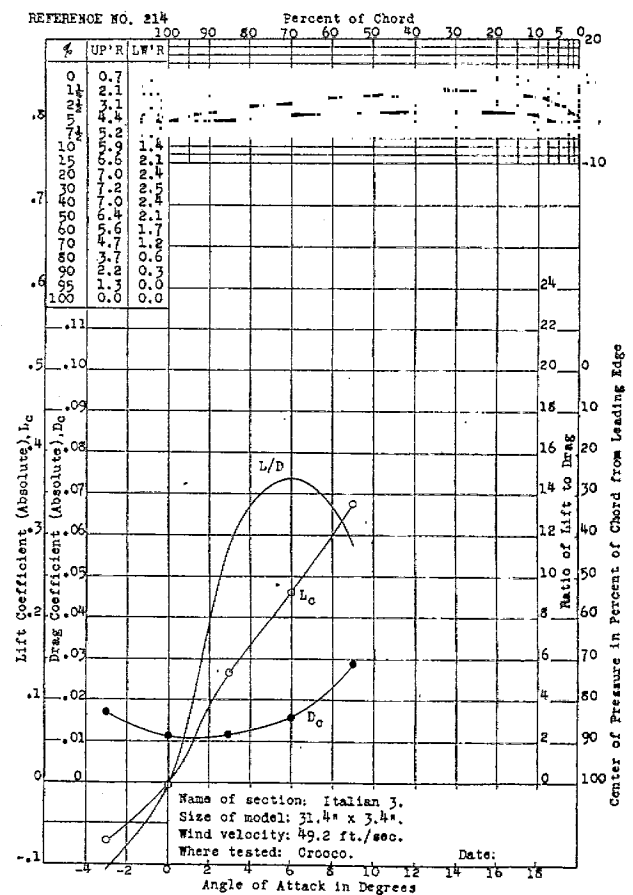
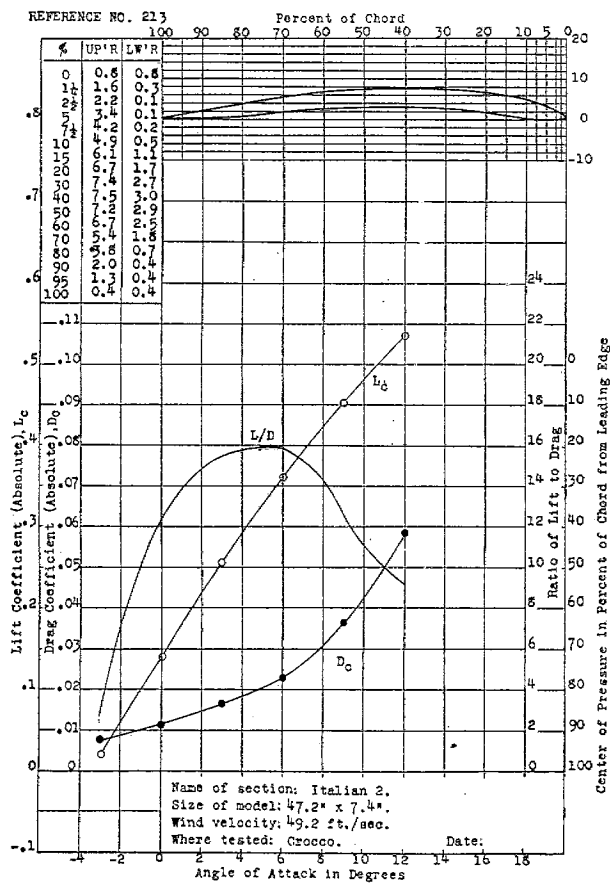


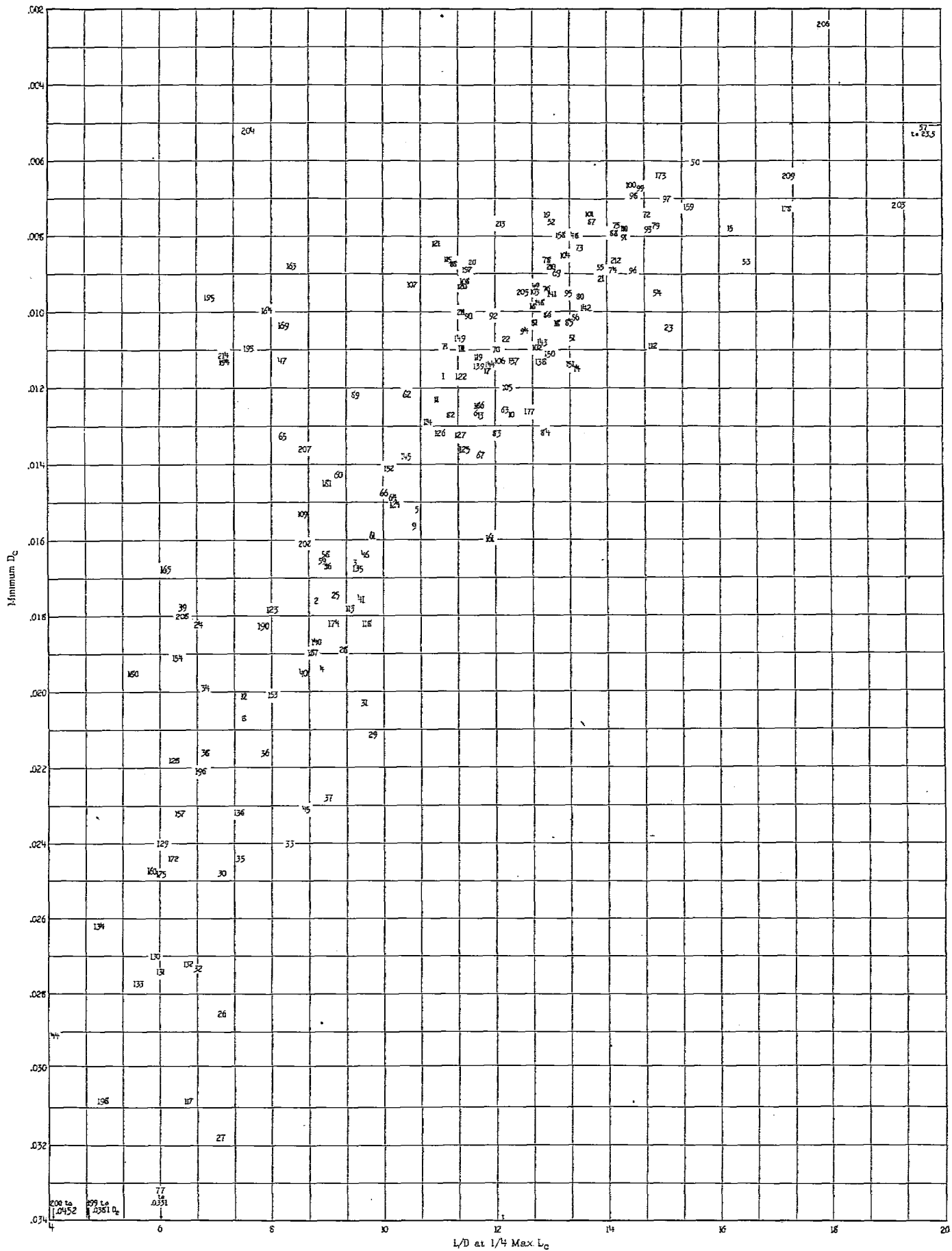
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REFERENCE NO. 212







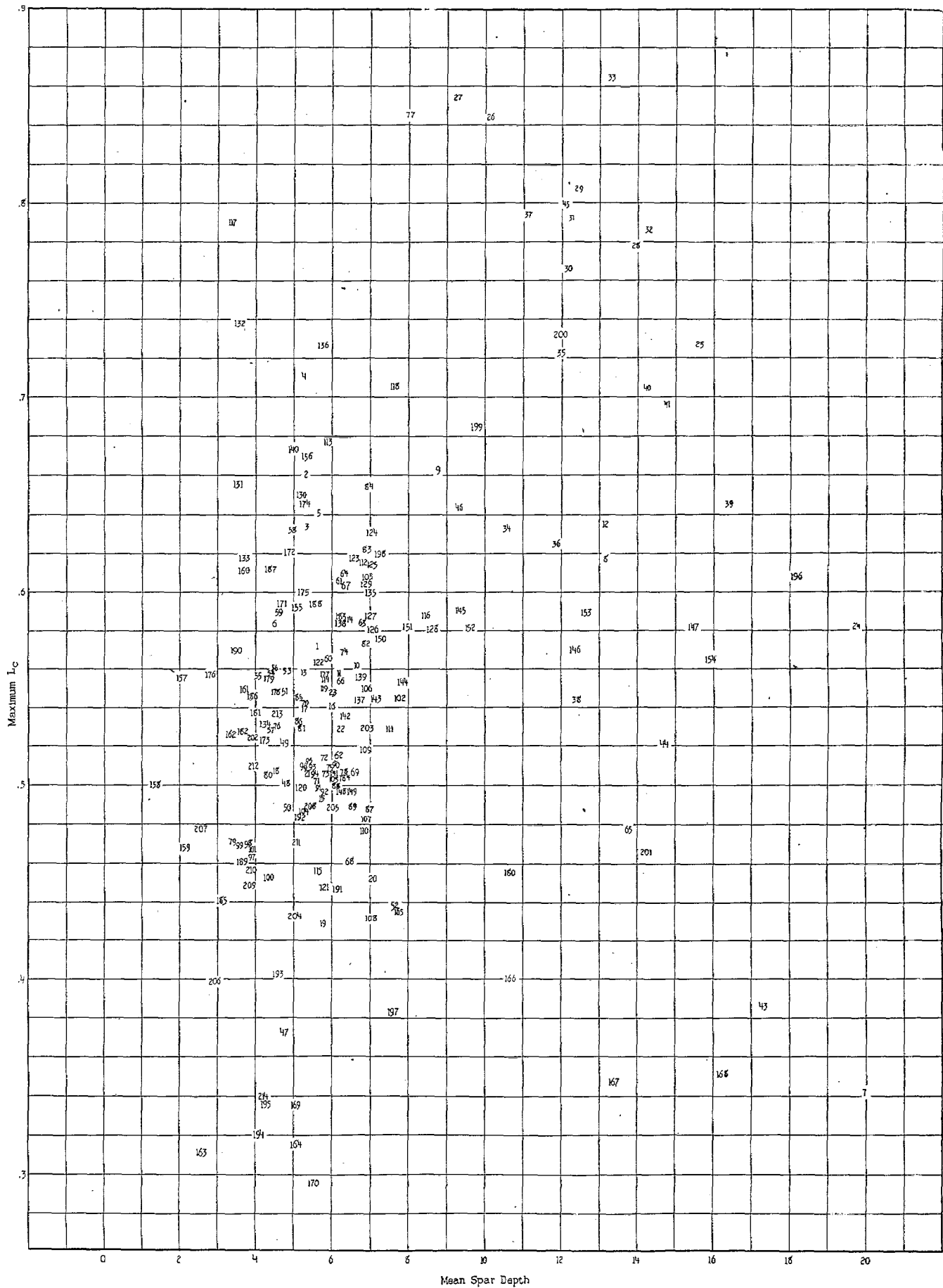


Chart No. 2.

