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TESTS OF BELL XP-63 LOW-DRAG WING MODEL

WITH SPLIT FLAP

By W. J. Underwood

Langley Memorial Aeronautical Laboratory
Langley Field, Va.

NACA

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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

MEMORANDUM REPORT

for

Materiel Division, U. S. Army Air Corps

TESTS OF BELL XP-63 LOW-DRAG WING MODEL

WITH SPLIT FLAP

By W. J. Underwood

INTRODUCTION

Tests were made on the Bell XP-63 wing root section, which is an NACA 66(2X15)-116 airfoil section, of $99\frac{1}{4}$ -inch chord and $35\frac{3}{4}$ -inch span, fitted with an 0.18c split flap hinged at approximately 0.805c on the lower surface. The model was finished smooth, sprayed with camouflage paint, and sanded lightly to remove the rough places in the paint. The tests reported herein were conducted to determine the effect of a 10° deflection of the split flap on the drag characteristics of the model at low lift coefficients. Results of previous tests of this model with the flap retracted are given in reference 1.

TESTS

The model with the split flap deflected 10° was tested in the Langley two-dimensional low-turbulence tunnel. The drag and lift characteristics were obtained for several angles of attack through a Reynolds number range from approximately 6.7 to 11.7.

RESULTS AND DISCUSSION

The results of these tests are given in figure 1. It is seen from the figure that drag coefficients are high throughout the range of lift coefficients tested. Comparing the drag curve in figure 1 with the results for the plain wing (reference 1) it is seen that the split flap produced a large increment in the drag coefficient. This

type of split flap, therefore, should not be used to increase the design lift coefficient of the airfoil because of the accompanying large increases in the profile drag.

Langley Memorial Aeronautical Laboratory
National Advisory Committee for Aeronautics
Langley Field, Va., September 19, 1941

REFERENCE

1. Quinn, John H., Jr.: Summary of Drag Characteristics of Practical-Construction Wing Sections. NACA TN No. 1151, 1947.

BELL XP-63 WING ROOT SECTION
 66, CX-118 39.5" CHORD
 SPLIT FLAP DEFLECTED
 $\delta_f = 10^\circ$

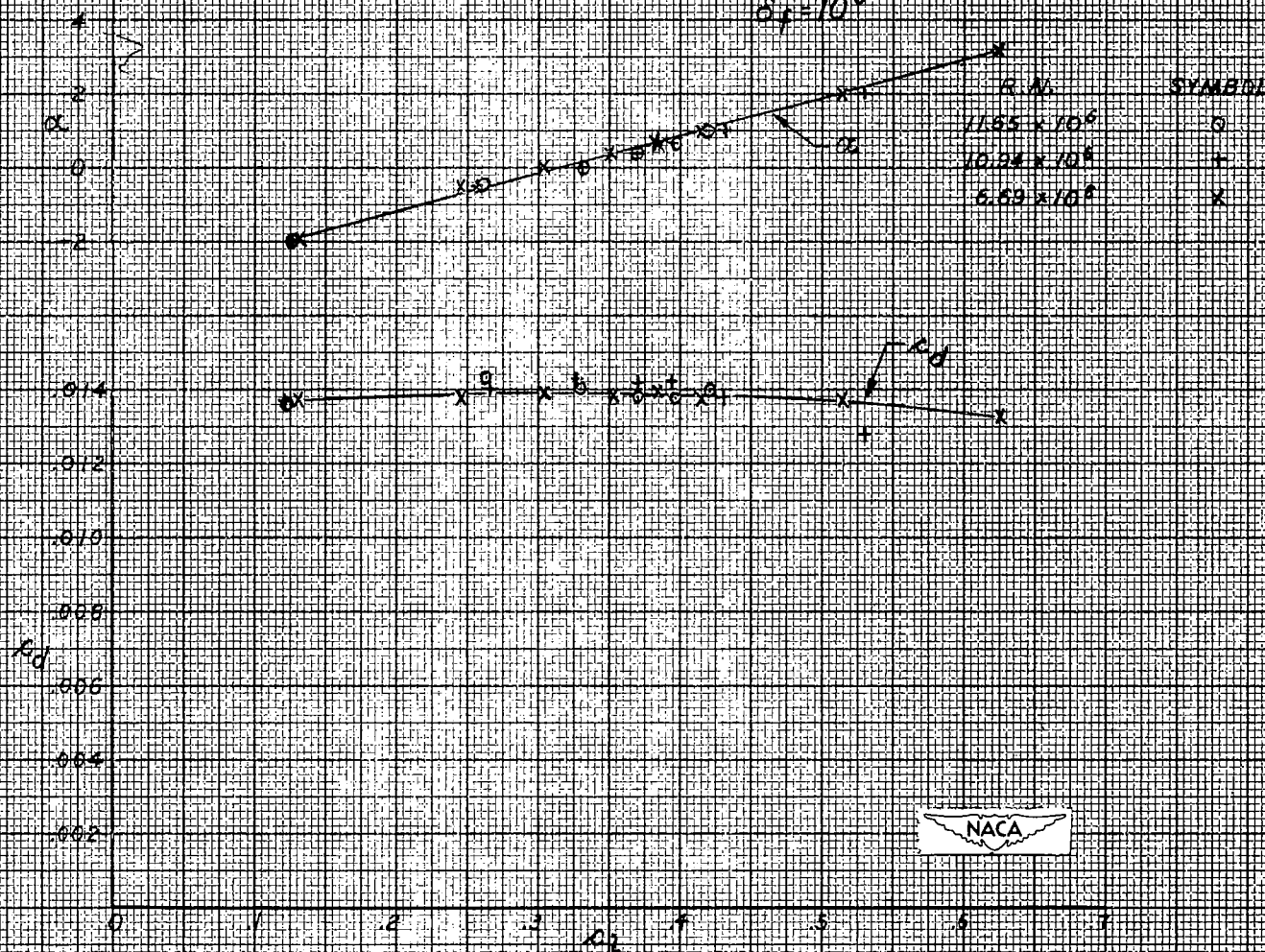


FIGURE 1.

Underwood, W. J.

DIVISION: Aerodynamics (2)
SECTION: Wings and Airfoils (6)
CROSS REFERENCES: Airfoils, Low drag (08258); Airfoils -
Split flap effect (08215)

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ABSTRACT

Tests were made on the Bell XP-63 fighter wing root section fitted with an 0.18c split flap to determine the effect of a 10° deflection of the split flap on the drag characteristics of the model at low lift coefficients. The drag and lift characteristics were obtained for several angles of attack through a Reynolds number range from 6.7 to 11.7. Results show that drag coefficients were high throughout the range of lift coefficients tested and that the split flap produced a large increment on drag coefficient.

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② $p_{1/3}$, $p_{1/1}$

②③ *wings

*Aerodynamic drag

split flaps