

MR Sept. 1941

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

# WARTIME REPORT

ORIGINALLY ISSUED

September 1941 as  
Memorandum Report

TESTS OF BELL XP-63 LOW-DRAG WING MODEL

WITH SPLIT FLAP

By W. J. Underwood

Langley Memorial Aeronautical Laboratory  
Langley Field, Va.

**FILE COPY**

To be returned to  
the files of the National  
Advisory Committee  
for Aeronautics  
Washington, D. C.



WASHINGTON

NACA WARTIME REPORTS are reprints of papers originally issued to provide rapid distribution of advance research results to an authorized group requiring them for the war effort. They were previously held under a security status but are now unclassified. Some of these reports were not technically edited. All have been reproduced without change in order to expedite general distribution.

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  $10^\circ$  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  $10^\circ$  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  
 66,2X-116 39.1" CHORD  
 SPLIT FLAP DEFLECTED  
 $\delta_f = 10^\circ$

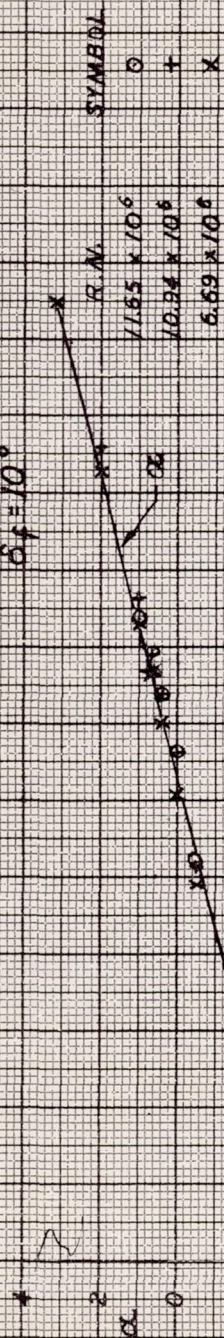


FIGURE 1