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WAR DEPARTMENT
AIR CORPS, MATERIEL DIVISION

JDA:mk1

MEMORANDUM REPORT ON

SUBJECT: Effect of Camouflage Paint on the Performance of the B-24 Series Heavy Bombardment Airplanes.

SECTION: Experimental Engineering

SERIAL No. EXP-M-51/B779-1

Date December 27, 1940

AC-12464
AC-13281
AC-16005

Contract No. 425-4-12
Expenditure Order No. 125-4-17
Purchase Order No.

A. Purpose

1. To comment on Consolidated Aircraft Report No. 34-32-002, "Estimated Effect of Camouflage Paint over Entire Airplane Surface," dated December 6, 1940, forwarded with D&DTR No. B-40-322, dated December 17, 1940.

B. Factual Data

1. The subject report claims that the addition of camouflage paint to the entire surface of the airplane will increase the equivalent parasite drag of the ship by approximately 5 per cent, thereby causing the decreases in performance listed below:

High Speed at 15,000 ft.	8 m.p.h. decrease
Range at 226 m.p.h., 15,000 ft., with 1848 gal. of fuel	120 miles decrease
Service Ceiling	600 feet decrease
Service Ceiling, 2 Engines	700 feet decrease

2. This report refers to T.H. 695, "Effects of Some Common Surface Irregularities on Wing Drag" by M. J. Hood, as the source for values of drag increments used. This report, together with N.A.C.A. Technical Report No. 667, "Determination of the Profile Drag of an Airplane Wing in Flight at High Reynolds Numbers" by J. Bicknell, was used by the Materiel Division for basic data.

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3. The main difference in the estimate by the Materiel Division from that by Consolidated lies in the assumption of the percentage of the total drag credited to skin friction. The value of 88 per cent of the parasite drag assumed by Consolidated is considered high, a value of 50 to 60 per cent being more reasonable.
4. The reduction in speed due to camouflage paint should be determined by the difference between the original finish and the camouflage paint finish. Polishing the surface of airplanes has been known to increase the speed considerably but it is not stated in the specifications that this is to be accomplished on the airplane.

C. Conclusions

1. If the airplane surface is assumed to be in a waxed and polished condition for making the performance guarantees, the decreases in the performance values as quoted in the subject report are considered to be excessive by about 20 per cent.
2. If the surface of the airplane is not polished, the application of lacquer camouflage paint will decrease the performance only slightly.

D. Recommendations It is recommended that:

1. The decreases in performance should be adjusted in accordance with paragraph C.1. or C.2.
2. Manufacturers should not be permitted to wax and polish airplanes in order to meet performance guarantees unless

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specifically stated in the specification. This is a special condition for the airplane since the Air Corps does not want service airplanes.

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Concurrence:

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