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AUTHORITY

19990305 - A/1 from E/4, Feb 24, 1999. Auth'ty: Mr J.A. Morrow, Hq AFMC/PAX, WPAFB, OH 45433

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CLASSIFICATION CHANGES

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WADC Reclassification List no. 9 dtd 20 Dec 1956

CLASSIFICATION CHANGED TO UNCLASSIFIED

LIST NO. 111

The following National Advisory Committee for Aeronautics Reports have been "Declassified" per authority of WADC Reclassification List No. 9 dated 20 December 1956.

Date DATE: 11 JANUARY 1957

Signed Richard L. Reedy
OFFICE SECURITY ADVISOR

A.T.I 16603

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NACA 1603

4. The enclosed program, proposed by the Langley 19-foot pressure tunnel staff, differs from that of the contractor in the following respects:

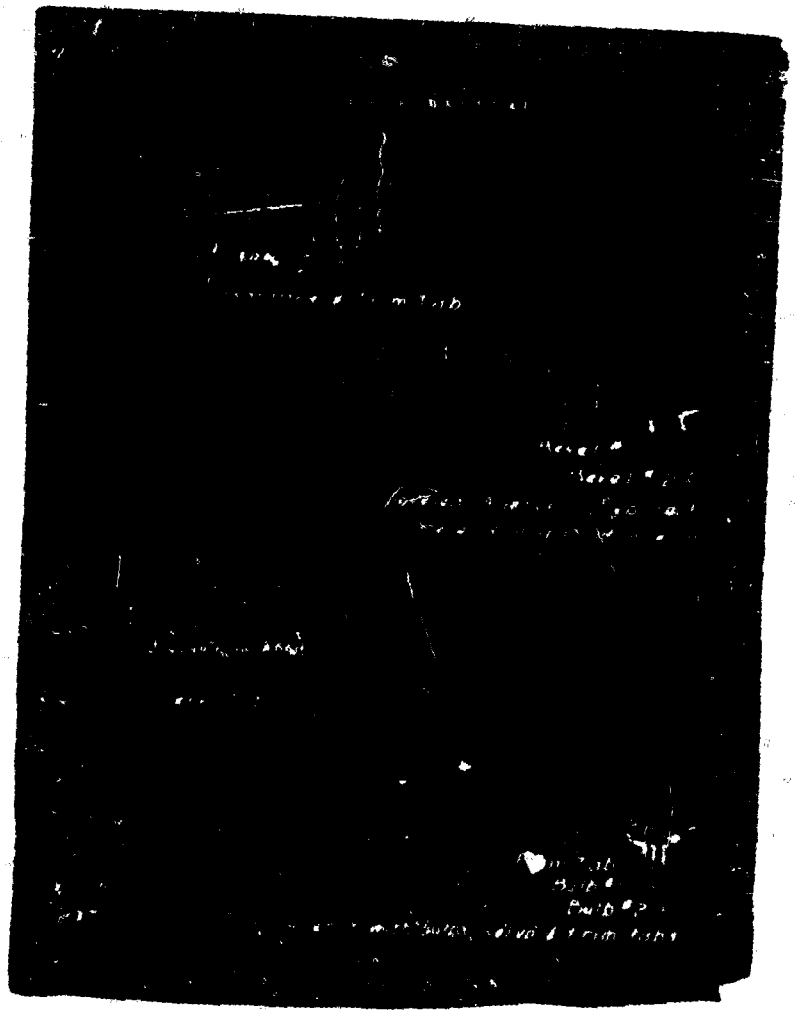
(a) Inasmuch as the contractor now agrees (reference (b)) with the conclusions of reference (a), that direct control for this airplane is impractical, no tests of direct-control configurations will be made, except insofar as necessary to provide information for determining the method of correcting the upfloating tendency of the ailerons.

(b) Detailed tests of the servo-control system will be made only of the aileron configuration to be employed on the airplane.

5. The spoiler-aileron investigation, as presented (Part IV) in the attached program, is inconclusive. Since each of the program of high-speed lateral control research in this investigation is contingent on the results of the tests as they proceed, it is not considered advisable to detail this investigation at the present time. In addition, it may be necessary to interrupt the spoiler-aileron investigation to insure that the detailed program of the servo-control system will be completed in the allotted time.

Hugh A. Dryden, Jr.
Acting Engineer-in-Charge

Enc. Test program
(4 copies)



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[illegible]

L/29- [illegible]

I. Aileron floating [illegible]
q = 100, [illegible]
δ_a = 0°, ±5°, ±6°, ±10°, ±15°, ±20°, -25°

A. Outboard slots closed, flaps 0°
1. Large bulb balance and trim tab 0°, -7°, -14°, -20°
(Tab deflections other than 0° will be tested at 3 values of q, but only if the bulb is adequate in correcting the floating tendency) trim tab 0°
2. Small bulb balance and trim tab 0° (This tab will be tested only if the large bulb is more than adequate in correcting the floating tendency).
3. Large under-surface bevel.
4. Small under-surface bevel. (This bevel will be tested only if the large bevel is more than adequate in correcting the floating tendency).
5. Plain trim tab 0°, -7°, -14°, -20°.
6. Plain balance and trim tab 0°, -7°, -14°, -20°. (This tab will be tested at 3 values of q, but only if the large bulb balance and trim tab is tested at deflections other than 0°)

B. Outboard slots open, single-slotted flaps 40°, double-slotted flaps 50°.
1. Large bulb balance and trim tab 0°, -7°, -14°, -20°.
(Tests of this tab will be made only if the tab is adequate in correcting the floating tendency flaps neutral, tab deflections other than 0° will be tested at 3 q's).
2. Small balance tab 0°. (Tests of this tab will be made only if the large bulb is more than adequate in correcting the floating tendency).
3. Large under-surface bevel. (Tests will be made only if the large bevel is adequate in correcting the floating tendency flaps neutral).
4. Small under-surface bevel. (Tests will be made if the large bevel is more than adequate in correcting the floating tendency).
5. Plain trim tab 0°, -7°, -14°, -20°.
6. Plain balance and trim tab 0°, -7°, -14°, -20°. (This tab will be tested at 3 values of q, but only if tests of the large bulb-tab deflections are made, flaps deflected).

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11. Servo aileron control trim variation
[illegible]
for δ_t = 0, δ_a = 0°, ±1°, ±2°, ±10°, ±15°, ±20°, ±25°
for α_t = +, δ_a = 0°, ±1°, ±2°, ±10°, +15°, +20°, +25°
for α_t = -, δ_a = 0°, ±1°, ±2°, ±10°, +15°, +20°

The aileron and tab deflections to be tested here will be determined on the basis of tests in [illegible]. Any conclusions as the model will be based on the tests [illegible] and [illegible] are being conducted.

a. Standard slots closed, flaps 0°,
1. servo tab 0°, ±5°, ±10°, ±15°, ±20°, ±25°

b. Standard slots closed, [illegible]-retracted flaps 10°
1. servo tab 0°,
(Servo tab deflections other than 0° will be tested only if a large change in the aileron characteristics from servo tab 0°, results from deflecting the flap).

c. Standard slots closed, flaps 0°, transition flaps at the leading edge.
1. servo tab 0°,

2a. Standard slots closed, flaps 0° servo tab sealed.
1. servo tab 0°, ±5°, ±10°.

2a. Standard slots open, single-slotted flaps 10°.
1. servo tab 0°, ±5°, ±10°, ±15°, ±20°.

2. Standard slots open, double-slotted flaps 10°, single-slotted flaps 0° and 10°.
1. servo tab 0°.
(As in (a) deflections other than 0° will be tested only if a large change in the aileron characteristics, servo tab 0°, results from deflecting the flap deflection of type of flap.

3. Standard slots open, single-slotted flaps 10°, transition flaps at leading edge.
1. servo tab 0°.

4. Standard slots open, single-slotted flaps 10° servo tab sealed.
1. servo tab 0°, ±5°, ±10°.
(This condition will be tested only if a large change in the aileron characteristics results from sealing the servo tab flaps neutral).

III. Flap effectiveness, aside irons, tail tunics.

Flap effect tunnel and stall studies (= 130.
Aside effect = 30, 60, 120.
a, ab, three-quarter lift.
Lower lip extension, extended, except as noted.

A. Aside effect and stall studies.
1. Aileron slots closed.
a. Plain 60°
b. Single-slotted flaps 40°
c. Double-slotted flaps 40°
2. Aileron slots open.
a. Plain 60°
b. Single-slotted flaps 20°, 40°
c. Double-slotted flaps 20°, 30°, and 40°
3. Spoiler configuration (tests in accordance with the final configuration)
a. Full-span double-slotted flaps 0°, 20° and 40°

B. Flap effectiveness.
1. Aileron slots open.
a. Double-slotted flaps 40° and 60°.
2. Aileron configuration (tests in accordance with the final configuration).
a. Full-span flaps 20°, 40°, and 60°.
3. Aileron slots open lower lip extension retracted.
a. Double-slotted flaps 20°, 30°, 40°, 50°, and 60°.

IV. Aileron theory control characteristics
q = 40 lbs. f.s.
δ_a = 0°, -5°, -9°, -15°, -25°, -35°, -50.0°

A. With full-span aileron, no gap-seals, no vent, no beveled lower side.
1. Flaps 0°
a. Comparisons of aileron and aside effectiveness to be obtained later.

B. With partial-span aileron (two outboard segments deleted) no vent, no beveled lower side.
1. Flaps 0°
a. Combinations of aileron and aside effectiveness to be obtained later.

If these tests are sufficient to indicate the desirability of eliminating the outboard segments ahead of the aileron, the remainder of the aileron investigation will be confined with these segments deleted.

If these tests are not conclusive, they will be [illegible] and the decision will then be made.

[illegible] on full-scale operation, no vent, no [illegible], no [illegible] layer slab.

b. Fin [illegible]

a. [illegible] of spoiler and grids wherein [illegible] to be determined later.

In particular, equipped a pressure vent, no pressurization, no [illegible] layer slab.

b. Fins [illegible]

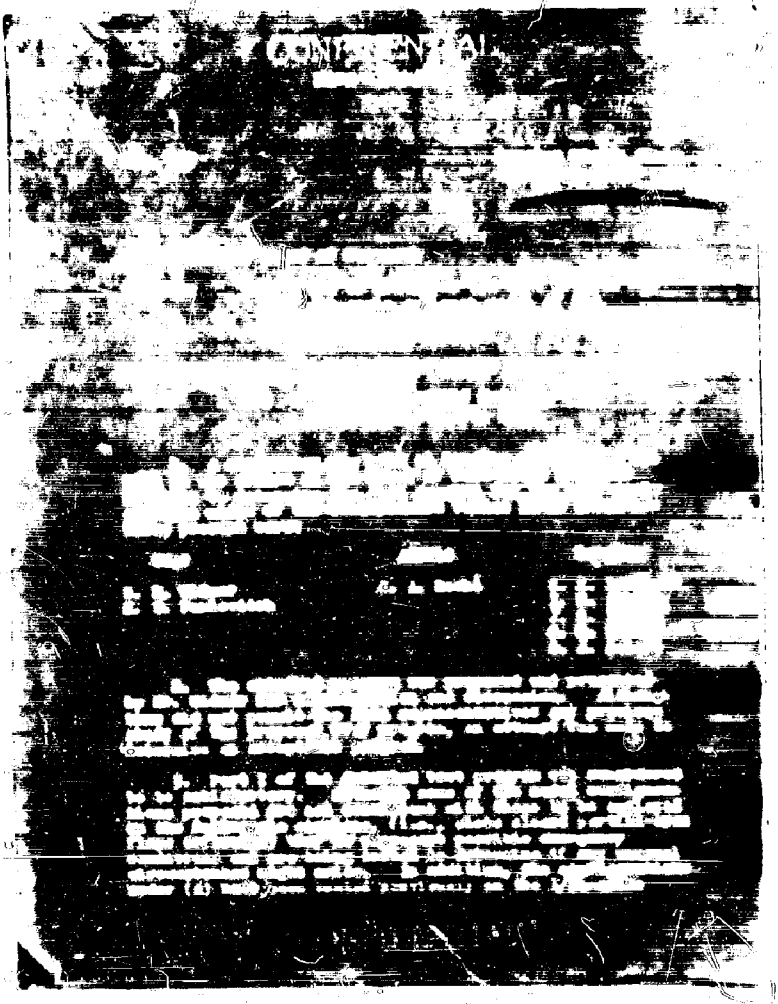
a. [illegible] of spoiler and grids wherein [illegible] to be determined later.

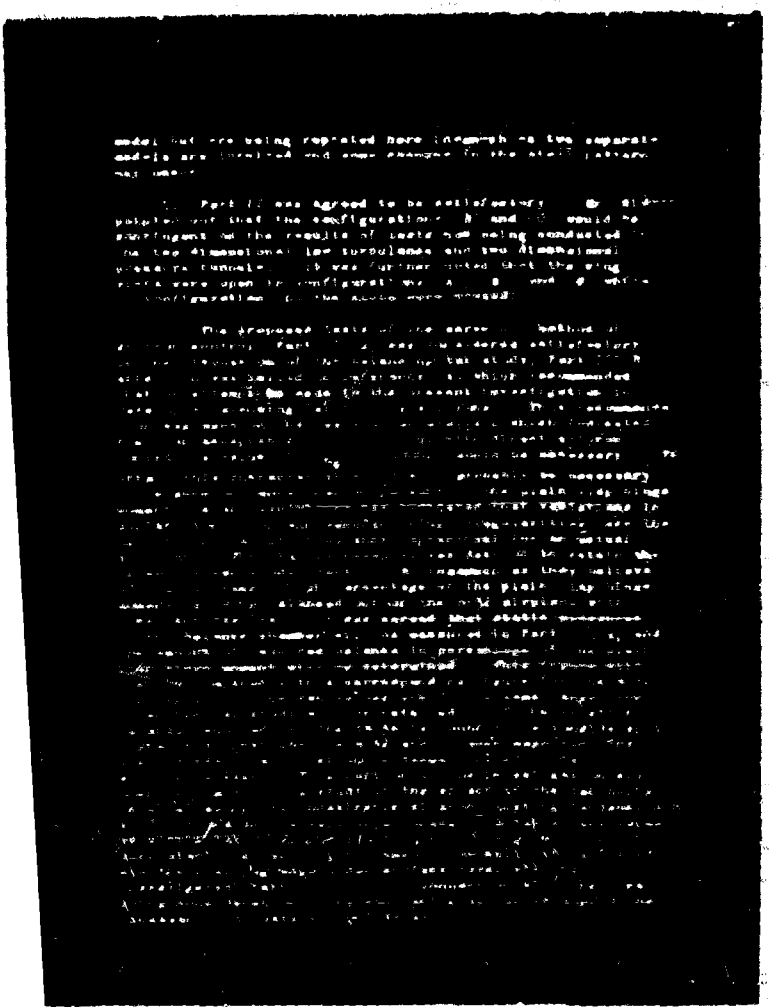
c. Fin particular equipped a 25 vent vent, no pressurization.

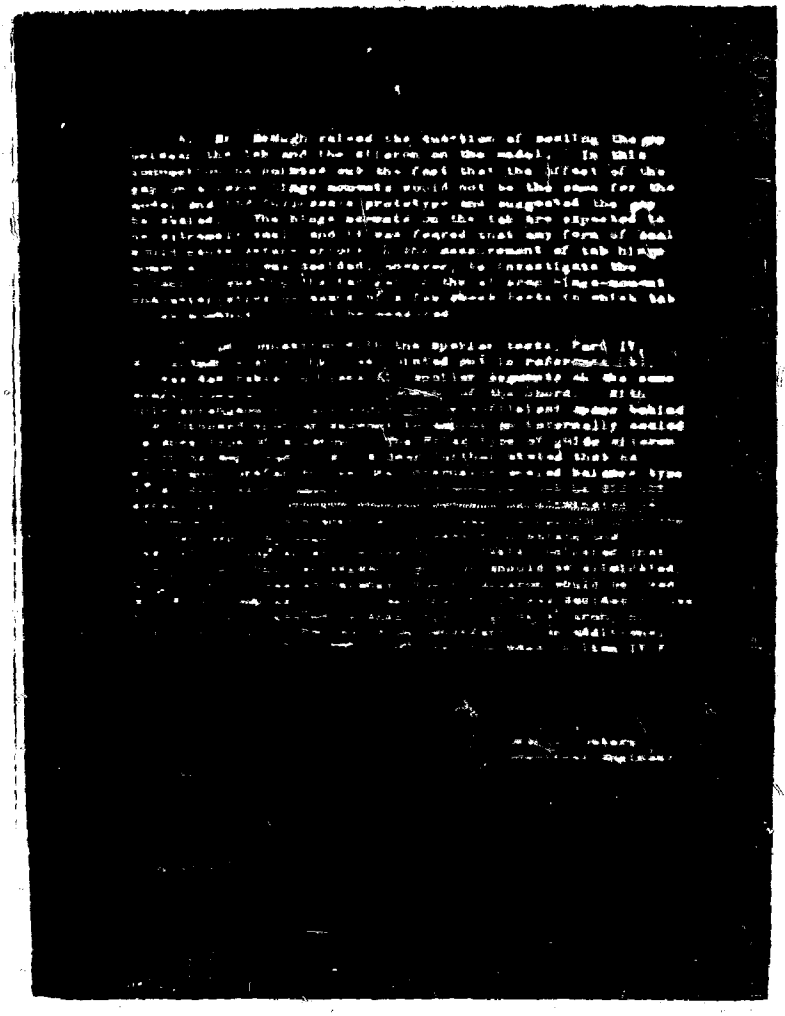
b. Fins [illegible]

a. [illegible] of spoiler and grids wherein [illegible] to be determined later.

Since the tests of the 2 percent vent show a considerable improvement over the 1 percent vent, the first configuration considered with a 2 percent vent will not be tested.







PREPARED BY
CHECKED BY
REVISED BY

Consolidated Vultee Aircraft Corporation
FORT WORTH DIVISION
FORT WORTH, TEXAS

REPORT NO.
MODEL
DATE

TEST PROGRAM

A/[illegible] SEMI-SPAN XB-36 WING MODEL

[illegible]DOT PRESSURE TUNNEL - LANGLEY FIELD

Proposed Series of Tests

1. Scale effect and stall studies (sketches and motion pictures)
2. Flap effectiveness
3. Aileron effectiveness and hinge moments
4. Tab effectiveness and hinge moments
5. Spoiler effectiveness and hinge moments

Detailed Test Program

I. Scale Effect and Stall Studies

A. [illegible]

1. Single slotted flaps 0°,20°,40°
2. Double slotted flaps 0°,20°,30°,40°

B. Plain Flaps

1. Single slotted flaps 0°,40°
2. Double slotted flaps 40°
3. Full span double slotted flaps 0°,20°-60°,40°-60° (up-flap vent 1%)

II. [illegible]

A. Single slotted flaps 0°,20°,40°

B. Double slotted flaps 20°,30°,40°,50°,60°

C. Double slotted flaps less lower lip extension 20°,30°

D. Full span double slotted flaps 20°-60°,30°-60°,40°-60°

BY
BY
BY

[illegible]

[illegible] tab effectiveness [illegible]

[illegible] balance, [illegible]

A. [illegible] Tab Aileron, [illegible] edge cusp

1. Slots closed

(a) Flaps 0°

2. Slots open

(a) Single slotted flaps [illegible]

(b) Double slotted flaps 0°

B. [illegible] Tab Aileron, [illegible] cusp

1. Normal balancing tab

(a) Slots closed

(1) Single slotted flaps [illegible]

(b) Slots open

(1) Single slotted flaps [illegible]

2. Small balancing [illegible] tab

(a) Slots closed

(1) Single slotted flaps [illegible]

(b) Slots open

(1) Single slotted flaps 0°, 40°

3. [illegible] balancing tab

(a) Slots closed

(1) Single slotted flaps [illegible]

(b) Slots open

(1) Single slotted flaps [illegible]

Consolidated Vultee Aircraft Corporation
FORT WORTH DIVISION
FORT WORTH, TEXAS

TEST PROGRAM (cont'd)

III. Aileron and Tab Effectiveness and Hinge Moments, Sub Sonic, Mach Numbers [illegible] (cont'd)

C. Beveled trailing edge aileron in tabs

1. Small trailing edge bevel

(a) Slots closed

(1) Single slotted flaps 0°

(b) Slots open

(1) Single slotted flaps 0°

2. Large trailing edge bevel

(a) Slots closed

(1) Single slotted flaps 0°

(b) Slots open

(1) Single slotted flaps 0°

IV. Aileron Tab Custom Round with Double Action Tabs

A. [illegible]

1. Flaps 0°-0°

Complete range of ailerons and guide aileron deflections

2. Flaps 0°-0°

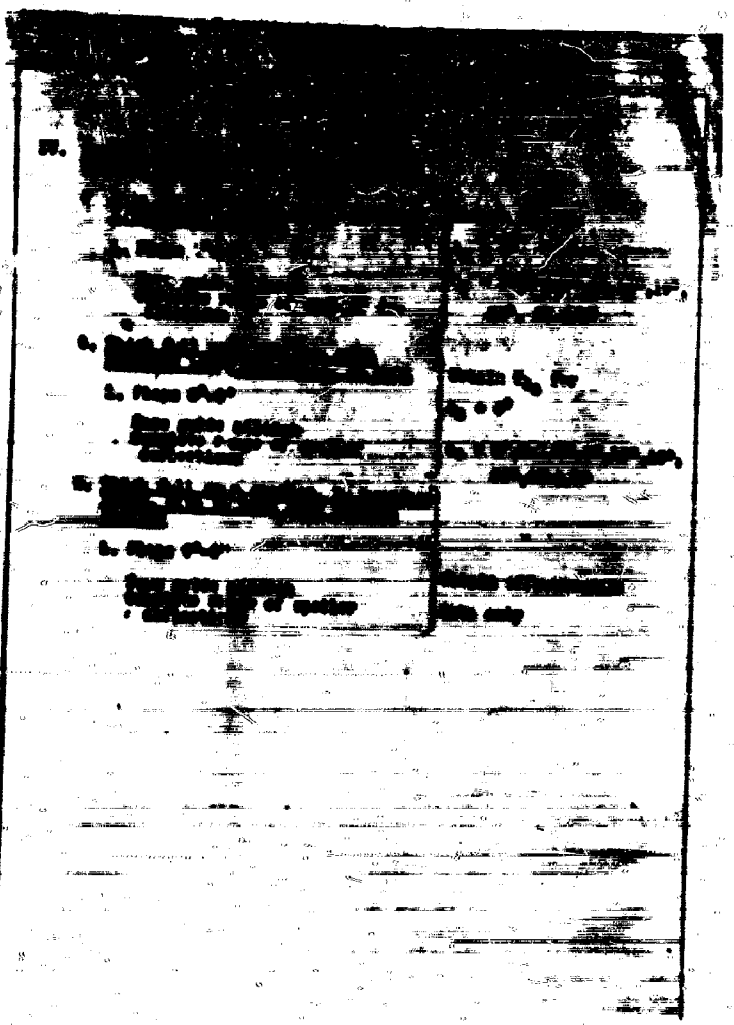
Complete range of ailerons and guide aileron deflections

3. Flaps 0°-0°

Complete range of ailerons and guide aileron deflections

4. Flaps 0°-0°

Complete range of ailerons and guide aileron deflections



CLASSIFICATION CHANGED TO UNCLASSIFIED

LIST NO. 11Y

The following National Advisory Committee for Aeronautics Reports have been "Declassified" per authority of WADC Reclassification List No. 9 dated 20 December 1956.

Date DATE: 11 JANUARY 1957 Signed Richard L. Reedy

OFFICE SECURITY ADVISOR

A.T.I 16603

UNCLASSIFIED

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ATI- 16603

TITLE: Conference to Determine the Test Program for the 4/29-Scale Semispan Model of the Consolidated Vultee XB-36 Airplane in the 19-Foot Pressure Tunnel

AUTHOR(S) : (Not known)

ORIG. AGENCY : Langley Aeronautical Laboratory, Langley Air Force Base, Va..

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ABSTRACT:

A discussion is presented on a test program for the XB-36 bomber including scale effect and stall studies, flap effectiveness and the servo tab method of aileron control. These parts of the program were agreed to be satisfactory. A possible revision of the balancing tab study was considered, but limited to a study of the effect of tab bulbs in eliminating the undesirable aileron floating tendency. In connection with spoiler tests the desirability of placing all spoiler segments on the same shaft was stressed.

DISTRIBUTION: SPECIAL. All requests for copies must be addressed to Publishing Agency.

DIVISION: Wind Tunnels (17)
SECTION: Testing (4)

ATI SHEET NO.:

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AIR TECHNICAL INDEX
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26

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10/10

(23) *wind tunnel tests
*bomber aircraft
(25) XB-36 aircraft