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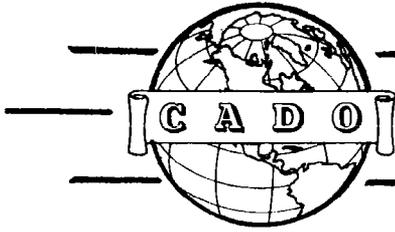
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NORTH AMERICAN AVIATION INC

FLIGHT TEST PROGRAM
FOR A
JET PROPELLED HIGH PERFORMANCE
MEDIUM BOMBARDMENT AIRPLANE
A.A.F. MODEL XB-45
(N.A.A. MODEL NO. NA-130)
CONTRACT NO. W33-038 AC-5126



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File No. _____

Report No. **NA-8641**

NORTH AMERICAN AVIATION, INC.
INGLEWOOD, CALIF.

ENGINEERING DEPARTMENT

FLIGHT TEST PROGRAM

FOR A

JET PROPELLED HIGH PERFORMANCE

MEDIUM BOMBARDMENT AIRPLANE

A.A.F. MODEL XB-45

(N.A.A. MODEL NO. NA-130)

CONTRACT NO. W33-038 AC-5126

PREPARED BY

**Power Plant, Structures and
Technical Sections**

APPROVED BY

R. H. Rice

R. H. Rice

REVISIONS

No. of Pages **5**

Date **July 24, 1945**

DATE	REV. BY	PAGES AFFECTED	REMARKS
8-9-45	EJH	2, 4	
"	"	5	Added
8-1-46	W.H.P.	All (8)	Revised in entirety to include subsequent detailed changes in test specifications.

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PREPARED BY: R.S.J.	NORTH AMERICAN AVIATION, INC. INGLEWOOD, CALIFORNIA	PAGE NO. 1 OF 8
CHECKED BY: G.R.M.		REPORT NO. NA-8641
DATE: 8-1-46	DEMONSTRATION FLIGHT TEST PROGRAM	MODEL NO. XB-45

INTRODUCTION

Minimum contractual requirements for Phase I flight tests of the AAF XB-45 airplane are specified herein. Originally published on 24 July 1945 as North American Aviation Engineering Report No. NA-8641, this specification has been rewritten in its entirety and republished to include subsequent changes in test requirements on 1 August 1946.

Inspection of the airplane and its approval for flight test by the Air Materiel Command is prerequisite to initiation of the program.

Phase I tests as outlined in this specification are defined under the following classifications:

- Part I Ground Tests
- Part II Initial Flights
- Part III Preliminary Flight Tests
- Part IV Final Compliance Tests

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NORTH AMERICAN AVIATION, INC., LOS ANGELES, CALIF. (REPORT NO. NA-8641)

FLIGHT TEST PROGRAM FOR A JET PROPELLED HIGH PERFORMANCE MEDIUM BOMBARDMENT AIRPLANE - A.A.F. MODEL XB-45 - NAA MODEL NO. NA-130

P.H. RICE (APPROVER) 24 JULY 1945 - REVISED - 1 AUG 1946 BRP

USAF CONTR. NO. W33-038-AC-5126

FLIGHT TESTING (13)
SPECIFICATIONS AND
REQUIREMENTS (1)

FLIGHT TESTING - PROGRAMS
AIRPLANES, JET BOMBER
B-45

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PHASE ONE

I - Ground Tests

A. Weight

Determination of final weight and C.G. location.

B. Structures

1. Control system check.

- a. Measure surface deflections.
- b. Determine system efficiencies.
- c. Determine torsional and bending stiffness
- d. Vibration and flutter check of controls with and without boost.

2. Doors

- a. Check operation alighting gear, bomb bay and nose wheel doors.
- b. Check canopy operation, all exit and entrance doors.
- c. Proof load doors and operating mechanisms.
- d. Measure door deflections.

3. Cabins

- a. Proof load by internal pressure main and tail cabins.
- b. Measure structure deflection.
- c. Take strain measurements where necessary.

4. Wing

- a. Determine torsional stiffness

5. Fuselage

- a. Determine rear end section, torsional normal and side bending stiffness.

6. Strain Gage

- a. Static loading wings, bomb bay and empennage to calibrate strain gages installed throughout structure.

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I - Ground Tests (Cont'd)

C. Power Plant

1. Check engine installation, controls, fuel and oil systems.
2. Functional starts and stops on individual units.
3. Individual unit operation in each nacelle and measurement of critical temperatures.
4. Double unit operation in each nacelle and check on critical cooling temperatures.
5. Fuel system operation to all units.
6. Emergency system fuel operation.
7. Ground thrust measurements.
8. Functional check of engine accessories.
9. Measurement of CO at crew stations.

D. Conditioning and Pressurization Units

1. Ground functional tests of cabin conditioning units.
2. Functional operation of cabin pressurization.
3. Wing and tail de-icing system operation.

E. Hydraulic

1. Functional ground check of booster control mechanisms.
2. Flap controls.
3. Brakes and braking system.
4. Bomb bay doors.
5. Wheel and wheel door operation.

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I - Ground Tests (Cont'd)

F. Electrical and Radio

1. Ground functional tests of generators electrical controls and instruments.
2. Radio communication and noise checks.
3. Ground functional tests of any telemetering equipment.
4. Functional test of all electric automatic recording equipment, oscillographs, pyrometers etc.

G. Photo Recorders and Allied equipment

Functional tests will be made on all photo recorder equipment and allied instruments.

H. Taxi Tests

1. Slow speed taxi smooth surface.
2. High speed taxi smooth surface.
3. Crosswind taxi, turning and parking.

Checks will be made of the following during the above taxi tests.

- a. Brakes and braking system.
- b. Steering mechanisms.
- c. Hydraulic struts.
- d. Vibration and shimmy damper.
- e. CO content at crew stations.
- f. Power plant functioning and cooling.
4. High speed taxi, handling and nose wheel lift off.

Functional checks on the following:

- a. Brakes and system.
- b. Nose wheel shimmy.
- c. Controls.
- d. Engines

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II - Initial Flight

- A. General Handling Qualities and Controllability
- B. Preliminary Stall Tests
- C. Critical Temperature Checks.
- D. General Power Plant Installation Tests.
- E. Carbon Monoxide Tests

III - Preliminary Flight Tests

- A. Preliminary Functional Checks
 - 1. Functional check on all controls.
 - 2. Test gear, wheels, flaps and bomb bay.
 - 3. Power plant.
 - 4. All equipment essential for flight.
 - 5. Partial unit operation in flight.
- B. Calibration Flight
 - 1. Airspeed position error calibration
 - 2. Altitude error calibration.
 - 3. Free air temperature calibration.
- C. Stalling Characteristics
 - 1. Determination of stalling speeds.
 - 2. Maximum lift coefficient.
- D. Qualitative Check on Stability and Control

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III - Preliminary Flight Tests (Cont'd)

1. Static longitudinal stability
Sufficient data to establish unaccelerated flight neutral C.G. position.
 2. Dynamic stability short period.
 - a. Dynamic longitudinal stability
 - b. Dynamic lateral stability
 - c. Dynamic directional stability
 3. Accelerated stability
Sufficient data to establish accelerated flight neutral C.G. position.
 4. Longitudinal trim effect
 5. Aileron effectiveness
 6. Directional and lateral
 - a. Directional and lateral control and stability characteristics for normal operation.
 - b. Directional and lateral control and stability characteristics with asymmetric power.
 7. Effectiveness of trim tab devices.
- E. Preliminary Power Plant Installation Tests
1. Thrust calibrations.
 2. Cabin conditioning.
 3. Heating systems
- F. Preliminary Performance Tests
1. Level flight cruise
 2. Climb performance
 3. High speed

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III - Preliminary Flight Tests (Cont'd)

G. Preliminary Landing and Take-Off Tests

1. Take-off and landing runs.
2. Longitudinal and lateral control effectiveness.
3. Cooling and functional checks on power plant.
4. Acceleration and stress measurements.

H. Preliminary Structural Demonstration

Dives and accelerations at design gross weight condition (82,600 lbs.) provided they are not limited by stability and control characteristics or excessive stresses.

1. Dive to a Mach number of 0.75 at an indicated airspeed optional with the contractor.
2. Dive to an equivalent airspeed ($V_t \times \sigma^{1/2}$) of 500 mph at Mach number optional with contractor.
3. At a speed not in excess of maximum level flight speed at 7,000 ft. obtain accelerations in steady turns at 1.5, 2, and 2.5 load factors and in abrupt pull-ups 2.5 and pushovers -0.5 load factors.
4. Roll tests at several speeds up to and including maximum level flight speed at 7,000 ft.

I. Flight Tests required by Contractor to Correct Deficiencies in the above Preliminary Flight Tests

IV - Final Compliance Tests

- A. Obtain sufficient data to show degree of compliance with all applicable stability and control requirements of Spec. R-1815A.
- B. Obtain sufficient data to show degree of compliance with applicable power plant requirements.
- C. Obtain sufficient data to show degree of compliance with the contractual performance guarantees.

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IV - Final Compliance Tests (Cont'd)

D. In a structural integrity flight demonstration, it shall be shown that the airplane at the design gross weight condition of 82,600 pounds can withstand the following tests provided stability and control characteristics do not prevent such tests:

1. A positive three (3.0) G pull-up at the minimum speed at which the acceleration can be obtained at not less than 7,000 ft.
2. A positive three (3.0) G pull-up at the maximum level flight high speed at not less than 7,000 ft.
3. A positive two and five hundredths (2.05) G pull-up at 7,000 ft. at a speed which corresponds to a Mach number of 0.8.
4. A negative one and one-half (1.5) G push-over at a speed which is not less than maximum level flight speed at an attitude not less than 7,000 ft.

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FLIGHT TESTING - PROGRAMS
AIRPLANES, JET BOMBER,
B-45

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DEPARTMENT OF THE AIR FORCE
WASHINGTON, DC

Office of the Secretary

24 June 2002

MEMORANDUM FOR: DTIC/DOD

FROM: SAF/PAS
1690 Air Force Pentagon
Washington DC 20330-1690

SUBJECT: Technical Report - Flight Test Program for a Jet Propelled High Performance

The subject information has been reviewed by:

- () The Department of Defense and is cleared for public release.
- () The Department of Defense and is cleared, as amended, for public release.
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