

CASE HISTORY OF THE XB-43 AIRPLANE

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THE XB-43 IS A LIGHT BOMBARDMENT TYPE AIRPLANE powered by two TG-180 (J35) turbo-jet engines. It was designed to have the following characteristics: wing span of 71 feet, 2 inches; length of 51 feet, 4 inches; design gross weight of 40,000 pounds; maximum speed of 503 mph at sea level and 453 mph at 35,000 feet; and range of 1,440 miles with bomb load of 8,000 pounds at 420 mph and 40,000 feet altitude.

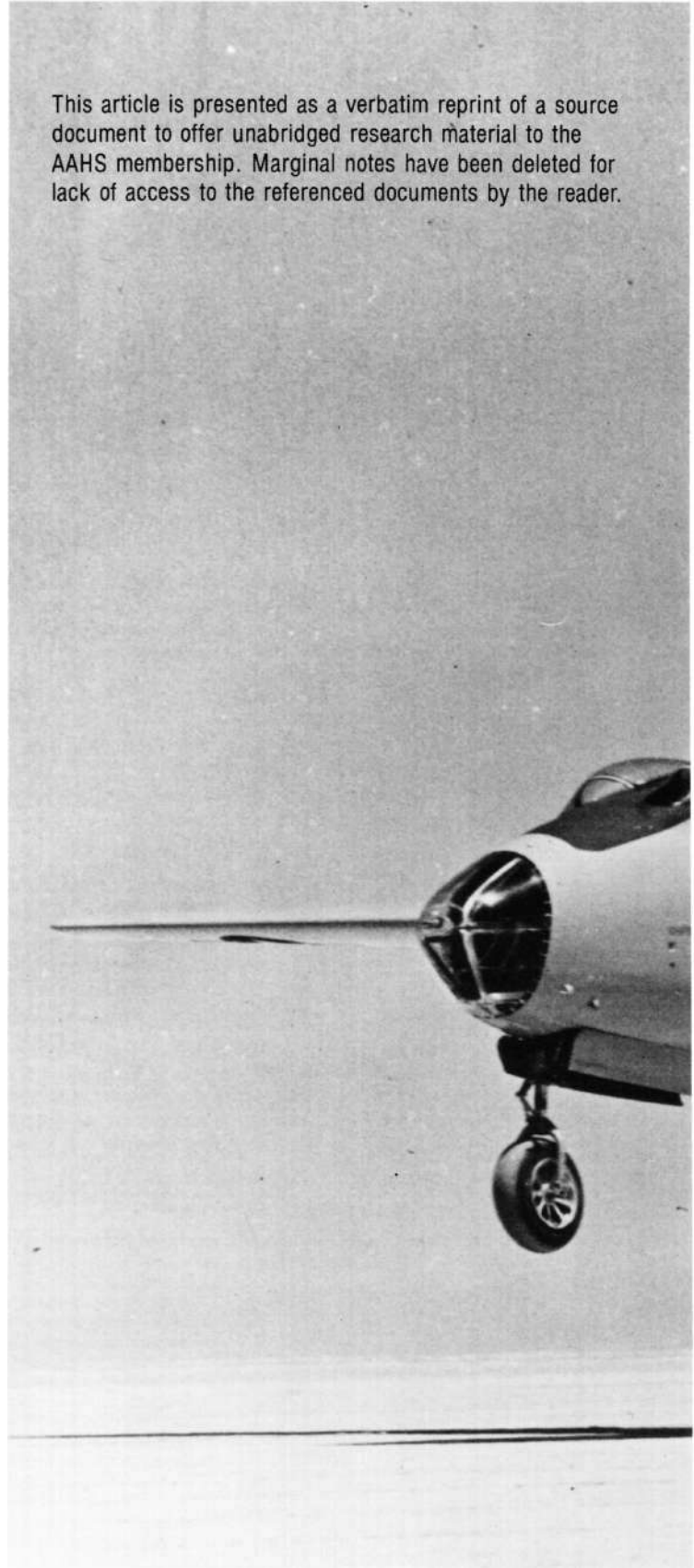
Documents in this case history cover the period from 25 July 1943 to 17 May 1948 and were obtained from the files of Air Materiel Command, Wright Field, and Headquarters, U.S. Air Force, Washington, D.C.

Introduction—The XB-43 light bombardment airplane, the first American bomber designed for turbo-jet engines, had the same appearance and structural design as the XB-42 conventional airplane except for the absence of the dual-rotating propeller at the rear of the empennage. The two General Electric-designed TG-80 (J35) turbo-jet propulsion engines located within the fuselage much in the same manner as the conventional engines of the XB-42 were to supply 8,000 pounds of thrust.* This airplane was of all-metal construction, mid-wing monoplane type, and was provided with pressurized cabin and sliding bug-eye canopy which could be jettisoned for exit after belly landing.

Like its predecessor, the XB-42, this airplane folded its wheels into wells in the side of the fuselage. * With the design bomb load of 8,000 pounds at an altitude of 40,700 feet and design gross weight of 40,000 pounds, the guaranteed average speed was to be 420 mph with a range of 1,445 miles. When the alternate load of 2,000 pounds of bombs was carried at the same bombing altitude and at 420 miles per hour, it was estimated that the range would be increased to 2,370

*"The XB-43—America's First Double Jet Bomber," *Douglas Airview*, dated June 1946, filed Library Section, Air Documents Division, AMC.

This article is presented as a verbatim reprint of a source document to offer unabridged research material to the AAHS membership. Marginal notes have been deleted for lack of access to the referenced documents by the reader.



Ship No. 1 seen landing at Muroc. The main gear doors appear to be missing. Flown by Douglas test pilots for nine hours, it was accepted by the Air Force Flight Test Division on 20 February 1947. After a landing accident on 1 February 1951 it was grounded and cannibalized for parts to keep the second prototype flying. (G.H. Balzer Collection)





The long, complex main gear of the XB-43 folding aft into the sides of the short fuselage caused critical center-of-gravity problems.

(R.E. Williams Collection)

The first XB-43 prototype was a reworked XB-42 structural test article. Here the fuselage, bearing the optimistic "Tokyo Express," is being moved to the wing-joining station.

(R.E. Williams Collection)

XA-42 airplane (model designation changed to XB-42 bombardment type on 26 November 1943). Engineering Division explained to Douglas Aircraft that it was anticipated that the static test articles of the XB-42 could be used for installation of jet engines in the event that the studies indicated that a satisfactory airplane would result. It was agreed that as many parts and as much material as possible from the static test XB-42 would be reworked and used in building the first prototype of Model 466 (XB-43). By November 1943 the decision had been made to install the General Electric axial flow jet propulsion TG-180 (J35) engine in this aircraft.

It was agreed early in the program that for the two XB-43 models only those assemblies and installations essential to flight to prove the functional practicability of the unconventional features with respect to their effect on performance, vibration characteristics, etc., would be included. To expedite the construction of these airplanes, the bomb rack installation, bomb sight and bomb release controls, life raft and similar incidental equipment were to be engineered and mocked up only for later installation if desired by Air Materiel Command. Since these models were designed and built on an experimental basis, strict interchangeability of parts was not maintained.

In December 1943, Development Engineering Branch, Materiel Division, Washington, approved the plan suggested by Materiel Command, Wright Field, to negotiate for installing TG-180 (J35) turbo-jet propulsion engines in the XA-42 (XB-42) static test article, and for procuring one additional flight article of that design. Materiel Division believed this project to be "in line with the general jet-propelled airplane program approved by these Headquarters." By the spring of 1944 the AAF Board had recommended the early development and production of jet-propelled bombers as one of the best possibilities for future defense against hostile jet fighters. Requirements Division of Office of Commitments and Requirements, Washington, stated that "this office wishes to go on record as favoring emphasis of the highest possible degree being placed on jet propulsion for our future bombardment aircraft. It is felt that we cannot obtain bombers of this type too soon." Instructions were issued to Materiel Command, Wright Field, that development of jet-propelled aircraft had proved so promising for fighter aircraft that a program adaptable to bombardment types should be accelerated. Suitable aircraft manufacturers were to be encouraged to submit bids for jet-propelled bomber aircraft on phase contracts in a manner whereby the Army Air Forces could terminate the development of a project upon completion of any one phase. Also aircraft manufacturers were to be encouraged to modify any existing airplane utilizing the latest developments in power plants which would produce a production article

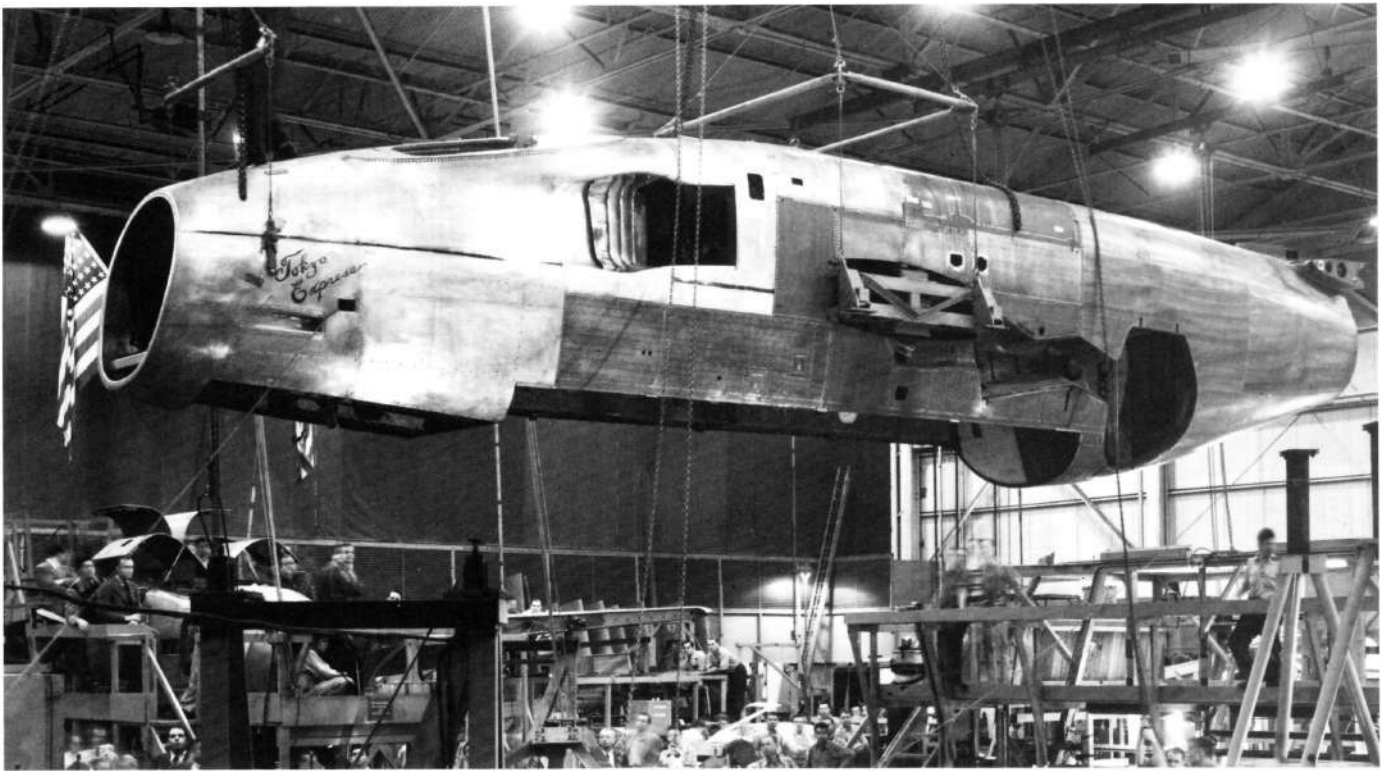
miles. Provision was made for a crew of three, with pilot and relief pilot situated in the nose, and the navigator-bombardier located in the forward well. No provision was made for armament installations.

Development of this aircraft may be attributed to the efforts of Douglas Aircraft Company, Santa Monica, California, and the cooperation of Air Materiel Command engineers. "Among Wright Field personnel who figured greatly in the successful production of the bomber were Col. Donald A. Putt, now heading AMC's Air Intelligence, and H. Allan Sullivan, civilian project engineer. Colonel Putt, while still attached to the bombardment section of the field's engineering division, is credited with the initiation of the project more than three years ago.*

As early as September 1943 instructions were issued to Engineering Division, Wright Field, by Materiel Division, Washington, that studies should be initiated for experimental airplanes incorporating one or more TG-180 (J35) turbo-jet propulsion engines. However, the Aircraft Laboratory, Wright Field, stated that several studies had already been completed covering aircraft powered with one, two or four of these engines and that reliable aircraft manufacturers were to submit preliminary designs in order that Materiel Command, Wright Field, might evaluate their possibilities.

Engineering Development—At a conference held with Douglas Aircraft Company and Materiel Command representatives in October 1943, TG-180 and I-40 turbo-jet propulsion engine design information was given to that company with a request that they submit a proposal covering installation of one of these engines in the attack bombardment

*Dayton Daily News, 13 May 1947.



capable of meeting the existing military characteristics. CTI-1781, Addendum 1, dated 15 August 1944, initiated action for this program.

Many of the early engineering problems of the engine may be attributed to the fact that the TG-180 (J35) engine was also in an early developmental stage. Although Power Plant Laboratory, Wright Field, and General Electric engineers worked in close contact with Douglas Aircraft, many engine delivery delays and engineering difficulties were encountered. When the first TG-180 engine was delivered to Douglas in December 1944 the airplane contractor found numerous items which appeared to be contrary to the accepted aircraft practice. Rework of approximately 180 items was accomplished by Douglas Aircraft under the supervision of General Electric, the engine manufacturer. As late as March 1945 Douglas stated that more than 3,000 man-hours had been expended to make the first power plant airworthy. Also, when additional engines were delivered to Douglas for both the first and second XB-43 models rework of these was authorized by Air Technical Service Command. General Electric engineers were to assume full responsibility for this rework and for delivery of the units to Douglas in a satisfactory condition for installation and operation.

By July 1945 the jet engine situation had become so acute that Requirements Division, AC/AS-3, Washington, requested that an investigation of the complete jet engine program, especially the TG-180, be made to ascertain what corrective action could be taken on workmanship and delivery. All of the bombardment aircraft of the B-40 Series was dependent upon the TG-180 engine. Douglas attributed much of the early delays in XB-43 experimental production to the steadily diminishing supply of skilled labor and to the fact that they were working on higher priority projects. Also, when modifications were made on the engines, it had been

necessary to revise the inlet air ducts, controls, piping and adjacent structure of the aircraft. Chevrolet-built TG-180 engine units were requested when that company assumed some of the engine production because it was believed by Douglas that the overall workmanship was more satisfactory. However, engines for the second XB-43 were delayed by work stoppages caused by labor difficulties at General Electric and Chevrolet Motor Company plants in late 1945 and early 1946.

After the labor strike at the engine manufacturers had been settled in March 1946, reallocation of the engines built by Chevrolet was made in order to augment the overall bombardment program. This and the oil leakage and engine turbine wheel difficulties further delayed the delivery of Chevrolet engines for the second XB-43. Upon delivery of the first Chevrolet TG-180 (J35) engine to Douglas for its second airplane, installation of this unit in the first XB-43 was made because one of the units for that airplane was undergoing overhaul at Muroc Army Air Field.

The plan for completing the second XB-43 except for engines for final inspection and acceptance was considered in November 1946. The airplane was to be stored by Douglas until the engine reliability and supply problem had been completely eliminated. However, by the middle of December 1946 Air Materiel Command had decided to continue the work on that article because of the improvement in the reliability of the engine units.

In January 1947 Douglas engineers conferred with Air Materiel Command officials on a bombing installation in the second XB-43. It was believed that this installation was desired for the purpose of making studies of the dropping of bombs from high-speed aircraft. When it was found that the remaining funds on the contract were not sufficient for the installation, Douglas was requested to submit a cost estimate. The estimated cost by Douglas was for \$75,000, but later



reduced to \$34,600 for work which could be accomplished by 30 June 1947. However, by 8 May 1947 Engineering Division, Wright Field, had decided that due to the very limited funds available for experimental projects, the high-speed bomb-dropping project on this airplane should be canceled.

Douglas suggested in January 1946 the elimination of the pressurized area for the entire nose section and nose wheel well because difficulty had been encountered in obtaining positive nose wheel door operation, and also because the nose gun installation for which the pressurization was needed had been deleted. Air Technical Service Command, Wright Field, did not concur in this recommendation and stated that the bombardier's nose was to be designed to render it safe for flight conditions, even if an all-metal nose in lieu of the plexiglass was necessary. By March 1946 difficulty had been encountered by Douglas in obtaining positive pressurization of the cabin, and it had been decided to eliminate this requirement from the airplane.

At the time the decision was made to eliminate the cabin pressurization, Douglas proposed construction of an all-metal nose in lieu of the plexiglass nose, but it was disapproved by Air Materiel Command. However, by 2 October 1947 the cracking of the plexiglass nose of the first airplane when operated in extremely cold temperatures or rapid temperature changes necessitated the replacement of that type by a metal or a wooden nose. Muroc Army Air Field constructed a plywood nose to replace the plexiglass one for the first XB-43.

Douglas recommended that flight of the second XB-43 by personnel of Muroc Army Air Field and Air Materiel Command Flight Test Division personnel be limited to a maximum of 20,000 feet pressure altitude because of the cracking of the plexiglass nose. That company also recommended that if check flights to greater altitudes prior to the acceptance were necessary, Air Materiel Command should arrange for

replacement noses either by construction of all-metal ones or by having Muroc Army Air Field make a replacement plywood nose similar to the one which had been designed and installed on the first airplane.

Douglas was informed that their responsibility for the XB-43 airplane would not end until the XB-43 had been safely flown as specified in the contractor's performance guarantee which stipulated altitudes considerably in excess of 20,000 feet. Although the first XB-43 had been flown at altitudes up to 40,000 feet, the plexiglass nose section and bugeyes had given very unsatisfactory service, and as a result of this, maintenance difficulties were encountered which necessitated the replacement of the plexiglass nose with a plywood nose. Provision for replacement of the plexiglass nose with one of plywood on the second airplane was made by Contract Change Notification 58 to contract W535 ac-40188, dated 28 January 1948.

By 11 March 1948 the wooden bombardier's nose had been completed on the second airplane and check flights had been accomplished by Douglas pilots.

Contractual Data—In the spring of 1943, the Army Air Forces started negotiations with Douglas Aircraft Company, Santa Monica, California, for two flight articles and one static test article of Douglas Model 459 (AAF Model XB-42).^{*} The letter contract W535 ac-40188, dated 25 June 1943, covering these models, authorized the expenditure of \$3,000,000. When the decision was made to have Douglas Aircraft Company convert the static test article of the XB-42 to a flying article with the two TG-180 (J35) turbo-jet power plant units installed in the fuselage, and to construct one additional flight article, the cost of the conversion, construction of an additional model and a wooden mock-up was estimated at

^{*}Case History of XB-42, and XB-42A Airplanes, dated March 1948, filed AMC Historical Office.

\$2,791,075. Discontinuation of work on the XB-42 static test article was provided for by Change Order 2 to contract W535 ac-40188, dated 13 March 1944. The contract was credited with a total of \$274,522 and the fixed fee of \$10,930.88.

It was believed desirable to use as many parts and as much material as possible from the static test XB-42 in the construction of the prototype XB-43. Douglas estimated flight of the first article by 31 December 1944, and first flight of the second article five months later. However, it was stipulated that these deliveries were contingent upon GFE engines being delivered by 1 August 1944, the government furnished milling machines for wing and empennage spar caps, and the assignment of priority rating to assist in obtaining non-standard materials.

Procurement of the two AAF Model XB-43 airplanes was negotiated on the XB-42 airplane contract W535 ac-40188. The Letter Supplement to contract W535 ac-40188, approved 14 January 1944, provided for these two airplanes at an estimated cost of \$2,649,388, exclusive of fixed fee of four percent. However, the formal Supplemental Agreement No. 1 to the contract covering the transaction at an estimated cost of \$2,683,726 and fixed fee of \$107,349.04 was not approved until 31 March 1944.

By August 1944, Douglas reported that the estimated costs

The J35 turbo-jet engines of the XB-43, nestled side-by-side in the upper fuselage aft of the flight compartment, were readily accessible for maintenance. (R.E. Williams Collection)

With the outer wing panels and vertical tail panels removed, the first XB-43 (s/n 44-61508) was towed to Muroc Army Air Base in February 1946. (R.E. Williams Collection)

established for this project had been optimistic and that a cost analysis showed the need for an additional \$2,546,474. During 1945 additional funds were allotted to this project to offset additional costs. Under Supplemental Agreement No. 10 to contract W535 ac-40188, approved 4 January 1945, the sum of \$2,990,418.64 was allotted for spare parts, ground handling equipment and changes in contract provisions. Of this amount, \$2,546,474 was for increased costs of XB-43 airplanes and \$24,207.68 was for spare parts for XB-43 airplanes. Because of further numerous miscellaneous engineering changes a revised flight test program, and overruns, additional allotments were made throughout 1945 and 1946. The total amount of money involved on the XB-43 portion of the contract as of 20 May 1947, including initial costs, overruns, spare parts, and flight tests, was \$6,414,461.58. Contract Audit, Air Materiel Command, informed the project engineer on 12 January 1948 that as of 30 November 1947, \$14,281,672.85 had been obligated on contract W535 ac-40188. The contractor's costs as of that date totaled \$14,997,328.91 of which \$13,454,329.49 in costs and \$227,765.52 in fixed fee had been paid. Since both XB-42 and XB-43 model airplanes were procured under this contract, the individual model costs cannot be ascertained.

Proposed Production Program—Since the XB-43 jet bomber was the first of its type to be engineered and to be approximately one year ahead of other jet bombardment types, it was believed by Materiel Division, Washington, that a quantity should be procured. Thus, the capabilities of jet bombers could be explored, a potential production facility for jet bombers could be established, and an education program





would be established for field activities in flight, maintenance and combat capabilities before improved jet bombers became available.

The first conference regarding this increased procurement was held on 11 December 1944 between General Wolfe of Procurement Division, General Carroll and Colonel Putt of Engineering Division, Wright Field and Douglas representative. Plans were drawn up and Douglas was requested to submit a proposal covering construction of 50 B-43 airplanes. These 50 articles were to be identical with the prototype XB-43 except for production design that was necessary to produce 50 airplanes. Also, the configuration was to include pressurized single canopy enclosure, both visual and radar bombsight, self-sealing fuel tanks and exterior disposable tanks non-leakproof, wing span of 71 feet, 2 inches and rear firing twin gun .50-caliber turret. Engineering and procurement, Wright Field and Douglas Aircraft agreed that an order for 50 B-43 airplanes was a small order to justify tooling. However, General Wolfe, Engineering & Procurement (WF), stated that if this procurement was approved, an additional allocation "would be requested for a year's production." Douglas estimated production of 1,000 B-43 airplanes for the first year if this additional procurement was approved.

A proposal for converting the proposed production B-43 airplane into an attack airplane by replacing the left and right inboard wing fuel cells with 16 forward-firing fixed guns was received from Douglas on 15 February 1945. This change was contemplated to make the airplane of greater tactical value. In the meantime, after discussions between Air Technical Service Command, Wright Field and Douglas Aircraft, it was decided that Douglas should proceed with construction of 50 production B-43 models. In order to get the program under way the manufacturer requested a letter contract for \$20,000,000 to provide for engineering and manufacturing these production models. While major tooling and design breakdown of the airplane would be for 50 models, detailed tooling was to be designed and manufactured on basis of reaching a maximum production rate of 200 airplanes per

month.

It had been agreed that the B-43 production airplane would be engineered at the Douglas-Santa Monica, California plant and built at the Douglas-Long Beach plant. Early in March 1945 the plan for building B-43 aircraft in the Douglas-Santa Monica plant by decreasing Douglas' monthly deliveries on C-54 aircraft from that plant was suggested to Materiel & Services, Washington, by Engineering and Procurement, Wright Field. However, Materiel & Services felt that there might be some reduction in requirements for C-54 aircraft at the end of the war in Germany, but that it was impossible at that time to coordinate the requirements for B-43 aircraft with the reduction of any of the existing types and models. Although a production order of 50 B-43 airplanes was recommended by Air Technical Service Command, Wright Field, in order to obtain operational, tactical and production experience on this type bombardment aircraft, Materiel Division (Washington) did not concur. That division believed that it possessed only enough potential value to the AAF to warrant procurement of a limited quantity. Therefore, Materiel & Services recommended a procurement of a service test quantity not to exceed 13 YB-43s and no production tooling.

Operations, Commitments & Requirements, Washington, realized that the Germans had approximately 200 to 300 jet fighters available, and that the Army Air Forces was behind in development of aircraft for these high speeds. Since these fast airplanes presented many problems in offensive and defensive tactics to which many answers were unknown, Operations, Commitments & Requirements recommended the procurement of a limited number of flying articles of each type of high-speed bombardment or attack aircraft then under consideration. These were to be used to determine if proper consideration to offensive and defensive tactics had been observed. Because the XB-43 was further advanced than other jet bombers, regardless of the fact that it did not meet the "latest military characteristics," Operations, Commitments & Requirements recommended procurement of 14



The clean lines of XB-43 No. 1 are evident in this front view at Muroc. The "bugeye" canopy was a flawed design giving both pilot and copilot a blind side and semi-isolation which inhibited communication.

(G.H. Balzer Collection)

The No. 1 XB-43, America's first jet bomber, on the flight line at Muroc Army Air Base in 1946. Its unencumbered laminar flow wing was uniquely efficient for 1946.

(Wright Field Photo via R.E. Williams)

The deceptively small-looking XB-43 takes on new proportions when compared to adult males in the photo.

(G.H. Balzer Collection)

YB-43 aircraft over and above the number required by various testing agencies of Materiel & Services. The following distribution was to be made of the 14 models: nine to AAF Tactical Center to determine the offensive and defensive tactics of jet bombers, two to AAF Proving Ground Command for operational suitability tests, and the remaining two to Radio and Radar Laboratory at Wright Field to determine needs for radar and electronic equipment.

By April 1945 Materiel & Services, Washington, reported that Douglas Aircraft had furnished further information concerning the attack version of the B-43 which was considered "sufficiently promising to warrant procurement of thirteen (13) service test articles for the purpose of investigating the merits of this type of design." Thus, Air Technical Service Command was directed to procure 13 service test articles of the attack version rather than the production model contemplated. These models were to be scheduled for delivery in time to assure testing at a date substantially earlier than could be expected in the case of the XB-45 or XB-46 jet bombardment types. No commitments for future production could be given at that time.

When the quotation of \$24,987,060 for the service quantity of 13 YB-43 airplanes, spares, and fixed fee was submitted on 12 May 1945, the first production model was scheduled for delivery in December 1946 with final delivery in September 1947. Although procurement negotiations were initiated for the procurement, Materiel & Services, Washington, believed the delivery dates highly unsatisfactory since the procurement had been authorized on the basis of "the neces-



sity for a delivery schedule which would assure testing of these airplanes at a time substantially earlier than can be expected in the case of the XB-45 or XB-46 types." Air Technical Service Command, Wright Field, was to determine possible delivery schedule of a similar quantity of either YB-45 or YB-46 jet bombardment aircraft. If these could be obtained at an early date, cancellation of YB-43 order was considered advisable. Delivery of a service test quantity of North American YB-45 bombers was investigated by Engineering Division, and it was revealed that these might be delivered between 1 November 1946 and May 1947 at a rate of two airplanes per month. Materiel & Services, Washington, directed Wright Field to procure 13 YB-45 jet bombardment aircraft in lieu of a like number of YB-43s in order to obtain jet bombardment aircraft for tactical purposes as early as possible.

Because the XB-43 did not meet military characteristics, and due to a late delivery schedule submitted by Douglas Aircraft, only two experimental XB-43 models were to be procured. TI-2145, Addendum 37, dated 10 July 1945, initiated action for cancellation of YB-43 procurement.

Flight Test Program—The airplane contract specified that the two airplanes were to be delivered completely set up, serviced and ready for flight at a flying field which was to be approved by the government near Santa Monica, California. After the ground tests, the airplanes were to be disassembled, transported to Muroc Test Base, Muroc, California, re-assembled, and the final preflight inspection given before the first flight.

The contractor's proposal for the flight test program was submitted on 16 March 1945 and included tests divided into four groups: functional test for first XB-43; qualitative test program for first XB-43, quantitative test and development program for second article. The estimated total cost for this flight program was \$548,374.75. However, Air Technical Service Command and Douglas Aircraft decided by 21 August 1945 to revise the test program for the first article to include tests for operational ground check; ground handling characteristics; initial flight; power plants; flight characteristics, airplane performance; and functional checks for a total flight of 53 hours. Also the flight program for the second article was revised to cover only ground handling characteristics, initial flight, flight characteristics, and demonstration flights for a total flight time of 20 hours.

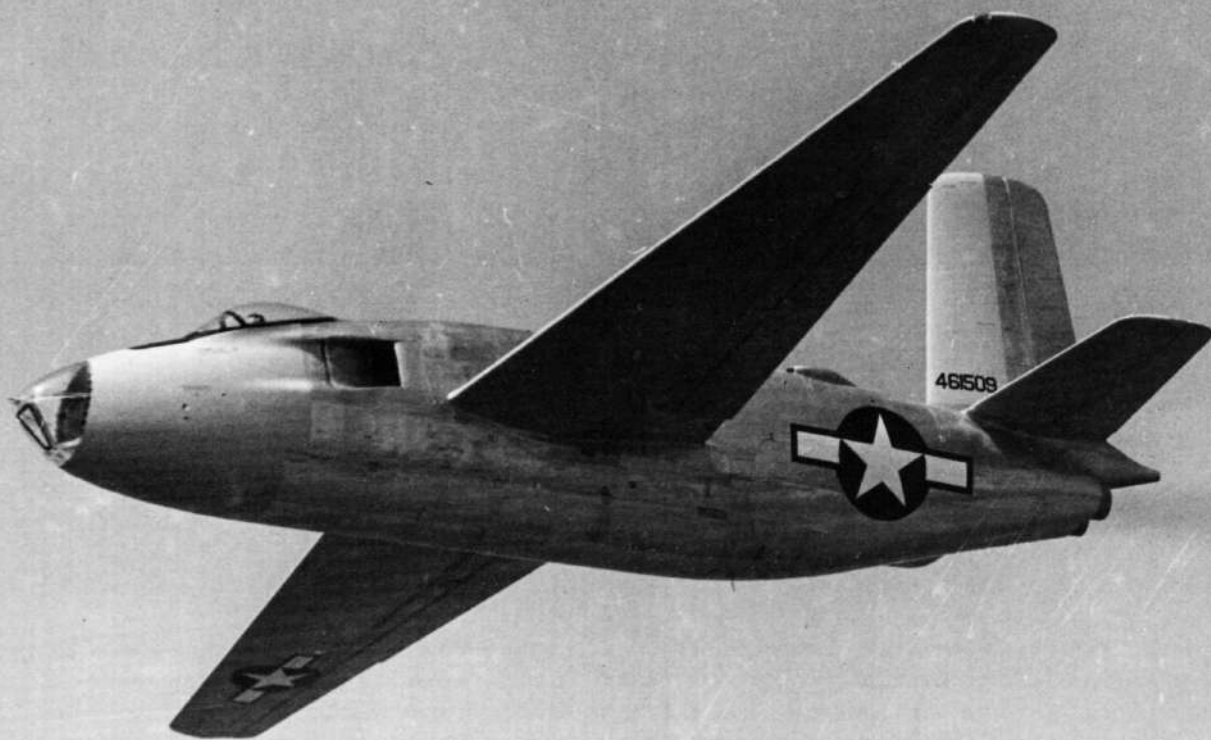
A further curtailment of the program was decided upon by Engineering and Flight Test Divisions of Air Technical Service Command in November 1945. This program was to include operational check on ground, ground handling characteristics, initial flight, check of power plant, flight characteristics and reduction of flight time of first flight article from 29 hours to 20 hours flight time for the first XB-43. The second article flight program was to include tests only for ground handling characteristics, initial flight and flight characteristics with flight time reduced to five hours.

By January 1946 Engineering Division, Air Technical Service Command, had decided that safety checks to prove the airworthiness of the airplanes should be conducted by the contractor and the flight time of first airplane limited to 15 hours and the second article to five hours. Douglas submitted a cost estimate of \$259,985.25 for this revised program. However, Engineering Division did not believe that the revised program cost submitted by Douglas Aircraft in January 1946 should exceed \$50,000 in addition to the money which had been already expended for taxi tests, instrumentation, etc., and asked that Douglas submit a

First flight of the XB-43 was at Muroc on 17 May 1946 piloted by Douglas test pilots Bob Brush and Russel Thaw. (AAF Photo via R.E. Williams)

XB-43 No. 2 (44-61509) in early flight at Muroc before modifications. It was accepted for the Air Force on 27 April 1948 by Air Materiel Command test pilot Major R.L. Cardenas and assigned to AMC Power Plant Laboratory for testing the J47 turbojet engine. (R.E. Williams Collection)





revised proposal. The proposal resubmitted by the aircraft manufacturer was for a program which could be accomplished for the specified additional sum of \$50,000, and was submitted with the belief that only two weeks flight test time on the first model and one week on the second article would be possible. Authority to flight test the first article and to use any of the remaining funds of the \$50,000 for tests on second article was approved by Change Order 27 to W535 ac-40188 dated 26 November 1946.

The flight test program of the first article had been two-thirds complete by May 1946, and approximately \$34,000 of the \$50,000 allotted for the total program had been expended. It was estimated that the remaining \$16,000 would be required to move the second airplane to Muroc, reassemble it and accomplish the first flight of that model. Therefore, Douglas was instructed to complete the flight program on the first XB-43 by using the money which had been allotted to the second article.

The Supplemental Agreement 1 to contract W535 ac-40188 dated 31 March 1944, providing for the procuring of these two XB-43 aircraft specified that the first model would be ready for first flight by 31 March 1944 and the second one by 31 May 1945. Because of labor shortages, early engineering developmental difficulties, labor strikes, at the engine manufacturer's plant, and other higher priority projects at Douglas Aircraft, it was necessary to revise the flight dates to 1 May 1945 and 1 October 1945 respectively, with delivery six months after first flights.

The first official flight of the first XB-43 was made on 17

May 1946 from Muroc Army Air Base for eight minutes at an altitude of 1,500 feet and maximum indicated airspeed of 230 miles per hour. On performance flights at 5,000, 12,000 and 25,000 feet at Muroc Army Air Base the left canopy and windshield cracked. At the request of Engineering Division, tests of the first airplane were made by Flight Test Engineer, Air Materiel Command, in order to check the contractor's guaranteed performance. The one-hour familiarization flight and two test flights totaling three hours and 40 minutes were flown by Flight Test Division personnel between 20 February and 19 March 1947. Previous to these tests the airplane had been flown only nine hours, at altitudes below 13,000 feet and at less than 445 miles per hour. However, a maximum speed of 515 miles per hour at 5,000 feet and 7,700 rpm with gross weight of 32,000 pounds was achieved. During these tests, the pilot's vision was reported as being restricted to the right by the "right canopy." The single canopy enclosure similar to the one on the second XB-42 was recommended as an improvement over the two bugeyes on the XB-43.

Although the airplane was not flown under the conditions for which the contractor's performance was guaranteed, it was possible to check the estimated performance curves on which the guarantees were based. The data obtained indicated that the XB-43 performance was at least as good as that estimated by the contractor, and that the airplane should meet all of its guaranteed performance with the possible exception of the takeoff and landing distances. It was concluded that the use of this aircraft was limited by stability problems at high speed, a low design load factor, insufficient center of gravity

Ship No. 2 was modified for photo reconnaissance tests. Note camera ports in solid nose, and "Air Force Flight Test Center" logo.
(R.E. Williams Collection)



range, and "numerous power plant difficulties peculiar to J-35 type engines." Upon investigation of the information obtained, it was concluded that sufficient data had been obtained for spot checking the contractor's performance guarantees, that no additional performance testing would be required by Air Materiel Command Flight Test Division.

The second XB-43 was flown by Douglas Aircraft pilots for a total of five hours and 15 minutes during which a quantitative evaluation and airworthiness checks were made. After the preliminary taxi tests, the first flight was made from Hughes Aircraft runway to Muroc Army Air Base on 15 May 1947 by R.W. Thaw, Douglas test pilot. General ground and flight handling characteristics and functional operation of mechanical units were found to be satisfactory except for directional and longitudinal stability and control, gapping of main gear door, and aileron vibration. The longitudinal, directional and control characteristics were improved with the installation of bulbous trailing edges on the elevators and rudder. While this addition "has not completely eliminated the stability problem on the XB-43, the elimination of long period oscillations, and the elimination of short period oscillations up to Mach number of .708, justifies the worth of the bulbs." In an effort to correct the main gear door gapping condition, vent ducts were installed in the lower half of each upper main gear door. Because of existence of aileron vibration in the first airplane at indicated airspeeds as low as 335 miles per hour, a limited amount of instrumentation was installed in the second XB-43 with which Douglas conducted pre-delivery tests. Examination of the results of these tests indicated that no aileron vibration or motion other than several intermittent low frequency vertical motions existed."

Also the original plexiglass bugeyes cracked during low temperature, high altitude flight during 12th flight. A redesign of the bugeye canopy proved satisfactory to the maximum altitude of 20,000 feet at which it was tested.*

Inspection and Acceptance—The engineering acceptance of the two XB-43 light bombardment airplanes was accomplished from 13 January to 16 January 1947 at Muroc

Army Air Base, Muroc, California, and at Douglas Aircraft Company, Santa Monica, California. Since the first airplane had been flight tested at Muroc Air Base by Douglas Aircraft, and no production was scheduled for this aircraft, a safety inspection was conducted in lieu of the full engineering acceptance inspection. Certain features of the airplane were of such a nature that corrective measures were not possible without an expensive rework program, and due to the purely experimental status of the airplane, no action was recommended on major items. However, numerous miscellaneous changes were recommended as necessary for both of the airplanes at the time of this inspection.

The first XB-43, Serial No. 44-61508, equipped with two Chevrolet TG-180 (J35) engines, was accepted by Captain J.M. Little, USAF test pilot, on 20 February 1947, at Muroc Army Air Base, Muroc, California, after eight hours and nine minutes flying time by Douglas and a 55-minute acceptance flight by Captain Little. The functioning of the airplane was reported as acceptable.

The second XB-43, Serial No. 44-61509, was delivered to Muroc Army Air Base, Muroc, California, on 15 May 1947. No preliminary check flight of the second XB-43 was made by Air Materiel Command. The evaluation of flight characteristics of this airplane by Douglas was accepted as satisfactory by Air Materiel Command. The second article was accepted by Major R.L. Cardenas, Air Materiel Command test pilot, on 27 April 1948 after seven hours and 35 minutes flying by Douglas and a one-hour acceptance flight by the AMC. The functioning of the airplane was satisfactory to the Air Materiel Command.

After acceptance of the second XB-43, that article was assigned to Air Materiel Command Power Plant Laboratory for conducting power plant tests on the J47 (TG-190) turbo-jet engines to determine flight performances of the engine. •

*Douglas Aircraft Co. Rpt. Dev-116 "Evaluation of Flight Characteristics of XB-43 #2 Airplane No. 44-61509," dated 14 Jan. 1948, filed in Eng. Div., AMC.

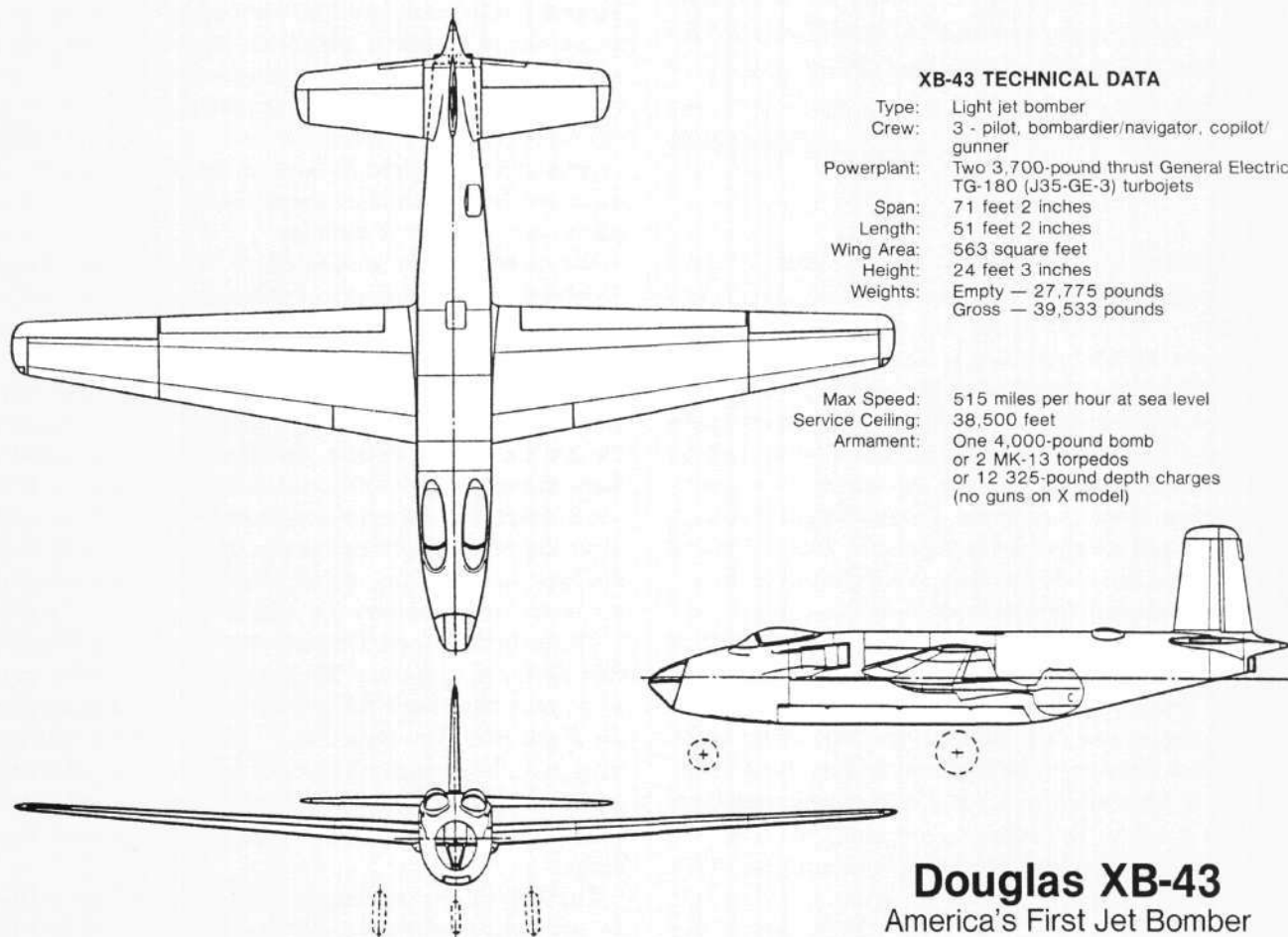
XB-43 No. 1 on the flight line at Muroc during flight tests in mid-1946 shows its clean lines. The large single cavity bomb bay extending from the nose wheel well to the main gear wells was nearly half the length of the fuselage.
(R.E. Williams Collection)



XB-43 TECHNICAL DATA

Type: Light jet bomber
 Crew: 3 - pilot, bombardier/navigator, copilot/gunner
 Powerplant: Two 3,700-pound thrust General Electric TG-180 (J35-GE-3) turbojets
 Span: 71 feet 2 inches
 Length: 51 feet 2 inches
 Wing Area: 563 square feet
 Height: 24 feet 3 inches
 Weights: Empty — 27,775 pounds
 Gross — 39,533 pounds

Max Speed: 515 miles per hour at sea level
 Service Ceiling: 38,500 feet
 Armament: One 4,000-pound bomb or 2 MK-13 torpedos or 12 325-pound depth charges (no guns on X model)



Douglas XB-43
 America's First Jet Bomber