



A B-25D taking off from Fairfax Field, with the North American Aviation, Inc. bomber plant in the background. Courtesy of the Wyandotte County Museum, Bonner Springs, Kansas.

B-25 Production and Test Flying at the Kansas City Bomber Plant

by Richard Macias

The B-25 bomber was a significant weapon in America's World War II arsenal. Designed and used primarily as a medium bomber, it also was modified to perform several other roles such as skip bomber, strafing, and airborne artillery. Many of these B-25s were produced and prepared for duty in North American Aviation's Kansas City, Kansas, facility. This article reviews the origin, development, and production of that defense plant and examines the pre-flight procedure, test flying, modifications performed, and notable mishaps.

World War II began in Europe on September 1, 1939, with Germany's invasion of Poland. The attacker was superior in both numbers of men and quality of materiel; this superiority showed itself especially in the air. Within two weeks of the war's start, the German air force, the Luftwaffe, destroyed its Polish counterpart. On September 25 the Luftwaffe bombed Warsaw at will, and the Poles capitulated three days later. In the spring of 1940 Hitler's forces occupied Denmark and then invaded and subdued Norway. On May 10, 1940, Germany struck France and the Low Countries of Holland, Belgium, and Luxembourg. The German land forces advanced swiftly, and the Luftwaffe figured prominently in the offensive. It attacked the enemy air forces on the ground and in the air. The German air arm also provided close support to the army, as demonstrated near Sedan, France, when its bombers and dive-bombers battered the French posts on the Meuse River. Within days seven panzer divisions had broken through the Ardennes sector and were closing on the English Channel ports. By the end of May the Low Countries were overrun, the British Expeditionary Force and other Allied forces were leaving the continent from Dunkirk harbor and adjacent beaches, and France was headed toward certain defeat.¹

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The author dedicates this article to his mother, Connie (Mejia) Macias. In May 1943, after graduation from high school, she began work at the bomber plant described herein. She assembled bomb bay doors in Department 13 – Sheet Metal Sub-Assembly. She performed this job until the war's end in August 1945. After the war she married an army veteran, and they raised three children. Her wartime service well represents the courage and sacrifice her generation made at home and abroad.

1. Cajus Bekker, *The Luftwaffe War Diaries: The German Air Force in World War II* (New York: DaCapo Press, 1994), 37–38, 58–59, 117–119.

President Franklin D. Roosevelt monitored the European war, and his observations were augmented by correspondence with various contacts on the Continent. For example, the U.S. ambassador to France, William C. Bullitt, noted in a telegram “that the battle certainly would be lost quickly unless the troops could be protected from German attacks from the air.”² Recently appointed British prime minister Winston Churchill wrote, “Hitler is working with specialized units in tanks and air. The small countries are simply smashed up, one by one, like matchwood.”³ President Roosevelt also had to consider Japan’s continued aggression against China in the Far East. In light of these threatening events, and particularly cognizant of America’s low level of military preparedness, the president believed the nation must modernize and expand its armed forces.

On May 16, 1940, Roosevelt delivered a special defense message to Congress in which he outlined a four-point program and requested a commensurate increase in defense spending. On the subject of aviation manufacture, he said, “I should like to see this nation geared up to the ability to turn out at least 50,000 planes a year.” To illustrate the scope of the proposed program, it should be noted that in 1939, a total of 5,856 aircraft had been produced in the United States.⁴ President Roosevelt envisaged an airplane industry that would meet American defense needs and fill future orders expected to come from the Allied powers.

In the summer of 1940 Congress passed large army and navy appropriation bills, a supplemental defense bill, and a tax law to pay for it all. To reach the president’s plane production goals required an increase in the nation’s factory floor space. Private and foreign investment could account for some expansion but not enough; ultimately the U.S. government provided most of the needed capital. There were several options for such federal financing, one of which was the government-owned, contractor-operated (GOCO) program. The government would build and own the facilities, stock them with machines and tools, and engage a contractor to operate them.⁵

2. Orville H. Bullitt, ed., *For the President, Personal and Secret: Correspondence between Franklin D. Roosevelt and William C. Bullitt* (Boston: Houghton Mifflin, 1972), 419.

3. Warren F. Kimball, ed., *Churchill and Roosevelt: The Complete Correspondence*, vol. I, *Alliance Emerging* (Princeton, N.J.: Princeton University Press, 1984), 37.

4. “To Meet Brutal Force,” *Kansas City Star*, May 16, 1940; John B. Rae, *Climb to Greatness: The American Aircraft Industry, 1920–1960* (Cambridge, Mass.: MIT Press, 1968), 81.

5. Irving Brinton Holley Jr., *United States Army in World War II, Special Studies: Buying Aircraft: Materiel Procurement for the Army Air Forces* (Washington, D.C.: Government Printing Office, 1989), 294–301.

The U.S. Army Air Corps (AAC) chief, General Henry H. “Hap” Arnold, and a special defense commissioner, William S. Knudsen, decided that some of the new production capacity should be built in the nation’s interior. Increased security was the primary reason for this decision. Moreover, since the majority of the nation’s aircraft plants were on the coasts, this placement could draw upon new sources of labor, power, transportation, and so forth.⁶ A Plant Site Board traveled to several locations in the Midwest, forwarding its findings to the War Department in autumn 1940, with defense officials finalizing their decisions in December. Consolidated B-24 four-engine assembly was to take place in Fort Worth, Texas, and Tulsa, Oklahoma. Omaha, Nebraska, was to be the site of Martin B-26 two-engine production, and Kansas City, Kansas, would produce the B-25 two-engine plane. North American Aviation, Inc. (NAA), was to operate the Kansas City plant.⁷

The Kansas City plant site was in the extreme northeast part of the city, adjacent to the small, privately owned Fairfax Airport. In February 1941 the Kansas City, Kansas, government purchased the airport, which provided for its free use by the military to test the completed bombers. Building contractors started plant construction in March; in April a crew erected the first structural steel and poured the concrete floor. At the end of June the plant’s skeleton was 70 percent complete. Sub-contractors soon began to install equipment and machinery in the facility.⁸ During the autumn the construction workers completed the sheet—steel siding, connected the electrical service, and began work on the office section. In mid-October the plant was 91 percent complete, and the U.S. Army Air Forces (AAF) representatives moved into their offices. These representatives were the liaison between the government and NAA.⁹

6. Wesley F. Craven and James L. Cate, eds., *The Army Air Forces in World War II*, vol. VI, *Men and Planes* (Washington, D.C.: Office of Air Force History, 1983), 311.

7. General Hap Arnold to Assistant Secretary of War Robert Patterson, November 27, 1940, Materiel Division, Colonel A. J. Lyon Project Files 1939–1941, Book 48, Government Owned Factories, RG 18, National Archives, Washington, D.C.

8. “Bomber Steel Up,” *Kansas City Star*, April 7, 1941; “Speed Up on Big Plant,” *Kansas City Star*, April 22, 1941; “Air Plant Tempo Gains,” *Kansas City Star*, April 30, 1941; W. F. Volandt to General Oliver Echols, June 28, 1941, 452.1 Airplanes: Bombers, Central Decimal Files 1939–1942, RG 18, National Archives.

9. In June 1941 the Army Air Corps reorganized as the Army Air Forces. “Move Plane Tools In,” *Kansas City Star*, September 25, 1941; “Aircraft Expansion Program: Recap of Essential Facilities Data,” October 15, 1941, 004.4, Firms and Factories, box 65, Central Decimal Files 1939–1942, RG 18, National Archives; “Ten Million Dollar Bomber Unit Is Landmark on Midwest Plains,” *North American Skyline* 2 (October



This is the first Kansas-assembled B-25, seen here on the day of its first flight (January 3, 1942), with North American Aviation, Inc., staff member Paul Balfour at the controls. The Kansas City, Kansas, plant developed as part of the War Department's 1940 decision to build new aircraft production plants in the nation's interior, thus protecting necessary war materiel from any potential external threats. Courtesy of the Wyandotte County Museum.

NAA, with its home plant in Inglewood, California, was led by James H. "Dutch" Kindelberger. While the Kansas plant construction was in progress, president Kindelberger transferred H.V. Schwalenberg, as plant manager, and a cadre of other managers and skilled staff to the new location. During the summer various aircraft parts began to arrive from California; chief among these were major assemblies with which to build the first six airplanes. NAA designed the B-25 using the sub-assembly method. There were five major assemblies—front fuselage, center section, rear fuselage, empennage, and outer wings. In addition, auto companies joined the airplane industry by making some parts and sub-assemblies. For

example, Fisher Body of General Motors, primarily the Memphis, Tennessee, division, was to supply the Kansas City plant.¹⁰

At the beginning of 1942 NAA's Kansas division employed 1,358 people. The initial NAA cadre was joined by a small group of experienced aviation industry workers, but the majority of the employees were local and had just received training. The school districts of Kansas City, Kansas, and Kansas City, Missouri, had already been offering national defense training courses, but after Kansas City was granted the bomber plant, school officials tailored training for the aviation industry. The training was funded by the federal government; therefore the

1941): 9, 35; For more information about the bomber plant's construction, see Richard Macias, "'We All Had a Cause': Kansas City's Bomber Plant, 1941–1945," *Kansas History: A Journal of the Central Plains* 28 (Winter 2005–2006): 247–249, www.kshs.org/publicat/history/2005winter_macias.pdf.

10. "Bomber Parts In," *Kansas City Star*, June 26, 1941; "In Bomber Plant," *Kansas City Star*, July 7, 1941; "A Bomber Part Start," *Kansas City Times*, October 16, 1941.



A view of B-25D planes on Fairfax Field, looking north from the Fairfax administration building. Located in northeastern Kansas City and formerly a private airport, Fairfax Field had been purchased by the city government and loaned free of charge to the military for the purpose of testing the completed bombers. Courtesy of the Wyandotte County Museum.

students paid no fees for the instruction. The initial offering was in basic aircraft sheet-metal work; the course lasted between eight and twelve weeks, according to the student's aptitude. Traditionally the aviation industry had been a predominantly male workplace, so in those early days only men eighteen to thirty-five years of age were considered for training.¹¹

The B-25 was a mid-wing monoplane. It had a tricycle landing gear, was powered by two Wright Cyclone radial engines, and had a twin rudder arrangement. It generally carried a crew of five and a standard bomb load of 3,000 pounds; its nominal top speed was 300 mph. The Kansas City plant began production with the D model. The B-25D had a top turret located just aft of the plane's midpoint, a

retractable bottom turret in approximately the same section, and a manually-operated .50-caliber machine gun and two fixed .50-caliber machine guns in the nose. On January 3, 1942, the first B-25D assembled by the Kansas division made its first test flight.¹² Production began slowly, however; for the first six months of 1942 the AAF accepted fifty-three planes from the Kansas plant. It took time to assemble a new work force and to receive the remainder of the machinery orders. Exacerbating the slow start were the early Fisher Body parts; assemblers sometimes finding that parts did not fit and required rework.¹³

When a newly-completed airplane exited the final assembly doors on the north side of the plant, two delivery trucks met it. An aviation-fuel truck and its operators filled the fuel tanks located in the airplane's wings. The other truck contained oil with which its tenders filled the engine-oil reservoirs. The flight line foreman then assigned the plane to one of an approximate dozen crew chiefs, after which a tug towed the plane to one of the numbered parking stalls. The crew chief and his assistants, generally a crew of three or four mechanics, proceeded to the stall to begin the pre-flight procedure. An NAA company inspector worked in concert with the crew chief in checking over the airplane. The twin Wright Cyclone engines would have come with a dehydrator plug in each spark-plug opening to absorb any moisture during assembly and installation; the crew replaced these with working spark plugs. They checked the oil levels and inspected the various connections serving the engines. Removing various access panels allowed the mechanics to confirm the security of fasteners, such as those connecting the center section to the wings. They also checked the various tubing, hoses, and electric wiring in the wings.¹⁴ Once these checks were made, they were ready to run the engines for the first time, but there was one prior step to perform.

Each radial engine was affixed in a vertical axis. When cold the piston rings did not seal well, resulting in oil

11. North American Aviation, Inc.: *A Brief History of the B-25 Mitchell Bomber* (Dayton, Ohio: U.S. Air Force Museum), 29; "A Bomber School Start," *Kansas City Times*, May 26, 1941; "First Hiring from Bomber Class Today," *Kansas City Kansan*, July 14, 1941; "Training," *Kansas City Kansan*, August 10, 1941.

12. "Bomber in First Flight," *Kansas City Star*, January 3, 1942; "It's Mitchell Bomber Now," *Kansas City Kansan*, January 23, 1942. NAA chief Kindelberger proposed that the B-25 be named in honor of Brigadier General William "Billy" Mitchell, an early American proponent of air power whose prescience was demonstrated early in World War II.

13. Tom Lilley et al., *Problems of Accelerating Aircraft Production during World War II* (Cambridge, MA: Harvard University Press, 1947), 97; Robert Gibler, interview by author, June 20, 1989; Don Calkins, interview by author, September 22, 1989.

14. "Pre-Flight, Engine Run-Up, Test Hops Make Flight Line a Beehive of Activity," *North Ameri-Kansan*, April 14, 1944.

leakage that by gravity tended to collect in the lower cylinders. If the crew attempted to start the engine with such oil buildup, it would create unduly high compression pressures within the affected cylinders because fluid is incompressible, and this could damage the cylinder heads and the connecting rods. To alleviate this problem, mechanics rotated the propeller by hand through three or four revolutions in the counter-clockwise rotation. Since the propeller was connected to the engine's crankshaft, this action cycled the engine's internal components. More specifically this action worked the exhaust valves, thereby expelling any oil that might have drained into the lower cylinders of the engine.¹⁵ Now they could proceed with the engine run-up.

The crew chief entered the cockpit and started one of the engines, bringing it to normal operating temperature. The crew chief then checked each gauge on the instrument panel for the proper readings. These included the oil pressure, fuel pressure, suction, manifold pressure, and idling speed. Should any of these readings be out of tolerance, he would communicate with his mechanics in a special sign language. For example, should the oil pressure be too high, he would signal out of the cockpit the letter "o" with his thumb and fingers and make a motion downward. The mechanic atop the wing behind the engine began making the appropriate adjustment. As he neared the desired pressure, the crew chief signaled with a slow side-to-side motion of his hand. When the desired pressure was reached the crew chief signaled "OK." Other hand signals signified fuel pressure, manifold pressure, and other readings. Some of the adjustments had to be made from the side of the engine. In this case the mechanic would use a ground ladder or work stand; another mechanic would stand in a position visible to both the crew chief and the mechanic at the engine and relay the signals. The crew chief also checked the propeller governor and its hydraulic pump. The crew then performed an identical procedure for the other engine. A follow-up inspection checked for any fuel and oil leaks from the engine run-ups.¹⁶

Once the crew chief was satisfied with the pre-flight checks and the engine run-ups, and the NAA inspector was also satisfied with his inspections, the crew chief turned in an Avoid Verbal Orders (AVO) form to the flight



The majority of D model bombers left the assembly plant painted in standard Army Air Force colors: green, brown, and gray camouflage, with gray undersurfaces. The light-colored planes in this image represent those planes destined for service in North Africa, hence their tan-and-pink color scheme. Courtesy of the Wyandotte County Museum.

line foreman. This signified that he considered the airplane to be air-worthy and ready for its first flight. The test pilots had an office in the flight hanger, a building just north of the assembly plant. For most of the war Paul C. Thornbury was the superintendent of flight operations and chief test pilot. He was a seasoned pilot and an aeronautical engineer. At the start there were only a few pilots; later they numbered approximately twenty-five. The test pilots, mostly in their twenties and thirties, had varied backgrounds. Several, such as Arlie Simmonds and Winthrop "Wink" Cantrell, had been primary flight instructors for government programs that trained AAF cadets. Eddie Fisher had once operated his own flying school in Kansas City. John K. "Tex" LaGrone was in his early fifties. Kansas City's first private pilot license holder, LaGrone was a friend of Charles Lindbergh and had once flown a young Franklin D. Roosevelt on a 1920s campaign trip. In the 1930s Don Walters performed aerobatics with an air show. A few of the pilots, such as Basil Sims and Leland Lloyd, had recently been members of the AAF's Ferry Command, which flew completed aircraft from the factories to service bases, departure points in the United States, and other locations.¹⁷

15. Headquarters, AAF, Office of Flying Safety, *Pilot Training Manual for the B-25 Mitchell Bomber* (Dayton, Ohio: Otterbein Press, 1944), 63.

16. "Pre-Flight, Engine Run-Up"; Elmer Brown, interview by author, July 7, 1988.

17. "New Test Flier Added to Bomber Plant Force," *Kansas City Kansan*, March 14, 1942; *North Ameri-Kansan*, April 10, 1942, "New Test

Each test pilot was identified by a number, and each had a small, flat square made of plastic known as a chit upon which his number was imprinted. For example, Jess Blevins was Flight 3, Winthrop Cantrell was Flight 5, and George Krebs was Flight 10. In the pilots' office was a vertical standing box that accommodated the chits. There was an opening at the top of the box, where the pilots deposited their chits, and a slot at the front of the box bottom. When an aircraft was ready for flight, the flight line foreman drew the chit from the slot at the box bottom and placed it on a chalkboard peg; alongside it he wrote the tail number of the assigned airplane so that the pilot knew his assignment. When the pilot concluded the assignment and returned to the office, he placed his chit in the top of the box and waited for his next flight. This system provided for an equitable rotation of the test flying duties.

The pilot took a parachute, proceeded to the flight line, and met with the crew chief. Not only was the crew chief responsible for determining the airworthiness of the airplane, but he also went on the flight as co-pilot. Several of the crew chiefs were rated pilots, and all were familiar with basic flying skills and could assist in an emergency. They did a general walk-around of the aircraft, after which the crew chief entered the cockpit while the pilot remained outside. The next step was known as "ringing out the controls." The crew chief simulated a starboard, or right, roll by turning the control wheel to the maximum right. The pilot checked to see that the right aileron was up and that the left one was down. A port, or left, roll position was then performed and checked. The crew chief simulated a nose-up attitude by pulling the control wheel backward; the pilot ensured that the elevators were all the way up. A nose-down attitude was then performed. Next the crew chief operated the flaps all of the way out and back in. The twin rudders were then checked in the starboard and port positions. The last checks were those for the trim tabs for the ailerons, elevators, and rudders. In performing the inspections, the men were ensuring that all of the control surfaces were rigged or connected correctly; it was possible to rig a control in an opposite manner. If all was satisfactory, the pilot entered the cockpit.

The men started the engines and contacted the Fairfax Field control tower for permission to taxi to the field. (During the war Fairfax Field was under federal government control and authorized for military traffic only.) The test pilot used his personal number in communications with the control tower to identify the flight because to use aircraft serial numbers or tail numbers would have proved lengthy and confusing. After moving to a runway ramp they once again ran up the engines and checked that all was ready. After receiving permission to use one of the four runways they taxied into position and powered the plane down the runway, and for the first time the B-25 took flight. A circuit around the airport was made to check the homing system followed by a steady climb to about 5,000 feet to a level-off. The first test was a speed check at straight and level; the pilot and crew chief knew what speed they should register at a given power setting. They then climbed to about 8,000 feet and ran the landing gear through an up-and-down cycle. Next was another check of the performance of all of the control surfaces and a check to ensure that the trim tabs could be adjusted to maintain a "hands-off" condition. The crew put on the automatic pilot system, checked its function, and then turned it off. The test crew then shut down one engine and feathered its propeller. To "feather" means to orient the propeller blade's edge into the wind. Otherwise the propeller would turn the stopped engine and transmit harmful vibrations to the airframe; it could also cause friction heat to build up in a non-lubricated engine and possibly cause a fire. When fully edged into the wind, the propeller came to a complete stop. The feathering system used a portion of the engine's oil supply to perform this operation. The men checked single-engine performance and then restarted the stopped engine by slowly unfeathering the propeller. The motion of the propeller now turning the engine internal parts aided in restarting the engine in much the same manner in which an automobile engine with a manual transmission can be push-started. After restart they checked the other engine and propeller in the same manner. The pilot induced a stall; this disrupted the airflow around the wings and caused a loss of lift, which resulted in the plane descending into a fall. The pilot tested that the plane possessed normal stall and recovery characteristics. Next came a check of the operation of the high and low blowers of the engine

Pilot Stores Stunt Plane for Duration," *North Ameri-Kansan*, June 19, 1942; "New Pilots Have Colorful Careers," *North Ameri-Kansan*, July 17, 1942; "Tex LaGrone Closes Hangar to Fly B-25s for North American," *North Ameri-Kansan*, February 5, 1943; "Test Pilot Flew B-25s to England," *North Ameri-Kansan*, April 2, 1943; "Two New Test Pilots Boast Long Records," *North Ameri-Kansan*, February 25, 1944; "Test Vets," *North*

American Skyline 5 (July – August 1944): 30; Arlie Simmonds, interview by author, August 8, 1988; Winthrop Cantrell, interview by author, May 8, 1989; John Cosmas, interview by author, July 6, 1989.

superchargers, which was followed by a momentary dive test at approximately 240 mph. All the while they monitored the engine and flight instruments for normal operation. This first flight generally required one hour to complete. If the airplane's performance was satisfactory, they returned to the airport, landed, picked up a radio operator, and took to the air again.

The second flight generally lasted an hour and a half, during which time the radioman checked the various communication systems on the airplane. There were command and liaison sets, a radio compass receiver, and a marker beacon receiver. The radioman performed these checks with an NAA control tower located at the northeast corner of the bomber plant. The radio operator also checked the interphone system that allowed the crew members at the various positions throughout the aircraft to speak with each other. This time also provided more opportunity to put the aircraft through its paces. Should all continue to check correctly after the allotted time, the pilot performed a touch-and-go landing, then a final landing, and taxied to the plane's parking stall. The pilot and crew chief signed off the checklist, and the pilot returned to the office.¹⁸

If at any time during the two flights the pilot and crew chief found minor problems or slight issues that needed correction, they wrote these down as "squawks." After returning from the second flight the crew chief and his assistants took action to correct these faults, the crew chief then requested a test pilot, and another test flight was made. Of course, if on any flight they found a serious discrepancy that called for immediate attention, the test crew would return and promptly initiate such corrective action. It sometimes occurred that an aircraft required several flights before it passed the required tests. In certain cases the flight line crew was not able to fix the fault on the flight line and would have to reroute an airplane back into the plant. Examples of this were a plane requiring a rigging adjustment or if a wing replacement was needed because the wing was not true (properly shaped), either of which caused the pilot to make out-of-tolerance control



All newly-completed airplanes underwent rigorous pre-flight testing, with a crew chief and three or four mechanics in charge of this crucial procedure. In this photograph, crew chief Elmer Brown, sitting in the co-pilot's seat, signals to his mechanic atop the wing, while the mechanic makes an engine adjustment. Courtesy of the Wyandotte County Museum.

corrections; an unsynchronized engine also required replacement within the plant.¹⁹

For the standard testing there was no set route that the flying crews had to follow, though they typically remained within a fifty-mile radius of the airfield. The crews flew where the day's weather permitted and attempted to stay away from the more inhabited areas. One of every fifty B-25s had to be flown to approximately 20,000 feet and remain aloft for five hours, so these flights could stretch hundreds of miles in any direction. The purpose of this flight was to check the long-term function of the oxygen delivery system to the crew members as well as to check the engine supercharger performance in a steady cold atmosphere. Ordinarily the armament was tested on the ground. After installation of the turret and machine guns, a ground crew moved the plane to a concrete test-fire enclosure, and armament personnel test-fired each gun into this sand-filled enclosure. Periodically the armament underwent in-flight testing. Specialists installed the Norden bombsight in the bombardier's compartment and dummy bombs in the bomb bay, and armorers installed a full complement of machine guns. The test crew flew to Wichita Army Airfield (now McConnell Air Force Base),

18. Elmer Brown, interview by author, July 7, 1988; Winthrop Cantrell, interview by author, May 8, 1989; John Cosmas, interview by author, July 6, 1989; Dan Meisinger, interview by author, October 9, 1989; "Pre-Flight, Engine Run-Up."

19. Elmer Brown, interview by author, July 7, 1988.



A test crew is performing an engine run-up on a flight line ramp. After ensuring that all pressures, temperatures, and speeds are within tolerance, the crew will move this B-25D into position on a runway for takeoff. Courtesy of the Wyandotte County Museum.

picked up a bombardier, and proceeded to the Cheyenne Bottoms Bombing and Gunnery Range near Great Bend, Kansas. There they dropped the bombs and test-fired the machine guns on practice targets. The flying crews all agreed that the sound and damage produced by multiple machine guns firing simultaneously was quite impressive.²⁰

Once the crew chief, NAA inspector, and test pilot were satisfied with the flight performance of the aircraft, the plane was ready for a final inspection. A ground crew moved the plane to a parking stall, where they removed the engine cowlings and all access panels. A group of AAF inspectors then examined each of the major systems, such as the electrical, hydraulic, fuel, and armament. If all was

satisfactory, they signed a Final Acceptance Form 262 signifying that the government had officially “bought” the airplane. If the plane was a “fly-away,” assigned for immediate deployment, ground personnel filled the fuel tanks and stowed loose equipment in the plane. Loose equipment included headsets, throat microphones, maintenance manuals, medical kits, portable oxygen tanks, various waterproof covers, and so forth. The army operations personnel (different from the AAF inspectors) placed a call to the Ferry Command Operations Office, which was across the street from the bomber plant. Within hours a ferry pilot and co-pilot arrived and flew the airplane to its destination—a training base, operational base, or final departure point in the U.S.²¹

NAA test pilots performed all of the required test flights for acceptance. However, for most of the period the AAF assigned two pilots who also performed test flights. On average, between the two, they flew every eighth or tenth aircraft. Whenever they desired, they simply contacted the flight line foreman and requested a check flight on this or that aircraft. First Lieutenant Frank E. Lair was a local product; in 1940 he interrupted his schooling at the University of Kansas to join the army’s air arm. Colleagues described him as reserved and business-like. He was senior by time in grade to First Lieutenant Herbert W. Pochyla, also known as “Pokey.” Pochyla hailed from Texas and came from a family with a long history of military service. He was easy-going and apt to joke or tease. Both were considered excellent pilots and were well liked by all concerned, and each expressed appreciation to the NAA employees for their work. Both were later promoted to the rank of captain.²²

As previously noted, the first six B-25s completed at the Kansas City plant had come from Inglewood in major assembly form. The next ninety-four planes were in various stages of assembly and were shipped to the Kansas City plant or to Fisher Body, but the assemblies were finalized at Kansas City. Starting with airplane 101, Kansas division workers were to perform 45 percent of the manufacture, with Fisher Body and other sub-contractors contributing approximately another 45 percent. The Inglewood facility was to contribute the remaining 10 percent by continuing to supply most of the

21. “B-25 Carries a Sizeable Cargo of Extras,” *North Ameri-Kansan*, June 15, 1945.

22. “Army Helps Build B-25s,” *North American Skyline* 3 (July 1942): 22–23, 32; “They O.K. Two Promotions,” *North Ameri-Kansan*, April 7, 1944; Walter Burwell, interview by author, November 8, 1989; Elmer Brown, interview by author, July 7, 1988.

20. “Prelude to Combat,” *North American Skyline* 5 (September–October 1944): 18–19; Dan Meisinger, interview by author, October 9, 1989; Elmer Brown, interview by author, July 7, 1988.

machined parts. However, top NAA management soon realized that the Inglewood facility could not long carry this load. In California NAA was building the B-25 as well as the P-51 fighter. Therefore, NAA of Kansas gained responsibility for making thirty-five new parts, effective with airplane 201, and 425 others effective with plane 601. The Kansas division gradually placed sub-contracts for these parts. For the third quarter of 1942 the AAF accepted forty-eight B-25s on average monthly.²³

Other notable changes were occurring. North American Aviation, along with several other companies, agreed to assist Boeing Aircraft Company with manufacture of the B-29 four-engine bomber. NAA planned to produce the B-29 in conjunction with the B-25 at the Kansas City plant. In July 1942 contractors began to build the "high bay," an expansive final assembly bay on the east side of the facility, and the Kansas City plant was to receive additional tooling for the new plane's production.²⁴ Soon, however, the AAF decided to exempt NAA from the B-29 program, and the plant addition continued with the intent to increase B-25 production. The high bay was completed in March 1943, and by that summer it was incorporated in the assembly process. Since the AAF controlled Fairfax Field under a fifty-year lease, it directed construction crews to enlarge and improve the airfield. When that work was finished, the field contained four concrete runways, each 150 feet wide with a mean length of 5,725 feet. In November 1942 85 Mitchells rolled out of the Kansas City facility, and in December the total was 150. By this time plant workers were no longer only young men; the draft and voluntary enlistments were creating vacancies for other demographics. North American offered new job opportunities to women, older men, and the physically challenged.²⁵

Between May and October 1942 workmen constructed a twin hangar on the southeast edge of the airfield. This facility was known as the Modification Center. The work performed there tailored, or altered, B-25s that had passed

final acceptance. During the war slightly more than half of the locally-produced aircraft passed through the center for modification. Along with these were planes from California, the Ferry Command bringing a number of the Inglewood-built planes to Fairfax Field for such work. The Modification Center also handled planes destined for other countries through the Lend-Lease Act. This program authorized the transfer of American military products and other needed items to "any country whose defense the President deems vital to the defense of the United States."²⁶ Great Britain and the Soviet Union were chief among these and each had representatives at NAA's Kansas division. In some cases the representatives specified different equipment for their aircraft, such as the substitution of bomb shackles or installation of different radio and electrical equipment. The work also involved the plane's paint scheme. The majority of the D-model bombers left the assembly plant painted in standard AAF green, brown, and gray camouflage, with gray undersurfaces. The USA star, or later USA star and bar, were applied to the fuselage and wings. For the British planes, the paint department applied an olive-drab finish, again with gray undersurfaces. They also replaced the U.S. insignias with the Royal Air Force (RAF) roundels and painted the RAF fin flashes on the vertical stabilizers. The Russian aircraft retained a camouflage pattern on the top and upper surfaces, and the bottom and lower surfaces were painted black; they were then emblazoned with the red Russian star.²⁷

A small number of those planes destined for service with the American armed forces also received different paint. B-25s to be used in the North African campaign were repainted in a paint scheme of mottled tan and almost pink in order to blend more into the desert. The U.S. Navy received a small allocation of the bombers, their naval designation being PBJ rather than B-25; these planes received a predominantly light-blue-and-gray paint pattern. The modification work also involved

23. "History of North American Aviation, Inc. of Kansas (Government Assembly Plant No. 2): Kansas City, Kansas, June 1941 to 31 October 1943," appendix to *Army Air Forces Materiel Command: History of the Midwestern Procurement District, 1943*, 5-6, U.S. Air Force Historical Research Agency, Maxwell Air Force Base, Alabama; Lilley, *Problems of Accelerating Aircraft Production during World War II*, 97.

24. *North American Aviation Inc.*, 28.

25. "Runways at Fairfax Almost Done," *Kansas City Kansan*, May 24, 1942; Lilley, *Problems of Accelerating Aircraft Production during World War*

II, 97; "Women Eligible for Shop Training Classes," *North Ameri-Kansan*, March 20, 1942; "Deaf Mutes in Dept. 22 Prove Valuable Workmen," *North Ameri-Kansan*, October 2, 1942; "Callouses Are 'Service Stripes' to Girls Who Work on Engines," *North Ameri-Kansan*, October 16, 1942; "Two Blind Persons Help Build Bombers at NAA," *North Ameri-Kansan*, October 23, 1942; "39 Grandmas Work at NAA," *North Ameri-Kansan*, November 27, 1942; "Women in Draft Wake," *Kansas City Star*, October 11, 1942.

26. Robert E. Sherwood, *Roosevelt and Hopkins: An Intimate History* (New York: Harper and Brothers, 1948), 264-265.

27. *North American Aviation, Inc.*, 30; "Just Before the Battle," *North American Skyline* 3 (September 1942): 12-13; "The Modification of Army



NAA and AAF test pilots, along with the crew chief—serving as co-pilot—meticulously checked the plane's functionality and performance. If all was satisfactory, they signed a Final Acceptance Form 262 signifying that the government had officially "bought" the airplane. Pictured here is a B-25J with eight-gun nose during a flight test. Courtesy of the Wyandotte County Museum.

serviceability concerns. To limit damage due to the fine desert sand in North Africa, employees installed dust excluders on air intakes and landing gear struts. In Alaska and the Aleutian Islands ground crews often used engine heaters to prevent the engine oil from becoming too viscous, thus allowing the engine to start; this heat damaged the rubber hoses serving the engine. Therefore, modification workers added insulation to the rubber hoses serving the engines. They also installed de-icer boots on the leading edges of the wings and of the horizontal and vertical stabilizers.²⁸

Much of the modification effort focused on additional armament packages. As previously noted, the D model had two turrets, one on the top and the other on the bottom, and three .50-caliber machine guns in the nose. Field experiments and combat trials of low-level attacks with increased forward firepower were proving successful. Therefore, one or more of the following modifications was often performed: The employees replaced the Plexiglas

nose of the aircraft with a fully enclosed aluminum skin and installed four fixed .50-caliber machine guns in the nose. Two .50-caliber machine guns were installed in the tail. A package of two .50-caliber machine guns was added on each side of the airplane below and forward of the pilot's compartment. At one time the work even involved placing a 75-millimeter cannon in the nose.²⁹

The plane proved to be a sound platform for these modifications. Given the priority on meeting production schedules, one might assume that the management of NAA would balk at the changes; rather, it was the opposite. In a November 1942 letter, the firm's president updated the chief of the AAF: "Generally speaking," wrote Kindelberger, "we are going ahead on the B-25 to put in every possible military improvement from now on without compromising its basic utility as a bomber."³⁰ Once the Modification Center employees had completed their work, the plane was again assigned to a crew chief. The center had its own staff of flight line personnel who maintained the plane before departure. The test flight was arranged as previously described,

with the exception that in most cases it would be a single flight. If again the test and AAF final inspections were all satisfactory, the calls were then made for fuel, loose equipment, and a ferry crew.

The original plan was that the Kansas City bomber plant in full stride would produce one hundred B-25s each month. However, the B-29 program cancellation in favor of increased Mitchell production revised the target. For example, the production goal for June 1943 was 170, with incremental increases to follow. Thus, for the new year the bomber plant's managers faced an accelerated B-25 production schedule.³¹ Not only would they need more workers, but they also had to replace the men who left for military service through the draft or voluntary

A/C in the United States," Army Air Forces Historical Studies No. 62, Reference Collection 1090, National Archives, 9–12.

28. "The Modification of Army A/C in the United States," 25–27, 47–49.

29. George C. Kenney, *General Kenney Reports* (New York: Duell, Sloan, and Pearce, 1949), 144, 154–155, 214, 277; "Stinger in B-25s," *Kansas City Kansan*, November 30, 1943; "B-25s Modified on Assembly Line at Modification Center," *North Ameri-Kansan*, April 28, 1944; "The Modification of Army A/C in the United States," 22–23.

30. James H. Kindelberger to Lieutenant General Henry H. Arnold, November 2, 1942, Henry H. Arnold Papers, General Correspondence 1939–1946, box 15, Library of Congress, Washington, D.C.

31. Craven and Cate, *The Army Air Forces in World War II*, vol. VI, 311; "History of North American Aviation, Inc. of Kansas," 5.

enlistment. NAA changed its employment entry requirements. Training courses that early on required at minimum eight weeks to complete were shortened to four to six weeks. Eighteen had been considered the minimum age for a bomber plant job, but now boys aged sixteen and seventeen became eligible for work there. An added incentive to all, men and women, was that trainees were now paid while they learned, sixty cents per hour, which was the starting wage at the bomber plant.³²

Women in particular responded to the appeal for workers, and during the year the Methods Department began to make changes to assist them in certain production jobs. Power tube benders replaced hand-operated machines. Roller benches made it easier to move and perform operations on heavy parts. Methods designed an attachment for portable electric drills that reduced the exertion necessary from the operator. Monorails and counter-balances suspended the heavier and larger sub-assemblies, allowing females to manipulate and perform operations on them.³³ In the autumn of 1943 NAA's Kansas division employment reached 23,468 – 39 percent of which were women. The women were performing a myriad of jobs and working in almost every department within the Modification Center and bomber plant. The local mobilization exactly reflected the national trend. By the middle of 1943 more than 310,000 women worked in America's aircraft plants, which equaled 39 percent of the airframe industry labor force. The single production-related death within the plant and Modification Center occurred at about this time. During a fuel-tank inspection, an electric lamp ignited coating vapors, and the tank exploded, killing a young female worker.³⁴

Monthly acceptances of B-25s from the Kansas City plant in the first half of 1943 totaled 775. There was a linear increase each month—90 in January and 170 in June—but production fell in July and August, and only 102 were delivered in September.³⁵ The slowdown was



The B-25D had two turrets, one on the bottom and one on the top, the latter being installed in the photo above. Faced with an accelerated production schedule and the loss of men to military service, the NAA in 1943 changed its employment entry requirements, with one result being an increase in the number of female workers. Though only men are shown here, 39 percent of NAA's Kansas division was women by the fall of 1943. Courtesy of the Wyandotte County Museum.

due in part to a persistent problem with subcontractors. As previously noted, NAA of Kansas assumed gradual responsibility for machined parts, but management subcontracted this production while it moved to utilize the additional machinery from the cancelled B-29 program for in-plant production. Unfortunately this shift was delayed as the expected machinery trickled into the bomber plant.

Although many of these vital machined part suppliers were local, some were as far afield as Detroit, Michigan, and Cleveland and Toledo, Ohio. A large percentage of these distant suppliers ultimately proved to be sub-standard, failing to make enough parts to sufficient standards. In May 1943, concerned about the declining-machined-part situation, local AAF representatives counseled plant management to contact the Midwestern

32. "Hundreds of Trainees Report to Work in Factory Jobs," *North Ameri-Kansan*, February 19, 1943; "Boys in Bomber Plant," *Kansas City Star*, June 4, 1943. For more information regarding the labor force, see Macias, 'We All Had a Cause,' 253–255.

33. "Women Only," *North American Skyline* 5 (May–June 1944): 10–11.

34. "Women Do Much of the Work at Kansas City's Big Bomber Plant," *Kansas City Star*, May 2, 1943; *History of North American Aviation, Inc. of Kansas*, 25; Bryan Fairchild and Jonathan Grossman, *U.S. Army in World War II: The War Department, the Army and Industrial Manpower* (Washington, D.C.: Office of the Chief of Military History, 1959), 173; "War Plant Blast Fatal," *Kansas City Times*, December 3, 1943.

35. Lilley, *Problems of Accelerating Aircraft Production during World War II*, 97.



In December 1943 the Kansas facility began production on the B-25J; number three thousand is shown here. Among other changes, the NAA did away with the retractable bottom turret, moved the top turret forward near the pilot's compartment, and added armor protection for several crew positions. Courtesy of the Wyandotte County Museum.

Procurement District, of which NAA of Kansas was a part. This organization possessed a Machine Tools Unit, which was well-placed to suggest suitable vendors. However, Kansas management took no such action. In June an essential Detroit supplier closed down due to labor difficulties. Bomber plant management again did not contact the Machine Tools Unit. Instead, the management pulled the tools and dies and distributed these to other poorly performing providers without first verifying the accuracy of these tools and dies. The result was another inflow of parts that required rework or, even worse, had to be recycled because they were unusable. Finally, in August, local NAA management pulled the tools and dies from the deficient vendors and brought them to be reworked in the Kansas plant, by which time the machine shop was more properly equipped.³⁶

In October 1943, in order to restore effective management, Kindelberger dispatched Harold R. Raynor to the Kansas plant to replace Schwalenberg. Under Raynor's leadership the Kansas division flourished in 1944. More of the machined parts were now made in-house, and adequate suppliers were settled upon to make the remainder. Work simplification—the breakdown of each task into a number of jobs—facilitated an employee's

mastery of his or her job and increased production. The production control method organized the work-flow; the proper materials in the correct quantities were in the correct departments at the right time, along with the necessary tooling and labor. Under this method the components, sub-assemblies, and other parts were scheduled to be in correct quantities at the right place and time on the assembly line. These and other methods enabled the facility's workforce to attain the production targets. Originally the Kansas City bomber plant had been planned to be an assembly center. In 1944 it evolved into a true manufacturing facility. Kansas City's bomber plant workers were accounting for approximately 62 percent of each airframe, Fisher Body for 29 percent, and other outside contractors for the remaining 9 percent. Government-furnished equipment outfitted the airframe with such items as engines, propellers, wheels, tires, and instruments.³⁷

In December 1943 the facility began producing the B-25J model. For the new model NAA, among other changes, did away with the retractable bottom turret, moved the top turret forward near the pilot's compartment, and added armor protection for several crew positions. The new model featured more machine-gun armament; there were two versions, one fitted with twelve .50-caliber machine guns and the other with eighteen. The J model was an improvement of the platform. The turret changes resulted in a more forward center of gravity, which resulted in increased stability during bombing runs. The armor meant a better defense for the crew, and the additional guns provided a more lethal weight of attack. The D model continued in production until March 1944, when the last unit rolled out of final assembly. Whereas the D model was almost always painted in camouflage, the J model often left the factory in plain aluminum finish.³⁸

NAA was still producing the B-25 and the P-51 fighter in its Inglewood, California, plant. The AAF wanted more P-51s to provide long-range escort for its bombers. With the Kansas division meeting its production targets and capable of more, North American decided to stop B-25

37. *History of North American Aviation Inc. of Kansas*, 16–20; *North American Aviation, Inc.: A Brief History of the B-25 Mitchell Bomber*, 28; "To Bomber Plant Helm," *Kansas City Times*, November 27, 1943.

38. *North American Aviation, Inc.: A Brief History of the B-25 Mitchell Bomber*, 12, 21–23; "Final Report on Test of Operational Suitability of

36. *History of North American Aviation Inc. of Kansas*, 6–9.

production at Inglewood in order to focus on the fighter, and effective July 7, 1944, it made the Kansas City plant the sole source of Mitchells.³⁹ With the plant running at such a high pitch, modifications were incorporated into the assembly process. As a result, the Modification Center was closed in October 1944, and thereafter it was used as an adjunct to the final assembly line. The 1944 total of monthly airplane acceptances was 3,012, an average of 251 medium bombers each month.⁴⁰

The pre-flight and flight-testing operations of course continued year-round. The flight line crews and test pilots at NAA in Inglewood could perform their work in the predominantly sunny and temperate southern California climate. It was decidedly not so for those doing this same work at the Kansas site. The Midwest's hot and humid summers could be uncomfortable, but winters presented the real challenge. Workers continued to carry out their important jobs nevertheless, and the Service and Janitor's Department operated tractors with rotary sweepers and trucks with snow-plows to clear the flight ramps and runways. The Methods Department built portable work sheds that could be placed near the aircraft so that the crews could perform at least some of the work out of the wind. The flight line crews used brooms and snow shovels to remove snow from the airplanes. They also used covers over the pilots' compartments and engines to keep these free from ice and snow. Elmer Brown was a crew chief on the production side of the operation. Originally from Illinois, he was accustomed to the Midwest's seasonal extremes, but when questioned about how the winter conditions affected the flight line, he simply said, "You wouldn't believe. It was really miserable."⁴¹

The safety record of the pre-flight and test flying at Kansas City's bomber plant was excellent. Well-prepared emergency services were an important factor. The fire department was staffed with experienced firefighters from departments throughout the Greater Kansas City

area. Periodically the fire administration, in concert with the Fairfax Field control tower and test-pilot department, ran scenarios to maintain readiness. The fire crews had no prior knowledge that any scenario would be a drill. As an example of a planned scenario, a test pilot, while returning to the airfield, might report on the radio to Fairfax Control that he had an engine fire. The tower alerted the medical staff within the plant and then placed an alarm to the fire department. A pumper truck, a 1,000-gallon tanker truck, and an ambulance responded.

The fire apparatus was equipped with a radio similar to the one used on the Mitchell, which let the firefighters communicate directly with the crew. Emergency responders readied themselves and their equipment near the plane's expected stopping point. When the aircraft landed and came to a stop, they placed their vehicles in the appropriate tactical positions and deployed their hose lines and extinguishers. They also raised a ground ladder to the top of the pilot's compartment in case the crew should want or need to exit by the top escape hatch. This training was important in maintaining emergency readiness.⁴²

On the whole the production workers and company and AAF inspectors ensured a constant stream of well-built and safe B-25s. As with any human endeavor or activity, however, there existed the rare instances of human error or oversight, and it was important for the inspection crew to maintain a sharp eye. For example, crew chief Elmer Brown recounted an episode experienced by his crew. One of the mechanics, Chick Moss, was atop the wing. The crew had already removed the fairing strips at the junction of the center section and the outer wing. (The center section composed approximately a quarter of the main fuselage and the inner portions of both wings, to just outboard of the engine nacelles.) Moss was inspecting this connection and placed a box end wrench on one of the nuts holding the outer wing to the center section; the wrench swung easily with one finger. He alerted Brown and tried another nut; it too was loose. Brown did not recall if they found more loose fasteners, but their discovery certainly required more scrutiny. They rerouted the plane back into the plant for further attention. If they had not been vigilant in their inspections, very likely the

B25J Airplane as Compared to B25D Airplane," May 17, 1944, Proof Department, Army Air Forces Proving Ground Command, Eglin Field, Florida, 245.64, USAF Collection, USAF Historical Research Agency, Maxwell Air Force Base, Alabama.

39. "Leads in Bombers," *Kansas City Times*, July 7, 1944.

40. "The Modification of Army A/C in the United States," Statistical Appendix, 20; Lilley, *Problems of Accelerating Aircraft Production during World War II*, 97. On October 6, 1944, military officials presented the Army-Navy E Award for production excellence to NAA's Kansas division.

41. "Blizzards No Hindrance," *North American Skyline* 4 (May-June 1943): 12; "When Winter Hits Fairfax—Sweep, Brother, Sweep," *North*

Ameri-Kansan, December 15, 1944; Elmer Brown, interview by author, March 3, 1991. The weather was so favorable in Inglewood that at times final assembly extended to the outdoors, employees attaching the outer wings and applying paint to the planes on the flight ramp.

42. "When Seconds Count," *North American Skyline* 4 (January 1943): 12; Winthrop Cantrell, interview by author, May 8, 1989.



Whereas the D model was almost always painted in camouflage, the B-25J model, pictured here on the flight line with the standard bombardier nose, often left the factory in plain aluminum finish. The dike in the background ran along the north and east perimeters of the bomber plant property and airfield. Courtesy of the Wyandotte County Museum.

wing would have folded in flight with catastrophic results.⁴³

Over the course of the almost four years of operation, there were several minor incidents. For example, one of the main landing gears on one airplane failed to come down, and the pilot was forced to make a landing on a sandy section of the airfield. Another plane experienced a fire involving the electrical wires leading to an engine, which the crew was able to extinguish, after which they landed on one engine. Another aircraft developed a serious oil leak in one engine, which resulted in an engine shut-down and propeller feathering malfunction. In this instance the test pilot made a forced landing in a farm field approximately twenty miles west of the bomber plant. All three aircraft suffered minor damage, re-entered the plant for repairs, and completed acceptance.⁴⁴ For the operational period there were only four serious incidents.

The first occurred on April 26, 1942. Interestingly it involved the thirteenth aircraft assembled at the plant. During its first flight on that Sunday morning, the B-25D (AAF serial number 41-29660) started its take-off roll from

the north and sped down the northwest/southeast runway, lifted off, reached a height of about one hundred feet, and promptly crashed into railroad tracks in North Kansas City, Missouri. All five crew members died in the crash and resulting fire.⁴⁵ (Early in the operations it was common for additional personnel to go along on test flights; after this crash company management limited those aboard.) In a letter addressed to all employees, plant manager H.V. Schwalenberg wrote, "A tragedy has occurred. Five soldiers of production have given their lives to our country, no less courageously than though they fought at Corregidor; we have lost our first bomber."⁴⁶

After the crash scene investigation the plane's wreckage was returned to the plant for inspection. Post-crash analysis showed that at the point of impact the left propeller was simply windmilling, indicating that the left engine was not producing take-off thrust but rather had returned to an idle speed. The pilots simply did not have enough altitude or forward speed to overcome the malfunction. The accident investigators found the cause to be a dislodged one-inch-long, 3/16-inch-

diameter bolt in the carburetor throttle linkage that either had not been secured with a nut or for which the nut had come loose; it had held for the engine run-ups and take-off roll but evidently had come loose immediately after take-off. The pilots had then lost control of the left engine.⁴⁷ To emphasize the need for utmost diligence the plant manager ordered that all production supervisors and inspectors view the wreckage. They were told of the dead employees and their families. Some employees were even shown photographs of the victim's burned bodies. A production employee later recalled that the crash was "a shock. Why? We all felt a part of it, a part of us was lost when that happened."⁴⁸

The second incident took place on July 18, 1942, and involved B-25D AAF serial number 41-29729. While the

45. "Five Die in Crash," *Kansas City Times*, April 27, 1942.

46. H. V. Schwalenberg to All Employees, April 26, 1942, copy in author's collection, Merriam, Kansas.

47. "Technical Report of Aircraft Accident Classification Committee 42-4-26-24," Department of the Air Force, Headquarters Air Force Inspection and Safety Center, Norton Air Force Base, California; Walter Burwell, interview by author, November 8, 1989; Harry Brown, interview by author, November 2, 1988.

48. Harry Brown, interview by author, November 2, 1988; Walter Burwell, interview by author, November 8, 1989; Tom and Enid Bender,

43. Elmer Brown, interview by author, March 3, 1991.

44. Ibid.

crew members were performing a dive test, they noticed that the flap on one of the wings had come loose and was trailing the wing. There was the danger of the flap breaking loose and interfering with the tail surfaces should they attempt a landing. The crew continued flying the plane for approximately two hours to burn off as much fuel as possible before bailing out. By then the plane was over North Kansas City, Missouri, which at the time was a less inhabited section of the metropolitan area. When a severe vibration developed in the plane, the pilot ordered the other two crew members to bail out. The pilot followed soon after. All parachuted safely to the ground with only one slight injury. The abandoned plane continued to fly as the on-lookers were treated to a show. For approximately twenty minutes the aircraft flew by itself, performing several aerobatic maneuvers, diving, zooming back up, flying inverted, twisting, then sharply descending again and recovering. Finally it crashed in a farm field about five miles north of the bomber plant. Research about this crash pointed to a broken aluminum casting whose purpose was to retain part of the flap.⁴⁹

On February 22, 1943, a flight line crew was performing an engine run-up test. One of the mechanics was a newly-arrived employee from the plant's final assembly section who had long been eager to work on the flight line and had finally made the transfer. He was used to being around the planes, but of course within the plant there would have been no hazard from running engines or spinning propellers—the flight line was a very different environment. The young man was in the cockpit, and the acting crew chief was explaining to him the cockpit procedures for the engine run-up. The trainee exited the forward section of the plane, using the short ladder that extended from the hatch opening at the center of the plane just below and behind the pilot's compartment. In his enthusiasm for his new assignment, he simply did not notice just how close he was to the whirling propeller. He walked into the propeller's arc and was instantly killed. After this accident a new policy required that a rope be lashed from the stairway out to each wing's landing-gear strut or each engine cowling as a physical signal to



An armament worker reviews the completed installation of the eight .50 caliber machine guns in the nose of a J model B-25. The new model featured more machine-gun armament than the D model, outfitted with a total of either twelve or eighteen .50—caliber machine guns, thus providing a more lethal weight of attack. Courtesy of the Wyandotte County Museum.

emphasize to ground personnel not to enter the danger zone of the propeller arcs.⁵⁰

The last occurrence did not involve AAF or NAA test flight personnel, but it occurred at Fairfax Field and involved a B-25 ready for delivery. In the late afternoon of June 16, 1943, a three-person ferry command crew prepared for departure. In addition to a full fuel load this plane had a reserve fuel tank in the bomb bay. The temperature that afternoon reached 83 degrees with a relative humidity of 70 percent. The ferry crew members started their take-off roll from the southern end of the

interview by author, August 17, 1988; Roy Corrison, interview by author, October 9, 1988; Donald Potter, interview by author, August 8, 1988.

49. "Struggle in Sky," *Kansas City Star*, July 19, 1942; "Serene in Chute," *Kansas City Times*, July 20, 1942; Harry Brown, interview by author, November 2, 1988; Walter Burwell, interview by author, November 3, 1989.

50. "Killed by a Propeller," *Kansas City Star*, February 2, 1943; Elmer Brown, interview by author, March 27, 1991; "Unremitting Vigil by Capable Safety Planners Keeps Plant Safety Mark High," *North American*, December 8, 1944.



A depiction of winter conditions on the Fairfax Field flight line. Pre-flight and flight-testing operations continued year-round, and although the Midwest's hot and humid summers could be uncomfortable, winters presented the real challenge. Snow plows cleared flight ramps and runways, flight line crews used brooms and snow shovels to remove snow from the airplane, and covers kept ice and snow from infiltrating the pilots' compartments and engines. Courtesy of the Wyandotte County Museum.

northwest/southeast runway. As they began to lift off, the co-pilot immediately brought up the landing gear; however, it proved to be too soon. The combination of the fully loaded and fueled plane and the hot, humid air resulted in the plane settling back down onto the runway. It skipped twice more on the runway before it remained grounded. It then skidded along the runway surface, smashed through the chain-link fence surrounding the airfield, and came to a stop against the dike. The crew exited from the top escape hatch just as a fire began within the plane. Within minutes flames engulfed the airplane. Due to the fuel load the fire crews were not able to extinguish the fire, and the plane, B-25D AAF serial number 41-30647, was a complete loss. Pilot error was the cause for this accident.⁵¹

Amid the busy schedules, ground work, and test flights in all weather conditions, there were still evident occasional instances of humor. Some of this humor centered on AAF test pilot Captain Pochyla. In the Fairfax District the Phillips Petroleum Company had a refinery.

Its gas flare, also known as a flare stack, was a flame emitting from the top of a tower some fifty feet in the air. It burned off the flammable gases released by over-pressurization of refinery equipment. In a number of instances Captain Pochyla buzzed the gas flare, and the airplane's wake extinguished the flame. Each time it required an hour or two of labor to reignite the discharge, much to the refinery management's consternation.⁵²

On rare occasions Captains Lair and Pochyla teamed and went on the same flight. One day Pochyla was flying as aircraft captain and Lair as his co-pilot, with crew chief Elmer Brown riding in the navigator's compartment aft of the cockpit. They were flying over downtown Kansas City, Missouri, and coursing along the Missouri River. Brown noted that they were slowly losing altitude over the river. On the interphone Pochyla posed the question "Brownie, how would you like to fly under the Chouteau Bridge?" (The original Francois Chouteau Bridge was a three-truss structure built in the 1890s; at the time it served railway traffic

between the eastern part of downtown Kansas City and North Kansas City.) The crew chief was apprehensive but responded, "Well, if you think you can make it." There was a brief silence, and then Lair's voice came over the interphone: "You fly under that bridge, and I guarantee you this time next week you will be in the jungles of the South Pacific carrying a gun." Pochyla said nothing, but the crew chief felt the sudden change in attitude as the bomber zoomed up and over the bridge.⁵³

In January 1945 the Kansas City plant set a production record: the AAF accepted 315 aircraft. Management expected to complete the B-25 schedule in December, so it gradually reduced average monthly employment during the first six months of the year. However, the end of the war in Europe on May 7 was followed several months later by the defeat of Japan on August 14. On August 15 the contracting officer in charge of B-25 production at Wright Field in Dayton, Ohio, sent a telegram to the Kansas division terminating the B-25 contract. Within days most of the NAA employees left in two stages of

51. "B-25 Crash Injures 3," *Kansas City Times*, June 17, 1943; "Report of Aircraft Accident 43-6-16-15," Department of the Air Force, Headquarters Air Force Inspection and Safety Center, Norton Air Force Base, California; Harry Brown, interview by author, November 2, 1988.

52. Walter Burwell, interview by author, November 8, 1989; Lynn Bogeart, interview by author, March 5, 2015.

53. Elmer Brown, interview by author, March 27, 1991.

layoffs.⁵⁴ Three test pilots remained to finish, with several planes nearing completion in final assembly and those planes awaiting test on the flight line. In October ferry crews flew away the last aircraft. During the operational period the bomber plant employees built, and the flight line crews and test pilots prepared, 6,608 B-25s for war duty. The Modification Center serviced approximately 4,000 Kansas-and-California built bombers along with a small number of P-51 fighters.⁵⁵ These aircraft were but a part of the total of America's aviation industry during the war. From July 1, 1940, to August 30, 1945, the American aircraft industry produced approximately 294,000 planes. From 1942 to 1945 Modification Centers all across the country serviced about 59,000 airplanes.⁵⁶

In the demobilization process after the war's end, the federal government classified the bomber plant, Modification Center, and associated properties as surplus and available for lease. Transcontinental and Western Air leased the Modification Center, whose first use would be in servicing its airliners. Next came the notification that General Motors had signed a lease for the former bomber plant. By December the plant was essentially cleared of all aircraft production material, and automobile-industry personnel began setting up shop. In October 1949 the federal government relinquished control of Fairfax Airport and returned it to the city of Kansas City, Kansas.⁵⁷

At the start of the war the Axis powers had the advantage of military superiority, especially in the air. The momentum shifted as Allied rearmament and manpower gradually equaled and then surpassed those of the Axis. The B-25 was one component of the reversal. Its combat crews strafed Japanese airfields and troop positions and attacked Japanese transport and troop ships. The British and the Dutch used it in Europe for tactical support of ground troops. The plane was instrumental in the interdiction of German ground transport in northern Italy. Time and again the B-25 and

its combat crews took the fight to the enemy. The Kansas division of NAA was an example of what took place in defense plants all across the country during World War II. The Japanese attack on Pearl Harbor and the fight against Nazism galvanized the American people. Many of the workers had brothers, husbands, sons, or friends in the military overseas. Many were working at a defense plant with the intent of producing the weapons with which to bring the war to a swifter conclusion, thus bringing the men home. Many of the interviewees expressed their purposes in similar manners. It was "a privilege to help the boys with airplanes for them." "I wanted to do for my country what I could do." Everyone was "there for a purpose. Everybody really took an interest in the work, there to win the war."⁵⁸

During the war NAA was one of the largest employers in the Kansas City area; it invigorated the local economy with more than \$160 million in payroll and paid approximately \$18 million in federal, state, and local taxes. The employees earned good pay; in 1945 a Kansas airplane production worker on average earned \$55.68 per week, and this at a time not far removed from the dismal atmosphere of the Great Depression. Of 59,337 total employees, approximately 55,000 had trained for and then garnered valuable work experience at the Fairfax facility. These workers gained knowledge and skills that prepared them for many peacetime occupations.⁵⁹

Many years have passed and the sights and sounds of that long-ago chapter have disappeared. What remains is the legacy of the resolve and effort put forth by the Kansas division's NAA and AAF personnel. From the initial phases of plane production to the ferrying preparations, the workforce provided a vital weapon to the Allied forces. This teamwork hastened the final victory in World War II and is the legacy of North American Aviation, Inc. of Kansas. [KH]

54. *North American Aviation, Inc.: A Brief History of the B-25 Mitchell Bomber*, 29; "Vital Plane Unit," *Kansas City Star*, August 17, 1945; "Speed Bomber Wind-Up," *Kansas City Star*, August 24, 1945; "B-25 Tools Out," *Kansas City Times*, September 28, 1945.

55. *North American Aviation, Inc.: A Brief History of the B-25 Mitchell Bomber*, 29-30; "The Modification of Army A/C in the United States," Statistical Appendix, 20.

56. Craven and Cate, *The Army Air Forces in World War II*, vol. VI, Men and Planes, 352; "The Modification of Army A/C in the United States," 57.

57. "TWA to Center," *Kansas City Star*, October 24, 1945; "Rush Car Plant," *Kansas City Star*, November 7, 1945; "Fairfax Airport May Make

Full Circle," *Kansas City Kansan*, April 30, 1978; "GM's Old Fairfax Plant Burns," *Kansas City Star*, January 19, 1989. See also Macias, 'We All Had a Cause,' 259-261.

58. Gloria Pool, interview by author, August 21, 1988; Augustine Dahlem, interview by author, September 6, 1989; Francis Gripp, interview by author, July 25, 1988.

59. "Contribution to Peace," *Kansas City Star*, August 19, 1945; Peter Fearon, "Ploughshares into Airplanes: Manufacturing Industry and Workers in Kansas during World War II," *Kansas History: A Journal of the Central Plains* 22 (Winter 1999/2000): 302.