

The high and the mighty

1928



1934-1935



From the Mustang to the Sabre Jet, from the Apollo spacecraft to the B-1 bomber, North American Aviation left a lasting legacy of aerospace excellence

By Mike Lombardi and Erik Simonsen

They brought us the iconic P-51 Mustang and the F-86 Sabre Jet fighters, designed record-setting supersonic and hypersonic aircraft and built the Apollo spacecraft that took astronauts on history's greatest voyage—to the moon and back.

The men and women of North American Aviation were part of a powerhouse of engineering, manufacturing and technology formally incorporated as a company 75 years ago.

Now part of The Boeing Company, the roots of North American Aviation can be traced to 1928 with the formation of a holding company in the United States by the same name. It brought together interests in Curtiss Aeroplane, Douglas Aircraft and Transcontinental Air Transport. The holding company later purchased aircraft manufacturer Berliner-Joyce as well as the General Aviation Manufacturing Co., which had controlling interest in the U.S. branch of the Fokker Aircraft Corp.

In 1934, New Deal legislation in the



GRAPHIC: The NAA Logo. BOEING ARCHIVES

PHOTOS: (Top) James Howard "Dutch" Kindelberger (left) and John Leland "Lee" Atwood led North American Aviation and charted its course for success.

BOEING ARCHIVES (Above) North American Aviation first set up shop in this Dundalk, Md., factory. BOEING ARCHIVES

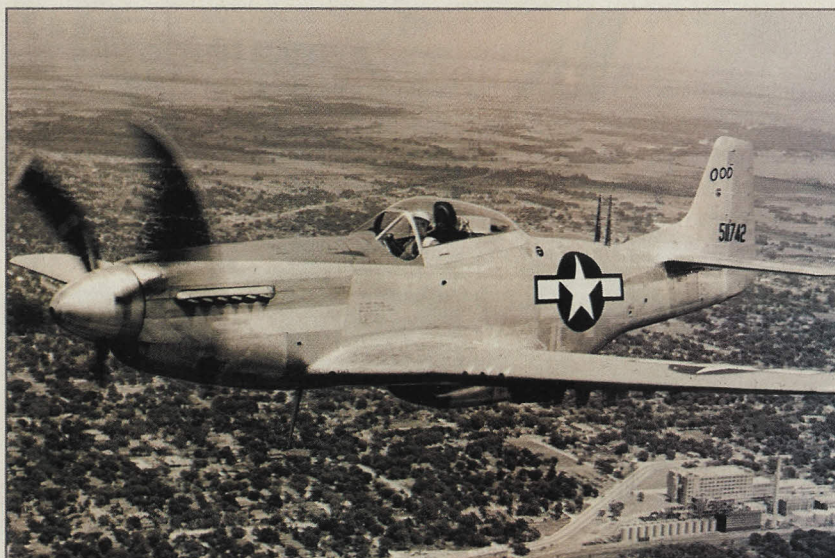
United States forced the breakup of all aviation holding companies and the North American Aviation holding company was dissolved. Its manufacturing capabilities, represented by Berliner-Joyce and General Aviation (Fokker), were consolidated into a single manufacturing company, which was incorporated on Jan. 1, 1935, as North American Aviation Inc.

James Howard "Dutch" Kindelberger, chief engineer of the DC-1 program at Douglas Aircraft, was named to head the new company. He brought along two fellow Douglas designers, J.S. "Stan" Smithson and John Leland "Lee" Atwood, who 30 years later would succeed Kindelberger as leader of North American Aviation.

Starting in the former Berliner-Joyce plant in Dundalk, Md., the company's only work was finishing a handful of Berliner-Joyce airplanes. Kindelberger directed work on two designs that would help to launch the new company. The first was an observation plane known as the O-47 Owl, and over the next five years 238 were built for the U.S. Army Air Corps. Assembly also began on a second aircraft type—the NA-16 monoplane trainer. Designated the BT-9 by the U.S. Army, it would evolve into one of the world's most famous trainers—the T-6 Texan.

The facilities in Dundalk would prove inadequate for the production of modern aircraft, and Kindelberger persuaded the board and a number of employees to move to Southern California, where they'd have year-round flying weather. A site near Inglewood at Los Angeles Municipal Airport (Mines Field) was selected, and on Jan. 1, 1936, a modern plant was opened.

With the success of the NA-16 series, North American investigated new designs. A number of different twin-engine models were flown—the XB-21, the NA-40 and the XB-28. But the design that found success was the B-25 Mitchell medium bomber. During World War II the B-25 saw action on every front, serving with all branches of the U.S. armed forces and most allied air forces. The B-25 may be best remembered as the plane used for the legendary "Doolittle Raid." On April 18, 1942, under the command of Col. James H. Doolittle, 16 of the medium bombers launched from the pitching deck of the aircraft carrier USS *Hornet* and headed for military targets on the Japanese mainland.



1940



1947

PHOTOS: (Top) The last North American P-51D Mustang fighter was built at the company's Dallas plant. **BOEING ARCHIVES (Above)** The F-86 Sabre Jet swept-wing fighter dominated the skies during the Korean War. **BOEING ARCHIVES**

Although North American Aviation had great success with the B-25, its fighter designs made the company a household name. In response to a request from Great Britain for P-40 Warhawk fighters, Lee Atwood said the company could design a better fighter. In just 127 days North American Aviation designed and built what would become one of the most beautiful and popular designs of all time as well as one of the most deadly fighters. First flown on Oct. 26, 1940, the Mustang incorporated many innovations including the first use of the laminar flow wing. When the British married the Mustang, designated P-51 in U.S. service, with the Rolls-Royce Merlin engine, the result was

arguably the finest fighter of World War II.

During the war, the North American Aviation facility in Los Angeles was one of the most efficient in the world and set a single-type production record when it delivered 571 P-51s in just one month. The company also opened a plant in Dallas to build T-6 "Texan" trainers, P-51 Mustangs and B-24 Liberator bombers, and a plant in Kansas City, Kan., to build B-25s. By the end of the war the three sites had built 40,000 airplanes, more than any other manufacturer.

When the war ended in the Pacific Theater, on Aug. 8, 1945, North American Aviation had 8,000 airplanes on its order books. Several months later, there

1953

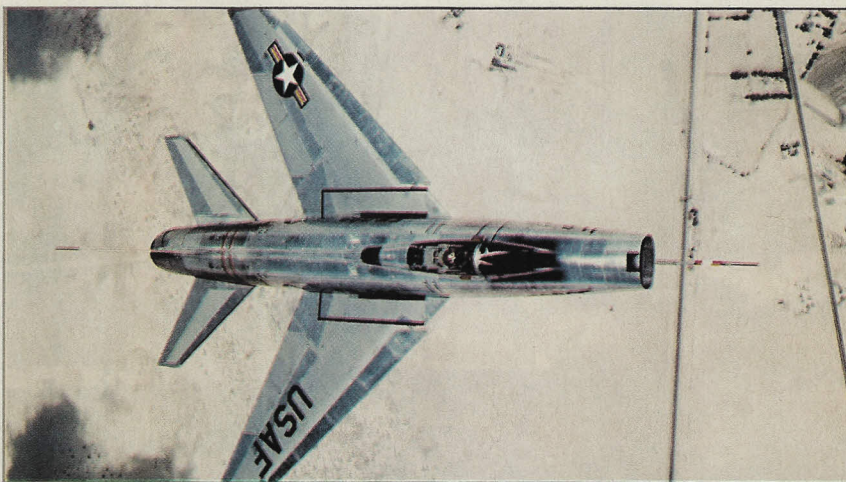


PHOTO: The F-100 Super Sabre was the first production airplane to fly at supersonic speed in level flight. **BOEING ARCHIVES**

1964

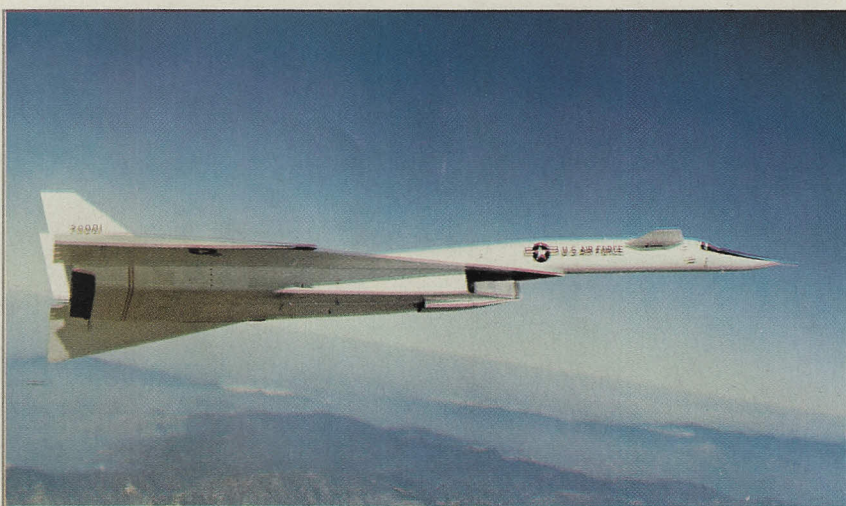


PHOTO: The XB-70 Valkyrie bomber prototype achieved speeds above Mach 3 (three times the speed of sound). **BOEING ARCHIVES**

1969

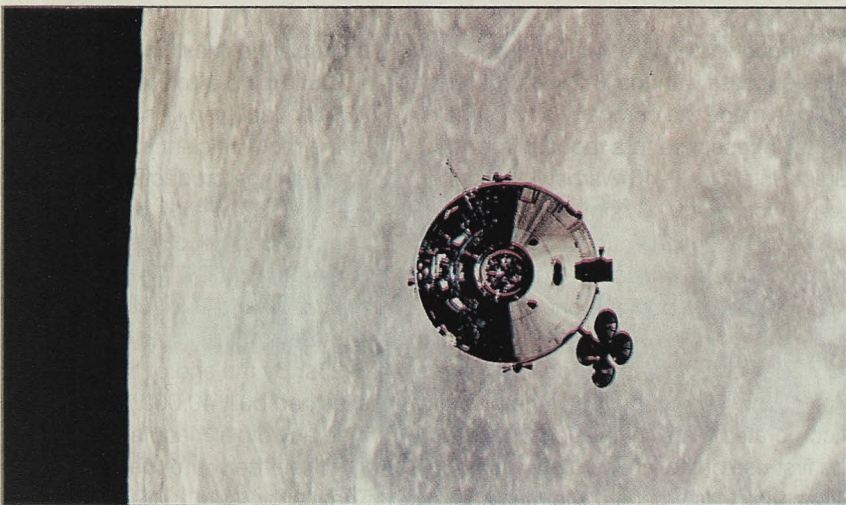


PHOTO: The North American-built Apollo Command and Service modules in Lunar orbit. **BOEING ARCHIVES**

were only 24. As the emphasis shifted from mass production to more sophisticated jet aircraft, Kindelberger and Atwood embraced new technology that would shape the next several decades of aviation.

North American's four-engine B-45 Tornado medium jet bomber, which first flew in March 1947, became the first multi-engine jet bomber for the U.S. Army Air Force. (The U.S. Air Force was formed on Sept. 18, 1947). The B-45 could carry 22,000 pounds (10,000 kilograms) of ordnance, and eventually served in the Korean War as a bomber and for high-altitude reconnaissance. Later that same year, on Oct. 1, on a dry lakebed at Muroc Army Air Field, Calif., North American test pilot George Welch pulled back on the stick of the XP-86 (later designated F-86), and the first U.S. swept-wing jet fighter was airborne. More than 8,680 of the jets would be produced, and it had great success in aerial combat during the Korean War against the Soviet-built MiG-15.

Only six years after the F-86 Sabre Jet was introduced, the F-100 Super Sabre took to the skies, becoming the Air Force's first operational supersonic fighter. The F-100 also served with many NATO countries. More than 2,290 were built.

By 1954, Atwood had decided that North American needed to diversify its business to remain competitive. After building tens of thousands of the airplanes that helped win World War II, North American Aviation focused on the emerging markets for spaceflight, missile guidance systems, rocket propulsion and electronics.

Winning the Apollo contract in November 1961 was critical to this new strategy. The company designed and built the Apollo Command and Service modules, and built the second stage of the 363-foot (111-meter) Saturn V moon rocket. North American's Rocketdyne Division (now owned by Pratt & Whitney), designed and built all the engines for the Saturn V. Boeing built the first stage and Douglas built the third stage, underscoring a remarkable legacy of achievement in space for three of the companies that make up Boeing today.

Helping prepare the way for the journey to the moon and back was knowledge gained by nearly 200 flight tests of North American's rocket-powered X-15 research

aircraft, which was used to verify systems for the Gemini and Apollo spaceflight missions. The X-15 established several speed and altitude records, ultimately reaching Mach 6.7 (4,970 miles per hour, or 7,995 kilometers per hour), and 354,400 feet (67 miles, or 108 kilometers).

But even as the country focused on manned spaceflight and the moon trip in the 1960s, North American Aviation continued developing cutting-edge aircraft. It won the competition to develop a bomber that could cruise at three times the speed of sound at 75,000 feet (22,860 meters). The XB-70 Valkyrie first lifted off the runway at the company's Palmdale, Calif., site on Sept. 21, 1964. Although the B-70 never entered operational service, it proved a technological triumph. The next two decades saw a merger with Rockwell Standard and the development of another fast bomber, the Rockwell B-1. Canceled in June 1977, the B-1 received new life under the Reagan administration when Defense Secretary Casper Weinberger announced in October 1981 that 100 B-1Bs would be built.

Described by pilots as flying like a fighter with the range of a bomber, today the Boeing B-1B Lancer is providing critical support to U.S. and allied warfighters in Afghanistan.

Seventy-five years after it all began with wood and fabric planes from North American Aviation that could only fly at 100 miles per hour (160 kilometers per hour), to building the space shuttle that travels at 7 miles per second (11 kilometers per second) in orbit some 150 miles (241 kilometers) above the earth—Boeing today continues North American's proud legacy of innovation, quality and aerospace leadership. ■

michael.j.lombardi@boeing.com
erik.simonsen@boeing.com

BY ANY OTHER NAME

In 1967, North American Aviation merged with Rockwell Standard, creating North American Rockwell. To enhance its international identity, in 1973 North American Rockwell was renamed Rockwell International. It ultimately became part of Boeing when the aerospace and defense segment of Rockwell International was purchased by the company in December 1996.



PHOTO: The legacy of North American Aviation continues with the space shuttle.
BOEING ARCHIVES

Today