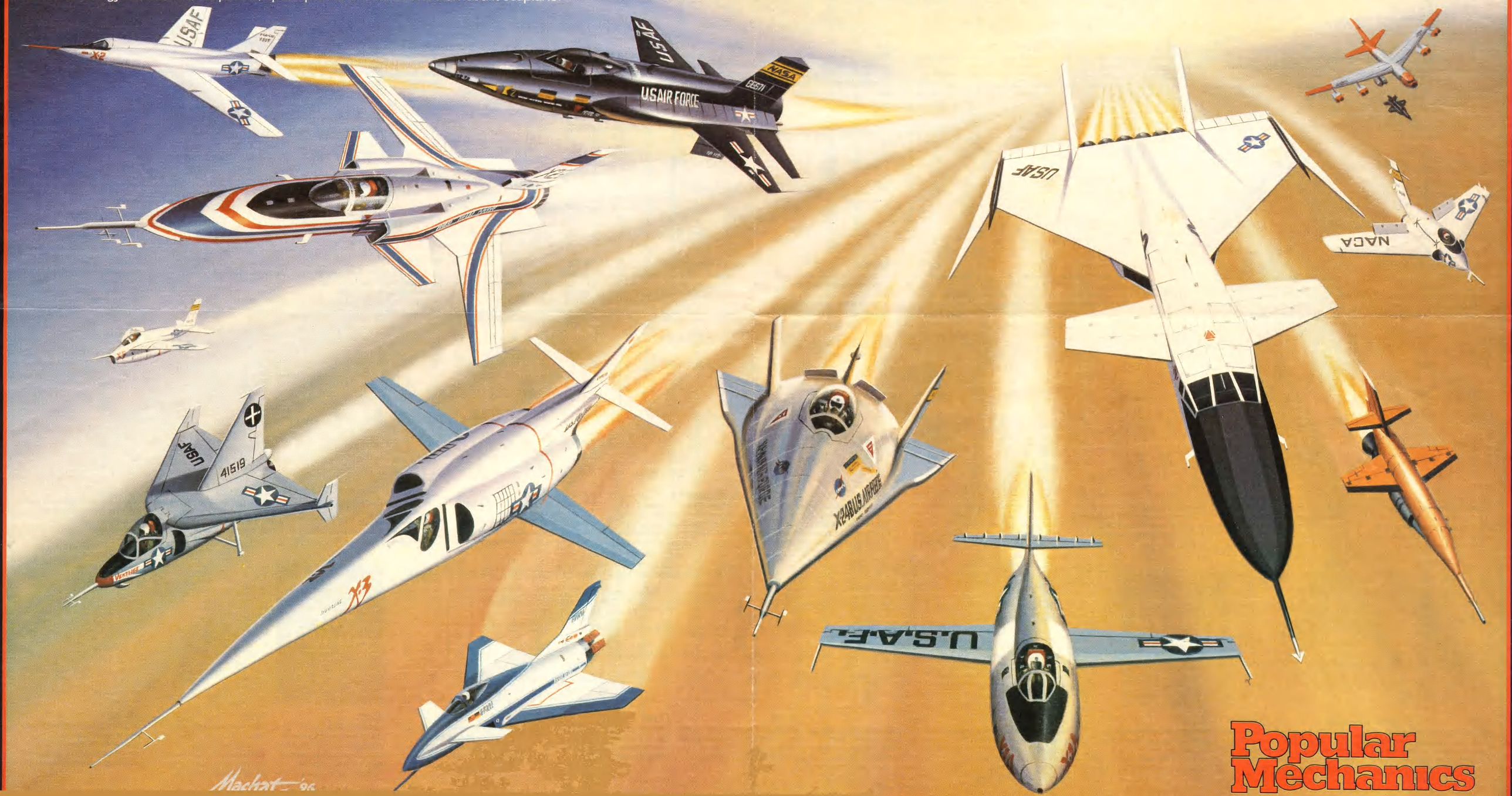
50 YEARS OF X-PLANES

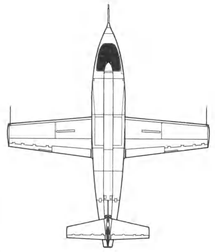
X stands for experimental, and nothing more boldly embodies courageous American aerospace adventure than the pioneering aircraft that proudly bear the designation X-plane. While the sound-barrier-busting Bell X-1 and high- and fast-flying North American X-15 usually come to mind, X-planes actually encompass a broad range of pure research aircraft. Their diverse family includes the following: lifting bodies, a nuclear-powered bomber, autogyros, rockets, sailplanes, space planes and even one homebuilt seaplane.



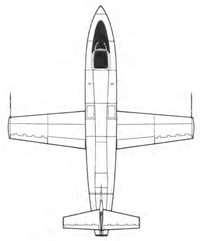
Popular Mechanics

X-SERIES AIRCRAFT

Popular Mechanics



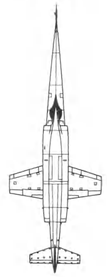
X-1
MISSION: To explore the aerodynamics of transonic speed flight.
FIRST FLIGHT: January 25, 1946.
ACHIEVEMENT: First manned aircraft to break the sound barrier.



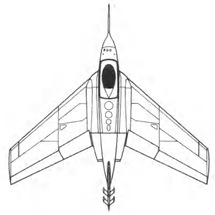
X-1A, B, C, D
MISSION: To study aerodynamic phenomena above Mach 2 and 90,000 ft.
FIRST FLIGHT: July 24, 1951.
ACHIEVEMENT: Perfected reaction control technology.

X-1E
MISSION: To investigate aerodynamics of thin-airfoil section wings.
FIRST FLIGHT: December 22, 1955.
ACHIEVEMENT: First aircraft to successfully fly with 4% wings.

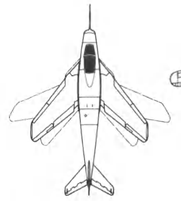
X-2
MISSION: To explore effects of heating at high Mach speeds.
FIRST FLIGHT: June 22, 1952.
ACHIEVEMENT: First to examine the "thermal thicket" above Mach 2.5.



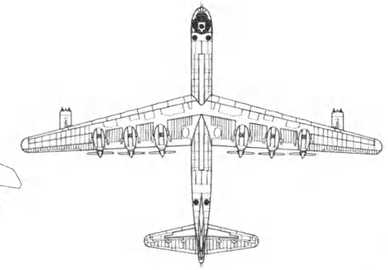
X-3
MISSION: To prove feasibility of low-aspect-ratio, high-load wings.
FIRST FLIGHT: October 20, 1952.
ACHIEVEMENT: None. Never passed Mach 1. Considered a failure.



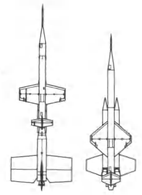
X-4
MISSION: To test semi-tailless and tailless configurations at transonic speeds.
FIRST FLIGHT: December 16, 1948.
ACHIEVEMENT: None. No solution could be found to pitch instability.



X-5
MISSION: To study aerodynamics of variable degrees of wing sweepback.
FIRST FLIGHT: June 20, 1951.
ACHIEVEMENT: First aircraft to successfully fly with a variable-position wing.



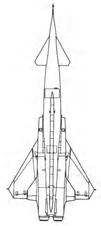
X-6
MISSION: To evaluate the operational practicality of a nuclear-powered bomber.
FIRST FLIGHT: Plane never built.
ACHIEVEMENT: None.



X-7 (SERIES)
MISSION: High-speed ramjet testbeds.
FIRST FLIGHT: April 26, 1951.
ACHIEVEMENT: First successful Mach 3 ramjet-powered aircraft.

X-8
MISSION: To gather scientific data on upper atmosphere.
FIRST FLIGHT: November 24, 1947.
ACHIEVEMENT: Civilian offshoots became the workhorses of early scientific research programs.

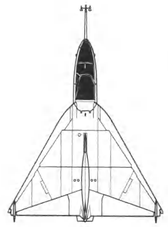
X-9
MISSION: Testbed for the future air-launched missiles.
FIRST FLIGHT: Early May 1950.
ACHIEVEMENT: Proved rockets could be used to carry nuclear weapons.



X-10
MISSION: To test the design of the second stage of the Navajo missile.
FIRST FLIGHT: October 14, 1953.
ACHIEVEMENT: Demonstrated potential of canard wing configuration.

X-11
MISSION: To gather engineering data needed for the Atlas ICBM program.
FIRST FLIGHT: June 11, 1957.
ACHIEVEMENT: Critical steppingstone toward development of the Atlas missile.

X-12
MISSION: To perfect technologies needed for a functioning ICBM.
FIRST FLIGHT: September 25, 1957.
ACHIEVEMENT: None. Destroyed shortly after takeoff.

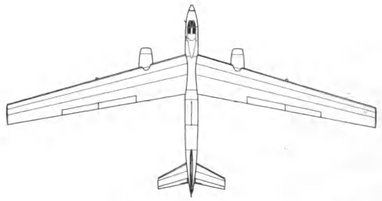


X-13
MISSION: To explore the feasibility of jet-powered vertical takeoff.
FIRST FLIGHT: December 10, 1955.
ACHIEVEMENT: Demonstrated Vertical Take-Off and Landing (VTOL) aircraft.

X-14 (SERIES)
MISSION: To determine whether or not conventionally controlled aircraft could be adapted for VTOL operation.
FIRST FLIGHT: February 17, 1957.
ACHIEVEMENT: Led to development of Hawker Siddeley's Harrier V/STOL.

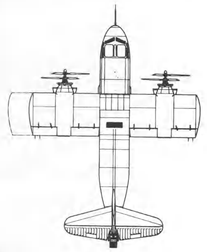
X-15
MISSION: To explore the then-anticipated problems of high-speed, high-altitude atmospheric and space flight.
FIRST FLIGHT: June 8, 1959.
ACHIEVEMENT: The most important research aircraft built in 20th century.

X-15A-2
MISSION: Testbed for Mach 8 hypersonic-ramjet (scramjet) engine technology.
FIRST FLIGHT: June 25, 1964.
ACHIEVEMENT: None. Flew only with dummy scramjet.

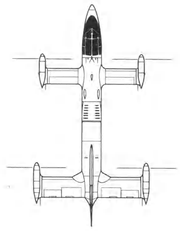


X-16
MISSION: A high-altitude spyplane that carried the X (for experimental) designation to disguise its function.
FIRST FLIGHT: Never flown.
ACHIEVEMENT: None.

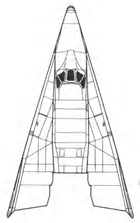
X-17
MISSION: To acquire scientific data needed to build re-entry vehicles.
FIRST FLIGHT: May 23, 1955.
ACHIEVEMENT: Made it possible to build nuclear-tipped ICBMs.



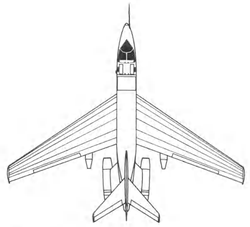
X-18
MISSION: To determine feasibility of building large VTOL aircraft.
FIRST FLIGHT: November 20, 1959.
ACHIEVEMENT: None. Flight tests were considered inconclusive.



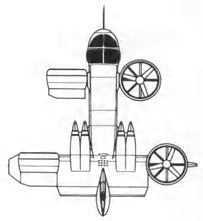
X-19
MISSION: To test tilt-propeller VTOL.
FIRST FLIGHT: November 20, 1963.
ACHIEVEMENT: None. Never transitioned from vertical to horizontal flight.



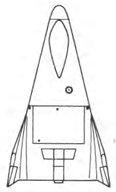
X-20
MISSION: To explore military uses of space, principally reconnaissance.
FIRST FLIGHT: Never built.
ACHIEVEMENT: None.



X-21
MISSION: To study laminar flow control (LFC) technology.
FIRST FLIGHT: April 18, 1963.
ACHIEVEMENT: Proved that LFC was possible, but economically prohibitive.

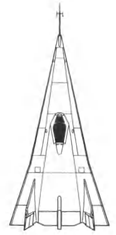


X-22
MISSION: Testbed for studying dual-tandem ducted-propeller VTOL.
FIRST FLIGHT: March 17, 1966.
ACHIEVEMENT: Considered one of the most technically productive X-planes.



X-23 (SERIES)
MISSION: To test technologies for a hypersonic lifting and re-entry body.
FIRST FLIGHT: December 21, 1966.
ACHIEVEMENT: Demonstrated vehicle could be maneuvered during re-entry.

X-24A
MISSION: To investigate aerodynamics of lifting bodies at low speeds.
FIRST FLIGHT: April 17, 1969.
ACHIEVEMENT: Proved manned lifting bodies could be controlled at low speed.

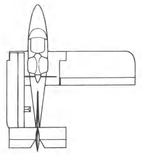


X-24B
MISSION: To study flight characteristics of a full-scale lifting body.
FIRST FLIGHT: August 1, 1973.
ACHIEVEMENT: Demonstrated supersonic lifting bodies could make runway landings.

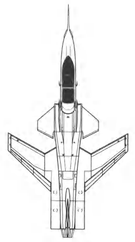
X-25 (SERIES)
MISSION: To test autogyros as rescue craft for pilots downed in Vietnam.
FIRST FLIGHT: June 5, 1968.
ACHIEVEMENT: None. Determined to be not technically practical.

X-26A, B
MISSION: To test sailplanes as reconnaissance platforms in Vietnam.
FIRST FLIGHT: July 3, 1962.
ACHIEVEMENT: Unknown.

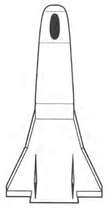
X-27
MISSION: An advanced, lightweight fighter concept plane.
FIRST FLIGHT: Never constructed.
ACHIEVEMENT: None.



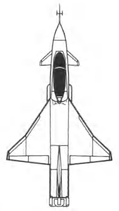
X-28
MISSION: To study use of single-seat seaplanes in policework in Vietnam.
FIRST FLIGHT: August 12, 1970.
ACHIEVEMENT: Only homebuilt to earn X-plane designation.



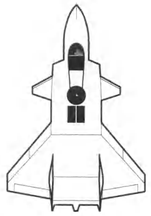
X-29
MISSION: To explore advanced design concepts, including swept-forward wings.
FIRST FLIGHT: December 14, 1984.
ACHIEVEMENT: Proved wing concept.



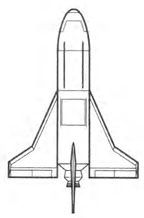
X-30
MISSION: Testbed to collect trans-atmospheric flight data for the National Space Plane.
FIRST FLIGHT: Project canceled.
ACHIEVEMENT: None.



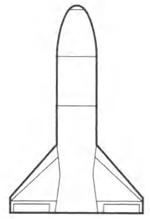
X-31
MISSION: To explore the aerodynamics of "post-stall regime" flight.
FIRST FLIGHT: October 11, 1990.
ACHIEVEMENT: A joint effort of Rockwell and Messerschmitt-Bolkow-Blohm, it is the first international X-plane.



X-32
MISSION: To explore technologies for 21st-century joint-services fighter.
FIRST FLIGHT: Unknown.
ACHIEVEMENT: None yet.



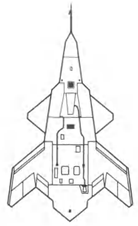
X-33
MISSION: Possible low-cost successor to the space shuttle.
FIRST FLIGHT: Set for March 1999.
ACHIEVEMENT: None yet.



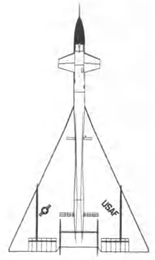
X-34
MISSION: Mach 8 reusable suborbital test vehicle capable of at least 25 flights.
FIRST FLIGHT: Scheduled for Fall 1998.
ACHIEVEMENT: None yet.

TOP SECRET

X-35
MISSION: Believed to be a classified Air Force project using the designation originally given to a canceled space-rescue vehicle.
FIRST FLIGHT: Unknown.
ACHIEVEMENT: None yet.



X-36
MISSION: Testbed for split-aileron and engine thrust-vectoring technology.
FIRST FLIGHT: A 28% subscale prototype to fly in late 1996.
ACHIEVEMENT: None yet.



XB-70
MISSION: Bomber recycled as high-altitude Mach 3 testbed.
FIRST FLIGHT: April 25, 1967.
ACHIEVEMENT: Amassed data essential to future flight research.