

F/A-XX – AE update, June 15, 2010

Phantom Ray – Bomber, Spy Plane, UAV

Boeing's Phantom Ray, an unmanned aerial system (UAS) being developed by the company's Phantom Works.

The Navy has its eyes on next-generation replacement fighter aircraft that may be needed as early as 2025 to replace the F/A-18E/F Super Hornet.

Like the Navy, the U.S. Air Force is also already looking ahead for the vehicle that will replace the F-22, which presents another opportunity for Boeing and its competitors.



2 Tailless vehicles, pilot-optional aircraft.

Roll out in May. Taxi in July. Flight and other tests, begin in December.

Phantom Ray is a redesign of Boeing's X-45.

Range 1,000 nautical miles (2,000 roundtrip); 4,500 pound payload.

May do autonomous aerial refueling.

3 The design is to be very aerodynamic, with swept wings and no tail fins.

Stealth; with or without a pilot, depending on the role.

Strike, Air superiority, Ground support, Precision bombing, Recon.

Enter production in the early 2020s.

4 Unmanned configuration will probably be lighter, more maneuverable, sustaining higher G-forces.

Hopefully laser-based weapons, as well as air-to-air and air-to-ground guided & unguided ordnance, laser-guided bombs, reconnaissance pods and other state-of-the-art weaponry.

Continuous firing laser for delivering a heavy blow to an enemy aircraft. However, high powered lasers such as Boeing's ABL - Advanced Ballistic Laser, mounted in the nose of a Boeing 747 requires lots of space, not available on an attack aircraft.

5 Supersonic speeds of mach 3-4 currently not feasible - such velocities have an adverse effect on stealth coatings, as per F-22s top speed of Mach 1.8.

Visual stealth.



X-47

1 Northrop Grumman makes the X-47 Navy combat UAS demonstrator and the Air Force's high-altitude surveillance Global Hawk.

General Atomics makes the Predator and Reaper hunter/killer UAS.

2 The twin-engine prototype is designed to stay aloft at 60,000 feet for days at a time.

The X-47A was a stealth design with no vertical control surfaces, yaw control being achieved by differential movements of surfaces in the wings.

3 The *Pegasus* was equipped with a U.S. Navy Shipboard Relative GPS navigation system, necessary for automatic landings on a carrier deck.

On its first flight, the X-47A landed on a pre-designated spot on the runway.

DARPA combined the program into the Joint Unmanned Combat Air Systems.

1 The X-47B doesn't have much in common with the X-47A.

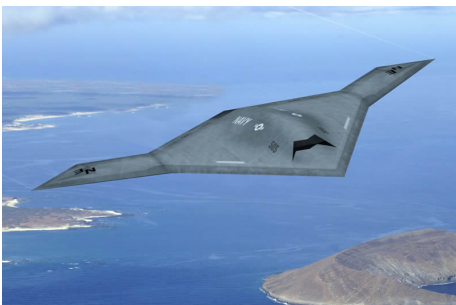
It has a turbofan engine, redesigned outer wing sections and intake/exhaust configurations.

2 The wing extensions provide for longer range and better low-speed characteristics, and are foldable to reduce parking space on the aircraft carrier.

X-47A



X-47B



MQ-X

1 Lockheed Martin's Skunk Works has unveiled a concept for the US Air Force's follow-on to its MQ-1 Predator and MQ-9 Reaper UAVs.

Blended wing/body design, 32ft-span, 24h-endurance version for catapult launch, and a larger version for runway take-off and landing.

Propulsion system a hybrid: pair of jet engines for high transit and dash speed, and a turbo-diesel with a propeller for longer, lower-speed loiter.

Used together, the engines can push the UAV to higher altitudes so it can bridge the gap between the medium-altitude Reaper and high-altitude Global Hawk.

2 The 300hp turbo-diesel is in the pod on top of the central fin, so the propeller can be mounted between the V tails to shield it from radar.

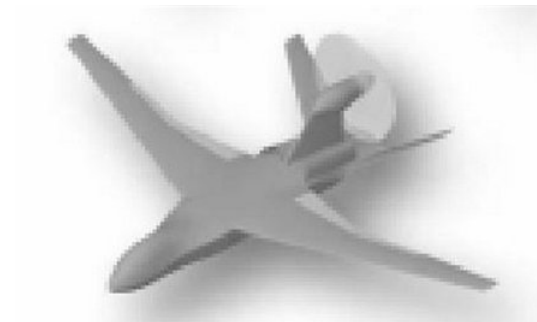
Internal sensor and weapons bays

Stealthy and modular, the AF's plan for future unmanned aircraft.

Designed to take mission-specific modular wings:

Shorter wing for medium-altitude hunter/killer role, providing higher speed but less endurance, around 20-30h at 20,000-25,000ft.

A longer wing to boost altitude above 40,000ft; endurance beyond 40h.



X-51 Waverider update

1 May 26 -- **EDWARDS AFB** -- An X-51A Waverider more than 200 seconds at Mach 5.

The previous longest scramjet burn was 12 seconds in a NASA X-43. First use of a practical hydrocarbon fueled scramjet in flight.

2 Four X-51A cruisers have been built for the Air Force and the (Defense Advanced Research Projects Agency) by Pratt & Whitney Rocketdyne and Boeing.

Intend to fly the three remaining X-51A vehicles this fall.

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