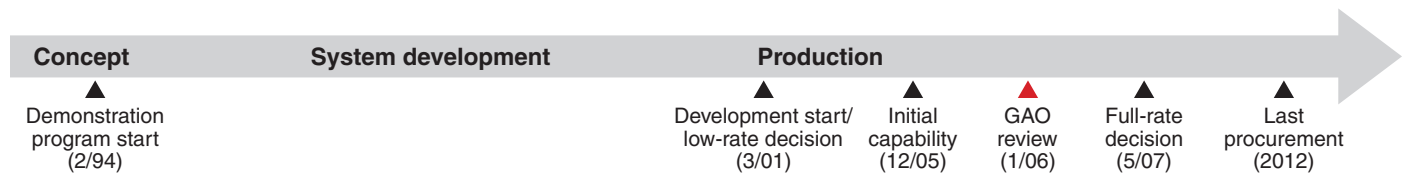


## Global Hawk Unmanned Aircraft System

The Air Force's Global Hawk system is a high altitude, long endurance unmanned aerial vehicle with integrated sensors and ground stations providing intelligence, surveillance, and reconnaissance capabilities. After a successful technology demonstration, the system entered development and limited production in March 2001. Considered a transformational system, the program was restructured twice in 2002 to acquire 7 air vehicles similar to the original demonstrators (the RQ-4A) and 44 of a new, larger, and more capable model (the RQ-4B).



Source: Northrop Grumman Corporation.



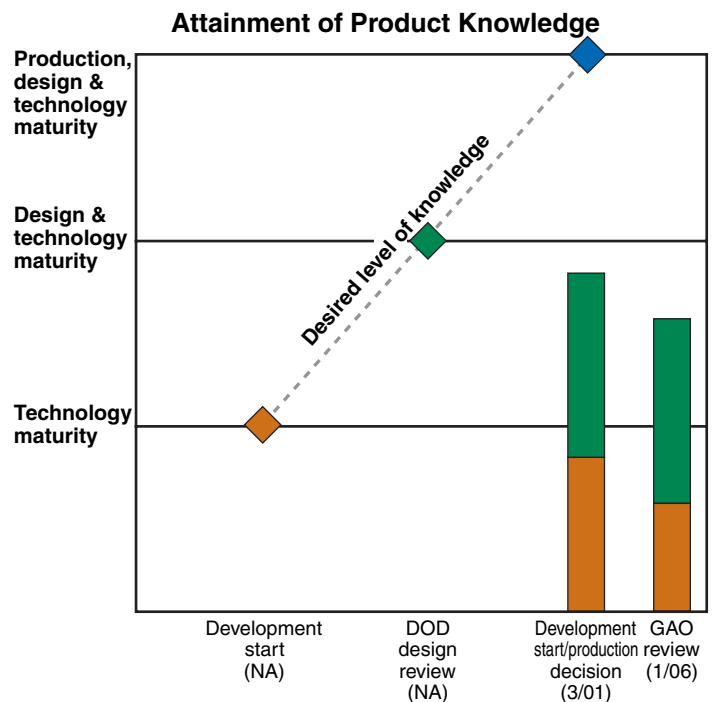
### Program Essentials

- Prime contractor: Northrop Grumman Integrated Systems
- Program office: Dayton, Ohio
- Funding needed to complete:
  - R&D: \$1,053.3 million
  - Procurement: \$2,773.0 million
  - Total funding: \$3,913.8 million
  - Procurement quantity: 37

### Program Performance (fiscal year 2006 dollars in millions)

	As of 03/2001	Latest 09/2005	Percent change
Research and development cost	\$925.2	\$2,459.1	165.8
Procurement cost	\$3,836.2	\$3,761.0	-2.0
Total program cost	\$4,789.5	\$6,352.4	32.6
Program unit cost	\$76.024	\$124.557	63.8
Total quantities	63	51	-19.0
Acquisition cycle time (months)	55	57	3.6

Key product knowledge on Global Hawk is lower now than in March 2001 due to program restructurings. Under the original plan to produce aircraft very similar to demonstrators and slowly acquire advanced systems, technology maturity and design stability were near best practices standards. Program restructurings, however, added the new RQ-4B aircraft and advanced sensors, overlapped development and production schedules, and accelerated planned deliveries. The new technologies are still maturing and the RQ-4B design required extensive changes. Officials are implementing statistical process controls, but data is incomplete. In November 2004, we reported significant risks from gaps in product knowledge and recommended reducing near-term RQ-4B buys to only those needed for testing. The program is now experiencing development and procurement cost increases, schedule delays, and quality problems.



## Global Hawk Program

### Technology Maturity

Of the Global Hawk's 13 critical technologies, 6 are mature by best practices standards; 3 are approaching maturity; and 4 are less mature. The less mature technologies include enhanced imagery and signals intelligence sensors and improved radar. The desire for these capabilities drove the decision to develop and acquire the new RQ-4B aircraft, which can carry 50 percent more payload than the RQ-4A. Integrating and testing advanced sensors won't be completed until late in the program after most of the fleet has already been bought. If space, weight, and power limitations or other performance issues surface as technologies mature, the program may experience costly rework, extended development times, or diminished capabilities.

### Design Stability

Program officials reported achieving the best practice standard for design drawings approved for manufacturer release in October 2004, shortly after RQ-4B production began. However, during the first year of production, there were more than 2,000 authorized drawing changes to the total baseline of 1,400 drawings. More than half of those changes were considered major, requiring model changes. Substantial commonality between the A- and B-models had been expected, but as designs were finalized and production geared up, design differences were more extensive and complex than anticipated. By the time of our review, design deficiencies, engineering changes, and work delays had contributed to a development contract cost overrun of \$209 million. Adding to design risk, the Air Force plans to buy almost half the RQ-4B fleet before it completes operational tests to verify the aircraft design.

### Production Maturity

The contractor has completed RQ-4A production and is fabricating the first RQ-4Bs. Program and contractor officials are in the process of implementing statistical process controls. They've identified critical manufacturing processes and started to collect data for demonstrating that new processes are capable of meeting cost, schedule, and quality targets. Officials also collect and analyze other performance indicators such as defects and rework rates to monitor manufacturing quality.

Technology immaturity, increased cost for sensors, and extensive design changes contributed to higher RQ-4B production costs than forecast. Although improving, there have been recurring concerns about the performance and work quality of several key subcontractors. The subcontractor building the tail scrapped seven of the first eight main box spars due to design maturity and process issues. The wing manufacturer terminated its subcontractor due to poor performance and quality; subsequently completed wings passed proof load testing and were installed onto RQ-4B aircraft.

### Other Program Issues

With RQ-4B costs increasing and schedules slipping, the Global Hawk program is rebaselining, its fourth since the March 2001 start. In April 2005, the Air Force notified the Congress of a Nunn-McCurdy breach (see U.S.C. 2433) with an 18-percent unit procurement cost increase over the current baseline. Further cost increases are expected. In December 2005, we reported that the Nunn-McCurdy notice to Congress did not include \$400.6 million (in base year 2000 dollars) budgeted for retrofit activities, including the procurement and installation of signal intelligence sensors in already-built aircraft. Including this amount would increase procurement unit cost growth to 31 percent and require the Secretary of Defense to certify the program to Congress.

### Agency Comments

In commenting on a draft of this product, Air Force officials partially concurred and offered technical comments that we incorporated where appropriate. They emphasized Global Hawk's early and continuing support to military operations in Iraq and Afghanistan with about 5,000 combat hours flown by demonstrator aircraft. They stated that DOD conducts comprehensive and forward-looking oversight, understands the risks and benefits, and implements an appropriate acquisition strategy to mitigate risk. Software, not hardware, is the critical element to the RQ-4B capability, drives the deployment schedule, and represents the chief technical and management challenges. Radar and signals sensors are the two critical technologies and portend revolutionary capability improvement. Each payload has a dedicated program office and contractor. Payload integration includes test and decision points to evaluate progress.