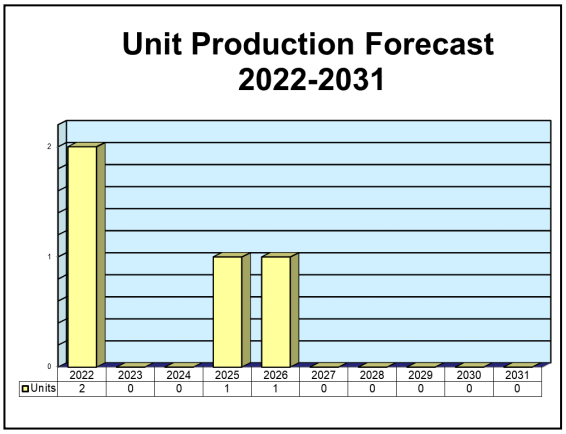
Global Hawk Integrated Sensor Suite (ISS)

Outlook

- Japan is the only remaining customer in the EISS's order book, and it will take delivery of its final units in 2022
- Although unlikely, additional international customers are possible, but only for the EISS and not for the ASIP component
- Any forecast for customers other than Japan is purely speculative



Orientation

Description. The Global Hawk Integrated Sensor Suite (ISS) combines the Enhanced Integrated Sensor Suite (EISS) and the Airborne Signals Intelligence Payload (ASIP). The EISS combines an SAR/MTI radar, third-generation IR sensor, and digital CCD camera into a high-altitude, long-endurance, all-weather battlefield surveillance capability that can provide commanders with near real-time situational awareness, targeting, and bomb damage assessment information.

Sponsor

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AF Systems Command
Aeronautical Systems Center
ASC/PAM
Wright-Patterson AFB, OH 45433-6503
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Tel: + 1 (513) 255-3767
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Application. Northrop Grumman RQ-4B Global Hawk Block 20 and Block 30 high-altitude endurance unmanned aerial vehicles (HAEUAVs). The Integrated Sensor Suite provides air-to-air surveillance, military reconnaissance, maritime patrol, land mapping, border surveillance, and environmental resource management.

The ASIP component has been installed on U.S. RQ-4B Block 30s and U-2 spy planes.

Price Range. The EISS is estimated to cost $4.8 million, while the ASIP is estimated to cost $5.5 million. These are rough estimates. Acquisition price varies depending on the number ordered, options installed, and stage of the system's technological readiness.

The ASIP Increment I upgrade costs an average of $1.3 million per kit, not including installation costs.

Global Hawk Integrated Sensor Suite (ISS)

Contractors

Prime

Northrop Grumman Mission Systems	http://www.northropgrumman.com, 6377 San Ignacio Ave, San Jose, CA 95119 United States, Tel: + 1 (408) 531-2376, Prime
Raytheon Intelligence & Space, Electronic Warfare Systems	http://www.raytheonintelligenceandspace.com, 2000 E El Segundo Blvd, El Segundo, CA 90245 United States, Email: products@raytheon.com, Prime
Northrop Grumman Aerospace Systems, Autonomous Systems	http://www.northropgrumman.com/what-we-do/air/autonomous-systems/, 17066 Goldentop Rd, San Diego, CA 92127 United States, Lead Contractor

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

	Metric	U.S.
Dimensions		
HISAR		
Receiver/Exciter/Controller	48.3 x 40.6 x 48.3 cm	19 x 16 x 19 in
Integrated Sensor Processor	48.3 x 53.3 x 57.6 cm	19 x 21 x 22.7 in
Transmitter	48.3 x 31.0 x 60.9 cm	19 x 12.2 x 24 in
Sensor Electronics Unit	48.3 x 34.8 x 41.9 cm	19 x 13.7 x 16.5 in
Power Distribution Unit	36.6 x 12.7 x 49.5 cm	14.4 x 5 x 19.5 in
Antenna/Gimbal	36.6 x 127.7 cm	14.4 x 49.5 in
EO/IR	62.2 x 66.5 x 107.4 cm	24.5 x 26.2 x 42.3 in
Weight		
Receiver/Exciter/Controller	46 kg	101 lb
Integrated Sensor Processor	80 kg	176 lb
Transmitter	41 kg	90 lb
Sensor Electronics Unit	29 kg	63.5 lb
Power Distribution Unit	18 kg	40 lb
Antenna/Gimbal	43 kg	95 lb
EO/IR	123 kg	271.3 lb

Characteristics	
Radar	
SAR Strip Map Mode	138,000 km²/24 hr, 10-km-wide strip @ 1-m resolution out to 200 km
SAR Spotlight	1,900 2 x 2 km spot images/24 hr @ 0.3-m resolution out to 200 km
GMTI	15,000 km²/min; minimum detectable velocity, 2.1 m/s (4 kt MVD)
Range	20-200 km
Frequency	X-band 600-MHz bandwidth
Peak Power	3.5 kW
Antenna Type	Planar array
Field of Regard (Global Hawk)	± 45º squint either side of the aircraft
EO/MWR Payload	Kodak digital CCD camera 3-5 micron IR sensor (based on AAQ-16B)
NIIRS	>6.5 (EO) >5.5 (IR)
"Both Payloads Carried"	40,000 nm² or 1,900 spots/mission SAR or EO/IR
Relay	LOS & relay sensor data: 1.5-274 Mbps Satcom (Ku, UHF): 1.5-50 Mbps

Global Hawk Integrated Sensor Suite (ISS)

Design Features. The original HISAR (Hughes Integrated Surveillance and Reconnaissance) system was a synthetic aperture radar (SAR) derived from sensors used on the U-2 spy plane and B-2 bomber. The X-band radar consists of five main components: a signal/data processor, receiver/exciter, transmitter, antenna/gimbal, and workstation (on manned aircraft).

The Global Hawk High-Altitude Endurance Unmanned Aerial Reconnaissance System includes a variant of the HISAR SAR, along with electro-optical and infrared sensors. The SAR can operate simultaneously with either the EO or IR sensor, enabling wide-area coverage for situational awareness and/or the ability to focus on specific targets for threat assessment, targeting, and bomb damage assessment. Scanning from either side of the UAV, the gimbaled radar antenna obtains 0.3-meter SAR imagery in spot mode and 1-meter SAR imagery in wide-area search mode.

The MTI mode detects moving targets (with opening or closing velocities as low as 2.1 m/sec, or 4 kt) over areas exceeding 30,000 square kilometers.

Global Hawk can loiter for more than 24 hours from an altitude of more than 21,000 meters (65,000 ft) day and night, in any weather. The RQ-4A can fly as far as 2,200 kilometers (1,200 nm) from its base to reach a surveillance area. The high-altitude-endurance UAV system addresses several service mission needs for long-range surveillance and broad-area-coverage imaging capability.

The Global Hawk EO system incorporates a third-generation IR sensor and Kodak digital CCD visible light camera. These provide an image quality that enables users to distinguish types of vehicles, aircraft, and missiles and to determine other information not available from any single sensor.

SAR imagery and a moving target indication (MTI) capability are provided by commercial off-the-shelf hardware and software.

Global Hawk is optimized for low-to-moderate-threat, long-endurance surveillance missions in which range, endurance, and persistent coverage are of paramount importance.

Operational Characteristics. By pairing the very high-resolution synthetic aperture/GMTI radar with a suite of advanced IE/EO sensors, the Global Hawk ISS provides field commanders with high-quality, near real-time situational awareness. Commanders can select from the SAR, MTI, IR, or EO sensors or from a combination of the sensors for attack or defense planning. By narrowing the focus to specific targets, battle damage assessment is possible. The IR/EO sensors make it possible to distinguish types of vehicles, aircraft, and ships.

Field commanders find the intelligence provided by Global Hawk to be a necessity. Such intelligence has proven essential for information dominance, and therefore, battlespace control. The ISS gives commanders a sharp, accurate view of enemy movements from great distances in near real-time.

While still in engineering and manufacturing development (EMD), Global Hawk was deployed to Afghanistan for use in the war on terrorism. The system proved valuable in spotting al-Qaeda and Taliban fighters and providing the information needed to target them. One RQ-4A crashed because of a malfunction while returning from a mission.

Global Hawks were rushed to support the war in Iraq, performing high-altitude loitering surveillance for ground commanders. Global Hawk was one of 10 different UAVs deployed to the combat arena.

RQ-4 Block 20 Global Hawk, the EISS's First Platform

Source: Northrop Grumman

Global Hawk Integrated Sensor Suite (ISS)

Variants/Upgrades

In the original HISAR program, designers switched to a Power-PC processor because the original processors were no longer available and new computers (up to 25) could generate better pixel-level data for downloading to the ground-based video data processor.

Planned Global Hawk upgrades included sensor cross-cueing and multisensor fusion. There were plans to add the Airborne Communications Node, as well as a multispectral EO/IR system and active electronically scanned array (AESA) radar. A block upgrade to the RQ-4A would have increased the electrical power and payload capacity so that a SIGINT sensor could be carried.

Lot 3 production contracts included one RQ-4B with an Enhanced Integrated Sensor Suite (EISS) and Clip-In Sensor (Hyper Wide). This was the first production EISS. It features a 50 percent range increase for the radar and EO/IR sensors, improved communications, and an integrated sensor processor in which data are fused. High-resolution photos can be processed on the vehicle and sent to the ground.

The radar range gain is the result of an increase in power and aperture size. EO/IR improvements are the result of changes in telescope optics. New materials (including a switch from aluminum to beryllium) better match the telescope to the optics. This better thermal match, combined with the improved surface finish, enhances performance.

The RQ-4B was designed to specifically carry the EISS.

Company-funded efforts were underway at one point to develop multispectral/hyperspectral upgrades for the Global Hawk sensor suite.

Spiral 1 (FY00-FY03). Under this phase, the Advanced Concept Technology Demonstrator (ACTD) was made operational.

Spiral 2 (FY02-FY04). This phase expanded IMINT and initial SIGINT capability.

Spiral 3 (FY03-FY05). This phase involved the development of full-spectrum SIGINT in support of midscale engagements.

Spiral 4 (FY04-FY06). This phase involved the development of improved radar with a track-quality ground moving target indicator (GMTI) and airborne surveillance capability.

Spiral 5 (FY06-FY08). This phase involved the development of expanded communications and of technology that enables operation in extreme environments, as well as the conduct of NBC operations.

Spiral 6 and Higher. References to spiral upgrades were dropped in the FY09 budget and onward.

Multi-Platform Radar Technology Insertion Program (ZPY-2 MP-RTIP). The Block 40 Global Hawk is equipped with the ZPY-2 MP-RTIP radar. This replaces the Global Hawk ISS, turning Block 40 Global Hawks into dedicated radar platforms supplementing E-8C JSTARS aircraft.

A report on the ZPY-2 MP-RTIP radar is available in Forecast International's *Airborne Electronics Forecast*, *AN Equipment Forecast, Electronic Systems Forecast*, and *Radar Systems Forecast.*

Program Review

Development of the original HISAR began around 1992, initially as an all-weather, day-or-night synthetic aperture radar derived from the family of radars used on the U-2 spy plane (ASARS-2) and B-2 bomber (APQ-181(V)). A suite of complementary sensors was used that could be customized for a variety of missions.

The first RQ-4 Global Hawk test flight took place in 1998. Two Global Hawks began a year-long flight test at Edwards AFB, California. A gimbaled antenna was carried beneath the nose capable of scanning on either side of the flight path. Deliveries by Northrop Grumman began in 2001.

Australia Shows Interest

In 1999, Australia joined the Global Hawk program, contributing $20 million to sensor R&D. The USAF and the Australian Defence Force were to share technical and operational data on the surveillance platforms. An interface would allow Global Hawk data to be received and processed by Australia's new airborne-surveillance concept demonstrator. The study also demonstrated for Australian officials the feasibility of using unmanned aerial vehicles for maritime surveillance.

Global Hawk Integrated Sensor Suite (ISS)

Global Hawk Goes to War

A congressionally directed USSOUTHCOM demonstration planned for February 2003 and a German demonstration in April 2003 required the development of maritime modes for the radar and the incorporation of EADS (now Airbus SE) electronic intelligence sensors. Test platforms were pulled from these efforts to support combat operations in Afghanistan and Iraq, delaying these demonstrations. Alternatives were being considered, such as rehabilitating ACTD airframes to support the tests.

During an invitation-only seminar on Capitol Hill, USAF commanders noted the importance of getting Global Hawk imagery to forces in the field in near real-time. Links were established to DCS-1 (Distributed Communications System-1) analysts, who would target Global Hawk surveillance to establish a baseline and then reimage and analyze the target every 10 minutes.

Global Hawk: A Server in the Sky

Global Hawk upgrades turned the UAV into a server in the sky, processing and storing imagery. Through a PDA-like device, Special Operations personnel on the ground were able to query the system to determine if imagery of specific target areas was available. If so, the images could be sent to the requester for display on the PDA (personal digital assistant) in two to three minutes. The requester could also have the system send high-value imagery to other personnel and units in the area, an important new ability for prosecuting high-value targets. This PDA link became a baseline for the developmental Global Hawk used in Iraq, but would not be part of the production Global Hawks that would be coming to the theater, according to Lt. Gen. Walter Buchanan, commander of the 9th Air Force and U.S. Central Command Air Forces.

Two production RQ-4As were delivered to the Air Force for combat operations, replacing the prototype Global Hawks being used in the global war on terror.

In November 2005, Raytheon delivered the first full-production Integrated Sensor Suite for the RQ-4A Global Hawk. The delivery was from Lot 2 of the Global Hawk low-rate initial production (LRIP) program.

Enhanced ISS Introduced

At the same time, Raytheon was building Lot 3 LRIP systems consisting of two basic ISS systems and one Enhanced ISS. The EISS extends the range capabilities of both the SAR and EO sensors by 50 percent over the basic ISS design. The EISS also has a larger SAR antenna, increased transmitter power, and improved receiver unit optics.

In 2005, Northrop Grumman received contracts for Lot 4 and Lot 5 Global Hawk RQ-4B production air vehicles with EISS units and other supporting hardware. In 2006, the Lot 6 contract for long-lead parts for and advance procurement of five RQ-4B vehicles was awarded.

MP-RTIP Effort Begins

The Multi-Platform Radar Technology Insertion Program (MP-RTIP) sensor can be used on the Global Hawk in place of the ISS/EISS. In April 2004, Northrop Grumman was awarded an MP-RTIP System Design and Development (SDD) contract that covered design, development, production, testing, and certification. It called for three LRIP units for the Global Hawk and two LRIP units for the E-10 MC2A aircraft.

EISS and MP-RTIP Global Hawks

In February 2007, Northrop Grumman was awarded a Lot 7 contract for long-lead parts/advance procurement for two RQ-4 Block 30 vehicles, each containing an EISS and two spare EISS units. In addition, the contract included three RQ-4 Block 40 vehicles, each containing an MP-RTIP sensor as well as other items.

Approximately one year later, in April 2008, Northrop Grumman was awarded a contract for Lot 8 advance purchase of two Block RQ-4 vehicles, three Block 40 vehicles, four MP-RTIP sensors, four EISS sensors, and supporting hardware. In December 2008, the Air Force modified the contract to include provision of additional long-lead items associated with five Global Hawks and two EISS sensors and related hardware.

In April 2009, Northrop Grumman was awarded a contract for advance procurement of Lot 9 selected long-lead items as required to meet the production schedule for two Global Hawk Block 30 and three Global Hawk Block 40 vehicles, plus selected long-lead items for the Airborne Signals Intelligence Payload (ASIP) sensors. Forecast International assumes that the Block 30 vehicles were equipped with an EISS and the Block 40 Hawks with MP-RTIP sensors.

Global Hawks with Different Sensors

In February 2007, the German Ministry of Defense awarded a $559 million (EUR430 million) contract to Northrop Grumman to develop, test, and support Euro Hawk UAVs, which are based on RQ-4 Global Hawks. The aircraft were to include sensors from EADS (now Airbus SE), rather than the standard system contained in the U.S. version of the Global Hawk.

In April 2008, Northrop Grumman was awarded a contract to support the U.S. Navy's MQ-4C Broad Area

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Maritime Surveillance (BAMS) program. The MQ-4C BAMS uses a maritime derivative of the RQ-4 Global Hawk equipped with a 360-degree multifunction active sensor AESA, along with Navy-specific ground stations.

EISS Problems

According to an FY10 report from the Office of the Director, Operational Test & Evaluation, the Block 30 Global Hawk systems were unlikely to meet operational availability or reliability performance thresholds during initial operational test and evaluation (IOT&E) or for initial fielding in FY11. During developmental testing, the EISS experienced problems in terms of technical performance, all-weather capabilities, and system interoperability with supporting intelligence exploitation systems.

Following a Global Hawk Comprehensive Test Review, the Office of the Secretary of Defense concluded that as of February 2010, the Global Hawk Block 20/30 development program was making progress, but remained short of required operational capability thresholds in several key areas. Identified high-risk areas included the technical performance of the EISS.

In March 2010, the Air Force conducted a Global Hawk Block 20/30 Integrated Systems Evaluation. The test revealed significant interoperability, radar moving target detection, and EISS image quality problems. Following a technical review of these deficiencies, the Air Force conducted additional interoperability flight tests in July and September 2010 that led to corrective actions.

In order to maintain the program's schedule, the Air Force deferred development of some Block 20/30 operational capabilities. Deferrals included EISS ground moving target detection, EISS sensor resolution, imagery-derived target geolocation, and other capabilities. These deferred capabilities were not to be delivered for the Global Hawk Block 20/30 IOT&E or initial fielding.

Contracts - Upgrades and Repairs

In January 2010, the USAF awarded Northrop Grumman a $22.55 million contract to develop a new SAR mode for the Block 20/30 EISS.

In related news, Northrop Grumman reported that the USAF had awarded the company a $50 million contract to provide an interim repair capability for the Global Hawk ISS/EISS. The interim repair line, separate from the existing production line, was to be located and operated at Raytheon Space and Airborne Systems (SAS) in El Segundo, California. Raytheon SAS partnered with Northrop Grumman to provide the EISS imaging system for the Global Hawk Block 20 and 30 systems.

According to Northrop Grumman, the sensor interim repair line would significantly improve the availability of the critical ISS/EISS components in support of an increased operations tempo. The Air Force predicted that combatant commanders would require Block 30 Global Hawks to fly many more hours than had been originally planned due to the improved capabilities of the EISS.

Lot 10 Contract

In May 2010, Northrop Grumman was awarded a contract for congressionally mandated advance procurement of long-lead items for two Block 30 and two Block 40 Global Hawks, two in-line ASIPs, two MP-RTIP sensors, two in-line EISS sensors, and other items and activities required to protect the Lot 10 production schedule. The company received an additional $46 million under a contract modification in January 2011. In June 2011, Northrop Grumman was awarded a similar $7.15 million advance procurement contract for long-lead items to protect the Lot 10 production schedule.

U-2 Replacement, MS-177 Sensor

There is an ongoing effort to transition the U.S. Air Force's surveillance fleet from reliance on the aged U-2 spy plane to, potentially, the Global Hawk Block 30. As part of this effort, various sensors are being adapted to work on either platform.

One of these sensors is the MS-177, an updated replacement for the U-2's UTAS-made SYERS-2C EO system. In February 2016, the SYERS flew on board a Global Hawk as part of a risk reduction program. By late 2016, the modernized MS-177 was being test flown on the UAV platform.

The long-term implications of this program would mean that the Global Hawk's traditional ISS would be replaced in a piecemeal fashion by U-2-derived technologies. The first system to be deleted would be the EISS. Its electro-optical component would be replaced by the MS-177 and its SAR radar could be replaced by the TacSAR or ASARS-2 radar. Implications for the ASIP are currently unclear.

Contracts/Orders & Options

(Contracts over $5 million)

Contractor	Award ($ millions)	Date/Description
Northrop Grumman	272.7	Jul 2005 – Contract mod to provide for LRIP Lot 4 items: four Global Hawk RQ-4B production air vehicles with EISS, one mission control element, and one launch and recovery element and spares. Completed Jul 2008. (FA8620-04-C-3430)
Northrop Grumman	60.2	Aug 2005 – Contract for LRIP Lot 5 items: five Global Hawk production vehicles, four vehicles equipped with EISS, one mission control element, and one launch recovery element. Completed May 2006. (FA8620-05-C-4692)
Northrop Grumman	20.5	Sep 2005 – CPAF contract modification to complete development of the RQ-4B in order to start IOT&E in Nov 2008. (F33657-01-C-4600, P00113)
Northrop Grumman	60	May 2006 – Fixed-price-incentive, firm target contract for long-lead parts for and advance procurement of LRIP Lot 6 items: five RQ-4B vehicles, three mission control elements, three launch recovery elements, support equipment, and initial spares. Completed Mar 2007. (FA8620-06-C-3002)
Northrop Grumman	5.0	Feb 2007 – Fixed-price-incentive, firm target contract for long-lead parts for and advance procurement of LRIP Lot 7 items for two RQ-4 Block 30-ASIP vehicles, each containing an EISS; three RQ-4 Block 40 vehicles, each containing an MP-RTIP sensor; one MCE; one LRE; two EISSs; and support equipment and initial spares. Completed May 2008. (FA8620-06-C-3002)
Northrop Grumman	10.0	Apr 2008 – Contract for Lot 8 advance purchase items: two Block RQ-4 air vehicles, three Block 40 air vehicles, four MP-RTIP sensors, four EISSs, one MCE, and one LRE. (FA8620-08-C-3001)
Northrop Grumman	18.22	Dec 2008 – Not-to-exceed modification of a fixed-price-incentive contract to provide additional long-lead items associated with five Global Hawks, two ground segments, two EISSs, and two ASIP sensor payloads. (FA8620-08-C-3001, P00005)
Northrop Grumman	21.6	Apr 2009 – Fixed-price-incentive contract for advance procurement of LRIP Lot 9 selected long-lead items as required to meet the production schedule of two Global Hawk Block 30 and three Global Hawk Block 40 air vehicles, plus selected long-lead items for the ASIP sensors. (FA8620-09-C-4001)
Northrop Grumman	22.55	Jan 2010 – Contract to develop and deliver a new SAR mode for the Block 20/30 EISS. (F33657-01-C-4600, P00331)
Northrop Grumman	50	Mar 2010 – Cost-plus-fixed-fee/firm-fixed-price contract for Global Hawk EISS interim repair capability separate from the repair line. This contract also covered the provision of additional specialized test equipment to support the existing datalink repair line and integrated mission management controller repair line. (FA8620-08-G-3005)
Northrop Grumman	30	May 2010 – Contract for congressionally mandated advance procurement of long-lead items associated with two Block 30 and two Block 40 Global Hawks, two in-line ASIPs, two MP-RTIP sensors, two in-line sensors, and other items and activities required to protect the Lot 10 production schedule. (FA8620-10-C-4000)

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Contractor	Award ($ millions)	Date/Description
Northrop Grumman	46.0	Jan 2011 – Modification for the advance procurement of long-lead items associated with two Block 30 and two Block 40 Global Hawks, two in-line ASIPs, two MP-RTIP sensors, two in-line EISS sensors, and other items and activities required to protect the Lot 10 production schedule. (FA8620-10-C-4000, P00002)
Northrop Grumman	7.15	Jun 2011 – Fixed-price-incentive firm contract modification to provide advance procurement of long-lead items associated with two Block 30 and two Block 40 Global Hawks. This includes two ASIPs, two MP-RTIPs, two EISSs, and other items and activities required to protect the Lot 10 production schedule. (FA8620-10-C-4000, P0006)
Northrop Grumman Aerospace Systems	114.22	Sep 2013 – FFP contract for Global Hawk LRIP Lot 11 advance procurement. The contract provides for long-lead items associated with three Block 30 Global Hawks, three in-line ASIPs, three in-line EISSs, two ASIP retrofit kits, and other items and activities required to protect the Lot 11 production schedule. Work was completed by Feb 28, 2015. FY11 advance procurement funds in the amount of $114.22 million were obligated at time of award. (FA8620-13-C-3018)
Northrop Grumman Aerospace Systems	13.039	May 2014 – Modification P00512 to a previously awarded contract for the EISS Timing and Control (TAC) Module A-3 replacement effort. At the time of the award, the total contract value was $2.318 billion. This award funded the completion of flight tests necessary to ensure the EISS TAC module and associated software developments are compatible with the Global Hawk aircraft in form, fit, and function. Work was completed in Jun 2015. (F33657-01-C-4600)
Northrop Grumman Systems	240.653	Aug 2014 – FFP modification PZ0001 to a previously awarded contract for three Block 30 RQ-4B Global Hawk UAVs, each containing an EISS and an ASIP, plus two additional ASIP sensors as retrofit kits. The cumulative value of the contract at time of award was $354.871 million. Work was expected to be completed in Jun 2017. (FA8620-13-C-3018)
Northrop Grumman Systems	657.400	Dec 2014 – Hybrid contract, including FFP, CPIF, and CPFF undefinitized contract actions for RQ-4B Block 30 Global Hawk UAVs for the Republic of Korea (South Korea). The contractor will provide four RQ-4Bs, two spare engines, and applicable ground control elements. Also included would be full EISSs for each UAV. Work was expected to be completed in Jun 2019. (FA8620-15-C-3001)
Northrop Grumman Information Systems	54.490	Mar 2016 – Not-to-exceed, predominantly CPIF undefinitized contract action delivery order (#0004) for a previously awarded basic ordering agreement for the ASIP Increment II – Build A program. Northrop Grumman will provide incremental software upgrades to the baseline ASIP capability as well as provide proof-of-concept for a modular open system architecture technique. Work was expected to be completed by mid-May 2018. (FA8620-13-G-3015)
Northrop Grumman Systems	30.257	Mar 2016 – Modification (P00013) to a previously awarded contract for Global Hawk Block 30 Lot 11 production. Northrop Grumman will retrofit eight Block 30I UAVs to Block 30M-capable aircraft. Work was expected to be completed by the end of Dec 2017. (FA8620-13-C-3018)
Raytheon	25.861	Aug 2017 – U.S. Air Force contract for the EISS modification and Enhanced Electro-Optical Receiver Unit retrofit. The contract provides non-recurring engineering and retrofits for the EISS upgrade to Global Hawk Block 30s. The contract work was expected to be completed by Feb 4, 2019. This was an FMS contract. (FA8620-17-C-1000)

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Contractor	Award ($ millions)	Date/Description
Northrop Grumman Aerospace Systems	130.470	Oct 2017 – U.S. Air Force undefinitized contract for the Japan Global Hawk program. The contract includes long-lead material to initiate the program for three Global Hawk Block 30I UAVs, two ground control elements, EISS, spares, and a site survey. The contract work was expected to be completed by Jul 27, 2018. (FA8604-17-C-1001)
Northrop Grumman Aerospace Systems	489.924	Nov 2018 – U.S. Air Force definitization and increase in scope, FPIF and CPFF contract for the Japan Global Hawk program, providing for three RQ-4 Global Hawk Block 30I UAVs, each containing an EISS payload and two ground control elements. Contract also covers spares and support equipment, system engineering, and program management tasks. Work is expected to be completed by Sep 1, 2022. (FA8620-18-C-1000 PZ0004)
Northrop Grumman Space & Mission Systems	13.000	Dec 2019 – U.S. Air Force IDIQ contract for ASIP efforts, including solutions for diminishing manufacturing sources and material shortages, systems integration lab and cybersecurity support, upgrades to meet routine requirements identified via Air Force IMT 1067 modification proposals, and engineering change proposals. Work was expected to be completed by Dec 31, 2020. (FA8620-20-D-3025)
Raytheon	10.873	Dec 2020 – U.S. Air Force CPFF contract for sustainment of the EISS. Work is expected to be completed by Dec 31, 2025. (FA8577-21-C-0002)

Worldwide Distribution/Inventories

Currently, the **United States**, **Japan**, and the **Republic of Korea (South Korea)** are the only customers of the Global Hawk ISS. The EISS equips RQ-4 Block 20 and Block 30 vehicles, while the ASIP only equips **U.S.** Block 30s. **Germany** has purchased the Global Hawk UAV (a Europeanized version called the Euro Hawk), but Airbus SE (formerly EADS) is making the sensor suite. Other countries interested in the Global Hawk that may include an ISS include **Australia**, **Canada**, **Sweden**, the **United Arab Emirates**, and the **United Kingdom**.

United States Air Force U-2s have been retrofitted with the ASIP.

Forecast Rationale

In recent years, the RQ-4 Block 30 Global Hawk program has faced difficulties. The U.S. Air Force has withdrawn support for the UAV several times, preferring to focus its funding on other budget items. Each time, however, Congress reintroduced funding, opting not to follow the USAF's decisions.

This pattern set the Block 30 and its sensor suite on a shaky foundation. Most recently, as made clear in its FY22 budget requests, the U.S. Air Force has once again withdrawn support for the Block 30. However, the service is expected to operate the system on its U-2 spy planes for the indeterminate future.

As part of the service's plan, the U.S. Air Force cross-integrated the Block 30's and U-2's sensors, integrating the U-2's MS-177 on board the Block 30 and the Block 30's ASIP on board the U-2. Funding requests and awards for these efforts continued even after much of the Block 30's funding ceased.

While U.S.-destined Block 30 production has ended, a November 2018 contract definitized Japan's procurement of three units equipped with the EISS. The country will receive its final units in 2022.

With the U.S.'s waning interest in the platform, and with its vulnerabilities to attacks heightening concerns, prospects for further sales are scarce. Consequently, one or two additional countries could pursue Global Hawk Block 30 procurements, but considering the platform's increasing age, attack vulnerabilities, and lack of domestic support, further purchases are highly unlikely and any forecast is purely speculative.

If a new order were to arrive, customers would procure just the EISS package and none of the U-2-derived components or the ASIP.

Global Hawk Integrated Sensor Suite (ISS)

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program		**High Confidence**				**Good Confidence**			**Speculative**			
	Thru 2021	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**Total**
Raytheon Intelligence & Space												
EISS <> Japan <> Air Force <> RQ-4 B												
	1	2	0	0	0	0	0	0	0	0	0	2
EISS <> Worldwide <> Armed Services <> RQ-4 Note: Highly Speculative												
	0	0	0	0	1	1	0	0	0	0	0	2
Subtotal	1	2	0	0	1	1	0	0	0	0	0	4
Total	1	2	0	0	1	1	0	0	0	0	0	4