# ARCHIVED REPORT

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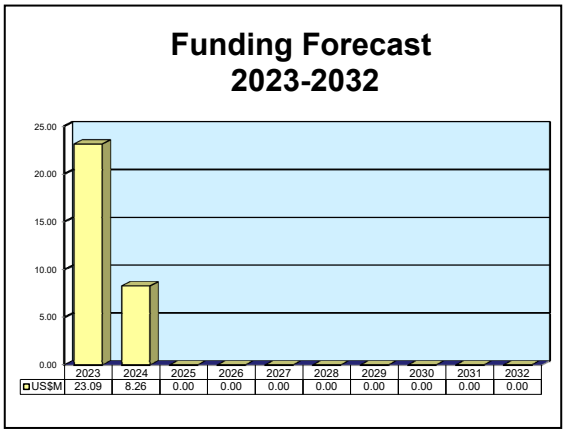
# Joint STARS

## Outlook

- JSTARS Recapitalization program canceled for FY19, reducing forecast JSTARS spending by over $6.0 billion
- Legacy E-8C JSTARS platforms are being divested from U.S. Air Force service, with the final example due to be retired in FY24
- Plans call for eight JSTARS aircraft to leave the fleet by the end of 2023, leaving four in service




| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
|---|---|---|---|---|---|---|---|---|---|---|
| US$M | 23.09 | 8.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## Orientation

**Description.** The E-8 Joint Surveillance Target Attack Radar System (Joint STARS or JSTARS) consists of a modified Boeing 707 mounted with battle management command and control (BMC2) and intelligence, surveillance, and reconnaissance (ISR) systems, including a multimode, mechanically and electronically scanned synthetic aperture radar (SAR) system. It is a primary source of battlefield intelligence and data used by commanders, air units, and ground units.

A recently defunct developmental program known as the Joint Stars Recapitalization (Recap) was designing a successor to the original 707-based JSTARS. The new aircraft was to feature a more capable version of the RQ-4's ZPY-2 MP-RTIP radar.

**Sponsor**

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Website: http://www.wpafb.af.mil

**Status.** Ongoing logistics support and upgrades.

**Application.** JSTARS is an airborne battlefield surveillance system and battle management command and control system.

**Price Range.** Based on the FY99 budget, the adjusted cost of an E-8C is approximately $289 million. A highly speculative estimate for the cost of the radar is $14 million. The ground station costs an estimated $12 million.

As of 2017, the Joint STARS Recap Suite (not including aircraft; platform unknown) was conservatively estimated to cost $127.8 million. This value was expected to rise over time as the direction of the program became better known.

## Joint STARS

A full-scale version of the MP-RTIP radar (estimated value: $17.3 million) was expected to equip the JSTARS Recap Suite. A separate report on the MP-RTIP is published in Forecast International's *Airborne Electronics Forecast*, *AN Equipment Forecast*, *Electronics Systems Forecast*, and *Radar Systems Forecast*. The totality of the JSTARS Recap Suite is covered in this report.

# Contractors

## Prime

| | |
|---|---|
| **Boeing Defense, Space & Security, Military Aircraft, Strike** | http://www.boeing.com/defense, 5000 E McDowell Rd, Mesa, AZ 85215 United States, Tel: + 1 (480) 891-9171, Prime |
| **Lockheed Martin Corp** | http://www.lockheedmartin.com, 6801 Rockledge Dr, Bethesda, MD 20817 United States, Tel: + 1 (301) 897-6000, Fax: + 1 (301) 897-6704, Prime |
| **Northrop Grumman Aerospace Systems, Military Aircraft Systems** | http://www.northropgrumman.com, 2000 W NASA Blvd, PO Box 9650, Melbourne, FL 32901 United States, Tel: + 1 (321) 951-5000, Prime |

## Subcontractor

| | |
|---|---|
| **Curtiss-Wright Defense Solutions** | http://www.curtisswrightds.com, 20130 Lakeview Center Plaza, Ste 200, Ashburn, VA 20147 United States, Tel: + 1 (703) 779-7800, Fax: + 1 (703) 779-7805, Email: ds@curtisswright.com (Radar Signal Processor (RSP)) |

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

# Technical Data

The JSTARS airborne system is a militarized Boeing 707-300 aircraft that carries an advanced radar, processor, and data display system. The system locates and tracks moving ground vehicles and can discriminate tracked from non-tracked vehicles while operating day or night and in most weather conditions. JSTARS provides tactical commanders with battlefield information in real time.

The E-8C JSTARS fleet is equipped with the APY-7 radar, an improved version of the APY-3. The system architecture accommodates growth, allowing JSTARS to take advantage of improvements in onboard processing. The large size and processing capability of the radar enable it to detect slow-moving targets in heavy ground clutter. JSTARS features low minimum detectable velocity, precise location accuracy, and high probability of detection at long range. It was designed to operate in a robust electronic countermeasures environment. The 24-foot-long side-looking phased-array antenna is located in a canoe-shaped radome under the forward fuselage of the aircraft.

The JSTARS radar has several modes of operation, including Wide Area Surveillance (WAS), Sector Search, Attack Control, Moving Target Indication (MTI), Synthetic Aperture Radar, and Ground Reference Coverage Area. The JSTARS radar tracks ground vehicles and low-flying aircraft across a broad area using its MTI capability. It can also create high-fidelity imagery of selected areas by operating in SAR mode.

Northrop Grumman reports that the E-8C Joint STARS platform can fly at a maximum altitude of 42,000 feet (12,802 m). According to the USAF E-8C Joint STARS Fact Sheet, the antenna can be tilted to either side of the aircraft, where it can develop a 120° field of view covering nearly 19,305 square miles (50,000 sq km), and is capable of detecting targets at more than 250 kilometers (more than 155 mi). The radar also has some limited capability to detect helicopters, rotating antennas, and low, slow-moving fixed-wing aircraft.


Crewmen at the Controls of a U.S. Air Force E-8C Joint STARS

Source: U.S. Air Force - Senior Airman Andrew Lee

# Program Review

**Background.** The Joint Surveillance Target Attack Radar System (Joint STARS or JSTARS) program has its roots in separate U.S. Army and Air Force experiments with ground-observing radar systems in the late 1970s. A joint Grumman/Norden Systems team provided a further foundation in 1987 when it delivered a radar prototype that combined target tracking, synthetic aperture radar capability, weapon acquisition tracking in real time, and navigation.

During the Persian Gulf War in 1991, two prototype JSTARS aircraft were deployed to the Middle East. The aircraft were later deployed in support of NATO peacekeeping operations in Bosnia. Full-rate production began in 1996.

### *MP-RTIP*

In the late 1990s, the U.S. Air Force began a program called the Radar Technology Insertion Program (RTIP) to upgrade its APY-3 Joint STARS radar. In 1999, the USAF awarded a pre-engineering and manufacturing development contract to Northrop Grumman worth $15 million to begin work on the RTIP.

Following a radar sensor study, the USAF decided to expand the RTIP effort. In April 2000, the Air Force changed RTIP from a Joint STARS upgrade to a program to develop a modular, scalable radar that could fit on multiple platforms. The new program was named the Multi-Platform Radar Technology Insertion Program (MP-RTIP). The same year, the Air Force awarded a $303 million contract to a Northrop Grumman-Raytheon team to develop the new radar. The USAF planned to equip a modified Boeing 767, dubbed the E-10, with the MP-RTIP to replace the aging Joint STARS. However, cost overruns prompted the Pentagon to cancel the program.

After the E-10's cancellation, the Air Force remained interested in the MP-RTIP's technologies. As a result, a plan was developed to upgrade Joint STARS with the radar.

## Joint STARS

In November 2008, Northrop Grumman was awarded a contract to conduct a risk reduction effort to study the feasibility of outfitting the JSTARS with an MP-RTIP. By August 2009, Northrop Grumman had been awarded a contract to provide a demonstration of an early MP-RTIP unit on board the E-8 JSTARS.

Ultimately, however, the program found itself shuffled between various budget line items before eventually being dropped.

### *Money to Keep Them Flying*

In March 2005, the U.S. Air Force received the 17th and final Joint STARS aircraft. In June 2007, Northrop Grumman completed its first flight test of a modified E-8C Joint STARS. The aircraft demonstrated the next-generation tracking capability offered by a Data Fusion System (DFS) under the Enhanced Land / Maritime Mode (ELMM) program.

Northrop Grumman completed a successful operational test flight for the E-8C Joint STARS Attack Support Upgrade (ASU) program in August 2007. The flight demonstrated the operational utility of the new Link 16 "Tactical Digital Information Links Command and Control" functionality. This capability enables JSTARS operators to better integrate battlefield data with ground troops and attack aircraft.

Additionally, the Air Force added a beyond line-of-sight (BLOS) communications capability via a satellite network to the aircraft. The upgrade allows the aircraft to remain farther away from battle while still being a part of intelligence networks by adding broadband and Internet Protocol (IP) communications capability. The BLOS capability was delivered in early 2009.

A key effort of the Joint STARS program is the development of a method for installing new engines on the E-8 aircraft. *Inside the Air Force* reported in September 2009 that the Senate was adding $35 million in funding to begin System Design and Development (SDD) work to replace JSTARS engines. The report added that Joint STARS aircraft would also need new avionics, cockpit displays, and defensive suites if the fleet were expected to perform for at least 25 more years. The cost of this modernization will likely exceed $5.5 billion.

In March 2010, Northrop Grumman was awarded a $223.6 million contract for two Joint STARS propulsion pod system sets. Each set contains four engines, pylon assemblies, and associated aircraft system interconnections. Deliveries were expected to start in 2011, pending final military certification of the engines on the "T-3," the Joint STARS testbed aircraft.

The FY11 National Guard and Reserve Equipment Report said that several Joint STARS modernization efforts were underway, including Phase II of a computer and networking upgrade. A Joint STARS low-cross-section radar detection upgrade had been allocated $500,000 for FY10.

### *Current Procurement Activities*

The U.S. Air Force, as of 2014, had two major procurement programs regarding O&M (operations and maintenance) activities for its E-8C Joint STARS aircraft.

Modification #38198 – Prime Mission Equipment - Diminishing Manufacturing Sources (PME-DMS) covered modifications to maintain net-centric warfighter activities, including ground moving target indicator (GMTI) and battle management command and control capabilities. The upgrades performed through this modification line were funded under PE#0207581F. This upgrade included changes to the operator workstation, transitioning it to a Linux OS. Additionally, mass storage devices, removable media modules, fiber switches, the LAN hub, the serial data hub, and the Radar Airborne Signal Processor (RASP) were all replaced. This modification was budgeted at $145.701 million through its program life, which began in 2012 and stretched through 2017.

The U.S. Navy also pursued an O&M/RDT&E combination, focusing on allowing connectivity of moving target indicator, fixed target indicator, and SAR data with Marine Air-Ground Task Force troops through the JSTARS Common Ground Station. This effort was to run through 2015.

### *Global Hawk Symbiosis*

By the 2010s, under the basis of a contract with the U.S. Air Force, Northrop Grumman had begun a program to integrate surveillance data from remote sources with the E-8's own.

The lead effort would allow Joint STARS operators to view data streams acquired from RQ-4 Global Hawk UAVs as if the information had originated locally – giving a far widened field of view. The Joint STARS aircraft, operating as the chief command and control unit, could then disseminate a more complete battlefield picture through its datalink.

The program proceeded well, and in March 2013 Northrop Grumman announced that it had achieved operational data exchange between an E-8C Joint STARS and an RQ-4B Block 40. The flight test had been conducted in conjunction with the U.S. Air Force a week and a half earlier, in late February.

### *JSTARS Recapitalization*

The U.S. Air Force's fiscal year 2015 budget request carried news that was at once a surprise and yet a long time coming.

The U.S. effectively announced its long-expected decision to abandon the JSTARS' archaic Boeing 707 platform in favor of a contemporary aircraft. Additionally, the Air Force would invest in overhauling the JSTARS mission suite, including modernizing the system architecture to coexist – on a fundamental basis – with the new network-centric battlefield.

Of the other system improvements announced, one of the most noteworthy was the intention to replace the JSTARS' radar with the MP-RTIP. Over the course of many years, this idea had been pursued and abandoned several times.

Since the 2000s, the USAF had funded efforts to develop and optimize the MP-RTIP for the JSTARS or a similar platform. At several points in the program's history (as referenced above), funding for this purpose was canceled or appropriated under other budget items. In the meantime, a scaled-down version of the MP-RTIP found a place as part of the RQ-4 Global Hawk UAV's equipment set.

### *JSTARS Recapitalization Progressing*

Support for the JSTARS Recap effort was maintained in the fiscal year 2016, 2017, and 2018 budgets.

In August 2015, contracts with Boeing, Lockheed Martin, and Northrop Grumman funded efforts for the companies to propose two aircraft each for the JSTARS Recap – one featuring a Northrop Grumman radar and another featuring a Raytheon-produced option. Boeing pitched an option derived from its 737 passenger jet, Lockheed Martin collaborated with Raytheon to propose a platform derived from Bombardier's Global 6000 bizjet, and Northrop Grumman partnered with L3 Technologies to propose a Gulfstream G550 bizjet-based solution.

The JSTARS Recap contest continued to progress until November 2017, when Raytheon lodged a formal protest with the U.S.'s Government Accountability Office over the decision to ban the company's Archimedes radar from further consideration. Under pressure from lawmakers and amid ballooning budget requirements, the Pentagon was motivated to focus on JSTARS funding in areas other than radar risk reduction. As a result, with Northrop Grumman's radar proposal further along in its development, Raytheon's was dropped from consideration.

### *JSTARS Recapitalization Canceled*

Raytheon's protests were for naught. With costs for development and procurement of the JSTARS Recap skyrocketing to an estimated $6.9 billion from 2018 through 2027 alone, the program "hit the chopping block" – the U.S. Air Force's FY19 budget proposal made no allowance for continuation of the JSTARS Recap effort.

Budgetary committees in Congress were not happy with the decision to cancel the JSTARS Recap, likely due to the hundreds of millions of dollars in research and development already spent. The House draft for the FY19 defense authorization bill reinstated JSTARS Recap funding; however, with the military emphasizing its desire to move to a decentralized, networked C4ISR setup in the future – something that JSTARS would not be a good fit for – the Senate draft removed a great deal of funding. Finally, the Congress's conference version removed all funding allowance for the JSTARS Recap program entirely, but with the stipulation that the E-8C JSTARS platform remain in service through 2028.

## Joint STARS


The radar antenna is mounted below on the U.S. Air Force E-8C Joint STARS.

Source: U.S. Air Force

# Funding

**U.S. FUNDING**

| | PRIOR QTY | PRIOR AMT | FY20 QTY | FY20 AMT | FY21 QTY | FY21 AMT | FY22 QTY | FY22 AMT |
|---|---|---|---|---|---|---|---|---|
| **Procurement (U.S. Air Force)** | | | | | | | | |
| *LI#E00800 – E-8* | - | 66.778 | - | 22.037 | - | 16.312 | - | 16.610 |

| | FY23 QTY | FY23 AMT | FY24 QTY | FY24 AMT | FY25 QTY | FY25 AMT | FY26 QTY | FY26 AMT |
|---|---|---|---|---|---|---|---|---|
| **Procurement (U.S. Air Force)** | | | | | | | | |
| *LI#E00800 – E-8* | - | 6.516 | - | 37.339 | - | 37.954 | - | 38.776 |

All $ are in millions.

Source: U.S. Department of the Air Force, FY23 Budget Estimates, Aircraft Procurement, Air Force, Vol. 2, BA 5, April 2022

# Contracts/Orders & Options

(Contracts over $5 million)

| Contractor | Award ($ millions) | Date/Description |
|---|---|---|
| Northrop Grumman | 532 | Nov 2005 – Contract to provide SDD improvements for the E-8C Joint STARS fleet. It covers the engineering, design, development, integration, test, and delivery of various enhancements and upgrades to the Joint STARS fleet and includes technical orders, support equipment, initial spares and training, and procurement of production and support-system retrofit kits and documentation. |
| Northrop Grumman | 56.2 | Jan 2007 – Improvement to JSTARS targeting capabilities under the Affordable Moving Surface Target Engagement (AMSTE) program. This effort provided the E-8C Joint STARS with an ELMM mobile target precision tracking and engagement capability. |
| Northrop Grumman | 5.8 | Nov 2008 – Cost-reimbursement-with-award-fee contract modification to provide for a Joint STARS modernization risk reduction effort to study the feasibility of incorporating an MP-RTIP onto the JSTARS platform. Hanscom AFB, MA, is the contracting activity. (F19629-00-C-0100 Modification P00153) |
| Northrop Grumman | 57.1 | Aug 2009 – Contract mod to provide a demonstration unit of the initial parts of the MP-RTIP for the Joint STARS E-8 platform. The Multi-Sensor Command and Control Aircraft Program Office, Hanscom AFB, MA, is the contracting activity. (F19628-00-C-0100 P00174) |
| Northrop Grumman Aerospace Systems | 414.5 | Oct 2013 – FFP, FPIF, CPFF, IDIQ contract for the Joint STARS System Improvement Program III. This contract supported the current JSTARS program office and air combat command projections of improvements to increase E-8C performance, capability, reliability, and maintainability. Work was expected to be completed by Oct 20, 2020. (FA8730-14-D-0002) |
| Boeing | 9.945 | Aug 2015 – FFP delivery order for a previously awarded General Services Administration Schedule (GS-23F-0183K) for pre-engineering and manufacturing development efforts under the JSTARS Recap program. The contractor would help assess the maturity of subsystem technology, reduce weapon system integration risk, and lower life-cycle cost by virtue of design. Work completed by the close of Jul 2016. (FA8730-15-F0052) |
| Lockheed Martin | 11.496 | Aug 2015 – FFP delivery order for a previously awarded General Services Administration Schedule (GS-23F-0150S) for pre-engineering and manufacturing development efforts under the JSTARS Recap program. The contractor would help assess the maturity of subsystem technology, reduce weapon system integration risk, and lower life-cycle cost by virtue of design. Work was completed by the close of Jul 2016. (FA8730-15-F0054) |
| Northrop Grumman Aerospace Systems | 10.000 | Aug 2015 – FFP delivery order for a previously awarded General Services Administration Schedule (GS-23F-0058K) for pre-engineering and manufacturing development efforts under the JSTARS Recap program. The contractor would help assess the maturity of subsystem technology, reduce weapon system integration risk, and lower life-cycle cost by virtue of design. Work was completed by the close of Jul 2016. (FA8730-15-F0052) |

# Joint STARS

| Contractor | Award ($ millions) | Date/Description |
|---|---|---|
| Northrop Grumman Systems Corp | 70.288 | Mar 2016 – A not-to-exceed, undefinitized contract for radar risk reduction efforts under the JSTARS Recap program. The contract provided for non-recurring hardware and software engineering activities to ensure radars were scaled to meet the JSTARS Recap wide area surveillance requirements. Work was completed by Sep 30, 2017. (FA8730-16-C-0016) |
| Boeing Aerospace, Operations, Defense, Space & Security | 983.000 | Jan 2017 – An IDIQ contract for engineering support services to support recurring and non-recurring activities related to C-32A, C-40B/C, E-4B, E-8C JSTARS, NT-43, and VC-25 aircraft. Work is expected to be completed by Jan 31, 2027. (FA8106-17-D-0002) |
| Rockwell Collins | 7.441 | Aug 2017 – Contract to provide contractor logistics support for the JSTARS aircrew training device. Work was expected to be completed by Feb 4, 2020. (FA8529-17-C-0003) |
| Rockwell Collins Simulation & Training Solutions | 40.220 | Aug 2019 – An IDIQ contract for E-8 aircrew training device sustainment, providing for contractor logistics support and operation of the JSTARS aircrew training device by the training system support center. Work is expected to be completed by Aug 3, 2029. (FA8529-19-D-0001) |
| Honeywell International | 17.065 | Sep 2019 – An FFP supplemental agreement contract modification (P00010) to a previously awarded repair and overhaul requirement to support aircraft accessories and aircraft instruments, ensuring serviceable assets are available to support the A-10, B-52, C-5, C-130, C-135, E-3, E-8, and F-16. The contract modification provides for option years three and four, which were not included in the basic contract. Work was expected to be completed by Feb 22, 2021. (FA8109-16-D-0016) |
| Northrop Grumman Aerospace Systems | 495.000 | Sep 2019 – An IDIQ contract supporting E-8C JSTARS aircraft, providing for modernization and sustainment of 16 mission and one trainer aircraft. Work is expected to be completed by Sep 26, 2024. (FA8529-19-D-0002) |
| KIDDE Technologies | 7.800 | Nov 2020 – FFP, ID/IQ contract to manufacture fire cartridge extinguishers for E-3, E-8, F-35, and KC-10 aircraft. Work is expected to be completed Dec 31, 2026. (FA8213-21-D-0001) |
| MH Systems | 24.691 | Jul 2022 – FFP requirements contract for aircraft painter manpower support, providing for the augmentation of personnel for depot paint and de-paint operations for C-5, C-17, C-130, F-15, Global Hawk, and JSTARS aircraft. Work is expected to be completed by Jul 17, 2027. (FA8571-22-D-0009) |
| Northrop Grumman | 87.800 | Oct 2022 – IDIQ, FFP, CPFF, and cost-reimbursable no-fee contract for support and sustainment of the E-8C JSTARS. The contract provides for program management, system engineering, system sustainment, JSTARS unique asset management, Joint Integrated Maintenance Information System (JIMIS) hardware and software infrastructure sustainment, weapon system interoperability certification, IC system sustainment, flight crew training, mission crew training, mission support training, training sustainment, provision of field service representatives, and cybersecurity. Work is expected to be completed by Oct 31, 2023. (FA8529-23-D-0001) |

# Worldwide Distribution/Inventories

Historically, the **U.S. Air Force** operated 17 707-based Joint STARS aircraft. As of February 2018, 16 were operational, and as of May 2021, the Air Force planned to retire an additional four aircraft, leaving 12 operational.

At one time, another 17 next-generation JSTARS Recapitalization aircraft were to be produced, but the Air Force's FY19 budget plans dropped support for the procurement.

# Forecast Rationale

Since its introduction, the 707-based E-8C Joint STARS airborne battlefield command and control platform has been a crucial component in the U.S. Air Force's arsenal. Consequently, JSTARS has been the subject of routine improvement and sustainment, receiving steady funding.

In the recent past, a massive program, known as the JSTARS Recap, was underway with a mission to design and build a replacement platform for the original E-8C JSTARS aircraft.

The JSTARS Recap prime contractor was due to be selected in 2018, but before this could happen, the U.S. Air Force canceled the program – as it had several E-8C JSTARS replacement efforts before.

The cancellation of the JSTARS Recap program meant the Air Force would be walking away from the sunk cost of hundreds of millions of dollars in development spending, but it also meant the avoidance of approximately $6.9 billion in additional development and procurement funding in the 2018 through 2027 period alone.

After a great deal of back and forth between the Air Force and budgetary groups in both houses of Congress, the conference version of the U.S.'s FY19 defense authorization bill contained no allocation of funding for the JSTARS Recap aside from $30.0 million for continued GMTI radar research.

The authorization bill made clear that even though the Air Force wished to move to a more decentralized, networked C4ISR concept than a platform like JSTARS could provide, the original E-8C Joint STARS would have to remain in service until that future C4ISR concept, the Advanced Battle Management System, reached maturity. At this time, the ABMS concept is not expected to reach Phase Two of its implementation until the mid-2020s and Phase Three until the 2030s.

By the time the U.S. military's FY22 budget estimates were released, the old JSTARS' new role had been further defined. As part of a gradual scale-down of the aircraft type, the Air Force planned to reduce its E-8C JSTARS operational fleet from 16 aircraft to 12. Plans for FY23 call for further divestiture of eight aircraft, while future plans calling for the remaining four aircraft to be retired in FY24. Congress had previously enshrined protection of the JSTARS in law, requiring the platform's operation until a replacement capability was available. However, if the latest draft of the 2023 National Defense Authorization Act were passed, the protective wording would be struck from the FY19 NDAA.

With a new roadmap for the E-8C JSTARS in place, the gargantuan JSTARS Recap program scrapped, and the fleet size being gradually reduced, JSTARS funding will cease in FY24 if current plans are followed. However, deliveries of the E-8's recently identified replacement – the E-7 Wedgetail – are not expected to begin until the latter half of the 2020s. This would result in a capability gap.

To protect its mission capability, it is possible that the Air Force will attempt to keep a handful of JSTARS in service until the E-7s start to arrive, but for now, funding for this purpose is not being forecast.

**Note:** *In October 2021, Northrop Grumman signed a Memorandum of Understanding with LIG Nex1 and Huneed to develop and pitch a JSTARS-K solution for a Republic of Korea requirement under its Joint Moving Target Surveillance and Control Aircraft (JMTSCA) program. The JSTARS-K is based on Gulfstream's now out-of-production G550 platform.*

*It is unknown how much of the JSTARS-K's technology will be based on the U.S.'s JSTARS, but if Northrop Grumman, the lead electronics integrator on the U.S. program, wins the competition, it could mean new, forecastable production for the JSTARS. However, to fulfill the requirement, Northrop Grumman will need to overcome a competing bid from Raytheon Technologies.*

## Joint STARS

# Ten-Year Outlook

| ESTIMATED CALENDAR YEAR O&M FUNDING (in millions US$) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Designation or Program | | High Confidence | | | | Good Confidence | | | Speculative | | | |
| | Thru 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | Total |
| Northrop Grumman Aerospace Systems | | | | | | | | | | | | |
| Joint STARS <> United States <> Armed Services <> E-8 C | | | | | | | | | | | | |
| | 889.97 | 23.09 | 8.26 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 31.34 |
| | | | | | | | | | | | | |
| Total | 889.97 | 23.09 | 8.26 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 31.34 |