

# DEPARTMENT OF THE AIR FORCE ACQUISITION



BIENNIAL REPORT 2019 + 2020

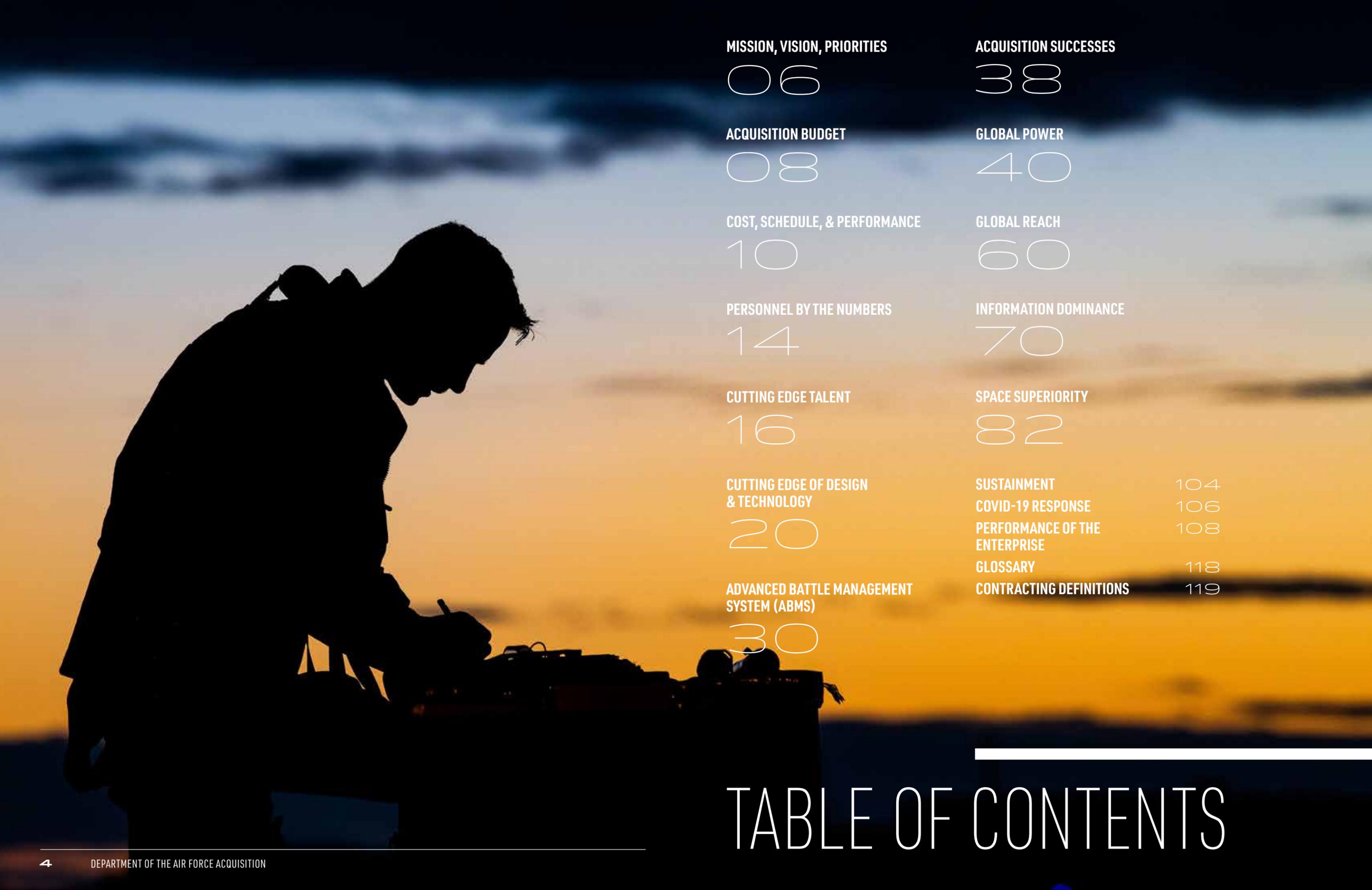
BUILDING  
THE **DIGITAL**  
FORCE





Innovation has percolated across the Department of the Air Force, and it is seen nowhere more than in the Acquisition Enterprise. Fiscal Years 2019 and 2020 were banner years for acquisition. Even in the midst of a pandemic, the acquisition team was dedicated to our mission and found innovative ways to continue essential Department work. We have learned to deliver capability to the warfighter faster than ever by empowering our workforce. In fact, we met our “Century Challenge” goal in May 2019 by removing 100 years from program schedules. We have driven the Digital Engineering imperative into leading programs. We executed the first end-to-end demonstration of the Advanced Battle Management System – shooting down a cruise missile with a hypersonic velocity gun. We are pushing the boundaries on containerization and software in-flight uploads, increasing mission system decision speed. We even helped stand up the nascent United States Space Force, the 6th branch of the Armed Services.

This biennial report provides a glimpse of the incredible work the Department of the Air Force’s Acquisition Enterprise accomplished in FY19 and FY20. First, we provide a high-level overview of our budget, programs, and personnel. Next, we discuss our focus on recruiting, hiring, developing, and rewarding a diverse and innovative workforce in the Cutting Edge Talent section. The Cutting Edge of Design and Technology section highlights several of our significant advances achieved over the last two years in rapidly developing and integrating innovative technologies, both Defense and commercial, onto military systems with unmatched agility. We showcase high priority initiatives and programs that will make a permanent impact on the way we do business across the Department, including the Advanced Battle Management System and Sustainment. This report also provides additional acquisition successes, details of acquisition programs across the Air Force and Space Force portfolios, and an overview of the performance of the Acquisition Enterprise. Lastly, we also put a spotlight on the incredible work of the Department of the Air Force Acquisition COVID-19 Task Force.



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## MISSION:

Cost-effectively modernize to increase the lethality of the force.

## VISION:

Rapidly deliver enduring, world-class capabilities to assure air, space, and cyberspace dominance for the nation and our allies.

## PRIORITIES:

- 1 Keep programs within cost, schedule, and performance parameters.
- 2 Tailor the acquisition process to provide capability to the warfighter.
- 3 Develop the acquisition workforce and delegate authority to the lowest appropriate level.
- 4 Drive innovation to secure our future.
- 5 Strengthen our alliances because we are stronger together.

# ACQUISITION BUDGET:

## FY 19 + FY 20

### 6 ACQUISITION CATEGORIES:

Acquisition programs are organized into three acquisition categories - or **ACATs** and three business categories or **BCATs**.

**ACAT I:** Eventual expenditure of more than \$480M in RDT&E, or more than \$2.79B in procurement, in FY 2014 dollars

**ACAT II:** Eventual expenditure of more than \$185M in RDT&E or more than \$835M in procurement in FY 2014 dollars

**ACAT III:** Does not meet the criteria of ACAT I or ACAT II

**BCAT I:** Expected total budget authority over the period of the current Future Years Defense Program in excess of \$250M

**BCAT II:** Expected total budget authority over the period of the current Future Years Defense Program in excess of \$50M

**BCAT III:** Does not meet the criteria for BCAT I or BCAT II

**533**  
FY 19 PROGRAMS

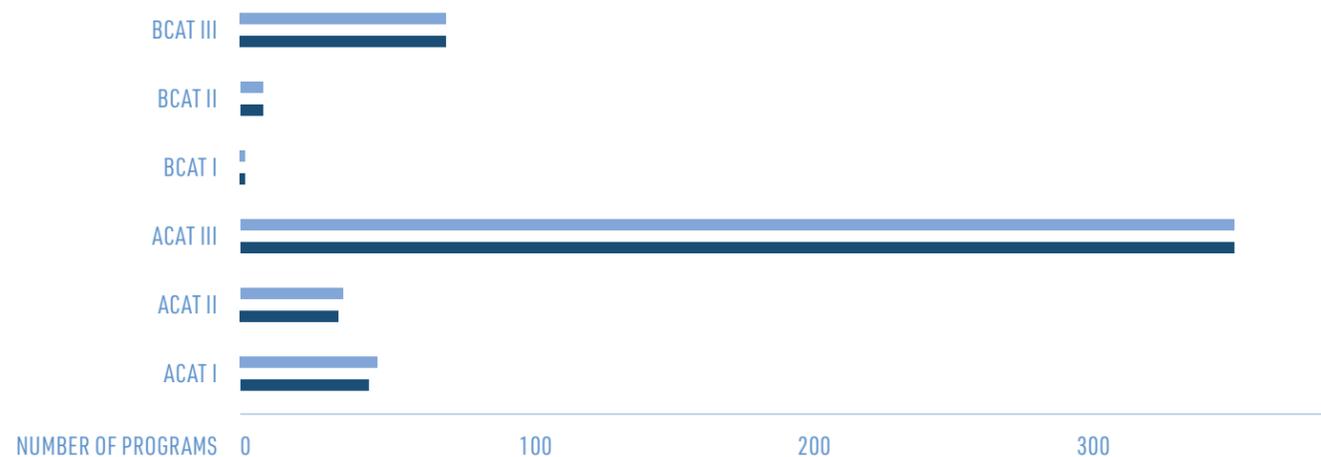
- ACAT I - 42
- ACAT II - 39
- ACAT III - 367
- BCAT I - 2
- BCAT II - 8
- BCAT III - 75

**522**  
FY 20 PROGRAMS

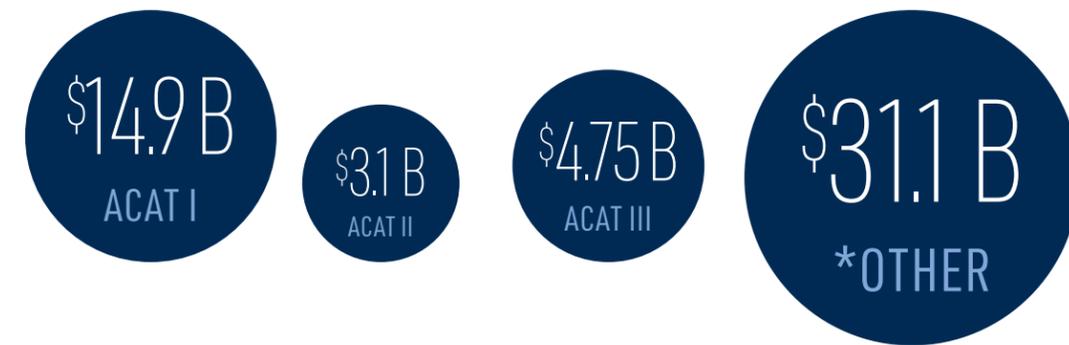
- ACAT I - 34
- ACAT II - 36
- ACAT III - 367
- BCAT I - 2
- BCAT II - 8
- BCAT III - 75

### PROGRAMS BY ACQUISITION CATEGORY

FY 19 FY 20



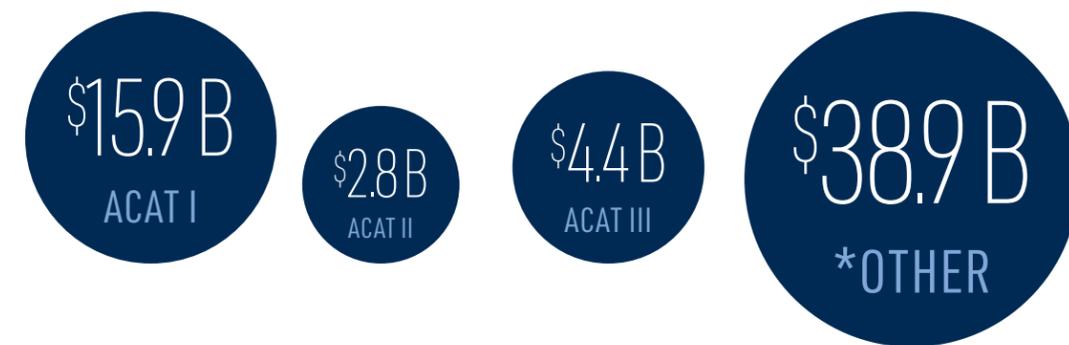
### FY19 FUNDING BY ACAT (RDT&E/PROCUREMENT)



FY19 FUNDING APPROPRIATION:

\$25.7 B  
PROCUREMENT  
\$30.4 B  
RDT&E

### FY20 FUNDING BY ACAT (RDT&E/PROCUREMENT)



FY20 FUNDING APPROPRIATION:

\$26.8 B  
PROCUREMENT  
\$35.3 B  
RDT&E

\*Includes: F-35, classified programs (including B-21), science and technology efforts, pre-acquisition activities, acquisition workforce, etc.

### FY19 FUNDING:

Education and Training	\$432 M
Special Operations	\$1.14 B
Agile Combat Support	\$8.06 B
Cyberspace Superiority	\$1.06 B
Personnel Recovery	\$1.37 B
Command and Control	\$1.29 B
Global Integrated ISR	\$2.71 B
Global Precision Attack	\$9.93 B
Special Access	\$10.21 B
Air Superiority	\$2.94 B
Rapid Global Mobility	\$4.62 B

### FY20 FUNDING:

Education and Training	\$464 M
Special Operations	\$1.12 B
Agile Combat Support	\$9.20 B
Cyberspace Superiority	\$936 M
Personnel Recovery	\$1.19 B
Command and Control	\$1.47 B
Global Integrated ISR	\$2.60 B
Global Precision Attack	\$12.36 B
Special Access	\$11.16 B
Air Superiority	\$3.84 B
Rapid Global Mobility	\$4.23 B

CAPABILITIES.

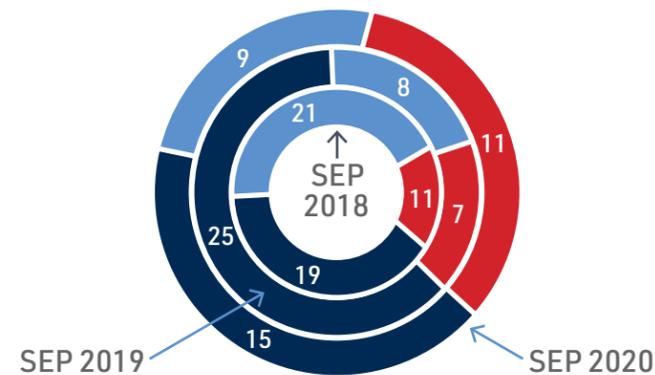
# COST, SCHEDULE, & PERFORMANCE

AGGREGATE PERFORMANCE DATA

The Department of the Air Force balances program cost, schedule, and performance to meet warfighter needs and optimize taxpayer dollars. Acquisition programs are organized into three categories (ACATs) based on level of spending. Baselines are used to show increases or decreases over time. These baselines provide a measure of accountability.

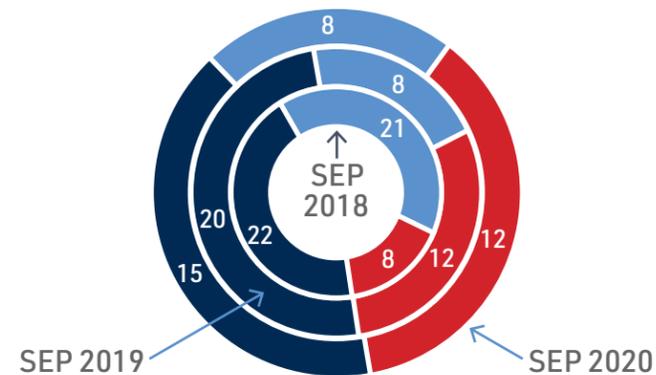
## ORIGINAL BASELINE CHARTS - ACAT I

ACAT I - COST PERFORMANCE ORIGINAL BASELINE



■ Under Cost ■ Unbaselined ■ Over Cost

ACAT I - SCHEDULE PERFORMANCE ORIGINAL BASELINE



■ On Schedule ■ Unbaselined ■ Over Schedule

PROGRAMS OVER ORIGINAL COST BASELINE (% GROWTH)

	2020 VALUE	2019 VALUE	2018 VALUE
F-15 EPAWSS	18%	24%	14%
ICBM FUZE MOD	16%	1%	2%
GPS III F	6%	-1%	N/A
HH-60W	5%	2%	-4%
OCX	3%	3%	3%
GPS III	3%	3%	5%
C-130J	1%	1%	0%
FAB-T CPT	1%	-6%	-7%
APT	1%	0%	N/A
SDB II	1%	-15%	-14%
AWACS Block 40/45 Upgrade	0.2%	-2%	-3%

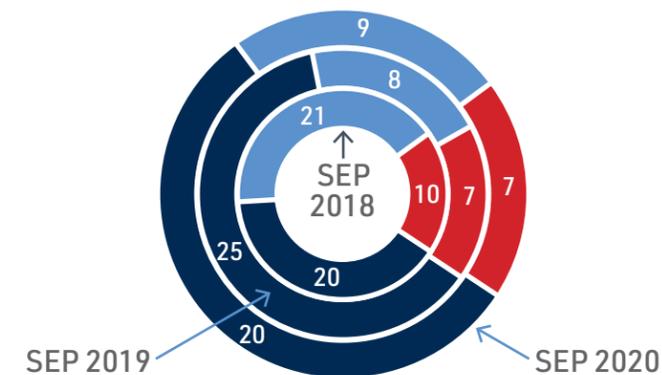
PROGRAMS OVER ORIGINAL SCHEDULE BASELINE (IN MONTHS)

	2020 VALUE	2019 VALUE	2018 VALUE
KC-46A	49	34	20
SDB II	42	37	30
GPS III	40	40	40
F-15 EPAWSS	33	16	1
AMRAAM	24	24	24
FAB-T CPT	21	18*	96
ICBM Fuze Mod	14	9	0
B61 Mod 12 LEP TKA	12	4	2
SBIRS Block Buy	12	12	12
JASSM ER	11	11	11
VC-25B	9	9	N/A
OCX	7	0	0

\* Original baseline was reset

## CURRENT BASELINE CHARTS - ACAT I

ACAT I - COST PERFORMANCE CURRENT BASELINE



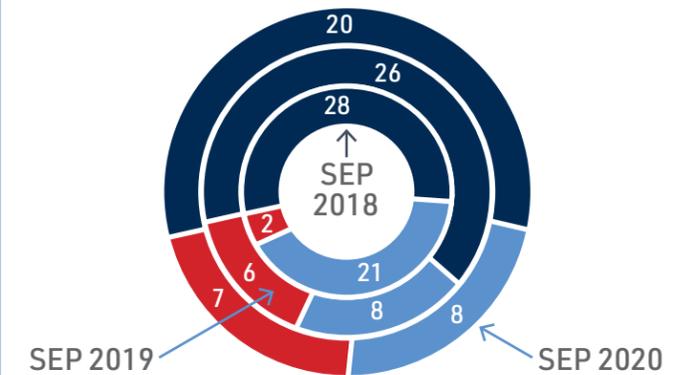
■ Under Cost ■ Unbaselined ■ Over Cost

PROGRAMS OVER CURRENT COST BASELINE (% GROWTH)

	2020 VALUE	2019 VALUE	2018 VALUE
ICBM Fuze Mod	16%	1%	2%
GPS III F	6%	-1%	N/A
FAB-T CPT	3%	-4%	-5%
SDB II	3%	5%	5%
OCX	3%	3%	3%
APT	1%	0%	N/A
F-15 EPAWSS	0.1%*	24%	14%

\* Current baseline was updated

ACAT I - SCHEDULE PERFORMANCE CURRENT BASELINE



■ On Schedule ■ Unbaselined ■ Over Schedule

PROGRAMS OVER CURRENT SCHEDULE BASELINE (IN MONTHS)

	2020 VALUE	2019 VALUE	2018 VALUE
B-2 DMS Mod	33	33	6
KC-46A	15	0*	6
ICBM Fuze Mod	14	9	0
B61 Mod 12 LEP TKA	12	4	2
SBIRS Block Buy	12	12	12
VC-25B	9	9	N/A
OCX	7	0	0

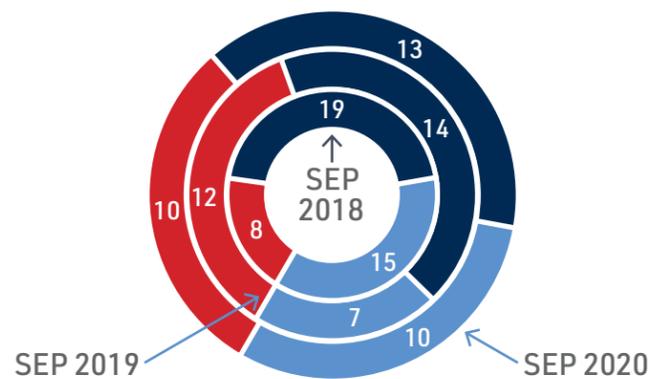
\* Current baseline was updated

# COST, SCHEDULE & PERFORMANCE

AGGREGATE PERFORMANCE DATA

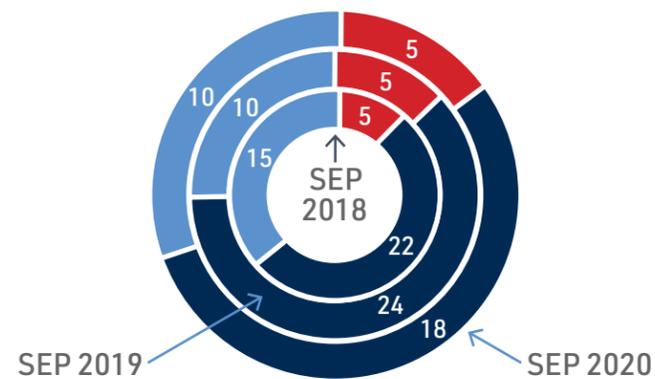
## CURRENT BASELINE CHARTS - ACAT II

### ACAT II - COST PERFORMANCE



■ Over Cost ■ Under Cost ■ Unbaselined/No Data

### ACAT II - SCHEDULE PERFORMANCE



■ Over Schedule ■ On Schedule ■ Unbaselined/No Data

### ACAT I - TECHNICAL PERFORMANCE ORIGINAL & CURRENT BASELINE



■ Will Meet/Met Key Performance Parameters ■ Unbaselined

The ACAT II portfolio does not have sufficient key performance parameter data to perform a yearly analysis.

Due to a lack of historical data ACAT II programs cannot be tracked to their original baselines

The ACAT III programs do not have sufficient baselines or data to perform a yearly cost, schedule, or performance analysis.

### PROGRAMS OVER ORIGINAL COST BASELINE (% GROWTH)

	2020 VALUE	2019 VALUE	2018 VALUE
Advanced Targeting Pod Modernization Program	169%	169%	0%
Advanced Targeting Pod - Sensor Enhancement	42%	43%	0%
F-15 Infrared Search and Track	39%	5%	0%
QF-16 Full Scale Aerial Target	18%	11%	-10%
F-15 Advanced Display Computer Processor II	13%	6%	7%
LGM-30G Flight Test Telemetry and Termination System	9%	9%	0%
F-15E Radar Modernization Program	5%	5%	-9%
C-130J BU Retrofit	5%	5%	0%
E-3 DMS Replacement of Avionics for Global Ops & Nav	2%	2%	2%
B-2 Flex Strike Phase 1	1%	10%	10%

### PROGRAMS OVER CURRENT SCHEDULE BASELINE (IN MONTHS)

	2020 VALUE	2019 VALUE	2018 VALUE
LGM-30G Flight Test Telemetry and Termination System	18	18	18
B-2 Flex Strike Phase 1	12	8	8
F-15E Radar Modernization Program	9	N/A	N/A
F-16 Active Electronically Scanned Array Radar	8	0	0
E-3 DMS Replacement of Avionics for Global Ops & Nav	7	6	18

### ORIGINAL BASELINE

The original baseline reflects the cost, schedule, and performance parameters as approved by the milestone decision authority in the program's first acquisition program baseline. Cost, schedule and performance parameters will only be revised in the case of recertification post critical Nunn-McCurdy breach or Critical Change.

### CURRENT BASELINE

The current baseline reflects the current cost, schedule, and performance parameters as approved by the milestone decision authority in the current acquisition program baseline. The current baseline differs from the original baseline as a result of updates made at milestones or decision points, major program restructures or breaches.

# PERSONNEL: BY THE NUMBERS



## TOTAL FORCE PERSONNEL:

# 54,000

28%



MILITARY + CIVILIAN ONLY

72%

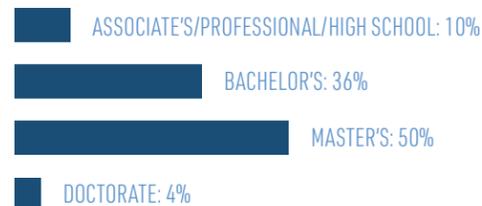


63% CIVILIAN

17% MILITARY

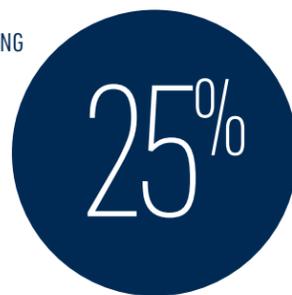
20% CONTRACTOR

### EDUCATION: HIGHEST DEGREE COMPLETED



## WORKFORCE CAREER FIELDS

ENGINEERING



CONTRACTING



PROGRAM MANAGEMENT



OTHER



LOGISTICS



TEST & EVALUATION



FINANCIAL MANAGEMENT / COST-ESTIMATING



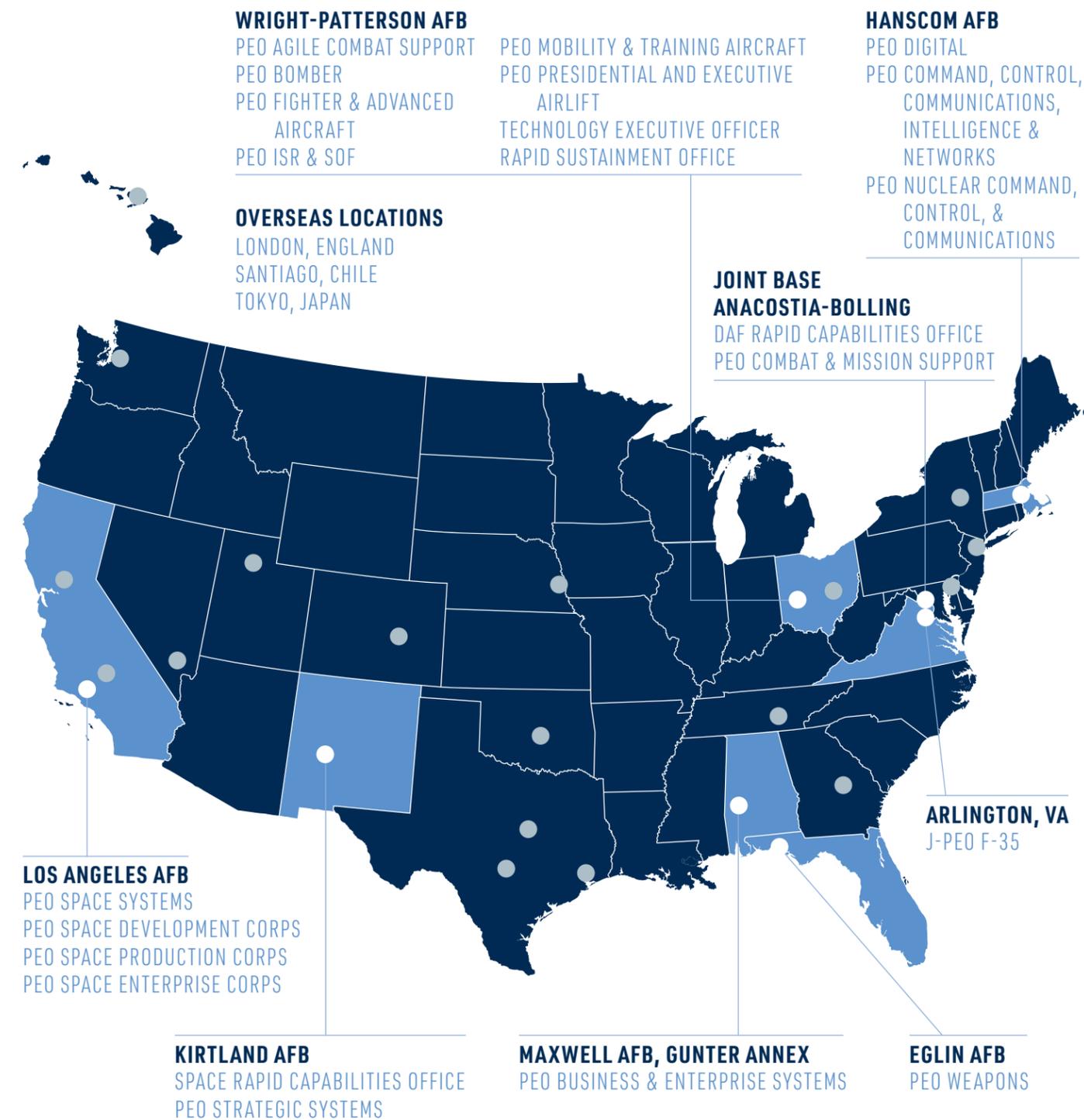
"Our Department of the Air Force acquisition professionals are officially next level—keeping national security strong, now and in the future."

— DR. WILLIAM ROPER

ASSISTANT SECRETARY OF THE AIR FORCE (ACQUISITION, TECHNOLOGY & LOGISTICS), February 2018-January 2021

# WHERE WE ARE:

PROGRAM EXECUTIVE OFFICER LOCATIONS ■  
OTHER PROGRAM / ACQUISITION LOCATIONS ■





# CUTTING EDGE TALENT

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Cultivating a lethal, agile force requires more than just new technologies and posture changes. It depends on the ability of our warfighters, including our acquisition workforce, to integrate new capabilities, adapt warfighting approaches, and change business practices to achieve mission success.

Our acquisition workforce is comprised of 54,000 military, civilian, and contractor business and technical professionals adept at managing all phases of the system lifecycle with the agility required by today's technology, trends, and threats. The Department of the Air Force's focus on recruiting, hiring, developing, and rewarding a diverse and innovative workforce that leverages different skills, backgrounds, experiences, attributes, and perspectives ensures we are poised to compete with our adversaries, now and in the future.

## RECRUITING

Competition with near-peer adversaries for the nation's top talent continues to drive our use of strategic and modern recruiting methods to access a broad talent pool. By using social media and the commercial market space to attract talent, we were able to keep people interested in Department of the Air Force career opportunities. During these unprecedented times when technical talent is at a premium, we leveraged Digital Hiring Projects in lieu of in-person "brick and mortar" recruiting events. For example, in July 2020, the Air Force Civilian Service (AFCS) partnered with the Air Force Life Cycle Management Center (AFLCMC) to support an F-35 Lightning II Joint Program Office hiring event by finding suitable candidates for 76 hard-to-fill Air Force and Navy positions for multiple locations using only a digital presence. A record number 1,743 candidates registered online for the event in the first three weeks. The record breaking numbers allowed recruiters to focus on the large pool of qualified candidates at their disposal prior to initiating the interview process. We continue to use the many modern capabilities available, but rarely used, across the federal workforce.



## HIRING

As we enhance our ability to attract the talent required to fuel our innovative culture we have also embraced multiple hiring strategies that fully leverage authorities provided to hire this talent. Over the last two years, we used the student direct hire authority, launching a strong college intern program that brought us 500 interns a year with a focus on Science, Technology, Engineering, and Math. This program also allowed us to build our Palace Acquire recent graduate program to hire 1,159 recent graduates into five different acquisition career fields in this last year. During FY19 and FY20, the Department of the Air Force used the vast array of Expedited and Direct Hire Authorities to acquire acquisition professional talent. In FY20, we hired 8,583 professionals under various hiring authorities, a significant increase from prior years.



## DEVELOPING

Developing both the technical and leadership skills of our workforce is the foundation of staying relevant in today's environment. Over the last year, in concert with the Office of the Secretary of Defense Human Capital Initiatives office, we made significant progress in re-designing our acquisition certification processes

and training. The new framework will launch in CY21 and transform our ability to keep our workforce relevant.

The Defense Acquisition Workforce Development Fund (DAWDF) is a critical tool. We used DAWDF funds to develop and deliver 84 training courses through the Air Force Institute of Technology, quickly reacting to the need for enhanced skill sets. We also used these funds to enhance workforce education by providing tuition assistance to 1,443 members pursuing Masters level degrees and 19 members pursuing PhD level programs.

One of our unique developmental offerings is the Education with Industry (EWI) program. During this 10-month experience, acquisition workforce members are immersed with industry partners, gaining insight to the latest corporate trends, developing business acumen, and understanding private industry best practices. EWI partners include traditional defense companies, software and digital-focused companies, venture capital firms, and small businesses. The current embedded class consists of 77 fellows across 29 career fields, located at 55 companies nationwide.

## REWARDING

We recognized and rewarded our talented workforce through formal and informal award programs, in combination with the acquisition demonstration program annual contribution and compensation process. The Acquisition Demonstration program

# DEPARTMENT OF DEFENSE ACQUISITION AWARDS TO DEPARTMENT OF THE AIR FORCE ACQUISITION TEAMS

2019

TEAM	AWARD
Launch Enterprise Team (Los Angeles AFB, CA)	★ David Packard Excellence in Acquisition Award
Air Force Pitch Day Team (Pentagon, Washington, D.C.)	★ David Packard Excellence in Acquisition Award
Kessel Run Team (Boston, MA)	Software Innovation Team Award

2020

TEAM	AWARD
Cloud One (HNII) and Platform One (HNCP) Team (Hanscom AFB, MA)	★ David Packard Excellence in Acquisition Award
Cloud One (HNII) and Platform One (HNCP) Team (Hanscom AFB, MA)	Software Innovation Team Award
Defense Production Act (DPA) Title III Executive Agent Program Office Team (Wright-Patterson AFB, OH)	★ David Packard Excellence in Acquisition Award
Ground Based Strategic Deterrent Program Office (Hill AFB, UT)	★ David Packard Excellence in Acquisition Award
Department of the Air Force Acquisition COVID-19 Taskforce (DAF ACT) (Washington, D.C.)	Flexibility in Contracting Team Award

continues to be the acquisition community's personnel performance program of choice, covering 41% of the acquisition workforce, which amounts to all but our bargain unit employees. Through the acquisition demonstration process, we rewarded our employees based on their level of contribution to the mission relative to their compensation, allowing us to reward the behaviors and outcomes we value.

## FUTURE

The Department of the Air Force must continue to drive transformation in how we recruit, hire, develop, and reward cutting edge talent to sustain the needed acquisition workforce. In FY19 and FY20, we cultivated workforce talent by employing innovative tools, using state of the art technology, relying on data-driven approaches, and encouraging education, training

and professional development as part of our everyday routine. We fostered and cultivated a diverse and high performing workforce set on accomplishing the mission requirements of the National Defense Strategy. Our diverse and innovative acquisition workforce members are the ones that get the job done and are truly essential for warfighting success. ■

# CUTTING EDGE OF DESIGN & TECHNOLOGY

Technology innovation is the battlefield of today. Across the Department of the Air Force we are developing innovative technologies more rapidly and integrating leading technologies, both Defense and commercial, onto military systems with unmatched agility. Competing across the entire technology ecosystem is a new challenge for the Department—especially with approximately 80% of our nation’s research and development now commercial—but one we’ve made significant progress in meeting. During FY19 and FY20, we took significant strides towards creating that speed and agility using advances in digital acquisitions and commercial ventures that are poised to change the face of weapon system procurement in ways we have never seen before—departing from twentieth century analog acquisition strategies, to leading twenty-first century digital acquisition approaches.



## Digital Trinity

Digital engineering, agile software, and open architectures—the new “digital trinity” of Air Force and Space Force acquisitions—hold the keys to creating the speed and agility needed to compete on the innovation battlefield. The Digital Trinity doesn’t just build better systems, it enables the Department to build systems better. In FY19 and FY20, we took many major steps to embrace this digital reality.

### DIGITAL ENGINEERING AND MANAGEMENT

Digital engineering involves creating a nearly perfect virtual model and environment to learn and experiment so that the physical system is fully integrated and tested before it is produced. Digital engineering is more than just using computers—it involves creating a

digital thread connecting digital “twin” models to make authoritative virtualization a reality. Digital engineering provides us the ability to create, modify, test, assemble, and experiment in the virtual world before ever bending metal in the physical world.

In FY19-FY20, the Department of the Air Force implemented digital engineering in the acquisition process, not only in design, but in weapon systems spanning the entire lifecycle.

- The **eT-7A Red Hawk** aircraft was designed for the Air Force using the digital approach. By embracing model-based engineering and 3D design tools, assembly hours were reduced by 80% and software development time was cut in

half. The aircraft moved from computer screen to first flight in just 36 months.

- The **Next Generation Air Dominance (NGAD)** program is employing digital engineering to replace once-in-a-generation, mass-produced fighters with smaller batches of iteratively-upgraded platforms of multiple types. This approach takes a cue from the digital transformation of the automotive industry, using high-fidelity models to troubleshoot design, assembly, maintenance, and sustainment before physical systems exist.
- The **Ground Based Strategic Deterrent (GBSD)** program is formalizing the use of models to inform program decision making, and will ultimately



produce a “digital twin” for every GBSD missile sortie, launch facility, and command and control element. The use of digital engineering has already made a significant impact on the GBSD program. For example, the Department analyzed over 6 billion GBSD variant designs digitally prior to making a selection. GBSD’s implementation of all elements of the Digital Trinity will reduce costs and implement faster design cycles, ensuring the land-based element of our nuclear triad is a threat for

decades to come.

- Digital engineering and management is not limited to new acquisitions. We implemented digital engineering for the **A-10 Enhanced Wing Assemblies and ATTACK wing programs**, demonstrating the significant value these principles bring to legacy platforms. Implementing digital engineering resulted in 236,500 operational hours returned to the A-10 fleet through individual aircraft maintenance assessments based on risk analysis methods

pioneered by the organic A-10 Structures team. These tools have the ability to ensure airworthiness, safety, and affordability of the A-10 fleet into 2030 and beyond.

### AGILE SOFTWARE DEVELOPMENT

Within the defense acquisition process, a linear, requirements document-driven approach has been the accepted standard for many years. However, to move at the speed of relevance and ameliorate risk at all phases of a system’s life cycle, software acquisition demands a more

effective paradigm shift away from traditional “waterfall” models. Agile software development is a modernized approach melding requirements, solutions, cross-functional collaboration, and end user-focused co-creation. The touchstones of adaptive planning, evolutionary development, early delivery, and continual improvement enable project teams and organizations to more readily respond to change.

Security is critical in capability development and end user applications. Using the Development Security Operations (**DevSecOps**) model, security is integrated into product life cycles from day one. This includes automating security “gates” and

containerization—a means by which a package of software code can run in standardized, consistent fashion to protect the ecosystem and reduce vulnerability. In FY19 and FY20, the Department of the Air Force took steps towards implementing agile software development across the enterprise. DevSecOps software development is fundamentally changing how we deliver digital capabilities to warfighters. With the establishment of the Program Executive Office (PEO) for Digital, a Chief Software Officer, and over 60 agile coding teams—spanning both traditional programs and new development “factories”—the Department is scaling modern software practices where cycle times are now measured in weeks and days

as opposed to years and months. The adoption of agile virtues and DevSecOps best practices means rapid development for secure capabilities and faster deployment cycles for game-changing capabilities.

Today, our software factories instantiate DevSecOps into actual warfighting capability deliveries at speed. The Department is also fielding common infrastructure that all programs can leverage, led by Cloud One—our enterprise cloud—and two coding platforms, Platform One and Kessel Run. These organizations currently provide enterprise-wide coding environments to employ leading commercial technologies—such as Kubernetes for efficient

containerization—to increase the reliability and security of code. Cloud One and Platform One make agile software development a reality by leveraging the power of cloud computing to put data mining and artificial intelligence to work. This benefits program offices as they are empowered to leverage proven, established platforms and enterprise services. The result is faster standup times, lower risk, and lower costs for quality code. Several ACAT I programs—kinetic platforms and cyber investments alike—have benefited from Cloud One and Platform One technology without the need to create it themselves.

#### **OPEN ARCHITECTURES**

The last element of the Digital

Trinity, open architectures, involves designing software and hardware systems to make subsystems portable, easily upgradeable, and less costly to swap-in the latest technology as it becomes available. Open architecture ensures mission systems—not the platform—drive the capability refresh rate.

Various initiatives across the Air Force and Space Force enable open architecture implementation. For example, Universal Armament Interface (UAI) is an effort to fully develop and standardize software interfaces between munitions, aircraft, and mission planning systems. UAI has been implemented on F-15E, F-16, JDAM, SDB I & II, and more. It has shown significantly reduced cost

and schedule associated with integrated weapons and platforms. During FY19 and FY20, UAI matured enough to be mandated as the interface solution for all air to ground smart weapons, as well as the carriage systems and weapons that employ them.

The Department of the Air Force is undertaking dozens of other open architecture initiatives including Open Mission Systems/Universal Command and Control Interface (OMS/UCI), Sensor Open System Architecture (SOSA), Weapon Open Systems Architecture (WOSA), and Common Network Convergence (CNC).



## Leveraging Innovation & Commercial Research and Development

### AFWERX 2.0

Successful implementation of the digital trinity goes hand-in-hand with our ability to integrate technology innovation occurring across the commercial market. We've made a commitment to become a preferred partner to access, accelerate, and absorb commercial technology currently untapped by the Defense Department. Over the last two years, we energized our **Small Business Innovation Research/Small Business Technology Transfer Program (SBIR/STTR)** to lower barriers for commercial tech companies, speed contracts, and bring private investment into the Defense market. In 2020, we stood up AFWERX 2.0 and grew it from a "start up" to a "scale up."

AFWERX is the focal point across the Department of the Air Force for finding, assessing, and bridging the commercial-to-military market chasm. AFWERX is influencing early technology investment dollars, internal innovation from our own Airmen and Guardians, and incubation of new commercial markets with significant military implications through three efforts: Spark, AFVentures, and Prime.

### SPARK

This effort empowers innovation at the operational edge. Spark connects Airmen and Guardians to commercial innovators using virtual collaboration, immersive training,

and networking opportunities. By connecting operators to acquisition, Spark provides a voice and conduit to turn powerful ideas into powerful operational realities. In FY19 and FY20, the Department of the Air Force stood up more than 80 Spark Cells and hosted more than 20 Challenges. The AFWERX team also hosted two Spark Tank events, where Airmen pitched innovative ideas to top Department leadership and industry experts.

### AFVENTURES

The AFVentures effort is focused on tapping U.S. and global technology ecosystems by using military problems to accelerate commercial technologies. We have transformed the Air Force and Space Force into an early-stage "investor" that leverages private capital, accelerates commercialization using military missions, and grows the number of companies partnering with us. The AFVentures process created simple pathways for commercial innovators and private investors to meet warfighter needs and solve urgent challenges. From FY19 and FY20, AFVentures put 1,433 U.S. small businesses on SBIR & STTR contracts worth a total of \$710M. Of these small businesses, >75% were new to the DAF SBIR and STTR program. These awards led to \$2.2B in follow on private funding (e.g., Venture Capital) and \$1.4B in follow-on, non-SBIR Federal contracts, a 5.6-to-1 return for the Department of the Air Force.

### PRIME

Our collaboration with tech startups is only part of how we are working with the commercial technology ecosystem. Prime is all about priming—and then accelerating—emerging commercial markets using military missions and equities. In addition to funding, Prime programs are leveraging other unique Department resources—like test infrastructure, certification authorities, interagency relationships, and early operational use cases—bringing the Air Force and Space Force's full value proposition to bear by becoming an early adopter to de-risk emerging markets.

We launched the first Prime program, Agility Prime, in April 2020 to accelerate the flying cars market. The Department of the Air Force has unique testing and safety resources—and revenue-generating military use cases—to help mitigate current commercial market and regulatory risks. Agility Prime is using these resources, vice significant R&D funding, to attract investors, build confidence, and expedite commercialization while providing warfighters revolutionary flexibility for numerous missions. Agility Prime resulted in 17 companies building flying cars with the Department of the Air Force in just one year, and a 10-to-1 return on the Department's investment through partnerships with the commercial sector.



## VANGUARDS

In 2019, the Department of the Air Force initiated new “Vanguard” initiatives, modeled after the Strategic Capabilities Offices rapid-prototyping process, to accelerate technology from the Air Force Research laboratory into programs of record. Warfighters, future force designers, technologists, and program managers will ensure technical feasibility, operational utility, and a solid business case to work through the complexities of implementation and facilitate transition into acquisition and fielding. Science and technology (S&T) funds are dedicated to complete the S&T components of each Vanguard effort. To

accelerate transitions, Program Executive Officers (PEOs) were designated upfront to develop and execute an acquisition strategy in collaboration with the Technology Executive Officer (TEO). Upon successful prototyping and experimentation, the Department of the Air Force will transition the technology into an operational capability. The Department of the Air Force Capability Development Council approved three initial Vanguard efforts: Skyborg, Golden Horde, and NTS-3.

The **Skyborg** Vanguard integrates Artificial Intelligence (AI) with autonomous Unmanned Air Vehicles (UAVs) to enable airborne combat mass by

building a transferable autonomy foundation for a family of layered, unmanned air vehicles. This foundation will deliver unmatched combat capability per dollar by lowering the barriers to entry for industry and allowing continuous hardware and software innovation in acquisition, fielding, and sustainment of critical mission systems. If successful, Skyborg will transition AI-enabled, low-cost, attritable aircraft technology (LCAAT) via the Next Generation Air Dominance (NGAD) program or new program of record. In March 2019, the first LCAAT, the XQ-58A Valkyrie, demonstrated high subsonic speeds at operationally relevant altitudes and payload capacities. In January 2020, the



Air Force initiated an effort to integrate an autonomous core system with unmanned aircraft and within six months was able to perform operator-involved virtual system experiments using a digital system integration lab.

The **Golden Horde** Vanguard demonstrates networked, collaborative, autonomous (NCA) weapons that share data, interact, and execute coordinated actions to defeat targets. Golden Horde leverages onboard radios and collaborative software to autonomously optimize target engagement. Flight demonstration of Collaborative-Small Diameter Bombs (C-SDB) began in 2020. These C-SDB

demonstrations expect to prove NCA concepts. The autonomy architectures will then transition to a digital ecosystem for maturation and eventual inclusion in future weapon systems or variants.

The **NTS-3** Vanguard is the first Satellite Navigation (SATNAV) space experiment in 40 years. The program is developing advanced techniques to provide military, civil, and commercial users a more resilient SATNAV capability. If successful, these techniques will transition to future generations of the Global Positioning System (GPS) satellites and receivers. Both the ground control segment and space segment passed their

Critical Design Reviews and are in production. Launch of NTS-3 is projected for 2022 with a planned one-year, on-orbit experimentation program. ■



Tech. Sgt. John Rodriguez, 321st Contingency Response Squadron security team, provides security with a Ghost Robotics Vision 60 prototype at a simulated austere base during the Advanced Battle Management System Onramp on Nellis Air Force Base, Nevada, September 1, 2020.

# ADVANCED BATTLE MANAGEMENT SYSTEM

“ The idea with ABMS is that the people are no longer the glue. ABMS is the machine-to-machine data exchange that finally will give our military internet-like capability – capability that’s universally available in our personal lives, but not typically available to our military. ”

– Dr. Will Roper, Assistant Secretary of the Air Force for Acquisition, Technology and Logistics, February 2018-January 2021



## The Advanced Battle Management System (ABMS)

is building the military Internet of Things that will empower current and future platforms with data. ABMS serves as the bedrock of the Air Force and Space Force technical contribution towards enabling Combined Joint All-Domain Command and Control (CJADC2) by developing the warfighting tech stack and networked data architecture for all-domain decision superiority that: (1) unlocks, (2) orchestrates, and (3) transforms data into information, aided by Artificial Intelligence operating at machine-to-machine speed.

In its first year, ABMS incubated a new foundational approach to rapid experimentation and transition of technology that has enabled capability across the Air Force and Space Force to be demonstrated and delivered alongside operators in three “first-of-their-kind” Onramps, culminating in the largest joint force technology experiment in recent history, including 70 vendors, 40 platforms, 30 geographic locations, 6 domains, and 2 primary Combatant Commanders.

In immediate response to COVID-19, ABMS proactively developed and deployed technology that enabled remote telework at the classified level for the first time and supported U.S. Northern Command operators on the front lines of the COVID-19 pandemic with mobile devices powered by ABMS cloud-based data, software, and Artificial Intelligence.

ABMS leverages a range of contract vehicles, but has set up three primary pathways to partner with commercial technology titans, tech start-ups, and long-standing defense companies.

1. BAA 1: Indefinite Delivery / Indefinite Quantity (ID/IQ)
2. BAA 2: White Paper
3. BAA 3: Cooperative Research and Development Agreements (CRADA)

ABMS capabilities are continuously developed and delivered. They are integrated by employing an acquisition strategy modeled after the successful DevSecOps practice of coupling operators and technologists in recurring development sprints.

In FY20 the Air Force and Space Force initiated development across two-thirds of ABMS product lines as well as conducted three “first-of-their-kind” Department of the Air Force Onramps supporting multiple Combatant Commanders. These pivotal events, each a combination of architecture-level Test and Evaluation at the joint force level, inclusive experimentation, and rapid commercial competition and integration, allowed technology across the Department to be developed and deployed side-by-side with operators in DevOps fashion.

ABMS is a systems-of-systems battle network enabling the sharing and processing of data, across all domains and classification levels in order to support decision makers and warfighters at the speed of relevance.

*Our military's most advanced platforms will only be as powerful as the data they can harness. Our warfighters need the military Internet of Things now, and in its first year, ABMS has proven that the military really can move at digital speed alongside the full spectrum of commercial innovation partners.*

– **Mr. Preston Dunlap**, Chief Architect, Air Force and Space Force



## Architecture Onramp 1

**Date:** December 16-18, 2019

**Locations:** Eglin Air Force Base, Florida; Gulf of Mexico, and Space

**Supported CDR:** NORAD-USNORTHCOM

### Notable Firsts:

- Protected shared data between F-22 & F-35 using automated translator on the ground (gatewayONE)
- Provided multi-domain SA and C2 over unclassified cloud-based environment (commandONE, cloudONE)
- Moved SA and C2 seamlessly from brick-and-mortar facility to rugged tent environment (omniaONE, edgeONE)
- Connected via commercial, high-rate proliferated LEO Satcom system to ops center (commercialONE)



Members of the 6th Special Operations Squadron use a tablet to upload coordinates during an exercise showcasing the capabilities of the Advanced Battle Management System at Duke Field, Florida, December 17, 2019. During the first demonstration of the ABMS, operators across the Air Force, Army, Navy, and industry tested multiple real-time data sharing tools and technologies in a homeland defense-based scenario enacted by U.S. Northern Command and enabled by Department of the Air Force senior leaders. The collection of networked systems and immediately available information is critical to enabling joint service operations across all domains. (U.S. Air Force photo by Tech. Sgt. Joshua J. Garcia)



Preston Dunlap, Department of the Air Force Chief Architect, briefs Department of Defense senior leaders during the first-ever Advanced Battle Management System live demonstration at Eglin Air Force Base, Florida, December 18, 2019. The collection of networked systems and immediately available information is critical to enabling joint service operations across all domains. (U.S. Air Force photo by Tech. Sgt. Joshua J. Garcia)

## Architecture Onramp 2

**Date:** September 1-3, 2020

**Locations:** 30 geographic locations, and Space

**Supported CDR:** NORAD-USNORTHCOM & USSPACECOM

### Notable Firsts:

- First integration of multiple Combatant Commanders into a single common operating picture with real-time digital coordination and effects tasking without minutes of wasted time and human error in phone calls and chat rooms (omniaONE, commandONE)
- First C2 of a hypervelocity gun (smartMunONE) shoot-down of a cruise missile
- First demonstration of 5G for tactical edge comms (commercialONE)
- First employment of operational AI algorithms for AI-recommended C2 Courses of Action (smartONE, commandONE)
- Seamless classified SA and C2 on the move at the edge with the same access to data as in the command center (tabletONE)
- Expanded cloud-based data feeds from unclassified to secret and SCI, integrating data from 60 new sources/sensors (dataONE, feedONE)



U.S. Air Force and Space Force operators monitor computers in support of the Advanced Battle Management System (ABMS) Onramp 2, September 2, 2020 at Joint Base Andrews, Maryland. The effect ABMS is attempting to achieve is Combined Joint All-Domain Command and Control (CJADC2). CJADC2 is meant to accelerate the speed of the kill chain by connecting sensors to shooters. ABMS is the digital infrastructure which allows a much enhanced level of connectivity and compatibility for our military at war. As a new Joint Warfighting Concept, Joint All-Domain Operations (JADO) seeks to create simultaneous dilemmas for adversary forces, overwhelming them with too many challenges to counter successfully. (U.S. Air Force photo by Senior Airman Daniel Hernandez)

## Architecture Onramp 3

**Date:** September 15-25, 2020

**Locations:** Joint Base Pearl Harbor-Hickam, Hawaii, and Guam

**Supported CDR:** INDOPACOM & USSPACECOM

### Notable Firsts:

- First OCONUS Onramp (Hawaii and Guam), with a focus on enabling distributed, resilient operations
- First OCONUS use of applications to enable agile combat employment operations and distributed operational and tactical C2



General Kenneth S. Wilsbach, Commander Pacific Air Forces, is briefed during Exercise Valiant Shield on Joint Base Pearl Harbor-Hickam, Hawaii, September 22, 2020. Valiant Shield is a biennial, U.S.-only, joint field training exercise with a focus on integration between U.S. forces in relation to current operational plans. (U.S. Air Force photo by Staff Sgt. Mikaley Kline)

## Architecture COVID-19 Response

**Date:** March 2020, ongoing

**Locations:** 30 geographic locations, Gulf of Mexico, and Space

**Supported CDR:** NORAD-USNORTHCOM & USSPACECOM

In addition to its planned product line development and Onramps, the Department was able to rapidly develop and deploy products as part of the U.S. Government's COVID-19 response operations. This "real world" Onramp demonstrated how capability can be implemented today to support a range of operations across multiple classification levels and enable disaggregated C2 in commercially relevant ways.

### Notable Firsts:

- Developed, secured, and deployed over 1000 secure laptops (deviceONE) to enable remote, classified processing at scale to maintain disaggregated operations and enable classified telework for the first time
- Partnered with USNORTHCOM to develop and deploy early prototypes of cloud-based dataONE, smartONE, and omniaONE in support of forward deployed medical operators aiding in the COVID-19 fight – including automated health status and readiness reporting, hospital utilization, and Artificial Intelligence assisted analytics



Governor Andrew M. Cuomo speaks at a press conference in front of members of the New York National Guard at the Jacob K. Javits Convention Center in New York City, March 27, 2020. The convention center became an alternate care site as part of New York's multi-agency response to COVID-19. The ABMS hub at NORTHCOM deployed deviceONE tablets to all of its joint forces operating at health centers across the country, but primarily in New York at the Javitz Center and the USNS Comfort. (U.S. Air National Guard photo by Senior Airman Sean Madden)

# ACQUISITION SUCCESSSES:

In addition to the accomplishments in other pages of this report, here are a number of highlighted successes from the Department of the Air Force acquisition enterprise in FY19 and FY20.

In partnership with the Defense Digital Service, the Department of the Air Force hosted the **Space Security Challenge: Hack-A-Sat** event as a part of DEFCON 28 to enable security researchers of all levels to focus their skills and creativity on solving cyber security challenges on space systems. During the Hack-A-Sat finals, one winning team sent code to a live satellite, snagging a moonshot picture from 385,000 km away.

The first-ever **Quantum Collider** event was held in June 2020, resulting in \$5.25M total funding being awarded to innovators.

In July 2020, **AFWERX 2.0** was ranked by Fast Company/Accenture as the top 16th Best Workplace for Innovators out of 865 organizations from around the world.

The Department of the Air Force hosted the inaugural **Space Pitch Day** in San Francisco, California on November 5-6, 2019, awarding on-the-spot contracts worth \$22.5M to 30 companies for technologies and products related to 11 specific goals.

The Department of the Air Force conducted OCONUS field assessments of our first operationally approved **directed energy weapon prototype** to be incorporated into future systems for application in base defense against small, unmanned aerial systems.

In March 2020, the AFWERX team transitioned the **2020 Pitch Bowl** to a virtual event in three days attended by more than 2,000 representatives from industry, government, and academia and resulting in combined award of nearly \$1B in contracts to more than 550 small businesses.

**The Ground Based Strategic Deterrent (GBSD) Engineering and Manufacturing Development** contract was awarded in September 2020. GBSD program is a full recapitalization of the MM III weapon system and includes a conversion of 461 existing Minuteman III Launch Facilities and up to 45 Launch Centers spanning 31,500 square miles in six states.

The Department designated **T-7A** as the first “e-Series” plane, designed with digital engineering. The Air Force and Boeing finalized the T-7A design with the completion of the Critical Design Review on August 14, 2020.

**Unified Platform** became the first Department of Defense program to transition to the new DoDI 5000.87 Software Acquisitions Pathway. This approach revolutionizes software acquisitions, allowing Unified Platform to deliver priority cyber capabilities to the warfighter in hours instead of weeks.

The **HH-60W “Jolly Green II”** first flight occurred on May 17, 2019. The program also achieved Milestone C in September 2019.

**The Next-Generation Overhead Persistent Infrared** program, the nation’s future missile warning capability, achieved Preliminary Design Review for the Geosynchronous system in September 2019, approximately seven months sooner than a traditional acquisition program.

In 2019, the **Cyber Resiliency Office for Weapon Systems (CROWS)** started fielding 11 cyber focus teams to support 177 acquisition offices across the Department of the Air Force, providing risk mitigations to acquisition and operational units to instill resilience concepts into their programs.

Operational **F-35As** completed their first combat mission for the Air Force on April 30, 2019.

In June 2019, the **Space Test Program-2** mission launched 24 Department of the Air Force, NASA, NOAA, and university payloads, tying a record set in 1968.

The **Electro-Optical Infrared Weather System Geostationary**, a repurposed NOAA satellite that now provides EO/IR weather coverage over the Indian Ocean in support of CENTCOM, reached initial operational capability on September 1, 2020. This \$70M procurement delivered an operational satellite in less than 18 months.

In September 2020, the Department of the Air Force completed installation of the **Integrated Battle Station**, the largest and most complex modification ever performed in the B-1B fleet history. The completed modification drastically enhances B-1B flight operations and mission readiness.

The **Air Force Research Laboratory** successfully designed, developed and tested a synthetic winch cable for the C-17 Globemaster III aircraft fleet. The new cable is 40% cheaper, significantly lighter, and much safer to use than the standard steel cable.

In December 2019 and May 2020, respectively, Clear Air Force Station and Cape Cod Air Force Station transitioned to **Upgraded Early Warning Radars**, completing a 15-year upgrade effort to improve real-time missile warning and missile defense capabilities.

The Department of the Air Force launched the final three **Advanced Extremely High Frequency (AEHF)** satellites on October 17, 2018, August 8, 2019, and March 26, 2020. These satellites bring greater resiliency to the protected communications in support of the President and the National Command Authorities.

Basic researchers, funded by the Air Force Research Laboratory, discovered a way to hide a target by masking its heat properties. **Quantum material** tricks an infrared camera by decoupling an object’s temperature from its thermal light radiation, allowing information about an object’s temperature to hide.

## Winning on the Innovation Battlefield with Celerity

Competing against rising peer adversaries during this time of unprecedented technology change requires a competitive acquisition system: one that is faster and more agile than our rivals. Fielding systems faster is step one. Through rapid prototyping and fielding authorities, we trimmed non-value-added steps that previously bogged down programs and slowed capability to warfighters.

Granted through Section 804 of the FY16 National Defense Authorization Act, Middle Tier of Acquisition (MTA) authorities enabled us to rapidly develop prototypes demonstrating new capabilities and rapidly field production systems with proven technologies. Our MTA programs spurred innovation ecosystems, fostered competition, forged non-traditional industry partnerships, reduced long-term costs through prototyping, and reduced risk early in a program’s lifecycle.



MID-TIER OF ACQUISITION (MTA)

In May 2019, we achieved our “Century Challenge” goal of removing 100 years from program schedules and we’ve just kept going toward a new goal of 150 years. By the end of FY20, we identified 83.75 years of program accelerations for MTA programs and an additional 29 years of accelerations by tailoring our traditional acquisition programs.



# GLOBAL POWER

Global Power is the Air Force's ability to threaten or strike any target anywhere in the world, assert national sovereignty, and provide joint freedom of action. The Department's global power portfolio ensures ours is the most lethal Air Force in the world through its bombers, fighters, Intercontinental Ballistic Missiles (ICBMs), and weapons and munitions programs. The Department's global power portfolio includes 21 programs worth \$22.27B.



# AIM-120

AIM-120 ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE

**ORIGINAL UNIT COST:**

\$1.51 MILLION

**CURRENT UNIT COST:**

\$1.5 MILLION (< 1% DECREASE)

The AIM-120 Advanced Medium Range Air-to-Air Missile program provides for the acquisition and upgrade of an advanced all-weather, all-environment missile. The system is an active radar guided intercept missile with inherent Electronic Protection capabilities for air-to-air applications against massed airborne threats. The current AIM-120D variant reached Initial Operational Capability in 2015.

In 2020, the program maintained joint tactical missile availability greater than 88% against an Acquisition Program Baseline threshold of 82%.

The AMRAAM's Form, Fit, Function, Refresh (F3R) and System Improvement Program (SIP) continues to address obsolescence issues and increase combat effectiveness to counter advanced threats and Electronic Attack techniques. The F3R program housing the SIP 3F software is projected to complete in 2023.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$2.61 BILLION**

**2021:**

**\$505  
MILLION**

**CONTRACTING:**

RAYTHEON TECHNOLOGIES,  
Tucson, Arizona

**Research, Development, Test & Evaluation**

- Cost-Plus-Incentive-Fee
- Cost-Plus-Fixed-Fee

**Production**

- Fixed-Price-Incentive-Firm

**SCHEDULE:**

In 2020, the Lot 33 production contract was awarded; this is the first production lot with the AIM-120D3 (F3R) missiles. The F3R program continued Phase 4B (integration & test), and Phase 5 (qualification & flight testing) in preparation for Lot 33 Production cut-in.

The AIM-120C Counter Emerging Threats (CET) software capabilities improvement effort completed Preliminary Design Review in June 2020. Projected fielding is in FY22.

The AIM-120D SIP 2 was fielded in February 2020. SIP 3 continued Integrated Testing in 2020 while SIP 4 continued Risk Reduction activities.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$12.3 BILLION**

**2021:**

**\$2.8  
BILLION**

**CONTRACTING:**

NORTHROP GRUMMAN CORPORATION,  
Falls Church, Virginia

**Engineering & Manufacturing Development**

- Cost-Plus-Incentive-Fee

**Production**

- Fixed-Price-Incentive-Firm

**SCHEDULE:**

The Air Force will procure a minimum of 100 B-21 Raiders. First aircraft deliveries to operational bases are slated for the mid-2020s.



# B-21

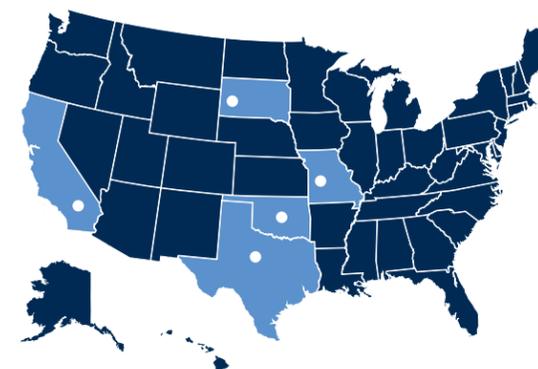
B-21 RAIDER

The B-21 Raider will form the backbone of our future bomber fleet as a long-range, highly-survivable bomber capable of carrying mixed, conventional, and nuclear payloads to strike any target worldwide.

The B-21 will provide operational flexibility for joint commanders, and will be relevant across the spectrum of conflict. From raid to campaign levels, the B-21 will penetrate modern air defenses to accomplish national objectives.

Agile acquisition processes, including digital engineering and agile software development, have been built into the B-21 development and procurement efforts to ensure the Air Force delivers system capabilities at the best value for taxpayers. B-21 Open Systems Architecture ensures adaptability and lethality as threats evolve.

The B-21 program is in the Engineering and Manufacturing Development phase.



**BASING STRATEGY:**

The preferred B-21 Main Operating Base locations are Ellsworth Air Force Base, South Dakota; Whiteman Air Force Base, Missouri; and Dyess Air Force Base, Texas. Edwards Air Force Base, California, will host the B-21 Combined Test Force. Tinker Air Force Base, Oklahoma, is the site for Depot Planning.



# B-52

## B-52 STRATOFORTRESS MODERNIZATION

The venerable B-52 is undergoing the most comprehensive modernization in its history to ensure the longest serving bomber continues to fly through 2050.

### COMMERCIAL ENGINE REPLACEMENT PROGRAM (CERP)

To meet this need, the Air Force will replace the current B-52 engines under the Commercial Engine Replacement Program (CERP). This program is a Middle Tier of Acquisition Rapid Prototyping program to re-engine the B-52 fleet with new commercial engines, using digital engineering to reduce risks. In 2019, the program established its system performance and interface requirements and awarded engine

analysis projects to potential vendors. These projects were the first steps toward selecting a new engine. They analyzed engine integration concepts and delivered digital prototypes for each candidate engine in November 2019. In December 2019, the CERP team demonstrated these digital prototypes using analysis-based videos, virtual immersive walk-throughs, and 3D-printed physical models. CERP's junior government engineers translated the digital prototypes into a printable format,

and then 3D-printed them on Air Force equipment.

In February 2020, the program awarded the Rapid Prototyping contract to complete the modification's preliminary design and deliver the digital system prototype. In May 2020 the program released the engine selection Request for Proposals, and proposals were received in July 2020.

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
\$3.77 BILLION

### 2021:

\$578  
MILLION

### CONTRACTING (ANTICIPATED):

COMMERCIAL ENGINE  
REPLACEMENT PROGRAM

**Engine contract**  
(Estimated award date is 3rd Qtr of FY21)  
Vendor is TBD

- Firm-Fixed-Price contract

RADAR MODERNIZATION PROGRAM  
(anticipated)

BOEING COMPANY, Oklahoma City,  
Oklahoma

**Engineering & Manufacturing  
Development**

- Cost-Plus-Incentive-Fee

### SCHEDULE:

The Air Force will procure radar subsystems, plus spares, for the entire fleet with production beginning in 2025



MID-TIER OF ACQUISITION (MTA)



### RADAR MODERNIZATION PROGRAM (RMP)

The B-52 radar is a mission essential component for effective accomplishment of all B-52 missions. In July 2019, a supplier was announced to design, develop, and produce an active electronically scanned array radar system to be integrated for the entire B-52 fleet. In October 2019, the Program Office also released the Engineering and Manufacturing Development (EMD) Request for Proposal.

The Contractor submitted the EMD proposal to the Program Office in July 2020, and the program completed a Weapon System-level Preliminary Design Review in October 2020. The program is using digital, models based tools to ensure traceability of design requirements to the data, activities, and artifacts generated during testing/verification process. The next program milestone is the EMD milestone decision and contract award currently projected for the second half of FY21.

With a modernized radar system, the B-52 will gain drastically greater reliability when compared to the legacy system and benefit from significantly improved digital processing and crew station capabilities to support national objectives for both conventional and nuclear missions, through 2050 and beyond.



# B61-12

## B61 MOD 12 LIFE EXTENSION PROGRAM TAILKIT ASSEMBLY

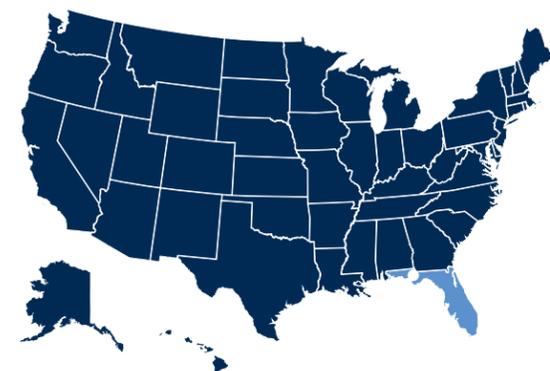
**ORIGINAL UNIT COST:**  
\$1.7 MILLION

**CURRENT UNIT COST:**  
\$1.3 MILLION (25% DECREASE)

The legacy B61 nuclear bomb is nearing the end of its service life and requires a Life-Extension Program (LEP) to address age-related issues.

The B61-12 LEP consolidates four legacy B61 variants – modifications 3, 4, 7, and 10 – into a single “mod 12” variant. The addition of an Air Force-provided tailkit assembly with a digital interface enables consolidation of these four mods while maintaining military capabilities. The first asset was delivered in June 2020.

B61-12 LEP is a cooperative program between the Department of Defense (DoD) and Department of Energy (DoE). The DoD is responsible for the B61-12 Tailkit Assembly development, weapon system, and aircraft integration, while the DoE is responsible for the B61-12 bomb assembly.



**DEPLOYMENT STRATEGY:**

The System Program Office is located at Eglin Air Force Base, Florida. The B61-12 nuclear weapon will be part of the airborne leg of the U.S. nuclear triad and will provide support to NATO allies. The B61-12 will be integrated on the B-2A, B-21, F-15E, F-16C/D, F-16 MLU, F-35, and PA-200.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$48.1 MILLION**

**2021:**

**\$45.3  
MILLION**

**CONTRACTING:**

BOEING COMPANY, St. Louis, Missouri

**Engineering & Manufacturing Development**

- Cost-Plus-Incentive-Fee

**Production (Lot 1 & 2 contracts awarded in June 2020)**

- Fixed-Price-Incentive

**SCHEDULE:**

Initial Operational Test and Evaluation was completed in April 2020. The Tailkit Assembly was approved to enter full-rate production in October 2020.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$1.5 BILLION**

**2021:**

**\$268  
MILLION**

**CONTRACTING:**

BOEING COMPANY, St. Louis, Missouri

**Engineering & Manufacturing Development**

- Firm-Fixed-Price (F-15C and F-15E)

**Production (Lot 1 contract to be awarded in the 1Q FY21)**

- Fixed-Price-Incentive-Firm (e.g., Group A kits, initial spares, installs, mod line equipment.)
- Firm-Fixed-Price: Group B Hardware, Depot Activation
- Cost-Plus-Fixed Fee: SE/PM, GFP Repair, Interim Contractor Support
- Time & Materials: Additional Mod Line Support
- Cost: Bridge buys as required

**SCHEDULE:**

Current production plans include 217 F-15Es and 144 F-15EXs.



# F-15

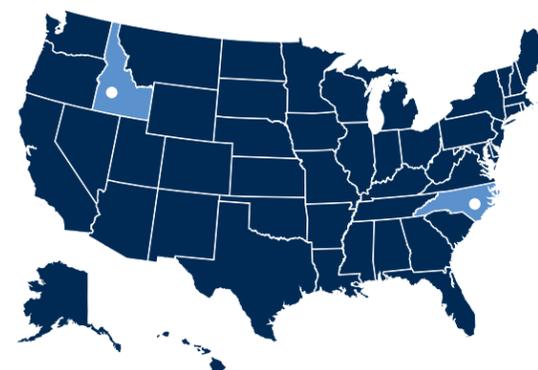
## F-15 EAGLE PASSIVE ACTIVE WARNING AND SURVIVABILITY SYSTEM

**ORIGINAL UNIT COST:**  
\$10.9 MILLION

**CURRENT UNIT COST:**  
\$13.6 MILLION (18% INCREASE)

The F-15 Eagle Passive Active Warning and Survivability System (EPAWSS) program replaces the existing, functionally obsolete F-15 electronic warfare self-protection system and is critical to maintaining the F-15's viability past 2040.

F-15 EPAWSS is an electronic warfare system with capabilities including electronic detection and identification, internal countermeasures, associated antennas, and countermeasures dispensing. This upgrade provides the F-15 the capability to autonomously and automatically detect, identify, and locate radio frequency threats. The upgrade will also provide the ability to deny, degrade, deceive, disrupt, and detect Radio Frequency and electro-optical/infrared threat systems in contested environments.



**IMPLEMENTATION STRATEGY:**

Mountain Home Air Force Base, Idaho and Seymour Johnson Air Force Base, North Carolina

Overseas Locations: Royal Air Force Lakenheath, England and Kadena Air Base, Japan



# F-15EX

F-15 EX

The F-15EX will replace the F-15C/D fleet and augment the aging F-15E fleet. The most significant difference between the F-15EX and legacy F-15s is its Open Mission Systems architecture, which enables rapid insertion of the latest aircraft technologies. The F-15EX will also have fly-by-wire flight controls, a new electronic warfare system, advanced cockpit systems, and the latest mission systems and software capabilities available for legacy F-15s.

In parallel with rapidly fielding the initial aircraft lots, the Air Force is also exploring technology insertion options to ensure the F-15EX remains a complementary platform with 5th generation assets operating in highly contested environments. The baseline F-15EX incorporates provisions for future growth, most notably fiber optic cabling for a high-speed avionics service bus to enable an Open Mission Systems computing environment.

Building on the digital engineering redesigns of the nose barrel and wings for the F-15QA, the F-15EX Program is redesigning the forward fuselage for increased producibility and reduced recurring production costs. With this upgrade, most of the F-15EX's avionics bays will be manufactured based on digital engineering models which can be quickly modified to accommodate new subsystems.

### IMPLEMENTATION STRATEGY:

- Eglin Air Force Base, Florida for the eight (8) Lot 1 aircraft
- Kingsley Field Air National Guard Base, Oregon for the twelve (12) Lot 2 aircraft
- Portland Air National Guard Base, Oregon for the twelve (12) Lot 3 aircraft
- Strategic Basing Process is in work to determine the fielding locations for subsequent aircraft lots.

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$8.9 BILLION**

### 2021:

**\$1.6  
BILLION**

### CONTRACTING:

BOEING COMPANY, St. Louis, Missouri

### Production

- Indefinite-Delivery/Indefinite-Quantity contract with a mix of: Firm-Fixed-Price, Fixed-Price-Incentive-Firm, Cost-Plus-Incentive-Fee, and Cost-Plus-Fixed-Fee.

### SCHEDULE:

Current production plans include 144 F-15EX aircraft. The two Lot 1A aircraft will be delivered in FY21; the six (6) Lot 1B aircraft will be delivered in FY23. Lots 2 through 6 aircraft will be ordered in FY21-25 in the amounts of 12, 12, 14, 19, and 19.



MID-TIER OF ACQUISITION (MTA)

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$5.89 MILLION**

### 2021:

**\$5.89  
MILLION**

### CONTRACTING:

LOCKHEED MARTIN CORPORATION,  
Fort Worth, Texas

### Engineering & Manufacturing Development

- Cost-Plus-Incentive-Fee

### Kit Production

- Firm-Fixed-Price

### Kit Installs

- Cost-Plus-Fixed-Fee

### SCHEDULE:

Fleet upgrades began in May 2019 with fielding expected to complete in 2021.



MID-TIER OF ACQUISITION (MTA)



# F-22

F-22 INCREMENT 3.2B MODERNIZATION

### ORIGINAL UNIT COST:

\$11.2 MILLION

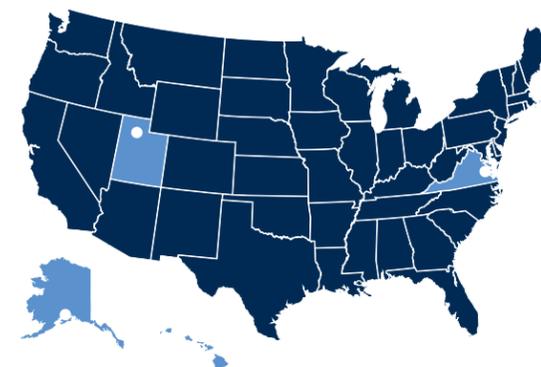
### CURRENT UNIT COST:

\$10.1 MILLION (9.8% DECREASE)

The F-22 Raptor's combination of stealth, supercruise, maneuverability, and integrated avionics make it the world's most capable combat aircraft.

The F-22 Increment 3.2B program upgrades the F-22 with the latest air-to-air weaponry (AIM-9X and AIM-120D), adds additional electronic protection techniques to guard against emerging threats, and improves the network-centric warfare capabilities of the aircraft. This upgrade dramatically increases lethality and survivability of the F-22 while providing an exponential leap in warfighting capabilities vital to supporting the National Defense Strategy.

Beyond Increment 3.2B, future F-22 modernization development will leverage the F-22 Capability Pipeline as a vehicle to rapidly prototype and iteratively field critical warfighting enhancements.



### BASING STRATEGY:

Increment 3.2B production kits will be installed on 143 F-22s located at Joint Base Langley-Eustis, Virginia; Joint Base Elmendorf-Richardson, Alaska; and Joint Base Pearl Harbor-Hickam, Hawaii. Additionally, installations are being completed at Hill Air Force Base, Utah while aircraft are undergoing depot maintenance to minimize downtime and return upgraded jets to the warfighter at the fastest rate possible.



# F-35

## F-35 LIGHTNING II JOINT STRIKE FIGHTER (JSF) PROGRAM

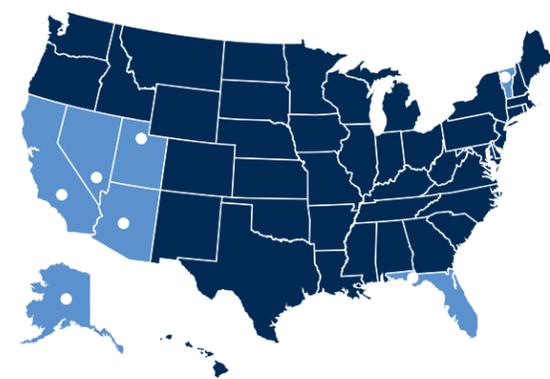
**ORIGINAL UNIT COST:**  
(2012 PROGRAM RECERTIFICATION):  
\$134.5 MILLION

**CURRENT UNIT COST:**  
\$130.2 MILLION (3.2% DECREASE)

The F-35 program is managed by a joint program office under the Office of the Secretary of Defense.

The F-35A is the centerpiece of our future fighter precision attack capability—serving in both conventional and nuclear capacities for the U.S. and partner nations. Its primary missions will include air interdiction, offensive and defensive counter-air, close air support, strategic attack, and suppression of enemy air defenses.

The program of record includes 2,456 U.S. production aircraft: 1,763 F-35A conventional takeoff and landing aircraft for the Air Force, and 693 F-35B short take-off and vertical landing aircraft and F-35C carrier variant aircraft for the Navy and Marine Corps. Partners and foreign military sales countries expect to buy approximately 760 aircraft.



**BASING STRATEGY:**

F-35As are currently based at Hill Air Force Base, Utah; Eglin Air Force Base, Florida; Luke Air Force Base, Arizona; Nellis Air Force Base, Nevada; Edwards Air Force Base, California; Burlington Air Guard Station, Vermont; and Eielson Air Force Base, Alaska. Future locations are Naval Air Station Joint Reserve Base, Fort Worth, Texas; Trux Field Air National Guard Base, Wisconsin; and Dannelly Field Air National Guard, Alabama.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$30 BILLION**

**2021:**

**\$6.7  
BILLION**

**CONTRACTING:**

LOCKHEED MARTIN CORPORATION,  
Fort Worth, Texas

**Development**

- Cost-Plus-Award-Fee

**Low-Rate Initial Production  
(Lot 4+ Production)**

- Fixed-Price-Incentive-Firm
- (LRIP Lot 12-14 contract awarded in October 2019)

**SCHEDULE:**

The Air Force fielded Block 3F capable aircraft in 2018. The F-35's next development effort centers on a Continuous Capability Development and Delivery process delivering upgraded Block 4 capabilities in smaller increments on expedited timelines.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$13.2 BILLION**

**2021:**

**\$1.5  
BILLION**

**CONTRACTING:**

- BOEING COMPANY, Huntsville, Alabama
- NORTHROP GRUMMAN CORPORATION, Redondo Beach, California

**Technology Maturation & Risk Reduction**

- Cost-Plus-Fixed-Fee

**Engineering & Manufacturing Development**

- Cost-Plus-Incentive-Fee

**SCHEDULE:**

The program will deliver a fully-integrated weapon system beginning in FY29.



DIGITAL ENGINEERING



2020 PACKARD AWARD



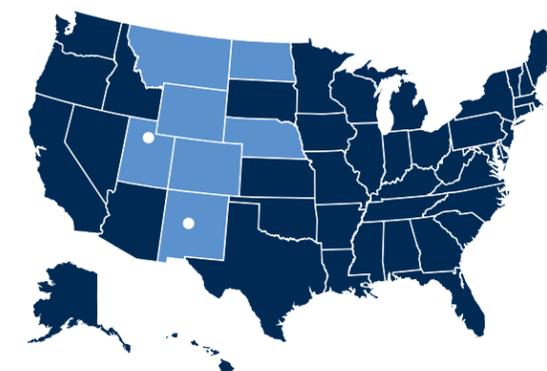
# GBSD

## GROUND BASED STRATEGIC DETERRENT

The Ground Based Strategic Deterrent (GBSD) will replace the current Minuteman III Intercontinental Ballistic Missile, which is years beyond its designed service life. The GBSD weapon system will ensure the ground-based leg of the nuclear triad remains a responsive deterrent capability against current and future adversaries through 2075.

Continued emphasis on Model Based Systems Engineering will enable the Air Force to reduce program life cycle costs and risks.

The GBSD program met the Milestone B Defense Acquisition Board in August 2020 and was subsequently approved to enter the Engineering and Manufacturing Development (EMD) phase. The Air Force awarded a \$13.3 billion EMD contract to Northrop Grumman in September 2020.



**BASING STRATEGY:**

The GBSD Program Office is located at Hill Air Force Base, Utah. The Program Office's headquarters is the Air Force Nuclear Weapons Center at Kirtland Air Force Base, New Mexico. The three Air Force missile wings are based in North Dakota, Wyoming, and Montana.

Minuteman III ICBM silos are based in Colorado, Montana, Nebraska, North Dakota, and Wyoming.

# ICBM

## AIR FORCE INTERCONTINENTAL BALLISTIC MISSILE FUZE MODERNIZATION

### ORIGINAL UNIT COST:

\$2.52 MILLION

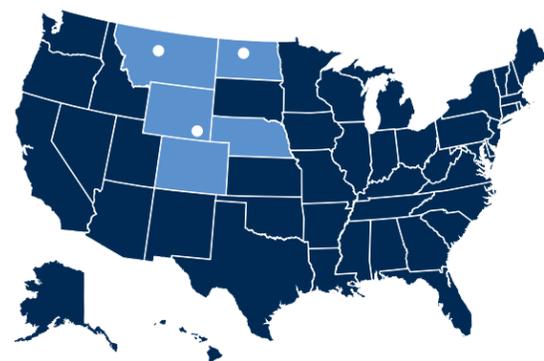
The Original Unit Cost reflects a new program baseline approved in December 2020.

### CURRENT UNIT COST:

\$2.5 MILLION (2.5% DECREASE)

The Intercontinental Ballistic Missile Fuze Modernization program is producing a replacement for the legacy Mk21 fuze, which is well beyond its planned design life. The program is a cooperative effort between the Air Force and the Navy that shares common-use technologies gained from the Mark 5 Alteration 370 fuze program, being deployed as part of the Navy's Trident II D5 submarine-launched ballistic missile system. The new Air Force fuze will incorporate modular and adaptable components that will improve design life, reduce development time, and achieve cost savings.

The Air Force successfully conducted the second flight test of a pre-production fuze assembly in February 2020 – the second fuze related developmental flight test in sixteen years.



### BASING STRATEGY:

The current ICBM force consists of 400 Minuteman III missiles located at F.E. Warren Air Force Base, Wyoming; Malmstrom Air Force Base, Montana; and Minot Air Force Base, North Dakota.

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$802 MILLION**

### 2021:

**\$214 MILLION**

### CONTRACTING:

SANDIA NATIONAL LABORATORIES,  
Albuquerque, New Mexico

#### System Development & Demonstration

- Military Interdepartmental Purchase Request

#### Weapon System Integration

- Cost-Plus-Fixed-Fee

### SCHEDULE:

The ICBM Fuze Modernization program successfully passed its Final Design Review in August 2020. The first production unit is scheduled for May 2024.

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$3.8 BILLION**

### 2021:

**\$576.7 MILLION**

### CONTRACTING:

LOCKHEED MARTIN CORPORATION,  
Orlando, Florida

#### Research, Development, Test & Evaluation

- Cost-Plus-Incentive-Fee
- Cost-Plus-Fixed-Fee

#### Production

- Fixed-Price-Incentive-Firm

### SCHEDULE:

- Began full-rate production in November 2014. Lot 14 (FY16) was the last year of U.S. JASSM-Baseline production. The Air Force awarded the Lot 17/Lot 18 contract for 750 JASSM-Extended Range missiles in March 2020.
- AGM-158B-2 low rate initial production deliveries are planned for FY25.



# JASSM

## JOINT AIR-TO-SURFACE STANDOFF MISSILE

### ORIGINAL UNIT COST:

\$1.6 MILLION

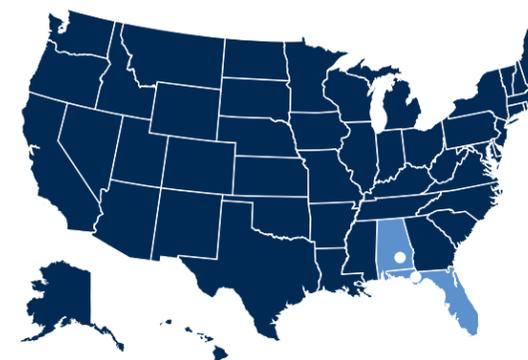
### CURRENT UNIT COST:

\$1 MILLION (37.5% DECREASE)

The Joint Air-to-Surface Standoff Missile (JASSM) is a conventional, autonomous, long-range, precision-guided, highly survivable, low-observable cruise missile capable of striking high-value, highly defended targets. Its standoff capability enables the delivery platforms to avoid surface-to-air missile and integrated air defense systems.

JASSM has three configurations: AGM-158A (Baseline, no longer in procurement) and two Extended Range variants, AGM-158B and AGM-158B-2. AGM-158A is integrated on the B-1, B-52, F-15E, B-2, F-16, and F/A-18 Foreign Military Sales. AGM-158B is integrated on the B-1, B-52, F-15E, F-16, and planned for the B-2. The AGM-158B-2 variant is in development.

Construction of a second production facility in Troy, Alabama began in May 2019 with factory completion expected in the fall of 2021.



### BASING STRATEGY:

All JASSM variants are produced in Troy, Alabama, with the System Program Office at Eglin Air Force Base, Florida. The JASSM inventory is distributed across the globe.



# LRSO

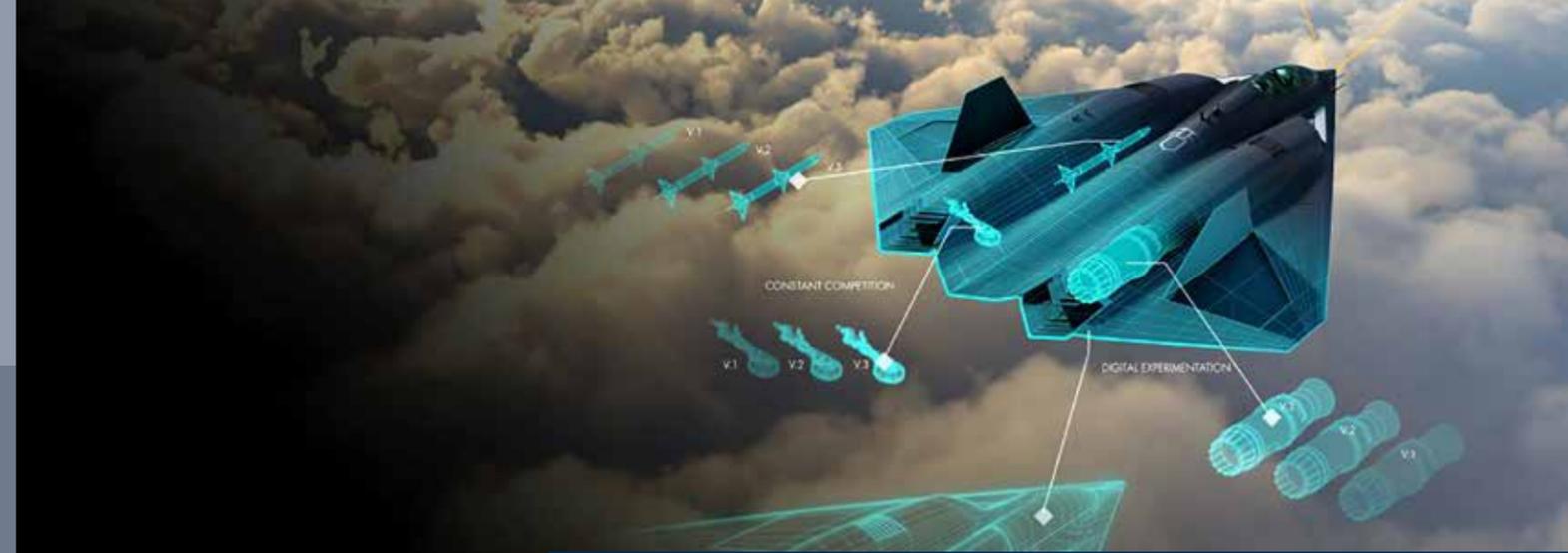
LONG-RANGE STAND-OFF (LRSO) CRUISE MISSILE

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$2 BILLION**

## 2021:

**\$474  
MILLION**



# NEXT GENERATION AIR DOMINANCE

The Long-Range Stand-Off (LRSO) cruise missile will replace the Air-Launched Cruise Missile (ALCM), designed in the 1970s and fielded in 1982 with a 10-year design-life expectancy. ALCM's ability to survive in hostile environments is diminishing as adversary air defenses improve. The LRSO cruise missile provides a visible and tailorable deterrent option to project power and target any location on the globe. The Air Force plans to buy approximately 1,000 missiles to support warfighter requirements, provide sufficient spares, and support Nuclear Weapon System Evaluation Program requirements.

Technology Maturation Risk Reduction activities for both competitors progressed as planned last year. One contractor will be selected for both the development and production phases. Development and procurement costs for the LRSO cruise missile are estimated to be close to \$10 billion.

### IMPLEMENTATION STRATEGY:

B-21 and B-52 bombers will employ the LRSO cruise missile.

### CONTRACTING:

- LOCKHEED MARTIN CORPORATION, Orlando, Florida
- RAYTHEON TECHNOLOGIES, Tucson, Arizona

### Technology Maturation & Risk Reduction

- Cost-Plus-Fixed-Fee

### SCHEDULE:

Initial Operational Capability is planned for 2030.

A highly advanced dynamic threat demands a different way of doing business. Next Generation Air Dominance is a family of capabilities that enable Air Superiority in the most challenging operational environments by enforcing the development pillars of digital engineering, agile software development, and open architectures. By executing shorter technology development cycles, the program matures technology and reduces risk through prototyping and operational experimentation. This delivers enhancements in survivability, lethality, and persistence for a highly-contested environment.

Designed to complement the F-35, F-22, joint, and partner forces in the Air Superiority role, Next Generation Air Dominance is an advanced aircraft program for development of penetrating counter air platforms with multi-domain situational awareness, agile resilient communications, and an integrated family of capabilities. The program uses a non-traditional acquisition approach to avoid traditional monolithic program schedules and exorbitant life-cycle sustainment costs. This strategy, called the Digital Century Series approach, creates a realistic business case for industry to adopt commercial best practices for key design activities – before a part is even manufactured.



DIGITAL ENGINEERING



# SDB II

SMALL DIAMETER BOMB INCREMENT II (SDB II)

**ORIGINAL UNIT COST:**

\$311,000

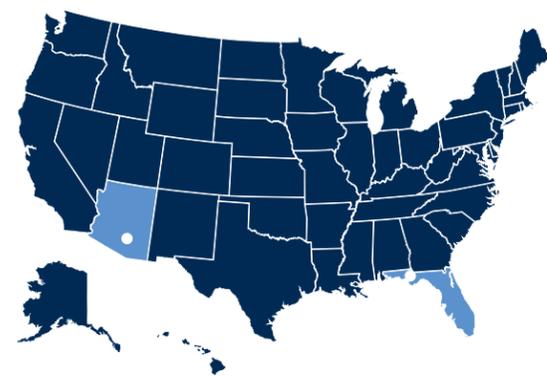
**CURRENT UNIT COST:**

\$265,000 (14.8% DECREASE)

The Small Diameter Bomb Increment II StormBreaker is a Joint Air Force and Navy program with the Air Force as the lead service. SDB II is designed to attack mobile and fixed targets from long distances, through adverse weather. The weapon is also designed with multiple attack modes so a single weapon can attack a variety of targets. The carriage of SDB II, considered a miniature munition, also allows a single aircraft to quadruple the number of targets available in a single mission when compared to a traditional single-carriage bomb.

The program successfully completed the first phase of Multiservice Operational Test and Evaluation on the F-15E, the Air Force's threshold aircraft, with the delivery of the final report in February 2020. The second phase on the Navy's threshold platforms, F-35B/C, is planned to start in late 2021.

Raytheon Missiles Systems is on contract to produce SDB II weapons. Raytheon completed production of Lots 2 and 3. Lot 4 production is in progress, with Lots 5 and 6 on contract. The Lot 7 contract is in negotiation with contract award expected in 2021.



**DEPLOYMENT STRATEGY:**

The SDB II program weapons are manufactured in Tucson, Arizona. The System Program Office is at Eglin Air Force Base, Florida.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$1.52 BILLION**

**2021:**

**\$290  
MILLION**

**CONTRACTING:**

RAYTHEON TECHNOLOGIES, Tucson, Arizona

**Engineering & Manufacturing Development**

- Fixed-Price-Incentive-Firm

**Production | Lots 1-3**

- Fixed-Price-Incentive-Firm

**Production | Lots 4-5**

- Fixed-Price Not-to-Exceed with Economic Price Adjustment

**Production | Lots 6-7**

- Fixed-Price-Incentive-Firm

**SCHEDULE:**

Integration on the remaining threshold aircraft, F-35B/C, is expected to complete in 2023. Initial fielding was authorized for the F-15E by Air Combat Command in 2020.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$581 MILLION**

**2021:**

**\$382  
MILLION**

**CONTRACTING:**

LOCKHEED MARTIN CORPORATION, Orlando, FL

- Cost-Plus-Incentive-Fee
- Cost-Plus-Fixed-Fee

**SCHEDULE:**

ARRW warhead qualification tests on the Holloman High-speed Test Track are planned for FY21 to characterize weapon lethality at operational speeds. In addition, the ARRW Booster Flight Tests are also planned in FY21 to demonstrate the solid rocket motor at operational conditions in preparation for All-Up-Round Test Flights.



MID-TIER OF ACQUISITION (MTA)



# ARRW

AGM-183A, AIR-LAUNCHED RAPID RESPONSE WEAPON (ARRW)

An operational hypersonic air-launched weapon would enable the United States to hold fixed, high value, time-sensitive targets at risk in contested environments from stand-off distances. Hypersonics, and the enabling military capability it affords the U.S., supports the National Defense Strategy, the National Security Strategy, and the Nuclear Posture Review.

The Air Force is leading the development of an air-launched hypersonic weapon rapid prototyping effort called the Air-launched Rapid Response Weapon (ARRW). The AGM-183A ARRW will be the United States' first operational hypersonic weapon with an early operational capability in FY22. A developmental hypersonic boost-glide missile system, ARRW leverages Air Force/Defense Advanced Research Projects Agency's Tactical Boost Glide research, a joint effort seeking to develop and demonstrate technologies that enable air-launched, tactical-range hypersonic boost glide systems.

In FY20 the ARRW program completed numerous developmental test milestones including instrument measurement vehicle flight, solid rocket motor static fire, and warhead arena test.

# ACAT II & III

## ACAT II & III PROGRAM HIGHLIGHTS



### A-10 THUNDERBOLT II WING REPLACEMENT PROGRAM

A-10 Thunderbolt II Wing Replacement Program (WRP) is a two-phase procurement effort to replace legacy wings on the entire fleet of the A-10 "Warthog" aircraft to meet the weapon system's 16,000 Extended Flight Hours requirement. The Enhanced Wing Assembly acquisition effort began in 2007 and completed in 2019. 173 of the 281 A-10 aircraft fleet were re-winged, with the final 8 installations accomplished in FY19, completing phase one. A-10 WRP is the foundational program for the platform's expansive, innovative, and lauded Digital Engineering initiatives. Wings are fully defined using Model-based Definition. Using these digital models accelerates the procurement, fabrication, assembly, and quality of products produced by virtually eliminating interpretation errors present in legacy 2D drawings.

#### **CONTRACTING:**

In August 2019, the A-10 THUNDERBOLT II Advanced Wing Continuation Kitting (ATTACK) contract was awarded for the procurement of up to 112 new wings for the remaining A-10 fleet. Since contract award, a Kickoff Meeting, three Program Management Reviews, and two Production Readiness Reviews have been accomplished. The Prime Contractor reports a high confidence level for 30-month delivery of first A-10 ATTACK wing.



### F-16 ACTIVE ELECTRONICALLY SCANNED ARRAY (AESA)

The \$1.8B F-16 AESA Radar program delivers cost effective, 5th generation radars to meet a validated Joint Emergent Operational Need (JEON) for homeland defense by providing an improved air-to-air detect and track capability. The AESA program includes radars for Air Combat Command, the Air National Guard, and the Air Force Reserve Command. The program includes iterative software releases to ensure F-16 viability through the 2040s, allowing for air operations in the Electronic-Warfare-contested environment. AESA radar capability is enabled in the F-16 through the Operational Flight Program (OFP). Agile software techniques were used in OFP development by the 309th Software Engineering Group to speed AESA capabilities to the warfighter 50% faster than a traditional waterfall development.

#### **SCHEDULE:**

In FY20, the F-16 Program Office installed 24 of 72 JEON radars systems on operational Air National Guard aircraft, meeting the Initial Operational Capability readiness schedule.



# GLOBAL REACH

Global reach characterizes the Department's ability to project American airpower quickly anywhere around the world. These airlift, air refueling, personnel recovery, special operations, and training programs deliver the aircraft and systems necessary for Airmen to accomplish their missions, ranging from major combat to humanitarian relief operations around the world. The global reach portfolio totals \$7B for 25 programs.



# C-130J

C-130J

**ORIGINAL UNIT COST:**

\$66.4 MILLION

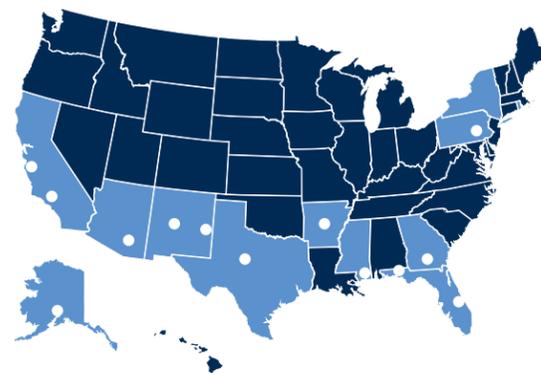
**CURRENT UNIT COST:**

\$65.8 MILLION (1% DECREASE)

The C-130J is a key component of tactical airlift modernization, replacing active duty, guard, and reserve C-130E/H, EC-130E, and WC-130H aircraft.

The HC/MC/AC-130 recapitalization program replaces the active duty, guard, and reserve 40+ year old legacy fleet with more advanced C-130J variants. These aircraft deliver in a common configuration, and then undergo unique mission modifications.

The C-130J Block 7.0/8.1 upgrade dramatically increases the capability of all Air Force C-130J variants, and keeps the aircraft viable into the future. The Multi-Year Procurement and Aircraft Commoditization Matrix Effort pricing scheme provides the FY18-FY20 congressional added aircraft definitization and pricing stability for additional C-130J procurements in the coming years.



**BASING STRATEGY:**

Channel Islands Air National Guard Base, California; Dyess Air Force Base, Texas; Harrisburg Air National Guard Base, Pennsylvania; Keesler Air Force Base, Mississippi; Little Rock Air Force Base, Arkansas; Quonset Point, Rhode Island

HC/MC/AC-130: Cannon Air Force Base, New Mexico; Davis Monthan Air Force Base, Arizona; Joint Base Elmendorf-Richardson, Alaska; Gabreski Air National Guard Base, New York; Hurlburt Field, Florida; Kirtland Air Force Base, New Mexico; Moffett Field, California; Moody Air Force Base, Georgia; Patrick Air Force Base, Florida

**Overseas Locations:**

C-130J: Ramstein Air Base, Germany, and Yokota Air Base, Japan  
 MC-130: Mildenhall Air Base, United Kingdom, and Kadena Air Base, Japan

**COST:**

2021 - 2025  
 PRESIDENT'S BUDGET:  
**\$686.1 MILLION**

**2021:**

**\$187.8  
 MILLION**

**CONTRACTING:**

LOCKHEED MARTIN CORPORATION,  
 Marietta, Georgia

**Production & Sustainment**

- Combination of Firm-Fixed-Price and Fixed-Price-Incentive-Firm

**Development**

- Cost-Plus-Incentive-Fee

**SCHEDULE:**

C-130J aircraft provided by FY20 congressional add will deliver with Block Upgrade 8.1 capability in 2Q-4Q FY24.

**COST:**

2021 - 2025  
 PRESIDENT'S BUDGET:  
**\$5.6 BILLION**

**2021:**

**\$1.1  
 BILLION**

**CONTRACTING:**

SIKORSKY, Stratford, Connecticut

**Engineering & Manufacturing Development and Low Rate Initial Production**

- Fixed-Price-Incentive-Firm

**Production & Deployment (FY21, Lot 3)**

- Firm-Fixed-Price

**SCHEDULE:**

Milestone C and Low Rate Initial Production approval occurred in September 2019.

The Program Office recently initiated upgrade efforts for the HH-60W, including Distributed Aperture Infrared Countermeasures, Global Positioning System Anti-Jam, and a Degraded Visual Environment system.



# HH-60W

HH-60W COMBAT RESCUE HELICOPTER

**ORIGINAL UNIT COST:**

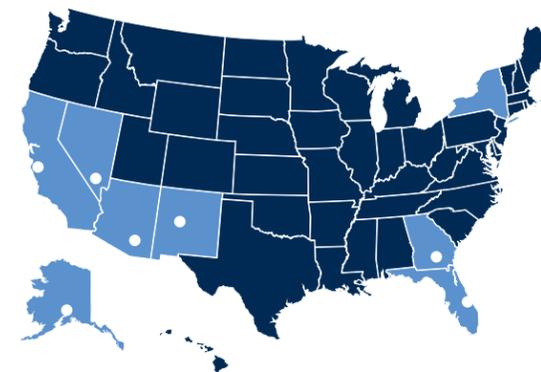
\$77.7 MILLION

**CURRENT UNIT COST:**

\$81.8 MILLION (5.4% INCREASE)

The HH-60W "Jolly Green II" Combat Rescue Helicopter recovers isolated personnel from hostile or denied territory, day or night, in adverse weather, and in a variety of threat environments – from terrorist attacks to chemical, biological, radiological, and nuclear threats. Other HH-60W missions include humanitarian operations, civil search and rescue, disaster relief, and medical and non-combatant personnel evacuation operations.

Following its first flight on May 17, 2019, the program successfully completed Milestone C and entered Low Rate Initial Production in September 2019. In addition to purchasing the aircraft, the contract includes product support and the development and fielding of aircrew and maintenance training systems.



**BASING STRATEGY:**

Davis Monthan Air Force Base, Arizona; Gabreski Field, New York; Joint Base Elmendorf-Richardson, Alaska; Kirtland Air Force Base, New Mexico; Moffett Field, California; Moody Air Force Base, Georgia; Nellis Air Force Base, Nevada; Patrick Air Force Base, Florida

Overseas Locations: Kadena Air Base, Japan, and Aviano Air Base, Italy

# KC-135

2021-2025 PRESIDENT'S BUDGET:  
\$473 MILLION

2021: \$92.9 MILLION



## KC-135 BLOCK 45 UPGRADE

## KC-135 BOOM INSTRUCTOR CUSHION MODIFICATION

The Block 45 upgrade modernizes the KC-135 fleet to ensure future viability.

The new systems improve signal fidelity and convert previous analog autopilot, radio altimeter, engine instruments, and flight director to digital systems.

This conversion creates a digital backbone, enabling future capability growth, ease of operator use, and future software integration. Implementation of the Block 45 modification reduces the KC-135 logistics footprint by mitigating ongoing reliability, maintainability, and supportability shortcomings of its present systems.

By the end of FY20, the Block 45 program has been installed on 181 aircraft out of a fleet of 398.

The KC-135 Boom Instructor Cushion Modification is derived from the Air Force's first Spark Tank innovation award winner.

This modification improves the ergonomic design and replaces the existing aft floor panel and cushion to correct uncomfortable boom operator body positioning, previously contributing to ongoing back and neck injuries.

In FY19, AFWERX produced and delivered 21 initial boom cushion kits for installation at Altus Air Force Base, Oklahoma. The production contract for the entire fleet was awarded in August 2019. Based on aircrew feedback, an additional change was made to the pad and production installations of the new pad configuration are set to begin in December 2020.

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
\$14.7 BILLION

## 2021:

\$3.2 BILLION

### CONTRACTING:

BOEING COMPANY, St. Louis, Missouri

### Engineering & Manufacturing Development

- Fixed-Price-Incentive-Firm

### Production

- Firm-Fixed-Price, Not-to-Exceed

### SCHEDULE:

The Air Force's total KC-46A procurement is 179 aircraft through 2027.



# KC-46A

KC-46A PEGASUS

### ORIGINAL UNIT COST:

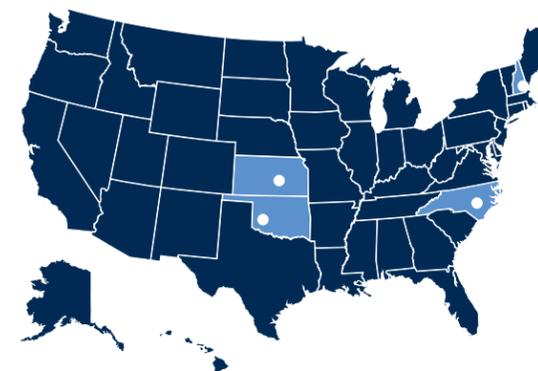
\$262.7 MILLION

### CURRENT UNIT COST:

\$216.6 MILLION (17.5% DECREASE)

The KC-46A Pegasus is a commercial-derivative aerial refueling platform intended to recapitalize a large portion of the Air Force's more than 50 year old fleet of tanker aircraft. The Air Force took delivery of the first KC-46A in January 2019 and as of October 2020 fielded a total of 38 new tankers. In September 2019, the Air Force awarded the fifth KC-46A production lot to Boeing, paying \$2.6 billion for 15 aircraft and associated support equipment. As of the end of FY20, the total number of new air refueling tankers on contract is 67. The sixth KC-46A production lot buy of 12 aircraft is being negotiated and is projected to award in FY2021.

On April 2, 2020, the Air Force and Boeing signed the Remote Vision System (RVS) 2.0 Memorandum of Agreement (MOA) to codify the implementation of RVS 2.0, as well as financial and contractual arrangements facilitating the joint commitment. Per the new agreement, Boeing will implement the RVS 2.0 solution on all previously delivered and new KC-46 aircraft. RVS 2.0 will include 4K color cameras with proper viewing geometry, operator stations with larger screens, a laser ranger for refueling aircraft distance measurement, and boom assistance augmented reality. Additionally, the RVS 2.0 MOA includes future autonomous tanking "hooks" intended to bring this technology to the battlefield 30 years earlier than planned.



### BASING STRATEGY:

Air Mobility Command established KC-46A units at three main operating bases: McConnell Air Force Base, Kansas; Pease Air National Guard Base, New Hampshire, and Seymour Johnson Air Force Base, North Carolina. The formal training unit is at Altus Air Force Base, Oklahoma. Joint Base McGuire-Dix-Lakehurst is the next KC-46A main operating base, and is projected to receive its first aircraft in the 1Q FY22.



# T-7A

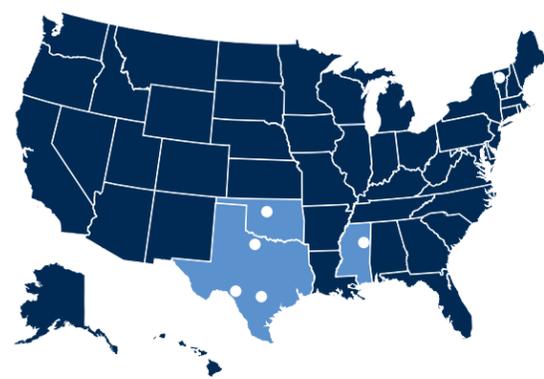
ADVANCED PILOT TRAINING SYSTEM (APT), T-7A "RED HAWK"

**ORIGINAL UNIT COST:**  
\$23 MILLION

**CURRENT UNIT COST:**  
\$23.2 MILLION (< 1% INCREASE)

The Advanced Pilot Training System (APT), T-7A "Red Hawk," will replace Air Education and Training Command's fleet of 429 T-38C aircraft with 351 T-7A aircraft and 46 associated training devices. This new system will provide advanced training capabilities the Air Force needs to increase the lethality and effectiveness of future pilots.

The APT program has had outstanding success following its contract award on September 27, 2018. On August 14, 2020, the program completed its Critical Design Review, marking the end of the design phase of the program and the beginning of the build and test phase. The program has continued developmental testing with over 250 test sorties completed. Phase 2 of developmental testing is scheduled to begin in early 2021.



**BASING STRATEGY:**

The T-7A will be fielded at five bases: Joint Base San Antonio-Randolph, Texas; Laughlin Air Force Base, Texas; Vance Air Force Base, Oklahoma; Columbus Air Force Base, Mississippi; and Sheppard Air Force Base, Texas.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$2.7 BILLION**

**2021:**

**\$248.7  
MILLION**

**CONTRACTING:**

BOEING COMPANY, St. Louis, Missouri

**Engineering & Manufacturing Development**

- Fixed-Price-Incentive-Firm
- Indefinite Delivery/Indefinite Quantity

**SCHEDULE:**

Joint Base San Antonio-Randolph will receive its first T-7A aircraft in 2023, with Initial Operational Capability planned for 2024 and Full Operational Capability expected in 2034.



**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$2 BILLION**

**2021:**

**\$256.9  
MILLION**

**CONTRACTING:**

BOEING COMPANY, Ridley Park, Pennsylvania

**Non-Developmental Integration**

- Firm-Fixed-Price

**SCHEDULE:**

Low Rate Initial Production is expected to begin in FY21.



# MH-139A

MH-139A UTILITY HELICOPTER REPLACEMENT PROGRAM

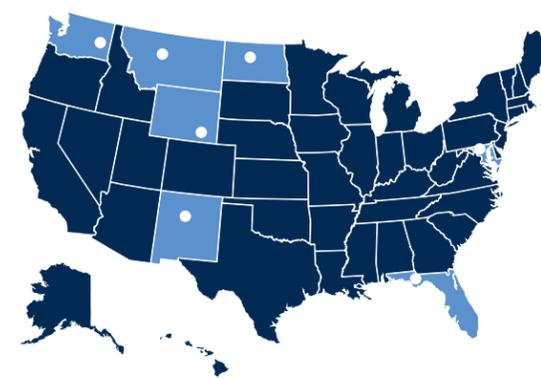
**ORIGINAL UNIT COST:**  
\$39.4 MILLION

**CURRENT UNIT COST:**  
\$38.9 MILLION (1.2% DECREASE)

The MH-139A "Grey Wolf" is being produced by Boeing and its primary sub-contractor, Leonardo Helicopter Division, to address vertical lift needs currently fulfilled by the aging UH-1N Huey helicopter. MH-139A will support critical mission requirements for Air Force Global Strike Command, Air Force District of Washington, Air Force Materiel Command, and Air Education and Training Command.

There are three primary missions for the MH-139A: Intercontinental Ballistic Missile (ICBM) convoy escort, ICBM Emergency Security Response, and Continuity of Operations/Government. It brings increased carrying capacity, speed, range, endurance, defensive systems, and survivability over the legacy UH-1N Huey.

Currently under test, the MH-139A leverages the existing AW-139 commercial aircraft foundation while adding militarization modifications.



**BASING STRATEGY:**

The new aircraft and training systems will be fielded at seven bases: Malmstrom Air Force Base, Montana, FE Warren Air Force Base, Wyoming, Minot Air Force Base, North Dakota, Kirtland Air Force Base, New Mexico, Eglin Air Force Base, Florida, Fairchild Air Force Base, Washington, and Joint Base Andrews, Maryland.



# VC-25B

VC-25B PRESIDENTIAL AIRCRAFT RECAPITALIZATION

**ORIGINAL UNIT COST:**  
\$2.556 BILLION

**CURRENT UNIT COST:**  
\$2.52 BILLION (1.7% DECREASE)

The VC-25B will replace the current VC-25A, known as Air Force One, to safely and securely transport and enable the President to execute the duties of Head of State, Chief Executive, and Commander in Chief. The VC-25B is a modified Boeing 747-8. The VC-25B acquisition baseline and strategy was approved in December 2018.

Two 747-8 aircraft were ferried from Victorville, California, to the Boeing modification facility at Kelly Field in San Antonio, Texas, in March and April 2019. On March 18, 2020, the program completed its Critical Design Review (CDR). Completion of CDR marked the end of the program's design phase and the beginning of the modification phase.



**BASING STRATEGY:**

Joint Base Andrews, Maryland, will remain the home of Air Force One when the VC-25B enters service. Construction of a new presidential complex is underway to house the next Air Force One.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$2.2 BILLION**

**2021:**

**\$801.4  
MILLION**

**CONTRACTING:**

BOEING COMPANY, Seattle, Washington

**Technology Maturation & Risk Reduction**

- Firm-Fixed-Price

**Preliminary Design**

- Firm-Fixed-Price

**Commercial Aircraft**

- Firm-Fixed-Price

**Engineering & Manufacturing Development**

- Firm-Fixed-Price

**SCHEDULE:**

The Air Force selected Boeing as the prime contractor to design, modify, test, and field presidential mission-ready VC-25B aircraft by 2024.

# ACAT II & III

ACAT II & III PROGRAM HIGHLIGHTS



## C-37B AIRCRAFT PROCUREMENT

The C-37B is a military version of the Gulfstream 550 aircraft that provides world-wide airlift for the nation's top senior leaders and dignitaries. In late 2018, the Air Force began a rapid acquisition to procure two new C-37B aircraft to mitigate capacity shortfalls created by the retirement of the C-20 fleet. In September 2019, the Air Force established a strategic 10-year contract with Gulfstream to fulfill Source Directed or Sole Source Gulfstream requirements of US Government agencies and Foreign Military Sales customers. In January 2020, the Air Force purchased two additional C-37B aircraft that will be delivered by the end of 2021.



## EXECUTIVE AIRLIFT SENIOR LEADER COMMUNICATIONS

The Air Force is rapidly acquiring, testing, and installing new airborne communications technologies for the Service's fleet of VC- 25A, C-32A, C-37A/B, and C-40B/C executive aircraft. These technologies will enable the Department to keep pace with emerging requirements for high-quality, secure, reliable, and assured communications between national leaders. The Air Force invested in broadband connectivity services over worldwide high-capacity satellite networks that will enhance data speeds to the aircraft and provide additional high-capacity satellite coverage throughout key military regions and oceanic routes.

# INFORMATION DOMINANCE

Information dominance is achieved through command, control, communications, computers, intelligence, surveillance and reconnaissance (or C4ISR) systems and architectures. The Department's information dominance portfolio includes airborne reconnaissance, business and enterprise systems, command and control, and cyber programs. The information dominance portfolio includes 10 programs worth \$4.38B.





# E-3

## E-3 AIRBORNE WARNING AND CONTROL SYSTEM (AWACS)

### ORIGINAL UNIT COST:

\$101.7 MILLION

### CURRENT UNIT COST:

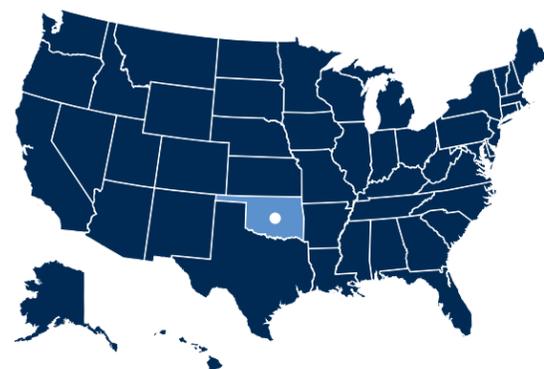
\$98.1 MILLION (9.7% DECREASE)

The Airborne Warning and Control System (AWACS) provides flexible and on-demand worldwide battle management, command and control, and wide-area surveillance.

AWACS Block 40/45 mission system upgrade is the most significant modernization in the fleet's history and is the foundation for all future E-3 modifications. Block 40/45 also enables significant growth potential for the life of the AWACS fleet.

It updates the 1970s-era mainframe computer/operating system and the 1990s-era mission systems with modern computing architecture. These upgrades dramatically improve the quality and timeliness of sensor data to the warfighter with an unprecedented high fidelity air picture and enhanced automation. This enhances the AWACS ability to deliver its critical airborne command and control mission.

The program delivered 23 upgraded aircraft to the Air Force to date. The Full Rate Production Completion contract will deliver the remaining 8 of the 31 aircraft fleet.



### IMPLEMENTATION STRATEGY:

Tinker Air Force Base, Oklahoma

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$95.7 MILLION**

### 2021:

**\$53.3  
MILLION**

### CONTRACTING:

BOEING COMPANY, Oklahoma City, Oklahoma

#### Production Kits & Production Support to Depot Modification Activities

- Cost-Plus-Incentive-Fee

### SCHEDULE:

Block 40/45 will achieve Full Operational Capability in 2024.



MID-TIER OF ACQUISITION (MTA)

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$266 MILLION**

### 2021:

**\$46.5  
MILLION**

### CONTRACTING:

CACI INTERNATIONAL, Inc., Chantilly, Virginia

#### Agile Development

- Time & Materials

DLT SOLUTIONS, Inc., Herndon, Virginia

#### Oracle-Managed Cloud Services

- Firm-Fixed-Price

### SCHEDULE:

Follow-on system integrator contract will award in mid-2021.



# DEAMS

## DEFENSE ENTERPRISE ACCOUNTING AND MANAGEMENT SYSTEM

The Defense Enterprise Accounting & Management System (DEAMS)\* is an ORACLE-based automated information system that supports the warfighter with timely, accurate, reliable, and auditable financial information to enable efficient and effective decision-making. DEAMS replaces legacy non-compliant accounting systems.

In FY20, the program delivered capability to all Increment 1 Department of the Air Force users, conducted a successful major software release, and garnered strategy approval to begin development of continuous capability delivery following award of the next System Integration contract.

Future efforts include migrating software development, test, and training environments to the Cloud, completing requirements for agile continuous capability development efforts, and completing operational testing to enable efficient and effective decision-making.

\* Note: Program designated a Business Acquisition Category (BCAT) level I. No cost/schedule data will be captured in the "Performance of the Enterprise" section of this report.



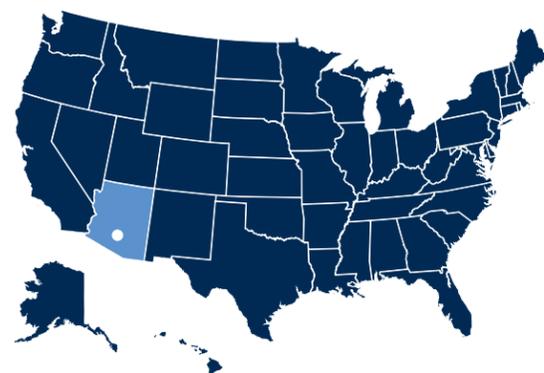
# EC-37B

EC-37B COMPASS CALL RE-HOST

Compass Call is the Air Force's premier wide-area airborne electronic attack weapon system. It denies, degrades, and disrupts adversary communications, information processing, navigation, radar systems, and radio controlled threats. Compass Call is designed for rapid updates to adopt new capabilities and counter emerging technologies, tactics, techniques, and procedures.

Compass Call supports U.S. and defense partner tactical air, surface, and special operations forces in contingency operations worldwide. Emerging threats in multiple theaters and rising sustainment costs on the legacy EC-130H platform compelled the Air Force to re-host the Compass Call capability to a modern, cost-effective, commercial derivative aircraft.

The Air Force plans to procure 10 re-hosted EC-37B aircraft while simultaneously retiring the EC-130H fleet in a phased approach.



**BASING STRATEGY:**

Re-hosted EC-37B Compass Call aircraft will be delivered to the 55th Electronic Combat Group, located at Davis-Monthan Air Force Base in Tucson, Arizona. The 55th ECG is the sole operator of Compass Call aircraft in worldwide contingency operations.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$1.61 BILLION**

**2021:**

**\$349.1 MILLION**

**CONTRACTING:**

- L3HARRIS (aircraft integration), Greenville, Texas & Waco, Texas
- BAE SYSTEMS (mission systems), Nashua, New Hampshire

**Aircraft System Integration**

- Cost-Plus-Fixed-Fee & Firm-Fixed-Price

**Commercial Aircraft Procurement**

- Firm-Fixed-Price

**SCHEDULE:**

The first EC-37B was procured in FY17 and the last is scheduled to be procured in FY25.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$1.78 BILLION**

**2021:**

**\$679 MILLION**

**CONTRACTING:**

GENERAL ATOMICS, Poway, California

**Research, Development, Test & Evaluation, Software Releases, & Sustainment**

- Cost-Plus-Fixed-Fee

**Production**

- Fixed-Price-Incentive-Firm
- Firm-Fixed-Price

**SCHEDULE:**

In September 2020, the Air Force awarded a contract to General Atomics for 11 additional MQ-9 Block 5 RPAs.



# MQ-9

MQ-9 REAPER

**ORIGINAL UNIT COST:**

\$33.9 MILLION

**CURRENT UNIT COST:**

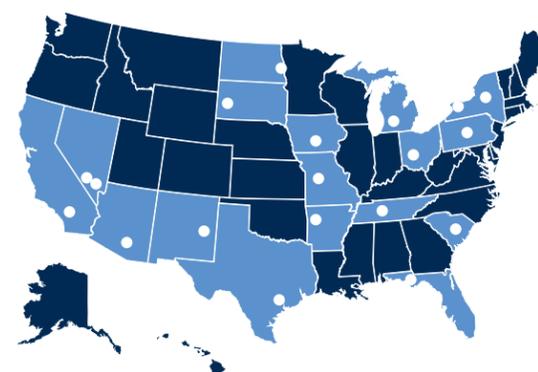
\$29.8 MILLION (12.1% DECREASE)

The MQ-9 Reaper is an armed, multi-mission, medium-altitude, long-endurance, remotely piloted aircraft (RPA). The MQ-9 is both a hunter-killer and an intelligence collection asset. Given its significant loiter time, wide range of sensors, multi-mode communications suite, and precision weapons, the MQ-9 can perform strike, coordination, and reconnaissance against high-value, fleeting, and time-sensitive targets.

The Block 5 MQ-9 and Block 30 ground control stations are among the most called-upon combat assets around the globe.

The MQ-9 Upgrade Program provides for agile capability development and rapid fielding of modernized hardware/software capabilities across the MQ-9 fleet on a 6-12 month schedule.

As of June 2019, the Reaper's total cumulative U.S. flight hours surpassed 2-million hours, signifying substantial MQ-9 employment.



**BASING STRATEGY:**

Creech Air Force Base, Nevada; Holloman Air Force Base, New Mexico; Cannon Air Force Base, New Mexico; March Air Reserve Base, California; Fargo Air National Guard Base, North Dakota; Hancock Field Air National Guard Base, New York; Nellis Air Force Base, Nevada; Kellogg Air National Guard Base, Michigan; Niagara Falls Air Reserve Station, New York; Ellsworth Air Force Base, South Dakota; Whiteman Air Force Base, Missouri; Hurlburt Field, Florida; Springfield Air National Guard Base, Ohio; Air Station State College, Pennsylvania; Berryfield Air National Guard Base, Tennessee; Ellington Field Joint Reserve Base, Texas; Davis-Monthan Air Force Base, Arizona; Des Moines Air National Guard Base, Iowa; Fort Smith Air National Guard Station, Arkansas; and Shaw Air Force Base, South Carolina



# 3DELRR

THREE-DIMENSIONAL EXPEDITIONARY LONG-RANGE RADAR

The Three-Dimensional Expeditionary Long-Range Radar (3DELRR) will provide detection of aerial threats to warfighters operating in deployed locations. The radar gives commanders the ability to orchestrate friendly operations and detect a wide range of airborne targets.

3DELRR replaces the aging AN/TPS-75 radar as the primary long-range, ground-based sensor for detecting, identifying, tracking, and reporting aerial targets in support of theater commanders providing capability against emerging threats.

Market research conducted in Fall 2019 revealed viable production-ready alternatives to respective sensor capability. The Air Force approved a Mid-Tier Acquisition approach under Section 804 in December 2019.

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$19.4 MILLION**

## 2021:

**\$19.4  
MILLION**

## CONTRACTING:

An integration contract may be issued in 2021 to integrate the selected system into Air Force networks with the potential for follow on production in 2022.

## SCHEDULE:

During a six-month demonstration program, the Air Force worked with Northrop Grumman, Lockheed Martin, and CEA Technologies to competitively demonstrate their proposed solutions in an operationally-relevant environment.



MID-TIER OF ACQUISITION (MTA)

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$565 MILLION**

## 2021:

**\$95.6  
MILLION**

## CONTRACTING:

### Software Development

- Indefinite Delivery/Indefinite Quantity
- Multiple vendors and contracts reaching nationwide to source expertise to realize the UP capability vision with the Government as the primary integrator

### IT Schedule 70 Task Orders

- GSA Indefinite Delivery/Indefinite Quantity Multiple Award Schedule
- Small Business Innovation Research contracts

## SCHEDULE:

Unified Platform will continue to expand connection of service big data platforms at different classifications that will greatly increase the Cyber Mission Force access to data. The next focus areas will be improved attack correlation and collaboration, user experience, alerting mechanisms, and data analytics.



# UP

UNIFIED PLATFORM (UP)

Unified Platform fulfills the need to fuse cyber data from multiple sources and classification levels across military services, and is a central component of US Cyber Command's Joint Cyber Warfighting Architecture. The centralization of offensive and defensive mission along with commercial and third-party data allows decision analytics that produce mission-relevant information. Cyber planners, operators, and support personnel may query this enriched information source across the 133 Cyber Mission Force teams and Service-specific cyber elements to enhance on-going cyber operations and planning. The scalability and interoperability of this architecture allows future expansion to new mission sets, integration of innovative technologies, and exploitation of emerging opportunities.

In 2019, Unified Platform delivered its first three capability increments. It now provides Cyber Mission Force operators the ability to search and share data across the DoD service components at Unclassified, Secret, and Top Secret classification levels.

In 2020, Unified Platform improvements to cyberspace operational capability include: ability to detect indicators of compromise, support to Election 2020 through a reporting system with the National Guard State departments, and support to Cyber National Mission Force Hunt Forward teams. Additionally, the program delivered substantial improvements to the efficiency of operators through the Single Sign-on and the Single Access Request initiatives.



### AIR FORCE INTEGRATED PERSONNEL AND PAY SYSTEM INCREMENT 1 (AFIPPS)

2021 PRESIDENT'S BUDGET:  
\$27.1 MILLION

The Air Force Integrated Personnel and Pay System--a web-enabled, commercial-off-the-shelf enterprise resource planning solution--will replace the legacy Defense Joint Military Pay System (DJMS) with modernized capability. AFIPPS integrates existing military personnel and pay processes into a single, Department of the Air Force executed, self-service system for the Total Force--active duty, guard, and reserve.

In FY20, the program continued agile development of the pay, leave, and self-service capability. AFIPPS achieved 89% completion of planned development while incorporating emergent Space Force requirements and adjusting to COVID-19 pandemic impacts.

**CONTRACTING:**

ACCENTURE FEDERAL SERVICES, Arlington, Virginia

**Agile Development**

- Cost-Plus-Incentive-Fee

**SCHEDULE:**

The Department of the Air Force will deliver a self-service capability allowing users to familiarize themselves with the application and perform data validation in January 2021. Full pay and leave capability will go live in June 2022.



### AIR FORCE DISTRIBUTED COMMON GROUND SYSTEM (AF DCGS)

2021 PRESIDENT'S BUDGET:  
\$113.5 MILLION

Air Force DCGS is a regionally-aligned, globally-networked Intelligence, Surveillance, and Reconnaissance (ISR) enterprise that delivers tailored intelligence and supports joint warfighter operations. This weapon system employs a global communication architecture that connects multiple intelligence platforms and sensors. It performs analysis and exploitation of sensor data, in support of immediate warfighter operations, and provides warfighters a decisive advantage.

Air Force DCGS develops and deploys Geospatial Intelligence, Signals Intelligence, and Multisource Intelligence (Multi-INT) mission capabilities via agile release trains (ART) on a 90-day cadence to the open architecture. The Multi-INT ART teamed with Air Force Research Lab to incorporate Artificial Intelligence (AI) and Machine Learning (ML) capabilities to assist analysts by automating some domain processes by using real-time models and algorithms. The resulting real-time analytics capability is an enterprise commercial-based IT platform that acts as a harness to host artificial intelligence and machine learning algorithms from a variety of sources including AFWERX, our mission partners, and the commercial industry.

**SCHEDULE:**

Air Force DCGS migration to a cyber-resilient, commercial-off-the-shelf mission ready system open architecture, which began in FY18, will complete enterprise wide (27 world-wide sites) in FY21.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
\$182.7 MILLION

**2021:**

\$24.5  
MILLION

**CONTRACTING:**

ACCENTURE FEDERAL SERVICES,  
Arlington, Virginia

**Development**

- Firm-Fixed-Price

**SCHEDULE:**

The program is on schedule for a Limited Deployment Decision/Minimum Viable Product Deployment Decision expected in October 2020.



# MROI

## THE MAINTENANCE, REPAIR, AND OVERHAUL INITIATIVE (MROI)

The Maintenance, Repair, and Overhaul Initiative is a business process transformation and standardization effort--along with an enabling software solution--that provides the Air Force Sustainment Center (AFSC) with an integrated capability for planning, scheduling, and executing organic depot maintenance. It supports maintenance-driven Air Force Working Capital Fund (AFWCF) financials auditability, agile planning, optimized workload assignment, resource allocation, and integrated quality.

MROI will implement a configured Oracle E-Business Suite commercial off-the-shelf software product with "complex MRO" being the core module for user interaction.

MROI's initial implementation will cover the commodities, electronics, missile, and propulsion maintenance groups across AFSC, followed by aircraft and remaining maintenance support groups. MROI's implementation will include transitional interfaces with various legacy systems throughout the interim roll-out to support continuous depot maintenance operations.

The backbone of logistics information technology modernization, MROI will replace 19 legacy systems.

# ACAT II & III

## ACAT II & III PROGRAM HIGHLIGHTS



### BATTLEFIELD AIRBORNE COMMUNICATIONS NODE (BACN) PROGRAM

The BACN Program enables tactical edge information interoperability across disparate tactical data networks. It provides beyond-line-of-sight voice, data relay, and persistent command and control data link coverage in austere environments while providing 24/7 operations.

The BACN aircraft payload is comprised of various datalink terminals and radios that receive, translate, and transmit communications between ground and air participants. BACN is deployed on a fleet of three E-11A commercial derivative aircraft and four EQ-4B remotely piloted aircraft.

The BACN Program has supported more than 15,000 missions and flown more than 195,000 combat flight hours, enabling seamless voice and data exchange between multiple locations.

#### CONTRACTING:

LEARJET/BOMBARDIER, Wichita, Kansas; Aircraft Procurement; Indefinite-Delivery/Indefinite-Quantity

NORTHROP GRUMMAN CORPORATION, Falls Church, Virginia; Payload Operations and Sustainment; Indefinite-Delivery/Indefinite-Quantity

#### SCHEDULE:

The BACN fleet will continue to provide critical tactical edge communication and information interoperability to the warfighter via continuous mission support in theater supporting 24/7/365 orbits. BACN will transition from a mixed fleet to a unified fleet of E-11A's by procuring additional E-11 aircraft throughout the FYDP. The outcome is greater operational flexibility and rapid deployment capabilities.



### CONTRACTING INFORMATION TECHNOLOGY (CON-IT)

The Contracting Information Technology (CON-IT) system replaces aging, legacy contract writing and management systems with a single contract management system to provide interoperability across all Department of the Air Force contracting. The program uses agile acquisition practices in partnership with the Department of Agriculture to develop, deploy, and enhance contract formation capabilities faster and with less risk.

This program is successfully deployed across 105 sites, supporting more than 4,000 contracting professionals. 1,600 users log on every day and award up to 1,500 contract actions per week. Recent accomplishments include the sunset and replacement of the legacy O'Conrux system as well as the Standard Procurement System 4 years ahead of mandate. In addition, the program supports multiple Department of the Air Force Pitch Days with more than 960 contracts worth \$228 million. In FY20 alone, CON-IT was used in over 100,000 contract actions awarding over \$15B.

In the future, the program will expand its capability offering to additional contracting communities including those in weapons system acquisition, research and development, and logistics.

#### CONTRACTING:

U.S. Department of Agriculture

- Conducts all Agile Development initiatives



# C-sUAS

## COUNTER-SMALL UNMANNED AERIAL SYSTEM (C-sUAS)

#### SCHEDULE:

In FY21 and FY22, the C-sUAS program will focus on fielding an initial operational capability to 30 high-priority sites to protect critical assets and infrastructure. The program will also support fielded urgent needs and integrate with additional systems such as Counter Rockets, Artillery, and Mortars (C-RAM) and Forward Area Air Defense Command and Control (FAAD-C2).

The Air Force's Counter-small Unmanned Aerial System (C-sUAS) programs, subsets of the Airbase Air Defense Systems Mission, are responsible for the design, development, procurement, delivery, installation, and sustainment of an \$800M joint urgent and emergent operational need portfolio and Middle Tier of Acquisition rapid fielding program. This effort consists of multiple mission capabilities to include fixed, mobile, portable, and handheld systems.

In FY20, the Air Force answered three Urgent Needs, delivered new capabilities to 14 sites, collaborated more closely with the other military services, and supported the stand-up of the U.S. Army C-sUAS Executive Agent office. The Air Force's collaboration with the C-sUAS Executive Agent aims to improve interoperability, compatibility, and commonality of fielded solutions across the Department of Defense.

#### IMPLEMENTATION STRATEGY:

In addition to covering the spectrum of operations—Detect, Track, ID, and Defeat—the program is developing and delivering operator, administrator, and maintenance training and the associated logistics network for base Security Forces personnel on more than 180 sites. This includes the original urgent programs suite spanning U.S. Strategic Command, U.S. Central Command, U.S. European Command, and Pacific Air Forces



MID-TIER OF ACQUISITION (MTA)

# SPACE SUPERIORITY

Space superiority is the Department's ability to not just win in space, but to dominate in space. The Department's space superiority portfolio- including satellite communications, space launch, space control, remote sensing, and positioning, navigation, and timing- enables the Space Force to protect our space capabilities and conduct global operations with speed, flexibility, and precision. The space superiority portfolio totals \$14.1B for 18 programs.



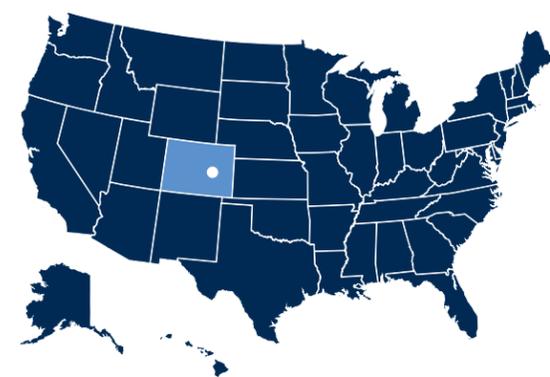
# AEHF

ADVANCED EXTREMELY HIGH FREQUENCY

**ORIGINAL UNIT COST:**  
\$1.85 BILLION

**CURRENT UNIT COST:**  
\$1.42 BILLION (23.5% DECREASE)

The Advanced Extremely High Frequency (AEHF) system is a joint service program that provides worldwide, survivable, secure, protected, and jam-resistant communications for high-priority military ground, sea, and air assets. The six-satellite constellation enables presidential and senior leadership conferencing, as well as command and control of strategic forces across the full spectrum of conflict, including nuclear threat environments.



**BASING/DEPLOYMENT STRATEGY:**

The Space Force 4th Space Operations Squadron controls the AEHF satellites and communications payloads from Schriever Air Force Base, Colorado.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$14.8 MILLION**

**2021:**

**\$7.8 MILLION**

**CONTRACTING:**

LOCKHEED MARTIN CORPORATION,  
Sunnyvale, California

**AEHF Satellites 1-3**

- Cost-Plus-Award-Fee

**AEHF Satellites 4**

- Cost-Plus-Incentive-Fee

**AEHF 5-6 Block Buy**

- Fixed-Price-Incentive-Firm

**SCHEDULE:**

Combatant Command Acceptance, which will enable it to be fully used by the joint forces, will occur by the end of the 2020.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$0**

**2021:**

**\$0**

**CONTRACTING:**

NORTHROP GRUMMAN CORPORATION,  
Redondo Beach, California

**Two Payloads - Classified Host**

- Cost-Plus-Award-Fee

**SCHEDULE:**

EPS achieved simultaneous Initial Operational Capability and Full Operational Capability in September 2019.



# EPS

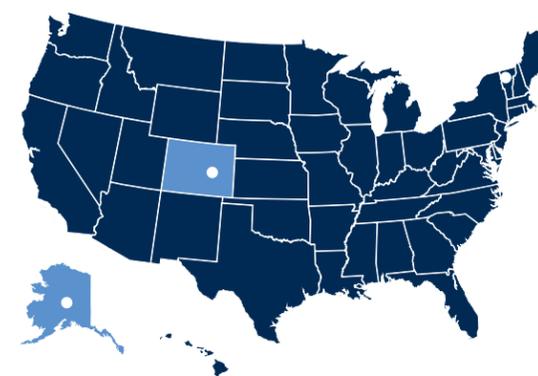
ENHANCED POLAR SYSTEM (EPS)

**ORIGINAL UNIT COST:**  
\$753.4 MILLION

**CURRENT UNIT COST:**  
\$682.1 MILLION (9.5% DECREASE)

The Enhanced Polar System (EPS) provides secure, protected, and jam-resistant communications over the northern polar region. The two EPS payloads, hosted on classified satellites, provide improved capability and more than 26 times the capacity of the legacy polar communications satellites.

EPS provides command and control to Naval and theater tactical forces to protect U.S. interests and provide an effective hedge against a near-peer adversary in the region.



**BASING/DEPLOYMENT STRATEGY:**

The program includes the Gateway, a fixed installation at Clear Air Force Station, Alaska, and the control and planning segment, a fixed installation at Schriever Air Force Base, Colorado.

# ESS

EVOLVED STRATEGIC SATCOM

Evolved Strategic SATCOM (ESS) is the next-generation protected SATCOM system, continuing the strategic mission of the Advanced Extremely High Frequency (AEHF) system. ESS will provide worldwide and Arctic secure, survivable, and jam-resistant communications for military ground, sea, and air assets in support of the Nuclear Command, Control, and Communications (NC3) mission. It will have enhanced cyber and resiliency features, providing a robust nuclear deterrent.

The ESS space segment is using a Middle Tier of Acquisition pathway to rapidly prototype key technologies, which will drive down space segment risk and improve the industrial base for the follow-on contract competition. Both the space and ground efforts are maximizing the use of digital engineering to improve acquisition models.

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$2.5 BILLION**

## 2021:

**\$71  
MILLION**

### CONTRACTING:

LOCKHEED MARTIN CORPORATION,  
Sunnyvale, California

#### Space Segment Rapid Prototyping

- Firm-Fixed-Price

NORTHROP GRUMMAN, Redondo Beach,  
California

#### Space Segment Rapid Prototyping

- Firm-Fixed-Price

BOEING COMPANY, El Segundo, California

#### Space Segment Rapid Prototyping

- Firm-Fixed-Price

### SCHEDULE:

The ESS space segment will continue a five-year rapid prototyping effort that will lead to a follow-on space and ground integration contract. The first ESS space vehicle is projected to launch in FY31.



DIGITAL ENGINEERING



MID-TIER OF ACQUISITION (MTA)

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$608 MILLION**

## 2021:

**\$131  
MILLION**

### CONTRACTING:

Space Enterprise Consortium (SpEC) Other  
Transaction Authority (OTA) agreements:

#### EWS Prototype Competitors:

- ASTRA, Alameda, California
- Raytheon Technologies, El Segundo, California
- General Atomics, San Diego, California

#### Weather Data as a Service:

- SpaceX, Hawthorne, California



# EWS

ELECTRO-OPTICAL / INFRARED (EO/IR) WEATHER SYSTEMS (EWS)

EWS marks a transition to smaller, more responsive EO/IR sensors for cloud characterization and theater weather imagery. EWS will employ a large number of small satellites in low Earth orbit to modernize and replace larger legacy weather capabilities. It will provide faster global weather data using complementary space based weather monitoring capabilities from civil agencies, industry partners, and allies. When fully operational, a constellation of EWS satellites will be capable of providing current global weather data on an hourly basis.

The EWS acquisition strategy is composed of three overlapping phases. The first is an Air Force Research Laboratory-led development effort through Small Business Innovation Research contracts: WeatherSat and Project Normandy. WeatherSat is aimed at producing modern EO/IR sensors of small weight and power needs; Project Normandy will assess the utility of the weather data from the smaller sensors through a prototype launch. The second phase uses the Space Enterprise Consortium (SpEC) to award Other Transaction Authority (OTA) agreements. Three competing vendors are producing EWS prototypes for launch by FY23. Another SpEC OTA agreement will deliver a model for purchasing weather data as a service; if viable, it may serve as a complementary Space Based Environmental Monitoring capability.

The third phase includes selecting the winner of the competitive prototyping efforts to design, integrate, test, and launch the first operational EWS mission in FY25.

### BASING/DEPLOYMENT STRATEGY:

The EWS prototypes are scheduled for launch by FY23. The first operational EWS satellite is scheduled for launch by the end of FY25.



# EWS-G

ELECTRO-OPTICAL / INFRARED WEATHER SYSTEM (EWS) – GEOSTATIONARY (EWS-G)

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$1.04 BILLION**

## 2021:

**\$248  
MILLION**



# FAB-T

FAMILY OF ADVANCED BEYOND LINE-OF-SIGHT TERMINALS (FAB-T)

The Electro-Optical/Infrared Weather System-Geostationary (EWS-G) program provides cloud characterization and theater weather imagery data over the Indian Ocean region in support of U.S. Central Command mission needs. The Department of the Air Force, through its partnerships with National Oceanic and Atmospheric Administration (NOAA) and National Aeronautics and Space Administration (NASA), repurposed a residual NOAA Geostationary Operational Environmental Satellite (GOES) (formerly known as GOES-13) to fulfill these taskings.

In July 2019, GOES-13 was recalled into service and renamed EWS-G after it was determined Europe's METEOSAT-8 would reach its end of life as early as the end of 2020. During this transition, EWS-G was relocated to cover the Indian Ocean region and legacy ground equipment was installed at the Dongara Satellite Station in Western Australia. Initial Operational Capability for EWS-G was declared in September 2020, and for Full Operational Capability in October 2020. EWS-G is the first Department of Defense-owned geostationary weather satellite.

### BASING/DEPLOYMENT STRATEGY:

EWS-G is remotely operated from the Dongara Satellite Station in Western Australia using legacy NOAA ground equipment.

### AGREEMENTS:

Department of the Air Force / NOAA Memorandum of Agreement (MoA), January 2017

GOES Indian Ocean Framework Agreement, November 2017

GOES Indian Ocean Operations and Sustainment Agreement, June 2019

### CONTRACTING:

RAYTHEON TECHNOLOGIES (Development), Marlborough, Massachusetts

RAYTHEON TECHNOLOGIES (Production), Largo, Florida

#### Development & Production

- Firm-Fixed-Price

The Family of Advanced Beyond Line-of-Sight Terminals (FAB-T) Command Post Terminal (CPT) program provides terminals capable of communicating with modern and legacy strategic communications satellites. These terminals are designed to survive and operate through a nuclear event and are an essential component of the nation's nuclear command, control, and communications system. FAB-T CPTs will be deployed to locations worldwide including ground fixed sites, ground mobile platforms, and on E-4 and E-6 aircraft.

All 84 planned FAB-T CPTs are on contract: 33 have been delivered to the Government, 18 are installed, and 14 have been accepted into early operational use.

### FAB-T FORCE ELEMENT TERMINAL

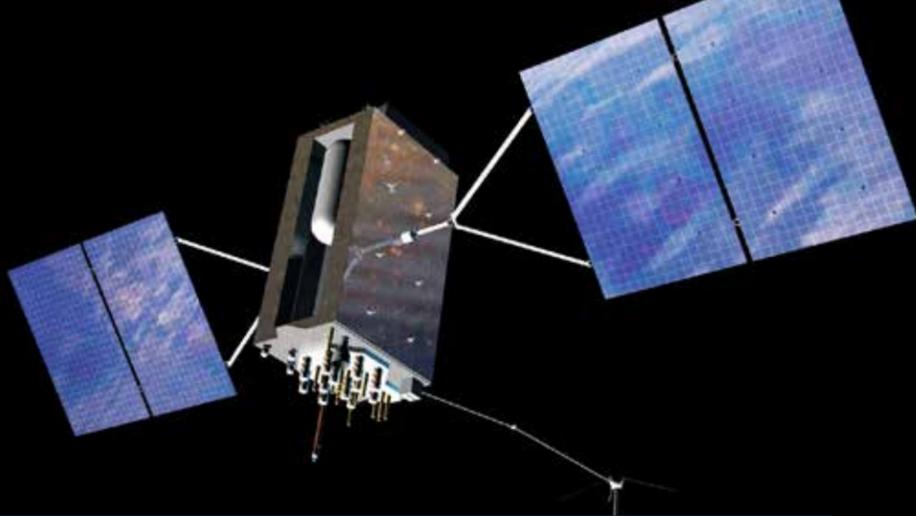
The FAB-T Force Element Terminal (FET) program provides nuclear survivable communications, emergency action messaging, and force report-back capability for the B-52 aircraft, which is a new capability.

### BASING/DEPLOYMENT STRATEGY:

FAB-T CPT has 84 terminals in airborne, ground-mobile, and ground-fixed configurations. Airborne terminals will be installed on E-4 and E-6 aircraft. Ground-mobile terminals will be installed at geographically-separated locations. Ground-fixed configurations deploy to 37 locations worldwide.



MID-TIER OF ACQUISITION (MTA)



# GPS III/IIIF

GLOBAL POSITIONING SYSTEM III/IIIF FOLLOW-ON PRODUCTION

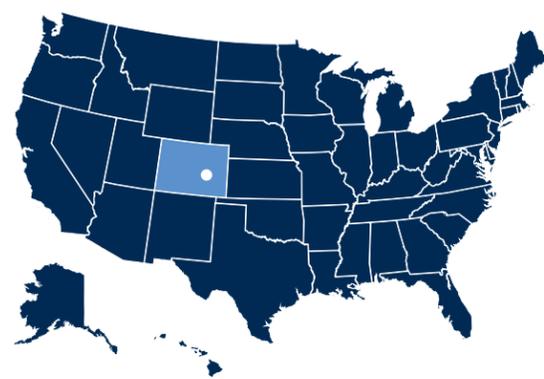
Global Positioning System III (GPS III) is the next-generation series of satellites for the GPS constellation that provides positioning, navigation, and timing capabilities to an unlimited number of users across the globe.

GPS III provides additional capabilities to users, including a boosted military-code signal for operations in GPS-contested environments, and a new international civil signal compatible with the European Galileo system.

## GPS IIIIF

The GPS III Follow-On (GPS IIIIF) program provides additional capabilities, including Regional Military Protection, which delivers a high-power, regional spot beam capability for military operations in GPS-contested environments.

Additionally, the satellite will host a redesigned U.S. Nuclear Detonation Detection System payload and a new Canadian-built search and rescue payload.



### BASING/DEPLOYMENT STRATEGY:

To optimize signal strength and coverage area, the GPS satellite constellation is deployed in a medium Earth orbit. GPS satellites are operated by the 2nd Space Operations Squadron at Schriever Air Force Base, Colorado.

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$4.97 BILLION**

## 2021:

**\$922  
MILLION**

### CONTRACTING:

LOCKHEED MARTIN CORPORATION,  
Denver, Colorado

#### GPS III SV-01-10

- Firm-Fixed-Incentive-Firm/Award Fee

#### GPS IIIIF SV-11-12

- Firm-Fixed-Incentive-Firm/Award Fee

#### GPS IIIIF SV-13-32

- Fixed-Price-Incentive-Firm

### SCHEDULE:

The first four of 10 GPS III satellite vehicles purchased are on-orbit and have been accepted into the operational constellation.

The first GPS IIIIF satellite vehicle has a projected available for launch date of 2Q FY26.

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$1.29 BILLION**

## 2021:

**\$393  
MILLION**

### CONTRACTING:

#### Increment 1:

RAYTHEON TECHNOLOGIES,  
El Segundo, California

- Cost-Plus-Award-Fee/Incentive-Fee
- Converting to Firm-Fixed-Price in FY21

BAE SYSTEMS, Cedar Rapids, Iowa

- Cost-Plus-Award-Fee/Incentive-Fee

L3HARRIS, Anaheim, California

- Cost-Plus-Award-Fee/Incentive-Fee

#### Increment 2:

TBD

### SCHEDULE:

The Increment 1 Program will re-baseline its remaining milestones associated with the aviation/maritime form factor following the conversion of the Raytheon contract to Firm-Fixed-Price 1Q FY21. The Service Acquisition Executive approved the MGUE Increment 2 acquisition strategy in FY19 and contract award for the first Middle Tier of Acquisition program is scheduled for 1Q FY21.



MID-TIER OF ACQUISITION (MTA)



# MGUE

MILITARY GLOBAL POSITIONING SYSTEM (GPS) USER EQUIPMENT

### ORIGINAL UNIT COST:

\$1.57 BILLION

### CURRENT UNIT COST:

\$1.45 BILLION (7.9% DECREASE)

## MGUE INCREMENT 1

The Military GPS User Equipment (MGUE) program develops GPS receiver cards for insertion into Department of Defense weapons systems that provide warfighters with secure and accurate positioning, navigation, and timing data in contested environments. The first ground card completed verification testing and was qualified by the Government in March 2019, and is being integrated into the Marine Corps and Army-led platforms. Developmental testing and Program Executive Officer certification for the Marine Corps-led platform completed in June 2020. Developmental testing for the Army lead platform completed in August 2020, with Program Executive Officer certification planned for February 2021. The Air, Ground, Naval, and Marine lead platforms are targeting completion in FY23 with Program Executive Officer certification targeting FY24.

Additionally, all three application-specific integrated circuits developed by the MGUE Increment 1 program are complete and being used to develop derivative M-Code GPS receiver form factors to fulfill other weapon system applications.

## MGUE INCREMENT 2

MGUE Increment 2 will continue to employ military-code receiver technology into additional applications to meet Service requirements. MGUE Increment 2 will deliver a military-code-capable handheld, address future requirements while maintaining backward-compatibility with MGUE Increment 1, and produce a lower size, weight, and power military-code receiver card to address the needs of users unable to employ the MGUE Increment 1 receiver cards.

The program continued preliminary design activities on a next-generation integrated circuit and initiated risk reduction efforts to design a military-code-capable handheld.



# NSSL

NATIONAL SECURITY SPACE LAUNCH (NSSL)

**ORIGINAL UNIT COST:**  
\$457.1 MILLION

**CURRENT UNIT COST:**  
\$263.7 MILLION (25.2% DECREASE)

The National Security Space Launch (NSSL) program acquires launch services that provide critical space support needed to satisfy Department of Defense warfighter, national security, and other Government spacelift missions. This mission includes the execution of the flight worthiness certification processes and booster-to-satellite mission integration. It also provides the gateway for intermediate and larger class payloads to maintain assured access to space.

On August 12, 2020, the Phase 2 Launch Service Procurement contracts were awarded to United Launch Alliance (ULA) and SpaceX. ULA will continue its Launch Service Agreements (LSA) Other Transaction Authority awarded in October 2018 to develop its Vulcan family of launch vehicles. Blue Origin and Northrop Grumman's LSAs will ramp down to a logical stopping point.

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$8.67 BILLION**

## 2021:

**\$1.6  
BILLION**

### CONTRACTING:

- UNITED LAUNCH ALLIANCE, Denver, Colorado
- BLUE ORIGIN, Kent, Washington
- SPACEX, Hawthorne, California
- AEROJET ROCKETDYNE, Sacramento, California
- NORTHROP GRUMMAN CORPORATION, Dulles, Virginia

### Development

- Rocket Propulsion System and LSA Other Transaction Authorities

### Procurement

- Firm-Fixed-Price Requirements Contracts

### SCHEDULE:

In FY21 the program will continue development work including first certification flights for Vulcan. The Space Force plans to procure three launches services in FY21 that will be launched in CY23.

## COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$1.2 BILLION**

## 2021:

**\$421.7  
MILLION**

### CONTRACTING:

RAYTHEON TECHNOLOGIES,  
Aurora, Colorado

- Cost-Plus-Award-Fee/Cost-Plus-Incentive-Fee

### SCHEDULE:

Block 0 was accepted in October 2017 and Blocks 1 and 2 will transition to operations concurrently in FY22. OCX remains on-track to deliver within its Acquisition Program Baseline milestones.



# OCX

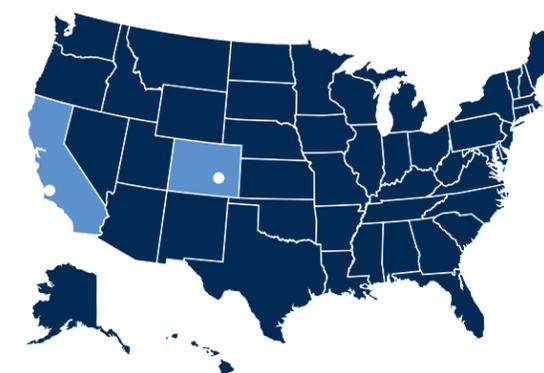
NEXT GENERATION OPERATIONAL CONTROL SYSTEM (OCX)

**ORIGINAL UNIT COST:**  
\$6.23 BILLION

**CURRENT UNIT COST:**  
\$6.49 BILLION (3.3% INCREASE)

The Next Generation Operational Control System (OCX) replaces the legacy control segment and provides command, control, and mission support for all GPS satellites. The OCX program will allow effective use of the latest military and civil GPS signals, enabling navigation warfare capabilities for the warfighter and ensuring the Space Force can combat the latest threats.

OCX Block 0 successfully supported the launch and on-orbit checkout of GPS III Space Vehicles 1 and 2 in December 2018 and August 2019, respectively. OCX Blocks 1 and 2 will be delivered concurrently. The development for OCX Blocks 1 and 2 completed in August 2019 and the program is currently in the integration and test phase.



### BASING STRATEGY:

OCX is a software-intensive development program structured to deliver capability incrementally in Blocks 0, 1, and 2, with two deliveries. OCX will be delivered and installed at Schriever Air Force Base, Colorado; Vandenberg Air Force Base, California; and various remote sites around the globe.



# OPIR

NEXT GENERATION OVERHEAD PERSISTENT INFRARED (OPIR) PROGRAM

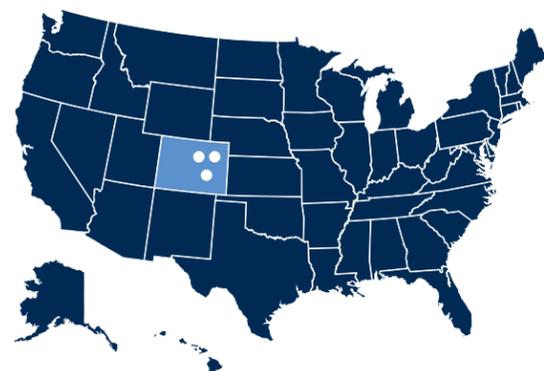
As the Space Force's follow-on program to the Space Based Infrared System (SBIRS), Next Generation Overhead Persistent Infrared (OPIR) will deliver missile warning, missile defense, battlespace awareness, and technical intelligence for the U.S. and its allies.

The program will deliver three geosynchronous earth orbit (GEO) satellites and two polar coverage satellites in Highly Elliptical Orbits (HEO), all with improved payload sensitivity, added resiliency features, and strengthened bus survivability.

The program is updating the ground control and mission data processing segment through the Future Operationally Resilient Ground Evolution (FORGE) program.

OPIR Space and Ground systems are Middle Tier of Acquisition (MTA) programs rapidly prototyping solutions. The MTA approach will deliver the first resilient GEO satellite and associated ground system to meet the 2025 warfighter need.

Next Generation OPIR Space Modernization Initiatives will refine space technology to deliver future capabilities in the areas of demonstrations, technology maturation, and data exploitation.



#### BASING/DEPLOYMENT STRATEGY:

To counter the growing strategic threats from Russia and China, the warfighter has demanded a survivable and resilient strategic missile warning capability by 2025. The Next-Gen OPIR GEO and FORGE programs are on-track to meet that requirement.

The Next-Gen OPIR constellation includes satellites in both geosynchronous and polar orbits. The satellite bus and payloads use a variety of locations for command and control, including: Mission Control Station, Buckley Air Force Base, Colorado; Mission Control Station Backup, Schriever Air Force Base, Colorado; and Mobile Ground Stations, Greeley Air National Guard Base, Colorado.

#### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$10.9 BILLION**

#### 2021:

**\$2.11  
BILLION**

#### CONTRACTING:

LOCKHEED MARTIN CORPORATION  
(Geosynchronous), Sunnyvale, California

- Cost-Plus-Incentive-Fee

NORTHROP GRUMMAN CORPORATION  
(Polar), Redondo Beach, California

- Cost-Plus-Incentive-Fee

RAYTHEON TECHNOLOGIES: FORGE Mission Data Processing Application Framework (MDPAF)

- Cost-Plus-Incentive-Fee

#### SCHEDULE:

A System Requirements Review was conducted in March 2019 and a Preliminary Design Review in September 2019. Both GEO satellites began their payload definition and design efforts in FY19. FORGE awarded the MDPAF contract in August 2020, awarded prototype contracts for MDP Application Provider (MDPAP) in September 2020, and continues to develop C2 capability for legacy SBIRS and Next-Gen OPIR assets through the Enterprise Ground Services (EGS) program.



MID-TIER OF ACQUISITION (MTA)

#### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$360 MILLION**

#### 2021:

**\$114.4  
MILLION**

#### CONTRACTING:

BOEING COMPANY, El Segundo, California

#### Developmental Contract

- Cost-Plus-Incentive-Fee/Award Fee



DIGITAL ENGINEERING



MID-TIER OF ACQUISITION (MTA)



# PTES

PROTECTED TACTICAL ENTERPRISE SERVICE (PTES)

The Protected Tactical Enterprise Service (PTES) will deliver a software-intensive ground system to provide worldwide, anti-jam protected communications to warfighters who are currently unable to operate through interference. PTES will use the Protected Tactical Waveform, enabling anti-jam capability over the existing Wideband Global satellite communication (SATCOM) system and the future Protected Tactical SATCOM system.

PTES is using digital engineering to increase speed and agility. The application of digital engineering will allow for an unprecedented understanding of system performance before any hardware is built or tested, and provide continuous insight for early problem resolution. Ultimately, this will help to deliver warfighting capability rapidly and affordably.

PTES is a Middle Tier of Acquisition rapid prototyping program bringing the capability to support two Navy Carrier Strike Groups, or any Service formation, in the Pacific Theater by the end of 1Q FY22, meeting emerging threats one and a half years earlier than a conventional acquisition program. The PTES development contract was awarded to Boeing in November 2018.

#### BASING/DEPLOYMENT STRATEGY:

The PTES provides a Hub, Mission Management System, and a Key Management System. Equipment comprising Hubs will be hosted at existing SATCOM gateway sites and will provide connectivity between user terminals. The MMS and KMS software applications will manage the allocation of tactical communications resources and will be hosted on commercially-available servers.



# PTS

## PROTECTED TACTICAL SATCOM (PTS)

Protected Tactical SATCOM (PTS) will provide advanced satellite communication (SATCOM) capabilities to tactical users in anti-access/area denial environments leveraging the resilient Protected Tactical Waveform. PTS will provide maximum anti-jam performance in close proximity to adversaries through on-board signal processing and advanced beam-forming using a distributed, diversified, and agile constellation of hostable payloads and high capacity free-flyers.

PTS is using digital engineering to increase speed and agility. The application of digital engineering will allow for an unprecedented understanding of system performance before any hardware is built or tested, and provide continuous insight for early problem resolution. Ultimately, this will help to deliver warfighting capability rapidly and affordably.

PTS is a Middle Tier of Acquisition rapid prototyping program that will deliver up to two prototype payloads available for launch in FY24, three years earlier than a conventional acquisition program. PTS rapid prototyping development contracts were awarded to Boeing, Lockheed Martin, and Northrop Grumman in February 2020.

### BASING/DEPLOYMENT STRATEGY:

PTS will provide worldwide (to include northern polar) protected tactical communications and will use the Protected Tactical Enterprise Service (PTES) as its ground system.

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$2.4 BILLION**

### 2021:

**\$205  
MILLION**

### CONTRACTING:

NORTHROP GRUMMAN CORPORATION,  
Redondo Beach, California

#### Prototype Payload Development

- Firm-Fixed-Price Other Transaction Authority Agreement

LOCKHEED MARTIN CORPORATION,  
Denver, Colorado

#### Prototype Payload Development

- Firm-Fixed-Price Other Transaction Authority Agreement

BOEING COMPANY, El Segundo, California

#### Prototype Payload Development

- Firm-Fixed-Price Other Transaction Authority Agreement

L3HARRIS, Camden, New Jersey

#### Space Hub End Cryptographic Unit

- Cost-Plus-Incentive-Fee

 DIGITAL ENGINEERING

 MID-TIER OF ACQUISITION (MTA)

### COST:

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$341 MILLION**

### 2021:

**\$65.7  
MILLION**

### CONTRACTING:

The launch service providers on contract include: Aevum, Firefly Black, Northrop Grumman Innovation Systems, Rocket Lab USA, SpaceX, United Launch Alliance, VOX Space, and X-Bow.

### SCHEDULE:

RSLP has multiple contracts for sub-orbital and orbital launches, two awarded in 3Q FY19 and 1Q FY20, to provide launch services through 2029.



# RSLP

## ROCKET SYSTEMS LAUNCH PROGRAM (RSLP)

The Rocket Systems Launch Program (RSLP) continues to provide a low barrier for new entry launch vehicles, enabling a diverse vendor pool consisting of both large and small businesses with a mixture of mature and emerging launch providers.

RSLP seeks to capitalize on the dynamic small satellite market by employing a flexible launch program, showcasing industry's innovation while providing affordable launch solutions.

Traditionally, RSLP remains the keeper of excess ballistic missile motors by safely storing, testing, and analyzing the motors as they age, and then either refurbishing the motors for U.S. Government launches or destroying the motors if no longer usable.

### SMALL LAUNCH PROVIDER

RSLP continues to foster small launch innovation by awarding launch services contracts to VOX Space for LauncherOne, Aevum for RavnX, and continues with Rocket Lab for its first Electron launch from U.S. soil.

RSLP is also developing a tactically-responsive launch capability with its award to Northrop Grumman for a Pegasus launch, to complete launch vehicle readiness in four months, and put the launch vehicle in a stand-by mode with a 21 day call-up to launch capability.

RSLP conducted the successful initial launch of a Minotaur IV from the Mid-Atlantic Regional Spaceport on July 15, 2020.

### LAUNCH SUPPORT SERVICES

RSLP maintains a stable of launch service providers to easily support U.S. Government customers.

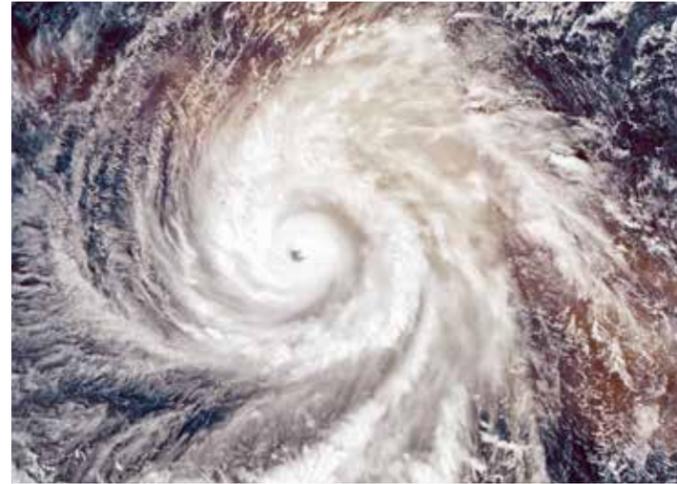


## SPACE COMMAND & CONTROL (SPACE C2)

2021 PRESIDENT'S BUDGET:  
\$190.2 MILLION

Adversary nations are fielding sophisticated space weapons at a pace that our legacy Space Domain Awareness (SDA) and space command and control (C2) systems cannot currently match. To address the rapidly expanding threats to the space enterprise, the Space C2 system will provide a collaborative environment that will enhance and modernize SDA and Battle Management C2 (BMC2) capabilities; create decision-relevant views of the space and multi-domain environment; rapidly detect, track, and characterize objects of interest; identify/exploit traditional and non-traditional sources; perform space threat analysis; and enable efficient distribution of data.

The program's acquisition approach involves an innovative agile Development, Security, & Operations (DevSecOps) effort linking users with developers to deliver improved and prioritized capabilities to operators on a recurring basis in a secure, flexible, and interoperable fashion. Employing an agile-based Rapid Delivery Framework with a 90-day Program Increment construct fosters a collaborative and integrated environment for the community to effectively plan and deliver C2 capabilities. The system will provide a common infrastructure and standards for rapid prototyping of dynamic SDA and BMC2 applications for end-to-end "sensor-to-shooter" execution for U.S. Space Command and the other Combatant Commands.



## WEATHER SYSTEM FOLLOW-ON - MICROWAVE (WSF-M)

2021 PRESIDENT'S BUDGET:  
\$64.9 MILLION

The Weather System Follow-On - Microwave (WSF-M) will satisfy Joint Requirements Oversight Council-validated environmental monitoring capability gaps in monitoring ocean surface vector winds and tropical cyclone intensity. WSF-M will replace some of the space-based environmental monitoring capabilities found in the decaying Defense Meteorological Satellite Program constellation.

Additionally, an energetic charged particle sensor will characterize low earth orbit energetic charged particles to aid in the attribution of satellite anomalies.

The WSF-M objective system contract was awarded to Ball Aerospace in November 2017. WSF-M is now in post Milestone B production, and is scheduled for launch in October 2023.

### CONTRACTING:

BALL AEROSPACE, Boulder, Colorado

### Engineering & Manufacturing Development, Production and Deployment

- Fixed-Price, Performance-based

### BASING/DEPLOYMENT STRATEGY:

WSF-M will be operated from the Naval Research Lab's Blossom Point Tracking Facility.



### CONTRACTING:

#### Other Transaction Authority

- As of the end of FY20, SpEC has awarded 77 unique awards totaling \$846M.
- In January 2020, the Space and Missile Systems Center began the re-compete of the consortium manager and expected award is in December 2020.
- SMC plans to award the next SpEC OT agreement this 2nd Qtr FY21.

The Space Enterprise Consortium (SpEC) mission is to foster collaboration and prototype development to reduce risk and improve the availability of new space-related technologies, thereby enhancing space architecture resiliency. By using Other Transaction (OT) Authority pursuant to 10 USC §2371b, the SpEC OT enables the Department of Defense (DoD) and its Space Force component to leverage industry, notably by attracting nontraditional defense contractors, to collaborate on requirements development and prototyping for space-related technologies and capabilities.

The Electro-Optical / Infrared (EO/IR) Weather Systems (EWS) pathfinder is an example of awarded SpEC OT agreements. Three SpEC OT agreements were awarded to competing vendors to provide a scalable proliferated low Earth Orbit (p-LEO) architecture to fulfill the two highest-priority space-based environmental monitoring capability gaps (cloud characterization and theater weather imagery) as validated by the Joint Requirements Oversight Council. Competitive down-select decisions would result in a winning vendor to provide an operational capability ready for launch by the end of FY25 to replace the decaying Defense Meteorological Satellite Program constellation.

The awards of three Mission Data Processing (MDP) Application Provider prototype efforts for the Future Operationally Resilient Ground Evolution (FORGE) program are another example of SpEC OT agreements. At the end of the 12-month Period of Performance, the Space and Missile System Center (SMC) will down-select to a single provider for the follow-on MDP applications development. This development effort is part of the Next Generation Overhead Persistent Infrared program and will provide a modular approach to developing mission applications capable of meeting tomorrow's missile warning threats.



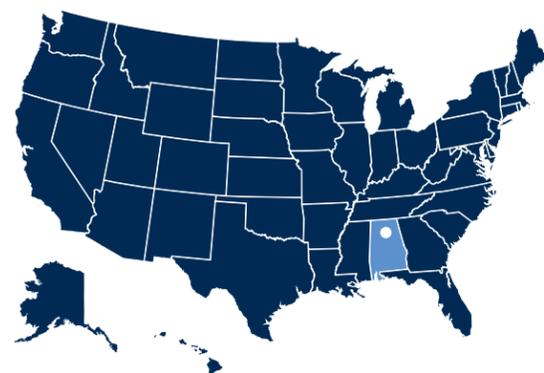
# SPACE FENCE

SPACE FENCE GROUND-BASED RADAR SYSTEM (SPACE FENCE)

**ORIGINAL UNIT COST:**  
\$1.7 BILLION

**CURRENT UNIT COST:**  
\$1.56 BILLION (8.3% DECREASE)

Space Fence is a second-generation, ground-based radar system that tracks satellites and space debris in Earth's orbit. It is designed to provide assured coverage of low Earth orbit for objects as small as 10 centimeters, and provides search capability for objects at higher orbits. Data from Space Fence will continuously feed into the Space Force's tracking database and provide space flight safety, early detection of potential threats to satellites, and situational awareness for manned space flight operators.



**BASING STRATEGY:**

Increment 1 funding delivered a radar site at Kwajalein Atoll, Marshall Islands with an operations center in Huntsville, Alabama.

**COST:**

2021 - 2025  
PRESIDENT'S BUDGET:  
**\$11.3 MILLION**

**2021:**

**\$11.3 MILLION**

**CONTRACTING:**

LOCKHEED MARTIN CORPORATION,  
Moorestown, New Jersey

**Engineering & Manufacturing Development, Production and Deployment**

- Fixed-Price-Incentive-Firm

**SCHEDULE:**

Initial Operational Capability and Operational Acceptance of Space Fence were declared on March 27, 2020.



# WGS

## WIDEBAND GLOBAL SATELLITE COMMUNICATIONS (WGS)

**CONTRACTING:**

BOEING COMPANY,  
El Segundo, California

10 of 11 satellites are operational and the eleventh satellite is projected to be ready for launch in 2024.

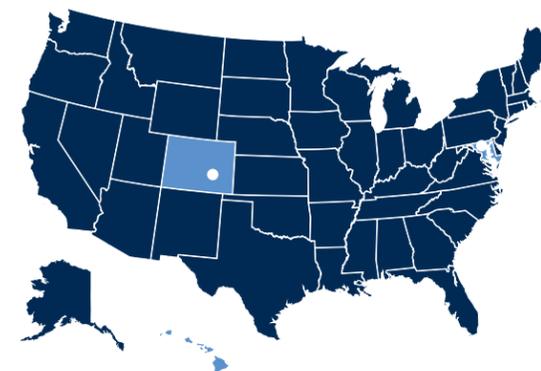
**Block II Follow-On (WGS-7 through WGS-11)**

- Firm-Fixed-Price

Wideband Global Satellite Communications (WGS) is a system of the highest-capacity communications satellites owned and operated by the Department of Defense (DoD). The deployment of the WGS system exponentially increases the DoD's communications capacity provided by the previous Defense Satellite Communications System.

WGS has ten operational satellites, with the tenth satellite launched on March 15, 2019, and accepted for operations on November 19, 2019. An eleventh satellite, WGS-11, is being procured and will provide twice the capacity of WGS-10. The Space and Missile Systems Center definitized the contract for production of WGS-11 on February 10, 2020, and completed an all-virtual preliminary design review from June 29 to July 1, 2020.

Multiple international partners use the WGS system, including Australia, Canada, Denmark, Luxembourg, the Netherlands, New Zealand, Norway, and the Czech Republic.



**BASING STRATEGY:**

The Space Force's 4th Space Operations Squadron operates the WGS satellites from Schriever Air Force Base, Colorado. The U.S. Army operates the WGS communications payloads at five Wideband Satellite Communications Operations Centers around the world: Fort Detrick and Fort Meade, Maryland; Wahiawa, Hawaii; Landstuhl, Germany; and Okinawa, Japan.





## ENHANCED POLAR SYSTEM RECAPITALIZATION

2021 PRESIDENT'S BUDGET:  
\$190.2 MILLION

Enhanced Polar System Recapitalization (EPS-R) recapitalizes the EPS space and ground segments to prevent a critical protected communications gap in the North Polar Region until next generation systems come online in the 2030s.

Two EPS payloads developed by Northrop Grumman Aerospace Systems will be hosted on spacecraft procured by Norway under a partnership called the Arctic Satellite Broadband Mission. A Memorandum of Agreement (MOA) between the U.S. Department of Defense and the Norwegian Ministry of Defense was signed in May 2019. Both spacecraft will be placed into orbit by a single SpaceX launch vehicle in late 2022.

The contract to modify the Control and Planning Segment was awarded to Northrop Grumman Mission Systems in May 2019. The Navy is accomplishing modifications to the EPS Gateway.

### CONTRACTING:

NORTHROP GRUMMAN CORPORATION, Redondo Beach, California

#### Payload Development and Production

- Cost-Plus-Incentive-Fee

NORTHROP GRUMMAN CORPORATION, Baltimore, Maryland

#### Ground Control and Planning Segment Development

- Cost-Plus-Incentive-Fee

### BASING/DEPLOYMENT STRATEGY:

The ground segment consists of the Control and Planning Segment at Schriever Air Force Base, Colorado and the Gateway at Clear Air Force Station, Alaska.



## GEOSYNCHRONOUS SPACE SITUATIONAL AWARENESS PROGRAM (GSSAP)

The Geosynchronous Space Situational Awareness Program currently has four operational satellites on orbit that have been formally accepted by the Space Force. The vehicles are tasked by the National Space Defense Center to characterize resident space objects in geosynchronous earth orbit. All four satellites have the capability to conduct rendezvous proximity operations to characterize their targets. This capability is used to collect data to contribute to anomaly and threat analysis, as well as satellite catalog maintenance. Vehicles 5 and 6 are on contract and are projected for launch in FY21.



## SPACE-BASED SPACE SURVEILLANCE FOLLOW-ON

2021 PRESIDENT'S BUDGET:  
\$173.1 MILLION

The Space-Based Space Surveillance Follow-On program is partnering with the National Reconnaissance Office to satisfy common Department of Defense and intelligence community requirements. Known as SILENTBARKER, the program will include both space elements and space telemetry, tracking, and commanding elements. SILENTBARKER will provide space situational awareness and indications and warning to detect geosynchronous orbit threats. The program has a launch date planned for 2023. Funding for system expansion began in FY20, and will provide full coverage of the geostationary equatorial orbit belt with a projected launch date in 2026.



## SPACE RAPID CAPABILITIES OFFICE (SpRCO)

In 2018 and 2019, the National Defense Authorization Acts established the roles and authorities of the Space Rapid Capabilities Office (SpRCO), with emphasis on urgently needed, classified space capabilities. The Director, SpRCO, reports to the Chief of Space Operations (CSO). In accordance with the law, the Secretary of the Air Force (SecAF) established and chairs the SpRCO Board of Directors (BoD), comprised of the CSO, Chief of Staff of the Air Force, Commander of U.S. Space Command (USSPACECOM), Undersecretary of Defense for Acquisition & Sustainment, Undersecretary of Defense for Research & Engineering, and the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics. SpRCO requirements are validated by the Commander, USSPACECOM, and programs are assigned by the BoD.

The SpRCO has conducted extensive organizational stand-up activities, while simultaneously executing its rapid acquisition mission, including several space programs in support of warfighter operational needs. The office is strengthening partnerships through engagements with other Government organizations, industry, academia, and Federally Funded Research and Development Centers. SpRCO is integrating digital engineering practices into its culture, to allow for rapid trades in design and ensure SpRCO-developed capabilities stay operationally dominant and deployed on timelines relevant to the warfighter.



# SUSTAINMENT

As fielded air and space systems continue to age, the importance of innovation in sustainment grows. The Air Force Rapid Sustainment Office (RSO) was established in 2018 to leverage emerging, mature, and new technologies to reduce sustainment costs and improve readiness. The RSO is focused on transforming the operations and sustainment enterprise vital to the

world's most advanced Air Force and Space Force.

Over the last two years, the RSO collaborated across the Department of Defense, industry, and academia to build upon the development of others and to conduct operations and technical assessments supporting delivery of critical technologies. The RSO worked to make Department

of the Air Force (DAF) money go further by selectively investing in companies with advanced research and development. To date, the RSO has realized a ten times multiplier in every dollar spent. Additionally, the RSO now has access to the world's top venture capital portfolios, gaining access to the best technology across the globe. The RSO is executing in 25 states in the U.S. and currently working with over 40 users in the Department of the Air Force.

The RSO has focused on a set of four core technology areas where emerging and commercial technology solutions can greatly increase readiness and decrease cost. The four focus areas are agile manufacturing, condition based maintenance plus (CBM+), automation and robotics, and augmented reality/virtual reality (AR/VR).

### AGILE MANUFACTURING

The Department of the Air Force successfully designed and printed tools, fixtures, prototypes, and

non-critical polymer and metal components. As enterprise lead for implementation of agile manufacturing, the RSO partnered with the Air Force Research Laboratory, Air Force Sustainment Center, and General Electric (GE) to launch a pilot to productionize the DAF's Additive Manufacturing (AM) capability at Tinker Air Force Base to mitigate obsolescence challenges and improve supply chain readiness. To date, the RSO has delivered over 970 additively manufactured metal and polymer parts to the Department of the Air Force with over 150 of these parts flying on various airframes.

### CONDITION BASED MAINTENANCE PLUS

Condition Based Maintenance Plus (predictive maintenance) supports the transformation of maintenance practices to use data in ways that enable users to make proactive, knowledge based decisions. CBM+ is a proven methodology that is now active in the Department of the Air Force. Implementing artificial intelligence and machine

learning within CBM+ has greatly reduced unscheduled maintenance, facilitated a digital flight line, streamlined maintenance operations into efficient human-centered processes, enhanced engineering effectiveness, optimized the supply chain, and improved asset generation and fleet awareness.

### AUTOMATION AND ROBOTICS

Automation and Robotics enable integrated automated process flow using common components with minimal human assistance. Automation can be multi-purposed for robotic painting and cleaning and when teamed with lasers, provides an advanced approach to coatings removal.

### AUGMENTED REALITY / VIRTUAL REALITY

AR/VR technologies have accelerated training and proficiency levels of the sustainment workforce by allowing maintenance personnel to quickly view, assess, and advise technicians to resolve problems and reduce flightline wait and response times.

### RSO INNOVATION PIPELINE

The RSO hosted the inaugural Advanced Manufacturing Olympics (AMO) October 20-23, 2020. More than 4,200 attendees from industry, academia, Congress, media, and government tuned in for four days of incredible speakers, peer networking events, and competitive technical challenges between companies leading in the AM industry. Additionally, more than 10,000 tuned in to the Department of Defense Twitter account to live stream the event.

The AMO aimed to accelerate the Department of the Air Force's ability to scale AM technology. Each AMO technical challenge was created to find solutions and innovative ideas to tackling specific roadblocks:

- Box of Parts Exercise – Reverse Engineering
- Material Hurdles – Material and Machine Quality
- Data Package Relay – Part Tech Data Package Development
- Approval Springs – Testing & Assembly
- Printer Shootout – Production
- Supply Chain Marathon – Support

Sixty-four teams from across industry, academia, and government competed in six technical challenges with a chance to win a share of \$1M in prizes. The teams and judges represented 22 states and Canada, 62 companies (both traditional and non-traditional), 11 universities, three Air Force units, and the Marine Corps. ■

# COVID-19 RESPONSE

When the COVID-19 pandemic presented a national crisis, the premier Department of the Air Force contracting enterprise leapt into action for the Department of Defense response. The Department of the Air Force COVID-19 Task Force (DAF ACT) was established in only 48 hours on March 25, 2020. This cross-functional, cross-command acquisition task force “weaponized” acquisition across four lines of effort (LOEs) to deliver rapid and agile procurement for national effects.



**LOE 3: RECOVER:** Assess and track COVID cost impacts to Defense Industrial Base and Department of the Air Force programs; \$1.96B to date

- Assessed and tracked 199 requests for equitable adjustments (REA) from 126 Program Offices and operational units, and projected additional programmatic impacts totaling \$1.66B
- Provided guidance to Acquisition professionals for CARES Act Section 3610 implementation for COVID impact recovery

**LOE 4: RAPID:** Rapidly transform innovative industrial ideas into operational capabilities

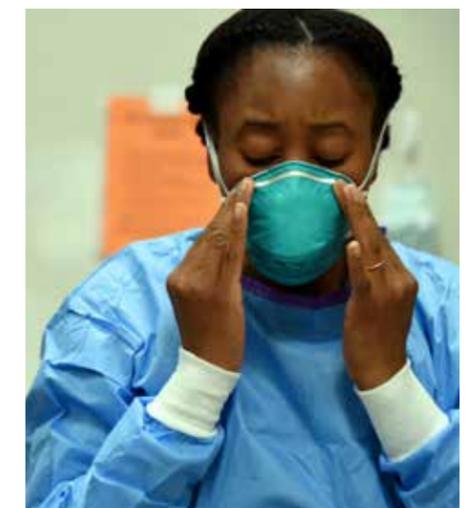
- Acted as the National “Front Door” for COVID industrial response
- Evaluated a DoD record 3,700 industry responses
- Selected 84 solutions across 6 DHHS priority medical supply categories
- Provided 219 solutions to Joint and other Federal agencies’ needs leading to over 100 contract actions and establishment of the Joint Contract Tracing requirement ■

**LOE 1: RELIEF:** Deliver immediate support to FEMA & DHHS and build future medical industrial capacity

- Awarded \$645M across 15 commercial contracts and 6 Defense Production Act (DPA) Title III agreements for medical industrial base expansion
- Increased national production capacity of:
  - N95 masks by 31M/mo
  - Surgical masks by up to 370M/mo
  - Testing swabs by 74M/mo
  - Testing kits by 10M/mo
  - Nitrile gloves by 37.5M/mo
  - Ventilator filter fiber units by 650K/mo
  - Injection syringes by 45M/mo
- Increased mask filter media production sufficient to support additional annual production of 110M N95 or 363M surgical masks

**LOE 2: RESILIENCE:** Preserve Defense Industrial Base capability, reduce reliance, and build resilience

- Awarded ~\$800M of CARES Act funding across 43 DPA Title III Defense Industrial Base projects preserving 43 high risk vendors and lower tier suppliers from financial distress and imminent layoff of highly trained employees
- Sectors: Aircraft & Propulsion (\$252.2M), Ship Building (\$234.5M), Electronics (\$71.6M), Materials & Hypersonics (\$41.7M), Space Components (\$35.5M), and Soldier Systems (\$16.6M)
- Awarded \$40M pre-CARES Act DPA Title III funding early in the pandemic to industry partners experiencing financial distress due to downturn in the commercial aviation industry



# PERFORMANCE OF THE ENTERPRISE:

## FISCAL YEARS 2019 – 2020 DEPARTMENT OF THE AIR FORCE ACQUISITION ENTERPRISE PERFORMANCE SUMMARY

Since the National Defense Authorization Act of 2011, the Department of the Air Force acquisition enterprise has conducted annual performance assessments on its abilities to acquire capabilities effectively and efficiently. Rather than focusing on individual program-by-program compliance against established cost, schedule, and technical performance objectives; data was aggregated to provide an enterprise or total system perspective.

In FY19, we analyzed 33 Acquisition Category (ACAT) I and 26 ACAT II programs that met the criteria for assessment: (1) had established program and (2) reported data consistently on a recurring basis. FY20 included 31 ACAT I and 34 ACAT II programs that met the same criteria.

The following programs were not included in the assessment: (1) ACAT IIIs as current reporting guidance does not provide sufficient data to analyze on a consistent yearly basis, and (2) non-Air Force led programs (e.g., F-35) because other services are responsible for data reporting. All cost data is expressed in FY20 dollars.

Over FY19, the Department of the Air Force acquisition enterprise cost growth increased from the previous year by 2.7% in the Acquisition Category I portfolio and by 14.3% in the Acquisition Category II portfolio. Schedule growth in the Acquisition Category I portfolio saw annual growth of 3.1%, and the Acquisition Category II portfolio saw annual schedule growth of 3%. Over FY20, ACAT I costs grew 1.9% and ACAT II costs grew by 1.7%

FY19 – FY20 enterprise results are reported in the following pages with comparisons to the trends from recent fiscal years.



## ACAT I COST PERFORMANCE SUMMARY

Cost growth control was largely successful in FY19 and that trend carried over into 2020. This assessment looked at: (1) cost estimate performance and (2) unit cost performance. Both the ACAT I and ACAT II portfolio showed sizeable cost increases that were driven by an increase in quantity buys, a trend started in 2019 and more so in FY20.

The total cost of the portfolio (based on current cost estimates) increased by a total of \$12.7B with \$7.4B occurring in FY19 and \$5.1B in FY20. These totals represent 2.7% and 1.9% growth respectively. In comparison, the rate of growth for 2018 was 0.4% and the prior five years averaged 0%. Driven primarily by quantity increases, FY19 and FY20 had the biggest annual cost increases in 5 years. At the end of FY19 the total portfolio cost estimate was \$287B and \$275B at the end of FY20. Retiring programs account for the difference.

In FY19, 12 of the 33 ACAT I programs increased their estimates, while 20 programs decreased their estimates, and one program had no change.

4 of the 12 programs that increased costs did so because of quantity increases, while 2 of the 20 programs that reduced costs did so because of quantity reductions:

- JASSM-ER: +4,334 units, +\$5,196M
- JDAM: +31,295 units, +\$823M
- NSSL: +18 launches, +\$3,386M
- WGS: +1 satellite, +\$420.9M
- HC/MC-130 Recap: -5 aircraft, -\$802M
- MQ-9 Reaper: -3 aircraft, -\$725M

Removing these six programs from the ACAT I portfolio results in a reduction in costs of \$807M for the remaining 27 programs.

In FY20, 17 of the 31 ACAT I program increased their estimates, while 11 decreased their estimates, and 3 programs had no change. Two of these programs reported cost changes due to quantity changes:

- F-15 EPAWSS: +145 units, +\$1,712M
- EPS: +2 satellites, +\$1,368M

Removing these 2 programs results in an increase of \$2,215M for the remaining 29 programs.

Unit cost performance analysis, which compares program estimates against their original and current unit cost baselines, showed positive results. For the 29 programs assessed in FY19, the average Program Acquisition Unit Cost (PAUC) was 6.7% below original baselines and 3.4% below current baselines. The unit cost measure used by Congress to monitor excessive

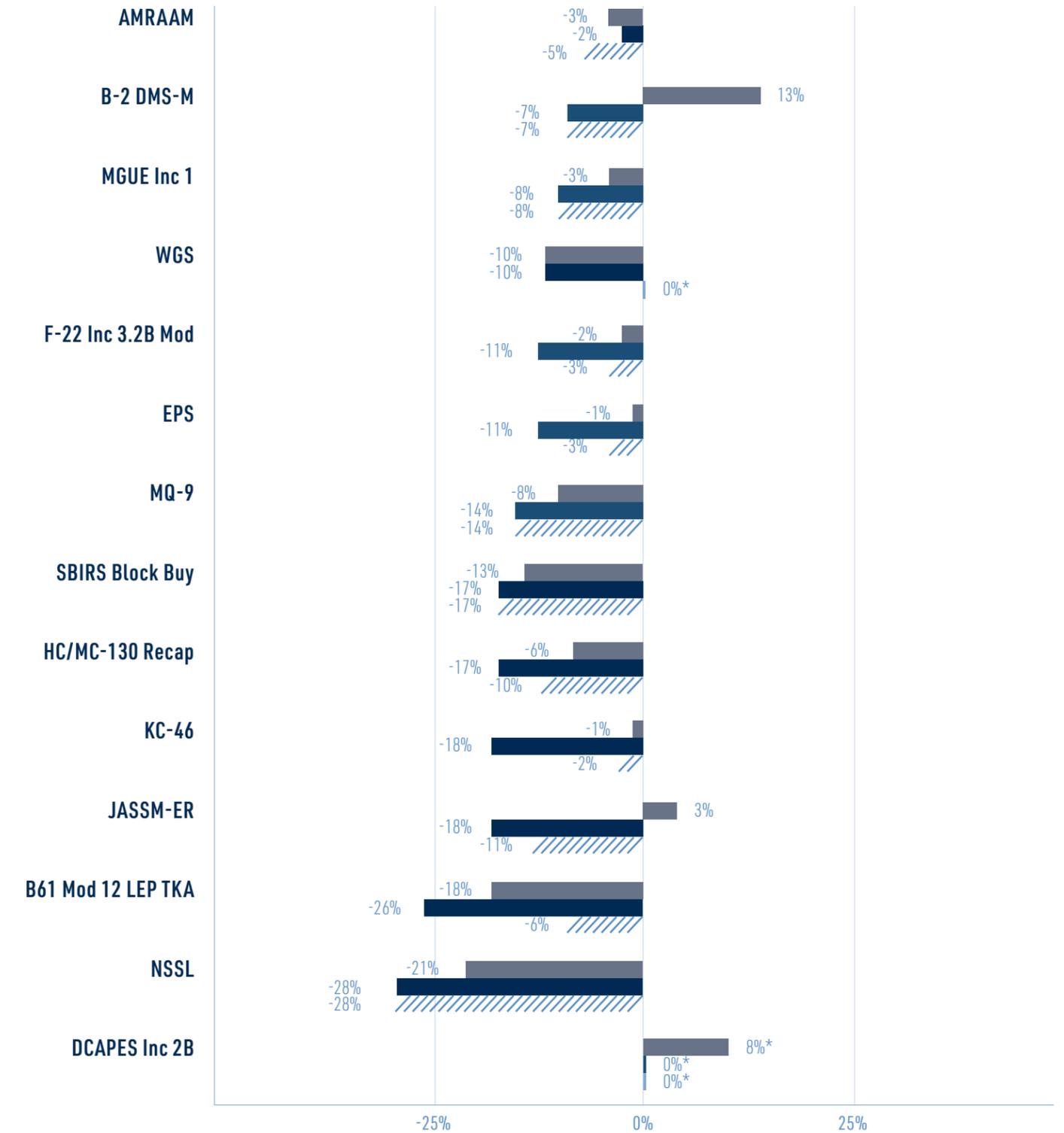
Service program cost growth (i.e., the Nunn-McCurdy Act) mandates the reporting of programs exceeding certain thresholds of cost growth against current and original baselines. In FY19, 76% (22) of the programs are below their original baselines with 93% (27) of the programs reporting below 10% growth. For current baselines, 72% (21) of the programs are below their current baselines with 90% (26) of the programs reporting below 5% growth. Four of the ACAT I programs do not report unit costs and are not included in this measure as they are either information systems that have no quantities or are delivering capabilities rather than quantities.

In FY20 unit cost performance remained stable. The average PAUC was 6.1% below original baselines and 5.3% below current baselines. Fifty-nine percent (16) of the programs are below their original baselines with 93% (25) of the programs reporting below 10% growth. For current baselines, 70% (19) of the programs are below their current baselines with 96% (26) of the programs reporting below 5% growth. Four of the ACAT I programs do not report unit costs and are not included in this measure as they are either information systems that have no quantities or are delivering capabilities rather than quantities.

## ACAT I UNIT COST GROWTH (PERCENT) ORIGINAL AND CURRENT BASELINE



## ACAT I UNIT COST GROWTH (PERCENT) ORIGINAL AND CURRENT BASELINE



\*NOTE: SAE approved DCAPES APB Restructure on 11 August 2020

## ACAT II COST PERFORMANCE SUMMARY

Overall cost control remained stable, with quantity increases driving some costs higher, mirroring the ACAT I portfolio.

The total portfolio cost (based on current cost estimates) grew \$3.5B in FY19, representing a 14.3% annual rate of growth that was also up from 2% in FY18. Ten of the 26 programs increased their estimates and six decreased estimates. The rest reported no change. In FY20 the ACAT II portfolio grew an additional \$459M, representing a

1.7% increase. Four of 23 actively reporting programs increased their estimates, three decreased estimates, and the rest reported no change. Due to the smaller sample, individual programs can play more of a factor in cost performance. Two programs in FY20, F-15 IRST and F-15 ADCP II, contributed a majority of the cost increase due to funding additional capability requirements.

Unit cost performance also showed an increase. Current baseline analysis shows that the average PAUC grew

across the ACAT II portfolio in both FY19 and FY20 and now stands at 7.2% above current baselines. In FY19 50% (13) of the programs executed at or below their current program baselines and 81% (21) of the programs reported below 10% growth. In FY20, 61% (14) of the programs executed at or below their current baselines and 86% (19) reported below 10% growth. The ACAT II programs do not have a record of original baselines to track against.



## ACAT I SCHEDULE PERFORMANCE SUMMARY

Some ACAT I programs showed schedule savings while the portfolio as a whole followed the trend of increased schedule growth from prior years. This assessment is based on: (1) schedule growth of programs aggregated to measure Enterprise performance and (2) Initial Operational Capability (IOC) timeline measuring individual program performance.

The aggregate schedule grew by 3.1% in FY19, which is in line with the 3% average rate of growth over the last five years. Scheduled growth in FY19 was driven primarily by 10 programs experiencing schedule

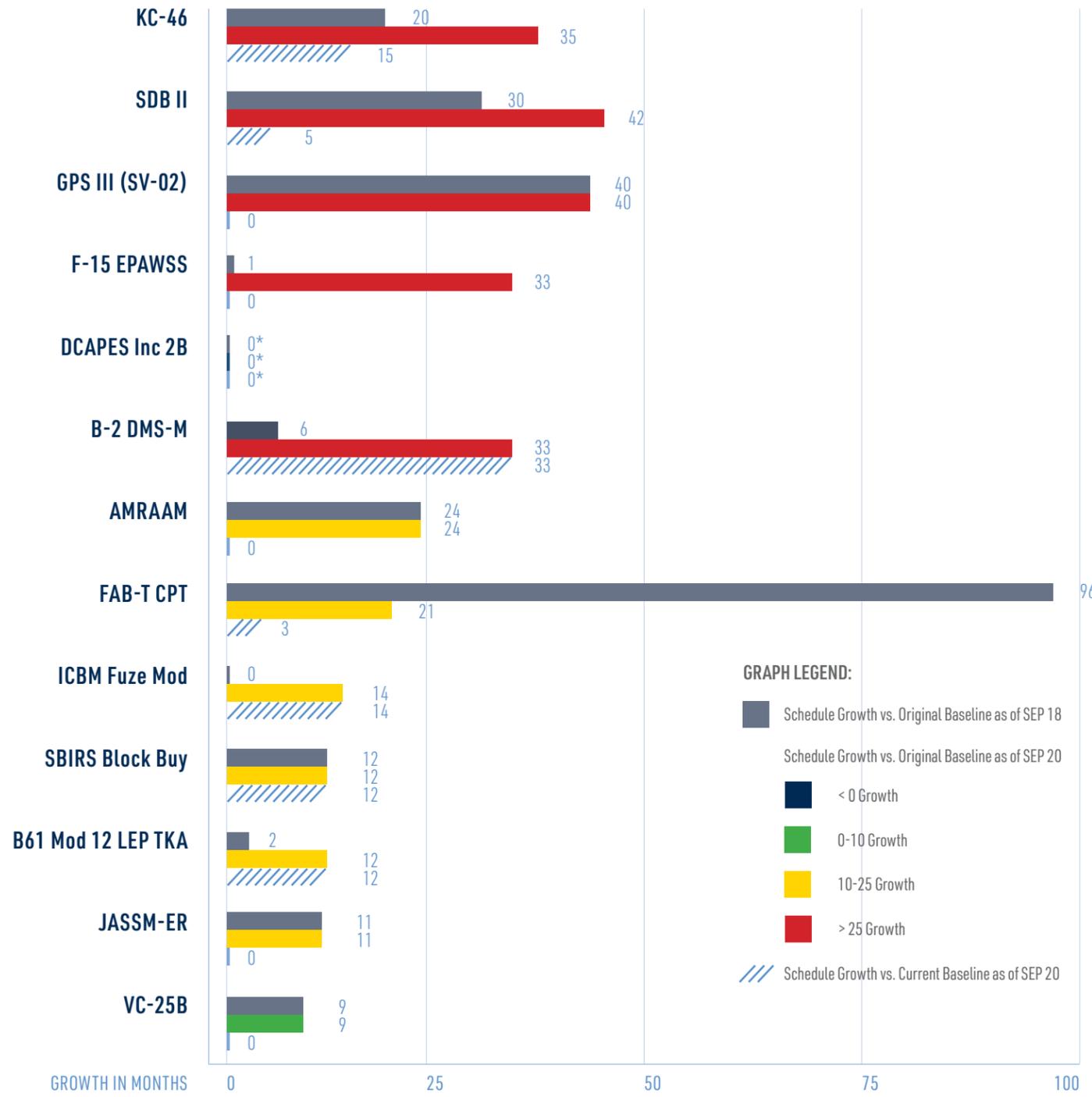
growth, with two of those, KC-46 and F-15 EPAWSS, growing by over 12 months. One program showed savings and shortened its overall schedule length. IOC achievement averaged approximately three months of growth per program over FY19, also in line with the last five years. On average, programs have achieved IOC approximately one and a half years later than the originally planned schedules estimated.

In FY20, the aggregate schedule grew by 5.1%, a further increase from FY19. More than half of this growth occurred in the final quarter and could potentially be reflective

of COVID-19 pandemic impacts. Schedule growth was driven primarily by 2 of 13 programs, again KC-46 and F-15 EPAWSS, with increases of over 12 months. Meanwhile two programs showed savings and shortened their overall schedule length by 16 months combined. IOC achievement averaged approximately three months of growth per program over FY20, and on average programs are still achieving IOC approximately one and a half years later than the originally planned schedules estimated, mirroring FY19.

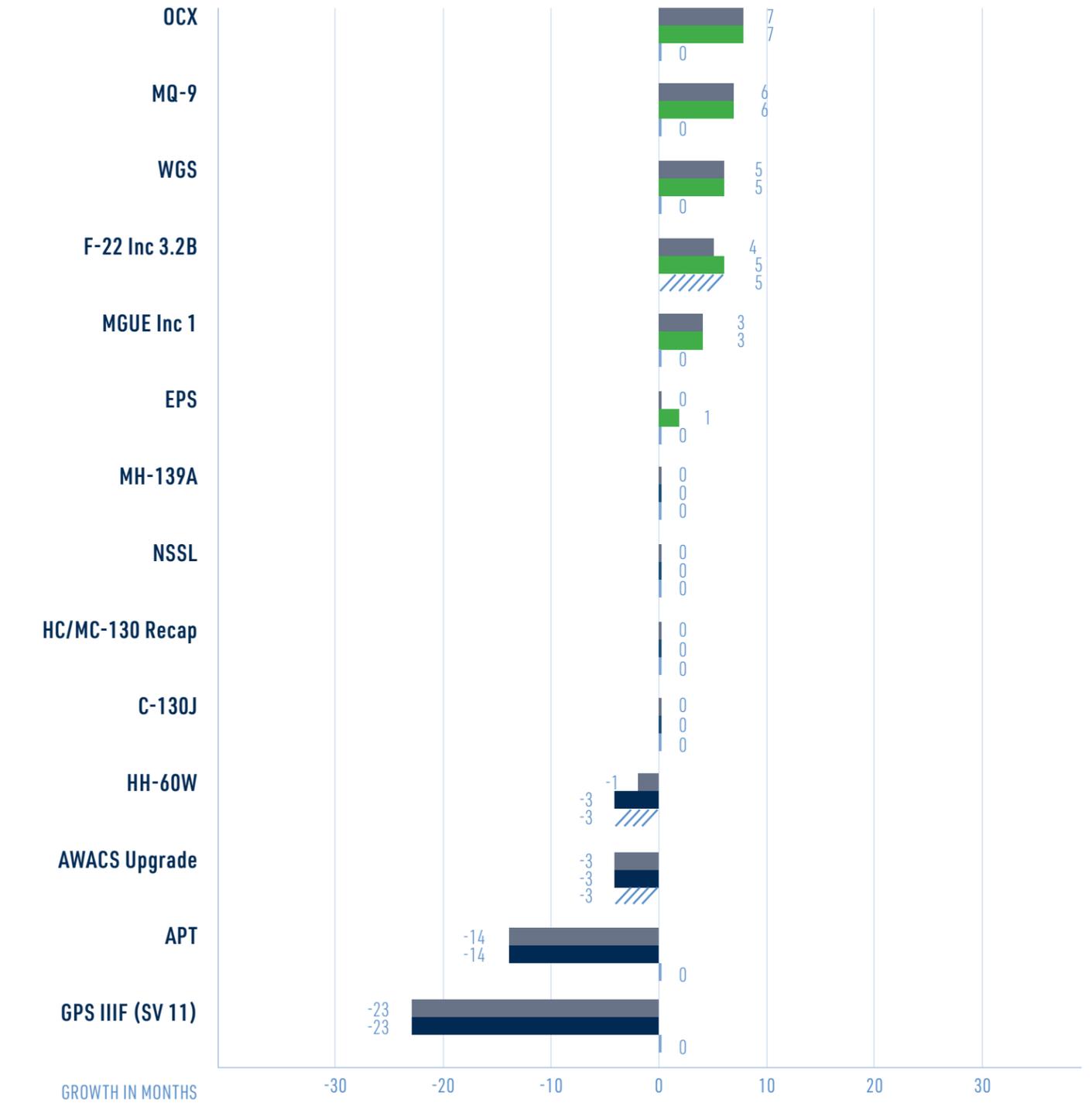


## ACAT I IOC SCHEDULE GROWTH (MONTHS) ORIGINAL AND CURRENT BASELINE



\*NOTE: SAE approved DCAPEs APB Restructure on 11 August 2020

## ACAT I IOC SCHEDULE GROWTH (MONTHS) ORIGINAL AND CURRENT BASELINE





## ACAT II SCHEDULE PERFORMANCE SUMMARY

Overall the Acquisition Category II portfolio had a growth rate of 3%. Seven programs experienced schedule growth, with two of these programs growing by more than 6 months. For the 23 programs assessed, 71% of programs are estimating achievement of their next upcoming milestone within six months of their baseline date. In FY20, the schedule growth

rate was 5%. Eight programs experienced schedule growth, with two of these programs, F-15 RMP and F-16 AESA, growing by more than 6 months. For the 23 programs assessed, 78% are estimating achievement of their next milestone within six months of their baseline date.

## ACAT I FY2019 – FY2020 TECHNICAL PERFORMANCE SUMMARY

Technical Performance trends remain stable. All ACAT I programs with future IOC milestones projected their (unclassified) Key Performance Parameters (KPPs) will be met between the threshold and objective trade space with no

pending breaches. Additionally, during FY19 – FY20 no changes were made to KPP requirements for unclassified ACAT I programs approved at an electronic Air Force Requirement Oversight Council (eAFROC), a continuing trend since 2011.

# GLOSSARY:

## **ACQUISITION CATEGORY (ACAT):**

Categories established to facilitate decentralized decision making and execution, as well as compliance with statutorily imposed requirements. The categories determine the level of review, decision authority, and applicable procedures.

## **AUTOMATED INFORMATION SYSTEM (AIS):**

A combination of computer hardware and computer software, data, and/or telecommunications that collects, processes, stores, transmits, and displays information.

## **AVERAGE PROCUREMENT UNIT COST (APUC):**

APUC is calculated by dividing total procurement cost by the number of articles to be procured. Total procurement cost includes flyaway cost (recurring and nonrecurring costs associated with production of the item, like hardware, software, systems engineering, engineering changes and warranties), plus the costs of procuring technical data, training, support equipment and initial spares.

## **COMMERCIAL OFF-THE-SHELF (COTS):**

A commercial item sold in substantial quantities in the commercial marketplace and offered to the government under a contractor or subcontract at any tier, without modification, in the same form in which it was sold in the marketplace.

## **ENGINEERING & MANUFACTURING DEVELOPMENT (EMD):**

The purpose of the EMD phase is to develop, build, and test a product to verify all requirements have been met and to support production and deployment decisions.

## **FUTURE YEARS DEFENSE PROGRAM (FYDP):**

A DoD database and internal accounting system that summarizes

forces and resources associated with programs approved by the Secretary of Defense. Its three parts are the organizations affected, appropriations accounts (e.g., research, development, test and evaluation; operation and maintenance), and the 11 major force programs (e.g., strategic forces, mobility forces, research and development).

## **INFORMATION TECHNOLOGY (IT):**

Any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the executive agency. IT includes computers, ancillary equipment, software, firmware and similar procedures, services (including support services) and related resources, including National Security Systems.

## **INITIAL OPERATIONAL CAPABILITY (IOC):**

In general, attained when some units and/or organizations in the force structure scheduled to receive a system have received it and have the ability to employ and maintain it. The specifics for any particular system IOC are defined in that system's capability development document and capability production document.

## **MAJOR DEFENSE ACQUISITION PROGRAM (MDAP):**

An acquisition program that is designated by the Under Secretary of Defense for Acquisition and Sustainment or estimated to expend a total of more than \$365 million in RDT&E or more than \$2.19 billion in procurement (in FY00 constant dollars).

## **MILESTONE (MS):**

The point at which a recommendation is made and approval sought

regarding starting or continuing an acquisition program (i.e., proceeding to the next phase).

## **PROGRAM EXECUTIVE OFFICER (PEO):**

A military or civilian official who has responsibility for directing several major defense acquisition programs and for assigned major system and non-major system acquisition programs. A PEO normally reports to and receives guidance and direction from the DoD component acquisition executive.

## **REQUIRED ASSETS AVAILABLE (RAA):**

The specific number of items that must be delivered to the government to support initial operational capability.

## **REQUEST FOR PROPOSAL (RFP):**

A solicitation used in negotiated acquisition to communicate government requirements to prospective contractors and to solicit proposals.

## **SYSTEM PROGRAM OFFICE (SPO):**

The office of the program manager and the single point of contact with industry, government agencies, and other activities participating in the system acquisition process.

## **TECHNOLOGY MATURATION & RISK REDUCTION (TMRR):**

The purposes of the Technology Maturation & Risk Reduction Phase are to reduce technology risk, engineering integration and life cycle cost risk, and to determine the appropriate set of technologies to be integrated into a full system. The TMRR phase conducts competitive prototyping of system elements, refines requirements, and develops the functional and allocated baselines of the end-item system configuration.

# CONTRACTING DEFINITIONS:

## **COST-PLUS-AWARD-FEE (CPAF)**

A cost-reimbursement contract is suitable for level-of-effort contracts where mission feasibility is established, but measurement of achievement must be by subjective evaluation rather than objective measurement. A CPAF contract provides for a fee consisting of both a base amount, which may be zero, fixed at inception of the contract, and an award amount, based upon a judgmental evaluation by the government, sufficient to provide motivation for excellence in contract performance. A CPAF contract may not be used to avoid establishing a cost-plus-fixed-fee contract when the criteria for CPFF contracts apply, or developing objective targets so a cost-plus-incentive-fee contract can be used.

## **FIXED-PRICE-INCENTIVE-FIRM**

A fixed-price contract that provides for adjusting profit and establishing the final contract price by application of a formula based on the relationship of total final negotiated cost to total target cost. The final price is subject to a price ceiling, negotiated at the outset.

## **TIME-AND-MATERIALS**

A contract that provides for acquiring supplies or services on the basis of 1) direct labor hours at specified fixed hourly rates that include wages, overhead, general and administrative expenses, and profit; and 2) actual cost for materials. A T&M contract may be used only when it is not possible at the time of placing the contract to estimate accurately the extent or duration of the work or to anticipate costs with any reasonable degree of confidence.

## **COST-PLUS-FIXED-FEE**

A cost-reimbursement-type contract that provides for the payment of a fixed-fee to the contractor. The fixed fee, once negotiated, does not vary with actual cost, but may be adjusted as a result of any subsequent changes in the scope of work or services to be performed under the contract.

## **INDEFINITE-DELIVERY CONTRACT**

There are three types of indefinite-delivery contracts: 1) definite-quantity contracts, 2) requirements contracts, and 3) indefinite-quantity contracts. The appropriate type of indefinite-delivery contract may be used to acquire supplies and/or services when the exact times and/or exact quantities of future deliveries are not known at the time of contract award.

## **COST-PLUS-INCENTIVE-FEE**

A cost-reimbursement-type contract with provision for a fee, which is adjusted by formula in accordance with the relationship that the total allowable costs bear to target costs. The provision for increase or decrease in the fee, depending upon allowable costs of contract performance, is designed as an incentive to the contractor to increase the efficiency of performance.

## **FIRM-FIXED-PRICE**

A fixed-price contract that provides for adjusting profit and establishing the final contract price by application of a formula based on the relationship of total final negotiated cost to total target cost. The final price is subject to a price ceiling, negotiated at the outset.



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