AVIATION WEEK
PROGRAM EXCELLENCE AWARDS

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Thank you for participating,

Gregory Hamilton
President
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Acknowledged, agreed, and submitted by

John Malaney — Digitally signed by John Malaney
Date: 2025.07.03 13:49:41 -07'00'

Nominee's Signature ______ Date ______

Nominee's Name (please print): John Malaney

Title (please print): Director, UCAV Programs

Company (please print): GA-ASI

NOMINATION FORM

Name of Program: XQ-67A OBSS Demonstrator

Name of Program Leader: John Malaney

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- ☒ Customer Approved
  - Date: 1 July 2025
  - Customer Contact (name/title/organization/phone): Trenton White, OBSS Program Manager, Air Force Research Laboratory, 937-245-1380
- ☐ Supplier Approved (if named in this nomination form)
  - Date:
  - Supplier Contact (name/title/organization/phone):

PLEASE REFER TO PROGRAM EXCELLENCE DIRECTIONS AS YOU COMPLETE THIS FORM.

SECTION 1: EXECUTIVE SUMMARY

Make the Case for Excellence

Value: 10 points

Use 12 pt. Times Roman typeface.

What is the vision for this program/project? What unique characteristics and properties qualify this program for consideration?

The Off-Board Sensing Station (OBSS) is an Air Force Research Laboratory (AFRL) program and General Atomics Aeronautical Systems, Inc. (GA-ASI) was selected in October 2021 to design, build and fly a new low-cost experimental uncrewed aircraft on an extremely aggressive completion schedule. OBSS reached critical design maturity in under 12 months using a robust digital engineering framework and achieved first flight on February 28, 2024, less than 30 months from contract award. Following first flight, OBSS was given the military designation XQ-67A making it GA-ASI's first official "X-plane."

The vision for this program can be summarized from the AFRL Statement of Objectives (SOO) as "the Air Force needs unmanned aircraft system (UAS) concepts that can offer dramatic reductions in life cycle cost," and that can be "delivered in months versus years" in order to "benefit from almost constant technology refresh." This need statement is based on the fact that, prior to 1975, the average time to develop new aircraft from concept to fully realized systems capable of achieving an initial operating capability (IOC) milestone was five years on average. Since then, aircraft development timelines have increased to over 20 years on average. The F-35 program is a prime example of this. As the research arm for the U.S. Air Force (USAF), AFRL engaged with the defense industrial base to look for ways to drastically reduce aircraft development timelines and costs in advance of the Collaborative Combat Aircraft (CCA) program of record that was in early planning phase at the time. The success of the AFRL OBSS program in achieving these goals provided Air Force leaders with the confidence they needed to initiate development of the CCA in October 2023 with a first flight mandate in CY2025.

In order to achieve the aggressive cost and schedule goals set by AFRL, the OBSS team at GA-ASI had to adopt significantly different program management approaches and methods compared to what had become the norm within the aerospace defense industry over the last 40 years. First, they determined that a much higher level of collaboration was required with their government counterparts at AFRL. This was achieved by enabling a new level of transparency between the development team at GA-ASI and AFRL. This included enabling direct access by AFRL to the digital engineering development environment at GA-ASI, as well as on-demand visits and physical access to GA-ASI facilities in California whenever desired by AFRL personnel. Secondly, the program team effectively used collaborations with AFRL on past programs, such as the Low-Cost Attritable Aircraft Platform Sharing (LCAAPS) program, to inform and accelerate the OBSS program. And third, AFRL reciprocated with transparency of their own by sharing lessons learned from prior development programs under this initiative, so those experiences could be incorporated into the OBSS effort. Without this collaboration, the OBSS program would not have been able to overcome the many challenges that are inevitable in any modern aircraft development program that on so many past programs have resulted in significant cost and schedule overruns.

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DIRECTIONS

- **Do not exceed 10 pages in responding to the following four descriptions**.
  - Allocate these 10 pages as you deem appropriate, but it is important that you respond to all four sections.

- DO NOT REMOVE THE GUIDANCE PROVIDED FOR EACH SECTION.

- Use 12 pt. Times Roman typeface throughout.

- Include graphics and photos if appropriate; do not change margins.

SECTION 2: VALUE CREATION

Value: 15 points

Please respond to the following prompt:

➢ **Clearly define the value of this program/project for the corporation; quantify appropriately**

GA-ASI is committed to making significant contributions to the success of the UAS air dominance market similar to the successes the company has achieved in the air-to-ground ISR Medium Altitude Long Endurance (MALE) UAS segment over the last 30 years.

GA-ASI led the air-to-ground ISR UAS revolution, accumulating close to 9,000,000 flight hours with 90% of those hours in combat, while maintaining a 90% availability rate for its products. GA-ASI's mission, since it was founded in the 1990s, has been to support the war fighter with reliable UAS platforms to deter aggressors and prevent conflicts from escalating into wars. In recent decades this meant developing UAS aligned with counter-terrorism missions. As the defense posture of the United States pivots toward missions to counter aggression from our near peer adversaries, GA-ASI intends to expand our UAS product portfolio to align with those needs.

A significant aspect of the pivot to deterring near peer adversaries is the need to provide affordable combat mass to the USAF. In the UAS air dominance domain, this means producing aircraft that are at least an order of magnitude less costly than crewed fighter aircraft but are capable enough to team effectively with them. This is the basis for the USAF Autonomous Collaborative Platform (ACP) concept with the first type of ACP to be developed being the CCA. The successful completion of the XQ-67A flight test program is a crucial step which validates many of the concepts that serve as the foundation for ACPs in general, and the CCA specifically. The OBSS program helps ensure CCAs are capable of operating alongside the most lethal crewed fighters of today and tomorrow, while remaining affordable.

In October of 2023, GA-ASI was selected as one of five contractors to develop CCA preliminary designs for evaluation by the USAF. In April of 2024, GA-ASI was one of two contractors down-selected to finalize their preliminary CCA design, build production-representative prototypes, and conduct developmental flight testing. Without a doubt, GA-ASI's success with AFRL on the OBSS program helped validate GA-ASI as a legitimate competitor for the CCA program.

- **Clearly define the value of this program/project to your customer**

While the rest of the military industrial complex was focused on the war on terror for the first 15 years of this century, AFRL was focused on a future conflict. AFRL realized that affordable combat mass was critical for achieving victory against a peer adversary. As a result, AFRL started the Low Cost Attritable Aircraft Technology (LCAAT) initiative, which spawned multiple programs in the mid-2010s, to explore the art of the possible with attritable aircraft.

The first AFRL effort was the Low-Cost Aircraft Strike Demonstrator (LCASD) program resulting in the XQ-58A Valkyrie. LCASD was a design and manufacturing benchmark, and showed that an air vehicle in this class could be designed against a notional set of requirements for limited life, built to achieve low cost targets, and flown in a short period of time.

After LCASD, AFRL took inspiration from another industry that produces high rates of complex, but affordable, systems on a daily basis: the automotive industry.

Automotive companies manufacture multiple vehicle variants using the same chassis. Their approach is a single chassis that can be the backbone for multiple car models (e.g. a small SUV, a medium sized SUV, and two sedan models). This enables the car company to create a highly automated, low-cost manufacturing line because multiple car models are built using the same chassis.

In 2017, AFRL created the Low-Cost Attritable Aircraft Platform Sharing Program—LCAAPS. AFRL wanted to understand the trade space related to developing multiple aircraft models (Species) off of a single core chassis (Genus). The core goal for LCAAPS was to achieve a 100th unit production cost of $3M (FY2015 dollars, aircraft only—no mission systems).

The OBSS program followed the LCAAPS program as the first Species aircraft to be built from an LCAAPS Genus. GA-ASI was awarded the contract in October 2021 for the design and awarded the option in Q3 2022 to build and fly the aircraft. OBSS was the capstone program for LCAAT initiative with an objective to quantify the cost and time savings for using the Genus-Species development method. By building and flying the XQ-67A, AFRL and GA-ASI were able to validate the assumptions, requirements, and intelligent risk that the program accepted to quickly design and build an autonomous collaborative platform (ACP) at the lowest cost timeline. Ultimately, the OBSS program provided the USAF the assurance they were seeking to validate that industry can provide affordable UAS combat mass capable of meeting USAF operational imperatives.

- **Clearly define the value of this program/project to members of your team; quantify if possible**

For the GA-ASI team who dedicated themselves to the success of the XQ-67A OBSS aircraft, one of the most thrilling and inspirational values of the program can be found in the first letter of the aircraft designation. Developing GA-ASI's first official X-plane required not only dedication but also the ability to collaborate with each other and our customer at a much deeper level, at a much higher tempo, while overcoming the many unforeseen challenges that come with developing and building an experimental aircraft – all this while executing to an extremely aggressive timeline.

To say this program was a monumental challenge is an understatement. The team who worked on this program were drawn from the top talent at GA-ASI, but to get to first flight on the aggressive timeline required, they were forced to grow and become even better engineers, program managers, procurement specialists, technicians, financial analysts, etc. This growth in capability and experience was not always comfortable. In order to be successful, this team had to learn to accept higher risks where appropriate, to identify when more analysis was only going to yield diminishing returns, and to prioritize what needed to be done on a given day and ensure it was completed, even when that meant working into the night. On top of all that, despite a higher level of risk acceptance on the program overall, the aircraft still needed to be safe for flight and was subject to the full aerospace level of rigor for airworthiness evaluation prior to being granted a military flight release.

The value of the OBSS program to the team was the experience of working together on an extremely challenging program and achieving success in spite of all the setbacks and challenges experienced along the way. Together with the AFRL team, they sharpened their skills, learned to think differently, and rapidly developed an experimental aircraft that provided proof of concept for the USAF's CCA program.

- **Clearly define the contribution of this program/project to the greater good (society, security, etc.)**

The XQ-67A OBSS program validates the cost and schedule attributes required for ACPs by the USAF in order to achieve affordable combat mass that can adapt quickly to improvements in technology without 20 year development timelines that end up costing taxpayers double, sometimes triple, or even more, compared to what was originally estimated at the beginning of development. This is imperative in order to provide a cost-effective deterrent to near peer adversaries of the U.S. and its allies.

From both a cost and schedule perspective, the Genus/Species concept explored on the OBSS program allows for aircraft to be developed quickly in the first place and then adapt quickly to mission needs in the future that military analysts do not even know exist today. Previously, new mission requirements would often require a new aircraft to be developed from scratch to become capable of that new mission or even just to effectively exploit a newly developed payload. This program enables a core Genus to be produced at a very low cost with mission kits to be developed within months, as needed, to support changing war fighter needs ensuring the USAF always has the most capable uncrewed air force in the world.

The achievement of maturing technologies such as XQ-67A's shared-platform design and accelerated construction methodologies (which will allow for efficient, affordable production at scalable production volume) cannot be understated.

SECTION 3: ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP

Value: 35 points

Use 12 pt. Times Roman typeface

Please respond to the following prompts:

- ***15 points:*** **Describe the innovative tools and systems used by your team, how they contributed to performance and why**

Opportunities for innovative tool development and use occurred frequently during the OBSS XQ-67A program. Some of the most important opportunities were realized by our Flight Technologies, Software, and System Test & Evaluation teams.

In order to save schedule and program cost, GA-ASI and AFRL agreed to forego traditional aircraft risk reduction testing such as high-speed wind tunnel testing as well as engine performance testing at the subsystem level on a test stand. This meant that the first time the airframe and propulsion systems ever saw actual high-speed flight conditions was during high-speed flight.

High subsonic and transonic computational fluid dynamics (CFD) models were used to analyze the design and predict aircraft performance. While most aircraft programs anchor the high speed CFD models to high-speed wind tunnel data, XQ-67A anchored its low speed CFD models to low-speed wind tunnel testing and trusted the CFD models to accurately predict aircraft and engine inlet performance at high subsonic speeds. While this increased uncertainty going into flight testing, it was a key enabler for accelerating the development schedule. GA-ASI then performed real-time inlet performance monitoring during flight testing to validate its CFD models at high speeds.

In alignment with the rapid development paradigm of the program, the initial flight testing planned for the platform was not intended to exceed five flights. This required efficient and effective use of the five flights in order to verify all key performance parameters. To enable the fastest possible progression through the complete flight envelope while managing risk, a variety of real-time analysis tools were developed to assess flight controller gains automatically, providing rapid clearance of flight conditions as autonomous maneuvers were executed. Other newly developed tools provided enhanced situational awareness of monitored aircraft states, measured sensors, and internal processing in formats easily actionable by human test monitors.

All of this test execution was backed by the confidence provided by extensive hardware-in-the-loop testing and simulation using actual flight hardware in a laboratory environment prior to first flight. Extensive simulation, as representative as possible of actual flight conditions, was a critical tool for developing flight controllers, software, and test procedures simultaneously, all of which was done using a mixture of traditional and improved GA-ASI tools and processes supported by evolving auto-coding techniques to alleviate human workload.

- ***10 points:*** **Define the unique practices and process you used to develop, lead and manage people?**

First, AFRL and GA-ASI formed a highly collaborative team focused on complete transparency. Our goal was to avoid the traditional bureaucratic contractor/customer relationship that prioritizes compliance with contract regulations via formal communications at defined intervals using government mandated “gate” reviews that must be approved in series. This serial development mindset often results in delays while action items from the last gate review are addressed and closed before work begins on the next set of dependent tasks. Instead, AFRL and GA-ASI jointly fostered a relationship where we were on the same side of the table working together to tackle the program's known and unknown challenges. Both sides trusted that all involved had the program's best interests at heart throughout the development, build, and testing of the aircraft, which allowed many tasks to be executed in parallel instead of in series.

Second, due to the aggressive cost and schedule objectives, AFRL and GA-ASI rigorously attacked unnecessary system requirements ensuring that only critical requirements were allowed to remain. This was predicated on the idea that every requirement levied by the customer ultimately costs money in order to verify it was met. If a requirement couldn't be shown to be critical for the design to meet program objectives, it was eliminated.

Third, the team streamlined and tailored all engineering processes, drawing release processes, manufacturing processes, and testing processes to maximize efficiency. The team questioned all processes to ensure only the absolutely necessary ones were used in accordance with program objectives without sacrificing flight safety during the flight test program.

Fourth, AFRL and GA-ASI agreed to funnel critical communications through key Program Management and Engineering Points of Contact (POCs). This approach prevented communication of changes in technical or programmatic direction to flow to the rest of their teams unless it was first validated with them, ensuring the teams maintained efficiency by not having to react to potentially well-intentioned, but not approved changes in direction or scope. All changes of this nature were documented and agreed upon in writing by both parties to ensure everyone agreed with "eyes wide open" with respect to the consequences to the program.

Fifth, recurring cost was treated as a design requirement from the beginning of development. The estimated cost for parts and assemblies was as important a driver of design decisions as structural, functional, or performance requirements and was weighted appropriately when trades needed to be made during development.

- ***10 points:*** **How did you leverage skills and technologies of your suppliers?**

GA-ASI is a very vertically integrated company compared to others in the aerospace industry today, which allows us to be our own supplier in many areas. This provides significant benefits because GA-ASI is able to exert more control over the designs and the quality assurance of lower-level parts and assemblies that we integrate into our aircraft systems. An example of one of the benefits in this area is GA-ASI was able to start building a complete set of production aircraft avionics at risk to ensure that they would be ready for integration into the OBSS aircraft if GA-ASI were selected by AFRL for this contract. This is an acceptable risk for GA-ASI because many of the avionics parts are useable in other GA-ASI aircraft and any parts forecast for a program we do not end up getting selected for can be re-allocated to another program.

That notwithstanding, GA-ASI relies on critical suppliers for some very significant aspects of our designs including our engine, some of our critical airframe tooling, carbon composite fabrics, vacuum assisted resin transfer molding, and other items. To help ensure success, the OBSS team focused on high Technology Readiness Level/Manufacturing Readiness Level (TRL/MRL) technologies and components from highly experienced, trusted, and industry-leading vendors. This ensured cost targets and schedule objectives were achieved.

Specifically, for the OBSS engine, we selected a highly reliable FAR-33 certified engine used on commercial business jets, to reduce risk. For complex tool geometries, we selected an industry leading tooling company that has proven itself over and over again on multiple aircraft programs. For light weight, complex tail structures, we selected a company that GA-ASI has used for over a decade that excels in this area.

As the global leader of MALE UAS design and production with products that have accrued more flight hours than any other OEM in the industry, GA-ASI enjoys exceedingly strong relationships with our key suppliers that we have developed over decades.

SECTION 4: DEALING WITH PROGRAM COMPLEXITY

(VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, or VUCA)

Value: 25 points

Use 12 pt. Times Roman typeface

Please respond to the following prompts:

***10 points:* Describe UNIQUE areas of VUCA faced by your program and why. (Please avoid the issues surrounding Covid-19 pandemic, which was faced by all programs.)**

A unique area of VUCA faced by the OBSS Program was the union of the Genus and Species aspects of the design. The Genus, which includes elements like the avionics, fuel system, landing gear, fuselage structure, and wing/tail interfaces, was inherited from the LCAAPS Program and was intentionally meant to be used as a non-volatile part of the OBSS design. In contrast, the Species aspect of the design included many areas of VUCA. The wings, tails, engine inlet(s), fuselage skins and other elements were meant to be customized based on the specific requirements for the OBSS Program and married to the LCAAPS Genus. In addition, it was desirable to show that the specific requirements for OBSS could exhibit VUCA through the beginning of the design process while design tradeoff analyses (performance and cost) were completed without causing huge delays to the overall program schedule. In effect, one of the unique characteristics of the OBSS Program was that it was intentionally set up to recognize and plan for the VUCA that nearly all aircraft development programs face in reality and is caused by requirements instability during the initial phases. The Genus aspect of the design allowed the program to isolate most areas of VUCA to just the Species design elements, which minimized cost and schedule impacts to the program.

- ***15 points:* Explain how your team responded to these challenges. What changes did you make, what were the results**

The PM and engineering teams had to develop strategies for managing a complex aircraft design where part of the design was known and fixed (Genus) and the other part was subject, at least initially, to a large amount of VUCA (Species).

The Genus structure and fuel system layout was designed in 2020 to the requirements levied by the LCAAPS program. In mid-2021, the Genus was structurally tested, and the low-cost fuel sealing techniques in the design were verified. In October 2021, AFRL selected GA-ASI to begin designing an OBSS Species around the already-designed and tooled Genus structure. GA-ASI completed the OBSS critical design review (CDR) by September of 2023.

In order to save schedule and program cost, GA-ASI and AFRL agreed to forego traditional risk reduction testing such as high-speed wind tunnel testing and an engine test stand. This meant addressing the associated uncertainty in aeroperformance and flight control by accepting more risk and being creative in defining a flight test program to burn these risks down quickly and safely. This was especially challenging since only five flight test events were included in the program.

As discussed previously, cost was as much of a design requirement as structural and functional requirements. Cost budgets were assigned to different areas of the vehicle in addition to the performance and functional requirements. This drove the team to incorporate low-cost manufacturing methods into the design such as infused braided/woven composites and low-temperature VARTM wherever feasible. Additionally, 3-D printed structures were used when that manufacturing approach fulfilled the programmatic objectives and requirements.

Additionally, the aircraft did not have a typical 1.5 structural ultimate factor of safety (FoS). Instead, the structure was designed to a 1.2 ultimate FoS. Additionally, the aircraft was structurally testing to a 1.15 FoS pushing the test program extremely close to the design limit. Additionally, fatigue analysis was waived since attritable aircraft were meant to have a limited life vs. the typical 20-30-year life of more expensive military systems.

High subsonic and transonic computational fluid dynamics (CFD) models were used to analyze the design and predict aircraft performance. While most aircraft programs anchor the high speed CFD models to high-speed wind tunnel data, XQ-67A anchored its low speed CFD models to low-speed wind tunnel testing and trusted the CFD models to accurately predict aircraft and engine inlet performance at high subsonic speeds. With this increased uncertainty going into flight testing, GA-ASI was able to perform real-time inlet performance monitoring during flight testing to validate these analyses.

SECTION 5: METRICS

Value: 15 points
Use 12 pt. Times Roman typeface

Please respond to the following prompts, where predictive metrics indicate items that provide a view of how yesterday's actions and today's actions will affect the future timeline, cost or other requirement.

Provide charts/graphs that illustrate performance to these metrics:

- **What are your predictive metrics?**

The primary AFRL objective of the LCAAPS / OBSS lineage of programs was cost for a relevant, war-fighting ACP. All decisions were focused on reduced requirements while optimizing the design and manufacturing to minimize aircraft recurring cost.

The secondary objective was time to ramp for an aircraft starting with only a Genus and minimal additional design work.

- **How did you perform against these metrics?**

While the final cost per pound metrics cannot be released at this time, the AFRL and GA-ASI team demonstrated that the OBSS program cost objective of $600/lb. (FY 2015) for a non-missionized aircraft is achievable.

From a program schedule perspective, GA-ASI designed OBSS in 11 months. Additionally, starting with no parts manufactured in late September of 2022, GA-ASI had a completed aircraft on the flight line for ground testing in November of 2023 with a military flight release (MFR). Between ground testing discoveries and weather delays, the aircraft first flew on February 28, 2024—17 months after option (aircraft build and flight test) award and 16-months after the program CDR. If the program funding profile were different, GA-ASI would have started manufacturing the aircraft in May of 2022 reducing the timespan from program start to first flight from 28 months to 22 months.

The OBSS program accelerated multiple low-cost manufacturing techniques while pushing the envelope on minimal system requirements. AFRL and GA-ASI have demonstrated a path to achieving previously unrealistic cost targets for unmanned aircraft systems.

- **How do your predictive metrics drive action toward program excellence? Please provide examples.**

The predictive cost and schedule metrics prove that autonomous collaborative platforms will enable the U.S. military to generate affordable combat mass for future warfighting success.

The best example we can provide is this: Former Secretary of the Air Force (SECAF) Frank Kendall spoke about needing ACPs and Collaborative Combat Aircraft (CCAs) to support future warfighters needs generating affordable combat mass at $25M to $30M per aircraft in a fully missionized configuration. AFRL and GA-ASI validated through XQ-67A that the former SECAF's objectives are achievable.