

February 12, 2024

The City of Signal Hill Administration  
Reference: Centennial Celebration Event Drone Show

To whom it may concern,

It is a pleasure to express Firefly Drone Show's enthusiastic interest in participating as the drone show provider for The City of Signal Hill's 100th Anniversary Celebration event scheduled for April 27th, 2024.

Understanding the unique significance of this milestone celebration, the Firefly team has thoroughly reviewed the Request for Proposal and has confidence in our ability to meet and exceed expectations. We appreciate the importance of delivering a captivating and memorable drone show that aligns seamlessly with the spirit of The City of Signal Hill anniversary.

As the 3rd company in the world to be fully licensed by the FAA; we've spent the last 7 years refining drone light show capability standards. With the only in-house drone show system designed and manufactured right here in the USA, Firefly is able to offer a seasoned and professional approach to your event's drone show production. Our team consists of industry thought leaders and developers who possess extensive expertise in drone technology, event coordination, and creative animation. We pride ourselves on our commitment to entertainment design, safety, and client satisfaction. We are confident in our ability to deliver a unique and memorable experience that will leave a lasting impression on the Signal Hill Community.

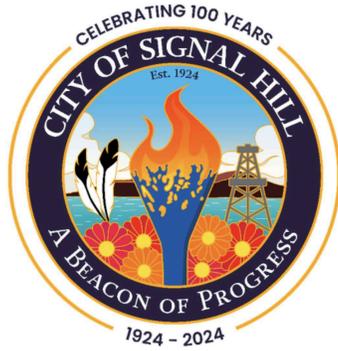
In response to The City of Signal Hill Request for Proposal; you'll find all of the necessary details relating to our experience, qualifications, show operations, and costs in the documents included with this letter. Our vision here at Firefly is to bring value to The City of Signal Hill as a partner when producing a unique community drone show together. We appreciate your consideration of our proposal and look forward to the possibility of collaborating on this extraordinary event. I will personally serve as the Project Manager and Primary Contact for this production. Should you require any additional information or clarification, please do not hesitate to contact me and I'd be happy to help!

Best regards,  
Matthew Sanker  
Sales Manager | Lead Producer  
[matthew@fireflydroneshow.com](mailto:matthew@fireflydroneshow.com)



Firefly Drone Shows, LLC  
5105 Williams Lake Rd  
Waterford, MI 48329  
(248).461.6615

<https://www.fireflydroneshow.com/>



# FIREFLY DRONE SHOWS

## THE CITY OF SIGNAL HILL

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Project Name: 100th Year Anniversary of City of Signal Hill-Drone Show

Firefly Drone Shows, LLC  
5105 Williams Lake Road  
Waterford MI, 48329  
+1 (248) 461-6615

### **Primary Contact:**

Matthew Sanker, Sales Manager | Firefly Drone Shows  
[matthew@fireflydroneshow.com](mailto:matthew@fireflydroneshow.com)  
Office: 1 (248) 461-6615  
Cell: 1 (810) 710-0814

### **ATTN:**

The City of Signal Hill Administration  
2175 Cherry Ave  
Signal Hill, California  
90755  
[achristenson@cityofsignalhill.org](mailto:achristenson@cityofsignalhill.org)  
562-989-7328

## **EXPERIENCE AND QUALIFICATIONS**

### **BIOGRAPHY**

It began with three partners and a dream to bring a new eco-friendly, awe-inspiring, and creatively uncapped activation to the event industry. From the ground up, Firefly Drone Shows, LLC was established in 2017. Ensuring the quality and precision in each drone show production and continuing to drive innovation in the industry, Firefly is still operated by its original three partners along with a highly trained network of experts. This includes the development team, production and design team, and operations team. The development team consists of a mixture of in-house and subcontracted industry leading hardware/software developers, innovative autonomous quadcopter flight specialists, as well as master systems engineers that bring Firefly's drone systems to life. Alongside development, Firefly's production team carries each project from any creative vision to a fully programmed drone show. This team consists of industry leading in-house animators, designers, and audio engineers; along with a partnering high-end animation studio. These talented artists bring each idea to life. After programming and animation, Firefly's seasoned pilots, field managers, crew hands, and logistics coordinators successfully deploy each show with precise expertise. Every step of the process, Firefly's experienced drone show producers continue to carry each project's vision all the way to the day of show. Altogether our team of 20+ full-time professionals and network of subcontractors currently design, produce, and perform over 100 shows annually. As the 3rd company in the world to be fully licensed by the FAA; we've performed shows across the entire United States, as well as a handful of countries internationally. Since its conception, Firefly continues to exponentially grow in size and quality to ultimately provide the most impressive productions and memorable drone shows yet. All of Firefly's drone fleets, positioning/communications systems, and piloting software are proprietary and are specifically designed for drone light shows.

Regarding Firefly's stability and accumulated experience; Firefly has successfully persevered through the challenges a new industry may face over time. Through economic dips, computer chip shortages, and a global pandemic that ultimately halted the event industry; Firefly has prevailed with grit and determination to maintain its industry leading and innovative reputation. To this day, over 7 years after its doors have opened, Firefly has honored every contract and does not cease to grow financially, organizationally, and technologically under any circumstances. Even on social media platforms, our projects have gained an extensive amount of impressions. With some of our latest posts gaining over 40 million views!

In 2023, Firefly performed a total of 113 live drone shows, with a total of 33,300 successful live drone flights. Below is the list of states serviced in 2023: Texas, Florida, Michigan, Washington, Arizona, Virginia, Kentucky, Oklahoma, Hawaii, Ohio, Pennsylvania, California, Illinois, Indiana, Utah, West Virginia, Massachusetts, Tennessee, Idaho, Georgia, Kansas, Arkansas, North Carolina, Minnesota, Wisconsin, and the Virgin Islands. To share a bit more regarding our company, please navigate to our latest [Production Highlight Video](https://www.youtube.com/watch?v=brxViIMy4rI). (<https://www.youtube.com/watch?v=brxViIMy4rI>)

## **PORTFOLIO**

Firefly has had the distinct pleasure to work with a number of different clientele. From cities to amusement parks, Some of our clients include; PGA Tour, T-Mobile, Capital One, Google Cloud, Xbox, Marvel, Amazon Music, Dell Technologies, Acura, Ford Motor Co, Sinclair Gasoline, Empire Records, Holiday World, as well as the Canyons Village Management Association to name a few. To view our portfolio, please navigate to our [work page](https://www.fireflydrones.com/work) on our website ([fireflydrones.com/work](https://www.fireflydrones.com/work)). There you can find the wide array of different experiences we've greatly enjoyed cultivating over the years.

## **OUR TEAM**

**Kyle Dorosz** - CEO and Co-founder of Firefly Drone Shows, LLC. Kyle has been designing and programming quadcopters since 2010. Having founded and operated an industry leading aerial imagery company since 2013, (<https://www.aerialimageryworks.com>), it was no question for Kyle's entrepreneurial spirit to lead his interest in more innovative drone applications. Kyle now continues to run the Research and Development of drone swarm technologies along with ensuring that all operations are up to a premium standard. Kyle holds both a Part 107 UAS and Part 41 Private Pilots License.

**Adam Gray** - COO and Partner of Firefly Drone Shows, LLC. Adam has been operating quadcopters for various applications including autonomous drone surveying and mapping since 2014. Having an intense passion and understanding for the capabilities of autonomous flight, Adam leads as the Chief Pilot in command. Overseeing all operations for pilots and drone technicians here at Firefly. Along with his role as COO and Chief Pilot, Adam also serves as the Lead FAA Liaison for all Airspace Authorizations and Waiver Approvals. Adam holds a Part 107 UAS License.

**Ryan Sigmon** - Director of Sales and Co-founder of Firefly Drone Shows, LLC. Ryan has maintained an enthusiasm for introducing customers to this new technology across the country. With a background in creative design and licensed consumer products since 2011, Ryan continues to ensure that every customer's vision is thoroughly heard and carried out to the best quality possible. While working directly with the animation and production team, Ryan also serves as the Executive Producer for Firefly.

**Jonathan Hearl** - Pilot at Firefly Drone Shows, LLC. Jon has been an enthusiast in quadcopters since 2014. Having graduated from the prestigious Embry-Riddle Aeronautical University with a 4 year UAS degree, obtained a Part 107 UAS license, a Part 41 Private Pilot's license, and a passion for drone technology, Jon makes a great fit to Pilot Drone Shows across the Nation.

**Joseph Poppleton** - Pilot at Firefly Drone Shows, LLC. Joey has also been an enthusiast in quadcopters since 2014. Having been in the first graduating class of the UAS program at University of Nebraska, obtained a Part 107 UAS License, and with field experience in autonomous quadcopter flight in both drone swarms and surveying since 2018, Joey continues to Pilot Drone Shows Nationwide.

**Matthew Sanker** - Sales Manager at Firefly Drone Shows, LLC. Matthew has been in the event industry since 2015. Having a passion for entertainment, customer relations, event production, and project management, Matthew continues to bring projects to completion with a standard of excellence, ensuring that the customer's vision is brought to the sky. Matthew holds a Part 107 UAS license.

**Michael Sanker** - Creative Director at Firefly Drone Shows, LLC. Michael has been involved in several creative mediums for just under two decades and in the event industry since 2015. With a passion in creative design, experiential artistry, animation, and media production, Michael continues to lead and create with Firefly's immersive drone show design and animation team.

## REFERENCES

### **City of Pompano Beach, FL**

*Contact:* Sandra King, Communications Administrator | (954)-786-4527 |

Sandra.King@copbfl.com

*Project Overview:* With an estimated number of over 20,000 guests, Pompano City Beach has created an event solely around a drone light show taking place next to their landmark pier. Firefly performed a 200-drone show in 2022 for this Southern Floridian Community which received such a positive response, that the city has decided to make the event an annual occurrence. Firefly has just recently performed two 300-drone show displays this past November.

Highlight Video: <https://youtu.be/SWYig2jJQI?si=VQjAEUjVPzr5VqOW&t=56>

### **Canyons Village Management Association, UT**

*Contact:* Brian Madacsi, President and CEO | (435) 655-2582 | bmadacsi@cvma.com

*Project Overview:* For three consecutive nights on July 1st-3rd, 2022; Firefly performed a 200-drone show at the Forum Festival Event held at Canyons Village. For four consecutive nights on July 1st-4th, 2023; Firefly performed a 300-drone show at the Forum Festival Event held at Canyons Village. Due to the event's success these past two years, Firefly will be performing another set of 300-drone shows for four consecutive nights in 2024.

Highlight Video: <https://youtu.be/fWVYyE44YZl8?si=P66vvSLccPwiTz7Y>

### **Shelby Township, MI**

*Contact:* Nicholas Monacelli, Production Coordinator | (586)-254-7130 | nmonacelli@shelbytwp.org

*Project Overview:* As the Township was looking for an alternative to fireworks for their 2023 Holiday Celebration. Firefly was awarded the bid to provide a 300 drone show for the annual Christmas Aglow event. With a resounding response from the community, Firefly will be back in July for another community celebration with the 2024 Christmas Aglow event in discussion as well.

Highlight Video: [https://youtu.be/GeGoKXq5bTA?si=JErJYAL\\_Uh-ayBcJ](https://youtu.be/GeGoKXq5bTA?si=JErJYAL_Uh-ayBcJ)

### **North Huntingdon Township, PA**

*Contact:* Dan Miller, Director of Parks & Recreation | (724)-863-3806 ext. 124 | dmiller@nhtpa.us

*Project Overview:* Celebrating their SesterCentennial in 2023, Firefly provided a 300 drone show for the community for a carnival event. With over a thousand people in attendance, the show made a big impact on the community.

Highlight Video: <https://youtu.be/mZIJ-yJTfeA?si=Yqj5hiPLgIH960jH>

### **Park City, UT**

*Contact:* Jennifer Dierson, Special Event Manager | (435) 640-5063 | [jenny.diersen@parkcity.org](mailto:jenny.diersen@parkcity.org)

*Project Overview:* To provide an eco-friendly city wide 4th of July Celebration on the night of July 4th, 2023; Firefly performed a 200-drone show at the top of a ski hill attached at a resort overlooking the city. Due to city promotions via local radio and press, thousands of community members were able to come and enjoy the display.

Highlight Video: <https://youtu.be/qUddpCfiZQ0?si=U1UvPdnvUt9ANuGu>

### **Arlington Fly-in, WA**

*Contact:* Barbara Tolbert, Events Coordinator | (360)-435-5857 | [barbara.tolbert@arlingtonflyin.org](mailto:barbara.tolbert@arlingtonflyin.org)

*Project Overview:* In 2018, The coordinators of Arlington Fly-in brought Firefly out to perform a small 60 drone show to cap their night of extraordinary aerobatic flights. For the years following, Firefly has brought out an increasingly more impressive show each year. With the latest show being a 200-drone show taking place over the Arlington Airport runway dazzling thousands of guests.

Highlight Video: [https://youtu.be/9I43fi3sw\\_g?si=jKG1RwtikNiKzAda](https://youtu.be/9I43fi3sw_g?si=jKG1RwtikNiKzAda)

### **Milwaukee Downtown, WI**

*Contact:* Beth Weirick, CEO | 414-220-4700 ext. 1 | [bweirick@milwaukeedowntown.com](mailto:bweirick@milwaukeedowntown.com)

*Project Overview:* During the pandemic, Milwaukee Downtown and Firefly produced a live streamed drone show for Milwaukee Holiday Lights Festival. This show took place just outside of Downtown Milwaukee, creating a spectacle for many to see live streamed or in person.

Highlight Video: <https://youtu.be/RjBZWZTPRCw?si=HPNyJMjN9YQEIUB->

### **City of Sequim, WA**

*Contact:* Barbara Hanna, Marketing Director | (360) 681-3422 | [bhanna@sequimwa.gov](mailto:bhanna@sequimwa.gov)

*Project Overview:* Since 2020, Firefly has worked with the City of Sequim to plan, design, produce and perform a drone light show for the annual Sunshine Festival. In 2023 Firefly brought out a 200-drone show to the event, and is currently discussing plans for 2024. Our show has been known for bringing out the largest crowds for any event held in Sequim.

Highlight Video: <https://youtu.be/-tiOd9zu8og?si=yR5yIz8gGRMJxSFr>

## CUSTOMER TESTIMONIALS

### Holiday World & Splashin' Safari - Santa Claus, IN

**Testimonial:**

*"The Firefly Drone Shows team has been incredible to work with. Four unique shows have been designed and flown over our Indiana theme park nearly 100 times over the last two years. Their drone technology has rapidly improved to become the brightest and most accurate drones in the industry. Our guests love every show and thousands of people stay to watch every night! We've seen a lift in satisfaction scores plus increased revenue as a result.*

*To top it off, Firefly is a company of good people. They are responsive, professional, and collaborative. Their passion for perfection shines bright and I look forward to working with them on another 50+ shows in 2024."*

- Eric Snow | Vice President & Chief Marketing Officer

**Highlight Video:** [https://youtu.be/CFk6Up\\_SSLA?si=61\\_5QDVE3tzgIFH3](https://youtu.be/CFk6Up_SSLA?si=61_5QDVE3tzgIFH3)

### Exploration Place, Science and Discovery Center - Wichita, KS

**Testimonial:**

*"Firefly Drones is a first-class partner, and Exploration Place is proud to be a repeat customer. Taking on our first drone light show was a bit of a risk for our science museum because it is a significant investment and something our community had no experience with. During our first conversation with Ryan and the Firefly team, we were impressed by their technical expertise as well as their consideration for legal requirements and risk management. Their breadth of knowledge and depth of experience figured significantly in our decision to hire Firefly Drones.*

*But drone shows are not just about technical precision. There truly is an artistry to these productions, and we loved working with the Firefly creative team to put together shows that absolutely wowed our community. We worked together on our vision, and the Firefly team took great care in designing custom formations and transitions that were deeply meaningful to Wichita, Kansas."*

- Laura Roddy | Vice President for Advancement

**Highlight Video:** <https://youtu.be/Oj-WaigLJJo?si=PO6LvIVNK-CpoHGv>

### Episcopal Collegiate School - Little Rock, AR

**Testimonial:**

*"Where do we begin with the Firefly team? Between their patience, reliability, and willingness to go above and beyond to ensure that our school had the perfect show- it's hard to articulate our appreciation in a few short sentences.*

*They executed a wonderful production and made it work seamlessly with what our school already had on hand, whether that meant navigating space/facilities, technology, or student/campus life, the priority was to make the event as memorable and easy for us as possible, and that's what they did.*

*Thank you again for playing such a big part in our school's 25th Anniversary Celebration. It made for an unforgettable experience that our community will be talking about for years to come."*

- Lauren Curtis | Director of Marketing & Community Outreach

## **Township Sestercentennial Celebration - North Huntingdon, PA**

### **Testimonial:**

*“Very professional from the initial phone call to the launch. - Matt was a clear communicator from the start educating me about product, service and packaging. We had a vision that was shared and he gave exactly what we hoped for. The night of the show, Ryan and his team of pilots, techs and videographer were outstanding seeing the event to the finish line. Thank you soooo much for exceeding our expectations.”*

- Dan Miller | Director of Parks & Recreation

**Highlight Video:** <https://youtu.be/mZIJ-yJTfeA?si=0K9RjzWoL4Ls-tWJ>

## **Pompano City Beach Veteran’s Day Celebration - Pompano, FL**

### **Testimonial:**

*“I used Firefly two years in a row to provide drone shows on the beach, and am extremely pleased with the quality of the program they were able to provide. I plan to work with them again, and can recommend them without reservation to others in need of a unique, exciting and well-run drone show. A few examples of their high-quality services include:*

- *Professional staff yet easy to work with.*
- *Very responsive and helpful customer service.*
- *Everything they said they would provide, they delivered in a timely manner*
- *They are extremely creative and listen to the client for what theme and transitions to use for the show.*

*I am very happy to recommend Firefly Drone Shows to you, and trust that your experience with them will be as positive as mine.”*

- Sandra King | Strategic Communications Administrator

**Highlight Video:** <https://youtu.be/SWYig2jJJOI?si=6tfSJHOFFT78PoTy>

## **Juniata River Valley Visitors Bureau - Lewistown, PA**

### **Testimonial:**

*“Wow! The Goose Day Drone Light Show that Firefly produced was a rousing success here in Central PA. People are still talking about it and asking if we’ll host it again next year. Of course! Nothing has brought this kind of attention and excitement to our annual holiday. It also has to be one of the easiest events I’ve ever produced. Using only maps, your staff found the best location to set up the drones and could also help us advertise the best places to view the show. For a first year event, that was critical information and spot on. We’re looking forward to next year’s show and are requesting an additional 100 drones. We can only see this show getting bigger and better every year. Thank you again for making us look so good!”*

- Jenny Barron Landis | Executive Director

**Highlight Video:** <https://youtu.be/auSXvs0IUg0?si=ojqYv2LkiKCVhF9g>

## **SHOW SPECIFICS**

### **PLAN EXPLANATION**

Throughout the years, Firefly has found that consistent communication and collaboration with our clients will often produce the most impressive results. With this in mind, attention to detail, comprehension of the end goal, and flexibility to match our customer's timeline has proven to be our key attributes to bring an unforgettable drone show to life. Considering these are our core tenants for every project, Firefly will look to The City of Signal Hill Event Team as our partner throughout the entire production process.

Typically, we like to start each project with an introductory call to listen and take note of our partner's vision for their show. From that initial conversation, we will piece together action items and a timeline to match them. The below timeline is a preliminary template we often work within. Depending on the scope of the design and necessary action items, we are flexible to work with an earlier introduction to the project to allow for additional correspondence between partners. After the scope is defined, our team will get to work. The animation and design team will begin piecing together concepts of the designs agreed upon. Our producers/sales team will be available at any point throughout the process for any questions or material deliverables the customer may need. Including, but not limited to; sharing key items necessary in the planning process, preparing the logistics for the upcoming event, going over any safety protocols necessary, and supplying frequent progress reports from the design team. Our team will continue this process leading up to the show until the logistics, creative content, safety requirements, and client satisfaction has been fulfilled. When executing the performance on the night of the event, Firefly's operation team will professionally and efficiently deploy, operate, and stow Firefly's proprietary drone show system within a few hours surrounding show time. The onsite Team Lead will remain as a point of contact with the appropriate event representatives to properly carry out a safe and successful display. In conjunction with these operations, our FAA Liaison will handle all FAA approvals necessary for our operations to take place at the time and location of the event and will additionally ensure each production is in compliance with Firefly Drone Shows, LLC and FAA standards.

## TIMELINE

Action Item	Date Completed
Initial Creative Call	Feb 29, 2024
Initial Design Preview Presented	Mar 11, 2024
Creative Finalized	Apr 8, 2024
Rehearsal at Test Field	Apr 22, 2024
Logistics Finalized	Apr 10, 2024
Safety Call	Apr 15, 2024
Load-in Onsite	Apr 27, 2024 12:00pm
Sound Check	Apr 27, 2024 5:00pm
Sunset	Apr 27, 2024 6:46pm
Safety Perimeter Secured	Apr 27, 2024 8:45pm
Showtime	Apr 27, 2024 9:00pm
Safety Perimeter Lifted	Apr 27, 2024 9:50pm
Load-out	Apr 27, 2024 11:00pm

*Please Note: This timeline serves as an estimate for lead time and planning purposes. However these are set dates and times above, Firefly is capable of accommodating our client's desired production timeline to the best of our ability.*

## CREATIVE CONCEPTION

### The City of Signal Hill Logo Mock Up (400 Drones)



#### **Artistic Vision**

The bright side to every drone show is that it can truly be specific to the event it embellishes. To present a list of potential designs, our Lead Designer pieced together a sequence of animations that are intended to showcase the “The Story of Signal Hill”. Below is a suggested list of designs for The City of Signal Hill 100th Anniversary Drone Show.

1. The introduction begins with the swarm of drones twinkling upward into the sky, taking over more of the audience's view. The drones then form into planet earth, rotating towards America. We watch, as the drones slowly zoom into the United States and highlight California. To finish the design, a golden star appears over the City of Signal Hill’s geographical location.
2. After the star has rotated and twinkled over the City of Signal Hill for a few moments, the drones begin to form into the shape of Signal Hill with a fire that ignites on the top.

3. As the fire continues to crackle on top of the hill, a group of drones form smoke clouds that rise above the fire. This is intended to represent the origin of the city's name and pays tribute to its initial use of the hill.
4. The smoke clouds then morph together to form "100 YEARS" text that sits above the Signal Hill. We watch as the text morphs into "SIGNAL HILL".
5. The hill, fire, smoke, and verbage all begin to fade away into darkness. With "SIGNAL HILL" being the last thing the audience sees.
6. The drones that once made up the hill scene form into an oil rig that has just struck oil.
7. The audience watches as the oil rig shifts and spouts oil out from the top. (Hidden drones would appear to form the oil. We will add an animation effect to make the movement fluid like).
8. Next, the drones form into a silhouette portrait of Jessie Nelson. This brief formation is intended to pay tribute to "the mother of Signal Hill".
9. From the portrait, the drones begin to wave and ripple as they begin to create a depiction of a 3D replica of the Signal Hill Unity Sculpture. (After this monument, the show begins to shift towards a modern day in Signal Hill.)
10. The drones forming the top of the Unity Sculpture begin to spread out and turn green. As the drones forming the bottom of the Unity Sculpture change and become cylindrical. Ultimately, a gigantic palm tree is revealed. The tree sways from side to side while the leaves shake and a few coconuts fall.
11. The tree then fades away as a select number of drones begin to transition into a person riding a bicycle. After a few moments, the remaining drones create a nature trail. Key features of the trail; like trees, rocks, shrubs, and other fauna, begin to show themselves. To complete the scene, we watch as the bicyclist rides along the path. We will add an effect that gives the illusion that the bicyclist gets smaller as they ride further down the path. (This pays tribute to the beautiful public parks and displays a common pastime for the typical Signal Hill Community Member).

12. As the audience watches the bicyclist ride further down the trail, the drones making up the natural scenery begin to alter slightly. We watch as they form a portion of Signal Hill featuring a paved road and grass on either side. The drones forming the bicyclist transform into a skateboarder.
13. The skateboarder then pushes off the pavement a few times, as if they were gaining speed, and races down the hill. (We can add a lighting effect that allows us to create the illusion of the skateboarder rapidly moving down the hill).
14. After the skateboarder rides the hill, the visible drones forming the road will begin to morph into a tortilla. The tortilla is then accompanied by another tortilla, which then forms into two tacos sitting in a taco tray.
15. The tacos both rise out of the tray and face opposite directions from each other. At the same time, the audience watches as a bite is taken out of each taco. (We will use lighting effects to darken the drones that will create the bitten taco).
16. Quickly, after the first bites, each taco gets a few more bites taken from them before they begin to transition into matching Margarita glasses. Each glass fills up with fluid and has a lime set on the rim.
17. The glasses then move in towards one another to form celebratory cheers. As the glasses clink, we will add an effect of the fluid inside of each Margarita that will move around and begin to spill.
18. After the glasses have cheered, we watch them turn into a set of musical instruments. A guitar, microphone on a stand, and a set of drums appear. They come to life with movement and color. A few hidden drones appear forming musical notes.
19. As the instruments finish their piece, the drones then form into a series of City of Signal Hill logos.
20. To close out the show, every drone will begin to sparkle in gold and form The City of Signal Hill 100th Anniversary logo. After a few moments have been taken to pay tribute to the City's celebration, the drones begin to head back to their landing position.

21. As an encore, the drones appear to head home, however a surprise set of “Drone Show Fireworks” erupt in the sky. With lighting and movement effects, we can create a series of interestingly designed firework formations that reveal at different times as if it were a traditional fireworks display.
22. After a few moments of the “Drone Show Fireworks”, the drones return to the launch site and the show concludes.

The above sequence of designs simply serves as a rough draft in the creative process and can be adjusted or replaced per the team’s desire. The sky's the limit with the ideas that The City of Signal Hill Event Committee and Firefly Drone Shows can feature in this community drone show. Other ideas for designs in the show include; sponsor logos/additional department logos, notable Signal Hill Wildlife, a Speed Run skateboard cart, patriotic designs, a frisbee thrown and caught by a dog, kids playing at the park/going down a slide, a surfer riding a wave, a mention of Downtown LA or Long Beach. Ultimately, it is our team’s objective to bring the 100th Anniversary Celebrations vision to the sky!

## FLIGHT PLAN

### 1.1 Event Details

Project: The City of Signal Hill’s Centennial Celebration Drone Show

Date: Saturday, April 27th, 2024

Location: 33°47'42.7"N 118°10'19.7"W

Time Frame: 9:00PM

Altitude: 0-400 ft AGL

NM Radius: < .10



Firefly is planning to operate 400 sUAS simultaneously under waiver 107W-2023-02976 on the date, time frame, and location specified above. The purpose of the operation is to provide a night time drone light show for an event held at Signal Hill Park, City of Signal Hill. The surrounding area displayed in the map above will be closed for the show. Only when the operating area is clear of and secure of any bystanders will the operation commence. All appropriate fail safes will be programmed prior to the operation. These include, max altitude, dual layer geofencing, battery voltage, etc. The RPIC will count into the takeoff sequence of the fleet. All VO’s will be monitoring takeoff to notify the RPIC of any unforeseen issues.

Once airborne, the operation will last approximately 18 minutes, making various designs, shapes and text. At the end of the show, all sUAS will return to the grid formation before initiating their return to launch sequence. Once landed they will automatically disarm.

## **SECTION 2 : SAFETY OPERATING PROTOCOLS**

### **2.1 Operating Area Requirements**

#### **2.1.1 Sterile Environment**

All flights will be conducted in a unique and restricted environment. Prior to each flight, the PIC and VO must become familiar with the boundaries and topography of the site operating area and the PIC must take caution not to exceed those boundaries during flight. sUAS operations personnel will sweep and secure the operations area to ensure that the environment remains free of nonparticipating persons. Firefly Drone Shows, LLC will coordinate with local jurisdictions to ensure compliance with all local permitting and regulatory requirements.

The operating area consists of any property in which the sUAS are operating directly over top of. Firefly Drone Shows, LLC's personnel will ensure that no nonparticipating persons are allowed within the operating area except those consenting to be involved and necessary for operation.

### **2.2 Failsafe Procedures**

#### **2.2.1 Lost Link Landing Sequence**

In the event that the sUAS loses its data link signal, the aircraft will initiate its Land procedure. Once initiated, the sUAS will enter a hover in its current position and begin to descend slowly. The aircraft is programmed to disarm itself once it reaches the ground, and detects that it is no longer descending.

#### **2.2.2 Lost GPS Signal Landing Sequence**

In the event that the sUAS loses its GPS signal, the aircraft will initiate its landing procedure. During the landing procedure, the sUAS will enter a stabilized hover and begin to descend slowly. The aircraft is programmed to disarm itself once it reaches the ground, and detects that it is no longer descending.

### **2.2.3 Aircraft Failure Procedure**

In the event that an individual or multiple sUAS have an in-flight failure, the FFDS will immediately detect the issue and disarm the aircraft allowing it to fall safely within the sterile operating area.

In the unlikely event that the FFDS does not trigger the sUAS to disarm, the PIC has the ability to manually disarm any sUAS from the Ground Station. If the PIC or any of the VOs notice an in-flight failure the PIC will identify which sUAS in the swarm are having a failure by using all available flight data. The GCS provides the PIC with a 3D visual representation of all aircrafts in flight which includes the aircraft's position, orientation, vibration, speed, and other critical flight data. Using this data the PIC can pinpoint which sUAS are having a failure.

Once all the sUAS with the failures are identified, the PIC has the following abilities.

- Hold the sUAS in its current position;
- Land the sUAS;
- Put the sUAS into Return to Home; and
- Disarm the aircraft.

The PIC will use his or her best judgment to remedy the failure and safely fly the sUAS(s) with the failures away from the swarm and land it in a safe area.

### **2.2.4 Ground Control Station Failure**

The GCS will consist of at least two computers to control the sUAS swarm. One computer will be the primary GCS and the second computer will be used as a backup GCS. Both the primary and backup GCS will be running the GCS software simultaneously. In addition, both the primary and backup GCS will have a secondary GCS software installed to control the drones in the event that there is a software failure.

In the event that the primary GCS fails, the PIC will use the backup GCS to regain control of the sUAS swarm and land safely. If the PIC determines that the GCS failure is not caused by the computer and that the failure is due to the GCS software, the PIC can use either the primary or backup GCS computer to run the secondary GCS software to regain control of the sUAS swarm and land safely.

### **2.2.5 Flight Operation Boundary Recovery Sequence**

In the event that a sUAS comes in contact with any part of the first layer of the Fly Fence during a mission, the sUAS immediately holds position and lands in a safe and controlled manner.

In the event that a flyaway aircraft is experiencing a severe in-flight failure causing the aircraft to quickly fly out of the first layer of the Fly Fence, the second layer of the Fly Fence will immediately disarm the aircraft when it crosses through the boundary causing the drone to fall to the ground safely within the sterile environment.

### **2.2.6 Intruding Personnel Procedure**

In the event that a person is detected within the operating area, the VOs will immediately notify the PIC of the intruding person and their location. The PIC, using the ground station controls and information, will then navigate any and all sUAS away from the intruding person and to a safe area to land as quickly and safely as possible.

### **2.2.7 Intruding Aircraft Procedure**

In the event that an aircraft is detected in the sterile operating area, the PIC will immediately navigate any or all sUAS away from the detected aircraft and land the sUAS as quickly and safely as possible.

In the unlikely event that an aircraft does enter the sterile operating area during a loss link Land procedure, the PIC, with the help of any and all VOs, will determine which sUAS pose a threat to the detected aircraft. Once determined, the PIC, will kill power to the threatening sUAS and allow them to fall within the sterile operating area to get them out of harm's way of the detected aircraft intruding on the operating area.

## **SECTION 3 : AIRCRAFT DETAILS AND LIMITATIONS**

### **3.1 Drone Systems**

Please navigate to (<https://www.fireflydronesystems.com/>) to learn more about Firefly Drone Systems.

#### **3.1.1 Model**

FireflyV2.0 is an F330 sized Quadcopter built and maintained by Firefly. Our drones have been designed specifically for the purpose of drone light displays. Built in the USA.

#### **3.2 Aircraft Specifics**

- Operating mass of 2.2lbs
- Top speed of 15mph per FAA waiver
- 9 inch propellers
- Flight time 22 min
- Wind threshold of 25 mph at 400ft
- Max ceiling 400 per FAA waiver
- Powered by 3s 4400mah Lipo Battery
- Three Quarter View:



*Built in the USA.*

### Standard Performance Specifications

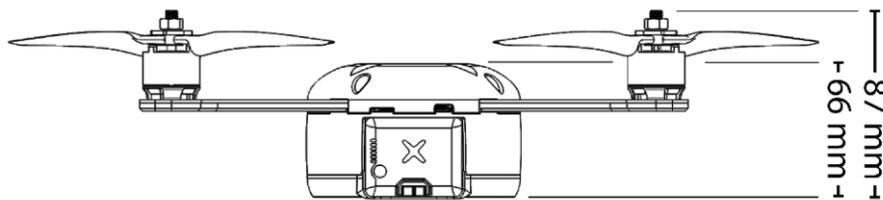
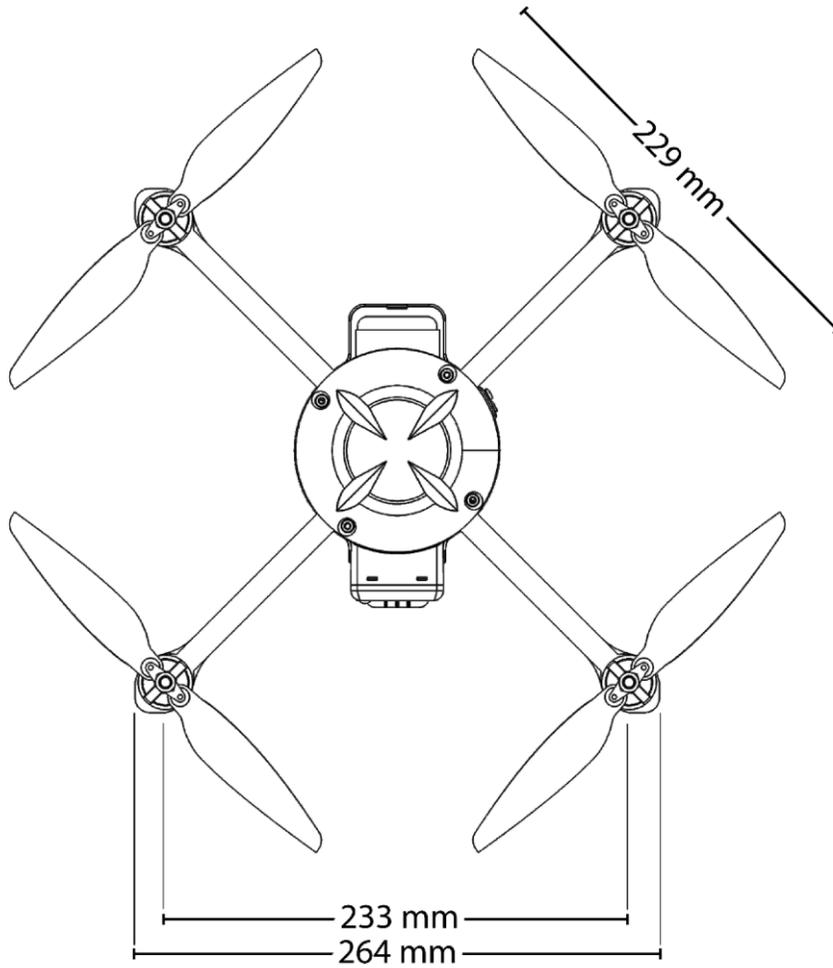
<b>Max Hover Time</b>	30 Minutes
<b>Max Show Length</b>	20 Minutes
<b>Battery</b>	45wh Smart LiPo Battery
<b>Charger</b>	50-Bank Multi Unit Smart Charger
<b>Frequencies</b>	2.4GHz, 915MHz/868MHz
<b>GPS</b>	High Precision RTK, F9P L1/L5
<b>IMU Sensor Stack</b>	Triple Redundant Thermally Managed
<b>Magnetometer</b>	Dual Redundant Magnetometer
<b>Transport/Storage</b>	50 Gen2 drones per Pelican 1730 Transport Case
<b>Wireless Power Up</b>	Yes, from Ground Station
<b>Country of Origin</b>	Made in the U.S.A.

### Show Performance Specifications

<b>Recommended Speed</b>	8.0 Meters Per Second
<b>Recommended Proximity</b>	2.0 Meters
<b>Wind Threshold</b>	11 Meters Per Second
<b>Show Lighting</b>	6x 9 Watt RGB LEDs    8x 5050 RGB LEDs
<b>Lumens</b>	3,600 per Drone
<b>Color Refresh Rate</b>	24Hz
<b>Position Refresh Rate</b>	4 Hz

**Technical Specifications**

<b>Weight</b>	890 Grams
<b>10 Drone Stacking Height</b>	585 mm



## **SECTION 4 : TESTING PROCEDURES**

Firefly will complete several testing procedures to ensure a safe and accurate autonomous flight is executed on each show day. We begin with checking every animation file for drone speed and proximity limits before leaving the studio. Once we have cleared the animation file verification process, the animation is then rehearsed in a controlled environment near Firefly headquarters before being brought onsite. Once brought on site, every drone goes through a preflight inspection. After the preflight inspection, every drone goes through a test hover to ensure the drone's performance is up to standard. Once each drone has cleared pre-flight checks and test hovers, our Remote Pilot in Command will complete several checks in Firefly's proprietary drone piloting software to ensure the location and heading parameters are correct. They will then be verified on site using small quantities. Throughout the testing process, if an error occurs or if a dissatisfactory result arises, our team will go through the process again to ensure the environment is optimal before the show's flight.

## **SECTION 5 : ENVIRONMENTAL RESPONSIBILITY**

A core value and motivating factor here at Firefly, is to provide an environmentally conscious alternative to the traditional firework display. With this in mind, Firefly continues to maintain sustainable practices to reduce the negative impact that can be left on the environment that we all share. From the office to the launch site, each Firefly team member is properly trained in maintaining a clean work area that prevents waste/debris from being added to the environment. Having switched to electric power sources for our ground control system and accessories, utilizing reusable components for every factor involved with deploying and tearing down each drone show display, adopting practices like Firefly staff using company issued reusable water bottles and providing recycling receptacles; Firefly can confidently reduce our negative environmental impact.

## **SECTION 6 : SAFETY RECORD**

Safety in operations and conduct is a key part of Firefly's core values. Firefly is proud to state that there have been 0 workplace accidents to present. Each team member is frequently updated with the safest procedures in executing a drone light show. In case of emergency, Firefly is well equipped with the materials and knowledge necessary to properly handle each risk scenario. The number one priority always being safety of all personnel and patrons.

## **DRONE DISPLAY DETAILS**

### **Description of Lights**

Firefly Gen 2 drones are capable of a full RGB spectrum allowing an unlimited design in color and gradients. Each Gen 2 is equipped with an array of LEDs. Each LED provides a vibrant illumination emitting from the top, side, and bottom of the drone. Totalling over 3,000 lumens per drone, with a clear line of sight, the Firefly Gen 2 can be observed from miles away.

### **Audio Pairing**

Due to the silent nature of drone light shows, Firefly strongly recommends adding an audio track to be paired with each drone light show display. Because of this, Firefly offers custom built audio soundtracks designed to follow the drone show and enhance the audience experience. Once a show is completed within our animation software, our in-house audio engineer will design a track to match the show. Firefly will provide an industry standard audio playback device to synchronize the audio to the drones in real time. This will ensure an incredible audio and visual experience.

## **ESTIMATED COST TO CITY**

### **COST BREAKDOWN AND PROPOSAL**

In general, our costs are broken down into two main sections, the Production Setup Fee (\$200 per drone in the production) + Logistics. Firefly offers up to 6 free custom formations within the Production Setup Fee. For additional customization, an animation fee is incurred (\$1,000 per additional design). However, we see the value in contributing to this milestone event for the historic City of Signal Hill. With that in mind, for a minimum of 8 minutes and a maximum of 18 minutes, Firefly will provide a 400 drone light show production consisting of fully customized designs within the budget of \$59,500. The above figures factor in the entire production necessary to perform each display near the Signal Hill Park viewing area on the date specified in the Request for Proposal or a backup date. Included in this response is a formal quote to reflect this offer.

## **WEATHER AND CANCELLATION**

Heavy rain is always our biggest threat to conducting a show. All of our drones are designed and built in house to be optimized to handle up to 25 mph winds and extreme temperatures. However, a downpour and electronics never mix well. Typically a little mist or sprinkle is not a problem. Even if it is raining all afternoon, our team arrives prepared with tarps to protect the equipment.

Over the years, we've become very efficient at "dancing around the rain" and making the show happen regardless. With a 400 drone production, as long as we have a 3 hour window of clear weather, we can get the show off the ground. Once our team arrives on site for an event, we will do everything in our power to make the show happen. It is ultimately up to the Pilot in Command to make the decision if the show can be conducted safely.

We have a few options for the service agreement in regards to weather. Our standard policy for multi-night events states that the client is required to pay 50% of the nightly rate or incurred costs (whichever is greater) in the event of inclement weather. This is the simplest policy and allows us to split the risk of weather 50/50 with our customers. We also have 2 rain date options available:

#1) If the show is canceled due to inclement weather, we can include a rain date for the following night at no additional costs. In this case, the rain date would be April 28th, 2024.

#2) Alternatively, we can select a mutually agreed upon rain date within 12 months from the original show date. A credit will be applied towards a future show. However, additional costs associated with travel, logistics and lodging will be incurred on the rescheduled date selected.

## **IN CLOSING**

Once again, Firefly would like to formally thank The City of Signal Hill for the opportunity to reply to this RFP related to the 100th Anniversary Celebration Event. As stated before, we are keen on building a working relationship and will continue to offer premium drone light show solutions for your events to come. Having the experience of performing drone shows in familiar settings and the passion to bring The City of Signal Hill's creative vision to life, Firefly is confident that we can properly service this Celebratory Event with the most impactful drone show that will best showcase what makes Signal Hill shine.

# ESTIMATE

Firefly Drone Shows  
 5105 Williams Lake Road  
 Waterford, MI 48329  
 www.fireflydronesshows.com



## Estimate

### ADDRESS

The City of Signal Hill  
 Administration  
 2175 Cherry Ave  
 Signal Hill, California  
 90755

ESTIMATE # 1753

DATE 02/12/2024

EXPIRATION DATE 03/01/2024

### JOB NUMBER

Centennial Celebration

ACTIVITY	QTY	RATE	AMOUNT
Drone Light Show 400 Drones, 18 Minutes - Date: April 27th, 2024 - Location: Signal Hill, CA	1	80,000.00	80,000.00
Custom Show Design & Animation - 16 Custom Formations (Creative TBD)	1	10,000.00	10,000.00
Travel, Logistics, Lodging, Per Diem - 5 Person Crew	1	9,500.00	9,500.00
Content Capture and Video Editing - Sony FX6	1	5,000.00	5,000.00

\* Firefly Sponsorship Applied \$45,000.00

\* FAA Waivers and/or Airspace Authorizations are included

\* Firefly synchronized music track included

SUBTOTAL 104,500.00

DISCOUNT -45,000.00

TOTAL **\$59,500.00**

Accepted By

Accepted Date

**INSURANCE**

**CERTIFICATE OF INSURANCE**

This certificate is given as a matter of information only and confers no rights upon the certificate addressee.

<p>Date: February 12, 2024          This is to certify to:          The City of Signal Hill Administration          2175 Cherry Ave          Signal Hill, CA 90755</p>	<p>That the following policy has been issued to:          FIREFLY DRONE SHOWS, LLC.          c/o KYLE DOROSZ          5105 WILLIAMS LAKE ROAD          WATERFORD, MI 48329</p>
<p>Policy No. 9039832 issued by one or more member companies of Global Aerospace Pool through Global Aerospace, Inc.          Policy Period: from June 06, 2023 to June 06, 2024 Policy Territory: Worldwide</p>	

<b>AIRCRAFT AND COMMERCIAL GENERAL AVIATION LIABILITY</b>	
<u>Coverages</u>	<u>Limits of Liability</u>
Single Limit Bodily Injury and Property Damage	\$1,000,000 Each Occurrence
Third Party War Liability	\$1,000,000 Aggregate
<b>AIRCRAFT PHYSICAL DAMAGE</b>	
Policy includes Physical Damage Coverage with insured values as set forth in the policy.	

Notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies. This certificate does not amend, extend or otherwise alter the coverages afforded by the policies described herein. Limits may have been reduced by paid claims.

GLOBAL AEROSPACE, INC.  
 BY:






**WAIVER**

<p>U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION</p> <p><b>CERTIFICATE OF WAIVER</b></p>	
ISSUED TO	<p><b>Firefly Drone Shows</b> <b>Responsible Person: Kyle Dorosz</b> <b>Waiver Number: 107W-2022-00713</b></p>
ADDRESS –	<p><b>2677 Aubrey Dr</b> <b>Lake Orion, MI 48360</b></p>
<p>This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the provisions contained in this certificate.</p>	
OPERATIONS AUTHORIZED	<p>Small unmanned aircraft system (sUAS) operations at night and during civil twilight without anti-collision lights meeting the requirements of § 107.29(a)(2) &amp; (b); Acting as a remote pilot in command (PIC) or visual observer (VO) in the operation of more than one small unmanned aircraft (sUA) at the same time.</p>
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE	<p><b>14 CFR §§ 107.29(a)(2) &amp; (b)—Anti-collision light requirement for operations at night and during periods of civil twilight, and</b> <b>107.35—Operation of multiple small unmanned aircraft systems</b></p>
<b>STANDARD PROVISIONS</b>	
<ol style="list-style-type: none"> <li>1. A copy of the application made for this certificate shall be attached to and become a part hereof.</li> <li>2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.</li> <li>3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.</li> <li>4. This certificate is nontransferable.</li> </ol>	
<p>NOTE—This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.</p>	
<b>SPECIAL PROVISIONS</b>	
<p>Special Provisions Nos. 1 to 30, inclusive, are set forth on the attached pages.</p>	
<p>This Certificate of Waiver is effective from July 31, 2022, to July 31, 2024, and is subject to cancellation at any time upon notice by the Administrator or an authorized representative.</p>	
<p><b>BY DIRECTION OF THE ADMINISTRATOR</b></p> <p><b>DEREK W HUFTY</b></p> <p><small>Digitally signed by DEREK W HUFTY Date: 2022.05.27 09:25:31 -0400</small></p> <p><b>General Aviation and Commercial Division, AFS-800</b></p>	

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
**CERTIFICATE OF WAIVER**

ISSUED TO

**Firefly Drone Shows**  
**Responsible Person: Kyle Dorosz**  
**Waiver Number: 107W-2023-02976**

ADDRESS—

**2677 Aubrey Dr**  
**Lake Orion, MI 48360**

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the provisions contained in this certificate.

OPERATIONS AUTHORIZED

Night small unmanned aircraft system (sUAS) operations; Acting as a remote pilot in command (PIC) or visual observer (VO) in the operation of more than one small unmanned aircraft (sUA) at the same time, and pursuant to 14CFR § 89.105 to operate its UA in the National Airspace System (NAS) without broadcasting Remote Identification (RID) subject to the the conditions of this waiver.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

**14 CFR §§ 107.29(a)(2) & (b)—Anti-collision light requirement for operations at night and during periods of civil twilight, and**  
**107.35—Operation of multiple small unmanned aircraft systems**

**STANDARD PROVISIONS**

1. A copy of the application made for this certificate shall be attached to and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

NOTE—This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

**SPECIAL PROVISIONS**

Special Provisions Nos. 1 to 31, inclusive, are set forth on the attached pages.

This Certificate of Waiver is effective from November 3, 2023, to July 31, 2024, and is subject to cancellation at any time upon notice by the Administrator or an authorized representative.

**BY DIRECTION OF THE ADMINISTRATOR**

**Emerging Technologies Division, AFS-700**



**FAA**  
Aviation Safety

# Certificate of Achievement

This is to certify that

**Joseph Christopher Poppleton**

has successfully completed the  
FAA Safety Team Aviation Learning Center Online  
Course

## **Part 107 Small Uas Recurrent**

Course Number ALC-677

Presented by FAAS Team

**June 11, 2023**

Certificate Number 1207704-20230611-00677

A blue ink signature of Patricia Mathes, written in a cursive style.

*Patricia Mathes, Manager, National FAA Safety Team*



Cut out the small certificate above and keep with your airman certificate. You should keep the remainder of this sheet in a safe place in case you lose your certificate above.

Your Name

Joseph Christopher Poppleton

Your faasafety.gov Registered Username

Joey@fireflydroneshow.com

Course Completed

Part 107 Small Uas Recurrent

Course Completion Date

June 11, 2023

Course Completion Certificate Number

1207704-20230611-00677