



# The Flightline



Volume 53, Issue 3 Newsletter of the Propstoppers RC Club, AMA 1042, October 2023



## President's Message

Gentlemen,

I am very happy to report that we have just added 2 more new members to Propstoppers.

Please welcome Giles and Beau Cannon when you meet them. That makes a total of six this year for a 12% increase in membership.

Our fields are both in good shape for flying, let's make the best of the flying season that remains.

We have had some challenges with our picnic schedule. We may try to pull off a "Flash Picnic" (as Paul put it) in November with weather and TFR permissions. We will also hold another General Membership Meeting in November for elections.

Thanks to all of you for everything you do to make our club vibrant and welcoming.

Mike

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Fields at Elwyn and CA are now fully open for members and guests, 8 AM to sunset every day all year round. (CA-electric only, Elwyn - Sunday mornings from 8AM to Noon electric only.

Covid is down, but not out! Please respect club members who are continuing to wear masks or who are not vaccinated, by maintaining social distancing safe health practices.

LOA with Philadelphia International:  
Please comply with the following rules to stay in compliance with our FAA Agreement:

- Maximum altitude 400 feet
- In case of Fly-Away call 215-492-4123 immediately. This is a direct line to the TRACON Office at Philadelphia International Airport.

Tuesday morning breakfast at the Tom Jones Diner starts at 9:00am Indoor flying at the Brookhaven Community Center gym follows at 10:00.

Members and guests must complete a waiver of liability form to fly at Brookhaven Gym.

**Propstoppers RC Club of Delaware County, Pennsylvania.**

**Club Officers**

**President:**  
Mike Black

**Vice President:**  
Paul Pujol

**Secretary:**  
Michael Black

**Treasurer:**  
Pete Oetinger

**Membership Chairman:**  
Ryan Schurman

**Safety Officers:**  
Eric Hofberg  
Ryan Schurman

**Newsletter Editor:**  
Larry Woodward

**Facebook Editor:**  
Ryan Schurman

**Webmaster:**  
Michael Black

**Propstoppers Web Site;**  
[www.propstoppers.org](http://www.propstoppers.org)

**Contact:** Propstoppers@gmail.com

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**Indoor Flying at the Brookhaven Gym**

The Brookhaven Community Gym is open to members Tuesdays at 10:00-11:00.

Indoor pilots must sign a waiver of liability form.



## Minutes of the Propstoppers Model Airplane Club

**General Membership Meeting Minutes** from August 17, 2023.

**Call to order:** 12:00 at CA Field. Seventeen members were present.

**Treasurer's Report:** A current balance of \$6,200 is in the account.

Current paid membership is 52 with 3 youth members.

**Website:** There is a need to review and resolve missing links.

**Newsletter:** No report.

**Safety:** Safety Report: Issue discussed about a non-flying members and flying UMX planes in no-fly areas of our field/Elwyn property. President (Mike Black) reiterated to members to bring any continued behavior to the club leadership. If you see unsafe actions it's your duty to politely intervene for safety of the members and for the future of our club. If for some reason the club member is not receptive to your polite intervention, please contact Paul with details and we will follow up with those individuals.

**Picnics:** Sept. 9th and rain date on 10th. Lunch at 12:30, 10am start.

### Old Business

- : FRIA approvals have begun. 2 area clubs received approvals. Notice will be sent once our fields are approved.
  - 
  - Trash: please put all trash in provided receptacles or take it with you.
- New Business: some members have asked about a Propstopper gear sale. 8 hand votes for members looking for hats, shirts and jackets. To investigate new ordering.
- Meeting Adjourned. Battery and hardware giveaway.

**New Business:** Mike met with Bob, the Grounds Director at Elwyn, to discuss the installation of wind socks. He reports that Elwyn is very pleased to host Propstoppers, especially because of the excellent care we take of the site. Let's all continue to be diligent about carrying out any trash and keeping the picnic table area clean. Bob did mention a problem with fuel residue on the tables. Please be careful with fuel and thoroughly clean up any spills.

**Adjournment** : Time not recorded.

\*\*\*\*\*

**General Membership Meeting Minutes** from October 22, 2023

**Call to order:** Time: 12:00pm (Online). Ten members were present.

**Treasurer's Report:** Preliminary Budget was presented with no change in the dues structure.

**Membership:** Welcome extended to new members Giles and Beau Cannon which makes 6 new members this year.

**Newsletter:** No report

**Website:** No report.

**Safety:** No report.

### **Old Business**

- FRIA, 1 month ago CA Field application was submitted to the FAA by AMA. Please read Tyler **Dobb's article regarding FRIA sites in Model Aviation.**
- 
- Please Check B4UFLY
  
- Fields, Both are in good flying condition thanks to Chuck.
- Picnic Dates, We will hold a "flash" or last minute picnic in November if possible.

### **New Business:**

- 2024 Club Officer Elections – all current officers were the only nominees.
- Budget – Dues will be \$90 by 12/30, \$100 after. On PayPal \$93 or \$103.
- Elwyn is planning to sell our field and the farmer's field next door to Williamson Trades School for agricultural education usage.
- Ampro – member purchased club merchandise distributed.

**Adjourned:** 12:26pm

## Editor's Notes:

By Larry Woodward



I think that one reason why I enjoy rubber band free flight modeling so much is that all the essential elements of aviation theory are there to examine from a very basic and tangible perspective. Add to that the pleasure of meeting for weekly breakfast with a group of science and engineering professionals, and it is not hard to see why my mind often drifts toward big picture questions about aviation.

As I assembled this issue of Flightline it was not long before the various articles started me looking at the connections between them and what they say about new, or old, theories of science and aviation.

The article about Frenchman Georges Barbet's English Channel crossing 100 years ago made me ask how close their thought process was, at that time, to my struggles with rubber band free flight models today. The articles on Steam Powered Model Airplanes and the World's Largest Rubber Powered Free Flight plane reinforced my belief in the value, and joy, of pursuing scientific and engineering principles through "seat of the pants" endeavor. Dave Harding's nostalgic article about taking his grandson to the 2003 AMA Nationals and his 2023 report on the club's volunteer work in support of Drexel's engineering students show the rewards to be had from demonstrating and facilitating this type of "elementary" design activity.

One example of a very fundamental scientific principle that Dave Harding wrote about a few years back in an article on "Scaling" is the idea that as an object gets larger its volume increases at a faster rate than the surface area. So, components get disproportionately heavier as they get larger. For aircraft this is a limiting factor. If you take a balsa model design and double the size of the same model, the larger plane will not have the same flying characteristics as the original because it will be disproportionately heavier. Furthermore, for any given structural material with a finite weight to strength ratio, there is an upper limit to how large you can build something before it is just not "strong enough" to support the weight. If you want to go bigger, you have to use a better, more efficient material. This is essentially why wooden planes eventually gave way to aluminum planes, and then to carbon fiber. More efficient materials "reset" the volume to surface area limitations.

The history of aviation in my lifetime has been, partially, a race to "scale up" larger and more complex aircraft to serve larger and more complex service demands. The article in this issue about the famous U-2 spy planes of my youth pictures a great example of an engineering triumph in this regard. But, there is an argument to be made that, without discovery of a new and even more efficient structural material, the size and complexity of conventional aircraft cannot be increased significantly beyond current maximums.

The article about the Phasa -35, "The slow and delicate aircraft taking on spy missions," is an example of how many design solutions today are reversing the 20<sup>th</sup> century focus on scaling up and instead see scaling down to



smaller and less complex elements as the key to achieving future goals. This aircraft is the antithesis of its U-2 predecessor, achieving, and in many ways surpassing, the same goal with a small fraction of the resources.

Jet Blue's blended wing design, "Air Force selects JetZero for blended-wing body prototype plane." is a study in surface to volume ratio where they are optimizing the useful volume, think cargo, while also attempting to optimize the lift from the resulting surface area, while minimizing drag.

Finally, the two articles on local delivery drones from Zipline and Wing argue that the smaller is better "rule" makes drones inherently more efficient transport than motor trucks. But, they also demonstrate that the "Last mile delivery" challenge will most likely not be solved by the best aircraft design but rather by the best air traffic management system.

It's a whole new world out there!



Another "High stakes" discussion of aeronautical theory at Tuesday Morning Breakfast Club

# Member Profile

## Meet new member Matt Hatfield

By Larry Woodward

“I’ve already been able to introduce myself to a large number of you and share various bits of my flying history. But this is a good way to lay it all out and actually bring back some good memories I mostly forgot. My RC history is quite disjointed with a lot of stopping and starting as I moved from place to place struggling to find good locations to fly. But no matter where I went, I always had a working airplane with me.

I started off around 2002 with the Hobbico Aero Cruiser. I remember buying it out of the Tower Hobbies catalogue I would regularly receive because I had gotten into RC cars a couple of years earlier. It was a 3-channel foamie powered by a brushed, direct-drive motor and 5-cell NiCad pack. I remember it being underpowered and quite lumbering when in the air, but that probably was just my inexperience. On nice days I’d spend a lot of time at the local high school’s parking lot flying and waiting for my single battery to recharge. As my experience grew, I upgraded various components and was eventually able to turn it into a pretty decent aircraft.



About 2006 is when I decided to dive into 4-channel flying. And of course I had to go with one that was quite beyond my abilities, an Electrify Fun Force which came in 4 variants (P-51, FW-190, A6M, and F6F). These were aerobatic park fliers designed for streamer battles with friends. It even came with a ribbon to attach to the tail. I remember this thing being a blast to fly as long as I wasn’t running it into nearby trees.

A combination of tape, balsa, and a lot of glue got me through to 2009 when I purchased my next plane, a Great Planes Reactor 3D. It was an extremely cool aerobatic plane that didn’t see a lot of action until I moved to Pennsylvania and found a park with a large field close to my home. Soon after, I purchased the Stevens Aero Helium MG2 balsa kit (many of you have seen this airplane soaring overhead).



The fun only lasted for a couple years before the park banned RC aircraft. That began my longest flying lull. I tried getting back into the hobby a couple times by buying a new kit (Stevens Aero RV-4) and joining another RC club, but it didn't last. That was until I was digging through boxes and found my partially finished RV-4 kit. I decided to get it in working order and look around for a local club. That's when I found the Propstoppers. I met up with a number of you at Elwin one weekend in July and was out flying as a member the next.

When I wasn't flying my airplanes, I could be found eyeing other club member's helicopters at Elwin, thinking about how cool it would be to fly one. That went on for several weeks until Lamarr showed up with a buddy box, his Goosky S2, and a goal of switching me to the dark side. It worked. That evening I purchased my own S2 and I've been flying helicopters almost exclusively ever since.

All of the club's heli pilots have been extremely helpful and supportive as I learn how to fly all over again. The learning curve is incredibly steep and I wouldn't be nearly as far along as I am now without their help. Thanks! Now, if only the nice flying days would return so I can get back into the air."

Matt





## Meet new member Soren Spring

My name is Soren Spring, and I live in Springfield. My interest in aviation started as a young boy following the Apollo space missions and dreaming about being either an astronaut or engineer. Unfortunately, Navy flight was not an option due to my vision, so engineering it was.

As a young engineer I found model aviation an inexpensive way to satisfy my love of planes while raising a family. I competed in a few fun flies but really just enjoyed the company on the field.

Early in my career, I worked at the Philadelphia Naval ShipYard and flew on the decommissioned runways, but thought it best to join a club and be legal. So I joined the Propstoppers in the early to mid 90s. But, as the Moore Field became in jeopardy, I left to finish school and keep working.

Now the kids are out of the house and I am back in the club enjoying the new technology of modern programmable radios and flight controls. I love the modern electric planes with power to spare. My hope is that the club continues to not only provide great fields, but also the company of different generations of model aviators.

If you see me on the field, please come over and share your stories. Eventually, I would like to find a way to help the next generation of young pilots start in this exciting hobby and feel the thrill of their first successful flight.

Soren



Self Portrait from my newest plane, a "Chill" Radian Powered Sailplane.



Young Engineer raising a family.



My first plane was a 3 channel Nifty 50 from Flyers out of PA.  
This picture is actually from Moore Field.





Flying in Connecticut around 1991.

# Air Force selects JetZero for blended-wing body prototype plane

The company says the airplane will have its first flight in 2027.

Submitted by Dave Harding

AUGUST 16, 2023

AIR FORCE  
TECHNOLOGY

By AUDREY DECKER



The U.S. Air Force has chosen California startup JetZero to build and test a wing-shaped airplane, which may influence the design of the service's future refueling and heavy transport planes. The service announced the winner of a Defense Innovation Unit-led competition for a blended-wing body prototype at an Air & Space Forces Association event.

"This is a prototype demonstration project that's intended to accelerate the next generation of what may be the large aircraft fleet that the Air Force needs in the future. It's a streamlined design, different significantly from traditional tube and wing design, and it will improve aerodynamic efficiency and mission capability," said Air Force Secretary Frank Kendall.

Potential benefits of this shape include the generation of enormous amounts of lift, reduced noise, aerodynamic efficiency, and thus fuel efficiency – JetZero claims up to 50% better fuel efficiency. The company envisions that the aircraft will initially be powered using traditional jet fuel or sustainable aviation fuel (SAF), with potential to be adapted to hydrogen propulsion in the future.



# French Airman's Flying Feat

Submitted by Dave Harding

Saturday May 06 2023, 12.01am BST,  
The Times

Another chapter in the history of flying was written 100 years ago when M Georges Barbot, French aviator, holder of the world's record for duration of gliding flight, crossed and re-crossed the English Channel in a tiny monoplane fitted with a 15 hp engine.



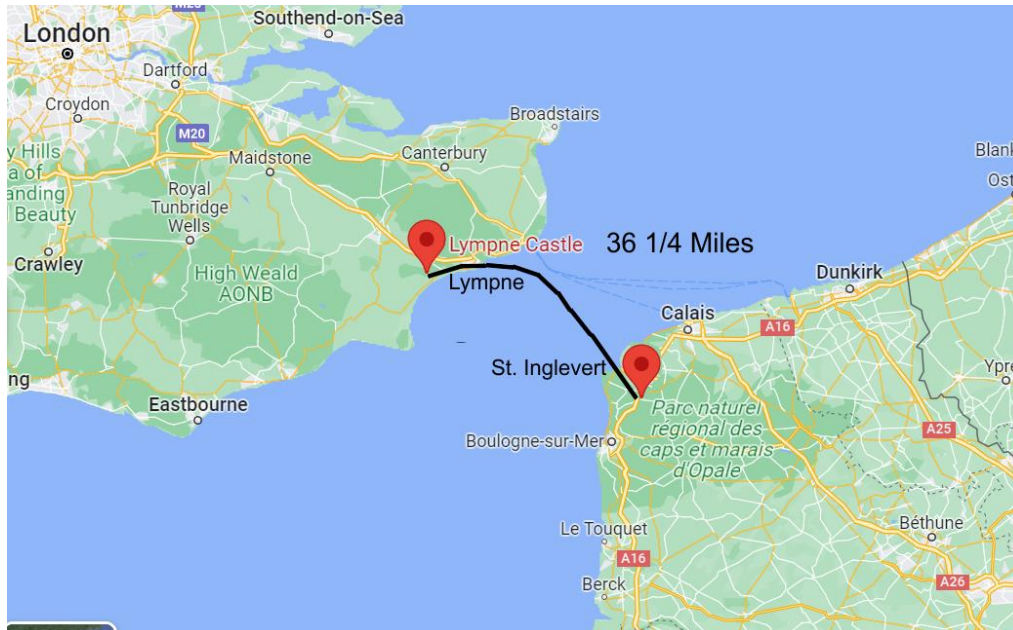
Georges Barbot was cordially acclaimed by the crowd

His flight was not a glide, strictly speaking, but as a demonstration of the possibilities of a very simple type of aeroplane it was a triumph.



M Barbot flew from the French aerodrome at St Inglevert to Lympne in England. The distance is 58km (36¼ miles), and the journey occupied one minute over the hour.

In landing M Barbot broke a bracing wire of the undercarriage, and half an hour was needed for repairs. Then the engine was slow to start, and it was not until 8pm, when the light was beginning to fail, that he was able to take off for the return journey.



At 6.30pm a wireless message was received at Lympne saying that he had started his flight, and would land at the aerodrome if he could find it. At 7 Lympne was notified that he was over the English coast. Smoke bombs spread spiral trails of red and black above the landing place, and there was a firework display which must have been visible for miles.

A crowd of about 200 people had gathered on the green slopes of the aerodrome, field glasses were in scores of hands, and the sky was eagerly watched. About ten past 7 a faint throb, like the sound of a distant, low-powered motor-cycle was heard. Then a black speck in the distance was recognized as an aeroplane, though indeed a baby one. The noise was like a kitten's purr compared with the roar of the airliners with which Lympne is daily familiar.

The aerodrome officials sent up Very lights, and the little monoplane made a graceful circle above the field and slowly sank to the ground.

M Barbot was cordially acclaimed by the crowd. He said he had had an excellent journey, with only light winds and a speed of about 70km an hour.

As soon as his papers were signed, he was ready to go back. The mechanics swung the propeller, M Barbot waved his hand, the crowd called "bon voyage", the machine climbed into the greying sky and was soon out of sight. In less than an hour we learned that it had safely reached St Inglevert. Just before 9 we heard that he had completed the round trip and won the prize of 25,000 francs offered by the French newspaper Le Matin.



# The U-2 Dragon Lady As You Have Never Seen It Before

Professional photographer Blair Bunting just flew an unprecedented air-to-air shoot at around 70,000-feet in the legendary U-2 spy plane.

Submitted by Dave Harding

*Blair Bunting*

[SHARE](#)

THOMAS NEWDICK

TYLER ROGOWAY

For fans of military aviation — or flying in general — in the civilian world, the chance to get a ride in the cockpit of a combat aircraft is very likely top of many a bucket list. But there's surely one in-service military jet that has a little more allure than most, for which getting strapped into is just the prelude to a trip into the stratosphere. That jet is the unique U-2 Dragon Lady spy plane, and one civilian photographer recently got a chance to fly in it and execute an air-to-air shoot unlike any other.

Our friend Blair Bunting, based out of Phoenix, Arizona, was that individual and he has documented his trip with his own incredible photos in his trademark style, as well as accompanying video, together with a written account about how it all came together. And, much like the U-2 itself, many of those images also look like they come from out of this world...



*Blair Bunting*

As to how it came to be, Blair's own career as a photographer brought him into contact with the U.S. Air Force Thunderbirds and a photo and video shoot with the demonstration squadron — “a wild ruckus of a flight,” in his words. After that, a friend of Blair's, a former pilot of the 425th Fighter Squadron, suggested he go one step further and try and get a flight in the legendary U-2.

“50,000 feet is higher than a jetliner, but you know there's a plane that goes even higher?” his friend told him. And with that, Blair embarked on a mission to get into the cockpit of a U-2.

“A few months later, I was visiting a friend at the Pentagon, and the conversation came up again about the U-2,” Blair recounts on his web page. “At this point, I'd started talking with Beale Air Force Base in Northern California about visiting and photographing the U-2.” Happily, someone at Beale had also seen Blair's earlier work with the Thunderbirds and that helped to secure a trip to the base for a photo shoot, albeit one that would take place on the ground.

*Blair Bunting*



Blair Bunting stepping to his TU-2S after many months of preparation. *Blair Bunting*

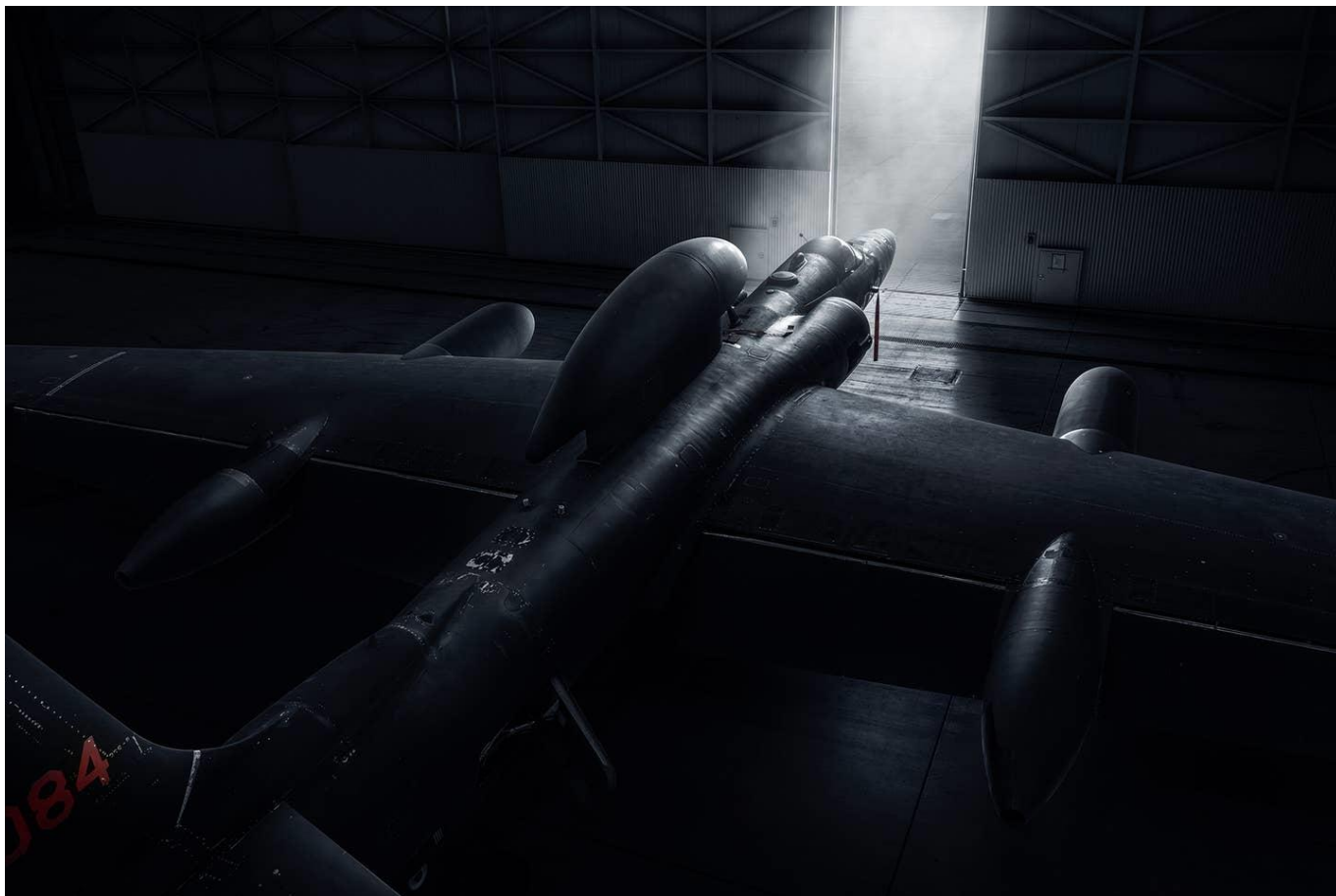


“Talking about doing a high-altitude flight in a U-2 is akin to a dog chasing a car,” Blair says. “The idea sounds incredible, but the concept of what to do when it comes to fruition is so far removed from comprehension that it is easier to have never chased it.” Still, Blair chased it, remaining in dialogue with the base “for months.”

A fatal U-2 accident that also saw the loss of a rare two-seat U-2 then put the project indefinitely on ice, before the base got back in touch with Blair about the first series of ground photos, a full six years after they had been taken. Then, in a conversation with a new public affairs officer, the topic of a Dragon Lady flight came up once again.

Understandably, a huge amount of paperwork had to be dealt with before Blair even got close to the U-2 flight line and, once the sortie was green-lit, he was left, in his words, “stunned and in disbelief.” He added: “I didn’t know what to think or who I could even tell. Just hearing myself say it to my parents had me realizing this was a situation that was unbelievable to most.”

That was just the start, however, since what followed was an almost total immersion in preparations for the flight, meeting with everyone from “squadron and base commanders to plane mechanics and the pilots that fly them” to understand how best to capture imagery from the U-2.



*Blair Bunting*

Blair Bunting



Blair Bunting



Blair Bunting



Then, of course, was the all-important spacesuit fitting, working out three times a week, not to mention researching what kinds of commercial cameras actually work at 70,000 feet (almost 300 camera and lens combinations were tested). There was even daily meditation, recommended by another pilot, which goes to show the extraordinary lengths to which Blair went to make sure the flight went just as it should.

Once it finally came to the details of the mission, Beale confirmed they would launch two Dragon Ladies, one a two-seat TU-2S carrying Blair and his pilot, and the second a single-seat U-2S.



When it came to shooting images up here, too, the peculiarities of the spacesuit would pose particular difficulties, as Blair recalls:

“The spacesuit was tailored so that if a rapid decompression happened, the pilot’s arms would stay down so that they could eject from the plane. This made it difficult to photograph, as the suit fights you when trying to raise your arms with a camera. On top of this, I would have to rely on a liquid-crystal display (LCD) screen as the fishbowl on my head made it impossible to use the regular viewfinder. These were only some of the considerations I had to think about daily.”



Blair explains: “Once we both reached high altitude, we would rendezvous and get the aircraft as close as we safely could to create images of the plane as it entered the darkness with ice beginning to form on its surface.”

As you might imagine, the [last few days of preparation](#) before the sortie itself were incredibly intense, with a seemingly never-ending checklist tempered by Blair’s own understandable nerves. After all, as he reflects: “The grandiosity and magnitude of it all were becoming more potent by the day, and I could hardly believe what I was preparing for.” Nevertheless, “With hundreds of phone calls and emails behind us, we knew we had done everything possible to make the shoot successful. Now was the time to bring it to life.”



Blair in the cockpit cruising through the Stratosphere.



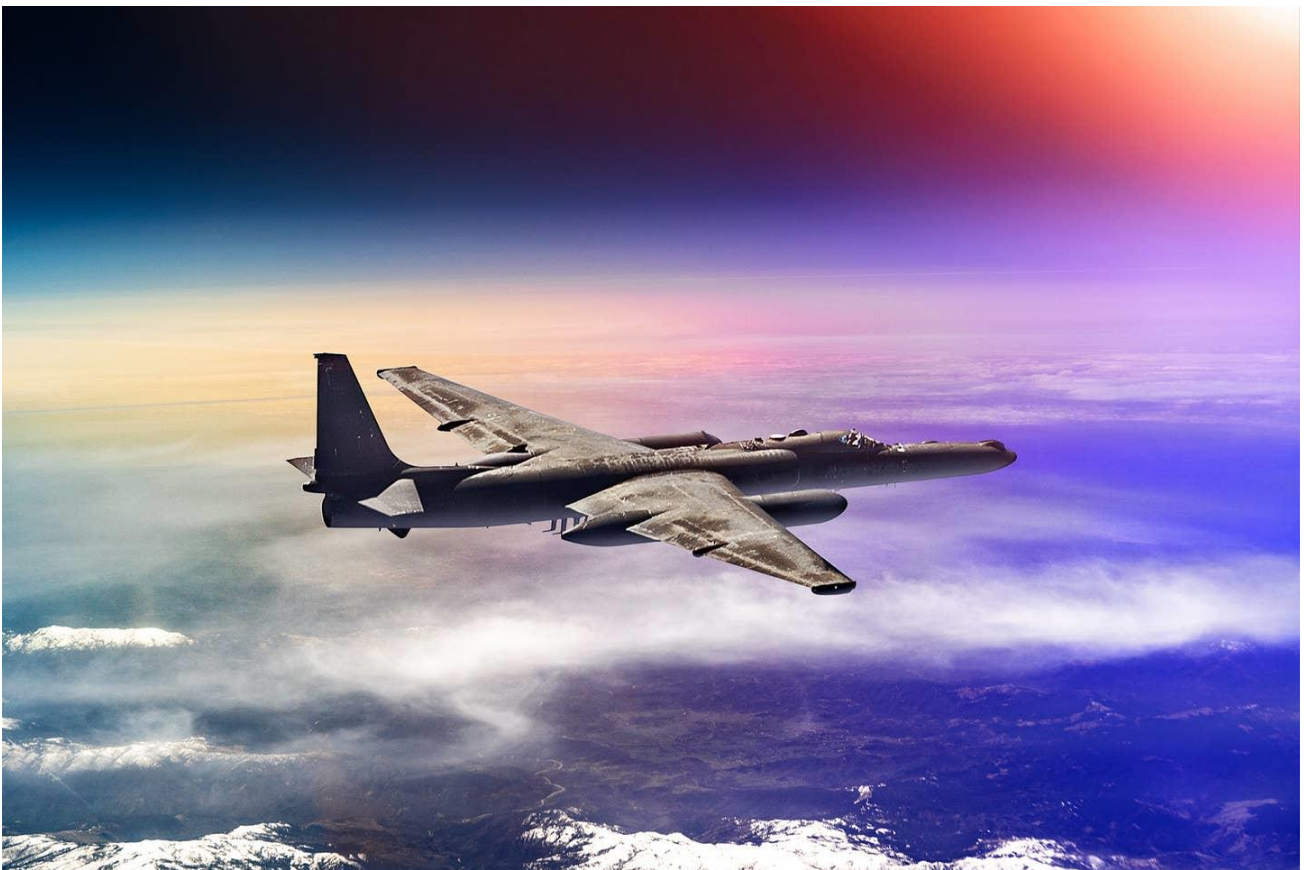
“In the first hour of being on the base, I realized how significant this was. The gravity of what was unfolding before me really started to sink in, and there was an electric feeling in the air.”

This feeling was heightened due to the fact that it had been a long time since the last civilian had actually flown in a U-2 and going up to the aircraft's true operating ceiling was another thing entirely.

Come the day of the flight, Blair had done all the preparation that was demanded of him, plus a lot more extra as well, and as the clock struck 6:00 AM, “we jumped in the car and headed to the base, blasting a mix of Dubstep and metal to keep my anxiety at bay.”

Blair’s flight was notable in that it was, according to him, the first time a high-altitude formation with two U-2s had been put up specifically for a photoshoot.

“Doing a photoshoot like this at the edge of space is entirely different than when I did the same thing with fighter jets,” Blair reflected. “At these altitudes, there are only 5 knots of speed that separate the planes from going so fast they fall apart or going too slow that they fall out of the sky completely. For this reason, we had to use geometric turns to stagger the aircraft rather than having the second plane speed up or slow down, which was yet another complexity that made this photoshoot as challenging as it was.”







What followed probably felt like a blur of the familiar chase cars long associated with the U-2 program, the rapid, sailplane-like climb to altitude, and, ultimately, the two spy planes making their “rendezvous at the top of the Earth’s atmosphere.”

We asked Bunting about about his major takeaways from completing the rarest of air-to-air photography shoots:

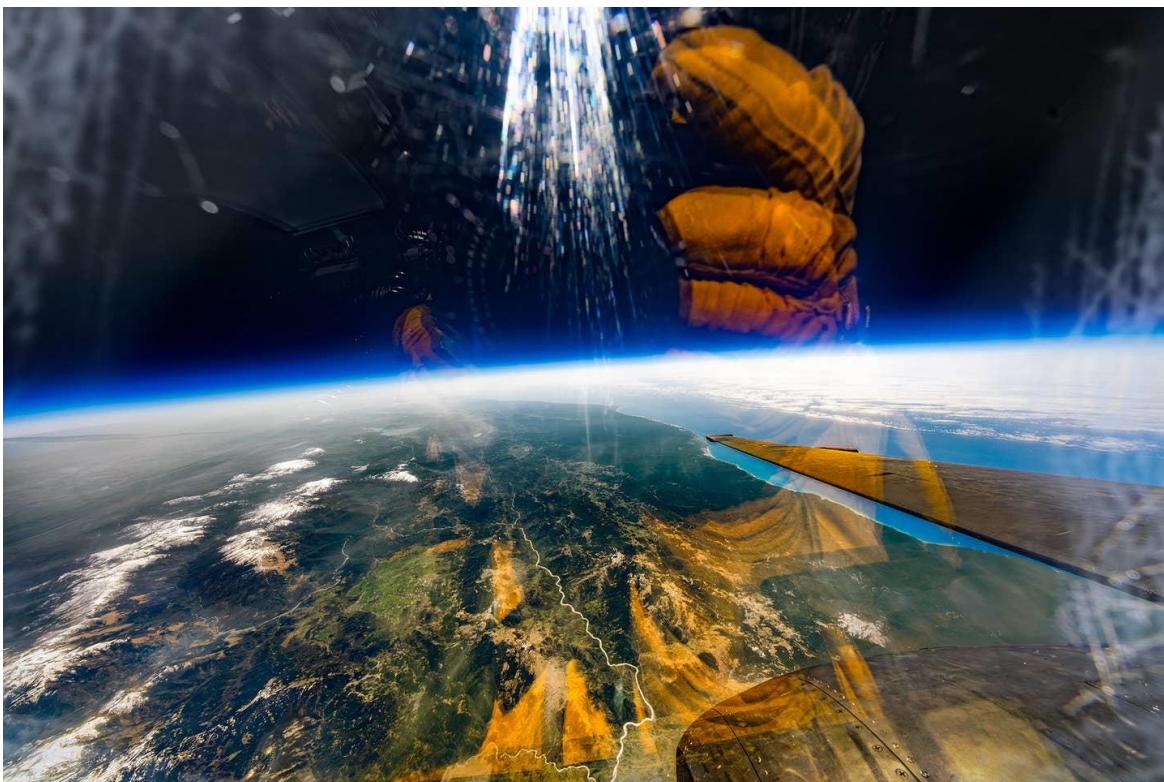
"I think the most surprising part of it all was when we got to the edge of the atmosphere and I looked up only to see the sun against the black background with the moon not too far from it, also against the blackness of space. I had done my best to mentally visualize what it would be like, but that was a situation I could've never predicted. It was a sight to behold."

Blair Bunting

"The hardest part of the entire project was the mental aspect of it all. Not only does one have to get comfortable being in a very loud, claustrophobic space suit, but you also have to be able to control your emotions and compartmentalize things, as crying at altitude is not possible. Irritating your eyes can be a big issue if you can't touch them due to the spacesuit helmet. Beyond that, we had to take measures to keep my heart rate and respiration (breathing) reduced as any excess excitement or fatigue would result in icing over the cockpit and I would not be able to take pictures."

"In retrospect, it is truly a humbling experience. I feel deep gratitude for the trust bestowed on me by those at the Air Force, Beale Air Force Base, and the video teams. I could have never deserved such an opportunity, no matter how hard I tried, and I'm still processing it all. I don't know if I will ever be able to fully realize the view that I took in when the Earth curved below the blackness of space, but just the opportunity to witness it has meant everything to me."





# The slow and delicate aircraft taking on spy missions

Submitted by Dave Harding

By Michael Dempsey

Technology of Business reporter



Wheels are optional for the Phasa-35

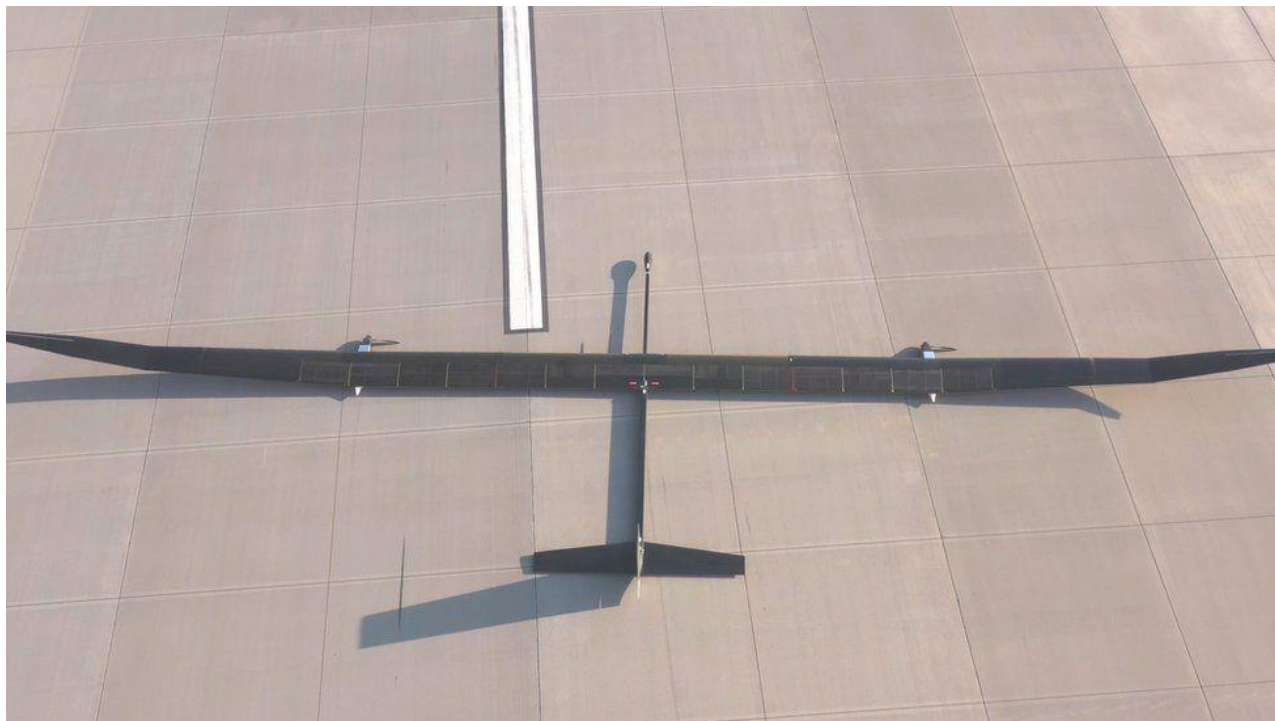
Most military spying is conducted from satellites hundreds of miles above the Earth's surface. But there's a new entrant in the old game of keeping an eye on your strategic opponents, and this new spy is surprisingly sluggish.

Phasa-35 moves so slowly it can appear to be going backwards. This weird, elongated British aircraft is powered by small electric engines attached to elongated wings encasing solar panels. These capture power during the day and keep the two engines turning at night. Solar power is stored in packs of lithium batteries like phone batteries. Having so many batteries mean some can fail during weeks of flight without any impact on endurance.

With a 35-meter wingspan, pencil-thin carbon fiber fuselage and 150kg all-up weight Phasa-35 looks a little flimsy.

The wheels it rolls on to take off are abandoned on the ground, the machine landing slowly on its two engine pods, and changing the bruised propellers after every flight. It resembles an arrow that has grown long thin wings.





The Phasa-35 has a 35m wingspan

That fragile appearance, more insect than airplane, is one clue as to why BAE Systems chose a US military range in New Mexico to test Phasa-35 in July this year. The normally-benign climate in the South-West US gave the aircraft its best chance of climbing to 66,000ft, twice the altitude of a commercial jet, without encountering strong winds that might tip the delicate machine over and into a dive earthwards.

Clambering to its stratospheric destination at a lazy 55 mph the machine can travel backwards in relation to the earth if it hits winds of higher velocity as it noses upwards through weather systems. One of its rivals, the Zephyr solar-powered high-altitude aircraft, flew for up to 18 days during 2021 tests in Arizona.

Zephyr was also built in the UK, for Airbus. But a more ambitious flight lasting 64 days ended in a crash in July 2022 due to high-altitude air turbulence.

In the rarefied air above 60,000ft such aircraft can dodge the weather, but they also get very little lift from their wings, leaving them vulnerable to any buffeting or gusts. This set-back took place while the Zephyr was testing the potential for such aircraft on behalf of the US Army.

Military minds on both sides of the Atlantic are pondering how to use them as satellite substitutes. They belong to a new category of unmanned aircraft, the High-Altitude Pseudo-Satellite (HAPS). In the UK the Ministry of Defense (MoD) says early pseudo-satellite trials have evolved into Project Aether. This embraces high-altitude balloons as well as solar-powered planes.

Carrying a small payload of cameras or other sensors one HAPS could sit above an area of interest for months, eavesdropping on communications or relaying information on hostile troop movements.



The suspected Chinese spy balloon shot down off the US coast in February appeared to heft a large package of electronic equipment. By contrast a pseudo-satellite is limited in the weight it can carry.

One key attraction of such spying equipment is price - they cost a fraction of launching a satellite into space. But before this vision is realized potential customers must be convinced the aircraft can stay aloft long enough to complete its job.

Weather forecasting on a very detailed scale plays a big part in this project. As the MoD states, "the understanding of how to operate pseudo-satellites within the stratosphere (above 60,000 ft) is novel but maturing all the time."



The Phasa-35 trials relied on a laser sensing system that measured weather conditions and wind speeds every 500ft up until the pseudo-satellite's final altitude. This granular approach to weather forecasting allowed Phasa-35 to dodge any unwelcome turbulence. Phil Varty, head of business development for Phasa-35 at BAE Systems, points out that loitering pseudo-satellites can stay "fairly still".

This is attractive for military clients who want to observe one spot for weeks, and for commercial clients who might want to put hundreds of pseudo-satellites up in formation to offer internet connections across a remote area. Long endurance and high-altitude aircraft could provide back-up for satellite systems

Mr Varty's team are building up experience to take on tougher weather conditions, though just like a space launch they will never gamble with thunderstorms.

He notes that pseudo-satellites have much in common with space exploration. "This is all a bit like the space industry used to be, it's just opening up."

In theory Phasa-35 is in the running to win records for high-altitude endurance, but Mr Varty wants his engineers to keep their feet on the ground. "I keep telling the team we're not chasing records here."

Military planners fear that jamming or destruction in space might deprive a nation of its spy satellites just when they are most needed. So pseudo-satellites represent a relatively cheap back-up.

Douglas Barrie, a defense and aerospace specialist at the International Institute for Strategic Studies think tank in London describes this as "an alternative approach to what a spy balloon gives you. A pseudo-satellite can sit over an area of interest for days and it's covert, there's not much radar signature. This is a technology on the cusp of having its time arrive."

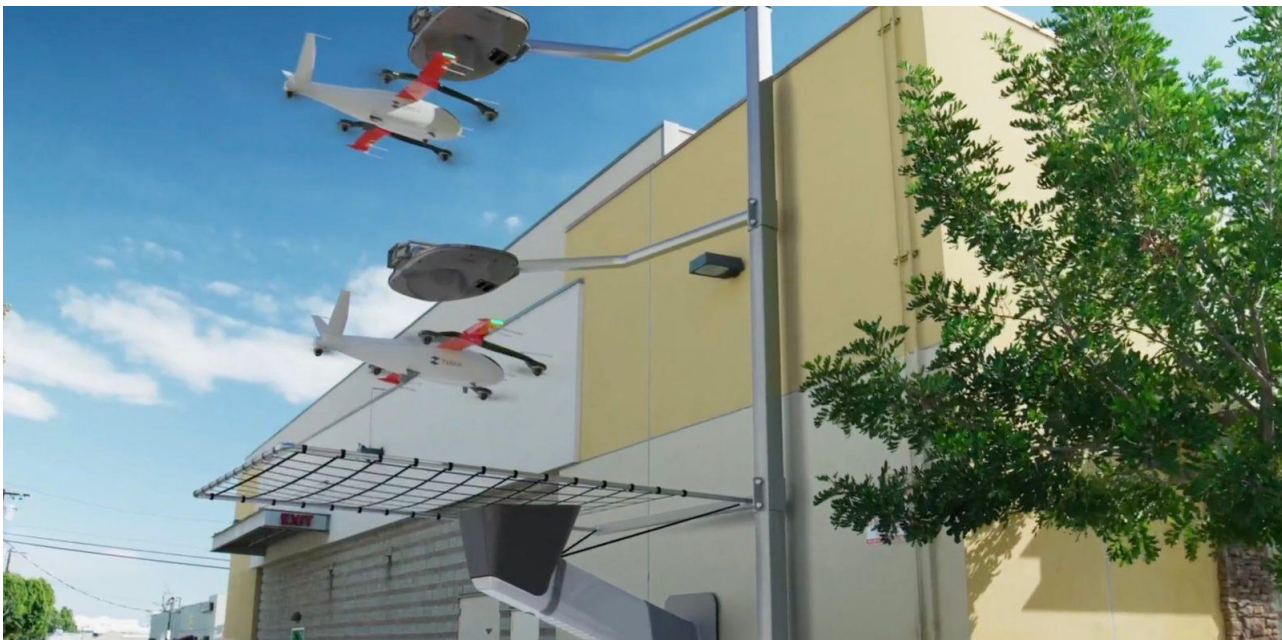
BAE Systems plans to expand the capability of Phasa-35 towards 2025. Four more aircraft will be made at Alton in Hampshire, though the wingspan means each one gets broken down into parts to be assembled at its launch site.

Airbus is talking to Saudi Arabian telecoms company Salam about Zephyr. Salam is interested in using pseudo-satellites to bounce 5G Internet signals down to earth.

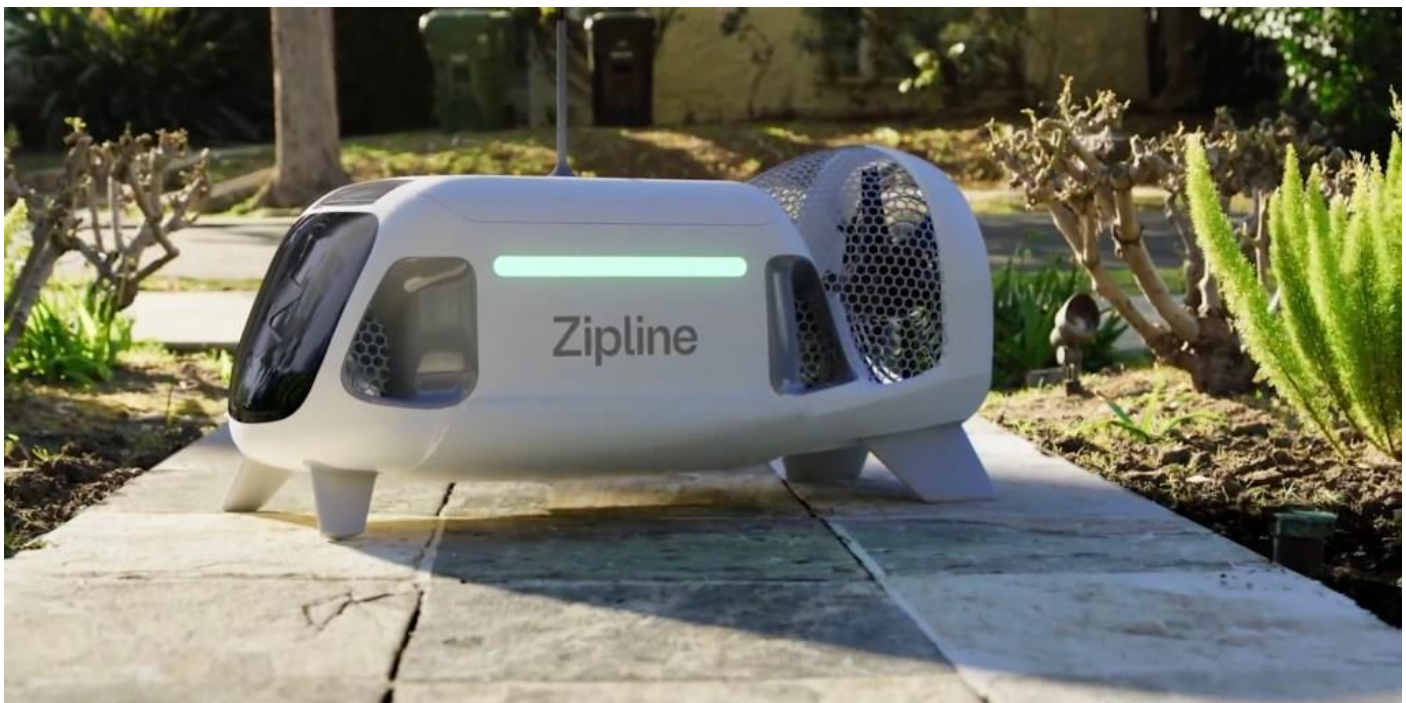


# Zipline unveils all new autonomous home delivery drone and payload droid network

By Bruce Crumley | Mar 15 2023 - 12:59 pm PT



World-leading instant logistics and drone delivery company Zipline has unveiled a major revision of its commercial transport network, featuring an entirely reconceived transport UAV and an equally autonomous payload droid that – once lowered to client destinations by a winch – can guide itself to an area for unloading as small as a patio table or steps up to a house.





South San Francisco-based Zipline presented its revamped home delivery system pairing the new fixed-wing Platform 2 (P2) drone with the final delivery droid, whose own onboard smart tech and internal propellers allow it to position over and touch down on even the smallest of spaces available at client destinations.

The company says both vehicles are practically silent, with the main UAV – known as a “Zip” – expected to make home deliveries up to 10 times faster than automobiles and complete 10-mile deliveries in about 10 minutes.

The newly revealed network not only represents a major update from the company’s previous drones – which were both larger and launcher-shot – but also represents a breakout from point-to-point delivery operations similar to the strategy Wing Aviation announced last week.

(See following article “Wing Delivery Network frees drones from point-to-point operation for faster, flexible service.” Editor)



Each P2 Zip drone boasts a 10-mile radius flight capacity while carrying six to eight pounds. That means that, when preferable, the UAVs can continue making round-trip deliveries by returning to the dual-source Zipline docking and recharging stations integrated into the facilities of partnering businesses.

But when the activity requires, those UAVs can also make up to 24-mile one-way trips, then replenish their batteries at the closest company stations before picking up whatever order is awaiting transport to the nearest client company. That enables a flexible, dynamic network of craft

capable of adapting to the ebbs and flows of incoming orders and serving businesses and ordering customers faster.

After flying at more than 300 feet above ground to their destinations, the new Zipline drones will hover quietly at the same altitude while winching the payload down to what the maneuvering delivery droid ensures will be a precise handoff in even the tightest of spaces.

Zipline has already signed on an array of companies waiting to use its new network. Those include Sweetgreen, Michigan Medicine, Intermountain Health, MultiCare Health System, and the government of Rwanda – the company’s first medical services client that now also plans to use the home delivery operation for urban aerial last-mile transport to homes, hotels, and health facilities in the capital Kigali and elsewhere in the country.



Payload drone, at right, is loaded with cargo inside the establishment and then hoisted by its tether wire outside, at left, to the waiting transport UAV. When it arrives at a destination the payload drone is lowered to the ground on the tether. The payload drone's onboard propulsion and autonomous control systems guide it to a very precise, and safe, landing area. The much larger and more dangerous transport UAV remains at a safe altitude throughout the delivery.

“Over the last decade, global demand for instant delivery has skyrocketed, but the technology we’re using to deliver is 100 years old,” said Zipline CEO Keller Rinaudo Clifton at the unveiling. “We’re still using the same 3,000-pound, gas combustion vehicles, driven by humans, to make billions of deliveries that usually weigh less than five pounds. It’s slow, it’s expensive, and it’s terrible for the planet. Our new service is changing that and will finally make deliveries work for you and around your schedule. We have built the closest thing to teleportation ever created – a smooth, ultrafast, convenient, and truly magical autonomous logistics system that serves all people equally, wherever they are.”

Zipline will now use about 100 of the new Zip home delivery drones to undertake high-volume trial flights involving more than 10,000 test sorties before rolling out the services later this year with partner businesses and end-user customers, who will place orders through Zipline’s marketplace.

In more than seven years of drone delivery operations, Zipline crafts have made over 500,000 autonomous commercial flights covering more than 40 million miles – equivalent to 80 round trips between the Earth and moon. The company says its current activities, combined with the growth expected from the new P2 network, should allow it in 2023 to surpass the output of all previous years combined.



Click here for video link: <https://youtu.be/affJ1CesKP4?si=xYKZoGVDR3M6kAIH>



## Wing Delivery Network frees drones from point-to-point operation for faster, flexible service

By [Bruce Crumley](#) | Drone DJ Mar 9 2023 ,



Google’s corporate cousin Wing Aviation has repeatedly innovated its methods of organizing and operating UAV transport of ordered goods between retailers and customers. Now it’s taking that to another level by devising reactive, pragmatic, and automated networks of delivery drones whose flexibility and increased efficiencies are what the company thinks will be key to massively scaling the activity.

Today the company unveiled its Wing Delivery Network system, which completely re-thinks the way drone transport services have been structured up until now. Rather than continuing to operate those as point-to-point shuttles between flight centers and customers’ homes – and back again – Wing will instead oversee a fluid approach that allows its UAVs to act more like taxis or cars in ride-sharing apps by responding and providing service to clients they are nearest to.

By enabling that kind of reactive roaming, recharging, and redeployment from whatever Wing hub receiving new orders happens to be the closest, the company believes it has created a plan for faster response times, better service, and the kind of synergetic networking required to provide entire urban areas with drone delivery coverage.

“Drones within the Wing Delivery Network can pick up, drop off, travel, and charge in whatever pattern makes the most sense for the entire system,” says Wing CEO Adam Woodworth. “For example, with multiple charging spots, they’ll have the flexibility to meet peaks in consumer demand across entire cities. Pad locations can be added simply, with the aircraft themselves used as the surveying tools to update and expand the network.”



Wing previously innovated its drone delivery model by setting up flight centers aside retail partners, serving several clients at once by operating from rooftop malls, and even partnering with commercial property companies to organize drone deliveries from unused spaces in strategic urban locations.

Introduction of the Wing Delivery Network, however, aims to be the drone transportation equivalent to the airline industry switching previous city-to-city route strategies to the spoke-and-hub structure a half century ago, which helped ignite an explosion in passenger volumes

“By the middle of 2024, we expect our system to be capable of handling millions of deliveries for millions of consumers at a lower cost per delivery than ground transportation can achieve for fast delivery of small packages,” Woodworth says.



But to make that automated expansion of drone delivery possible, Wing is also rolling out an additional innovation: the Autoloader. The device is designed to do for UAVs what Covid-19-inspired curbside pickup services have done for supermarkets, restaurants, and myriad retailers by making the order/fulfillment process faster and easier.

The units allow employees to prepare orders as they come in, then hang them from the Autoloader and go on to other tasks while the nearest drone in the Wing network arrives. Once above the machine, the UAV lowers its delivery chord into a feeder mechanism that attaches it to the hanging flight container, which is in turn winched up to the UAV for transport to the client.

The invention says Woodward, fits into the free-flowing operation of Wings UAV fleets to create a better, quicker, and broader overall operation.

“Wing Delivery Network’s automation makes it very easy to deploy and maintain,” he adds. “For businesses and other organizations, building drone delivery into the last mile can be as simple as ordering drones, turning them on, and letting them connect to the network.”

Follow the link below for video of the Wing delivery network.

<https://youtu.be/xEcspDhZJuM>



# Attempt at Flying the World's Biggest Free-flight Rubber Powered Airplane

From the Southern California Antique Model Plane Society newsletter:  
By Dave Harding

This is an attempt to capture the record for the largest rubber powered free flight airplane.



Some flight testing of a candidate aircraft was recently performed at our Perris flying site and captured in a You Tube video which you can view at your leisure.

There are several videos, the first concerning the design goals and development activity leading up to initial test flights of this design. Then a more recent video where the model is attempted to launch from a helium balloon lifting setup.

The guy is talented, but needs to spend some time flying rubber power before diving into this concept. It's fun to watch - look for it by using the search words "Balloon launching massive 16-foot rubber band airplane". The title itself shows a certain level of ignorance of the free flight hobby, and the content demonstrates this. Perhaps the intent is the entertainment value and not the technical challenges so much.

<https://www.youtube.com/watch?v=uQKE3sHre98>

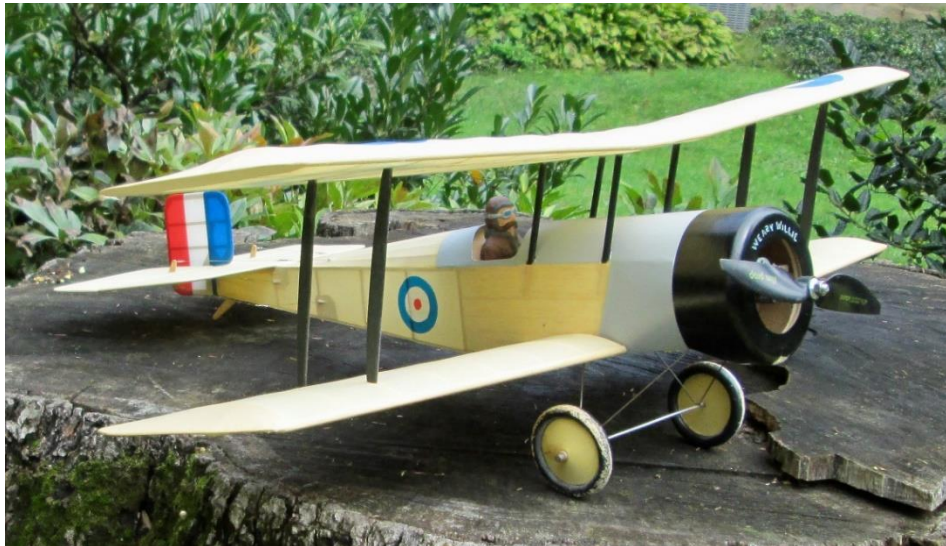
<https://www.youtube.com/watch?v=igwkA-hLvf4>



## 2003 AMA Electric Nationals

A nostalgic look back at a fun time for Propstoppers of all ages.

By Dave Harding



**Where did that come from..... 20 years later?**

Wait, that was the model grandson Matt flew at the 2003 AMA Electric Nationals. Where did that come from?

In 2003 Dick Barkowski, Mick Harris and I had dived into electric flight and Mick was building up a storm. So when Dick and I decided to compete at the AMA Electric Nationals at Muncie we noticed there was a scale event. Mick offered three WWI models he had built so we took them along together with my grandson Mathew. Matt grew up on the earliest computers and games so learning to fly came easily. So we took along a model for him too.

Here are all the models flown in the event, the first three built by Mick.



The event was done on the basis of the model appearance score and then a flight score. Flight was scored on the basis of actual flight realism for the type.

Dick suffered an oops in his flight and damaged beyond repair for further flights. Matt and I made it to the finals with one other guy who had an excellent model. The three of us would make one more flight scored to determine the winning places.

Well, the competition was my grandson, but I wanted to improve my flight score, so I decided to add a touch-and-go element.

In the actual event the third guy did some wild aerobatics, which were judged to be a poor match to the type, and scored appropriately.

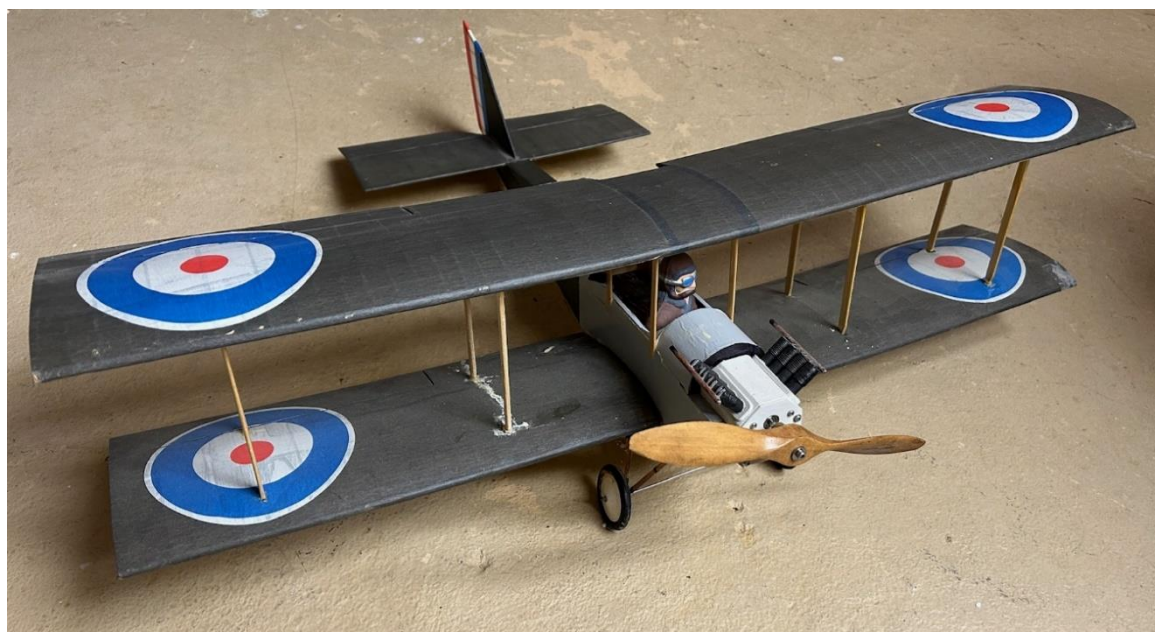
I made my flight but unfortunately the touch-and-go became a touch and stop as the prop hit the ground! So Matthew flying Mick's Bristol Scout was the winner. The AMA organizers were even more pleased as of course he was a Junior AMA member.



So, where did the model come from this last week? Well, turns out it had been hanging from Matt's bedroom ceiling since 2003 and, what can I say, my daughter is a bit slow in organizing interesting stuff!

### ***Dave Harding***

Wait, what is that on one of my workshop shelves? Wish Mick was still with us to tell me just what airplane this is!



**But Wait....  
There's More.**



The other reason grandson Matthew was with us was that the Gencon gaming convention was on in Indianapolis, and of course he wanted to go to that too.

So while we flew the other events the next day he “played”



Matt eventually graduated from Rochester Institute of Technology; RIT, with a degree in game design. He has been working at Activation Blizzard for eight years and is now a senior developer on The World of Warcraft Classic.





# Steam powered model airplanes

By Murray Wilson

When I joined Propstoppers ten plus years ago Dave Harding, then the editor of the newsletter, asked me as a newcomer to write an article for the newsletter. The subject could be anything of my choosing and so I chose steam powered airplanes. Not as unlikely a subject as might be supposed for the earliest history of powered flight is of steam power. Even the first helicopter was steam powered, it flew and it still exists. If you'd like to reread the article I'd be happy to send it to you.

Writing it gave me an urge to build a steam powered plane, but unfortunately not also enough personal steam to tackle it. The interest remains though and I was delighted recently to come across a video on YouTube of one built and flown in Sri Lanka five years ago. The link is <https://www.youtube.com/watch?v=8fGUUnf3OiQ>. The power unit was based on one described in "Model Engineer" many years ago and that information is available online, I can provide the links. So go ahead someone, just make sure your AMA membership is paid up.

Murray Wilson



Edward  
Pererra  
Sri Lanka

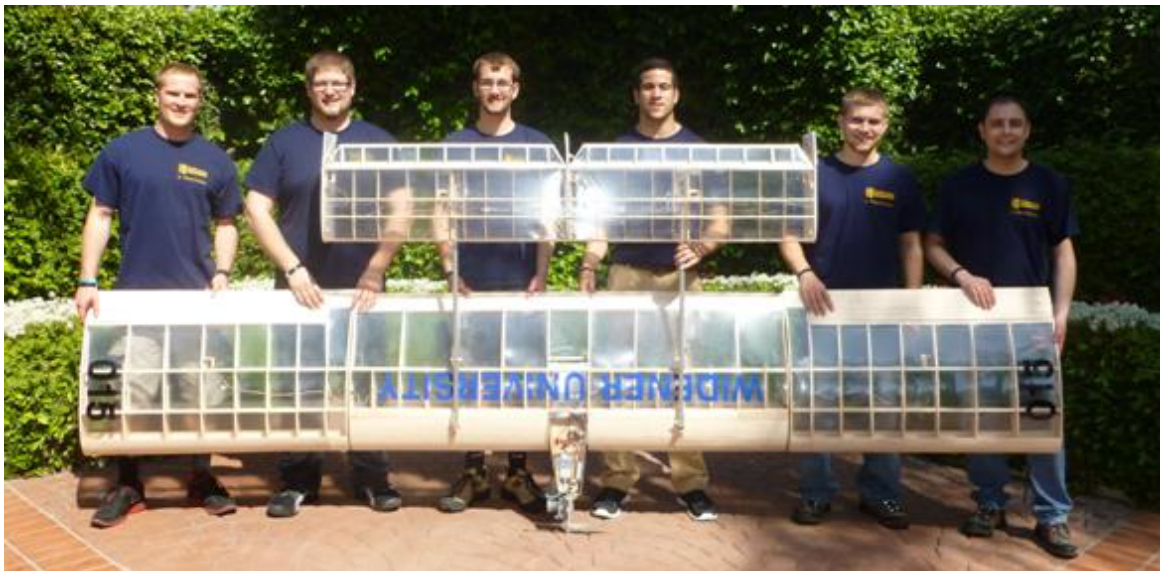


## Drexel at Elwyn 2023

By Dave Harding

As most of you know we have been supporting Widener and Drexel University students in various aviation courses over the years. Many of these events have been final year courses where the students perform in groups on the Society of Automotive Engineers, SAE, International competitions.

Here are prior year Widener and Drexel airplanes from the big airplane class





Last year two Drexel teams competed in the SAE Competition Small Class and we gave them considerable support as the requirements were unusually challenging; heavy flight off an 8 foot table! The two teams were very late in designing their airplanes and the difficult design challenges resulted in two very late very unprepared models.

However both teams eventually completed their models just before leaving for Texas and the actual competition. Propstoppers managed to test fly one of the models but the other didn't quite make it before leaving. Both flew, however, at the event in Texas.

Here is Paul Pujol setting up for a test flight at CA Field.



The other activity you may be more familiar with is the support we have given to Professor Yousuff's class on Aircraft Design. This is a regular engineering class which takes place over one semester, or about ten weeks. Before we became involved, the course final exam was for groups to design airplanes to a specific requirement, say "carry 12 passengers 4000 miles" etc. The students then made designs and analyzed the performance, stability etc. But the design was only on paper.

So Professor Yousuff asked us if there wasn't a way to have them design then build and fly the resulting design. Of course in a ten weeks course that seemed impossible, but our late member Chuck Kime suggested if we could provide the basic fuselage with propulsion and control hardware



perhaps the students could design and build wings and tails then bring them for us to test fly. This is what we have been doing for some years now (lost count of how many times).

This has been a very successful program with substantial attendance and support.

Here is one of the early program events which we flew at CA field



So this year's Drexel program was one of these courses and again we provided the fuselages. The students are provided with wing ribs, and sheet balsa for the tails, which they design to meet performance requirements. We provide the fuselage and propulsion data and they design and build the wings and tails.

Recently we decided to hold one last class at Drexel before the flying to ensure the wings built at that time were without warps and tails were properly hinged and set with control horns.

Six teams attended the flight program at Elwyn and the first four models performed perfectly. But two were late finishers and one wing had considerable warps and the other had improperly joined wing halves.

These were challenges and, as usual, Propstoppers applied their skills to sort them out. Unfortunately I didn't get any pictures this time but here is one from the past program. Bottom line is both the students and Propstoppers attending always enjoy the results



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## A Moment in Flight:

Flight Video by Pedro Navarro

You might want to get a check-up from your cardiologist before watching this issue's flight of Pedro's Pitts biplane to a fast tempo samba called Moliendo Café.

Click below to see this issue's Moment in Flight.

[The Pitts and Moliendo Cafe](#)

