



BRIEFINGS



January-April 2024

HILLER AVIATION MUSEUM WHERE INSPIRATION TAKES FLIGHT

FLYING THE SILENT SKIES WITH LOCKHEED'S YO-3A QUIET STAR

By Jenna Kimberlin

In the tumultuous landscape of the late 1960s during the Vietnam War, the United States military found itself grappling with the challenge of surveilling elusive Viet Cong soldiers that were performing nighttime supply missions to South Vietnam. It was specifically for this task that the DoD's Advanced Research Projects Agency (ARPA), renowned for its innovative and experimental programs, embarked on a pioneering initiative - the creation of a "quiet aircraft" tailored specifically for nocturnal reconnaissance along the river in South Vietnam.

The inaugural phase of this clandestine aerial surveillance project materialized in 1967 at NASA Ames Research Center at Moffett Field, CA. The brainchild of ARPA, the aircraft was named the "QT-2" and drew inspiration from unpowered gliders which possessed an unparalleled ability to traverse the sky like ninjas. The wingspan of the aircraft, based upon a Schweizer SGS 2-32 sailplane, allowed it to soar silently for long distances without waking up the whole neighborhood.

YO3A Flying in Vietnam



ARPA's QT-2, captured the attention of Lockheed Missiles & Space Company in Sunnyvale, CA which was awarded the contract to build these planes. Intriguingly, this division of Lockheed (a titan in aerospace) found itself in uncharted terri-



QT-2 Prototype

tory: Missiles and Space had never built an aircraft before! The resultant creation, christened the YO-3A or the "Quiet Star," underwent a metamorphosis at the hands of the Sunnyvale engineers, who tricked it out with all sorts of soundproofing magic. They introduced noise-dampening engine cover interior coatings, silicone sealants, and an asymmetrical exhaust vent and muffler which were strategically positioned on only one side of the cowl and created a deliberate modulation of sound frequencies.

Under the hood, the YO-3A housed a 220-horsepower six-cylinder Continental engine, its propeller shaft driven by rubber belts at a low RPM. The meticulous engineering approach sought to mitigate the overwhelming propeller noise that had the potential to compromise the aircraft's covert operations. Rigorous testing and



Leaping Leprechaun
by helicopter March 17



Spring Model Train Show
March 30 - April 7



Easter Bunny March 30
by helicopter



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analysis culminated in the adoption of a three-blade “paddle” prop design, forsaking the preference of a quieter variable pitch propeller, which was a sacrifice needed to meet the deployment deadline.



The YO-3A’s capabilities extended beyond mere engineering marvels. Laden with a laser-targeted designator and an advanced night vision system featuring infrared-enhanced intensification, the aircraft “provided a capability for the aerial observer, who sat in the front seat of the aircraft, to see a Vietcong soldier light a cigarette from a distance of one nautical mile at night in one-quarter moonlight.” (Schnebly, 2000)

In the year 1969, Lockheed completed the assembly of eleven YO-3As, with Bohannon Industrial Park in Menlo Park serving as the crucible for project management, design, and manufacturing. Soon after, nine of these stealthy sentinels embarked on a journey to South Vietnam, where they dutifully served for 18 months in locales such as Bien Hoa and Lang Bien. Remarkably, none were ever audibly detected by the enemy. There was only one singular incident recorded when an activation of landing lights momentarily betrayed its presence.

Upon their return to the United States in the early 1970s, several YO-3As found a new calling within the ranks of the Federal Bureau of Investigation (FBI) deployed on kidnapping cases. Working in Southern California, these operatives assumed the role of silent aerial agents, circling ransom drop zones, and discreetly monitoring suspects below. Coordinates of the kidnappers were radioed to agents on the ground and the criminals would be arrested, often in total disbelief as to how they had been tracked. This covert methodology proved instrumental not only in the pursuit of kidnappers but also in combating drug trafficking operations.

One particular vehicle from this chapter of spy plane history, the YO-3A with serial number 18001, found its way from Sunnyvale, CA to the Mekong Delta, to the Hollywood Hills, and right back here

to the Silicon Valley at the Hiller Aviation Museum in San Carlos where it hangs proudly in our gallery. Among the squadron of nine dispatched to Vietnam in May 1970, this aircraft remained in active service for 18 months. Subsequently, from 1974 to 1978, it transitioned seamlessly into FBI service, patrolling the airspace over the sprawling expanse of Los Angeles, and supposedly participating in the historical events surrounding the capture and rescue of heiress Patty Hearst.

In retrospect, these silent guardians of the skies, initially conceived amidst the exigencies of war, transcended their intended purpose. Their legacy endures not only in the annals of military aviation but also as iconic developments in acoustic science, aerial reconnaissance, providing new tools for law enforcement, and clearly paving the way for modern drone innovation.

NASA YO3A test aircraft



The evolution from the YO-3A, a quiet reconnaissance aircraft used during the Vietnam War, to modern drone technology represents a transformative journey in aerial surveillance and intelligence. The YO-3A showcased early efforts to minimize acoustic signatures for stealth, while contemporary drones leverage 21st century technologies like artificial intelligence, GPS, and high-resolution cameras. Over the decades, drones have become pivotal in military, commercial, and consumer applications, offering enhanced endurance, autonomy, and versatility. The transition reflects a paradigm shift from manned to unmanned platforms, symbolizing the intersection of aviation, robotics, and digital innovation, profoundly impacting fields such as defense, agriculture, and disaster response. ARPA and Lockheed paved the way with the QT-2 and YO-3A, and now companies like General Atomics, Raytheon, and Thales are turning sci-fi futurism into high flying reality.

References:

Schnebly, F. David. (2000).

A Greenhouse Anthology: High Technology R&D Adventures and Principles. Xlibris.

PRESIDENT'S PERSPECTIVE



The chilly days are shorter and the star-filled nights are longer. Winter is at hand at the Hiller Aviation Museum! The museum will ring in 2024

with new exhibits to explore. Our new Paper Plane Adventure will formally open on January 20th with fold-and-fly stations and a motorized launcher. The museum is delighted to welcome back master paper airplane builder and former world record holder John Collins as we cut the ribbon on our newest interactive.

Aerial innovation has flourished in the San Francisco Bay Area for over a century, and the Hiller Aviation Museum is pleased to showcase exciting examples of aviation technology developed in our own backyard. One of the museum’s most recent additions is the donation of Wisk’s Cora aircraft – an Urban Air Mobility vehicle capable of vertical takeoff and zero-emission electric flight. UAM development is a cornerstone of aeronautical research, and the Hiller Aviation Museum is delighted to exhibit Cora and other UAM aircraft in its collection.

More high-flying excitement is in the wings for 2024. We’re looking forward to welcoming new aircraft, enhanced exhibits, and delightful public events all through the year. Thank you for being part of the Hiller Aviation Museum’s amazing constellation of supporters that helps us to shine brightly all throughout the year.

*Jon Welte
President & CEO*

Hiller Aviation Museum has gone green with digital eMembership cards

Members, please visit www.hiller.org/digital-membership for details and download the eMembership App on your Smartphone.



REGISTER NOW

WWW.HILLER.ORG/RUN

SUNDAY, APRIL 14, 2024



HILLER
AVIATION
MUSEUM



WALK

JOG

STROLL

on the
San Carlos Airport Runway!

Certified 5K and 10K courses & 2K fun run

***SPONSORSHIPS
NOW AVAILABLE!***

***VOLUNTEERS
NEEDED!***

HEXAGON: SPIES IN THE SKY

RECONNAISSANCE TECHNOLOGY DURING THE COLD WAR

PRESENTED BY RICKY DEUTSCH, SATURDAY FEBRUARY 17, 11 AM



During the Cold War, the US evolved reconnaissance technology, resulting in today's real-time video capabilities. Initially, film was used in satellites to monitor treaty compli-

ance and intelligence gathering of the Soviet Union and other "denied areas." The vehicle, HEXAGON, was 60-feet long and took pictures from 100 miles up. The program was urgent and required cooperation between the CIA and the Air Force, guided by the National Reconnaissance Office. This unclassified briefing by someone "who was there," gives a first-person historical look at how high-resolution images were not only taken but returned via parachute to be caught in mid-air. Essential to success was the work of the launch team, command & control, tracking stations and the aircrews who made the daring catches of the film buckets. This program was a critical Cold War asset.

PERFECT PAPER PLANES

SATURDAY JAN 20, 11AM

Legendary author and paper plane designer John Collins returns to the San Francisco Bay area for a special presentation at the Hiller Aviation Museum! Designer of the paper airplane that set a world distance record in 2012, Collins has written multiple books and presented hundreds of workshops in a quest to help everyone create their own perfect paper plane. Join John for a spectacular table-top air show of paper-light flyers.



PAPER PLANE ADVENTURE

EXHIBIT DEDICATION

SATURDAY, JANUARY 20, 12:15 PM

John Collins joins the festivities as the Hiller Aviation Museum officially opens its newest interactive exhibit. Visitors explore the forces of flight while they fold and fly their own paper planes – some inspired by John Collins' own design! Exhibit open daily and included with museum admission.



MEMBERS ONLY EVENT!

FEBRUARY 2024

More details coming soon...



CALENDAR

JANUARY

TUE-FRI, JAN 2-5

Aviation Camp

SUN, JAN 7 • 10 AM – 5 PM

Scout Day

SUN, JAN 7, 11 AM

Glider Discovery

SUN, JAN 14 • 11 AM

Bot Bowl

MON, JAN 15

Aviation Camp

SAT, JAN 20 • 11 AM

Paper Airplane Show

SUN, JAN 21 • 11 AM

Helicopter Adventure

SUN, JAN 28 • 11 AM

Straw Rockets

FEBRUARY

SUN, FEB 4 • 11 AM

Glider Discovery

SUN, FEB 11 • 10 AM – 12 PM

Bot Bowl – Flying Footballs

FRI, FEB 16

Aviation Camp

SUN, FEB 18 • 11 AM

Helicopter Adventure

MON-FRI, FEB 19 – 23

Aviation Camp

SUN, FEB 25 • 11 AM

Straw Rockets

DRONE PLEX • SATURDAY

INVENTION LAB • SATURDAY

FLIGHT SIM ZONE • SATURDAY
11AM

BSA AND GIRL SCOUTS
OFFERED EACH MONTH – \$5

OF EVENTS

MARCH

SAT, MAR 9 • 10 AM – 3 PM

Garden Model Railroad

SUN, MAR 10 • 11 AM

Glider Discovery

SUN, MAR 17 • 10:00 AM – 12:00 PM

Kids' Carnival – Leaping Leprechaun

SUN, MAR 24 • 11 AM

Straw Rockets

SAT, MAR 30 • 10 AM – 12 PM

Easter Bunny by Helicopter

MAR 30 – APRIL 7

Spring Model Train Show

SUN, MAR 31 • CLOSED

Easter Sunday

APRIL

APR 1 – APRIL 5

Aviation Camp

SUN, APR 7 • 3 PM – 4:40 PM

Flight Sim Rally

MON, APR 8, 10:30 AM – 12 PM

Solar Eclipse Viewing

APR 8 – APRIL 12

Aviation Camp

SUN, APR 14 • 8 AM

Airport Runway Run

SUN, APR 21 • 10:00 AM – 12:00 PM

Kids' Carnival

SUN, APR 28 • 11 AM

Glider Discovery

WEDNESDAYS & SUNDAYS, 11AM-3PM

THURSDAYS & SUNDAYS, 11AM-3PM

FRIDAYS & SUNDAYS, 11AM-3PM

**OUT PROGRAMS
SEE WEBSITE FOR DETAILS**

FLYING FOOTBALLS FUN FEST & BOT BOWL

SUN FEB 11, 10AM-12PM

FOOTBALL DROP AT 12PM



Join the excitement of the big game as the Hiller Aviation Museum explores the combination of football and flight in a family-friendly extravaganza! See a helicopter football drop, participate in the Robo Bowl, split the uprights with an FPV drone, run through the obstacle course, program a robot to carry a football to the end zone in the Invention Lab, and more! Wear your favorite team jersey and get a prize!

Come "Tailgate" with hotdogs and pizza available for purchase. Plenty of time to get home afterwards for the big game! Event included with Museum admission

BAY AREA GARDEN TRAINS

SAT MAR 9, 10 AM - 3 PM



The Bay Area Garden Railroad Society's waist high track features live steam locomotives. These railroad engines are designed to be run in anybody's backyard garden. Live steam locomotives have a butane fueled fire that boils water. The resultant steam is then used to power the pistons. This is the same technique full sized locomotives have used for 175 years. Many examples of old time model steam locomotives will be seen running on the track, all the while puffing wonderful plumes of steam.

LEAPING LEPRECHAUN

SUN, MAR 17, 10 AM – 12 PM
LEPRECHAUN LANDS AT 12 PM



Come celebrate St. Patrick's Day at the Hiller Aviation Museum with face painting, bounce house, "Pot of Gold" treasure hunt and a Skydiving Leprechaun! Event included with museum admission.

EASTER BUNNY ARRIVES BY HELICOPTER

SAT, MAR 30, 10 AM – 12 PM

Join the Easter Eggstravaganza on Saturday, March 30 from 10 AM – 12 PM, The Bunny arrives at 11AM. Get an Easter Egg straight from the Bunny and enjoy face painting and bounce house. All included with museum admission.



TRAINS & PLANES DISPLAY

**SAT, MAR 30 – SUN, APR 7 DAILY,
10 AM – 4 PM**



Join us for our annual Spring Model Train Show. This year there will be five separate model train layouts set up at the museum.



HILLER AVIATION MUSEUM

Garden Steam Model Trains



**Saturday
March 9
11am - 3pm**

Spring Model Train Show

**March 30
through
April 7, 2024**

See up to five exquisitely crafted scale model train displays in a magical world of miniature landscapes, scenery and villages.



Trains included with museum admission
650-654-0200 www.hiller.org

HILLER AVIATION MUSEUM PRESENTS Dreams Take Flight 19TH BENEFIT GALA & AUCTION

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Special Thanks

EDUCAT

**AVIATION CAMP—SPECIAL WINTER/
SPRING SESSION GRADES K-5**

**WONDERS OF FLIGHT
JANUARY 15**



**GOT BOTS
FEBRUARY 19-23**



**ENGINEER'S WORKSHOP
APRIL 1-5 & APRIL 8-12**



Aviation Camp returns with high-flying fun throughout the school holidays January-April. Each session explores the science and adventure of aviation with hands-on activities, flying model aircraft, realistic flight simulation and opportunities to investigate real aircraft.

Visit www.hiller.org for complete information on each program, or to register online today!

ION PROGRAMS WINTER/SPRING 2024

FAMILY EVENTS

BOT BOWL

**SUNDAYS, 10AM-12PM:
1/14, 2/11**

Join the Robo Bowl and take a turn commanding programmable robots to run plays in the Hiller Aviation Museum's own robotic stadium!



HELICOPTER ADVENTURE

**SUNDAYS, 11AM-12PM:
1/21, 2/18**

Launch a vertical adventure with helicopters! Explore a real, full-sized helicopter and learn how to control an aircraft capable of vertical flight. Make a simple paper helicopter and test fly it in a wind tunnel, and climb aboard the Scorpion helicopter to try out the controls!



STRAW ROCKET WORKSHOP • AGES 5+

**SUNDAYS, 11 AM
1/28, 2/25, 3/24:**

Explore the world of rocketry! Each Rocket Blastoff features an introduction to rocketry and Newton's Third Law of Motion, including an exploration of a real JPL rocket on display at the Hiller Aviation Museum. Following a demonstration, participants construct a high-performance straw rocket, then launch it across the museum with a calibrated burst of air.



GLIDER DISCOVERY DAY • AGES 3+

**SUNDAYS,
11AM-12PM:
1/7, 2/4, 3/10, 4/28**

Explore aircraft up-close and personal at Glider Discovery Day! Learn the parts of an airplane, help to assemble a full-size aircraft mockup, and build and fly balsa gliders in a fun-filled investigation of flight.



FLIGHT SIMULATOR RALLY - AGES 8+

SUNDAYS, 3PM-4:30PM: 4/7, 5/19

The Flight Simulator Rally, held in the Hiller Aviation Museum's Flight Sim Zone, presents participants with a specific mission in simulated flight. Each 30-minute session provides ample time for participants to learn a particular flight, then ends with a challenging flight to achieve the best possible results!



KIDS CARNIVAL

**SUNDAYS, 10AM-12PM:
3/17, 4/21, 5/12**

Join the fun to build and fly a model aircraft, check out in an aircraft cockpit, experiment with wind tunnels and weather permitting paint a full-size airplane! On March 17 the carnival will welcome the Leaping Leprechaun in a spectacular parachute jump!



AERO DESIGN CHALLENGE - AGES 9-12

**SATURDAY,
1:30 PM - 4 PM: 2/17**

Aero Design Challenge is an exploration into design and engineering. The program explores concepts in aeronautics that challenges participants to construct a working prototype. Each student in the Aero Design Challenge participates in a series of discovery experiences including flight simulation, Exploration of Museum, and Design Challenges.



Held annually since 2013, the Aero Design Challenge celebrates the design thinking process in the world of flight. Offered at no cost to participants through the generous support of sponsors, the Aero Design Challenge has engaged over 4,500 participants since its inception. The Aero Design Challenge is generously funded through the support of the SAGA Foundation.

All Sunday Family Events are included with Museum admission. Space is limited for some events and no-cost tickets or reservations may be required. Check www.hiller.org for capacity information, or request tickets at the Admissions counter on the day of each program.

AVIATION CAMP • SUMMER 2024

Registration is now open for this summer's Aviation Camp program!
Visit www.hiller.org for more information. Online registration now available.
Make your plans now to join us this summer for an amazing experience in flight!

Shred: 3 banker boxes per person. Shred service will close when truck is full (come early)

eWaste: computers, laptops, monitors, mice, keyboards, cables, tape and zip drives, printers, phones, DVD players, radios, stereos, VCRs, video game consoles, fax machines, scanners, televisions

Not acceptable: household appliances