

BRIEFINGS



October - December 2021

HILLER AVIATION MUSEUM WHERE INSPIRATION TAKES FLIGHT

TILTING WITH WINDMILLS RETURN OF THE TILTWING AIRCRAFT

by Jon Welte

One of the many unusual and distinctive aircraft designed, built and flown by the Hiller Aircraft Corporation was the X-18. Conceived as a hybrid aircraft able to combine the best features of a high-speed airplane with a vertical takeoff and landing (VTOL) capable helicopter, the X-18 was developed in the late 1950s and first flew in 1959.

As a research and development platform, the X-18 was a unique combination of parts cobbled together from other projects. The fuselage was scavenged from an oddball military transport plane that had originally been developed as a postwar assault glider. The twin turboprop engines were castoffs from earlier Department of Defense-funded projects at Lockheed and Convair,



X-18 Horizontal Flight

respectively, to create a VTOL-capable fighter plane that would take off and land on its tail. And the technology to put it all together came from the Hiller Aircraft Corporation in modern-day Menlo Park.

The X-18 was specifically built to test the feasibility of building and flying a large-scale hybrid aircraft able to take off and land vertically, while flying horizontally, through use of engines mounted on tilting wings. The X-18 was not the first aircraft to employ a fully tilting wing, but unlike the earlier and much smaller Vertol VZ-2, the X-18 was the size of contemporary airliners such as the DC-3. The X-18 completed 20 test flights and a demanding set of ground tests.



Hiller X-18 VTOL Mode

SPECIAL NOTE

THE HILLER AVIATION MUSEUM WILL REMAIN OPEN AND RESUME EVENTS IN ACCORDANCE WITH PUBLIC HEALTH ORDERS. EVENTS LISTED IN THIS EDITION OF BRIEFINGS MAY BE MODIFIED, RESCHEDULED OR CANCELLED IF NECESSARY TO COMPLY WITH FUTURE PUBLIC HEALTH GUIDANCE. PLEASE VISIT WWW.HILLER.ORG FOR UP-TO-DATE INFORMATION.



OCT 23 - OCT 31



SANTA BY
HELICOPTER
DEC 4



CELEBRATE
NOON YEAR'S EVE

@ Hiller Aviation Museum

December 31

10 AM - 1 PM

Bring in the New Year with your family and enjoy games, entertainment and activities for all ages.



Smithsonian Institution
Affiliations Program

While the X-18 demonstrated the feasibility of a hybrid airplane with a tilting wing, it also uncovered some of the design's weaknesses. Among the most vexing was the aircraft's vulnerability to crosswinds when operating in hover mode at low speeds. The large, vertically-tilted wing caught the wind like an enormous sail, and lateral control in gusty conditions proved difficult to maintain. While the tiltwing concept was further refined on later vehicles such as the LTV XC-142, future efforts to develop hybrid aircraft focused instead on the related tiltrotor technology, in which the wing remains fixed while large, wingtip-mounted rotors change orientation to allow for a transition from vertical to horizontal flight. Tiltrotors were first used in a mass-produced aircraft in the Bell Boeing V-22 Osprey, which entered service with the United States Marine Corps in 2007.



Bell Boeing MV-22

Although development of large scale tiltwing aircraft slowed after the 1950s, the idea has more recently been revisited for use in small, electric powered personal air vehicles. The all-electric, distributed-thrust technology first harnessed in small multirotor drones has proved to be applicable to small, personal air vehicles, and on smaller scales the control challenges of tiltwing aircraft are reduced – and the benefits, which include reduced drag in VTOL operations, more important.

Airbus Industries' Silicon Valley-based technology development subsidiary A³ ("a-cubed") began development of such an electric-powered tiltwing aircraft in 2016. Named Vahana, the aircraft was designed and built as a technology demonstrator. Two aircraft were flown



Airbus A³ Vahana .

2018-2019. Unlike many other electric-powered VTOL personal air transports tested in the past decade, the Vahana's tiltwing feature enabled it to achieve cruise speeds of well over 100 miles per hour. As is the case with many electric-powered VTOL vehicles flight endurance is limited by available battery capacity, but the high cruise speed possible in horizontal flight mode allowed a range of over 60 miles in the final flight variant. The Vahana project was completed at the close of 2019, with the knowledge gained applied toward new aircraft.

The San Francisco Bay Area has been at the forefront of cutting-edge aviation technologies since the late 19th century, a legacy that continued with the groundbreaking work of the Hiller Aviation Corporation in the second half of the 20th century and which endures today with the ongoing proliferation of innovative aeronautical startups across Silicon Valley. In September, an Airbus A³ Vahana flight prototype will go on display at the Hiller Aviation Museum, joining other recent additions to the museum's collection that highlight new developments in personal air transportation. Visit the museum this fall see these extraordinary aircraft and the remarkable design features that will pave the way for a new future in personal air transportation.

Resources

<https://acubed.airbus.com/projects/vahana/>, Downloaded 25 August

<https://www.airbus.com/innovation/zero-emission/urban-air-mobility/vahana.html>, Downloaded 26 August

Vertical Challenge: The Hiller Aircraft Story, Jay Spenser, 2003




AIRPORT RUNWAY RUN
 2K | 5K | 10K 
THANK YOU
SAN CARLOS AIRPORT,
VOLUNTEERS &
PARTICIPANTS!
YOU MADE THE
AIRPORT RUNWAY RUN
A SUCCESS!

EXPLORER SPONSORS
 K I T T Y H A W K


Mark Jon Bluth

This event is expected to be conducted fully or partially outdoors!

HILLER AVIATION MUSEUM PRESENTS

V I S I O N S F R O M T H E S T R A T O S P H E R E

17TH BENEFIT GALA

Saturday, October 16, 2021

5pm · Cocktails 6:30pm · Dinner & Auction

Keynote by **Alan Eustace**

Stratospheric Explorer, Pilot, and World Record Holder for Highest Altitude Free-Fall Jump

Benefiting the Museum's Aviation and STEM education programs



HILLER
AVIATION
MUSEUM

Individual Ticket
\$300

Table of 10 Sponsorships
\$15,000 · \$10,000 · \$5,000 · \$3,500

Questions?

Contact Rebecca Duran, VP of Development: 650-654-0200 x203 / duran@hiller.org

Tickets, Sponsorships, Donations · www.hiller.org/gala

HILLER MUSEUM EDUCATION PROGRAM

AVIATION CAMP

FALL/WINTER AVIATION CAMP

HOLIDAY CAMP PROGRAMS • OCTOBER 2021-JANUARY 2022

9 AM—4 PM (EXTENDED HOURS AVAILABLE)

Take flight over the fall and winter holidays at Aviation Camp! Build and fly model aircraft, take on challenging flight simulations, explore Museum aircraft and more while exploring a unique subject in flight.

PILOT CADETS

OCTOBER 11-15

PHYSICS FLYERS

NOVEMBER 22-26

DRONE ZONE

DECEMBER 17

AERO ENGINEERS

DECEMBER 20-23

TEST PILOT SCHOOL

DECEMBER 27-30

DRONE ZONE

JANUARY 3

Visit www.hiller.org for complete program descriptions, registration forms and additional information. We'll see you there!



PUBLIC EVENTS

FAMILY SUNDAY PROGRAMS, FALL 2021

Special family events make Sundays fun days at the Hiller Aviation Museum! Each program features hands-on activities just for kids, ranging from drone flights and paper planes to design challenges and airplane painting. Visit www.hiller.org for more information on each event.

KIDS' CARNIVAL • ALL AGES

SEPTEMBER 19, OCTOBER 23-24
(SATURDAY-SUNDAY, HALLOWEEN EVENT),
NOVEMBER 14. • 10:00 AM – 12:00 PM

WATER ROCKET RALLY • AGES 5+

OCTOBER 10 & NOVEMBER 7 • 11:00 AM

GLIDER EXTRAVAGANZA • AGES 5+

SEPTEMBER 26, OCTOBER 17, NOVEMBER 21 •
11:00 AM



MS FALL/WINTER 2021

HOLIDAY FUN WEEK

SPECIAL EVENTS • DECEMBER 27-31

Celebrate the holidays with a special event in flight! Daily events December 27-31 provide special experiences in aviation for kids and adults alike! Each is included with museum admission.

OPEN COCKPIT DAY

MONDAY, DECEMBER 27 • 10AM – 2PM



Explore the captain's seat in airliners, seaplanes, helicopters and more! The doors of many of the Hiller Aviation Museum's unique and historic aircraft swing open for visitors of all ages on Open Cockpit Day.

PERFECT PAPER PLANES

TUESDAY, DECEMBER 28 • 11:00 AM

Join world champion paper airplane designer John Collins for an interactive, hands-on celebration of the art and science of paper light flight! John shares his award-winning designs and leads everyone in the quest to build and fly the perfect paper plane.

HAPPY BIRDS

WEDNESDAY, DECEMBER 29 • 11:00 AM

Take a flight on the wild and feathered side with the Happy Birds! Back by popular demand, this outrageous troupe of parrots, macaws and cockatiels performs a remarkable routine of natural and trained behaviors.



SLED DRIVER – FLYING THE SR-71

THURSDAY, DECEMBER 30 • 11:00 AM



Celebrated United States Air Force pilot Major Brian Shul returns to the Hiller Aviation Museum this December to share his experiences flying the world's fastest operational combat aircraft. Capable of exceeding three times the speed of sound, the SR-71 Blackbird was truly exceptional – as was the elite cadre of aviators who flew it.

NOON YEAR'S EVE PARTY

FRIDAY, DECEMBER 31 • 10:00 AM – 1:00 PM



Join the countdown to 12 noon on the last day of the year in a kid-friendly New Year's Eve spectacular! Dance and music routines, hands-on activities, and special presentations prepare the way for the dramatic countdown and noon-time balloon drop. Advance tickets are required and go on sale Dec 1st.



PRESIDENT'S PERSPECTIVE FALL 2021



The museum is doing well even as the pandemic continues to make its presence felt. In August we conducted

a very successful Airport Runway Run event thanks to the efforts of our VP of Development, Rebecca Duran, in cooperation with San Carlos Airport. We hosted over 700 participants running a 2K, 5K or 10K course that included a large amount of runway and airport scenery and, for 5K and 10K runners, a highly enjoyable route along the Bay shore.

We've also welcomed many new and renewing museum Members who are discovering what the museum has to offer. Our weekend activities in the Flight Sim Zone, the Invention Lab, the Drone Plex and the FMX flight simulator all provide engaging experiences to enrich a weekend visit to the museum. Meanwhile, we wrapped up one of our busiest ever summers of Aviation Camp. This high intensity day camp is highly sought after and a family favorite in the Bay Area, thanks to the creativity and capable management of Jon Welte and Linh Fanger.

We are very grateful for the support we've received during the pandemic and we greatly appreciate our family of museum visitors and Members for helping make the Hiller Aviation Museum a vibrant and exciting part of the community. We look forward to seeing you soon at the Museum!

*Jeffery Bass
President & CEO,
Hiller Aviation Museum*

HILLER AVIATION MUSEUM



Saturday Oct 23 through Sunday Oct 31, Daily 10am-5pm

HAUNTED HANGER

KIDS' CARNIVAL

SAT-SUN

OCT 23/24

10 AM-12 PM

- SPECIAL ACTIVITIES JUST FOR KIDS
- COCKPIT EXPLORATION
- GLIDER AND HELICOPTER CONSTRUCTION
- PAINT THE MUSEUM'S PRINT-A-PLANE ORANGE AND BLACK
- FUN FOR THE WHOLE FAMILY!

HELICOPTER PUMPKIN DROP

SAT-SUN

OCT 30/31

OCT 30 EVENT 5PM-7PM (DROP AT 6:20PM)

OCT 31 EVENT 10AM-12PM (DROP AT 12PM)

- PUMPKIN DROP
- CREEPY GAMES AND PRIZES
- MEET THE WITCH AND SIGN HER SPECIAL HALLOWEEN PUMPKIN

GET TICKETS @ HILLER.ORG

HILLER AVIATION MUSEUM 601 SKYWAY RD SAN CARLOS, CA 94070



SANTA CLAUS ARRIVES BY HELICOPTER

Saturday, December 4, 11 AM • RAIN OR SHINE. Doors open at 9:30.

Join the West Bay Community Band and sing Christmas carols while the kids line up to tell Santa their Christmas gift list. No Museum admission fee required for this event!



CALENDAR

SEPT

SAT, SEPT 18 • 11AM - 12PM
The X-15 Rocket Plane

SUN, SEPT 19, • 10AM - 12PM
Kids' Carnival

SUN, SEPT 26, • 11AM - 12PM
Glider Discovery Day

OCTOBER

SUN, OCT 10, • 11AM - 12PM
Water Rocket Rally

SAT, OCT 16, • 5PM - 10PM
Visions From the Stratosphere Benefit Gala

SUN, OCT 17, • 11AM - 12PM
Glider Discovery Day

SAT-SUN, OCT 23-24, • 10AM - 12PM
Kids' Carnival

SAT-SUN, OCT 23-31, • 10AM - 5PM
Halloween Haunted Hangar

NOVEMBER

SUN, NOV 7 • 11AM - 12PM
Water Rocket Rally

SUN, NOV 14 • 10AM - 12PM
Kids' Carnival

SUN, NOV 21 - 11AM - 12PM
Glider Extravaganza

WED, NOV 24 - 10AM - 1PM
Open Cockpit Day

THURS, NOV 25

Thanksgiving - Museum Closed

DECEMBER

SAT, DEC 4 - 11AM
Santa by Helicopter

SAT, DEC 25
Christmas Day - Museum Closed

MON, DEC 27 - 10AM - 1PM
Open Cockpit Day

TUE, DEC 28 - 11AM
Perfect Paper Planes

WED, DEC 29 - 11AM
Happy Birds

THU, DEC 30 - 11AM
Sled Driver Brian Shul

FRI, DEC 31 - 10AM - 1PM
Noon Year's Eve

**FLIGHT SIM ZONE AND
FMX FLIGHT SIM
WEEKENDS 11AM - 2PM**

**INVENTION LAB
WEEKENDS 11AM - 3PM**

**DRONE PLEX
WEEKENDS 11AM - 3PM**



HILLER AVIATION MUSEUM

601 Skyway Road, San Carlos, California 94070 www.hiller.org

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Organization
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Halloween Costumes

Be an Aviator,
pioneer
airline pilot
fighter pilot
or astronaut

Suit up in
the Gift Shop!

*Special
Holiday Shopping*

NOV 26 THROUGH DEC 31

**MUSEUM MEMBERS RECEIVE A
25% DISCOUNT
IN THE GIFT SHOP**

NOVEMBER 26 - DECEMBER 31

**Become a Museum Member
and take advantage of this
great holiday offer!**

Join Now!

- Senior (age 65+) \$55**
One adult plus 2 one-time use guest passes
- Individual \$70**
One adult plus 2 one-time use guest passes
- Family \$105**
2 adults and up to 4 children (17 & under)
plus discounts on Aviation Camp
- Pioneer \$140**
Family Membership benefits plus one
additional card for an adult, ideal for
caregivers (up to 3 adults per visit),
& 2 one-time use guest passes

Pilot \$275
Family Membership benefits with a total of
3 guest passes + 8 FMX Flight Simulator
passes and 50% off additional FMX tickets

Barnstormer \$550 • Adventurer \$1,000
Pilot Membership benefits with a total of
4 guest passes + 10% off Museum Rental and
Birthday Parties

Explorer \$2,500 • Navigator \$5,000
Pilot Membership benefits with a total of
8 guest passes + 15% off Museum Rental
and Birthday Parties

Aviator \$10,000
Pilot Membership benefits with a total of
12 guest passes + 25% off Museum Rental
and Birthday Parties and a
Hiller Aviation Museum jacket

Annual Membership Application

Or join online at www.hiller.org/member

I want to be a member of Hiller Aviation Museum in the following category:

- | | |
|--|---|
| <input type="checkbox"/> Senior (65+) \$55 | <input type="checkbox"/> Barnstormer \$550 |
| <input type="checkbox"/> Individual \$70 | <input type="checkbox"/> Adventurer \$1,000 |
| <input type="checkbox"/> Family \$105 | <input type="checkbox"/> Explorer \$2,500 |
| <input type="checkbox"/> Pioneer \$140 | <input type="checkbox"/> Navigator \$5,000 |
| <input type="checkbox"/> Pilot \$275 | <input type="checkbox"/> Aviator \$10,000 |

New Member Annual Renewal

Primary Adult Member: _____

Second Adult Member: _____
(Family Memberships and up)

Third Adult Member: _____
(Pioneer Memberships only)

Address: _____ City: _____

State: _____ Zip: _____ Daytime Phone: _____

Email: _____

This is a gift membership from: _____

Payment Amount: _____ VISA MC AMEX

Card #: _____ Exp. Date: _____

CSC: _____ Print Name on Card: _____

Signature _____

Thank you for your support.

Please make checks payable to
Hiller Aviation Museum
601 Skyway Rd, San Carlos, CA 94070