ne 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, 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.
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.

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 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 start-ups 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 transporation.

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
HILLER AVIATION MUSEUM PRESENTS

VISIONS FROM THE STRATOSPHERE

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

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
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!
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

SLED DRIVER – FLYING THE SR-71
THURSDAY, DECEMBER 30 • 11:00 AM

Celeb rated 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.

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.

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.

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.

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.

特殊事件 • 12月27-31日

在12月27-31日庆祝圣诞节！每天活动在12月27-31日提供特别的航空体验给大人和小孩！每个活动包括博物馆的入场。

开放驾驶舱日
12月27日星期一 • 10AM – 2PM

探索飞行员在商用飞机、海面飞机、直升机和其他航空器中的驾驶舱！希尔航空博物馆的许多独特的和历史性的航空器的门向所有年龄的访客开放。

完美的纸飞机
12月28日星期二 • 11:00 AM

加入世界冠军纸飞机设计师John Collins的互动活动！John分享他的获奖设计，并带领大家建造并飞行完美的纸飞机。

快乐的鸟
12月29日星期三 • 11:00 AM

体验野生和羽毛的飞行！最受欢迎的鸟儿表演团队回归！

午夜新年派对
12月31日星期五 • 10:00 AM – 1:00 PM

加入从12月31日最后一天的午夜倒计时！舞蹈和音乐表演，手工艺活动，以及特别的展示来为午夜倒计时和午夜气球下降做准备。需要提前购票，12月1日开始销售。
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 PAINT-A-PLANE ORANGE AND BLACK
• FUN FOR THE WHOLE FAMILY!

HELCOPTER 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

#### SEPTEMBER

- **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
### 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:

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
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<tr>
<td>Senior (65+)</td>
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<tr>
<td>Aviator</td>
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</tbody>
</table>

- New Member
- Annual Renewal

Primary Adult Member: _______________________________________

Second Adult Member: _______________________________________

Third Adult Member: _______________________________________

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.

### 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!