Between the end of World War II and the dawn of the Space Age, aircraft performance led pilots to ever higher altitudes and faster speeds. The stresses on both pilot and aircraft were extreme, and the consequences of a pilot being forced to eject from an aircraft were dire.

In 1958 the United States Air Force launched Project Excelsior. The mission plan for Project Excelsior was outwardly quite simple: launch a helium-filled balloon to extreme altitude, and have the pilot within exit by parachute. Parachutes had been used since the 1780s, but a jump from 100,000’ or more is daunting. At altitudes above 60,000’, air pressure drops to a point at which water boils at human body temperature. Depressurization results in unconsciousness in seconds, and death in minutes. The pilot project for Project Excelsior was Air Force Captain Joseph Kittinger. Kittinger traveled to altitude in an unpressurized balloon gondola, wearing a pressure suit and multiple layers of insulating clothing. The first jump, from 75,000’, took place in November 1959. A series of mishaps during exit caused Kittinger’s drogue chute to open early. The chute tangled around Kittinger’s neck and he entered a spin of over 100 rpms. Kittinger lost consciousness in the 20 g spin, and the tangled drogue was unable to extract the main parachute as planned. Kittinger survived only through the automatic deployment of his emergency parachute. Many modifications were made, leading to an uneventful second test just one month later.

Excelsior III was the final jump in the series, and intended to reach the highest altitude. Riding the balloon to an officially recorded altitude of 102,800’, Kittinger stepped out into the void—Air Force crew had placed a plaque at the foot of the balloon’s egress port helpfully stating “This is the highest step in the world.” Kittinger fell for over four and a half minutes, reaching a speed of Mach 0.9 – nearly the speed of sound – in his rapid descent.

The Excelsior III gondola held its billing as the world’s highest step for over half a century. Earth’s atmospheric pressure at 100,000’ is about the same as the mean atmospheric pressure on the surface of Mars, and accidental depressurizations proved fatal for two would-be record breakers in the 1960s. This altitude—some 20 miles above sea level—is well below the internationally-recognized line at 62 miles considered to be the boundary to space, or even the 50-mile limit at which NASA and the United States Air Force issue astronaut wings to pilots and flight crew. Nonetheless, the low atmospheric pressure poses many of the same challenges faced by astronauts working in space.
It was not until 2012 that Joe Kittinger’s record was finally broken. Professional skydiver Felix Baumgartner joined the Red Bull Stratos project in 2010 with the goal of breaking the altitude record. Unlike Project Excelsior, Stratos involved an ascent in a pressurized balloon gondola. This added complexity to the balloon system, but meant that the pressure suit need only provide primary life support for a span of minutes, not hours. The concept was demonstrated successfully in a pair of test jumps in early 2012. In October 2012 Baumgartner successfully jumped from an altitude of 127,800’. During nearly 4 minutes of free fall Baumgartner reached a maximum descent speed of Mach 1.25—jumping without a drogue chute to stabilize his descent allowed a faster free fall. Despite some stability problems early in the jump, Baumgartner maintained control and landed safely.

While the Red Bull Stratos project was under development, Alan Eustace became intrigued with the concept of exploring the stratosphere by balloon and descending via parachute. Eustace partnered with Paragon Space Development in Roswell, New Mexico, to develop a system capable of supporting a record-breaking launch and descent in a new project named StratEx. Unlike Excelsior or Stratos, StratEx did away with the balloon gondola altogether. Like Kittinger, Eustace would be protected by his pressure suit for the entire mission. Unlike either Kittinger or Baumgartner, Eustace would not need to exit a gondola. Suspended directly from the balloon, just beneath the balloon’s avionics bus, Eustace would start his descent by simply firing explosive bolts to separate his pressure suit from the balloon assembly. This simplified the mission profile and removed appreciable risk: in 1962, Soviet test pilot Pyotr Dolgov was killed in a jump from over 90,000’ when his helmet faceplate impacted part of the balloon gondola during exit, causing a lethal depressurization of his pressure suit. Eustace’s flight began at dawn on October 24, 2014, as he was lifted in a face-down position from a launching platform. It took over two hours for Eustace and the StratEx balloon to rise to the mission’s maximum altitude of over 135,000’, nearly two miles higher than Baumgartner’s previous record and more than six miles higher than Kittinger’s mark from Project Excelsior.

Following separation, Eustace returned to Earth in just 15 minutes, free falling for over 120,000’.

Despite its apparent daredevil aspects, extreme skydiving has had the practical effect of boosting access to the stratosphere for both scientific and commercial purposes. Paragon Space Development has leveraged its experience with StratEx to support World View, a program focused on providing high altitude balloon flights for both research missions and private sightseeing flights. With operational flights planned for later in 2017, World View expects to offer missions to 100,000’ in gondolas containing two crew and up to six passengers. During recovery, the entire gondola will separate from its balloon, descending to land beneath an enormous para wing parachute.

The Hiller Aviation Museum welcomes Alan Eustace on Saturday, March 11th as he discusses his involvement in the StratEx project and his experience setting the world’s high altitude parachute jump record. The following Saturday, March 18th, the Museum hosts its annual Leprechaun Leap event, featuring a parachute jump from a helicopter in the airspace above San Carlos. The Museum’s Leaping Leprechaun will launch from an altitude of 4,000’—thirty times lower than the height of Alan Eustace’s jump in 2014. Make your plans to join us and learn the full story of this remarkable achievement.

Resources
http://www.paragonsdc.com/stratex/twentyeight, downloaded 2 February 2017
http://www.redbullstratos.com/, downloaded 1 February 2017
http://www.worldview.space/voyage/, downloaded 2 February 2017

After a busy holiday the museum has jumped headlong into 2017 with exciting new weekend events, workshops, Scout programs and school experiences, many of which are described in this issue of Briefings. This year is especially busy with STEM-focused educational school field trips and we are seeing our highest attendance ever from area K-12 schools.

We’ve also been working steadily behind the scenes to improve gallery exhibits with the goal of making the museum experience even more intriguing, educational and fun. Our new display dedicated to “Women in Aviation” tells the stories of 29 aviatrices who overcame adversity, accomplished much, and inspired the world in making their dreams of flight a reality.

We are pleased to add a new addition to the aircraft on display in our gallery, a full-size replica of SpaceShipOne, an aircraft which made world headlines in 2004 as the first privately funded vehicle to fly into space. We thank Chabot Space & Science Center for the loan of this impressive artifact, which will be on display until 2019.

Meanwhile, our Board of Directors continues to grow and provide diverse skill sets to help steer the course of the museum and assist with museum improvement efforts. Joining the museum’s Board for 2017 is Brenna O’Boyle, a creative and energetic presence on the Peninsula with particular expertise in public relations and marketing. We welcome her enthusiastically!

Our goal is to make the Hiller Aviation Museum a place where inspiration takes flight and aviation dreams come alive. Thank you for helping make the Hiller Aviation Museum a vibrant and exciting place to visit. We look forward to seeing you soon at the Museum!

—Jeffery Bass, President & CEO
Thank you to our Business Circle Partners!

To join our Business Circle, contact Rebecca Duran, VP of Development
duran@hiller.org or 650-654-0200 x203

www.hiller.org/join-and-support/business-circle

Make life easy.

THANK YOU TO OUR BUSINESS CIRCLE PARTNERS!

NEW MEMBERS


FOOD TRUCK CRAZE CONTINUES!

AT HILLER! EVERY WEDNESDAY
11AM TO 2PM – RAIN OR SHINE!

The parking lot of the museum turns into a food court every Wednesday. Several food trucks participate in this gourmet event. The trucks rotate weekly, so come for your favorite truck or try something new! Dine under our porte-cochere, or indoors when it’s a little cold, or, grab and go!
FLYING LEPRECHAUN
SAT, MARCH 18, 10AM-12PM
LEAPING LEPRECHAUN AT 11AM
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.

TRAINS AND PLANES DISPLAY
APRIL 8 – APRIL 15
DAILY, 11AM-3PM
Join us for our annual Spring Model Train Show. This year there will be five separate model train layouts set up at the museum.

HAPPY BIRDS
PARROTS, MACAWS AND COCKATOOS
WED, APRIL 5, 11AM
This talented team of precocious parrots gives a remarkable demonstration of feathered flight. Marvel at their antics as they fly, walk, talk and even sing through a wide range of amazing behaviors that will entertain the whole family!

EASTER BUNNY ARRIVES BY HELICOPTER
SAT, APRIL 15, 10AM
Join the Easter Eggstravaganza on Saturday April 15 from 10AM-1PM. The Bunny arrives at 11AM. Get an Easter Egg straight from the Bunny and enjoy face painting, a bounce house and slide and an amazing model train display. All included with museum admission.

PERFECT PAPER PLANES
FEATURING PAPER PLANE CHAMPION, JOHN COLLINS
SAT, MAY 6, 11AM
Join a unique exhibition of paperlight flight! Author and master paper airplane builder John Collins leads an interactive 45-minute session investigating the science of making things fly and the notebook-scale engineering required to fold and fly record-breaking paper gliders. Come prepared to try your hand building and flying your own paper plane!

Open Cockpit Day
SAT, MAY 13, 10AM – 2PM
Climb inside an L-39 fighter jet, A Grumman Albatross Seaplane, Cessna Cardinal, Boeing 737 and many more museum aircraft not usually open to the public. This is a unique opportunity to get a pilot’s-eye perspective of these amazing machines.

Volunteers Wanted
Volunteers Give the Gift of Time

Volunteer Opportunities include:
- Spending time as a museum Docent
- Working in the Restoration Shop
- Volunteering in the Library or with office admin tasks

We are specifically in search of Docent volunteers for the Saturday or Sunday morning shift from 9:30 - 1:30

Contact Jen Roger - Volunteer Coordinator jen@hillermuseum.org 850-654-0200 Ext. 219

Gourmet Food Trucks
DRONE PLEX • SATURDAYS & SUNDAYS
INVENTION LAB • SATURDAYS
FLIGHT SIM ZONE • SATURDAYS & SUNDAYS
BOY AND GIRL SCOUT PROGRAMS OFFERED EACH MONTH – WWW.HILLER.ORG/SCOUT-PROGRAM

Weekday Invention Lab Hours April 10-14 And May 29

Calendar

March 2016
SAT, MARCH 11 • 11AM
Free Falling – World’s Highest Parachute Jump
SAT, MARCH 18 • 10AM – 12PM
Leaping Leprechaun
SAT, MARCH 25 • 10:30 & 1PM
Starlab Sky Show
SUN, MARCH 26 • 10AM – 4PM
Drone Build-A-Thon

April
SAT, APRIL 1 • 10AM – 12:30PM
Nano FPV Drones
APRIL 3 – APRIL 7
Aviation Camp
WED, APRIL 5 • 11AM
Happy Birds
SAT, APRIL 8 • 10:30 & 1PM
Starlab Sky Show
SAT, APRIL 8 – SAT, APRIL 15
Spring Model Train Show
FREE FALLING – WORLD’S HIGHEST PARACHUTE JUMP

SATURDAY, MARCH 11, 11AM
PRESENTATION BY ALAN EUSTACE

In 2011, Alan Eustace decided to pursue a stratosphere parachute jump. Over the next three years, the test program included 5 airplane jumps from 18,000 feet, and 3 balloon jumps, from 57,000, 105,000 and 135,890 feet, setting 3 skydiving world records, including the highest exit altitude.

On October 24, 2014, Eustace made a jump from the stratosphere, breaking Felix Baumgartner’s 2012 world record. The launch-point for his jump was from an abandoned runway in Roswell, New Mexico, where he began his gas balloon-powered ascent early that morning. The balloon used for the feat was manufactured by the Balloon Facility of the Tata Institute of Fundamental Research, Hyderabad, India. Eustace in his pressure suit hung tethered under the balloon, without the kind of capsule used by Felix Baumgartner.

His descent to Earth lasted 15 minutes and stretched nearly 26 miles with peak speeds exceeding 821.45 miles per hour, setting new world records for the highest free-fall jump, and total free-fall distance 123,334 feet.

Water Rocket Rally
WEDNESDAY APRIL 12, 11AM

Discover the technology that has opened our solar system! Learn about the science of rocketry and space exploration, then staff and volunteers guide children to recycle an ordinary bottle into a high flying water rocket! Bring a clean, recycled soda bottle from home or purchase one at the museum Gift Shop for $1 on the day of the event.

Biggest Little Air Show
Saturday, June 3
10am-1pm

Remote Control Air Show Featuring:
Gas & Electric Powered Airplanes
Helicopters
Jets
Drones

And one FULL Scale aerobatic performance by John Collier in his WWII SNJ

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Alan’s talk summarizes solutions to critical issues like redundancy, emergency aborts, CO2, fogging, spins, drogue deployment, and balloon launches, along with photos and videos of the key milestones. Event included with Museum admission.
WALK! JOG! STROLL!

SUNDAY, APRIL 23

5K/10K Benefiting Hiller Aviation Museum

Registration opens February 1 at www.hiller.org/run

Course includes San Carlos Airport runway and continues to Bay Trail.

MAJOR SPONSORS

REDWOOD CITY
TOYOTA 101
We Make It Easy!

SEE WELLMY LEARN
Prevent Blindness
Northern California

HILLSDALE
SHOPPING CENTER

A RUNNER’S MIND
AVIATION CAMP
SPECIAL SPRING SESSIONS: GRADES K-6
EXTREME FLIGHT: APRIL 3-7 & APRIL 10-14
Launch an adventure to the far edge of flight in a special Spring Break Aviation Camp! Investigate the largest and smallest airplanes, supersonic flight and vertical aviation. Fly a drone, experiment with electricity and more with flight simulations, model aircraft construction and hands-on experiments in flight.

DRONE DAY WORKSHOPS
HIRO 180/450 BUILD-AND-FLY (10AM – 4PM) AGES 18+
SUNDAY MARCH 26, SATURDAY APRIL 29
NANO FPV (10AM – 12:30PM) AGES 10+
SATURDAYS APRIL 1 & MAY 6
Join the drone revolution! Drone Day Workshops provide high-quality hardware and flight training to all participants in the Museum’s unique Drone Plex. Two different programs are available. Build and Fly features a choice of two competition-level drones. The Hiro 180 provides “first person view” flight experience suitable for racing, while the larger Hiro 450 can be used for many applications. Participants build, fly and learn to safely operate the drone of their choice. Nano FPV is appropriate for younger pilots and adults alike. Small, ready to fly drones with integrated cameras are used to provide an exceptional introduction to drone flight. All participants leave with a working drone, radio, battery and charger, screen/goggles (FPV only) and all other equipment needed to fly safely. FAA registration is included with Hiro aircraft (it is not required for nanos).

STARLAB SKY SHOW
10:30AM & 1PM
MARCH 25, APRIL 8, MAY 29
Enter the mysterious Starlab Planetarium and take a spectacular trip through the glittering stars, planets and constellations of spring. Identify star patterns visible from your own backyard this season during a special 30-minute presentation. Space for each presentation is limited. Tickets are required and may be purchased at the Gift Shop on the day of the program. Visit www.hiller.org for more information.

INVENTION AND EXPLORATION
DROP-IN WEEKEND/HOLIDAY ACTIVITIES
The Hiller Aviation Museum offers special interactive activities for families on weekends and select holidays. Invention and Exploration destinations include:
- Imagination Playground, open 10AM – 5PM
- Flight Sim Zone, open 11AM – 2PM (additional fee required)
- FMX flight simulation, open 11AM – 2PM (additional fee required)
- Invention Lab, open 10:30AM – 4PM
- Drone Plex, open 10:30AM – 12PM and 1PM – 3PM
Visit www.hiller.org for a complete list of dates and topics.

AVIATION CAMP
SUMMER 2017
Registration is now open for this summer’s Aviation Camp program! See the enclosed flyer or 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!
Join Now!

Senior (age 65+) $50
Unlimited admission for you + 2 guest passes.

Individual $65
Unlimited admission for you + 2 guest passes.

Family $90
Unlimited admission for 2 named adults and up to 4 children (17 & under) + discounts on Aviation Camp.

Pioneer $125
Family Membership benefits + an additional card for a named member (ideal for caregivers) and 2 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.

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

- □ Senior (65+) $50
- □ Individual $65
- □ Family $90
- □ Pioneer $125
- □ Barnstormer $550
- □ Adventurer $1,000
- □ Explorer $2,500
- □ Navigator $5,000
- □ Pilot $275
- □ Aviator $10,000

- □ 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.