



# AAHS FLIGHTLINE

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NASA 872 Global Hawk in flight over Edwards AFB in October 2009. (NASA photo)

## A Different Perspective on Drones

By Hayden Hamilton

The Internet is a marvelous source of information, often with unexpected results. This story starts back in July at

EAA AirVenture and eventually leads to a use of unmanned aerial vehicles (UAV) that we hear almost nothing about.

about this time and location.

A few minutes later he points out another airliner high over Lake Winnebago and states, "That's Condor 322, a Boeing 767, out of Munich going to Austin, Texas." Yeah. Right. This guy is blowing smoke. You take your telephone lens, zoom out to max focal length and snap a picture with your digital camera. Quickly zooming in on the preview screen, what do you find. A fuzzy image of a 767 clear enough to make out the Condor tail paint scheme!

Imagine sitting on the flightline on a bright, cloudless summer afternoon enjoying the air show. The gentleman next you points out an airliner passing high above the event and says, "That's United 123 out of Heathrow going to Chicago." The immediate thought is this fellow is probably an airline pilot familiar with that particular flight, knowing it would be descending into O'Hare at

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Flight crew and scientists occupy the Global Hawk Operations Center at NASA Armstrong during GRIP mission in 2010. (NASA photo by Tom Tschida)

Forget the air show. How the heck did this guy know this? There is no way he could possibly have known both those flights. You turn and ask him just how he pulled this trick off, showing him the image. His response is to show you an app on his cell phone and responds with, “Wow! This is the first time I’ve had any conformation that this app really works.”

The free cell phone application is from FlightAware and can be accessed from smart phones, tablets and even your desktop computer. For the next couple of weeks, I was using it to identify airliners flying at altitude over my home in southern California. The application shows the airliner’s track, operator, departure and destination, altitude and ground speed. You can even drill down further and find out things like departure gate and time, time estimated enroute, destination time and gate, etc. And, you are not just limited to your current location. You can monitor flights into and out of almost any place in the world. [Note: it does not cover military flights and operators can have their data suppressed – like political candidates’ flight operations.]

### Hurricane Matthew

In early October, Hurricane *Matthew* was threatening to slide up the east coast of the U.S., essentially following the coast line. Curiosity was aroused as to what impact this would have on airline traffic along this heavily traveled corridor. Fire up FlightAware and take a look.

First glance showed that most airliners were re-routing to stay 50-100 miles away from the hurricane eye. Then a flight was noticed that was tracking straight toward the eye from the south. Must be a hurricane-hunter flight. Click on the target and, yes, it’s an agency flight, NASA 872. Wait a minute. The tracker says it’s at 60,000 feet!!! And, it departed from Edwards AFB and would be returning to Edwards? That’s strange. Why would NASA be flying a weather mission to the east coast with a U-2 straight from Edwards and return? Hold on; the flight duration says 24 hours nonstop! What the heck is going on here?



Enlargement of the flight path of NASA 872 through Hurricane Matthew October 7, 2016. (Image from FlightAware)

While U-2s do have inflight refueling capabilities, is it really possible that we would stick a single pilot in a cockpit for 24 hours? Particularly for something that isn’t necessarily a national emergency? And why out of Edwards and return when there are a number of air bases on the east coast that can handle a U-2?

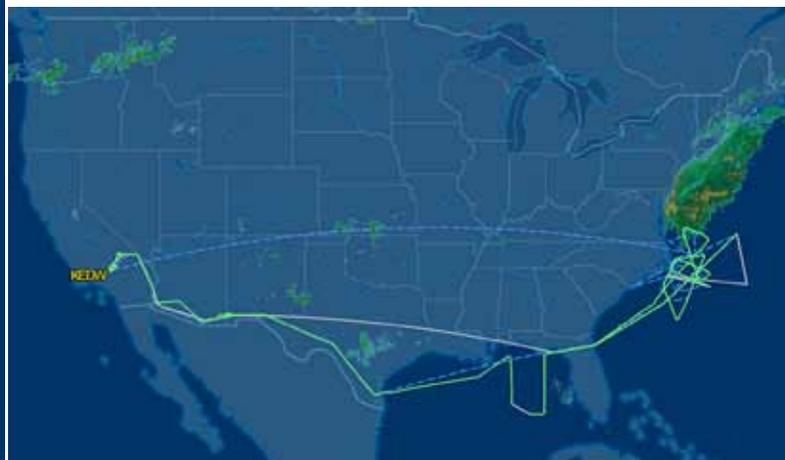
Trying to answer these questions led to more digging, which led to the following.

### NASA 872

The flight tag “NASA 872” is the tail number of a NASA aircraft – specifically a Northrop-Grumman RQ-4 Global Hawk. 872 is one of two Global Hawks configured for NASA’s high-altitude, long-duration earth science missions. The other is the recently retired 871. A third Global Hawk, 874, is currently undergoing modifications for these missions. NASA 871 and 872 were part of the initial seven pre-production, DARPA Advanced Concept Technology Demonstration program airframes delivered to the USAF for evaluation. NASA 871 was AV-1 and NASA 872 was AV-6. (NASA 874 is an early Block 10 production model.) NASA obtained these airframes in 2007 following the USAF’s evaluations, with initial

Specifications	
Wingspan:	116.2 ft (35.4 m)
Length:	44.4 ft (13.5 m)
Height:	14.6 ft (4.2 m)
Gross Take-off Weight:	26,700 lbs. (12,110.9 kg)
Internal Payload Capacity:	1,500 lbs (680.4 kg)
Pod Payload Capacity:	700 lbs per side (317.5 kg)
Ferry Range:	11,000 nm (20,372 km)
Maximum Altitude:	< 65,000 ft (19.8km)
Loiter Velocity:	343 knots TAS
Maximum Endurance:	31 hrs
Power:	Allison Rolls-Royce AE3007H turbofan

The distinctive V-tail, engine cowling, aft fuselage and wings are constructed primarily of graphite composite materials. The center fuselage is constructed of conventional aluminum, while various fairings and radomes feature fiberglass composite construction.



Flight path for entire flight of NASA 872 from Edwards AFB to Edwards AFB on October 8/9, 2016. (Image from FlightAware)

deployment occurring in the second quarter of 2009. In 2010 Global Hawk 871 was deployed as part of the agency's Genesis and Rapid Intensification Processes (GRIP) mission to study how and why some tropical storms intensify into hurricanes. These 24 hour plus missions were flown out of NASA's Dryden Flight Research Center at Edwards AFB in Southern California to the study tropical disturbance AL-92 southeast of Haiti and the Dominican Republic. The Global Hawk flights were coordinated with NASA's DC-8 flying 20,000 feet below on correlated data-collection passes over the storm at the same time. NASA 872 became operational in the second quarter of 2011.

Since 2011, 872 has been deployed on a number of missions covering the eastern Pacific, Arctic and Atlantic Oceans as far east as off the west coast of Africa. While primarily based at the Dryden Flight Research Center at Edwards, the Global Hawks can also operate from NASA's Wallops Flight Center

NASA, like most other U.S. government agencies, cannot function without creating acronyms for their projects. Here is a key to the understanding some of the ones used in this article.

- GRIP - Genesis and Rapid Intensification Processes
- WISPAR - Winter Storms and Pacific Atmospheric Rivers
- HIWRAP - High Altitude Imaging Wind and Rain Airborne Profiler
- HAMSR - High Altitude MMIC Sounding Radiometer
- HS3 - Hurricane and Severe Storm Sentinel
- HRR - Hurricane Rapid Response
- ATTREX - Airborne Tropical Tropopause Experiment
- CAST - Commercial Aviation Safety Team
- MMIC - Monolithic Microwave integrated Circuit
- NOAA - National Oceanic and Atmospheric Administration
- NOAA-O3 - Ozone measuring
- SHOUT - Sensing Hazards with Operational Unmanned Technology
- ENSO - El Niño-Southern Oscillation

**Table 1: Programs Employing the Global Hawks**

Program	Date	Base
Global Hawk Pacific (GloPac) (871)	Apr-10	EDW
GRIP (871)	Aug-Sep 2010	EDW
WISPAR	Jan-Mar 2011	EDW
HS3	Sep-11	EDW
HS3 for Atlantic Storms	Aug-Sep 2014	WFF
HS3 for Atlantic Storms	Sep-Oct 2012	WFF
ATTREX	Jan-Mar 2013	EDW
HS3 for Atlantic Storms	Aug-Sep 2013	WFF
ATTREX deployment to Guam	Jan-Mar 2014	Guam
HS3 for Atlantic Storms	Aug-Sep 2014	WFF
CAST ATTREX Flights	Mar-15	EDW
NGC OMS System Flights	May-Jun 2015	EDW
NOAA SHOUT Flights	Aug-Sep 2015	EDW
SHOUT ENSO Flights	Feb-15	EDW
NOAA SHOUT HRR Flight	Jul-Aug 2016	EDW

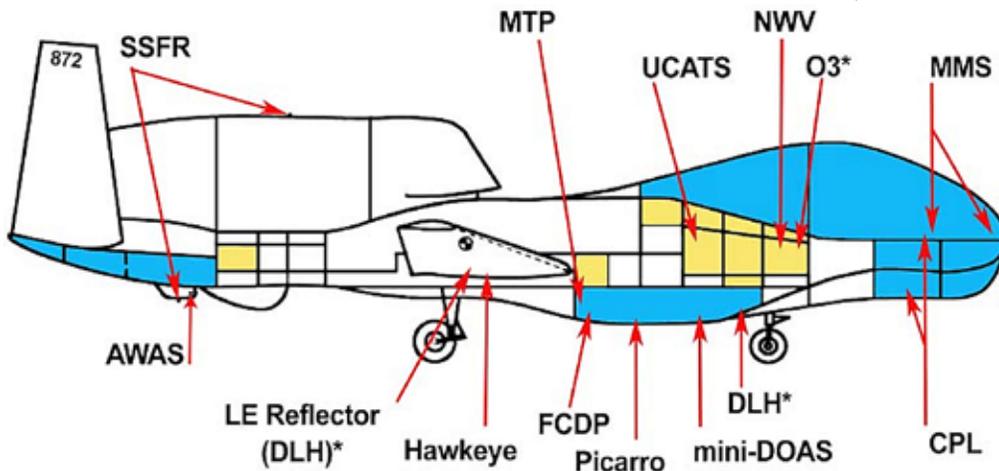
in Virginia. There was also a deployment to Guam in 2014 for a brief period. Table 1 shows some of the more significant research programs that 872 has been used in. Almost all of these projects included multiple 24-hr plus flights.

One of the primary reasons for operating out of Edwards AFB is the issue of integration of UAVs in commercial air space. Operating from NASA's Wallops Flight Center is more restrictive in this aspect than taking advantage of the restricted airspace around Edwards to allow the Global Hawks to climb to above 50,000 feet before heading out on their mission.

**Instrumentation**

The Global Hawk is capable of carrying a variety of instrument packages (see Table 2). Some of these instruments have been adapted from weather satellite applications where in the Global Hawk they provide greater fidelity in the measurements because they are much closer to the space being observed. A couple of the more interesting are HIWRAP and HAMSR.

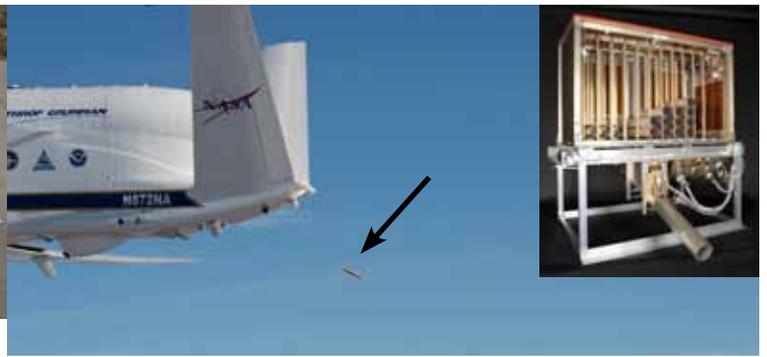
HIWRAP (High-Altitude Imaging Wind and Rain Airborne Profiler) is a dual-frequency radar (Ka- and Ku-band), dual-beam (300 and 400 incidence angle), conical scan, solid-



*Location of various instrumentation packages on the Global Hawk airframe. A brief description of the package and what measurements it takes is presented in Table 2. (NASA drawing)*



NASA Global Hawks 871 and 872. 871 has been retired and is being replaced by an early Block 10 RQ-4. (NASA photo)



A dropsonde being deployed (arrow) during testing of the dispenser system (inset). (NASA photos)

state transmitter-based system, designed for operation on the high-altitude (20 km) Global Hawk UAV. HIWRAP characteristics include conically scanning, simultaneously on both Ku/Ka-band and with two beams at 30 and 40 degrees. It measures winds using precipitation and clouds as tracers and ocean vector wind scatterometry. It is capable of mapping the 3-dimensional winds and precipitation within hurricanes and other severe weather events. It can map ocean surface winds in clear to light rain regions using scatterometry.

The High Altitude Monolithic Microwave integrated Circuit (MMIC) Sounding Radiometer (HAMSR) is a microwave atmospheric sounder developed by the Jet Propulsion Laboratory in Pasadena, Calif., under the NASA Instrument Incubator Program. Operating with 25 spectral channels in 3 bands (50-60 Ghz, 118 Ghz, 183 Ghz), it provides measurements that can be used to infer the 3-D distribution of temperature, water vapor, and cloud liquid water in the atmosphere, even in the presence of clouds. The new UAV-HAMSR with 183GHz LNA receiver reduces noise to less than a 0.1K level improving observations of small-scale water vapor. HAMSR is mounted in payload zone 3 near the nose of the Global Hawk. HAMSR provides observations similar to those obtained with microwave sounders currently operating on NASA, NOAA and ESA spacecraft, and this offers an opportunity for valuable comparative analyses.

While the Global Hawk carries instrumentation similar to current satellite technology, it offers a number of advantages. It can provide higher fidelity in the measurements taken by being

closer and observing a much smaller area than possible with a satellite, as well as providing comparative data to satellite measurements. Measurements being taken are transmitted back to the operations base allowing scientists to monitor the data in real time.

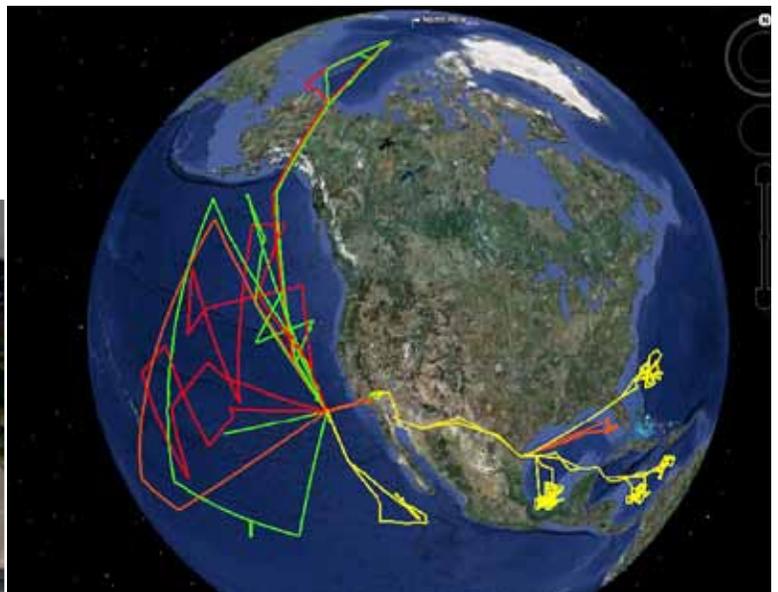
Generally flown autonomously on a pre-planned, pre-programmed route, the Global Hawk does have the capability to be manually flown in order to explore areas of interest that present themselves during the flight. This provides the flexibility found in manned aircraft such as the ER-2 and DC-8, but with the ability to operate at higher altitudes and for longer duration.

### Summary

Exploration and curiosity can lead to the discovery of interesting things. In this case, the use of a drone for purposes that can benefit us all through a better understanding of weather behavior, which can lead to better weather forecasting. NASA, and their partner agencies, should be given credit for recognizing the potential uses of the Global Hawks and capitalizing on an opportunity to re-purpose these platforms once their military evaluations were completed. →



ATTREX instrumentation package loaded in the Global Hawk's payload bay on the belly forward of the leading edge of the wing. (NASA photo)



Global Hawk missions flown in 2010/2011. Flight path colors represent mission type: GloPac - green, GRIP - yellow, WISPAR - red, HS3 - orange. (NASA flight data plotted on Google Earth)

**Table 2: Global Hawk Instrumentation Payloads**

<b>INSTRUMENT</b>	<b>Acronym</b>	<b>Type</b>	<b>Measurements</b>
2D-S Stereo Probe	2DS	Particle imager	Particle size distribution, Particle concentration, Particle Extinction
Advanced Vertical Atmospheric Profiling System	AVAPS	Dropsonde	Pressure, Temperature, Humidity, Wind
Advanced Whole Air Sampler	AWAS	Whole Air Sampling	CFC13, CF2C1CF2, Halon-1211, NMHCs, CO, CH4, N2O
Airborne Chromatograph For Atmospheric Trace Species	ACATS	Gas chromatography	CFC13, CF2C12, CF2C1CF2, CH3CCl3, CCl4, Halon-1211, CHCl3, CH4, H2, N2O, SF6
Airborne Compact Atmospheric Mapper	ACAM	Camera	NO2, O3, Aerosol, SO2, CH2O
Airborne Detector for Energetic Lightning Emissions	ADELE		Gamma-Rays, Relativistic Electrons
Cloud Droplet Probe	CDP	Particle imager	Particle size distribution, Particle concentration
Cloud Particle Imager	CPI	Particle imager	Particle size distribution
Cloud Physics Lidar	CPL	Lidar	Aerosol, Optical Depth, Particle size distribution
Diode Laser Hygrometer	DLH	Laser absorption	H2O
Dual-Beam UV-Absorption Ozone Photometer	NOAA O3	Photometer	O3
Focused Cavity Aerosol Spectrometer	FCAS	Optical particle counter	Particle size distribution
Harvard University Picarro Cavity Ring Down Spectrometer	HUPCRS	Spectrometer (in situ)	CH4, CO2, CO
Hawkeye	Hawkeye	Particle imager	Particle size distribution
High Altitude Imaging Wind and Rain Airborne Profiler	HIWRAP	Radar, Scatterometer	Radar Reflectivity, Doppler Velocity, Wind
High Altitude Monolithic Microwave integrated Circuit (MMIC) Sounding Radiometer	HAMSR	Sounder, Microwave Radiometer	Temperature, H2O
Hurricane Imaging Radiometer	HIRAD	Radiometer	Wind Speed, Rain Rate
JPL Laser Hygrometer	JLH	Spectrometer (in situ)	H2O
Lightning Instrument Project	LIP		Electric field, Lightning, Air Conductivity
Meteorological Measurement System	MMS		Wind, Turbulence, Temperature, Aircraft position
Microwave Temperature Profiler	MTP	Microwave Radiometer	Temperature
mini-DOAS	mini-DOAS	Spectrometer	BrO, NO2, O4
Multiple-Angle Aerosol Spectrometer Probe	MASP	Spectrometer (in situ)	Particle concentration, Particle size distribution, Particle Extinction
NOAA Water	NW	CIMS, Laser absorption	H2O, H2O (total)
Nuclei-Mode Aerosol Size Spectrometer	NMASS	CN counter	Particle size distribution, Cloud Condensation Nuclei
O3 Photometer - UAS (NOAA)	UAS-O3	Photometer	O3
Scanning High-Resolution Interferometer Sounder	S-HIS	Interferometer	Temperature, H2O
Solar Spectral Flux Radiometer	SSFR	Radiometer	Solar flux, Irradiance
Tropospheric Wind Lidar Technology Experiment	TWiLITE	Lidar	Wind
UAS Chromatograph for Atmospheric Trace Species	UCATS	Gas chromatography, Spectrometer (in situ), Photometer	N2O, SF6, CH4, CO, O3
Ultra High Sensitivity Aerosol Spectrometer	UHSAS	Spectrometer (in situ)	Aerosol Size Distribution, Aerosol Concentration
Unmanned Aerial System Laser Hygrometer	ULH		H2O

# 2017 Annual Meeting in Review

It gets harder and harder to fit all the interesting things we want to do at the AAHS Annual Meeting into just a day or two, and this year was clearly jam packed! Friday afternoon early bird arrivals, like Arv Schultz and Cal Taylor, Ryan Reeves and others helped set up tables at the Allen Airways Museum hangar, with Bill Allen staging his McCormick Farmall Cub tractors underneath his 'Airport Tavern' neon sign — just a preview of the neat collectibles Bill had stored inside!

With setup done, we met up with the Commemorative Air Force Air Group One unit at the airport café for a snack and a sitdown, while Bill Allen took Rafe Tomsett up for a spin and a smoke in his PT-17, once owned by Steve McQueen (the airplane smoked, not the occupants).

Many of us gathered at the Carlton Oaks Country Club that evening to have a glass of wine and hear from AAHS member Gary Fogel, a local scientist (mechanical learning systems), aviation historian, avid modeler (he holds 11 world records!) and author of several books, dealing with the aviation history of San Diego. He gave an outstanding presentation to attendees on the early aviation career of John J. Montgomery, based on his book *John J Montgomery and the Dawn of Aviation in the West (2012)*. It was astonishing to learn of the striking similarities between Montgomery's experiments with 'wing warping' that so closely paralleled the Wright brothers', without his efforts or accomplishments ever coming into the public eye. Fogel's books are well worth the expenditure, as they document some of the key individuals that built the significant aviation tradition we enjoy on the west coast.

Saturday morning was hectic, as we had registration, coffee and snacks at the Allen Airways Museum, at Gillespie Field, and a setup of the book and merchandise sales (organized very effectively by Bob and Mari Palazzola). Our tour of the San Diego Air and Space Museum (SDASM) Restoration Annex started at 9 am, on the *other* side of the field. But a quick drive got us in to see Terry Brennan, chief curator for SDASM, who came in on his day off to show some restoration projects to AAHS members.

The SDASM uses almost entirely volunteer staff (and one hangar dog) to restore aircraft to static condition, to be used for display at the SDASM in Balboa Park, San Diego. There was



Early bird AAHS attendees grab a snack at the airport cafe. (Photos by Jerri Bergen)



Gary Fogel shares, to a standing-room-only dining room audience, his fascinating history of the early aviation exploits of John J. Montgomery. (Photos by Jerri Bergen)

a huge variety of aircraft hulks in work, such as a tiny P-26 Peashooter (recently on loan to the Boeing Museum of Flight, as they don't have one), up to jets such as a General Dynamics F-16. Terry let us wander around, through the engine shops, fabrication areas and the model shop, in which AAHS member (and SDASM Model shop lead) Ron Peterka displayed a B-17G *Outhouse Mouse* model that is currently under construction. The fuselage itself is more than five feet long, and each piece is created by hand from wood or fiberglass. Ron has been making models for almost 60 years, and shows off the shop's meticulous craftsmanship. As most museums, SDASM has limited floor space, and is turning to larger scale models such as *Outhouse Mouse* to educate a younger generation on these aircraft and their histories.

Back at Allen Airways, Bill Allen gathered attendees in his main hangar and gave a tour of the aircraft stored there (such as his Ryan STM2) and, walked us through a gallery displaying just some of the several hundred original aviation movie and air meet posters Bill and his wife Claudia have collected over the years. The posters, some hand-printed, are huge, some 4x3 feet, all have great stories behind them, regarding the artists, the venues where they were displayed, and what they were promoting; it made for aviation history that you rarely hear about! *'Looping the Loop – Posters of Flight, (2000)*, documents the history of some of Bill's posters, and is currently out of print but well worth the price if you can find a copy.

While at Allen Airways, the Air Group One team, headed by Christopher Stelle, stood by with a SNJ Texan and an L-4, available for rides.

Our lunch program, following an authentic San Diego taco plate, provided a platform for Bill and Claudia to describe to attendees how they got started with their unique aviation collection, and what it has meant to them. Both Bill and Claudia have been blessed to know and befriend many local aviation personalities, and have sought ways to keep these histories from disappearing.

Similar objectives were voiced by SDASM CEO Jim Kidrick, who came to present the status of SDASM. Jim relayed



AAHS member (and SDASM Model lead) Ron Peterka describes model shop activities to the attendees. (Photos by Jerri Bergen)



Terry Brennan (in black coat) introduces AAHS members to the SDASM Restoration Annex. (Photos by Jerri Bergen)

the advances SDASM has made in growth (by attendance and collection size) over the last ten years, and where the museum is headed. What we heard very clearly is that museums like SDASM, to survive, to keep the doors open, really need to approach operations like a business, and provide venues that are varied, interesting and bring in visitors of all ages. San Diego is a huge tourist draw, and there are many distractions for folks that may have only a few days in the city. Jim outlined their strategies such as much more hands on exhibits (such as their recently initiated 'Be The Astronaut' for kids to experience elements of space using core curriculum skills with videogame technology). They are also offering the use of their space for special events. The museum gets donations all the time (such as recently the entire Vought Co. historical collection) and they have to prioritize what will get used, and what gets stored or used as a support to another institution. Jim is working to develop an affiliate program at the Museum, and AAHS has offered to be a guinea pig to try it out when ready. AAHS members also had the opportunity to meet several key SDASM employees; Francis French, head of Educational Programs, and Katrina Pescador, Head Archivist, as well as chief curator Terry Brennan. Francis took a moment to describe a new book he's co-authored, *Falling to Earth*, an autobiography on

astronaut Al Worden.

We also had some announcements for attendees, specifically that AAHS will for the first time staff a table in the Vintage Hangar at EAA AirVenture, July 24-30. We are looking to have AAHS members planning to attend AirVenture volunteer to staff our table a couple of hours a day, handing out AAHS information, answering questions, and promoting our organization. (Want to help? Contact Jerri Bergen at the AAHS headquarters.)

With a down time break, many attendees stuck around to hear from Hayden Hamilton, who described many features coming to the AAHS website, now under redevelopment. Hayden answered questions and helped individuals understand what's to come on the website.

Following our raffle and a break, a public Board of Directors meeting was called to order in the bar (no aviation museum should be without one) with AAHS members invited to attend, listen and comment. The topic centered around the mechanisms by which the Phoenix Wing AAHS organization activity, mission and financial structure can best integrate with AAHS HQ. AAHS HQ has in the past inadvertently set up miscommunications with chapter organizations, causing friction and negative relations. Ryan Reeves, president of the



The lunch program inside Bill's smaller hangar space. (Photos by Jerri Bergen)



Attendees take time to wander among the aircraft and artifacts in Bill and Claudia's hangar. (Photos by Jerri Bergen)



*Head Archivist Katrina Pescador introducing the Library and Archive programs at SDASM. (Photos by Jerri Bergen)*

*Steve Johnston, Rafe Tomsett, Derek Buckmaster, Jerri Bergen, Jim Kidrick, Melinda and John Lyon pose for a picture at the end of the SDASM tour. (Photos by Jerri Bergen)*

Phoenix Wing, reported that his organization was open to more interaction with AAHS, such as sharing member information. AAHS HQ will take actions to modify our database to recognize Phoenix (or other chapter/affiliate organizations) members, and work on an agreed membership rate to the affiliate (with a portion of the dues going to the affiliate for specific activities). This issue and action plan will be discussed more in a different article.

With business completed and follow-up actions recorded, everyone pitched in to help clean up the hangar, and restore the hangar to pre-meeting status. What a great crowd!

We tried to get to bed early (but still had a great pizza dinner with the AAHS crowd) as we wanted to be up and ready for the SDASM archive tour on Sunday morning. We were met by docents and head archivist Katrina Pescador, who, in a classroom setting, gave the 30+ attendees an informative overview of the SDASM archives, what systems are used and how to do research at SDASM. Katrina, a professional archivist, at SDASM since 2007, has helped SDASM not only organize its extensive book library and photo archives, but has utilized the Library and photos to drive more traffic to SDASM.

We toured the basement levels of SDASM, to include their

cold storage of films (they've digitized over 1,200), negatives and photos, and entire rooms of other historical files, drawings, technical journals, company administrative information, manuals, etc. The basement is also the location of more aircraft and engine restoration efforts, such as a working model of the engine used to power the Wright Flyer.

Like AAHS, the incoming donations overtake their archive efforts regularly; Katrina noted they have three million photos/negatives archived, and have more than that awaiting the archival process! Katrina has professional librarians that will respond to individual requests for research and, with some advance notice, locate not just photos, but other information regarding the topic you've asked for.

A big tool used by SDASM for the promotion of the SDASM Library and Archives is their social media pages. They use Flickr, Instagram, Twitter and Facebook to get more of their images out to the public, something AAHS is doing as well.

Many of us lingered for some time, enjoying the interactive flight simulators, the uniforms and full-sized aircraft scattered throughout SDASM. Upon leaving, we all agreed, we'll enjoy meeting more new friends and new experiences next year. →



*LEFT: Just some of the technical drawings in temporary storage in the SDASM basement. MIDDLE: Susan and Les Whittlesey flank author Gary Fogel at SDASM. RIGHT: Nina and Charles Tucker take a break in front of the SDASM F-16. (Photos by Jerri Bergen)*

# AAHS Lifetime Recognition to Gerald Balzer, Life Member #189

The AAHS Board of Directors has awarded Gerald 'Gerry' Balzer, member #188 (Life Member #189) with the *AAHS Lifetime Achievement Award*, for his many contributions to aviation history and AAHS. Gerry joined AAHS in its first year of operation in 1956, and since then, has promoted aviation history in numerous ways.

Gerry started his aviation interest in the Army Air Corps, and performing flight crew duties for P-51Ds, where he got a little stick time in the P-51 trainers. While working at Northrop Aircraft, Inc, at Hawthorne, Calif., he joined AAHS. He worked on the F-89s, the X-21, the SM-62 Snark missile (design and stress analysis), the T-38/F-5 series, and several special assignments.

In 1963, while at Northrop, Gerry was able to divert a truckload of the company's negative material that was literally headed to the city dump to his residence, thus acquiring approximately 350 boxes of negatives containing some 200,000 negatives; it took almost a year to survey this material, salvaging some 3,000 negatives of historical interest. Gerry has since digitized these images.

Gerry worked for McDonnell Aircraft Corp. in the mid 1960s, which soon merged with Douglas Aircraft to become McDonnell Douglas Corp., in system integration. He assisted in melding the McDonnell and the Douglas proposals for the Navy VSX program that was eventually awarded to Lockheed as the S-3. Gerry was assigned to the FX (F-15) project proposal working through the loading of the first prototype F-15 into a C-5 for transport to Edwards AFB. After an aerospace layoff, Gerry was hired as a product analyst by ITT Blackburn, and then by TRW on several black projects. He retired from TRW in 1992.

Gerry became AAHS vice president in the early 1980s. His duties included treasurer, facility leasing, facility maintenance, office support (supplies and utilities) to name a few.

In addition to writing three books, *American Secret Pusher*



*Gerry celebrated his 90th birthday last June by sitting in his favorite chair with his favorite workbench and working on his favorite subject - aviation history. Go Gerry!!! (Photo from Gerald Balzer)*

*Fighters of World War II: XP-54, XP-55 and XP-56, Northrop F-89 Scorpion, and Curtis Ascender XP-55 (Air Force Legends No. 217)* (all available on Amazon), Gerry has spent his career working with authors/collectors scattered from California to Europe and the AAHS office in support of technical questions and Northrop photograph research. Gerry continues to share his love of aviation history with ongoing donations of digital photos to the AAHS archives to be available to current and future members.

We appreciate and recognize the lifelong support of Gerry and his efforts to support our shared mission, thank you Gerry! →

## Volunteers Needed!

### AAHS at EAA VINTAGE HANGAR, AIRVENTURE 2017

July 24-30, 2017



For the first time, AAHS will have a presence at EAA's AirVenture 2017, in Oshkosh Wisconsin. If you plan to attend Oshkosh this year, please consider supporting AAHS at our table at the Vintage Hangar, right in the middle of the vintage aircraft display area!

Donate a few of your EAA Oshkosh hours to hang out at the AAHS table, talking old airplanes, handing out AAHS materials, making some new friends and recruiting new members!

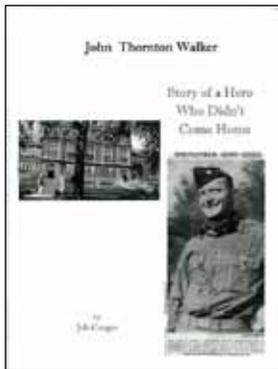
We'll provide snacks, water and a cool place to sit. AAHS has also reserved a nearby home during the event, where we will host get-together dinners and provide limited, lower-cost housing on a first-come, first-served basis. Four bedrooms are available at a \$125 per night, just a ten-minute walk from AirVenture front gates!

We are creating a volunteer staffing schedule now, as well as a reservation list for the available housing. A deposit is required for the housing (50% by June 1).

**Contact the AAHS office at 714-549-4818 and we'll get you on the list!**

## Book Reviews

### John Thornton Walker, *Story of a Hero who Didn't Come Home*



**Home**, by Job Conger. AeroKnow Museum, 900 N. Capital Airport Dr, Springfield, Ill. 62707. Copyright 2016, paperback, 8.5"x11", 60 pages, numerous photos. \$20.00.

This biography provides insight into the life of a man who served his country during WWII, but like so many others didn't return home to celebrate the victory and return to normal life. John Thornton Walker was the Air Liaison officer of the 15th Army Group and served as Gen.

Mark W. Clark's personal pilot in Italy at the time of his death. While frequently encountering life threatening situations flying slow, unarmed liaison aircraft over combat zones, leading to his being awarded a Silver Star, Legion of Merit and the Air Medal, it would be the crash of a transport plane taking him home on leave that terminated his life.

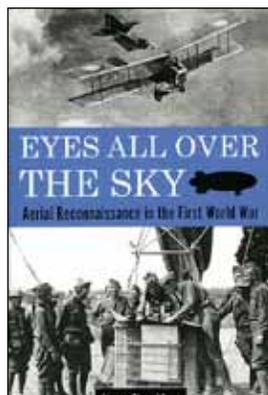
The book takes you through his life's story – birth, school, early employment as a journalist and his love of aviation. Walker received his pilot's license in 1937 and became his local paper's aviation columnist about the same time. He was actively involved in the aviation community and was responsible for forming the Springfield, Ill., Abraham Lincoln Chapter of the National Aeronautic Association. Possibly seeing the "handwriting on the wall" through his journalism activities, Walker enlisted in the Illinois National Guard, rising to the rank of sergeant major by 1936. His unit was activated on October 27, 1940, and Walker was promoted to 1st lieutenant less than 30 days later. Due to his aviation experience, it wasn't long before he was in flight training as a liaison pilot. Walker would be briefly assigned to England before being sent to North Africa with the 15th Army Group, with which he would serve continuously through Sicily and Italy before losing his life.

The author has pieced together Walker's story from newspaper clippings, log books and family material provided by Walker's daughter, weaving an interesting tale. The book is a short read, but well worth the price for those interested in learning more about aviation in the late 1930s and liaison operations during WWII.

Reviewed by Hayden Hamilton

**Eyes All Over the Sky, Aerial Reconnaissance in the First World War**, James Streckfuss. Casemate Publishers, Havertown, Penn. Copyright 2016, ISBN: 978-1-61200-367-2, hardcover, 9"x6", 240 pages, 31 photos and 2 charts, bibliography, notes, index. \$32.95.

The author has focused on an aspect of WWI (and in reality, all wars) that has been woefully overlooked by many researchers of the aerial conflict during this period. This is the role that aerial reconnaissance played in providing critical information to officers planning and managing campaigns.



In fact, the most written about subject of the aerial conflict, the fighter planes and pilots, owed its existence to the need to deny this information from the enemy. After aircraft became equipped with guns, the reconnaissance planes were frequently escorted by fighters to assure that their critical information could be obtained and returned.

Aerial reconnaissance was in its infancy in WWI. Just like the aircraft, the tools and infrastructure to obtain and process aerial reconnaissance information was developing in parallel. Camera, radio and communications all had to be put in place for the impact of the information to be viable. In nine chapters, the author explores the various aspects of this arena. From the "fighter pilot mystique," to artillery spotting, tracking attacks, the development of aerial photography and the air war over the sea. Finally, the author looks at the evolution of aerial reconnaissance into air power that transformed the U.S. Army air service eventually into the air force.

This book is an easy read, loaded with details and facts. The reader will not only come away from it with a different perspective of aviation during WWI, but also a better understanding of how the U.S. air forces evolved during this period, and more importantly, in the period between WWI and WWII. The reader will also come to realize how under recognized these reconnaissance crews were for the measure they gave.

This reviewer highly recommends this work for those with an interest in the development of early aviation and WWI.

Reviewed by Leland Pugsley

### Liberty Lady, A True Story of Love and Espionage in WWII



**Sweden**, by Pat DiGeorge. Beaver's Spur Publishing, Vero Beach, Fla.. ISBN: 978-0-998257006 copyright 2016, 9"x6", paperback, 470 pages, acknowledgements, bibliography, endnotes, index. ~50 B&W photos. \$19.95.

In *Liberty Lady*, Pat DiGeorge has written a biography of her parents that reads like one of John le Carré's novels. The main characters are American B-17 bombardier, 1st Lt. Herman Allen and Swedish-American Hedy Johnson who worked in England and Sweden for William Donovan's OSS. They met and fell in love after Allen's B-17, *Liberty Lady*, landed in Sweden, on March 6, 1944. Battle damage during a raid over Germany caused the number two engine to shut down. Knowing they could not return to England, the crew headed for Sweden, where the airplane was landed with no injuries to the crew. The 10 crew members were taken into Swedish custody and were eventually settled in an internment camp at Rättvik, in central Sweden.

DiGeorge details the internment system in clear and interesting detail. Its procedures and the persons important in its operation included Count Folke Bernadotte, who was responsible for all internment camps in Sweden. Eventually, Lieutenant Allen found himself in Stockholm in April 1944. This put him in the center of Sweden's flourishing espionage world. He soon interacted with the OSS counterespionage division X-2, where Hedy Johnson was a secretary. His first impression was, "You're for me."

Allen found himself engaged in espionage. At first, he worked very closely with Count Folke Bernadotte as the internee adjutant to ensure that internees were interviewed about their circumstances. Allen's duties soon included social functions where he looked for and reported on German sympathizers. Over time, his activities extended to befriending persons suspected of involvement with Germany

Allen's espionage activities expanded rapidly. He dined with suspect individuals and reported on them to X-2. He was able to build solid cases on several individuals, rendering them useless as German assets. At this point, Allen was working in an environment where such persons as Bernt Balchen, Raoul Wallenberg, William Casey and James Angleton were players.

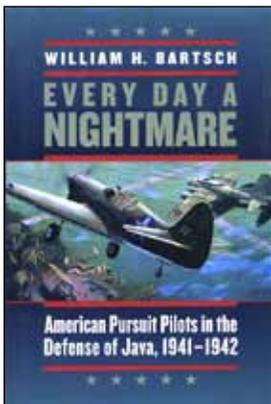
Allen and Johnson's feelings grew rapidly. The couple married in January 1945 in the Gustav Adolfskyrkan, where Count Bernadotte gave the bride away. The entire American legation filled the church. A month later, Allen departed for the United States but his new wife had to remain in Sweden until mid-June 1945. They were finally reunited at MacDill Field, in Tampa.

Pat DiGeorge lovingly describes her parents' background and their lives after the war. Hedy Johnson was Swedish-American from Hibbing, Minn., and Herman Allen came from Lithuanian and Russian Jewish parents. On both sides, the families made their lives in the United States, overcoming the challenges of language, culture and economy. After the war, Herman Allen settled his growing family in Florida. DiGeorge describes those years with love and caring.

The romance that began in Stockholm continued to its end in Florida.

Reviewed by Cal Taylor

### **Every Day a Nightmare, American Pursuit Pilots in the Defense of Java, 1941-1942;** by William H. Bartsch.



Texas A&M University Press, College Station, Texas. Copyright 2010, ISBN: 978-1-60344-176-6, Hardcover, 9"x6", 506 pages, 50 plus pictures and drawings, extensive references, appendix and index. \$40.00.

This book covers the short, chaotic period from shortly before November 1, 1941 through March 4, 1942, a roughly four month period encompassing the attack on Pearl Harbor and the fall of the Philippines and the Dutch East

Indies. We follow the assignment/selection of young American fighter pilots – most just out of flight training with little or no

experience in actual fighter aircraft – initially intended to be shipped out to bolster MacArthur's forces in the Philippines but diverted to Australia with the intent to moving them on to defend Java. The bulk of the story covers the period from arrival in Australia, assembling their P-40Es, and the trials and tribulations of trying to get them to Java.

While the story line is sometimes a challenge to follow caused by the author trying to keep his time line consistent as various groups are moving about the region, it also conveys at the same time the chaotic environment of the times. Orders issued on Monday being rescinded on Tuesday, then reinstated on Wednesday. Missing or inadequate supplies and components, inexperience and lack of familiarity of pilots and ground crews with their aircraft were just a few of the situations encountered by this group. For example, the initial batch of P-40s that arrived with the pilots in Brisbane, Australia, were shipped without any glycol coolant for the engines, creating a problem of assembled planes having to be parked because they couldn't be operated.

Once pilots started arriving in Java, following their 3,000 mile ferry flight flown in 400-500 miles stages, often being shepherded along by a lead B-17, Lockheed 12, or Beech 18, the crews found themselves on a war footing again without adequate supplies. Added to this was the typical chaos of war – poor to non-existent enemy raid warning, aircraft sent on missions with partial loadout of 50 caliber ammunition because there wasn't enough, having to manufacture bomb attachment hardware to adapt Dutch bombs to American shackles . . . the list goes on.

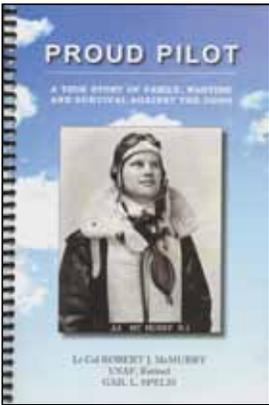
In spite of these hardships, the spirit of the pilots remained fairly high with a willingness to throw themselves into combat. It was the individual loss of squadron mates that weighed heaviest on these crews. While they did all they could, the momentum of the battle was in the Japanese favor at this time. After a period of only a couple of months, the units were essentially non-operational and command started extracting them out of Java in order to regroup. Getting out was just as chaotic as the getting in had been.

One interesting fact learned by the reviewer in reading the book was the final fate of the United States' first aircraft carrier, the USS *Langley*. By 1941, this ship had been partially reconfigured to its original supply ship role with about half of the flight deck being removed. As part of the supply effort to Java, it was carrying 32 P-40s, 33 pilots and 12 enlisted crew when it was sunk in the Indian Ocean just 75 miles short of its destination. Along with the 32 planes, 24 pilots would be lost in conjunction with this sinking.

If you have an interest in WWII and want to learn more about the earliest days of this conflict in the Pacific, this well researched book is an excellent place to start. It provides insight not only into the combat side of the war, but also what was happening behind the scenes as well. The 345 pages of story are supported by roughly 160 pages of appendices, references and index.

Reviewed by Hayden Hamilton

**Proud Pilot**, by Lt. Col. Robert J. McMurry (USAF, Retired) as told to Gail L. Spelis. Professional Press, Chapel Hill, N.C. ISBN: 978-1-4951-4255-0, copyright 2016, 9"x6", hardback,



256 pages, 120 B&W photos. \$24.99 from [www.gailspelisauthor.com](http://www.gailspelisauthor.com)

A heartwarming tale of the life of an aviator in WWII and after. My eyes were misty from the first pages. This is a complete story, not just wartime and military service. The anecdotal format is an excellent way to tell the story through important events in his life.

Bob and Jeanne McMurry were in the first generation of air force people who lived in many countries and experienced life in new cultures.

They went from rubble-strewn Munich in 1946 to civil war-torn Greece then to California's Hamilton AFB and Dover AFB, Delaware. He was a high time pilot on the Berlin Airlift and endured challenging missions in Italy, Iceland and the Azores.

Together, the McMurrays experienced Paris, the Pyramids and Venice, including a daughter born in Germany. At Travis AFB, Calif., they raised two daughters and explored Northern California. One daughter witnessed an airplane crash that claimed the life of a dear family friend. At the 1959 Paris Air Show, McMurry flew a magnificent demonstration of the Douglas C-133, the largest air force transport at the time, before witnesses including President Charles DeGaulle.

On retiring from the Air Force in 1964, McMurry continued flying with the airlines. He added 13,000 airline hours to the 20,000 flown in the military. His personal and professional

performance brought recognition as the Golden West Airline pilot of the year in 1980.

Throughout the book, McMurry's love of his wife and family is a constant thread. They shared life in all its facets, from his marriage to 18-year-old Jeanne to her passing 68 years later, surrounded by her family. After that, they all moved on to care for one another as the years caught up with them.

This is a personal and loving tale of Bob McMurry's years in life and in the air. I recommend it very highly and salute him as, indeed, a *Proud Pilot* who had reason for that appellation.

Reviewed by Cal Taylor

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# President's Message

The year has begun with a great visit with AAHS members from around the U.S. and Australia (thank you, Derek!) at our 2017 Annual Meeting, held this year at AAHS members Bill and Claudia Allen's place, Allen Airways Museum, Gillespie Field, near San Diego, California.

Not only did we have the opportunity to renew friendships, we made new ones, such as AAHS member Gary Fogel, who gave us a fascinating overview of early aviation pioneer John J. Montgomery, and AAHS member Ken Penneck, a volunteer at the model shop at SDASM restoration center, who's currently building a 1/5 scale model of the B-17G-25-BO *Outhouse Mouse*, 42-31636, that will go on display in SDASM sometime in the future.



*Bill Allen seen giving an overview of some of his displayed aviation movie posters. (Photo by Jerri Bergen)*

Our Annual Event this year gave us an opportunity to see how aviation buffs, like Bill and Claudia Allen, display their aviation collection, as well as larger institutions, like SDASM. Much of the priorities set by SDASM Head Archivist Katrina Pescador for their library and archive are very similar to AAHS. Katrina even provided AAHS a copy of the SDASM Library Operations Manual from which we can draw some best practices.

Some of our priorities will take more hands on effort, and I encourage you to give some time to our common goal of preserving our members' photos. We have a goal to get 20% more negatives and photos identified and loaded to the website this year than last year, and we can use members' help in correctly labeling file names. Contact our office and we'll show you how to do it, right from your own home office.

Moving forward we have more partnerships than ever to nurture, such as the American Society of Aviation Artists, and the Antique Aircraft Association. We'd enjoy having combined events, so that members from each group can get to know one another.

Speaking of new associations, we are very excited to plan for an AAHS week at Oshkosh 2017! With a table at the Vintage Hangar, we hope to reach out to more aviation enthusiasts and get more people involved. We've reserved an *AAHS clubhouse* near Whitman field, (walking distance!) for afternoon get togethers and are now working to possibly lead a forum at some point during the week. We're looking for volunteers to help us in this recruiting effort (see page 9). If you can't physically participate, maybe you will consider making a donation to help defray the expenses associated with promoting the Society.

Plan to spend more time with AAHS this year; we'll all benefit!

Jerri Bergen  
President

# New Members

Editor's Note: Due to search engines extracting and indexing personal information, the AAHS will no longer publish detailed addresses. Please contact the office if you wish to contact a member.

Raymond Barak  
Huntington beach, CA 92646

Marvin Besch  
Redmond, WA 98052-1927

Stephen Cirillo  
Lumberton, NJ 08048

Joshua Shields  
Shoreline, WA 98155

John Tylko  
Lincoln, MA 01773

Moose Peterson  
Wildlife Research Photography  
Mammoth Lakes, CA 93546

Felix Quast  
Winsted, MN 55395

Don Kerkhoff  
Good Thunder, MN 56037

Ed Touchtone  
Bakersfield, CA 93301

Gabriel Hernandez  
New York, NY 10002-4153

Warren Lammert  
St Louis, MO 63124

Bryan Monroe  
Pleasanton, CA 94588

J. Michael Pereira  
Fairhope, AL 36532

Daniel Mahon  
Davis Junction, IL 61020

William C. McDonald  
Birmingham, AL 35213

Roy Bowen  
Chester, VA 23831

Arthur N. Eich  
Ellicott City, MD 21043-3429

Roger Gernaey  
Lovendegem, 9920 Belgium

John Pluquet  
Great Walingfield, Sudbury, Suffolk  
United Kingdom

James Spering  
Suisun City, CA 94585

Gary Beck  
Upland, CA 91786

Dennis Brennan  
Duvall, WA 98019

Gary Fogel  
San Diego, CA 92191-1008

Chris Kenefick  
La Mesa, CA 91941

Max Miller  
Sedona, AZ 86336

Eric Pearson  
Friendswood, TX 77546

Guido Visconti  
67100 Coppito, AQ Italy

Ronald Vandervort  
Goodyear, AZ 85395

Les Ives  
Ozark Air Works  
Midway, AR 72651

Don Falencykowski  
Oswego, IL 60543

Johan Kala  
Boerne, TX 78015

Robert Robert  
Palm Desert, CA 92211-1603

Jim Walker  
Alexandria, VA 22314

Mark S. Thomsen  
San Diego, CA 92122

Amy Thorne  
Cave Creek, AZ 85331

John McKee  
Shiloh, IL 62221-3455

Robert Arnold  
Suisun City, CA 94585

Christian Figueroa  
Casilla 631, Talca 3460000  
Chili

Daniel Clifford  
Indianapolis, IN 46237-3732

Elizabeth Morales  
Austin, TX 78727

## NEW MEMBER DRIVE

The AAHS is in its sixth decade of operation and continues to face the challenge of sustaining its membership.

As current members, **YOU** can contribute to the success of helping grow the organization.

Did you know that more than **50 percent of all new members** learned about the AAHS from a friend?

Do you have friends who are interested in aviation history?

Pass them a copy of the Membership Application above and encourage them to join!

Make it a commitment to **recruit one new** AAHS member this year!

**MAKE A DIFFERENCE  
RECRUIT A FRIEND**

## AAHS FlightLine

American Aviation Historical Society

**President:** Jerri Bergen

**Managing Editor:** Hayden Hamilton

The *AAHS FlightLine* is a quarterly electronic publication of the American Aviation Historical Society and is a supplemental publication to the *AAHS Journal*. The *FlightLine* is principally a communication vehicle for the membership.

Business Office: 15211 Springdale Street  
Huntington Beach, CA 92649-1156, USA

Phone: (714) 549-4818 (Wednesday only)

Website: [www.aahs-online.org](http://www.aahs-online.org)

Email: [aahs2333@aahs-online.org](mailto:aahs2333@aahs-online.org)

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# Wants & Disposals

**WANTED:** Unpublished, good quality images of Curtiss-Wright AT-9 Jeeps and North American O-47 series aircraft in other than factory or manufacturing settings, preferably at station and in service, after December 7, 1941.

Dan Hagedorn,  
Life member 100  
23053 SE 246th Place  
Maple Valley, WA 98038  
email: [hagedorn\\_dan@comcast.net](mailto:hagedorn_dan@comcast.net)

**DISPOSAL:** Hundreds of B&W original negatives of U.S. aircraft, mainly 620 size, photographed during the 1970s to mid-1980s decades at \$3 each.

Contact:

Robert Esposito  
e-mail: [baesposit@verizon.net](mailto:baesposit@verizon.net)

**WANTED:** I am interested in contacting any descendant of Bertram "Bert" Acosta, 1895-1954, and/or locating any collections of letters and other papers that Bert may have left. Please contact me with any information or leads.

Mike Gough  
email: [mgough39@yahoo.com](mailto:mgough39@yahoo.com)

**DISPOSAL:** AAHS Journal back issues 1964 (Vol 9) to 1995 (Vol 40) inclusive with all issues for each year. Any reasonable offer will be accepted.

Also, numerous aviation books are available as well. Please contact me for details.

All items will be shipped USPS Media Mail, or the buyers choice.

Michael P. Jungers  
Los Vegas, NV  
Phone: 702-642-6998  
Email: [silverplate@cox.net](mailto:silverplate@cox.net)

**DISPOSAL:** The following individual issues of the AAHS Journal are available for \$20/magazine (postage included).

1960, No. 4  
1964, Nos. 1, 2, 3, 4  
1965, Nos. 1, 2, 3, 4 (2 sets)  
1966, No. 4  
1967, Nos. 1, 2, 3, 4

If interested, please contact via email.

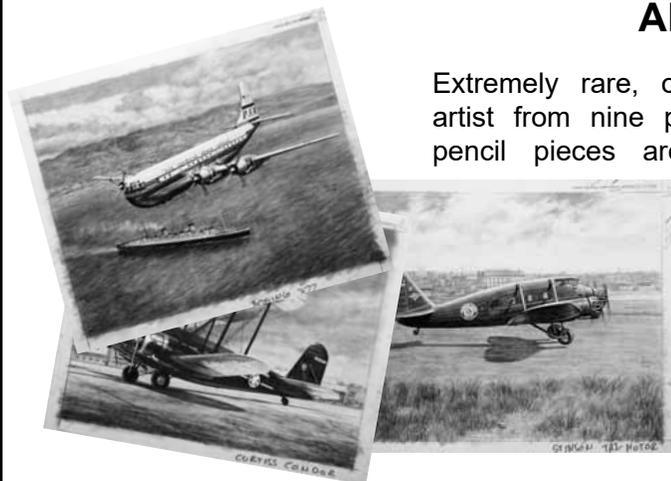
Hans-Joachim Klein  
Steinkirchen-ILM, Germany  
Email [hajo\\_klein@t-online.de](mailto:hajo_klein@t-online.de)



Disposal: Original 1909 postcard of Berlin-Tempelhof hangar with Orville Wright signature. Best offer above \$400. Interested parties should contact via email:

Hans-Joachim Klein  
Steinkirchen-ILM, Germany  
Email [hajo\\_klein@t-online.de](mailto:hajo_klein@t-online.de)

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**Dennis Eggert at: 651-291-7925  
or E-mail at: [steco1911@aol.com](mailto:steco1911@aol.com)**



**American Aviation Historical Society**  
P.O. Box 3023, Huntington Beach, CA 92605-3023

**MEMBERSHIP APPLICATION**

Please enroll me as a member of the AAHS. Enclosed is my check (money order or bank draft) for dues as checked below. I understand that I will receive all issues of the *AAHS Journal* published to date during my membership year, plus all issues of the *AAHS FlightLine* (Downloadable from the AAHS website). Individuals joining after October 1, will have their membership begin the following year, but will receive the Winter issue of the *Journal* as a bonus. I also understand that renewal is due at the end of the calendar year in which membership will expire. (Valid through December 31, 2017)

- |                 |                               |                                |
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|                 | 1 Year                        | 2 Years                        |
| United States   | <input type="checkbox"/> \$46 | <input type="checkbox"/> \$89  |
| Canada & Mexico | <input type="checkbox"/> \$54 | <input type="checkbox"/> \$104 |
| Other Countries | <input type="checkbox"/> \$75 | <input type="checkbox"/> \$145 |
| eMembership     | <input type="checkbox"/> \$29 | <input type="checkbox"/> \$56  |

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**AAHS Photo Archive CDs Series**

The Society has recently started development of a series of photo CDs. These CDs contain high-resolution scans of negatives, slides and prints from the AAHS Image Library. The resolution of these scanned images is sufficient to make an 8"x10" photographic quality print. Each CD focuses on a particular aspect of American aviation history - be that a particular manufacturer, type or class of aircraft.

As of this date, the following CDs are available. Each CD contains between 70 and 140 images depending on content.

- 1001 Douglas Propeller-Driven Commercial Transports
- 1006 Lockheed Constellations, Part I
- 1007 Lockheed Connies in Color
- 1009 Lockheed P-38/F-5
- 1011 Curtiss Transports
- 1021 Boeing Propeller-Driven Commercial Transports
- 1031 Golden Age Commercial Flying Boats



These CDs are available to members for \$19.95 (\$29.95 non-members) each plus shipping (\$2.50 U.S., \$10.00 International - add \$1.00 for each additional CD). Order forms are available online and on request, but a note along with your donation specifying your particular interest is sufficient.

Proceeds go to support the preservation of the photo archives. Do you have a particular interest or suggestion for a CD in this series? Drop us a line or email the webmaster ([webmaster@aahs-online.org](mailto:webmaster@aahs-online.org)). We are currently researching the possibilities of offerings covering the following areas: Connies Part II, XP-56, Northrop X-4, Bell Aircraft, and Early Lockheeds.