



Rocky Mountain Metropolitan Airport Broomfield, Colorado Vol. 3 No. 5 May, 2010

# AIRWAVES

## OPERATION MOUNTAIN PASSAGE

### SAREX: “The Big One”

*by*  
*Capt Patricia Sargent*

*Honing skills to keep volunteers sharp and ready to respond quickly, Civil Air Patrol provides training both in the classroom and at mission base. Planners, air crews, ground crews, air operations, communications, safety, public relations, personnel, and even a chaplain stand at the ready to go where needed to save lives and serve our country.*

The weekend of April 23-25 was the culmination of months of planning by Project Officers, 1st Lt Robert Schmid and Assistant, Maj Bruce Hertelendy. Basic planning took place in an air



1st Lt Robert Schmid, Lead  
Project Officer



Maj Bruce Hertelendy,  
Assistant Project Officer

#### TEAM LEADERS



Capt William O'Connor led the SAREX as  
Incident Commander

Photos by Capt P.D. Sargent

**CELEBRATING READINESS**

## SAREX

of secrecy as the planners tried to simulate the element of surprise for volunteers who came from wing squadrons. The wing exercise was a massive simulation.

The plan was comprehensive, and unexpected reversals of mission simulated real life experience. When a group set out on a sortie, it might turn into a REDCAP; the crew, and all supportive personnel, had to turn their attention to what might become a real emergency. That's how real life goes, and that is how past sorties have, indeed, often gone. Planning for surprise, for the unknown, and for emergency is crucial for automatic response. Hertelendy and Schmid are experts in that sort of planning. Chief Project Officer, Schmid, who has earned COWG honors for his planning in the past, said, "Usually the United States Air Force is guiding and evaluating us. This was the first attempt at a Civil Air Patrol Guided SAREX. The wing intent was to better prepare ourselves for both USAF evaluation and for real life scenarios." Due to COWG logistics issues, Schmid said, a Disaster Response element had to be cancelled.

"We conducted the SAREX with the main command post at BJC," said IC Capt William O'Connor of Thompson Valley Composite Squadron (TVCS). He served as Incident Commander to squadrons from Colorado Springs (COS) Grand Junction (GJT) and Rocky Mountain Metro (BJC) each of which had local mission-based ICs. He said that Groups I-IV at all bases participated. O'Connor was assisted by trainee, Capt Bill Waite of Boulder, who now qualifies for Incident Command in future exercises. A number of other operations qualifications were also added to the participants' 101 cards at the end of the SAREX.



Capt Scott Orr, COWG/MIO uses journalistic skill and television experience.

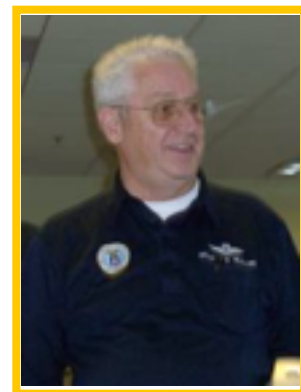
"We conducted 50 air sorties and 40 ground sorties over the three days," said . "Along with the usual challenges to leadership that all exercises have, valuable training and experience was gained," he added.



Lt Col John Butler, Briefer and Debrief, tells aircrews of potential TFRs and possible difficulties on the sortie.



Maj. Jeff Johnson, Chaplain. Ready to serve in times of stress. Outcome of Search and Rescue are unpredictable.



Lt Col Howard McClure, Planning Section Chief. He was assisted by Maj Andrew McKenna.

re-emphasized the value of practice. He said, "One of the goals of any SAREX is not only to find the target but also to practice the process of performing the objective." He concluded, "I thank the planning team for setting up the logistics and developing the challenging incidents of the SAREX." He added, "I thank everyone for their active participation. It is always a pleasure to lead a complex team of professionals who are skilled in what they do, even though we are volunteers."

"Certainly dealing with adjunct mission bases was part of the exercise," said . BJC was the ICP for the exercise: Peterson AFB and Grand Junction airport were two sub-bases with their own mission staff.

### **Mission Staff**

On Friday and Saturday, the Safety Officer was Capt Ken Anderson of Thompson Valley, and on Sunday that position was filled by Maj Tom Bellinger of Jeffco. Over 90 sorties including both air and ground, we completed over two days with no mishaps. "That is a tribute to the safety consciousness and professionalism of all involved with the exercise," said IC Capt Bill O'Connor .

Lt Col John Butler was the Briefer/Debriefer assisted by 2d Lt Dennis Mercer and Capt Paul Carter. All are from the Jeffco squadron. According to Butler, four sorties were dispatched from BJC on Saturday and eight on Sunday. Butler said, "The Incident Command post was swarming with people, which sometimes became confusing." Undoubtedly, that is

how a real emergency would look with so many people needed to meet the numerous tasks.

Finance was manned by Capt Jim Garrard of Boulder. Garrard researched the actual data laboriously gleaned from IMU and WIMRS. By actual account the number of squadrons participating was 30 with 200 volunteers participated on the ground teams, as mission base support personnel, and on the air crews. According to WIMRS, thirteen aircraft flew 50 sorties, including relocation. Aircrews flew 85.0 actual Hobbs hours using 978 gallons of fuel. The cost of which was \$4,522.80. The most sorties flown for one airplane was seven. At least 23 different Mission Pilots flew sorties, including relocation.



Capt Jim Garrard provided data for this article. As Finance Officer, he totaled the costs of the wing's training effort and provided statistics in this article.

According to IMU, 23 squadrons, four groups, wing Headquarters, and region headquarters were involved. 200 volunteers logged 2675 "man" hours although Garrard noted "the numbers are somewhat unreliable since we didn't get the actual check out times for Colorado Springs, Grand Junction, and Steamboat Springs, so we had to estimate."

Facilitating a complex task is a challenge both to leadership and to those filling the needs of the mission. "Coordination of all the participants, meeting the simulated requests for missions that come from AFRCC and agencies that Civil Air Patrol supports, such as Homeland Security and local Sheriffs presents many challenges," said . "Communication is a key issue as we

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operate on multiple platforms depending on the agency involved.”

Maj Lynn Newman of Jeffco served as the Communications Officer. He was assisted by Capt Ralph Nations of Broomfield Composite, and Capt Sy Jenkins of Jeffco.

Information Technology, IT, was headed by Jeffco’s 1st Lt Mike Linn, who serves as a consultant to all things technical such as computers, printers, storage, databases, the Internet, and the networks that tie all of these resources together making them securely available to the largest number of people within the organization.

“At check in, we provided computers and a CAP database with ES qualifications, computer access to the Internet and to a networked printer.” said Linn.

“The network, computer, and printer setup at the SAREX was pretty simple, and all went well initially,” he said. “However,” he continued, “the difficulty comes with getting the people used to the SAREX designated network. A number of people used computers that they were unfamiliar with or did not belong to them. The network access to the Internet in the Mt Evans room, unlike in our office, is not controlled by us, and it either works or doesn’t.

“Unfortunately we had some problems with the network access to the Internet that Pilatus so graciously provided us. We were able to get most users on the network on Saturday, but we had to disconnect on

Sunday. The issues are still being investigated.”

“This is why we practice.” said Linn. “There must always be a plan B. Technology is great, but in the event of a real natural disaster, most forms of communication that we rely on, email, the Internet and cell phones may just abandon us, and we need to be prepared.” When all else fails, Linn said, “Paper and pencils are still the most reliable backup, along with the CAP communication network.”

Air Operations Branch Director was Maj Sue Wolber of TVCS. “AOBD tasks included coordinating two remote bases, Grand Junction and Colorado Springs, and handling the aircraft coming into Metro,” she said.



1st Lt. Mike Linn, who has won wing recognition for outstanding work in Communications

“Saturday involved a lot of back-and-forth communication among the four aircraft that were going to come inbound to Metro. All but one were grounded all day for weather,” she said. “Colorado Springs was also grounded all day Saturday for weather, while West Slope aircraft flew all day.”

“The two aircraft based at Metro were able to fly Saturday. Briefings for all the West Slope aircraft were done via phone, and all 104’s were entered in WMIRS electronically. Using electronic 104’s was a learning experience for both my assistant AOBD the trainee, and me,” she said. “That was true of the

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briefers and it seemed like most of the aircrews as well.”

“Sunday is typically a very quiet day compared to Saturday, but because of the adverse weather Saturday, Sunday was the busiest day. Planning scenarios for the crews went smoother Sunday and AOBD spent most of our time tracking the aircraft, helping with brief and debrief, and helping with photo upload practice into WMIRS. Maj Wolber is an experienced leader who has often served as Incident Commander in past SAREXs.



Maj Sue Wolber, who has served many roles including IC, heads up Air Operations.

### Ground Team Searchers

The operation took a concerted effort on all fronts: aircrews, mission base support group, and ground crew teams. Quoting data from WMIRS, Garrard said there were 10 different ground vehicles, not including relocation, and 40 ground sorties, including relocation. The teams traveled 2150 miles using 211 man hours. Squadrons from Ground Team Leaders (GTL) from Colorado Springs Cadet Squadron, North Valley Composite, Boulder Composite, Broomfield Composite, Thompson Valley Composite, Black Sheep Senior Squadron Parker Cadet Squadron, Pueblo Eagles Cadet Squadron, and Dakota Ridge Composite.

Because most cadets were in school on Friday, ground teams worked both Saturday and Sunday. Unlike aircrews, ground crews teams are capable of operating in

inclement weather. “The ground teams successfully found their targets,” said 1st Lt Schmid, including live ‘rescues’ on both days in Colorado Springs, west of Boulder, and northwest of Fort Collins.” One ground team included a SARDOG named “Chewie.” Ground Operations was led by Lt Col Bob Toy of Group III HQ.



SFO Josh Wepman, Ground Team Leader

Cadet Ground Teams were headed by SFO Josh Wepman of Broomfield Composite Squadron. Wepman, soon to turn 21 and become a member of a senior squadron, said “two sorties for ground teams left from Jeffco on Saturday, one Urban Direction Finding, UDF, search, which resulted in a live ELT, non-distress find. Another was a simulated live victim search in Nederland.” Cadet teams, comprised of both young men and young women, came from Parker, Dakota Ridge, Boulder, Broomfield, and North Valley. Leading the teams were 2nd Lt Andy Dunn, Capt Peter Dunn, SFO Josh Wepman, Capt Nathaniel Beer, Maj David Fort, and C/Lt Col Michael Head, all experienced ground team members. Leaders were from Parker Dakota Ridge, Boulder, Broomfield, and North Valley.

Wepman said, “Teams were sent out on both Saturday and Sunday, but I was involved only on Saturday. Some of the teams went as far as Ft. Morgan. I believe they were on the Urban Direction Finding

sortie.” He continued, “Teams on the simulated live victim search went to Nederland, Ward, and Estes Park, but we quickly triangulated the beacon to an area between Nederland and Ward on the Peak-to-Peak Highway.” He continued, “There were two sorties for ground teams from Jeffco on Saturday, one UDF, which resulted in a live ELT find (non distress,) and a simulated live victim search in Nederland in which we participated.”

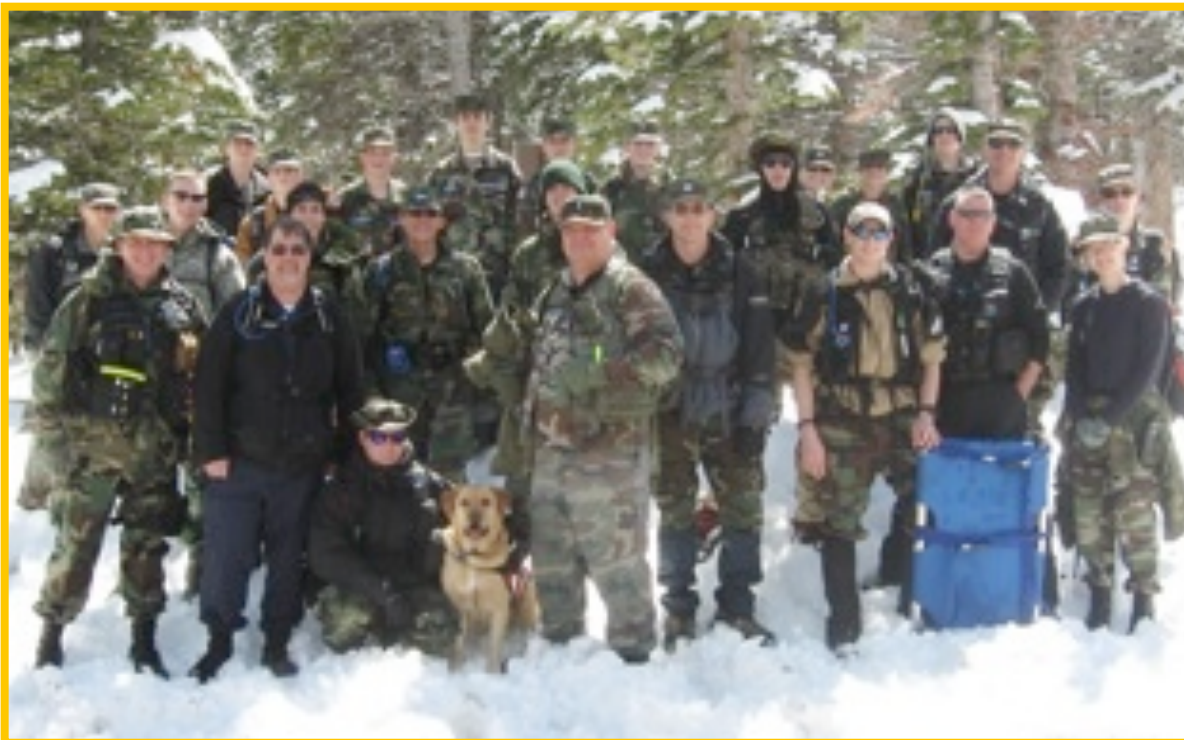
Wepman not only participated in the SAREX but also afterward dug up critical information for this article. Wepman has participated as an instructor in adult training activities including SLS and CLC.

Capt O’ Conner summed up the exercise: “The SAREX went well. We had some challenges with weather and logistics that are potentially challenges for real missions as well. Training and practice in all mission functions were accomplished at all mission locations. The next wing-wide event is the Guided Training Exercise to be held in July.



**Sy Jenkins  
Dick Sargent  
Bob Burrell  
Dan Meyer  
Steve Rew**

Photos by Lisa Sowell, Broomfield Composite



Ground teams do their work despite the weather. Their relentless search to follow indications of lat and long from air crews help them locate the objective and safely carry out, if necessary, individuals unable to walk. These hardy cadet volunteers, mostly junior and senior high school students, come prepared with proper clothing and substantial gear to sustain life in all Colorado’s challenging terrains. An able-bodied adult accompanies along with the SARDOG, “Chewie.”

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# Volunteers Protect National Heritage

*by 2nd Lt Luc Moens*

*“What you love you will protect” is the theory Michael Stewartt believed when he started Light Hawk thirty years ago. Manned by volunteer pilots throughout the United States and some parts of Canada, Mexico, and Guatemala, and funded by the Foundation and Major Donors, Light Hawk monitors pristine lands including precious habitat throughout North America. Ed.*

In 1979, a pilot in Santa Fe named Michael Stewartt, became increasingly disturbed by the things he saw on the ground while flying around the Western United States. After hearing about the planned installation of a new coal plant right next to the Grand Canyon, he decided to fly reporters through a smoke plume of a similar power plant, hoping that this would raise awareness among the public about the poor air quality created by such plants. The film footage created during this flight, was shown during the evening news on television, and caused such a public outcry that the building project was stopped. This unique use of aviation as a means to educate the public, prompted Stewartt to create an organization called *LightHawk*, that has since then grown into an international



Photo by Capt P.D. Sargent

Pilot, Mark Conway and Outreach Administrator, Laura Stone accept a Jeffco Squadron cap from AE Officer, 1st Lt Todd

organization that also operates missions in Canada, Mexico and Central America ([www.LightHawk.org](http://www.LightHawk.org)).

This story was the opening of an engaging presentation given during our April squadron meeting by Laura Jones, Program Manager of *LightHawk* for the Rockies region. She was accompanied by

Mike Conway, a USAF-trained pilot who had a 33 year career with United Airlines, and who now flies missions for *LightHawk* as a volunteer pilot. This non-profit organization has 10 staff people who work out of their homes all across the country, and is overseen by a 15-member Board of Directors. The missions are carried out by 180 volunteer pilots, who live all across the US, Mexico, Honduras and Canada, and who donate around \$ 500,000 worth of flights every year in the form of time and fuel using their own planes. Last year, 375 flight hours were donated in the Rockies over 90 missions. *LightHawk* owns three planes of its own (Cessna 185, 206, 207) that were donated by people who appreciated the missions of this non-profit organization. Because of the dangerous nature of the missions that involve low and slow flying around rural areas, mountains, coastlines, the entry requirement for volunteer pilots is 1000 hrs PIC.

Jones pointed out that the flights are primarily geared towards environmental projects and

*Continued on page 8*

research, and *LightHawk's* mission is not to tell people what to think. It just wants to gather information through aerial photography under partnerships with a wide range of clients and organizations. The pilots fly missions for conservation groups such as The Nature Conservancy and the World Wildlife Fund among many others, as well as government agencies, colleges or universities. Jones' statements were beautifully illustrated by impressive slides that showed several aerial photos of illegal clear-cutting in protected forests, something that was not immediately noticeable from the ground, as well as environmental damage from expansive mining activities and run-offs. By the same token, these pilots also fly industrial clients around sensitive areas, and such missions can provide information on how to properly extract minerals and energy resources in a more environment friendly manner. For example, the region near the Yellowstone River was experiencing pressure from groups interested in oil and gas development, and *LightHawk* was able to present convincing arguments that there are better places to search for oil and gas than right next to this beautiful river. Jones made it very clear that the goal of *LightHawk* is not to tell people what to think, but just to show visual material to clients and the public without pushing an agenda. Its pilots fly around with all sorts of people who have different beliefs on a variety of issues, and *LightHawk* has thus become a catalyst to start a dialogue between opposing parties where there would otherwise be none at all. Perhaps no better example of how *LightHawk* fulfilled this role can be found in the resolution of a conflict that took place in the Klamath Basin, an area that stretches from the high desert of South Oregon to the redwood forests of Northern California. For many decades, it was the center of much animosity between ranchers, Native American tribes, farmers, conservationists and government officials who once opposed each other in the courtroom over water use and management, and efforts to

preserve the habitat for species of endangered fish. It was at one time the third-most productive river system for salmon in the US and its 350,000 acres also hosted enormous numbers of migratory birds. Thanks to a concentrated series of donated flights, *LightHawk* became instrumental in showing the interconnectedness between people and their natural environment, and it thereby strengthened the common ground that unites the diverse stakeholders in this area. As Jones put it, now they work together where not too long ago they were out to kill each other! She also admitted that there are environmental groups that can be very focused on one particular issue without paying attention to others, but we should not forget that there are also groups that believe that it's all about having good water, clean air and a good economy with good jobs for people. *LightHawk* can thereby provide a means for people to see the state of the Earth.

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# Civil Air Patrol Founder, Maj Gen John Curry, Welcomed Women Pilots

## Jackie Cochran Was an Aviator, Test Pilot, Spokesman, and Businesswoman, A Winner!

by  
*Capt Patricia Sargent*



*In mid twentieth century, when our nation was threatened with invasion, American pilots came forth to defend and protect our shores. At first Washington insiders scoffed at the preposterous idea of civilians using their own aircraft to provide assistance to well-trained military personnel. But when a frontal attack on Pearl Harbor in the Pacific came in 1941, officials had second thoughts, and Civil Air Patrol was formed. As in industry, both men and women were needed to help in the war effort of WWII.*

Gen John F. Curry, an Army Air Corps Officer, became Civil Air Patrol's first national commander. With significant battle experience, he envisioned a well-trained civilian core of volunteers serving as an auxiliary to fly undetected in their private aircraft bombing submarines and observing and reporting other naval activity that infiltrated waters dangerously close to our shores. Under his command, a Civil Air Patrol wing was established in every one of the 48 states. Curry helped mobilize 100,000 private pilots for non-combatant service therefore freeing military pilots for wartime duty. Among those pilots was Jackie Cochran, an experienced pilot who had been flying since the early 1930s, breaking records, and winning awards.

By 1938, Cochran was considered the best woman pilot in the United States. With the Bendix Race under her belt and known as the nation's "Speed Queen," she set a new transcontinental speed record as well as altitude records, which, by this time, were competitions not just for women but for pilots in general. She won five Harmon



Jackie Cochran, winner of the 1938 Bendix Race. She had worked with Amelia Earhart to get women into the race.

Trophies as the outstanding woman pilot in the world. Like women of all time who

compete with men, she loved to win.

But winning wasn't all there was to life. Serving the country *and* winning was tantamount. Writing a letter to Eleanor Roosevelt, wife of President Franklin Delano Roosevelt, she proposed starting a women's flying division in the Army Air Force. She also wrote a letter to Lt Col Robert Olds, who was helping to organize the Air Corps Ferrying Command for the Air Corps at the time. Olds asked Cochran to find out how many women pilots there were in the United States, what their flying records were, their skills, their interest in flying for the country and personal information about them.

In wartime, gender became a minor issue as women had been flying since the early 1930s and were competent, dedicated, and reliable. Curry relied on individual ability, experience, and past records.

"There must be no doubt in the minds of our gallant women fliers that they are needed and, in my opinion, indispensable to full success of the Civil Air Patrol organization," he said. "A great part of the progress made in organizing civilian aviation under Civil Air patrol has been due to the volunteer help given by women flyers," he concluded.

That generous gesture in a time of chauvanist America was not shared by Gen Hap Arnold. In 1940, when Cochran wanted to organize women pilots to fly in the Air Corps Ferrying Command for the Air Corps, originally a courier/aircraft delivery service, and despite the shortage of pilots, Gen Arnold wanted proof that

women could be the solution to his staffing problems.

Cochran set out with seventy-six eager and able women pilots, each of whom had more than 1,000 hours of flying experience, and each who paid her own way to New York for an interview and to Montreal to take the physical examination. Expectations were high and the washout-rate was high. Cochran was able to take the cream of the crop, twenty-five outstanding pilots to join the British Air Transport Auxiliary, for whom she had been working.

Eventually through diligent lobbying, Cochran persuaded Gen Arnold to form Women Air Force Service Pilots, WASP of which she became director and supervised the training of hundreds of women pilots. In 1977 WASP won recognition that the WASP had answered America's call when she needed them. They too had fought and died for their country. Cochran's war efforts won her the Distinguished Service Medal and the Distinguished Flying Cross. Visit: <http://www.hill.af.mil/library/factsheets/factsheet.asp?id=5678>

After the war, she reported for a magazine that wanted to document post war global events. In that position, she was the only woman to witness defeated Japanese General Tomoyuki Yamashita's surrender in the Philippines, the first non-Japanese woman to enter Japan after the War, and she attended the Nurenburg Trials in Germany.

In 1948, she joined the United States Air Force Reserve where she eventually rose to the rank of Lieutenant Colonel. In that

capacity, she flew the new jet aircraft and was the first woman pilot to go supersonic. Urged on by Major Chuck Yeager she borrowed a Canadian Air Force Canadair F-86 Sabre jet at the average speed of 652.337 mph, and became the first woman pilot to break the sound barrier.

Many men have had similar goals as aviators, and many have excelled in amazing feats, but no one expected a woman, who was born in poverty and had no higher education, to break aviation records, own her own cosmetic business, start a discreet branch of the military service, and be successfully married to the founder of Atlas corporation and CEO of RKO.

Cochran made many contributions to aviation.

As a woman:

- She was the first woman to land on an aircraft carrier
- The first woman to fly at Mach 2
- The first woman to pilot a bomber across the North Atlantic Ocean,
- The only woman to ever be President of the Federation Aeronautique International
- The first woman to fly a fixed-wing jet aircraft across the Atlantic, and
- The first woman to enter the Bendix Trans-Continental Race.
- She was the first woman pilot to make an instrument landing

She was the first pilot to fly above 20,000 feet with an oxygen mask, and she still holds more distance and speed records than any pilot living or dead. And the list goes on. She flew the Goodyear Blimp in the 1960s, sponsored the Mercury 13 Program to test the ability of women to be astronauts. Incidentally, both John Glenn

and Scott Carpenter testified before Congress against admitting women to the astronaut program. At the time, NASA required all astronauts to be graduates of military jet test piloting programs and have engineering degrees. In 1962 no women could meet these requirements.

But times have changed. Since 1963 when two Soviet women entered the elite astronaut field, at least three score American women have joined the ranks along with women from other parts of the world including Russia, Canada, Japan, and France.

Cochran continued to be in the forefront of things. She ran for Congress, because of her military and political involvement, she and her husband, Floyd Odlum, played a major role in General Dwight D. Eisenhower's presidential campaign, and because of her many achievements, the airport from which she flew in her home town of Indio, California was named after her, Jacqueline Cochran Regional Airport. A postage stamp honoring Jacqueline Cochran, Pioneer Pilot was issued in 1996.



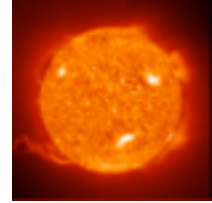
Jackie Cochran in the cockpit of the Canadair Sabre with Chuck Yeager, her lifelong friend

Content, graphic, and photos gleaned from Wikipedia  
[http://en.wikipedia.org/wiki/Jacqueline\\_Cochran](http://en.wikipedia.org/wiki/Jacqueline_Cochran)

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# Search for Alternative Technologies

## Aviation Fuels II: Have you considered Biomass Hydrocarbons in your Cessna?



by 2nd Lt Luc Moens

*Behind the scenes, business, industry, and the military are searching for alternative high energy fuels to replace those from petroleum. With his third article in the fuel series, Dr. Luc Moens, senior research scientist and chemist at NREL, teaches us about substances we never heard of like jatropha oil and camelina oil. Ed.*

In the previous two articles of this series on renewable fuels for aviation, I introduced the concept of biofuels as well as the various reasons why the current R&D efforts in this arena are becoming very important. For this month's installment, it might be interesting to mention a few real-life experiments with synthetic fuels for aviation produced from biomass. In truth, the synthetic fuels tested so far are a blend containing a traditional Jet A-1 fuel used in commercial jet aircraft, and a certain percentage of a biomass-derived fuel. One misconception held by the public is that people perceive biofuels or renewable fuels as some kind of "exotic" material that somehow "slips" through the maze of stringent fuel specifications. Nothing could be further from the truth.

The reality is that any biofuel must go through a rigorous testing process and must satisfy a host of specifications that are standards for petroleum-derived fuels. In fact, the process is more rigorous and time-consuming for biomass-derived fuels and can require special engine modifications like we currently see in the ethanol business.

However, the biggest push for biofuel R&D is now towards the development of traditional hydrocarbon fuels such as gasoline, diesel and jet fuel, with the intention of producing a fuel that can be introduced into the existing fuel

distribution system, a so-called "drop-in" fuel. This is in contrast with the ethanol-based fuel blends that require separate fuel distribution systems like tanks, pumps, etc.

As we said previously, this series, the R&D around algae is currently getting significant attention from the commercial and military sector, but the cost of production of algae, the harvesting of their oils, and the

downstream chemical processing in a refinery is not yet cost effective. Of course, most of us are familiar with another source of oils, *i.e.*, oil crops or plants from which we can extract a variety of oils such as soybean oil, sunflower oil, coconut oil, camelina oil and the like. These oils end up in our food and animal feed supply and constitute an important part of the human and animal diet. Furthermore, oil crops such as soybeans cannot satisfy more than

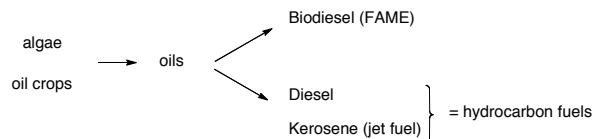
People perceive biofuels or renewable fuels as some kind of "exotic" material that somehow "slips" through the maze of stringent fuel specifications.

Nothing could be further from the truth.

total consumption of diesel fuel in the US, and hence algae are the most attractive option for producing oils on large scales, using a minimum of land space.

Without going into too much chemical detail, any of these algal or plant oils can be converted into two types of fuel. The first is a traditional diesel or kerosene fuel, the latter is used in jet engines, that are pure hydrocarbon liquids and are generated in traditional oil refineries using their existing hydroprocessing technologies.

The second type of fuel that can be derived from algal or plant oils is called 'Biodiesel' that is chemically different from regular diesel, and it is often referred to by its acronym, FAME, which stands for Fatty Acid Methyl Ester. A FAME contains chemically bound oxygen and is therefore not a true hydrocarbon. However, it is currently used in blends of up to 20% with a regular diesel fuel (BD20) and has an excellent cetane number as well as lubricity that is superior to regular diesel fuel. In future articles, we will look at these various fuels in more detail, because all this information can be quite confusing. For now, we should keep the following diagram in mind to follow future discussions:



As for the real tests in aviation, Richard Branson's airline, *Virgin Atlantic*, successfully demonstrated that flight was possible using a fuel blend of Jet A-1 and 20% biodiesel derived from coconut and babassu palm oil. This fuel was tested in one of four Boeing 747-400 engines--General Electric--on a flight between London and Amsterdam in February 2008. Another example is that of *Air New Zealand* that successfully tested a 50/50 blend of Jet A-1

with a hydrocarbon 'drop-in' fuel derived from *Jatropha* oil, in one of four Boeing 747-400, Rolls Royce, engines.

The test flight occurred between Auckland and Wellington, New Zealand, in December 2008. *Continental Airlines* successfully used a twin-engine aircraft--Boeing 737-800--to test a 50/50 blend that contained 47.5% hydrocarbon fuel derived from *Jatropha* oil, and 2.5% algae-derived hydrocarbon fuel. This test demonstrated the feasibility of the hydroprocessing technology needed for the conversion of oils into hydrocarbon fuel, and was also the first to make use of oils derived from algae. In January 2009, *Japan Airlines* tested a 50/50 blend that contained 42% hydrocarbon derived from *Camelina* oil, 8% from *Jatropha*, and less than 0.5% from algae.

For readers who are very technically inclined, a hydrocarbon derived from *Jatropha* oil *via* hydroprocessing has an energy density of 44.3 MJ kg<sup>-1</sup>, compared to 43.2 MJ kg<sup>-1</sup> for conventional Jet A-1 fuel. This means that the energy contained in biomass-derived hydrocarbon slightly surpasses that of the petroleum-derived jet fuel!

*Luc Moens, is a Senior Research Scientist, Chemist, at the National Renewable Energy Laboratory in Golden, Colorado. Aside from being actively engaged in biofuel research, he also enjoys educating the wider public about the ongoing R&D.*



### Web Site Information

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Airwaves Editor: [capnewsletter@mac.com](mailto:capnewsletter@mac.com)

# Awards and Promotions: April Squadron Meeting



Luc Moens moves on up to 2d Lt



Maj Tom Bellinger belatedly receives the Subordinate Unit Inspection, SUI, Achievement Award for outstanding marks for Squadron Safety in 2009. All squadron departments are regularly assessed according to implementation of policies, procedures and regulations, management of personal, corporate resources, CAP programs, compliance with Civil Air Patrol directives, and financial management and controls, accounting and general fiscal responsibility.



Jonathan Thorne moves up to Captain



Wing's Inspector General inspects each Civil Air Patrol unit every 36 months. Squadrons are expected to make regular assessments between official visitations.



Recruitment and Retention Officer, 2d Lt Dennis Mercer Earns Yeager Award



Capt Jeremy Sing Earns Benjamin O. Davis

Photos by Capt P.D. Sargent

## MARK YOUR CALENDAR

### MAY

22-23 Wing Conference, Colorado Springs

### JUNE

5 Photo Clinic, Jeffco

6-11 IG College, Kirtland AFB, Albuquerque, NM

19 Summer Weather Hazards Seminar\*\*

### JULY

3 Air Crew Clinic, Jeffco

5-11 Guided SAREX, Peterson, RMMA, Montrose

10-25 Glider Academy, TBA

16-18 CSRB Conference

16-18 Colorado SAR Conference, Gunnison,  
Contact Leonard Ginther

17-25 Region Staff College TBA

23-25 Pilot Survival. GSAR

23-31 GSAR Academy, Gore Pass area

### AUGUST

7 Air Crew Clinic, Jeffco

21 Aviation Weather Decoded Seminar \*\*

27-29 RMMA / BJC Air Show

### SEPTEMBER

4 Air Crew Clinic, Jeffco

11-12 Communication Unit Leader Class, TBA

### OCTOBER

2 Air Crew Clinic, Jeffco

16 Winter Weather Hazards Seminar \*\*

### DECEMBER

8 Mountain Flying Seminar \*\*

ICS 300 and 400 available on request:

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\*ICS 300 is required for IC, OSC, PSC, LSC, FASC,  
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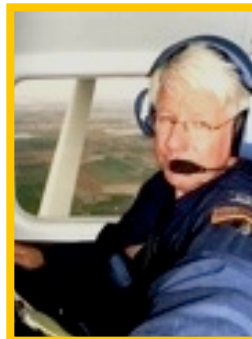
CAPT P.D. SARGENT



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