

Summer 2019

Peaks and Planes



Official Magazine of the Colorado Wing, Civil Air Patrol



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- ▶ Colorado Legislative Day
 - ▶ Warrior Weekend 2019
 - ▶ 2019 COWG Lightning II Summer Encampment
- And Much More!





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Colorado Wing Commander

Col. Celeste Gamache, CAP

Colorado Wing PAO

2nd Lt. Daniel Turner, CAP

Article submissions are always welcome. Please send them in Microsoft Word format to 2nd Lt. Daniel Turner, *Peaks and Planes* at dturner@cap.gov. Attach photos (in jpeg format) to your email and make certain to include full caption information for each photo at the end of your article.

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COVER: Colorado Springs Cadet Squadron and Air Academy Cadet Squadron in front of the Thunderbird's F-16 Fighter aircraft. INSET: Alpha Flight poses in front of the Air Force Academy chapel and F-16. Alpha Flight was awarded honor flight for the 2019 COWG Summer Encampment.

Commander's Comments

*Col. Celeste Gamache, CAP
Commander, Colorado Wing*

Team Colorado!

What a great Compliance Inspection! As a Wing, we did fantastic. We earned an Effective rating. While we had 11 discrepancies, this was one of the lowest numbers of discrepancies of any Wing in CAP. I want to thank everyone on Wing staff for their hard work to get their areas ready for this inspection. I also want to thank those squadrons that were inspected as part of the CI.



For those of you who are not sure exactly what a CI is, you need to understand why this is a big deal. The inspection system provides the commander with a credible, independent process to measure effectiveness and ability to comply with regulations. CAPR 20-3, para 1. A Wing is inspected every 4 years. Much like a Subordinate Unit Inspection (SUI) on a squadron, a CI inspects all areas of the Wing such as Cadet Programs, Aerospace Education, Operations, Administration, Logistics, etc. There are worksheets where we answer questions concerning compliance as yes or no, and we have to back up our yes answers with paperwork to prove we are in compliance.

This paperwork can be overwhelming. For example, we have to provide the paperwork for every aircraft in the fleet. This can be quite a stack of paperwork. Once collected, all of these documents and worksheets have to be uploaded on to the NHQ inspection site. This has to be completed 6 weeks prior to the inspection teams arrival for the on-site inspection of the Wing. At this point, no further changes can be made to the worksheets or additional documents uploaded. This is a very laborious process. A big thank you to Lt. Col. Buddy McCormick for his work uploading all these documents

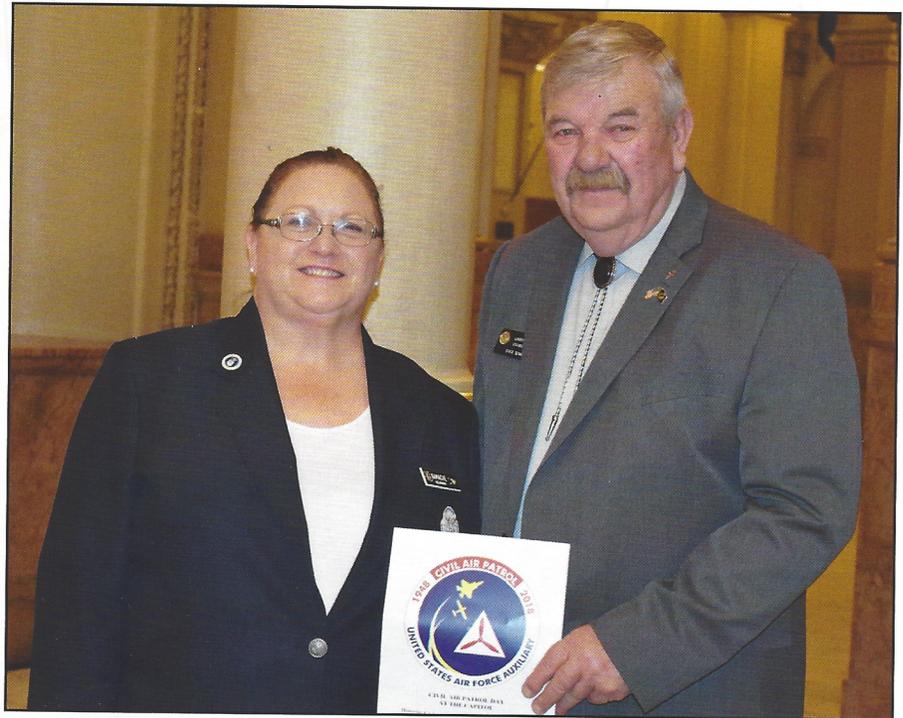
Continued on page 23 . . .

2019 Colorado CAP Day at the Capitol

By Col. Gary Tobey, CAP, Government Relations Advisor and
Capt. Jen Knellinger, CAP, Commander, PPSS, Group III PAO

Every year, Colorado Wing makes every effort to thank the Colorado Legislature for their continued support of Civil Air Patrol. With the March event postponed due to a blizzard, the April 18th event was a tremendous success with senior and cadet members attending from across the Front Range to meet and celebrate CAP Day at the Capitol with legislators.

Colorado Wing Commander, Col. Celeste Gamache hosted the event with a reception and greeting as legislators and staff began their day. Light refreshments, information and conversation welcomed State guests as well as opening remarks by Col. Gamache, Rocky Mountain Region Commander, Tom Kettell, Government Relations Advisor, Col. Gary Tobey and Deputy Legislative Commander, Senator Larry Crowder. Several legislators stopped by to both learn more about CAP and thank those



CO Wing Commander, Col. Celeste Gamache with Senator Larry Crowder.

attending for their continued service to Colorado.

Under the command of Lt. Col., CAP (Legislative Unit), Colorado Representative Dafna Michaelson Jenet, has shared 95 out of 100 Colorado State House representatives are Civil Air Patrol members. Major, Deputy Commander, Senator Larry Crowder has relayed all State Senators are members. Both Colorado chambers are proud supporters of Colorado Wing CAP and the several thousand volunteer members serving across the state.

Both the Senate and House chambers were honored by award-winning color guard units presenting the colors and leading the pledge of allegiance. Each chamber in

turn honored Colorado Civil Air Patrol's service to the State since 1942 by resolutions read at the beginning of each session. Each shared the missions, breadth of volunteer service, and resources with all attendees with thanks and appreciation.



Color Guard 2019

Peaks and Planes



COWG Government Relations Advisor, Col. Gary Tobey.

Summer 2019



Color Guard prepares to go into legislative chambers.



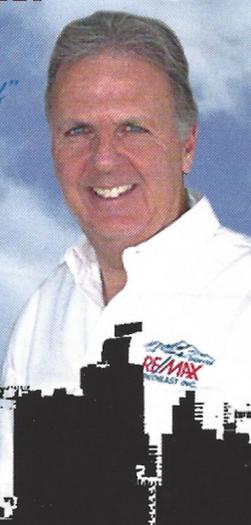
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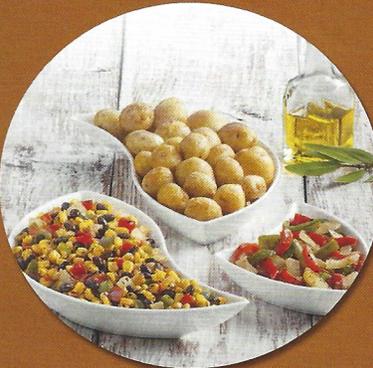



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2019 Cadet Competition

*By Lt. Col. Rick Maher, CAP
Group 1 Commander*

The wind outside was only exceeded by the excitement inside as seven teams, representing 4 squadrons, gathered for the 2019 Colorado Wing Cadet Competition. The competition was held at the Colorado Military Academy in Colorado Springs.

Teams representing Air Academy, Banning Lewis Ranch, Colorado Military Academy and Parker, competed in such events as Color Guard (indoor and outdoor), Team Leadership Problem, Uniform Preparation, Uniform Inspection, and a Written Exam. Cadets and seniors also had the additional benefit of interacting with members from other squadrons.

At the end, Air Academy finished in first place. Banning Lewis Ranch finished second. Both teams will be traveling to Hill AFB in April for the Region Competition. The top two teams from that competition will travel to Washington, D.C. for the National Cadet Competition.



1st Place Overall: Talon/Air Academy Cadet Squadron. Pictured left to right – Cadet Senior Airman Noah Ramos, Cadet Senior Master Sgt. Jonathan Broske, Cadet Senior Master Sgt. Carissa Sigler, Lt. Col. Buddy McCormick, Cadet Capt. Jenna Jones, Cadet Senior Airman Andrew Strub, Cadet 2nd Lt. Nicole Orphan

Cadet Competition Results:

Overall Competition:

1st Place: Talon 1/Air Academy Cadet Squadron

2nd Place: Banning Lewis Ranch Cadet Squadron

Flag Presentation:

Indoor: Parker Cadet Squadron

Outdoor: Talon 1/Air Academy

Team Leadership: B2's/Colorado Military Academy Cadet Squadron

Uniform: Talon 1/Air Academy Cadet Squadron

Written Exam:

Team: Talon 1/Air Academy Cadet Squadron

Individual: 1st Lt. Jenna Jones, Talon 1/Air Academy Cadet Squadron

Physical Fitness Test:

Team: Banning Lewis Ranch Cadet Squadron

Individual Male: Cadet Staff Sgt. Joshua Stozier, Banning Lewis Ranch

Individual Female: Cadet Staff Sgt. Julia Peeler, C130s/Colorado Military Academy

Start planning your team now for next year's competition. Information on Cadet Competition can be found in CAPP 52-4, National Cadet Competition Curriculum Guide. You could be representing Colorado Wing at next year Regional Cadet Competition in Utah.

Special thanks to 1st Lt. Kimberly Culp (Project Officer) of Thompson Valley and Lt. Col. Robert Rhoades (Assistance Project Officer) of Colorado Military Academy. Also, a big thank you to the judges and sponsors. Without them, this event would not be possible. 🏆



2nd Place Overall: Banning Lewis Ranch Cadet Squadron. Pictured from left to right – Cadet Col. Taylor Metzger, Cadet Master Sgt. Joshua Stozier, Cadet Chief Master Sgt. Dylan Weatherly (Team Captain), Lt. Col. Buddy McCormick, Cadet Senior Airman Jayden Leonard, Cadet Senior Airman Jacob Stozier, Cadet Senior Airman Christian Keyston

2019 COWG “Lightning II” Summer Encampment

By Cadet Senior Master Sgt. G. Dalton Peck, CAP
Encampment Public Affairs Staff



“Well, for starters, it was the only plane left to choose,” said Cadet Maj. Taylor Coffey, the cadet commander of the 2019 encampment, on why he chose the F-35 *Lightning II* as this year’s theme aircraft, “but the real reason was because the F-35 is a new, stealthy, and multi-role aircraft that can complete all of the Air Force’s operations with ease. That’s the exact same thing we want our cadets to do during this encampment.” The *Lightning II* encampment welcomed 151 cadets from around the Colorado Wing and other wings around the nation to the U. S. Air Force Academy preparatory school on Saturday, 8 June, 2019, for the annual week long event that trains cadets in leadership and teamwork skills, familiarizes them with military discipline, and introduces them to the operations and traditions of the United States Air Force. Upon in-processing, the cadets were sorted into their squadrons and flights. The 2019 Encampment can once again boast 3 squadrons, up from the 2 that sufficed last year: Squadron 1 with their red hats, Squadron 2, characterized by yellow covers, and Squadron 3, traditionally identified by their blue hats. Each squadron has 3 flights for a total of 9 named by the phonetic alphabet from “Alpha” to “India.” The activities for the week included rigorous drill training, physical activity, character development, an aerospace knowledge bowl, a tour of the Air Force Academy, and a number of team leadership activities. Through the rigor of encampment, cadets learn to better lead themselves and others, and open a number of doors for themselves in the future.



Alpha Flight receives Honor Flight for the encampment.

Taylor Metzger Receives CAPs Highest Cadet Honor, the Spaatz Award

By 1st Lt. Greg Schmitz, CAP, Commander, Banning Lewis Cadet Squadron and Capt. Jen Knellinger, CAP, Group III PAO

On May 22, 2019, Cadet Col. Taylor Metzger of the Banning Lewis Cadet Squadron was awarded Civil Air Patrol's highest cadet honor, the General Carl A. Spaatz award (#2229). The Spaatz Award recognizes extraordinary achievement in a demonstration of leadership, character, fitness and aerospace education while progressing through sixteen blocks of the Civil Air Patrol (CAP) cadet program. The final step, a demanding four-part evaluation including extensive written exams, moral reasoning essay and challenging physical fitness testing, requires considerable study, training focus and commitment.



Banning Lewis Cactus Tradition



Metzger Lamborn USAFA Appointment

Presented by General Stephen R. Lorenz (Ret.), former Commandant of Cadets at the United States Air Force Academy (USAFA), and most recently the Commander of Air Education and Training Command, General Lorenz is also a 1973 graduate of the Academy – Taylor's dream and realized destination to be part of the class of 2023.

Looking back, Cadet Col. Metzger credits much of his success in CAP to the numerous opportunities afforded him by his squadron and senior mentors to take on significant responsibility, experiment with innovation and new traditions, actively participate in flying gliders, planes, balloons as well as Search and Rescue missions, and attend a number of Encampments where he served in

staff leadership roles. He has received the Red Service Award, Community Service Award, DAR Outstanding Cadet Award, and USAF Organizational Excellence Award.

Even at 15 years old, Metzger made a very adult values-based decision in his quest to gain an appointment to the United States Air Force Academy. He had to decide whether to chart a course with Junior ROTC or Civil Air Patrol. He chose CAP because of its long history of civilian defense of the country's safety and security, strong connection to the military, and most importantly, its foundation of volunteer service.

Taylor is also quick to point out the positive impact of the many relationships forged in Civil Air Patrol with fellow Colorado cadets as well as those from across the country. Not from a military



Metzger, Lorenz with Lt. Col. Hall and Col. Gamache

family and citing the opportunity to lead, succeed and fail, he also appreciates the unflinching support of his parents and family in allowing him to chart his own path and take ownership of his successes and mistakes in pursuing his goals.

On behalf of Banning Lewis Cadet Squadron, Group III of Colorado Wing and Colorado Wing, a sincere congratulations to Cadet Col. Taylor Metzger for his Spaatz Award and best wishes for his continued success. 🇺🇸



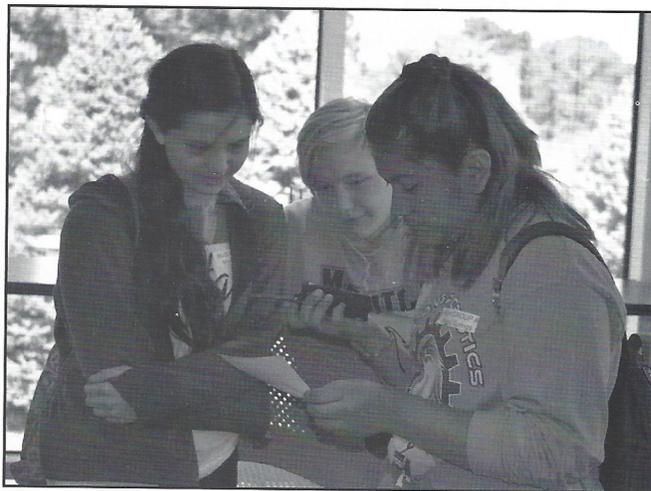
Banning Lewis Cadet Squadron

PPSS Works With PAFB and CAP USAF Team to Support Youth STEM Diversity Event

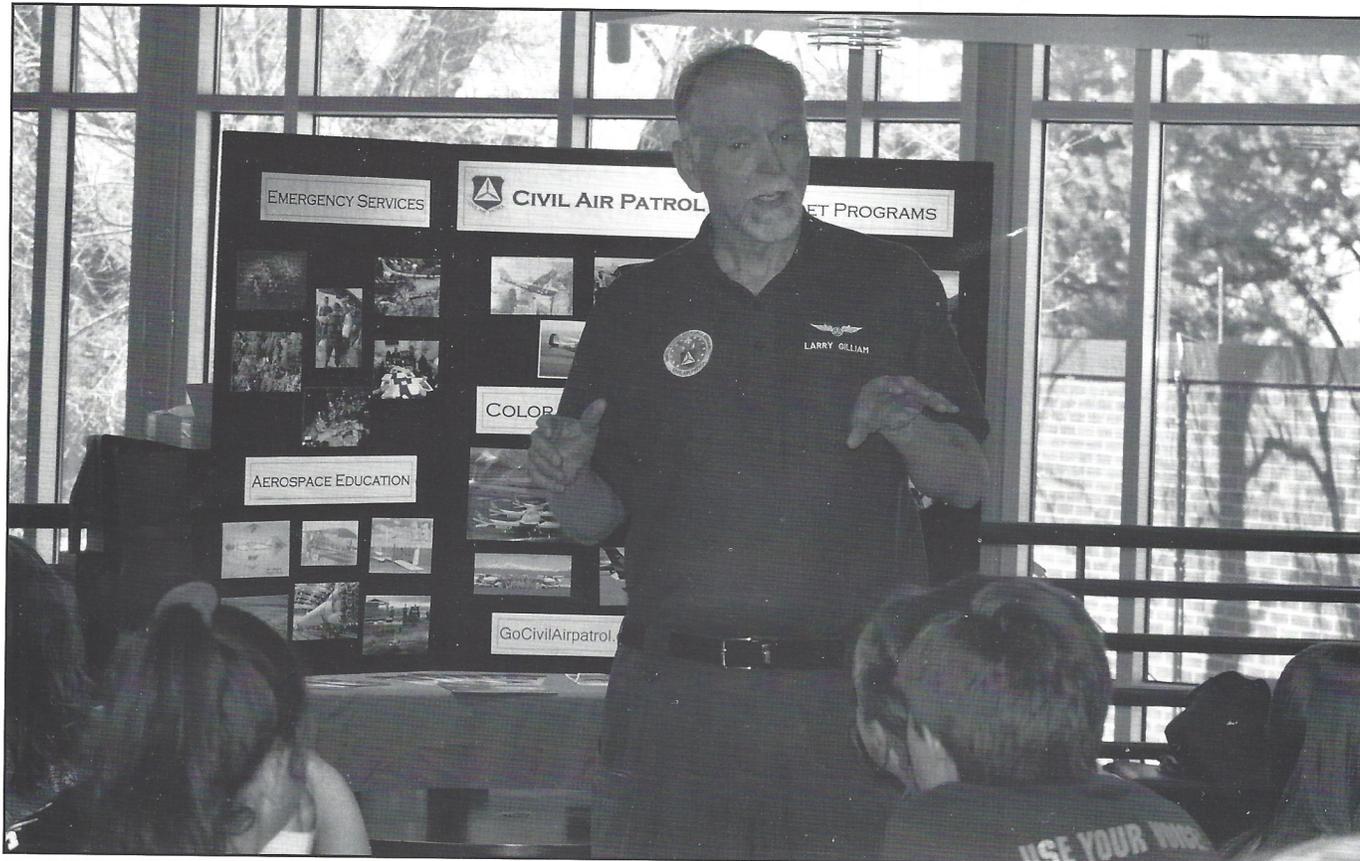
Story and Photos by Capt. Jen Knellinger, CAP Squadron Commander, PAO, PPSS

Almost a year ago, Lt. Alex Bendoyro, Asst. AE Officer for Pikes Peak Senior Squadron volunteered to help out with an event designed to help elevate the knowledge of and engage multiple students in the community regarding technology efforts and expertise associated with Peterson Air Force Base. Searching for a hands on activity where students are far more likely to be interested than receive a lecture, Alex explored CAP equipment and resources for “technical interest”.

Radios became a natural solution; they are also not well known by young people as most communicate by cell phone. Radios, particularly something as



Students learn to work with ISR radios in a com exercise.



COM Officer Larry Gilliam discusses radio use in CAP with students.



simple as an ISR radio, (which can stand for both Intelligence, Surveillance and Reconnaissance as in the military, as well as Intra Squad Radio in the field) are useful in team communication, often when cell phones can be ineffective or inappropriate for the task at hand. During a search and rescue mission, ground teams can communicate with each other to note locations, target sighting or need for help. Using designated and restricted frequencies, team members can speak freely within a certain range to transmit needed information.

For the event, Group III and Pikes Peak COM



Peaks and Planes

Officer, Larry Gilliam devised a short communication exercise teaching students about the proper “prowords” and communication processes when using an ISR. Asst. COM Officer, Kevin Leinbach and fellow PPSS aircrew member, Louis Jensen split 3 large groups of students into smaller “tactical” units to work through the exercise in small groups. Capt. Gilliam, also a member of the El Paso County Search and Rescue team shared how more advanced radios are used in emergencies; Maj. Leinbach and Lt. Jensen also shared other types of radios used in CAP, such as those in an aircraft.

In addition to the radio knowledge and the exercise, the PPSS team shared knowledge of Civil Air Patrol - love of aviation, how youth are involved in the cadet program and types of CAP missions most Colorado squadrons are most often engaged.

The PPSS team met with over 100 students and want to thank Colorado Springs Cadet Squadron for the use of their ISR radios to teach local students about the technology, Civil Air Patrol and the opportunity for future service using technical tools and training for excellence. 

Colorado Cadets Meet Thunderbirds

*By Maj. Bill Blatchley, CAP
Colorado Wing Director of Aerospace Education
All photos credit Capt. William Romano*

Each year, the Air Force Thunderbirds come to Colorado Springs to perform at the United States Air Force Academy graduation. While in town, they set up shop at Peterson Air Force Base. In addition to entertaining spectators with the aerial demonstration, the Thunderbirds mission includes community engagement to help retain and recruit members of the Air Force.

On 28 May, cadets from the Colorado Springs Cadet Squadron and the Air Academy Cadet Squadron received the opportunity to visit the flight line and see the aircraft up close and personal. Due to potential severe thunderstorms in the area, the line crew was preparing to hangar each of the aircraft. There were the 6 show aircraft on the line along with Thunderbird 8 which is a two seat F-16 used for media flights. The show aircraft had just returned from an afternoon practice session over the Air Force Academy and Thunderbird #8 was preparing for a media flight.

Cadet Senior Airman Claire Donahue of the Air Academy Cadet Squadron summed up her experi-

ence by saying "To me seeing and meeting the Thunderbirds, it felt like it was a once in a life time opportunity. You get to see inside where the pilots sit and maneuver the jets. You get to see them take off and get to hear how the engine sounds when it's not in the air. Hearing the crew member's stories of how and why they wanted to join the Air Force inspired not just me but other cadets to become pilots."

Cadets and senior members had the chance to climb the maintenance stairs to take a look into the cockpit of Thunderbird #1. Each person also had the chance to pose in front of #1 to capture the "hero shot."

One can imagine that joining the Air Force as an officer after graduating from college is one path to becoming a pilot. Approximately half the graduating class from the Air Force Academy will attend pilot training. However, for other people, the commercial route is their desired path to the cockpit.

As the time on the flight line came to a close, Thunderbird 8 was undergoing its final checks for a flight. A very few selected civilians are blessed with

Continued on page 23 . . .



Colorado Springs and Air Academy cadets and seniors on the flight line with the Thunderbirds.



Cadet Chief Master Sgt. Nicole Henderson of the Colorado Springs Cadet Squadron by Thunderbird #1.



Civilian Swayne Martin climbs aboard Thunderbird #8 for the ride of his life.

CADETS MEET THUNDERBIRDS,

Cont. from page 20

the opportunity to fly in the back seat of Thunderbird #8 flown by the Advance Pilot/Narrator who is Maj. Jason Markzon for this season. Primarily media personnel are selected so they can promote the mission of the Thunderbirds and the Air Force. The media personality flying this day with Thunderbird #8 was Swayne Martin. Swayne is a young pilot who has documented his flight training since his solo flight six years ago just after his 16th birthday. Today, he is a first officer for Envoy Airlines which is a regional airline affiliated with American Airlines. His YouTube vlogs are an accurate representation of a path toward becoming an airline pilot. If you are even remotely interested in this as a career path, search for his high quality videos on YouTube.

On 30 May, over 160 Colorado Wing members formed the air show security line for the Thunderbirds performance after the Air Force Academy graduation. Security was tight at Falcon Stadium since President Trump was the commencement speaker. The Thunderbirds started the show with their six aircraft Delta Formation over the stadium as the graduates tossed their hats into the air. After the President was safely outside of the acrobatic box and on his way to Peterson to board Air Force One for the flight back to Washington, DC, the main show began minus Thunderbird #3. The right wing pilot potentially struck a bird after the flyover and safely returned to Peterson Air Force Base.

Cadet Donahue summed up the day as “The graduation felt like another once in a life time opportunity by getting to hear the president talk and hand out awards and the people cheering each other on. While waiting for the air show, I was able to talk with other Colorado cadets to my left and right and learn a lot about them. The real fun happens when the Thunderbirds come out, you hear their rumbling. The Thunderbirds did lot’s of cool tricks.”

Remember, there are many paths to the cockpit of an aircraft. CAP has new programs to help cadets obtain their private pilot license. The program is closed to applications at this time but will reopen in the Fall with new funding. Check out the Youth Aviation Initiative at <https://www.gocivilairpatrol.com/programs/cadets/cadetinvest/youth-aviation-initiative>. 

COMMANDER’S COMMENTS

Cont. from page 1

and coordinating the CI preparation. He was the outstanding performer of the CI.

During the 6 weeks prior to the inspection team’s visit, the inspectors call their counterparts in the Wing and go over their worksheets and paperwork submitted. For some, their inspection is complete at this point. For other areas, like Operations, Logistics, Communications, Transportation, Administration, Aircraft Maintenance, the Directors are interviewed in person by the inspectors when they come to the Wing. The inspectors are made up of Air Force personnel and CAP personnel from outside Rocky Mountain Region.

As the Commander, I am interviewed last. The inspection team then works on their report and we are given an out-brief prior to their departure. This is where we are given our final grade and the number of discrepancies. The final report is published a few weeks later.

CAP is going to a concept of continuous compliance. Instead of cramming at the last minute for the CI, the Directors will keep their worksheets up to date and upload documents as they go along. This way, they know (and the Wing Commander knows) that their area is in compliance with the regulations that govern them. We will be rolling out our plan for continuous compliance in the near future.

I want to acknowledge those directors who had no discrepancies during the CI:

Capt. Amy Griswold - Administration and Personnel

Maj. Bill Blatchley - Aerospace Education

Maj. Bill O’Connor - Operational Mission Management

Maj. Eric Schwarm - Communications

Maj. Matt Flanders - Aircraft Management

Lt. Col. Victor Sabatini - Professional Development

2nd Lt. Daniel Turner – Public Affairs

Lt. Col. Andy Rajca – Logistics

Maj. Kristine McGovern – Safety

Please thank your Wing staff members for all their hard work for the Wing and their great work on the CI. They make Colorado Wing shine. 

Pikes Peak Senior Squadron supports Emergency Management Exercise

*Story and Photos by Capt. Jen Knellinger, CAP
PPSS, Squadron Commander, PAO*

PPSS performed a dual mission on Saturday, June 8th during the Pikes Peak Regional Office of Emergency Management (OEM). Annually, since the Waldo Canyon fires of 2012 burned the vegetation of the natural gulches and drainages in both Williams and Waldo canyons, the OEM contracts with the trained PPSS Aerial Photography (AP) aircrews to monitor new growth and effectiveness of mitigation steps in the area and affected communities.

Known as the Waldo Canyon fire, the many days of fires wreaked havoc on the natural flow of water from the mountains above Manitou Springs, Glen Eyrie and Rockrimmon neighborhoods causing flooding and damage – more insult and injury to areas already struggling to recover and rebuild. Over the years since the fires, The City of Colorado Springs has continued to construct drainage and retention ponds as needed and monitor their effectiveness. Along with evaluating the regrowth of vegetation to slow the flow of water, each year the city reviews its current status and preparation for the familiar early and late summer flash storms and potential for flooding by working with CAP.

Since both the Waldo and Black Forest fires, Civil Air Patrol has worked closely with the OEM. PPSS has also become a part of the annual Evacuation exercise, sharing CAP's role in disaster relief and recovery. This year the Evacuation exercise was held for Crystal Hills, Crystal Park and Upper Skyway neighborhoods; with drills directing "evacuees" to Holmes Middle School, where they learned about disaster preparation, heard Mayor Suthers speak about the need for preparation, interacted with local resources and were hosted for lunch by the Salvation Army. The Red Cross, Humane Society, Salvation Army and other local nonprofits plus Civil Air Patrol were there with city government; an opportunity for residents to recognize and be aware of the number of partners activated in the event of disaster.

Uniquely, at this year's event, by request of OEM Manager, Gordon Brenner, the PPSS AP aircrew was launched the same morning for the annual AP mission. In addition to shooting close to 600 photos, the crew of PIC Doug DalSoglio, Mission Commander, Milt Moores and AP, Jon Bucher, planned a "time on target" pass of Holmes Middle School so residents will recognize CAP aircraft as an integral partner and resource of support in the local community during these type of events or disaster. PPSS members, Stephen Fontenot, Ashleigh Lopes and Alex Bendoyro presented materials and spoke with "evacuees" at the event.

Pikes Peak Senior Squadron and all of COWG Group III continue to work together to share CAP's expertise and resources with the communities they serve.



Presentation Team



Pilot Doug DalSoglio and AP Jon Bucher review targets for City Mission flight.

Peaks and Planes



Time on target at EVAC exercise

Summer 2019

Former Jeffco Senior Squadron Pilot Webinar on Midair Collision Safety

By 1st Lt. Robert Patlovany, CAP, Mission Pilot
Huntsville Senior Squadron SER-AL-055
(Formerly Jeffco Senior Squadron RMR-CO-136)

This is an updated and edited version of a similar article that I wrote for the Winter 2019 *Bama Express*, published by the Alabama Wing of the Civil Air Patrol.

On January 31, 2018, I presented an 84-minute webinar produced by the Experimental Aircraft Association (EAA), *Midair Collision Physics, Gambles, and Myths*. This webinar was a summary of the published research results from my April 1997 article in *Risk Analysis: An International Journal*, "U.S. Aviation Regulations Increase Probability of Midair Collisions."

The day before my webinar was the two-year anniversary of the survival of Professor H. Paul Shuch, PhD, during his near midair collision accident which opened a two-foot long crack in his windshield. Professor Shuch discussed lessons learned about his accident in his own EAA webinar, *Anatomy of a Near Midair Collision*, May 11, 2016. My webinar referenced Dr. Shuch's accident as a case study showing how the professor was especially at risk of death because of his skillfully precise obedience to regulations inadvertently designed to encourage midair collisions.

Professor Shuch's accident is all the more remarkable in that he is a frequently published academic and aircraft flight instructor who received his doctorate in aviation transportation engineering from Embry-Riddle Aeronautical University. This doctorate was supported by a full ride fellowship awarded for, among other impressive credentials, his invention of an airborne radar system for detecting midair collision threats. This invention was substantially motivated by his survival after missing his scheduled flight September 19, 2011, on Pacific Southwest Airlines Flight 182, which was destroyed during a San Diego midair collision killing 144, while destroying 22 homes.

In my webinar, I explained my experimental method, results, conclusions, and recommendations from my 1997 article. My webinar references the fully corroborating article published in the Fall 2000 *Air Traffic Control Quarterly*, "A Linear Altitude Rule for Safer and More Efficient Enroute Air Traffic," by NASA Ames Research Center computer programming scientist, Russell Paielli. What I had done with an interpreted basic program modeling a 1000' X 1000' X 2000' virtual airspace experiment on a 25 MHz 386 PC, Mr. Paielli had corroborated with a compiled C++ program running on a NASA Sun Sparc workstation with a far more elegant model 500 nautical miles square by 10,000 feet tall.



1st Lt. Robert Patlovany, while flying with Jeffco Senior Squadron, RMR-CO-136.

The results of both models showed that the hemispherical cruising altitude rule (HCAR) has an inadvertently designed-in system safety engineering technical error that causes about six times more midair collisions, compared to non-compliant renegade pilots flying at totally random altitudes. The HCAR formula encourages midair collisions around the world with variations customized to local geography. These geographically-inspired "common sense" variations very strongly hint at the fundamentally unsustainable safety basis for HCAR, as explained in my webinar. Here in the USA, HCAR has been codified since September

30, 1963, as Federal Aviation Regulations (FARs) 91.159 and 91.179.

The HCAR design basis technical error makes pilots obeying these two FARs especially vulnerable to single failure disasters caused by either: (1) human physiological limitations, (2) pilot error, (3) Air Traffic Control error, or (4) failures in collision safety electronics (either airborne or ground based). Mr. Paielli began his 2000 article with a detailed discussion about the lack of fault tolerance in the FARs. He contrasted the FARs fail-dead design with two passive fail-safe designs. Nuclear reactors drop their scram control rods automatically when the electrical power holding them up

is lost. The first Otis elevators used redundant fail-safe ratchet teeth or brake pads automatically forced against the vertical guide rails by spring tension. These teeth or pads were pulled away from the rails during normal operation by the tension of the unbroken winch cable supporting the elevator. In contrast, the risk-encouraging design of these two FARs leaves no room for failure by anybody or anything.

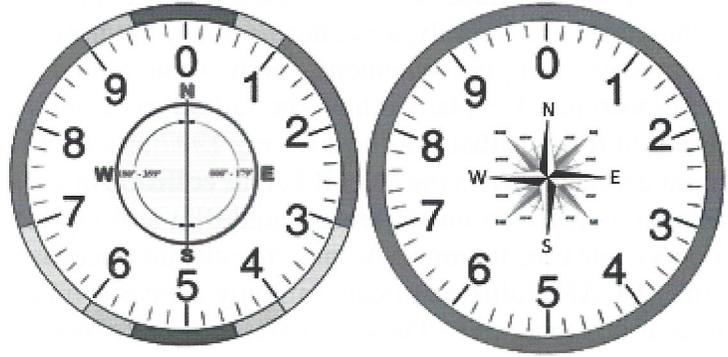
My webinar explains how **three failures are required for every midair collision**: (1) the failure of being on a midair collision course, (2) the failure to detect the midair collision course, and (3) the failure to evade the midair collision course. The FAA definition of **airmanship** includes, “the exercise of sound **judgment** that results in optimal operational safety and efficiency.” My webinar explains how “optimal operational safety” is not achieved with the unsound judgement that was used to create these two FARs—and is likewise not achieved by precision obedience to them.

The **first failure** of the three is controlled by the 1850s discovery of the mean free path formula that I learned as a 19-year-old sophomore Texas A&M nuclear engineering student. My webinar explains the simplicity of this high-school-algebra-like formula accounting for nothing more than collision target size and target density as the **only** factors affecting the average or mean length that an aircraft flies before having a midair collision. My webinar explained how **airmanship** affects the probability of being on the collision course in the first place. Piloting with precision obedience to HCAR makes the mean free path artificially and unnecessarily short.

My webinar explains the far safer 1928 Australian invention of a cruising altitude rule based on 90-years-ago instrument panel technology already installed (as in—**free**—for no additional charge) on all powered aircraft of that day—even in the Outback. I called the 1928 invention, Altimeter-Compass Cruising Altitude Rule (ACCAR), in my December 1998 article in *Aviation Safety*, “Climb and Maintain What?: Cruising Altitude Rules Increase Your Risk of a Mid-Air Collision.”

In 1996, when I was unknowingly reinventing ACCAR, I imagined a small compass rose in the center of the mechanical altimeter glass. Recall that the 100-foot hand of the altimeter completes one full rotation for every 1000-foot altitude change. This relationship gives the 100-foot hand of the altimeter a compass rose “heading” angle. If this 100-foot hand compass rose “heading” matches the actual compass heading of the aircraft, then ACCAR is being used to automatically maintain a vertical separation of 500 feet for all head-on traffic using any heading at any altitude. Perpendicular traffic is then vertically separated by 250 feet. In an ACCAR world, collisions are only possible between faster traffic overtaking slower traffic flying on nearly the same heading, and only after a long, relatively slow, chase up the turbulent wake of the slower aircraft.

The **second failure** is strongly influenced by the visible time to impact, as affected by both **airmanship** and collision threat geometry. The HCAR FARs inadvertently and systematically make the visible time to impact very short for conflicts between aircraft headed mostly north and south. By design, such near



Altimeter unsafe and safe zones for HCAR (left) and ACCAR (right).

polar headings have a high probability of causing head-on collisions by aircraft required by the FARs to be at the same altitude. Professor Shuch was set up to fail in exactly this way when he was flying mostly to the north, and slightly west, head-on into the nose of a Bonanza flying mostly south, and also slightly west—with both pilots obediently at the same altitude.

In my webinar, I explained how the failure to detect a collision threat is controlled by the probability of detection formula that I derived for my 1997 article. This formula is very strongly influenced by collision threat geometry. With the HCAR FARs, collision threats can approach from any angle, and the pilot's most diligent visual scan must view all angles in a disciplined pattern. The head-on angles have an extremely short visible time to impact because the closing speed is the **sum** of the airspeed of both aircraft. In contrast, with ACCAR, collision threats can only appear from directly ahead, and all threats are flying away from the overtaking aircraft. These two effects greatly increase safety. First, the ACCAR pilot's eyes need only scan directly ahead of his aircraft in the very small arc where slower aircraft might be at the same altitude. Second, with ACCAR conflicts, the closing speed is the **difference** of the airspeeds of both aircraft. This difference is always a smaller value than the sum. This smaller closing speed gives the overtaking pilot many opportunities to detect the slower threat before impact, even with infrequent looks outside, and even with temporary distractions inside the cockpit.

The **third failure**, also strongly influenced by **airmanship**, is the pilot's **judgement** selecting the evasive action maneuver. The FAA Advisory Circular 90-48D includes a list of time consuming pilot actions that typically occur in the midair collision process during the 12.5 seconds from the first moment that a collision threat is visible, until the moment of impact. My webinar explains how the four seconds allocated to the decision to turn left or right inadvertently result in an unnecessarily dangerous delay in responding to the threat. Additionally, turning as an evasive action offers up a single sacrificial wingtip for being cut off by the incoming threat. The ill-advised counter-productive turning strategy from 90-48D always makes the vulnerable area of the turning aircraft far bigger and easier to hit. When the vulnerable area of the aircraft is maximized in a banked turn, the mean free path is minimized—along with the life span of the pilot and passengers. Rather than wasting four seconds, and sacrificing one wing in the bank and turn per 90-48D, my webinar recommends an immediate vertical pull up to climb or push down to dive out of the flight path of the incoming threat.

Airspeed indicators have red, yellow, and green arcs to help pilot avoid dangerous speeds. Figure 1, below from my webinar showed how altimeters would appear if they had similar danger and safe arcs for HCAR and ACCAR. The red arcs are for very accurate HCAR compliance maintained by autopilots. The orange arcs are for hand flying pilots qualified for an instrument rating. The yellow arcs are for pilots lacking instrument-rated proficiency. The HCAR green safety arcs are less than half the scale, and are **illegal** to use for cruising altitudes more than 3000 feet above the ground. The ACCAR altimeter has only a green full circle, with no special danger arcs.

My webinar was viewed by over 600 people. Near the end of the webinar, the EAA webinar producer, Timm Bogenhagen, gave viewers the opportunity to vote on their preference of four midair collision safety alternatives for cruising altitude rules:

- (1) The hemispherical cruising altitude rules (HCAR) of Federal Aviation Regulations 91.159 and 91.179,
- (2) The altimeter-compass cruising altitude rule (ACCAR),
- (3) An ACCAR modification altered to create a repeated pattern every 2000 feet (RP2000),
- (4) Random altitude cruising flight.

The webinar viewers voted for their preferred cruising altitude rule as follows:

- (1) 11% HCAR—hemispherical cruising altitude rules,
- (2) 66% ACCAR—altimeter-compass cruising altitude rule,
- (3) 8% RP2000—rule proposal with a 2000-foot vertical repeating pattern,
- (4) 15% Random altitude cruising flight.

The votes showed 89% agreed that a change is needed to abandon the poorly designed “safety” regulations that systematically increase midair collision risk compared to random altitude noncompliance. The ACCAR option was preferred by 66% of the voters, six times more than those favoring retention of the current regulations. Russ Paielli, the NASA Ames Research Center Air Traffic Control scientist who corroborated my 1997 article, prefers the RP2000 modification of ACCAR for the convenience of air traffic controllers. My webinar explained why RP2000 is extremely difficult for pilots to visualize with traditional instruments, compared to ACCAR. This human factors difficulty maximizes the kind of human errors that killed 33 on September 13, 1997, when a German pilot trying to obey HCAR (with German precision) made one very small, very typical human error—as Paielli warned in the introduction of his article. Almost twice as many voters chose random altitude flight (15%) compared to those who voted for the Paielli ATC-friendly RP2000 favorite (8%). Eight times as many pilots voted for ACCAR, compared to those who preferred the ATC-friendly RP2000 modification of ACCAR.

After the webinar was over, I contacted Professor Shuch about one of the peer reviewers for my 1997 article. Doctor Ward Edwards had provided my editor with about 15 comments that I had to address before my article would be worthy of publication. Dr. Edwards’ comments mentioned Paul Shuch. Dr. Edwards was the brother of the wife of Shuch’s mother’s brother. Shuch grew up calling him Uncle as he was a relative through marriage. Here is how Shuch described him.

“As we were both pilots, and scientists, and academics, we formed an instant bond. Ward was one of the world’s leading authorities on decision theory, and was my informal mentor and external advisor during my grad school days. His most significant contribution to my midair collision research was an off-hand reference to three-way case control studies, an analytical technique from the field of epidemiology with which I was then unfamiliar. Upon researching that particular tool, I came to the startling conclusion that aircraft midair collisions were in fact a public health issue, which could be quantified using an epidemiological approach. What resulted were my doctoral research, my dissertation.”

The connection between Ward Edwards and Paul Shuch is important for reinforcing their subject matter expertise as validated by my editor’s trust of Ward Edwards expertise for providing comments necessary to forge my 1997 article into something worthy of publication. In this context as a world famous academic, Dr. Edwards commented to my editor about my draft, “I would expect the publication of this paper in RA [Risk Analysis] to lead to front-page stories in every newspaper in the country.”

Unfortunately, Dr. Edwards’ prediction about the newsworthiness of my 1997 article has not yet come true. On the contrary, my post-publication request to the Federal Aviation Administration (FAA) for a Notice of Proposed Rulemaking (NPRM 28996) resulted in a rejection letter stating that my proposed changes “... have merit but do not address an immediate safety concern.” This letter was signed September 19, 1997, six days after 33 people died in a midair collision over the South Atlantic between two aircraft that were required to follow HCAR. The FAA rejecting my request with 33 freshly dead bodies in the South Atlantic for only six days inspired my wonder about what level of current newsworthiness rates “an immediate safety concern.”

A 3-minute YouTube video by Redstone Composite Squadron (SER-AL-119) Senior Member Luke Van Cleef features my webinar summary in front of an RC-12N Guardrail Common Sensor version of a Beechcraft King Air A200CT. A civilian King Air almost killed me and my hangar partner in 1981 when it cut through our formation flight of two KR-2s. The King Air was visible for only about five seconds from its first moment as a barely detectable dot an inch above my partner’s canopy, until its formation splitting intersection with our flight path. My survival of such a dangerous flight safety threat inspired my research into midair collision safety, the same way that Professor Shuch’s survival of his own near midair collision inspired his research for presenting his own lessons learned webinar. Luke Van Cleef’s video is available at:

<https://www.youtube.com/watch?v=-mEJHxLfnRs&feature=youtu.be>

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The EAA recording of my webinar is available at:

<http://www.eaavideo.org/detail/videos/webinars/video/5724032078001/>

The EAA recording of Professor Shuch's lessons learned webinar is at:

<http://www.eaavideo.org/detail/videos/feature/video/4890470314001/>

I have three engineering degrees (nuclear, mechanical, and environmental), and professional engineer registration in Colorado and Texas. I have been providing system safety and probabilistic risk assessment engineering analyses since 1988 for nuclear power plants, a nuclear weapon parts plant, aircraft and spacecraft. In less than five years as a contract engineer at NASA Marshall Space Flight Center, I earned a NASA Silver Snoopy award. My Silver Snoopy pin flew in the Orion spacecraft during Exploration Flight Test 1. The Silver Snoopy award is a special honor awarded to NASA employees and contractors for outstanding achievements related to human flight safety or mission success. I am also a Civil Air Patrol mission pilot, with over 1300 hours of flight time, now holding a commercial pilot certificate with an instrument rating applicable to single- and multi-engine land aircraft. 

Aerospace Education Update

By Maj. Bill Blatchley, CAP
Colorado Wing Director of Aerospace Education

Many COWG members know of the Air Force Association's CyberPatriot program but few know about the StellarXplorers Program (<http://www.stellarxplorers.org/>).

This competition is based on the Systems Tool Kit (STK) application from Analytical Graphics, Inc. where teams compete by configuring launch parameters for rocket launches with various communications packages as the payload. Included in the competition materials is a text book *Understanding Space*. Similar to CyberPatriot, team members compete in a quiz and a practical exercise. There are practice rounds and competition rounds in the Fall with the national finals competition to be held in April in Houston, Texas, home of the Johnson Space Center from where US manned space flight are controlled.

CAP participation in StellarXplorers is rather low and we need to change that. Since this program involves a certain understanding of orbital mechanics, teams should look on the CAPNHQ Aerospace Education web page for Civil Air Patrol - Systems Tool Kit Aerospace Program. This modular curriculum introduces cadets to the six Keplerian Elements.

The CyberPatriot season will be upon us again very quickly. Through an arrangement between CAPNHQ and the AFA, any CAP squadron or group can hold a CyberCamp the week of 29 July to 2 August. The CyberCamp is designed around a four hour camp day Monday through Thursday followed by a mini-competition on Friday. This is an opportunity for squadrons to introduce prospective team members to cyber security and the CyberPatriot competition. Camp material will be provided to squadrons that participate in the camp. Interested squadrons should contact Maj. Blatchley at wblatchley@cap.gov if they want to participate. Squadrons would be responsible for securing a facility for the camp along with computers and Internet access.

The CAPNHQ/AE team has indicated that funds are available for Aerospace Education Members (AEMs) to take Teacher Orientation Flights. All AEMs should have received an email from CAPNHQ inviting them to apply for a flight. Any AEM can contact Maj. Blatchley to get the ball rolling if they would like a flight.

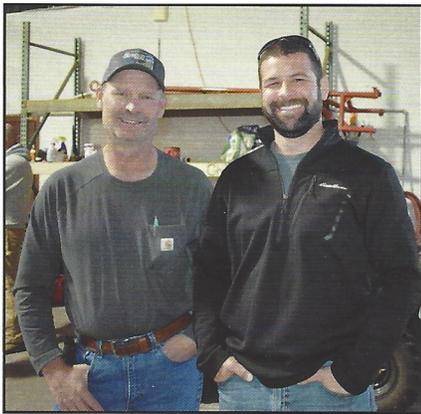
As Summer rolls on, also consider working on the new STEM badges for squadron cadets. This is an excellent way to promote Aerospace Education within the squadron.

Civil Air Patrol Aircrew Helps Scouts Earn Aviation Merit Badge

By Capt. Jen Knellinger, CAP
Commander, PAO, Pikes Peak Senior Squadron

With a national mission priority of partnering with likeminded organizations, Colorado Wing accepted an opportunity to support the Boy Scouts of America on April 27th by providing an aircraft and aircrew to fly in to Kit Carson Airport to help educate about 30 Scouts' working toward their Aviation Merit Badge while participating at the High Plains Camporee in Burlington, CO.

By request, John Stewart sought the assistance of the Colorado Civil Air Patrol to help a small subset



John Stewart (L) and fellow pilot scout supporter.

He credits the Scouts and aviation experience for his personal life success.

Sincere thanks to both Capt. Terry Rohr and Lt. Col. Dave Micheletti of Pikes Peak Senior Squadron for their excellent, hands-on, active presentations of the aircraft and for fielding numerous questions from the scouts. We greatly appreciate the opportunity John Stewart offered to Civil Air Patrol to share CAP expertise



Terry Rohr discusses level flight.

of the over 500 scouts attending the annual High Plains Camporee near Burlington, Colorado interested in earning their aviation badge. With COWG support, Pikes Peak Senior Squadron flew out in their CAP T182T with two experienced aviators and a PAO – all with CAP experience and Air Force connections, to present a program sharing aviation basics, aircraft design, navigational technology and CAP history.

John Stewart's love of both aviation and the Scouts comes from a long family history. His father was a Civil Air Patrol pilot in the 1940's and shared his passion for flying with his son. To this date, John continues to support both the Scouts and CAP as well as fly his own airplane.

and aviation missions with the scouts. The mission was a success in many ways and helped to develop CAP's relationship with the Scouts while inspiring young aviation enthusiasts and perhaps recruit new CAP cadets!

Warrior Weekend 2019 Doubles Participation and Scope

*By Capt. Jen Knellinger, CAP
Squadron Commander, PAO, PPSS, CAP*

Under Project Officer, Lt. Mark Borshelt, Warrior Weekend at Meadow Lake Airport doubled its size and breadth with 94 cadets, 80 seniors and over 20 squadrons participating and training at the fourth annual event. Host squadron Banning Lewis Cadet Squadron and the Meadow Lake Airport Association allows Civil Air Patrol to use the facilities each year for the premier event. The hum of activity started forming in the facilities and on the campground Friday, May 3 as mission base formed, the Colorado Wing COM Mobility trailer set up, cooking facilities were organized and aircraft began arriving.

With a unified mission number and dedicated Incident Commander, additional training and scope of air and ground sorties expanded to include Flight Line Supervisor and Marshaling specialties as well as UDF ground training and exercise evaluations. Daily formations and an additional night of camping



Cadets learn flight marshaling



Glider Flight

Peaks and Planes

led to full days of training with camaraderie building food and fun in the evenings.

Up to the challenge and with extraordinary organization and detailed preparation, Mary Rieth, husband Nick and team provided delicious meals and snacks for all those at the event over the three days. Nothing short of incredible.

A record setting number of total air sorties, including eight Emergency Services training flights were flown this year to train both new Mission Scanners and Observers. Orientation flights in both powered and glider aircraft were offered to cadet attendees both Saturday and Sunday with 45 powered and 12 glider flights for cadets flown with eight powered aircraft and two gliders. Twelve total volunteer powered, glider and tow pilots were busy both days to make these happen. In addition, Specialty qualification tasks were met for seniors and cadets with first aid education, communications skills training, scanner ground school, mission staff assistant tasks, Air Operations Branch Director (AOBD) reviews and more by skilled volunteer instructors.



A fun flight thumbs up!

Consistent COWG Facebook presence added to the sharing of photos and activity among members and a media visit by KRDO news of Colorado Springs presented an evening news story highlighting CAP's role in area communities and the country. With beautiful weather, collaborative staff and leadership, cadets and parents, the weekend was a model for future events where "Fun with a purpose" is what it's all about. 🇺🇸



Cadets Piltingsrud and Vinson having fun at Warrior Weekend