



Missions for America
Semper vigilans!
Semper volans!

The Coastwatcher

Publication of the Thames River Composite Squadron
Connecticut Wing
Civil Air Patrol

300 Tower Rd., Groton, CT
<http://ct075.org>

LtCol Stephen Rocketto, Editor
srocketto@aquilasys.com

C/SSgt Virginia Poe, Reporter
C/SrA Michael Hollingsworth, Printer's Devil
Lt David Meers & Maj Roy Bourque, Papparazis

Vol. VIII, No. 21 10 June, 2014

SCHEDULE OF COMING EVENT

- 17 JUN-TRCS Meeting
- 24 JUN-TRCS Meeting-Finance Committee Mtg.
- 28 JUN-Columbia Open House

- 04 JUL-GON Parade and Squadron Picnic
- 07-11 JUL-ACE Academy I (GON)
- 09 JUL-MIT Aero and USS Constitution-tentative
- 18 JUL, 2014-CTWG Golf Tournament
- 19 JUL-02 AUG-Nat'l Emergency Services Acad.

- 08-16 AUG-CTWG Encampment-Camp Niantic
- 11-15 AUG-ACE Academy II (GON)
- 23 AUG-Wing Wide SAREX-HFD

- 20 SEP-Cadet Ball-USCGA (tentative)
- 01 OCT-CTWG Commander's Call and CAC
- 17-19 OCT-CTWG/NER Conference
- 16-18 OCT-NER AEO Course at Conference
- 18-25 OCT-NER Staff College-New Jersey

CADET MEETING

10 June, 2014

submitted by

C/SSgt Michael Hollingsworth

The first part of the meeting was drill practice followed by team building exercises.

C/Amn Ryan Poe and C/Amn Ian Poe were promoted to C/A1C.



Ryan and Ian Poe are awarded their insignia by Mrs. Poe and LtCol Kinch.



C/CMSgt. Johnstone assumed the duty of First Sergeant. C/SSgt. M. Hollingsworth and C/SSgt. D. Hollingsworth were assigned as the Flight Sergeants for Alpha and Bravo Flights respectively.

SENIOR MEETING

10 June, 2014

Submitted by

Capt. Christopher L. Magee

Commander's Call

Maj Paul Noniewicz reviewed the TRCS squadron goals which had been set earlier this year. Maj Noniewicz indicated that he was pleased with our accomplishments but noted

areas which need improvement. He pointed out area where more member participation is desired, noted the need for written department plans, and addressed the issue of building maintenance.

LtCol John deAndrade and Majs Roy Bourque and Willi Lintelmann will serve as point men scheduling planned maintenance.

LtCol Tom Wisehart provided the grounds for a safety discussion concerning the special problems of an aircraft engine failure occurring immediately after lift-off and under 200 feet.

Maj Lintelmann, Finance Committee Chair, noted that we are in a solid financial position, our electric bill is down, and our our outstanding mortgage of just over \$1,000 will be retired this year.

Maj Scott Farley led a session which evaluated last week's RI-CT SAREX which the Squadron hosted. LtCol deAndrade, the Incident Commander indicated that he was satisfied with the overall performance of the Squadron.

Participants then rendered their opinions about those those functions about which they had first-hand knowledge. Weak areas were noted and suggestions for improvement.

THE SQUADRON PRESENTS A PAIR OF AEROSPACE PROGRAMS

TRCS continues its external aerospace education program with two more school events. On Wednesday, 04 June, LtCol Rocketto visited the Annie Fisher STEM Magnet School in Hartford to work with the CAP Aerospace Connections in Education (ACE) rocket launchings. ACE is a CAP program is an aerospace education program for elementary teachers (K-6) who are aerospace education members (AEMs) or senior members Civil Air Patrol (CAP).

Rachael Manzer runs the program at Annie Fisher. Manzer is a distinguished_educator who was the CAP Aerospace Education Teacher of the Year in 2010 and has been selected by NASA as

one of seven teachers offered a ride into space on one of the commercial vehicles under development.

Manzer designed and teaches two aerospace education courses at Annie Fisher for elementary and intermediate grade students. She then leveraged her influence by teaching other teachers to teach the courses which are two of the most popular in the school.

Two sets of students, about 40 altogether, reported to the field behind the school to launch their rockets. A safety briefing was held. Then, for the next hour, cries of wonderment, screams of excitement, and laughter filled the air as one after another, students prepared, launched, and recovered their vehicles.



Manzer and Rocketto assist students in attaching electrical leads to the rocket's fuse.



Each of the participants was also presented with a CAP ACES T-shirt and given permission to wear that sign of achievement to school on the next day.



On Friday, the 6th of June, Rocketto visited Two Rivers Magnet High School and observed students in Dr. Robert Polselli's Principles of Engineering class practicing the engineering design process by constructing bottle rockets.



“Dr. Po makes a point as is students construct rockets and make journal entries on their computers.”

Two Rivers Magnet School is another institution which uses the STEM concept to teach modern technological disciplines, concepts, and practices.

Dr. Polselli is a pilot who holds a CFI certificate and his room contains two flight simulators equipped with yokes, rudder pedals, and power consoles. While there, I watched a video of some rocket launches which they filmed from the air using a radio controlled quadcopter.

Near the end of the class we went outdoors and the students launched several rockets. The launch area sits in the shadow of the Colt Dome, a fitting place for a STEM school. At one time, the Connecticut River Valley and its nearby region was the “Silicon Valley” of the 19th and mid 20th century. Tool making, machinery, measuring equipment, and manufacturing of goods from clocks to firearms to locks to tools were shipped from here to the world. *Sic transit gloria mundi.*

The rockets were filled with a quantity of water and the reservoir was pressurized by the combination pump and launch system.



A careful perusal of the picture will reveal where the water ejecta ended and ballistic flight began. The water rocket, in the upper right, is at its apogee, about 75 feet high.

Rocketto is scheduled to return to Two Rivers for a second session which will include familiarization with CAP and a set of science demonstrations.

CT-RI SAREX *07 June, 2014*

A final meeting for Saturday's training exercise was held on Friday night. LtCol John deAndrade led a conference call with the staff and the TRCS cadre did a table-top planning exercise to put the finishing touches on the plan.

On Saturday, LtCols Richard Doucette and Stephen Rocketto opened the sign-in desk at 0700, greeting the first of the 49 participants, 27 officers and 12 cadets. Four of the officers were from Rhode Island as was one of the cadets.

Rocketto then shifted to the radio room where he and Maj Willi Lintelmann opened radio communications with the first of four aircraft which joined the mission. Incident Commander's

Michael Heath and deAndrade assembled the command staff: Maj Keith Neilson, Air Operations Branch Director, Malcolm Dickenson, Ground Team Operations, LtCol Rui Rodriguez overseeing safety and Majs Scott Farley and Paul Noniewicz fulfilling a number of roles wherever needed.



Rocketto, Lt Pagenkopp, and Lintelmann man the commo shack.



Incident Command Staff Ponder a Problem

Air and Ground teams gathered for the first briefing which started precisely as planned, 0830, with Cadet SrA Hannah Ramsey leading the Pledge of Allegiance and the CAP Safety Pledge. Mission goals, staff, communications, and weather were reviewed and cadets and officers were dismissed and sent on their respective missions.

An air and ground search for an electronic locator beacon launched first followed by a number of missions including shoreline patrols, bridge and dam infrastructure surveys along the Connecticut-Rhode Island Border, and an air reconnaissance of Richmond Airport seeking to identify a specific aircraft. A second ground team, dispatched in the afternoon tracking an emergency locator beacon.



LtCol Wisehart smiles as he fills out the flight logs.

TRCS Maj Roy Bourque and personnel from other squadrons led the ground teams. LtCol Thomas Wisehart flew one of the search aircraft training a scanner and observer. LtCol Larry Kinch ran the ground transportation and airport gate security details.

In addition to simulated emergency missions, a number of officers and cadets practiced ground mission roles at Haley Farm State Park just east of Mystic. The morning program consisted of a line search and signal mirror practice and hot weather injuries were discussed. In the afternoon, familiarization and preparatory classes were conducted at the airport.



A signal mirror is one of the simplest and cheapest ways of attracting attention.



By 1000, all units were deployed on various missions. Debriefings were held as each team returned and subsequent missions followed during the 12 hour exercise. All missions were successfully completed.

Each training mission is a learning experience. LtCol deAndrade, the Incident Commander, was pleased with the overall operation but stated that we needed to generate air sorties faster and improve ground team techniques in order to accomplish more. Communications noted that a more comprehensive briefing on stand-by frequencies should be added to the next communications plan.

Thames River Squadron Commander Maj Noniewicz noted that one-third of the officers present came from TRCS, with most occupying staff positions. Maj Farley, the Squadron's Emergency Training Officer was commended for his consistent efforts to provide training sessions and keep ES personnel qualified.

AEROSPACE HISTORY

A Short History of Aerial Photography

by
Stephen M. Rocketto

Part One The Early Days (1858-1939)

Aerial photography has developed as an important mission for the Civil Air Patrol and a new specialty qualification has emerged, airborne photographer. Over the last several years, the Connecticut Wing has engaged in a number of reconnaissance missions focusing on the details of selected ground targets. The Federal Emergency Management Agency employed CAP aircraft for a large scale damage survey left behind by Hurricane Sandy. Homeland security missions have led to photographic studies of bridges, dams, and highways and CAP aircraft use cameras "to assist in locating illicit drug trafficking and growing activities."

This article will be devoted to aerial photography, imagery taken by airborne vehicles using film. The fascinating aspects of photographs taken by space vehicles will not be considered. That story, how cameras on spacecraft contribute to military intelligence, environmental research, economic development, astronomy, and agriculture must be reserved for some other time.

The applications of aerial photography may be divided up into two broad enterprises; mapping and intelligence. Aerial mapping is the process of acquiring aerial photographs of terrain and reducing that data to useful maps and charts for aviators, environmental scientists and engineers, and a multitude of governmental planners and commercial interests. In the 1930's, some 50% of the earth's land surface was at best, crudely mapped, with topographical features either missing or miles from their actual locations. As late as the 1960s, when the author of this article was flying in South America, he used USAF Operational Navigation Charts which contained white areas with notations such as "Relief Data Unreliable" and "Position of Town Uncertain." Today, all of these uncertainties and mistakes have been eliminated or rectified by aerial and satellite imagery.

Aerial Intelligence is the discipline which examines the works of man found on the ground or water. This might be a factory, fortification, or military encampment but could also be groups of men or the tracks they leave behind, the heat signature of a vehicle, or the damage done by bombing or artillery. Both mapping and intelligence functions are vital to effective military planning.

Both the mapping and intelligence enterprises employ photo-interpreters who might specialize. A hydrographer's primary interest will be in water courses, lakes, and glaciers. Agricultural specialists might focus on crop health or plowing practices. Military analysts might be submarine, armor, or missile site experts. The disciplines cross over. The state of grain crops on the Russian steppes will be of interest to Russian agronomists as well as to CIA economic analysts.

The story of aerial photography can be broken down into four separate but interrelated areas: aircraft, cameras and recording media, image processing, and interpretation techniques. This essay will attempt to shed some illumination on each of these facets of aerial photography.

The history of aerial photography goes back to a time before powered flight. France led. In 1858, Gaspar Felix Tournachon took the first photos from a tethered balloon. Kites and pigeons have also served as camera platforms. During the U.S. Civil War, Thaddeus Lowe, the grandfather of Pancho Barnes, formed the Union Army Balloon Corps. The balloons were used for visual reconnaissance and messages could be transmitted to the ground by telegraph signals. However, even though balloon borne photography has already been successfully done in the United States prior to the war, none was ever taken by the Balloon Corps. Perhaps the complex and slow developing process made military applications impracticable.

However, balloons reentered the air reconnaissance game in the late 1950s. During the early stages of the Cold War, the United States lacked both targeting information about the Soviet Union and aircraft which had the range and payload to obtain it. The details of how balloons were employed to try to solve this problem will be covered in the “Cold War” section of this essay.

From the Civil War to World War I, experiments were carried out in a number of places. Alfred Nobel was the first to propose using a rocket as a camera carrier and patented the idea in 1896, a precursor of rocket launched reconnaissance satellites. In 1902, Ernest Shackleton used a tethered hydrogen balloon to obtain photographs during the Nimrod Antarctic expedition. Shortly afterwards, the German Gauss Antarctic expedition performed a similar feat using a hot air balloon. Great Britain led the world in kite borne cameras. Meteorologist E.D. Archibald used strings of box kites to sent instrumentation aloft, An American, Samuel Franklin Cody settled in Great Britain and used kites to obtain aerial photographs.

At about the time of the Wright's first powered flight, Germany ran experiments using pigeons to carry cameras. A light weight camera, around two ounces, was fastened to the breast of a homing pigeon. The pigeon would be released and would head back to its dovecote while the camera automatically took photographs at some pre-set rate. The Bavarian Army established a Pigeon Corps using homing pigeons to carry messages but also used them as organic photo ships. Alas, enemy fire and raptors took their toll of the feathered photographers whose flights were made at a height of about 200 feet.



*Ist das nicht eine taube mit kamera?
Ja, das ist eine taube mit kamera!*
(Credit: Bundesarchiv)

Wilbur Wright piloted the first powered airplane which took aerial photographs. While trying to sell airplanes to the Europeans in 1908, he took L.P. Bonvillain aloft for the first still aerial photos and a year later used a movie camera.

The first use of an aircraft for reconnaissance of a battlefield took place during the Italo-Turkish War of 1911-1912, with the Italian pilots sketching the disposition of Turkish forces. Around the same time, British, French, and German military technicians were also engaging in research to improve aerial photography and make it a practical tool for tacticians.

The “Great War,” the “War to End All Wars,” World War One, introduced the camera as an important device to gather intelligence. The airplane was first seen as an airborne calvary and a

principal role of cavalry is scouting to determine the disposition of enemy forces.

Photographs of the battlefield were prized and efforts were made both to obtain them and to prevent the enemy from doing the same. Photo planes were prime targets and heavy fighter escort were often provided to protect them.



*DH-4 Used to Patrol Mexican Border
The marking on mid fuselage state:*

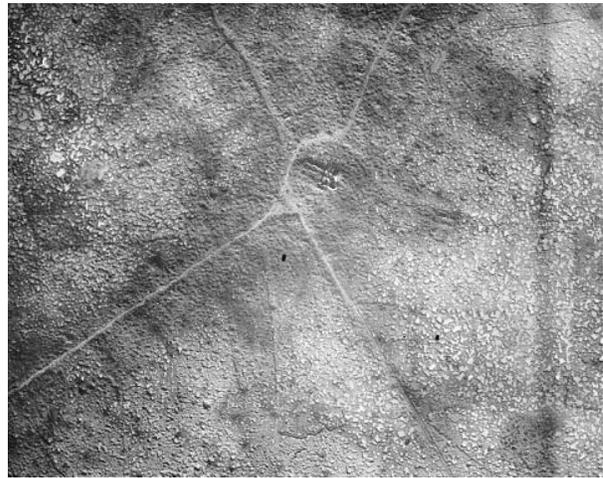
**BY ORDER OF CHIEF OF AIRSERVICE
THIS PLANE IS TO BE USED FOR PHOTOGRAPHIC WORK ONLY.**

Planes such as the DH-4 were used in WW I for photographic reconnaissance. The British aircraft was designed by Geoffrey de Havilland and built in Great Britain by Airco. In the United States, Boeing, Dayton-Wright, Standard Aircraft, and Fisher Body produced the aircraft with the classic Liberty L-12 engine rather than a Rolls-Royce Eagle or other British power plant.

The following photos are before and after pictures of the village of Passchedale, Belgium taken from about 12,000 ft. Between July and November of 1917, during the Battle of Third Ypres artillery barrages and heavy rains reduced the village and its surrounding region to a plain of shell craters and a morass of mud. The battle cost the Allies and Germans a half million casualties, about 5,000 per day or four men per second!



Aerial photographs illustrate the hell of battle.



The quality of the imagery was hampered by the crude lens and shutter systems and the slow film. And a photograph had no value until the data captured could be interpreted. Sgt A.V. Laws, a member of the Royal Engineers and Royal Flying Corps assembled strips of overlapping photographs and used a stereoscopic view to provide a three dimension view, enabling photo-interpreters to determine the geometrical shape and dimensions of objects from vertical photographs.

World War One aircraft and cameras were lash-ups of what was available and what could be improvised. Both the Allies and the Central Powers worked out solutions to the problems that arose and the primitive equipment and methods led to developmental work during the immediate post-war period.

Commercial aerial photography was established as a business and some famous names in aviation, science and technology collaborated on various projects: Sherman Fairchild, George Eastman, and George Goddard to name three of the principal actors.

Fairchild was the son of a founder of a member of the U.S. House of Representatives who was a founder of IBM. While attending college, he developed an interest in photography and invented a synchronized camera shutter and flash unit. Excluded from active military service by poor health, he commenced work on a practical shutter system for aerial photography and a series of prototype cameras which were used by the military. At the age of 28, he inherited millions and became the largest stockholder in IBM.

Fairchild pioneered shutter technology and manufactured cameras which became a standard for the industry. A consummate entrepreneur, he started an aircraft company to build specialized photo ships, a company to manufacture their engines, and operated an aerial survey company using his own planes and cameras. Governmental agencies found that aerial photographs were cheaper than ground mapping and faster to acquire. Business boomed.



Fairchild FC-2, the first of his purpose built photo planes.

Before he died in 1971, Fairchild had formed 70 different companies and held around 30 patents. Fairchild Camera Corp. spun off Fairchild Semiconductor and pioneered silicon transistors and integrated circuits. From 1917 to 1967, a half

century, Fairchild products, from the F-1 camera to the Apollo lunar mapping cameras, were in continuous use by the photographic community.

George Eastman and the company which he founded, Eastman Kodak, contributed roll film and specialized emulsions to the field. The roll film replaced the individual glass plates which were fragile, cumbersome, and slow to use. The improvement in the emulsions on the films allowed for higher operating speeds, better resolution, and easier developing. Films produced covered the entire optical spectrum: infrared, panchromatic black and white, and color, all finding special applications in aerial photography. Business boomed until the advent of digital photography.



Eastman Kodak K-5 Camera circa 1920

George Goddard, a U.S. Army Air Service officer was a unifying influence in the developing field of aerial photography. Remarkably, his military assignments kept him working directly on aerial photography for almost his entire 36 year career. Under Goddard's leadership, the US Army Air Corps, later the US Army Air Force, and finally, the US Air Force, developed many of the aerial photo-mapping and aerial photo-intelligence equipment and methodologies which ultimately led to the amazing successes of satellite borne cameras. He seemed to have his hand in almost all of the key developments or brought in people who could make the breakthroughs needed.



Dr. S. M. Burke and Lt. Goddard in 1925
(Credit: Defense Visual Information Center)

Goddard conducted experiments provide sufficient light to take photographs at night. The first attempts involved using flash powders contained in towed gliders or free fall bombs whose detonations were synchronized with the camera. Cumbersome pyrotechnics gave way to more sophisticated flares and illuminators.



Night Imagery, New York City, 1931
(Credit: Defense Visual Information Center)

Cameras and lenses were not overlooked. The cameras were optimized for the special environment in which they had to operate, the cold upper atmosphere and the vibrating aircraft. Lenses and shutter mechanisms improved. Mechanisms were devised to eliminate the blurring caused by the motion of the aircraft. Lens focal lengths grew, greatly increasing the resolution of detail in the photographs.

Focal length is the distance between the lens and the film plane. Increasing the focal length increases the magnification but decreases

the field of view. Anyone who has manipulated a zoom lens is familiar with this property of lenses. It is also obvious that longer focal lengths add volume, weight, complexity, and expense to the lens. There is no free lunch in physics.

The time taken for processing of film and delivering usable imagery to the customer was shortened. Some aircraft had darkrooms on board, field darkrooms were created, and new chemical processes contributed to the ease and speed of film processing.



An Early Flying Photo Lab

(Credit: Defense Visual Information Center)

A portable photo lab suitable for operations in the field.

(Credit: Defense Visual Information Center)



Finally, industry was marshaled to produce the necessary equipment. The aforementioned Fairchild and Eastman were in regular contact with Goddard whose network of military officers, industrialists, scientists, engineers, and industrialists were consulted, employed, or served voluntarily at the behest of this visionary man.

The 1920s and 30s were difficult times for Goddard and his colleagues. War weariness and the financial exigencies of the Great Depression hampered progress. None the less, fascist aggressions by Italy, Germany, and Japan soon raised the specter of another great war and new initiatives in aerial photography were introduced by the great powers. The next article in this series will examine some of the characters, technology, and photographic reconnaissance missions in World War Two.