

Missions for America

*Semper vigilans!*  
*Semper volans!*



13-15 MAY-CTWG Great Starts  
21-22 MAY-Corporate Learning Course (tentative)  
21-25 JUN-National AEO School  
9-16 JUL-RSC-McGuire AFB  
9-16 JUL-Reg. Cadet Ldrshp School-Concord, NH  
23 JUL-07 AUG-NESA (two sessions)  
08-14 AUG-CTWG Encampment  
13-20 AUG-Reg. Cadet Ldrshp School-McGuire  
17-20 AUG-CAP Nat'l Summer Conference  
22-24 SEP-AOPA Summit-Hartford  
22-23 OCT-CTWG Convention

## The Coastwatcher

Newsletter of the Thames River Composite Squadron  
GON  
Connecticut Wing  
Civil Air Patrol

<http://capct075.web.officelive.com/default.aspx>

S. Rocketto, Editor  
srocketto@aquilasys.com

C/2Lt Flynn, Cub Reporter  
1Lt Scott Owens, Paparazzi

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### SCHEDULE OF COMING EVENTS

#### For Future Planning

Cadet meetings normally start with drill and end with aerospace history, current events, and Commander's moment. Blues are worn on the second week of the month and BDUs at other times. Main topics will be indicated on the schedule below. See website for updates.

22 MAR-Emergency Services  
-Professional Development Program  
29 MAR-Preparation for Tri-State SAREX

01-03 APR-Tri-State SAREX  
07 APR-GON AOA renewals-1000 hours  
16 APR-CSRRA High Power Rifle Clinic

### CADET MEETING NOTES

*15 March, 2011*

*reported by*

*C/2Lt Brendan Flynn*

Cadets met at 1700 hours to practice drill and to review marching movements from last Saturday's drill session. Flanks, to the rear, change step, double time, quick time, close march, and extend march were among the movements reviewed. First Sergeant, C/SSgt Daniels, took an active part in teaching the cadets.

After an hour of drill, cadets returned to the squadron. Capt Wojtcuk reminded them to get their Basic Encampment and Great Start Encampment paperwork in as soon as possible. Cadets who require the paperwork should email her. C/1st Lt Flynn told cadets to get their paperwork in within two weeks as this eases the load on the administrative personnel who process documents.

Capt Wojtcuk went over the senior mentoring program. In the near future, cadets interested in specific aerospace and military subjects may be mentored by a senior member proficient in that topic.

Lt Miller, an aeronautical engineer, taught an aerospace education class which outlined the principles used to design aircraft.

Capt Noniewicz informed cadets about the upcoming tri-state (PA, CT, and NJ) SAREX. The scenario for the SAREX is a response to an earthquake caused tsunami that has struck the eastern U.S. coast. This exercise will be held on April 2nd and 3rd. Cadets interested in attending should email Maj Bourque.

Capt Wojtcuk told cadets that car-parking for the Mitchell Farm concert will take place on September 21.

Cadet Brendan Schultz was promoted to Technical Sergeant, having completed both the Wright Brothers and Eddie Rickenbacker achievements. Cadets Drew Daniels and Kyle Hall both received the Wright Bros. Award and were promoted to Staff Sergeant. Cadet Thomas Ray completed the Hap Arnold achievement was promoted to Airman First Class.

### ***Deep Space Network Upgraded***

The NASA communication system which is used to send commands vehicles in interplanetary space will be upgraded. The world-wide network of stations is operated by the Jet Propulsion Laboratory and has sites in Australia, Spain, and at Fort Irwin, California.

*The 85 foot dish of Deep Space Station 4, Island Lagoon, Woomera, Australia. This was the first DSS established outside of the United States. It was decommissioned in 1972*



## **AEROSPACE CURRENT EVENTS**

### ***Autonomous Aerial Refueling***

Northrop Grumman flew one of its RQ-4 Global Hawk UAVs in company with a manned Scaled Composites Proteus in order to gather data which can be used to establish methodology for the aerial refueling of one UAV by another UAV.

The two aircraft in the experiment flew as close as 40 ft to each other at 45,000 ft in order to study wake turbulence effects, flight control responses, and engine performance. The plan is to accomplish a UAV to UAV refueling twelve months from now.

The next stage in the project is to run a one week endurance flight by the RQ-4 in an attempt to compete with the liquid hydrogen fueled AeroVironment Global Observer and the Boeing Phantom Ray.

### ***Recovery of Douglas Devastator Planned***

Capt. Ed Ellis (USN, retd.), head of aircraft restorations for the National Museum of Naval Aviation, in Pensacola announced that a rare Douglas TBD Devastator torpedo bomber will be recovered from the sea of the coast of California. If successfully recovered and restored, this will be the only Devastator in the world.



*(photo credit; National Archives)*

*COMMENTS ON THE DEVASTATOR AND ITS  
ROLE AT MIDWAY*

The Devastator, added to the fleet in 1937, was already obsolescent by the time of the Pearl Harbor attack but still in naval service. The necessity for a long, slow straight-in run for a successful torpedo attack was extraordinarily dangerous and they were cursed with a defective torpedo design.

But the Devastator and her crews played a significant and tragic role at the Battle of Midway. Torpedo Squadron Eight (VT-8) was one of the first units committed to the attack on the Japanese fleet approaching Midway. Fifteen Devastators, under the command of Lt. Cmdr. John C. Waldron launched from the *USS Hornet*.

Two principles of military tactics are concentration of force and mass of force. Fundamentally, they promote the use of the largest amount of firepower in the shortest possible time. The result is not linear but exponential. Doubling an attack force and halving the time of the strike might increase the effect of the attack by four to eight times. At a minimum, this means that concentration and mass, when properly applied, can make a strike force consisting of six squadrons of torpedo bombers and dive bombers equal to one of 24 squadrons.

However, as Carl von Clausewitz noted in his seminal text on strategy and tactics, *Vom Kriege (On War)*, that the lack of detailed intelligence, the ambiguity of the intelligence obtained, and the chaos of the battle space create what is metaphorically called the "fog of war." This condition can cause indecision or erroneous decisions. This is what happened at Midway.

The rudimentary command, control, and communications which existed at that time prevented a coordinated attack from the fighter, dive bomber, and torpedo bomber squadrons from the three US carriers. Torpedo Eight arrived first and they had no fighter cover. Some three dozen Japanese Zeros pounced on the slow, low flying

torpedo bombers and within minutes all fifteen had been shot down, scoring no torpedo hits. Only one man of the thirty crewmen survived.

The VT-8 attack was followed, within the next hour or so by similar attacks by Devastators from the *USS Enterprise* and the *USS Yorktown*. The torpedo bombers were slaughtered and no hits were scored on the Japanese ships. About 44 Devastators attacked and 90 percent of them were shot down.

But the Japanese air cover had been drawn down to the wave tops and with their fuel and ammunition nearly exhausted, they returned to their carriers for replenishment. Not only was their air cover out of position but the maneuvering Japanese fleet was delayed in preparing their strike against the US fleet and was frantically refueling a rearming aircraft on deck.

It was then that the Douglas SBD Dauntless dive bombers from the US carriers arrived. The Japanese carriers were caught in a most vulnerable position with little air cover and their decks covered by aircraft being refueled and rearmed. Within six minutes, three Japanese carriers were so badly damaged that they were eventually scuttled. The loss of a fourth carrier on the next day brought an end to the Japanese assault on Midway and was a turning point in the Pacific theatre of operations.

Clausewitz also commented on the role of chance in war. He noted that there is a "friction" in war which lowers performances, causes delays, makes plans go awry, and often leads to results unforeseen by the planners. At Midway, chance favored the US attack.

The uncoordinated attacks by the Devastators and the suicidal courage of the crews in pressing home their torpedo runs opened a window of opportunity for the dive bombers that destroyed the Japanese carriers. Ironically, the death ride of the Devastators at Midway was a crucial contribution to the United States victory at Midway.

### *Messenger, Meet Mercury!*

NASA's Lunar and Planetary Laboratory in Pasadena has announced that the Messenger Spacecraft will enter orbit around Mercury on Thursday, the 17th. The spacecraft will study the surface of Mercury in order to determine how the extreme climate affects weathering of surface features. Data obtained will assist in interpreting the information which has been received from other rocky space objects.

22 MAR, 1915-The US Navy adopts the term "naval aviator" to replace "naval air pilot." The term 'pilot' was reserved for its traditional maritime usage, the helmsman and/or navigator of a ship. Plato often used the image of the "pilot" as an example of a skilled technician. In Greek, the word is *kubernētēs* from which the word 'cybernetics' was coined by polymath Norbert Weiner. Cybernetics is the theoretical study of command and control in complex systems.

23 MAR, 2001-Space station *Mir*, after 15 years in space, is de-orbited and falls to earth.

### AEROSPACE HISTORY

20 MAR, 1956-First flight of the North American AJ-2P Savage.



*The Savage was a composite powered aircraft with two piston engines and one turbojet.*

24 MAR, 1977-First flight of the Lockheed YC-141B, the stretched Starlifter equipped with in-flight refueling gear.



*C-141B, named the Garden State Airlifter at McGuire AFB, NJ.*

21 MAR, 1946-The USAF establishes the Strategic Air Command, the Tactical Air Command and the Air Defense Command.



*Starlifter Flight Engineer Panel*

*Starlifter  
Navigator's  
Station*



25 MAR, 1958-First flight of the Canadair CF-105 Arrow, piloted by Janusz Zurkowski.



*Model at Canadian Air and Space Museum,  
Downsview-A promising design killed by a  
political decision.*

26 MAR, 1992-Cosmonaut Serge Krikalov, who departed from the Soviet Union, returns to the Commonwealth of Independent States having spent 313 days aboard Space Station Mir during which time, the Soviet Union dissolved. Krikalov has spent more time in space than any other man and is now the chief of the Yuri Gagarin Cosmonaut Training Center

27 MAR, 1975-First flight of DeHavilland of Canada DHC-7.



*PanAm Express Dash 7 Rotates*

28 MAR, 1971-Pioneer in aerial photography and aircraft production, Sherman Fairchild goes West.

29 MAR, 1927-The Aeronautics Board of the Department of Commerce issues Aircraft Type Certificate Number One to the Buhl C-3A Airster.

30 MAR, 1931-Boeing delivers the first 247 to United Airlines.



*United's 247D, the first modern airliner, flown by Roscoe Turner and Clyde Pangborn to third place in the MacRobertson Race, England to Australia. The winner was a DH-88 racer specifically designed for the race. In second place was a Douglas DC-2 flown by legendary KLM pilots Koene Parmentier and J.J. Moll.*

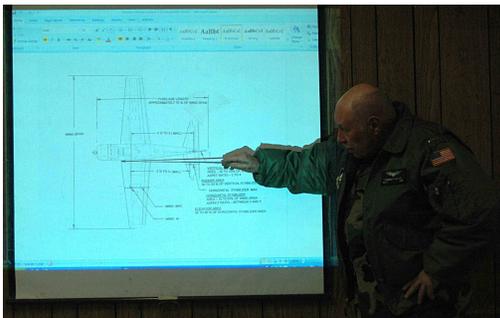
31 MAR, 1911-Congress makes its first appropriation for Army aeronautics, \$125,000 for fiscal year 1912.

### LT MILLER AND AIRCRAFT DESIGN PRINCIPLES

1Lt Edward Miller, an aeronautical engineer now retired from Sikorsky has been presenting a series of lectures on the principles which are used to design aircraft.

The lectures cover both the aerodynamic theory and the structural considerations which must be taken into account in aircraft design.

The first portion of his lectures concerns the fundamentals of airfoils and definitions of terms such as 'mean aerodynamic chord. He details the ratios of areas of wing to stabilizers to control surfaces which are generally used to provide stability.



*Miller Explains Wing Design on A-1 Skyraider*

Design is a series of compromises to optimize the final product and must consider a wide range of demands for performance, cost, ease of production, maintainability, and aesthetics.

A notable example of design compromise was the configuration of the Curtiss SB2C Helldiver. The length of the aircraft was fixed by the size of the elevators on the aircraft carriers. Consequently, it had to have a short fuselage which resulted in the necessity of designed a large vertical stabilizer in order to provide the necessary lateral stability.



*The Helldiver Exhibits is Stubby Fuselage and Oversized Vertical Stabilizer.*

Miller also discusses the range of center of gravity motion allowed under both "free stick" and "fixed stick" conditions. A point which he repeatedly makes is that the conditions of flight are constantly changing and that engineers must create designs

which are controllable under all conceivable modes of flight.

Other compromises which engineers make are discussed. The beautiful elliptical wing-tips of the British Spitfire improved performance but were expensive and slow to manufacture. Consequently, they are rarely seen on most aircraft.



*Spitfire at Hendon flashes it elliptical wing-tips.*

He points out that unforeseen conditions might occur which create hazards. A specific example was the deep stall situation which developed in the testing of the British Aircraft Corporations BAC 1-11. Pilot Michael Lithgow and his crew were killed when, during stall tests at high angles of attack, the wing blanked out the airflow over the T-tail, destroying elevator effectiveness and preventing recovery.



*T-Tailed rear engined BAC One-Eleven*

The second part of the lectures consists of a discussion of design loads on wings and fuselage, the problem of material fatigue, and the danger of aerodynamic effects such as "flutter."

The g-loadings which aircraft are subject to from either turbulence, hard landings, or radical maneuvering are explained. Aircraft are designed with specified load limits and safety factors but these are ideal values of new aircraft and might be

compromised by factors such as age or the type of operation to which the aircraft is subjected. For example, Grumman's A-6 Intruder was designed to operate at high speed on the deck and was subjected to high g-loadings which aged it far faster than a high flying, slower aircraft.



*USMC A-6E at Miramar  
The Grumman Iron Works builds them tough.*

Fatigue failures are illustrated by the well-known story of the DeHavilland Comet, the first relatively successful jet airliner. The pressurized fuselage of the Comet would expand and contract with each flight. Stress fractures formed at the corners of the square windows and two of the aircraft were lost. A redesign of the window shape fixed the problem.

An Aloha Airlines Boeing 737 lost part of its fuselage in flight and one flight attendant was lost but the aircraft landed safely. Aloha operates its fleet on very short runs in the salt air atmosphere of the Hawaiian Islands. Corrosion and the many pressurization cycles to which the aircraft had undergone were found to be the cause of the failure.



*Aloha Airlines Fuselage Failure  
(Associated Press Photo)*

Examples of aircraft losses due to versions of flutter are also presented. Flutter is caused when part of the structure vibrates and then feeds the energy to another part of the structure. Under

certain conditions, a resonance is established and the energy feeds back and forth, increasing the amplitude of motion and eventually destroying the structure. In 1940, the brand new Tacoma Narrows Suspension Bridge in Washington was destroyed in this way. Consider how one "pumps" energy into a child's swing to increase its amplitude. The loss of several Lockheed Orions and a prototype Gloster Javelin were presented as examples. Miller then explains some of the techniques which are used to prevent this phenomenon.



*Sociedad Aeronáutica de Medellín Electra  
Two, one from Braniff and one from Northwest,  
disintegrated in flight due to flutter problems. An  
engine would "whirl" in its mount and feed its  
energy to the wing which would feed it back to the  
engine. The resulting resonance led to loss of the  
wing.*



*Javelin at Hendon  
Gloster's chief test pilot Squadron Leader W.A.  
"Bill" Waterton was testing a prototype when  
flutter caused the loss of both elevators. Waterton  
managed to get the aircraft back on the ground  
using trim!*

Much of the lecture was based upon work that Miller has done in designing a low wing, two place, retractable gear, experimental aircraft.

The lecture concluded with a question and answer session