



Missions for
America
Semper vigilans!
Semper volans!

The Coastwatcher

Publication of the Thames River Composite
Squadron
Connecticut Wing
Civil Air Patrol
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24 January 2018

27 JAN-Cadet PT Testing 0900
30 JAN-TRCS Meeting-Seniors will not meet.
3-4 FEB-Unit Commanders Course Course
06 FEB-TRCS Meeting
10 FEB-CTWG TRANEX
12-16 FEB-ICS 300/400 Course-Mystic
13 FEB-TRCS Meeting
20 FEB-TRCS Meeting
24 FEB-CTWG TRAEX
27 FEB-TRCS Meeting
10-11 MAR-Squadron Leadership Course
17 MAR-Geophysics Lecture
07 APR-CTWG TRAEX
17 APR-MIT/Hartford Club-Geophysics topic
28-29 APR-Corporate Leadership Course

CADET MEETING

24 January, 2018

The leadership activity was conducted by SM Diaz. The issue was bullying.

Maj Bourque led a UDF training session.

Lt Col Rocketto presented an aerospace education lesson explaining the apparent positions of the rising and noon day sun during the course of a year.

SENIOR MEETING

24 January, 2018

Maj Farley briefed the senior members about the salient points discussed at the pilots meeting.

The changing requirement for satisfactory completion of an ice patrol mission was discussed.

TRAINING

*Saturday UDF Exercise
20 January, 2018*

The Squadron launched a full scale UDF (Urban Direction Finding) TRANEX. Lt Schmidt hid the emergency locator simulator, which was located, in a shed surprising the trainees who expected it to be in plain view.

Maj Roy Bourque led the exercise and C/SMSGT Benjamin Ramsey supervised the radio room.

The other participants were SM Thornell and Cadets R. Thornell, C. Munzer, J. Race, D. Martin, and D. Ramsey.

23 January, 2018

Maj Farley trained observer candidates Lt Trotochaud and SM Diaz.

23 January, 2018

Maj Bourque ran a night-time UDF training exercise attended by Cadets Martin, Guilliams, and Diaz.

MISSIONS

*Orientation Flights
14 January, 2018*

Capt. Richard Kornutik brought the Gippsland GA-8 in from Sikorsky-Bridgeport and flew TRCS cadets on two orientation flights.



Cadet Lussier received her first front seat ride and Cadet Kirkpatrick also received a ride in the right seat. The follow cadets each got at least one backseat ride: Martin, Diaz, Race, Thornell, and Lussier and Kirkpatrick.

The GA-8 Airvan can carry up to eight and is powered by a 300 hp Lycoming engine. It is manufactured in Australia.

Later that afternoon, Lt Arturo Salazar flew a Cessna 182 in from Hartford-Brainard and Cadet Simmons got his first orientation ride.

*Ice Patrol
21 January, 2018*

Maj Noniewicz, Lt Schmidt, and Lt Col Rocketto flew the eastern route on Sunday. Heavy

icing was photographed on portions of the Connecticut River.



Ice back-up up river from the Route 82 bridge at East Haadam.

The combination of good weather, heavy publicity, and an unusual natural phenomenon brought out the air tourists. At times there seemed to be more gawkers above the river than ice on the river.



This picture of the G1000 multi function display screen in the aircraft shows six other aircraft within five miles of the our aircraft, one charlie pop! The diamonds indicate the nearby aircraft and the number above or below the diamond indicates their altitudes relative to one charlie pop in hundreds of feet.

PILOTS MEETING
20 January, 2018

Maj Farley and Lt Pineau attended the Pilot Meeting at Meriden-Markham Airport.

The agenda consisted of four topics; First, the requirements of CAPR 70-1 were reviewed. CAPR 70-1 governs aspects of CAP flight operations.

The new flight release protocols were reviewed.

The choices of which of four communication channels top use, State-Wide 1 and 2, Air 1, and Ground 1, was explicated.

A review of recent missions during the current ice conditions on Connecticut waterways was conducted.

AEROSPACE HISTORY

Engines on the Tips of Wings Part III

This is the final section of an article which discusses engines mounted on the tips of rotors or wings. Part One considered rotors with ramjets. Part two looked at fixed wing aircraft which had power plants mounted on the wing tips. Part III looks at two varieties of wing tip engines: swiveling nacelles and tilt wing designs.

Fixed wing and powered lift (tilt wings) aircraft have been constructed with power plants mounted at the tips of their wings. This has some dubious advantages. The wing can be aerodynamically cleaner and would be more room in the fuselage for fuel and equipment. However, the longer fuel lines and electrical wiring adds weight and the larger bending moment on the wing calls for more structural material which adds even more weight.

However, these disadvantages pale considerably compared to the adverse yaw which occurs if one engine fails.

Swiveling Nacelles on Fixed Wings

The German aircraft industry experimented with wing tip engine mountings in the 1960s. Bolkow,

Heinkel, and Messerschmitt formed a consortium named *Entwicklungsring Sud* (EWR). The plan was to produce a Mach 7 vertical takeoff and landing (VTOL) interceptor which was named the EWR VJ101



Six Rolls-Royce turbojets provided the power: two units within the fuselage were mounted vertically to provide direct lift. The other four were paired in swiveling wing tip nacelles. The aircraft were constantly modified and provided important engineering and aerodynamic data until their loss or retirement.

Back in the '50s, Bell proposed a Mach 2 VTOL aircraft using tip mounted engines. The D-188A, sometimes referred to as the AF-109, mounted two turbojets on each wingtip. The nacelles swiveled much as those on the Osprey. The design contained four more fuselage mounted engines: two for forward thrust and two for vertical thrust. The design reached the mock-up stage but the Air Force cancelled the project for undetermined reasons



The mock-up carried Navy colors? (Photo Credit: Bell)

Tilt Wings

The Philadelphia area was a hot bed for rotor craft development, home to Piasecki and Kellett. The Delaware Transcendental Aircraft Company started a tilt wing design, the Model 1G, in 1945 and it first flew in 1954.

Model 1



A 160 HP Lycoming engine contained in the fuselage drove wing tip rotors via a shaft and gearbox arrangement. Some 100 flights were made before the prototype crashed.

In 1956, the Air Force granted Transcendental additional funding and the Model 2 was built. However the Bell XV-3 showed greater promise and Air Force interest in the Model 2 wained. Transcendental was starved for funds and was sold to Republic Aircraft.



Model 2

Bell's design, the XV-3, was also tilt rotor. A fuselage mounted engine supplied drove wingtip propellers via drive shafts enclosed in the wings.



The wings could rotate 90 degrees so that vertical takeoffs were possible. Once aloft, the wings rotated and provided horizontal thrust. The experiments were successful and led to the development of the 1970s XV-15 and the 21st century V-22 Osprey.

The 1977 XV-15 was another tilt rotor which showed promise. Rather than mount the power plants in the fuselage, Bell moved them to the wing tips. Previous designs suffered from the mechanical and weight penalties resulting from the drive shafts and gear boxed needed to get power from the engine to the rotors.



The first of two XV-15 aircraft crashed but the second one served as a NASA test vehicle and led to the maturity of tilt rotor technology. Both the Bell-Augusta-Westland 609 and the Bell Boeing V-22 Osprey which is now serving with the USAF and the USMC.

It took about 60 years for a commercially successful aircraft with wing tip mounted engines top reach production, the V-22 Osprey. The Bell-Boing Osprey was first adopted by the USMC as the MV-22 and is primarily used to insert or extract troops and to carry cargo. The USAF Special Operations Command operate the CV-22 for special missions and search and rescue duties. The USN has contracted for the CVM-22 which will be used as a carrier-on board deliver (COD) aircraft and for cross deck operations shifting cargo to and from ships without flight decks. Their first deliveries are scheduled for 2020.



V-22 Prototype at the American Helicopter Museum

Not to be outdone, the US Army wants to join the tilt wing club. Bell is currently ground testing the CV-280 Valor for the Army and the first flight is expected next month. The Valor is constructed from composite materials which reduces weight which will translate to a larger cargo capacity or longer range.



The Valor design speed is 280 knots, hence the name. A big difference between the Valor and the Osprey is that the Valor rotates the propellers, not the entire engine-prop combination. In case of an engine failure a shaft and gear box arrangement allows power from a single engine to run both rotors.

Finally Augusta-Westland bought the 609 design from Bell and will manufacture it as the AW609. Augusta Westland is developing the aircraft for civil use, especially the off-shore oil servicing industry. The aircraft will be pressurized which will make it suitable as an executive aircraft.



Leonardo, the parent organization of Augusta-Westland touts the 609 as suitable for military, search and rescue, and law enforcement duties. However, Bell and Augusta Westland agreed that the 609 would not be armed so that precludes many military and quasi-military missions.

The holy grail of the VTOL concept has been to develop an aircraft with the capabilities of a helicopter and the speed of a fixed wing aircraft.

So, at the present time, three different tilt wing aircraft with tip mounted engines approaches this goal, the Osprey, 609, and Valor.

The tilt wing designs such as that of the Osprey eliminates the primary problem which restricts high speeds in helicopters. The forward moving overhead rotor experiences rapid and sharp changes in speed as it rotates. The advancing blade receives lift both from its rotational speed and the forward speed of the aircraft. Its speed is the rotational speed of the aircraft plus its forward speed. The retreating blade produces less lift since its speed through the air is the rotational speed of the blade less the forward speed of the aircraft.

Since lift is directly proportional to the square of the speed, the side of the aircraft with the advancing blade develops considerably more lift than the side with the retreating blade. The lift is equalized by a mechanism at the hub which increases the angle of attack of the retreating blade and decreases the angle of attack of the advancing blade.

The rotors limit the forward speed of the aircraft since as horizontal speed increases, so does the speed of the advancing rotor tip. As it approaches the speed of sound, radical aerodynamic forces occur. But when the rotors are tilted downward to produce horizontal thrust, the forward speed of the aircraft is no longer a factor.

However, the propellers are still limited in their angular speed, the longer the prop, the lower the limit. One way to beat the problem is to shorten the blades and add more of them to maintain the thrust. But the speed of any of these craft will never match that of a pure jet.

One final aircraft bears mentioning. NASA is flying a ten engine unmanned aircraft with ten engines, two of which are tip mounted. Called the GL-10 Greased Lightning, the motors are electrical, powered by lithium-ion batteries. Plans are to replace two of the electric engines with diesels whose excess energy will be used to charge the batteries.



A 50% scale prototype of the GL-10

One plan is to shut down all of the inboard engines during horizontal flight, saving battery energy and increasing range.

AEROSPACE CHRONOLOGY

25 JAN, 1983-Saab doesn't just build cars. The company was founded in 1947 as *Svenska Aeroplan Aktiebolaget* (Swedish Aircraft Corporation). The 25th marks the date of the first flight of the Swedish designed SAAB-Fairchild 340, a regional airliner.



26 JAN, 1953-Chance-Vought produces the last F4U Corsair after a 13 year production run. The aircraft was designated F4U-7 and produced for the French navy.



27 JAN, 2002 – Boeing's 737, the world's most widely used twin jet, becomes the first jetliner in history to amass more than 100 million flying hours. The 737 was launched onto the market in 1965 and to this date just under 10,000 have been built.

NASA 512 is the first 737 build and was used for testing before NASA acquired it in 1968 and modified it for a number of experimental programs.



512 in flight over NASA's Wallops Island Flight Facility.

The original 727s before fuselage extensions and turbofans, were known as "Fat Alberts." The aircraft is now on display at the Museum of Flight near Seattle.



One of the New Generation, a 932-ER.

In 1982, Cessna delivered its 1000th business jet, a Citation CJ2.



The CJ2 is part of the Cessna 525 family.

28 JAN, 1919 – Franciszek Gabryszewski, better known as Gabby Gabreski was born. Gabreski was the top U.S. fighter ace in Europe in World War II flying P-47s. During the Korean War, he achieved ace status again, becoming one of only seven U.S. pilots to become aces in two wars.



28 January 1971 - Commander Donald H. Lilienthal, USN flew a P-3C Orion to a world speed record for heavyweight turboprops. Over a specified course, he reached 501 miles per hour.



Cdr. Lilienthal and co-pilot Lt. Cdr. Stoodley with their P-3C. (Credit: JAX AIR NEWS-LATWINGER)

29 JAN, 1973-Frontier Airlines hires Emily Howell Warner who in 1976 becomes the first woman to command a passenger airliner. When Frontier went out of business, she flew 737s and DC-8s for UPS and ended her aviation career with the FAA.



(Photo Credit: National Air and Space Museum Archives)

30 JAN, 1948-Orville Wright goes West.



Orville, on left with Maj John Curry and Charles Lindbergh. At that time, Curry was Chief, Air Service Engineering Division, McCook Field, Ohio. The photograph was taken on 22 June, 1924. Curry went on to be the first commander of the Civil Air Patrol.

31 JAN, 2011 – Death of Charles Huron Kaman, American aeronautical engineer, businessman, inventor and philanthropist, known for his work in rotary-wing flight and also in musical instrument design.

OKaman left Sikorsky in 1945 and, in 1947 produced the K-125 using intermeshing rotors and a servo-flap control which he invented. In 1951, his K-225 became the first helicopter to be powered by a gas turbine engine.



A passionate guitarist, Kaman developed an acoustic guitar using aerospace composite materials and founded the Ovation Guitar Company.



Later, he and his wife Rhoda established the Fidelco Guide Dog Foundation and developed a breed of German Shepherd to act as guide dogs for the blind.

MONITORS CHIME IN!

Former TRCS member Tom Petry, now living in Arizona spotted that the Coast Guard aircraft labeled a Beech T-6A Texan II is actually a

Beech T-34 Mentor. CAP once flew the Mentor and Petry has been so charmed by the Model 35 Bonanza variant that he includes its name as part of his e-mail address.



Mentor in CAP Livery

The T-6 Texan II is a license built variant of Switzerland's Pilatus PC-9.



Texan II towed in at NAS Pensacola where Ensign Flynn is undergoing his initial flight training.

Lt Col Stidsen, CTWG Librarian and honcho at the New England Air Museum's Ramsey Library commented on the F-102 Delta Dagger/F-106 Delta Dart discussed in the notes on Whitcomb's Area Rule.

According to *Convair Advanced Designs II* there was no XF-102, the design designation going straight from the drawing board as the MX1554 to a Service test batch of ten as the YF-102. The straight barrel fuselage of the original XF-92 limited the maximum speed to Mach 0.98. So, an initial redesign included a seven foot

lengthening of the fuselage, revised wing and fin locations, a revised canopy, and modifying the cylindrical fuselage by adding acorn bulges at the aft end.

The new designation was YF-102A but the modifications did not solve the drag problem which would not allow supersonic flight. So a second redesign of the fuselage incorporated the "wasp waist" demanded by the area rule. An additional four feet were added to the length of the fuselage.

The revised & revised YF-102A (now called the "Hot Rod" by the Design Team), with the final production configuration flew on June 24,1955, and demonstrated Mach 1.22 at 53,000 feet.



An F-102 flown by Connecticut's Flying Yankee Air Guard out of Bradley between 1966 and 1971.

The F-106A was a redesign of the 102 and was originally designated F-102B. She was the last USAF aircraft built as a pure interceptor. The redesign and more powerful engine resulted in a maximum speed of Mach 2.3, roughly double that of the F-102A

Cornfield Bomber



F-106A-The Cornfield Bomber

On a cold day in February, 1970, Captain Gary Faust ejected after the aircraft entered a flat spin. The change in balance brought about by the ejection stabilized the aircraft and it landed itself!

Note the top photo. The aircraft was perfectly level, skidding through the field but headed for a stone wall. Disaster loomed. But the F-106 skidded to the right and passed through a gap in the wall! The bottom photo shows it after coming to rest with only minor damage. The engine was still running.



(Photo Credits: 49th/Fighter Association) and: USAF)



From time to time, the aircraft would lurch forward on the slick surface and the rescue party was reluctant to approach the plane to shut down the engine. It took an one hour and forty five minutes for the engine to run out of fuel.

This is not the first time that this has happened and both incidents involve delta wing aircraft.

In November of 1963, Captain Ran Ronen, an Israeli fighter pilot, was flying a Dassault Mirage IIIC, Shahack 53, back from a reconnaissance mission when his engine packed up and it became a glider.

Survival of a dead-stick gear up landings were problematic due to a tendency for this type of aircraft to break apart at the cockpit. Ronen cleared a village and ejected at 500 feet landing safely.

The aircraft glided to a relatively smooth landing with very little damage. Shahack 53 went back to the shop, was repaired, and returned to flight status.



Shahack 53 guarded by a soldier. A Sikorsky S-55 or S-58 is visible in the background.

Investigation revealed that faulty seals in the fuel injectors caused the flame-out. The French has been plagued by a number of Mirage losses caused by engine flame-outs but investigation of the wreckage yielded no clues as to the cause

The Israelis notified the French, the French fixed the problem and in gratitude gave the Israeli Air Force a new engine.

Ronen flew over 350 combat missions and was credited with seven kills. He retired as a brigadier general.

