



Missions for America

Semper vigilans!

Semper volans!

NSEP Mission

Lt Adam Spreccace and Maj Scott Farley flew National Security Emergency Preparedness mission over the week-end. They flew from Groton to Danbury and return, exchanging pilot in command and observer duties. Photographs were taken of important bridges and Connecticut Yankee's Haddam Neck Nuclear Waste Site.

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There are 43 casks on a three foot thick concrete pad. Each cask is made from a 3.5 inch steel liner surrounded by 21 inches of reinforced concrete. A full cask weighs 1256 tons.

While at DXR, Spreccace took a photo of what looks like a familiar Piper J-3 Cub but is the only example of a Capone-Rocco Cuby Model-B.

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SQUADRON CALENDAR

Virtual Meetings and Independent Projects to be Scheduled

12 MAY-TRCS Commander's Call

16 MAY-Commander's Cup Rocket Contest

23 MAY-TRCS Meeting

30 MAY-TRCS Meeting



(Credit: Lt Spreccace)

THAMES RIVER COMPOSITE SQUADRON ACTIVITIES

Maj Farley has requested that TRCS members who have ideas about a continuation of squadron training activities contact him.

The mission also practiced communications link-ups with three of CTWG's Charter Oak stations.

Maj Roy Bourque, Squadron Emergency Services Officer, trained SM Daniel Docker for his Ground Team qualification.

Maj Bourque, ever eager for a challenge, spent time determining the source of the constant drain on our squadron vehicle's battery. Unless started every two or three days, the vehicle cannot be started.



He successfully traced the amperage drain to a fuse which, unfortunately, is necessary to drive the vehicle so the 15 minute run-ups will continue.

Lt Jennifer Thornell, Deputy Commander of Cadets broadcast an e-mail suggesting certain physical training exercises.

Lt Col Rocketto is working on a self-instruction module which will assist cadets in learning how to read and take useful notes from the Aerospace Education Modules.

CURRENT EVENTS

Chinese Launch

China launched three new military satellites into orbit on a Long March 2C rocket today today. The rocket was launched from Xichang Satellite Launch Center in Sichuan Province.



The satellites are Yaogan-30 Group 6 surveillance satellites capable of “electromagnetic environment detection and related technological tests.”

What Goes Up Sometimes Comes Down

China successfully launched a Long March 3B on March 9th which carried a navigation satellite into a geosynchronous orbit.

But one of the boosters landed downrange outside of the planned impact area. No one was injured.



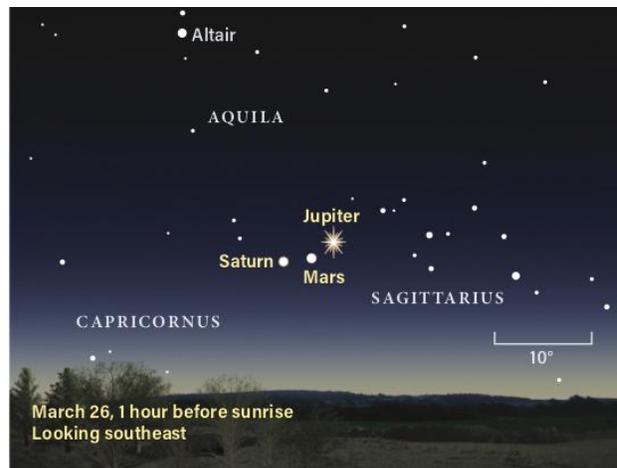
Giant Lawn Dart (Credits: CCN)

Splendor in the Sky

Spring has sprung! Take a look to the west before sunrise and you will see Mars and Jupiter in close proximity. A pair of 7X binoculars may reveal the some of the four largest moons of Jupiter. Look for tiny dots aligned around the equator of the planet.

On the 24, the moon reaches apogee, its furthest point from Earth in its orbit.

On the 26th, Mars can be seen between Jupiter and Saturn. Look to the southeast an hour before sunrise.



(Credit: Astronomy/Roen Kelly)

AVIATION HISTORY

Dissimilar Air Combat Training Birthed by the Vietnam Experience

The basic requirement driving Dissimilar Air Combat Training (DACT) is the need for realism, to pit your own aircraft against aircraft which mimic the size and performance of the enemy's. In doing so, fighter pilots learn about the relative strengths and weaknesses of both their own aircraft and a potential enemy and can capitalize on that knowledge to achieve victory or avoid defeat.

DACT is one part of the education of U.S. fighter pilots. Traditionally, pilots within the same aircraft community would engage in practice dogfights with other pilots flying the same type of aircraft. So USAF F-4 Phantom and USN pilots developed their skills in aerial maneuvering by mixing it up with fellow pilots also flying the Phantom. But this did not prepare them for the war in Indochina.

The Vietnam experience brought about a radical change in how fighter pilots would be trained. The record of aerial combat in Vietnam was not like that of World War II and Korea where U.S. forces managed to amass disproportionate kill/loss ratios over the enemy. In Korea, the USAF was flying F-86 Sabres against the MiG-15 Fagots and the kill/loss ratio was about 10:1. In southeast Asia, after a good start, the North Vietnamese Air Force developed new tactics and the kill ratio approached parity.



Former Foes Kiss and Make-Up

Most of the fault lay in U.S. training. The Air Force and Navy were committed to a style of warfare in which the gun was considered obsolete and missiles fired beyond visual range (BVR) would be the primary fighter weapon. But in the furballs over Vietnam, BVR was not possible due to the danger of a blue-on-blue casualty so the fight was reduced to the use of short range missiles and guns. And the Phantom had until the F-4E came along in June of 1967, no guns and relatively ineffective missiles.

Furthermore, in Vietnam, the expected superiority of the large and powerful Phantom was pitted against what were believed inferior Soviet designed MiG-17 Frescos and later, the MiG-21 Fishbeds. The MiGs were smaller and less powerful than the Phantoms but were harder to see and more agile. The subsonic MiG-17 could turn on a 1 ruble coin and leave 90 kopeks change.

1966-the United States commenced *Operation Rolling Thunder*, the bombing of North Vietnam. The North Vietnamese strategy was a two-fold plan, "air deniability." The primary leg of the plan was to build an anti-aircraft defense consisting of a wide variety of low level and high level anti-aircraft artillery and missiles and an early warning system. The secondary leg of the plan was utilization of their small force of fighters, about 100 MiG-17s and later MiG-21s using tactics involving ambushes, ground controlled hit-and-run attacks, a kind of aerial guerrilla warfare. Rarely could the American flyers engage the wily Vietnamese and when they did so, the more nimble MiGs could not be called to account. The previous failure to envision a different kind of air battle and an arrogant attitude about a less sophisticated opponent became costly in aircraft and body count. U.S. air to air losses increased to an alarming extent.

The U.S. fighter community reacted. Tactics were changed. The powerful Phantom would decline a horizontal turning fight with a Fagot or Fishbed but would maneuver in the vertical use its now more refined missiles to attack or its superior acceleration and speed to exercise a discrete exit.

The U.S. air-to-air kill ratio improved slightly. But the lessons learned were not immediately instituted in a formal training program.

The ultimate in DACT is to obtain a model of one of the enemy's aircraft. In World War II, a Mitsubishi A6M Zero had crashed-landed in the Aleutians and it was salvaged and flown to determine its strengths and weaknesses.

In Korea, an award of 100,000 dollars was awarded to No Kum Sok when he defected and brought a MiG-15 over. It was taken to Okinawa and flown by various pilots, including Chuck Yeager, to assess its strong and weak points.



No Kum Sok's MiG-15, now in the Air Force Museum

In 1966, the Israelis had a problem. Their basic equipment was French made Dassault Mirages and a U.S. and French arms embargo blocked upgrading to more modern aircraft. And the Soviet Union had been supplying the MiG-21 to Egypt, Syria, and Iraq.

The Mossad, Israel's external intelligence agency had determined that a disaffected Iraqi MiG-21 pilot, Capt. Munir Radfa would be willing to defect and after arranging for the safety of his family, and in August of 1966, he flew a MiG-21 to Israel.



Radfa's MiG-21, now in the Israeli Air Force Museum and assigned a James Bond bort number

Dani Shapira, Israel's top test pilot evaluated the aircraft and the Israeli Air Force was able to develop tactics for dogfighting the MiG-21. Selected Israeli pilots also flew their Mirages against the Fishbed and over the following years of combat, sketchy information indicates that the Mirage to Fishbed kill ratio was an extraordinary 20/1!

One night, the disassembled Fishbed was loaded onto a C-5 and flown to Groom Lake, better known by its airspace designator, Area 51. U.S. military and civilian intelligence agencies joined together in *Have Doughnut*, a intensive effort to milk as much information about the flight and technical characteristics of the aircraft as possible.



007 now a YF-110B USAF Livery (Credit USAF)

Another windfall. A short time later, two Syrian MiG-17 Fresco drivers had a navigation mixup and thinking they were over Lebanon, landed on an Israeli airfield. Once again, after wringing out the aircraft by their own evaluators, the Israelis sent the Frescos to Groom Lake

Now under the project names of *Have Drill* and *Have Ferry*, pilots and engineers flew and studied the other Soviet aircraft which the Vietnamese were using so effectively. They were flown against a wide range of U.S. aircraft from the Navy's A-4 Skyhawk to the Air Force B-66.



Have Drill and Have Ferry as YF-113s (Credits: Defense Intelligence Agency)



The aircraft were compared not only for commonly accepted standards of performance such as speed but combinations of speed and altitude were studied. The evaluators determined the best tactics which each of them might employ when meeting the MiGs. Strengths and weaknesses became apparent and the U.S. combat pilots were made aware of them.

Nevada. The Air Force trains their DACT instructors as part of the USAF Weapons School, Nellis AFB, Nevada.



**TAC Evaluation
Performance Comparison**

AREA OF COMPARISON	F-4	F-105	F-100	F-5
TURN				
0.9 Mach/450 KIAS, MAX	Comparable	Superior	Superior	Superior
0.9 Mach/450 KIAS, MIL	Comparable	Comparable	Comparable	Superior
350 KIAS, MAX	Inferior	Inferior	Inferior	Comparable
350 KIAS, MIL	Inferior	Inferior	Inferior	Comparable
ROLL				
450 KIAS	Superior	Superior	Superior	Far Superior
350 KIAS	Superior	Superior	Superior	Superior
SPEEDBRAKE DECELERATION				
Constant Power	Inferior	Inferior	Inferior	Inferior
Idle Power	Inferior	Inferior	Inferior	Inferior

Note that the comparisons are made at specific speeds and altitudes. Dogfights tend to descend and slow as the aircraft lose energy

The Navy was first off the block in building an organization to teach ACM. Their DACT instruction courses TOPGUN, was started at Miramar Naval Air Station in California. The program became part of popular culture after the movie, *Top Gun*, was released in 1986. Paramount Films, never to miss a money-making opportunity and the Navy, knowing a recruitment pitch when it sees one, will release a sequel, *Top Gun: Maverick* this summer.

*Vote
Who is the prettiest: Kelly,
Tom of the Tomcat?*



The graduates of both schools return to their squadrons and impart the skills which they have learned to their squadron mates and teach them how to exploit the specific flight characteristics of both their and adversary aircraft.

In the 6th century BCE, the Taoist philosopher and military strategist Sun Tzu suggested precisely this: “Do not engage an enemy more powerful than you. And if it is unavoidable and you do have to engage, then make sure you engage it on your terms, not on your enemy's terms.”

As the aircraft of potential adversaries improved, the aircraft used to simulate them had to change. The F-16 and the F-5 are now players and civilian “contract air forces” are flying Mirages, Czech L-159s, and the Israeli Kfir in mock combat with Air Force, Navy, and Marine aviators.

Aggressor Squadron Markings



F-16

F-5N



F-21 Kfir

Today, the arcane skills of DACT instructors are developed at the USN Strike Fighter Tactics Instructor (SFTI) program at Naval Air Station,

The program has expanded so that two week exercises which mix aircraft from fighters to bombers to cargo aircraft are held. Red Flag, one of the better known events, not only pits dissimilar aircraft against each other but add simulated anti-aircraft and radar units to the mix. The U.S. Army encapsulates what is meant by DACT as “Fight as your train! Train as you fight!”



Black Widows, Mustangs, and Gooney Birds Rest in the Shadow of Suribachi

THE WEEK'S AEROSPACE ANNIVERSARIES

Mar. 25, 1979 – QANTAS retires its last Boeing 707 and becomes the world's first airline with a its entire fleet composed of Boeing 747s.



Mar. 26, 1945 – U. S. Army Air Forces P-61 Black Widow night fighters based on Iwo Jima shot down at least two Betty bombers in what were the last air attacks on the island.



The P-61A, “Midnight Madness” taxis in on Iwo's Airfield No.1.

The island is declared secured but Japanese hold-outs continue to resist, the last surrendering in 1949, four years after Japan had surrendered!

Mar. 27 , 1944 – Convoy JW58 departs Scotland bound for the Soviet Union. The convoy is guarded by at least 17 destroyers, a light cruiser, two escort carriers.



Escort Carrier HMS Alacrity, light cruiser HMS Diadam and destroyer HMS Westcott are some of Convoy JW58's escorts.

(Credits: Imperial War

Museum)



The aircraft are credited with sinking or assisting in the sinking of two German submarines and shooting down six German aircraft. Two U-boats are sunk by the surface ships. Only one merchantman of the fifty is sunk. The voyage and its use of effective escorts is the beginning of the end of U-boat threats in the Battle for the Atlantic.

The Focke-Wulf 200 Condor was used to shadow convoys and radio information to the U-Boats. Several were shot down by Grumman Martlet (Wildcats).





A Fleet Air Arm Avenger machine gunning U-288 which was later sunk.

Mar. 28 1957 – First flight of the Canadier CP-107 Argus. Canadair adapts the wings, tail, and landing gear of the Bristol Britannia airliner to develop an effective maritime patrol and anti-submarine aircraft. The Britannia's Bristol Proteus turboprops are exchanged for Wright R-3350 turbo compound engines which allow increased range at low altitudes.



Argus at the National Air Force Museum of Canada

Mar. 29, 2001 - The first flight of the X-32B Joint Strike Fighter. The X-32 is in direct competition with the Lockheed-Martin X-35 for a 200 billion dollar contract. The Lockheed-Martin X-35 was declared winner and developed into the F-35 Lightning II.



Loser and Winner at the Navy's PAX River Museum.



The concept of a do-it-all aircraft suitable to more than one service has proven to be risky, witness the failure of the General Dynamics F-111 to satisfactorily meet the Navy's standards. A “Jack-of-All Trades” may be versatile but lacking in the special qualities it needs to be a “Master of One.” The F-35 design has been a compromise to satisfy the requirements of the USAF, USN, and USMC.

Not surprisingly, late deliveries and very much over-budget has plagued the program. The day of a North American P-51 Mustang or Lockheed P-80 Shooting Star both of which needed about six months from design start to first flight are over.

Mar. 30, 1982 – Mar 22, 1982 – Unusual rain floods Rogers Dry Lake at Edwards Air Force Base and space shuttle Columbia, STS-3, is diverted to a landing on Northrup Strip, White Sands, New Mexico.



STS-3, accompanied by two T-38 chase planes landing at Northrup Strip (Credits: NASA)

The field was originally used in World War II by Northrop Aviation to test target drones but the name was misspelled in a press release. Confusion followed and the name stuck. NASA improved it and the facility, named White Sands Space Harbor, consisted of two 35,000 foot runways which are 900 feet wide.

Shuttle pilots in training used it to practice flying a modified the Grumman Gulfstream II Shuttle Training Aircraft (STA). Each of the four STAs have cockpits designed to simulate both shuttle controls and seating.



STA Cockpit

The Shuttle Trainee sits on the left which is set up like a Shuttle panel. Note the control stick

To mimic a shuttle descent, the main gear is lowered and the engines thrust are reversed. The approach also mimics an actual shuttle approach using both electronic and visual guidance. When the pilot's eyes are 32 feet above the runway, as they would be in a landing shuttle, the instructor pilot in the right seat takes over and executes a go-around.



Mar 31, 1995 – First flight of the only Grob Strato 2C. Grob was chosen by the German Aerospace Center to develop the aircraft to carry out high-altitude research. One its last flight before retirement, it set a world altitude for manned piston-engined aircraft of 60,897 feet.



(Credit: Wolfgang Kleuser)

The aircraft had three engines. Two supercharged Continental IO-550s , 400 HP each, and a P&W PW 127 gas generator for cabin pressurization.