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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MIDSUMMER NIGHT FROLIC

submitted by
2d Lt Susan Poe

Thames River Composite Squadron held its annual midsummer picnic on Tuesday. The evening was organized by Lt Susan Poe and Joel Trost served as Grill Meister. Much of the food was brought by the membership in the best traditions of "pot luck." After eating, games fill most of the Cadet schedule. A brief parents' meeting was held to review the past year's events, discuss upcoming activities, and explain how parents can assist the Squadron.

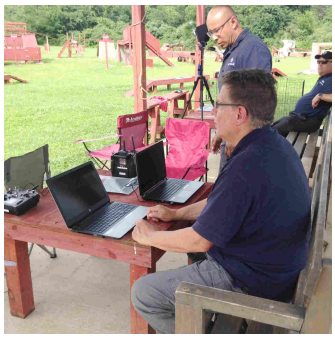
LT MEERS BACK FROM ATTERBURY'S UNMANNED AERIAL VEHICLE TRAINING

1st Lt David Meers has returned from the National Emergency Services Academy at Camp Atterbury, Indiana where he spent two days in an intensive course learning to fly an experimental hexcopter which CAP is testing.

Connecticut was one of several states selected by CAP to participate in the pilot project to, of course, train pilots. The camera equipped remote piloted vehicle (RPV) is intended to assist ground teams in the search efforts.

Meers and Jay Lavoie from Meriden were selected by Lt Col Stephen Rocketto, the project manager. Training began several weeks ago using an on-line simulator and a small training RPV. The Camp Atterbury time was spent studying potentials of the hexcopter and learning to fly it. Upon return, they will serve as instructors for selected members of the CTWG.

Lavoie Illustrates the Size of the RSPV



Meers at the Control Station
Photo Credit: Meers and Lavoie)

July 2016

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2 LISP
3 LISP	July 4th LISP	5 NO Meeting	6	7	8	9
10	11	12 CC CALL	13	14 RCLS	15 RCLS	16 RCLS
17	18	19 SUI Draft Due	20	21	22	23
24 OFlight	25	26 SQ Picnic	27	28	29	30 LISP

August 2016

SUN	MON	TUE	WED	THU	FRI	SAT
31 LISP	1	2	3	4	5	6
					Encampment	
7	8	9 No Meeting	10	11	12	13
-----		Encampment Camp Niantic		-----		
14	15	16 CC CALL	17	18	19 Aviation Day	20 OFlight Tranex
21	22	23	24	25	26	27 LISP
28 LISP	29	30 No Meeting	31			

September 2016

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13 CC CALL	14	15	16 SUI	17 OFlight
18	19	20	21	22	23	24 LISP
25 LISP	26	27	28	29	30	CI -OCT Nov 3 - Elks

October 2016

SUN	MON	TUE	WED	THU	FRI	SAT
1/2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18 CC CALL	19	20	21	22
23	24	25	26	27	28	29
30	31					

Excellence

Date	Senior	Cadets
5	Conference Call- Staff 1900	Conference Call, as arranged
12	Commanders Call	Drill, Safety, CD, DDR, Promo (Blue)
13-17	Regional Cadet Leadership School: CT Fire Academy	
19	ES - Air/GT Coord (Meers/Bourque)	Drill, AE/ES- ICUT(3), Ground Team (BDU)
23	OFlight	OFlight
26	SQUADRON PICNIC POC LT Poe, Potluck, 6-8	
2-4	LISP	

Volunteer Service

Date	Senior	Cadets
2	Planning: Staff Mtg	PT, cadet staff meeting (PT), Flight Time
5-11	Encampment, no meeting 9th, try to attend	
16	Commander's Call / Prom / ES: AP	Drill, CD, AE, Safety, Promo (Blues)
19	Aviation Day, POC Kinch, Schmidt, Cadet H Ramsey, parking detail	
23	SUI due, review CC	Drill, guest spk, DDR, Flight (BDU)
30	No formal mtg	No Mtg, Cadet staff Conf Call

Respect

Date	Senior	Cadets
3		
6	Planning-Staff/ SUI Upload complete	Leadership, Testing, Admin (civies)
10		
13	Commanders Call	Drill, Insp, Sfty, CD, Lead, Promo (Blues)
16	SUI, POC Farley (date20?)	
17		OFlight
20		
24		
27		

Excellence

Date	Senior	Cadets
11		
18		
25		

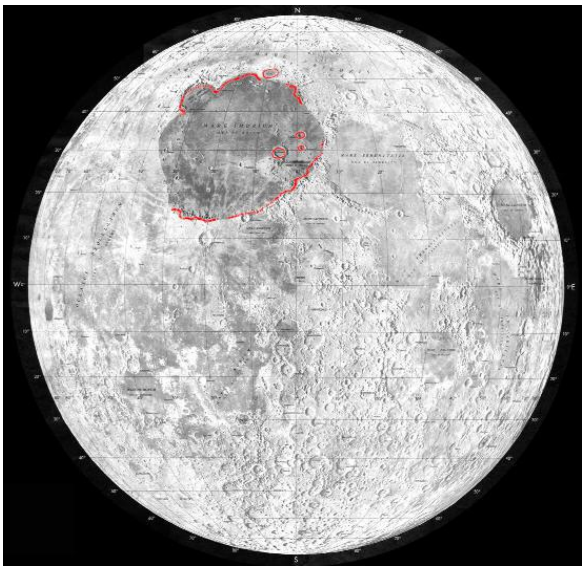
Conference: 712-432-0075; 900387

Other	Ground	Tranex	O-Flight	Meeting	Wing	National

This schedule is not a replacement for good communications.

CURRENT EVENTS

NASA scientists have estimated that the lunar impact site known as the Imbrium Basin may have been caused by an object ten times more massive than originally calculated.



The Imbium Basin Outlined in Red.
(Credit: srbauer)

NASA's Ames Research Center has been using a device called the Vertical Range Gun to study impacts at extreme velocities. The device is a 14 foot long cannon that can fire projectiles at speeds of up to 16,000 mph. The scientist use high speed cameras, impact on targets, and analysis of the patterns on the moon to conclude that the Imbrium Basin, 775 miles in diameter, was formed by the crash of a proto-planet 150 miles in diameter and ten times more massive than the previous estimates. Computer modeling suggest that the furrows in the southeast quadrant of the basin indicate that the impactor approached from the northwest.

The new findings indicate that many of the other impact sites observed on the moon and planets may have been caused by more massive objects that previously believed. Most of these sites occurred during a period of time knows as the Late Heavy Bombardment, some four billion years ago.

AEROSPACE HISTORY

Firebombing: An Ambiguous Verb!

Prologue

Ironically, the verb "firebombing" has two meanings which are antonyms. Firebombing can refer to an aerial raid intended to burn enemy structures. It might also refer to the practice of dropping water and fire retardants to control and put fires out.

In a typical fire bomb attack by the military, incendiaries are combined with high explosives. The explosives splinter structures and make them more vulnerable to the incendiaries which set them alight. Some of the earliest examples are the Nazi attack on Guernica during the Spanish Civil War and their World War II campaigns against London, the "Blitz." The Royal Air Force responded accordingly, operation Gomorrah. In July of 1943, Hamburg was attacked. A lack of firefighting resources and the intensity of the raid led to a firestorm. In about a hour, four and a half million pounds of bombs rained down on the city. The enormous fire created a low pressure area and winds up to hurricane force not only spread the flames but fanned the also. Temperatures in the center of the storm reached 1,500 degrees Fahrenheit. Estimated deaths totaled 43,000.

The most well-known firebombing raids conducted by the United States Army Air Force were directed agains Japanese cities. The B-29s, a strategic bomber designed for high altitude "pinpoint" bombing was found lacking. From 25,000 feet, the east flowing jet stream not only disrupted the path of the falling bombs but under certain circumstances, reduced the speed of the bombers to unacceptable levels. General Curtis LeMay, in command of the XXI Bomber Command new tactics using incendiaries to set alight the wooden structures prevalent in Japan's cities. He eliminated much of the defensive armament of the planes which were not needed for the night raids. This allowed the aircraft to carry a

heavier payload. LeMay then sent them in at low altitudes, under 10,000 feet. The planes carried combinations of incendiaries, napalm, white phosphorous, and thermite bombs.

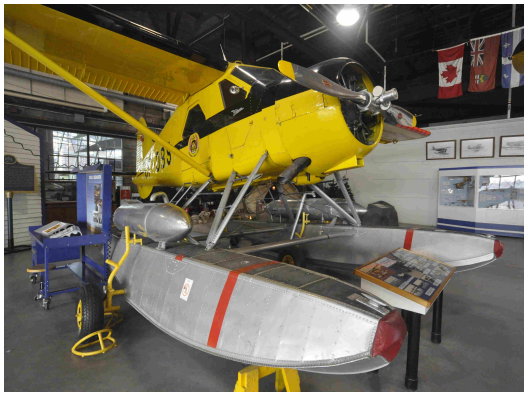
In March of 1945, he launch "Operation Meetinghouse," probably the most destructive air raid in World War II. This one attack, three million pounds of bomb, resulted in 100,000 deaths and the destruction of 250,000 structures. The immediate deaths at Hiroshima and Nagasaki were estimated to be in the same range! But the firebombing was a continuous campaign. One estimate is that 230,000 more deaths can be attributed to firebombing.

The Early Days

Fairchild KR-34

In Canada in 1921, a ranger and his fire fighting equipment was delivered to the site of a fire and managed to extinguish it, the first known incident of an aircraft used to fight a fire. But the aircraft was just a transport, not a water bomber. The earliest water bombing ting can be traced back to the State of Washington, attempt, in 1930, to put out fires by dropping water filled wooded kegs. The aircraft employed could not carry enough payload to make a difference. During the late '30s and early '40s, a Fairchild KR-34 was used experimentally by Carl Crossley to drop water bags and use a 45 gallon drum placed in the front seat of the Fairchild. Three to five gallon water bags were also used and a conveyor system was installed in a Norduyn Norseman. In 1945, Crossley extinguished a small fire at Elk Lake, Canada. A DeHavilland of Canada (DNC) Beaver was employed in 1950 and had some success. However, slow response time, poor accuracy, and limited coverage ended these early attempts

Five years later, Tom Cooke of the Ontario Provincial Fire Service (OPAS) developed tanks which could be fitted on the top of floats and filled while the seaplane was in motion. Water delivery was much improved and within five more years the OPAS fitted the tanks to all of its 25 Beavers and eight DHC Otters.



Beaver with Float Mounted Roll-Over Tanks

The Era of Development

Canada, rich in lakes, specialized in float aircraft. In the United States, with fewer lakes, land-based aircraft predominated. The vast number of cheap surplus aircraft left over from World War II now entered service. The aircraft ranged from the single engine Grumman TBM Avengers large four engine bombers such as the Boeing B-17 and the Consolidated PB4Y Privateer.

A CL-215 flanked by two B-17s.

Hawkins & Powers Privateer at their Greybull Base

The gap in between was filled by a host of twin engined aircraft such as the North American B-25 Mitchell, and the Douglas A-26 Invader. Aircraft which did not see active service due to their late development were also added to the fire-fighting fleet, one example being the Grumman F7F TigerCat. Transport aircraft which were modified included the giant Martin JRM Mars the Douglas DC-7, and the jet augmented Fairchild C-119 Packet.

Mars at Its Sproat Lake Base

Last of the Line of Piston Powered Douglas Transports-A DC-7B Sporting an External Tank

A jet equipped Packet Awaits Maintenance

By the 1970s, newer aircraft were converted to fire-bombers. Seven Grumman S2F Tracker was adopted by he Canadians and modified with in-fuselage tanks. DHC developed a new aircraft specifically for the fire fighting missions, the Canadair CL-215.

A Flight Line of CALFIRE Trackers
(Credit:CALFIRE)

Tactics were improving. In general, drops are not made directly on a fire but along the edges or ahead of it to stop its spread. A lead plane, the air attack plane, is often called a "bird dog" is used to carry the supervisor to determine critical aspects of the fire and sometimes, lead the air tanker to the correct site. Lead planes range from the piston powered Cessna 337 Skymaster to the turbo prop North American OV-10 Bronco to the jet Cessna Citation.

Part of the CALFIRE Bronco Fleet
(Credit CALFIRE)

Water is used but it is not as effective as dedicated chemical mixtures. The drops are inaccurate, too diffuse, and the water evaporates quickly. The new chemicals contain thickeners which improve the characteristics of the water and enhancers which increase the ability of the water to "stick" to surfaces. Past practice used borate salts but they rendered the soil sterile and were toxic to wildlife. Now, ammonium sulfate and ammonium polyphosphate are commonly used and actually fertilize the soil. The red color marks the drop site to provide guidance to subsequent drops. The chemicals must be loaded on the ground. Aircraft which pick up water directly while "on the fly" sometimes carry tanks of guar gum to "thicken" the water which improves accuracy.

The most modern aircraft include modified Lockheed Electras, the Douglas DC-10, and even a Boeing 747.

A DC-10 Passes it King Air Bird Dog.
(*Credit: 10 Tanker Corporation)*

The Lockheed C-130 Hercules is sometimes called up from Air National Guard and Air Force Reserve units. When this is done, the "Herc" is equipped with a Modular Airborne Fire Fighting System or MAFFS. The palletized MAFFS unit contains tanks of retardant and pressurized air tanks which propel the retardant through two nozzles mounted on the rear cargo ramp. The newest systems discharges the retardants through the paratroop door, a change which improves the aerodynamics of the aircraft.

North Carolina Air National Guard C-130 on Duty

Helicopters such as Sikorsky's S-61 Sea King and the Boeing CH-46 Chinook are also part of the battery of airborne fire fighters.

One of Coulson's S-61s Fills it Belly Tank at Sproat Lake, British Columbia.

The twin engine jet Beriev Be-200 is a Russian contribution and the Japanese ShinMaywa US-2, a four engine turbo prop amphibian has seen limited service. Even single engine aircraft may be found on the fire line, notably the PT-6 powered Ayers Thrush and Grumman S-T2.

Two Thrushes Await the Call at Custer State Park. South Dakota.

Older aircraft are still utilized. The piston powered Lockheed P2V Neptune modified with the addition of two jet engines are used by at least two U.S. operators.

Neptune Depositing its Suppressant Payload
(Credit: Jeremy Ulloa)

In the United States, the U.S. Forest Service (USFS) and the Bureau of Land Management contract private corporations to fight the fires such as Aero Union, Neptune, and Erickson Aero. Canadian corporations, some of which fly in the United States include Coulson and Conair.

The State of California has its own "air force." The California Department of Forestry and Fire Protection, CAL FIRE, owns a fleet of over 50 aircraft: Trackers, Broncos, King Airs, and Super Hueys at 13 different bases. The pilots and maintenance personnel are contracted employees and a number of aircraft are "on-call" and available through private companies. Other nations maintain water bomber aircraft, some as national assets. In France, the *Direction de la Défense de la Sécurité Civile* flies the Bombardier 415, the Grumman Turbo Cat, and the Bombardier Dash-8. In Israel, the Air Force has established Unit 249 and equipped them with Air Tractors AT-802F.

In the United States alone, the USFS spends almost 300 million dollars a year to finance the service. Around 50,000 dollars/day is need as a retainer fee for the private companies. Aircraft on call may run over $10,000/day. When one counts ground crews and equipment the bill for suppressing wildfires works out to about 1.2 billion dollars. But the economic losses can be counted in the many billions and include property damage, insurance payments, labor market and transportation disruption and losses in the tourist trade.

Epilogue

Some of the other aircraft used in aerial fire fighting are worth viewing.

The Douglas MD-87

A Sikorsky S-70 Firehawk Visiting Groton. These Florida based aircrews joust with death and survive. Are they here to try their luck at the casinos?

This Italian based Bombardier 415, on the step, in the act of scooping up water.
(Credit: Horticultural marxist)