

NGA Reference Chronology

Office of the Historian

Office of Corporate Communications, National Geospatial-Intelligence Agency

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18th Century

1775, 19 Apr

With the conclusion of the French and Indian War, or Seven Years War, in 1763, anti-crown sentiment grew in British North America. Antagonism reached its peak on 19 April 1775, with Paul Revere's legendary ride and the subsequent fighting between Minutemen and British regulars at Lexington and Concord, Massachusetts.

1775, 16 Jun

George Washington was appointed General and Commander-in-Chief of the Continental Army by the Continental Congress meeting in Philadelphia. America had an army before it had a constitution.

1775, 17 Jun

British regulars won a pyrrhic victory on Bunker Hill, Charlestown, Boston.

1776, 4 Jul

Proclamation by American patriots of the Declaration of Independence

1777, 27 Jul

Scotland-born Robert Erskine was appointed Geographer and Surveyor General to the Continental Army at the request of General George Washington. Working in teams, his surveyors completed over 200 maps and surveys of the war's northern theater for General Washington and the Army.

1777

British forces under General Burgoyne attacked south from Canada in an attempt to cut off and isolate New England from New York. The British were defeated at Saratoga, north of Albany, New York. The American victory at Saratoga was of singular importance, as it convinced France and Spain to ally with the Americans against Britain.

1777

The Articles of Confederation were approved. Washington wintered over at Valley Forge, Pennsylvania.

1781, 1 Mar

The Articles of Confederation became law.

1783, 3 Sep

The American Revolution formally concluded with the Treaty of Paris.

1788

US Constitution became the fundamental law of the United States and replaced the Articles of Confederation.

1789

George Washington, the first President of the United States of America, was sworn into office.

1791

The Bill of Rights was ratified.

1794, 26 Jun

Observations from the French reconnaissance balloon *Entreprenant* proved decisive at the Battle of Fleurus in the Netherlands. *Entreprenant* was under the control of the Aerostatic Corps. It remained aloft for ten hours; this permitted the French to position their ground forces effectively to defeat the Austro-Dutch armies. This was the first battle in history in which aerial reconnaissance contributed significantly to the victory.

19th Century

1802

Nathaniel Bowditch, a mathematician-astronomer from Salem, Massachusetts, published *The New American Practical Navigator*, which corrected 8,000 errors in the tables of heretofore standard English language work on navigation.

1802, 16 Mar

Legislation signed by President Thomas Jefferson directed the Army Corps of Engineers to build the US Military Academy at West Point, New York.

1802, 4 Jul

The US Military Academy opened at West Point, New York.

1803, 18 Jan

President Thomas Jefferson requested funding for an expedition to establish trading houses with the Indian tribes west of the Mississippi River in what was then the French territory known as Louisiana.

1803, 30 Apr

After secret negotiations with France, the US purchased the Louisiana Territory. The government revealed the “Louisiana Purchase” on 4 July.

1804, 14 May

Meriwether Lewis, William Clark, and the “Corps of Discovery” began their journey from St. Louis, Missouri through the Louisiana Territory to the Pacific. The exploration lasted two-and-a-half years (1804–1806), during which its personnel gathered intelligence on the European powers in the area, established diplomatic and trade relations with the indigenous tribes, discovered species of animals and plants unknown in Europe, and mapped vast expanses of the territory.

1806–1807

Army First Lieutenant Zebulon Pike was ordered to form a unit of explorers to define the west/southwest interior of the newly-acquired Louisiana Territory, as well as its borderlands. Pike's company departed from St. Louis at Fort Belle Fontaine.

1812

The War of 1812 began between the US and Great Britain.

1813, 3 Mar

As part of the War Department's mobilization for the War of 1812, the US Congress authorized the Topographical Engineers to conduct surveys to facilitate the safe movement of troops.

1815

US troops, under command of future president General Andrew Jackson, defeated British forces at New Orleans; this action essentially ended the War of 1812.

1817, 4 Jul

Construction began on the Erie Canal, designed to link Albany on the Hudson River with Buffalo on Lake Erie. At Albany and the Hudson, agricultural exports from the American Midwest moved down the Hudson to New York City, the open sea, and onward to European markets.

1818, 1 Aug

The Topographic Bureau, established within the Army Engineer Department under the command of topographical engineer Major Isaac Roberdeau, initially exercised only custodial responsibilities—maintaining books, maps, and scientific equipment—but eventually assumed responsibility for civil works activities.

1823

The Monroe Doctrine proclaimed that the Americas were off limits to foreign powers and were under the aegis of the United States.

1825, Oct

The Erie Canal was completed from Albany to Buffalo. "Clinton's Ditch," named after canal champion and New York State Governor DeWitt Clinton, was the first major east-west water route in the US.

1830, 6 Dec

The Department of the Navy established the Depot of Charts and Instruments to maintain the Navy's stock of nautical charts and navigational instruments. By 1835, it had begun chart production, and in 1838, began to conduct astronomical observations and original hydrographic research.

1832

The New England Anti-Slavery Society was established. The state government of South Carolina proclaimed the Nullification Act.

1838

Trail of Tears: Cherokees were driven into the West by the federal government.

1838, 5 Jul

Congress established the Corps of Topographical Engineers with responsibility for all civil engineering works, leaving military engineering to the US Army Corps of Engineers.

1838, 7 Jul

John J. Abert, long an advocate for the creation of a distinct topographical engineer unit, took command of the Corps of Topographical Engineers upon promotion to lieutenant colonel. He held the position until his retirement in 1861. Known as the "Topogs," the organization was made up of Army Engineer Department officers. During the Civil War, the Topogs rejoined the Army Engineers.

1838–1848

Junior Army officer John Fremont was assigned to the Topographical Engineers; over the next decade he led expeditions from present-day New Mexico to California and the Pacific Northwest. He excelled as a topographer and conducted a trans-continental railroad survey on

the 38th parallel. Fremont worked closely with frontiersman Kit Carson. Known as the Great Pathfinder, Fremont published topographical and botanical findings from his expeditions. He and Carson scouted the Oregon Trail, the Great Basin, Lake Tahoe, and Mt. St. Helens. His work was critical to the Gold Rush '49ers and members of the Latter Day Saints in their great trek to the West. Fremont was also one of the foremost supporters of Manifest Destiny.

1840

French physicist and astronomer François Arago used photography to calculate elevations and other surface features, an early manifestation of a discipline that became known as photogrammetry.

1842, 1 Jul

USN Lieutenant Matthew F. Maury, a pioneer in the development of oceanography, became head of the Depot of Charts and Instruments of the United States Navy (USN) Department. Two years later he became the first Superintendent of the Naval Observatory.

1842, 31 Aug

The Depot of Charts and Instruments became part of the Bureau of Ordnance and Hydrography (BuO&H).

1846

US declared war on Mexico as a result of unresolved Texas issues and sectional pressure to extend slavery westward.

1847

The Navy's Matthew F. Maury published *Wind and Current Chart of the North Atlantic*, a compilation of thousands of marine observations recorded in ships' logs from around the world. It was the first in a series of compilations of nautical charts that revolutionized sailing through more efficient plotting of courses.

1850–1900

During this period, military balloons were used for the aerial bombing of military targets, aerial reconnaissance by tethered or captive balloons, and the transport of personnel, equipment, mail, and communications.

1852

A rail line across Pennsylvania, from Philadelphia to Pittsburgh, was completed.

1853, 8 Jul

USN Commodore Matthew C. Perry, commissioned the previous November by President Millard Fillmore to seek a treaty with Japan, arrived in Edo (Tokyo) Bay with six ships armed with weaponry technologically superior to Japanese equipment. Perry demanded a treaty rather than negotiating one. He departed on 16 July after asserting that he would return in the spring expecting a favorable reply.

1854, 14 Mar

After Commodore Perry's return in February, Japan signed the Treaty of Kanagawa, opening Japanese ports to US trading ships.

1854, 12 Dec

The Secretary of the Navy re-designated the Bureau of Charts and Instruments as the US Naval Observatory and Hydrographic Office.

1855

USN officer Matthew F. Maury published *Physical Geography of the Sea*, generally recognized as the first textbook in the new science of oceanography.

1858

French journalist, caricaturist, photographer, novelist, painter, and balloonist Félix Nadar took the first aerial photographs from a tethered balloon. Félix Nadar was the pseudonym of Gaspard-Félix Tournachon.

1859

Aimé Laussedat, a colonel in French Army, became the first person to use terrestrial photography for composing maps by applying François Arago's mathematical techniques to surveying.

1859

Abolitionist militant John Brown raided the US Arsenal at Harper's Ferry, Virginia with the intention of seizing materiel to arm slaves and raise a rebellion in Virginia. The raiders were defeated by Army Colonel Robert E. Lee, commanding Marines from the Washington Navy Yard. Brown was executed.

1860, 13 Oct

Photographers Samuel A. King and James W. Black, operating from the balloon *Queen of the Air*, took the first aerial photo made in the United States from a height of 1,200 feet over Boston's North End, facing east toward Boston Harbor. This inaugurated the combination of technologies that created modern aerial intelligence.

1860, Nov–Dec

Illinois Republican attorney and former US Congressman Abraham Lincoln was elected President of the United States. South Carolina seceded from the federal union.

1861

Lincoln took office in March. In April, Fort Sumter in Charleston, South Carolina was attacked by South Carolina militia. The Civil War was underway.

1861, 17 Jun

Thaddeus S.C. Lowe reported his aerial observations via telegraph in a demonstration for President Abraham Lincoln, introducing the use of observation balloons during early Civil War campaigns in Northern Virginia and the Peninsular Campaign around Williamsburg, Virginia in 1862.

1863, 3 Mar

The US Congress abolished the Topographical Bureau and the Corps of Topographical Engineers within the Army and transferred their functions back to the US Army Corps of Engineers.

1865, Apr

In April, Grant's forces captured Richmond. Grant pursued Lee. Terms were offered and Grant accepted the surrender of General Robert E. Lee's Army of Northern Virginia at Appomattox Courthouse, Virginia, ending the Civil War in Virginia. Lee rejected counsel to fight on as insurgents.

1865, 14 Apr

President Abraham Lincoln was assassinated in Washington. Vice President Andrew Johnson of Tennessee succeeded Lincoln.

1865, Apr–Dec

Sporadic Confederate Army resistance continued on the ground through June. The last Confederate Navy warship, the steam cruiser and commerce raider CSS *Shenandoah*, struck her colors in Liverpool, England in November 1865. In the US, the Freedmen's Bureau was established to assist former slaves, and the 13th Amendment passed into law, abolishing slavery in the US.

1866, 21 Jun

The Bureau of Navigation separated the Hydrographic Office (HO) from the Naval Observatory. The HO assumed the responsibility of preparing and publishing maps, charts, and nautical books required for safe navigation. The Naval Observatory continued to care for the US Navy's chronometers, charts, and other navigational equipment and to conduct astronomical observations.

1867

Secretary of State William Seward closed the sale of Alaska from Russia to the United States.

1869

The Navy's Bureau of Navigation issued the first Notice to Mariners. Printed weekly, it included warnings to guarantee safe navigation as well as updates to navigational charts and other publications. The transcontinental railroad was completed. The first labor union prototype was founded by Terrence Powderly of the Knights of Labor.

1870–1871

During the Franco-Prussian War, balloons played a high-profile role, especially when Prussian forces besieged the French capital. French aeronauts, Félix Nadar in particular, suggested the use of balloons to postal officials in order to communicate with unoccupied France. The first balloon ascended with 227 pounds of mail. More mail and people followed. Balloonists dropped visiting cards on Prussian troops. At the war's conclusion, sixty-six balloons were launched and fifty-eight landed safely. Two million pieces of mail, 102 humans, and five dogs were delivered. In 1874, the government of France established a commission of aerial communications. In turn, a military aeronautical establishment followed in 1877, and continues to exist.

1879

In 1879, training with balloons by the British Army's Royal Engineers (RE) began in England. Earlier, in 1878, a balloon school had been established by RE. Technology also improved in areas such as hydrogen gas storage and gas-tight valves. During the Second Boer War, four balloon sections served with the ground forces from 1899–1902.

1882, 23 Mar

General Order 292 established the Office of Naval Intelligence (ONI) within the Bureau of Navigation. Initially combined with the newly established Naval Library, it collected and recorded intelligence information.

1884

Improved versions of balloons were used by the French military to capture Dien Bien Phu in northwestern Vietnam, near the frontier with Laos.

1884

Germany organized a balloon corps within its army.

1889, 12 Apr

The US Army's Adjutant General, Richard Coulter Drum, established the US Army Military Information Division (MID) to collect and compile information on geography and foreign forces, which it communicated to military attachés.

1890, 4 Sep

Established by presidential order, the US Board of Geographic Names sought to standardize the spelling of geographic names to achieve uniform use in US government publications.

1890, 29 Dec

In the late nineteenth century, the Ghost Dance movement developed among Native Americans in the American Southwest and spread quickly among many tribes west of the Mississippi River. Ghost Dance was a millennial belief system. It offered a degree of hope for the downtrodden and held that the zealous would ascend to the sky, that the whites would be swept back to Europe, and that those in the sky would descend to a pre-European paradise. By 1890, the Lakota in the High Plains had lost their hunting grounds, had witnessed the destruction of the buffalo herds, were forced onto reservations, were instructed to farm, and were fed government-issued rations. Fears among the whites that the Lakota would rise up as a result of Ghost Dance and the urging of some chiefs led to the arrival of elements of the Army's 7th Cavalry. Orders to arrest certain chiefs heightened fears among the Lakota, and one band fled the main encampment. Pursued, the band was trapped in a snow-covered ravine and many were killed at Wounded Knee Creek. The Indian Wars ended, and the American Frontier closed.

1893, 10 Nov

The Secretary of War established the Northern Frontier Section in the MID to collect and maintain the strategic map collection of the War Department.

1893

Austria organized a balloon corps. Russia followed soon thereafter.

1898

Spanish-American War broke out.

1899

Treaty of Paris formally concluded the Spanish-American War. In the Americas, the US acquired direct control of Puerto Rico and indirect control of Cuba, to include a naval station at Guantanamo. In the Pacific, the US took possession of Guam and the Philippine Islands.

20th Century

1900

The new US Territory of Hawaii was established.

1902

The US acquired a French construction company's rights to construct an inter-oceanic canal across the isthmus of the Colombian province of Panama.

1903

In reforms initiated by Secretary of War Elihu Root, the MID became the Second Division within the first General Staff, and was responsible for collecting military information. Ohio's Wright brothers flew a heavier-than-air aircraft for the first time. Revolution took place in the Panamanian Province of Colombia. The revolutionaries were pro-American Panamanian businessmen. The first silent movie, *The Great Train Robbery*, was produced.

1903

The Germans developed a seventy-gram camera that a pigeon could carry. It took thirty-eight-millimeter negatives automatically every thirty seconds.

1904, Dec

President Theodore Roosevelt issued a message to the Congress during the course of his 1904 State of the Union address that eventually became known as the Roosevelt Corollary. It was a corollary to the Monroe Doctrine and stated that the United States reserved the right to intervene, as a last resort, in conflicts between European nations and Latin American nations to enforce the legitimate financial claims of the European nations, rather than have them press their claims directly on impoverished Latin American states.

1904

With the collapse of the French effort to build a canal across Panama, the US stepped into the vacuum. Construction resumed on a trans-isthmian canal across Panama under the aegis of the US.

1907, 1 Aug

US Army's Signal Corps established an Aeronautical Division to take charge of all matters pertaining to military ballooning, air machines, and other kindred subjects. From 1865 to 1907, the Signal Corps took delivery of ten balloons.

1908–1909

Army Signal Corps acquired a small dirigible in 1908, but the airship did not make its first manned ascent until 1909.

1907–1909

Roosevelt sent the USN's Great White Fleet to circumnavigate the world, show the flag, demonstrate US presence, and prove blue water capability as well as the Navy's ability to operate and sustain operations in distant waters. There were sixteen battleships along with escorts. The battleships took their name from their white painted hulls.

1908–1909

In 1908, the US Army expressed continued interest in the airplane. Aircraft testing began at Fort Meyer, Virginia in 1908, and in 1909, the Army purchased one aircraft. On 2 August 1909, the Signal Corps formally accepted "Airplane No. 1" on behalf of the Army.

1909

The National Association for the Advancement of Colored People, usually abbreviated as NAACP, established as an African-American civil rights organization in the United States in February.

1909

USN officer (later Rear Admiral) Robert E. Peary, and explorer, skilled navigator, and African American Mathew A. Henson became the first men to reach the North Pole. Whether the two men actually reached the North Pole or merely came close remains in dispute.

1910

The US Army Engineer School established a Map Printing Plant at Washington Barracks (now Fort McNair, Washington, DC) as a map reproduction unit and lithographic school.

1911–1913

Between 1911–1913, in some parts of the Balkans and in Libya, the Ottoman Empire fought Italy and some of the Balkan nations. In the Balkan Wars and the Italo-Ottoman conflict in Libya, heavier-than-air aircraft were used for visual aerial reconnaissance.

1911, 10 Jan

US Army Major Jimmy Erickson made the first known photograph taken from an airplane in the United States while flying over San Diego, California.

1911, 16 Jan

First known attempt at photo-reconnaissance from a US military aircraft failed when ground troops hid in a wooded area to evade detection by the air crew.

1911

“Airplanes are interesting toys, but of no military value.”
—Ferdinand Foch, Marshall of France.

1911, 11 Apr

The US Army Signal Corps began flight training school at College Park, Maryland. In September the school added aerial photography to the curriculum. The school moved to San Diego, California in 1913.

1911, 1 Nov

In October 1911, Italy invaded Libya, an Ottoman possession in North Africa. Turkish troops and loyal Arab irregulars resisted, and Italian troops held coastal strips ranged by naval gunfire support. The vast interior remained under Ottoman control. On 1 November, Lieutenant Giulio Gavotti of the Royal Italian Army's Air Service flew a reconnaissance mission to the area east of Tripoli. During the mission over the oasis of Ain Zara, Gavotti also threw grenade-like bombs from his aircraft. This marked the first use of bombing by an aircraft in war.

1912

Britain established the Royal Flying Corps or RFC. By 1914, Royal Navy claimed the maritime air mission as the Royal Naval Air Service (RNAS). During 1917–1918, it was evident that the two “aviation wings” should be amalgamated. In 1918, the Royal Air Force was established by absorbing the RFC and the RNAS.

1912, 14 Apr

British Royal Mail Ship (RMS) *TITANTIC*, the largest luxury passenger liner of the time and supposedly “unsinkable,” struck an iceberg on its maiden voyage and sank in the North Atlantic. The sinking influenced the establishment of the International Ice Patrol and a requirement to maintain a twenty-four-hour radio watch on ocean liners, and instituted new lifeboat regulations.

1912, 5 Nov

Army Air called for artillery adjustments for the first time at Fort Riley, Kansas. Signals were made via radiotelegraphy, drop cards, and smoke.

1913, 31 Mar

In a flight across Texas, Army aviators made the first aerial map from an aircraft.

1913, 8 Dec

The 1st Aero Squadron was established, replacing the earlier 1st (Provisional) Aero Squadron. The 1st Aero Squadron was the first military unit of the US Army devoted entirely to aviation. The unit continues to exist in the US Air Force as 1st Reconnaissance Squadron.

1914, 30 Jan

The 1912 sinking of RMS *TITANTIC* prompted countries with shipping interests in the North Atlantic to improve communications at sea. The first Safety of Life at Sea (SOLAS) Convention gathered in London in November 1913. It led to the early 1914 creation of the International Ice Patrol, which located and tracked icebergs in the North Atlantic and issued warnings to ships in the vicinity of icebergs, a service that the National Geospatial-Intelligence Agency now provides.

1914, 28 Jun

In Sarajevo, Bosnia, the assassination by a militant Serb nationalist of Austrian Hapsburg heir Archduke Franz Ferdinand and his spouse, the Duchess Sophie, set in motion the final crisis that led to World War I (or the Great War, as it was then called). In 1914, Sarajevo was part of the Austro-Hungarian Empire.

1913–1916

During this period, Britain's Royal Navy (RN) had sole control over all lighter-than-air craft. At the war's onset in 1914, units of the British Army, known as the British Expeditionary Force (BEF), deployed to France with no balloons, and therefore no aerial observation capability. The RN supplied several balloons while RFC operated airships. Inter-service rivalry developed almost immediately, and by 1916, the War Office ordered balloons for operation by the RFC.

1914–1918

Fred Zinn, an American in France in 1914, enlisted in the French Foreign Legion at the outbreak of the Great War. After two years in the infantry and multiple wounds, he was transferred to aviation in 1916. As a bombardier, he also took reconnaissance photos. One of the reconnaissance aircraft that he flew was the Rumpler Taube, or "invisible airplane." It used translucent wings, which complicated detection. German aviation also used a version of the Rumpler Taube or "dove," of which there were fourteen versions. With the entry of the US into the conflict in 1917, Fred Zinn transferred to the US Army's Air Service.

1914–1918

Thousands of tethered and manned observation balloons followed the trench line of the Western Front from the Atlantic to the Franco-Swiss frontier. Used by both sides, a balloon at 4,500 feet and in good weather permitted observers to "see" for eight miles. As the war progressed, observation balloons or "sausages" were difficult to strike, as tethers were rigged to motorized winches to speed descent.

1914, 18 Jul

The Army's Signal Corps' Aeronautical Division was replaced by Aviation Section as the aviation operators. The Aeronautical Division continued to exist as the Washington office of the Aviation Section. Three hundred-twenty officers and men were authorized.

1914, Aug–Nov

By August, most of Europe was at war. In a secret treaty on 2 August, the Ottoman Empire entered the coalition of the Central Powers led by Germany; on 5 November, Turkey declared war on France, Great Britain, and Russia.

1914–1917

At the outbreak of the Great War in Europe during August 1914, the US Army's 1st Aero Squadron represented the entire tactical air strength of the Army: twelve officers, fifty-four enlisted men, and six aircraft. As the war continued, the neutral United States authorized the creation of twenty-four squadrons; however, 1st Aero Squadron remained the only squadron that was fully equipped and fully organized. In April 1917, the Aviation Section had an inventory of fifty-five aircraft. There were no combat aircraft because Signal Corps continued to stress the air reconnaissance mission.

1914, 15 Aug

The fifty-one-mile long Panama Canal was completed and opened to traffic. As a result, the east moved 8,000 miles closer to the west. Elaborate inaugural celebrations were canceled because of the war. In 2010, fifty ships per day transited the waterway.

1914, Sep

The RFC first employed aerial observation to direct artillery fires. Number 4 Squadron's records detailed the aviator-observer adjustment of artillery fire that destroyed two German artillery batteries.

1915, Feb

RFC established a provisional unit to assess aerial photography. The first RFC aerial cameras were designed and built by London's Thornton-Pickard. The initial design, a tapered box mostly of wood, was awkward, but designs improved quickly.

1915, 10–15 Mar

In March of 1915, the British launched a major offensive against the German position around Neuve Chapelle. It was the first time that aerial photoreconnaissance played a major role on

the Western Front. RFC aerial observers spotted significant German troop movement near Neuve Chapelle, Fauquissant, and Artois. Entire sections of the German trench lines were mapped from the air. When relayed to higher authority, Allied troops moved to block the German advance.

1915, 26 Jul

Eight Curtiss Jenny aircraft from 1st Aero Squadron deployed to and exercised at Fort Sill, Oklahoma in observation and fire control experiments with the Field Artillery School.

1916, 15 Mar

The 1st Aero Squadron, part of the Aviation Section of the US Army's Signal Corps, deployed to the Mexican border (Mexican Punitive Expedition) under General John J. Pershing in the search for Mexican revolutionary leader Pancho Villa. Villa's troops had raided an Arizona border town. Between its initial aerial reconnaissance sortie over Mexico on 16 March and 15 August 1916, the squadron, composed of eleven officers, eighty-four enlisted men, and one civilian mechanic, flew 540 missions over or on the border with Mexico. Because of its Mexican service, 1st Aero Squadron became the US Army's first air combat unit.

1916, 31 Oct

By General Order 58, the War Department redesignated the Map Printing Plant at Washington Barracks (now Fort McNair) in Washington, DC as the Central Map Reproduction Plant, which began operation in 1917 under the direction of Army Captain Charles Ruth. During World War I, the Central Map Reproduction Plant produced nearly nine million maps.

1916

By 1916, aerial reconnaissance photography had assumed three responsibilities: (1) Liaise with the infantry, especially in coordination with artillery in creeping barrages, as precise information was required for the artillery and fratricide was constant, with the danger of artillery rounds falling short on advancing infantry. Aerial observers, therefore, watched the infantry advance (the ground marked through use of large colored panels), and communicated through use of weighted messages before radios were common. (2) Directors of artillery fires and directors of counter-battery. (3) Observers began to use detailed check lists for activity noted from the air.

1917, Feb

After centuries in power, Russia's Romanoff monarchy was overthrown by the Russian Revolution. Moderate democratic nationalists led by Alexander Kerensky honored Russia's

alliance with western partners to continue the fight against the Central Powers. Much war-weariness and political-economic turmoil was rampant throughout Russia.

1917, Feb

Germany announced that its naval forces were to conduct “unrestricted submarine warfare.” The greatest impact of the German submarine campaign took place in the North Atlantic shipping lanes.

1917, 13 Mar

Army Air Intelligence Subdivision Office approved

1917, 6 Apr

The United States entered World War I as an “associated power” in support of France, Great Britain, and Russia. In his request to Congress for a declaration of war, President Woodrow Wilson proclaimed that the “world must be made safe for democracy.” The US entry into World War I stimulated advances in the technology of aerial reconnaissance. The marriage of the airplane and the camera was a significant event.

1917, Apr–May

A memorandum from the Army Chief of Staff in April 1917 redesignated the Military Information Section (MIS) as the Military Intelligence Section. Subsequently assigned to the newly established Executive Division of the War Department General Staff, the section underwent a series of name changes and reassignment of functions over time.

1917, Jun–Sep

Reconnaissance was the primary aviation mission of US Army’s Signal Corps’ Aviation Section. Prior to 1917, the Aeronautical Division was the subdivision of the Office of the Chief Signal Officer that dealt with aviation matters. During June 1917, Pershing created Air Service, AEF, and removed aviation from Signal Corps, at least in Europe. Pershing’s decision caused confusion for Army aviation in the United States. Legally, the final break took place in May 1918, when President Wilson placed Army Air under the Secretary of War.

1917

In September 1917, General Pershing approved a plan to double the size of the Observation Squadrons to support Anglo-French and US combat units.

1917

An enduring problem for the Air Service was that the skills required for aerial observation and photo-interpretation lacked equivalent civilian vocational work skills. In general, lesson plans, lectures, and training designs of the AEF began as the war concluded. The Air Service trained for these skills through the instruction of the French and the British. In July 1918, the AEF established an intelligence school at Langres, France. The program operated six days a week with content specific to air intelligence, such as map reading and aerial photography. Aviators also received training specific to the air intelligence mission: maintaining a planned flight plan in a side wind, flight strategies to acquire both vertical and oblique photography, following center lines of rails and roads for each frame, and formation flying to capture systematic coverage.

1917

Army Air Service adopted the French-design, semi-automatic de Ram aerial camera in 1917. De Ram was an important contribution by the US to the field of photo reconnaissance. The French government had earlier rejected the de Ram camera. It carried a magazine of fifty plates at 7 inches x 9.5 inches, and was first used by Air Service in the Argonne offensive of 1918.

1917–1918

The Army Corps of Engineers applied systematic photogrammetric analysis to obtain fine-grained terrain data. This map production was handled by the 29th Engineers, who were largely composed of former US Geological Survey (USGS) personnel. Over 5 million maps were used or reproduced between July and November 1918. These maps provided for the Battle Map and the establishment of artillery firing data of accurate large scale 1:20,000 for fires on unobservable targets.

1917, 6 Nov

Under orders from veteran Russian revolutionary V.I. Lenin, leader of the Bolshevik faction in Russia, sailors from the cruiser AURORA, anchored off the city of Saint Petersburg, began to seize government offices. The populace waiting in breadlines, sailors and soldiers from the local garrisons, and the factory workers of the pro-Bolshevik Red Guard soon joined them. The mob stormed the Winter Palace of the former Czar in the coup d'état that became known as the beginning of the Bolshevik (Communist) Revolution, dated 24 October by the Julian calendar used in Russia. A day later, Lenin took control of the Russian government.

1918, 23 Jan

First US military balloon ascent in France

1918, Feb–Mar

Signal Corps established an aerial photography school at the Eastman Kodak Company in Rochester, New York.

1918

Observation and reconnaissance was the main effort of Air Service. Air Service conducted more visual observation missions than any other task, with the balloon companies the primary operators. Balloon observers were to report by telephone only raw data, and no personal observation. The bias for observation and reconnaissance was evident in the April 1918, Air Service's air-order-of-battle (AOB): 8,000 observation aircraft, compared to 2,000 pursuit (fighter) and 1,500 bomber (attack) aircraft.

1918

Army aviation defined two major roles for aviation. *Tactical* provided support to ground forces by means of observation, while *strategic* meant air superiority and deep attack missions. In the tactical role, there were three different missions: visual and photo-reconnaissance, adjustment of artillery fires, and contact missions.

1918, 1 Apr

The Royal Air Force (RAF) was established.

1918, 11 Apr

The 1st Aero Squadron made its first observation patrol over German lines.

1918, 15 Apr

The first US tactical surveillance flight by the 1st Aero Squadron took place.

1918, 24 May

By Executive Order, Army aviation was transferred from Signal Corps to two agencies under the Secretary of War: the Bureau of Aircraft Production and the Division of Military Aeronautics. The War Department officially recognized these two Army agencies as the Air Service of the Army.

1918

WWI (like WWII to follow) drew heavily on the existing skills of mapping specialists. In 1918, Army Major James Bagley, a civilian with USGS prior to 1917, arrived in AEF to field test the three-lens aerial camera. As a USGS employee, Bagley had applied photogrammetric principals to topographic mapping using terrestrial photography, and drew up applications of his techniques to aerial photography. Bagley's techniques were validated, but too late for WWI. The Bagley design became the key component of civil aerial survey following WWI.

1918, 1 Jul–11 Nov

Allied forces on the Western Front halted a great German offensive that had been launched in March and began a counteroffensive a few months later. Some 1.3 million aerial photos were taken over the Western Front during this reporting period. From the time a photo was taken, developed, and printed, to when it was "read out" or interpreted was, in some cases, twenty minutes.

1918, Sep

Each Air Service Observation Squadron was composed of twenty-four aircraft. This was up from eighteen aircraft per Observation Squadron in September 1917.

1918, 12 Sep

Allies launched a major offensive on the Western Front known as the Meuse-Argonne. The Air Service attached to the 1st Corps developed 16,000 photos in one day.

1918, 2 Oct

Experiments with pilotless aircraft began at the end of WWI. The Army's Kettering pilotless aircraft "The Bug," with preset controls, made successful flights in Dayton, Ohio.

1918, 11 Nov

Germany's monarchy collapsed, and the Hohenzollerns fled to the Netherlands. The newly-declared German (Weimar) Republic agreed to an armistice on 11 November 1918, and subsequently signed the comprehensive and punitive Versailles Treaty in June 1919 at Compiègne, France. This formally ended WWI.

1918, 11 Nov

Seven-hundred-forty US aircraft were on the Western Front at the end of the fighting. They represented ten percent of total Allied air strength. On Armistice Day, the RAF was the world's largest separate service air force.

1918

The US Army Corps of Engineers established the School of Surveying, Map Production and Ranging at Camp A.A. Humphreys (now Fort Belvoir), Virginia.

1918–1919

The Spanish Influenza, a great pandemic, swept across the globe in the wake of WWI. The trace lines of the disease followed troops to their homes and an estimated 22 million died.

1919, Jan

The Signal Corps began experiments on thermal detection from aircraft at Langley Field, Virginia.

1919, Jan–Jun

The Paris Peace Conference brought together Britain, France, the United States, Italy, and Japan to set terms for the vanquished powers of Germany, Austria-Hungary, and the Turkish (Ottoman) Empire. The treaty and the international system that grew out of it failed to overcome the destabilizing destructiveness of the war.

1919, 23 Mar

Benito Mussolini, a former Socialist turned Nationalist during World War I, founded the Fascio di Combattimento in Piazza San Sepolcro, Milan as a new force in Italian politics willing to use violence in the streets to gain power.

1919

The Engineer Reproduction Plant (ERP) was established by the US Army to compile, draft, and reproduce maps. It absorbed the Central Map Reproduction Plant, the Central Photographic Laboratory and Engineer School Press, and all branches of the Engineer School. The ERP became responsible for supervision and maintenance of the War Department's Map

Collection. Under the direction of Army Captain Charles Ruth, the ERP became one of the major military topographic organizations in the world.

1919, 29 July

Adolf Hitler, an Austrian who served during WWI as a combat-decorated corporal with a Bavarian infantry regiment of the German Army, became the leader of a fringe ultra-nationalist protest group, the German National Socialist Workers' (Nazi) Party.

1919, 30 Dec

The Board of Surveys and Maps was established to assume the surveying and mapping functions of the US Board on Geographic Names. The Board of Surveys and Maps was abolished in 1942.

1920

USMC Air established Flight E, 3rd Air Squadron at Marine Corps Base Quantico. In time, the unit designator changed to Marine Observation Squadron Six. In 1928, the unit, as VO-6M, deployed by sea to Nicaragua to assist in quelling the Sandinista rebellion. The Curtiss F8C-1 Falcon biplane was used to conduct visual reconnaissance and perform aerial photography. Marine Observation Squadron Six performed myriad missions, medical evacuation, transport, and artillery spotting, as well as photo-reconnaissance.

1922, Feb

Using the first depth sounding machine, the Sonic Range Finder was designed and developed by Dr. Harvey C. Hayes for the US Navy. The "four piper" Clemson class destroyer, USS *Stewart* (DD-224), carried out successful tests to map ocean depths. The first test made 900 graphic representations of soundings from Newport, Rhode Island to Gibraltar. The device provided data for the first modern bathymetric chart, published in 1923. From Gibraltar, the *Stewart* transited to the Pacific. She did not return to the United States until 1945. Following Pearl Harbor, *Stewart* was sunk by the Japanese in the Dutch East Indies (Indonesia). Raised and refitted, the destroyer served in the Imperial Japanese Navy (IJN) until retaken by the US Navy in 1945.

1922, 26 Oct–25 Nov

Mussolini organized Fascist squadristi (street fighting groups, some motorized) to March on Rome and seize control of the government. As a result of the threat, King Victor Emmanuel III invited Mussolini to Rome to form a government. Four weeks later, the Italian Chamber voted to give Mussolini full power.

1923, 1 Nov

American physicist Robert H. Goddard successfully tested a liquid oxygen and gasoline rocket engine, a feat which, when coupled with publication in Germany of Hermann Oberth's *Die Rakete zu den Planetenraeumen* (*The Rocket into Planetary Space*), touched off a wide-ranging international discussion of rocket propulsion.

1924, 4 Apr–28 Sep

Starting from Seattle, four Air Service planes began a flight to circumnavigate the globe using patched-together hydrographic charts. Two of these planes completed the trip, landing back in Seattle 175 days later. The trip was dubbed the "First Around-the-World Flight."

1926

US Army Air Corps (AAC) was established as a corps and replaced the Air Service. All aircraft, however, remained attached to divisions, corps, and armies. It remained the Army's air combatant arm. Its aircraft inventory continued to reflect its main mission in the Great War: 169 observation planes and sixty pursuit (fighter) aircraft. In 1926, AAC also established the Information Division.

1927

Charles "Lucky Lindy" Lindbergh flew solo from North America to Europe. At the time, Lindbergh was a captain in the Missouri National Guard's 110th Observation Squadron.

1928, 12 May

After sixty-five hours in the air over a two-month period, an AAC reservist completed a 3,000-square-mile aerial survey of Florida's Everglades.

1928, Dec

The AAC launched a Map Unit as part of the Information Division to acquire and distribute maps for military use.

1929

AAC, in theory, continued to support air observation as a tactical mission in support of divisions and corps. In fact, the AAC pursued high speed aircraft that could not loiter. Speed meant not only survivability, but also a decline in capability at the tactical level for such missions as artillery adjustment and photo-reconnaissance.

1929, Oct

Trading on the New York Stock Exchange declined sharply on 24 October and then again on 29 October. This led to a total collapse of the exchange and precipitated a tightening of credit and available cash, leading to the international Great Depression of the 1930s.

1930

William F. Friedman created the Signal Intelligence Service to improve the gathering and understanding of signal intelligence, using new mechanical cipher machines and aerial photography.

1931

New York City's Empire State Building opened.

1932

American aviator Amelia Earhart flew solo across the North Atlantic.

1932, Nov

Franklin Delano Roosevelt was elected to the US presidency on 8 November 1932.

1933

The first purpose-built USN aircraft carrier, USS *RANGER* (CV-4), launched.

1933, 30 Jan

The consistent increase in voter support for Adolf Hitler and his Nazi Party in elections throughout 1932 created the occasion for German President Paul Hindenburg to appoint Hitler chancellor in late January.

1933, 25 Mar

Japan announced its resignation from the League of Nations, established by the Treaty of

Versailles as the arbiter of international disputes, because the League had condemned Japanese military action in Manchuria as aggression.

1934, 19 Aug

Adolf Hitler reached the undisputed position of German leadership with the death of Paul Hindenburg, WWI Army chief and German president (Weimar Republic).

1935, 3 Oct

Italian forces invaded Abyssinia (Ethiopia). Four days later, the League of Nations Council unanimously declared Italy the aggressor. The sanctions that the League imposed on Italy excluded all military action and proved totally ineffective.

1937, 12 Dec

Japanese Naval aircraft struck and sunk the USN River Gunboat USS *PANAY* (PR-5) while it was at anchor as the station ship in the Yangtze River, upriver of China's then-capital city of Nanking (now Nanjing). Three Navy Bluejackets were killed and forty-three were wounded, as well as five civilians. Japan claimed the case was one of misidentification and unintentional, apologized, and paid an indemnity. Anchored near the *PANAY* on the Yangtze were US-flagged tankers. These were also struck, and suffered fatalities.

1937, 13 Dec

Imperial Japanese Army units entered Nanking. The Rape of Nanking followed.

1939

German General Werner von Fritsch of the General Staff predicted that in the event of war the side with the best aerial reconnaissance capabilities would emerge as the victor.

1939, 1 Apr

The Spanish Civil War concluded with the victory of the Nationalists (Rebels) of Francisco Franco.

1939, 23 Aug

Germany and the Soviet Union signed a Non-Aggression Pact in Moscow that relieved Germany of the threat of military pressure from the east and the specter of a two-front war. Secret clauses in the treaty partitioned Poland between Germany and the Soviet Union in the event of war.

1939, 1 Sep

Germany invaded Poland, touching off World War II in Europe.

1939, 1 Sep

At the outbreak of war, the AAC lacked light observation aircraft—something that could land in a cow pasture. AAC pursued strategic doctrine from 1926 to 1939, and as a result observation aircraft reflected the AAC's long-range, strategic reconnaissance mission. The Infantry and Artillery Branches called for light observation platforms.

1939, 17 Sep

Soviet Union invaded Poland.

1940, 10 Jul–17 Sep

During the Battle of Britain, the German Air Force launched sustained air attacks designed to weaken British defenses in preparation for an invasion from France. The British used a new electronic device to identify and pinpoint attacking aircraft; it was the first decisive use of radar in combat, which proved crucial to the British success in staving off the attacks. Unable to establish air superiority, Hitler canceled plans to invade Britain.

1941, 11 Mar

The US Congress passed the Lend-Lease Bill, which ultimately provided billions of dollars of materiel to the Allies.

1941, 20 Jun

US Army Air Forces (USAAF) was established. Existing Army Air Corps (AAC), with separate roles and missions, continued to exist under the USAAF organizational umbrella. In 1947, the USAF subsumed AAC/USAAF as an independent military service.

1941, 22 Jun

Germany invaded the Soviet Union.

1941

US personnel, cooperating with the Allied Central Interpretation Unit of the Royal Air Force (RAF), Medmenham, United Kingdom, began shifting the emphasis in the use of aerial photography from mapping and strategic planning to photographic analysis. USAAF and USN photographic interpreters (PIs) developed the ability to identify troop strength and location, types of weapons deployed, and whether weapons were new, modified, or older models. The intelligence gleaned by both the British and American analysts from studying the aerial photographs played a critical role in battlefield successes in all theaters of operation during World War II. One of President Roosevelt's sons, Elliott Roosevelt, served at Medmenham during WWII. Roosevelt entered the AAF in 1940 as a captain, and separated from the service in 1945 as a brigadier general. As a photo-reconnaissance officer, he also served in intelligence, weather, and night photography assignments.

1941

The USAAF converted twenty-four A-29s for use in photo-reconnaissance, aerial surveying, and mapping. Stripped of all armament, the aircraft were fitted out with cameras, associated-mounting, operating hardware, and optically flat glass panels. After conversion, the aircraft were designated as type A-29Bs. During 1942, A-29Bs completed aerial mapping surveys over British Columbia (BC) for aircraft ferry pilots operating between the Continental United States (CONUS) and Alaska. This air route was critical for aircraft Lend-Lease agreements between the US and the Soviet Union and was known as the Alaska-to-Siberia (ALSIB) route. It ran from Great Falls, Montana, over BC, and on to Fairbanks, Alaska. Red Air Force pilots took delivery in Fairbanks, flew on to Nome, and then west to Siberia. Eight thousand aircraft were ferried to the Soviet Union using this air bridge.

The RAF's De Havilland DH 98 Mosquito entered production in 1941. Mosquitoes flew in several USAAF units as photographic and weather reconnaissance platforms. Constructed primarily of plywood with a balsa wood core, they were designated type F-8. The Royal Canadian Air Force (RCAF) provided forty aircraft to the USAAF, and the RAF supplied more than one hundred Mosquitoes under Reverse Lend-Lease.

1941, 21 Aug

The first Arctic convoy (Murmansk Run) to the Soviet Union's Kola Peninsula departed Iceland. That same day, German ground forces reached and cut the Leningrad-Moscow rail line.

1941, 16 Sep

Convoy HX-150 departed Halifax, Nova Scotia, Canada. It was the first convoy to receive official protection from the USN.

1941

USAAF took delivery of the North American P-51D Mustang. In 1943, during fighting in North Africa, some fifty-five P-51s were redesignated as F-6A photo-reconnaissance aircraft. These platforms made up the first of the USAAF's P-51 unit—the 154th and 111th Observation Squadrons.

1941, 2 Oct

German ground forces reached the approaches of Moscow.

1941, mid-Oct

Lenin's body was evacuated from Moscow by Soviets. Stalin announced his intention to stand fast in Moscow despite the growing German threat.

1941, 31 Oct

A Navy destroyer was the first USN combatant sunk in the North Atlantic by hostile fire during WWII. Post-WWI USN four-pipe Clemson class destroyer USS *REUBEN JAMES* (DD-245) was sunk by *U-552* while conducting Neutrality Patrol convoy escort (Convoy HX-156) duty in the North Atlantic, off Iceland. *REUBEN JAMES* picked up Convoy HX-156 in Newfoundland and made transit to Iceland for turnover with the Royal Navy. A *U-552*-launched torpedo blew the destroyer's bow off; she sank in five minutes and of the 159 officers and men onboard, there were 44 survivors. *U-552* was scuttled in Germany by her crew in May 1945.

1941, 30 Nov

First successful use of air-to-surface radar; RAF attack aircraft located, fixed position, and sank a German submarine.

1941, 7 Dec

Sunday, 7 December 1941, IJN forces attacked USAAF and US Army installations on Hawaii and the USN's Pacific Fleet at Pearl Harbor, Hawaii. The following day, the US declared war on Japan. On 11 December, Japan's European Axis allies, Germany and Italy, declared war on the United States.

1942, 18 Apr

USAAF Lieutenant Colonel James H. Doolittle and sixteen twin-engine B-25 "Billy Mitchell" medium bombers launched from the deck of the US Navy's Yorktown class carrier, USS *Hornet* (CV-8), and bombed Nagoya, Kobe, Osaka, and Tokyo. It was the first air strike on the Japanese homeland. The Doolittle Raid resulted in little damage, infuriated the Japanese, and boosted Allied morale. An Army Air Forces (AAF) photo-reconnaissance version of the B-25 emerged later in WWII as the F-10. The B-25 was the only aircraft in the AAF inventory named after a person.

1942, May

The Army Map Service (AMS), created from the reorganized Engineer Reproduction Plant (ERP) and relocated to Brookmont (Bethesda), Maryland, began operations. During the balance of World War II, it produced some 500 million topographic maps.

1942, Jun

The Grumman F4F-3P Wildcat was the first photo-reconnaissance variant of the F4F fighter, which had entered service with the USN and the USMC in 1940. Famous as a fighter with Marine Air at Wake and Guadalcanal, some Wildcats were converted to photo-reconnaissance. Following modifications, the first F4F-3P platform transferred from the USN to Marine Air's VMO-251 in June 1942. Removed was the reserve fuel tank, and installed were two aerial cameras. The aircraft's normal armament was retained.

1942, 4 Jun

The Battle of Midway was an overwhelming USN victory; the IJN never regained its strategic initiative, as Japanese industrial capacity was unable to replace its lost carriers, and hence sea-based naval aviation.

1942, 6 Jun

The War Department approved the assignment of light aircraft to field artillery (FA) units. The aircraft were to function as organic to the FA units. Almost immediately, disputes arose between Army Ground Forces (AGF) and the AAF regarding the use of enlisted men as aviators, and the matter of who could direct artillery fire.

1942, Oct

PBY4-1 was the USN designation for the AAF's B-24D Liberator. The USN version had a different nose turret than that of the AAF's B-24s. Marine Air took delivery of new production PBY4-1s, converted for long range photo-reconnaissance in 1942. Newly formed long-range

photo-reconnaissance VMD-154 and VMD-254 squadrons deployed to the Pacific in 1942 and 1943 with eight PB4Y-1Ps.

1942, Oct

The Grumman F4F-7P Wildcat was a long-range photo-reconnaissance variant of the Grumman F4F-3P Wildcat. The -7P retained the same engine as the -3P, but carried a fuel tank of 685 gallons, which gave the plane a maximum range of 3,700 miles and eleven hours of flight time. Grumman produced twenty of the -7Ps. On Guadalcanal, these aircraft served with Marine Air's VMO-251. The USN photo lab on board USS *CURTISS* (AV-4) performed all film processing and photo interpretation.

1942, 8 Nov

Allied forces landed in North Africa for OPERATION TORCH. Lockheed's P-38 Lightning—designed, built, and manufactured in the 1930s—first experienced large-scale combat in North Africa in 1942. Its versatility allowed it to serve in many roles to include photo-reconnaissance.

1942

In North Africa, AGF commanders expressed discontent with the AAF regarding tactical air support. This frequently revolved on the issue of timely aerial photography, with the time of request until delivery in the field usually a twenty-four-hour process.

1942, 2 Dec

The first self-perpetuating nuclear chain reaction (using uranium isotope U-235) took place in the “atomic pile” at the University of Chicago on a squash court below Amos Stagg Field under the supervision of physicists Enrico Fermi and Arthur J. Compton working with a team of scientists. Born in Rome, Fermi was a refugee from Mussolini's Italy.

1943, 27 Jan

The USAAF's 8th Air Force conducted its first raid over Germany.

1943

In one month in 1943, USAAF photo-reconnaissance aircraft flew over 200 missions with 500,000 prints delivered.

1943, 2 Feb

The Battle of Stalingrad ended in the destruction and surrender of Germany's 6th Army.

1943, 13 May

With the fall of Tunis in early May, all Axis forces were driven out of Africa.

1943, Jun

The AAF Aeronautical Chart Plant began operations in St. Louis, Missouri.

1943

The USAAF's 14th Photographic Squadron of the 8th Air Force operated the British-built Supermarine Spitfire PR.X1s from 1943 to 1945. Unarmed, it relied on speed alone. It was modified to carry cameras, and was refit with a larger engine and a larger fuel tank. Most of the Mark X1s served on long-range reconnaissance missions over Germany and occupied Europe.

1943

Grumman F6F-3P and F6F-5P Hellcat were the USN and USMC variants of the Hellcat fighter. A small number of these -3Ps and -5Ps were produced with one camera mounted in the rear of the fuselage, behind the wing.

1943, Aug-Sep

Allies invaded Sicily and western Italy south of Rome. AAF's Piper L-4 Grasshopper directed artillery fires, provided naval gunfire support (NGS), laid wire, provided transportation, and performed aerial observation and aerial reconnaissance. AAF recognized the capability of light aircraft and created liaison squadrons for service with the AGF. Italian Fascist dictator Benito Mussolini was overthrown. German troops invaded and occupied northern Italy, and established a puppet state in northern Italy (Italian Social Republic/Salo Republic) with Mussolini as the nominal leader.

1944

US Naval Air and Marine Air operated some of the over 11,000 F4U Corsairs built in WWII. Vought produced over 7,800. In 1944, nine F4U-4Ps were manufactured with an oblique reconnaissance camera in a blister with a sliding window on the left side of the fuselage behind the wing, and were designated F4U-4P. These aircraft retained a full F4U armament.

1944

The Aeronautical Chart Division was redesignated the Aeronautical Chart Service.

1944, 6 Jun

Western Allies invaded Normandy, France and opened the long-awaited Second Front in Europe.

1944, 13 Jun

The first German V-1 subsonic rocket-propelled bomb (also known by Allies as the buzz-bomb or doodle bug) fell on London, a week after the Normandy invasion.

1944, Nov

Major Floyd Hough, assigned to the Office of the Chief of Engineers of the US Army, led a team of two dozen men and women to the European Theater of Operations (ETO) to recover Axis maps of the Pacific and related optical and photogrammetric equipment. They captured ninety tons of geodetic materials, including vast archives of German geodetic surveys covering European Russia and earlier Czarist-era geodetic surveys done by German engineers covering the Trans-Siberian Railway from Moscow to the Pacific. During the Cold War (1945–1991), the captured photographs, documents, and maps provided the basis for US intelligence concerning Eastern Europe and the Soviet Union. Hough worked for an NGA antecedent agency both before and after WWII.

1945, 19 Feb

USMC's Fifth Amphibious Corps (VAC) made a storm landing at Japanese-defended island of Iwo Jima. Marines secured the island in late March. Its runways were used by USAAF attack and escort aircraft for strikes against Japan. Iwo Jima was so close to the Japanese homeland that in peace it was administered by Tokyo's municipal government.

1945, 7 May

War ended in Europe with the unconditional surrender of Germany. President Harry S. Truman declared 8 May as Victory in Europe Day (V-E Day). Stalin declared 9 May as Soviet Victory Day. Combat continued against Japan in the Pacific.

1945, 26 Jun

Fifty countries participating in the United Nations Conference in San Francisco signed a charter creating the United Nations (UN) Organization.

1945, 16 Jul

The first atomic bomb was successfully tested near Alamogordo, New Mexico, making feasible the use of atomic bombs to end the war with Japan.

1945, July

The Consolidated B-32 Dominator first entered combat in the Pacific Theater of Operations (PTO) in July 1945. It was built originally as insurance against the failure of the B-29. The B-29 flourished, and the B-32 survived many program cuts and delays. It never served in the ETO. By the summer of 1945, Dominator was to replace all B-24s in the PTO. In mid-August, B-32s of the 386th Bomb Squadron took on photo-reconnaissance missions over Japan. As Japan sued for peace on 14 August, the photo-reconnaissance missions essentially verified Japan's non-hostile intentions.

1945

Grumman F7F-3P Tigercat was the photo-reconnaissance version of the F7F fighter Tigercat. Tigercat was the first twin-engine fighter aircraft design to serve with the USN. Delivered to Marine Air late in WWII, this aircraft did not see combat service. Following the Korean Conflict, they were withdrawn from the inventory in 1954.

1945, Aug

The United States dropped two atomic bombs, one on Hiroshima (6 August) and another on Nagasaki (9 August). During this period, the Soviet Union entered the war in the Pacific against Japan.

1945, 2 Sep

The formal Japanese surrender (official acceptance of the "Instruments of Surrender") was signed aboard the Iowa class battleship USS *MISSOURI* (BB-63) in Tokyo Bay, officially ending World War II combat.

1945, Sep

With the conclusion of WWII, commanders of the Army Ground Forces were convinced of the value of organic aviation for the reconnaissance mission.

1946

The Northrop P-61 Black Widow was a WWII purpose-built, heavily armed night fighter. Following the war, Northrop built thirty-six Black Widows as F-15As—unarmed photo-reconnaissance aircraft.

1946, 15 Apr

The Inter-American Geodetic Survey (IAGS), established by President Harry S. Truman, assumed responsibility for assisting Latin American nations with their mapping efforts.

1947

With US government funding, the Mapping and Charting Research Laboratory at Ohio State University began a research program in geodetic sciences, photogrammetry, and cartography.

1947

US Board of Geographic Names reorganized to its present form under the Secretary of Interior with two committees, the Domestic Names Committee (DNC) and the Foreign Names Committee (FNC).

1947

The USAAF took delivery of the North American B-45C Tornado in 1947, and it achieved many “firsts” in its life span. As a bomber, it was the first USAAF four-engine, jet-powered bomber to fly, the first production jet bomber, the first atomic bomb capable jet bomber, and the first multi-jet reconnaissance aircraft to refuel in midair. North American built thirty-three RB-45Cs configured for high-altitude photo-reconnaissance and aerial refueling. In England, at RAF Sculthorpe, the USAF’s 19th Tactical Reconnaissance Squadron and RAF’s Special Duty Flight manned RB-45Cs during the 1950s. The RAF RB-45C crews flew deep into Communist Europe on highly classified missions.

1947, 12 Mar

President Truman requested \$400 million in aid from Congress to combat Communism, emphasizing Greece and Turkey. The extension of this willingness to aid any nation threatened by Communism, known as the Truman Doctrine, became a cornerstone of the foreign policy of the United States until December 1991.

1947, 5 Jun

In a graduation speech at Harvard, Secretary of State George C. Marshall proposed a program of massive aid to help Europe rebuild after World War II. Stalin's Soviet Union and Red Army-occupied Central and Eastern Europe declined US aid, protesting against "dollar enslavement." Nearly \$13 billion went to Europe from 1948 to 1952 under the Marshall Plan, officially known as the European Recovery Program.

1947, 26 Jul

The National Security Act of 1947, signed by President Truman, created the National Military Establishment (renamed in 1949 as the Department of Defense) and the National Security Council, whose members included the president, vice president, Secretary of State, Secretary of Defense, and others. The act established the separate and independent Department of the Army, Department of the Navy, and Department of the Air Force. The act also established other agencies such as the Central Intelligence Agency (CIA).

1947, 18 Sep

The United States Air Force became a separate military branch of the armed forces and full partner with the Army and the Navy. Among the USAF's many charges was the requirement to conduct "strategic air reconnaissance operations."

1947, 18 Sep

The CIA began its function as the main civilian organization tasked with gathering foreign intelligence for the National Command Authority.

1948, Jun

The concept of the Convair B-36J Peacemaker arose during WWII when the USAAF declared a requirement for a strategic, intercontinental bomber with a 10,000 mile range and a ceiling of 45,000+ ft. Strategic Air Command (SAC) took delivery of the first operational B-36 in 1948. Some B-36s served as photo-reconnaissance aircraft while others were configured to launch and retrieve specially modified RF-84F/K reconnaissance planes. Peacemakers never experienced combat and left the AOB in 1959. They were replaced by the all-jet B-52.

1948, 24 Jun

Three years after the conclusion of WWII in Europe, tensions between the West and Stalin's Soviet Union continued to escalate. On 24 June 1948, Soviet authorities blockaded all overland (road, rail, and canal) access to the Western Allied sectors of the city of Berlin, trying to expel France, Great Britain, and the United States from their positions as joint occupiers of

the city. In response, US and British planes airlifted 1.5 million tons of supplies to the residents of West Berlin. The air bridge reached 200,000 flights and proved that such aerial supply caravans could sustain West Berlin. Stalin abandoned the blockade in May 1949. The Allied air effort continued for some months, however, in an effort to bolster stocks of food, clothing, and coal in the event that Stalin resumed the blockade.

1949

The North American Treaty Organization (NATO) was established.

1949, 20 May

The US Secretary of Defense signed a secret order creating the Armed Forces Security Agency to oversee the military signal intelligence (SIGINT) agencies: Army Security Agency, Naval Security Group, and Air Force Security Service.

1949

Colonel Paul C. Schauer was named Commander of the US Air Force's Aeronautical Chart Service (ACS). Originally established in January 1945, the ACS moved to St. Louis during Schauer's tenure as commander and in 1954 became the USAF Aeronautical Chart and Information Center (ACIC).

1949

USSR detonated its first atomic bomb.

1950, 25 Jun

As part of the settlement of World War II in the Pacific region, two states emerged on the Korean Peninsula, divided at the 38th parallel. At 4:00 a.m. Sunday, 25 June 1950, the Democratic People's Republic of Korea (North Korea or DPRK) invaded across the 38th parallel in a surprise attack upon the Republic of Korea (South Korea or ROK). Within hours, the United States appealed to the United Nations to restore peace in Korea. On 27 June, President Truman dispatched US forces, and the United Nations Security Council condemned the invasion and established a fifteen-nation combat force to defend South Korea.

1950–1953

McDonnell F2H-2 P Banshee served as a photo-reconnaissance platform during the Korean Conflict. Eighty-nine photo-reconnaissance variants were built, with the first flight on 12 October 1949. Its nose held six vertical and oblique cameras. For night photography, a

container held twenty flash cartridges that were mounted under each wing. In 1952, Marine Photo Reconnaissance Squadron One (VMJ-1) operated Banshees from the Pohang area. Banshees from VMJ-1 were rated the best of the photo-reconnaissance aircraft in Korea; VMJ-1 was credited with providing the highest percentage of the film taken by any unit in the Far East Air Forces, and was assigned to the highest value targets from the Yalu River to the south. Following the Korean Conflict in 1953, VMJ-1 flew clandestine photo missions over the People's Republic of China (PRC).

1950, 20 Nov

The Ohio State University Board of Trustees authorized establishment of the Institute of Geodesy, Photogrammetry, and Cartography (IGPC). OSU became the first graduate degree-granting institution in the geodetic sciences in the western hemisphere. The university recruited Dr. Weikko Heiskanen from Finland to become the institute's first scientific director. In the mid-1950s OSU negotiated a special program through the USAF's ACIC in St. Louis by which employees enrolled as special students for intensive and specialized courses in geodesy and photogrammetry.

1950, Dec

Grumman F9F-2P Panther was the unarmed photo-reconnaissance version of the F9F-2 Panther. F9F-5P followed, and was the unarmed photo-reconnaissance version of the F9F-5 with a longer nose. In December 1950, F9F-2Ps first deployed with VC-62 aboard the Ticonderoga class aircraft carrier, USS *PRINCETON*, (CV-37/CVA-37). The Ticonderoga class was a heavily modified Essex class aircraft carrier. In 1952, F9F-5Ps replaced the -2Ps in Korea. Two Marine Air reconnaissance squadrons, VMJ-1 and VMJ-3, flew the -5Ps. The F9F-5P were purpose-built for unarmed photo-reconnaissance unlike the -2Ps, which were modified from F9F-2 fighters. Thirty-six -5Ps were built. The nose held housing for vertical and oblique cameras.

1952, Jan

Inter-American Geological Survey Cartographic School formed in Panama to train Latin American students in cartography and geodesy and the new technologies that supported them. The school was located at Fort Clayton, Panama, where it remained for thirty-seven years. Approximately 9,000 technicians and professionals from twenty-nine countries received training at the school.

1952, Aug

The CIA established the Photo Interpretation Unit (PIU) within its Office of Research and Reports, building on the experience and achievements of photo interpreters in enhancing intelligence information during World War II. In 1953, CIA recruited Arthur C. Lundahl to

expand and lead this special independent element within the CIA, renamed the Photographic Intelligence Division (PID).

1952, Aug

USAF's Aeronautical Chart and Information Center (ACIC) resulted from the merger of two predecessor agencies, the Aeronautical Chart and Information Service, established in Washington, DC, and the Aeronautical Chart Plant, located in St. Louis, Missouri. The ACIC consolidated all the services and facilities in St. Louis.

1952, 1 Nov

The United States exploded the world's first hydrogen bomb at a test site in the Pacific's Marshall Islands. The US monopoly on hydrogen weapons lasted for less than a year before the Soviet Union announced its first test of a hydrogen bomb.

1952, 29 Dec

National Security Agency (NSA) succeeded the Armed Forces Security Agency (AFSA), created in 1949, to conduct communications intelligence (COMINT) activities for the military. NSA incorporated AFSA's military activities with non-military activities to enhance its effectiveness in securing the nation's communication systems and exploiting foreign signals intelligence (SIGINT).

1953, 1 Jan

Project US Magnet used USN aircraft to gather information needed to determine the differences in time and location in the Earth's magnetic field. Officially established in 1953—although test flights had begun as early as 1951—the project was the first use of aircraft to measure magnetic variation around the Earth.

1953, 5 Mar

Josef Stalin died in Moscow. He had served as dictator of the Soviet Union from the late 1920s and was the dominant figure of international Communism.

1953, 27 Jul

UN forces defending South Korea, led by the US military, signed an armistice ending the Korean Conflict, with the border between North and South roughly the same as it had been in

1950. The willingness of both China and North Korea to end the conflict was, in part, attributable to the death of Stalin.

1953, 12 Aug

The Soviet Union exploded its first hydrogen bomb less than a year after the United States acquired the H-Bomb.

1954, 7 May

At Dien Bien Phu, in northern Vietnam and near the Laotian border, Communist military forces under Ho Chi Minh and General Vo Nguyen Giap defeated French military forces in a battle that ended French colonial control of northern Vietnam. The Geneva Accords reached in July divided the Vietnam at the 17th parallel and two states emerged, North Vietnam and South Vietnam.

1954–1955

President Dwight David Eisenhower authorized development of a new high-altitude reconnaissance aircraft, designated U-2 because it was officially listed as a “utility” aircraft to conceal its true mission. The U-2 was designed in California by Lockheed’s iconic Clarence “Kelly” Johnson at the equally iconic “Skunk Works.” The aircraft first flew in 1955.

1955, 18 Feb

Grumman F9F-8P Cougar was the unarmed photo-reconnaissance version of the Cougar fighter. The -8P housed forward, vertical, and oblique cameras; it first flew on 18 February 1955, and Grumman produced 110 platforms for the USN/USMC. In 1962, the -8 was re-designated RF-9J. Cougar had a brief career and was replaced by the supersonic F8U-1P Crusader.

1955, Aug

Over 2,000 B-47 Stratojets were built for the USAF’s Strategic Air Command (SAC) as nuclear bombers, but the USAF also needed a collection aircraft to report on Soviet air defenses. The Boeing RB-47H Stratojet electronic reconnaissance platform met the requirement. Boeing built over thirty RB-47Hs.

1955, 27 Dec

OPERATION GENETRIX, authorized by President Eisenhower, used balloons with cameras to gather photographic intelligence over Soviet/Warsaw Pact and Chinese airspace. Although the operation produced valuable data, many of the balloons malfunctioned, were shot down, or released their photographic payloads in inaccessible areas. By the end of the operation in February 1956, only thirty-six of the 516 releases had been successfully recovered.

1956

The Martin RB-57D joined USAF inventory the same year as the far more famous U-2. RB-57 helped to fill the Air Force's need for a strategic reconnaissance aircraft that could fly high enough to avoid interception.

1956

The Douglas RB-66B Destroyer was acquired by the Air Force in 1956, and was based upon the USN's A-3D Skywarrior (aka "the Whale"). The Air Force used the B-66 as a light tactical bomber while RB-66B served in the photo-reconnaissance role.

1956

USN took delivery of the first Douglas A-3D Skywarrior for its heavy (nuclear) attack squadrons. Reconnaissance versions were modified to pressurize the entire fuselage with as many as twelve ports for oblique or vertical cameras. These models were designated RA-3B in the early 1960s. "The Whales" saw combat service in Indochina and served Naval Air for forty years.

1956, 21 Jun

First successful U-2 operational flights took place over the Warsaw Pact countries of Poland and East Germany. Such U-2 flights became the primary source for intelligence collecting over the Soviet Union and other denied areas.

1956, 4 Jul

The first U-2 mission flown over the Soviet Union photographed the shipyards of Leningrad—the site of the Soviet submarine construction program, the bomber test facility at Ramenskoye airfield, the Kaliningrad missile plant, and the Khimki rocket engine plant, as well as major military airfields and the Soviet Baltic states. The second mission, the next day, was the only one to fly over and photograph Moscow.

1956

Egypt's Pan-Arab government nationalized the Suez Canal. As a result, France, Israel, and Britain invaded Egypt. President Eisenhower refused to support the invaders and the three countries withdrew from Egyptian territory.

1957

The Model A-2 Camera Set was a system of three high-altitude aerial reconnaissance cameras developed for the U-2 in the late 1950s. These HYCON Model 732 cameras created much more detailed images than earlier cameras. It also provided photo mapping and natural resources monitoring as it aged and newer cameras were used onboard the U-2.

1957, May

The first operational McDonnell F-101B Voodoo was acquired by the USAF in May 1957. Designed as a long-range SAC bomber escort, its original mission changed as B-52s entered the inventory. One of its new roles was in photo-reconnaissance, where the Voodoo served as the world's first supersonic photo-reconnaissance aircraft. RF-101s were widely used for low-altitude photo coverage during the 1962 Cuban Missile Crisis and the conflict in Indochina.

1957

The ACIC began sending employees to Ohio State University for graduate courses in geodesy. Two years later, the ACIC expanded its advanced education program to include the University of Virginia.

1957, 4 Oct

The Soviet Union launched Sputnik I, the first man-made satellite to orbit the Earth. Weighing 184 pounds, the satellite circled the earth every ninety minutes

1957, 6 Dec

The USN's VANGUARD rocket rose a few feet off the launch pad, and then collapsed into flames. This was the first attempt by the United States to launch an Earth-orbiting satellite. On St. Patrick's Day of 1958, the USN successfully launched a VANGUARD 1.

1958, 31 Jan

The United States space program successfully launched its first satellite, EXPLORER 1, from Florida's Cape Canaveral. The operator was the US Army Ballistic Missile Agency. The Army worked the rocket design and modifications, and the Jet Propulsion Lab produced the satellite. The satellite made 58,000 Earth orbits before orbital decay in 1970.

1958, Feb

USAF leaders briefed Eisenhower on progress in developing a photo-reconnaissance satellite that would electronically scan photographs obtained by its cameras in space and transmit the digital data back to a ground station, where it would be reconstructed into a picture.

1958, 7 Feb

The DoD established the Advanced Research Projects Agency (ARPA) "for the direction or performance of such advanced projects in the field of research and development as the Secretary of Defense shall, from time to time, designate by individual project or by category." ARPA, renamed Defense Advanced Research Projects Agency (DARPA) in March 1972, was a direct response to the Soviet launch of Sputnik and designed to "assure that the United States maintains a lead in applying state-of-the-art technology for military capabilities" and "to prevent technological surprise from adversaries."

1958, 1 Oct

National Aeronautics and Space Administration (NASA) began its first official day of operations.

1959, 1 Jan

Cuban revolutionary Fidel Castro and his Rebel Army/26th of July Movement ousted former Cuban Army sergeant and long-time Cuban strongman Fulgencio Batista. Castro began to take Cuba into the Soviet camp almost immediately.

1959, 25 Jun

The fourth CORONA satellite test launch became the first to carry a camera, subsequently designated KEYHOLE-1 (KH-1), capable of scanning thirty-five degrees in each direction from the line of flight.

1959, 21 Jul

The US Army sponsored an independent mapping project called ARGON, which was handled under the auspices of the CORONA program because of the need for security and a concern

over competition for launches. ARGON used a three-inch focal-length still camera with five-inch wide film and resolution of about 460 feet. Images covered 300 x 300 nautical miles.

1959, fall

ACIC in St. Louis, in cooperation with NASA, began producing lunar maps and providing space support mapping in anticipation of the planned Mercury-Earth orbital flights and manned journeys to the moon. Within the next half-year, the ACIC completed the first USAF Lunar Atlas, a collection of the best photographs of the moon available. It was a joint endeavor with the Air Force Cambridge Research Laboratory (AFCRL) and Yerkes Observatory.

1960

The World Geodetic System (WGS 60), made publicly available by the DoD, marked a major advance in efforts to define a best-fitting ellipsoid and an earth-centered orientation system that integrated data on distance, shape, and specific point location anywhere on the globe. Based on work undertaken by the Army, Navy, and Air Force, the system integrated available surface gravity data, astrogeodetic data, and a variety of other data sets to allow data from one study or product to merge with information from any other source and made possible truly precise geodetic information, thus achieving a worldwide geodetic reference system.

1960, Jan

In Senate testimony, Secretary of State John Foster Dulles observed that the most important national security issue facing the US was the status of the Soviet Intercontinental Ballistic Missile (ICBM) program.

1960

Project LAMP (Lunar Analysis and Mapping Program) involved the Army Map Service's development of methods of mapping the moon, begun in 1958. By early 1960, and in conjunction with the US Geological Survey, Stage I of the program, feasibility studies, had led to preparation of the first maps of the moon on scale of 1:500,000.

1960, 1 May

A Soviet SA-2 surface-to-air missile (SAM) downed a U-2 reconnaissance aircraft over the missile sites of Sverdlovsk and Plesetsk. Reportedly, Soviet air defense batteries fired fourteen SA-2 SAMs. The aircraft suffered damage to the fuselage, and the U-2 pilot bailed out. During the engagement, there was also a red-on-red incident in which defenders shot down one of their own MiG-19 fighters. The Soviet military captured CIA civilian pilot Francis Gary Powers. Powers had served in the Air Force as a fighter pilot, but in 1956, he resigned his USAF commission and joined the CIA as a civilian aviator.

1960, 1 Aug

The US Army established its Geodesy, Intelligence and Mapping Research and Development Agency (GIMRADA). It incorporated all research and development in the field of topographical engineering by US Army Engineer Research and Develop Laboratories (ERDL) and all research and development by Army Map Service (AMS).

1960, 9 Aug

Director of CIA Allen Dulles established the Committee on Overhead Reconnaissance (COMOR) to coordinate acquisition of overhead reconnaissance of the USSR and other denied areas. As its first task, COMOR established security procedures for handling the new satellite reconnaissance materials.

1960, 19 Aug

USAF launched the world's first space photo-reconnaissance satellite using the THOR (stage one) AGENA (stage two) A rocket. Under the code name CORONA, these photo-reconnaissance satellites penetrated "the denied areas" of the Eurasian land mass without the risk of manned flight and with an extensive photo footprint. The film provided evidence of the Soviet Union's AOB and missile-order-of-battle (MOB) to the United States' National Command Authority. CORONA was managed jointly by the USAF and the CIA.

1961, 18 Jan

Days before he left office, President Eisenhower issued National Security Council Directive No. 8, changing the name of the CIA's Photographic Interpretation Center to the National Photographic Interpretation Center (NPIC). Arthur C. Lundahl, director of the photo interpretation operation at the CIA since 1952, continued as director of NPIC. Eisenhower retained NPIC under the CIA.

1961, 17 April

With clandestine assistance from the CIA developed under former President Dwight D. Eisenhower, Cuban exiles invaded their homeland at the Bay of Pigs. Fidel Castro's military forces, with foreknowledge of the invasion, defeated the anti-Castro attackers and embarrassed newly inaugurated President John F. Kennedy, who had permitted the attack to take place.

1961, 1 Aug

The newly established Defense Intelligence Agency (DIA) became the lead agency in charge of intelligence gathering for the military forces. DIA continues to be a DoD combat support agency that produces and manages intelligence for warfighters and defense policymakers.

1961, 13 Aug

East German security forces constructed the Berlin Wall, cutting off free passage between the two halves of the city and effectively ending the flight of East Germans to the West. Eventually, the entire Inner-German-Border (IGB) was fenced and fortified.

1961, 6 Sep

Secretary of Defense Robert S. McNamara established a National Reconnaissance Program (NRP) consisting of all US space-based satellites and aerial reconnaissance projects. To direct it, he converted the Office of Missile and Satellite Systems into the National Reconnaissance Office (NRO) on 7 September 1961, as a classified agency within the DoD, responsible for managing aerial overflight programs and space reconnaissance systems.

1962

As the conflict between North Vietnam and South Vietnam intensified, NPIC analysts conducted battle damage assessment (BDA), identifying possible targets and producing intelligence assessments.

1962, 10 Jul

The US Naval Oceanographic Office (NAVOCEANO) superseded the Hydrographic Office, continuing its many hydrographic responsibilities.

1962, 29 Aug

Photo interpreters (PIs) at NPIC, using analysis of photos taken by a U-2 mission, discovered the presence of Soviet SAMs in Cuba, the first overt signs of a serious military threat introduced into the Western Hemisphere by the Soviet Union.

1962, Oct

Early in the crisis, the clarity or fidelity of low-level Cuban imagery was less than crisp. With the possibility of nuclear conflict ever-present, the intelligence evidence had to be definitive. Air Force Chief of Staff General Curtis Le May summoned a consultant, retired Air Force Brigadier General George W. Goddard, to clarify the situation. A key pioneer in the field of aerial photographic imagery, Goddard reviewed the imagery, and announced that the Voodoo photo-reconnaissance aircraft were fitted with the incorrect cameras for their high-speed, low-level mission. He pointed out that a shutter camera used at low-level caused blur and distortion. Goddard recommended a stereo continuous strip camera. Goddard pointed out that this camera stopped motion regardless of speed, and the results appeared in three dimensions. Aerial photography as a key tool for decision-makers reached its zenith with this intelligence victory.

1962, 16 Oct

The Cuban Missile Crisis intensified when aerial photography taken during a U-2 mission over Cuba on 14 October revealed the presence of Soviet medium-range and intermediate-range ballistic-missiles.

1962, 21 Oct

USN Light Photographic Squadron Sixty-Two (VFP-62), stationed at Cecil Field, Jacksonville, Florida, received the warning order in early October to have eight camera-ready RF-8A Crusaders (“the photo-gators”) ready to launch from Naval Air Station (NAS) Key West on short notice. The mission was to confirm the presence of Soviet offensive missiles in Cuba. Shortly thereafter, the Second Marine Aircraft Wing (2nd MAW) at USMC Air Station, Cherry Point, North Carolina received tasking to augment VFP-62 with Marine photo Crusaders.

1962, 22 Oct

In a nationally televised speech, President Kennedy announced that the US had “unmistakable evidence” of Soviet offensive missiles at several sites in Cuba. The range of the nuclear-tipped warheads on the missiles covered most of the United States.

1962, 24 Oct

A variety of Navy platforms enforced a quarantine in the waters around Cuba. This decisive action, coupled with the irrefutable photographic evidence of Soviet weaponry, provided a powerful case against Soviet intentions in Cuba.

1962, 26 Oct

On 21 October 1962, the 363rd Tactical Reconnaissance Wing deployed RF-101 (Voodoos) and RB-66 (Destroyers) aircraft to MacDill AFB in Florida from Shaw AFB in South Carolina. On 26 October, the 363rd flew its first low-level reconnaissance missions. The wing gathered significant intelligence on the sites over the next three weeks and uncovered the location of IL-28 Soviet bombers and air-to-air and surface-to-air missile sites. During this time, SAC continued U-2 missions to gather more information, maintained nearly sixty nuclear-armed heavy bombers on airborne alert, and placed all of its available intercontinental ballistic missiles on alert to launch at any moment.

1962, 27 Oct

Major Rudolf Anderson died when his U-2 reconnaissance aircraft fell victim to a surface to air missile over Cuba. Major Anderson was the only American casualty of the Cuban Missile Crisis.

1962, 28 Oct

The Cuban Missile Crisis ended when Soviet Premier Nikita Khrushchev announced that the Soviet Union would withdraw all missiles and related equipment from Cuba in exchange for a pledge from the US not to invade the island. Photo imagery and intelligence were essential in exposing the threat, in peacefully resolving the crisis, and in monitoring the withdrawal of Soviet military equipment.

1962

McDonnell RF-4B Phantom II was acquired by USN/USMC in 1963. The USN was initially not interested in the Phantom and preferred to remain with the Crusader for photo-reconnaissance. However, the USAF was planning for a night capability that the Crusader lacked, and this motivated the USN to acquire the initial buy of nine of forty-six RF-4Bs for Marine Air. USAF, USN, and USMC versions were unarmed. The nose of the fighter was replaced with reconnaissance applications. There were three camera stations. Film was developed in-flight and film cassettes were ejected at low altitude for the use of ground commanders. In 1990, Marine Air stood down the last unit of RF-4Bs.

CORONA spacecraft with a KH-4A camera blasted off carrying up to 160 pounds of film, in contrast to the thirty-nine pounds carried in the KH-3 missions.

1963

In the 1960s, the USAF took a page from the Doolittle (“30 Seconds over Tokyo”) Raid of 1942: launching Air Force aircraft from USN carrier decks. During this period, U-2s were unable to range certain remote areas due to political sensitivities of basing the U-2s in some countries. Both the CIA and the USN studied the problem of launching U-2s from carrier decks and developed Project Whale Tale, which fitted a few U-2s with arresting hooks or “tail hooks” for carrier operations.

1963

GAMBIT-1 satellites were the first US high-resolution space reconnaissance systems, and operated until 1967. They added important new close-up capability to wide-search satellites already in use, and were the first satellites to feature stereo high resolution cameras.

1963, Oct

CIA established the Satellite Photography Working Group to explore the engineering and physical limitations of satellite photography. The study arose because PIs were overwhelmed by the quantity of data being generated, and were thus finding it difficult to detect new items of interest.

1963, 22 Nov

President John F. Kennedy assassinated in Dallas, Texas

1964, 18 May

The first production reconnaissance aircraft McDonnell Douglas RF-4C Phantom II made its initial flight on 18 May 1964. The Air Force recognized the need for additional tactical reconnaissance aircraft to supplement the RF-101s in service. Almost 500 RF-4Cs were ordered over time. The unarmed platform carried three nose-mounted camera stations. In 1965, the USAF's 16th Tactical Reconnaissance Squadron was the first operational unit to deploy to Vietnam with RF-4Cs. For the next thirty years the RF-4Cs flew on combat photo-reconnaissance missions around the world. The USAF removed all RF-4Cs from the AOB in 1995.

An incident in the Gulf of Tonkin, off the coast of North Vietnam, involving North Vietnamese patrol boats and two US Navy destroyers, USS *Maddox* (DD-731), an Allen M. Sumner class, and USS *Turner Joy* (DD-951), a Forrest Sherman class, led to congressional approval of the Gulf of Tonkin Resolution, on 7 August 1964. This granted President L.B. Johnson authority to “take all necessary measures to repel any armed attack against forces of the United States and to prevent further aggression.”

1964, October

The US Air Force began using Ryan Firebee 147 series drones for reconnaissance over Vietnam.

1964

The North American RA-5C Vigilante first joined the fleet operational reconnaissance squadron RVAH-5 aboard the Forrestal class carrier USS *RANGER* (CV-61/CVA-61). Vigilante was a supersonic, long-range, all-weather, carrier-based platform. Originally designed to replace the A-3 Skywarrior in the nuclear-strike role, the reconnaissance variant served in Indochina and saw much combat. The RA-5C was replaced by the Grumman F-14 Tomcat and existing RF-8G Crusaders. Marine Air operated the RF-4B Phantom in the reconnaissance role.

1965, 8–9 Mar

Some 3,500 US Marines landed at Da Nang, South Vietnam in the first large ground deployment of US conventional combat troops in Vietnam. First ashore was Battalion Landing Team 3/9. A month earlier, US aircraft had begun a bombing campaign against North Vietnam for its support of insurrection in South Vietnam.

1965, Nov

The Naval Oceanographic Office received the mission to complete comprehensive geodetic, coastal, and harbor surveys of the coastline of South Vietnam. The United States realized only

after the first US combat troops landed in Vietnam that coastal charts for South Vietnam, based on Japanese hydrography from World War II, were unreliable, particularly in the river deltas.

1966

GAMBIT-3 (KH-8) represented an improvement over GAMBIT-1 (KH-7) by providing better image resolution in tracking adversaries' weapons development. GAMBIT-3 was a long-lived system, and completed fifty-four missions from 1966 to 1984. The most notable of GAMBIT-3 over GAMBIT-1 was the addition of a "roll joint" between the camera module and the AGENA control vehicle in the rear. The rolling joint made for a stable photo platform, conserved film, and increased the number of targets photographed. In addition, new super-thin photographic film allowed the vehicle to carry more film.

1966, 24 Jun

The National Geodetic Satellite Program, a network of satellite tracking stations, used BC-54 cameras and the Satellite Triangulation technique to photograph the Passive Geodetic Earth Orbiting Satellite (PAGEOS) balloon satellite against a star background. The first spacecraft employed by the program was the Geodetic Earth Orbiting Satellite (GEOS 1), designed exclusively for geodetic studies.

1966, Oct

All three Marine Air VMCAJs flew the Vought (LTV) F8U-1P/RF-8A Crusader. The aircraft first flew in 1956 and the last left active service with VMCAJ-1 in 1966. The platforms operated in the USMC Reserve and Naval Air Reserve until the 1970s and 1980s. F8U-1P was the unarmed photo-reconnaissance version of the F8U-1 fighter. On the photo-reconnaissance variant, the lower half of the forward fuselage was modified to enable the installation of three CAX-12 trimetrogon cameras and two K-17 vertical cameras. The aircraft achieved fame during the Cuban Missile Crisis. Florida-based RF-8As of VFP-62 flew low-level missions repeatedly on Soviet-crewed missile sites on Cuba. Both Marine Air and Naval Air operated the RF-8As over Cuba.

1965–1970

The US Navy undertook a robust refurbishing program during this period to upgrade and extend the service life of the many photo-reconnaissance Crusaders in their air inventories. These were remanufactured by Vought as the RF-8G Crusaders. A total of four new camera bays were added. The RF-8G was the longest serving member of the Crusader family.

1966, Dec

The Naval Oceanographic Office established a branch office in Saigon as part of its mission to gather the information necessary to produce accurate charts. The office provided updated

nautical charts and publications for use by USN, USCG, and USMC units in their interdiction efforts along coastal southern Vietnam as well as naval air support actions.

1967

The U-2 underwent a major modification in 1967 when the U-2R was introduced. Its 103-foot wingspan was twenty-three feet wider than earlier U-2 models and it had a more powerful engine. U-2R significantly expanded the U-2's range and endurance. The U-2's name changed on a number of occasions to reflect its shifting roles. NASA referred to the U-2 as the ER-2, which stood for Earth Resources, scientific research. Late in the Cold War (1945–1991), the U-2s based in Europe were referred to as TR-1s; TR stood for tactical reconnaissance, as some NATO allies wanted the platform to reflect a tactical ground support role and to ease concerns in some European nations about “spy planes” based within their countries. Lockheed made 104 U-2s of all types from 1955 to 1989, including two for NASA. More than twenty years after the conclusion of the Cold War, the U-2 continues to fly and serve.

1967

US troops deployed in Vietnam drew upon photographic analysis from NPIC and ACIC in St. Louis for battle damage assessment (BDA), identification of possible targets, penetration of enemy defenses, and numerous other intelligence assessments.

1967

The Naval Hydrographic Office completed comprehensive geodetic, coastal, and harbor surveys of the US coastline, providing updated nautical charts and publications for use by the USCG, USN, and USMC.

1967, 31 May

The SR-71, a new high-speed, high altitude reconnaissance aircraft flown by the CIA, began operational sorties over North Vietnam to provide photographic imagery for analysts in St. Louis, to determine the exact coordinates of targets.

1967, 5 Jun

Following the closure of Egypt's Suez Canal to Israeli shipping, the blockade of the Strait of Tiran, and the withdrawal in mid-May of US troops from Sinai and Gaza, Israel launched a series of devastating air strikes on Egyptian air bases. The attacks became the first combat action of the “Six Day War,” in which Israeli military strategy, tactics, and equipment overwhelmed the forces of Egypt, Jordan, and Syria.

1967, Jun–Jul

Imagery obtained from overflights provided enough evidence for analysts to conclude that no surface-to-surface missiles had been deployed in North Vietnam.

1967, 1 Jul

The Committee on Imagery Requirements and Exploitation (COMIREX) superseded the Committee on Overhead Reconnaissance, assumed the responsibility for gathering requests for target coverage from the Intelligence Community (IC), determined collection priorities, and handled day-to-day operations of imagery reconnaissance systems.

1967, 28 Jul

The US Army incorporated its topographic sciences—mapping, geodesy, and military geographic information, formerly administered by its Engineer Topographic Laboratories—into its Geodesy, Intelligence and Mapping Research and Development Agency (GIMRADA).

1967, Sep

The CORONA (KH-4B) launched with the capability of taking photographs of the Earth's surface at a resolution to approximately six feet.

1968, Feb

Communist forces, both North Vietnamese regulars and Viet Cong irregulars, attacked across South Vietnam under cover of the Vietnamese lunar new year holiday of Tet. While Communist forces were soundly defeated, the perception of a US defeat emerged among the American public.

1968, 20 Aug

Soviet and other Warsaw Pact military forces invaded Czechoslovakia to put an end to Czechoslovak leader Alexander Dubcek's reformist "socialism with a human face," thereby ending the so-called "Prague Spring." Imagery returned from CORONA film buckets had shown "unmistakable Soviet preparations for invasion."

1968, 1 Sep

The US Army established the US Army Topographic Command, which included the Engineer Topographic Laboratories as a subordinate command.

1969

US Army Aviation began operating the Bell OH-58 Kiowa Warrior. A scout helicopter, it was originally designed as a light observation helicopter and continues to serve as an observation and armed reconnaissance rotary-wing aircraft.

1969

Former IBM employees founded M&S Computing, later known as Intergraph, with a focus on mapping and engineering.

1969, Mar

Secretary of Defense Melvin Laird introduced Safeguard, a system to protect the land-based missile force—the ICBMs stored in underground missile silos in Nebraska, Wyoming, the Dakotas, Missouri, Kansas, and Arkansas—from a Soviet first strike.

1969, 20 Jul

The Apollo 11 mission to the moon used charts and graphics from Missouri's ACIC in planning and executing the voyage, determining lunar orbits, and finding landing sites, making possible man's first walk on the moon.

1969

AMS established the Satellite Survey Branch, thus creating an organizational identity for the BC-54 camera survey teams that had previously worked out of the Surveys Division, Department of Geodesy.

1970

As demands for targeting information grew in Vietnam, ACIC deployed a new targeting system database, the Point Positioning Database (PPDB), which enabled attacking US and allied aviators to strike targets more accurately while evading North Vietnamese air defenses.

1971, 15 Jun

The launch of the HEXAGON (KH-9) photo-reconnaissance satellite marked a new generation of technology that used a wider array of sensors, improved spatial resolution, and four film "buckets." KH-9 was the largest and last satellites to return photographic film to Earth. From 1971 to 1984, nineteen HEXAGON missions imaged 187 million square miles of the Earth's surface. Objects smaller than two feet across could be imaged from about eighty to a hundred miles altitude.

1972, 1 Jan

The Defense Mapping Agency (DMA) began operations as a DoD entity, consolidating multiple mapping agencies and assuming responsibility for producing and distributing maps, charts, and geodetic products and services to the combat services, federal agencies, Merchant Marine, and mariners in general.

1972, 25–31 May

The launch of the 145th and final mission of CORONA took place, with the 165th and final film recovery occurring on the 31 May.

1972, 23 Jul

The ERTS-1 satellite (originally Earth Resources Technology Satellites, then renamed Landsat 1) was launched. This collaborative project between NASA and the Interior Department's USGS carried equipment that obtained visible and near-infrared photographic imagery of the Earth. It provided the only source of historical imagery for many parts of the world, making it invaluable in recent studies of changes in the Earth's surface.

1973, 23 Jan

The United States, South Vietnam, and North Vietnam signed the Paris Peace Accords, which ended US combat operations in Vietnam. A cease-fire went into effect on 28 January, and US military units departed South Vietnam two months later.

1973, 14 May

With support from DMA's Aerospace Center (DMAAC, formerly ACIC), NASA launched Skylab, the first US space station in orbit and DMA's first joint venture into space. Skylab-DMAAC created hundreds of cartographic products to support the mission, including graphics for recovery and science site graphics for various experiments. Skylab itself was a hundred-ton assemblage that featured an eighty-nine-foot long workstation with living and work quarters for the crew during extended stays in space.

1973, May

The Special Mission Tracking Program (SMTP) began, with field operations at eleven remote tracking stations around the world, tracking satellites to obtain atmospheric observational data in support of scientific space operations.

1974

The C-12 Huron is a militarized version of Beechcraft's Super King Air. The twin-engine turboprop is used by all of the US Armed Forces. . RC-12 X, RC-12N Guardrail, and RC-12G Crazy Horse are operated by Army Aviation as tactical ISR collectors. The intelligence,

surveillance, and reconnaissance (ISR) variant of the C-12 employed in 2013 is designated MC-12 Liberty and operated by the USAF.

1974, Nov

The Defense Dissemination Program Office (DDPO), established as a command within the USAF, provided the first electronic dissemination of national digital imagery, affording the functional and geographical US Combatant Commanders (COCOMs) nearly instantaneous access to high quality overhead imagery to assist in rapid targeting and assessment of strategic threats. The DDPO performed its classified mission at the Space and Missile Systems Center at Los Angeles Air Force Base.

1975

The conflict in Vietnam required production of more than 300 million topographic maps and charts. Teams from DMA Aerospace Center in St. Louis deployed to the theater to support the first field-based digital mapping, charting, and geodesy product, the Point Positioning Data Base.

1975

DMAAC began support to the cruise missile program through the production of the digital data necessary to develop the navigation system used to guide the cruise missile. By 1977, DMAAC had five products in development: Terrain Contour Matching (TERCOM) reference scenes, used by cruise missiles to update their inertial navigation systems; Digital Scene Matching Area Correlation (DSMAC), used to provide additional accuracy; Point Positioning Data Bases (PPDB); Digital Terrain Elevation Data (DTED); and Vertical Obstruction Data (VOD).

1975, 15–24 Jul

The United States and the Soviet Union cooperated in the Apollo/Soyuz Test Project, during which NASA, supported by DMAAC, docked an Apollo Command Module with the Soviet Soyuz spacecraft. The cooperative venture served as a symbol of the policy of détente (relaxing of tensions) between the two superpower adversaries in the Cold War.

1975, Dec

The University of Texas at Austin's Applied Research Labs completed development of the Bottom Topography Survey Subsystem (BOTOSS), the sonar subsystem of the Bathymetric Survey System.

1976

The US Naval Oceanographic Office relocated to the National Space Technology Laboratories (later renamed the John C. Stennis Space Center) in Hancock County, Mississippi, where it continued its functions in mapping, charting, and geodetic production under the DMA.

1976, Feb

NPIC exploited U-2 imagery over Guatemala to assess the damage caused by an earthquake. It was the first time high-resolution imagery of a foreign natural disaster was made available to the affected nation in time to be useful in support of disaster relief.

1977

DMA completed construction of a new secure production wing at the Aerospace Center in St. Louis.

1978, Sep

DMA's Hydrographic Center and Topographic Center merged, and the Hydrographic Center relocated to Bethesda, Maryland under the name DMA Hydrographic/Topographic Center (HTC), which provided mapping, charting, and geodetic products with increased efficiency in production and flexibility of operations.

1979, Feb

DMA introduced its first simulation product, the Digital Land Mass Simulation (DLMS) system.

1979

The Digital Aeronautical Information File became available to military customers. Originally developed by DMACC, it consisted of a series of files with information on airports, navigational aids, airspace, and relevant information on flying anywhere in the world.

1980

Intergraph, formerly M&S Computing, released the first computer graphics terminal to use raster technology. The dual 1280 x 1024 pixel displays established the industry standard for high-resolution presentation.

1980, 7 Mar

DMA's AGS headquarters began relocation from Panama to San Antonio, Texas, completing the move on 18 January 1982. The relocation occurred because of the pending Panama Canal Treaty, signed 4 September 1977, which progressively turned sovereignty of the canal over to the Panamanian government. The IAGS Cartographic School remained in Panama until 1989

1981, 12 Apr

NASA launched *COLUMBIA*, its first orbital flight (STS-1) of the Space Shuttle program. Orbiter Vehicle-102 (OV-102) launched from Florida and was recovered in California.

1982

ESRI, a privately held firm founded as Environmental Systems Research Institute in 1969, launched its first commercial GIS software, called ARC/INFO, to run on minicomputers.

1982, Feb

Under direction from Dr. Richard DeLaurer, Undersecretary of Defense for Research and Engineering, DMA began implementation of the Hermann Panel Report, which recommended that DMA expedite development of a modernized production line that accommodated digital softcopy source materials and used digital, time-responsive processing.

1982, Feb

DMA established the Special Program Office for Exploitation Modernization (SPOEM), a single organization with a single senior manager accountable for all acquisition and development of the Digital Production System (DPS).

1983, 1 Sep

A Soviet fighter aircraft shot down civilian passenger airliner Korean Air Line (KAL) Flight 007, which had strayed into Soviet territory, killing all 269 people on board. To avoid such navigational errors in the future, President Reagan announced that the United States would make available the Global Positioning System (GPS), under development by the DoD, for international civilian use once the system became operational.

1983, Dec

The US Air Force's GRYPHON, a land-attack nuclear-tipped missile also called the Ground Launched Cruise Missile (GLCM), became operational. DMA had begun support of the cruise missile in the mid-1970s.

1984

Intergraph introduced the InterPro, a 32-bit standalone workstation with 2 MB memory, a 26-MB hard disk, and a 1.6 MB floppy drive.

1985, 19 Apr

DMA became the first DoD agency to win the Defense Joint Meritorious Unit Award.

1986

ESRI released PC ARC/INFO, a stand-alone PC-based GIS station.

1986, Feb

France launched its first commercial SPOT satellite, a precursor to its HELIOS intelligence-gathering system.

1986

The Space Shuttle *Challenger* exploded, killing all aboard.

1987, Jan

DMA established the Systems Center to perform the research, development, and engineering for the creation of a single digital production line for all its maps.

1987

The headquarters of DMA moved from the Naval Observatory in Washington to Merrifield, Virginia. This building became the first headquarters of NIMA.

1987

DoD formally requested the Department of Transportation (DOT) to establish and provide an office to respond to civil users' needs and to work closely with the DoD to ensure proper implementation of GPS for civil use. Two years later, the US Coast Guard, an integral part of the DOT, became the lead agency for this project.

1987

DMA provided the first liaison officer to the Strategic Air Command and Joint Strategic Target Planning Staff at Omaha, Nebraska.

1987

Culminating work sponsored by the DoD and begun over two decades earlier (WGS 60), the World Geodetic System 84 (WGS 84) became the world standard to define the exact size and shape of the Earth. NASA's space flight program and the DoD both adopted the final published report on WGS 84.

1987

The NavStar GPS, a space-based, radio-positioning technology, became operational using the WGS 84 database to provide accurate and continuous data on position, velocity, and time under all weather conditions.

1988

Intergraph introduced the industry's first 27-inch, 2-megapixel display.

1988, 16 Feb

The DMA's Reston Center (DMARC) opened as the agency's third production center and the first facility housing the Digital Production System, which provided an increased volume in mapping, charting, and geodetic products furnished by the agency.

1989

The IAGS, founded in 1946 with headquarters in the then-Panama Canal Zone, came under DMA in 1972, and moved its headquarters to Ft. Sam Houston, Texas in 1980. In 1989, it was disestablished and became a DMA staff element.

1989, 2 May

Communist Hungary's border officials began dismantling all barbed wire fences and other barriers between their country and Austria; large numbers of citizens from the German Democratic Republic (DDR/East Germany) crossed the Hungarian frontier to Austria, anticipating the fall of the Berlin Wall in November 1989.

1989, 30 Sep

The DoD transferred the DMA Inter-American Geodetic Survey (DMAIAGS) from San Antonio, Texas to Bethesda, Maryland, putting it under the operational control of the DMA Hydrographic/Topographic Center (HTC). DMAIAGS continued to support Latin American nations.

1989, 9 Nov

Leaders of the German Democratic Republic announced unrestricted travel to and from West Germany, effectively opening the Berlin Wall and ending, for practical purposes, the physical division of Germany between East and West.

1990, 16 Jul

Photo analysts at NPIC studying satellite imagery observed that literally overnight, an empty desert in southern Iraq had become crowded with Soviet-made tanks and a division of the Iraqi Republican Guard.

1990, 24 Jul

CIA leaders presented President George H. W. Bush with photographic evidence of Iraqi movements in the desert near Kuwait.

1990, 25–30 Jul

NPIC analysts examined imagery showing that three Iraqi Republican Guard divisions had moved into southern Iraq, and the division normally stationed in the south had moved closer to the Kuwaiti border.

1990, 2 Aug

Mechanized infantry and armored units of the Iraqi Republican Guard invaded Kuwait and seized control of the small country. In response to the Iraqi invasion of Kuwait, DMA activated Emergency Operation Centers (EOCs) to provide support for mission planning during OPERATIONS DESERT SHIELD and DESERT STORM.

1990, 7 Aug

US forces began deployment to the Middle East in OPERATION DESERT SHIELD to deter a possible Iraqi invasion of Kuwait's neighbor, Saudi Arabia.

1991, 17 Jan

OPERATION DESERT STORM in Iraq began with predawn bombing strikes on targets in Baghdad and other key locations. Imagery played a key part in intelligence support for the air war. NPIC, DIA, and military interpretation centers in the United States participated in interpreting the imagery. During the operations, DMA produced approximately 35 million maps to support the buildup of coalition forces, in addition to customized individual and digital products prepared for combat troops.

1991, 22 Feb

The ground campaign of OPERATION DESERT STORM succeeded in forcing Iraqi troops out of Kuwait. On 3 March, Iraq accepted a cease-fire agreement, ending the conflict.

1990–1991

OPERATIONS DESERT SHIELD and DESERT STORM provided the first look at an Unmanned Aerial Vehicle (UAV) fleet that spanned all of the US military.

1992

ESRI released ArcView, an affordable, easy-to-learn desktop mapping tool, and ArcData Program, designed to promote the publishing of commercial off-the-shelf high-quality data sets to help users quickly build and grow their GIS applications.

1992, 24 March

Thirty-four countries sign the Open Skies Treaty in Helsinki, Finland. The agreement took effect on 1 January 2002. The provisions permitted limited overhead surveillance of the signatory countries to confirm the fulfillment of treaty obligations.

1992, Apr

The Director of Central Intelligence (DCI), Robert Gates, established a panel to examine the structure guiding the IC's imagery assets; chaired by Robert Burnett and composed of active and retired senior military officers, it recommended that imagery and mapping be integrated within a single agency. This idea had been proposed by Keith Hall, Deputy Assistant Secretary of Defense for Intelligence and Security. Army General Colin Powell, CJCS, rejected the proposal.

1992, 6 May

DoD established the Central Imagery Office (CIO), a combat support agency, created as the focal point for imagery within DoD and the IC. CIO consolidated imagery support for the DCI and the defense communities, replacing the Committee on Imagery Requirements and Exploitation (COMIREX, 1967), and the Committee on Overhead Reconnaissance (COMOR, 1960). William Lackman served as the first director.

1992, 18 Sep

Deputy Defense Secretary Donald Atwood announced to the public the existence of the previously secret agency, the NRO. The announcement came on the forty-fifth anniversary of the founding of the USAF and CIA, the two organizations most directly involved in the NRO's operations.

1992, Nov

DMA delivered full operational capability of the Digital Production System after ten years of work to modernize all its production processes.

1993, 26 Jun

USAF launched the 24th Navstar satellite into orbit, completing a constellation of twenty-four satellites known as GPS. This system, accessible to civilians free of charge, located every position on the globe and had its origin in a military initiative to develop an application for targeting missiles.

1993, Apr–Aug

Deluged with unprecedented rains in April that lasted throughout the summer, the Mississippi and Missouri Rivers and their tributaries flooded vast areas of the Midwest, from southwest Minnesota to the lower Missouri River, spilling over banks and rupturing levees. Floodwaters covered about 320,000 square miles, causing the worst flood disaster in seventy-five years and, in some measures, exceeding the record flooding of the Great Mississippi Flood of 1927, the largest previous flood on record for the Midwest. In July, DMA employees at the South Annex of DMAAC filled sandbags in an effort to hold back the rising River des Peres. The floodwall around the building broke. The cleanup and repair of the DMA facility forced personnel to relocate.

1993, 1 Oct

The Office of Imagery Analysis (OIA), organized within the CIA in 1976, merged with NPIC.

1993

The DMA site in Herndon, Virginia closed. Personnel at the site operating the GPS functions of satellite tracking, equipment maintenance, receiver equipment testing, and evaluation and supply relocated to the DMA's Hydrographic/Topographic Center in Bethesda, Maryland. The Herndon site had opened in 1964 and expanded its personnel in 1981 to staff monitoring stations for GPS.

1993

The Special Mission Tracking Program (SMTP) ended. All electronic maintenance had been transferred to the DMA Systems Center in 1987.

1994, 30 Sep

DMA's Louisville Office closed; for forty-three years it had been a component of a succession of mapping organizations.

1995, Jan

Production of Digital Point Positioning Database (DPPDB) became available to deployed DoD personnel, providing a stereo image-based product to support mission planning, targeting, and weaponeering, and especially to provide target orientation to aircraft that used radar navigational systems. The DMA Hydrographic/Topographic Center (DMAHTC) in Maryland and DMAAC in St. Louis had developed DPPDB to replace the film-based Point Positioning Database (PPDB) developed in 1970.

1995, 24 Feb

President William J. Clinton signed an Executive Order directing the declassification of early satellite imagery from the CORONA, ARGON, and LANYARD systems. This order declassified more than 800,000 satellite images collected between 1960 and 1972, making them available to the public to assist in environmental studies and other civilian applications.

1995, 25 Apr

In Senate confirmation hearings for the position of DCI, recently vacated by James Woolsey, nominee Dr. John Deutch testified that he would “move immediately to consolidate the management of all imagery collection, analysis, and distribution” in a new agency “to assure that all our imagery efforts are brought together in one coherent way to serve the needs of the military commander.” He proposed to consolidate all military and civilian offices that analyzed and distributed data identifying geographic locations.

1995, 2 Jun

Air Force Captain Scott F. O’Grady ejected over Bosnia when Serbian fire struck his F-16 aircraft while he was patrolling the no-fly zone. For six days he ate little, avoided Serb patrols, and tried to contact the NATO combat force. He was rescued on 8 June by United States Marines of the 24th Marine Expeditionary Unit (MEU) aboard the Wasp class amphibious assault ship USS *KEARSARGE* (LHD-3). His rescue depended on the portable radio receiver contained in his life vest and tuned to the GPS constellation of twenty-four satellites. O’Grady was able to determine his position behind enemy lines—longitude, latitude, and altitude—to within a few hundred feet, and he was then able to signal that position to the Air Force aviators overhead and to the Marines who rescued him. O’Grady publicly gave credit to DMA and its Escape and Evasion Chart for his success in avoiding potentially hostile surroundings.

1995

DCI John Deutch named Navy Admiral Dennis Blair to implement the concept of bringing all imagery assets together. Blair established the National Imagery Agency Steering Group, which chartered an NIA Task Force chair by Evan Hineman.

1995, 17 Sep

The USAF announced that the GPS satellite system had met all qualifications for full Initial Operational Capability (IOC). Later that year the government made GPS available for worldwide civilian use, free of charge.

1995, 27 Nov

Secretary of Defense William Perry, DCI John Deutch, and Army General John Shalikashvili, CJCS, sent a joint letter to Congress affirming their mutual commitment to create a new “single agency within the Department of Defense,” designated as the National Imagery and Mapping Agency (NIMA). The new agency would “improve the overall effectiveness and efficiency of imagery and mapping support to both national and military customers.”

1995, 28 Nov

Navy Rear Admiral Joseph “Jack” Dantone, Jr. was announced as Director-designate of the proposed NIMA, with three deputies: Dr. Annette Krygiel from CIO, Leo Hazlewood from CIA, and W. Douglas Smith from DMA.

1995, Nov

A technical team from DMA and the US Army Topographic Engineer Center provided support at negotiations in Dayton, Ohio (Wright-Patterson AFB), where Serb, Croat, and Bosnian representatives met to negotiate an end to ethnic discord and violence in the former Yugoslavia. The technical team’s digital representations of the disputed areas in the Balkans included terrain visualization and cultural and economic data, which allowed the diplomats to “see” in explicit detail the areas under discussion and thus helped them reach an accord.

1995, 5 Dec

The implementation team charged with establishing the newly proposed NIMA met for the first time at the DMA headquarters in Merrifield, Virginia. Drawing on personnel from each of the proposed participating agencies, the team formed eight working groups to develop a structure for the new organization and to identify and address major issues.

1996, 29 Mar

DARKSTAR first flew on 29 March 1996. In the 1990s, the USAF integrated various ISR systems into one interconnected “system of systems.”

1996, 15 Apr

Congress received the implementation plan for the proposed NIMA.

1996, 16 May

Rear Admiral (U/H) John J. Dantone, Jr., USN, assumed directorship of DMA upon the retirement of Major General Philip W. Nuber, USAF, and in anticipation of DMA's inclusion in the pending NIMA.

1996, 1 Oct

NIMA, authorized by Congress's passage of the DoD authorization bill for fiscal year 1997, integrated into one agency the services of mapping, charting, imagery, and geospatial information to a wide range of customers, including the Armed Forces and the government. NIMA's creation brought together the DMA, the CIO, the DDPO, and NPIC, as well as elements of the DIA, the NRO, the Defense Airborne Reconnaissance Office, and smaller contingents from the research and development section within the CIA's Directorate of Science and Technology. Rear Admiral John J. Dantone, Jr., the Director of DMA, became Acting Director of NIMA.

1996

NIMA helped create Earth Gravity Model 96 (EGM 96), part of the enhancement done to the World Geodetic System (WGS 84). An international endeavor, the effort included cooperation with NASA/Goddard Space Flight Center, Ohio State University, and scientists around the world. The new model improved accuracy in GPS readings, determination of satellite orbits, and measurements collected by geodetic satellites, all of which were factors in making navigation and targeting more accurate.

1997

NIMA and Federal Emergency Management Agency (FEMA) implemented a new damage classification system with standards for wind damage, earthquakes, and flooding.

1997

Intergraph introduced the industry's first single and dual Pentium II workstations and the first workstations to feature Macintosh compatibility. The new monitor featured HDTV standard format at high resolution.

1997, Jul

Flooding in Poland was the worst in Europe in a century and prompted the Polish government to request assistance from the United States. NIMA provided eleven maps to help assess the extent of the damage.

1997, Sep–Dec

Wildfires in Indonesia prompted assistance from the United States; NIMA produced seventy-eight imagery-derived maps covering a total of 13 million acres, helping Indonesian authorities and reserve units from the US military deployed to the area to assist in suppressing the fires.

1998, Feb–Sep

NIMA's headquarters moved from Fairfax, Virginia to Bethesda, Maryland, to consolidate the work force and to reduce operating costs.

1998, 1 Apr

The Defense Logistics Agency (DLA) assumed responsibility for managing supply and distribution of hardcopy maps and disc-formatted materials, formerly supervised by NIMA. Management of supply relocated from Bethesda, Maryland to Richmond, Virginia, and of distribution from Philadelphia, Pennsylvania to Richmond. NIMA remained the source for production, and DLA became the distributor to DoD customers, thereby increasing efficiency.

1998, 27 Sep

NIMA opened its Arnold Facility in Jefferson County, Missouri, housing a computer-to-plate printing plant, remote and CD-ROM replication activities, a digital scanning and conversion facility, and a Customer Help Desk.

1998, Oct

NIMA participated in the Arctic Gravity Project (ArcGP), born at the International Conference of Arctic Margins in Celle, Germany, where the NIMA representative took the lead in a multinational undertaking. The goal of the project was to standardize all the gravity data available for the Arctic region and to create a uniform gravity grid for the area. The applications for this were numerous, from more accurate satellite orbiting to more insight into the tectonics dynamics of the region, to enhancement in weapons accuracy requirements and targeting.

1998, 26 Oct

NIMA created maps and image products to support negotiations over a disputed boundary track between Ecuador and Peru.

1998, 29 Oct

Army Major General James C. King, Acting Director of NIMA since March 1998, became the first Director of NIMA upon his promotion to lieutenant general. DCI George J. Tenet officiated at a ceremony marking the occasion.

1998, 16–19 Dec

In OPERATION DESERT FOX in Iraq, Anglo-American air units bombed Baghdad in a punitive mission after Iraq's refusal to comply with a UN order mandating inspection of weapons of mass destruction (WMD). NIMA products supported mission planning and included digital terrain data over Iraq.

1999, 26–27 Jan

NIMA supported the US Secret Service and other law enforcement agencies in providing security for Pope John Paul II during his visit to St. Louis, Missouri.

1999, 24 Mar

NIMA supported the NATO-led OPERATION ALLIED FORCE in Kosovo with maps, navigational support, imagery-derived products, and intelligence briefings for US military personnel from the US and the other nineteen countries supporting NATO action. RQ-5 HUNTER UAV deployed with the US Army to the former Yugoslavia to support NATO operations in Bosnia. Its payload was an electro-optical and infrared package.

1999, Mar

NIMA developed its Mobile Integrated Geospatial-Intelligence System (MIGS), a mobile, fully self-sustaining suite of equipment, life support, and transportation that, because it was mounted on a "Humvee," enabled NIMA personnel to move with the troops, unpack, and set up within two hours to provide tailored geospatial intelligence. The MIGS carried its own power generator and supported three work stations fully equipped with all the capabilities of a geospatial intelligence exploitation system.

1999, 14 May

Peru and Ecuador laid a ceremonial boundary stone in a disputed area of the Amazon jungle as a result of NIMA's provision of precise maps that helped resolve the long-standing border dispute between the two nations.

1999, 26 Jul

Introduction of the Navigation Safety System (NSS) marked another stage in NIMA's effort to convert all navigational information from hardcopy to digital form. The NSS governed the production of all the agency's navigational publications. It also provided access to sailors around the world through the Marine Navigation Department website and the Navigation Information Network Service (NAVINFONET). NSS supported all the maritime safety information databases, ensuring protection of life at sea and property.

1999, 30 Jul

NIMA received the Joint Meritorious Unit Award, presented by DoD in recognition of the NIMA's outstanding service from 1 October 1996, to 25 July 1999. During this period, NIMA supported operations in Bosnia, Iraq, Afghanistan, Sudan, Kosovo, and Serbia. Simultaneously, NIMA provided imagery and geospatial information to military customers abroad and to federal authorities working towards national security objectives.

1999, 31 Jul

NIMA activated the National Exploitation System (NES) to replace earlier products, including the DIA's Advanced Imagery Requirements and Exploitation System (AIRES) Life Extension System and NIMA's National Data System (NDS). NES gave imagery and intelligence analysts a tool for exploiting and reporting on imagery.

1999, 2 Aug

NIMA released fifty-nine imagery derived products (IDPs) to support researchers studying the impact of global warming on the polar ice caps. The research program Surface Heat Budget of the Arctic (SHEBA), a joint project involving collaboration among the United States, Japan, and Canada, planned to use the IDPs in conjunction with field data.

1999, 24 Sep

Space Imaging, a privately held company, launched IKONOS, the world's first Earth imaging commercial satellite with one-meter resolution.

1999

The product NIMA-in-a-Box became available, a combination of hardware (a Pentium II notebook computer) and software that allowed NIMA to provide imagery and geospatial

information on the spot to deployed military units. Two configurations were used in OPERATION ALLIED FORCE in Kosovo.

1999

The Predator drone began operations in the Balkans

1999

Congress requested that the DCI and the Secretary of Defense form a commission to review NIMA.

21st Century

2000, 11 Feb

The Shuttle Radar Topography Mission (SRTM), a joint effort between NIMA and NASA undertaken from Space Shuttle Endeavour, acquired elevation data over about eighty percent of the Earth's surface, on which ninety-five percent of the population lives, using the technique known as interferometric synthetic aperture radar. NIMA used this topographical data for multiple applications, from targeting and navigation to geological and environmental purposes.

2000, Jun

The National Joint Imagery Training Facility (NJITF) opened as part of the National Imagery and Mapping College, providing state-of-the-art classrooms with student workstations and teleconferencing capabilities and offering training in imagery collection and imagery analysis.

2000, Jul

NIMA's National Information Library (NIL) opened as an archive for digital imagery. It increased archival storage and capabilities and exported imagery directly to the customer's workstation.

2000, 29 Sep

NIMA introduced the National Imagery Exploitation System (NIES) to replace the Imagery Data Exploitation (IDEX II) system. NIES enhanced the capabilities of system and of geospatial production tools and, as part of the United States Imagery and Geospatial Information Service (USIGS), provided more accurate and timely imagery and geospatial intelligence to the warfighter.

2000, 12 Oct

While refueling in Aden Harbor, Yemen, an Arleigh Burke class guided-missile destroyer, USS *COLE*, (DDG-67) was attacked by an al-Qaeda terrorist cell. *COLE* was attacked with explosives at port mid-ships by small boat bombers, which led to a 40 foot x 60 foot hole, the deaths of seventeen sailors, and the wounding of thirty-nine others.

2001

NIMA, USGS, and the Federal Geographic Data Committee (FGDC) jointly formed the National Coalition for Geospatial Assurance to guarantee the availability of the geospatial information in support of homeland security efforts.

2001

NIMA's work for the Shuttle Radar Topography Mission (SRTM), which flew aboard the Space Shuttle *Endeavour* in February 2000, garnered the agency and its partners the Aviation Week and Space Technology Award.

2001, Jan

NIMA established the new Maritime Safety Information Center to oversee the agency's maritime safety and hydrographic activities. In supporting the agency's customers and its mission to guarantee navigation safety, the Center collected, evaluated, stored, and provided access to products from around the world, including databases that aided navigation.

2001, 20 Jan

NIMA supported the Presidential Inauguration by providing near-real-time "situational awareness" information to the military, Secret Service, and the FBI through the combination of commercial maps, aerial photography, and imagery. Local and federal law enforcement professionals received both hardcopy and interactive maps from NIMA.

2001, 23 Mar

NIMA monitored the crash of the Russian space station *MIR* into the South Atlantic space junk graveyard, and transmitted nautical and aeronautical warnings to its customers. NIMA distributed its hydrographic warnings for the Pacific and Indian Oceans (HYDROPACs) and Notices to Airmen (NOTAMs) through online databases and network broadcasts to allow avoidance of any collision between ships or aircraft with *MIR*'s falling debris.

2001, 29 Mar

NIMA established its Office of Americas to provide integrated imagery and geospatial information for the area from the Canadian Arctic to Tierra del Fuego in South America. The office addressed national security, mission planning, exercises and training, counternarcotic operations, disaster relief, and humanitarian assistance.

2001, 8 Jun

In collaboration with NASA's Jet Propulsion Laboratory (JPL) and Earth Data International, NIMA unveiled a new radar system, Geographic Synthetic Aperture Radar (GeoSAR). The dual-frequency radar, housed in a Gulfstream-II aircraft, was capable of mapping the Earth underneath foliage and other vegetation. The resulting three-dimensional terrain models were used for mission planning, environmental protection, and other geographic applications.

2001, 8 Aug

Lieutenant General James R. Clapper, Jr., USAF (Ret.), was named to succeed Army Lieutenant General James C. King as NIMA Director upon General King's retirement.

2001, 11 Sep

Two hijacked commercial airliners flew into the World Trade Center Twin Towers in New York City, which caused the buildings to collapse, killed thousands of people, and shocked the world. Almost simultaneously, another hijacked airliner crashed into the Pentagon in Arlington, Virginia, killing more than 120 people and injuring scores. A fourth plane was forced to crash land in rural Shanksville, Pennsylvania by passengers who overpowered the hijackers. The hijackers were determined to be Islamic terrorists and members of Usamah-bin-Ladin's (UBL) Al Qaeda (AQ) organization.

2001, 12 Sep

NIMA activated a North America and Homeland Security Division by joining a small number of analysts from the Office of Americas with an analytic staff that had long supported the agency's responsibilities for disaster readiness, response, and recovery.

2001, 13 Sep

Lieutenant General James R. Clapper, Jr., USAF (Ret.), took command of NIMA without any formal ceremony, given the events of 9/11.

2001, 7 Oct

OPERATION ENDURING FREEDOM (OEF) began when a multinational coalition invaded Afghanistan, which was controlled by the Taliban, a group of radical Islamists who provided sanctuary for AQ, led by UBL. President George W. Bush described the goals of the military incursion in a speech on 20 September as “the destruction of terrorist training camps and infrastructure within Afghanistan, the capture of al Qaeda leaders, and the cessation of terrorist activities in Afghanistan.”

2001, Oct

NIMA Director Clapper formed NIMA Support Teams (NSTs), and reorganized the agency around a focus on “Now, Next, and After Next.”

2001, 1 Oct

DoD established US Northern Command (USNORTHCOM) to provide command and control of DoD homeland defense efforts, and to coordinate defense support of civil authorities. NIMA placed an NST within NORTHCOM.

2001, 8 Oct

President Bush appointed Pennsylvania Governor Tom Ridge as the first chief of the newly created Office of Homeland Security. Ridge formally resigned as Pennsylvania's forty-third governor on 5 October 2001.

2001, 18 Oct

DigitalGlobe's QuickBird satellite launched from California's Vandenberg AFB. QuickBird offered sub-meter resolution imagery, industry-leading geolocational accuracy to within twenty-three meters, on-board data storage, and sufficient fuel for seven years.

2002, 8–24 Feb

The Winter Olympics NIMA Support Team deployed to Salt Lake City, Utah in late January, and provided counterterrorism support to the Olympic Intelligence Center throughout the Winter Games.

2002, Jul

NGA began a partnership with the USGS to provide comprehensive geospatial information in support of homeland security.

2002, 16 Sep

NIMA established the National Center for Geospatial Intelligence Standards (NCGIS) to address issues related to developing standards for technologies, data architecture, and software tools to achieve interoperability.

2002, 20 Sep

NIMA hosted a conference at the University of Maryland University College (UMUC) on the declassification and release to the public of the imagery from the satellite systems KH-7 and KH-9.

2002, 25 Nov

President Bush signed the Homeland Security Act of 2002 and created the Cabinet-level Department of Homeland Security (DHS). He nominated former Pennsylvania Governor Tom Ridge, who had served as director of the White House Office of Homeland Security, to lead the new department.

2002 – 2004

Global Hawk deployed for use by CENTCOM.

2003

The RQ-11B RAVEN UAV was introduced into the US defense inventory in 2003. With more than 19,000 units made, it is the world's most-used UAV. It is capable of providing twenty-four-hour ISR. It is operated by the Army, Marines, and Air Force, as well as international forces. It is a small, hand-launched, electric motor-powered, remote-controlled UAV. The range is about six miles and the payload can include an infrared night vision camera. Its weight is slightly more than four pounds.

2003, 1 Feb

When the *COLUMBIA* Space Shuttle disintegrated during re-entry, NIMA helped locate debris over an area more than 10,000 miles long. NIMA analysts produced custom products for NASA, FEMA, and other local, state, and national agencies working in the recovery operations.

2003, Mar

For the first time in its history, NIMA deployed its most senior military officer, Air Force Brigadier General Mike Lee, to oversee NIMA support to the CENTCOM area of operations.

2003, Mar

General Clapper established the Strategic Transformation Office (T) at NIMA to provide single-point accountability for agency-wide activities involving strategic objectives.

2003, 17 Mar

United States and its allies launched OPERATION IRAQI FREEDOM (OIF) with air strikes on Iraq.

2003, 19 Mar

NSTs deployed to OIF in support of combat forces with customized systems such as the Mobile Integrated Geospatial Intelligence Systems and the NIMA Deployable Communication System (NDCS). On-site NIMA analysts worked directly with troops in the field to produce products tailored to their needs.

2003, 13 May

US Commercial Remote Sensing Space Policy charged NIMA with key responsibilities for commercial remote sensing from space as it applied to national security and foreign policy.

2003

NIMA established the Source Operations and Management Directorate (S), responsible for acquiring, managing, and delivering imagery and other source data and information to the National System for Geospatial Intelligence (NSGI). The directorate evolved from the Central Imagery Tasking Office (CITO), which was a successor to Committee for Imagery Requirements and Exploitation (COMIREX).

2003, Aug

NIMA established the Office of Deployed and Externally Assigned Personnel, later renamed Office of Global Support.

2003, 1 Oct

The National Center for Geospatial Intelligence Standards (NCGIS) became operational, charged with identifying, advocating, and promulgating standards for geospatial intelligence.

2003, 24 Nov

The 2004 Defense Authorization Bill changed the name of the agency from NIMA to the

National Geospatial-Intelligence Agency (NGA) to reflect the changed role of technology and its uses. The term geospatial intelligence (GEOINT) conveyed a new perception of the overlapping technologies developed over several decades and now applied to mapmaking and intelligence gathering by the agency to support national security and the nation's policymakers and warfighters.

2004

The RQ-7 SHADOW UAV was used by the Army, Marines, and international militaries for ISR for the ground forces. Launched from a truck and recovered in a fashion similar to a carrier landing with a "tail hook" and arresting cable, its payload was an electro-optical and infrared camera. Its range was in excess of sixty miles.

2004

NGA contracted for the acquisition and integration of airborne imagery over eighty-three high-priority urban areas as part of the Homeland Security program. NGA also acquired and integrated a variety of data sets on eleven critical infrastructure sectors.

2004

NGA analysts, working closely with the NST at the Department of State (DoS), provided GEOINT that brought significant attention to the humanitarian crisis in Darfur, Sudan. In collaboration with the DoS's Humanitarian Information Unit, NGA developed a ten-page Darfur atlas using a commercial software application, ArcGIS, and DigitalGlobe Imagery to pinpoint areas of conflict.

2004, May

Sea trials began for the USN's Ticonderoga class guided missile cruiser, USS *CAPE ST. GEORGE*, (CG-71) which used the Electronic Chart Display and Information System-Navy (ECDIS-N) and the Digital Nautical Chart (DNC[®]) produced by NGA.

2004, 11 May

In support of OPERATION IRAQI FREEDOM, NGA deployed the MIGS II, a leaner version of the original MIGS first used in Kosovo in 1999.

2004, Aug–Sep

NGA responded to four hurricanes that hit Florida during the 2004 hurricane season: Charley, Frances, Ivan, and Jeanne. Before the storms made landfall, NGA collaborated with FEMA

and provided vulnerability analysis; after the storms hit, the agency furnished products to assess damages.

2004, Sep

After more than four years' work, the digital data gathered during the Shuttle Radar Topography Mission (SRTM) was completely retrieved, processed, and converted to complete the final step of the SRTM project.

2004, 15 Sep

NGA and Germany's Bundeswehr Geoinformation Office (BGIO), the sole provider of geospatial information to the German military, signed an agreement that provided for bilateral coproduction and the exchange and release of geospatial data and information.

2004, 28 Sep

The DNC[®], a database of electronic charts created by NGA and its predecessors over a period of fifteen years, was certified for use. The digital medium consolidated 5,000 paper charts into twenty-nine CD-ROMs that could be updated quickly. The system provided up-to-the-second navigational information, promoted a paperless bridge on each Navy ship, maximized efficiency, and reduced staff numbers and human error.

2004, Oct

NGA received the Joint Meritorious Unit Award in recognition of its achievements from 11 September 2001 to 1 December 2003, which included its response to the terrorist attack on 11 September and its support to the OPERATIONS NOBLE EAGLE, ENDURING FREEDOM, and IRAQI FREEDOM.

2004, 25 Dec

The Notice to Mariners, published since 1869, became fully digital. The new technology allowed more timely dissemination of information to sailors at sea and eliminated delays associated with printing and distribution costs.

2004, 26 Dec

On 26 December 2004, a magnitude 9.3 earthquake struck off the northwest coast of the Indonesian island of Sumatra, causing a tsunami that resulted in widespread death and destruction. In response, NGA provided support to US troops deployed to the Indian Ocean and distributed unclassified imagery through the internet to US agencies, the UN, and international relief agencies to facilitate relief and recovery efforts. The agency also created products to assess damage to infrastructure and conducted further surveys to update the maps and charts of the region with new features created by the tsunami.

2005, 8 Jan

USN's Los Angeles class nuclear attack submarine *USS SAN FRANCISCO* (SSN-711) struck an undersea mountain in the Pacific. The submarine's commander and crew members responsible for navigation failed to use the NGA-provided navigational charts on board that showed the obstruction.

2005, Jan–Jul

NGA supported DHS, USGS, and the FBI with special products for the Presidential Inauguration, Super Bowl, funeral of former President Ronald Reagan, patrols along the Mexican border, and G-8 Summit on the Sea Islands of Georgia.

2005, 17 Feb

President Bush named Ambassador John D. Negroponte, former US Ambassador to the UN, Honduras, and Iraq, as the first Director of National Intelligence (DNI).

2005, May

USS CAPE ST. GEORGE became the first USN surface combatant certified to navigate using the DNC[®], developed by NGA, and the Electronic Chart Display and Information System-Navy (ECDIS-N).

2005, Jul

NGA created the Joint Operations Integration Office (JOIO) to ensure that NGA continued to deliver GEOINT through the integration of new technology.

2005, 26–29 Aug

NGA forwarded one hundred graphics on 26 August 2005 depicting the locations of key infrastructures—hospitals, police stations, highways, schools, etc.—for the counties in the path of Hurricane Katrina. On 29 August 2005, Katrina, the sixth strongest Atlantic hurricane ever recorded and the third strongest to make landfall in the United States, came ashore east of New Orleans, Louisiana. Within forty-eight hours, two NGA MIGS and twenty-six analysts were en route to the affected area.

2005

The Fairchild C-26 Metroliner (Metro) served in the Army, Navy, and Air Force. The twin turboprop aircraft had a Multi-Mission Surveillance Aircraft (MMSA) RC-26B variant. Originally, this model was fitted with phased array radar in a “canoe” beneath the fuselage, which was

replaced with a sensor turret on the belly. It was typically operated by Army (Aviation) National Guard (ARNG) units in support of DHS.

2005, Sep

Google released Version 3.0 of Google Earth, a 3-D viewer of streaming image and vector data with an easy-to-use navigation system, as well as location “look up” for places and addresses.

2005, 16 Sep

Orbimage, an orbital imaging corporation, announced it would purchase a competitor, Space Imaging, reducing to two the number of US companies operating imaging satellites. In 2004, NGA had signed contracts with Orbimage and DigitalGlobe to purchase imagery. NGA’s shift to using commercial imagery intensified during the War on Terrorism.

2005, 8 Oct

An earthquake struck in Pakistan and NGA provided the Pakistani government with maps, imagery, and charts to aid damage assessment and coordinate disaster relief.

2005, 8 Oct

CRYOSAT, a European Space Agency (ESA) satellite, broke up in flight. ESA had planned to conduct a three-year mapping mission of polar sea ice and provide more reliable data on global warming.

2005, Nov

NGA released the National System for Geospatial-Intelligence (NSG) Statement of Strategic Intent to convey its vision for the future of GEOINT and the challenges it would encounter.

2005, Dec

The last of 234 CDs of NGA Vector Map Level 1 (VMap1) was delivered, culminating a twelve-year effort to create near global map coverage. The Vector data is equivalent to a 1:250,000-scale hardcopy map. Most of the sources used to produce VMap1 were scanned paper maps. Nineteen participating countries have free access to the data.

2006, Jun

Unified GEOINT Operations (UGO), a collaborative and coordinated effort to assess, align, and execute geospatial intelligence analysis and production across the NSG and its partner organizations

2006, 7 Jul

Vice Admiral Robert B. Murrett, USN, took office as the third Director of NGA at its Bethesda headquarters. He had served as Director of Naval Intelligence since 1 April 2005.

2006, 27 Jul

US Army recommended new NGA BRAC site at Fort Belvoir's Engineering Proving Grounds on the North Post, northwest of main side.

2006, 28 Jul

The Korean Aerospace Research Institute launched a lightweight commercial imagery satellite called KOREAN MultiPurpose SATellite (KOMPSAT-2), South Korea's first one-meter resolution system.

2006, 28 August

Domestic Mobile Integrated Geospatial-Intelligence System (DMIGS), a self-contained, deployable, purpose-built vehicle mounted on a fire truck chassis that permitted NGA analysts to drive to a crisis location and provide on-the-spot GEOINT analysis and products

2006

NGA introduced Global Area reference System (GARS) for battle-space deconfliction.

2007, 18 Sept

The successful launch of the World View-1 satellite. The imagery increased the use of commercial imagery to satisfy the nation's GEOINT requirements.

2007, 25 Sept

NGA broke ground for its BRAC-directed headquarters complex at Fort Belvoir in Springfield, Virginia.

2007, 21 Oct

NSTs deployed to support local efforts to combat California wildfires.

2007, Nov

National Exploitation System (NES) upgraded to version 3.2.2. This version provided NGA analysts with enhanced imagery management flexibility for their imagery orders and introduced a GeoScout prototype reporting capability. It also provided tactical data query capability which allowed airborne still imagery to come to the analyst via NES, bringing airborne data from platforms like the U-2 and Global Hawk to the desktop.

2007, Nov

The Sea Lane of Opportunity Program (SLOOP) was launched by NGA's Marine Analysis; SLOOP provided in-house instruction for the NGA workforce on such topics as dead reckoning, tides and data, use of charts, and many other maritime-related topics.

2008

Integrated Collection and Analysis Requirements System (ICARS), a group of enterprise tools and services that enabled collection requirements management, became available.

2008, 17 Apr

NGA officially unveiled the latest and most accurate global model of the Earth's gravitational field: Earth Gravitational Model 2008 (EGM 08).

2008, Jun

NGA analysts provided assistance to DHS and FEMA with near-real-time imagery to evaluate flooding and assess damage in the Midwest.

2008, 30 Jul

President Bush signed an updated Executive Order 12333 authorizing the DNI to name functional managers. The Director of NGA was named as functional manager for GEOINT. This affirmed NGA's place within the IC and summarized the agency's functions and authority.

2008, 8–24 Aug

NGA provided geospatial support to the Summer Olympics in China. This took the form of situational awareness, contingency planning, data and services, intelligence analysis, and event monitoring for the events.

2008, 6 Sep

Successful launch of GeoEye-1, the second commercial imaging satellite developed under NGA's Next View program

2008, 8 Oct

GeoEye-1 released its first image—the campus of Kutztown University in Kutztown, Pennsylvania.

2009, Jan

Inauguration of Barack H. Obama as the forty-fourth President of the United States; NGA personnel provided precise and real-time geospatial intelligence to the US Secret Service, FBI, FEMA, and DoD.

2009, Jan

NGA took delivery of second-generation DMIGS, known as DMIGS2.

2010

NGA completed the successful rollout of the GEOINT Information Management System (GIMS).

2010

NGA's Graphical Exploitation and Reporting Tool (GERT) provided direct GEOINT support to US Pacific Command for critical operations with a carrier, a command and control ship, and an amphibious platform.

2010

NGA provided support to massive oil spill remediation efforts in the Gulf of Mexico.

2010, Aug

Ms. Letitia Long assumed the position of Director of the NGA. Ms. Long, an engineering graduate of Virginia Tech, was the first woman to head an IC agency.

2011, 12 Jan

A massive earthquake struck Haiti. NGA provided GEOINT products to US agencies and non-governmental organizations (NGOs) for relief work.

2011, Jan

The first group of NGA employees moved into the new NGA headquarters complex on Fort Belvoir's North Post, the former Engineering Proving Grounds (EPG). The facility is also referred to as NGA Campus East (NCE), while the Missouri site is referred to as NGA Campus West (NCW).

2011, 1 May

NGA and other members of the IC collaborated with US Armed Forces to locate and subdue al-Qaeda leader Usamah-bin-Ladin.