CONTRAILS

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THE
AIR FORCE CADET HANDBOOK

United States
Air Force Academy
Colorado
CONTRAIRS STAFF

Captain David W. Keith
Captain Jerome V. Martin
PREFACE

Air power has progressed at a phenomenal rate since 1903, and with it the Air Force. You are beginning training which will enable you to be an integral part of the nation’s first line of defense, but you must take only one step at a time as did the Air Force. Basic Cadet Summer is your first step toward becoming a professional cadet, just as being a professional cadet is the first step toward becoming a professional officer.

This handbook introduces you to basic military concepts, the Air Force and its heritage, the Academy, the Cadet Program, as well as the other military services. You, as cadets, are but a small part of the whole, but each, nonetheless, is important. You must strive to do your absolute best in every undertaking. You owe it to yourselves to understand what is being taught. Understanding, plus maximum effort, will make you a better cadet and, more importantly, a better officer.

While every effort was taken to insure that CONTRAILS is as up-to-date and reliable as possible, the nature of the rapidly changing Air Force may make some of the information in this book out of date even as it is published. Current information may be obtained from your Professional Military Studies Instructor, your Air Officer Commanding, or your Squadron Training Officer.
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HIGHT FLIGHT

by
John Gillespie Magee, Jr.

Oh, I have slipped the surly bonds of earth
And danced the skies on laughter-silvered wings;
Sunward I’ve climbed and joined the tumbling mirth
Of sun-split clouds—and done a hundred things
You have not dreamed of—wheeled and soared and swung
High in the sunlit silence. Hovering there
I’ve chased the shouting wind along and flung
My eager craft through footless halls of air.
Up, up the long delirious, burning blue
I’ve topped the wind-swept heights with easy grace,
Where never lark, or even eagle flew;
And, while with silent, lifting mind I’ve trod
The high untrespassed sanctity of space,
Put out my hand, and touched the face of God.
‘I wear the uniform of my country because of its heritage of honor’

Over two hundred years ago the first thread of the uniform I wear was woven. While great men dreamed of a country of free people, the army and navy that would win her liberty had already begun to organize. As the fledging country grew stronger, so did its uniform develop. Each button and ribbon that had been added through the years boasts of victory at sea, conquests on land and some of military aviation’s greatest successes. The added medals and insignia laud moments of heroism known to us all. I wear the uniform of my country because, as America is a blend of races and cultures, my uniform is a woven, visual history of her people’s courage, determination and unique love of freedom.

Without a word this uniform also whispers of freezing troops, injured bodies, and Americans left forever in foreign fields. It documents every serviceman’s courage, who by accepting this uniform, promises the one gift he truly has to give: his life. I wear my uniform for the heritage of sacrifice it represents and more.

No factor in America’s growth has been greater than the men and women who have worn her uniform to help keep her strong. In war and in peace, they have circled the earth and journeyed to the moon, always carrying America’s ideals with them. Their service to her has been a legend of honor.

I wear my uniform with pride for it represents the greatest nation of free people in the world. America serves as an example for those who strive to be free. They recognize this uniform as standing for millions of Americans who respect their world neighbors and wish to live in peace with them. My uniform is an extension of my people and my nation.
Most importantly, I wear the uniform of my country because others do not. America’s freedom is a right given by God, but defended by man. It is our overwhelming responsibility to preserve our heritage of freedom for all Americans and I accept that challenge willingly.

I wear the uniform of my country because of its history, its heritage of honor, its service to America, its representation of my people and because of my desire to live in a free land. Hopefully, I wear this uniform in peace. But America’s enemies must know that I will also stand fearlessly in war as those before me have stood.

I pray only that I do not stand alone.

Captain Karen Dorman Kimmel
Scott AFB, Ill.
Welcome to the United States Air Force Academy and to the ranks of those who devote themselves to their country and to the military profession. The staff, faculty and Cadet Wing join me in congratulating you on your appointment to the class of 1985.

The Academy is not only an academic institution but one which produces the finest leaders possible. This can be done only with highly select individuals who have uncommon potential. You have shown this potential for leadership and for the intellectual, physical and moral development necessary to become Air Force officers. Your years at the Academy are designed to develop that potential.

Time and again you will face challenges which you think are insurmountable. Meet these challenges with the same motivation that has overcome obstacles in the past. Never lose sight of the goal that brought you here, and never accept failure. Use your experiences as a springboard to set higher goals and give every test, every challenge, your whole effort. Internalize this attitude, and you will find that your capabilities far exceed what you thought they were.

You are beginning the finest experience of your life. By taking advantage of all the opportunities available to develop your skills, you will be ready to take your place with those who have gone on before, to be a member of the finest Air Force in the world.

I am looking forward to watching your class grow and mature. Keep a good spirit, hold your goals high and let nothing deter you from making ’85 the best class ever.
Brig Gen Robert D. Beckel
Brigadier General Robert D. Beckel entered the Air Force at Lowry Air Force Base in June of 1955 with the United States Air Force Academy’s first class. He subsequently graduated in June 1959, the only cadet to ever hold the rank of Cadet Wing Commander twice. Following graduation, then Second Lieutenant Beckel attended Undergraduate Pilot Training at Vance Air Force Base, receiving his pilot’s wings in June 1960, the outstanding graduate of his class.

After completing undergraduate pilot and jet fighter training, General Beckel was assigned to the 49th Tactical Fighter Wing, Spangdahlem Air Base, Germany where he flew F-100s and F-105s. Since that time, he has served the United States as a member of the U.S. Air Force Aerial Demonstration Team, The Thunderbirds, as solo pilot; as F-100 flight commander and wing chief standardization/evaluation officer at Phan Rang Air Base, Republic of Vietnam; and as Fighter Weapons School instructor in the F-100. Additionally, General Beckel served as Secretary of the Air Force liaison to the House of Representatives and commander of the 100th Combat Support Group and 100th Air Refueling Wing, Beale AFB; 410th Bombardment Wing, KI Sawyer AFB; and 7th Air Division, Ramstein Air Base.

In addition to his many military achievements, General Beckel was named as one of the Three Outstanding Young Men from the State of Washington in 1968, a Jaycees’ Outstanding Young Man of America in 1970, a member of the Helms All-American Basketball Team in 1959, and the winner of the Orville Wright Achievement Award presented by the Daedalians in 1960. He is, also, a command pilot with more then 3500 flying hours, and his decorations include the Silver Star, the Distinguished Flying Cross with four oak leaf clusters, the Bronze Star, the Meritorious Service Medal, and the Air Medal with 15 oak leaf clusters.

General Beckel holds a Bachelor of Science degree from the United States Air Force Academy and a Master of Science degree in International Affairs from George Washington University. He is a graduate of the Naval Command/Staff Course and the National War College.
Brig Gen William A. Orth

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DEAN OF THE FACULTY

Brigadier General William A. Orth graduated from West Point in 1954, and was commissioned in the Air Force. After completing flying training at Laredo AFB, he served as a fighter-interceptor pilot in the U.S., England and Germany.

Following a brief assignment in intelligence at Hq USAFE, he attended Purdue University in 1961 and received his master’s degree in Mechanical Engineering. His first assignment to the Air Force Academy, in the Department of Mechanics, lasted two years. In 1963 he was assigned to ATC as an instructor pilot, assistant operations officer, and chief of safety at Vance AFB.

General Orth’s next assignment was to Brown University in 1965 where he received his doctorate in Applied Mathematics. An assignment to the Academy in the Department of Mathematics started in 1968. Two years later he left for a tour in Vietnam where he flew A-37 aircraft. During this tour he served as Chief of Safety, 3rd TAC Ftr Wg, and Commander, 8th Special Operations Squadron.

His assignment, following Vietnam was to Hq SAC in accounting and finance, DCS/Comptroller. There he became the Director of Engineering and Construction, DCS/Civil Engineering, and in 1973 moved to the position of Assistant DCS/Civil Engineering. He was serving in that position when he was appointed permanent professor and head, Department of Physics, USAFA, in 1974.

General Orth became the Academy’s fourth Dean of Faculty on 1 September 1978. His decorations include the Legion of Merit, Distinguished Flying Cross, Air Medal with 10 oak leaf clusters, and the Air Force Commendation Medal.
Colonel John J. Clune

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DIRECTOR OF ATHLETICS

Colonel John J. Clune graduated from the United States Naval Academy in 1954 with a bachelor’s degree in engineering. While there he was selected as an All-American in basketball; his career and single season scoring marks are still Annapolis’ records.

His initial assignments were in missile operations, missile maintenance, and administration. He earned a master’s degree in electrical engineering from the University of Southern California in 1964, and was assigned to AFSC. He served as an AOC at the United States Air Force Academy from 1965 to 1968. During that time he also coached the junior varsity basketball team. Prior to returning to the Academy, he was Chief of the Electronics and Equipment Division, AFLC and Chief of Logistics Engineering Branch, Headquarters USAF.

Colonel Clune has a senior missileman rating. His decorations include the Meritorious Service Medal with one oak leaf cluster and the Air Force Commendation Medal.
REFLECTIONS ON PROFESSIONALISM

I salute the men and women of the Class of 1985 and welcome you to the Long Blue Line! As the temporary custodian of the "point position" in that formation, I feel a special warmth and kinship with you, its newest members. You're entering an exciting and challenging new phase of your lives, and doing so at a time when the Air Force is poised for many equally exciting changes—new systems, new applications, new concepts.

However, despite all our soaring technological progress, the Air Force's fundamental mission remains what it has always been: to remain constantly ready to contribute to the defense of our country and our national interests. Stripped to its essentials, I believe that mission also defines what the Air Force Academy is all about—to prepare you to join, contribute to, and eventually lead these efforts.

It is in this context that each of you should recognize that the Air Force is a profession, indeed a "calling," rather than "just another job" or occupation. The hallmark of that profession is Service, with a capital "S." By the same token, the Academy is far more than just a college or a "trade school." In the broadest sense, it's a leadership laboratory designed to educate, broaden, toughen and motivate you for a life of dedicated service to your country.

You've got a lot on your minds right now, but I think it's important for you to grasp this essential nature of the Air Force and the Academy early. Without this perspective, the intellectual, physical,
and emotional challenges you will face as a cadet in
the days ahead may seem pointlessly rigorous. More
important, the demands you will face later as an
officer may overtax your tolerance unless your career
goals are framed by the question, “What am I in for?”
rather than “What’s in it for me?” What you should
be “in” for is service to country, and it’s not too
eyearly to begin evaluating the Academy and your-
self in that framework.

Each of you was selected on the basis of excel-
ence—qualities of intellect, character, integrity, and
leadership which made you stand out from most of
your peers. I urge each of you, in your own private
way, to make a personal commitment to excellence in
every aspect of your lives. Build upon and develop
the qualities that won you admission to this select
group. Set your personal and professional standards
just a little higher than the “system” establishes for
you. Whether you leave the Air Force early or decide
to devote your life’s energies to its mission, the
important thing is to make the professionalism you
will learn at the Academy the personal touchstone of
your daily living.

I’ve learned lots of lessons in the nearly quarter
of a century since I stood where you are, but one of
the most elevating of all has been this: give me 10
dedicated professionals with a selfless willingness to
serve and I can accomplish more than with scores of
“job holders.” We’ll never outnumber our adversaries,
so we have to outthink and outperform them. We
simply have no room for the “summer soldier or the
sunshine patriot”—in peace or wartime.
I want to emphasize, though, that the dedication and commitment I’m talking about mustn’t be a blind and unquestioning form of ancestor worship, without a shred of initiative or imagination. On the contrary, the Air Force depends for its vitality on the innovation and vision of our people. In my book there’s no inconsistency between selfless loyalty and a constant search for better ways to perform our mission.

All of these concerns probably seem very remote to you right now; I can remember that my early horizons as a new cadet were often limited to how to get through the next formation alive! But I want to assure you that it won’t be long before each of you has to confront many of these professional issues of commitment, challenge, integrity, goals, etc., head on. I hope these random thoughts from somebody who’s been through it all will provide a peg on which to hang some of your own thinking.

Good luck to all of you and I look forward to serving with you in the best and most professional Air Force in the world.

Pete Todd
Brig Gen, USAF
Class of 1959
THE CADET PRAYER

Lord, God of hosts, my life is a stewardship in Your sight.
Grant the light of Your wisdom to the path of my cadet days.
Instill within me an abiding awareness of my responsibility toward You, my country and my fellowman.

I ask true humility that, knowing self,
    I may rise above human frailty.
I ask courage that I may prove faithful to duty beyond self.
I ask unfailing devotion to personal integrity that I may ever remain honorable without compromise.

Make me an effective instrument of Your peace in the defense of the skies that canopy free nations.
So guide me daily in each thought, word and deed, that I may fulfill Your will.
May these graces abide with me, my loved ones, and all who share my country’s trust. Amen
Since man first lifted his eyes to the heavens he has dreamed of conquering the sky. This fascination at first took the form of myth, legend, and whimsy, but it was also the object of a great deal of study, experimentation, and plain hard work.

In the late 15th Century, for example, Leonardo da Vinci directed his genius to the observation of birds in flight. The manuscript he prepared, The Flight of Birds, contained sketches of flying machines and set forth principles that were to be used many years later by the designers of the first gliders.

For nearly three hundred years man made little progress toward making the dream of flight a reality. In late 18th Century France, however, the Montgolfier brothers began experimenting with hot air balloons. Displaying the wisdom and caution that would mark future aviators, the Montgolfiers choose as the first “aeronauts” a reluctant rooster, a sheep, and a duck. With the safety of flight established, “test pilot” Jean-Francois de Rozier took his place in the basket under the Montgolfier’s balloon on 15 October 1783. The young physician soared 85 feet—to the end of the tether—and stayed airborne for nearly four and a half minutes.

The military soon found a use for the wonder of flight. The world’s first aerial reconnaissance mission was conducted during the French Revolution. The American military first realized the military significance of airships during the Civil War, when observation balloons like the Intrepid saw sporadic use. In 1898 the Army’s lone balloon was destroyed in Cuba, but not before it had directed artillery fire against Spanish positions on San Juan Hill. While of limited military value, ballons made ascent possible, but they were not the
answer to man’s dream of flight.

Giders were yet another step forward. An English inventor, Sir George Cayley, developed several model gliders between the end of the 18th Century and the middle of the 19th. These gliders would influence the work of a later experimenter, Otto Lilienthal of Germany. Lilienthal, working in the 1890’s, improved and expanded Cayley’s designs and eventually produced an airship that could carry him aloft. Lilienthal flew his gliders by shifting his weight—he was the first hang-glider pilot—and made more than two thousand flights before crashing fatally in 1896. His last words were: “Sacrifices must be made.” Neither the balloon nor the glider were entirely satisfactory solutions to the quest for flight. Man was free from the shackles of the earth, but he could not yet wheel and soar like the birds. Before man could fly his airfoils had to be refined and a light weight but powerful source of propulsion discovered.

To this end Samuel P. Langley returned to da Vinci and the study of bird wings, building a wing tunnel to analyze their lift and drag. In 1896 Langley’s steam-powered airplane caught the attention of several high-ranking U.S. Army officers, and he received a grant of $50,000 to produce a full size aircraft. In December 1903 Dr. Langley attempted to launch his aircraft by catapulting it from atop a houseboat anchored in the Potomac River. The catapult system failed, and the aircraft stalled and crashed. Langley and his sponsors were stunned. Stung by Congressional and public criticism for “squandering” money, the Army adopted a skeptical attitude toward heavier-than-air craft.

Six days after Langley’s failure, two unknown brothers, Orville and Wilbur Wright, made history. The toss of a coin on the morning of 14 December 1903 decided that Wilbur
would attempt the first flight. It lasted only 3.5 seconds as he stalled the aircraft shortly after lift-off. This effort was the culmination of hundreds of test flights using a glider airframe. The Wright’s power plant on that chilly December day was a small gasoline engine driving two counter-rotating propellers. Their aircraft was the first canard, or tail first, plane ever designed.

Today we celebrate 17 December as the day of man’s first powered flight. The Wrights actually made the second through fifth flights on this day; the longest flight lasted 59 seconds with the aircraft traveling 852 feet. These were the world’s first controlled flights of powered heavier-than-air craft.

The Wrights offered their invention to the War Department twice during 1905 but could not come to terms due to the furor created by the Langely incident. They subsequently took their aircraft to Europe, where in 1908 their demonstrations simulated European, especially German, aviation development.

On 1 August 1907, the Chief Signal Officer of the U.S. Army established the Aeronautical Division, which consisted of one officer. American military aviation was finally underway. Prodded by President Teddy Roosevelt, the War Department called for bids on an airplane that could carry two people at a speed of 40 miles per hour for 125 miles. The Wright Brothers were awarded a $25,000 contract for a biplane similar to the model which the Army had refused in 1905. The Army officially accepted the aircraft on 2 August 1909, five days after Orville Wright and Lt Frank P. Lahm had remained aloft for 1 hour, 12 minutes and 40 seconds.

By 26 October 1909, the Army’s first two pilots, Lts.
Lahm and Humphreys, had soloed. The training site was then moved from College Park, Maryland, to Fort Sam Houston, Texas to take advantage of the better flying weather. There Lt Benjamine D. Foulois became the third Army pilot, learning from the Wrights by "correspondence." Lahm and Humphreys were returned to ground duty prior to the move to Texas, leaving Foulois as the only active pilot until 1911. Additional officers were eventually trained, and by the time the Army established the rating of military aviation in 1912, there were seventeen Army pilots.

In 1914, the Curtiss JN-1, the forerunner of the famous Jenny, was formally accepted by the Signal Corps. At the same time the Army created the 1st Aero Squadron, under the command of Captain Benjamin Foulois. This unit flew observation and liaison missions for Pershing in 1916 during the campaign against Pancho Villa in Mexico. The experience proved a failure, however, because the aircraft then available could not cope with the altitude, wind, and storms. All of the original eight aircraft were unflyable after a month of operation.

The wholly inadequate performance by American air power, especially in the shadow of the great dogfights being waged over the Western Front in Europe, showed just how far behind the United States had slipped in the production of airframes and engines. Once involved in World War I, Congress realized the air arm's ineffectiveness and in July 1917 appropriated $640 million for aviation development. The money came too late to provide an effective American-equipped combat force for the Great War.

WORLD WAR I

World War I was a time of rapid growth and development.
for military aviation. The airplane emerged from the contempt of early military leaders to a position where the millions of men fighting below could not do without it. It was an age of men whose daring and courage brought them both fame and early death. Indeed, the aviators of the first war in the air are still remembered as heroes.

When German troops entered Belgium and France in August, 1914, the airplane was a flying machine, not a fighting machine, and its job was observation. Observation played a key part in the early part of the war. The decisive battle of the Marne was fought based on reports from air observers. During this time pilots would wave cheerfully to one another as they crossed the lines. Casualties resulted from engine failure, wings dropping off, and bad landings, rather than from enemy attacks. When the "quick, decisive war" which both sides expected turned instead into a bloody stalemate, the air war became more serious. Pilots fired shots, threw bricks, and dropped hand grenades attempting to down enemy planes. Finally, machine guns were attached to the rear cockpit of two-seater aircraft, but their weight and unreliability hampered their effectiveness.

Improved aircraft, engines, and machine guns gave the airplane the potential for offensive operations, but in early 1915 there was still no acceptable method of firing a machine gun forward. The lightweight design of the plane of that period prohibited the placement of guns on the wings, outside the propeller arc, as would be done with World War I aircraft. Similarly unsuccessful was the attempt to mount a gun above the propeller arc. In this position the gun tended to jam in the slipstream, was difficult to load or clear from the cockpit, and hampered the performance of an aircraft already difficult to fly. The ideal place for a gun was on the fuselage,
in front of the pilot, somehow firing through the propeller arc.

In February 1915 two German observation planes were shot down by a French plane, firing through its propeller arc. The German air forces were thrown into panic. If the Allies perfected this technique, only a few days would pass before they cleared the skies of German aircraft. The Germans lost four more planes in the following three weeks. They realized that a new, highly effective weapon was being employed against them. A Frenchman, Roland Garros, had attached steel wedges to his propeller to deflect the seven-to-ten percent of the bullets he estimated would strike the blades. Unfortunately for the Allies, in April 1915 Garros was forced down while on a strafing mission behind enemy lines. The Germans captured his plane and discovered his secret system.

The Germans turned the problem of reproducing the design over to a young Dutch engineer named Anthony Fokker. He quickly discarded the Frenchman’s system on the basis that its continued use would shake the engine from its bearings. Within forty-eight hours Fokker had developed a synchronization system which interrupted the firing whenever a blade was in front of the barrel. He mounted a gun and synchronization device on one of his E-1 Eindekkers. After proving his device to the General Staff, Fokker was told to take the plane to the front and shoot down an enemy aircraft. He protested and turned his Eindekker over to Lt Oswald Boelcke. Boelcke scored the first kill with this device in April 1915.

The German’s innovation initially gave them overwhelming air superiority. The British and French planes made easy targets for the E-1s. This period of German air
superiority, known then as the "Fokker Scourage," lasted until early 1916. Boelcke became the first ace by using the synchronizer.

Both the British and the French tried various methods to end the Fokker Scourage. The French mounted Lewis machine guns on the top wing of their Nieuport Scouts, while the British developed a peculiar series of pusher scouts with the propeller behind the pilot. During this time the British combined some of their scouting aircraft into the world's first true fighter squadron—Number 24 Squadron, Royal Flying Corps—under the command of Major Lanoe G. Hawker. Hawker became the foremost British ace in 1916, but his career ended abruptly when he became the eleventh victim of a rising young German ace name Manfred von Richthofen. By the summer of 1916 the Allies had their own synchronization device and the Germans lost their overwhelming advantage.

The technological advantage was to see-saw back and forth for the rest of the war. The Germans came out with the Albatross in late 1915. The Albatross was powered by a superb Mercedes-Benz engine and armed with two synchronized Maxim machine guns. The D-2 and D-3 models, which appeared in late 1914, were also enhanced by the formation of Jagdstaffels or "Jastas" (hunting packs). By "Bloody April" of 1917 the Germans again held the upper hand. The French countered, gaining air superiority by building several superb aircraft, including the SPAD 7 and the Nieuport 17. The British developed one of the finest aircraft of the war, the SE-5. In the summer of 1917 the Germans made an attempt to renew their superiority with the Fokker DR-1 triplane, but the DR-1 proved too difficult for the average pilot to handle and their attempt failed. They then
produced the best design of the war, the Fokker D-7. It was held in such high esteem by the Allies that it was specifically banned after the war by the Treaty of Versailles. During this period the British developed a fine series of aircraft built by the Sopwith Company. The most notable of these aircraft was the Sopwith Camel. The Camel, named for the humped fairing over the cowling, was an extremely maneuverable plane—having the capacity to turn almost in place. It accounted for more kills than any other aircraft of the war. Camel pilots claimed this record was due to circumstances. Their plane could neither outrun nor outclimb a Fokker; it had to shoot them down.

The war in the air was not limited to observation and swirling dogfights. It also saw the beginnings of strategic bombing. By 1916 both sides realized that aerial bombardment was necessary. The Germans held the lead in this area for most of the war. They carried out attacks on France and Britain, starting in January 1915 and continuing through the end of the war. The original bombers were the lighter-than-air rigid airships called Zeppelins. These airships caused a great deal of panic but not much damage. They did, however, divert a large number of planes and men from the front protection of London. The use of heavy anti-aircraft guns and the incendiary bullet led to the eclipse of the Zeppelin.

The Germans were more successful with their long-range bombers such as the Gotha and the giant R-class bombers, which had a wing span of 138 feet. (The Boeing 707/KC-135 has a 131 foot wing span.) The British also developed a strategic bombing force, the Independent Air Force (IAF), but the war was ended before the IAF could begin full-scale operations.
Although the air war was more glamorous than the war in the trenches, it was by no means less dangerous. The average life expectancy of a fighter pilot in 1916 was three weeks. The pilots, always under the specter of violent death, were forced to push themselves to the limit in machines that reeked of engine oil and gunpowder. The aircraft of the day were extremely temperamental; they would shed wings, stall out and spin without warning. The planes were highly flammable and often burned with the helpless pilot inside. Until near the end of the war, none of the pilots carried parachutes. This was due partly to their size and weight and partly to the insistence of ground-oriented superiors who thought pilots would be prone to jump from ‘‘perfectly good airplanes.’’ It also was due in part to the prejudices of the ‘‘macho’’ pilots themselves, who thought parachutes were ‘‘sissy.’’

With such terrible odds against them, those pilots who survived and amassed large numbers of ‘‘kills’’ were often idolized by the public. The French ‘‘Ace of Aces,’’ Corporal George Guynemer, captured the hearts of Frenchmen by shooting down 53 enemy aircraft. He was shot down eight times, surviving each time. Guynemer was one of the few World War I pilots to use a cannon, which he sighted with tracers from his machine gun. He disappeared mysteriously while on a mission over Belgium in September 1917. Among the British heroes were the young, audacious Albert Ball and James McCudden, scoring 43 and 58 kills respectively. Ball flew into a cloud one day and was never seen again. McCudden was killed when he stalled and crashed on a routine takeoff. With the death of Max Immelmann on 18 June 1916, the German public turned to Oswald Boelcke as their hero. Boelcke commanded Jasta Two. He was an outstanding leader, and many of the great aces of Germany
were at one time his "cubs." Ironically, Boelcke was killed in a mid-air collision with his best friend. Boelcke died with forty victories to his credit.

The highest scoring ace of the First World War was Baron Manfred von Richthofen, the "Red Knight of Germany." With 80 confirmed victories, Richthofen was a hunter who enjoyed the chase in the sky. Having been one of Boelcke's cubs, Richthofen was a master tactician, skillful pilot, and excellent marksman. He was killed by the ground fire of an Australian machine gun crew. Richthofen was so highly respected that the British buried him with full military honors.

The second leading ace of the war was French Captain René Fonck. An extraordinarily skilled and egotistical pilot, Fonck scored over 75 victories, and in all his years of fighting, he was hit only once. British Major Edward "Mick" Mannock was the third ranking ace and probably the greatest air fighter of the war. Mannock was consumed with an almost pathological hatred of Germans, and he delighted in shooting down as many as he could. Mannock was also a brilliant flight leader and took great pride in bringing his entire flight home. He would often give his kills to inexperienced pilots, knowing that their chances for survival went up greatly after receiving credit for their first victory. Mannock was killed by a German infantryman's bullet. His final tally was 73 aircraft.

In fourth place was Canadian Lt William "Billie" Bishop with 72 kills. He became an ace in two weeks after downing four Albatrosses and a balloon. In June of 1918, the General Staff told Bishop that he would be taken from the front in twelve days. In the few days that remained he shot down 25 more German planes and ended his career with more
decorations than any man alive at that time.

A German ace with 22 victories took command of the “Flying Circus” (the nickname given von Richthofen’s unit by the British) after von Richthofen’s death. This man, who eventually rose to command the Luftwaffe during World War II, was Hermann Goering.

On 6 April 1917 the United States entered the Great War, possessing not a a single combat aircraft, yet vowing to fill the skies over Europe with “a cloud of planes.” Brigadier General William “Billy” Mitchell had been observing the air war in Europe before the U.S. entry and thus was the logical choice for the position of Chief of the Air Service, First Army. Mitchell gained a reputation as a flamboyant, outspoken commander and aerial tactician. He devised and executed, with stunning success, a plan that put 1500 planes over the battlefield in support of American ground attacks at St. Mihiel.

A number of excellent American flyers were involved in the war long before April 1917. They were the members of the Lafayette Escadrille. The best among these volunteers was the famous Gervais Raoul Lufbery. Lufbery was commissioned a major in the American Air Service after the U.S. entered the war. He led the 94th “Hat in the Ring” Aero Squadron, instructing future greats like Rickenbacker in the intricacies of aerial combat. On 18 April 1918, Lufbery decided that Rickenbacker and two other officers were ready to patrol on their own. They took off, leaving Lts Alan Winslow and Doublas Campbell on alert in case they were chased home. The patrol returned without incident, but as they landed two German aircraft were reported in the area. Winslow and Campbell took off immediately and within a matter of minutes shot the two Germans out of the sky. The
first went to Winslow. The other, seconds later, fell to Campbell, for the first American victories of the war. On 18 May 1918, Lufbery jumped to his death when his plane caught fire. His career ended with seventeen official and as many as 73 unconfirmed kills.

From September through November 1918, Captain Eddie Rickenbacker commanded the 94th, showing the stuff that earned him the title of America's "Ace of Aces." Before the war he had been a champion race car driver, and his first assignment was as General John J. Pershing's chauffeur. The lure of combat aviation, however, was too great to resist. His leadership, like that of Mannock (he too gave kills away), went a long way toward making the 94th an effective fighting unit. Rickenbacker ended the war with 26 official kills, but he had nearly the same number of unconfirmed victories. These accomplishments are all the more remarkable considering he compiled his score in only four months. Captain Rickenbacker was the first flyer to earn the Medal of Honor, awarded for conspicuous bravery in the face of 7 to 1 odds during an engagement on 25 September 1918.

Another pilot who earned the Medal of Honor during World War I was Lt Frank Luke, Jr., the "Arizona Balloon Buster." Luke was an undisciplined maverick, without much technical skill, but he accomplished one of the most impressive feats of the war: he flamed fifteen enemy balloons and three airplanes in the space of seventeen days. His fascination with attacking balloons, which most pilots considered more dangerous than engaging the best German pilots, led to his death. On the evening of 29 September 1918, Luke took off alone in search of German "Drachen." He found and destroyed three balloons and was making his trademark treetop escape when he was jumped by German
fighters. He sent two of them down, but was hit by ground fire and forced to land. He strafed and killed six Germans during this approach to land, cleared the wreckage of his plane, pulled a revolver to defend himself, and was killed in a hail of bullets from approaching troops. His final action brought his tally to eighteen and earned him the Medal of Honor.

On 11 November 1918, when the Armistice took effect, the United States had 45 squadrons at the front, manned by a total of 767 pilots, 481 observers, and 23 aerial gunners. Eighty Americans had earned the title of "Ace," and the Air Service accounted for the destruction of 781 enemy aircraft and 73 balloons. There was little doubt that America had discovered a potent weapon.

**BETWEEN THE WARS**

The post-World War I period was a time of organizational growth for the Air Service. It was marked by experimentation and innovation in aircraft design, by achievements of air pioneers, and by continued controversy as the young Air Service attempted to gain its independence from the Army.

Demobilization hit the Air Service as hard as it hit the Army and Navy. The wartime Air Service of 200,000 men had been reduced to a mere 10,000 by the summer of 1920. Congress canceled wartime orders for 13,000 aircraft and 20,000 engines within days of the Armistice. Cancellation of orders contributed to the eventual liquidation of ninety percent of the wartime aircraft industry. Two years after the war ended, Congress passed the Army Reorganization Act of
1920. Despite loud protests from Brigadier General Billy Mitchell, the Act confirmed the Air Service as a combatant arm of the Army and parcelled out its aircraft among Army ground commanders.

Mitchell, who became the Assistant Chief of the Air Service, was not one to give up to the fight for independence so easily. He reasoned that the Air Service would stand little chance of gaining independence unless it had a mission that neither the Army nor the Navy could accomplish. Since the United States had entered a period of political isolation, Mitchell felt that he would be unable to convince either the War Department or the defensive-minded Congress that the Air Service should be granted independence on the basis of the strategic bombing of civilian populations and enemy industry. (This was the doctrine that Mitchell, Italian air leader Air Marshal Giulio Douhet, and British Air Marshal Sir Hugh Trenchard believed should be the guiding principle of aerial operations in future wars.) He choose instead to argue that the Air Service could accomplish the mission of coastal defense better than the Navy. His argument was based on his belief that the airplane had made the battleship obsolete. After several months of debate, the Navy gave Mitchell a chance to prove his claims in the summer of 1921. His crews, flying Martin MB-2 bombers, sent three captured ships to the bottom of the ocean. The last ship sunk by Mitchell’s crews was the “unsinkable” ex-German battleship, the Ostfriesland.

Despite these victories, Mitchell failed in his attempt to gain independence for the Air Service. For his efforts he was transferred to Texas where Army leaders hoped he was far enough away from Washington to stay out of trouble. Billy Mitchell would not keep quiet. When the Navy airship
Martin B-10

When delivered to the Army in 1932, the B-10 was the first production all metal monoplane bomber. The B-10 pioneered many advanced features that appeared on later bombers such as internal bomb storage, retractable landing gear, enclosed cockpit and gun turrets. When first introduced, the B-10 was faster than the Army’s standard fighter.
Shenandoah crashed in September 1925, Mitchell called a press conference and issued a prepared statement accusing his superiors of "incompetency, criminal negligence, and almost treasonable administration of the National Defense." At the request of President Coolidge and Secretary of War Weeks he was court-martialed and found guilty of "conduct unbecoming an officer and gentleman." He was ordered to forfeit all pay and allowances for five years. Instead of suffering this disgrace, Mitchell resigned. As a civilian he continued to voice his beliefs about a separate Air Force until his death in 1936.

Bill Mitchell was not the only air leader who believed that the Air Service should be removed from Army control. The Chief of the Air Service, Major General Mason W. Patrick, unlike Mitchell, directed his efforts not to the goal of complete independence but to the objective of attaining "the greatest degree of autonomy" for the Air Service under the existing organization. Basing his arguments largely on the evidence gathered by the Lampert Committe and the Lassiter Board, two groups that had investigated Air Service operations and made a series of recommendations, in 1925 Patrick urged the creation of an Air Corps with autonomy similar to that enjoyed by the Marine Corps within the Navy Department. His efforts bore some fruit, for Congress eventually passed the Air Corps Act of 1926. Although the Act did not radically change the organization of the Air Service, it did give the air arm a new name. The name strengthened the concept that the air arm was an offensive arm rather than support branch. The Act also insured that the air arm would be better represented in the War Department.

The name change from Air Service to Air Corps and the greater representation within the War Department provided
the impetus for a number of organizational developments. Wright Field, Ohio, the location of the Material Division, became the center of extensive research and development which helped improve aircraft design and performance. The "West Point of the Air" was established at Randolph Field near San Antonio, Texas. Here, under the watchful eye of Brigadier General Frank P. Lahm, aviation cadets trained to become pilots.

The doctrine of strategic bombardment, which Mitchell had preached during the 1920s, was still on the minds of many Air Corps leaders in the early 1930s. Men such as Major Hugh Knerr, commander of the Second Bombardment Group, and Lt Colonel Clarence Culver, commander of the Second Bombardment Wing, persisted in their requests that the Army purchase bombers capable of accomplishing the doctrine. Their requests were partially fulfilled in the early 1930s when the Army purchased the Boeing B-9 and the Martin B-10. Both were superior to any bomber the Air Corps had yet operated. The Martin B-10 was a major breakthrough. It was a mid-wing, all metal airplane with retractable landing gear. Its top speed was 207 miles per hour, making it the fastest bomber in the world. Although these bombers did not completely fulfill the air theorists' hopes for a true strategic bomber, they at least represented steps in the right direction.

The bomber that would meet those expectations resulted from an Air Corps design competition for a multi-engined bomber capable of carrying a 2,000 pound bomb load over a range of 1,200 miles at a speed of 200 miles per hour or better. All but one of the manufacturers competing for this contract assumed that Air Corps wanted another twin-engine bomber. Boeing engineers decided to gamble and designed a
four-engine bomber. In September 1934, the Boeing Model 299, later to be designated the XB-17, flew for the first time. The XB-17 had a wing span of 103 feet; a service ceiling of 30,000 feet; could carry a load of 2,500 pounds over a distance of 2,260 miles; and had a top speed of 250 miles per hour. This was the bomber of the Air Corps’ dreams. Despite the XB-17’s outstanding performance and capabilities, the Army purchased the cheaper twin-engine Douglas B-18 in quantity. Only a few B-17s were added to the inventory.

The struggle for independence from the Army surfaced again in 1934. A series of training crashes and the dismal failure of the Air Corps to carry air mail, resulted in a committee to study all aspects of military aviation. Headed by former Secretary of War Newton D. Baker, the Baker Board concurred with the earlier recommendation of the Drum Board that a General Headquarters (GHQ) Air Force be created. On 31 December 1934, the War Department accepted this advice and appointed Brigadier General Frank M. Andrews the first commander of the GHQ Air Force. For the first time a centrally controlled strike force was under the control of a flyer. With Andrews in command of all Army combat planes, the air arm had taken a giant step toward autonomy.

In May 1938, in response to Hitler’s growing power in Europe and the rise of Japan in the Far East, the United States began to rearm. President Roosevelt’s first concern was the aircraft industry. He decided to build it up so that in the event of war in Europe the United States could protect herself as well as the Western Hemisphere. Thus the GHQ Air Force was allocated money to expand its force to 5,500 airplanes by 1941. This meant the Air Corps would be able to purchase over 3,200 aircraft in the next two years. After France fell in
Boeing B-17 Flying Fortress

The B-17 was designed to meet Army specifications in 1934 for a multi-engine bomber. The prototype B-17 known as the model 299 far exceeded the Army’s requirements, but was destroyed during an early flight accident. The B-17 was originally armed with five .30 caliber machine guns but by the end of World War II, this had increased to 12 .50 caliber machine guns. The B-17 was the standard Army heavy bomber in Europe and remained in service until 1946.
the spring of 1940, the number was increased to 18,000. Without much debate, Congress allocated the money for this expansion.

As a result of this rapid expansion, the deficiencies of the GHQ Air Force/Air Corps organization became obvious to the leaders of the air arm. Secretary of War Henry L. Stimson, in turn, was made aware of these deficiencies and pressured Army leaders to correct them. The Army responded with Army Regulation (AR) 95-5 on 20 June 1941. This regulation created the Army Air Forces (AAF) in place of the GHQ Air Force and Air Corps—the latter had been responsible for procurement and training—and established the AAF as a quasi-independent air organization. This gave the air arm the organization that would carry it through World War II.

On 9 July 1941, as the United States moved slowly toward war, Colonel Harold L. George, Lt Colonel Kenneth N. Walker, and Majors Laurence S. Kuter and Haywood S. Hansell completed what would become the AAF’s "blueprint for action." This blueprint, entitled AWPD-1 (Air War Plans Division, Plan-1), would be the plan by which the AAF would conduct operations in the coming war. AWPD-1 called for the destruction of German war industry by high altitude, daylight, precision bombardment. AWPD-1 went on to list the number of medium, heavy, and very heavy bombers necessary to accomplish the goal. Thus, when war was declared, the AAF was ready with a wartime organization and plan.

The changes made in the organization of the military air arm were not the only aviation news of the inter-war period. Due to the advance in aircraft technology, members of the Army air arm set new altitude, speed, distance, and
endurance records. Lieutenants Cy Bettis and Jimmy Doolittle set speed records in winning the Pulitzer and Schneider Cup Races in 1925. A plane designed by Anthony Fokker, piloted by Maj Carl Spaatz, Capt Ira Eaker, Lt Elwood Quesanda, and crewed by three other men, set an endurance record in early 1929. The plane they flew, the "Question Mark," was in the air for 150 hours, 40 minutes, and 15 seconds. During this time, the airplane was refueled 43 times, taking on 5,660 gallons of gas. On 6 April 1924, four Douglas-built aircraft, aptly named "World Cruiser," set out from Seattle on the first round-the-world flight. Two planes returned on 28 September after flying 26,000 miles in 175 days. Although all these events were significant, none could compare with Charles A. Lindbergh's solo flight across the Atlantic in 1927. At the controls of his plane for 33½ hours, Lindbergh fought fatigue and cold to become the first person to fly solo, non-stop across the Atlantic. (He was actually the 19th man and the 12th flight to cross the ocean.)

WORLD WAR II

The airplane underwent considerable improvement in the two decades after the First World War. The theories of employment of combat aircraft had developed even further. In World War II, the strategic bombardment concepts of Mitchell, Douhet, and Trenchard would be tested. In the development of air power doctrine, the experiences of World War II would have a lasting influence on future Air Force leaders.

On 1 September 1939, the Second World War opened with
the Nazi invasion of Poland. Using the *blitzkrieg* ("lightning war"), a tactic that relied on a highly mechanized army and a tactical air force, the Germans overcame Polish resistance in sixteen days.

Germany’s air arm, the Luftwaffe, was designed primarily as a ground support air force. The dive bomber was its primary close support weapon, and Germany’s principal dive bomber was the Junkers Ju-87 Stuka. The Stuka was a fearsome weapon when the air around it was free of hostile fighter planes. The fighter arm of the Luftwaffe provided this environment during Hitler’s early campaigns.

By July 1940, Poland, Norway, Denmark, Holland, Belgium, and France had fallen victim to Germany’s mechanized units and air force. Great Britain stood alone against the Nazi-dominated continent. The moat-like English Channel was a good defense against the German Army, but it did not stop the Luftwaffe. If the British wished to stop the invasion of their homeland, they would first have to stop the Luftwaffe.

_Reichsmarschall_ Hermann Goering’s Luftwaffe was a tactical arm, ill-suited to the task of waging a strategic bombing campaign, but it was forced to do just that against the prepared defenses of the Royal Air Force Fighter Command. Under the superb guidance of Air Chief Marshal Sir Hugh Dowding, the British devised an air defense system to thwart the Luftwaffe. A series of early warning radar stations located German aircraft on their way to bomb the United Kingdom. These radar stations would pass their date to Fighter Command and an appropriate number of Spitfires or Hurricanes would intercept the Nazi raiders. Thus, when the Germans launched *Adlerangriff* ("Eagle Attack") on 13 August 1940, they met determined resistance. On 7
September, the Luftwaffe made a fatal error by switching its offensive from RAF ground installations (radar sites and airfields) to the city of London because Hitler demanded retaliation for an RAF raid on Berlin. By mid-September, the German air assault had failed because of appalling losses to Fighter Command’s excellent defense system and gallant pilots.

The British pilots were the heroes of the nation. ‘‘Never in the field of human conquest has so much been owed by so many to so few,’’ Prime Minister Winston Chruchill said of the Battle-of-Britain pilots. Squadron Leader Douglas Bader was one of the ‘‘few.’’ He had lost both legs before the war, but despite this handicap, Bader became an ace with 22½ victories. The ‘‘indestructible’’ Al Deere was shot down seven times and survived two mid-air collisions. He evened the score by destroying 22 German aircraft.

The Germans had their heroes, too. Major Werner Molders shot down 100 opponents by November 1941. As a result, he became the first General of the German Fighter Arm. The second and last leader of the Fighter Arm was Molder’s friendly rival, Major Adolf Galland. Unlike Molders, he survived the war with 70 victories.

During the course of the war, the Luftwaffe produced aces with even more kills. The Messerchmitt Me-109, the Focke-Wulf Fw-190, and the Messerschmitt Me-262 were the mounts of 99 pilots scoring over 100 victories each. The leader of these aces was Major Erich Hartmann, known as ‘‘the Black Devil of Ukraine.’’ Hartmann scored 352 victories, all but seven of which were Russian. Major Gerhard Barkhorn finished second with a tally of 301 aircraft. In the tradition of von Richthofen, the Luftwaffe had produced some very talented fighter pilots.
Consolidated B-24 Liberator

Designed to a requirement for a heavy bomber of better performance than the B-17, the B-24 made use of the Davis high aspect ratio wing. This design enabled the B-24 to have a better range than the B-17; however, the B-24 was not as heavily armed or armoured as the B-17.

North American B-25 Mitchell

Designed in 1939, the B-25 became the standard medium bomber used by the Army during World War II and served on every major front. Specially noted for its carrier raid on Japan, the B-25 carried the war to Japan as an anti-shipping bomber armed with a 75 mm cannon. Some versions were armed with 18 .50 caliber machine guns and became very formidable attack bombers.
After the Battle of Britain, the RAF began an intense campaign of night attacks on German cities. The British used the cover of darkness to prevent prohibitive bomber losses. This tactic evolved after the Germans shot down impressive numbers of RAF bombers during the daylight raids of August 1940. The USAAF, which still remained at peace, continued to believe in the concept of precision daylight bombing.

After the Japanese attack on Pearl Harbor on 7 December 1941, the United States found itself engaged in a two-front war. Germany, considered the stronger enemy, took precedence. The newly created Army Air Forces prepared to wage a campaign of high altitude, daylight, precision bombing against the war industries of the Third Reich. The Chief of the USAAF, General Henry H. Arnold, appointed Major General Carl Spaatz to command the U.S. Eighth Air Force—the first American strategic bomber force in Europe. Spaatz’s bomber commander, Brigadier General Ira Eaker, launched bomber raids against France and Germany beginning in August 1942. American air leaders were still convinced that tight bomber formations and heavy defensive armament would protect the Boeing B-17 Flying Fortresses and Consolidated B-24 Liberators on their daylight operations. In 1943, the Americans and British began joint strategic bombardment operations against Germany. This effort was known as the CBO—the Combined Bomber Offensive.

The initial American bomber assaults deep into Germany met with disaster. On 14 October 1943, the USAAF launched two groups of B-17s to attack the ball bearing plants at Schweinfurt, Germany. Twenty-eight of the B-17s were knocked out of the sky before the aircraft reached their target. Another 32 fell victim to the Luftwaffe on the way back to
their English bases. An additional seventeen B-17s sustained heavy damage and were eventually declared lost. A further 121 sustained less serious damage. Thus, of the original 291 aircraft, no fewer than 198 had been damaged or destroyed. This raid, combined with the losses absorbed on three other raids during the same week, cost 148 bombers and their crews. These results caused the Americans to seriously question their aerial tactics. The USAAF would strike no targets deep in Germany for the rest of 1943.

USAAF leaders, despite these tremendous losses, were not ready to discard the doctrine of strategic bombardment. General Arnold felt that a fighter with sufficient range to escort the B-17s and B-24s into the heart of Germany was the answer to the attrition of the bomber war. Eighth Air Force attempted to increase the range of the available fighter planes, the Lockheed P-38 Lightning and the Republic P-47 Thunderbolt. These airplanes, fitted with drop tanks, proved to be only a stop-gap measure. It was the arrival of the North American P-51 Mustang that turned the tide. The P-51 was able to escort the bombers to the farthest reaches of Germany.

The Eighth resumed its raids in late February 1944, with what is now known in Air Force history as "Big Week." The attacks launched during "Big Week" were aimed at the German aircraft industry. It turned, however, into a prolonged and bitter struggle between the escort fighters and the Luftwaffe for control of the air. This struggle continued throughout February and March. By April 1944, the results were obvious: the American fighters had gained control of the air.

Because of this hard-won air superiority American and British bombers were able to target virtually any factory or
Lockheed P-38 Lightning
Originally designed to meet a requirement for a high altitude interceptor, the P-38 served in every combat area of WWII in a variety of roles. First flown in 1939, the P-38 became the first American fighter to exceed 400 mph in level flight. With an unusual twin tail design, the P-38 was flown primarily in the Pacific because of its twin engine reliability and long range. The P-38 was flown by the two leading American aces of World War II and continued in service until 1949.

Curtiss P-40 Warhawk
Supplied in large numbers to our allies, the P-40 was an in-line engine derivative of the P-36. The P-40 was America's front line fighter when the Japanese struck and was used in every theater of WWII, particularly the Pacific. Used as a fighter-bomber, the P-40 was very rugged and was capable of absorbing great amounts of battle damage.
oil refinery in Germany for the rest of the war. By April 1945, the CBO had significantly hampered the German war machine.

The Allies, like the Germans, had successful fighter pilots. The leading British ace of the European Theater was Group Captain J.E. ‘‘Jonnie’’ Johnson. Johnson compiled a score of 38 victories, all of them single-engine fighters. General Ivan Kozedub led the Soviet Air Force with 62 confirmed kills. The top American ace in Europe was Colonel Francis S. Gabreski with 28 victories.

Halfway around the world in the Pacific Theater another air war was being conducted by bombers and fighters of the USAAF. As in Europe, the American bombers attempted a strategic bombing campaign against the Japanese homeland. In the Pacific the campaign was delayed because the bases held by the USAAF at the beginning of the war were too far from Japan for even the B-24 to strike at the Home Islands. The strategic bombing of Japan would have to wait until ground or amphibious forces could secure airfields nearer Japan.

The first American air unit to see action against the Japanese was the American Volunteer Group (AVG), better known as the Flying Tigers. The unit was formed before Pearl Harbor by a group of American pilots interested in aiding the Chinese in their war against Japan. Flying Curtiss P-40 Warhawks emblazoned with a shark’s mouth on the cowling, the Flying Tigers had destroyed 286 aircraft by the time the United States entered the war in December 1941. The commander of the Flying Tigers, Major General Claire Chenault, handed the AVG over to the USAAF in the summer of 1942.

Early in the war the U.S. began supplying our Chinese ally
Republic P-47 Thundebolt

The P-47 began development as a light weight fighter, a far cry from its final claim as the heaviest single engine fighter of WWII. The P-47 entered service originally as an escort fighter but its unparallelled ruggedness soon made it the best fighter-bomber of the war. The P-47 still holds the speed record for the highest speed achieved by piston engined aircraft at 504 mph. The P-47 ended the war with one of the lowest loss per sortie rates ever and continued in service with several South American countries until 1967.

North American P-51 Mustang

Originally designed as a replacement for the P-40 for the British, the P-51 went on to become the top American escort fighter. The Mustang achieved a large measure of its performance from its laminar flow airfoil. The P-51 turned out to be the solution to high bomber losses over Germany and was used in every theater of the war. The P-51 achieved its great performance potential when its Allison engine was replaced with the Rolls-Royce Merlin. The P-51 served in the Air Force from 1943 until after the Korean conflict.
with arms to fight the Japanese. The Japanese Army quickly captured all the roads over which these supplies traveled. This forced the U.S. to supply the Chinese completely by air. Flying over the Himalayan Mountains from bases in India, Douglas C-47 Skytrains and Curtiss C-46 Commandos kept the Chinese Army supplied for almost the entire war. The gallantry of these transport pilots cannot be measured in aerial victories or bombing results, but had it not been for their efforts, China might well have been overrun.

The aircraft carrier quickly became one of the premier weapons in the Pacific Theater. Its importance was demonstrated on 18 April 1942 when Lt Colonel James H. Doolittle led sixteen North American B-25 Mitchell bombers on a daring raid on the Japanese mainland. Although this raid caused insignificant material damage, it did boost the sagging morale of the American people, and caused the Japanese to devote more resources to home defense. The aircraft carrier proved to be the decisive weapon in numerous major battles. The Battle of the Coral Sea was the first naval battle in history where all fighting took place between the aircraft of opposing fleets. The surface vessels engaged in this battle never saw each other. In June 1942, at the Battle of Midway, which was the turning point of the Pacific War, U.S. Navy pilots sank four Japanese carriers, destroying forever any hopes the Japanese might have had of winning the war.

The USAAF had several distinguished pilots fighting in the Pacific. Major Richard I. Bong, America’s Ace of Aces, had forty victories. Bong lived through the ferocious combat of the Pacific only to be killed testing a jet fighter, the Lockheed XP-80, in August 1945. Another distinguished pilot was Major Thomas P. McGuire, victor over 38
Curtiss C-46 Commando

Remembered as the primary aircraft used to fly the "Hump into China during WWII," the C-46 was the largest and heaviest twin engine aircraft used by the Army. A development of a civilian commercial transport, the C-46 first entered service in 1942. The C-46 was used primarily in the Pacific and continued in service until 1953.

Douglas C-47 Skytrain

Affectionately known as the "Gooney Bird," the C-47 was in service from 1941 until 1973, an unequalled longevity. A development of the Douglas DC-3, the C-47 was used as a cargo carrier, paratroop carrier, and glider tug. Later, more jobs were performed by the C-47, many which were never forseen by the designer, such as the AC-47 "Spooky" gunship.
Japanese aircraft. McGuire died in combat attempting to aid a comrade. Both McGuire and Bong received the Medal of Honor.

The Navy and Marines had pilots of which they too could be proud. Captain David McCampbell, the top Navy ace of the war with 34 victories, set a record when he shot down nine Japanese aircraft during a wild naval battle known as the "Marianas Turkey Shoot." McCampbell received the Medal of Honor for this accomplishment. Lt Colonel Gregory "Pappy" Boyington was the top Marine ace of World War II. He destroyed six aircraft while a member of the AVG. He later increased his total to 28 as the commander of the "Black Sheep" Squadron.

The Japanese also had their aces. Their top ace was Chief Warrant Officer Hiroyashi Nishizawa, with 87 kills. Nishizawa, a true master of aerial combat, was never touched in a fight. He died in a transport plane which was shot down on its way to Japan. The leading Japanese ace to survive the war was Suburo Sakai, who ended the war with 64 kills. On one occasion, he piloted his aircraft 200 miles to home base after he had been seriously wounded. He recovered from those wounds to fly again.

The principle Japanese fighter was the highly maneuverable Mitsubishi A6M Zero-sen. This plane gave American pilots a great deal of trouble early in the war. By 1943, however, new American fighters, such as the Grumman F6F Hellcat and P-38, evened the score. The P-38 was the design of Clarence "Kelly" Johnson, who also designed the F-80, U-2, and SR-71. The P-38 was the mount of both Bong and McGuire. The F6F was the first aircraft designed specifically to out-perform the A6M Zero-sen. A third American fighter that helped the U.S. gain superiority
was the Chance-Vought F4U Corsair. The Corsair is best remembered for its inverted gull wing. It was the plane "Pappy" Boyington and his "Black Sheep" flew.

The strategic bombing campaign finally got underway in earnest in late 1944 when the Marines captured the Marianas Islands. Major General Curtis E. LeMay commanded the Marianas-based B-29s; it was through his direction that these Boeing Superfortresses exacted a terrible toll from the Japanese. LeMay's 21st Bomber Command conducted the fire bombing raids on Japanese cities. One such raid left sixteen square miles in the center of Tokyo completely barren. Japan could not take this kind of punishment for long, but it was the atomic bombs of August 1945 that forced the Emperor to capitulate. On 6 August 1945, the world entered the age of atomic war when a B-29 named "Enola Gay" dropped the uranium-core "Little Boy" on the city of Hiroshima. Three days later, "Bock's Car" dropped a second atomic bomb, the plutonium-core "Fat Man," on Nagasaki. On 14 August 1945 Japan surrendered to end World War II.

THE POST WAR WORLD

In 1945, the United States was the only country in the world that had the expertise to construct and deliver atomic weapons. Many leaders felt that all we needed for defense was a strategic bomber force capable of delivering these weapons. Therefore, after World War II, almost all of the AAF, with the exception of the B-29s, was dismantled. By 1946, the AAF had fallen from a wartime strength of over 2,000,000 men to just over 300,000. The
Strategic Air Command (SAC) was formed in 1946 to deliver atomic weapons, but SAC did not become a viable deterrent until General Curtis LeMay assumed command in 1948. Using the B-29 and the Consolidated-Vultee (Convair) B-36 Peacemaker, LeMay organized the most destructive air fleet the world had ever seen.

Research and development was emphasized during the post-war period. Probably the most spectacular development of the immediate post-war years occurred on 14 October 1947, when Captain Charles E. Yeager piloted the Bell X-1 to speeds in excess of Mach 1. Captain Yaeger became the first man to fly faster than the speed of sound. The Bell X-3 was a follow-on to the X-1, further exploring the high speed range, testing wing and engine inlet designs. The Northrop X-4 Swallow tested the dynamics of an aircraft without a horizontal stabilizer, in effect, a flying wing. The Bell X-5 was the first American airplane to test the aerodynamics of a swept-wing. Another airplane tested during this period was the Northrop YB-49 Flying Wing. The YB-49, piloted by Captain Edwards, crashed shortly after takeoff from Muroc Dry Lake Test Center. In his honor, the Test Center was renamed Edwards Air Force Base. Edwards is presently the base where the Air Force tests new and experimental aircraft.

Immediately following World War II, the struggle for an independent air arm resumed as Congress began a reconsideration of the nation’s defense structure. With President Harry Truman’s prodding, Congressional efforts culminated in the National Security Act, signed into law on 26 July 1947. The Act established the Department of Defense and created the United States Air Force as one of three co-equal services. Billy Mitchell’s Air Service had finally gained its independence.
Convair B-36 Peacemaker

The biggest aircraft in sheer size ever in service with the Air Force, the proposal for the B-36 was forwarded in 1941 when it was conceivable that the United States might have to bomb European targets from the United States. The B-36 was the first true intercontinental bomber. The B-36 was also used in the parasite fighter project. The B-36 entered service in 1947 and left service in 1959 after being adopted for many unique jobs. It was the backbone of SAC’s bomber force in the 1950s and was never used in war.

Boeing B-29 Superfortress

Initial design of the B-29 began in 1940 under the title of “Hemisphere Defense Weapon.” Best remembered as the plane that first dropped the atomic bomb, the B-29 was responsible for destroying most of Japan’s industrial capability during the fire bomb raids of 1945. Of very advanced design, the B-29 featured remotely controlled gun turrets under direction of central fire control computer which eliminated much of the guess work involved in air to air gunnery. However, the B-29 was insufficiently developed when first introduced to combat and caused many early difficulties. After the war, the B-29 became the primary weapon of the newly formed Strategic Air Command.
Executive Order 9877, signed the same date as the National Defense Act, outlined the main functions of the three services. The Air Force was assigned the responsibility for conducting strategic warfare—the same mission that had gained it its independence.

America had busied itself "organizing for defense," because the first chills of the Cold War were being felt in Europe. By the end of World War II, the Soviet Union had occupied Eastern Europe, including the zone of East Germany that included Berlin. In 1948, in a test of Western will, the Soviets blockaded Berlin. By the end of June, they had cut off all rail, barge, and road traffic leading to Berlin from Germany's Western-occupied zones. The only remaining avenue was air traffic. The Allies had been guaranteed three twenty-mile-wide air corridors into the city, and General Lucius D. Clay, the U.S. military governor of the beleaguered city, decided to resupply the city by air transport.

What came to be known as the Berlin Airlift began on 26 June 1948, when Air Force C-47s lifted off from Wiesbaden Air Base with a cargo of milk, flour, and medicine bound for Berlin's Tempelhof Air Base. By 20 July, 54 C-54s and 105 C-47s were airlifting 1,500 tons of supplies a day into Berlin. General Hoyt S. Vandenberg, Commander of United States Air Forces Europe, ordered 72 more C-54s into the airlift when it became apparent that the Soviets were not going to lift the blockade. By December, "Operation Vittles" planes were flying around the clock to bring supplies to Berlin. At the height of the joint British-American effort, cargo planes, many piloted by men who had hauled decidedly different loads over Berlin a short three years earlier, landed and took off at the rate of one every three minutes. The airlift
continued through a long, cold winter and a dismal, rainy spring. Finally, on 12 May 1949, the Soviets lifted the blockade. The Berlin Airlift had accomplished what few thought possible: it had supplied an entire city with its basic necessities completely by air.

THE KOREAN WAR

The peace that reigned after World War II was a tense, unpredictable one. Intense competition saw each site jockey for position. On 25 June 1950, the Cold War turned hot when North Korean troops, led by Soviet-built T34 tanks, supported by Soviet-supplied Yak fighters and brandishing Russian-made rifles, crossed the 38th Parallel into South Korea. President Truman sent aid immediately and went directly to the United Nations to obtain the support of the rest of the world in his effort to stop North Korean aggression.

In charge of all Air Force activity in the Pacific area, the Far East Air Force (FEAF) under Lt General George E. Stratemeyer was involved in the police action from almost the very beginning. While protecting the air evacuation of American citizens from the South Korean city of Seoul, a flight of F-82 Twin Mustangs intercepted five Yak-9 fighters. The F-82s acted swiftly and within minutes three enemy fighters had been shot down, with the first victory of the war going to Lt William G. Hudson.

The first air battle of the war was like all the rest of the war in the air fought over Korea—with the exception of a small area over northwest Korea. This area, known as "Mig Alley," was the only area where North Korean and Chinese pilots dared to challenge FEAF’s control of the air.
When war broke out, FEAF’s fighter armament consisted of the F-82, the F-51, and the F-80. Initially successful in air-to-air and air-to-ground roles, these aircraft were soon outclassed by the advent of the Russian-built MiG-15. At the time of its introduction, the MiG-15 was the best fighter in the world. On 1 November 1950, six MiG-15s attempted, unsuccessfully, to jump a flight of Mustangs just south of the Yalu River. A week later the MiGs bounced a flight of F-80s. The F-80s, although technologically no match for the Russian fighters, engaged them. Lieutenant Russell J. Brown shot down on enemy fighter, thus becoming the first USAF jet fighter pilot to score a victory.

Most air-to-air combat between MiG-15s, F-80s, and F-84 Thunderjets was generally decided in favor of the MiG. To help overcome this technological inferiority, the Air Force sent the 4th Fighter Interceptor Wing (FIW), equipped with the new North American F-86 Sabrejet, to Korea in December 1950. From this unit, and later from the 51st FIW after it had re-equipped with F-86s, would come the fighter aces of the Korean War.

The F-86 was actually inferior to the MiG-15. The MiG had a much higher speed at altitudes above 30,000 feet, was much lighter, had a higher rate of climb, and a much smaller turn radius. The advantage that the Sabre enjoyed was the MiG’s advantages, 792 of them were destroyed in air-to-air combat with F-86s. MiG pilots managed to destroy only 78 F-86s. This is testimony to the quality of pilots who flew the Sabrejets.

While the battle for air superiority was being waged over “MiG Alley,” a much more important conflict was being fought at a table in the small North Korean town of Panmunjom. Peace negotiations began 10 July 1951, after
Lockheed F-80 Shooting Star
The first operational jet aircraft of the Air Force, the F-80 saw considerable service in the Korean Conflict. Developed around the turbojet delivered from England, the F-80 was designed and built in the remarkably short time of 139 days. First delivered in 1945, the F-80 took part in the first all jet combat over Korea. A development of the F-80, the T-33 was the first jet trainer the Air Force had and is still in use.

North American F-86 Sabre
The first swept-wing American fighter, it achieved fame in the skies over Korea by compiling a 14.7 to 1 kill ratio over its rival, the MIG-15. A result of captured German information on swept-wing performance, the F-86 was developed as a day fighter, fighter-bomber and all-weather interceptor and continued in service until the 1960s.
the ground war had stagnated and both sides had temporarily given up on ground offensives.

In an attempt to speed up the negotiations by applying military pressure to the Chinese, the FEAF launched a rail interdiction campaign in August, 1951. General Stratemeyer believed that by interdicting the North Korean rail system, over which passed almost all of the supplies for the Chinese armies, FEAF could "strangle" the Chinese into signing a peace treaty. Twice a day, F-80s, F-84s, and B-29s would fly over North Korea to bomb rail bridges, railway beds, and rolling stock carrying supplies to the Chinese armies. This interdiction campaign, which became known as Operation Strangle, continued until March 1952. "Strangle" was an overly-optimistic title: air interdiction could not hope to completely shut-off supplies to the front lines because of the extraordinary lengths to which the Chinese and North Koreans went to keep supplies moving. "Strangle" evolved into "Saturate," and in July 1952, FEAF introduced a third strategy of air interdiction—Operation Pressure. The brainchild of two staff officers, Lt Colonel B.I. Mayo and Colonel R.L. Randolph, Operation Pressure called for making "the war in Korea so costly to the Communist regime, that it would agree to a reasonable armistice at the Panmunjom truce tables." Instead of attempting to stop the flow of supplies to the Chinese armies, Mayo and Randolph argued that destroying trucks, aircraft, radar sites, troops, locomotives, supplies, and remaining strategic targets would force the Chinese to sign a peace treaty.

"Pressure" operations began in earnest by striking military targets within the North Korean Capital, Pyongyang. Supply dumps, factories, troop billets, marshaling yards, and gun positions were the objects of these
July 1952 attacks. In the following months, the Chinese, North Koreans, and Soviets witnessed FEAF F-84s and B-29s neutralizing much of the North Korean industrial potential by bombing the hydro-electrical system. FEAF aircraft also ruined much of the North Korean rice crop by breaching the dams that fed the vital irrigation system. By the middle of 1953, the economic and military cost of the war became so great that on 27 July 1953 the Chinese signed the treaty that ended the Korean War.

The Air Force ended the war with 38 aces. Captain Joseph McConnell, Jr. was the Air Force’s top ace with 16 kills, and Captain James Jabara was the second ranking ace with 15. Air Force pilots accounted for a total of 918 enemy airplanes while losing only 147 of their own.

**THE COLD WAR**

The tensions between the United States and the Soviet Union intensified in the wake of the Korean War. Many Americans believed that the Soviets had a master plan to dominate the world. This fear caused the American defense establishment to expand. The U.S. choose to develop weapons of such great power and global range that they would deter the Soviets from taking the first step. The Air Force assumed the lead in developing these weapons. This responsibility made it the cornerstone of the defense of the United States—a position the Air Force still holds today.

During the 1940’s, the Air Force continued the development of the strategic bomber. The first all-jet intercontinental bomber, the Boeing B-47 Stratojet, came into the inventory and replaced the B-36 and B-29 as SAC’s
main bomber. The B-47, in turn, was replaced by the Boeing B-52 Stratofortress in the late 1950s.

A second strategic weapon was developed during the Cold War: the Intercontinental Ballistic Missile (ICBM). The first American ICBM was the Convair Atlas. In 1962, a much more accurate ICBM, the Titan I, replaced the Atlas. The first Minuteman missiles became operational in 1962. Today SAC possesses Titan II, Minuteman II, and Minuteman III missiles. A newer missile, the MX, is on the drawing boards awaiting Congressional approval.

The Cold War deepened again at the start of the 1960s when the Soviets shot down an American U-2 reconnaissance aircraft piloted by Francis Gary Powers. A scheduled summit meeting was canceled as the result, but even more serious confrontations were to come.

On 22 October 1962, President Kennedy revealed to the nation reconnaissance photos taken by Air Force U-2s and RF-101s, confirming the presence of Soviet intermediate range ballistic missiles in Cuba. American military forces were immediately placed on alert. In response to a naval blockade and the threat of “surgical” air strikes, the Soviets withdrew their missiles.

The Soviet Union’s ability to place the satellite Sputnik into earth orbit in October 1957 represented a major challenge to the belief that the United States was the more technologically advanced nation. The United States quickly reacted, but the Soviet lead could not easily be overtaken. On 12 April 1961, the USSR placed the first man in orbit. Both countries fought for supremacy in the “space race” that dominated the 1960s. The United States won the race to put a man on the moon on 20 July 1969, when Neil Armstrong became the first man to set foot on the lunar surface. Appollo
**Boeing B-47 Stratojet**

The first swept-wing jet bomber built in quantity anywhere, the B-47 design was initiated in 1943. Originally designed to use a straight wing, post-war data on swept wings captured from the Germans led to a redesign of the aircraft. First deliveries began in 1950 with the B-47 being the first Air Force aircraft to receive a weapons system designation. B-47s were used for weather reconnaissance and were finally phased out of service in 1967.

**Convair B-58 Hustler**

The first American production supersonic bomber, the B-58 project was started in 1949. The B-58 utilized aluminum honeycomb structure for low weight and high strength. The B-58 was unusual in employing an external pod to carry extra fuel, offensive weapons and electronic gear instead of internally. The B-58 was phased out of the Air Force inventory because of a lack of range and lack of growth potential in relation to electronics development.
II's Lunar Module, the "Eagle," landed in the Sea of Tranquility, where Armstrong, followed by Air Force Colonel Edwin Aldrin, walked on the surface of the moon.

VIETNAM

The competition between the Soviet Union and the United States, while often intense in the Cold War period, recognized certain limits. The fear of nuclear war loomed large in both nations. The Soviets and Americans tacitly recognized the return of limited war, war fought for limited objectives rather than for the annihilation of the enemy. The Korean War had been fought on this model; so too would be the war in Vietnam.

Late in 1961, President Kennedy sent military advisors to South Vietnam. This initial group included an Air Force Special Air Warfare Unit called "Farmgate." Flying T-28s, AC-47s, and A-26s, Farmgate instructors improved the skills of Republic of Vietnam (RVN) pilots. Between 1972 and 1964, A-1E aircraft arrived to supplement the initial Farmgate force. Also, in 1962, the first USAF combat unit the 509th Fighter Interceptor Squadron, arrived in South Vietnam.

American participation was limited to an advisory and defensive role until 1964. In retaliation for North Vietnam PT boat attacks on two U.S. Navy destroyers stationed in the Gulf of Tonkin, President Johnson ordered air strikes on North Vietnam in August 1964.

American involvement in the war mushroomed, with Air Force units of all types joining the fray. In the South, or "in-country," F-100s and later F-4s flew the bulk of the air
support missions, aided in target location and identification by Forward Air Controllers (FACs) flying O-1 Bird Dogs, OV-10 Broncos, and the O-2. One FAC, Captain Hilliard Wilbanks, discovered a large enemy force closing in on an American position. Armed only with a rifle, Capt Wilbanks made repeated passes on the enemy, hoping to delay them. He succeeded in warning the American troops, but was killed in the process. For his heroism, Capt Wilbanks was awarded the Medal of Honor.

C-130, C-123, and C-7 “trash haulers” supported Army operations, braving intense enemy fire to resupply isolated or surrounded outposts like Khe Sanh and An Loc. The unarmed transports not only hauled in food, fuel and ammunition, but they evacuated the wounded. In 1968, Lt Colonel Joseph Jackson flew his C-123 into an airfield under heavy enemy assault to rescue a Combat Control Team. His fortitude was recognized by the award of the Medal of Honor.

It was the air war against the North that captured the attention of American decision-makers. In February 1965, the United States launched Operation Rolling Thunder, an aerial campaign against North Vietnam that was to last until 1968. Rolling Thunder was calculated to end the war by striking selected targets and driving the North Vietnamese to the treaty table. Should they resist the initial assaults, aerial pressure would be increased in a system of “graduated response.” By 1966, the focus of American attacks became the Red River Valley, stretching some 120 miles from Yen Bai in the Northwest to Haiphong on the Gulf of Tonkin. For the first five years of the USAF’s involvement in the war in SEA, the Republic F-105 Thunderchief bore the brunt of the air war against the North, flying 75% of the missions. The
Lockheed F-104 Starfighter

Although no longer part of the active USAF inventory, the "missile with a man in it" is a widely used free world fighter. Designed as an air superiority fighter, it has been modified by our allies for reconnaissance and fighter-bomber roles. After seeing service in Vietnam on MiG CAP duty, the F-104 is now found only at Luke AFB, AZ where it is used to train German AF pilots. The NG-104A, with an auxiliary rocket engine above the tail, was used by NASA to train test pilots and astronauts.
F-4, F-111, and B-52 would later supplant the “Thud.” A 1964 Academy graduate, Karl Richter, finished 100 dangerous F-105 missions over the North, and then signed up for an additional tour. On 28 July 1967, on his 198th mission, Lt Richter was shot down. Ejecting safely from his crippled aircraft, Richter disappeared into a rocky valley. In critical condition, he was rescued by a helicopter crew, but died enroute to a hospital. Richter, the youngest pilot to shoot down a MiG, received the Air Force Cross for his heroism and devotion to duty.

Despite the dedication and sacrifice of men like Richter, Rolling Thunder did not force the North Vietnamese to a peace conference. On the contrary, its picemeal nature enabled them to build up their air defense. The pilots flying against the North faced the most sophisticated air defense network ever tested in combat. The Soviet-supplied and -organized system included some 2,300 surface-to-air missiles (SAMs), thousands of anti-aircraft artillery (AAA) guns of all calibres, and approximately 180 MiGs aircraft. The vast majority of this air defense force was concentrated in a sixty-mile-long by forty-mile-wide section of the Red River Valley, with the capital city of Hanoi as the hub. An extensive net of radar sites provided early warning of American attacks. The North Vietnamese coordinated the SAMs, AAA, and MiGs to provide optimum coverage of key targets.

Two-seat F-105s known as “Wild Weasels,” were assigned the responsibility for SAM suppression. These aircraft played a deadly game of cat and mouse with enemy radar sites, hoping to destroy the enemy before they could lock-on and eliminate the Weasel. Major Merlyn H. Dethlefsen was awarded the Medal of Honor for his gallantry
in suppressing SAM sites even after his aircraft had been seriously damaged.

The Air Force and the Navy were also able to neutralize the MiG threat. Early in the war air-to-air battles pitted the older MiG-17s and MiG-19s against early models of the F-4. The first Air Force MiG kill of the war was by an F-4C on 10 July 1965. By 1967 the MiG-21 Fishbed appeared in quantity. The Air Force started flying MIGCAP escort missions. Colonel Robin Olds’ 8th Tactical Fighter Wing, the “Wolfpack,” helped subdue the Vietnamese MiGs. Colonel Olds, promoted to Brigadier General, later served as Commandant of Cadets at the Air Force Academy.

A 1964 graduate of the Academy, Captain Steve Ritchie, became the first Air Force ace of the Vietnam War on 28 August 1972, while flying with the 555th (Triple Nickel) Tactical Fighter Squadron. Twelve days later, his navigator, Captain Charles DeBellevue, became the second Air Force ace. DeBellevue, who was to become the leading American ace of the war with six kills, was also the first weapon system operator/navigator in history to become an ace. Captain Jeffrey Feinstein, also an Academy graduate, was the third and last Air Force ace of the war.

Despite the successes of SAM suppression and escort sorties, American aircraft were shot down. “Jolly Green Giant” and “Super Jolly” rescue helicopters and their A-1 “Sandy” escorts accomplished seemingly impossible rescue missions deep in hostile territory. Major Bernard Fisher landed his A-1 on a cratered runway surrounded by enemy gunners to save a fellow pilot. For this act, Major Fisher received the Medal of Honor. First Lieutenant James Fleming received the Medal of Honor for exposing his UH-1 helicopter to intense enemy fire while rescuing a stranded
Special Forces Team.

Peace talks, including all parties in the dispute, opened in Paris in January of 1969. They continued without effect until March 1972, when North Vietnam launched a major offensive, spearheaded by Soviet tanks and backed by heavy artillery and SAMs, across the DMZ into the South. In April 1972, President Nixon authorized the resumption of the air effort against the North. This bombing campaign, Operation Linebacker I, was more intense and effective than the earlier Rolling Thunder operations. The main targets were North Vietnamese communications centers, road networks, railroads and rolling stock, bridges and military barracks. The effort was intended to cut off the movement of supplies to the North Vietnamese Army in the South and to destroy or severely limit North Vietnam’s ability to conduct the war. At President Nixon’s direction, the harbors of Haiphong and several lesser ports were mined in May 1972 to eliminate shipping as a source of supply for the North Vietnamese. As a result of that decision the North Vietnames government was forced to rely on rail and road connections with the People’s Republic of China. The two rail networks leading into Hanoi from China carried the heaviest traffic and became the focus of U.S. fighter-bombers.

As in the 1965-68 operation against North Vietnam, the brunt of the offensive would be borne by fighters and fighter-bombers. The heavy B-52 bombers, used “in-country” since 1965, continued tactical bombing operations in South Vietnam and against the Ho Chi Minh Trail. The B-52, as the main nuclear weapons delivery system of the United States, was at first considered too valuable to risk against the air defense network of the North. The “BUF” began to strike targets in the North in late
December 1972 as part of Operation Linebacker II. The “Christmas Offensive,” the first true strategic bombing campaign directed against the North, quickly brought the North Vietnamese back to reality. By January 1973, a cease-fire agreement was reached and Prisoner of War (POW) exchanges began in February.

Of all the cases of bravery demonstrated by our men in the military during the Vietnam War, few accounts can surpass the undaunted courage and sense of honor exhibited by the POWs. These men, from the infantry soldiers to downed pilots, endured terrible physical and mental torture—inhuman treatment specifically outlawed by the Geneva Convention.

In November 1970, an elite helicopter-borne force of American raiders commanded by Colonel Arthur D. “Bull” Simons attempted to rescue a number of American POWs. The force attacked the Son Tay POW Camp located 23 miles from Hanoi. Upon arriving at Son Tay they found it deserted. Even though the raid failed, it demonstrated America’s resolve to get the POWs back. The raid also forced the North Vietnamese to consolidate the prisoners into larger camps. In these larger compounds, the POWs were able to resist Communist exploitation more effectively.

Many men demonstrated outstanding courage while in captivity. Captain Lance P. Sijan, a 1965 graduate of the Academy, was posthumously awarded the Medal of Honor for his valiant struggle to survive. Captain Sijan became the first Academy graduate to receive the highest military decoration of our country.

Although the United States did not accomplish its political objectives in the war in Vietnam, the Air Force once again proved it was equal to the task, contributing significantly to
the war effort under new and sometimes radically different conditions. In reaction to the war in Vietnam, the USAF developed new weapon systems, methods of ordnance delivery, and training programs. Coordination between FACs and tactical fighters was perfected, and new means of aerial resupply developed. The AC-130 Spectre, mounting a 105m howitzer, pushed the gunship concept to its ultimate development. The F-111 was tested under all types of weather conditions, and the B-52 was used in the conventional rather than nuclear role. Electronic Counter Measures (ECM) evolved at a dizzying pace to counter the air defense systems that ringed North Vietnamese target areas.

A particularly important lessen of the war was the need for Aggressor Squadrons to fly dissimilar tactics missions against Air Force aircrews. This training is designed to cut combat losses by exposing aircrew members to enemy tactics and a realistic combat environment before they actually go into battle.

This is the heritage of the Air Force. The heritage of men like Rickenbacker, Mitchell, Lindbergh, Bong, Jabara, McConnell, Ritchie, and Sijan. This is the heritage of all those who served and pioneered in aviation, who lived and died in the Air Force. This is the heritage of all who wear the Air Force Blue. This is now YOUR heritage.
THE AIR FORCE ACADEMY
HISTORY OF THE AIR FORCE ACADEMY

Following organization of the United States Air Force as a separate service in 1947, work commenced toward the realization of yet another dream—its own academy.

In 1948, Secretary of Defense James Forrestal appointed a Service Academy Board to review the capabilities and facilities of the Military and Naval Academies and make recommendations for the establishment of an academy for the Air Force. On 1 April 1954, 4 years after the Board’s report was received, Congress authorized the construction of an Air Force Academy. The Air Force had been preparing for this action. Forty officers and civilian educators headed by Colonel Eiler at the Air University, Maxwell Air Force Base, Alabama, had developed the curriculum for the Academy several years in advance. Secretary of the Air Force Harold Talbott personally selected the location for the Academy on the basis of the Colorado site’s notable advantages of a quiet, isolated location still accessible to large towns, favorable weather for training, and the fact that the State of Colorado offered one million dollars for the purchase of the land.

Over 340 architectural firms competed for the commission of designing and constructing the Academy. Skidmore, Owings and Merrill, Architects and Engineers, finally won. Their original plans were deemed “too modernistic” by Congress. The
“accordion-like” chapel was the central object of controversy. Not only Congress, but also such well-known American architects as Frank Lloyd Wright considered the design to be in poor taste. Before 126 million dollars were allocated for construction, the design had to be modified to more traditional lines of architecture, a change which increased the final building cost by four times. The approved layout of the newest Academy was finally unveiled on 14 May 1955.

On 11 July 1955, the same year that construction began, the first class of 306 men was sworn in at a temporary site at Lowry Air Force Base, Denver. Lt General Hubert R. Harmon, a key figure in the development of the Academy since 1949, was recalled from retirement to become the first Superintendent. Two years later Maj General James E. Briggs took over as the Academy’s second superintendent. During his tour, on 29 August 1958, the Wing of 1145 cadets moved to its present site from Denver. Less than a year later the Academy received accreditation. Maj General William S. Stone became the third superintendent in 1959; Maj General Robert H. Warren, the fourth; Lt General Thomas S. Moorman, the fifth; Lt General Albert P. Clark, the sixth; Lt General James R. Allen, the seventh; and presently Lt General Kenneth L. Tallman, is the eighth.

The 18,000 acres which comprise the Air Force Academy are located on the east slope of the Rampart Range; 7,258 feet above sea level. The base is divided into three major areas: the cadet area, the base community area, and the service and supply area.
The cadet’s life is centered around the nine major buildings in the cadet area. These buildings have been named after Air Force officers who were particularly vital to the history of the Air Force and the Academy.

Vandenberg Hall, the cadet dormitory, contains 1,320 cadet rooms, the Cadet Store, barber shop, supply and counseling offices, as well as various rooms for professional activities and recreational clubs. The dormitory was named after General Hoyt S. Vandenberg, the second United States Air Force Chief of Staff, who served from 1948 until 1953. His efforts strengthened the position of the Air Force and aided in the development of today’s forces.

Fairchild Hall contains both academic classrooms and administrative facilities, including the Air Force’s Frank J. Seiler Research Laboratory. The library on the north end of Fairchild Hall now has well over 304,810 volumes. The academic building was named after the first commander of the Air University, General Muir S. Fairchild, who later became Vice Chief of Staff, in recognition of the fine work done by the Air University and General Fairchild on improving educational opportunities in the Air Force.

Mitchell Hall, the cadet dining hall, has facilities for serving meals to 4,400 cadets simultaneously. Mitchell Hall was named in honor of Brig. General “Billy” Mitchell. He was the most outspoken and farsighted American advocate of air power during World War I and the period following. He sacrificed his career for the advancement of air power.

The Cadet Chapel, dedicated in September 1963 is
the architectural high point of the Academy. It can seat 1,200 for Protestant services, 600 for Catholic services, and 100 for Jewish services.

Arnold Hall, the cadet social center, has a large ballroom, a 3,000 seat theater, snack bars, recreation areas, and a bowling alley, as well as an office for the Wing Hostess. The lounge is separated into the upper-class lounge known as the Richter Lounge, and the doolie lounge or Smack Bar (as it is known to cadets). Arnold Hall also includes a pizza parlour and an ice cream parlour as well as a Disco. In the recreation areas are billiards, pool, ping pong, and television. The theater provides a good selection of movies and Allied Art performances including plays, concerts, and top recording stars. The ballroom is the scene of formal receptions and dances. Arnold Hall was named after the first general of the Air Force, Henry H. "Hap" Arnold, who was chief of the Army Air Force during World War II and fought vigorously for a separate Air Force.

Harmon Hall, the administrative center of the Academy, houses the offices of the superintendent and his staff. It was named in tribute to Lt General Hubert R. Harmon, who worked from 1949 until 1954 on plans for an Air Force Academy and who was instrumental in getting Congressional approval for the Academy.

Cadets at the Air Force Academy have available to them some of the finest facilities in the nation for physical activity. The Cadet Gymnasium, surrounded by athletic fields, contains several gyms, two swimming pools, squash and handball courts, and
facilities for playing nearly every sport. Falcon Stadium, the site of all home football games, is located on the east side of the Academy, away from the cadet area. The cadet Fieldhouse is the center of many Academy sports and activities. The Fieldhouse is divided into three areas: the largest is the indoor track area which is covered with astro-turf and is used by the football and baseball teams for indoor practice; the second section has a hockey rink with seating for 2,600 spectators, and is used on weekends for recreational skating by cadets and Academy personnel; and the last area has a basketball court with seats for 6,000 and also houses intercollegiate wrestling matches.

Expansion of the Cadet Wing to an authorized strength of 4,417 brought with it many improvements and additions. A second dormitory was built on the south perimeter of the Cadet Area, increasing from 1,320 to 2,233 the number of cadet rooms. The Tailor Shop and the Dental Clinic were moved into the new dormitory, leaving room for the existing Cadet Store and Dispensary to expand. On 31 May 1976, the new dormitory was dedicated and named in honor of Lance P. Sijan, Class of 1965. Captain Sijan was the first USAFA graduate to receive the Medal of Honor, awarded to him posthumously for heroism as a POW in North Vietnam.

Other changes to the Cadet Area included expansion of the Pine Valley Airfield in the southeast corner of the base, increasing room for the Academy’s Aero Club, parachuting, soaring and T-41 flight training programs. Arnold Hall also received
attention in the form of the new Richter Lounge, dedicated to USAFA Class of 1964 graduate Karl Richter, who was killed while on his 198th mission over North Vietnam in an F-105.
Although the Air Force Academy is relatively young in comparison to other service academies, our graduates are establishing a strong tradition of dedication and excellence that has brought many of them national recognition. The young men and women who pass through the Academy come from many walks of life, different ethnic backgrounds, and a variety of religions. In effect, the Academy serves as a rallying point for these different aspects of American culture; and from this will come the leaders of tomorrow in the Air Force and the nation. The qualities that Cadets develop in the diverse programs of the Academy will help them in their subsequent undertakings. The last point is exemplified by the records of our outstanding graduates.

No single list or short essay can adequately describe the deeds of all graduates. However, the few outstanding officers cited herein should serve as standards of a level of achievement that all Cadets can strive to attain. These standards must be cultivated and nurtured and may be reached only if the Cadets develops those traits of character and leadership necessary to be a good officer, a responsible civic leader, and a contributing community member.

Possibly one of the most outstanding all-around graduates is Lt Colonel Brock T. Strom, Class of 1959. Cadet Strom was a great combination of brain and brawn receiving such awards as consensus All-American in football and Outstanding Cadet in Mathematics. After graduation, he earned his Master’s degree from MIT and a few years later his Doctorate from Arizona State University in Engineering Mechanics. He is presently in school at the Industrial College of the Armed Forces.
Brock Strom, Jr., is a member of the Class of 1982. Another noteworthy member of the Class of 1959 is Colonel Bradley C. Hosmer. After graduating as the number one Cadet in the General Order of Merit, he went to Oxford on a Rhodes Scholarship in Philosophy and Political Science. When finished with his Rhodes education, Colonel Hosmer became air liaison officer with the First Cavalry Division in Vietnam. He was one of the first four graduates promoted to Colonel and has received the Distinguished Flying and two Bronze Stars. Presently Colonel Hosmer is Commander of the 347th TAC Fighter Wing.

Colonel Karol J. Bobko, a distinguished graduate, was the first former Cadet to enter the space program. As a Cadet, Colonel Bobko had a fine record and was on the Superintendent’s List during his junior and senior years. He received a Master’s degree in Aeronautics from the University of California. After completing training at the Air Force’s Aerospace Research Pilot School at Edwards AFB, he was assigned to the Manned Orbiting Laboratory Program in August 1969. He is currently assigned to the Space Shuttle project. Colonel Bobko is one of many graduates selected as an “Outstanding Young Man in America.”

Brigadier General Harold W. Todd, Class of 1959, distinguished himself by being the first Academy Graduate to be promoted to this rank. While at the Academy he served as a Flight Commander and on the Group Staff. In addition, he was named the Outstanding Cadet in Foreign Languages. After completing pilot training, he flew both B-47 and B-52 aircraft, completing 156 combat missions in Southeast Asia. When subsequently assigned to Headquarters, U.S. Air Forces in Europe (USAFE), he authored the NATO study which led to the creation of Allied Air Forces, Central
Europe. He is presently the Commander of the 25th Air Division at McChord AFB, WA.

Brigadier General Robert D. Beckel, Class of 1959, has continued to distinguish himself on active duty as he did while a Cadet. He is the only person to have served as Cadet Wing Commander twice. He also was named as the Most Valuable Basketball Player in 1959, having set several Academy records which still stand. After pilot training he flew F-100 and F-105 aircraft, completing 280 combat missions in Southeast Asia. He also served a tour with the Air Force Thunderbirds aerial demonstration team. He was assigned as Vice Wing Commander, 9th Strategic Reconnaissance Wing, Beale AFB CA, and later commanded the 410th Bomb Wing at K.I. Sawyer AFB MI and the 7th Air Division, Ramstein AFB, Germany. General Beckel is presently Commandant of Cadets at USAF Academy.

Brigadier General Robert C. Oaks, Class of 1959 has flown three tours of duty in Southeast Asia, during which he completed 190 combat missions in the F-100 aircraft. Subsequently, he returned to the Air Force Academy where he was Air Officer Commanding for the 18th Cadet Squadron. When he returned to flying, he commanded the 391st Tactical Fighter Squadron which was equipped with F-111F aircraft. Upon his promotion to Colonel, he was transferred to the Pentagon where he served as Chief, Joint Policy Branch, Headquarters USAF. He is currently stationed at Ramstein Air Force Base, Germany.

The first Academy Graduate to return as Permanent Professor is Colonel Ervin J. Rokke. Colonel Rokke is a member of the Class of 1962 and received his PhD from Harvard University. He served tours as an instructor at the
Academy, a photo intelligence officer, a staff officer at Headquarters Pacific Air Force, and as a member of the U.S. mission to NATO in Brussels, Belgium, and as a Professor and Head of the Department of Political Science at the Air Force Academy. Currently Colonel Rokke is an Air Attache at the American Embassy in London.

Many Graduates made the ultimate sacrifice during the Vietnam conflict. One hundred and forty-one gave their lives in the struggle.

First Lieutenant Karl Richter, Class of 1964, became the youngest Air Force pilot to down a MIG in combat. He received the Air Force Cross, and a Purple Heart in addition to Vietnamese Government decorations and 22 Air Medals. After volunteering for 200 missions, Lieutenant Richter was downed while on his 198th mission in the F-105D.

Another Graduate who lost his life while performing meritoriously was Captain Harlow K. Halbower, Class of 1959. His long list of decorations includes the Silver Star, the Distinguished Flying Cross, the Purple Heart, the Air Medal with 11 clusters and the Gallantry Cross with Palm. Captain Halbower died while serving as a Forward Air Controller (FAC) when his 0-1F was hit by ground fire on a mission 15 miles west of Saigon.

One of the most striking examples of courage and love of freedom can be seen in Lance Peter Sijan, Class of 1965. On November 9, 1967, Captain Sijan was flying in the back seat of an F-4 on a bombing pass over North Vietnam, when his aircraft was hit and exploded. Captain Sijan suffered a skull fracture, a mangled right hand, and a compound fracture of his left leg. The North Vietnamese found Sijan 45 days later and took him prisoner. Sijan managed one escape but was captured again within a couple of hours. During his three
months of captivity he endured torture by his interrogators and constant beating by guards for his relentless efforts to break out of his bamboo cell.

In January of 1968, Lance Sijan finally succumbed to his injuries as a Prisoner of War in Hanoi. Never once did he give up his quest for freedom, the freedom he fought for and ultimately died for. On March 4, 1976, President Gerald R. Ford awarded the Medal of Honor to Captain Sijan for his “Extraordinary heroism and intrepidity above and beyond the call of duty at the cost of his life. . . .” Three other former prisoners of war, all living, also received Medals of Honor from President Ford on the same day. One of them was Air Force Colonel George E. Day. Colonel Day wrote to the *Airman Magazine*.

“Lance was the epitome of dedication, right to death! When people ask about what kind of kids we should start with, the answer is straight, honest kids like him. They will not all stay that way, but by God, that’s the minimum to start with.”

There were many other Academy Graduates whose courage, skill, and leadership made them heroes as well as examples for all of us. The first Graduate to down a MIG was a 1959 Graduate by the name of Captain (now Colonel) Robert E. Blake. He was joined by two former cadets who were pilots in General Robin Olds’ 8th Tactical Fighter Wing, the famous “Wolfpack.” These two men, Captain (now Lieutenant Colonel) Norman E. Wells, Class of 1963, and First Lieutenant (now Colonel) Steven B. Croker, Class of 1964, each downed two MIGs. Perhaps the most
distinguished fighter pilot, Academy Graduate of the Vietnam War was Major Richard Stephen Ritchie, Class of 1964. He not only was the first Air Force ace of the Vietnam War, but he was also the 1972 winner of the McKay Trophy (most meritorious flight of the year), and the Jabara Award for Airmanship (Academy Graduate whose accomplishments demonstrate superior performance in fields directly associated with aerospace vehicles.) He received the Air Force Cross, the Silver Star with three clusters and the Distinguished Flying Cross.

Other Jabara Award winners who deserve mention because of their heroic actions during the Vietnam conflict are Captain (now Lieutenant Colonel) Donald D. Stevens, Captain (now Lieutenant Colonel) Dale E. Stoval, and 1Lts (now Captains) Donald R. Backlund and Ronald T. Rand. Captain Stevens (now Col), Class of 1960, distinguished himself by extraordinary heroism by directing various supporting arms in an unarmed 0-2A that resulted in the successful rescue of a wounded soldier with no further casualties suffered by any participating friendly units. Captain Stevens made diving passes directly into the heavy enemy fire, fired four marking rockets between the advancing enemy and the soldier, directed USAF fighters to attack, giving careful and precise instructions concerning the location of the body, the advancing enemy, and the areas of concentrated fire, and directed the medical evacuation helicopters to the area.

Captain Stovall (now Lt Col), Class of 1967, led a formation of two Jolly Green HH-53 rescue helicopters deep into North Vietnam to pick up a downed airman, Captain Roger C. Locher. Captain Stovall braved heavy ground fire and MIG interceptors in an unsuccessful attempt to locate
Locher. Nevertheless, Stoval volunteered for a second chance to locate Locher even after being advised of the extremely hazardous nature of a second mission into the Red River Valley. This time, Captain Stovall spotted Locher’s signal mirror and brought the helicopter to a hover over him. The helicopter continued to receive ground fire while Locher was lifted into the aircraft. In a team effort, Captain Stoval voluntarily penetrated the heavily defended Red River Valley of North Vietnam to rescue a fellow airman. At great risk to his own life, he repeatedly braved North Vietnamese MIGs, SAMs, antiaircraft artillery fire, and ground forces to successfully recover Captain Locher from deep in North Vietnam.

Two more recent heroes are 1Lt Donald R. Backlund and 1Lt Ronald T. Rand, both from the Class of 1971. Lt Backlund led the initial flight of three HH-53 helicopter carrying a boarding party of United States Marines to be placed aboard the USS Holt for use in the recapture of the SS Mayaguez.

Lt Rand served as a crew member and combat photographer. Together they provided cover for rescue attempts and continued to ferry troops in the face of intense hostile fire and severe battle damage. Their efforts significantly contributed to the success of the Mayaguez rescue mission as well as providing spectacular photo coverage of the incident. Captain Backlund died on 29 August 1979 in an A-10 aircraft.

These are but a few of the men who have distinguished themselves in their various fields of endeavor. Some performed in an outstanding manner as cadets, however, most of them graduated without much recognition. These men developed the necessary qualities of leadership
and character as cadets and later employed them in the Air Force and in service to our nation.
THE ASSOCIATION OF GRADUATES

The Association of Graduates (AOG) is the Academy’s alumni association. The central office is located in RM 216-A, Harmon Hall, where the records of every graduate are kept. Through the AOG it is possible to contact any graduate anywhere in the world. Yet, this is not their only purpose. The AOG strives to support not only the graduates, but also the Cadet Wing and such Academy activities as Homecoming and 100th Night. The AOG also tries to encourage qualified young people to apply for appointment to the Academy.

Through its efforts, the AOG is able to promote an air of esprit de corps amongst graduates and cadets alike. To help facilitate this objective the Association maintains an Executive Director and Board of Directors here at the Academy.

All graduates have an option to join the AOG, and most do. However, anyone interested in the Academy can join as an Associate Member. From 1959 through 1980 the Academy has graduated nearly 14,000 cadets. Hence, the AOG is a rapidly growing organization.
THE FALCON

Strength, alertness, aggressiveness, and poise; these are terms symbolic of the mission of the United States Air Force. These also aptly describe the Falcon, chosen by the first class to enter the Academy as the official mascot of the Cadet Wing.

The falcon is a noble bird that catches its prey in flight, killing on impact. It has keen eyesight, a broad wingspan, curved talons, and a hooked beak for flighting. The fastest of all birds, the falcon can reach top speeds of 180 mph. Its ability to turn sharply and to streak only inches above the ground make it one of the most maneuverable of birds.

The white gyrfalcon, Baffin, was the true mascot of the Cadet Wing. She was named after the Northern Canadian Island where she was caught. Baffin died in 1978. The Academy also has several Prairie Falcons that are flown in demonstrations, and at home football games. These Falcons are released and allowed to dive toward a lure held by a Cadet Falconer.

The Falcon’s speed, power, temperament and courage make it a fitting and proud mascot for the Air Force Academy.
MILITARY TRAINING

In keeping with the mission of the Air Force Academy, Professional Military Training under the guidance of the Commandant of Cadets begins the day a cadet enters and lasts throughout the entire 4 years. This training is divided into two primary areas. The summers are devoted almost entirely to military training in a wide variety of forms and areas while the academic year finds Professional Military Studies as part of the routine class schedule. The cadets additionally will profit through the experience of living 24 hours a day in a military environment.

The cadets’ first summer at the Academy is spent in BCT (Basic Cadet Training) which is designed to help them make the transition from civilian to military life. During this period they are introduced to the military way of life, military customs and courtesies, and basic military abilities and skills. This is indeed basic training, but it is run by the upperclass cadets themselves with officer support and advice, always keeping the higher demands and requirements of the Academy in mind.

The training is divided into two phases: the first takes place in the Cadet Area. During this phase the Basic Cadet is introduced to Air Force rules and regulations, Cadet Wing regulations, the Military Training System, the Honor Code and Cadet Wing Ethics, Air Force Heritage, uniform neatness, drill, rifle manual, and personal hygiene. The Basic Cadet receives extensive physical training through participation in intramurals and physical education periods, each stressing a high degree of physical fitness.

The second phase of BCT is conducted in Jack’s Valley, a field training area located on the northern end of the
Academy grounds. During this part of Basic Summer, the general military skills of patrolling, combatives, and fellowship are taught. Further training is accomplished through the Confidence Course, the Assault Course, and the Leadership Reaction Course. The emphasis of the training is to build, in all cadets, confidence in themselves and their abilities. Each Basic Cadet also receives .38 pistol training. Accomplishment and pride in each individual are highly stressed. Basic Summer culminates with Field Day, when Basic Cadet squadrons compete against each other in many athletic contests.

During Third Class Summer, cadets learn SERE (Survival, Evasion, Resistance, and Escape) techniques, then select either Operation Non Com or Airmanship. SERE training includes two weeks of land navigation, mountain and water survival, and simulated POW resistance training. Exercises are realistic, and the cadets must rely on their own skills and a minimum amount of food and equipment to survive. Third Class Summer Training concludes with the cadet’s first real exposure to the operational Air Force. In the Airmanship program, cadets learn both freefall parachuting and how to pilot a glider. Cadets not enrolled in Airmanship participate in Non Com, where they spend three weeks at an active duty Air Force base understudying noncommissioned officers.

During the remaining two summers, the choice of summer programs is much wider. During these summers, cadets complete the summer training core curriculum of one leadership option and one option at an active duty base. Leadership requirements can be filled through command/staff positions in SERE, BCT, or at the Air Force Basic Military Training School at Lackland Air Force Base. Those
cadets not participating in Operation Non Com during Third Class Summer complete Operation Air Force during either their Second or First Class summers. In this program, they understudy junior Air Force officers. In addition to these core requirements, many optional programs are available each summer. Additionally, cadets may elect to further their flying skills in Academy navigation or T-41 flight indoctrination programs.

Planning, direction and operation of all summer training programs are carried out by upperclass staffs. Cadets gain first-hand leadership experience through these opportunities to train lower classes, receiving minimal direction from commissioned officer advisors.

Additionally, a limited number of summer research positions are open to academically qualified upperclass cadets. Each of these positions deals with a real Air Force problem, and research may be conducted at either the Academy or at an active Air Force facility. As might be expected, competition for this limited opportunity is keen and only the best competitors are selected.

During the academic year military training continues, emphasizing individual performance and responsibility. In addition, each class has a core Professional Military Studies course which cadets attend as part of their academic curriculum.

The Fourth Class course focuses on the mission, organization and operation of the USAF. It introduces the cadet to the military ethic and professional foundation necessary to become a career officer. It details the structure of the Air Force, the operation of the Department of Defense, and the Air Force’s role in support of national objectives.

The Third Class Professional Military Studies course
provides the cadet with a practicum in military communication and analytic skills expected of a junior officer. Cadets prepare and critique a variety of written and oral communications to include case studies and formal programs of civil-military communications.

The course required during the Second Class year delves deeply into U.S. military doctrine and employment concepts. Cadets relate basic doctrine to current force structures and employment concepts, then relate this to selected force employment issues through exercises and student preparations.

The final course, taken during the First Class year, provides the foundation of professional military thought upon which the cadets will be able to build throughout their military careers. It discusses current military strategy including characteristics of the modern battlefield and current conflicts.

Flying programs begin during the first summer when each Basic Cadet takes an indoctrination flight in a glider and helicopter, as well as the T-43 navigational trainer. These flights are designed to not only motivate cadets, but also to introduce them to the fundamentals of flight which they will study in class.

Courses in aviation fundamentals and navigation and freefall parachuting are available during the Fourth, Third, Second, and First Class years, and during the Second and First Class summers. An advanced navigation course is offered for the First Class in preparation for Undergraduate Navigator Training. Other navigation courses in avionics and astronomy are available as electives. All navigation training flights are made in the T-43.

During the First Class year, cadets eligible for pilot
training may take the T-41 Flight Training Program. This light plane flying program is the first step toward earning an Air Force pilot rating and may also be counted toward a private pilot’s license. Cadets who do not take T-41 must complete a course in aviation fundamentals and navigation.

Supplementing formal military training at the Academy is a series of lectures and presentations pertinent to USAF developments and leadership. Additionally, through the Squadron Sponsor Program, cadets are taken on trips to visit operational USAF units.

Military training at the Academy can be defined simply: the training of each cadet occurs during every class and at every formation. Military discipline and adherence to military bearing are first learned as concepts and then put into practice, initially on the basic “following” level, and later as upperclassmen, on a level similar to that exercised by junior officers of the Air Force.

Detailed descriptions of all military academic programs can be found in AFCR 50-1 and the United States Air Force Academy Catalog, 1981-1982.
ACADEMICS

As one of the nation’s service academies, this is a distinctive type of college. The Academy provides not only outstanding undergraduate education but also career motivation and leadership training aimed at producing long-term career officers of high quality.

The Dean of the Faculty, Brigadier General William A. Orth, is directly responsible for the entire academic program. The faculty is divided into 17 departments which are administratively separated into four divisions: Basic Sciences, Engineering Sciences, Social Sciences, and Humanities.

The Faculty is comprised of approximately 560 officers, plus NCOs and civilians. Each faculty member is required to possess at least a Master’s degree and be a volunteer. Nearly 30 percent have earned their Doctorates.

The core curriculum, required of all cadets, consists of courses that are fairly evenly split between the social sciences and humanities versus the basic and engineering sciences. The core requirement has proven to be extremely valuable as a basis for a future Air Force career.

Every cadet who graduates from the Academy is required to major in a particular area of their choice. The Academy offers a total of 23 majors, the majority of which are in science and engineering. Past experience has shown that approximately 50 percent of the Cadet Wing majors in science or engineering.

The number of hours required to graduate from the Academy will vary depending on the individual cadet’s major.

The Enrichment Program allows each cadet to strive for
his own level of academic achievement. Each cadet's academic program is tailored on an individual basis, and he is challenged to progress as far and as quickly as his abilities will take him. A cadet may participate in the Enrichment Program through transfer credits, the validation of courses, the substitution of advanced courses for required ones, the selection of honors courses in which course material is studied in greater depth, or voluntarily overloading by taking extra classes. Cadets may also audit courses. At any given time over 50 percent of the Cadet Wing participates in the Enrichment Program.

Additionally, most departments at the Academy offer 499 level courses in which students work on independent research of varying levels of sophistication. Other opportunities include work in the Aeronautics Laboratory, the Physics labs, the NASA-supported Bioengineering Laboratory, and the Frank J. Seiler Research Laboratory, all of which carry out research and development on an Air Force wide scale.

In daily classes, cadets are frequently graded and called on to demonstrate their knowledge of the day's study material. Cadets who excel in academics (by keeping their grade point averages (GPA) above 3.00) are named to the Dean's list. Those who do poorly and whose GPAs are low, or who have received failing or near failing grades in individual courses, are put on academic probation and receive limited passes until their grades improve.

The Academy emphasizes quality education through small classes (16-18 students per class), highly qualified instructors, and excellent facilities. This type of education has produced many graduates with high levels of achievement. Cadets who maintain both high academic and
military standards can compete for the chance to study one semester at the French Air Force Academy in France, the United States Military Academy at West Point, the United States Naval Academy at Annapolis, or the Coast Guard Academy at New London, Connecticut. Every year cadets also compete for national and international awards including Rhodes Scholarships, and Guggenheim and Fulbright Fellowships.

The United States Air Force Academy has established a proud academic tradition. Tomorrow's Air Force requires officers who are extremely well qualified and current in developments in their fields. The Academy's continuously evolving academic program meets this challenge well.
PHYSICAL EDUCATION
AND ATHLETICS

The Department of Physical Education plays a very important role in the life of each cadet at the Academy. Under the direction of Colonel John J. Clune, this department has the responsibility for leading the cadet through numerous areas of physical endeavor and instruction designed to maximize the benefits of physical activity. The object of this program is to develop traits of courage, aggressiveness, self-confidence, good physical condition, and an intense desire to win, all of which are essential to an officer in the United States Air Force. From the day a cadet enters the Academy until graduation 4 years later, the cadet must meet the challenge of a rigorous physical program.

Basic cadet summer is the period where the new cadets go through a program of intensive training and rigorous conditioning that demands a high degree of stamina and endurance. This program, consisting of motivational runs, obstacle courses, and calisthenics is very challenging. Together with the cadet's introduction to intramurals, it endeavors to provide the basic cadets with the conditioning and competitive spirit that they will need in cadet life and future training. At the end of basic cadet summer, all new cadets can feel proud of the knowledge that they have pushed themselves far beyond the limits which they thought possible, in the process establishing even higher limits to reach during ensuing years.

During the Fourth Class year, physical education classes emphasize upperbody development through courses in gymnastics, boxing, and swimming. Fourth Class women will take a physical development course in place of
boxing. Courses taken by Third Class cadets include introduction to court sports, tennis and basic combatives. Classes taught during the Second Class year build upon the principles of fitness, conditioning, strength and endurance emphasized during the first two years. Each Second Class cadet takes courses in judo, golf and water survival. First Class cadets will receive instruction in volleyball, unarmed combat and running techniques. In addition to the three mandatory courses taken each year, cadets are able to select one elective to augment their core physical education courses. Electives include advanced tennis and golf, basic ice skating, badminton, strength training, racquetball, basketball, handball, squash, fencing, scuba and instructor training.

All cadets who do not compete in intercollegiate sport, or who are not considered “on-season” for other activities must participate in the intramural program. Sports include football, soccer, tennis, cross-country, rugby, basketball, swimming, team handball and flag football. The intramural program is probably the most competitive program at the Academy and is appropriately called “intramurder” because of the very spirited competition in all the sports. The cadets develop a good deal of “esprit” for their team and squadron from the intramural program and learn how to work with people both as a team member and as a leader. This ability to “give one’s all” for a team and to organize a team to achieve maximum output is a vital characteristic for any future job. The traits developed in the intramural program are not soon forgotten; they remain with a cadet for life.

One of the most coveted trophies within the Cadet Wing is the First Lieutenant John J. Malanaphy Trophy. This trophy is awarded to the squadron that places first in intramural competition. The awarding of this trophy marks the
termination of the physical education program each year and for the graduating cadets the termination of a rewarding 4-year physical education program.
PROFESSIONAL ETHICS

The nature of the military profession demands that you have high ethical standards because, as an Air Force Officer, your decisions can have a devastating impact on others’ lives and property. For this reason, INTEGRITY, or the capacity to do what is right even when it costs you something, must be the basis of an officer’s ethics. Without this quality of character, an officer cannot set the proper priorities between self-interest and his or her official responsibilities to the unit, mission, Air Force, and country. The Cadet Professional Ethics Committee (CPEC) is the cadet organization chartered to help foster an atmosphere at USAFA in which each cadet can develop and internalize a personal sense of integrity in order to graduate with the character necessary for responsible officership.

The Cadet HONOR CODE is the facet of professional ethics most familiar to cadets. At the beginning of the fourth class year, each class takes an expressed oath that “We will not lie, steal, or cheat, nor tolerate among us anyone who does.” This oath—simple and direct in its wording—is a contract with the rest of the Wing that each cadet will meet his public responsibilities to the Academy community by putting the Wing’s interests above whatever personal advantages would accrue to him by lying, stealing, cheating, or tolerating. The Code represents a minimum standard of behavior that each cadet is expected to surpass. Because it is based on integrity and governs all aspects of cadet life, the Honor Code is perhaps the best officership training that exists at USAFA.

Let us look at each of the four tenets of the Honor Code in turn. LYING—a cadet’s word or signature is his bond;
regardless of motive, cadets are expected to tell the truth at all times. STEALING—depriving another of the possession or use of his property shows a callous disregard for his rights; cadets are expected to respect these rights at all times. CHEATING—taking unfair advantage of others is particularly tempting in a highly competitive academic environment. Cadets must always ensure they are graded on their own work. TOLERATION—the Non-toleration clause is the backbone of the Honor Code because the clause makes it clear that each cadet has a personal obligation to enforce ethical standards in the cadet community.

The Honor Code is administered on behalf of the Cadet Wing by the Cadet Professional Ethics Committee, whose members are elected from among first and second class cadets in each squadron. Suspected Honor Code violations are investigated by a Squadron First Class Ethics Representative. When appropriate, a case is referred to a Cadet Honor Code Board in which 12 cadets sit as jurors to hear the evidence and judge whether a violation occurred.

Penalties for violating the Honor Code are severe; they range from temporary suspension to disenrollment. When extenuating circumstances justify it, the cadet jury can also recommend that the Commandant of Cadets grant the guilty cadet 'discretion'. If this recommendation is approved, the cadet is returned to the Wing, is placed on aptitude probation and receives retraining on ethical standards. Cadets found not to have violated the Code are retained in the Wing without prejudice. Cadets who violate the Code and are not granted discretion or offered voluntary suspension by the Superintendent are expected to resign from the Air Force Academy. The Honor Code Reference Handbook (Blue Book) is the primary source for a more detailed treatment of
the Honor Code’s administration.

The purpose of the professional ethics education program is to provide cadets a firm understanding of the professional responsibilities of cadets and officers. As a result of this instruction, cadets should recognize that the Honor Code is part of a broad moral point of view based on a personal sense of integrity. Cadets should internalize this spirit of the Code as their guide for conduct, and they should avoid gaming the Honor Code or interpreting it in a legalistic manner.

A highly developed sense of honor or integrity is the basis of the officer corps’ professional ethics because of the nature of the military profession. Only officers who have these values are worthy of the trust which their nation extends them to guard its security and command others in combat. Life under the Honor Code is realistic training to develop these qualities of character in cadets and prepare them for that trust.
MAJOR COMMANDS

While the mission of the United States Air Force is often paraphrased as "to fly and to fight" the structure of the Air Force that makes that possible includes a great number of support organizations. The overall effectiveness of the Air Force depends on the mutual support and cooperation of all its components.

Major Air Commands:  Alaskan Air Command (AAC)  
Military Airlift Command (MAC)  
Pacific Air Force (PACAF)  
Strategic Air Command (SAC)  
Tactical Air Command (TAC)  
US Air Forces Europe (USAFE)  
Air Force Communications Command (AFCC)  
Air Force Logistics Command (AFLC)  
Air Force Systems Command (AFSC)  
Air Training Command (ATC)  
Electronic Security Command (ESC)

Separate Operating Agencies:  
Air Force Accounting and Finance Center (AFAFC)  
Air Force Audit Agency (AFAA)  
Air Force Engineering and Service Center (AFESC)  
Air Force Inspector General Activities Center (AFIGAC)  
Air Force Intelligence Center (AFIC)  
Air Force Service Information and News Center (AFSINC)  
Air Force Manpower and Personnel Center (AFMPC)
SAC

Headquarters: Offut AFB, Nebraska

SAC is the United States Air Force’s long range strike force composed of a mixture of combat aircraft and intercontinental ballistic missiles (ICBMs). The mission of SAC is to maintain a global force to deter aggression during peace time and destroy an enemy’s war-making capability in war time conditions. In keeping with its mission, SAC’s motto is “Peace is Our Profession.”

SAC’s airborne command post, a Boeing EC-135 containing a general officer, is constantly airborne for survivability. This aircraft is normally referred to by its nickname “Looking Glass.”

Within the continental United States there are two numbered air forces and a missile division: Eighth Air Force, Barksdale AFB, Louisiana; Fifteenth Air Force, March AFB, California; and 1st Strategic Aerospace Division, Vandenberg AFB, California. SAC also has two air divisions overseas: Third Air Division, Anderson AFB, Guam and Seventh Air Division, Ramstein AB, Germany.

Approximately 400 B-52s and 600 KC-135s comprise the
bomber-tanker force. This force has global range through aerial refueling. The bombers are equipped with the following weapons: SRAM-Short Range Attack Missile released by the B-52 and FB-111 providing standoff capability, nuclear gravity weapons, and a variety of conventional ordnance.

Approximately 40 percent of the bomber-tanker force is on ground alert all the time, positioned to take off within the warning time of an ICBM attack provided by the Ballistic Missile Early Warning System (BMEWS). The missile force is composed of 54 Titan II, 450 Minuteman II, and 550 Minuteman III ICBMs. The Titan II is a liquid fueled missile and has the largest warhead of all US missiles. The Minuteman II has improved range over early models. Minuteman III is able to employ Multiple Independently-Reentry Vehicles (MIRVs). All Minueman missiles are solid fueled.

SAC is the Air Force’s single manager for tanker operations, providing air to air refueling for all USAF fixed wing aircraft and supporting most refueling requirements for the other services.

Strategic reconnaissance is also provided by SAC. The SR-71 (a mach 3 + aircraft) ensures accurate intelligence information is available when needed.

This combination of manned bombers and unmanned ICBMs provide SAC with a flexible and survivable strategic force. They are two parts of our strategic TRIAD force. Combined with the Navy’s sub-launched ballistic missiles (SLBMs), they guarantee the effectiveness of our deterrent strategy.
TAC

Headquarters: Langley AFB, Virginia

The mission of the Tactical Air Command is "to produce and maintain combat-ready forces capable of conducting world-wide tactical air operations." In order to fulfill its role, TAC is composed of fighter, reconnaissance, communications, and support units. These forces provide TAC with quick reaction capability to any part of the world.

TAC forces are assigned the responsibility for: (1) Counterair — gain and maintain air superiority, (2) Air Interdiction — deny an enemy’s combat forces the supplies, mobility, and troops needed for sustained operations, (3) Close Air Support — destruction of enemy forces in support of friendly troops in the immediate battle area, (4) Tactical Air Reconnaissance — obtain information of enemy activities. In addition TAC provides F-4s for air defense alert under the operational control of NORAD. These functions give TAC one of the most versatile capabilities in the Air Force.

With headquarters at Langley AFB, Virginia, TAC directs the operations of two numbered air forces: the 9th Air Force, Shaw AFB, South Carolina, and 12th Air Force, Bergstrom AFB, Texas. TAC also controls the USAF Southern Air Division, USAFSO, in Panama. TAC also directs the Tactical Air Warfare Center, Eglin AFB, Florida, the Tactical Fighter Weapons Center, Nellis AFB, Nevada, and the Special Operations Force, Eglin AFB, Florida.

Finally, TAC provides air forces to the following US unified commands: Readiness, Atlantic, USAFE, PACAF and Alaskan.
USAFE

Headquarters: Ramstein AFB, Germany

The United States Air Forces in Europe was formed in 1962 but traces its origin back to early 1942. USAFE’s job is to train and equip Air Force units assigned to NATO, and to aid NATO nations in the development of their air forces. All USAFE-NATO missions are directed by the Supreme Allied Commander, Europe (SACEUR).

The USAFE forces operate throughout Western Europe and the Middle East. The three numbered air forces of USAFE are: 3rd Air Force, Mildenhall, England; 16th Air Force, Torregjon AB, Spain; 17th Air Force, Sembach, Germany. The primary fighter aircraft in Europe is the F-4 with many of the older F-4s being supplanted by the new F-4Es. F-111s are also used to complement the tactical role USAFE plays in Europe. F-15s and A-10s are also assigned there.

AAC

Headquarters: Elmendorf AFB, Alaska

The Alaskan Air Command’s mission is to provide offensive and defensive air forces for employment against a military attack in the Alaskan region. It also provides defensive forces for operational control by NORAD against an air attack on the North American Continent.

AFSC

Headquarters: Andrews AFB, Maryland
The purpose of the Air Force Systems Command is to advance USAF aerospace technology and adapt it into operational systems. The major operations of AFSC include new aeronautical developments; national space program; and management of USAF scientific and technical resources and advances in technology. An integral part of these operations includes extensive research and development (R & D) which has been responsible for many programs such as the B-1, F-15, F-16, and C-5A. R & D has been one of the most relied upon tools of the AFSC, complementing the maxim of "Fly Before Buy."

**AFLC**

**Headquarters:** Wright-Patterson AFB, Ohio

The Air Force Logistics Command provides materiel support to all forces in the Air Force. Weapons, ammunition, parts for aircraft and vehicles, etc., are among the varied articles the AFLC supplies. Since logistics has been a difficult task for armed forces throughout history, the AFLC has employed the concept of the Air Logistic Center (ACL), each of which (there are five) specializes in maintaining different aircraft and systems. The war in Vietnam called for new concepts such as Rapid Area Maintenance (RAM) teams. The command also has two specialized units: the Military Aircraft Storage and Disposition Center and the Aerospace Guidance and Metrology Center to maintain and calibrate precision instruments.
The Air Training Command supplies the qualified personnel needed to man the various USAF weapons systems. ATC provides many different types of training, ranging from basic military training at Lackland AFB, Texas, to technical training in any of the wide variety of career fields in the Air Force. Pilot training, a major portion of ATCs work, is conducted in the T-41, T-37, and T-38. Professional Military Education is conducted by ATC at Air University, Maxwell AFB, Alabama. ATC has been responsible through its programs for the success of our air forces throughout the world.

**PILOT TRAINING**

Air Force Pilots are among the best trained and most professional aviators in the world. After many hours of classroom preparation and practical instruction in basic flying skills received from the Air Training Command, the new pilot is ready for assignment to any aircraft in the USAF.

The Undergraduate Pilot Training (UPT) course includes 1,000 hours of involvement in a 49-week course. Major portions of this training are 176 flying hours, 364 hours in ground training and 124 officer development, and 66 hours in the integrated flight simulators.

The flying program is separated into two phases. Phase I training begins in the Cessna T-37 jet trainer. It is a twin engine, subsonic jet which is versatile enough to have been used by the USAF and Vietnamese Air Force in its combat
version (A-37). Training in this phase includes 75 hours of flying in the T-37.

Phase II training is conducted in the Northrop T-38 Talon, a twin engine aircraft capable of speeds up to Mach 1.2 (800 mph). The student receives 101 hours in the Talon, but flying is not the only training he receives.

Additional procedural training in UPT, UNT and UHT is now being accomplished in student-actuated, programmed learning centers where students can receive individual instruction through the use of short training films and tapes.

Professionalism is stressed in subjects dealing with physiology, navigation, flight planning and safety. Emphasis is placed on physical training through a 98-hour program.

The completion of UPT is an end to basic flying and a beginning to the officer’s flying career.

The six UPT bases are:

Columbus AFB, MS       Vance AFB, OK
Laughlin AFB, TX        Williams AFB, AZ
Reese AFB, TX           Sheppard AFB, TX (EURO NATO)

NAVIGATOR TRAINING

All United States Armed Forces Undergraduate Navigator Training (UNT) is conducted at Mather AFB (Sacramento) California. During the 28-week basic UNT Course a student receives a total of 29 T-37 flying hours devoted to instrument, contact, and visual low level flight. Another 153 hours of T-43 flying and support are dedicated to basic navigation procedures and techniques. The T-43 is the military version of the Boeing 737, and radar, celestial, and
maritime techniques are incorporated at both high and low altitudes. An additional 98 hours are spent in the T-45 navigation simulator and 394 hours are spent in class.

Upon completion of UNT, the newly-rated navigator has several options available. The new navigator may continue on to a 4-week advanced navigation program that leads to transports, tankers, or special operations; or continue on to a tactical navigation program that leads to fighters and reconnaissance operations. Alternately, the new navigator can choose advanced training in radar bombardment or electronic warfare.

The navigator flies in every command and in nearly every type of aircraft from the F-4 to the C-5, directly contributing to the success of their missions. Measures have been taken to provide enhanced long range career opportunities, more responsibilities, and increased potential for command. Select navigators serve as flight commanders, squadron and wing operations officers, squadron and wing commanders and vice commanders in flying and missile units. Along with other rated officers, navigators may also complete career broadening duty in nonrated career fields, especially in research and development, logistics, or as instructors and staff for pre-commissioning sources and professional military education programs.

**UNDERGRADUATE HELICOPTER TRAINING**

Undergraduate helicopter training is conducted at Fort Rucker, Alabama. The course of instruction is 36 weeks long, with initial instruction in the Hughes TH-55 primary trainer. Fifty hours are spent in the TH-55, with approximately 15 hours solo. From there, the student
progresses to the Bell UH-1H for 25 hours of dual instruction, followed by 55 hours of instrument instruction, 35 of which are simulated. Four weeks of night flying is the next requirement, followed by 65 hours of combat skills training. This is the last phase of undergraduate helicopter training, after which the student is awarded his/her wings. The next block of helicopter instruction is conducted at Kirtland Air Force Base, New Mexico. The 1550th Aircrew Training Wing at Kirtland instructs the students in the operation of the helicopter they will use in the Air Force. Among these are the UH-1N, the HH-53, and the HH-3.

**MAC**

Headquarters: Scott AFB, Illinois

The Military Air Transport Service (MATS) established in 1948, immediately proved its capabilities by helping to break the Berlin Blockade. On 1 January 1966, MATS changed its name to the Military Airlift Command (MAC), on 1 Dec 1974 it was identified as the single manager operating agency for airlift, and on 1 Feb 1977 became a specified command. Its mission, however, remains the same, to provide strategic and tactical airlift to support the fighting forces of the United States and to serve the humanitarian needs of people everywhere.

MAC’s resources are separated into three types of organizations: airlift components, technical services, and special wings. The airlift units are: 21st Air Force, McGuire AFB, New Jersey, which controls MAC operations from east of the Mississippi to Calcutta, India; 22nd Air Force, Travis AFB, California, which controls operations
west of the Mississippi to India; and commercial airlift, as MAC is the single manager for airlift service within the DOD, supplying commercial airline support through the Civil Reserve Air Fleet (CRAF), to back up MAC’s strategic and tactical airlift forces.

The technical services of MAC are broken into the Aerospace Audio-Visual Service (AAVS) at Norton AFB, California; Air Weather Service (AWS), Scott AFB, Illinois; Aerospace Rescue and Recovery Service (ARRS), Scott AFB, Illinois. Finally, the special wings of MAC provide medical evacuation, and transportation for the President and his staff.

PACAF

Headquarters:  Hickam AFB, Hawaii

The Pacific Air Forces, the air component of the United States Pacific Command (PACOM), is responsible for aerospace operations in the Central and Western Pacific, the Far East and Southeast Asia. The PACAF mission is to provide mobile, tactical forces for any emergency; assist friendly nations; provide intratheater airlift; support the air aspects of the Military Assistance Program (MAP); and aid in US military and civilian space programs.

AFCC

The Air Force Communications Command (AFCC) provides command and control communications, data automation and air traffic control services, as well as meteorological equipment and support, for Air Force units
and specified Department of Defense functions throughout the world.

AFCC communications responsibilities include automatic voice and digital data communications networks (AUTOVON and AUTODIN), automatic secure voice communications (AUTOSEVOCOM), long-haul communications systems such as tropospheric scatter radio and satellite communications, and tactical/mobile communications for the Air Force. In keeping with its motto, AFCC is truly "Providing the Reins of Command."

But AFCC responsibilities extend beyond the Air Force communications mission. As the single manager for USAF general purpose data automation resources, both hardware and software, AFCC provides computer services at 120 Air Force installations worldwide. AFCC provides all Air Force navigational aids; e.g., Tactical Air Navigation (TACAN) and Radar Approach Control (RAPCON) facilities; as well as air traffic control services at Air Force bases in the United States and overseas. Additionally AFCC operates and maintains specialized aerospace defense radar systems, such as the Pave Paws phased-array radars and the AN/FPS-85 spacetack system, in addition to USAF weather radar and weather satellite systems.

Employing over 50,000 personnel in 49 states and 22 foreign countries, the Air Force communications Command is the most widely dispersed Major Air Command.

**AFRES**

Headquarters, Robins AFB, Georgia

The mission of the Air Force Reserve is to provide combat ready units and trained individuals in time of war or national
crisis. This direct reporting unit manages all of the Air Force Reserve units. These units perform the same missions as the active force and often have operational Air Force missions. The Air Force Reserve is the USAF’s primary source of additional forces in an emergency.

**ANG**

The Air National Guard (ANG), while not a formal part of the USAF, is another important source of aircraft and trained personnel to augment active duty forces during a crisis. These state militia units fly the same aircraft and train for the same missions as active duty Air Force units.

Further information on these and all other Air Force organizations may be found in your Military Studies text books and the May issue of Air Force Magazine.
FOURTH
CLASS
KNOWLEDGE

106
OATH OF ALLEGIANCE TO THE UNITED STATES

I, having been appointed an Air Force Cadet in the United States Air Force, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies, foreign and domestic, that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office on which I am about to enter. SO HELP ME GOD.

MISSION OF THE UNITED STATES AIR FORCE

The mission of the United States Air Force is to organize, train, and equip air forces for the conduct of prompt and sustained combat operations in the air.

MISSION OF THE UNITED STATES AIR FORCE ACADEMY

To provide instruction and experience to all cadets so that they graduate with the knowledge and character essential to leadership and the motivation to become career officers in the United States Air Force.
THE PURPOSE OF THE FOURTH CLASS SYSTEM

The purpose of the Fourth Class System at the United States Air Force Academy is to lay the foundation early in the cadet's career for the development of those qualities of character and discipline which will be expected of an officer. These qualities must be so deeply instilled in the individual's personality that no stress or strain will erase them.

QUOTATIONS

"Duty then is the sublimest word in the English language. You should do your duty in all things. You can never do more. You should never wish to do less." (General Robert E. Lee.)

"In the development of air power, one has to look ahead and not backward and figure out what is going to happen, not too much of what has happened." (Brigadier General William "Billy" Mitchell; Winged Defense, 1924.)

"Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur." (Italian Air Marshall Guilio Douhet, 1928.)

"I don't mind being called tough, since I find in this racket it's the tough guys who lead the survivors." (Colonel Curtis LeMay, USA, to Lieutenant General Ira Eaker, USA, in England, 1943.)
“When there is a visible enemy to fight in open combat . . . many serve, all applaud and the tide of patriotism runs high. But when there is a long, slow struggle with no immediate, visible foe, your choice will seem hard indeed.” (President John F. Kennedy, Address to the Graduating Class, U.S. Naval Academy, June 1961.)

“Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity.” (General George S. Patton, Jr., War as I Knew It.)

“If I can’t go back with my self-respect, I won’t go back at all.” (Captain Theodore Harris, USAF, in solitary confinement for 14 months as a Prisoner of War in Korea.)

“You may have to fight when there is no hope of victory, because it is better to perish than live as slaves.” (Sir Winston Churchill.)

“Never in the field of human conflict was so much owed by so many to so few.” (Sir Winston Churchill, after the Battle of Britain.)

“If you can’t get them to salute when they should salute and wear the clothes you tell them to wear, how are you going to get them to die for their country?” (General George S. Patton, Jr.)

“Man’s flight through life is sustained by the power of his knowledge.” (Inscription on the Eagle and The Fledglings by Austin “Dusty” Miller, HQ ATC.)
“There is no type of human endeavor where it is so important that the leader understands all phases of his job as that of the profession of arms.” (Major General James C. Fry.)

“A leader is a man who has the ability to get other people to do what they don’t want to do, and like it.” (President Harry S. Truman; Memoirs, 1955.)

“Be an example to your men, in your duty and in private life. Never spare yourself, and let the troops see that you don’t in your endurance of fatigue and privation. Always be tactful and well mannered and teach your subordinates to be the same. Avoid excessive sharpness or harshness of voice, which usually indicates the man who has shortcomings of his own to hide.” (Field Marshall Erwin Rommel.)

“The discipline which makes the soldiers of a free country reliable in battle is not to be gained by harsh or tyrannical treatment. On the contrary, such treatment is far more likely to destroy than to make an army. It is possible to impart instruction and give commands in such a manner and such a tone of voice as to inspire in the soldier no feeling but an intense desire to obey, while the opposite manner and tone of voice cannot fail to excite strong resentment and a desire to disobey. The one mode or the other of dealing with subordinates springs from a corresponding spirit in the breast of the commander. He who feels the respect which is due to others cannot fail to inspire in them respect for himself while he who feels, and hence manifests disrespect toward others, especially his
subordinates, cannot fail to inspire hatred against himself.” (Major General John M. Scholfield’s graduation address to the graduating class of 1879 at West Point.)

The general is sorry to be informed that the foolish and wicked practice of profane cursing and swearing (a vice heretofore little known in an American army) is growing into fashion; he hopes that the officers will by example as well as influence, endeavor to check it, and that both they and the men will reflect that we can have little hope of blessing of heaven on our arms if we continue to insult it by our impiety and folly. Added to this, it is a vice so mean and low that every man of sense and character detests and despises it.” (General George Washington: General Order to the Continental Army, 3 August 1776.)
SERVICE SECRETARIES

Secretary of the Air Force
Secretary of the Army
Secretary of the Navy

CHIEFS OF STAFF

Chairman of the Joint Chief of Staff
Chiefs of Staff
Chief of Staff, USAF
Chief of Staff, USA

Commandant of the Marine Corps

Chief of Naval Operations
AIR FORCE
CHAIN OF COMMAND

President of the United States
Secretary of Defense
Secretary of the Air Force
Chief of Staff, USAF
Superintendent
Commandant of Cadets
Deputy Commandant for the Cadet Wing
Group AOC, Summer
Group AOC, Academic
Squadron AOC, Summer
Squadron AOC, Academic
CADET CHAIN OF COMMAND

BASIC CADET TRAINING

First Detail:

Group Commander
Squadron Commander
Operations Officer
Flight Commander
Element Leader
Element NCO

Second Detail:

Group Commander
Squadron Commander
Operations Officer
Flight Commander
Element Leader
Element Sergeant
ACADEMIC YEAR

First Semester:

Wing Commander
Group Commander
Squadron Commander
Operations Officer
Flight Commander
Element Leader
Element NCO

Second Semester:

Wing Commander
Group Commander
Squadron Commander
Operations Officer
Flight Commander
Element Leader
Element Sergeant
# Insignia of the United States Armed Forces

## Pay Grade

### Navy
- E-1: Seaman Recruit
- E-2: Seaman Apprentice
- E-3: Seaman
- E-4: Petty Officer Third Class
- E-5: Petty Officer Second Class
- E-6: Petty Officer First Class
- E-7: Chief Petty Officer
- E-8: Senior Chief Petty Officer
- E-9: Master Chief Petty Officer
- W-1: Warrant Officer
- W-2: Chief Warrant Officer

### Marines
- Private
- Private First Class
- Lance Corporal
- Corporal
- Sergeant
- Staff Sergeant
- Gunnery Sergeant
- Master Sergeant
- Warrant Officer
- Chief Warrant Officer

### Army
- Private
- Private First Class
- Specialist 4
- Specialist 5
- Specialist 6
- Specialist 7
- Specialist 8
- Specialist 9
- First Sergeant
- Staff Sergeant
- Sergeant First Class
- Sergeant
- Warrant Officer
- Chief Warrant Officer

### Air Force
- Airman
- Senior Airman
- Staff Sergeant
- Technical Sergeant
- Master Sergeant
- Senior Master Sergeant
- Chief Master Sergeant
- Warrant Officer
- Chief Warrant Officer

(Silver Star)

(BLUE STAR)

1. CMSGT of the Air Force - Wreath Around Star.
2. ANY RANK WITH A DIAMOND IS A FIRST SERGEANT.
AIR FORCE RATINGS AND INSIGNIA

PILOT: Must have successfully completed an Air Force or Naval Training course and be physically qualified.

SENIOR PILOT: (Wings with star) must have 7 or more years rated service. Total 2,000 hours or 1,300 hours as a first pilot or instructor.

COMMAND PILOT: (Wings with star and wreath) must have 15 or more years rated service. Total 3,000 hours or 2,300 hours as a first pilot or instructor.

NAVIGATOR: Must be a graduate of an appropriate navigator training command course.

SENIOR NAVIGATOR: (Wings with star) must have 7 or more years of service as a rated navigator or aircraft observer, and have 2,000 hours flying time.

MASTER NAVIGATOR: (Wings with star and wreath) must have 15 years of rated military service, 3,000 hours as a navigator or aircraft observer, and be on flying status.

FLIGHT SURGEON: Must have successfully completed an appropriate course or have 1 or more years on flying status as an aviation medical examiner, have 100 flying hours, and be on flying status as a designated medical examiner.

AIRCREW MEMBER: Must perform a duty as a crew member during flight of an aircraft. Examples: radio operator, tail gunner, boom operator, steward.
ASTRONAUT RATING: The shooting star insignia, when superimposed over any aircrew rating, indicates that the holder possesses that rating and has flown to an altitude of 50 miles or higher in a powered space vehicle.

PARACHUTIST: Must have completed either the Basic Airborne Course at a military parachute school (usually Fort Benning) including at least five jumps, or the Freefall Parachuting Course (AM-490) at USAFA.

MISSILE BADGE: This badge is worn by eligible Air Force personnel who are directly assigned to a job with an operational strategic missile function. At the operational level, it is awarded when an individual is certified combat ready.

WEAPONS CONTROLLER: This badge is awarded to combat ready air defense Weapons Controllers after completing one year of operational duty. Senior and Master badges are awarded for longer periods of service.

AIR TRAFFIC CONTROLLER: This badge is awarded to persons who have completed formal training, been certified mission ready, and served at least one year of operational duty as an air traffic controller. Senior and Master badges are awarded for longer periods of service.
CADET RANK
AND INSIGNIA

1st CLASS

WING COMMANDER
C/COL

DEPUTY
WING COMMANDER
C/COL

GROUP COMMANDER
C/COL

C/LT COL

C/MAJ

C/CAP

C/ LT

C/FIRST CLASS
UNRANKED

POCKET AND UPPERCLASS CAP INSIGNIA

DEAN'S LIST

SUPERINTENDENT'S LIST

COMMANDANT'S LIST

PROP AND WINGS
(GOLD IF RELATIVE WAS MEMBER OF ARMY AIR CORPS)

SUMMER PROGRAM RANK INSIGNIA
THE AMERICAN FIGHTING MAN'S CODE OF CONDUCT

I

I am an American Fighting man. I serve in the forces which guard my country and our way of life. I am prepared to give my life in their defense.

II

I will never surrender of my own free will. If in command, I will never surrender my men while they still have the means to resist.

III

If I am captured, I will continue to resist by all means available. I will make every effort to escape and aid others to escape. I will accept neither parole nor special favors from the enemy.

IV

If I become a prisoner of war, I will keep faith with my fellow prisoners. I will give no information nor take part in any action which might be harmful to my comrades. If I am senior, I will take command. If not I will obey the lawful orders of those appointed over me and will back them up in every way.
V

When questioned, should I become a prisoner of war, I am required to give name, rank, service number, and date of birth. I will evade answering further questions to the utmost of my ability, I will make no oral or written statements disloyal to my country and its allies or harmful to their cause.

VI

I will never forget that I am an American fighting man, responsible for my actions, and dedicated to the principles which made my country free. I will trust in my God and in the United States of America.
THE STAR SPANGLED BANNER
by
Francis Scott Key, 1814

I
O say can you see, by the dawn’s early light
What so proudly we hail’d at the twilight’s last gleaming?
Whose broad stripes and bright stars, thro’ the perilous fight,
O’er the ramparts we watched, were so gallantly streaming?
And the rockets’ red glare, the bombs bursting in air,
Gave proof thro’ the night that our flag was still there.
O say, does that star spangled banner yet wave
O’er the land of the free and the home of the brave?

II
On the shore, dimly seen thro’ the mists of the deep,
Where the foe’s haughty host in dread silence resposes,
What is that which the breeze, o’er the towering steep,
As it fitfully blows, half conceals, half discloses?
Now it catches the gleam of the morning’s first beam,
In full glory reflected, now shines on the steam:
’Tis the star spangled banner: O long may it wave
O’er the land of the free and the home of brave?
III
And where is that band who so vauntingly swore
That the havoc of war and the battle's confusion,
A home and a country should leave us no more?
Their blood has wash'd out their foul footsteps' pollution.
No refuge could save the hireling and slave
From the terror of flight or the gloom of the grave:
And the star spangled banner in triumph doth wave
O'er the land of the free and the home of the brave!

IV
O thus be it ever when free men shall stand
Between their lov'd homes and the war's desolation;
Blest with vict'ry and peace, may the heav'n-rescued land
Praise the pow'r that hath made and preserv'd us a nation!
Then conquer we must when our cause it is just,
And this be our motto: "In God is our trust!"
And the star spangled banner in triumph shall wave
O'er the land of the free and the home of the brave!

THE AIR FORCE SONG

Off we go into the wild blue yonder,
Climbing high into the sun;
Here they come zooming to meet our thunder,
At' em boys, giv'er the gun!
Down we dive spouting our flame from under,
Off with one hell-uv-a-roar!
We live in fame or go down in flame,
Nothing'll stop the US Air Force!

Minds of men fashioned a crate of thunder,
Sent it high into the blue;
Hands of men blasted the world asunder,
How they lived God only knew!
Souls of men dreaming of skies to conquer
Gave us wing, ever to soar.
With scouts before and bombers galore,
Nothing can stop the US Air Force!

Here is a toast to the host of those who love the
the vastness of the sky,
To a friend we send the message of his brother men
who fly.
We drink to those who gave their all of old,
Then down we roar to score the rainbow's pot
of gold.

A toast to the host of men we boast,
The US Air Force.

Off we go into the wild sky yonder,
Keep the wings level and true!
If you'd live to be a gray-haired wonder,
Keep the nose out of the blue!
Flying men guarding our nation's borders,
We'll be there followed by more.
In echelon we carry on!
Nothing'll stop the US Air Force.
USAF OPERATIONAL AIRCRAFT
ATTACK

Vought Corp A-7D Corsair II

Fairchild Republic A-10 Thunderbolt II

Lockheed AC-130 Spectre
Vought Corp A-7D Corsair II

Originally designed for the Navy, the A-7D replaced the A-1 in the ground attack and close air support roles. It has an internal 20mm cannon and can carry up to 15,000 pounds of munitions on its external stations. It has a Heads-Up-Display (HUD) to give the pilot vital flight information without requiring that he look in the cockpit.

Fairchild Republic A-10 Thunderbolt II

With a 30mm gun mounted in the nose, the A-10 is designed specifically for close air support. It can carry over 16,000 pounds of ordnance including the Marverick missile. It can loiter for over 2 hours over a target. The survivability of the aircraft is enhanced by mounting the engines high on the fuselage to protect them from ground fire, self-sealing fuel tanks, and titanium armor plating on all sides of the cockpit.

Lockheed AC-130 Spectre

The AC-130 is the most effective truck killer in the USAF inventory. The primary reason for this is the large quantity of electronic sensing gear aboard the aircraft including low-light level TV, infrared and radar sensors. Most versions are equipped with 20mm and 40mm cannon, while the later versions include a 105mm howitzer.
Boeing B-52 Stratofortress

The B-52 has been the mainstay of SAC for over 20 years and still is quite capable. It has been modified countless times to keep it viable in the rapidly changing arena of combat. The most recent modification has been the addition of FLIR (Forward Looking Infrared) and Low Light Level TV for low altitude penetration and better acquisition of targets on night missions. Although it is currently outfitted for low level penetration, it was used extensively in Vietnam for high altitude bombing. The B-52 is also used for maritime reconnaissance.
General Dynamics FB-111

Developed from the F-111A, the FB-111 is a supersonic bomber equipped with terrain following radar which makes it particularly useful for low level bombing missions. It can carry up to 50 750 lb bombs (2 internally, 48 externally), but when it is configured this way it is restricted to subsonic flight because the wings cannot be swept back. It can also carry the SRAM missile and nuclear gravity bombs.
McDonnell-Douglas F-4 Phantom II

Northrop F-5E Tiger II
McDonnell-Douglas F-4 Phantom

Originally designed as an interceptor for the Navy, the F-4 has been the mainstay for TAC since the 1960s. The F-4C was the first model used by the Air Force. Because it was designed as an interceptor, it did not have an internally mounted gun, so gun pods were developed for the D model for use in Vietnam. The E model was the first to have an internal gun mounted in the nose and is the model used to the greatest extent by the Air Force. When equipped for the ground attack role, the F-4 can carry almost any conventional ordnance in the inventory. When configured for air-to-air combat, the F-4 carries the Sparrow and Sidewinder missiles. The RF-4 is an unarmed, photo-reconnaissance version.

Northrop F-5E Tiger II

The F-5E is a combat derivative of the T-38. It is capable of carrying Sidewinder missiles, 7,000 pounds of ordnance and has two internal 20mm cannons. It is used primarily by allied nations in the Military Assistance Program. F-5E aircraft are also used by Air Force aggressor pilots to conduct Red Flag missions at Nellis AFB, Nevada.
McDonnell-Douglas F-15 Eagle

General Dynamics F-16

General Dynamics/Convair F-106 Delta Dart
McDonnell-Douglas F-15 Eagle
The F-15 is the first aircraft that the USAF has designed specifically for air superiority since the F-100. The Eagle is armed with the Sparrow and Sidewinder missiles and a 20mm cannon. When it is used in the ground attack role it carries up to 15,000 pounds of external ordnance.

General Dynamics F-16
The F-16 was designed as a low cost, lightweight fighter and was picked over the Northrop YF-17 in a fly-off competition. Although a relatively simple aircraft, it contains advanced technology such as a seat reclined 30° to allow the pilot to sustain higher G’s while maneuvering and a fly by wire, fully electronic, control system. Its armament includes the Sidewinder missile and an internal 20mm cannon. The F-16 can carry up to 15,200 pounds of external ordnance on ground attack missions.

General Dynamics/Convair F-106 Delta Dart
Originally designated the F-102B, the F-106 is the main interceptor for NORAD. It can carry the Genie and/or Falcon missiles. Studies are currently underway to find a replacement for this aircraft, possibly the F-15. The F-106 was the first all-weather interceptor to employ a digital computer system. The F-106, a Mach 2 fighter, is still in operational service in both the active force and the Air National Guard, but is being phased out.
General Dynamics F-111

Lockheed C-5 Galaxy

McDonnell-Douglas C-9 Nightingale
General Dynamics F-111

Variable geometry wings and sophisticated avionics equipment make the F-111 the most advanced fighter-bomber in the USAF inventory. Equipped with terrain following radar (TFR), it is designed for low level penetration in high threat environments. Combat missions in SEA demonstrated the capabilities of the F-111 which proved to be very effective during the Linebacker II operation.

TRANSPORT AND TANKER

Lockheed C-5 Galaxy

Designed to carry heavy and bulky cargo for long distances, the C-5 is the largest aircraft in the world. Although resembling the C-141 in external design, the C-5 is a different aircraft internally. The C-5 has 28 wheels in its landing system to allow landing on semi-prepared runways. Above the cargo deck is a permanent passenger section with a 75 seat capacity.

Although primarily designed for cargo, seating for 270 troops is possible on the cargo deck. Typical loads for the C-5 are 2 M-60 tanks, 10 Pershing missiles with vehicles or 36 pallets as compared to the C-141's 10 pallets. The C-5 also is equipped for parachute delivery of cargo and troops and has dropped up to 70,000 pounds on a single pass.

McDonnell-Douglas C-9 Nightingale

Essentially a DC-9-30 commercial transport, the C-9 has been internally modified to carry up to 40 litters, 40 ambulatory patients or combinations of the two. With a medical crew of 5, the C-9 is able to provide comfortable transportation for patients within the US.
Lockheed C-130 Hercules
The primary tactical airlift aircraft, the Hercules has been produced in over 15 versions. Currently the E is the primary version with its uprated engines and underwing fuel tanks. The HC-130P is used in air-sea rescue and is equipped for recovery of individuals with the Fulton recovery system. It is also able to refuel HH-3s and HH-53s in flight with a drogue system. The DC-130 is equipped to launch and control four drones for air reconnaissance for high threat areas. The WC-130 flies weather missions such as hurricane hunting and cloud seeding. The LC-130OR is fitted with wheelskis and JATO bottles for missions into the polar regions. The Hercules is designed for palletized cargo and is capable of air delivering these pallets by parachute or low-level extraction system.

Lockheed C-140 Jetstar
Of the 16 AF Jetstars, 5 C-140As are used for navigation aid inspection by the AF Communication Command, 5 B-types are used for mission support roles and 6 are used by MACs 89th Special Activities Wing for VIP transport.

Lockheed C-141 Starlifter
Equipping 13 squadrons on the East and West coasts, the C-141 has been the mainstay of MAC and with the C-5 forms an all-jet strategic airlift fleet. The C-141 is designed for air delivery of the pallets and can accommodate 123 fully equipped troops. The C-141 has been modified to carry Minuteman missiles in its cargo bay and has a capacity of carrying up to 90,000 lbs. A stretched B model is being developed with the capability to be air refueled.
Lockheed C-130 Hercules

Lockheed C-140 Jetstar

Lockheed C-141 Starlifter
McDonnell-Douglas KC-10A Extender

The KC-10A is based on an advanced version of the commercial DC-10, modified to include body bladder fuel cells in the lower cargo compartments, a boom operator's station, an aerial refueling boom, a hose and drogue refueling system, and military avionics. In its primary role of increasing US air mobility, a single KC-10A will be able to combine the tasks of a tanker and a cargo aircraft by refueling fighters and simultaneously carrying the fighter's support equipment and personnel on overseas missions.

Boeing KC-135 Stratotanker

Developed from the Boeing 707, the KC-135 is used by SAC to support its own force and those of other commands with aerial refueling for all tactical, strategic, and cargo aircraft. With high speed and high altitude capabilities, the KC-135 can also be used as a long-range passenger and/or cargo transport, although the C-135 Stratolifter, essentially the same aircraft without the refueling capabilities, is better equipped to handle that mission. Another version, the VC-137C, is the Presidential transport known as "Spirit of 76." Additionally, the EC-135 and RC-135 are used as an Airborne Command Post (ABNCP) and for reconnaissance, respectively.
McDonnell-Douglas KC-10A Extender

Boeing KC-135 Stratotanker
RECONNAISSANCE AND SPECIAL MISSION

Lockheed TR-1

Lockheed SR-71 Blackbird

Boeing E-3A Sentry (Airborne Warning and Control System-AWACS)
Lockheed U-2
Designed by Kelly Johnson, the U-2 became famous when one was shot down over Russia in 1960. Basically a jet-powered glider, the aircraft uses its 80-foot wingspan and high altitude capability to carry out reconnaissance missions. The U-2 is also used to sample air in nuclear tests. The U-2 production lines will be reopened under the name of the Lockheed TR-1. The TR-1 will be specifically designed for European reconnaissance.

Lockheed SR-71 Blackbird
Developed from the YF-12A, the SR-71 is used by SAC to provide detailed photographic reconnaissance throughout the world. Flown by the 4200th SRW at Beale AFB, CA the SR-71 operates at altitudes above 80,000 feet and at speeds in excess of Mach 3. The SR-71 requires a special jet fuel and has air refueling capabilities.

Boeing E-3A Sentry (Airborne Warning and Control System-AWACS)
A modified Boeing 707, "Sentry" was the name given to our AWACS aircraft. It was developed to track enemy aircraft and to direct fighters to intercept them. The Sentry is a greatly improved successor to the EC-121 Warning Star. Sentry will also provide a platform for the control of strike forces as is currently done by the C-130s flying ABCCC (Airborne Command and Control Center) missions.
Boeing E-4A Advanced Airborne Command Post (AABNCP)

The E-4A is a modified Boeing 747, designed to replace SAC's EC-135 Airborne Command Post (ABNCP) aircraft. It is equipped with much more electronic gear than the EC-135, and its capabilities are greater. The E-4A is currently serving as the National Emergency Airborne Command Post.
Beechcraft C-12 Super King Air
A twin engine turboprop transport, the C-12 is used to train Air Force pilots who serve in attache and MAAG posts around the world. This sleek eight-passenger aircraft is particularly suited for short airfields.

Boeing T-43A
The T-43 is a military version of the civilian 737. It is capable of training 12 students simultaneously at individual consoles arranged four per instructor. It is used in UNT at Mather AFB, CA and at USAFA for navigation courses.
Cessna O-2 Skymaster
The O-2 is a conversion of the civilian Supper Skymaster. It is used in the FAC role, and due to its greater capabilities it has replaced the O-1E.

Rockwell International OV-10 Bronco
The OV-10 supplements the O-2 in the FAC role. It is, however, more versatile as it can carry more ordnance and has attack and cargo capabilities in addition to the FAC ability.

DeHavilland UV-18B Twin Otter
The Air Force Academy Parachute Team and AM-490 students jump from the DeHavilland UV-18B Twin Otter. The Academy is the first Air Force organization to fly this high wing, fixed landing gear, twin engine aircraft. The UV-18B carries 18 people—15 jumpers, a jumpmaster, and two pilots.
Cessna O-2 Skymaster

Rockwell International OV-10 Bronco

DeHavilland UV-18B Twin Otter
Helio U-10 Courier

A utility transport used in COIN missions, the Courier has excellent STOL capabilities and can perform reconnaissance at speeds as low as 30 mph. It is a derivative of the civilian aircraft of the same name.
Cessna T-37 Tweet
A jet trainer with side-by-side seating, the T-37 is the first aircraft now flown in the UPT program. After 90 hours in this aircraft, students progress to the T-38.
Northrop T-38 Talon

The advanced jet trainer in UPT series, the Talon held world records in climb rates and is still one of the best climbing aircraft in the world. Developed as a trainer, the performance was so good that the F-5 was developed as a fighter and is now being sold to our allies. The Talon has tandem seating and with its white paint is easily recognizable.

Rockwell International T-39 Sabreliner

With swept wings and 2 engines mounted externally on the fuselage aft of the wing, the T-39 resembles a fighter more than a trainer. Used for cargo and proficiency flying, the B model is also used to train “Wild Weasel” crews in operating airborne detection systems.

Cessna T-41A

Recently removed from the UPT initial flying phase, the T-41 is still used in ROTC and USAFA programs. The C model features a supercharger to insure better capability at high altitudes.
Bell UH-1 Huey

The UH-1 operates in coordination with ICBM sites and is used extensively by the Special Air Warfare Forces for insurgency operation. The Army flies the UH-1H version on a major scale.

Sikorsky CH/HH-3 Jolly Green Giant

Used extensively by the USAF Aerospace Rescue and Recovery Service, the HH-3E is famous for hundreds of rescue operations in SEA. The aircraft is equipped with armor plating, self-sealing fuel tanks, retractable landing gear, flight refueling pods, defensive armament and a rescue hoist. Despite these advantages over most helicopters, the Jolly Green is being replaced by the more powerful HH-53.
Sikorsky CH/HH-53 Super Jolly Green Giant or BUFF (Big Ugly Fat Fellow)

The HH-53C is the largest rotary wing aircraft in the Air Force inventory. Improvements in the C model include extra armor plating, more powerful engines, 3 miniguns, removeable external fuel tanks, and air refueling capability from HC-130Ps. With a dash speed of over 200 mph and cruise of 175 mph, the “BUFFs” have replaced the HH-3E in the SAR missions. Flown by the Aerospace Rescue and Recovery Service, the HH-53 is easily recognized by its externally mounted turbine engines.
RESERVE AND ANG AIRCRAFT

McDonnell-Douglas F-101 Voodoo

Fairchild Republic F-105 Thunderchief

Cessna A-37 Dragonfly
DeHavilland C-7 Caribou

In addition to those aircraft which are pictured, Air National Guard and Air Force Reserve units fly aircraft which are still in the active inventory, including: KC-135’s, C-130’s, AC-130’s, CH-3’s, HH-53’s, A-7D’s, F-106’s, and RF-4C’s. Air Force Reserve crews also fly active duty C-141’s, C-5’s and C-9’s under the Reserve Associate program.
U.S. STRATEGIC MISSILE SYSTEMS

LGM-25C Titan II
The heavyweight of the U.S. strategic missile force is the Titan II, which carries the largest nuclear warhead in the Air Force ICBM Inventory. The Titan is a 2-stage missile which uses storable liquid propellants and is capable of destroying enemy targets more than 6,000 nautical miles away. Fifty-four Titan IIs have been deployed since 1963 at three operational bases — in Arizona, Arkansas, and Kansas. For maximum survivability and effectiveness, individual launch complexes are separated by a distance of 7 to 10 miles. All incommission missiles are maintained in a constant alert condition, with less than one minute reaction time from key-turn to liftoff.

LGM-30F Minuteman II
The as. For maximum survivability and effectiveness, individual launch complexes are separated by a distance of 7 to 10 miles. All incommission missiles are maintained in a constant alert condition, with less than one minute reaction time fal miles. It employs the MK 11 reentry vehicle, which carries a single nuclear warhead, and 450 Minuteman IIs are maintained on alert in underground, unmanned, hardened launch facilities.

LGM-30G Minuteman III
Deployment of the Minuteman III or “G” model began in 1970, with 550 now operational. This is also a 3-stage, solid propellant, inertially guided ICBM with a range in excess of 7,000 NM. Unlike the Minuteman II, the Minuteman III employs the MK 12 reentry vehicle, a Multiple Independently Targetable Reentry Vehicle (MIRV)
with penetration aids. This enables a single missile to place warheads on three separate targets with a high degree of accuracy while increasing the possibility of penetrating enemy defense systems. The MK 12 reentry vehicle is being replaced by the MK 12A, which will increase the yield of the Minuteman III warhead. Under a force modernization program, SAC has provided Minuteman III with the Command Data Buffer System that permits rapid missile retargeting. The reaction time for the Minuteman missiles is less than 30 seconds.

**MX**

Due to the increasing vulnerability of SAC’s land-based ICBMs, a new missile system, Missile X or MX, is being developed. It is designed as a follow-on to the Minuteman III, with full-scale deployment expected by 1986. MX has twice the gross weight of the Minuteman III and four times its throw-weight. The missile will have increased range and improved accuracy over current systems, with each missile carrying up to 10 warheads. A mobile deployment mode known as multiple protective structures is currently being studied to improve survivability.

**AGM-69 SRAM (Short Range Attack Missile)**

The Short Range Attack Missile, deployment of which began in 1972, is an inertially guided, supersonic air-to-surface weapon carried on board SAC’s B-52 and FB-111 aircraft. The SRAM carries a nuclear warhead and was designed fundamentally to attack and neutralize enemy terminal defenses, such as SAM sites, although it is capable of destroying any target. At the present time there is no known defense against the SRAM.
ALCM

The Air-Launched Cruise Missile (ALCM) is a small unmanned winged air vehicle capable of sustained subsonic flight following launch from a carrier aircraft. It has a turbofan engine and carries a nuclear warhead, and is programmed for precision attack on surface targets. Guidance is by a combination of inertial and terrain comparison techniques. Small radar signature and low-level flight capability enhance its effectiveness. When launched in large numbers, each of the missiles would have to be countered, making defense against them both costly and complicated. Additionally, by diluting defenses, the ability of manned aircraft to penetrate to major targets would be greatly improved. A B-52 could carry 12 ALCMs externally (6 mounted under each wing) and 8 internally on a rotary launcher, with the missiles’ wings and tail folded, and engine air intake retracted. The cruise missile can also be launched from ships, submarines, and ground launchers.
<table>
<thead>
<tr>
<th>Letter</th>
<th>Phonetic</th>
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<tbody>
<tr>
<td>A</td>
<td>Alpha</td>
<td>N</td>
<td>November</td>
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<td>B</td>
<td>Bravo</td>
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<td>D</td>
<td>Delta</td>
<td>Q</td>
<td>Quebec (Kay-beck)</td>
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<td>E</td>
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<td>T</td>
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<td>U</td>
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<td>V</td>
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<td>J</td>
<td>Juliet</td>
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<td>X</td>
<td>X-Ray</td>
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<td>L</td>
<td>Lima</td>
<td>Y</td>
<td>Yankee</td>
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<tr>
<td>M</td>
<td>Mike</td>
<td>Z</td>
<td>Zulu</td>
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</table>
AIR FORCE ACADEMY FOOTBALL
1980

September 12  *Brigham Young University
September 19  *Wyoming
September 26  *New Mexico
October  3  *Colorado State
October 10  Navy
October 17  **Tulane
October 24  Oregon
October 31  Army
November 2  Open
November 14  Notre Dame
November 22  *Las Vegas
November 28  *San Diego State

* - Denotes Western Athletic Conference game.

** - Denotes game designated to count in WAC standings.

CONFERENCE:  Western Athletic Conference

HEAD COACH:  Ken Hatfield (2nd Year)
FALCON FIGHT SONG

Fly you Falcons down the field; tear the enemy asunder!
Bare your talons, make them yield; give them all your thunder!
Spread your strong wings wide and high; fight for victory!
Never say die, keep flying high, for the Air Force Academy!

GEAR UP AND GO!

Rev up and go Falcons to the fight,
For our spirit is high.
Gear up and go Falcons, surge ahead,
On the field as in the sky
For you will see silver and the blue
Reign supreme upon the field.
We will prove that we can’t be beaten,
For the Falcons never yield.
CHEERS

USAFA PRE-GAME

U-S-A-F-A
Air ----- Force
Fight! Fight! Fight!

YEA SILVER

Yeaaa Silver!
Yeaaa Blue!
Yeaaa Air Force!
We’re For You!
USAFA POST-GAME

Sing the third verse of the Air Force Song.

GO FALCONS!

Go! Go! Go Falcons!
Fight! Fight! Fight Falcons!
Go Falcons! Fight Falcons!

Go Falcons Fight!

SLASH’M WITH A BEAK

Slash’m with a beak!
Rip’m with a claw!
Bring on the meat wagon,
Rah! Rah! Rah!

AFA JIVE

1, 2, 3, 4, 5
AFA don’t take no jive
6, 7, 8, 9, 10
Back it up, and do it again.
(Repeat)
Hey Gang!

Yeah man?
I said Hey Gang!
Yeah man?

What's the matter with the team?
Well the team's all right.
And who says so?
Every ------ body
And whose everybody?
The A - F - A

Well lets hear fifteen rahs for the AFA
Hey-rah, Hey-rah, Hey-rah-rah-rah-rah
Hey-rah, Hey-rah, Hey-rah-rah-rah-rah
Hey-rah, Hey-rah, Hey-rah-rah-rah-rah
ABORT (v.) to discontinue or abandon; (n.) an abandoned take-off.
BANDIT (n.) an unfriendly aircraft.
BASE (n.) installation owned and/or operated by the Air Force.
BASE LEG (n.) the next to the last leg of traffic pattern flown perpendicularly to the runway.
BEDCHECK CHARLIE (n.) World War I ace who appears at USAFA football games and other wing functions to lend supernatural support.
BIRD (n.) a flying machine, usually an aircraft, but sometimes a missile.
BOGEY (n.) an unidentified flying object or radar blip. A member of wing or Group Staff.
BOMB (n.) to do extremely poorly, i.e., to bomb a graded review (GR).
BUY THE FARM (v.) to crash.
CANOE U. (n.) a small school which forms a suburb of the capital of Maryland with a campus partly on land and partly in Severn River.
CEILING (n.) that level of altitude where the sky becomes more than one half obscured by clouds as seen by an observer on the ground.
CLANK (v.) to freeze up; to goof.
COMM SHOP (n.) that organization coming under the control of the Commandant and consisting of those departments directly affecting the Cadet Wing.
CONTRAILS (n.) Condensation trails, a visible trail of water droplets or ice crystals formed in the wake of an aircraft.
flying at high altitude. Also the name of the Air Force Cadet Wing handbook.

**CONVERTER (n.)** the T-37, since it converts JP-4 fuel directly to noise.

**CRASH (n.)** a landing in which the vertical velocity is so great and the time spent in reducing it to zero is so brief that the deceleration and hence the forces acting are so large as to cause structural failure.

**CREW CHIEF (n.)** enlisted man or NCO in charge of maintenance of a certain aircraft.

**DESTRUCT (n.)** a system for deliberate exploding of a missile after launch.

**DOOLIE (n.)** that insignificant whose rank is measured in negative units; one whose potential for learning is unlimited; one who will graduate at some time approaching infinity.

**DOWNWIND (n.)** the leg in a traffic pattern which is parallel to the runway and with the wind.

**DRAG (n.)** a resistant force exerted in a direction opposite to the direction of motion.

**FIGMO (adj.)** that state of being which causes one to place a de-emphasis on matters of military or other importance and proceed to kiss it off.

**FINAL (n.)** the last leg of traffic pattern, the aircraft approaching the runway in the direction of landing.

**FIRSTIE (n.)** that immortal having superhuman powers and disposed to acts of great wonder and cunning; a first class cadet.

**FORWARD AIR CONTROLLER (n.)** an officer with a pilot rating and usually airborne qualified in charge of a combat control team responsible for directing aircraft to targets by radio in close air support operations.
FREE FALL (n.) condition of weightlessness.
GIB (n.) guy in the back.
GOONEY BIRD (n.) the C-47.
GROUND POUNDER (n.) non-flying officer.
GUIDED MISSILE (n.) unmanned bird with self contained propulsion system.
HACK (n.) a time synchronization; (v.) to be able to cope with; “he can hack it.”
HOT (adj.) fast or good.
HUDSON HIGH (n.) a little school on the Hudson River having 178 years of tradition unhampered by progress (West Point).
HYPersonic (adj.) speeds in excess of Mach 5.
HYPOXIA (n.) oxygen lack.
INITIAL (n.) entry leg into a traffic pattern.
INTERDICTION (n.) bombing of points on the enemy’s supply route in an attempt to cut off his supply line.
INTRAMURDER (n.) athletic competition between squadrons.
JET STREAM (n.) a high velocity wind usually occurring just below the tropopause in temperate zones.
JOCK (n.) that individual performing superhuman feats of physical dexterity; an athletic.
LEG (n.) non-airborne qualified personnel.
LIFT (n.) the force upon an aircraft that acts in an upward direction opposing the pull of gravity.
MACH (n.) the speed of sound; unit of measurement of speed in relation to the local speed of sound, such as “.9 MACH.”
MAGIC (n.) that name applied to the department of Electrical Engineering and all related hand waving activities.
MAX (n.) the maximum 100%; (v.) to achieve the maximum.
NINO BALDACCI (n.) that individual having entered with the class of '59 and remaining until the present time never having been off academic probation and never having taken a privilege. He is a perpetual turnback near and dear to all cadets.
PITCH (n.) rotation about the lateral axis of the aircraft.
POLARIS (n.) the north star; name of the Air Force Cadet yearbook.
PORT (adj.) left (as opposed to right).
POST (n.) an order signifying to a subordinate that his/her presence is no longer necessary.
PRO (adj.) short for probation, i.e., Ac Pro (academic probation).
ROCK (n.) that superhuman free from entanglements with the opposite sex.
ROLL (n.) movement about the longitudinal axis of an aircraft.
SCRAMBLE (v.) to get an aircraft ready for combat in the shortest time possible.
SIERRA HOTEL (adj.) phonetic abbreviation denoting a job well done.
SMACK (n.) soldier minus ability, coordination, and knowledge.
SOUP (n.) thick clouds.
STAFF TOWER (n.) the level in the dining hall where Wing Staff eats.
STARBOARD (adj.) right (as opposed to left).
T-BIRD (n.) the T-33.
THRUST (n.) a propelling force exerted on an aircraft or missile.
THUD (n.) the F-105.
TOWER (n.) control tower; the level in the dining hall where Wing Staff eats.
TRUCK DRIVER (n.) the pilot of a non-fighter aircraft with more than one engine, i.e., a bomber or transport pilot.
TURN AROUND (n.) that time between when an aircraft is sent for necessary maintenance or fueling and when it is combat ready; that time when beverages have been sent out in the dining hall.
TWEET (n.) the T-37 (see converter).
TWO (n.) a command ordering the subordinate to return to whatever he/she was occupied with before being interrupted.
VATOR (n.) an ingenious device designed to fail when the wing returns from holidays or TDY programs; as in “Hold the . . . ”
YAW (n.) rotation about the vertical axis of an aircraft.
WALDO (n.) a puny pink animal found wandering aimlessly about Jacks Valley during the summer months.
ZILCH (n.) the opposite of max; nothing.
ZOOMIE (n.) that term by which a cadet is commonly known among civilians.
ABBREVIATIONS (USAF)

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AAC</td>
<td>Alaskan Air Command</td>
</tr>
<tr>
<td>ABN</td>
<td>Airborne</td>
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<tr>
<td>ADIZ</td>
<td>Air Defense Identification Zone</td>
</tr>
<tr>
<td>AFB</td>
<td>Air Force Base</td>
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<tr>
<td>AFCC</td>
<td>Air Force Communications Command</td>
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<tr>
<td>AFIT</td>
<td>Air Force Institute of Technology</td>
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<tr>
<td>AFLC</td>
<td>Air Force Logistics Command</td>
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<tr>
<td>AFSC</td>
<td>Air Force Specialty Code; Air Force Systems Command</td>
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<tr>
<td>AIM</td>
<td>Air Intercept Missile</td>
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<tr>
<td>ALC</td>
<td>Air Logistics Center</td>
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<tr>
<td>ALCM</td>
<td>Air Launched Cruise Missile</td>
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<tr>
<td>AO</td>
<td>Airdrome Officer</td>
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<tr>
<td>APU</td>
<td>Auxiliary Power Unit</td>
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<tr>
<td>ARM</td>
<td>Anti-Radiation Missile</td>
</tr>
<tr>
<td>ASAP</td>
<td>As Soon As Possible</td>
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<tr>
<td>ATA</td>
<td>Actual Time of Arrival</td>
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<tr>
<td>ATC</td>
<td>Air Traffic Control; Air Training Command</td>
</tr>
<tr>
<td>ATD</td>
<td>Actual Time of Departure</td>
</tr>
<tr>
<td>AU</td>
<td>Air University</td>
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<tr>
<td>AWACS</td>
<td>Airborne Warning and Control System</td>
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<tr>
<td>AWOL</td>
<td>Absent Without Leave</td>
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<tr>
<td>BLC</td>
<td>Boundary Layer Control</td>
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<tr>
<td>BMEWS</td>
<td>Ballistic Missile Early Warning System</td>
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<tr>
<td>CAS</td>
<td>Close Air Support</td>
</tr>
<tr>
<td>CAVU</td>
<td>Ceiling and Visibility Unlimited</td>
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<tr>
<td>CBR</td>
<td>Chemical, Biological, and Radiological Warfare</td>
</tr>
<tr>
<td>CEA</td>
<td>Circular Error Average</td>
</tr>
<tr>
<td>Abbreviation</td>
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<td>--------------</td>
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</tr>
<tr>
<td>CEP</td>
<td>Circular Error Probable</td>
</tr>
<tr>
<td>COMC</td>
<td>Commander in Chief</td>
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<tr>
<td>COIN</td>
<td>Counter Insurgency</td>
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<tr>
<td>CONUS</td>
<td>Continental United States</td>
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<tr>
<td>CQ</td>
<td>Charge of Quarters</td>
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<tr>
<td>DAF</td>
<td>Department of the Air Force</td>
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<tr>
<td>DCS</td>
<td>Deputy Chief of Staff</td>
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<tr>
<td>DEW</td>
<td>Distant Early Warning Line</td>
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<tr>
<td>DFC</td>
<td>Distinguished Flying Cross</td>
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<td>DOD</td>
<td>Department of Defense</td>
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<tr>
<td>DR</td>
<td>Dead Reckoning</td>
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<td>DSC</td>
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<tr>
<td>ECM</td>
<td>Electronic Countermeasures</td>
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<td>E&amp;E</td>
<td>Escape and Evasion</td>
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<td>Electronic Intelligence</td>
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<tr>
<td>ETA</td>
<td>Estimated Time of Arrival</td>
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<td>ETD</td>
<td>Estimated Time of Departure</td>
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<td>EWO</td>
<td>Emergency War Order; Electronic Warfare Officer</td>
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<td>FAA</td>
<td>Federal Aviation Administration</td>
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<tr>
<td>FAC</td>
<td>Forward Air Controller</td>
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<tr>
<td>GAR</td>
<td>Guided Air Rocket</td>
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<tr>
<td>GCA</td>
<td>Ground Controlled Approach</td>
</tr>
<tr>
<td>GCI</td>
<td>Ground Controlled Intercept</td>
</tr>
<tr>
<td>ICBM</td>
<td>Intercontinental Ballistic Missile</td>
</tr>
<tr>
<td>IFF/SIF</td>
<td>Identification-Friend or Foe/Selective Identification Feature</td>
</tr>
<tr>
<td>IFR</td>
<td>Instrument Flight Rules</td>
</tr>
<tr>
<td>ILS</td>
<td>Instrument Landing System</td>
</tr>
<tr>
<td>IP</td>
<td>Initial Point; Instructor Pilot</td>
</tr>
<tr>
<td>JATO</td>
<td>Jet Assisted Takeoff</td>
</tr>
<tr>
<td>JCS</td>
<td>Joint Chiefs of Staff</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>LABS</td>
<td>Low Altitude Bombing System</td>
</tr>
<tr>
<td>LOP</td>
<td>Line of Position</td>
</tr>
<tr>
<td>LORAN</td>
<td>Long Range Navigation</td>
</tr>
<tr>
<td>LOX</td>
<td>Liquid Oxygen</td>
</tr>
<tr>
<td>MAC</td>
<td>Military Airlift Command</td>
</tr>
<tr>
<td>MIRV</td>
<td>Multiple Independently-targetable Reentry Vehicle</td>
</tr>
<tr>
<td>NASA</td>
<td>National Aeronautics and Space Administration</td>
</tr>
<tr>
<td>NLT</td>
<td>Not Later Than</td>
</tr>
<tr>
<td>NORAD</td>
<td>North American Air Defense Command</td>
</tr>
<tr>
<td>OER</td>
<td>Officer Effectiveness Report</td>
</tr>
<tr>
<td>OIC</td>
<td>Officer in Charge</td>
</tr>
<tr>
<td>PACAF</td>
<td>Pacific Air Force</td>
</tr>
<tr>
<td>PCS</td>
<td>Permanent Change of Station</td>
</tr>
<tr>
<td>PJ</td>
<td>USAF Combat Pararescue Man</td>
</tr>
<tr>
<td>RADAR</td>
<td>Radio Detection and Ranging (Obsolete)</td>
</tr>
<tr>
<td>RHIP</td>
<td>Rank has its Privileges</td>
</tr>
<tr>
<td>RON</td>
<td>Remain Overnight</td>
</tr>
<tr>
<td>RSVP</td>
<td>Respondes s’il vous plait (answer if you please)</td>
</tr>
<tr>
<td>SAC</td>
<td>Strategic Air Command</td>
</tr>
<tr>
<td>SAGE</td>
<td>Semi-Automatic Ground Environment</td>
</tr>
<tr>
<td>SAR</td>
<td>Search and Rescue</td>
</tr>
<tr>
<td>SHAPE</td>
<td>Supreme Headquarters — Allied Powers Europe</td>
</tr>
<tr>
<td>SHORAN</td>
<td>Short Range Navigation</td>
</tr>
<tr>
<td>SLBM</td>
<td>Submarine Launched Ballistic Missile</td>
</tr>
<tr>
<td>SOF</td>
<td>Supervisor of Flying</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>SP</td>
<td>Security Police</td>
</tr>
<tr>
<td>SPADATS</td>
<td>Space Detection and Tracking System</td>
</tr>
</tbody>
</table>

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STOL  Short Takeoff and Landing
TAC    Tactical Air Command
TACAN  Tactical Air Navigation
TAR    Terrain Avoidance Radar
TDY    Temporary Duty
TWX    Teletype Message
UCMJ   Uniform Code of Military Justice
UHF    Ultra High Frequency
UHT    Undergraduate Helicopter Training
UNT    Undergraduate Navigator Training
UPT    Undergraduate Pilot Training
USAFE  United States Air Forces Europe
VFR    Visual Flight Rules
VHF    Very High Frequency
VOR    VHF Omirange
VTOL   Vertical Takeoff and Landing
WX     Weather
X      Experimental (as in designation of aircraft
ZI     Zone of the Interior

ABBREVIATIONS (AFA)

AOC    Air Officer Commanding
AH     Director of Athletics
BOR    Base of Ramp
CCQ    Cadet in Charge of Quarters
CFD    Correct for Data
CIC    Cadet in Charge
CW     Commandant of Cadets

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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSQ</td>
<td>Cadet Squadron</td>
</tr>
<tr>
<td>DF</td>
<td>Dean of the Faculty</td>
</tr>
<tr>
<td>DI</td>
<td>Dormitory Inspector</td>
</tr>
<tr>
<td>EI</td>
<td>Extra Instruction</td>
</tr>
<tr>
<td>GPA</td>
<td>Grade Point Average</td>
</tr>
<tr>
<td>GDO</td>
<td>Group Duty Officer</td>
</tr>
<tr>
<td>GR</td>
<td>Graded Review</td>
</tr>
<tr>
<td>IRI</td>
<td>In Ranks Inspection</td>
</tr>
<tr>
<td>MPA</td>
<td>Military Performance Average</td>
</tr>
<tr>
<td>NCOD</td>
<td>Noncommissioned Officer of the Day</td>
</tr>
<tr>
<td>NE</td>
<td>Notation Error</td>
</tr>
<tr>
<td>OTF</td>
<td>Over the Fence</td>
</tr>
<tr>
<td>PDA</td>
<td>Public Display of Affection</td>
</tr>
<tr>
<td>PE</td>
<td>Physical Education</td>
</tr>
<tr>
<td>PFT</td>
<td>Physical Fitness Test</td>
</tr>
<tr>
<td>RTFQ</td>
<td>Read the Full Question</td>
</tr>
<tr>
<td>RTP</td>
<td>Read the Problem</td>
</tr>
<tr>
<td>SDO</td>
<td>Squadron Duty Officer</td>
</tr>
<tr>
<td>SOD</td>
<td>Senior Officer of the Day</td>
</tr>
</tbody>
</table>
MEDAL OF HONOR
UNITED STATES MILITARY DECORATIONS

The MEDAL OF HONOR is the highest award the United States can offer a member of her Armed Forces. It was authorized by an Act of Congress for the Navy in 1861 and the Army in 1862. It is awarded to those individuals who demonstrate exceptional gallantry and courage beyond the call of duty. The act of bravery must have occurred in actual combat against an enemy of the United States and must have involved conspicuous risk of life. The degree of risk must have been such that failure to commit the act would not have resulted in any censure. The MEDAL OF HONOR is awarded by an Act of Congress and is usually presented by the President of the United States.

The AIR FORCE CROSS, NAVY CROSS (USN AND USMC), and DISTINGUISHED SERVICE CROSS (USA) are awarded to United States and foreign military as well as civilian personnel for an act distinguished by heroism in connection with military operations against the enemy. Such heroism must have involved extraordinary risk of life.

DEFENSE DISTINGUISHED SERVICE MEDAL is awarded to any military officer of the Armed Forces of the United States who is assigned to joint staffs and other joint activities of the DOD for exceptionally meritorious service to the United States in a position of unique and great responsibility, while serving with the joint staff or any other joint activities of the DOD.

The DISTINGUISHED SERVICE MEDAL is presented to any person (military, civilian, or foreign) who has distinguished himself by the exceptional exercise of authority or judgment in duties which decide the successful
outcome of a major military operation.

The SILVER STAR denotes any individual (military, civilian, or foreign) who exhibits gallantry in action against an enemy of the United States; gallantry being defined as a high degree of heroism.

DEFENSE SUPERIOR SERVICE MEDAL is awarded to any United States Military personnel by the Secretary of Defense who is assigned to a joint staff or other joint activity of the DOD for rendering superior meritorious service in a position of significant responsibility.

The LEGION OF MERIT recognizes exceptionally meritorious conduct in the performance of outstanding service to the United States. The award itself consists of three levels or degrees which are awarded in accordance with the rank of the recipient. It is awarded without degree to members of the armed forces of the United States. To members of foreign armed forces it is awarded in four degrees: Chief Commander, Commander, Officer, and Legionnaire.

The DISTINGUISHED FLYING CROSS is awarded to a member of the armed forces of the United States or to a member of the armed forces of a foreign nation. It is awarded for an act in aerial flight which displays distinctive heroism involving operations that are not routine.

The AIRMAN'S MEDAL, NAVY-USMC MEDAL and SOLDIER’S MEDAL designate members of the armed forces who voluntarily and heroically risk their lives under conditions not involving conflict with an armed enemy.

The BRONZE STAR recognizes persons serving in the armed forces who distinguish themselves by heroism in surface combat against the enemy or by meritorious achievement in connection with military operations against
DEFENSE MERITORIOUS SERVICE MEDAL is awarded by the Office of the Secretary of the Air Force, Washington Headquarters Services, Defense Agencies and Headquarters Unified and Specified Commands for noncombat meritorious service or achievement that is incontestably exceptional and of a magnitude that clearly places an individual above his or her peers.

The MERITORIOUS SERVICE MEDAL is awarded to United States military personnel for outstanding noncombat meritorious achievement or service to the United States.

The AIR MEDAL is awarded to United States and foreign military and civilian personnel for meritorious achievement while participating in aerial flight, or for sustained operations against an enemy of the United States.

The JOINT SERVICE, AIR FORCE AND ARMY COMMENDATION MEDALS recognize meritorious achievement or service on the part of a member of the armed forces. These medals are given primarily under peacetime conditions.

The PURPLE HEART is presented to military or civilian citizens of the United States who are wounded or killed in action. The wound must have been received in battle and required medical treatment.

The PRESIDENTAL UNIT CITATION designates units which have displayed great herosim in battle. This award corresponds to the Distinguished Service Cross but on the organizational instead of the individual level.

The AIR FORCE OUTSTANDING UNIT AWARD and the NAVY UNIT COMMENDATION are bestowed in recognition of outstanding unit achievement.

The AIR FORCE ORGANIZATIONAL EXCELLENCE
AWARD is awarded to organizations of the United States Armed Forces who have distinguished themselves by exceptionally meritorious achievement or service in support of military operations. It is also awarded when the organization is involved in an event of great national or international significance when not in support of combat operations.

The GOOD CONDUCT MEDAL for all services is given to enlisted personnel for exemplary behavior, efficiency, and fidelity. It is the most widely awarded medal during peacetime.

The bronze OAK LEAF CLUSTER (GOLD STAR, USN-USMC) designates a medal for which a second or subsequent award is made.

The silver OAK LEAF CLUSTER (SILVER STAR, USN-USMC) is equal to five bronze OAK LEAF CLUSTER.

The bronze SERVICE STAR designates campaign participation credit and additional awards.

The silver SERVICE STAR equals five bronze service stars.

A bronze letter "'V'" device attached to a ribbon is awarded for valor in combat.

Detailed information on these and all other USAF awards and decorations can be found in AFM 900-3 and AFM 900-48.
UNITED STATES MILITARY DECORATIONS

- MEDAL OF HONOR
- DISTINGUISHED SERVICE CROSS
- LEGION OF MERIT
- DISTINGUISHED SERVICE MEDAL (AF)
- Distinguished Flying Cross
- BRONZE STAR MEDAL
- MERITORIOUS SERVICE MEDAL
- AIR FORCE COMMENDATION MEDAL
- ARMY COMMENDATION MEDAL
- AF OUTSTANDING UNIT AWARD
- AF ORGANIZATIONAL EXCELLENCE AWARD
- GOOD CONDUCT MEDAL
- OUTSTANDING AIRMAN OF THE YEAR RIBBON
UNITED STATES
MILITARY DECORATIONS

ASIATIC-PACIFIC CAMPAIGN MEDAL

EUROPEAN-AFRICAN-MIDDLE EASTERN CPN MEDAL

MEDAL FOR HUMANE ACTION

NATIONAL DEFENSE SERVICE MEDAL

ARMED FORCES EXPEDITIONARY MEDAL

VIETNAM SERVICE MEDAL

AIR RESERVE MERITORIOUS SERVICE RIBBON

USAF NCO ACADEMY GRADUATE RIBBON

PHILIPPINE LIBERATION RIBBON

PHILIPPINE INDEPENDENCE RIBBON

RVN CROSS OF GALLANTRY W/PALM

UNITED NATIONS SERVICE MEDAL
THE OTHER SIDE:
USSR

New MiG: Ram L
At the present time the world community recognizes two superpowers. The United States is one and the other is the Union of Soviet Socialist Republics (USSR). Although a number of political and economic factors contribute to gaining this status, for the Soviet Union the major element of its climb into international prominence has been military power. This power is guided and controlled by a political system and philosophy which is quite different than that of the United States. It is imperative that military officers in the United States' military understand both the Soviet political outlook and the military concepts and forces which support their political goals. The core academic and Professional Military Studies courses at the Academy will provide a basis for this understanding. This segment of Contrails is designed to complement these courses and give you a general overview of the Soviet military.

For the average American perhaps the most threatening military capability of the USSR is that found in its strategic strike forces. As in the U.S. military, the Soviets rely on Intercontinental Ballistic Missiles (ICBM), Submarine Launched Ballistic Missiles (SLBM), and long ranged bombers to deliver nuclear warheads. The Soviets have been conducting an apparently continuous upgrading of these forces.

The key element in the Soviet version of the "Triad" is the ICBM arm which is referred to as the Strategic Rocket Forces (SRF). The SRF is equipped with approximately 1400 ICBMs, of which more than 550 are the newest types. These latest ICBMs are the SS-17, SS-18 and SS-19. They are generally categorized as fourth generation missiles. The Soviets are currently believed to be developing a new, fifth generation of strategic missiles.
Savage three-stage solid-propellant ICBM

Standard Delta class nuclear-powered SLBM submarine, carries 12 SSN-8 missiles. New enlarged Delta class submarines carry 16 or 20 (US Navy)
Camera ports under the bomb bay are a recognition feature of the 'Bear-E' version of the Tu-95 (Royal Air Force).

'Backfire-B' version of the Tupolev Tu-26/Tu-22M photographed from a Draken interceptor of the Swedish Air Force.
The SRF is complemented by the Soviet SLBM fleet. This SLBM force is also undergoing an extensive modernization. The fleet includes approximately 30 older Yankee Class submarines with relatively short ranged (3,000 km) missiles. These submarines are now being replaced by a series of Delta Class SLBMs which are armed with longer ranged (approximately 8,000 km) missiles. This longer range allows the 32 Deltas to hit targets in the United States from waters close to the USSR. Reports have recently surfaced that the Delta Class will be superseded by an even larger submarine which will also be armed with long range missiles. This new craft has tentatively been named the Typhoon.

The third and least important strategic arm in the USSR is the bomber force which is called Long Range Aviation (LRA). LRA only has approximately 150 long range heavy bombers. The bulk of these are the Tu-95 Bear, which is a pre-1960 design. A new bomber (or perhaps two) has been announced by the Soviets; however, no evidence has been detected to confirm this. LRA assets also include over 500 medium bombers which can be used in areas relatively close to the USSR. Most of these bombers are the older Badger, but the Soviets are slowly building up the number of Tu-22M Backfires, which some consider capable of intercontinental operations.

These strategic offensive forces are backed by an extensive strategic defensive system. This system includes over 7,000 radars, 64 anti-ballistic missile (ABM) launchers with Galosh missiles, and over 10,000 surface-to-air missile (SAM) launchers at over 1,000 sites. These SAM systems include the SA-1 Guild, SA-2 Guideline, SA-3 Goa, and SA-5 Gammon. The Soviets are currently developing the SA-X-10 which is designed to shoot down low altitude targets such as the American cruise missiles.
SA-3 Goa missiles at a Yugoslavian air defence site
The Tu-126 airborne warning and control system (AWACS) aircraft, known to NATO as ‘Moss’

Sukhoi Su-15, known to NATO as ‘Flagon-C’

MiG-25 ‘Foxbat-A’ interceptor, armed with four air-to-air missiles (NATO ‘Acrid’)

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These ground based defensive systems are complemented by airborne systems. The Soviet radar network is being expanded by an Airborne Warning and Control System (AWACS). The current design is called the Moss, but an improved replacement is currently being developed. The Soviet interceptor force numbers approximately 2,500 aircraft. Although this force includes at least eight types of fighters, the bulk are Su-15 Flagons and MiG-23 Floggers. The Flogger is also the cornerstone of the tactical fighter force. Perhaps the most famous of the Soviet interceptors is the MiG-25 Foxbat (also used for tactical reconnaissance). The Foxbat was designed for high altitude, high speed intercepts. A newer variant is being designed with a capability to attack low flying aircraft from a higher altitude; a look-down capability.

The strategic forces of the USSR are only part of an immense military machine. The Soviet Union maintains an extensive theater warfare capability in the form of a large army and a supporting air arm. The army has been roughly developed in the pattern of the mechanized ground forces which existed at the end of World War II.

These ground forces are built around armor, especially the tank. Although older T-54 and T-62 tanks are still found in Soviet and Warsaw Pact armies the current main battle tank is the T-72. The Soviets are rumored to be developing a new tank which has been labeled the T-80, but this has not yet been deployed. To keep pace with the tanks and to be protected themselves, Soviet infantry forces ride in armored personnel carriers (APCs). The most common and most modern of these is the BMP.

Tank and infantry forces must have fire support to be effective on the modern battlefield; also, Soviet doctrine
T-72 MBT’s on parade in Moscow late in 1977 (Tass)

BMP-1 MICV without Sagger mounted over barrel of 73mm gun
emphasizes heavy firepower. Artillery fire is provided by a variety of systems. These include large numbers of traditional towed artillery pieces; however, self-propelled weapons, especially in the 122mm and 152mm sizes are entering service. These provide mobile and responsive support. The Soviets also use large numbers of multiple rocket launchers and guided missiles for firepower.

The firepower of ground forces must also include air defense systems. The air defense network which protects the Soviet Army is the most extensive and intense to be found anywhere in the world. This network includes highly mobile guns and surface-to-air missiles (SAMs). Although a variety of guns are available, the most effective weapon is the ZSU-23-4 Shilka. This system combines four 23mm guns with a radar and optical sighting systems.

A variety of SAM systems are assigned to the Soviet ground forces. The short ranged, infra-red guided SA-7 Grail and SA-9 Gaskin are normally found forward with the ZSU-23-4 protecting the attacking forces. These forward assets are provided with additional support by the radar guided SA-4 Ganef, SA-6 Gainful, and SA-8 Gecko. The Soviets are also reported to be developing a new radar guided system which has been identified as the SA-11. The variety of air defense systems available to the Soviet ground forces allows dense, complementary and overlapping protection.

The Soviet ground forces are also supported by a dedicated arm of the Soviet Air Force which is called Frontal Aviation (FA). FA aircraft provide reconnaissance, air defense and ground attack support. The reconnaissance mission is carried out by modified versions of tactical aircraft or MiG-25 Foxbats. The air defense role is carried out by fighters such as the older MiG-21 Fishbed. Although an old design, many
BM-21 122mm multiple rocket systems ready for action (TASS)

ZSU-23-4 of Egyptian Army on parade (Egyptian Ministry of Defence)
modified, late model Fishbeds are still in service. The current main line fighter for FA is the MiG-23 Flogger B/G. This variable geometry wing (VGW) aircraft can perform ground attack as well as air-to-air missions. The Soviet Air Force is reported to be developing two new fighters in the F-16/17 and F-15 classes; however, neither of these aircraft have entered production.

The ground attack arm of FA has a variety of aircraft available to conduct operations against enemy ground targets. The MiG-27 Flogger D is a variant of the MiG-23. The Su-17 Fitter C/D is a VGW improved model of the Su-7 Fitter. Both of these systems are single seat fighter-bombers which can provide close air support or go against deeper targets. These two aircraft also are supported by a longer ranged, two seat fighter-bomber, the Su-19 Fencer. The Fencer is similar to the American F-111, but is slightly
Preparing SA-6 Gainful missiles for launch

MiG-23S ‘Flogger-B’ single-seat variable-geometry air combat fighter of the Soviet Air Force.
Artist’s impression of Sukhoi Su-19 variable-geometry attack aircraft (Michael A. Badrocke)

‘Hind-A’, first major production version of the Mil Mi-24 assault helicopter, with original starboard-side tail rotor
smaller. The Soviets are reported to have a new ground attack aircraft under development which is similar to the U.S. A-10.

The Soviet Air Force also has responsibility for attack helicopter systems. Large numbers of these rotary wing aircraft are entering the Soviet inventory. The most impressive attack helicopter in FA is the Hind D which is one of the most heavily armed helicopters in the world. The Hind D carries anti-tank guided missiles, machine guns, rockets and/or bombs. It also can carry troops on an assault mission.

This summary has only briefly described the various military forces and systems available to the Soviet Union. In the interest of space, such important elements as the Naval Fleets, Naval Infantry, and Airborne forces have not been described. This coverage should, however, serve as a starting point for the professional study of the armed forces of the USSR.