Thunderbirds

1992 Pennsylvania Int'l Airshow

Featuring the USAF Thunderbirds

Photo courtesy Sgt. Jeff Wolfe US Air Force Thunderbirds

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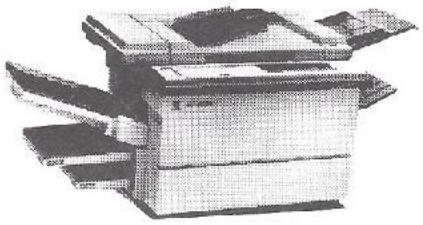

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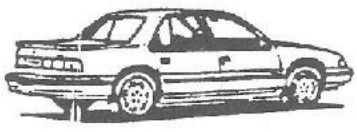

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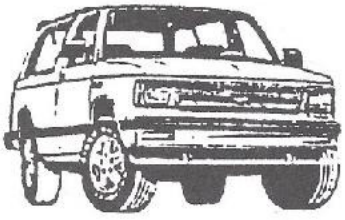

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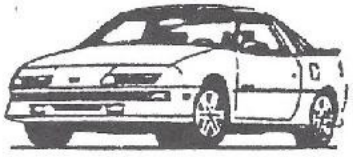

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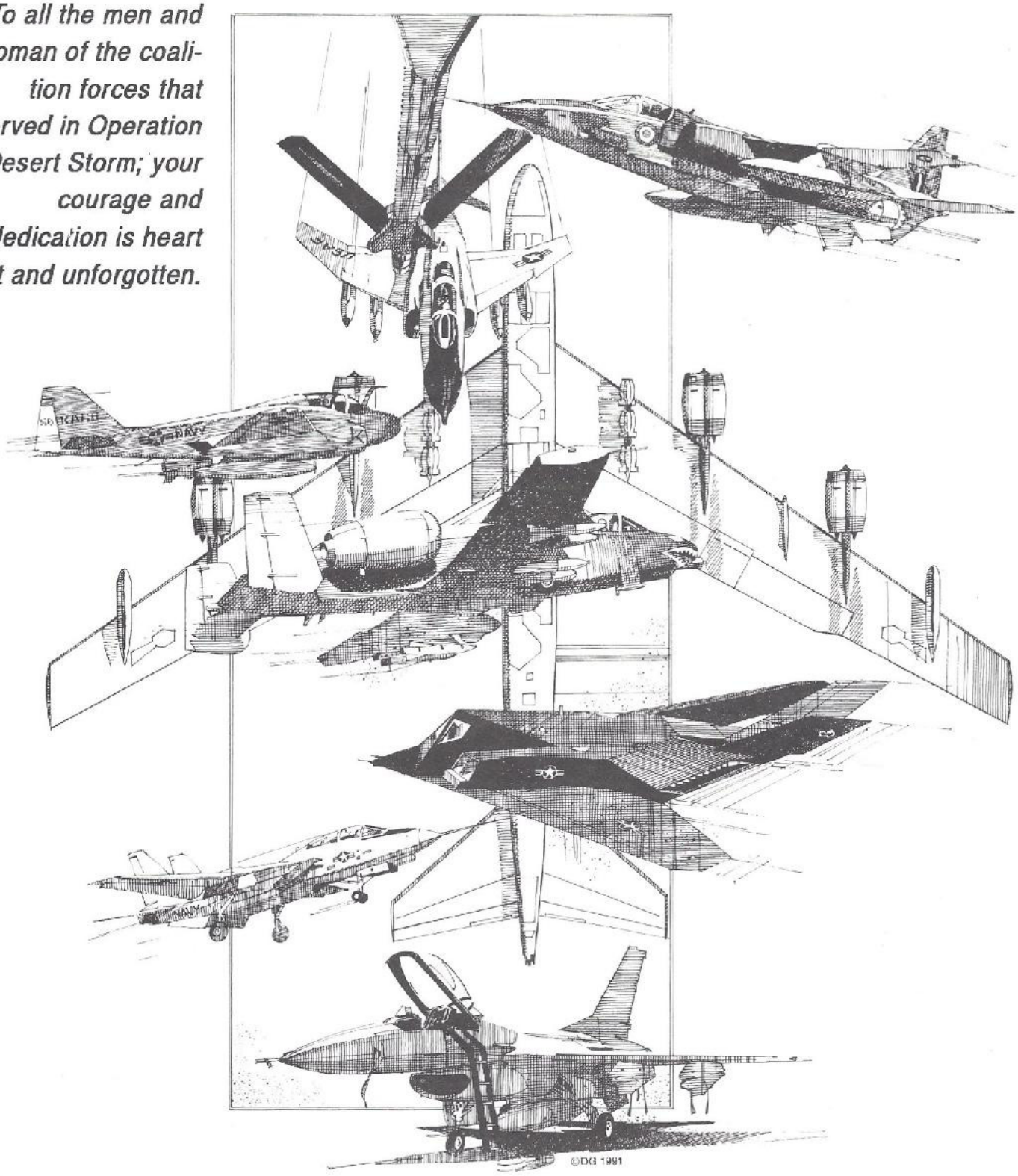
Public Affairs Office

Thank You !

To all the men and woman of the coalition forces that served in Operation Desert Storm; your courage and dedication is heart felt and unforgotten.



Spectator Information

Throughout the show, the performers are constantly preparing themselves and their aircraft to entertain you. They often perform engine run ups, taxi the aircraft to show center and review checklists. You can participate in some of the responsibility; to insure an **EXCITING, SAFE, and COMFORTABLE** event, by adhering to the following safety precautions and suggestions:

We sincerely Thank You for your cooperation. From every-one involved in the production of this spectacular air event; we wish you and your family a wonderful time and we look forward to seeing you at our next airshow.

The airshow announcer often provides Lost & Found locations, special promotions and an abundance of interesting and informative conversation; direct your ear to show center.

NO SMOKING in the vicinity or under the wings of aircraft, fuel tanks can leak. They also overflow through the vents on a hot day as the fuel expands.

Locate the nearest First-Aid station when you arrive, in the event an emergency should present itself.

Please read and adhere to all Signs of information and caution, for your knowledge and protection.

Throughtout the event, during a hot day, make sure to drink plenty of fluids to prevent a chance of dehydration.

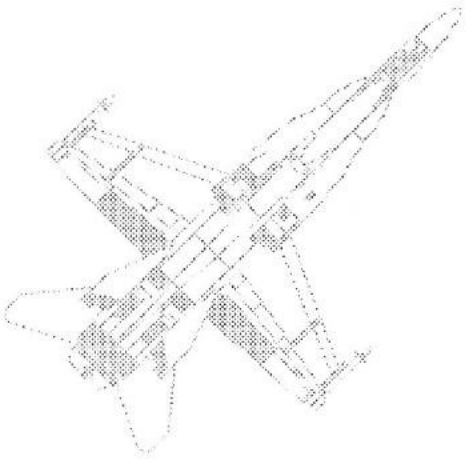
For the protection of others, please **DO NOT** ride bikes or skateboards on the airshow grounds.

For your protection as well as the performers **DO NOT** attempt to cross the flight line or any other lines of restriction.

For security reasons, there are some restricted buildings located on the airshow grounds, **PLEASE**, do not attempt to gain access.

For your convenience, there are portable rest rooms located throughout the airshow grounds.

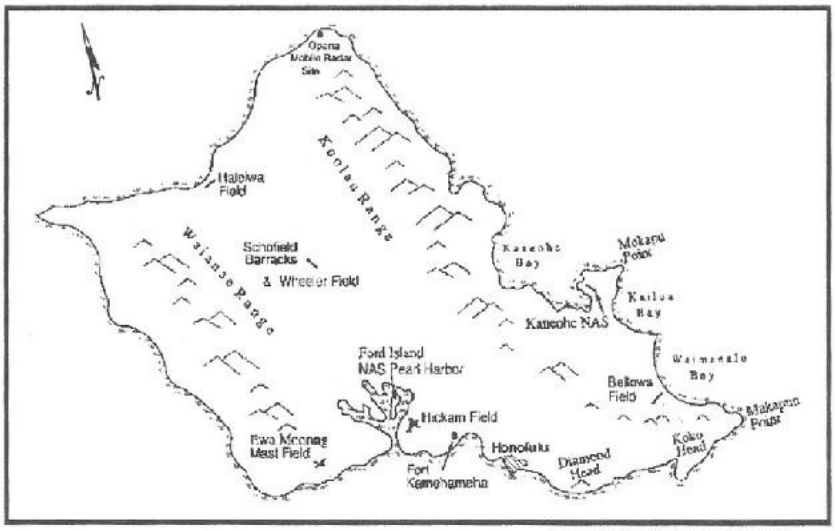
Please place all litter into the appropriate receptacles located throughout the show grounds. If foreign objects (F.O.D.) get sucked into the engines of an aircraft, the aircraft and the pilot could be endangered.



Please...

DO NOT touch or climb on the display aircraft!

Pearl Harbor...



Map of the Island of Oahu

It was a moment of historic surprise, a moment when the impossible happened, when warfare suddenly spread, for the first and only time in history, to virtually the whole world. This was the moment that changed Americans from a nation of provincial innocents, into a nation that would often have to bear the burdens of rescuing the world.

50 years ago, a day we choose to always remember; a day we choose not to forget, for on this 7 December 1941, the unexpected and traumatic occurred, The Japanese task force under the command of Vice Admiral Chuichi Nagumo bore down upon Oahu.

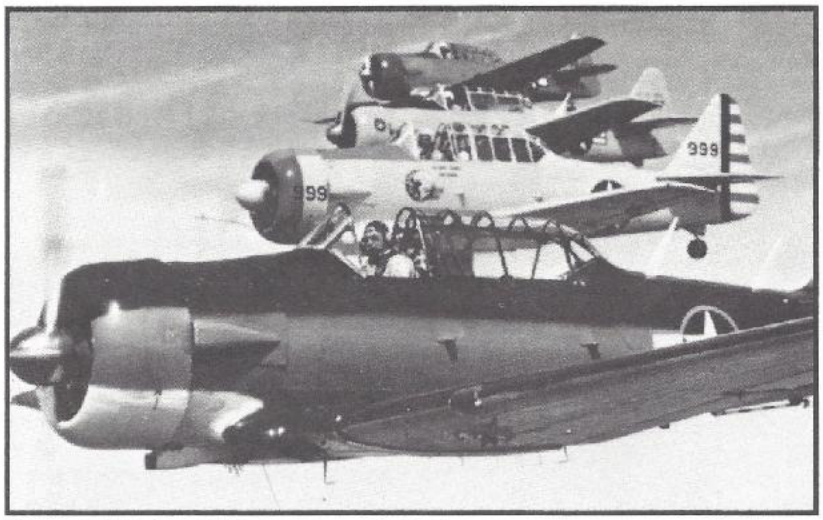
In American mythology, Pearl Harbor still represents, even after a half-century, a moment of treachery. It was a moment of historic surprise, a moment when the impossible happened, when warfare suddenly spread, for the first and only time in history, to virtually the whole world. This was the moment that changed Americans from a nation of provincial innocents, into a nation that would often have to bear the burdens of rescuing the world.

The surprise of Pearl Harbor was largely a matter of national illusions, the leaders on both sides fully expected a war, indeed considered it inevitable, but neither side really wanted to fight unless it had to. Up to the last minute, each side thought the other was bluffing.

Japan's navy had already begun planning and training for the attack on Pearl Harbor when Emperor Hirohito startled his assembled advisors on September 6, 1941 by asking an imperial question. In the middle of an intense debate over when and how to go to war, the Emperor, who very rearly ever spoke at these sessions, suddenly pulled out and read a poem by his grandfather Emperor Meiji. It was as follows:

All the seas, in every quarter, are as brothers to one another. Why, then, do the winds and waves of strife rage so turbulently throughout the world?

It took Nagumo's fleet five days to reach the rendezvous point at Hitokappu Bay in the Kuriles just north of Japan's main islands. Fog swirled over the desolate outpost, and snow fell intermittently as the fleet steamed eastward at dawn on November 26, 1941. The armada boasted six carriers, led by Nagumo's flagship, the AKAGI, some 350 warplanes, two battleships, two cruisers, nine destroyers and a dozen other surface ships. At an average 13 knots, refueling daily, the attack fleet pursued a course 3,500 miles through the empty expanse of the North Pacific. Its orders provided that in the event an agreement is reached in the negotiations with the United States, the task force will immediately return to Japan.
Upon reaching a point some 220 miles north of the island, they launched two successive waves totaling 350 aircraft; 40 torpedo bombers, 78 fighter aircraft, 103 high-level bombers, and 129 dive bombers. Their targets were the ships



Vintage WWII aircraft / Photo courtesy of Sky Typers

50 Years

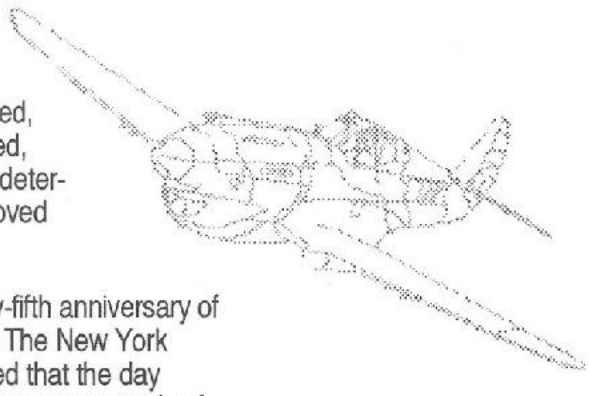
After the Day of Infamy.

of Admiral Husband E. Kimmel's U.S. Pacific Fleet at moorings in Pearl Harbor. The Japanese also concentrated heavily upon American airpower located at army airfields and naval air stations throughout the island. Hickam, Wheeler, Ford Island, Kaneohe, and Ewa.

At 0750 Commander Mitsuo Fuchida, leader of the air strike, signaled for the general strike. Approximately four hours later, his aircraft, the last to leave the scene, touched down on Akagi's flight deck.

In terms of casualties and destruction, the U.S. lost 2,433 killed (about half of them on the Arizona) and 1,178 wounded. The Japanese, who had expected to sacrifice as much as one-third of their force, lost 55 airmen, nine crewman aboard five minisubs and approximately 65 on one sunken submarine. The U.S. lost 18 surface warships, sunk or seriously damaged. The Japanese lost none. The U.S. lost 188 planes, 159 damaged; the Japanese lost 29. Three of the U.S. battleships (the California, Nevada and West Virginia) were eventually restored to service.

If Pearl Harbor seemed to be an American disaster, it proved to be a Japanese disaster as well. Pearl Harbor helps to emphasize that strength and courage are not enough. In terms of quality of personnel and weapons at our disposal, the U.S. was prepared to counter the strike on Pearl Harbor and inflict serious damage upon Nagumo's task force. The lesson is clear: Preparedness is not alertness. Pearl Harbor united Americans in rage and hatred, and thus united, powerful and determined, we proved invincible.

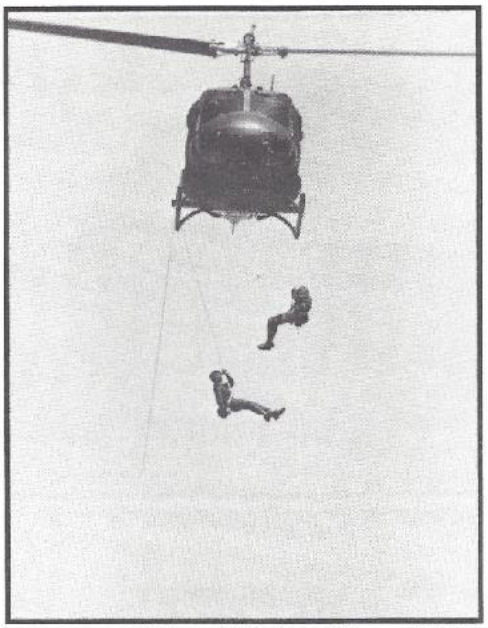


On the twenty-fifth anniversary of Pearl Harbor, The New York Times declared that the day "must live in memory not only of things past and men long dead, but as a perpetual reminder to future generations that ambition must be tempered with restraint and courage with wisdom."

If Pearl Harbor seemed to be an American disaster, it proved to be a Japanese disaster as well. Pearl Harbor helps to emphasize that strength and courage are not enough.

United States Army

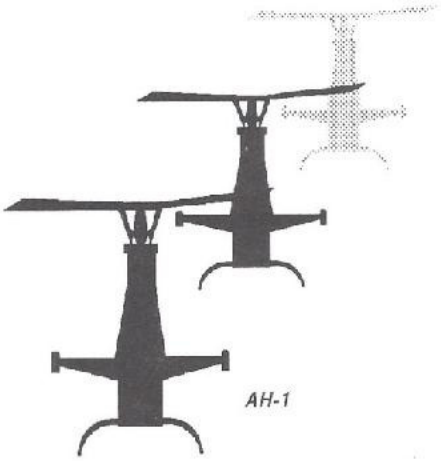
The Army of today is composed of quality Americans, men and women of ambition and accomplishment who embody the qualities of sacrifice and service that are at the very soul of our nation.



US Army UH-1 Huey / Photo RIARNG

The United States Army is the oldest of the U.S. military services, created as the Continental Army by the Continental Congress on June 14, 1775. Since then, America's Army has been the centerpiece of of our nation's security and protection of our vital interests. From Bunker Hill to the Basra Pocket, soldiers have fought with courage and honor on behalf of the American people. Today, the Army continues as the bedrock of American security; a Total Force trained and ready to fight, serving the nation at home and abroad, a strategic force capable of total victory.

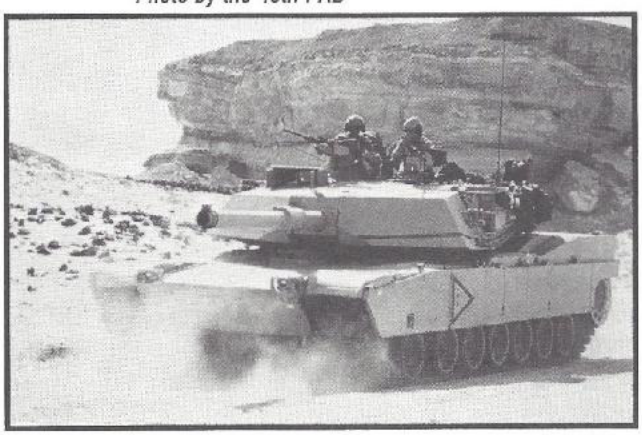
Congress has directed the Army be organized, trained and equipped primarily for prompt and sustained combat incident to operations on land (and) is responsible for the preparation of land forces necessary for the effective prosecution of war, except as assigned and in accordance with integrated mobilization plans, for the expansion of the peace time components of the Army to meet the needs of war.



AH-1

The Army of today is composed of quality Americans, men and women of ambition and accomplishment who embody the qualities of sacrifice and service that are at the very soul of our nation. America's soldiers are trained to a razor's edge, equipped with the finest weapons our nation can produce, and led by officers and sergeants of matchless ability. Taken together, these qualities have forged an Army that is the finest land force in our nation's history and the best in the world. It is an Army that steadfastly secures the ramparts of freedom around the globe, and it is an Army that, as an integral element in a multi-service international coalition, fought and won in the historic triumph of **DESERT STORM**. It is, in short, an Army in which all Americans can be justifiably proud.

US Army M1A1 Tank in Saudi Arabia
Photo by the 49th PAD



The Chief of Staff of the Army sees four major challenges facing the Army as our nation responds to the end of the Cold War and the demise of the Soviet Union. These challenges are depicted below:

- Ensure a trained and ready Army - Maintain the Edge
- Reshape the Force to best accommodate the national military strategy
- Achieve greater efficiencies in how we Provide Resources for the force
- Strengthen the total force (active and reserve) achieve total force readiness in word and fact

As the Army prepares to enter the next century, it will become smaller as the force is shaped in response to the changing international environment. But the Army of tomorrow will remain faithful to the Army of today and to the nation it serves. It will remain fully capable of accomplishing its missions and delivering victory - anywhere in the world. In addition to retaining the ability to fight and win major conflicts, the Army will continue to fulfill other crucial missions such as assisting in counternarcotics operations, nation-building, and support to civil authorities.

Our Army will be uncompromising in its commitment to our most treasured asset - our soldiers, civilians, and families. In the final analysis, we are an Army of people - proud Americans steeped in the traditions of selfless service and committed to the defense of the Constitution. This is America's Army that American people deserve and a strategic land force Americans can always count on.

AH-64 Apache

US Army , Hughes AH-64 Apache / Contractor photo released by US Army

The Hughes AH-64 Apache is designed to be the definitive attack armor helicopter for the Army, to live with front-line troops for extended periods and provide the precision fire-power needed at crucial points, especially against armor, by day or night and in any weather.

The Apache is designed to survive hostile fire from projectiles up to 23mm calibre. The sight systems are the most interesting part of this intense vehicle. While the machine bristles with advanced fly-by-wire flight EW systems, the nose contains a stabilized FLIR, laser ranger, target designator and laser tracker, all managed by the co-pilot/gunner.

It also contains the PNVS (pilot's night vision system) for blind sensing of the external scene, while both crew members have IHADSS integrated helmets that move with the wearer's head to speed up target acquisition.

Type: Advanced attack helicopter.

Specifications: length of fuselage, 49ft 1 1/2in (14.97m); diameter of main rotor,48ft Oin (14.63m); height, over tail fin, 11ft 7 1/2in (3.54m); weight (maximum take-off),17,650lb (800kg).

Max speed: 192mph (309km/h).

Service ceiling:20,500ft (6,250m)

Range: Internal fuel, 380 miles (611km); ferry with external fuel, 1,121 miles.

Armament: Hughes 30mm Chain Gun with 1,200 rounds, four pylons each carrying four Hellfire laser-guided anti-armour missiles or up to 76 folding -fin 2.75in rockets or a mix of Hellfires and rockets.

Powerplant: Two 1,536shp (1,145kW) General Electric T700-GE-700 turboshaft engines with special IR-surpressing exhausts.

Contractor: Hughes Aircraft

US Army, Sikorsky UH-60 Blackhawk

UH-60 Blackhawk

The UH-60 Blackhawk is the basic transport version Blackhawk, and can carry eleven soldiers within the cabin or up to 8,000lbs (3,600kg) of cargo as a slung external load. It is scheduled to become the main US Army assault helicopter. Add-on kits allow the basic aircraft to carry out medical evacuation missions.

Type: Combat assault helicopter.

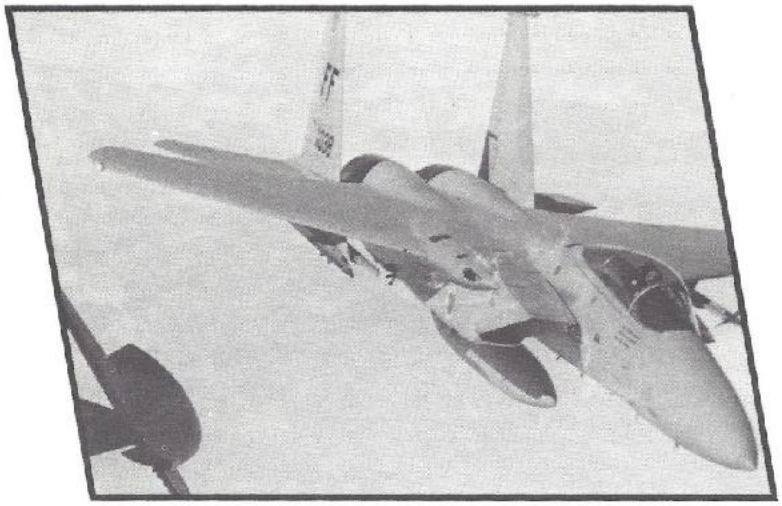
Specifications: length, 50ft 1 in (15.26m); diameter of rotor,53ft 8in (16.36m); weight (mission take-off),16,260lb (7,375kg).

Max speed:160kt (296km/h).

Range:(at max. take-off wt.) 324nm (600km)

Maximum external Payload: 8,000lbs

Powerplant: Two 1,560shp (1,150kW) General Electric T700-GE-700 turboshaft engines.



US Air Force F-15 Strike Eagle / Photo courtesy of Seymour Johnson AFB

F-15 Eagle

Mission: Air Superiority tactical fighter
Length: 63 feet 9 in
Wing Span: 42 feet 9 3/4 in
Height: 18 feet 7 in
Weight: Empty 27,300 lbs; Gross 68,000lbs
Speed: Mach 2.5+
Crew: F15 A, C - one; F15E - Two
Range: (ferry) Aprox. 3,450
Ceiling: 65,000 ft

Powerplant: Two Pratt & Whitney F-100PW-100 turbofan engines with afterburners. (25,000 lbs thrust ea.)
Armament: one M-61A1 20mm multibarrel gun mounted internally with 940 rounds of ammunition, four AIM-9L/M Sidewinder and four AIM-7F/M Sparrow missiles.
Contractor: McDonnell Douglas.

The F-15 Eagle is an all-weather, extremely maneuverable, tactical fighter aircraft designed to achieve air superiority in aerial combat. It is capable of outperforming and outfighting any current or projected enemy aircraft. The F-15 development started in 1963 when the USAF required a jet fighter that could maintain air-superiority against the Mig-25.

The F-15 Eagle is powered by two Pratt & Whitney F-100 PW-100 turbofan engines with afterburners producing 25,000 lbs. of thrust in each engines. A second major advantage of the F-15 Eagle is its unique multi-mission avionics. The aircraft's advanced avionics can help a pilot accomplish many tasks' from difficult landings to destruction of multiple aircraft targets. These systems include advanced radar, a heads-up display an inertial navigation system and sophisticated target tracking and firing systems.

C-5 Galaxy

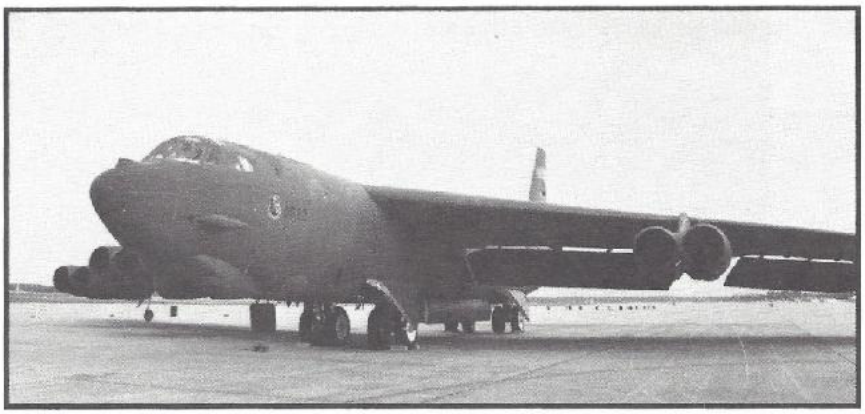
The C-5 Galaxy is the largest aircraft in the inventory of the free world's air forces, and is a giant in more than just size. The C-5 can carry over-sized equipment, and dense cargo, like tanks, which had never been air transportable until the Galaxy. The C-5 has a cargo compartment 121 feet long. The aircraft has an overall length of 247.8 feet, and a wing span of 227.7 feet. The tail is 65 feet off the ground taller than a six story building.

At take off with a maximum load of 240,000 lbs aboard, the C-5 weighs 769,999 pounds and can hold up to 50,000 gallons of fuel. With that full load, the aircraft can cruise 3,250 miles at 520 miles per hour. With no load the aircraft can cruise 6,940 miles at 555 miles per hour. There are six crew members on the C-5. Power is provided by four General Electric turbofan jet engines each delivering 41,000 pounds of thrust at takeoff. When at full power for takeoff, each engine gulps 42 tons of air a minute.

US Air Force C-5 / Staff Photo

Length: 247 feet 10 in
Wing Span: 222 feet 8 1/2 in
Height: 65 feet 1 1/2 in
Weight: Empty: 374,000 lbs; Gross: 837,000 lbs
Speed: Max 571 mph
Crew: six
Range: 6,940 miles empty; 3,250 miles at gross

Ceiling: 35,750 ft
Powerplant: Four General Electric TF39-GE-1C turbofans
Armament: None
Contractor: LASC Georgia Division of Lockheed.
Mission: Long range, air-refuelable, heavy logistics transport.



US Air Force B-52 Stratofortress / Staff Photo

United States Air Force

World War II had been over for two years and the Korean War lay three years ahead when the Air Force ended a 40-year association with the U.S. Army to become a separate service. The U.S. Air Force thus entered the new era in which air power became firmly established as a major element of the nations defense and one of its chief hopes for deterring war.

The Department of the Air Force was created when President Harry S. Truman signed the National Security Act of 1947. It became effective September 18, 1947, when Chief Justice Fred M. Vinson administered the oath of Symington, a position filled by presidential appointment. The same act as amended in 1949, also created the Department of Defense as an executive department, with three coequal departments - Army, Navy and Air Force - operating under the authority, direction and control of the secretary of defense.

Currently, Air Force resources include 13 major commands, 16 separate operating agencies, 11 direct reporting units, 140 major installations in the United States and overseas, more than three-quarters of a million active duty, Air National Guard and Air Force Reserve personnel and a quarter of a million civilians.

F-15

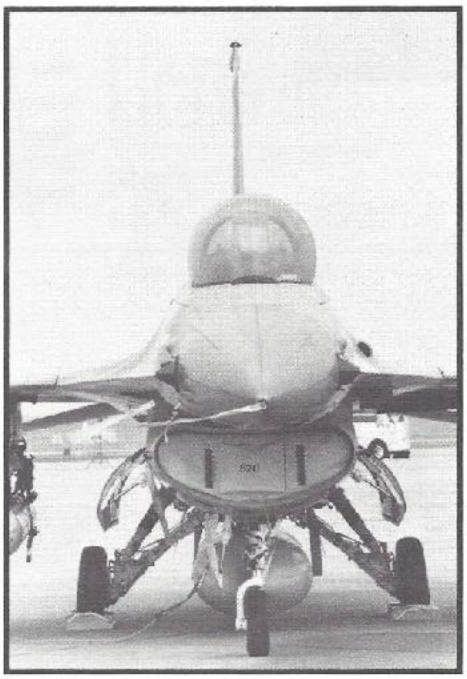
The mission of the U.S. Air Force is to provide an Air Force that, with the other armed forces, can preserve the peace and security of the United States, provide for its defense, support national policies, implement national objectives, and overcome any nation responsible for aggressive acts that imperil its peace and security. Teamed with the Army, Navy, and Marine Corps, the Air Force is prepared to fight and win any war if deterrence fails.

The Air Force is responsible for providing:

- Strategic aircraft and missile forces necessary to prevent or fight a general war.
- Land-based tactical air forces needed to establish air superiority, to interdict the enemy and to provide air support of ground forces in combat.
- The primary aerospace forces for the defense of the United States against air and missile attack.
- Major space research and development support for the Department of Defense.
- Assistance to the National Aeronautics and Space Administration in conducting our nation's space program.

The U.S. Air Force thus entered the new era in which air power became firmly established as a major element of the nations defense and one of its chief hopes for deterring war.

US Air Force F-16 Fighting Falcon / Staff Photo



US Coast Guard

HH-60J Coast Guard Helicopter / Photo courtesy of US Coast Guard

On an average day, the Coast Guard saves 16 lives, (one every 91 minutes). They assist an additional 361 people and save $2.5 million dollars worth of property. The Coast Guard seizes over 3,500 pounds of marijuana and 50 pounds of cocaine during an average day.

On August 4, 1991 the Coast Guard celebrated its 201st birthday. The service has come a long way since Alexander Hamilton created the Revenue Cutter Services under the Treasury Department to guard against smugglers.

Today's current Coast Guard was formed in 1915 when the Life-Saving Service and the Revenue Cutter Service merged. In the 1930's and 40's the Coast Guard added the Light House Service, the Bureau of Navigation and the Steamboat Inspection. In 1967 the Coast Guard was moved to the newly created Department of Transportation, after being in the Treasury Department for 177 years.

Missions such as Search and Rescue, Maritime Law Enforcement including Fishery Patrols, Drug Inspection and Interdiction, Environmental Protection, Aides to navigation, Port Safety and Security, Marine Inspection and Licensing, Boating Safety and Waterways management show the diversity of today's Coast Guard.

US Coast Guard C-130 / Staff photo

On the average day, the Coast Guard saves 16 lives, one every 91 minutes. They assist an additional 361 people and save $2.5 million dollars worth of property. They attend twenty-three oil hazardous chemical spills. Seventeen marine casualties are investigated and more than 8,000 transactions take place in the Marine safety Information System.

The Coast Guard seizes over 3,500 pounds of marijuana and 50 pounds of cocaine during an average day. The street value of those drugs are estimated to be $6.5 million, or $4,500.00 for every minute of the day. They assist other law enforcement agencies in the seizure of an additional $3.5 million worth of illegal drugs.

All this and much more is done daily by a force of only 30,000 enlisted personnel and 5,000 officers (there are 28,000 police officers in the city of New York). The Coast Guard Reserve numbers only 12,500 and assists all regular stations.

Because of the many and diverse missions facing the Coast Guard, the service must utilize fixed and rotary winged aircraft. The Coast Guard's Aviation program requires each enlisted member to be a qualified aircrewman. They are the only service that does this. Because of its size, they cannot have personnel or specialists who do not fly. If you break it you fix it and if you fix it you fly it.

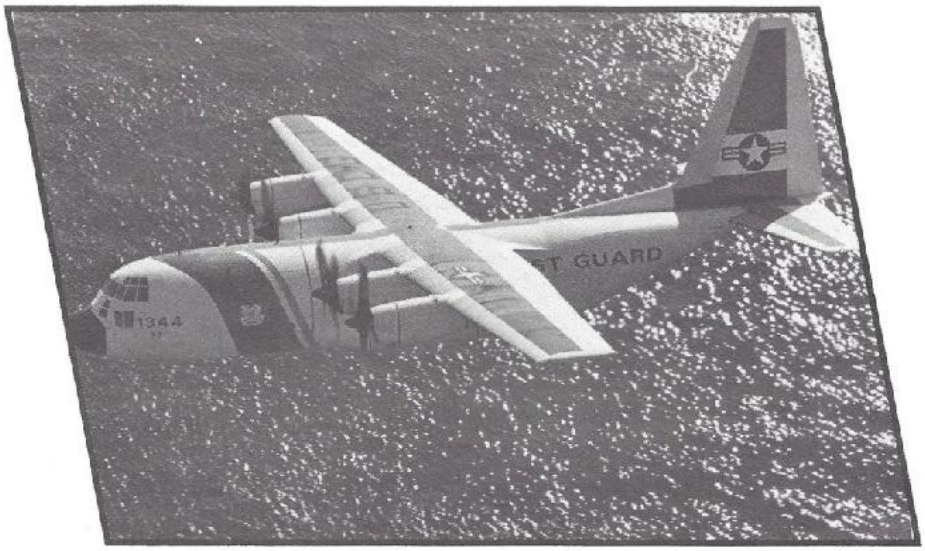
Today's Coast Guard does its job from small boats, cutters and aircraft on and over the high seas. They are proud, professional team ready to defend the country's sovereignty and assist the American public. Thus, constantly living up to their motto "Semper Paratus" or Always Ready.

HH-65 Dolphin

US Coast Guard HH-65A Dolphin / US Coast Guard photo

Approximately 20 percent of the Dolphin is made from composite materials. Initial version of the Dolphin (a civilian AS.356N) first flew in March 1979. The HH-65A uses a fenestron tail rotor. The main rotor is four bladed made with carbon-fiber spars and skin. Powered by Two Turbomeca Arriel IC 710 shp Turboshafts mounted on either side of the main rotor drive shaft this feature minimizes the chance of a single projectile disabling both engines. Used primarily for search and rescue missions the Dolphin is one of the newest aircraft in the Coast Guard inventory.

Length: 38 feet
Main rotor dia.:39 feet
Height: 13 feet
Weight: Empty 6,092; Gross 8,900
Speed: .125 knots
Crew 1-2 pilots 1 crewman
Range: 400 NM
Normal Endurance: 3 hours
Cargo Sling Load: 2,000 lbs
Armament: None
Contractor: Aerospatiale
Mission: Search and Rescue



US Coast Guard C-130 Hercules / US Coast Guard photo

C-130 Hercules

The C-130 is a medium-range tactical airlift aircraft designed to transport both cargo and personnel directly into the theater of operations. Variants of the C-130 perform many other missions, including close-air support, rescue and recovery, special operations and all weather reconnaissance.

The aircraft can deliver personnel, equipment or supplies by landing or by various aerial delivery modes.

Its ability to use relatively short semi-prepared runways, and to air-drop personnel and cargo, makes the C-130 ideally suited for a disaster related mission. These aircraft have flown to crisis areas around the world to deliver food, clothing, shelter and medical personnel and supplies to victims in disaster areas.

Length: 97 feet 9 in
Wing Span: 132 feet 7 in
Height: 38 feet 3 in
Weight: (maximum for TO) 175,000 lb
Speed: maximum cruise 374 mph
Crew: five
Range: with max payload, 2,487 miles
Ceiling: 33,000 feet
Powerplant: Four Allison T56-A-15 turboprops4,508 ehp
Armament: Usually none
Contractor: LASC Georgia Division of Lockheed Corporation.
Mission: Airlift Support

US Air Force A-10 Thunderbolt / Photo courtesy Fairchild AFB

A-10 Thunderbolt II

Length: 53 ft 4 in
Wing Span: 57 ft. 6 in
Height: 14 ft 8 in.
Weight: Empty 24,959 lb, max gross 50,000 lb.
Speed: combat speed at S/L, clean, 439 mph
Crew: One
Range: range with 9,500 lb weapons and 1.7 hr loiter, 20 min reserve, 288 miles.
Powerplant: Two GE TF34-GE-100 turbofans; each 9,065 lb thrust.
Armament: Armament: one 30-mm GAU-8/A gun, eight underwing hardpoints and three under fuselage for up to 16,000 lb of ordnance, including various types of free-fall or guided bombs, combined effects munition (CEM) dispensers, gun pods, six AGM-65 Maverick missiles, or four AIM-9 Sidewinder missiles, and jammer pods.
Contractor: Fairchild Republic Company, Division of Fairchild Industries.

Everything that can be done to ensure survivability has been done. The pilot sits in an armoured "bathtub" of titanium, control systems are fully duplicated, and the engines have been widely spaced apart to ensure that both cannot be knocked out with a single minor hit.

The fuel tanks are filled with reticulated foam to minimize the risk of fire if the aircraft is hit, while fuel lines not protected by armour are fitted with self-sealing covers.

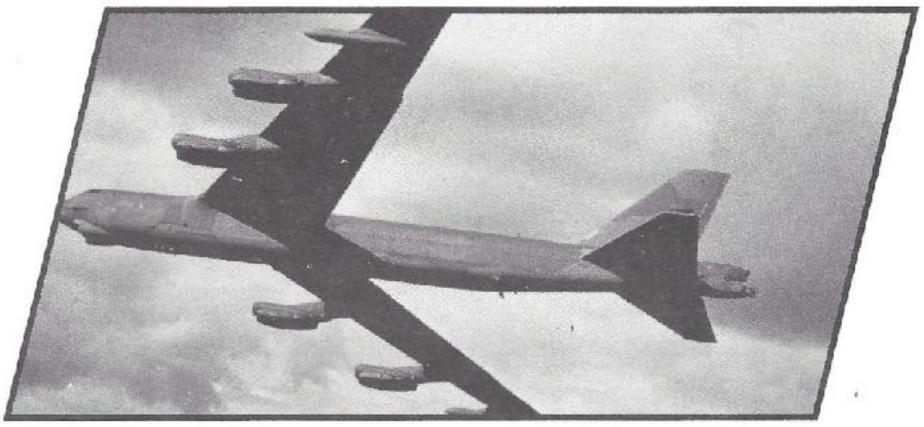
As main armament the A-10 is Equipped with the most powerful gun mounted on an aircraft in the world, capable of firing 70 rounds each second. Each round weighing a pound-and-a-half. It can put all 70 rounds within an eight-foot circle from a mile away! The Fuselage - mounted 30mm GAU-8/A Avenger canon, a weapon designed to destroy main battle tanks by penetrating the relatively thin armour on the sides, top and rear of the hull.

B-52 Stratofortress

The B-52 Stratofortress is a long-range, heavy bomber capable of flying at high subsonic speeds at altitudes up to 50,000 feet. For more than 30 years, B-52s have been the primary strategic bomber force for the United States capable of carrying nuclear or conventional ordnance.

The B-52 first flew in 1954, and entered the U.S. Air Force in 1955. Today all Stratofortresses are equipped with an electro-optical viewing system using forward-looking infrared and low-light-level television sensors to augment the terrain-following system and further improve low-level flight capability.

The use of aerial refueling gives the B-52 Stratofortress a range that is limited only by the endurance of its crew. The newer B-52's have more fuel-efficient engines and has an unrefueled range or more than 8,800 miles.



B-52 Stratofortress / Photo Coutresy Fairchild AFB

Length: 160 ft. 11 in
Wing Span:185 ft
Height: 40 ft, 8 in.
Speed: 650 mph
Crew: Six
Range: 1,605 miles
Powerplant: Eight (8) Pratt & Whitney engines: B-52G - J57-P43Wb turbo-jet, B-52-H - TF33-P-3 turbofan.
Ceiling: 50,000 feet
Armament:more than 20,000 lbs mixed ordnance, short-range attack missiles under wings, bombs and short-range attack missiles carried internally; B-52G - four .50 caliber machine guns; B-52H - 20mm automatic gatling-type or Vulcan gun.
Contractor: Boeing

Thunderbirds

United States Air Force Air Demonstration Squadron

Thunderbirds

The U.S. Air Force Demonstration Squadron, Thunderbirds, plans and presents aerial maneuvers to exhibit the capabilities of modern high performance aircraft and the high degree of professional skill required to operate these aircraft in a precision aerial demonstration and to maintain the capability for rapid reconfiguration and integration into a combat role, if required.

Objectives of the squadron are to:

Demonstrate to the public the professional competence of Air Force personnel.

Support U.S. Air Force community relations and people-to-people programs.

Support U.S. Air Force recruiting and retention programs.

Strengthen morale and esprit de corps among Air Force personnel.

The Team

The Thunderbirds squadron is a Tactical Air Command/Air Combat Command unit comprised of eight pilots (six of which are demonstration pilots), three support officers, and more than 130 enlisted people performing in 33 different career fields.

The diamond aircraft formation demonstrates the precision and training of formation flying, while the solos demonstrate the maximum capabilities of the F-16 Fighting Falcon. The pilots perform about 30 maneuvers in a demonstration. The entire show, including ground and air, lasts about an hour and 15 minutes. The demonstration season lasts from March to November, with the winter months used for training new team members. Officers serve a two-year tour with the team, as replacements for about half the team are trained each year.

The squadron performs no more than 88 air demonstrations each year while they travel almost 210 days. Since the team's inception in 1953, more than 254 million people in all 50 states and 56 foreign countries have witnessed the red, white, and blue jets in 3,131 official aerial demonstrations.

The team has never canceled a performance due to maintenance difficulties.
In addition to their responsibilities as the official U.S. Air Force aerial demonstration team, the Thunderbirds are part of the combat force. If required, team members and aircraft can be reintegrated into a tactical fighter unit within 72 hours.

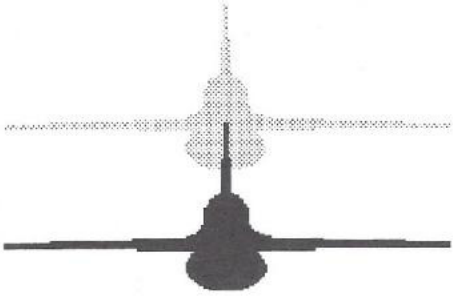
To keep their combat skills polished, team pilots fly periodic weapons training missions in addition to demonstration flights. Maintenance personnel are also ready to perform their combat role.

This operational concept conserves personnel and aircraft resources as well as ensures all of the nation's finest pilots and aircraft are available for national defense.

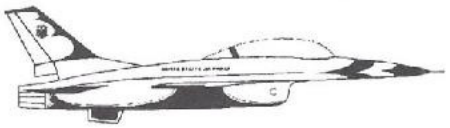
Thunderbirds

The Team

Thunderbirds

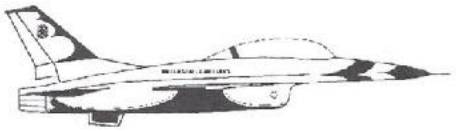


Lieutenant Colonel Daniel J. Darnell
Commander/Leader #1

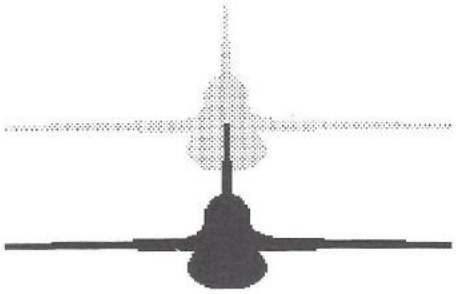


Lt. Col. Dan Darnell, 39, is in his first year flying the No. 1 aircraft as commander/leader of the Thunderbirds. Born in Riverside, Calif., Colonel Darnell calls Vinton, Va., home. Colonel Darnell is a senior pilot with more than 3,000 flying hours. He is married, and has three children.

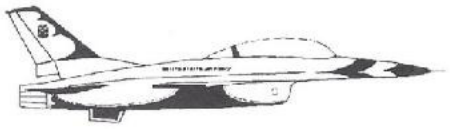
Captain Jeffrey B. Rochelle
Left Wing #2



Capt. Jeff Rochelle, 31, is in his first air demonstration season, flying the No. 2 aircraft as left wing in the diamond. Born in Apple Valley, Calif., Captain Rochelle calls Las Vegas, Nev., home. Captain Rochelle has logged more than 2,000 hours flying high performance jet aircraft. He's married and has a daughter.



Captain Lennie T. Coleman
Right Wing #3

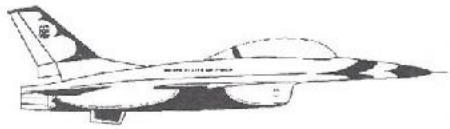


Capt. Lennie Coleman, 33, in his second year with the Thunderbirds, flies the No. 3 aircraft as the right wing in the diamond. Born in Savannah, Ga., Captain Coleman still calls Savannah, home. Captain Coleman has logged more than 2,600 flying hours. He's married and has a son.

Captain Paul C. Strickland
Slot #4

Capt. Paul Strickland, 34, is in his second year with the Thunderbirds flying the No. 4 aircraft in the diamond's slot position. Born in Santa Ana, Calif., Captain Strickland calls Trabuco Canyon, Calif., home. Captain Strickland has logged more than 2,000 hours of advanced fighter aircraft time. He is married and has two daughters.

Captain David A. Coffman
Lead Solo #5



Capt. Dave Coffman, 30, flies the No. 5 aircraft as the Thunderbirds lead solo pilot and is in his second demonstration season. Born in Chicago, but calls Jacksonville, Fla., home.Captain Coffman has logged more than 2,500 flying hours in high performance jet aircraft. He's married and has two children.

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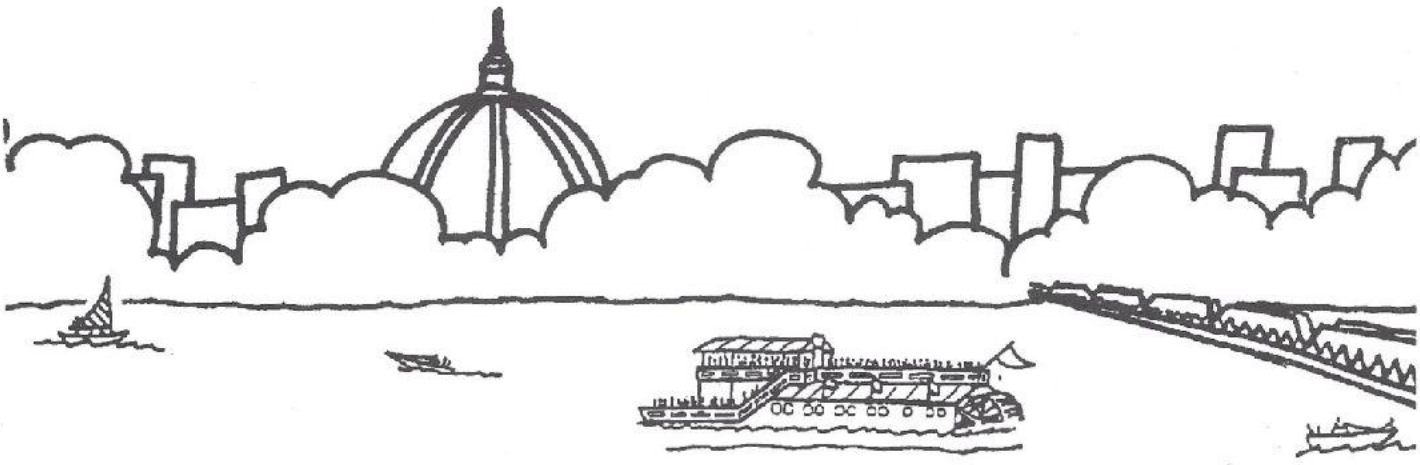
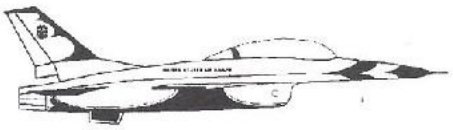


#1 For Music, Money & Fun

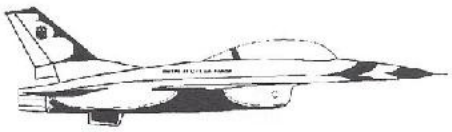
Thunderbirds

Thunderbirds
The Team



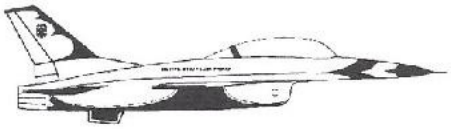
Captain Clark "Buck" Rogers
Opposing Solo #6

Capt. Clark "Buck" Rogers , 30, in his first year with the Thunderbirds, flies the No. 6 aircraft as the team's opposing solo. Born in Enid, Okla., but calls Tampa, Fla., home. Captain Rogers has more than 2,100 flying hours in high-performance jet fighter and trainer aircraft. He is married and has three sons.



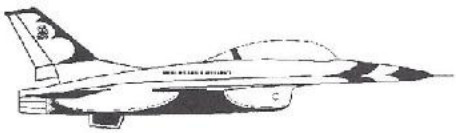
Major Scott G. Anderson
Logistics Officer #7

Maj. Scott Anderson, 36, flies the No. 7 aircraft as the Thunderbirds logistics officer. In his second year with the team, calling Brooklyn Park, Minn., home. Major Anderson has logged more than 2,700 hours flying high performance jet aircraft. He's married and has four children.



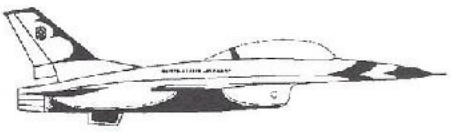
Captain Chris R. Chambliss
Narrator #8

Capt. Chris Chambliss, 32, in his second year with the Thunderbirds, flies the No. 8 aircraft as the team's narrator and advance man. Born in Alton, Ill., Capt. Chambliss calls Overland park, Kan., home. He's logged more than 2,200 hours flying high performance jet fighter and trainer aircraft. Captain Chambliss is married and has two sons.



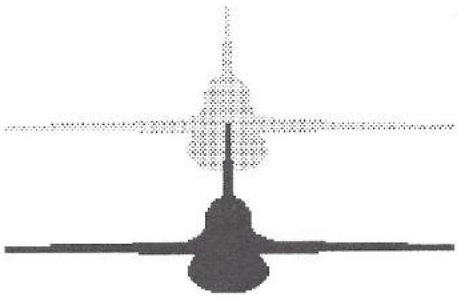
Captain Marc G. Paquette
Maintenance Officer

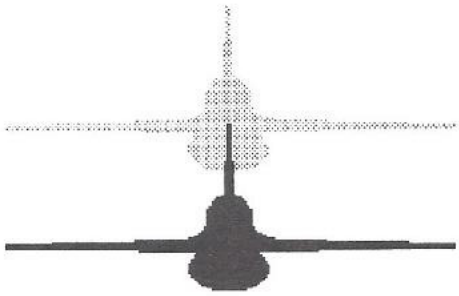
Capt. Marc Paquette, 33, in his second year with the Thunderbirds, is the team's maintenance officer. Captain Paquette, a Montreal, Canada, native, he earned a bachelor's degree in technical management at Regis College, Colorado Springs, Colo. He's married and has three sons.



Captain Joseph LaMarca Jr.
Public Affairs Officer

Capt. Joe LaMarca, 31, is the public affairs officer for the Thunderbirds. In his third year with the team, Captain LaMarca oversees the Thunderbirds publicity programs. Born in Port Jefferson, N.Y., Capt. LaMarca calls Charlotte, Fla., home.Captain LaMarca is married and has two daughters.





Thunderbird History

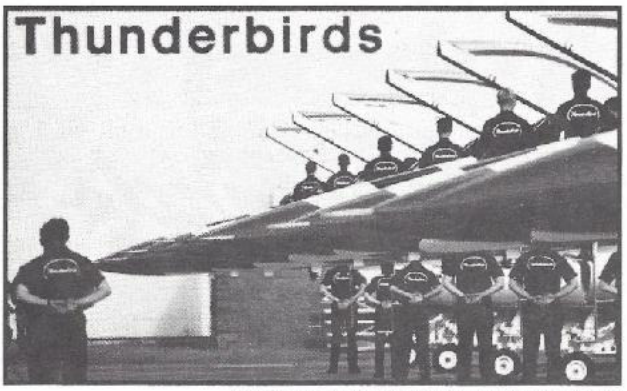
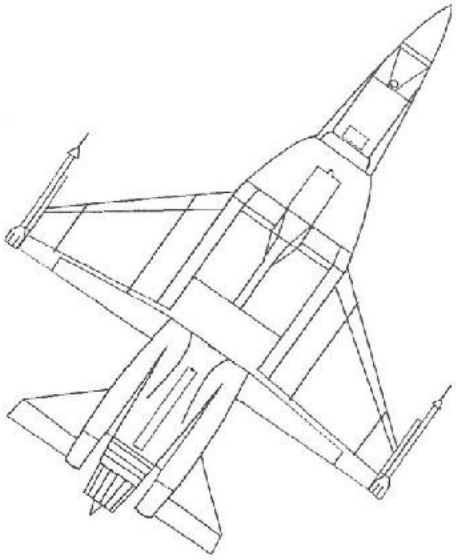


Photo courtesy US Air Force Thunderbirds



The Thunderbirds were officially activated June 1, 1953, as the 3600th Air Demonstration Team at Luke Air Force Base, Ariz. The first aircraft was the straight-winged F-84G Thunderjet. Early in 1955, the Thunderbirds transitioned to the swept-wing F-84F Thunderstreak. In their first three years with the F-84, the team performed for more than nine million spectators in 222 shows that included tours of Central and South America.

In June 1956, the team moved to its current home at Nellis Air Force Base, Nev. At the same time, the Thunderbirds traded the veteran F-84 for the U.S. Air Force's first supersonic fighter, the F-100 Super Sabre -- the aerial platform that would serve the Thunderbirds for 13 years. More than 1,000 demonstrations were flown in he "C" and "D" models of the aircraft, thrilling spectators from the Far East to North Africa. In the middle of the F-100 era, the team changed briefly to the F-105 Thunderchief. After only six shows in 1964, due to an extensive modification that became necessary on all Thunderchiefs, the Thunderbirds returned to the F-100.

From 1969 to 1973, the Thunderbirds flew the Air Force's front-line fighter of the time, the F-4E Phantom. In five seasons the team performed more than 500 demonstrations while traveling to 30 of the 50 states, Canada, Central America and Europe.

In 1974, the Thunderbirds converted to the T-38 Talon, the world's first supersonic trainer. The T-38 was more fuel-efficient and less costly to maintain than the larger F-4. The team flew nearly 600 demonstrations during eight seasons with the Talon.
Early in 1983, the Thunderbirds reinstituted their traditional role of demonstrating the Air Force's front-line fighter capabilities. Transition to the F-16 Fighting Falcon allowed the team to retain manpower and fuel efficiency while demonstrating to spectators the very latest in fighter technology.

In 1984, the team returned to Europe for the first time in 13 years. More than 3.2 million people viewed the aerial demonstrations in 11 countries, including the first visit to Norway. In 1986, the Thunderbirds participated in the rededication fly-by of the Statue of Liberty, which was viewed by tens of millions via national television. In 1987 the team performed in China - the first time any military demonstration team performed in a communist country.

In 1991, the team traveled to Europe for the first time since 1984. Eleven air demonstrations were performed in eight countries, including first-time visits to Switzerland, Poland, and Hungary. During the 30-day tour, more than a million people viewed the red, white, and blue F-16s. In the U.S. the team visited 30 states. All totaled, almost 10 million people saw their 75 official air demonstrations in 1991.

1992: Year of Transition

In 1992, the Thunderbirds transitioned to the F-16C for their aerial demonstrations. Since 1983, the team employed the A-model of the Fighting Falcon and was the last active-duty unit to convert to the upgraded model. the conversion took lace simply because the team represents the rest of the Air Force and every frontline F-16 squadron employs the F-

B-1B Bomber

US Air Force B-1B Bomber / Staff photo

The B-1B can fly thousands of miles; travel at near supersonic speed within 200 feet of the ground, at night, and in all types of weather. The B-1B can penetrate the most sophisticated network of electronic air defense systems, and deliver a variety of conventional and nuclear weapons.

The B-1B can obtain speeds up to mach 1.2 at high altitudes and fly over 7,500 miles unrefueled. With the internal advanced defensive avionics, the B-1B has the ability to reduce its radar signatures by utilizing Radar Absorbent Materials (RAM). Some modification sacrifices had to be made to obtain this low radar signature.

Some of the B-1B's special features include its retractable wings, which allow the aircraft to alter its speeds effectively.

Length: 150ft 2 1/2in
Wing span: closed is 84ft, open; is 136ft 8 1/2in.
Height: 33ft 71/4in.
Weight: Max takeoff 477,954 lbs.
Speed: 800mph, Mach 1.2/25,000ft.
Power plant: Four 30,000lb GE F101-GE-102 turbofans, each rated at 30,000lbs with afterburner.
Armament: conventional, 128Mk 82 bombs (84 internal) or 38Mk84 (24 internal), 26 B-43 (12internal), or 38 B-61 or B-83 (24 internal); missiles, 38 SRAM (24 internal) or 22 ALCM (8 internal).
Contractor: Rockwell International
Mission: Strategic bomber and ALCM carrier.

US Air Force F-16 Fighting Falcon / Photo courtesy Mac Dill AFB

F-16 Fighting Falcon

Since its introduction in 1979, the F-16 Fighting Falcon has made its mark as a true multi-role fighter; proving itself as a highly maneuverable aircraft in air-to-air combat.

A High-tech cockpit layout allows the pilot to fly the airplane, rather than manage control systems. The pilot is strapped into an ejection seat that is tilted back at a 30 degree angle. This semi-reclining position enables him to pull over 8'G' without grey-out or tunnel vision.

The F-16 now serves at many U.S. Air Force bases, West Germany, Japan, the Republic of Korea and Spain, as well as being used by the Air National Guard, Air Force Reserve, and even the U.S. Navy. The F-16 has become the choice fighter of such countries as Greece, Thailand, Singapore, Indonesia, and Bahrain. Over 1,600 Fighting Falcons have been produced.

Length: 49 feet 4 in
Wing Span: 32 feet 9 3/4 in
Height: 16 feet 8 1/2 in
Weight: Empty 16,794 lbs. Gross 37,500 lbs
Speed: Mach 2
Crew: one
Range: (ferry) 2,000 + miles
Ceiling: 50,000 + feet
Powerplant: One GE F110-GE-100 or one Pratt & Whitney F100-PW-220 engine with 29,000 lbs thrust
Armament:One 20mm multibarrel cannon, wing-tip infrared missiles and other air-to-air or air-to-surface munitions
Contractor:General Dynamics Corporation

US Navy F-14 Tomcat / Photo courtesy US Navy Lt. Cmdr. John R. Leenhouts

F-14 Tomcat

The latest version of the swing-wing, the F-14D Tomcat incorporates numerous modifications which give it a combat capability far in to the 21st century. The D model has higher thrust F110-GE-400 engines giving it 54,000 pounds of total thrust to lift and propel it to speeds in excess of mach 2.0 during intercept missions. A new electronics package features the much improved AN/APG-71 radar with capabilities Incorporating electronic-counter measures. The F-14 possesses the best capability to stop any type of target; fighter, bomber, or cruise missile. Other onboard target sensors, give the F-14 the only U.S. fighter capability to simultaneously coordinate multisensor inputs to resolve target identification and determine correct attack options.

A heavyweight among fighters, the F-14 can use its automatically programmable swing-wing to maximize maneuverability and to provide maximum speed capability.

Length:62'9"
Wing Span: 64.1' unswept; 38' swept.
Height: 16 feet
Weight: Empty 40,100 lbs. Gross: 62,260 lbs.
Speed: Mach 2.0+
Crew: Two
Range: (ferry) Aprox. 3,450
Ceiling: 50,000 + ft

Powerplant: Two F110-GE-400 engines with afterburning.(54,000 lbs total thrust)
Armament: Six Phoenix missiles, four Sparrow missiles, four Sidewinder missiles, one 20mm Vulcan cannon
Contractor: Grumman Aerospace Corp.

E-2 Hawkeye

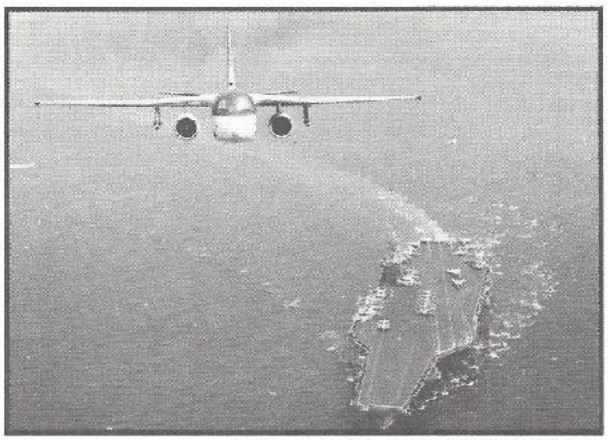
Grumman was the original pioneer of the seagoing AEW aircraft, (airborne early warning) with the AF-2W Guardian and later the E-1 Tracer in which radar was put above the fuselage instead of below. As a flying machine the E-2 possesses few problems. The Allison turboprops, basically similar to those of the C-130 and P-3, run at a constant speed. All flight controls are fully powered, and even with full internal fuel the Hawkeye can be aerobically maneuvered almost like a fighter.

The ATDS (airborne tac data system) is the nerve center of the aircraft, manned by the combat info centre officer, air control officer and radar operator. The E-2 is capable of tracking more than 250 aerial targets and control more than 30 intercepts. Small objects the size of a cruise missile can be tracked at 115 miles.

US Navy E-2C Hawkeye / Photo courtesy US Navy D. Smith

Length: 56 feet 6 in
Wing Span:80 feet 7 in
Height: 18 feet 3 in
Weight: Gross: 53,000 lbs
Speed: 320 knots
Crew: five
Range: 1,605 miles
Ceiling: 30,000 feet
Armament: None

Powerplant: Two Allison T-56-A427 turboprop engines (5,000 shaft horsepower each)
Contractor:Grumman Aerospce Corp.
Mission: Provide all-weather airborne early warning, cammand and control functions for the carrier battle group.



US Navy S-3A Viking / US Navy Photo

United States Navy

Naval aviation can be traced back to 1910, when pioneer airplane builder Eugene Ely took off in a biplane from a specially built platform on the cruiser USS Birmingham. One year later, on May 8,1911, the Navy purchased its first airplane- an A-1 Triad, with a speed of 60 miles per hour and a cost of $5,500. This date marks the official birthday of naval aviation in the United States.

Much has happened to naval aviation in the past 81 years. When the United States joined World War I in 1917, the Navy had one air station (in Pensacola,FL.), 48 pilots and 54 aircraft. It wasn't until 1922 that the first experimental aircraft carrier, the USS Langley, appeared, which carried up to 34 planes.

During the 1930s, when war again threatened, naval aviation expanded tremendously, and World War II demonstrated the power of sea-based aviation and confirmed aviation's place in sea warfare. The aircraft carrier played an essential role in defeating the enemy in both the Atlantic and Pacific.

Responding to Crisis - A Traditional Naval Mission

Since 1980, the U.S. Navy has been the President's choice no fewer than 50 times to respond to international and regional crises affecting United States citizens, our national interests and those of our allies.

The Navy will also play a key role in the expanding contribution that the Department of Defense will provide in the President's national drug control strategy. Plans call for a greater employment of naval forces, including carrier battle groups, major amphibious ships and aircraft, operating in international waters.

Maritime Contributions

The United States is a maritime nation which requires a ready and reliable Navy-Marine Corps Team for our nation's economic well-being and national security.

The Navy of the future will be a smaller force capable of operating with greater economy, efficiency, flexibility, and versatility.

The Navy-Marine Corps Team is daily on-station, forward deployed, and maintaining long term U.S. presence in overseas areas of vital interest. One-third of the Navy is underway on any given day.

The sea-based Navy-Marine Corps Team is sustainable for the long term and free from declining overseas land bases.

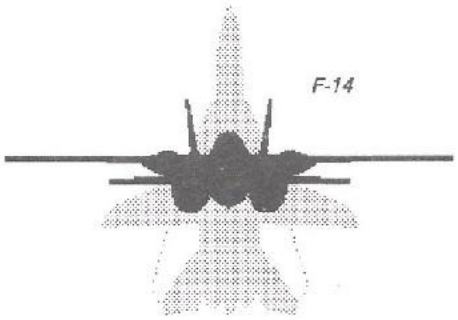
The Uncertain Future

The United States Navy must retain the capability to respond to rapid changes throughout the world. Uncertainty is, by far, one of our greatest enemies. Naval aviation will continue to play a major role in this nation's defense structure and the threat of an uncertain future. The proud history of the Navy's air warfare role will substantially contribute to the progress of aviation in the future, and in meeting this threat head-on.

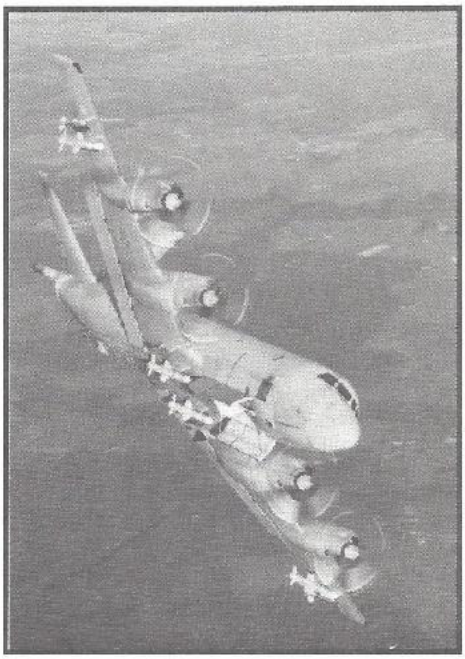
The World War II generation of naval aviators changed the country and the world in many ways. As the United States commemorates the 50th anniversary, from the first victory at Midway Island in June,1945, we recognize and honor the individuals who fought against totalitarian regimes world-wide.

When Iraq invaded Kuwait on August 2, 1990, the aircraft carriers USS Independence and USS Dwight D. Eisenhower moved immediately to the north Arabian Sea and the eastern Mediterranean. Consequently, naval deterrent air power was on station three days before the ground force and land-based air force deployments began.

Since 1980, the U.S. Navy has been the President's choice no fewer than 50 times to respond to international and regional crises affecting United States citizens, our national interests and those of our allies.

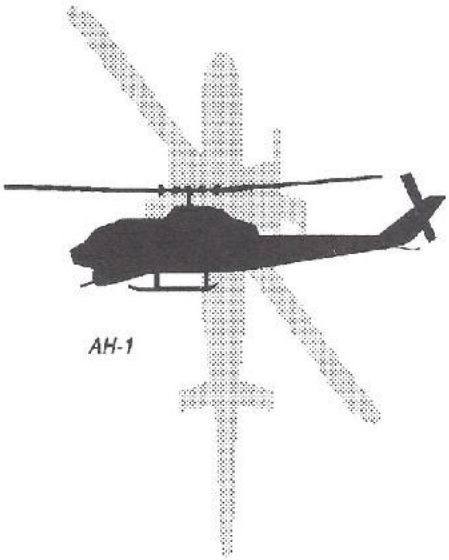


US Navy P-3 Orion / Photo courtesy Mark Meyer

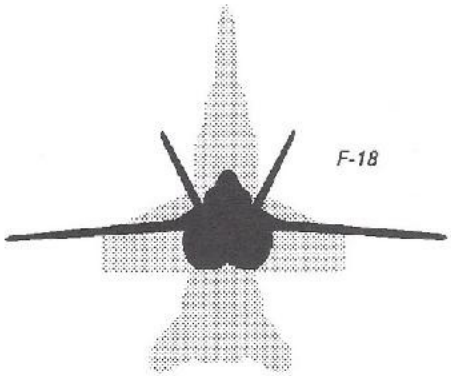


United States Marines

The Middle East crisis, launched by the Iraqi invasion of Kuwait on August 2, 1991, was the latest test of the Marines Corps team's flexibility in crisis response.



AH-1



F-18

US Marines Photo / F/A-18 Hornet

Almost a year older than the United States itself, the Marine Corps dates back to its founding by the Second Continental Congress that passed a resolution stating that "two Battalions of Marines be raised" for service as landing forces with the fleet.

The Middle East crisis, launched by the Iraqi invasion of Kuwait on August 2, 1991, was the latest test of the Marines Corps team's flexibility in crisis response. Eight weeks before Iraq's invasion and occupation of Kuwait, the Marine Corps was deployed to the coast of Liberia to assist Americans and other foreign citizens during the violent civil war in that country. In early January, Marines who were already involved in Operation Desert Shield were dispatched to Somalia to rescue 260 American and Foreign nationals from the embassy. These three operations added up to 53 Marine crisis responses since 1980.

When the decision was made to send 45,000 strong Marine Expeditionary Force to Saudi Arabia, two Marine Expeditionary Brigades were airlifted, with their heavy equipment, including tanks, ammunition and other supplies, via two squadrons of maritime prepositioning ships. The ships provided the Marines with immediate seabased sustainability.

At 1900 (EST) on January 16, 1991, the White House announced that "the liberation of Kuwait has begun!" The offensive action against Iraq, codenamed Operation Desert Storm, is being carried out under the provisions of twelve U.N. Security Council resolutions and resolutions of both houses of the U.S. Congress.

On January 26, 1991 the Marines staged the biggest artillery attack of the war, firing a battery of 155mm howitzers at Iraqi troops six miles inside Kuwait. The beginning of Kuwait's liberation started on January, 29, when the 13th Marine Expeditionary Unit assaulted and captured Umm al Maradim Island. Marines planted the Kuwaiti flag, and destroyed anti-aircraft weapons and stored artillery.

On March 3, 1991, General Norman Schwarzkopf and Joint Forces Commander Prince Khalid bin Sultan bin Adul Aziz met 7 Iraqi military officials, led by Deputy Chief of Staff LtGen. Sultan Hasheem Ahmad, at Safwan Airfield in occupied Iraq. After a two hour meeting, Iraqi military officials formally accept all demands for a permanent ceasefire. President Bush, on March 6, addressed a joint session of Congress: "I can report to the nation: Aggression is defeated. The war is over."

US Marine Corps Photo / AH-1J Sea Cobra

AV-8B Harrier II

US Marines AV-8B Harrier II / Staff photo

The AV-8B Harrier II, a vertical/shorttakeoff and landing attack jet, represents a revolutionary modernization of the Corps' light attack force. It can provide close air support for ground troops better than any other type of attack aircraft.

The AV-8B is operable from all naval flight decks, and from highways and helicopter-type landing zones. This capability enables the Corps to position the aircraft close enough to fighting Marines to deliver supporting ordnance where it's needed, when it's needed. In a forward basing mode, the aircraft routinely responds with ordnance on target in 10 minutes.

In 1989 all production AV-8Bs were equipped with night-attack features. These features include a forward-looking infrared sensor, a color digital moving map, and night vision goggles for the pilot.

Length: 46.3 feet
Wing Span: 30.3 feet
Height: 11.6 feet
Weight: Empty 13,000 Gross for VTO: 17,500 Gross for STO: 21,489 maximum for CTO: 29,750
Speed: .91 Mach
Crew 1 pilot (2 in TAV-8)
Range: 471 NM with 7MK 82s/25mm
Ceiling: 40,000+ feet
Powerplant: 1 Rolls-Royce 402 vectored-thrust turbofan; 21,500 pounds of thrust.
Armament: 25mm guns, Payload is maximum of 9,200, 16 500-pound bombs or six 1000-pound bombs and 2 anti-aircraft missiles.
Contractor: McDonnell Douglas.

F/A-18 Hornet

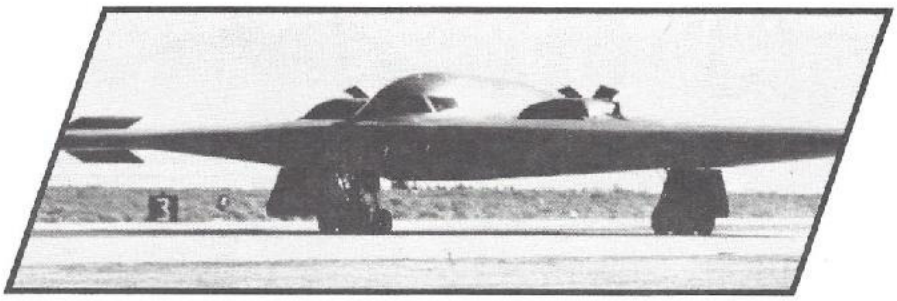
USNavy F/A-18 Hornet / Photo courtesy US Navy Lt. Cmdr. T. B. Surbridge

Length: 56 feet
Wing Span: 37 feet 6 in
Height: 15 feet 3 1/2 in
Weight: Empty (maximum for TO) 47,000
Speed: about 1,188 mph Mach 1.8
Crew 1 pilot
Range: Fighter: 400 nautical miles; Attack: 550 nautical miles
Ceiling: 50,000+ feet
Powerplant: Two General Electric F404-GE-400 low by-pass turbofans (16,000lbs thrust each).
Armament: One 20mm M-61A1 cannon, Sparrow III and Sidewinder missiles, Guided and conventional ait-to-ground ordnance.
Contractor: McDonnell Douglas.

Single-seat, twin-jet, all-weather aircraft, designed to fulfill missions for the Marines and the Navy. The F/A - 18 is strengthened to operate from aircraft carriers.

Powered by two General Electric F404-GE-400 engines, the Hornet provides superior maneuvering performance as well as the ability to achieve high mach for intercept missions and still maintain a degree of economically efficient cruise performance provided by the turbofan engines. The combat range of the F/A - 18 exceed 400 miles in the air to air combat role and a range of over 550 miles in the strike/interdiction role. Armed with an internal 20mm multi-barrel gun, the F - 18 possesses a powerful radar to help guide a complex combination of air to air, air to ground and air to ship weapons.

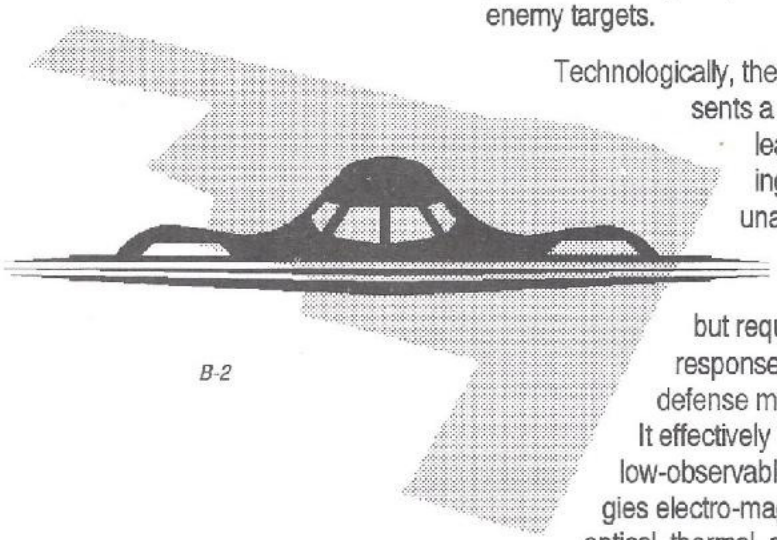
Stealth B-2 Bomber



US Air Force B-2 Advanced Technology Bomber / Photo courtesy Edwards AFB

Technologically, the B-2 represents a generational leap incorporating capabilities unattainable with conventional airframes but required in response to enemy air defense modernization.

The mission of the B-2 is the same as every bomber before it: deterrence, both nuclear and conventional. The B-2 will be a mainstay of the nation's nuclear deterrent Triad well into the next century. Its stealth technology revolutionizes our manned bomber force and prevents atrophy in the airbreathing leg that would otherwise lead to the eventual disintegration of the balanced Triad concept. With its combination of penetrativity, accuracy and weapon yield, and "man-in-the-loop" damage assessment, the B-2 can hold the full range of targets at risk. The B-2 will carry out the same mission as its predecessors, such as the B-36 and the B-52 by holding valued enemy assets at risk by retaining the ability to penetrate enemy airspace and destroy enemy targets.



B-2

Technologically, the B-2 represents a generational leap incorporating capabilities unattainable with conventional airframes but required in response to enemy air defense modernization. It effectively integrates low-observable technologies electro-magnetic, optical, thermal, and acoustic -- among the most significant technologies to appear in recent decades -- into a large aerodynamically efficient aircraft, creating a highly survivable bomber with long range and a heavy payload. The B-2's low observable characteristics significantly reduce the capability of enemy forces to detect, track, and engage, which provides the B-2 with unparalleled capabilities to penetrate sophisticated air defense, attack targets with a wide range of weapons, and survive.

The B-2 program is currently in its flight-test phase. The first two aircraft have logged more than 112 flight hours on 30 test flights. The test program has been an unqualified success to date, with many significant test objectives completed. In fact, aircraft handling qualities have been as good as or better as predicted in the simulator. The immediate future of the test program will be devoted to low-observable testing and continuation of the flight envelope expansion which began in late 1990. A total of 75 operational aircraft are planned.

A new stealthy airplane is essential to continued viability of the bomber force. The B-52 has served the United States well, but service life is limited and the technology is old. The B-1B is the best operational long-range bomber in the world today, but continuing improvements to Soviet air defense systems tax the penetration abilities of both the B-52 and B-1B. Improved air defenses will eventually force traditional bombers into a "stand-off" cruise missile role constraining our ability to hold at risk a wide variety and number of targets.

Stealth F-117 Fighter

US Air Force F-117 Stealth Fighter / US Air Force photo

The F-117A "Stealth Fighter" is the world's first operational aircraft designed to be "invisible" to enemy radar. The subject of world speculation for years, the single-seat F-117A "Stealth" made its maiden flight in June, 1981 and became operational in 1983.

The F-117A was to be optimized to covertly penetrate defense threat environments and attack high value targets with pinpoint weapon accuracy. Heavy emphasis was placed on making the aircraft totally autonomous, totally passive, and as elusive a target as technologically possible. The F-117A is not dependent upon external communications of any kind in order to accomplish its mission.

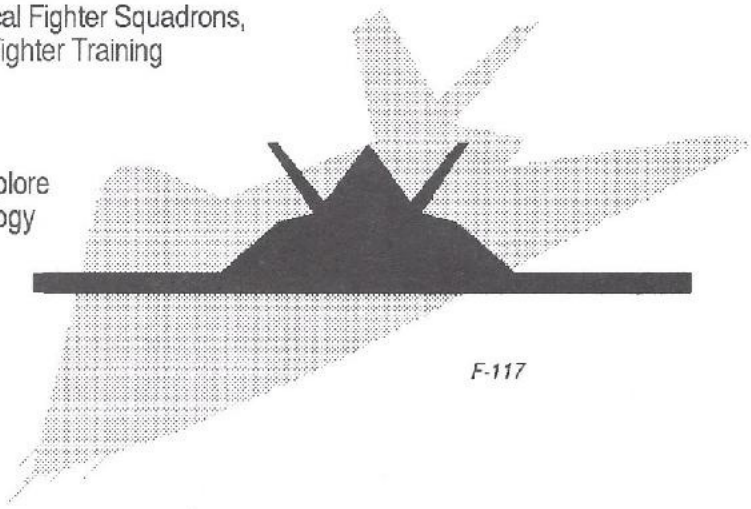
Among the design features are the short squat, angular central body mounted on swept wings with a sharply canted vee tail. It also incorporates low noise characteristics and minimal engine infrared and smoke emissions.

The unique design of the air refuelable F-117A, provided exceptional combat capabilities. About the size of an F-15 Eagle, the twin-engine aircraft is powered by General Electric F404 turbofan engines and has quadruple redundant fly-by-wire flight controls. The F-117A can employ a variety of weapons and is equipped with sophisticated navigation and attack systems integrated into a state-of-the-art digital avionics system thereby increasing mission effectiveness.

The first operational-standard production aircraft was turned over to the Tactical Air Command's 4450th Tactical Group during 1982, and on October 26, 1983 initial operational capability (IOC) was attained with the 415th TFS; the 416th followed during January. The group initially was a direct reporting unit to the Tactical Air Command, Langley AFB, Virginia. During 1985, however, operational command was transferred to the Tactical Fighter Weapons Center, Nellis AFB, Nevada. During October of 1989, it became the 37th Tactical Fighter Wing, under the operational command of the 12th Air Force headquartered at Bergstrom AFB, TX; comprised of the 415th and the 416th Tactical Fighter Squadrons, and the 417th Fighter Training Squadron.

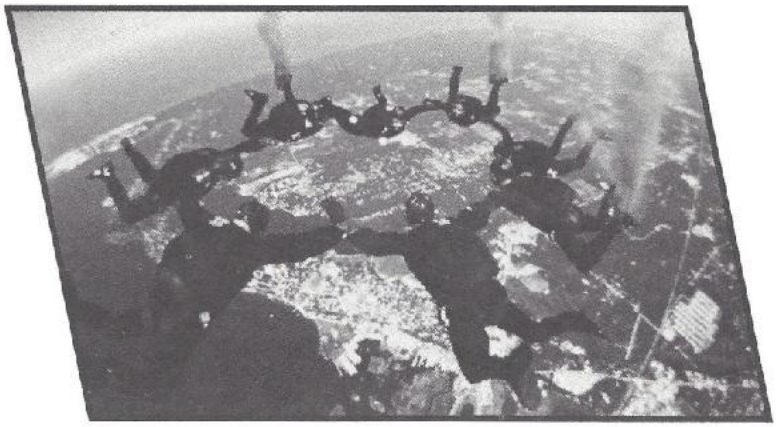
Lockheed has continued to explore F-117A technology and design options and it is known that an advanced version of the aircraft, sometimes referred as the F-117B, with more powerful engines and other changes providing additional performance, has been offered to the Air Force.

The F-117A was to be optimized to covertly penetrate defense threat environments and attack high value targets with pinpoint weapon accuracy.



F-117

US Army Golden Knights



USArmy Golden Knights Freefall team formation / Golden Knights photo

Equally demanding is "Accuracy Competition" in which parachutists must land with their heel or toe on a disk the size of a "silver dollar" after exiting the aircraft from only 2,800 feet. World-class competitors in this event have won with a score of only 1 centimeter.

The Golden Knights were formed in 1959, expanding from 13 original team members, the current team consists of approximately 76 men and women.

The Golden Knights referred to themselves as Precision Freefall Parachutists, rather than "skydivers". The Golden Knights do have several military missions which include representing the U.S. Army worldwide and numerous research and development activities associated with military parachuting.

When not performing at airshows, the Golden Knights are competing in world-class events. Competitive parachuting recognizes both "Style and Accuracy" and "Relative Work." Accordingly, the Golden Knights have two teams, one for each category.

In "Style Competition," the parachutist must perform free-fall demonstrations involving various flips and turns after exiting the aircraft at 6,600 feet. The competitors are clocked for speed and judged for precision with the winner achieving the lowest average time. The average time for world-class competitors in style competition is usually less than 7 seconds.

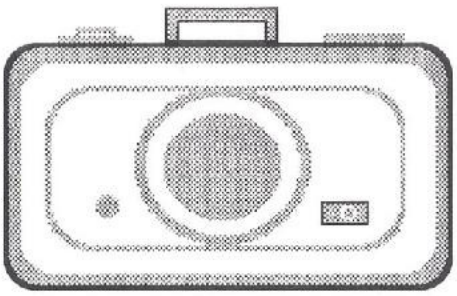
Flag Jump / Golden Knights photo

Equally demanding is "Accuracy Competition" in which parachutists must land with their heel or toe on a disk the size of a "silver dollar" after exiting the aircraft from only 2,800 feet. World-class competitors in this event have won with a score of only 1 centimeter. This means that during 10 competitive jumps, 9 out 10 rounds resulted in dead centers and 1 round less than a 1/2" of center.

"Relative Work" competition is a team effort. In this arena, a group of parachutists jumps together and attempts to form a maximum number of various shapes by linking together in a limited time period. The team to complete the most free-fall formations in the least amount of time wins.

A typical Golden Knights airshow has a patriotic beginning. A single Golden Knight descends gracefully with the American flag streaming from the suspension lines on its rectangular shaped, black and gold parachute, referred to as either a ramair or "square" canopy. As he descends the National Anthem is played.

The Golden Knights full show includes four exciting performances. The "Baton Pass" demonstrates the basics of free-fall flight control while two jumpers exchange a 14-inch wooden baton. In the "Cutaway," a Golden Knight intentionally malfunctions his parachute to demonstrate the procedures employed when a parachute malfunctions. The "Diamond Track" maneuver is designed to demonstrate the amount of lateral movement a parachutist can obtain while falling up to 180 miles per hour. To demonstrate this, two Golden Knight performers glide apart and then reunite to form a diamond. Finally, the Diamond Formation demonstrates precision and accuracy without touching while falling at speed in excess of 100 mph.



Airshow Photography tips!

Both the amateur photographer with their instamatic and the professional armed with a 35mm camera, zoom lens and of course, a bag full of bells and whistles enjoy the excitement of an airshow. An airshow offers many opportunities for photographers to test their skills and imagination by capturing the thrills in the sky.

The instamatic camera is excellent for spontaneous snapshooting and offers the ease of aim and fire. This camera is usually light-weight and easy to carry in your pocket or handbag. However, because of its fixed shutter speed, fast action shots may come out blurry, objects in the distance may appear small, and photos may lack interest.

The 35mm SLR camera is capable of giving good results in aerial shots. Most SLR cameras have interchangeable lenses. A telephoto zoom lens would be desirable to catch the action at various altitudes and distances. A teleconverter or 2x doubler that attaches to the camera will double the power of the lens, enabling you to take very impressive shots of the aircraft in flight.

The wide-angle lens is another very useful attachment. This lens allows you to take pictures of large subjects without having to move back a great distance. You will be able to catch the action of several aircraft in flight or a large plane on the ground.

Film is an important aspect of good photos; today there is a wide selection of film. On a bright sunny day, you can use film with an ASA rating of 100 or 200. These two types will give shutter speeds that are fast enough to stop the action. If you prefer to take slides, an ASA of 64 or 200 will give excellent color and sharpness. An ASA 200 film is very versatile and should give good results under any condition.

If you prefer to shoot with black and white film, you may want to use a variable ASA film. This is called Chromo-genetic and will have good results in both contrast and sharpness.

Taking photos at an airshow can be a real challenge. The varying brightness of the sky as the aircraft changes position can trick the best of us. For the best results, take the light meter reading from the darkest or bluest part of the sky, then take the camera off automatic and adjust it manually to that setting. This should give you good results for your aerial shot, but do not forget to reset it to automatic when you are ready to take pictures of subjects on the ground.

In addition to the UV or skylight filter you may use to protect the lens, you may want to use a polarizer. This filter will reduce glare and reflections, and helps to brings out the brilliant colors in your pictures. If you have not used a polarizer before, you may want to practice with it before you attend another airshow. A lens hood will be useful for keeping the sunlight from falling on the lens and creating a glare.

The excitement of an airshow offers many opportunities for photographers to test their skills and imagination by capturing the thrills in the sky.

1992 Military Flight Team Schedules

U.S. Navy Blue Angels

March
14 NAF El Centro, CA
21 Luke AFB, AZ
28-29 MCAS Beaufort, SC

April
4-5 Wilmington, NC
11-12 MacDill AFB, FL
18-19 Off Easter Weekend
24-26 MCAS El Toro, CA

May
2-3 Redding, CA
9-10 Cape Girardeau, MO
16-17 Chattanooga, TN
22-23 Andrews AFB, MD
25 U.S. Naval Academy, MD
30-31 McConnell AFB, KS

June
6-7 Watkins, CO
13-14 Hillsboro, OR
20-21 NAS Whidbey IS., WA
27-28 Davenport, IA

July
4-5 Traverse City, MI
11-12 Chicago, IL
18 Pensacola Beach, FL
25-26 NAS Brunswick, ME

August
1-2 Seattle, WA
8-9 Abbotsford, CN
14-16 NAS Miramar, CA
22-23 Grissom AFB, IN
27 Deploy To Europe

September
European Deployment
28 Re-Deploy to U.S.

October
3-4 Houston, TX
10 San Francisco, CA
11 NAS Fallon, NV
17-18 NAS Moffett, CA
24-25 NAS New Orleans, LA
31 NAS Jacksonville, FL

November
1 NAS Jacksonville, FL
7-8 Miami, FL
13-14 NAS Pensacola, FL

U.S. Air Force Thunderbirds

March
21 Homestead AFB, FL
28 Norton AFB, CA
29 Boulder City, NV

April
4 Seymour Johnson AFB, NC
5 Pope AFB, NC
11 Roswell, NM
12 Altus AFB, OK
14-15 Muskogee, OK
18-19 Amarillo, TX
25-26 NAS Norfolk, VA

May
2 Maxwell AFB, AL
3 Brunswick, GA
9 Shaw AFB, SC
10 Martinsburg ANGB, WV
16 Ft. Smith ANGB, AR
17 Baker AFB, AR
23 Kelly AFB, TX
24 Reese AFB, TX
27 USAF Academy, CO
30 Chanute AFB, IL
31 Scott AFB, IL

June
3 Myrtle Beach AFB, SC
6 North Kingstown ANGB, RI
7 Niagara Falls, NY
13-14 Racine, WI
16-17 Selfridge ANGB, MI
20-21 Dayton, OH
27 Hill AFB, UT
28 Mountain Home AFB, ID

July
4 Harrisburg, PA
5 McGhee Tyson ANGB, TN
7-8 Battle Creed, MI
11 Mankato, MN
12 Whiteman AFB, MO
18 Atlantic City, NJ
19 MCAS Cherry Point, NC
22 F.E. Warren AFB, WY
25 Elmendorf AFB, AK
26 Eielson AFB, AK

August
8 Latrobe, PA
9 Reading, PA
12 Loring AFB, ME
15-16 Geneseo, NY
22-23 Offutt AFB, NE
29 EAU Claire, WI
30 Grand Forks AFB, ND

September
5-7 Cleveland, OH
12 Kirtland AFB, NM
13 Liberal, KS
16-17 Reno, NV
19-20 Topeka, KS
26 Goodfellow AFB, TX
27 Holloman AFB, NM

October
3 Bowling Greene, KY
4 Dubuque, IA
10 Klamath Falls, OR
11 Stockton, CA
17 Patrick AFB, FL
18 Charleston AFB, SC
21 Deploy to South America

November
9 Re-Deploy to U.S.
14 Beale AFB, CA
15 Nellis AFB, NV

Canadian Forces Snowbirds

April
28 Slave Lake, Alta
30 Peace River, Alta

May
3 CFS Yellowknife, Nwt
5 Thompson, Man
7 Dauphin, Man
9-10 Richards Gebaur AFB, MO
13 Peterson AFB, CO
16-17 CFB Edmonton, Alta
18 Regina, Sask
23-24 Windsor, Ont
26 Timmins, Ont
28 Brantford, Ont
30 Chatham, NB
31 CFB Greenwood, NS

June
2 Paspebiac, Que
4 Maniwake, Que
6-7 Montreal, Que
9 Chibougamau, Que
13-14 CFB Bagotville, Que
20-21 CFB Portage La Prairie, Man
23 Lac Etchemin, Que
24 St. Frederic De Beauc, Que
25 St. Isidore, Que
27-28 CFB Trenton, Ont
29 Brockville, Ont

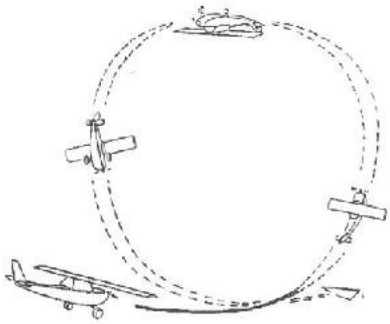
July
1 CFB Petawawa, Ont
4 CFB North Bay, Ont
5 CFB Borden, Ont
7 Ear Falls, Ont
11-12 CFB Moose Jaw, Sask
17 Shoal Lake, Man
19 Fort St. John, BC
20 Fort Nelson, BC
22 Inuvik, NWT
25 Elmendorf AFB, AK
26 Whitehorse, YT

August
2 CFB Comox, BC
3 Boundary Bay, BC
5 Kamloops, BC
7-9 Abbotsford, BC
12 Port Hardy, BC
15 Lethbridge, Alta
22 Fredericton, NB
23 Baie Comeau, Que
25 Summerside, PEI
29 CFS St. Johns, Nfld
30 CFB Gander, Nfld

September
1 Rouyn Noranda, Que
5-7 Toronto, Ont
9 Leamington, Ont
12-13 NAS Oceana, VI
16 Sept-Iles, Que
19-20 CFB Shearwater, NS
26 Fort Worth, TX
27 Lafayette, LA
30 Phoenix, AZ

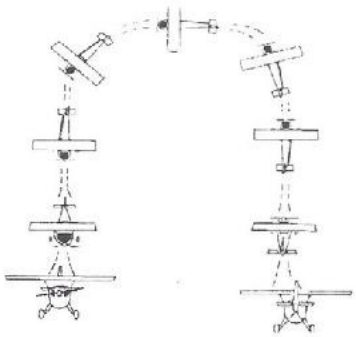
October
3-4 Salinas, CA
7 Fresno, CA
10-11 NAS Point Magu, CA

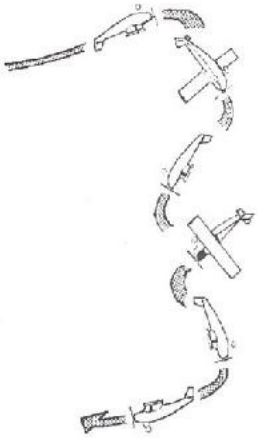
Basic Aerobatic Maneuvers



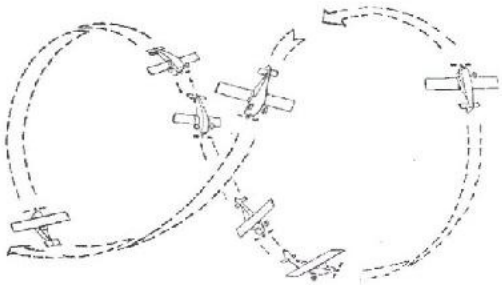
LOOP - The loop must be round - not tall and thin, or stretched out. It must be completed at the same altitude it began.

HAMMERHEAD - The up and down lines of the hammerhead should be absolutely vertical, and the airplane pivots around the top.





SPIN - The airplane stalls with the nose and wing dropping at the same time. The spin rotates an exact number of times at the completion the nose is straight down before pulling out.



HORIZONTAL EIGHT - Both halves of the eight should be the same size and equally round. Any rolls must be done in the middle of diagonal lines.

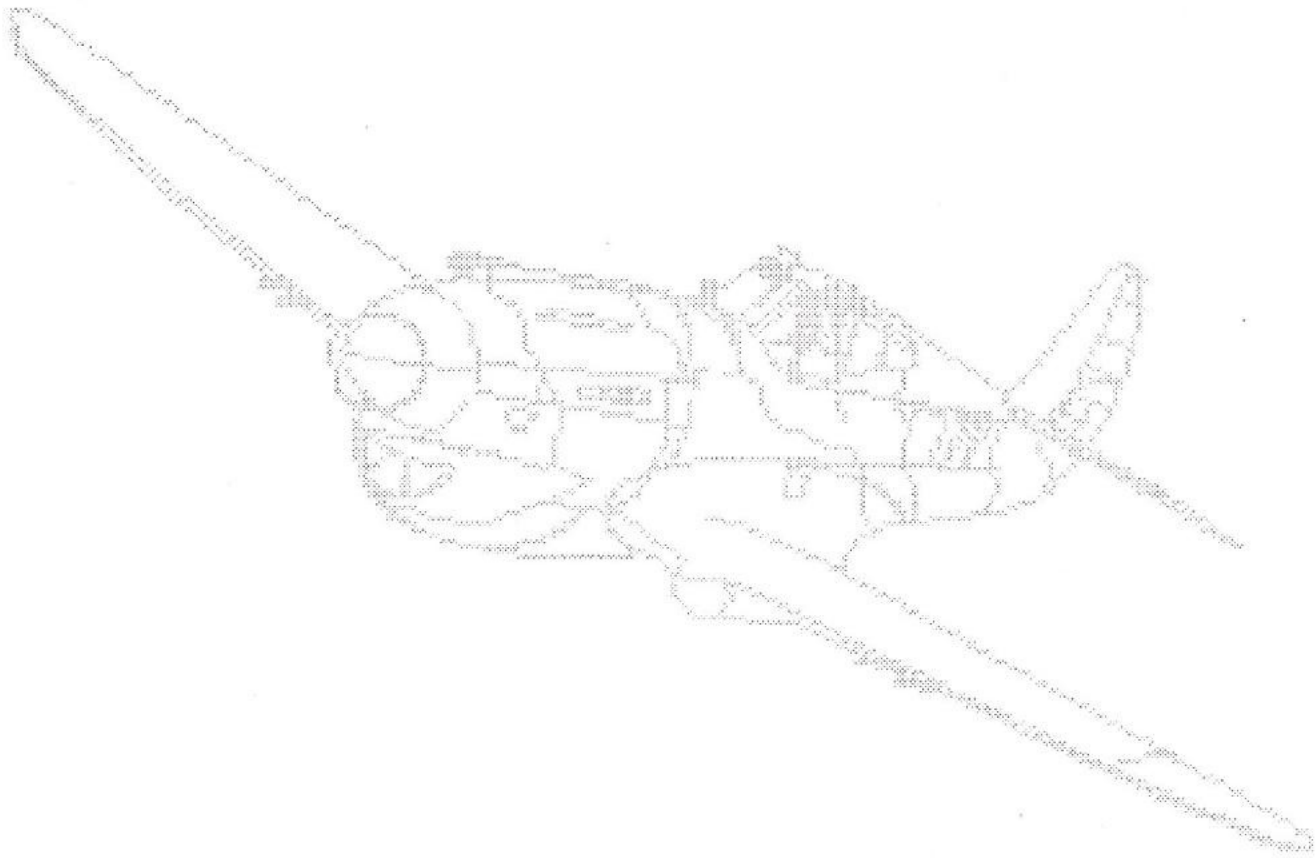
SLOW ROLL - Most often done straight up or down, as part of a Hammerhead. The roll must remain constant all the way around.

In military training commands, aerobatic training has always been considered a prime element in the development of the complete pilot.

The training received is designed to give full mastery over the airplane.

Autographs

Use this Page for autographs of your favorite pilots



Schedule Of Events

NOTE:
This is the event schedule as of presstime. Airshow Officials reserve the right to modify this schedule at any time due to weather, safety, and/or aircraft availability factors.

Saturday

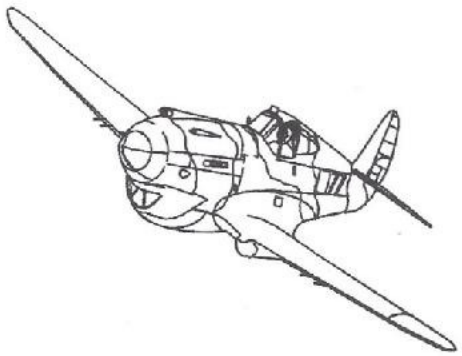
1301	Opening	Golden Knights
1315	Golden Knights	Parachute Jump
1330	RAF Nimrod	Demo
1352	USN A-6	Demo
1402	Oscar Boesch	Sailplane
1415	R.A. Bob Hoover	Shrike
1442	Leo Loudenslager	Laser 200
1521	US Air Force	Thunderbirds
1606	Closing	

Sunday

1301	Opening	Golden Knights
1315	Golden Knights	Parachute Jump
1330	USN A-6	Demo
1355	Oscar Boesch	Sailplane
1410	R.A. Bob Hoover	Shrike
1441	Leo Loudenslager	Laser 200
1512	RAF Nimrod	Demo
1530	Closing	

Children's Miracle Network Telethon

One Miracle at a Time!



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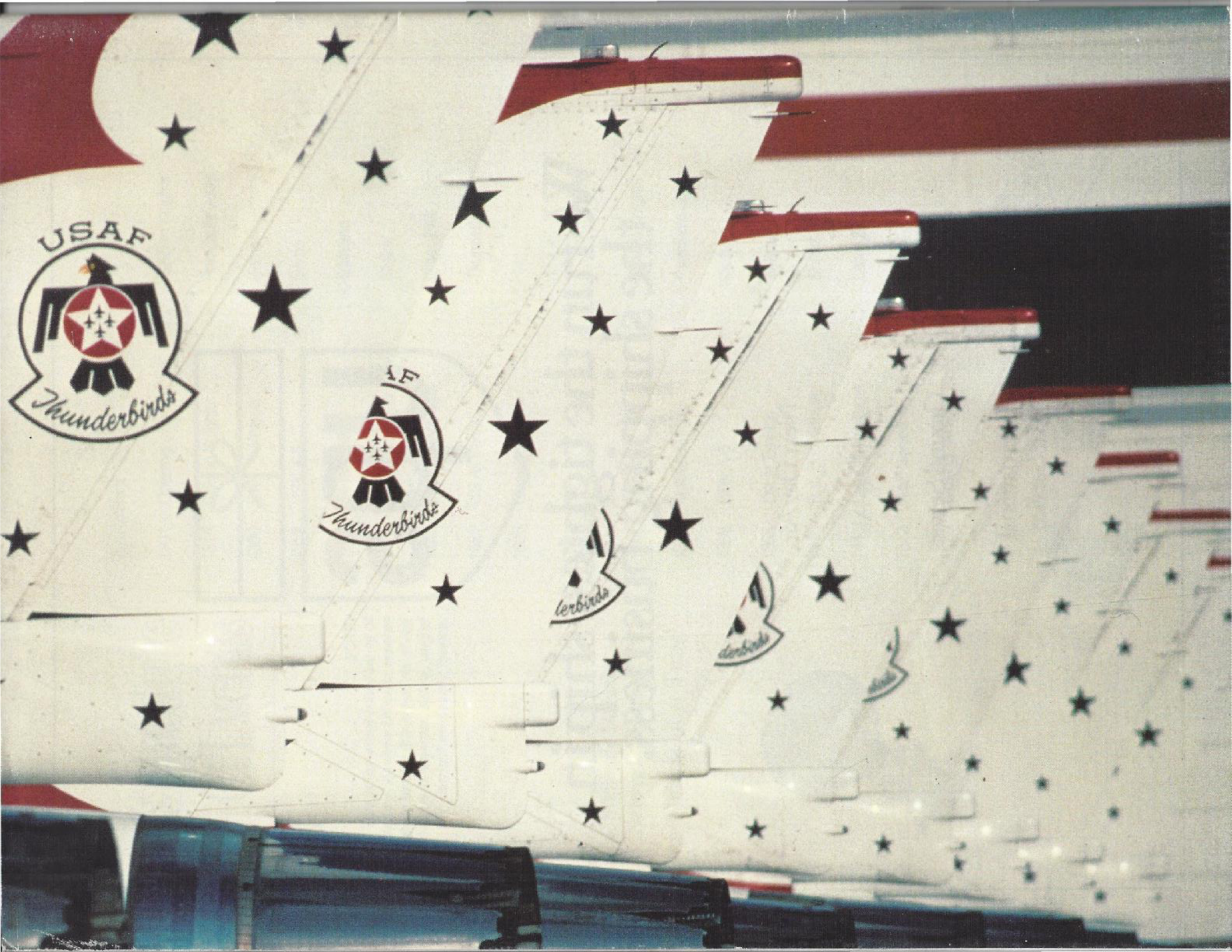
USAF
Thunderbirds
Thunderbirds