

# AIR FORCE FLIGHT TEST CENTER

AIR RESEARCH AND DEVELOPMENT COMMAND



EDWARDS AIR FORCE BASE, CALIFORNIA

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1946-1947

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# A I R F O R C E F L I G H T T E S T C E N T E R

MAJ. GEN. JOHN W. CARPENTER, III, COMMANDER

Edwards Air Force Base, Calif.

## INTRODUCTION

The Air Force Flight Test Center (AFFTC), proving ground for tomorrow's aircraft, is the only one of its kind in the Air Force. Its 301,209 acres make it the Air Force's second biggest installation.

AFFTC is among about a dozen facilities doing specialized experimental work under the Air Research and Development Command (ARDC), Andrews AFB, Md., near Washington. Essentially, ARDC conducts and supervises scientific and technical studies to make sure the Air Force gets the best planes, materiel, fuels and weapons possible for its complex role as the nation's aerospace power for peace.

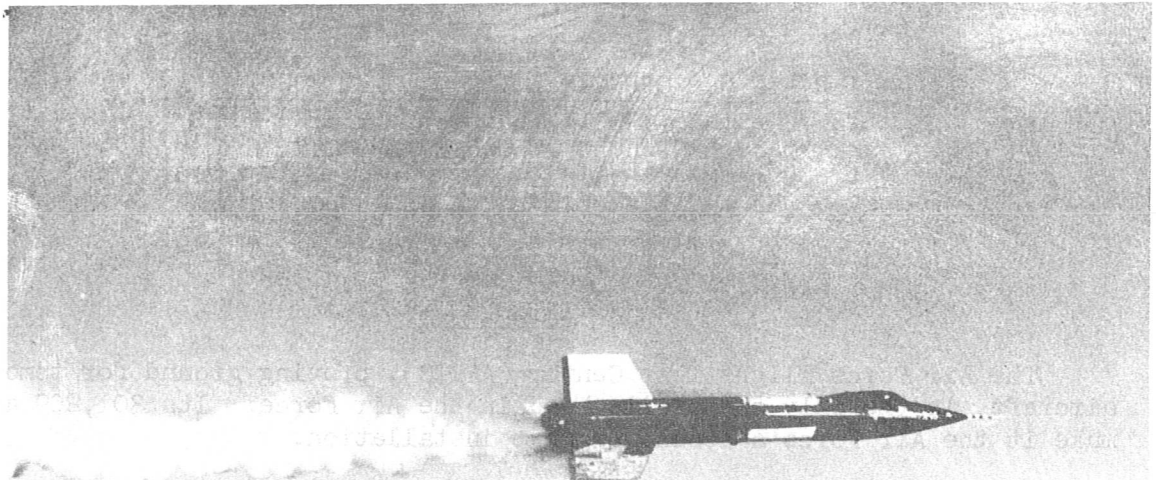
The Flight Test Center's part in this consists mainly of flight testing aircraft; research and development work on aircraft, rocket engines and missile systems. It requires the joint efforts of nearly 12,000 workers--military and civilian, including those of some 40 commercial aircraft, missile and other contractors who maintain facilities here. Aircraft contractors also pay Uncle Sam to use AFFTC's unique facilities to test their own planes, such as Douglas' DC-8, Boeing's 707 and Convair's 880 jet liners.

Geographically and climatically, the Center is ideally located as a testing installation. Although readily accessible by air, rail and highway, its isolation provides maximum security and safety. Flying weather is virtually assured 350 days a year. And Rogers Dry Lake, which prompted selection of the site, gives the Flight Test Center the world's finest natural landing field. Thanks to the lake and a 15,000-ft. man-made runway, the Center can handle landings of the biggest and speediest aircraft or research vehicles now in service or due to come off the drawing board.

Also participating in aircraft research programs--such as the X-15, designed by North American aviation to fly man 50 miles up--are the National Aeronautics and Space Administration (NASA) and the Navy.

At the Rocket Propulsion and Missile Directorate on Luehman Ridge, highly specialized Air Force and contractor systems engineers do original research and development work on rocket propulsion systems; conduct evaluation tests of captive missiles; and design major test facilities for rocket engines and missiles.





**X-15**



**X-15 Mating**



## AIRCRAFT FLIGHT TESTING

Nearly every kind of airplane used by the Air Force since 1946 has been flight tested here. Improved versions of models already in use (operational) as well as entirely new and experimental (research) ones are put through their aerial paces to determine whether they meet exacting Air Force needs.

The complications of flight testing become apparent with an understanding of the Air Force functional approach to its weapon systems--manned and unmanned. Aircraft are generally regarded as one of two kinds of systems, depending on function. Combat planes (fighters, bombers) are weapon systems. So are rockets and missiles. Non-combat (trainers, transports, weather) types are support systems.

Also, various sections of the aircraft (tail assembly, landing gear, engine, fuselage, heating) called sub-systems, are really complex systems in their own right. They first undergo rigorous individual ground and air testing before installation in the aircraft for which they were designed. Later the process is repeated when the prototype aircraft is ready for testing as a complete system.

Tests to determine the independent and collective performance, stability and reliability of systems, sub-systems and components are designed to cover many vital operational requirements. Among them are compatibility of components; capabilities and limitations under varied actual or simulated climatic conditions; durability, acceptability of maintenance qualities; parts use rate; support facility needs; personnel and training demands.

Meanwhile, reams of electronically and otherwise gathered data are sifted and studied for the all-important continual evaluation necessary through every stage of research and development.

## ROCKET PROPULSION AND MISSILE DIRECTORATE

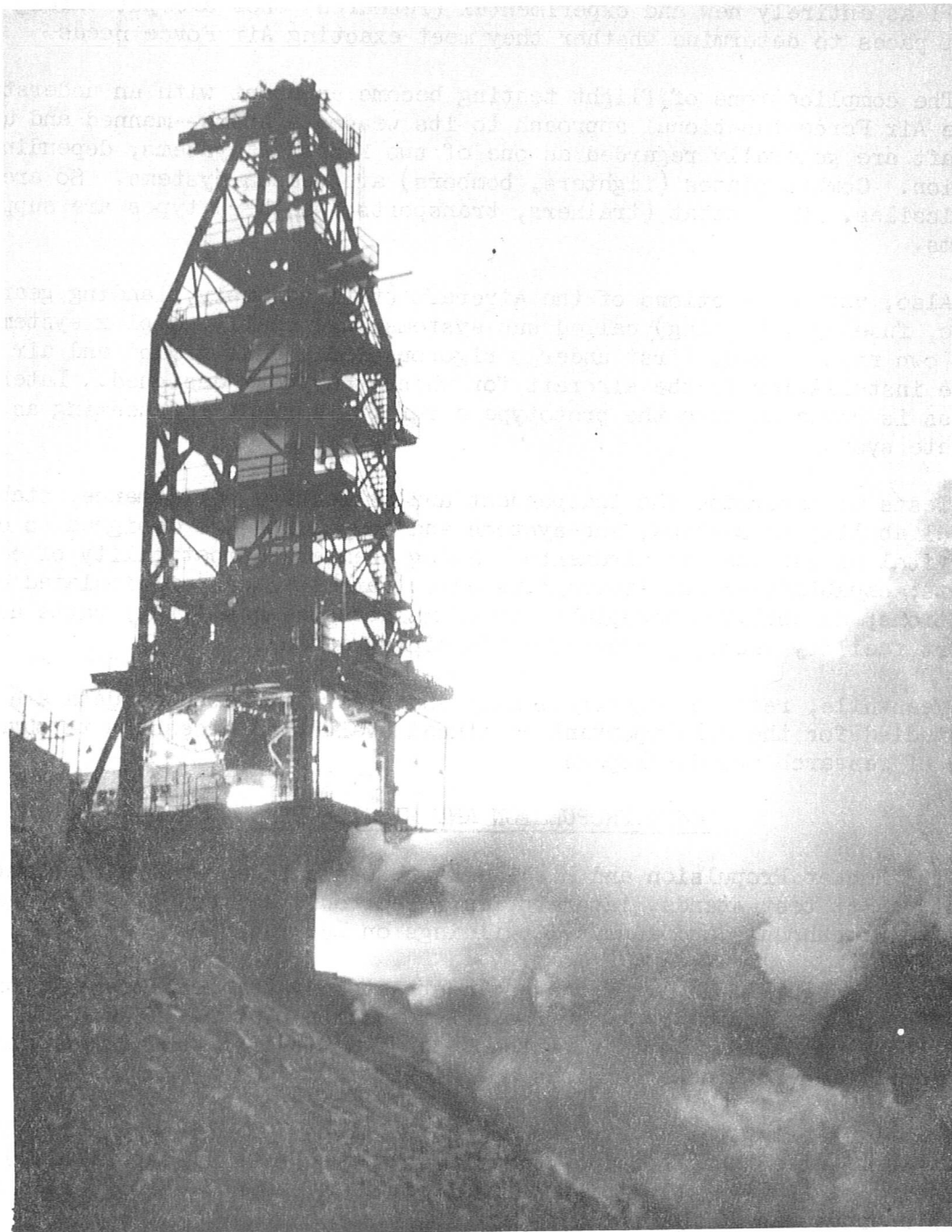
The Rocket Propulsion and Missile Directorate is a network of giant high thrust rocket test stands, laboratories, electronic equipment, reinforced concrete blockhouses and assorted buildings on Luehman Ridge.

Highly specialized Air Force and contractor systems engineers do original research and development work on rocket propulsion systems--liquid and solid propellant; conduct evaluation tests of captive missiles; and design major test facilities for rocket engines and missiles.

Missiles being tested are the Air Force Atlas ICBM (intercontinental ballistic missile) and Thor IRBM (intermediate range ballistic missile). Also going on is developmental work and testing of an underground silo for Boeing's Minuteman ICBM.

Scientists and technicians devise and evaluate new propellants; devise and test new principles of rocketry; and demonstrate the feasibility of new propulsion system designs for future missiles and military space vehicles.

Also tested for possible Air Force use are new contractor-designed rocket engines, ground support equipment and missiles.



Captive Atlas Test Firing

### SPECIAL FACILITIES

AIR FORCE EXPERIMENTAL FLIGHT TEST PILOT SCHOOL, only one of its kind in the Air Force, has but four known counterparts in the world. Here, already highly skilled pilots discover how much more skill and knowledge they must acquire for the intricate, demanding role of experimental test pilot.

Application to the school is voluntary but each class is limited to a carefully hand-picked 16. Would-be students must be 25 to 33 years old and have at least 1,500 hours of diversified flying time (most have much more); a current working knowledge of college algebra, plane geometry, differential calculus; theory of flight, aeronautical mechanics and aerodynamics.

Crammed into the eight-month course, divided into two 16-week phases, is the equivalent of the last two years of a college engineering course plus precision flying.

The first phase--aircraft performance--involves learning the fundamentals of testing techniques, theory of aircraft performance, data reduction methods and preparation of carefully detailed reports.

The second phase--stability and control--includes being taught to do the tests required to determine whether aircraft meet flying safety and control standards. Each phase calls for about 240 hours of class work and 55 of flying.

Although most students are Air Force pilots, some are from other services, government agencies, aircraft contractors and allied foreign air forces.

SPACE POSITIONING RANGE, tracks experimental and prototype aircraft with radar and electronic cameras equipped with special telephoto lenses. They provide precise trajectory data within an area 125 miles long, 100 miles wide and more than 100 miles high. Thus the position of an airplane in aerospace can be accurately determined, often to within 10 feet. Radar equipment, including a mobile van, provides a 350-mile range in any direction.

Space Positioning also keeps an electronic eye on man-made space satellites--foreign and domestic. This is done through five tracking stations--two here and one each at Beatty, Nev., Kingman, Ariz., and El Centro, Calif. Reports go to ARDC's National Space Surveillance Control Center, Hanscom Field, Bedford, Mass., which is responsible for maintaining the ceaseless vigil.

INTERNATIONAL CERTIFIED SPEED COURSE, certified by France's Federation Aeronautique Internationale, is used for attempts to establish international speed records over a 15 to 25 kilometer (9 to 15½-mile) course at an unrestricted altitude. Visual sighting wires at east and west outer markers of the course and at two other specified points known as timing gates. Special cameras at the gates record the flight to make sure altitude, flight path, time and other requirements are met.



15,000-FT. RUNWAY, believed the Air Force's longest, is a 300-ft.-wide concrete strip, whose eastern end joins Rogers Dry Lake. It runs from east to west to take advantage of the prevailing southwest wind. A few miles west is four-and-a-half-mile long Rosamond Dry Lake, whose 20 square miles offer another natural emergency landing field. The combination gives the Flight Test Center probably unparalleled aircraft landing facilities.

ROGERS DRY LAKE, used for extensive aircraft testing, is 13 miles long and spreads out some 65 square miles from the eastern edge of AFFTC's concrete runway. For 10 months of the year its sun-baked, wind-smoothed clay and silt surface hardens to withstand pressures up to 250 pounds a square inch.

Nature, AFFTC's best contractor, not only provided this auxiliary landing field and testing ground but resurfaces it regularly each year. This occurs in winter--usually January and February--when the lake bed is flooded by several inches of accumulated rain. Shifting wind then blows the slowly evaporating water back and forth, smoothing the lake bed until completely dry. Records show an estimated saving of \$867,613,454 in averted aircraft damage by use of the lake for emergency landings since April 4, 1946. The value in lives saved is immeasurable.

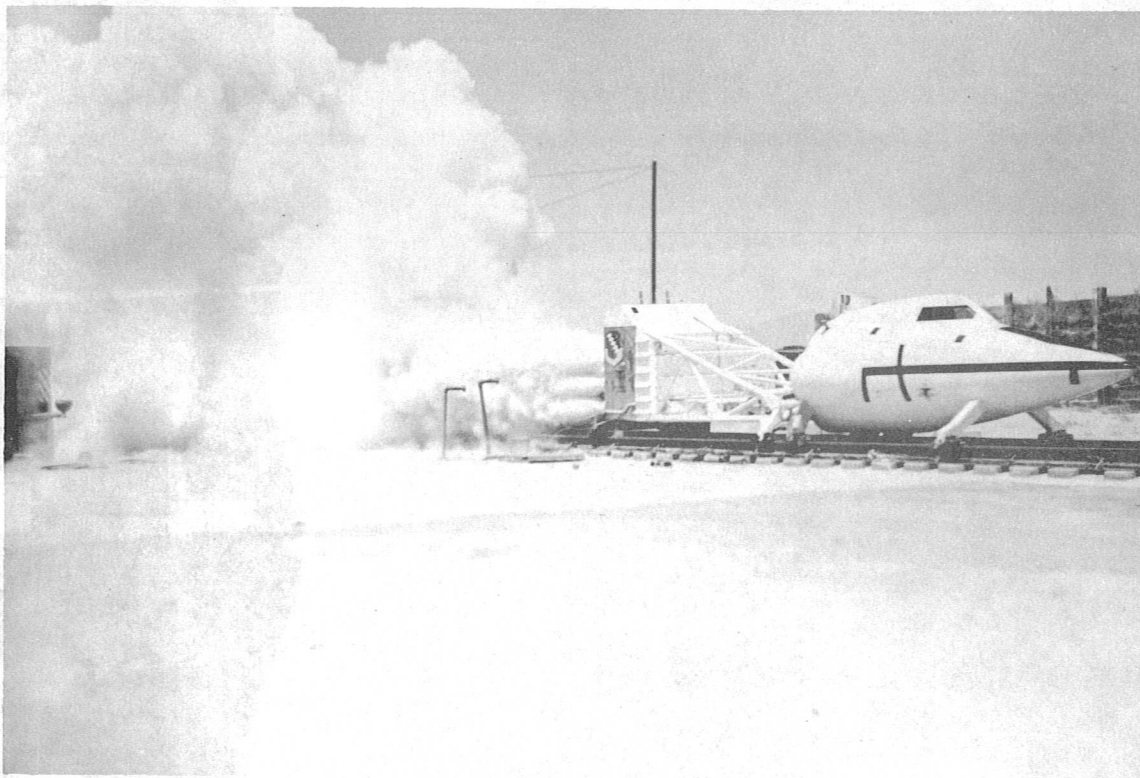
PRECISION BOMBING RANGE, operated by the Ballistic Test Facility, a branch of ARDC's Air Proving Ground Center at Eglin AFB, Valparaiso, Fla. The Ballistic Test Facility collects and analyzes test data connected with engineering development and bomb ballistic programs of the Air Proving Ground Center, Air Force Special Weapons Center, Kirtland AFB, Albuquerque, N.M., also under ARDC, Atomic Energy Commission, Army Chemical and Ordnance Corps and Naval Air Special Weapons Facility.

EXPERIMENTAL HIGH SPEED TRACK, one of the world's fastest and straightest railways, is among two operated by AFFTC's Experimental Track Branch. Special rocket-driven sleds whiz along its 20,000 feet of precision aligned rails nearly as fast as four times the speed of sound (Mach 4) in still another effort to unravel the secrets of space. They are designed to test complete and partial aircraft, rocket, missile and parachute recovery systems; and related components. Also ejection seats, canopy jettisoning, munitions, special weapons and the effects of rain erosion.

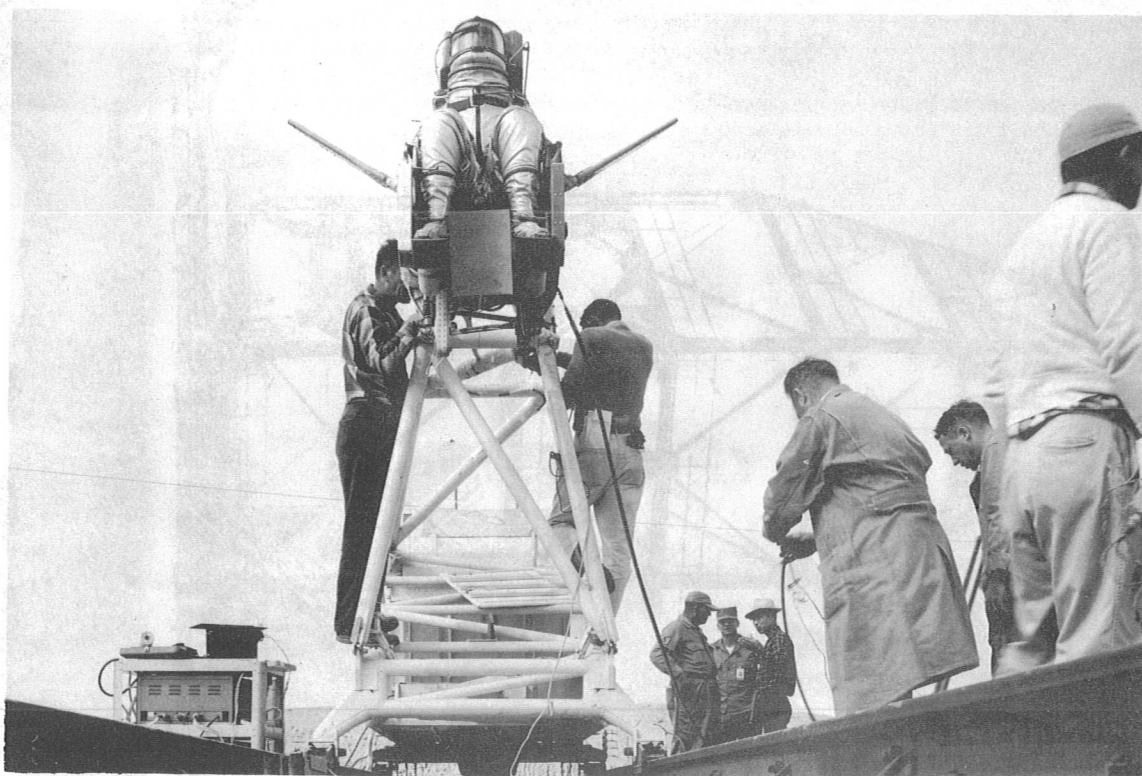
Fully instrumented for telemetry (electronic data gathering), the track also has cameras strategically mounted for additional fact finding. A water brake built into the last 6,000 feet of track stops the costly, instrument-laden sleds.

HURRICANE SUPERSONIC RESEARCH SITE, Hurricane, Utah, near Zion National Park, is where AFFTC maintains a 12,000-ft. high speed track that ends at a 1,500-ft. cliff enabling researchers to conduct tests closely simulating actual flight. The research site is a contractor-operated facility under AFFTC supervision.

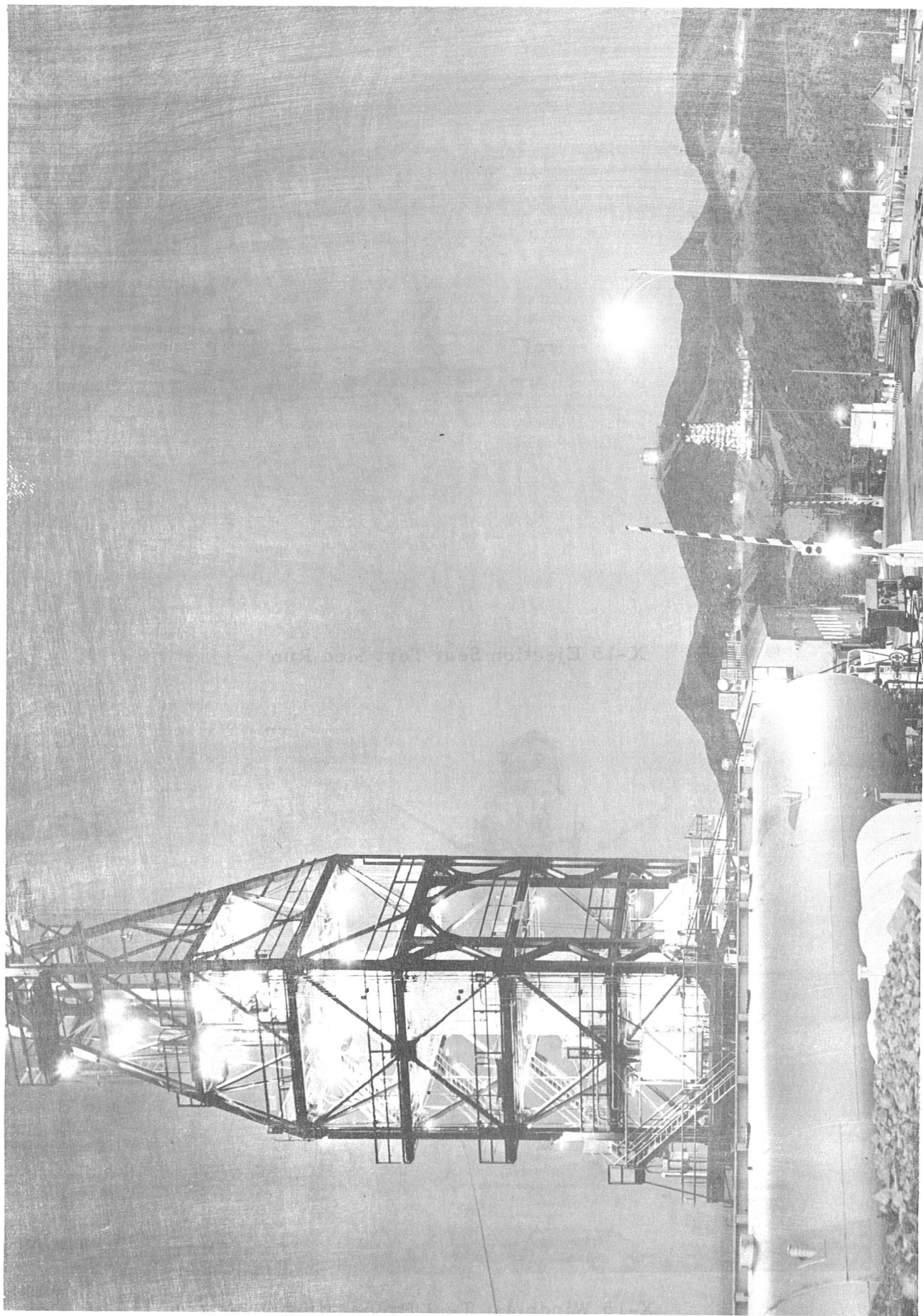
6511th TEST GROUP (PARACHUTE), at El Centro, Calif., tests and evaluates newly developed and experimental parachutes for troop jumps, missile and capsule recovery programs, supply drops and pilot escape systems. Every parachute designed for human use is put through at least 200 dummy test jumps and 500 by parachutists. Special equipment includes a 147-ft. high whirl tower by which a steel gondola on a cable is swung in a circle at speeds up to 500 miles an hour.



X-15 Ejection Seat Test Sled Run



X-15 Windblast Test Preparations



Night View of Atlas Test Stand



## HISTORY

The first military contingent at Rogers Dry Lake was established in 1933 with the erection of a camp on its east side (now a bombing range). But its aircraft testing possibilities were not put to use until World War II.

By then the south end of the lake was primarily used as a training field for P-38 Lightning fighter, B-24 Liberator and B-25 Mitchell bomber crews. Bombing practice targets included a realistic 650-ft. model of a Japanese navy heavy cruiser of the "Mogami" class, dubbed the "Muroc-Maru."

Pilots and bombardiers used the "ship" for strafing, identification and skip bombing practice. Undulating mounds of dirt piled alongside the replica and shimmering heat waves from the blazing desert sun made it look like a real ship afloat--startling many a passing motorist.

The Muroc-Maru passed from landmark to legend when it was sunk in 1950 as a flight hazard by Army engineers, who first had to rid the hull of unexploded bombs.

What became the Air Force's first jet airplane was first test flown Oct. 2, 1942 at the north end of Rogers Dry Lake. That was the P-59, a Bell Aircraft developed twin jet fighter now known as the F-59 Airacomet.

In 1946, what then was the Flight Test Base, at the north end of the lake, and the Training Base, at the south end, were merged as a forerunner of today's Flight Test Center.

Originally known as Muroc, the base was renamed Jan. 27, 1950 in honor of Capt. Glen W. Edwards, a test pilot and native of Lincoln, Calif. He died June 5, 1948 in the crash of an experimental YB-49 Flying Wing he was testing.

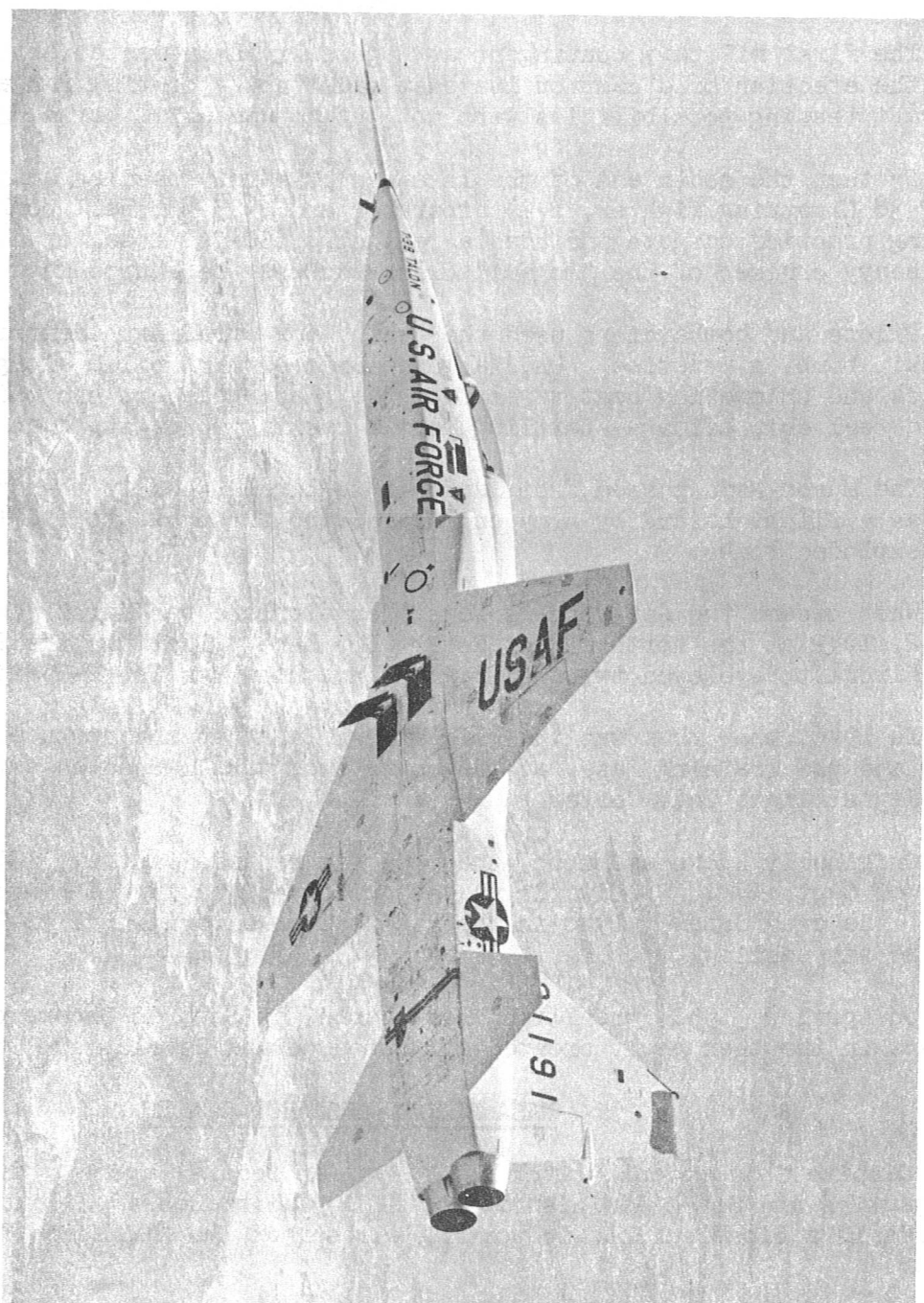
On April 2, 1951, the Flight Test Center at Edwards became one of four centers in the then newly created Air Research and Development Command.

## NASA FLIGHT RESEARCH CENTER

Despite independent status as a civilian federal agency, the National Aeronautics and Space Administration (NASA) Flight Research Center at Edwards is a close scientific working partner of the Air Force Flight Test Center.

Ample evidence of the relationship is the current X-15 rocket plane research program and work done on its predecessors, X-1, 1A, 1B, 2 and others.

Space pioneering in extremely high speed, high altitude manned aircraft now is the main concern of the NASA center's skilled aeronautical research engineers and technicians. And soon they expect to make Edwards the jumping-off point for the highest and fastest flights yet made by man.



T-38

## GENERAL BASE INFORMATION

LOCATION--Edwards AFB, on the western edge of the Mojave Desert, is 100 miles northeast of Los Angeles. Nearby communities are Lancaster and Palmdale, 30 and 40 miles southwest, respectively; Rosamond, 18 miles west; Mojave, 23 miles northwest; North Edwards, 12 miles north; and Boron, 20 miles northeast. They are among more than 20 communities in Antelope Valley, a 4,500 square mile section of Los Angeles and Kern Counties.

CLIMATE--Humidity is low, with average annual rainfall about four inches. Summer daytime temperature averages 100 degrees but has climbed to 112. Nights are pleasantly cool. Winter temperature readings average in the mid-40s. However, a spread of 30 to 40 degrees between sunrise and nightfall occurs frequently throughout the year. Although strong winds prevail, storms are rare. Good visibility, essential to flight testing, is another advantageous characteristic.

HOUSING--Edwards has 2,110 units of family type quarters. Of these, 1,332 are houses and apartments, about 200 of which are occupied by civilian employees. Also included are 778 newly completed Capehart homes for military (officer and enlisted) personnel; and a 186-unit trailer park. Incoming personnel are urged to query the Housing Office before bringing dependents on base.

TRANSPORTATION--Direct rail service to Edwards is provided by Santa Fe Railway, which maintains a station here. Its San Francisco Chief picks passengers up twice daily--on the way to San Francisco and going east to Kansas City, Mo. From Lancaster, Southern Pacific has three trains making daily round-trips to Los Angeles; and two each to San Francisco and Sacramento.

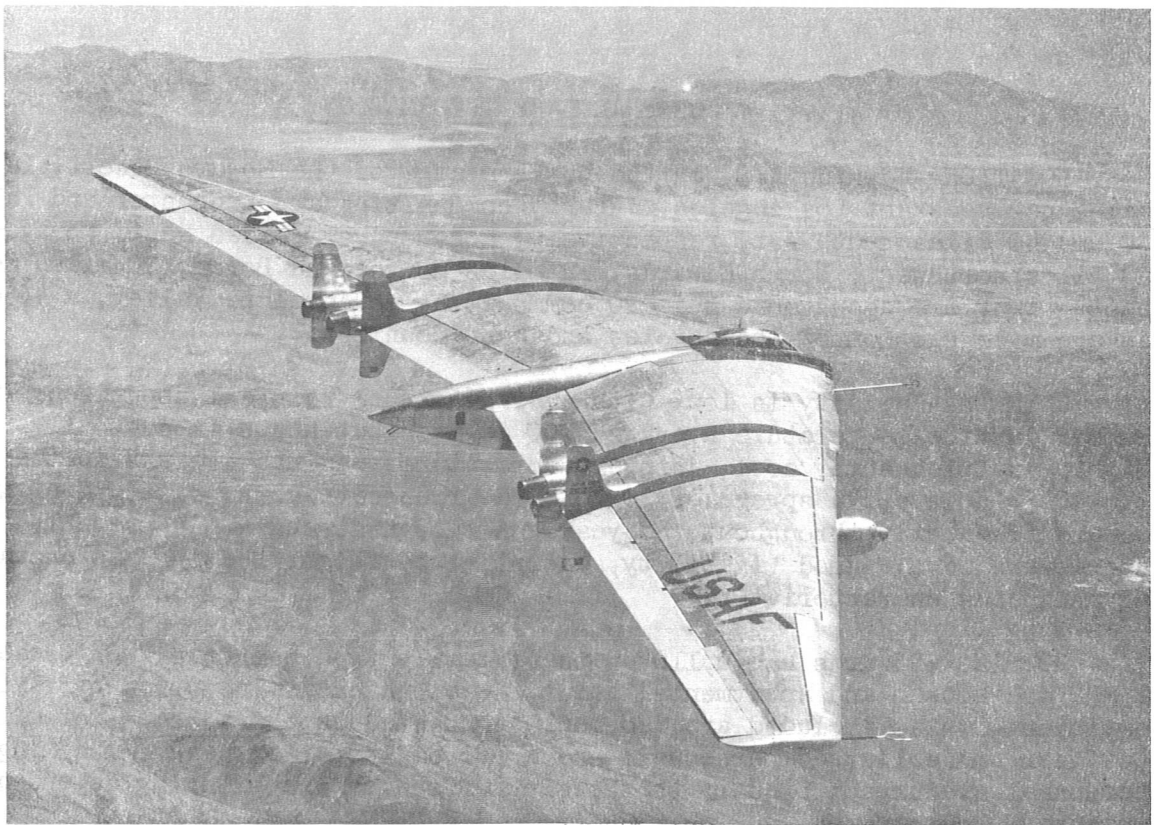
Lancaster's Antelope Valley Bus Co. makes a daily trip to Edwards. It arrives at 7:20 a.m. and leaves at 4:30 p.m. to coincide with normal base work hours. Greyhound bus in Lancaster has three daily round-trips each scheduled for Los Angeles and San Francisco.

Pacific Air Lines at Lancaster's Fox Airport has four daily flights to Los Angeles and three back; one to San Francisco and two in return.

SCHOOLS--Edwards Elementary School, with some 1,300 pupils from kindergarten through eighth grade; and Desert High School, with about 300 students from ninth to twelfth grades; are in the base housing area.

CHURCHES--Two chapels provide regular Protestant and Catholic services. Jewish services are scheduled monthly. Religious services of nearly all creeds are available in neighboring communities.





**XB-49 Flying Wing**



**X-1A**

RECREATION--Commissioned and non-commissioned officers, airmen, civilian and wives clubs as well as other social and fraternal group activities. Other facilities include theater, library, swimming pools, golf course, roller skating rink, tennis courts, bowling alleys and hobby shops. Mountain, beach and desert resorts within a one to three-hour drive of the base offer swimming, hiking, fishing, skiing, hunting and other activities.

SHOPPING--Besides a conveniently located commissary, Base Exchange and two automobile service stations, a modern 13-store shopping center is in the housing area. The first of its kind on a State-side Air Force base, it was officially opened May 5, 1955. Included are food, clothing, hardware and drug stores, restaurant, post office, television and radio repair, beauty and barber shops.

MEDICAL--A fully equipped 45-bed hospital and a dental clinic care for military personnel and dependents. A medical center for civilian use is in the shopping center.

NURSERY--Children, ages 1-10, are cared for at nominal fees Monday through Saturday. Child care service Sunday morning is free but only to churchgoing parents.

BANK--A Bank of America branch, offering all the usual services, is open from 11 a.m. to 4:30 p.m., Monday through Friday.

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#### CENTER ECONOMICS

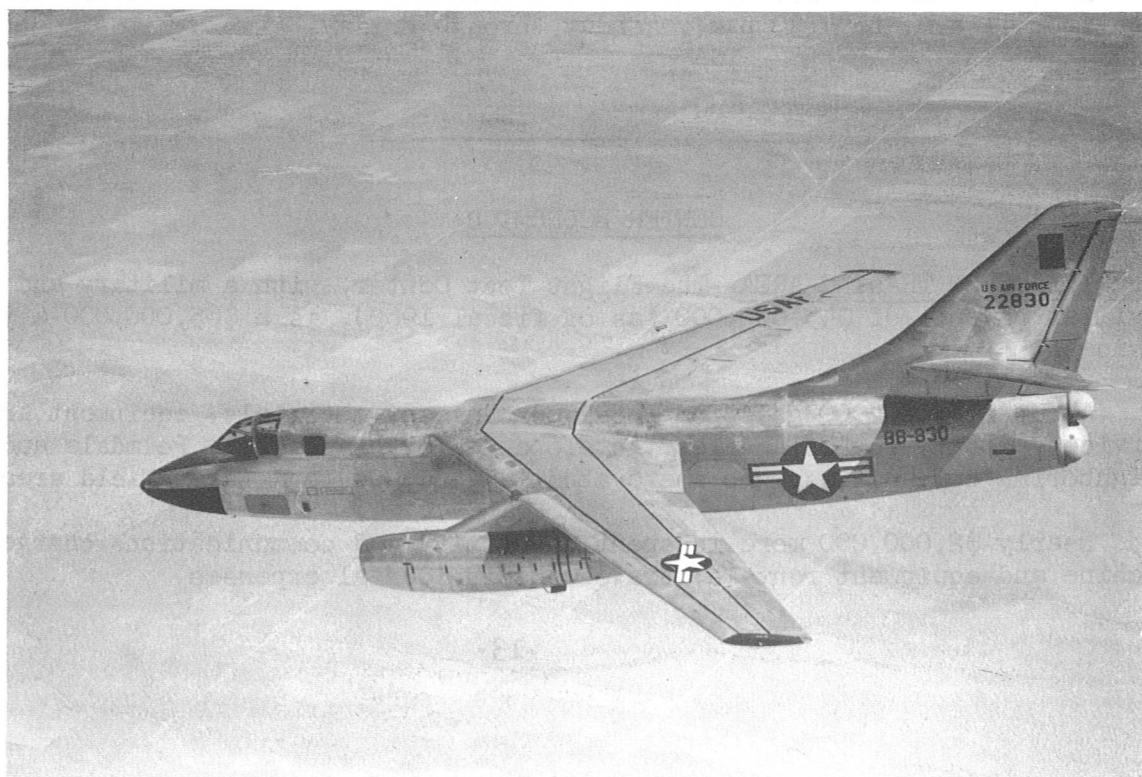
IMPACT ON TRADING AREA--The Flight Test Center, with a military and civilian payroll of \$45,000,000 (as of fiscal 1960), is a \$65,000,000-a-year business.

About \$18,000,000 goes for local purchase of materials, equipment and services, mostly in Los Angeles, Antelope Valley (Lancaster, Palmdale and neighboring communities, who share about \$3,500,000) and Bakersfield areas.

Nearly \$2,000,000 more is spent on utility and communications charges; machine and equipment rentals; travel and incidental expenses.



B-58



B-66A

MEMORABLE EDWARDS DATES

OCT. 2, 1942 First U.S. Flight by turbojet plane is made in Bell P-59.

SEPT. 12, 1946 Northrop Aircraft rocket test sled does 1,019 mph.

OCT. 14, 1946 Air Force says it will turn base into jet aircraft and rocket research center.

DEC. 9, 1946 Bell X-1 experimental rocket plane hits 550 mph. in first flight under own power.

JUNE 19, 1947 United States regains world speed record from Great Britain with 623.8 mph. flight over a 1.86-mile course by retired Maj. Gen. (then colonel and Flight Test Division chief) Albert Boyd in Lockheed F-80R, now known as F-80 Shooting Star.

OCT. 14, 1947 Lt. Col. (then captain and center test pilot) Charles E. Yeager flies faster than the speed of sound (760 mph. at sea level) in Bell X-1 experimental rocket plane.

SEPT. 15, 1948 Then Maj. Richard L. Johnson, center test pilot, sets world speed record of 671 mph. in fully armed and equipped North American F-86 Sabre jet.

FEB. 9, 1949 Northrup YB-49 Flying Wing flies from Edwards to Andrews AFB, Md., in four hrs., 25 mins., averaging 511.2 mph. for the 2,258-mile flight.

APRIL 6, 1949 Bell X-1 rocket plane sets unofficial record of 1,100 mph.

MAY 9, 1949 First supersonic rocket-powered flight by a U.S. experimental fighter is made in Republic XF-91.

JAN. 27, 1950 Base renamed in honor of Capt. Glen W. Edwards, center test pilot, killed June 5, 1948 in crash of YB-49.

AUG. 17, 1951 Col. Fred J. Ascani (then Flight Test director) sets 635.686 mph. speed record for 100-kilometer closed course in North American F-86E Sabrejet.

NOV. 19, 1952 Then Capt. J. Slade Nash, center test pilot, establishes 698.505 mph. world speed record in North American F-86D Sabrejet at Salton Sea, Calif.

JULY 16, 1953 Then Lt. Col. William F. Barnes Boosts 3-km. world air speed record to 715.5 mph. in an F-86D at Salton Sea, Calif.

SEPT. 2, 1953 Brig. Gen. J. Stanley Holtner (then AFFTC commander) flies 690.118 mph. in North American F-86D Sabrejet for a 100-km. closed course speed record at Vandalia, Ohio.





Century Series Stable (clockwise  
from bottom, F-104A, F-100A,  
F-102A, F-101A, F-105A).

OCT. 29, 1953 Col. Frank K. Everest Jr. (then lieutenant colonel and Flight Test Operations chief) sets 15-km. world speed record of 755.149 mph. in North American F-100 Super Sabre.

DEC. 12, 1953 Lt. Col. Charles E. Yeager (then major and test pilot) flies Bell X-1A rocket plane 1,650 mph., twice the speed of sound.

JUNE 4, 1954 Maj. Arthur Murray (then AFFTC test pilot) climbs to a record 90,000-ft. in Bell X-1 an experimental rocket plane.

OCT. 12, 1954 Opening of 15,000-ft. (world's longest) runway.

DEC. 7, 1954 First recovery of a missile (Navaho X-10) using a fully automatic approach and landing system.

AUG. 20, 1955 Col. Horace A. Hanes (then Flight Test director) sets first official world supersonic speed record of 822.135 mph. in North American F-100C Super Sabre.

JUNE 18, 1956 Joint Flight Test Center-Convair designed rocket sled hits 1,560 mph.

JULY 23, 1956 Colonel Everest tops 1,900 mph. in Bell X-2 rocket plane.

SEPT. 7, 1956 Capt. Iven C. Kincheloe (then center test pilot) flies Bell X-2 to what then was altitude record of 126,200-ft., nearly 24 miles up.

SEPT. 10, 1956 First flight of North American F-107 supersonic fighter-bomber.

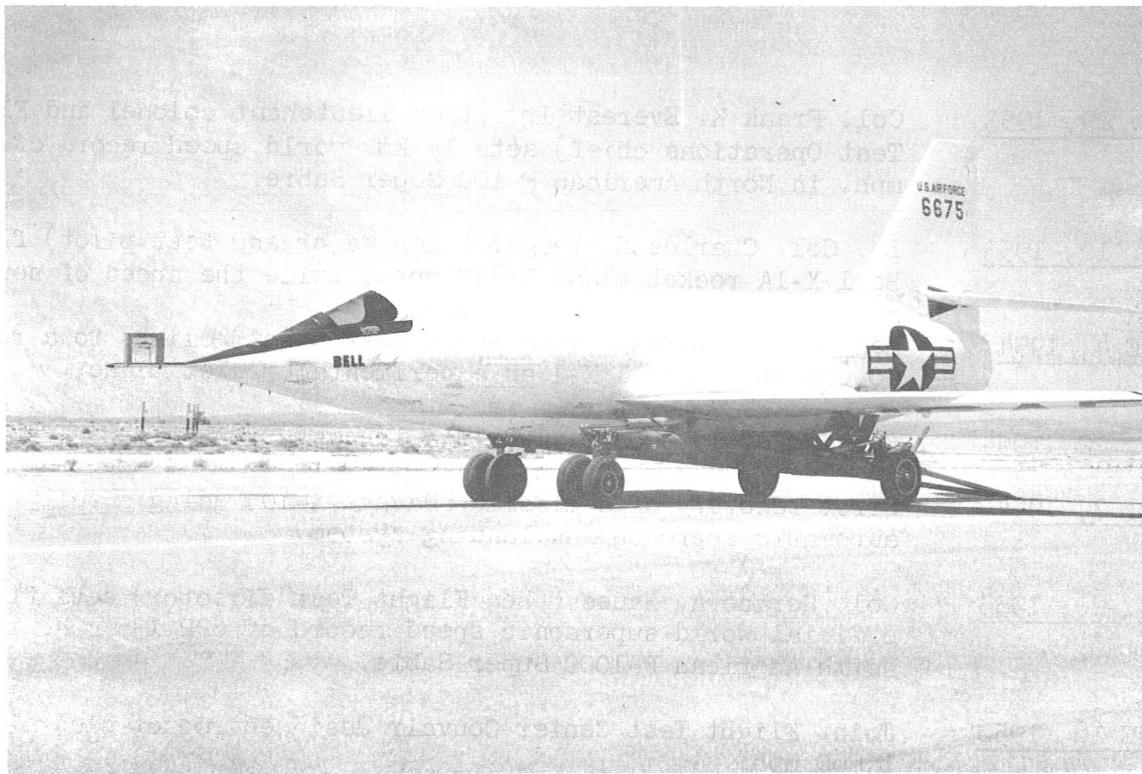
SEPT. 27, 1956 Capt. Milburn G. Apt (then center test pilot) flies Bell X-2 a record 2,100 mph. but dies shortly after in rocket plane's crash.

DEC. 26, 1956 First flight of Convair F-106A Delta Dart all-weather interceptor.

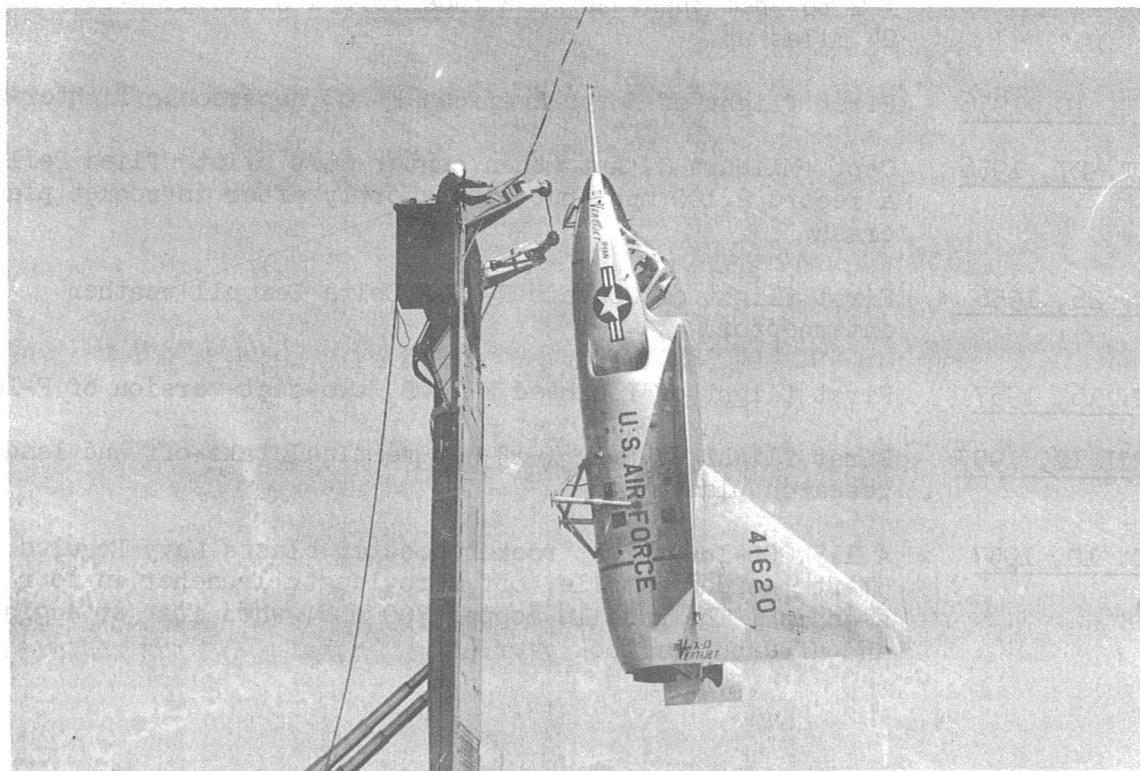
JAN. 16, 1957 First flight of Lockheed F-104B, two-seat version of F-104A.

APRIL 12, 1957 First flight of Ryan X-13 jet vertical take-off and landing research plane.

DEC. 10, 1957 A 115,000-lb. thrust rocket booster blasts Navy Regulus II, 57-ft. guided missile, off zero-length launcher in four seconds. The missile topped 300 mph. when its jet engine and afterburner took over.



X-2



X-13

DEC. 12, 1957 Maj. Adrian E. Drew (a fighter-bomber pilot) establishes world jet speed record of 1,207.6mph. over a measured course in McDonnell F-101A Voodoo fighter.

MARCH 12, 1958 Lockheed's new CL-329 Jetstar utility transport flies from Edwards to Dobbins AFB, Marietta, Ga., in three hrs., 29 mins., averaging 557 mph., an unofficial record for the 2,015-mile flight.

MAY 7, 1958 Maj. Howard C. Johnson (then a fighter pilot) sets world altitude record of 91,249-ft. in Lockheed F-104A Starfighter.

MAY 15, 1958 Capt. Walter W. Irwin (then a fighter pilot) flies 1,404.19 mph., a new world speed record, in Lockheed F-104A Starfighter.

MAY 28, 1958 Capt. Robert F. Titus (then center test pilot) is first military pilot to zero-length launch a North American F-100D Super Sabre. It was shot into the air by a 130,000-lb. thrust detachable solid propellant booster rocket.

JULY 26, 1958 Capt. Iven C. Kincheloe dies in crash of Lockheed F-104A Starfighter shortly after test flight take-off.

SEPT. 17, 1959 X-15 climbs to 50,000 ft. and tops Mach 2 (twice the speed of sound) in first powered flight after release from B-52 launch aircraft at 38,000 ft. Scott Crossfield, North American test pilot, lands the experimental rocket plane on Rogers Dry Lake after 10 minutes in the air--six under its own power.

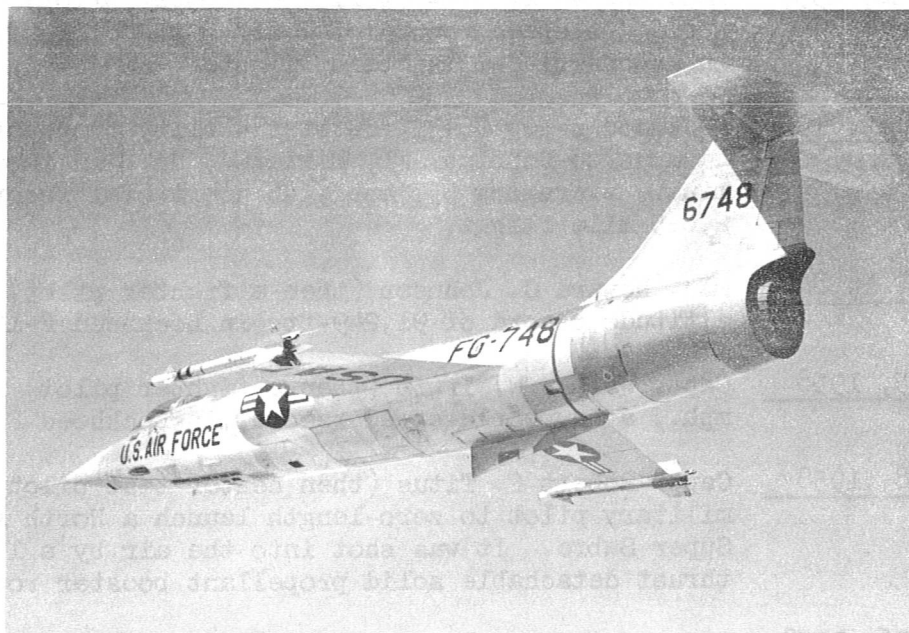
DEC. 9, 1959 Capt. Walter J. Hodgson, center test pilot, climbs to 30,100 ft. for a new helicopter world altitude record in Kaman H-43B Huskie at Bloomfield, Conn.

DEC. 11, 1959 Brig. Gen. Joseph H. Moore, a Tactical Air Command wing commander, speeds 1,217.05 mph. to a new world record for a 100-km. closed course in a Republic F-105 Thunderchief fighter-bomber.

DEC. 14, 1959 Capt. Joe B. Jordan, center test pilot, zooms 103,395.5 ft. (nearly 20 miles) to a new world altitude record in Lockheed F-104C Starfighter.

DEC. 15, 1959 Maj. Joseph W. Rogers, Air Defense Command pilot, flies 1,525.95 mph. in Convair F-106 Delta Dart, a new world speed record for a 15-25-km. straightaway course.





F-104



F-106

## AIRCRAFT INFORMATION

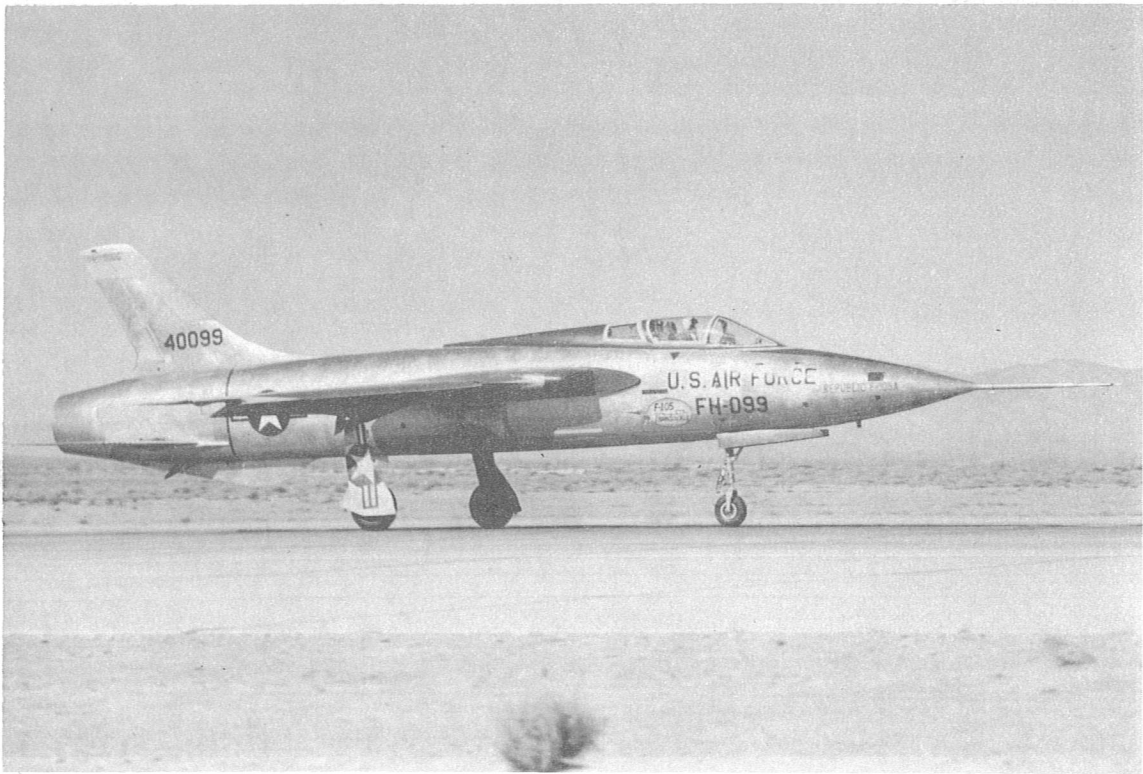
CATHEQUE

### RESEARCH

- X-1 (Bell)--An experimental rocket plane and the first to fly at supersonic speed, it now is in the Smithsonian Institute, Washington. Piloted by Lt. Col. (then captain) Charles E. Yeager, the X-1 first proved man could fly faster than the speed of sound Oct. 14, 1947.
- X-1A (Bell)--An advanced version of the X-1 in which then Major Yeager set a speed record of 1,650 mph. Dec. 12, 1953 and Major Arthur Murray climbed to a then new high of 90,000 ft. June 4, 1954. A crash in 1955 ended the X-1A's flying career.
- X-1B (Bell)--A specially instrumented version of the X-1A for full-scale aerodynamic heating research. First flown at Edwards Oct. 8, 1954 by Major Murray, it now is in the Air Force Museum, Wright-Patterson AFB, Dayton, Ohio.
- X-2 (Bell)--Also an experimental rocket plane and until recently, the world's fastest and highest flying aircraft. The late Capt. Iven C. Kincheloe flew it to an as yet unbroken altitude record of 126,200 ft. (nearly 24 miles) Sept. 7, 1956. Nineteen days later Capt. Milburn G. Apt set a speed a record of 2,260 mph. in a flight that ended in a crash that cost his life.
- X-3 (Douglas)--A twin turbojet engine aircraft with special instruments for checking various problems of supersonic flight, it was first flown at Edwards Oct. 20, 1952. It now is in the Air Force Museum.
- X-4 (Northrop)--Known as the Skylancer and developed to probe the buffeting characteristics of supersonic flight and problems of tailless aircraft, it was first flown at Edwards Dec. 16, 1948. The X-4 now is on display at the Air Force Academy, Colorado Springs, Colo.
- X-5 (Bell)--A jet monoplane with variable (from a 20 to 60-degree angle) swept-back wings and the only one of its kind. First flown at Edwards June 20, 1951, it also is in the Air Force Museum.
- X-13 (Ryan)--The first jet vertical take-off and landing (VTOL) aircraft produced, its maiden flight was at Edwards April 12, 1957.
- X-15 (North American)--An experimental rocket plane designed to take man at least 50 miles up at more than 3,600 mph. First captive flight, March 10, 1959; first glide flight, June 8, 1959; first powered flight, Sept. 17, 1959, when it climbed to 50,000 ft. and topped Mach 2 (twice the speed of sound) after release from a B-52 launch aircraft. All X-15 flights (as of Feb. 29, 1960) were at Edwards, with Scott Crossfield, North American test pilot, at the controls. Scheduled to fly it in later research stages are Maj. Robert M. White, Capt. Robert A. Rushworth, both AFFTC; Joseph A. Walker, John B. McKay, Neil Armstrong, all National Aeronautics and Space Administration; and Lt. Cdr. Forrest S. Petersen, Navy.

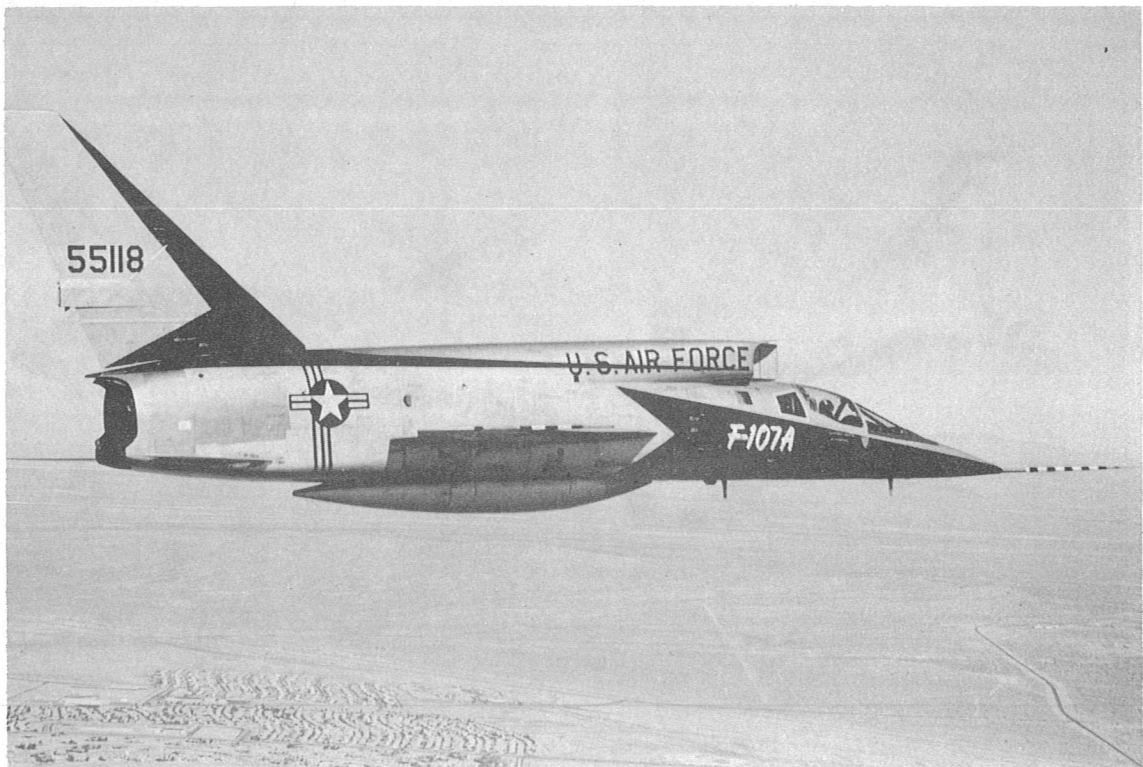
## FIGHTERS

- F-80 (Lockheed) Shooting Star--The first U. S. jet fighter used in combat. It downed a Soviet MIG-15 in the first all-jet air battle over Korea Nov. 10, 1950.
- F-84F (Republic) Thunderjet--A prototype with an imported British-built Sapphire engine was first flown Feb. 14, 1951. Production models were equipped with a more powerful Wright version of the Sapphire. Air history was made July 17, 1952 when 58 of them made a record transoceanic hop led by then Col. David C. Schilling from Turner AFB, Albany, Ga., to Yokota Air Base, Japan--10,895 miles--with only seven stops.
- F-86A (North American) Sabrejet--The first production model was flown May 20, 1948. Less than three months later, then Maj. Richard L. Johnson set a record of 671 mph. at Edwards with a fully armed and equipped model.
- F-86D (North American) Sabrejet--An improved all-weather interceptor that superseded the F-86A and was first flown Dec. 22, 1949. On Nov. 19, 1952, then Capt. J. Slade Nash flew a combat equipped production model a record 698.505 mph. over a 3-km. course at Salton Sea, Calif. On July 16, 1953, then Lt. Col. William F. Barnes boosted it to 715.697 mph. over the same course. And Brig. Gen. J. Stanley Holtoner (then AFFTC Commander) piloted a Sabrejet 690.118 mph. for a 100-km. closed course record at Vandalia, Ohio.
- F-89D (Northrop) Scorpion--a twin jet interceptor in the 600 mph. class first flown in August 1948. Armed with 104 rockets in two wing tip pods, its crew of two includes a radar observer.
- F-94C (Lockheed) Starfire--a two-seat improved version of the F-80 with thinner wings, longer nose, swept horizontal tail and larger vertical surfaces that put it in the 600 mph. class. It was first flown in January 1950.
- F-100 (North American) Super Sabre--The Air Force's first supersonic fighter. Its prototype flew faster than sound on its first flight May 25, 1953. Four months later (Oct. 29) Col. Frank K. Everest Jr. (then lieutenant colonel and Flight Test Operations Chief) averaged 755.149 mph. a 15-km. world speed record. On Aug. 20, 1955, Col. Horace A. Hanes (then Flight Test director) set the first official world supersonic speed record of 822.135 mph. in an F-100C.
- F-101A (McDonnell) Voodoo--a long-range, twin jet, swept-wing tactical fighter first flown at supersonic speed Sept. 29, 1954. It was developed from the experimental XF-88 and XF-88A, tested in 1949 and 1950 both victims of defense cutbacks and changed technical requirements.
- F-102A (Convair) Delta Dagger--A delta wing all-weather jet interceptor, the prototype of which made its maiden flight Oct. 24, 1953. A developed model was first flown Dec. 20, 1954 and topped the speed of sound next day.



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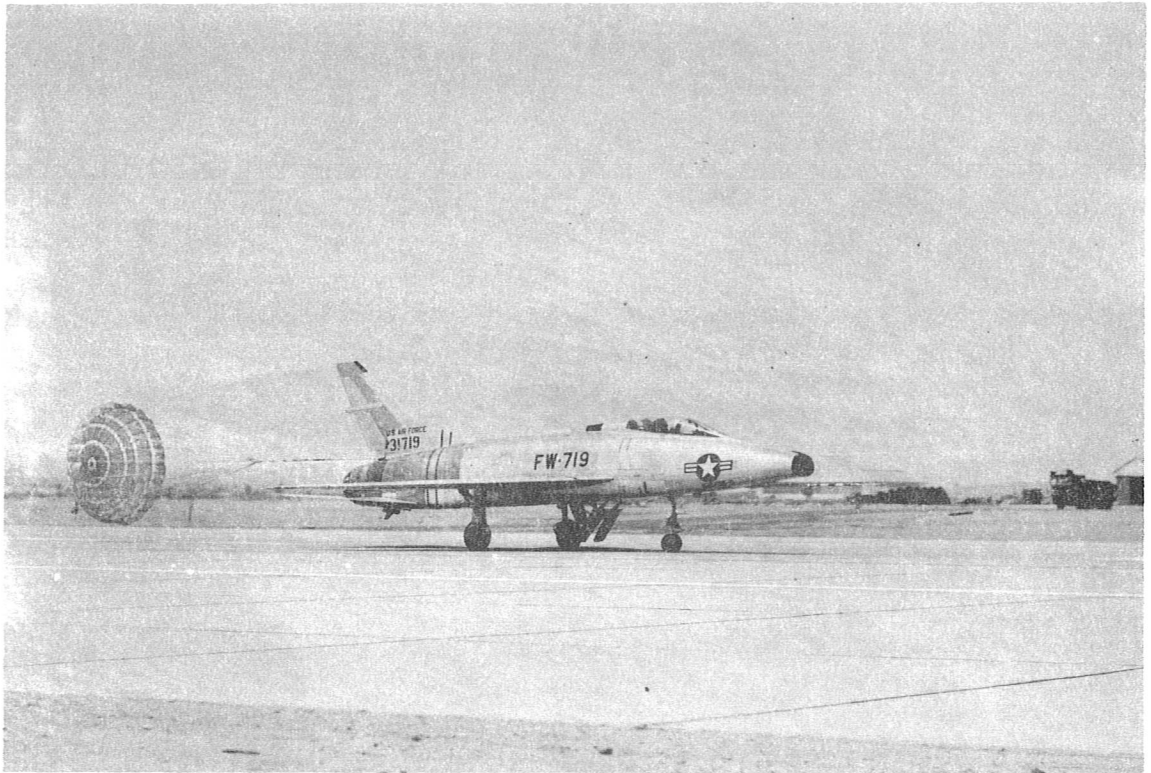
F-105A



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F-107A





F-100C

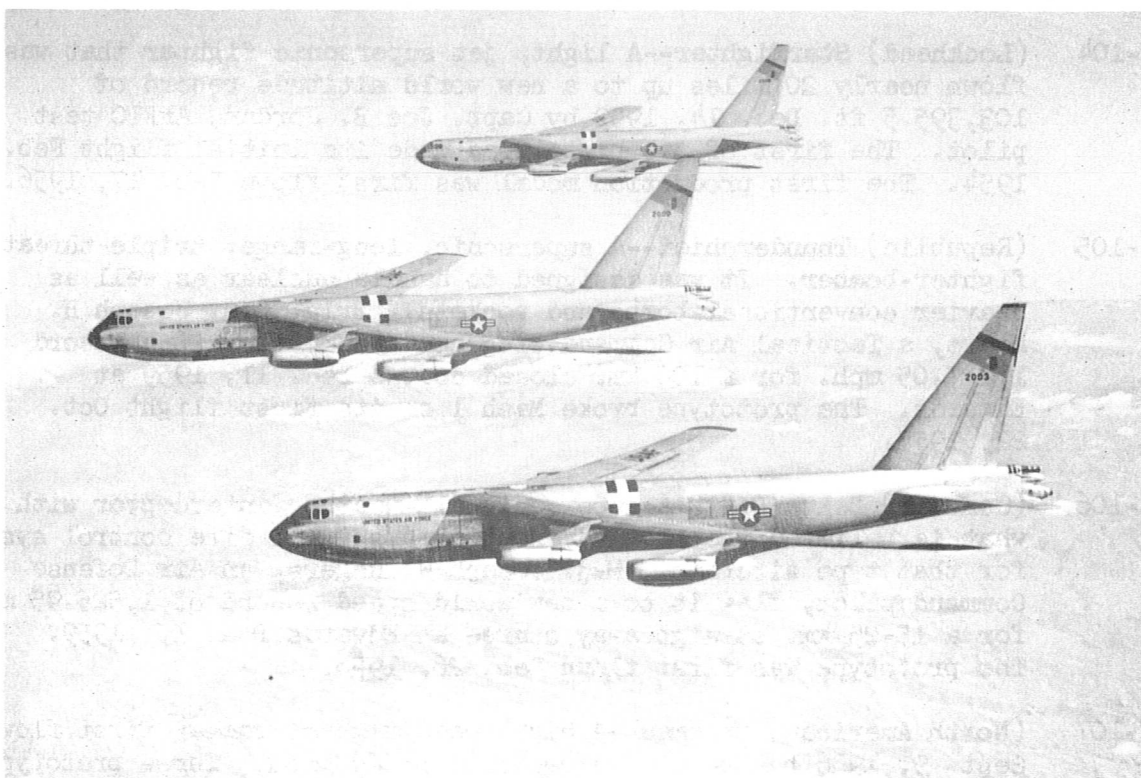


KC-135

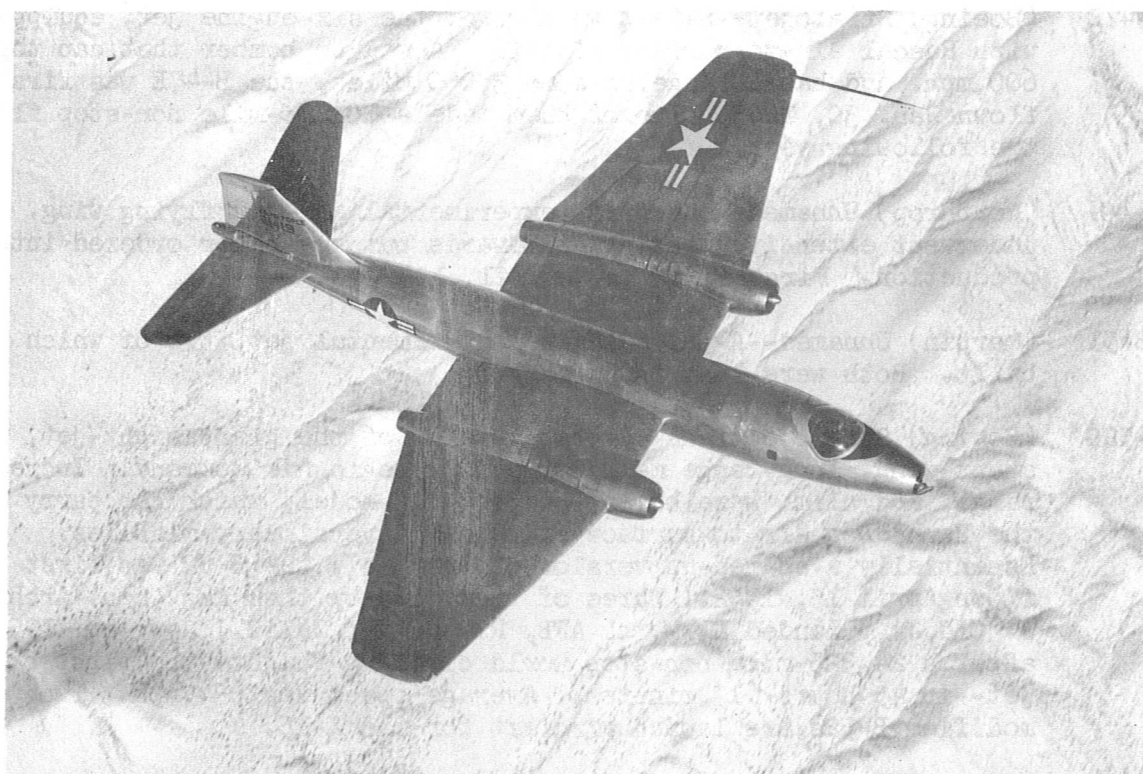
- F-104 (Lockheed) Starfighter--A light, jet supersonic fighter that was flown nearly 20 miles up to a new world altitude record of 103,395.5 ft. Dec. 14, 1959 by Capt. Joe B. Jordan, AFFTC test pilot. The first of two prototypes made its initial flight Feb. 7, 1954. The first production model was first flown Feb. 17, 1956.
- F-105 (Republic) Thunderchief--A supersonic, long-range, triple-threat fighter-bomber. It was designed to handle nuclear as well as heavier conventional bombs and rockets. Brig. Gen. Joseph H. Moore, a Tactical Air Command wing commander, flew it a record 1,217.05 mph. for a 100-km. closed course Dec. 11, 1959 at Edwards. The prototype broke Mach 1 on its first flight Oct. 22, 1955.
- F-106 (Convair) Delta Dart--A supersonic all-weather interceptor with what is believed the most advanced armament and fire control system for that type aircraft. Maj. Joseph W. Rogers, an Air Defense Command pilot, flew it to a new world speed record of 1,525.95 mph. for a 15-25-km. straightaway course at Edwards Dec. 15, 1959. The prototype was first flown Dec. 26, 1956.
- F-107 (North American) Unnamed--A high speed fighter-bomber first flown Sept. 9, 1956 but never ordered into production. Three prototypes were built, and one is now in the Air Force Museum.

#### BOMBERS

- B-47E (Boeing) Stratojet--Latest version of the six-engine jet, equipped with Rascal air-to-surface missile. A medium bomber that can top 600 mph. and has a range of some 3,000 miles, the B-47E was first flown Jan. 30, 1953. Two of them made a 10,000-mile non-stop flight the following year.
- XB-49 (Northrop) Unnamed--The first experimental all-jet flying wing. It underwent extensive testing at Edwards but was never ordered into production. First flight: Oct. 21, 1947.
- XB-51 (Martin) Unnamed--A three-engine experimental jet, two of which were built. Both were lost in accidents.
- B-52G (Boeing) Stratofortress--Latest version of the giant eight-jet, swept-wing, long-range mainstay of Strategic Air Command. Increased range, and climb were built into the new model, which can carry the Hound Dog air-to-surface and Quail diversionary missiles. Essentially a scaled-up version of the B-47, the B-52 was first flown April 15, 1952. Three of them, led by then Maj. Gen. Archie J. Old Jr., landed at March AFB, Riverside, Calif., Jan. 18, 1957 after a 24,325-mile non-stop world circling flight--the first by jet--in 45 hours, 19 minutes. Average speed was 534 mph. Two modified B-52s are launch aircraft for the X-15.



B-52.



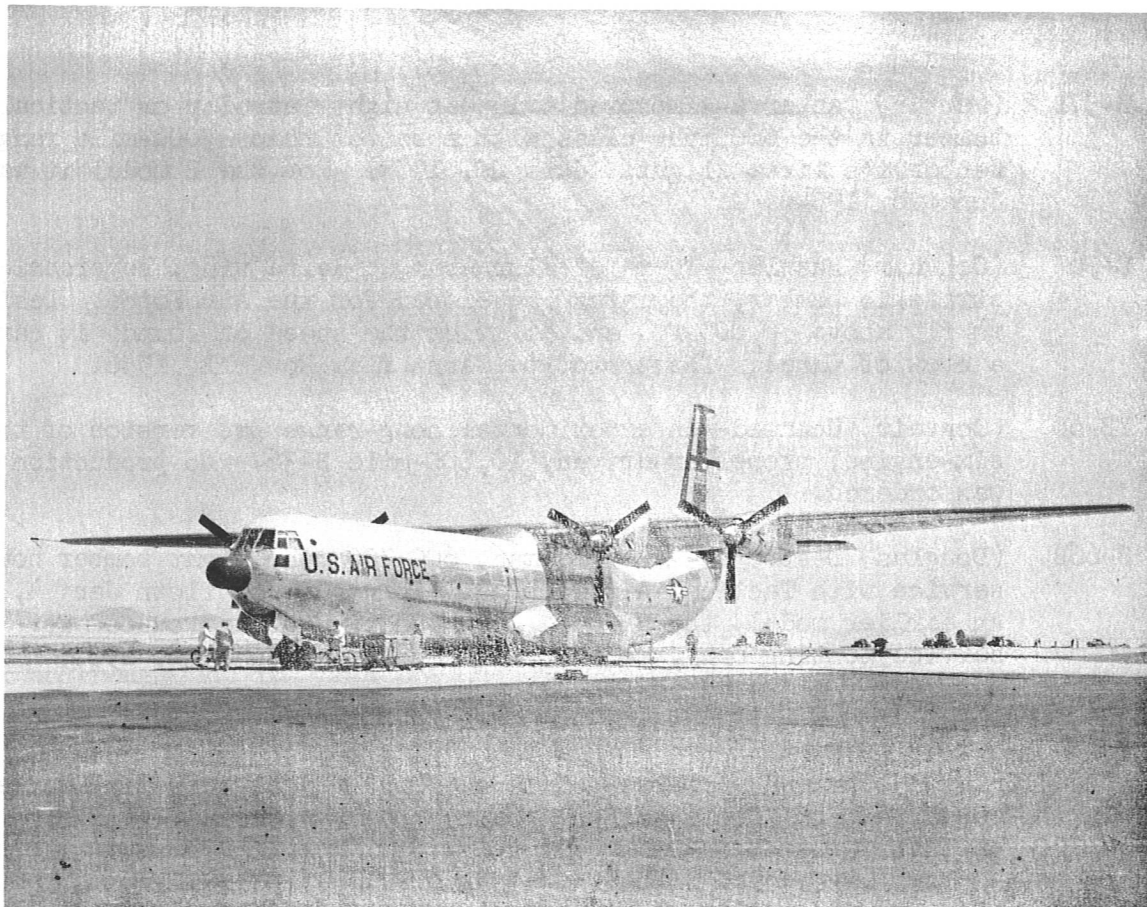
B-57

- B-57B (Martin) Canberra--Improved twin jet night intruder or tactical bomber in the 600 mph. class with a better than 2,000-mile range. Canberra's first flight: July 20, 1953. For the B model it was June 28, 1954.
- B-58 (Convair) Hustler--Four-jet, long-range, delta wing, supersonic strategic bomber, the latest developed for the Air Force. Designed to fly above 50,000 ft. and at twice the speed of sound, it carries a crew of three. The prototype first flew Nov. 11, 1956.
- YB-60 (Convair) Unnamed--An experimental long-range jet version of the six-engine, propeller-driven, 10,000-mile B-36. No production was ordered.
- B-66B (Douglas) Destroyer--A three-man, 600-700 mph. light bomber now in service with Tactical Air Command. It was first flown Jan. 4, 1955. An earlier model, the RB-66A, of which five were produced for service testing only, made its maiden flight June 28, 1954.

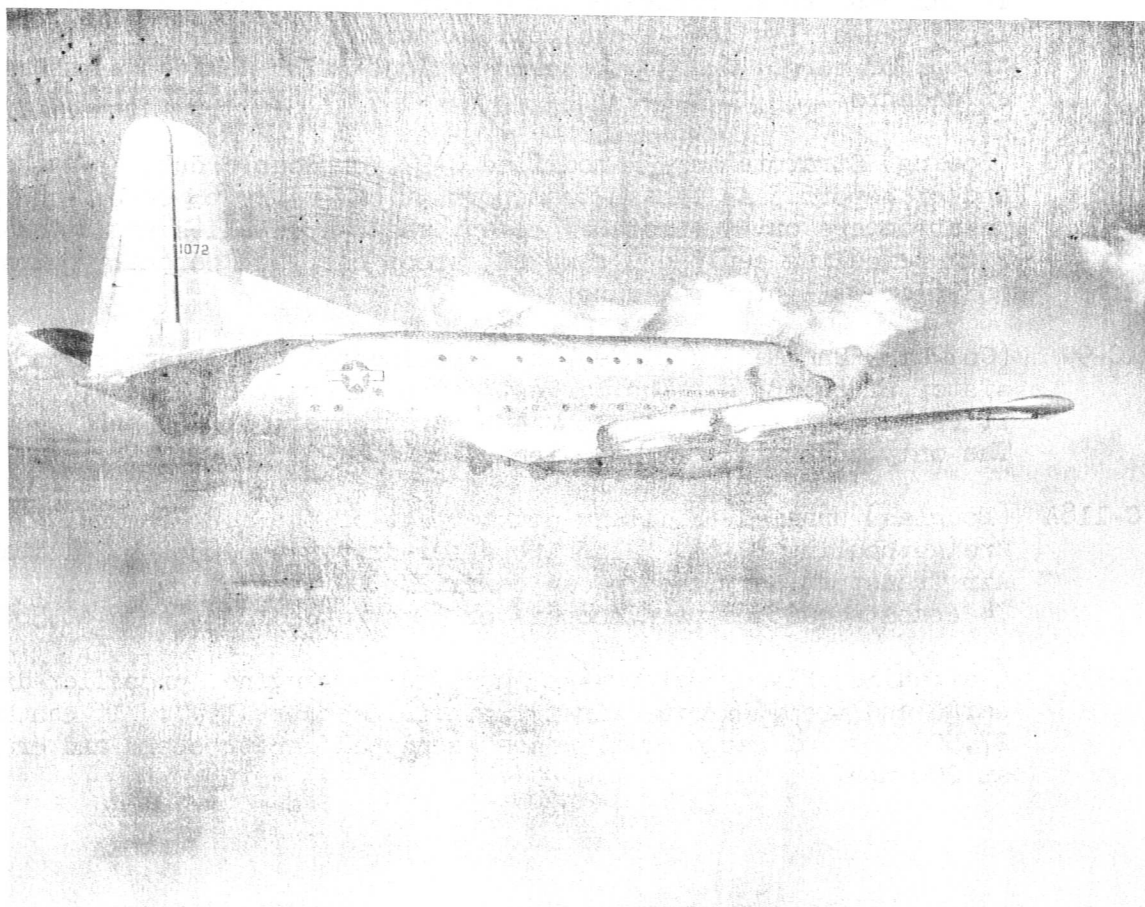
#### CARGO & TANKERS

- KB-50J (Hayes) Unnamed--A three-point, 400 mph. flight refueling tanker converted from Boeing's B-50 that can carry some 30,000 lbs. of fuel.
- C-97 (Boeing) Stratofreighter--A four-engine, propeller-driven, heavy transport, the military counterpart of Boeing's Stratocruiser. It can haul three fully-loaded one-and-a-half ton trucks or two light tanks; 134 combat-equipped paratroopers, mixed loads of troops or cargo; or 83 stretcher patients with medical supplies and attendants.
- KC-97G (Boeing) Stratotanker--A modified C-97 for double duty as tanker and transport. As tanker-transport it can carry 65 combat-equipped paratroopers or 49 stretcher cases, medical supplies and attendants. With refueling equipment removed, troop carrying capacity jumps to 96 or 69 litter patients.
- XC-99 (Convair) Unnamed--A six-engine experimental propeller-driven sister of the B-36. The largest cargo aircraft ever built, it could haul 100,000 lbs. or 400 paratroopers at 300 mph. The only one built, it was dismantled in 1958.
- C-118A (Douglas) Unnamed--Military counterpart of the four-engine, freighthauling DC-6A. Also propeller-driven and used by Military Air Transport Service, it can carry 27,000 lbs. of cargo or 74 combat-equipped paratroopers or 60 stretcher patients at 360 mph.
- C-119 (Fairchild) Flying Boxcar--An improved two-engine, propeller-driven cargo and troop carrier first flown in December 1947. It can haul 27,500 lbs. of cargo or 67 combat-equipped paratroopers and cruises at 200 mph.





C-133A



C-124

- C-121 (Lockheed) Constellation--A four-engine, low-wing, long-range transport used by Military Air Transport Service. Also a "prop" job, it is quickly convertible as a carrier for 75 passengers; 47 litter patients or 28,000 lbs. of cargo.
- C-123B (Fairchild) Avitruc--A two-engine, propeller-driven cargo or passenger plane first flown Sept. 1, 1954. It can carry 24,000 lbs. of cargo, 60 passengers or 35 stretcher patients and cruises at 245 mph.
- C-124 (Douglas) Globemaster--Giant, four-engine military transport with three-bladed propellers that can haul 74,000 lbs. of cargo or 200 combat-equipped paratroopers. As an ambulance, it can handle 127 stretcher and 52 sitting patients plus medical attendants. First flown Nov. 27, 1949.
- C-130 (Lockheed) Hercules--Versatile four-engine turbo-prop cargo and troop carrier first flown Aug. 23, 1954. In use by Tactical Air Command, it can carry 40,000 lbs. or 90 fully armed military personnel or be speedily converted for ambulance use. Special equipment enables it to be used for high altitude mapping, weather reconnaissance, search and rescue and flight refueling.
- C-133 (Douglas) Cargomaster--A four-engine turbo-prop transport--the Air Force's latest. Only slightly bigger than the Globemaster, it can haul about twice as much and cruises at 320 mph. Also it can carry the IRBM and ICBM (intermediate range and inter-continental ballistic missiles). Initial flight: April 23, 1956.
- KC-135 (Boeing) Stratotanker--a 550 mph. four-jet tanker--the Air Force's fastest and highest flying--developed from Boeing's 707 Stratoliner for Strategic Air Command. First flown Aug. 31, 1956.
- YAC-1 (De Havilland) Caribou--A twin-engine transport, believed the biggest fixed wing short take-off and landing (STOL) aircraft of its type. Currently being tested here for the Army, it is designed to carry 8,000 lbs. of fuel and cargo and operate from short, improvised air strips. When fully loaded, it reportedly can get off the ground after a take-off run of 540 ft.; cruise at 184 mph.; and has a 1,150-mile range. First test flight at Edwards was on Dec. 29, 1959. The prototype was first flown July 30, 1958.

#### HELICOPTERS

- H-5A (Sikorsky) Unnamed--A two-seater equipped with hydraulic hoist for rescue work and rigged for night flying, it was first flown in October 1943.



H-21



H-43B

- YH-16A (Piasecki) Transporter--A twin-engine aircraft designed to carry 40 passengers or 32 stretcher patients plus a crew of three, it was first flown Oct. 23, 1954. No production was ordered.
- H-19 (Sikorsky) Unnamed--The 12-seat utility "chopper," equipped with hydraulic hoist proved rugged and dependable in Korea, where it was used by the 3rd Air Rescue Service. The prototype was first flown Nov. 5, 1949.
- H-21 (Vertol, formerly Piasecki) Work Horse--A banana-shaped, single engine troop and cargo carrier also used for assault airlift, rescue and evacuation missions. It holds 20 fully armed men or 12 stretcher patients plus crew of two and cruises at 98 mph. The prototype was first flown in April 1952.
- H-32 (Hiller) Hornet--A two-seat ramjet whose rotor must be spun to 50 rpm.s by a small auxiliary gasoline engine, electric motor or hand cranking to start the ramjets. Top speed is about 80 mph.
- H-37 (Sikorsky) Mojave--A twin-engine, single rotor assault transport, about the size of a Douglas DC-3. It can carry 23 passengers or 24 litter patients in addition to a crew of three and cruises at 115 mph.
- XH-40 (Bell) Unnamed--An experimental free-shaft turbine powered utility carrier planned for personnel, cargo and ambulance use.
- YH-41 (Cessna) Seneca--Designed for the Army, its engine is in the nose of the fuselage for greater cargo or passenger space and easier servicing. Prototype's first flight was in July 1954.
- YH-42 (Hughes) Unnamed--An extremely light two-seat observer designed for the Army and first test flown in October 1956. Its Army designation is YHO-2-HU.
- H-43B (Kaman) Huskie--High-climbing crash and rescue aircraft that carries a crew of three plus fire fighting equipment. Capt. Walter J. Hodgson, AFFTC test pilot, flew it to a record 30,100 ft. for its class Dec. 9, 1959 at Bloomfield, Conn.
- Djinn (Sud) French-made small turbine-powered two-seater, whose two-blade rotor is driven by compressed air from a turbo-generator in the fuselage. It has no rotor tip combustion chambers. First production model flight was on Jan. 5, 1956.
- Alouette (Sud) French fixed shaft turbine-powered general purpose chopper with a high useful load capability.



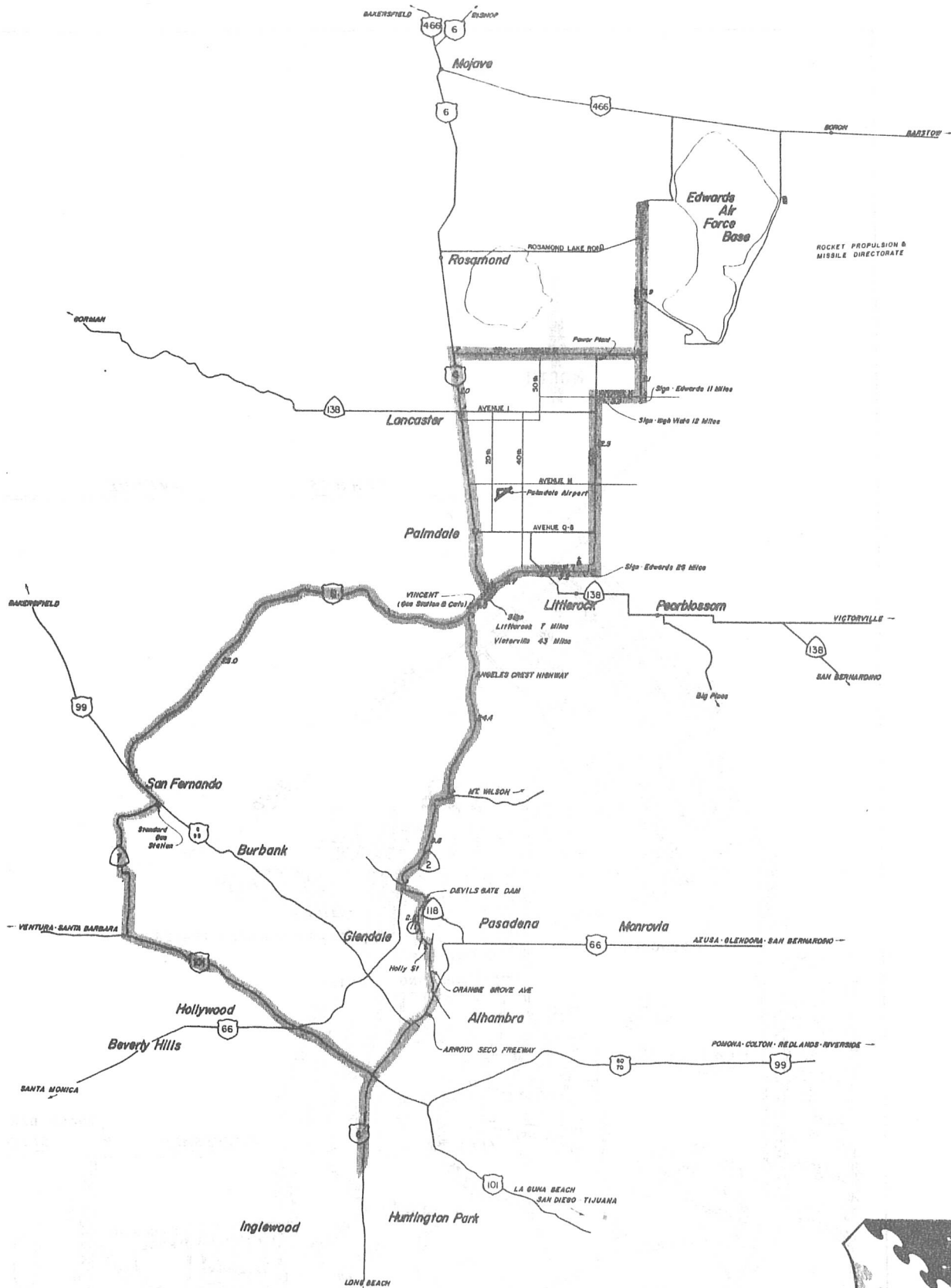
## CONVERTIPLANES

- XV-3 (Bell) Unnamed--An experimental single engine, fixed-wing tilting rotor type two-seater designed to combine the features of the helicopter and airplane. Two combination rotor-propellers near the tips of the fixed wings operate as conventional lifting rotors during take-off, landing and low speed flight. The props take over for horizontal cruise and high speed flight when lift is provided by the wings. As a helicopter, it can hover, fly forward, backward or sideways. The National Aeronautics and Space Administration has one of the only two built. The other was wrecked in a test flight crash.
- X-18 (Hiller) Unnamed--A 16-ton experimental tilt wing vertical take-off and landing (VTOL) aircraft, believed the world's biggest. It is powered by two turbo-prop engines and driven by four contra-rotating propellers. On an 18-minute maiden test flight here Nov. 24, 1959, it climbed to 4,000 ft. and hit 195 mph. Both take-off and landing were conventional.

## TRAINER

- T-38 (Northrop) Talon--Compact, relatively small twin-jet supersonic basic trainer now in production for the Air Force. First prototype flight: April 10, 1959. Production model's initial flight was on Jan. 8, 1960.

Prepared by:  
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SUGGESTED ROUTES TO EDWARDS AIR FORCE BASE FROM LOS ANGELES & VICINITY



