

Republic F-84F Thunderstreak

F-84F Thunderstreak

RF-84F Thunderflash



USAF F-84F Thunderstreak

Role	Fighter-bomber
Manufacturer	Republic Aviation
Designer	Alexander Kartveli
First Flight	3 June 1950
Introduction	12 May 1954
Retired	1972 (US ANG) 1991 (Greece)
Primary users	United States Air Force Belgian Air Force Greek Air Force Turkish Air Force
Unit cost	US\$769,330 (F-84F)
Developed from	Republic F-84 Thunderjet
Variants	Republic XF-84H Thunderscreech

The Republic F-84F Thunderstreak was an American-built swept-wing turbojet fighter-bomber. While an evolutionary development of the straight-wing F-84 Thunderjet, the F-84F was a new design. The RF-84F Thunderflash was a photo reconnaissance version.

Design and development

In 1949, Republic created a swept wing version of the F-84 hoping to bring performance to the F-86 level. The last production F-84E was fitted with a swept tail, a new wing with 38.5 degrees of leading edge sweep and 3.5 degrees of anhedral, and a J35-A-25 engine producing 5,300 pound-force (23.58 kN) of thrust.^[1] The aircraft was designated XF-96A. It flew on 3 June 1950 with Otto P. Haas at the controls. Although the airplane was capable of 602 knots (693 mph, 1,115 km/h), the performance gain over the F-84E was considered minor. Nonetheless, it was ordered into production in July 1950 as the F-84F Thunderstreak. The F-84 designation was retained because the fighter was expected to be a low-cost improvement of the straight-wing Thunderjet with over 55 percent commonality in tooling.

In the meantime, the USAF, hoping for improved high-altitude performance from a more powerful engine, arranged for the British Armstrong Siddeley Sapphire turbojet engine to be built in the United States as the Wright J65. To accommodate the larger engine, YF-84Fs with a British-built Sapphire as well as production F-84Fs with the J65 had a vertically stretched fuselage, with the air intake attaining an oval cross-section. Production delays with the F-84F forced USAF to order a number of straight-wing F-84Gs as an interim measure.

Production quickly ran into problems. Although tooling commonality with the Thunderjet was supposed to be 55 percent, in reality only 15 percent of tools could be reused. To make matters worse, the F-84F utilized press-forged wing spars and ribs. At the time, only three presses in the United States could manufacture these, and priority was given to the Boeing B-47 Stratojet bomber over the F-84. The YJ65-W-1 engine was considered obsolete and the improved J65-W-3 did not become available until 1954. When the first production F-84F finally flew on 22 November 1952, it differed from the service test

aircraft. It had a different canopy which opened up and back instead of sliding to the rear, as well as airbrakes on the sides of the fuselage instead of the bottom of the aircraft. The aircraft was considered not ready for operational deployment due to control and stability problems. The first 275 aircraft, equipped with a conventional stabilizer-elevator tail plane, suffered from accelerated stall pitch-up and poor turning ability at combat speeds. Beginning with Block 25, the problem was ameliorated by introduction of a hydraulically-powered one-piece stabilator. A number of aircraft were also retrofitted with spoilers for improved high-speed control. As a result, the F-84F was not declared operational until 12 May 1954.

Operational history

Project Run In completed operational tests in November 1954 and found the aircraft to be to USAF satisfaction and considerably better than the F-84G. However, ongoing engine failures resulted in the entire fleet being grounded in early 1955. Also, the J65 engine continued to suffer from flameouts when flying through heavy rain or snow. As the result of the problems, the active duty phase-out began almost as soon as the F-84F entered service in 1954, and was completed by 1958. Increased tensions in Germany associated with construction of the Berlin Wall in 1961 resulted in reactivation of the F-84F fleet. In 1962, the fleet was grounded due to corrosion of control rods. A total of 1,800 man hours was expended to bring each aircraft to full operational capacity. The aircraft were retired from active service in 1964. Stress corrosion forced retirement of ANG F-84Fs in 1971.

Thunderflash

The second YF-84F prototype was completed with wing-root air intakes. These were not adopted for the fighter due to loss of thrust. However, this arrangement permitted placement of cameras in the nose and the design was adopted for the RF-84F

Thunderflash reconnaissance version. The first YRF-84F was completed in February 1952. The aircraft retained an armament of four machine guns and could carry up to fifteen cameras. Innovations included computerized controls which adjusted camera settings for light, speed, and altitude, a periscope to give the pilot better visualization of the target, and a voice recorder to let the pilot narrate his observations. Being largely identical to the F-84F, the Thunderflash suffered from the same production delays and engine problems, delaying operational service until March 1954. The aircraft was retired from active duty in 1957, only to be reactivated in 1961, and finally retired from the ANG in 1972. Several modified Thunderflashes were used in the FICON project.

Flying the Thunderstreak

The Thunderstreak suffered from the same poor takeoff performance as the straight-wing Thunderjets in spite of having a more powerful engine. In reality, almost 700 pounds-force (3.11 kN) or 10 percent of total thrust was lost because the J65 was installed at an angle and its exhaust had a prominent kink. On a hot day, 7,500 feet (2,285 m) of runway were required for takeoff roll. A typical takeoff speed was 160 knots (185 mph, 300 km/h). Like the Thunderjet, the Thunderstreak excelled at cruise and had predictable handling characteristics within its performance envelope. Like its predecessor, it also suffered from accelerated stall pitch-up and potential resulting separation of wings from the airplane. In addition, spins in the F-84F were practically unrecoverable and ejection was the only recourse below 10,000 feet (3,000 m).

With the appearance of Republic's F-105 Thunderchief, which also used wing-root mounted air intakes; the Thunderstreak became known as the Thud's Mother. The earlier F-84A had been nicknamed the "Hog" and the F-84F "Super Hog," the F-105 becoming the "Ultra Hog."

By the mid-1960s, the F-84F was replaced by the North American F-100 Super Sabre and the RF-84F by the RF-101 Voodoo in USAF units, being relegated to duty in the Air National Guard. The last F-84F Thunderflash retired from the ANG in 1971. Three Hellenic Air Force RF-84Fs that were retired in 1991 were the last operational F-84s.

Richard Bach, who later wrote the bestseller *Jonathan Livingston Seagull*, was an ANG F-84F pilot who was once activated for duty in Europe. His first book, *Stranger to the Ground*, described in detail what it was like to fly the Thunderstreak in the course of an operational flight at night from England to France in adverse weather.



MAPS F-84F, Serial Number 52-6524

The F-84F that is part of the MAPS aircraft collection was manufactured by Republic Aviation in Farmington, New York and delivered to the United States Air Force on September 10, 1954. Its initial assignment was to the 12th Strategic Fighter Wing of the Strategic Air command (SAC) at Bergstrom Air Force Base (AFB), Texas.

A month later, 52-6524 was re-assigned to the 27th Strategic Fighter Wing (SAC) also at Bergstrom. During this assignment, the aircraft was deployed to the Royal Air Force base in Sturgate, United Kingdom. While on this deployment, the F-84 was re-assigned in August of 1955 to the 3928th Air Base Group (SAC) which was also at RAF Sturgate. In September of that same year, the aircraft was re-allocated to the 7559th Maintenance Group which was part of the United States Air Forces – Europe (USAFE) and stationed at RAF Burtonwood.

Upon re-deployment back to the Continental United States (CONUS) in January of 1956, 52-6524 was assigned to the Mobile Air Material Area at Brookley AFB in Alabama. The

aircraft was returned to Republic Aviation in Farmingdale, New York for upgrades and refitting in June of 1956.

In January of 1958, the F-84 was assigned to the Illinois Air National Guard with the 162nd Tactical Fighter Squadron near Springfield. It returned to active service with the 121st Tactical Fighter Wing (part of the Tactical Air Command –TAC) also at Springfield, Ohio in October of 1961. In October of 1961, 52-6524 was re-assigned to the 15th Tactical Fighter Wing (TAC) at Macdill AFB in Florida. In July of 1964, the aircraft traveled to its last assignment with the 164th Tactical Fighter Squadron of the Ohio Air National Guard near Mansfield, Ohio. It was dropped from the Air Force inventory in May of 1972 as surplus to needs.



Ohio Air Guard Unit (probably at summer camp). The aircraft at the left is 52-6524.

It was purchased by an individual and placed in a private collection. The Republic F-84F Thunderstreak (Serial # 52-6524) was donated to MAPS from that private collection in Newberry, Ohio. Recovery of this airframe started in November of 2009 with arrival at MAPS on March 28, 2010.

Variants

YF-84F

Two swept-wing prototypes of the F-84F, initially designated **YF-96**.

F-84F Thunderstreak

Swept wing version with Wright J65 engine. Tactical Air Command aircraft were equipped with Low-Altitude Bombing System (LABS) for delivering nuclear bombs. 2,711 built, 1,301 went to NATO under Mutual Defense Assistance Program (MDAP).



F-84F Thunderstreaks flown by USAF Thunderbirds

GRF-84F

25 RF-84Fs were converted to be carried, and launched from the bomb bay of a GRB-36F bomber as part of the FICON project. The aircraft were later redesignated **RF-84K**.

RF-84F Thunderflash

Reconnaissance version of the F-84F, 715 built.



RF-84F Thunderflash, the reconnaissance version of the F-84F Thunderstreak.

XF-84H

Two F-84Fs were converted into experimental aircraft. Each was fitted with an Allison XT40-A-1 turboprop engine of 5,850 shaft horsepower (4,365 kW) driving a supersonic propeller. Ground crews dubbed the XF-84H the **Thunderscreech** due to its extreme noise level.

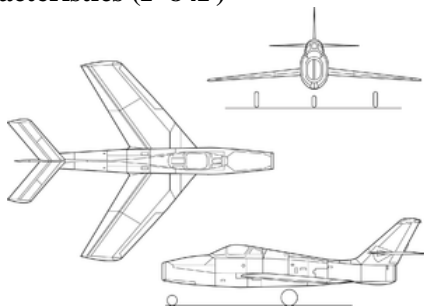


The Republic XF-84H Thunderscreech prototype.

YF-84J

Two F-84Fs were converted into YF-84J prototypes with enlarged nose intakes and a deepened fuselage for the General Electric J73 engine; the YF-84J reached Mach 1.09 in level flight on 7 April 1954.^[1] The project was cancelled due to the excessive cost of conversion of existing F-84Fs.

General characteristics (F-84F)



- **Crew:** 1
- **Length:** 43 ft. 4¾ in (13.23 m)
- **Wingspan:** 33 ft. 7¼ in (10.25 m)
- **Height:** 14 ft. 4¾ in (4.39 m)
- **Wing area:** 325 ft² (30 m²)
- **Empty weight:** 13,830lb (5,200 kg)
- **Loaded weight:** lb. (kg)
- **Max takeoff weight:** 28,000 lb. (12,701 kg)
- **Power plant:** 1 × Wright J65-W-3 turbojet, 7,220 lbf (32.2 kN)

Performance

- **Maximum speed:** 695 mph (604 knots, 1,119 km/h) at sea level
- **Range:** 810 mi (704 nmi, 1,304 km) combat radius with two drop tanks
- **Service ceiling:** 46,000 ft. (14,000 m)
- **Rate of climb:** 8,200 ft./min (42 m/s)
- **Wing loading:** 86 lb./ft² (423 kg/m²)

Armament

- 6× .50 in (12.7 mm) Browning M3 machine guns,
- Up to 6,000lb (2,727 kg) of rockets and bombs, including one Mark 7 nuclear bomb

Avionics

- A-1CM or A-4 gunfight with APG-30 or MK-18 ranging radar.