Republic F-84G Thunderjet

A famous, early jet fighter

Modelled for Flight Simulator 2004 by

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Introduction

The straight-wing F-84 Thunderjet was the second jet fighter to enter USAF service (the first was the Lockheed F-80 Shooting Star), and it was produced in very large numbers, 4.455 in all. Of these, 3.025 were of the final F-84G model, which was optimized for the low-level fighter-bomber role.

The early F-84 models (F-84A to C) had a number of problems, as did most of the early jet fighters, so later models quickly replaced them. The first really useful F-84 was the -D, which was considered by the authorities as superior to the F-80C in almost all performance parameters. The F-84D was the first Thunderjet to serve in the Korean War.

With the much-improved F-84E, with a stronger airframe and a longer fuselage, the Thunderjet finally became a success. 843 F-84E's were built.

In the Korean War, the F-84D and E's initially flew as escorts for B-29 bombers, but after the MiG-15 entered the picture, the Thunderjets were mostly used as fighter-bombers, a role they excelled in. The task of fighting the MiG-15's was taken over by the F-86 Sabre.

The success of the F-84 as a fighter-bomber, and delays with other programs (such as the swept-wing F-84F Thunderstreak), finally led to the F-84G. Compared to the -E it had a more powerful engine, could carry a heavier load, had an autopilot, and was equipped for in-flight refuelling, the first production fighter to have this capability.

The F-84G was used extensively in Korea, and when that war was over it was supplied in large numbers to countries like Belgium, Denmark, France, Italy, The Netherlands, Norway, Taiwan, Thailand, Turkey, Portugal and Yugoslavia. The last user of the F-84G was Portugal.

This model of the F-84G includes two paint jobs:

1. The F-84G of Lt. Billy Ellis, of the 8th squadron, 49th wing, USAF, Korea 1953.
2. An F-84G of the Royal Danish Air Force. Denmark received no less than 238 F-84G, in addition to 6 F-84E. KP-X is preserved today.

Technical data:

> **Republic F-84G Thunderjet Specification**
>
> **Power Plant:** One Allison J35-A-29 axial-flow turbojet rated at 5,600 lb (2 540 kg) thrust. Internal fuel capacity, 450 US gal (1 709 l), with provision for two wingtip and two underwing 230 US gal (870 l) drop tanks.
>
> **Performance:** Max speed, 622 mph (1 001 km/h) at sea level, 575 mph (925 km/h) at 20,000 ft (6 095 m), 540 mph (869 km/h) at 36,000 ft (10 970 m); continuous cruise, 483 mph (777 km/h) at 35,000 ft (10 670 m); time to 35,000 ft (10 670 m), 7·9 min, (with external tanks), 9·4 min; service ceiling, 40,500 ft (12 345 m); range (internal fuel), 670 mls (1 078 km), (with wingtip tanks), 1,330 mls (2 140 km), (with max external fuel), 2,000 mls (3 217 km).
>
> **Weights:** Empty, 11,095 lb (5 033 kg); normal loaded, 18,645 lb (8 457 kg); max, 23,525 lb (10 670 kg).
>
> **Dimensions:** Span, 36 ft 5 in (11,09 m); length, 38 ft 1 in (11,60 m); height, 12 ft 7 in (3,83 m); wing area, 260 sq ft (24,15 m²).
>
> **Armament:** Six 0·50-in (12,7-mm) Colt-Browning M-3 machine guns with 300 rpg, with provision for up to 4,000 lb (1 184 kg) of external ordnance.

References

Scale drawing: Obtained from Bob's Aircraft Documentation , *www.bobsairdoc.com*. The drawing was originally published in the Koku-Fan magazine.

Bert Kinzey: F-84 Thunderjet in Detail, Squadron/Signal Publications 1999 .

Warren Thompson: Thunderjets in Korea, Air Enthusiast 19, 1982

Robert F. Dorr: Inside the Great Jet Fighters, Windrow & Greene 1996

Credits

Many of the gauges in the panel are from a set of F-80C Shooting Star gauges by Bruce Thorsen, used with permission. Thanks!

Other gauges are standard gauges of FS2004 by Microsoft, or slightly modified by me.

The Autopilot control is by myself, but I did use the Douglas DC-3 autopilot by Microsoft as my starting point. I have also studied the work of other freeware developers, notably Saviero Maurris' autopilot for the De Havilland Dove (the turn button!)
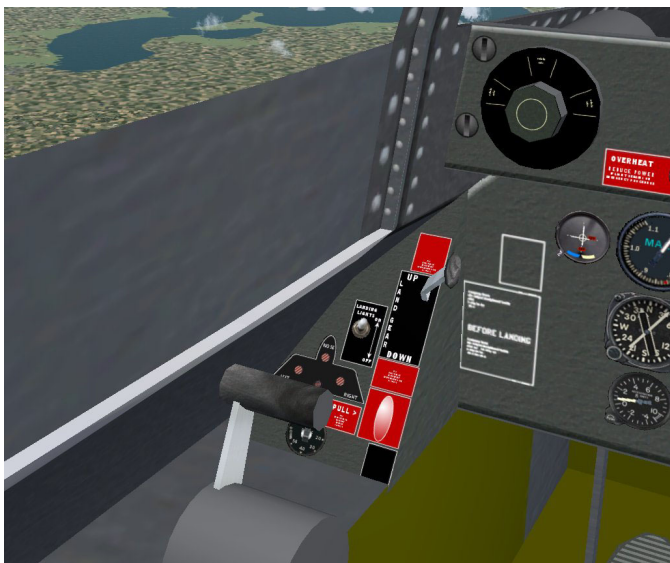
Using the panel

You should, as a rule, fly this model from the Virtual Cockpit. A 2D-panel is also provided, for those of you who prefer this. Almost all essential instruments (gauges) are visible in the VC standard view. Only before takeoff, and at a few other times, do you have to pan around to find other gauges. (The gun sight looks impressive, but in this model it does nothing!)

Look down and left to see the throttle, the landing gear lever, the landing light switch and the flap control.

Look down & right to see the other light- and deice-switches and the airbrake button.

Popup panels

SHIFT+2 : Radio panel. You have one ADF and one NAV radio at your disposal.

SHIFT+3 GPS. GPS did not exist in the 1950's, but the GPS map is a nice substitute for the Flight Simulator map view.

SHIFT+4: Autopilot.

This autopilot control is intended to represent the functions of a typical 1950's system. It is supposed to look like the Pioneer PB-10 or the Sperry A-12, but I don't claim any high degree of accuracy.

Read the instructions carefully if you are not used to old autopilots:

The standard autopilots of FS2004 typically control heading, climb rate, the desired altitude, and (sometimes) airspeed or MACH.

Instead, old autopilots could control bank and pitch, and hold the current altitude. *There is no way to pre-set the desired altitude, the desired climb rate, the desired heading or the desired speed.*

Top right: Autopilot master switch. When engaged, the AP automatically holds the present heading and pitch.

Top: Pitch control. Use this wheel to change the pitch (and thereby the climb rate).

Bottom left: Altitude hold. Engage ALT HOLD when you are at the desired altitude – disengage to re-enter pitch-hold mode.

Bottom right: The AP mode selector

1. Gyro Pilot: Normal autopilot operation as described above.
2. LOC: VOR/Localizer hold mode (called NAV mode on other FS2004 autopilots)
3. ILS: Approach mode (APR mode on other FS2004 autopilots)

In the centre is the 'Turn button'. Click on the left side to enter a left turn, on the right to enter a right turn, and in the centre to stop turning (i.e. select the current heading).

Flying instructions

This information is available during your flight, just press F10 to call up the electronic kneeboard, and select the reference tab.

NOTE: To adjust fuel load, on the Aircraft menu, click Fuel and Load.

NOTE: The drop tanks can be released in two different ways:

1. Empty them ☺
2. Assign a key combination (such as shift+D) to the 'Release Drop Tank' event in Flight Simulator, and press this key combination twice.

Before takeoff

20 degrees of flap (press F7 twice). Some elevator up trim can be useful (press NumPad 1 as required, with Num Lock turned off).
Unless you are planning a long flight, empty or release the drop tanks.

Takeoff and initial climb

Full throttle. Takeoff at approx 140-150 kts.

When safely airborne throttle back a little bit. Retract landing gear and, gradually, the flaps. Climb slowly at first, and let the plane accelerate to 300 kts. Then climb at 4000-6000 ft/min according to weight.

Climb to altitude

Reduce climb rate gradually to keep the airspeed around 340 mph (300 kts), or 315 mph (280 kts) IAS above 25000 ft.

Service ceiling: 35.000 ft with a full load, 40.500 ft with internal fuel only (drop tanks released and tip tanks empty).

Cruise and general flying

Cruising speed is approx 480 mph (430 kts) true airspeed. The indicated airspeed varies with altitude, examples:

At 15000 ft : approx 405 mph (360 kts) indicated, or MACH 0.72

At high altitudes: MACH 0.74.

Warning: Maximum permitted speed is MACH 0.82. At low altitudes it is very easy to exceed this speed limit.

Approach and landing

Reduce airspeed to approx 300 mph (270 kts).
Flaps 10 degrees, reduce speed to 280 mph (250 kts).
Before entering glideslope: Flaps 20 degrees, reduce speed to 245 mph (< 220 kts).
Entering glideslope: Extend landing gear, flaps 30 degrees.
At 1000 ft: Flaps 40 degrees
At 700 ft: Full flaps (50 degrees)
Cross end of runway at 165 mph (150 kts), flare and land. Touchdown at approx 145 mph (130 kts).

Note: I have checked these flying notes by test-flying the model intensively in Flight Simulator.