

# ***Third Wire Strike Fighters 2 Series***

## **F-5A Freedom Fighter**

### **Hellenic Air Force**

#### **Volume I** VERSION 1.0

### **F-5A and RF-5A**



#### **F-5A variants included in the Package:**

**HAF F-5A standard version (1965 - 1974)**

**HAF F-5A with Martin Baker IRQ-7a ejection seat (1975 - 1999)**

**HAF Rf-5A reconnaissance variant with 4 K-92a cameras**

## **CREDITS:**

### **Sophocles**

- 3D Model, Cockpit, textures

### **Ravenclaw\_007**

- 3D Modeling, Animations, Weapons, Beta testing, Project "God-father"

### **Baffmeister**

- Flight model, weapons edits, Beta testing

### **Crusader**

- Avionics and data tweaks, Beta testing

### **Guuruu**

- Sounds and Afterburner effects, Beta testing

### **Guest contributors:**

#### **Alfa2**

- **Loadouts and a wealth of info on the HAF variants.**

#### **GKABS**

- **Pilot figure**

Special Thanks to the staff and members of **Combatace.com** whose passion and efforts have enabled this game to endure, and to provide so much fun and excitement!

Additionally, many thanks to the following Combat-Ace Modders, who either actively contributed to the project over the years, or who invested their time either providing much needed hints and help, or researching various aspects of the model.

Brain-32

NeverEnough

Russouk2004

- Modeling advice, initial cockpit.cfg + more
- Initial work on the Flight model
- Always answering questions when I needed help..Cheers!!

Dag

- RoNAF textures and research (to be included in a dedicated future RoNAF F-5A module)

Derk

- Many, many references!!!

Blade

- Excellent mini-tutorial on damage textures

Finally, thanks to TK and **Thirdwire** for creating such a fantastic game.

# HAF F-5A USER MANUAL



We are proud to present the F-5A HAF Volume I, the first of many to come, focusing on one of the most enduring American military aircraft designs ever produced during the Cold War period. This first Volume depicts the following Hellenic Air Force variants; the HAF F-5A standard, the HAF F-5A with the Martin Baker IRQ-7a ejection seat, and the HAF RF-5A reconnaissance variant. It has been our goal to provide to the simmer a highly detailed model and texture base which preserve the beautiful lines of this aircraft; and to engineer flight model files and a cockpit/gauge file-set that are authentic and add to the immersion of the flying experience within the Strike Fighters 2 series.



## INSTALLATION INSTRUCTIONS

**1.** Copy the contents of the "To Mods Folder" to your SF2 Mod root directory of choice, which is typically:

C:\Users\user\Saved Games\ThirdWire\StrikeFighters2.

Allow directory merging and overwrites, provided the overwrites pertain to "fake pilot" entries, as well as weapons made by ravenclaw\_007, which are included in this and many other releases.

**2.** Add the entries of "ADD\_TO\_SOUNDLIST.txt" to your SOUNDLIST.INI (located in the "*user\Saved Games\ThirdWire\StrikeFighters2\Flight*" folder). If one does not exist, then you will need to extract it using the 3rdWire CAT extract utility. You are simply required to substitute the "XXX"s with the next sequential number in the sound file section of the file.

### **NOTE 1:**

Both Regular and Higher resolution cockpit textures are included in their own distinct folders in the package. The user may alternate between the two by "commenting out" the relevant line in the *F-5A\_STANDARD\_COCKPIT.ini*

**[CockpitData]**

**//Directory=cockpit**

**Directory=cockpit\_Lo-Fi <---This is the default**

In order to "activate" the higher resolution textures you would "de-comment" the previous line and comment out the next line, thus:

**[CockpitData]**

**Directory=cockpit <---This is now Hi-Res**

**//Directory=cockpit\_Lo-Fi**

### **NOTE 2:**

Another frame-rate friendly option for those with older hardware is to use the Next level of Detail Model as the primary external model. This simply involves changing the first line in the *F-5A\_HAF\_65.ini* from this..

**[LOD001]**

**Filename=F-5A\_STANDARD.LOD**

to this..

**[LOD001]**

**Filename=F-5A\_STANDARD\_002.LOD**

Much effort was made to provide those with lower end systems an alternative lower poly-model to be able to enjoy the F-5a, so please take advantage of this \_002.LOD model should you experience frame-rate issues. While not as "rounded" as the Higher poly version, it is nonetheless just as detailed and extensive.

### **NOTE 3:**

For those who may find loading times excessive, the .jpg files in the texture folders can be reduced to 50% of their size without sacrificing too much surface detail.

## FEATURES

- \* Three model set including the HAF F-5A standard version (1965 - 1974), the HAF F-5A with Martin Baker IRQ-7a ejection seat (1975 - 1999), and the HAF RF-5A reconnaissance variant with 4 K-92a cameras; each with their own custom loadouts.
- \* Three, highly detailed external 3d models, including the RF-5A, whose nose was graciously modeled by ravenclaw\_007.
- \* Specular color and Normal (bump) maps on all models
- \* Seven Level of Detail models (LODs) for each model, providing an almost seamless transition from distance to distance; and perhaps more importantly, ensuring that the frame-rate "impact" of the aircraft is as low as possible.
- \* Two sets of highly detailed external Fuel Tanks by ravenclaw\_007; both the Factory variety and the Sargent Fletcher variants.
- \* Extensively fine-tuned flight parameters in three distinct aircraft data configuration files for all 3-D models, emphasizing the F-5A's agile and highly maneuverable characteristics - courtesy of Baffmeister.
- \* 8 high resolution texture sets; thoroughly researched historic depictions of the Aircraft fielded by many HAF Wings and Squadrons.
- \* Quality sound-set included. Base sounds, by Guuruu, were sourced from existing recordings of various aircraft at air-shows and were modified to match the prominent characteristics of the F-5A General Electric turbojets, the "buzz" of the M39 Pontiac 20mm machinegun, and the flap/Air-brake, undercarriage deployment and retraction sequences of the Freedom Fighter.
- \* Super detailed 'Virtual Cockpit' with animated throttle control, rudder pedals, control stick, landing gear lever, canopy, canopy lever, drag-chute lever, weapons selectors and weapon station arming flick switches.
- \* Accurate and functional representation of the Norair F-5A gun sight, with animated Mils selector and accompanying animated combining glass (Mechanics by Crusader).
- \* A full complement of highly (or should I say "insanely" detailed HAF weapons carried by the HAF F-5A, all by ravenclaw\_007.



- \* Comprehensive Hellenic Air Force Loadouts representing the weapons carriage evolution of the F-5A in Greek service from 1965 to the late 90s by Alfa2.
- \* Complex animation of canopy opening mechanism, and animated Turbine blades; both thanks to ravenclaw\_007.
- \* GKAB's superb highly detailed crew figure with authentically modeled oxygen mask and flight helmet.
- \* All new afterburner, emitter, and engine smoke effects by Guuruu



# The Cockpit

## Main Instrument Panel

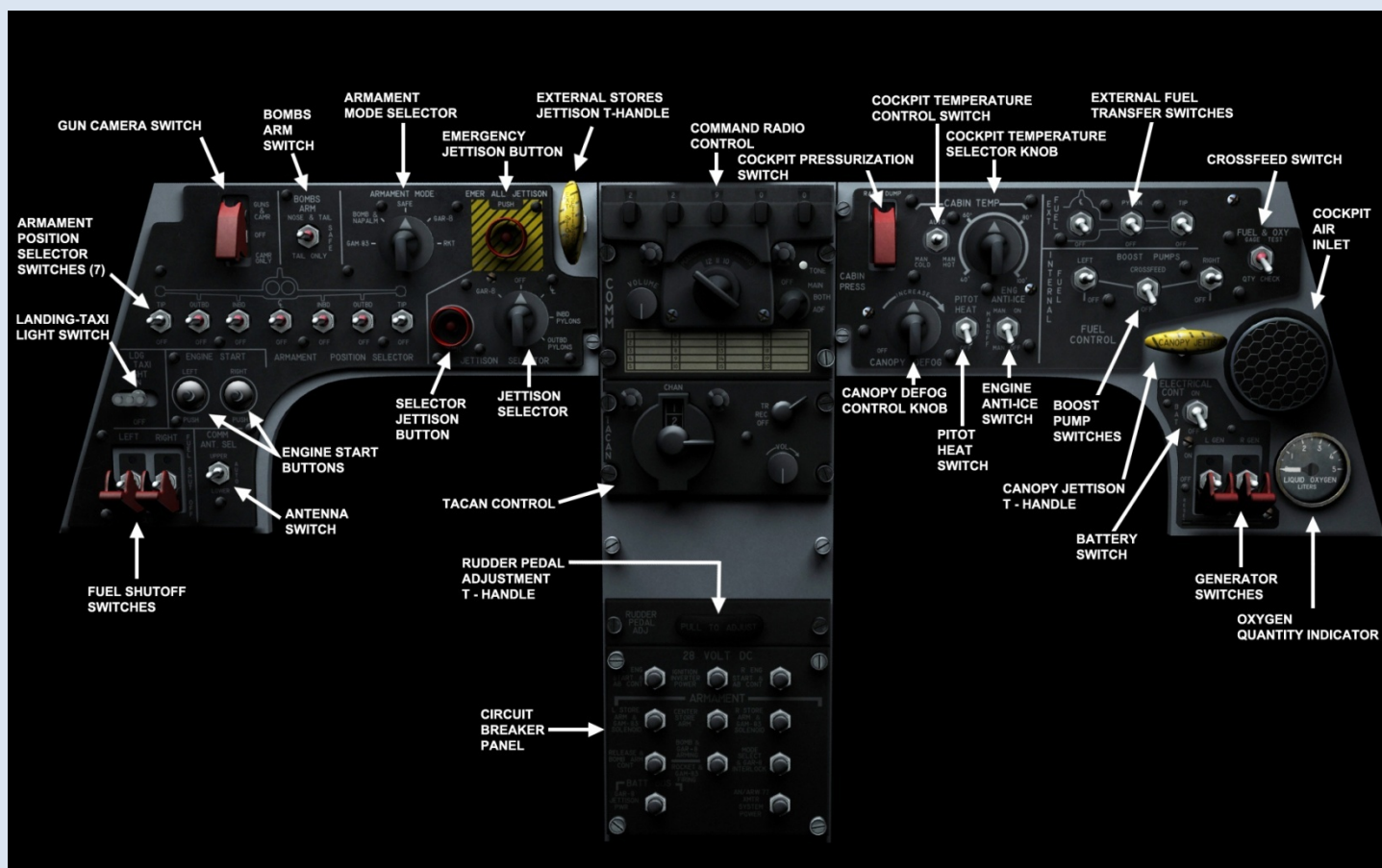


- |   |  |
|---|--|
| 1. LANDING GEAR POSITION INDICATOR LIGHTS | 17. FUEL QUANTITY INDICATORS               |
| 2. DRAG CHUTE T-HANDLE                    | 18. NOZZLE POSITION INDICATORS             |
| 3. ENGINE FIRE WARNING LIGHT              | 19. FUEL FLOW INDICATORS                   |
| 4. FLAP POSITION INDICATOR                | 20. CABIN ALTIMETER                        |
| 5. ATTITUDE INDICATOR FAST ERECT SWITCH   | 21. VERTICAL VELOCITY INDICATOR            |
| 6. GYRO POWER SWITCH                      | 22. TURN AND SLIP INDICATOR                |
| 7. ACCELEROMETER                          | 23. BEARING - DISTANCE - HEADING INDICATOR |
| 8. AIRSPEED - MACH INDICATOR              | 24. CLOCK                                  |
| 9. ATTITUDE INDICATOR                     | 25. COURSE INDICATOR                       |
| 10. ALTIMETER                             | 26. HORIZONTAL TRIM INDICATOR              |
| 11. MASTER CAUTION LIGHT                  | 27. SIGHT RETICLE BRIGHT. CONTROL KNOB     |

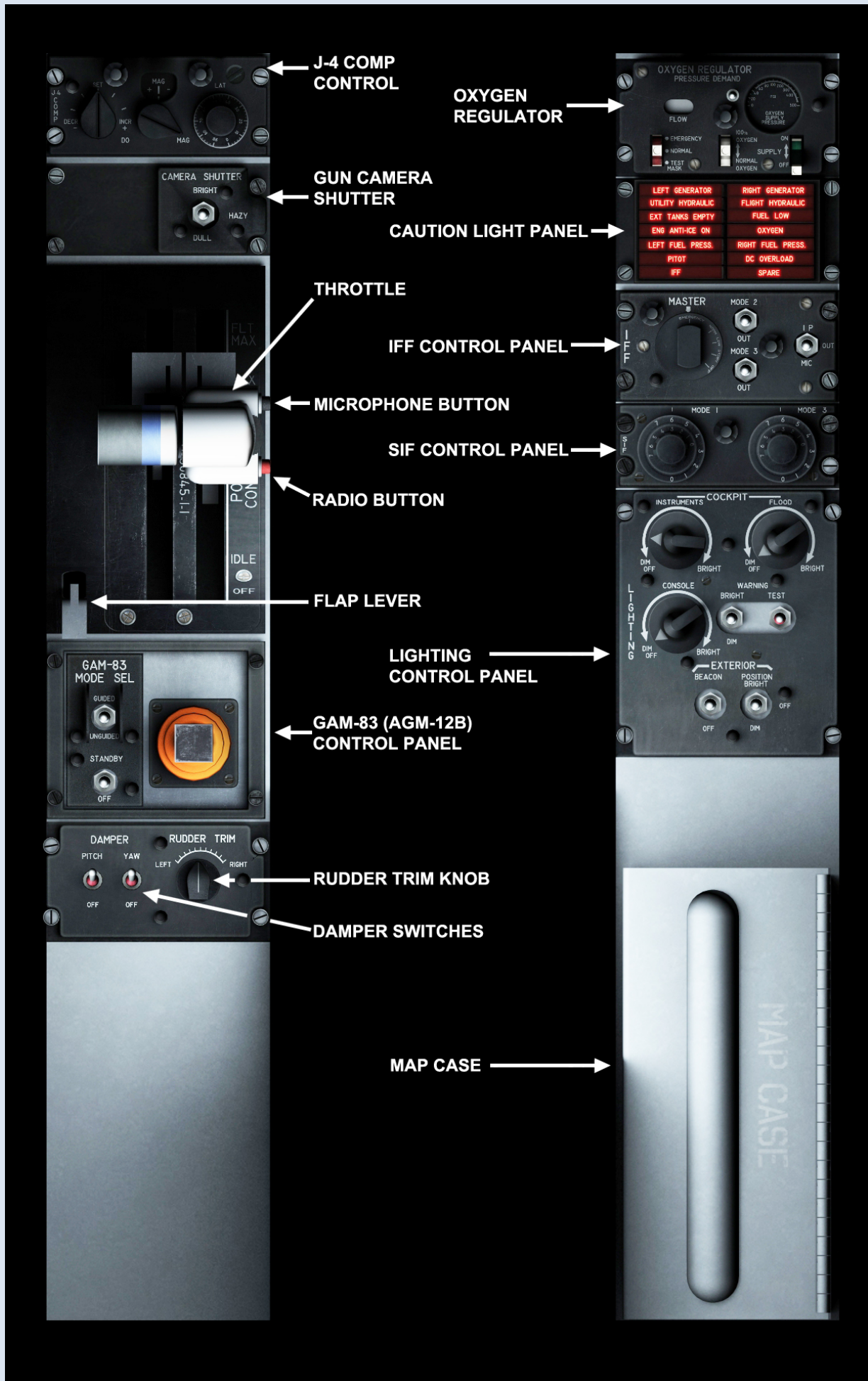


- |                                   |   |
|-----------------------------------|---|
| 12. ENGINE TACHOMETER INDICATORS  | 28. SIGHT FILAMENT SELECTOR SWITCH      |
| 13. EXHAUST GAS TEMP. INDICATORS  | 29. MISSILE VOLUME CONTROL KNOB         |
| 14. HYDRAULIC PRESSURE INDICATORS | 30. DOWNLOCK OVERRIDE BUTTON            |
| 15. CANOPY UNLOCKED WARNING LIGHT | 31. LANDING GEAR LEVER                  |
| 16. OIL PRESSURE INDICATORS       | 32. LANDING GEAR WARNING SILENCE BUTTON |

## Vertical Control Panels



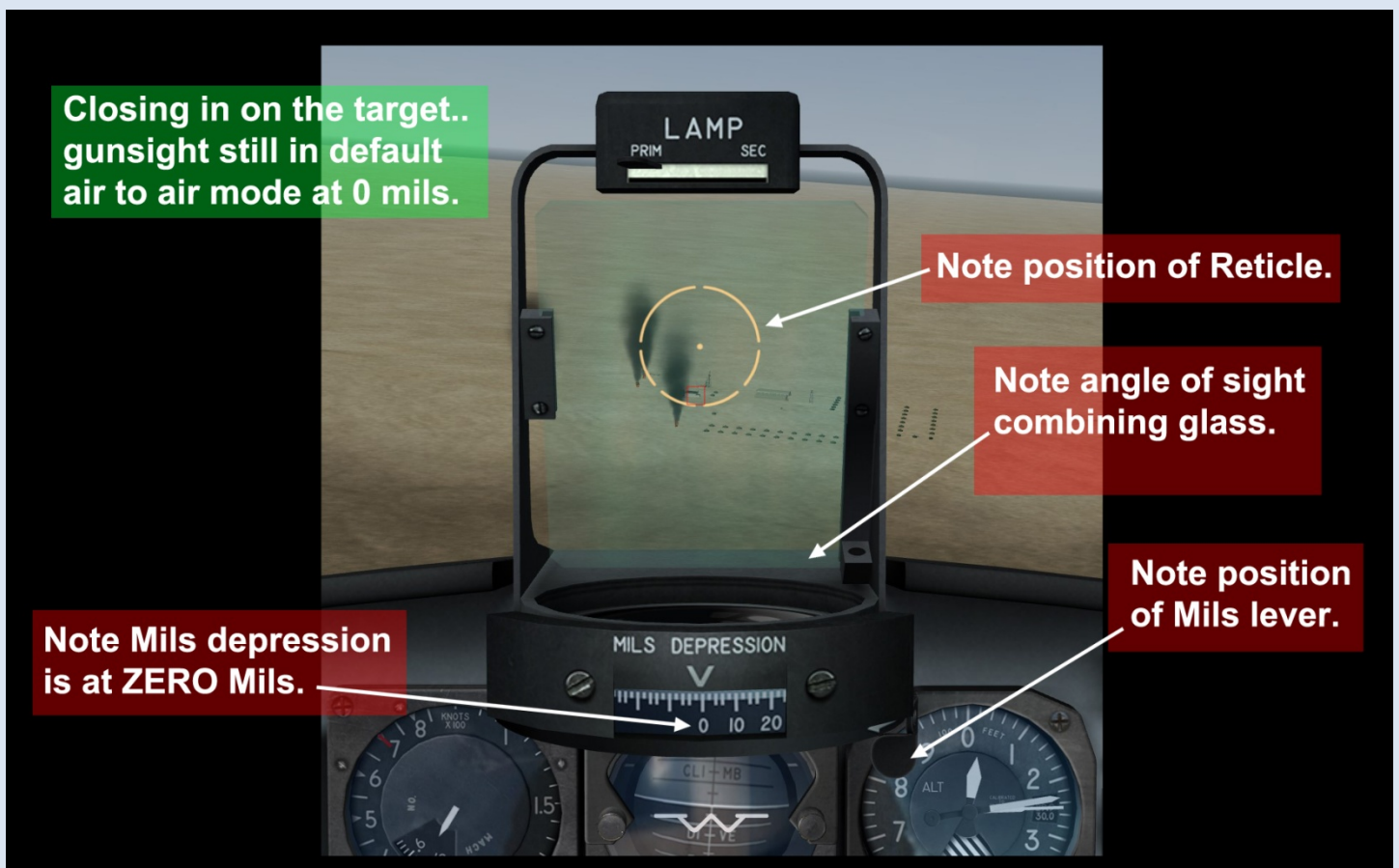
# Side Consoles



# The Gun Sight

The designers of the F-5A elected the simplest and most reliable gunsight conceivable. The low-cost, optical-mechanical reticle display was manually adjustable from 0 to 200 mils depression. It was collimated to avoid sighting errors. The gunsight was acceptable for aiming AIM-9B missiles, guns, rockets and bombs.

It was possible to "replicate" this simple, mechanical operation within *Strike Fighters 2* series parameters, and thanks to Crusader's cockpit.ini entries, we have the following functionality: The site itself is animated so that the Mils lever and the combining glass of the site move according to the Mills selected (activated when cycling through air to air weapons ; and more importantly, air to ground weapons with "Backspace" and "\" Backslash accordingly). The following in-game screenshots show this in action for an air to ground attack on an enemy Generator building.





Cycling through Air to Ground ordinance using (\) "Backslash" Key. Gunsight now in Cannon mode at 10 mils.

Note position of Reticle.

Note angle of sight combining glass.

Note Mils depression is now at "10" Mils.

Note position of Mils lever.

Cycling through Air to Ground ordinance using (\) "Backslash" Key. Gunsight now in Rockets mode at 36 mils.

Note position of Reticle.

Note angle of sight combining glass.

Note Mils depression is now at "36" Mils.

Note position of Mils lever.

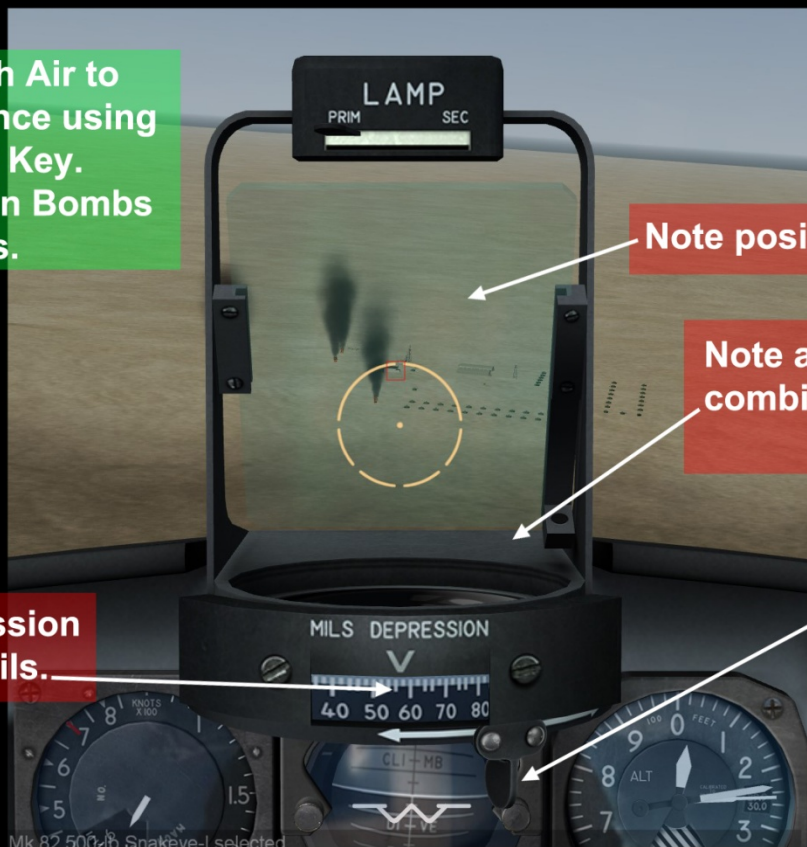
Cycling through Air to Ground ordinance using (\) "Backslash" Key. Gunsight now in Bombs mode at 58 mils.

Note position of Reticle.

Note angle of sight combining glass.

Note Mils depression is now at "58" Mils.

Note position of Mils lever.



Gun Camera "still" a split second after releasing a couple of MK.82 "Snakeyes" ...





**BOOM!!!**

**"mission complete..RTB"**



## Animated

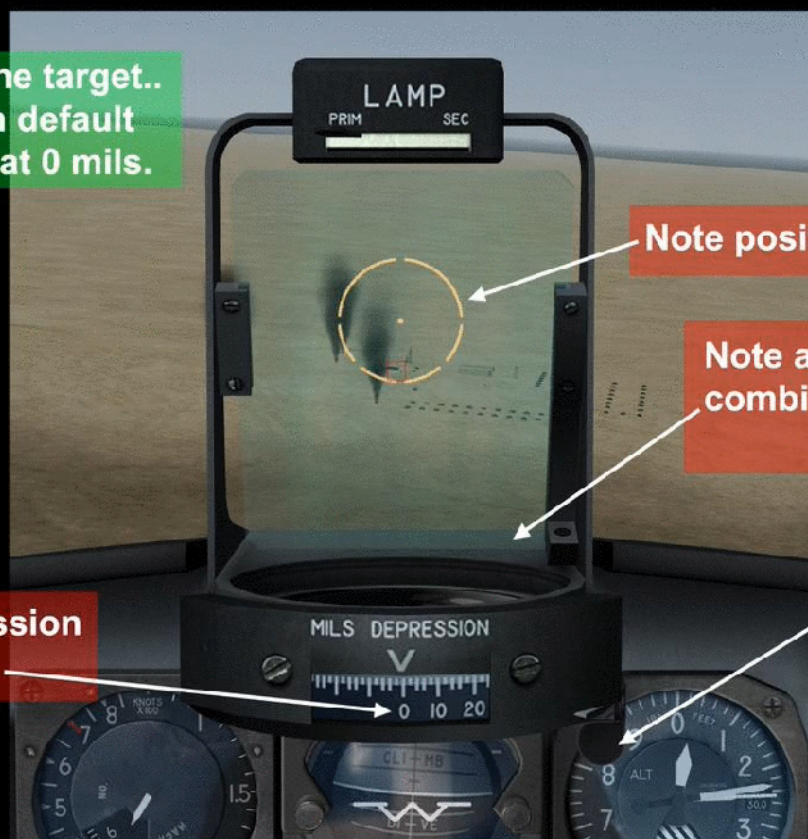
**Closing in on the target..  
gunsight still in default  
air to air mode at 0 mils.**

**Note position of Reticle.**

**Note angle of sight  
combining glass.**

**Note position  
of Mils lever.**

**Note Mils depression  
is at ZERO Mils.**



# Pilot's Notes

## F-5A Limit and Reference Speeds. [Indicated Airspeeds]

FLAPS: **300kts** for both leading and trailing edge.

NOTE: The F-5A uses full flaps for take off but due to a game bug you must manually select full flaps for take off when player flown. The AI will use full flaps although you can hear the flap sound cycling between flap 1 and flap 2.

LANDING GEAR: **240kts**

DRAG CHUTE: **165kts**

CANOPY: **50kts**

NOSE WHEEL STEERING: **65kts**

MAXIMUM INDICATED AIRSPEED: **710kts** [redline]

MAXIMUM MACH: **1.72 Mach** design limit but thrust/drag limited to about mach 1.50 in a 60deg dive from 50,000ft.

## TAKE OFF ROTATION SPEEDS

13500lbs: **155kts** [full internal fuel and two sidewinders]

20500lbs: **195kts** [about the maximum weight possible with included stores]

NOTE: Use full flaps for take off! Adding 6kts for every 1000lbs above 13500lbs should give good aft stick/rotation speeds.

## CLIMB SPEEDS

### Military Power:

13500lbs: **375kts** with a transition to mach 0.89

20500lbs: **310kts** with a transition to mach 0.74

### Maximum Power:

13500lbs: **595kts** with a transition to mach 0.93

20500lbs: **480kts** with a transition to mach 0.85

## FINAL APPROACH SPEEDS

With 500lbs fuel remaining and some empty racks use **160kts**. Add 5kts for every additional 500lbs of fuel.

NOTE: Target touch down speed is 20kts less than final approach speed.

## Brief Description

The F-5A Freedom Fighter is a small, highly aerodynamic fighter designed around two compact and high-thrust General Electric J85 engines, focusing on performance and a low cost of maintenance. Smaller and simpler than contemporaries such as the F-4 Phantom II, the F-5A cost less to procure and operate, making it a popular export aircraft. Though primarily designed for a day air superiority role, the aircraft is also a capable ground-attack platform. The F-5A entered service in the early 1960s. During the Cold War, over 800 were produced through 1972 for U.S. allies.

## Hellenic Air-force Service History

A charter member of NATO since 1951, Greece was a prime candidate for the Freedom Fighter under the Military Aid Program. The Hellenic Air Force was the first European air force to receive the Freedom Fighter. Service began with the delivery of 18 aircraft in June of 1965 to the 341st Moira (Fighter Squadron) based at Nea Anchialos, followed by deliveries to 343 Moira in March 1966, and to 337 Moira in December of the same year. Additional Northrop F-5As and F-5Bs were received to equip a total of two and a half Squadrons by April 1967, before the USA suspended the delivery of further F-5s, following a cooling of relations between the two countries due to a Greek military coup in 1967. The embargo was lifted by late 1968, allowing for deliveries to bring the three Squadrons to full strength. The US Military Aid Program was completed in July 1971, totalling 51 Northrop F-5A, 16 Northrop RF-5A, and 9 Northrop F-5Bs.

In the mid 1970s, ten F-5A and two F-5B Freedom Fighters, formerly serving with the Imperial Iranian Air Force, were delivered to Greece to supplement the original order. Subsequently, 13 F-5As and 6 F-5Bs were delivered from Jordan in 1983, and Norway transferred nine F-5As to Greece from May to August of 1986. In a second transfer from Jordan in 1989, 16 F-5As and four F-5Bs were delivered, and in 1991, ten Canadair NF-5As and two NF-5Bs, formerly with the Royal Netherlands Air Force, were acquired to supplement the survivors from the original MDAP deliveries. The NF-5As entered service with the Thessaloniki-based 349 Moira.



A total of 114 F-5As, 34 RF-5As, and 20 F-5Bs were supplied to Greece. At the height of its operational career in the Greek air force, the 28th Tactical Air Command had four operational F-5A squadrons:

111 Pterix (WING)

337 Moira - "PHANTASMA"    F-5A/B    (GHOST)

341 Moira - "VELOS"                F-5A/B    (ARROW)

343 Moira - "ASTERI"                F-5A/B    (STAR)

110 Pterix (WING)

349 Mira - "KRONOS"                RF-5A    (SATURN)

In the capable hands of Greek pilots, the nimble F-5A served with distinction throughout its service in the Hellenic Air Force, and was routinely scrambled to intercept Turkish A/F F-4E and F-104Gs which had violated Greek territorial air space. Such intercepts would commonly deteriorate into mock dogfights where the freedom fighters would routinely capture their foe's "six", thus ending the said incursions. Even into the nineties, F-5As were often called upon to intercept more advanced machines like the early block Turkish F-16s, which similarly, would frequently be outmaneuvered thus providing the chasing F-5A's with missile and gun solutions!

It must also be noted that in 1974\* (during Turkey's invasion of Cyprus, two F-5As were scrambled to intercept a pair of F-102 Delta Daggers which had violated Greek air space. The intercept quickly escalated into a dogfight after the leader of the F-5A flight pair witnessed the internal weapons bay of the lead F-102 open and an AIM-4 falcon being fired at his wingman! The missile failed to guide, but the leader immediately maneuvered behind the offending F-102 and fired two sidewinders; the first refused to track, but the second went straight into its tail and blew it to pieces. The second F-102 bugged out, but in an attempt to make an emergency landing on a roadway in Turkey some time later, crashed owing to fuel starvation.

With the progressive disbandment of the Squadrons in the 90s, all operational F-5s were gathered within the only remaining Freedom Fighter unit by 1997; the 343rd Squadron at Mikra. Although its official role was ground attack, it also played an important role as a "lead-in" fighter for advanced training of young pilots prior to being transferred to Mirage 2000 or F-16 units.



The last F-5 was decommissioned on the 29th of March, 2001, and the type was finally retired after 36 glorious years of operation in the Hellenic Air Force.

### **Sources:**

"Hellenic Wings" - Hellenic Air Force publication, issue 3, Autumn 2007

[http://www.joebaugher.com/usaf\\_fighters/f5\\_9.html](http://www.joebaugher.com/usaf_fighters/f5_9.html)

<https://www.the-northrop-f-5-enthusiast-page.info/>

\*[http://www.joebaugher.com/usaf\\_fighters/f102\\_5.html](http://www.joebaugher.com/usaf_fighters/f102_5.html)

\*Demetrius Stergiou, Europe & Cold War Database ,Cyprus 1974.

## **Hellenic Air Force Combat roles and Configurations**

Although the primary role of the F-5a was interception, it was also tasked with CAS and Interdiction missions.

On Intercept and Combat air Patrol missions, the F-5a was typically loaded with AIM-9 sidewinder missiles on wingtip launchers - AIM-9B(1965-74),-J(1976-79), - P1(1980-84), -P3,(1985-89) and the all aspect -P4 and -L (1990 on).

In the close air support role during its early life, (1965-1974) the F-5As carried LAU-3 rocket launchers and either Mk82 or Mk83 bombs under the wing pylons, but could also alternatively carry BLU-27 napalm bombs. Due to thermal fatigue however, from the mid-70s on, rocket launchers ceased being used and loadouts were typically Mk.20 Rockeye bombs (anti armor missions), or CBU-58B (anti-personnel missions) under the wings - though these imposed a heavy high-drag penalty, and an LAU-10 rocket launcher on the centerline.

On early service Interdiction missions, the F-5a was loaded with either two M117(750 pound) or two Mk83 1000 pound bombs, while on later missions (anti-runway, especially), the F-5a was loaded with Mk.82 SE (High Drag) Snakeye bombs. The standard Mk.82 500 pound (low drag) variants were used for shallow dive attacks on point targets.

# Specifications\*



## Engines:

Two General Electric J85-GE-13 turbojets, rated at 2720 lb.s.t., 4080 lb.s.t. with afterburning.

## Performance:

Maximum speed: 925 mph (Mach 1.4) at 36,000 feet.

Maximum cruising speed without afterburning: 640 mph (Mach 0.97) at 36,000 feet.

Stalling speed: 147 mph with flaps extended.

Initial climb rate: 30,400 feet per minute.

Service ceiling: 50,500 feet.

Takeoff run: 2650 feet with two Sidewinder missiles.

Landing run from 50 feet with braking parachute: 3900 feet.

Range with maximum fuel: 1387 miles.

Combat radius with maximum payload: 195 miles.

Combat radius with maximum fuel and two 530-pound bombs: 558 miles.

### Fuel:

Two internal fuel tanks composed of integral cells with total usable capacity of 583 US gallons. One 150 US gallon drop tank could be carried on the fuselage centerline pylon, two 150 US gallon droptanks could be carried underneath the underwing pylons, and a 50-gallon tank could be carried at each wingtip, bringing total fuel capacity to 1133 US gallons.

### Dimensions:

wingspan: 25 feet 3 inches

length: 47 feet 2 inches, height 13 feet 2 inches.

wing area: 170 square feet.

### Weights:

8085 pounds empty, 11,477 pounds combat, 13,433 pounds gross, 20,677 pounds maximum takeoff.

### Armament:

Two 20-mm cannon in the fuselage nose. Two AIM-9 Sidewinder missiles could be carried at the wingtips. Five pylons, one under the fuselage centerline and four under the wings that can carry up to 6200 pounds of ordinance or fuel tanks. A variety of bomb, rocket and gun packs can be carried from the centerline pylon, while underwing loads can include, 2 AGM-12 Bullpup air-to-surface missiles, bombs, unguided rockets, gun packs, or external fuel tanks.

\*(From [http://www.joebaugher.com/usaf\\_fighters/f5\\_2.html](http://www.joebaugher.com/usaf_fighters/f5_2.html))

# Paint Schemes





Between 1965 and 1970, all F-5a aircraft in HAF squadrons wore the typical Clear Coated Aluminum (Silver) scheme. From 1970, this scheme was replaced by the SEA (South East Asia) 3-tone scheme.

In 1980 the first 5 planes of 341 SQ were painted blue and then transferred to 343 sq. Eventually, all F-5A's of 341 & 343 adopted the Aegean Blue (inspired by the Mirage F-1CG's ), while those of 349 (F-5A's and RF-5A's retained the SEA scheme until their retirement).

Ex-Iranian F-5's were painted SEA upon arrival, while the ex-Jordanian aircraft retained the "Asia Minor" desert scheme from 1983 until 1986-87, by which time they were painted in either Aegean Blue or SEA colors.

Finally, the Ghost scheme (inspired by the F-16C/D Blk 30's) was adopted around 1992 and replaced the very effective Aegean Blue of all blue-painted jets.



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Sophocles

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