THE **SU-27 SK**

FLIGHT SIMULATION & COCKPIT

FOR ***FLIGHTGEAR.ORG***

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Introduction

This is an implementation of the SUKHOI's SU-27 4th generation fighter aircraft made for simulation in FlightGear 2017.2.1 and later .

This 4th generation fighter aircraft was built and planned initially to work in the Soviet Air Force as an air superiority fighter , and as a competitor for the 4th gen US and generally the west/NATO air forces superiority fighters , especially the Variants of the F-15 Eagle .
the **SK** variant of the fighter made first in the USSR and then in Russia & still in service in Russian and many air forces in the world , NATO reporting name : Flanker B.
You can get more information in Wikipedia by visiting this Page .
This aircraft have a stunning flight capabilities in combat maneuvers or in aerobatic shows , it was especially known by its amazing aerodynamics . It's also obvious that it was an icon in the
USSR and Russia aerospace industry .
This variant as a **commercial/export** version has been even manufactured under license in India and China . And since it flies outside the soviet Geo-space , got a lot of upgrades and modified avionics and systems especially :

- GPS navigation capability .
- Navigation using standard VOR/NDB/TACAN frequencies bands.
- Improved Flight Control System .
- A lot of other upgrades that you can find in details by Googling for : "SU-27 upgrades" .

Before starting the docs :
This work uses a lot of models and scripts and other works made by
* the FGUK-team for their SU-27 prototype ,
* MIG-29 developers,
* The F-15 developers,(their svg HUD was a huge help),
* The Mirage2000-5 developers ,
* A lot of FG Aircraft's developers ,
So Greetings and THANKS to all of them .

Greetings also flies to the FlightGear simulator Developers (The simulator Core developers, as they like to call themselves ;)) who spent a lot of time and efforts to bring a such beautiful piece of software .

The current aircraft package is at version 0.4 (as of feb/2019), so this is a "DEVELOPMENT" version , just published for Fun, Tests, and may be some contributions .

General flight characteristics

- Crew: 1
- Length: 21.9 m (72 ft)
- Wingspan: 14.7 m (48 ft 3 in)
- Height: 5.92 m (19 ft 6 in)
- Wing area: 62 m² (667 ft²)
- Empty weight: 16,380 kg (36,100 lb)
- Loaded weight: 23,430 kg (51,650 lb) with 56% internal fuel
- Max. takeoff weight: 30,450 kg (67,100 lb)
- Fuel capacity: 9,400 kg (20,724 lb) internal
- Power-plant: 2 × Saturn AL-31F turbofans
    - Dry thrust: 75.22 kN (16,910 lbf) each
    - Thrust with afterburner: 122.6 kN (27,560 lbf) each

Performance

- Maximum speed:
    - At altitude: Mach 2.35 (2,500 km/h, 1,550 mph)
    - At sea level: Mach 1.13 (1,400 km/h, 870 mph[103])
- Range:
    - At altitude: 3,530 km (2,193 mi; 1,906 nmi)
    - At sea level: 1,340 km (800 mi; 720 nmi)
- Service ceiling: 19,000 m (62,523 ft)
- Rate of climb: 300 m/s[107] (59,000 ft/min)
- Wing loading:
    - With 56% fuel: 377.9 kg/m² (77.3 lb/ft²)
    - With full fuel: 444.61 kg/m² (10,550.75 lb/ft²)
- Thrust/weight: 1.07 with 56% internal fuel; 0.91 with full fuel
- Maximum g-load: +9 g

* A lot of informations cited above were taken from Wikipedia.org

Part 1:

Cockpit

General cockpit overview

Pic N°:1:

1. HUD (Head Up Display).
2. HUD color and brightness control panel .
3. Armament pylons indicators .
4. HDD Head Down Display :Navigation & radar screen.
5. Angle of attack (left needle)and G load indicator(right needle).
6. Air speed indicator (in Km/H).
7. Attitude indicator(pitch,roll,bank and navigation indicators).
8. Vertical Velocity indicator(M/s).
9. Engines tachometer (RPM %).
10. Fuel quantity indicator(*1000 Kg).
11. Cockpit magnetic compass.
12. EKRAN (Early warning system) display .
13. Status leds indicators panel (canopy, radar,drag-chute,…etc..) .
14. Radar Warning System display device (RWS/RWR).
15. Radar Altimeter (M).
16. Pressure Altimeter (M for big needle/M*1000 for the small).
17. Horizontal Situation Indicator (HSI).
18. FOD Engines Intakes position indicator .
19. Exhaust temperature indicators (°C).
20. Gears control lever .

21. Flaps/Gears/Slats/Air Brake deployment indicator .
22. Clock watch & Chronometer .
23. Inner & outer radio navigation markers indicator lights (for ILS landing ops).
24. Hydraulics and pneumatic systems pressure indicators.

The Autopilot panel :

PIC N°2:

1 : **LAND:** by activating the AP (switch n°9) and pressing this button ,the LAND mode will be engaged .
Correct runway localizer frequency must be already set in NAV1(use radio dialog , press F12 to show the dialog).and check the beacons indicator lights ON if in range .
You should also be at max 25° deviation from the localizer course at 1820m (6000 ft) of altitude when entering localizer zone . keep your speed below 500 km/h , touchdown at about 270km/h of airspeed .

2:**NAV** : This is for the lateral radio NAV hold (Experimental , please test).

3:**NAVIG** : This button make an active AP (switch 9) follow the navigation route , route should be set and ACTIVATED from the route manager dialog .
If no active route found the ACS (AP) will fail and a warning light will be lit (N°4 under the HUD see “pic2”).The AP then should be RESET by pressing button8 from the same panel .

4:**AUTO** : This button make an active AP (switch 9) maintain the current attitude (Roll & Pitch).

5:**RADAR ALT** : Radar altitude hold (Or Terrain follow : NOT Yet Implemented).

6: **VERT** ; Vertical Speed hold mode ,(NOT Yet Implemented).

7:**ALT-HOLD** : Barometric altitude hold mode ,This button make an active AP (switch 9) maintain the current barometric altitude , no matter what roll commands entered by the pilot .

8:**RESET** : This button reset the AP , thus , disengaging any already active mode and solves the ACS failures due to lost route or localizer .use it generally when you see light N°4 (PIC2).