

# SAAF CHEETAH C

## For Microsoft Flight Simulator 2004

The Cheetah programme started out as an upgrade of existing Mirage III aircraft into Cheetah D and E aircraft. The Cheetah C entered service with the SAAF, after the Cheetah D and E.

The Cheetah C is fitted with high-tech radar, avionics and the latest weapons to make it a formidable opponent to even later fighter aircraft.

The Cheetah C features basically the same aerodynamic layout as the Cheetah D, E and R. The external components have been refined to make them more streamline. The new fixed in-flight refuelling probe uses less external piping to reduce drag. The wing is more refined, with the midway fences being deleted, but the dogtooth was retained. However, the biggest advantage of the Cheetah C, is the use of the Atar 9K50 engine as used in the Mirage F1 types and some later Mirage III types

The Cheetah C is South Africa's current front line aircraft and our nations' first line of defence. It is scheduled to remain in service until at least 2012.

### TECHNICAL INFORMATION

The Cheetah C has low-mounted delta wings with pointed tips. There is one turbojet engine inside fuselage, with semicircular air intakes forward of the wing roots below the canopy and a large, single exhaust. The fuselage is long, slender, and tubular with a pointed nose and a bubble cockpit. The tail is large, swept-back, and has a tapered tail fin with a square tip. There are no tail flats.

#### Designation

Cheetah C

#### Role

Intercept

#### Number Of Engines

One

#### Powerplant type

SNECMA-Atar 9C turbojet with afterburner

#### Max Power Rating

4,280kg (9,436lb) static thrust or 6,200kg (13,670lb) with afterburner

#### Length

49 ft, 3 in (15.02 m)

#### Span

27 ft (8.24 m)

#### Ceiling

17,000 meters

### Cruise range

900 nm

### In-Flight Refueling

Yes

### Internal Fuel

2,350 kg (2941L (980L c 980L l 980L r) (260g)

### Payload

4,000 kg

### Sensors

Cytano II radar, RWR

### Drop Tanks

625 L drop tank with 499kg of fuel for 96nm of range

1,300 L drop tank with 1,038kg of fuel for 199 nm of range

1,700 L drop tank with 1,358 kg of fuel for 260 nm of range

### Armament

2 30mm DEFA 552 cannon

R.530 R.550 Magic, AS.37 Martel, EU3 450Kg bombs,

AN52 nuclear bombs

### **THE FS MODEL**

The aircraft was designed as close as possible to the real aircraft. The panel was designed from photos, and represents the configuration used by the SAAF. The package consist of the model, panel, sound, VC and is fully animated. It features the following effects:

Droptanks

Chute

Afterburner

Contrails.

These effects are all executed via xml gauges on the main panel. The droptanks are released via a gauge on the left panel. The Chute is activated via a gauge on the main panel. It will automatically release when the airspeed is below 40 knots. The afterburner is engaged via a switch on the main panel, and can only be activated if the RPM is above 8200, and the throttle is above 95%, otherwise the engine will burn out. The contrails is automatically activated during flight.

All the gauges are designed in xml format, and are described in this document. A number of sub panels are included and toggled from the main panel. Please read

the instructions to operate the panel and aircraft optimally.

## INSTALLATION

Click on the selfinstalling file. It will automatically install all files to the correct folders in FS9

## MAIN PANEL



- 1. Clock**

Standard clock with seconds meter at the bottom. You are only allowed to do two barrel rolls, as it takes 16 seconds for the fuel to drain out of the feeder tanks if the aircraft is upside down
- 2. Compass**

Standard compass indicating the aircraft heading in degrees
- 3. Incidence Meter**

This gauge is used extensively in the real aircraft and its placement next to the HUD is an indication of its importance. Only the brightness of the gauge can be set by the pilot and position of the needle will alter according to the aircraft's weight, speed and configuration. Heavy airplanes at low speed need a higher incidence and where the limit is exceeded, the aircraft will stall. The red band indicates the danger zone and should be avoided.

4. **G Meter**

The gauge gives the positive and negative G's of the aircraft. Normal operation is limited to the blue area of the gauge

5. **HUD toggle switch**

6. **Fire Warning**

This button will flash during an engine fire. The fire may be extinguished by clicking on the button. An effect will show at the aircraft exhaust.

7. **Afterburner Warning Light Afterburner**

This light will go on when the afterburner is engaged.

8. **Airspeed Indicator**

Displays Indicated Airspeed (IAS) in Knots.

9 **Altimeter**

Displays height above sea level in feet.

10. **VSI (Vertical Speed Indicator)**

Shows the vertical speed in thousands of feet per minute.

11 **Fuel Tank Levels**

The gauge shows the total fuel and percentage left. The aircraft is configured to hold the following fuel loads:

Internal Fuel: 2,350 kg (2,941L (980L center, 980L left, 980L right) (260g)

Drop Tanks: 1,700 L drop tank with 1,358 kg of fuel for 260 nm of range

12 **MFD**

The MFD with nav info

13 **ARC/ROSE**

**Toggles the arc/rose functions of the MFD**

## 14 Flight data



This gauge shows flight data such as KTS, Mach, RA and Altitude

## 15 Fuel data



This gauge shows fuel data such as Center, left and right tanks, as well as total and time available

## 16 Nav data



This gauge shows NAV data such as Heading, Waypoint, DME and Waypoint heading

## 17 Engine data



This gauge gives the readout of engine stats

## 18 Chute Lever

As FS does not cater for a drag chute, the "TAIL HOOK" function of FS is used to control drag chute operation and the appropriate TAILHOOK keyboard key may also be used. The Chute is also activated via a gauge on the main panel. Open the chute by flipping the switch just before touchdown. The chute will open when the aircraft is on the ground, and will automatically release when the airspeed is below 40 knots.

## 19 NAV/GPS switch

**20 Refuel**

**Add fuel by clicking this button**

**21 Afterburner**

The afterburner is engaged via a switch on the main panel, and can only be activated if the RPM is above 8200, and the throttle is above 95%, otherwise the engine will burn out.

**22 Spoiler warning**

This light will go on when the spoilers are opened.

**23 Flight Director Mode (HSI)**

Flight director information is displayed by the attitude indicator (main panel). The flight director in FS is not completely independent of the autopilot, so the FD switch in the model works as a simple on/off switch.

The FD mode is actually taken from the autopilot NAV mode rotary switch. When FD is on, the FD switch points to the NAV mode that is currently selected on the autopilot. In FS the autopilot automatically starts the flight director. FD can be switched off while the autopilot is running and FD can also be switched on while the autopilot is off.

**24 Overspeed warning**

**25 U/C warning**

**26 LIM warning**

This light will go on when the gear is opened under to high speed and when the afterburner is engaged below 8200 RPM.

**27 Master waring light**

**28 Mach warning light**

Mach warning light activates when the aircraft reaches Mach1

**29 RADAR**

Eric Marcianos Radar gauge

**30 Mach Indicator**

The Mach indicator gives the Mach reading from M 1.25 to M 2.20

### 31 PDF

This gauge consist of 3 separate subpanels.

### PFD

This gauge displays the artificial horison and angle of the aircraft.

### 32 Weapons



Toggles the Weapons panel

It shows the weaponloads. You can change the number of rounds, but it will have no effect, as FS9 is not a combat simulation.

### 33 Map



Toggles the map panel

This is a conversion of the gps map

### 34 Parking Brake

#### Toggle Switches



The toggle switches open a number of sub panels:

- |   |           |   |             |
|---|-----------|---|-------------|
| 1 | Map       | 4 | GPS         |
| 2 | ATC       | 5 | Left panel  |
| 3 | Checklist | 6 | Autopilot   |
|   |           | 7 | Right panel |

## SUB-PANELS

### HUD



The HUD gives the normal readings like airspeed, altitude, Heading as well as readouts like RA, Waypoint, NDB, RPM, Gforce etc.

### GPS

The standard GPS has been included for flightsimmers who wants to use it. The CheetahC Is not equipped with a GPS.

### LEFT PANEL



#### Landing Gear Lever & Indicators

Click the lever to raise or lower the landing gear.

#### Engine Starter Button

Automatically starts the engine. Ensure that the fuel valve switch is on.

#### Fuel Valve

In order to start the aircraft, the fuel valve switch must be turned ON. This switch is also used to shut down the engine.

#### Drop Tank

By clicking on this switch, the drop tank is released.

### Air Brakes

This lever extends or retracts the air brakes fully. Should you prefer proportional control, you may assign this function to a spare joystick control lever

### Parking Brake

Click on brake lever to apply or release brake.

### Throttle

The throttle can be moved by dragging the mouse forward or backwards

## Engine Switches

Toggles the following switches:

Pitot

Battery

Alternator

Avionics

## RIGHT PANEL



### Panel lights

Simple On/Off panel lights.

### Strobe lights

Operates the white flashing beacons on the aircraft.

### Navigation lights

Operates the red & green lights on the wing tips.

### Landing lights

The landing lights are simplified in FS.

## RADIO

### Com & Nav

NAV1 is used for ILS and VOR tracking. There are two

of these gauges, with the second giving COM2 & NAV2

frequencies. FS radios work in whole numbers and fractions. The frequency is split into two either side of the decimal point. Click on either side of the numbers to increase or decrease the value: left side to decrease, right side to increase.

### ADF frequency

FS treats ADF as four independent numbers. There doesn't seem to be any way to increment the decimal place. Change the numbers - hundreds, tens, units. They work by increments only

## AUTOPILOT



The autopilot is a separate window from the main panel. It is toggled on/off by the toggle button.

### AP

Master On/Off button for autopilot functions. AP master does not control the auto throttle, which independently of the autopilot. The flight director can still use the NAV modes if the autopilot is off.

## **ALT**

Altitude hold will hold the altitude set using the Altitude hold selector above the altimeter (main panel). The vertical speed of any automatic climb/descent is set using 'DATUM ADJUST' (12). Altitude hold can be selected without the autopilot being on. With AP off 'ALT' mode will still pass required pitch information to the flight director (see Attitude Indicator, main panel). Selecting ALT hold will automatically deselect IAS or MACH hold, if either is in use.

## **HEADING**

Heading hold. Will hold the heading set on the Horizontal Situation Indicator (main panel). The heading is shown by the triangular bug on the HSI.

## **IAS**

This is not an autothrottle control. Indicated Air Speed hold will hold the current air speed by adjusting pitch alone. The current air speed value is read when IAS hold is activated. IAS hold will activate the autotrim system which will automatically adjust the tailplane setting for the held speed. With IAS hold selected, any manual change in throttle setting will be translated into a change in climb rate. Selecting IAS hold will automatically deselect ALT or MACH hold, if either is in use.

## **MACH**

This is not an autothrottle control. Mach Hold will hold the selected Mach number by adjusting pitch alone. The Mach number to hold can be set using the bug on the Mach indicator (main panel). Mach hold will activate the autotrim system which will automatically adjust the tailplane setting for the held speed. With MACH hold selected, any manual change in throttle setting will be translated into a change in climb rate.

## **VS**

Change the VS

## **NAV**

Master On/Off button for all auto navigation options. The 'NAV' button must be ON to use any of the functions on the rotary switch (9) below it (HEADING, MAN, LOC/VOR, GS AUTO, GS MAN, FLARE). When you first select 'NAV' mode on, the model will always be in 'MAN' mode. This has a similar effect to a wing leveler, taking control of both bank and pitch. NAV modes can be selected without the autopilot being on. When the autopilot is off, the NAV modes will still pass information to the flight director (see Attitude Indicator, main panel & Flight Director, centre panel).

## **CHECKLIST**

### **Pre-Start Cabin Check**

#### **Clock SET**

Mach/Airspeed indicator ZERO  
RPM indicator ZERO  
A/B lights TESTED  
Slaved Altimeter FLAG VISIBLE  
Vertical speed indicator ZERO  
Landing light switch OFF  
Landing gear handle DOWN  
Radio SET  
Throttle lever CLOSED  
Cockpit lights OPERATIONAL  
Fuel gauge CHECKED  
Cross-feed switch OFF  
Alternator switch ON  
Failure warning lights TESTED

### **Engine Start**

Parking brake ON  
Fuel valve ON  
Thrust lever IDLE  
Start power ON  
Engine STABLE AT 2900 RPM  
JPT NORMAL  
Alt lights OFF

### **After Start Checks**

Vertical reference ON  
Heading selector NAV1 or HDG  
VOR/ILS ON  
Standby Horizon ON  
Radio frequencies SET

### **Pre-Taxing Checks**

Trims SET  
Airbrakes CHECKED  
Fuel cross-feed OFF  
Fuel gauge quantities CHECKED  
Hydraulic pressure NORMAL

### **Taxing**

Parking brake OFF

Wheel brakes CHECKED

### **Line-up**

Heading CHECKED

Failure warning lights OUT

Pitot heat ON

Takeoff power RPM SET

### **Takeoff**

Landing lights ON

100 kts time-check CHECKED

AB IGNITED

RPM and JPT CHECKED

### **Climb**

Gear UP / LOCKED

RPM CHECKED

Landing lights OFF

### **Normal Descent**

RPM approximately 6,500

Establish -10 deg flight path slope

Maintain M = 0.92 and final IAS of 450 kts

### **Fast Descent**

RPM = 6,500

Airbrakes EXTENDED

Maintain IAS 300 kts

If rate of descent is to be reduced, retract airbrakes, maintain 300 kts, 6,500 RPM and a flight path of -5 degrees.

### **Downwind Leg Checks**

#### **Course / NAV SET**

Hydraulic pressure CHECKED

Airbrakes RETRACTED

Gear DOWN / LOCKED

Remaining Fuel CHECKED

Cross-Feed ON

Brakes light OFF

Landing lights ON

RPM CHECKED

Incidence CHECKED

### **Landing**

Maintain velocity vector on runway by compromising angle of attack, glide slope and engine RPM

Chute activate before touchdown

AOA 9 TO 11 DEGREES

Engine RPM 7,000 TO 7,600

At overrun AOA 13 degrees

Engine RPM 7,000

AS 135 kts

After touchdown, move throttle to idle. Do not extend airbrakes during flare-out

**After Clearing Runway**

Avionics OFF

Landing Light OFF

Trims NEUTRAL

**On Parking Area**

RPM STABILIZED

Avionics OFF

**Shutdown**

Throttle IDLE

Fuel valve OFF

Time RECORD

Battery OFF

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Rob Barendregt: Afterburner, and Chute gauges.

Radar: Eric Marciano

## DISCLAIMER AND USE

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