

# Operation Manual ICARO EC135

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## The Original

The [Eurocopter EC135](#) is a twin-engine civil helicopter produced by Eurocopter, widely used amongst police and ambulance services and for executive transport. It is capable of flight under instrument flight rules (IFR). The EC135 can trace its history back to before the formation of Eurocopter. It was started as the BO 108 by MBB of Germany in the mid-eighties. A technology demonstrator ('V1') flew for the first time on 17 October 1988, powered by two Allison 250-C20R/1 engines. A second BO 108 ('V2') followed on 5 June 1991, this time with two Turboméca TM319-1B Arrius engines. Both these machines had a conventional tail rotor.

BO 108 prototypeIn late 1992, the design was revised with the introduction of the Fenestron tail rotor system, reflecting the creation of Eurocopter that year through the merger of Messerschmitt-Bölkow-Blohm (MBB) and Aérospatiale. The combination of lower accident potential from the enclosed rotor, and interior space, have made the EC135 popular with aeromedical helicopter operators. The EC135 is the best selling light twin of the past 10



years. Two pre-production prototypes were built. They flew on 15 February and 16 April 1994, testing the Arrius 2B and Pratt & Whitney Canada PW206B engines, the older and less powerful Allison Model 250 powerplant having been rejected. A third helicopter followed on 28 November 1994.

The EC135 made its US debut at the Heli-Expo in January 1995 at Las Vegas. After over 1,600 flight hours, European JAA certification was achieved on 16 June 1996, with FAA approval following on 31 July. Deliveries started on 1 August, when two helicopters (0005 and 0006) were handed over to Deutsche Rettungsflugwacht. The 100th EC135 was handed over to the Bavarian police force in June 1999. By that time the worldwide fleet had accumulated approximately 30,000 flight hours. As of 2008, the fleet total stood at over 1 million flight hours, with over 650 aircraft delivered.

Single-pilot IFR (SPIFR) certification was granted by the German LBA on 2 December 1999. Deliveries to the German Aviators Corps began on 13 September 2000 at the German Army Aviators School at Bückeburg Air Base near Achum, Germany. The EC135 received SPIFR certification from the UK CAA in December 2000. In autumn 2000, Eurocopter announced the start of certification work for the Pratt & Whitney Canada PW206B2, a version of the PW207 which offers improved single-engine performance and 30 second emergency power. The LBA certification was achieved on 10 July 2001, and the first EC135 with the new engines was handed over to the Swedish National Police on 10 August 2001.

*(Source: Wikipedia)*





## Abbreviations and Terms

A/C - Aircraft  
ADF – Automatic Direction Finder  
AEO – All Engines Operative  
AFCP - Automatic Flight Control System  
AP – Autopilot  
BRG – Bearing  
CAD – Caution and Advisory Display  
CPDS – Central Panel Display System  
CRS – Course  
DH – Decision Height  
DME – Distance Measurement Equipment  
DST – Distance to go  
DTK – Desired Track  
ENG – Engine  
FADEC – Full Authority Digital Engine Control  
FCDS – Flight Control Display System  
FCS – Flight Control System  
FLI – First Limit Indicator  
FMS – Flight Management System  
GPS – Global Positioning System  
GS – Glide Slope  
GSM – Global Standard for Mobile communication  
HDG – Heading  
HSI – Horizontal Situation Indicator  
IAS – Indicated Airspeed  
ICP – Instrument Control Panel  
IFR – Instrument Flight Rules  
ILS – Instrument Landing System  
MFD – Multi Function Display  
ND – Navigation Display  
NDB – Non Directional Beam  
NMS – Navigation Management System  
OAT – Outside Air Temperature  
OEI – One Engine Inoperative  
PFD – Primary Flight Display  
RA – Radio Altimeter  
SAS – Stability Augmentation System  
TAS – True Air Speed  
TCAS – Traffic Collision Avoidance System  
TRQ – Torque  
TTG – Time To Go  
UL – Upper Limit  
VEH – Vehicle  
VEMD – Vehicle and Engine Monitoring Display  
VFR – Visual Flight Rules  
VOR – Very high frequency Omnidirectional Radio ranging  
XFER – Transfer  
XMSN – Transmission  
XPDR - Transponder



## Project History

The entire project is based on the EC 135 from Guenter Kraemer and Franz Haider, which was already published in July 2003 for the FS2002 with different variants. The panel/gauge appears by the way also in the EC 135 conversion of Heiko Richter.

Altogether we used nearly 18 months, in order to make the ICARO EC 135, what it is. We provided not only the external model, but also put much energy into the system depth. Now we have a helicopter, which is in the operation (normal procedures) very near to the original. We could not implement all things, the FS sets us barriers e.g. Engine 2, VCRain or a usable rotor brake.

Our thanks are valid for Guenter Kraemer and Franz Haider, they give us permission to use and develop their great work.





## The ICARO EC 135 in Flight Simulator

After installation ([see important.txt](#)) you will find 25 different models in FS under Eurocopter -> EC135 ICARO.

| Model                         | Skid        | Cockpit           | Sound  |
|-------------------------------|-------------|-------------------|--------|
| ADAC D-HBLN Winch             | norm        | clock1            | pw     |
| ADAC D-HBYF Radar Nose        | norm        | glass             | pw     |
| ADAC D-HDEC Sandfilter        | norm        | clock1            | pw     |
| ADAC D-HGWD                   | middle      | clock1            | pw     |
| ADAC D-HRET                   | norm        | clock1            | pw     |
| ADAC D-HWFH                   | norm        | clock1            | pw     |
| Bavarian Police D-HBPD        | middle      | glass/TCAS        | pw     |
| BMI HEMS D-HZSL               | high        | glass/HELLAS      | arrius |
| BMI HEMS D-HZSL               | Winter high | glass/HELLAS      | arrius |
| Bond G-DORS                   | norm        | glass UK          | arrius |
| BPOL D-HVBR                   | high        | glass/HELLAS/TCAS | arrius |
| DRF D-HDRP                    | norm        | clock             | pw     |
| DRF D-HDRU Winch              | norm        | clock             | pw     |
| Elitaniana I-PNTA Floats      | norm        | glass             | arrius |
| HEER 82+60                    | high        | glass             | arrius |
| ICARO HB-MUH                  | middle      | glass             | pw     |
| Life Flight D-HBYE Radar Nose | norm        | glass             | pw     |
| PHI N301PH                    | middle      | glass big         | pw     |
| POL Brandenburg D-HBBZ        | norm        | glass/TCAS        | pw     |
| REACH N86RX                   | middle      | glass half        | pw     |
| STAR ZS-RSR Sandfilter        | norm        | clock1            | pw     |
| STAT MED N533ME               | norm        | clock half        | pw     |
| US Carolina Air Care N861NC   | middle      | glass half        | arrius |
| ÖAMTC OE-XEP                  | norm        | clock1            | arrius |
| ÖAMTC OE-XEP Winter           | norm        | clock1            | arrius |

All models are developed with [LOD Level of Detail](#)

### Determination

The models can be differentiated relatively easily over the three skid heights: normal (low), middle and high. Then there are different additions such as radar noses, antennas, sinking protection at the skids, FLIR, search lights, hoists, hook systems, floats and winter equipments etc.

Altogether the models have ten different cockpit variants, which essentially differ by two types: glass and clock instrumenting.



## Cockpit Audio

All cockpits have cockpit audio recorded from original samples and in the volume uniformly. That begins with switches, goes over various warning audios up to windshield wiper or sand filter sounds.

## Engines Sound

There are two different sounds of engine - in each case for inside and outside: PW stands for Pratt & Whitney and Arrius for the Turboméca Arrius versions. We have recorded real sounds and converted them to FS. We adhered to the T2 and P2 models. The Arrius sound corresponds to the Turboméca Arrius 2B2, the PW sound the Pratt & Whitney Canada PW206B2.

*Tip: The cockpit audio sounds are not adjustable via the sound settings in FS - contrary to the sounds of the engines.*

*In case of too loud audio sound, level up the engines sounds in FS Settings and turn down the sound system of your computer.*

## Specifics

There are only two standard [2D cockpit](#) variants included - glass und clock. The 2D cockpits have the same functions like the VC cockpits variants



**2D-Cockpit Glass**



**2D Cockpit Clock**

To get the correct numbers, and all systems working as intended, [Cold & Dark](#) situation is recommended. Load the default Flightsim situation (Cessna in Seattle). Shutdown the engine and all systems. Reposition the Cessna to your favourite location and select a ICARO EC 135 model of your choice. Wait until rotor has stopped and save the new situation.

The behavior to control the engines is quite different to standard helicopters in FS. So key functions like [Ctrl+E](#) to start up engines [is not possible](#). Like the real one you have to start up the engines by yourself from the cockpit.

To get the correct working of the instruments in VC, it is recommended to open 2D main panel first.

**RADIOS:** Do not use radios in VC, take the standard one in 2D cockpit.



### After the first loading in FS

Perhaps you will hear engines sound and the rotor is turning. To eliminate this, please go to the engine control panel on main and

1. switch on Batterie BAT MSTR
2. both FADEC ENG 1 and ENG 2 switch on und
3. switch off again.

Engines are running down. Wait until rotor has stopped. And finally switch off battery BAT MASTER. Save this new situation.



All switches have mouse  
courser display



## Minimums to start the engines

If you want to discover the systems, you should start the engines and connect the electrical systems. This is essential, because the batteries will discharge very quickly.

For normal procedures please follow the checklists at the end of this manual. They characterize the procedures of the real helicopter.



- |                            |                                                  |
|----------------------------|--------------------------------------------------|
| 1. BAT MSTR                | - ON (self test CDPS displays)                   |
| 2. GEN 1+2                 | - ON                                             |
| 3. INV 1+2                 | - ON (Overhead)                                  |
| 4. FADEC 1 + 2             | - ON (self test FLI+RPM Tacho)                   |
| 5. PRIME fuel pumps 1+2    | - ON (Overhead)                                  |
| 6. ENG 1 control           | -> IDLE                                          |
| 7. ENG 2 control           | -> IDLE                                          |
| 8. Throttle                | >25 % until CAD remarks IDLE - than throttle 0 % |
| 9. XFER fuel pumps FWD+AFT | - ON (Overhead)                                  |
| 10. PRIME fuel pumps 1+2   | - OFF (Overhead)                                 |
| 11. ENG 1+2                | -> FLIGHT                                        |



## To open the doors

The four side doors can be opened with the mouse from VC separately. Simply click on the respective door. The front sliding windows are to be opened by clicking on the sliding window field.



You can also use the keys STRG+E+1 ... 4.

|          |                          |
|----------|--------------------------|
| STRG+E+1 | left front door          |
| STRG+E+2 | right front door (pilot) |
| STRG+E+3 | left sliding door links  |
| STRG+E+4 | right sliding door       |

The [shell doors](#) opens with Tailhook key. Perhaps you have to activate this key function in FS separately.

[Hoist](#) animation is combined with the left sliding door



## Cockpit Description



*Virtual Cockpit Glass Hellas TCAS (EC 135 T2 Bundespolizei)*



*Virtual Cockpit clock 1 (EC135 P2 Deutsche Rettungsflugwacht)*



## Overview Main Panel



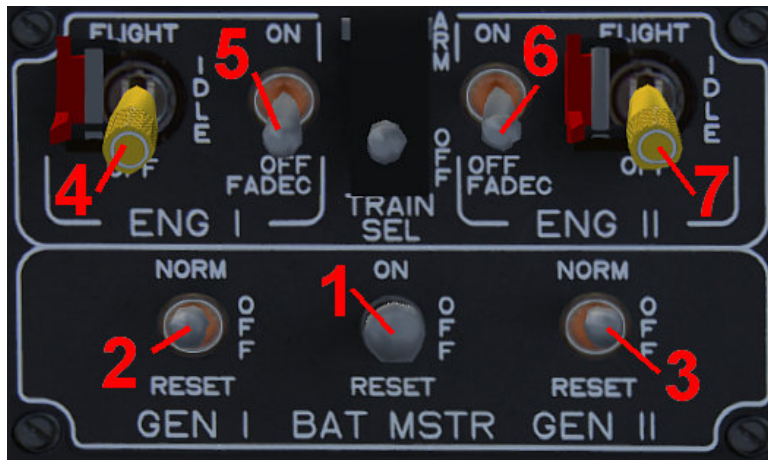
- |                         |                      |                     |
|-------------------------|----------------------|---------------------|
| 1 PFD+ND pilot          | 6 Backup Instruments | 11 Engine 2 Fire    |
| 2 CPDS                  | 7 Clock              | 12 High NR switch   |
| 3 PFD+ND copilot *      | 8 RPM Tripple Tacho  | 13 HELLAS display   |
| 4 Engine Control        | 9 Warning Unit       | 14 Headphones mount |
| 5 Switch MFD copilot ** | 10 Engine 1 Fire     | 15 TCAS display     |

\* if FSMap is installed, click on Left MFD area to activate (left PFD/ND display must be off)

\*\* Left Multi Function Display (PFD+ND):  
Switch on/off Left PFD/ND display



## Engines Control System



- |                       |                           |
|-----------------------|---------------------------|
| 1 Batterie (BAT MSTR) | 4 Engine 1 Control Switch |
| 2 Generator 1 (GEN 1) | 5 FADEC 1                 |
| 3 Generator 2 (GEN 2) | 6 Engine 2 Control Switch |
|                       | 7 FADEC 2                 |

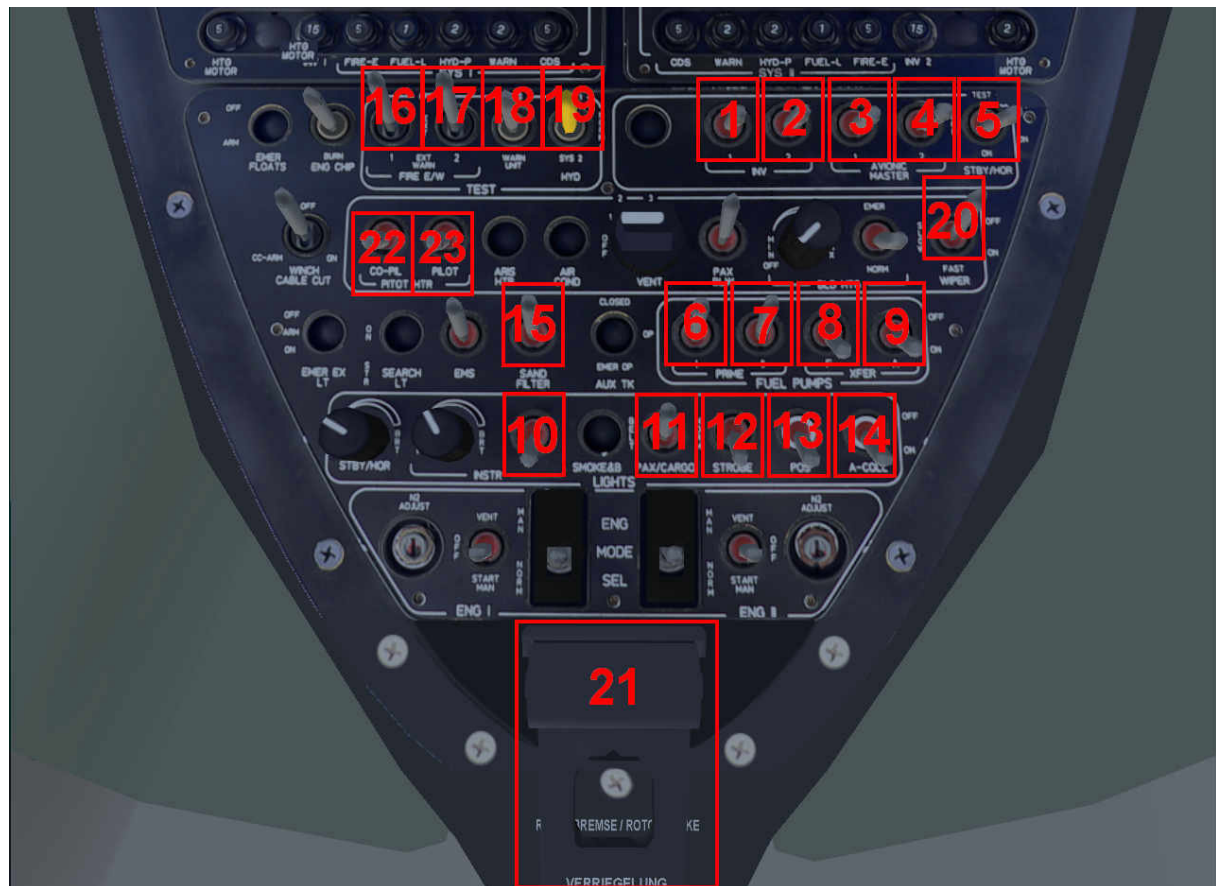


Function of engines switches VC:

- FLIGHT** - mousecoursur + sign  
**IDLE** - mousecoursur hand sign  
**OFF** - mousecoursur - sign



## Overview Overhead Panel



- |                     |                           |                  |
|---------------------|---------------------------|------------------|
| 1 Inverter 1        | 11 Pax Cargo Lights       | 21 Rotor brake * |
| 2 Inverter 2        | 12 Srobe Lights           | 22 Pitot HTR LH  |
| 3 Avionics Master 1 | 13 Position Lights        | 23 Pitot HTR RH  |
| 4 Avionics Master 2 | 14 Anti Collision Lights  |                  |
| 5 Horizont BAT      | 15 Sandfilter             |                  |
| 6 Prime Pump 1      | 16 Engine 1 Fire Test     |                  |
| 7 Prime Pump 2      | 17 Engine 2 Fire Test     |                  |
| 8 XFER Pump FWD     | 18 Warn Unit/Display Test |                  |
| 9 XFER Pump AFT     | 19 Hydraulic System Test  |                  |
| 10 Interior Lights  | 20 Wiper Control          |                  |

\* without funktion



## Overview middle consoles

### Slant console (glass cockpit variants)



- 1 AFCP
- 2 Trimble GPS
- 3 ICP Pilot
- 4 ICP Copilot
- 5 COM 1
- 6 NAV 1
- 7 COM 2
- 8 NAV 2
- 9 ICARO GPS \*

\* ICARO members only

### Slant console (clock instrument cockpit variants)



- 1 Garmin 430
- 2 Garmin 430 #2
- 3 Garmin Transponder GTX 330
- 4 ICARO GPS \*
- 5 Audio Sel
- 6 Audio Sel #2

\* ICARO members only



## Middle console and collective



### Collective

- 1 Landing Light in/out
- 2 Landing Light on/off
- 3 Floatation System
- 4 Wiper (normal speed)
- 5 Taxi Lights

### Console

- 6 COM 1/2 Sel
- 7 ADF
- 8 Transponder
- 9 HELLAS on/off
- 10 ICARO FMS \*

\* ICARO members only



## PFD Primary Flight Display (SMD45H)

The primary flight display provides all essential flight parameters.



Displayed parameters:

- Attitude
- Airspeed
- Altitude
- Vertical speed, digital and analogous
- Speed trend
- Altimeter pressure
- Radar Altitude (digital and bar graph)
- Decision height flag
- AFCS indications

## Navigation Display (SMD45H)

The navigation display provides all navigational data required by the pilot.



Displayed parameters:

- Heading, analogous
- VOR1/VOR2/ADF/GPS-Information
- VOR Course
- Time to Go to DME-Station or GPS waypoint
- Speed
- Autopilot Heading Setting
- Bearing
- Distance to DME-Station or GPS waypoint
- Decision Height
- Radar Altitude

## ICP (Instrument Control Panel)

PFD and ND are controlled by the ICP located on slant or middle console.





## CPDS Center Panel Display System



### CAD

- 1 Display on/off
- 2 Scroll page
- 3 Select

### VEMD

- 1 Upper Display on/off
- 2 Lower Display on/off
- 3 Scroll (System Status page on/off)
- 4 Reset (Flight Report page)
- 5 Select EI system display
- 6 + EI system
- 7 - EI System
- 8 Enter

### CAD Caution and Advisory Display

The CAD displays cautions and fuel quantity parameters. The fuel parameters are only displayed on the CAD and are no longer available if the CAD fails.

The cautions inform the crew about defects in onboard systems. They appear in three columns:

- left column: messages relating to engine 1 and system 1
- center column: messages relating to non-redundant systems
- right column: messages relating to engine 2 and system 2

The cautions are listed in order of their appearance. If there isn't enough room to display all cautions, "1 of 2" will appear at the top of the center column to indicate the presence of a second page with cautions. This page can be accessed by the "Scroll" button.



### Acknowledge of CAD messages

You have to acknowledge all caution messages either by pressing the reset button on the stick or by pressing the “Select” button next to the CAD (you can also use the brake bottom on your joystick). This leads to all cautions being displayed in their order of appearance. Also the yellow master caution will extinguish.

### VEMD Vehicle and Engine Monitoring Display

The upper VEMD displays the FLI page. It contains following parameters: Torque, TOT, N1 and the Mast Moment. If a parameter fails, it is displayed with yellow characters without its associated numeric value.

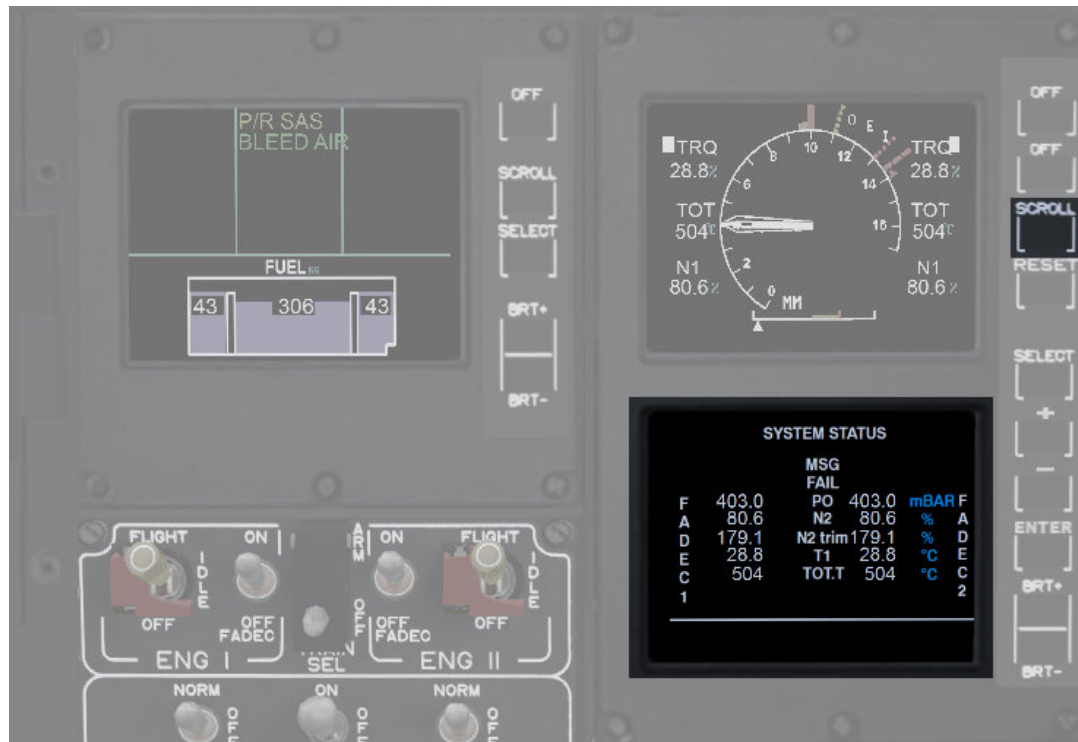
The lower screen contains parameters of the engines and the electrical system. The following parameters are displayed: outside air temperature, voltage and current, oil pressure and temperature.

In case of a failure of the upper VEMD display (or you switch it off), a new display appears in CAD display. It shows both engines Torque parameters

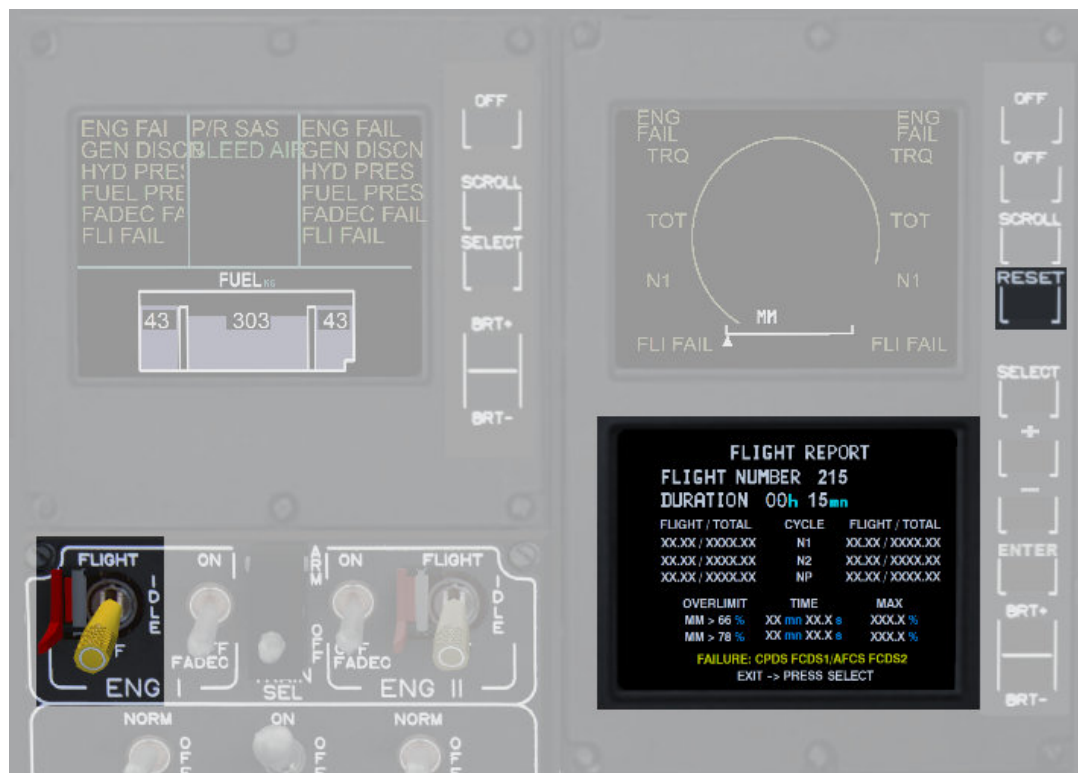




The [System Status](#) page with more engines parameters appears with the SCROLL-key.



The Flight Report page automatically appears by switching off Engine 1.



RESET key will reset the recorded duration time to zero again.



## System Tests

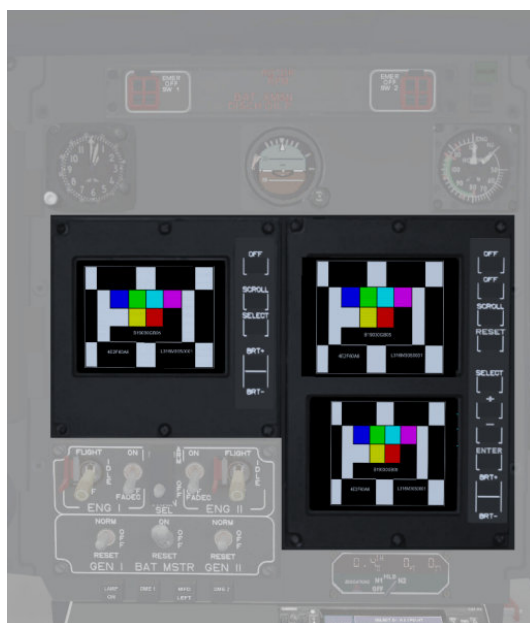
In overhead panel the system test switches are located the left upper range (see Overview Overhead switches 16 - 19). All switches are acting usually interactively with the CAD and have partial special audio sounds.

### Engines Fire Test (switches 16+17)

It serves for testing whether the fire-extinguishing system of the two engines also follow functions.



### Test CPDS Displays und Warning Unit (switch 18)



*Position CPDS*



*Position Warning Unit*



## Fire-Extinguishing System

A simulated fire-extinguishing system is included.

1. Open the red safety cap with the mouse (mouse: FIRE ENG CAP)
2. Press the key which is under the cap (mouse: Emergency switch). Since the engines are coupled, both engines are running down immediately. You will hear the blowout sound of the fire extinguishers.



*Open red safety cap*



*Engine 1 shut off*

If you use the system in flight, you can simulate auto-rotation landings. Function of collective will work.



## Miscellaneous

### High NR



High NR is used within normal procedures exclusively to take off/landing or slow-speed flight. The system is already active after switching on the electrical systems (automatic mode). In HIGH NR mode, the engines bring 3 per cent more power. A higher take-off weight as well as more power reserves for takeoff, landing and slow-speed flight are available.

In order to preserve the engines, main gear boxes and rotor system, HIGH NR may only until 60 KIAS to be used. With click on the switch the system is deactivated.

HIGH NR is successor of the CAT A system and is build into the P2+/T2+.

### Clock



The second hand is activated, by clicking on the field right above with the mouse. A second mouse click brings the pointer back to zero.



## Cage Backup HORIZON



The Backup Horizon is an analog instrument and is locked for protection. This is signaled by a red warning flag. Before take off the instrument must be unlocked.

\*\*\*\*\*





## CHECKLIST FOR NORMAL OPERATION

### 1. PRE-START CHECK

BAT MSTR switch - ON; CPDS internal test starts

**NOTE: Do not switch off CPDS during or after flight**

CDS/WARN UNIT TEST sw up - WARN UNIT (all lights on)

CDS/WARN UNIT TEST sw dwn - CPDS; Check display test screen

Fuel XFER pumps (AFT and FWD) sw - ON; Check caution (F PMP AFT/FWD) off

Fuel XFER pumps (AFT and FWD) sw - OFF

Fuel PRIME pumps (1 + 2) sw - ON and check caution coming on

A-COLL light sw - ON

CPDS - Check units

VEMD - DC voltage: minimum 24V DC

CAD fuel quantity indication - Check quantity

**CAUTION DO NOT SWITCH ON FADEC UNTIL CPDS SELF TEST HAS BEEN COMPLETED**

FADEC sw 1+2 sw - ON

Sandfilter sw - ON (sandfilter versions only)

### 2. STARTING ENGINES

Before starting engines Rotor area - Clear

First Limit Indicator - Check needle shows TOT

**ENG1 MAIN sw**

- **IDLE**, simultaneously start clock
- FLI Monitor:
- N1 increase
- TOT rise (~ 720°C) note that FLI needle moves not until ~ 350°C.
- Engine oil pressure increase
- N2 and NRO increase

**Throttle (collective) >25 % power** until FLI remarks IDLE TRQ 8.6 % - than throttle 0 %

Ground IDLE - Check approx. N1=63%



- ENG2 MAIN sw**
- **IDLE**
  - FLI Monitor:
  - N1
  - TOT
  - Engine oil pressure
  - N2 and NRO

When IDLE 1+2 speed of N2= >60% is reached:

- Both Fuel XFER (AFT and FWD) sw** - **ON**
- Both Fuel PRIME pumps (1+2) sw** - **OFF**
- Inverter 1+2 sw** - **ON**
- Avionic Master switches 1+2 sw** - **ON**
- Avionics - Check on and set
- Instruments - Set and check
- Both ENG1+2 MAIN sw** - **FLIGHT**

## 2.1 ENGINE QUICK START PROCEDURE

**NOTE:** *Only recommended if special circumstances require.*

- INVERTER 1 sw** - **ON**
- First Limit Indicator - Check needle shows TOT
- ENG1+2 MAIN sw**
- **FLIGHT**, simultaneously start clock
  - Monitor:
  - N1 increase
  - TOT rise (~ 720°C) note that FLI needle moves not until ~ 350°C.
  - Engine oil pressure increase
  - N2 and NRO increase

When N1>65% at both engines:

- Both Fuel XFER pumps sw** - **ON**
- Both Fuel PRIME pumps sw** - **OFF**
- Inverter 2 sw** - **ON**
- Avionic Master 1+2 sw** - **ON**
- Avionics and Instruments - Check on and set



### 3. SYSTEM CHECKS

#### PRE-TAKEOFF CHECK

- |                          |              |
|--------------------------|--------------|
| NRO/N2                   | - Check ~97% |
| All WARNINGS, CAD & VEMD | - Check      |
| All doors                | - Closed     |

**NOTE:** Due to start sequence the FLI needle of the second started engine can show TOT start mode instead of torque. Switch the engine in TOT mode to FLIGHT position first.

#### 4. TAKEOFF

- |                                    |                                                                                                                                                                                      |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collective                         | - Check if starting triangles disappeared, if not perform small input (~ 30% torque)                                                                                                 |
| Hover flight                       | - Perform                                                                                                                                                                            |
| NRO/N2 instrument                  | - Check ~ 100%                                                                                                                                                                       |
| FLI needles                        | - Check matched at same Parameter                                                                                                                                                    |
| All WARNING, CAD & VEMD indication | - Check                                                                                                                                                                              |
| Recommended takeoff procedure:     |                                                                                                                                                                                      |
| Acceleration and climb             | - Start nose down pitch rotation and simultaneously increase power smoothly so that the helicopter gains speed and height. Observe Height-Velocity diagram as described in Section 5 |
| When reaching 50 KIAS              | - Maintain airspeed until reaching 50ft AGL, then accelerate to VY (65kt) and climb through 100ft AGL                                                                                |
| When reaching 60 KIAS.             |                                                                                                                                                                                      |
| HIGH NR sw                         | - OFF                                                                                                                                                                                |



## 5. PRE-LANDING CHECK

All instruments - Check

All WARNINGS, CAD & VEMD indications - Check

## 6. LANDING

**CAUTION** AN OSCILLATION, WHICH COULD BE UNINTENTIONALLY INDUCED/ASSISTED BY THE PILOT (PIO/PAO) MAY BE EXPERIENCED DURING RUNNING LANDING OR HARDER VERTICAL LANDINGS.

**IN CASE OF PIO/PAO, RAPIDLY INCREASE OR DECREASE COLLECTIVE LEVER, WHATEVER SITUATION ALLOWS, UNTIL OSCILLATION HAS STOPPED.**

Recommended landing procedure:

- |                          |                                                                                                       |
|--------------------------|-------------------------------------------------------------------------------------------------------|
| After reaching 50 ft AGL | - Descent with 300 ft/min = R/D<br>< 500 ft/min at 40 KIAS                                            |
| Before touchdown         | - Establish flare attitude to reduce<br>ground speed and raise collective<br>lever to cushion landing |
| Touchdown                | - Establish with zero groundspeed                                                                     |
| Cyclic stick             | - Neutral                                                                                             |

## 7. ENGINE SHUTDOWN

- |                                    |                                                 |
|------------------------------------|-------------------------------------------------|
| ENG1+2 Main sw (s)                 | - IDLE; Clock - Start                           |
| Inverter sw (s)                    | - OFF                                           |
| Avionic Master switches            | - OFF                                           |
| STBY/HOR sw                        | - OFF                                           |
| Fuel XFER pumps (FWD and AFT)      | - OFF                                           |
| All electrical consumers           | - OFF; except anti-collision light and FADEC sw |
| After 60 seconds:<br>ENG 2 Main sw | - OFF<br>MonitorEngine parameters               |
| ENG 1 Main sw                      | - OFF<br>MonitorEngine parameters               |



When rotor has stopped:

- |                             |              |
|-----------------------------|--------------|
| <b>Anti collision light</b> | <b>- OFF</b> |
| <b>FADEC sw (s)</b>         | <b>- OFF</b> |
| <b>BAT MSTR sw</b>          | <b>- OFF</b> |

\*\*\*\*\*





## ICARO EC 135 Team

**Joerg Hammes**  
**Martin Hanneman**  
**Michael Jordan**  
**Roman Keich**  
**Thomas Roehl**

**Airfiles**  
**Interior Textures**  
**Co development FSX**  
**Sounds, Effects, Lights**  
**Models, Panels, Gauges, Panelsounds, Textures, Manuals**

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| Lee Hetherington    | TCAS ILH gauges                   |
| Don Kuhn            | Garmin Radios                     |
| Philipp Odenthal    | Repaint LifeFlight D-HBYE         |

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| Guenter Kraemer   | FSDS Source-Files EC 135                       |
| Nate Rosenstrauch | reworking outside fuselage and rotor animation |



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Germany, November 2011

ICARO Aircraft Development Team

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